Comprehensive Service Analysis

FINAL REPORT

APPENDICES

April 2017

CRCOG CAPITOL REGION COUNCIL OF GOVERNMENTS

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APPENDIX A

REVIEW OF PREVIOUS PLANNING STUDIES

PREVIOUS PLANNING STUDIES

Over the past 15 years, a number of planning studies at the local, regional, and state-wide level have either directly focused on transit service in the Greater Hartford region, or have focused on related issues that can impact CT Transit's services and operations. These documents provide context for the issues, challenges, and opportunities related to mobility in the Hartford area.

The study team identified and reviewed the following seven studies that are directly relevant to the Comprehensive Service Analysis:

- Connecticut DOT Statewide Bus System Study (2000)
- CRCOG Regional Transit Strategy (2001)
- Hartford East Bus Rapid Transit Feasibility Study (2004)
- Northwest Corridor Transit Study (2007)
- Buckland Area Transportation Study (2009)
- NHHS Rail Service Development Project (2011 update)
- CTfastrak 2015 Service Plan – Revision 1

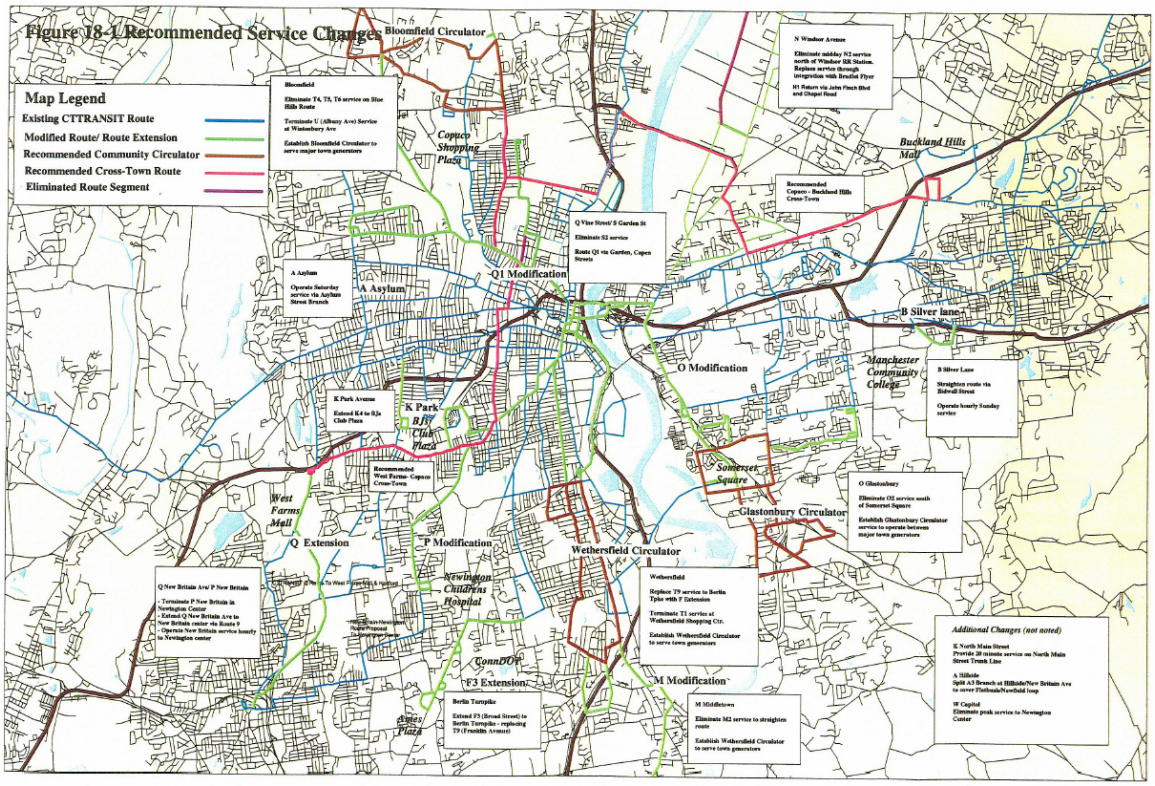
The key findings and recommendations of each study are described below. Comparing these recommendations against the existing transit network will allow the study team to understand the origins of the current service approach, as well as the persistent challenges that have kept some recurring recommendations from being implemented.

Connecticut DOT Statewide Bus System Study (2000)

The Connecticut DOT Statewide Bus System Study was prepared for the State of Connecticut to analyze how effectively each of the state's 20 urban and rural transit systems operate and determine opportunities for improvements in efficiency and service coverage. The study includes 21 individual reports, with one report completed for each system in Connecticut, including CTTransit's Hartford system. The Study was conducted by a team led by Urbitran Associates and completed in July 2000.

The study identifies statewide opportunity areas for improved service, including adjusting schedules to better match transit demand, improving interregional connections, and serving newer commercial, industrial or residentially areas that are currently unserved. The study's proposed changes emphasize efficient reallocation of resources. The report focusing on Hartford recommends service modifications for many of CTTransit's routes. These changes include increases in frequency, route modifications, and changes to hours and days of service.

Another recommendation included in the study is the creation of two new cross-town routes, which would allow for direct suburb to suburb travel without requiring a transfer through downtown Hartford. The first recommended cross-town route would travel from Copaco to Buckland Hills Mall, creating an east-west corridor north of the center of Hartford. The second would travel from West Farms Mall to Copaco, creating a north-south corridor on the western side of the Connecticut River, which would provide access from numerous low- and moderate-income residential areas to the commercial areas along the corridor.



CRCOG Regional Transit Strategy (2001)

The CRCOG Regional Transit Strategy (RTS) was developed by a team led by Parsons Brinkerhoff to help the Region's decision-makers gain a better understanding of the implications, both transportation and fiscal, of future investments in public transportation. The RTS also sought to define a role for transit that addressed the known needs of the Region's residents and employers, both current and future. The Strategy put forth recommendations for four major elements of a transit system: rapid line haul service; local feeder, distributor service; circulation within activity centers; and passenger portals such as bus stops, stations, and transfer centers.

The development of exclusive transit facilities was recommended along five corridors. Four of these corridors were to be developed as busways: the New Britain Hartford Busway, the Griffin Busway, the Manchester Busway, and the Rocky Hill Busway. The final corridor, the New Haven Hartford Springfield corridor, would be developed for commuter rail service.

A downtown circulation system was evaluated as part of the Strategy and found to be integral to the success of the rapid transit facilities. Such a system was being studied in another project at the time, so the RTS did not work to define the system; however, the document emphasizes the importance of a downtown circulator to provide means for people to move between activity centers downtown.

Proposed enhancements to existing services were put forth, due to the recognition that despite investments in a fixed guideway system, local bus service would continue to function as a crucial part of the overall transit system. These recommendations include:

- More hours of service;
- More timed transfer centers;
- Increased service frequency to provide timed transfers at new centers;

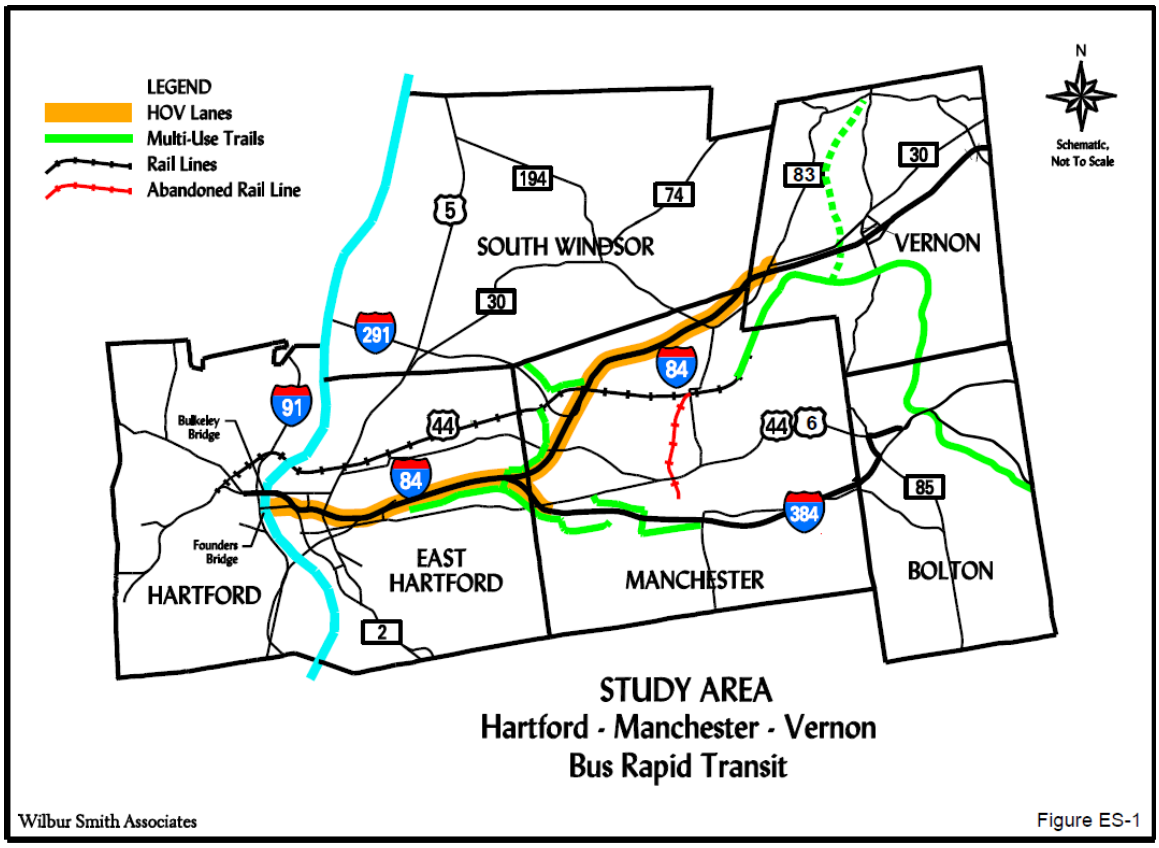
- New routes that provide for greater suburb to suburb service, to provide circulators within activity centers, and to provider circumferential route in the region's inner ring suburbs;
- Modifications to existing routes in order to create more direct service, improve operating efficiency, or prevent duplication of route segments; and
- Integration of alternate fueled vehicles in the transit fleet.

The RTS recommended that four time-transfer centers be located throughout the region. These transit centers, which would create a "multi hub" system, were recommended at Copaco Plaza (Bloomfield), West Farms Mall (Farmington), Buckland Hills Mall (Manchester), and Wethersfield Shopping Center (Wethersfield).

Hartford East Bus Rapid Transit Feasibility Study (2004)

The purpose of the Hartford East Rapid Transit Feasibility Study was to build on a recommendation from the CRCOG Long Range Transportation Plan to retain the Hartford East Corridor as a high priority corridor and to reassess transportation improvement options in order to determine the most appropriate improvements for the corridor. Additionally, the study built on the Regional Transit Strategy (RTS), which identified the Hartford East Corridor as a location with high potential for successful implementation of Bus Rapid Transit. The Study was intended to further develop the alternative analysis conducted for the RTS by evaluating the need and feasibility of Bus Rapid Transit in this corridor. The study was conducted by a team led by Wilbur Smith Associates and was completed in December 2004.

The Study evaluated two routing alternatives for a Bus Rapid Transit system in the Hartford East Corridor: routing along an existing HOV lane system and routing along existing railroad right-of-way. The HOV lane system alternative was developed as a near-term implementation alternative and would interface the BRT route with existing HOV lanes. The HOV-rail corridor alternative was developed as a long-term implementation alternative and would consist of portion of the BRT interfacing with HOV lanes and the other portion operating along the freight rail line that travels from Hartford through East Hartford. The near-term alternative would consist of six stops, traveling from Simmons to Rockville, while the long-term alternative would extend service from Rockville to Main Street.



Northwest Corridor Transit Study (2007)

The Northwest Corridor Transit Study was prepared by a consulting team led by TranSystems. The Study was designed to increase transit ridership in the corridor, ensure the viability of Union Station as a busway terminus, and ensure that busway buses can be added to downtown transit traffic.

Part 1 of the study covers the Day Hill Road area and was initiated in 2007. Part 1 describes the background conditions in the Day Hill Road study area, which includes suburban-style employment sites and low density developments, and sets forth a proposed transit service improvement program for the study area. Recommendations include:

- Establish transfer hub at the Exit 38 "Poquonock" Park & Ride lot;
- Improve CTTransit services to the Day Hill Road area and to the proposed transfer hub; and
- Establish new cross-town CT Transit peak period bus routes on experimental basis.

Part 2 of the study addresses upgrading and modernizing Union Station in downtown Hartford. This study evaluates the existing conditions at the station as well as ways the station could be improved. The study recommends a number of alternatives relating to Union Station and the creation of a new bus transit center, including:

- A design for Union Station that would increase the Ground Transportation Center by around 10,750 square feet;
- Concept of a Transit Center at the North Parking Lot in concert with a new Air Rights Garage to help provide additional parking for future commuter rail passengers and any transit oriented development that might occur;

- TOD recommendations, including development of a residential high-rise building and other residential developments near Union Station; and
- Recommendations to improve pedestrian conditions near the station.

Part 3 was undertaken to better understand downtown Hartford travel patterns, which could then be used to develop a downtown circulation plan and select the location(s) of one or more downtown transit center(s). The key recommendation in this study is for the development of a Transit Center, due to the high volume of transfers that occur in downtown Hartford. The study recommends the development of a transit center on the northwest side of downtown. Under this recommendation, East and South routes would each serve a stop near Main Street before continuing to the transit center where they would be through-routed to West and North routes.

Figure 8: Bus Routes and Key Locations in the Study Area

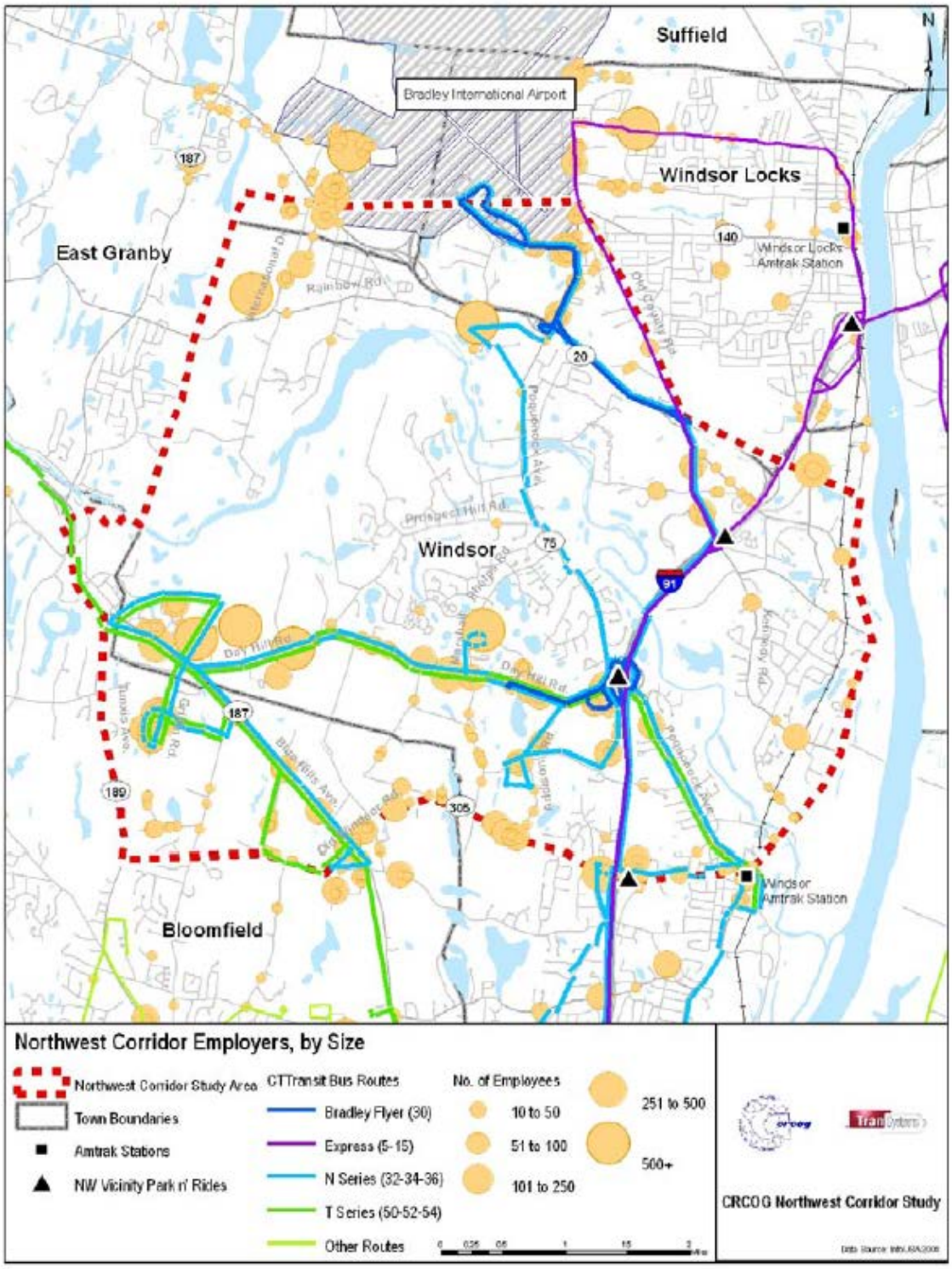
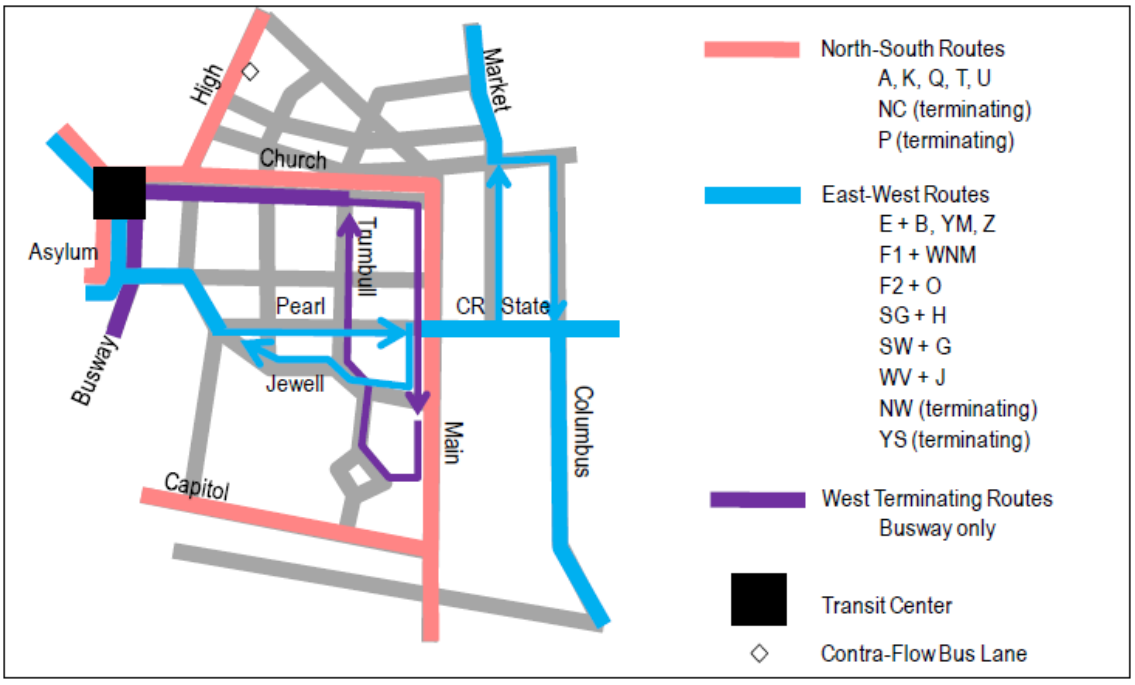


Figure 1-5: Recommended Downtown Local Bus Circulation



Buckland Area Transportation Study (2009)

The purpose of the Buckland Study was to identify near- and long-term transportation improvements in the Buckland Commercial Area, which includes parts of the Towns of Manchester, South Windsor, and East Hartford. The study was conducted by a team led by Dewberry for CCOG and CTDOT and was published in 2009. The study found that without any transportation improvement or expansion, the study corridor would experience gridlock and residents of the study corridor would experience a decline in quality of life. The study makes various recommendations, for roadway design and expansion, TSM/TDM, transit, bike, and pedestrian facilities, and land use strategies.

Transit Alternative Recommendations:

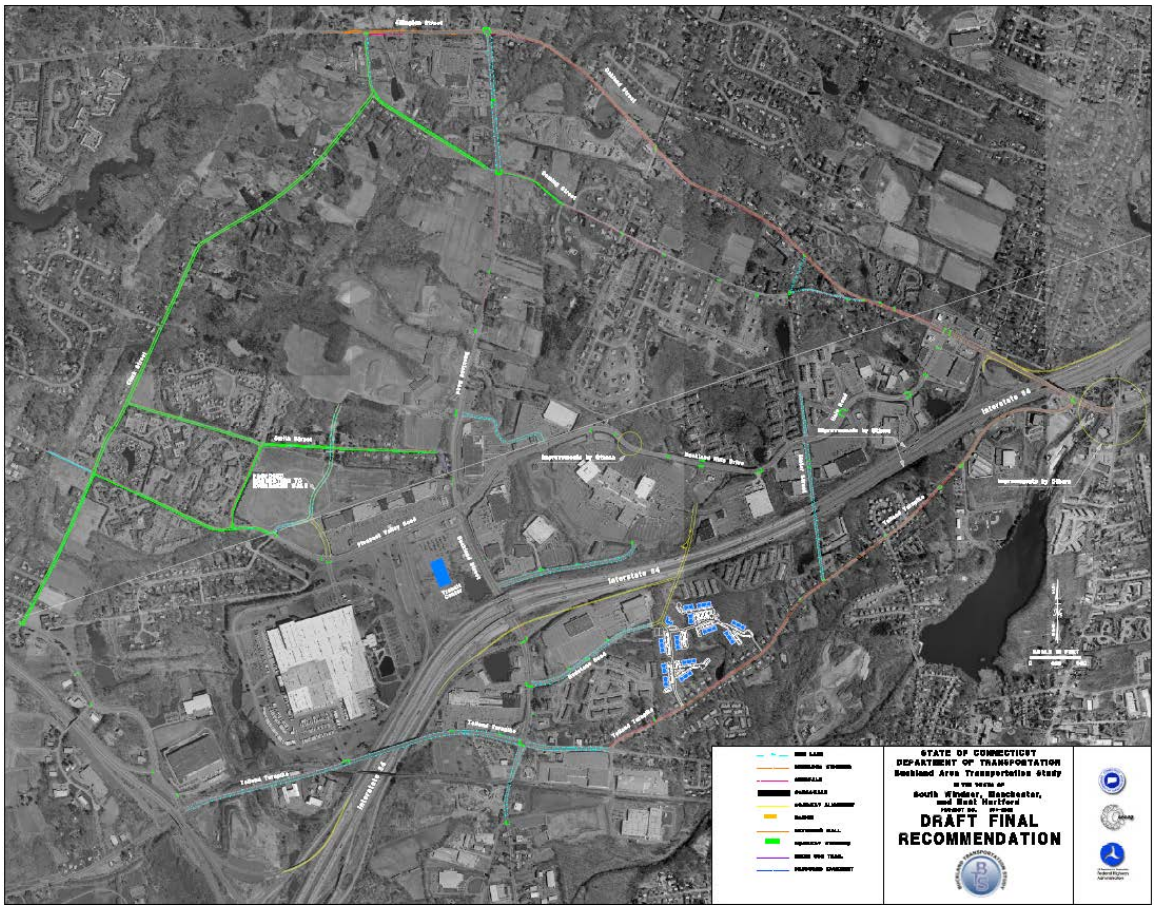
- Improve bus stop signage and shelters;
- Improve/consolidate existing bus routes;
- Consolidate existing bus stops;
- Provide Circulator Shuttle bus service;
- Replace bus radio system;
- Maintain/improve level of para-transit service;
- Implement Intelligent Transportation Systems;
- Construct multi-modal transportation center; and
- Provide Bus Rapid Transit to Manchester and Vernon.

Bike/Pedestrian Facilities Recommendations:

- Maintain continuity of sidewalks on all the streets in the study area;
- Improve the riding surface of existing mixed use trails;
- Provide exclusive bike lanes on the roads identified in the study;
- Provide crosswalks and pedestrian signals at intersections identified in the study
- Provide a bike station in the proposed transit center; and
- Provide weather protected bike shelters at locations identified in the study.

Land Use Recommendations:

- Land use management techniques can complement other congestion mitigation efforts by creating a critical mass of mixed-use and more options for travel;
- The greatest potential impact from best land use management strategies for Buckland may be the reduction of internal automobile trips within the study area to offset current conditions where people are now making multiple short trips amongst retail and service destinations; and
- A pattern of mixed-use concentrated activity nodes within the Buckland study area in an organized pattern relative to one another can achieve car-trip reductions much more effectively than a random general increase in density and land use types consistent with the current zoning.



NHHS Rail Service Development Project (2011 update)

The purpose of the New Haven-Hartford-Springfield (NHHS) Rail Project Service Development Plan was to lay out an overall scope and approach for the proposed NHHS Rail Project over the next 20 years. The plan builds off the 2030 Vision Plan developed by Connecticut, Vermont, Massachusetts, and Amtrak to transform passenger rail service in the region.

Four cases were modeled in order to simulate existing and future conditions. Cases 1 and 2 represented no build alternatives with existing conditions and reflecting 2020 volumes, respectively. Case 3 modeled changes based on the NHHS 2030 vision plan and reflected 2020/30 conditions, while Case 4 is the result of the optimization of Case 3 through modifications to the trains' schedule and operating plan. The delay percentage, minutes of delay per 100 train miles, and on-time performance were calculated for each case. Of the future condition cases, Case 4 had the lowest delay percentage and minutes of delay per 100 train miles, while Case 2 had the best on time performance.

The plan concludes that for Phase II, Case 3 (Alternative C1 2020) reaches the maximum number of train movements possible for the infrastructure configuration while maintaining reasonable operating conditions. The report further concludes that a reduction of planned passenger services in 2020 would be required to reach equal or better than average delay parameters as compared to the No Build existing situation.

The Project included a ridership and revenue forecast, which was then used to conduct a benefit cost analysis in order to determine whether the rail service development project is economically feasible. Costs included the opportunity cost of capital, capital improvements along the Springfield Line, and operating costs on the Springfield Line. Project benefits included ridership and revenue, diversions, travel time savings, VMT reduction, and carbon reduction. The benefit cost analysis found that the project is economically feasible, as the annualized benefits to riders and the region as a result of the project ($72.58 million) were greater than the annual costs ($69.40).

Benefit	
	Savings ($ MILLION)
Travel Time Savings - Existing and Diverted Riders	$11.95
Enhanced Amenities	$5.97
Reduced Emissions	$3.71
Reduced Highway Maintenance	$4.63
Reduced Automobile Usage	$46.33
Annual Value of Benefits	**$72.58**
Costs	
Annualized Capital Cost	$27.70
Incremental Rail Operation and Maintenance	$41.70
Annual Cost	**$69.40**

Table 6-3 Summary of Annualized Benefits and Costs

CTfastrak 2015 Service Plan – Revision 1

The purpose of the CTfastrak 2015 Service Plan is to describe the bus route network that would use the CTfastrak guideway in the New Britain to Hartford corridor. The plan builds on previous planning and demand modeling work that was completed for the project over the past 15 years and represents an update to the draft 2030 Service Plan submitted in 2009. The plan was intended to define an efficient route structure that attracts the maximum number of riders and provides the highest user benefit for the minimum operating cost. The report was completed by a team led by IBI Group in October 2013.

The document provides recommendations that would improve existing local routes in the New Britain area and in Hartford, CTfastrak Express Routes, CTfastrak Local Routes, and new connector and circulator routes. Principle changes from the 2030 Service Plan submitted in 2009 include:

- Some reduction in frequency on the guideway to adjust for lower expected demand in 2015 relative to 2030;
- Reduction of the frequency of BW2 'all stops' service to/from Bristol on the guideway and introduction of an express bus service to/from Bristol with non-stop operation;
- Restoration of express bus service to/from the Batterson and Corbins Park & Ride lots via I-84;
- Elimination of the BW5 short-turning shuttle between Hartford and Newington Junction and inclusion of a BW6 route that connects Westfarms and Buckland Hills via the guideway;
- Addition of a new connector route (C5) linking UConn Health Center to Newington Center; and
- Extension of the C4 connector route from Bishops Corner to Copaco in Bloomfield to improve north-south connectivity.

CTTransit Systemwide Customer Survey Results (2011)

CTTransit conducted a comprehensive survey of passengers across all eight divisions in late October and early November 2011. This was the first customer survey of Hartford, New Haven, and Stamford customers since a HNS Management, Inc. survey in 2004, and was the first customer survey conducted across all CTTransit divisions. The survey was available to complete both on paper and online. Among all divisions, maintenance staff equipped buses the night before with boxes to distribute and collect surveys, and email alerts were sent to subscribing customers to advertise the survey online.

Although the results of each question are summarized in the Customer Survey Results document, only some results are broken out by division. Among Hartford Division riders, 2,097 responded to the survey, accounting for just over 50% of all respondents across all eight divisions. 3% of surveys were completed in Spanish. Notable results for Hartford include the following:

- 15% of surveys were completed online.
- Among survey respondents, 62% were female and 39% were male.
- 21% of survey respondents reported that they speak a language other than English at home.
- 30% reported having a household income of $75,000/year or higher.
- Just over 30% of respondents drove a car to reach their bus stop, indicating the relatively high share of riders who use the Hartford Commuter Express routes serving park-and-ride lots.
- According to the 2004 HNS survey, 41% of respondents indicated that they traveled by transit because no vehicle was available to them.

The breakdown of reported fare payment type is below. 26% of respondents paid their fare in cash, and 19% used a Local 31-Day Pass; 31% used a Commuter Express pass or ticket.

FARE TYPE	% OF RESPONDENTS
Cash	26%
Token	4%
All-Day Local	2%
3-Day	<1%
5-Day	1%
7-Day	1%
31-Day Local	19%
10-Trip Local	8%
Senior 10-Trip	4%
Youth 10-Trip	<1%
Express 10-Trip	14%
Express 31-Day/Monthly	17%
UniTicket	<1%

In addition, Hartford riders contributed 761 written comments, providing feedback on current service, fares, behavior of drivers and fellow passengers, ideas for future service, and other topics.

APPENDIX B
STAKEHOLDER INPUT

CRCOG CAPITOL REGION COUNCIL OF GOVERNMENTS
Working together for a better region.

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CONNECTICUT DEPARTMENT OF TRANSPORTATION

Comprehensive Service Analysis

STAKEHOLDER INPUT

January 2015

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1 INTRODUCTION

OVERVIEW

The Capitol Region Council of Governments (CRCOG) and the Connecticut Department of Transportation (CTDOT) retained a consulting team led by Nelson\Nygaard Consulting Associates to prepare a Comprehensive Service Analysis (CSA). The CSA is focused on inventorying transit needs in the Greater Hartford area and reviewing existing services provided by CT***transit's*** Hartford Division to ensure they are matched with demand and operated as efficiently and effectively as possible. The CSA began in September 2014 and is scheduled to be completed by the end of 2015.

The CSA consists of several large tasks, including a review of existing conditions; an assessment of the demand for travel in the CT***transit*** service area; outreach with stakeholders and members of the public; a detailed evaluation of CT***transit's*** fixed-route services; and the development of service improvement recommendations. The overall goal of the CSA is to develop a transit plan that will help CT***transit*** better match services with need and demand, and identify opportunities to improve the overall delivery of CT***transit*** services. While the analysis and resulting recommendations will focus primarily on transit services, the CSA will also consider the full spectrum of service delivery including passenger information systems, and passenger facilities.

As part of the CSA, the study team conducted a series of stakeholder interviews and focus groups. This research was designed to better understand how key members of the community perceive CT***transit*** service today. The study team also hoped to collect specfic ideas about travel needs and service improvement opportunities. This techncial memo reports on the findings of these stakeholder interviews and focus group research.

Methodology

CRCOG identified a list of stakeholders and target audiences for the focus groups and passed this information to the consulting team. The list of stakeholders included representatives from organizations, major employers, regional advocacy groups, social service agencies and others who work closely with transit riders on a daily basis, or who work for an institution that relies on transit service in some way. The focus groups, on the other hand, were organized around key ridership groups, especially groups that can be difficult to reach, such as young professionals, non-native English speakers, students, and older adults. The reserach also included two additional focus groups not with rider groups, including one with representatives from major employers and another with CT***transit*** drivers.

The interviews and focus groups were centered around a series of common introductory questions, but were open-ended and intended to start a free-flowing conversion on regional transit needs and challenges.

A total of 14 stakeholder interviews and five focus groups were conducted between October and December 2014. A complete list of the organizations who participated is included in Appendix A, along with the questions used to frame the conversations.

Interviewees were asked to provide honest opinions and input regarding CT***transit*** services and the existing transit network, and were assured that their responses would not be individually attributed. This document summarizes key themes and priorities voiced during these meetings, but does not attribute findings to any individual or organization.

SUMMARY OF FINDINGS

The research collected a lot of information about CT***transit*** service and their operations, including ideas that revolve around specific routes and the overall network of service. The following text highlights a series of key themes that were consistent throughout the research and voiced strongly among all groups. These findings also have the most signficant impact to the CSA research.

Access to Jobs is Essential: Numerous stakeholders stated their belief that the transit network should be oriented towards providing access to employment as much as possible. Stakeholders also recognize that the employment market has shifted away from traditional "9-5" office employment in the downtown Hartford with less standardization in both the times and days of the week worked. Regional job growth has occurred in outlying areas and in the service, retail, hospitality and warehousing industries. This shift has two implications for transit:

- More evening and late night service is needed to access 2nd and 3rd shift work;
- Opportunities for reverse commutes to outlying employment sites are needed.

The need for later evening service was echoed by those who are hoping to rely on transit for all or nearly all of their travel, including trips for after work activities and errands.

Provide better customer information: Both regular riders as well as those who represent social service clients and help first time users of the system expressed a strong and consistent need to make route and schedule information easier to find and understand. The most common suggestions reflect a desire for mobile apps and real time bus arrival information.

Demand has shifted away from the historic radial transit network: There is consensus that downtown Hartford will continue to be the center of the region and merits the good transit service it receives. At the same time, stakeholders also talked about a desire for more and better regional connections and more crosstown service, or direct connections between suburban destinations.

Need for more service, especially increased frequency: There is a desire for increased frequency throughout the system, with most stakeholders believing that resources should be primarily devoted to areas with existing high demand or to corridors where future growth is desired and anticipated.

Maintain on-time performance: Although many stakeholders explicitly mentioned CT***transit*** service runs reliably today, others stressed that maintaining this on-time performance should continue to be a top priority.

Improved airport service: The Bradley Flyer service was called out by many as a route that has the potential for improvement and to attract more riders. Suggestions include: better branding and marketing, user-friendly schedules and improved signage at the airport.

CT*transit* should capitalize on regional investments in transit infrastructure: CT***fastrak*** came up repeatedly in discussions, along with other regional projects such as New Haven-Hartford-Springfield commuter rail, IQuilt, Union Station and downtown development. Area stakeholders and residents have much optimism that the region is changing in a positive way, and see transit playing an important role in supporting continued economic growth. They believe CT***transit*** must work with local and state partners to seize near-term opportunities to transform the system and attract more riders.

Opportunities for Change

In addition to identifying a handful of key findings, stakeholders and focus group participants also pointed to handful of trends that are creating opportunities for CT***transit*** and the region. These include:

- **Declining vehicle ownership and vehicle miles traveled (VMT)**: National trends show declines in car ownership and miles driven, particularly for urban dwellers and Millenials. Several suggested CT***transit*** should capitalize on this trend by better accommodating riders who travel via a mix of walk-bike-transit trips (e.g. bike share and bike facilities at key bus stops). IQuilt will also help reinforce the connection between walking and transit.
- **More residential units area being built downtown:** New construction and conversions underway will add many (estimated at more than 3,000) units over the next few years, and TOD around CT***fastrak*** stations will create greater densities. Having more people living downtown without cars, will create new synergies for transit but will also create stronger demands for reverse commutes by bus.
- **Downtown employment growth:** The downtown commercial vacancy rate has been steadily decreasing with more growth anticipated over the coming years. Hartford Hospital is growing, UConn and Trinity College are opening downtown campus, and other large employers are consolidating in downtown (e.g. The Hartford, Travelers and State of Connecticut). Given the growing residential population, the number of residents walking to work and living without a car will further increase.
- **More employers are charging for parking and offering transit incentive programs**: While most employers in Hartford offer free parking, others have recently started to charge employees to park and expressed interested in offering some sort of transit incentive or other transit program for their employees and visitors. Many of those interested in incentivizing transit were looking for assistance and/or support.
- **CT*fastrak* has a positive image**: Area stakeholders are excited about CT***fastrak*** and the opportunities the new guideway will provide. They believe the higher levels of service on CT***fastrak*** will encourage transit use throughout the Hartford area, and open up new opportunities for TOD and economic growth. Most think CTDOT has done a good job marketing the system so far, but recognize that early success is critical. They also see the possibilities to expand the system to have a broader reach.
- **CT*transit* and transit in general has broad support and many partners:** Way to Go CT is putting up touch screen kiosks at sites with elders, veterans, etc. Partnership for Strong Communities is working with CT***fastrak*** communities (Hartford, West Hartford, Newington and New Britain) to develop mixed/affordable housing near the

guideway. Many suggested CT***transit*** work to further develop such partnerships that create ridership demand (e.g. with schools, large employers, state workers, etc.). CT***transit*** also coordinates and works closely with the statewide ridesharing organization, CT***rides***.

2 STAKEHOLDER AND FOCUS GROUP INPUT

The stakeholder and focus group discussions were lively, reflecting a general consensus that transit is an important part of the region. People who participated in this process also expressed an appreciation for CT***transit*** and the bus serivce currently available. Nearly all stakeholders and focus group participants were easily able to express what is working with CT***transit*** service as well as opportunities for improvement. This next section summarizes input received through both stakeholders and focus group converstations and organizes the findings by topic.

Successes (What does CT*transit* do best?)

As discussed, nearly everyone had several positive things to say about CT***transit*** service. The top strengths of the system were identified as:

1. **Bus service is safe and reliable:** This comment was voiced by a number of interviewees, including those representing individuals with disabilities. Stakeholders noted that bus breakdowns are rare, substitutes are provided quickly, and CT***transit*** is reliable even in challenging winter weather.
2. **The urban core (downtown Hartford, East Hartford and West Hartford) is well served by transit:** Downtown Hartford and the surrounding urban core has good coverage and frequent service, particularly during peak periods. A few stakeholders stated their belief that Hartford benefits from the best transit service in the state.
3. **Buses are clean and well-maintained:** Many noted an improvement in the bus fleet over the past few years. Riders with disabilities also appreciate that kneeling buses with ramps work better than wheelchair lifts. While some suggested minor improvements such as branding or more comfortable seats, most believe the buses look attractive and are well maintained.
4. **Express service is excellent**: Express services were consistently pointed out as successful services, as downtown workers are attracted by the fast one-seat service. (Note that express routes are operated by a handful of service contractors, whereas CT***transit*** local service is operated by the same contractor.)
5. **CT*transit*'s fare structure and cost of service is reasonable:** Although it is recognized those with low incomes may not have been represented, there was no dissatisfaction expressed about fare structure or the price of service and the two hour timeframe for transfers was viewed as reasonable. Some did say it is difficult to come up with money for a monthly pass up front, others noted that the senior/disabled half-fare helps with affordability.

6. ***CTtransit* is responsive to issues and problems**: Major institutions and riders see CT***transit*** as a responsive agency that is committed to addressing problems brought to their attention. The Greater Hartford Transit District was also noted as being responsive.

Weaknesses (What Does CT*transit* not do so well?)

Consistent with strengths, stakeholders and focus group participants were also able to identify things about CT***transit*** service that are less effective. The most common cited weaknesses of system included:

1. **Low frequency during off-peak times:** One of the most frequent comments heard related to reduced service levels after 6 pm, making it challenging to use transit for after work activities or to access 2nd shift jobs. A desire for more weekend service was also commonly expressed, followed by a desire for more mid-day weekday trips.
2. **Over-reliance on a radial system and travel into downtown Hartford:** The orientation towards downtown Hartford is based on old streetcar routes that no longer reflects current travel patterns. The radial network also means some trips require travel into downtown in order to change direction. For example, travel from Manchester Community College to a job at the Buckland Hill Mall requires traveling into Hartford then back out on another route, instead of a short cross-town trip. A similar situation exists for people traveling from some of the western suburbs to Asylum Hill. This also means that getting to and from as well as travel around some of the suburban and outlying areas is difficult.
3. **Challenging marketing and information systems (see section on next page):** The amount, type and presentation of information about CT***transit*** service is inadequate. As a result, some stakeholders expressed a desire for routes or programs that are already in place today. These include programs such as guaranteed ride home, one-stop service through downtown to Asylum Hill, express services from Simsbury, etc. Others were not aware of different fare products and how they can be purchased.

    a. **Real-time passenger information:** Many stakeholders felt a community the size of the Hartford should have real-time passenger information systems so people can use their smart phones to know when a bus will be at the bus stop. This technology is in place in many other communities across the United States, including smaller cities. The technology makes a difference for riders and Hartford should have it.

    b. **Passenger schedules:** CT***transit***'s passenger schedules, system maps and website are not user friendly. This makes the system difficult to understand and discourages first time riders. Simplifying passenger schedules, creating an easy to read system map and improving the website are all low cost strategy that would dramatically improve people's understanding of the system.

    c. Purchasing fare media is cumbersome: Paying the bus fare and buying bus passes is inconvenient. The fareboxes on the buses require exact change, which makes it difficult especially for occasional riders who may not be prepared. Many riders also expressed an interest in being able to re-loadable their passes when they board the bus. And in general, purchasing passes is cumbersome; there is

only one downtown location to buy passes, and some passes are not always available.

4. **CT*transit* should improve customer service:** Stakeholders and riders gave CTtransit's customer service agents mixed reviews; some felt representatives are helpful and responsive, while reported less positive experiences. Complaints included operators don't always know enough about an area to be helpful, or had a tendency to give "generic responses". Other complaints included onboard announcements, such as the next stop announcements, that are not consistently made and/or can be difficult to understand. Next step announcements are required under the Americans with Disabilities Act (ADA) Act.
5. **Overcrowding is an issue on some routes:** Buses sometimes fill beyond seating capacity, especially on routes serving schools and colleges that get crowded when classes let out.
6. **The DASH route is too circuitous:** Several individuals said the downtown circulator route is very indirect, making it difficult to understand and use. Others said the service would benefit from real time arrival information signage or mobile apps because it is really difficult to know when the bus will arrive. These concerns were expressed by people who have used the service, but also felt it would be even more difficult for tourists and other casual riders.
7. **CT*transit* doesn't handle surprise events well.** Although CTtransit is responsive to issues, they do not always respond quickly. For example, when there is heavy snow and offices shut down mid-day, there are not enough buses sent out enough buses to handle sudden demand.

Suggested Service Improvements (How Could CT*transit* do Better?)

Stakeholders offered their ideas for how CT***transit*** might better meet local travel needs. A large number of comments addressed the need for better customer information, or suggested new types or locations for service. These issues are summarized separately below. More general suggestions include:

- **Provide more evening and late night service:** There is a strong perceived need for more service in the 6:00 pm to 10:00 pm timeframe to provide access for 2nd shift jobs and to allow for after work activities. Others felt service should extend even later until after restaurants close, particularly on routes serving Farmington, New Britain, Albany and Franklin avenues, as well as Park and New Park streets.
- **Increased frequency:** Shorter headways would increase the overall convenience and predictability of service. Specific times and areas identified as needing more frequent service include retail/shopping centers on weekends and overcrowded routes.
- **More trips on express routes:** Lack of mid-day and late evening trips on express routes limits the attractiveness of these services. Late evening trips are desired and, at a minimum, should be offered when there are special downtown events. Specific services mentioned included Colchester, Canton and Vernon.
- **More peripheral or crosstown service:** It is challenging for people who work outside of downtown to commute via bus without a transfer and long trip. Specific

examples were given by those who: live in Farmington and work on Day Hill Road, live in Bristol and work in Farmington, and live in Wethersfield and work in Unionville. West Hartford was also commonly mentioned as an area needing more direct service.

- **Better coordination of schedules at key transfer pairs:** Coordination between routes at outlying destinations is a particular challenge when only hourly service is operated. Locations where transfers should be better coordinated include Manchester (Routes 83, 84 and 88) and Route 55 connections to Middletown services.
- **Need for more service that operates through downtown to Asylum Hill.** Several stakeholders said the large concentration of jobs and transit riders commuting to Asylum Hill west of downtown warrants more direct service.
- **Modify the "Capital loop" used by express buses:** Ridership is low on this loop and buses get caught in traffic. Loop could be replaced by a better or additional Dash circulator, or more direct service to the major employers west of downtown (e.g. Aetna, St. Francis hospital, etc.)
- **Bradley Flyer:** Suggestions to make this a stronger more attractive service include improved branding and marketing, user-friendly scheduling (e.g. service on the hour), expanded service from more park-ride lots in different parts of the region, and use of the HOV-lane on I-91.
- **Serve suburban industrial parks:** Several stakeholders commented that, with the exception of downtown which is well served, the transit network is focused on shopping centers and retail areas. Although these retail areas have strong employment, the network does not do a good job of serving suburban industrial parks.

Improved Customer Information

A large number of participants in the interview and focus group process commented on CT***transit***'s existing customer information systems, with many offering suggestions for how the system could be improved. While many of the people who currently use the system talked about using the CT***transit*** website and Google Maps when looking for information about the system as well as calling customer service or ask drivers. However, there were numerous suggestions for improvement, most of which reflect an interest in making information simpler, more accessible and more modern:

- **Schedules, maps and the CT*transit* website could be more user-friendly:** Many individuals mentioned that bus schedules and maps are difficult to understand, making system navigation a barrier for first-time users. It would be helpful if the printed schedules were smaller, more intuitive and easier to read. Many also suggested creating a route map that included key destinations. On-line, users found the trip planner to be frustrating because users must scroll through separate pages to view route maps and schedules.
- **There is a strong desire for more mobile apps:** Riders are interested in functional mobile apps with route and schedule information, as well as real time bus arrival information. Many are aware of these apps through their experience with other transit systems, and believe mobile apps will not only make the Hartford system more convenient but will attract new riders. Creating texting options would also be useful for those who don't have smart phones.

- **Provide more information at bus stops:** Most bus stops lack information and asking drivers about schedules or other information gets mixed results. It would be helpful to have large visible bus stop signs so both drivers and passengers know where buses stop. Schedule information at express stops are sometimes not updated with service changes, although this issue has improved recently. Real time information (via signs or text messaging) would improve predictability and convenience.
- **Bradley Flyer needs enhanced marketing and branding:** Several stakeholders suggested that the Bradley Flyer is underutilized, but has great potential. Some of the suggestions for improvement included: 1) better signage at the airport; 2) unique branding on vehicles, schedules and signage; and, 3) a more user-friendly timetable (e.g. leaving the airport on the hour). Others suggested the service should have fewer stops and luggage racks on buses.
- **Timeliness and distribution of service change information:** Information on service changes and detours is often sent out last minute or is not timely (e.g. Terminal B at Bradley Airport is no longer served, but is still shown on Route 30 schedules). Many organizations that might benefit from information do not have it readily available (e.g. case managers at One-Stop centers).
- **Make information more readily available in Spanish:** Some have seen schedules posted in Spanish on buses, but wonder why these same materials are not made available on-line or through other means. A Spanish version of the web-site would be helpful, as would Spanish speaking customer service representatives. Phone prompts are also only in English.
- **Offer CT*transit* "Try it Once" program:** The hardest trip to get people to take is their first one. A one-time multi-trip free pass for new riders would get people over the hurdle of using the bus. CT***transit*** could offer vouchers or raffle something to entice new riders.
- **Create a one-stop regional travel planning tool**: It would be helpful to have one site that includes all available service options (CT***transit,*** human services providers, etc) and takes eligibility into consideration.

New Service Areas and Service Types

In addition to ideas about how to improve service, stakeholders and focus group participants also had suggestions about areas that needed service and opportunities for new types of service.

There is a need for more regional connections: The desire for better regional connections was one of the most frequently voiced. Better Hartford-Waterbury connections were the most frequently mentioned, but this will be addressed by a new CT***fastrak*** 925 Waterbury Express route. Other desired connections include:

- Waterbury to western Hartford suburbs (e.g. Bristol and Torrington)
- Willimantic/Storrs to Manchester, New Britain, New London, western MA
- Hartford to Meriden/Wallingford via the Berlin Turnpike
- Hartford to Enfield to serve three prisons
- Hartford to Putnam (to serve the Lowe's distribution center)
- "Missing Links" as recommended by the Regional Plan Association in a 2010 study:

- A Newington/Wethersfield/Rentschler/East Hartford/Buckland Hills Express, linking communities south of Hartford with the shopping and job centers of East Hartford and Manchester via a hub for transfers at Wethersfield.
- A Rocky Hill/Wethersfield/Glastonbury Express, supporting travel between Hartford's southern and western suburbs and using Wethersfield as a hub.
- A Bradley Airport/Windsor Locks service, connecting the airport with future rail service along the I-91/rail corridor.
- A New Britain/West Hartford Express route (note that a New Britain-Westfarms Mall route will be part of CTfastrak service)

Improve connections to neighboring cities (New Haven and Springfield): Hartford is close to both Springfield and New Haven (between 30 and 40 miles away), but travel between these cities is difficult and expensive. Currently travel between Hartford and Springfield and Hartford and New Haven rely on intercity bus and Amtrak; these services are good but are geared towards occassional travel rather than regular trips. Although commuter rail will be implemented within the next couple of years, there is potential to develop "starter" service in the near term to address this need. Another connection identified in the process is to the Groton/New London area.

Provide connections to and within rural areas, particurlarly to the northwest and northeast. Many mentioned a need to better connect with less developed parts of the region, particurlarly in the Torrington/Salisbury/Canton/Avon area to the northwest, and to the north and east along the I-84, Route 6 and Route 2 corridors.

Operate more reverse commute services: One stakeholder noted that a large portion (75%) of those commuting out of Hartford have fairly low incomes of $40,ooo or less and many do not own vehicles. Both of these circumstances makes it challenging to get to 2nd or 3rd shift jobs located in the suburbs, including in Windsor, along Day Hill Road, the Blue Hills Avenue Extension, and on International Drive (Walgreens). Another example offered is service to Simsbury, which is available but designed for workers traveling inbound, but not outbound. One of the needs identified for workers traveling to the suburbs is for caregivers living in urban areas commuting to homes to low density suburban areas.

Create more regional hubs to support cross-town connections: A commonly suggested solution to provide more service between outlying areas without a downtown transfer was to create regional hubs. For example, the Berlin Turnpike could have a hub where connections from New Britain, Hartford and Meriden meet. Today, different transit districts serve different locations in this corridor (i.e. New Britain route serves Wal-Mart, Hartford route serves Price Chopper across Berlin Turnpike) and connections are not easily made. The Capital Region Council of Governments also did a northwest corridor study that recommended mini-transit hubs.

Use feeder service to expand access for individuals with disabilities: The ¾ mile eligibility boundary for ADA services limits many from getting service. One suggestion was to consider smaller feeder vans is smaller towns (Windsor, Bloomfield) to bring riders to mini-hub connection points. This service would also help future increased demand for paratransit to serve those "aging-in-place."

Operate express service to the airport: Several stakeholders voiced support for high frequency, dedicated service to the airport. A variety of different service models were identified,

including fast and direct bus service from downtown, shuttle service from the future rail station at Windsor Locks and light rail service from downtown.

Other Suggested Improvements (not Service Related)

The research also uncovered a variety of other non-service improvements. These included:

- **Regional fare integration:** There is inconsistency in terms of fare costs as well as a lack of fare integration between adjacent transit districts and between public/private operators. For example, Middletown bus passes don't work on the Hartford system, but some Hartford passes work on Middletown buses. In addition, while some Enfield passes work on Hartford buses, others do not. CT***transit*** and future commuter rail fares should be integrated, and some feel CT***transit*** should work with Peter Pan, Uber and other operators to weave together a more integrated transit system to improve overall transportation choice, access and convenience.
- **More convenient fare payment:** More locations or methods for fare payment are desired. Many are frustrated by the need for exact change at the farebox and expressed a desire for stored value cards or on-board debit payments, or tap cards (preferred to swipe cards). Today's system is seen as time-consuming, inconvenient, and also creates conflict when passengers do not have exact fare.
- **Lower or discounted fares:** Customers feel monthly passes should be provided at a discount and CT***transit*** should partner with schools/colleges to offer universal access fare programs, such as U-Pass programs. Given that transportation is a signficant barrier to keeping students from finishing their education, transit passes should be an eligible cost under financial aid. Large employers could also be offered similar universal access bus pass programs.
- **More shelters and other bus stop amenities:** Riders want more shelters with seating, particularly at high ridership stops (Wal-Mart and Franklin Avenue named as examples). Some existing shelters are too small or are poorly maintained with broken plexi-glass. Other items mentioned include better lighting and covered bike storage (e.g. at the train station). Restroom access at key locations is desired, but commenters realized this is difficult to provide.
- **Winter snow removal:** Lack of snow removal at bus stops is a concern. Additionally, many drivers continue to stop only at the marked bus stop even if it is piled with snow and riders are waiting at a cleared location just beyond.
- **Improve driver training and customer service skills:** While many riders complemented drivers on their friendly and courteous attitudes, others see inconsistencies in attitude and policy enforcement and a lack of patience with customers. More frequent training updates were suggested to cover: customer service, wheelchair securement, stroller issues, ADA announcements, sensitivity to disabilities, preferred seating, fare policy, schedule adherence, overcrowding, etc.
- **Vehicle fleet and fleet assignment:** There were mixed opinions whether articulated buses are assigned to the most overcrowded routes. Others desired cleaner vehicle technology or thought "cool looking" buses would encourage more riders. Others were unhappy with bus wraps you can't see through and uncomfortable seats.
- **Driver schedules/work rules:** Layover policy needs consideration to ensure drivers get breaks where there are restroom facilities, and to avoid passenger complaints when

drivers stop en route. Drivers also expressed the need for a better process to communicate issues and concerns to decision-makers, including length of layover breaks. Drivers also have a desire for better time point data, noting they have limited data on the bus and are not always aware they are running late.

3 REGIONAL CHALLENGES AND OTHER ISSUES AFFECTING TRANSIT

In addition to specific suggestions about how transit service may be improved in the Hartford region, there were also a handful of issues that relate to transit service but were not oriented around how travel is provided.

Transit has a Negative Perception

Many spoke about the need to overcome negative perceptions associated with bus transit, recognizing this is an issue that extends beyond Hartford, but also one that other communities have been able to overcome. Boston was cited as an example of a place where transit is more universally accepted. Stakeholders concerned about transit's overall perception felt that Hartford has a "cultural reliance" on the automobile, with many local residents thinking buses are "unpleasant," "unsafe" or primarily for low-income individuals. Of those concerned with this issue, many believe the best approach is to educate the broader community on the benefits and goals of transit to create more support. Others think a radical remaking of bus transit is needed to change opinions and behavior, and CTf***astrak*** may present that opportunity. If successful and well-utilized it may be the first step in changing local biases and getting more people to use transit.

One of the factors that creates a negative perception of transit generally and CT***transit*** in particular are the crowds of passengers waiting in downtown. Although well documented, our discussions also voiced frustrations with the number of passengers "hanging around" in downtown Hartford and the wall of buses created when vehicles line up at bus stops. Main Street and Pearl Street are the worst examples, but stakeholders felt this happens in other locations. While it was acknowledged that CT***fastrak*** and the TIGER project will help this problem, by dispersing passenger activity, some believe more needs to be done to address this problem. Others think the best approach is to support more bus activity by making additional improvements for pedestrians and buses, not cars.

Perception of CT*transit*

While several stakeholders complemented CT***transit*** on being "good listeners" and receptive to new ideas, others expressed frustration with the time it takes to implement change. If a major employer changes their shift schedule, CTtransit cannot respond fast enough to change bus schedules and many people will lose their jobs. Another commenter expressed frustration that CT***transit*** holds public meetings to gather input and feedback but then nothing happens for years; the pace of change discourages many people from participating.

Local Planning and Development

Generally speaking accommodating transit and ensuring people have good, safe access to transit is an afterthought for most local jurisdictions. Many stakeholders felt there are opportunities for the state to educate and encourage local planners and developers to ensure new development are accessible by transit. There are many known strategies that make transit significantly easier and more attractive to riders, such as the location for new development, parking requirements, building set-back standards, and building infrastructure for cyclists and pedestrians. There are also incentives that may be develop to encourage coordination between housing, economic development, job creation and transit, steering growth to desired corridors along major transit lines (e.g. CT***fastrak*** and NHHS commuter rail).

Another critical way to support transit use is pedestrian facilities. Some parts of the CRCOG region are well served by transit but others are in need of pedestrian and safety enhancements; investing in this type of infrastructure could strengthen transit use considerably. Crosswalks are either non-existent or in very poor shape. There is a need to better enhance walking and biking, both in downtown Hartford and in outlying destinations where buses stop along major roadways and there are often no sidewalks. Areas mentioned include Downtown North, where a new ballpark will be built and Berlin Turnpike.

Traffic congestion is a problem that should unify transit planners and local authorities because congestion affects both parties. Peak-period congestion affects autos, as well as the on-time performance of buses and the ability to make bus connections at scheduled time points. Stakeholders felt local authorities should work together to coordinate and keep each other abreast of construction projects so CT***transit*** can modify their bus schedules.

Other local planning factors that impact CT***transit***'s ability to be successful relate to parking, including pricing, supply and enforcement. Generally speaking, parking in downtown Hartford is inexpensive compared to other northeast cities and plentiful. In addition, and many employers still offer free parking for their employees and institutions such as colleges and hospitals also offer free or low-cost parking. In addition, stakeholders said Hartford and many other communities in the urban core do not enforce parking regulations. Cars frequently park in bus stops making buses stop in traffic, creating congestion and frustration. "No parking" at bus stops should be enforced.

Transit Decision Making

People participating in both the stakeholder interviews and the focus groups were asked how CTtransit should prioritize transit investments. The most commonly voiced strategies included:

- **Focus on access to jobs:** Transportation is a huge barrier in terms of maintaining a job, and most thought it should be the foremost priority in network design. Access to school was also identified as key factor.
- **Put more service where demand is highest:** Service frequency was identified as being more important than coverage. CT***transit*** should address overcrowding on highly utilized routes. Areas with low demand could be provided with very limited service (e.g. carefully matching shift times at outlying work destinations). Stakeholders understand the challenges inherent in getting workers to suburban employment, and think many would be satisfied if they could even get within range of work.

- **Focus transit in major growth corridors:** The CT***fastrak*** and New Haven-Hartford-Springfield rail corridors are anticipated to be where growth will occur over upcoming years. Strong, fast and convenient feeder services are needed to build up demand where service is strong. Related land use/TOD incentives should also be created to increase density and steer growth to these corridors.
- **Transit service must be cost-effective:** CT***transit*** must stay within budget and look at new ways to do business.
- **Don't be afraid of radical changes in the design of transit:** Radical changes in the physical look and feel of transit are needed to overcome past perceptions of transit. CT***fastrak*** is a good start towards rethinking the entire system.

Appendix A Stakeholder Interviews

The stakeholder interviews included conversations with staff from 15 organizations:

1. Connecticut Bureau of Rehabilitative Services
2. Way to Go Connecticut
3. Connecticut Public Transportation Commission (CPTC)
4. Hartford Business Improvement District
5. Metro Hartford Alliance
6. Connecticut Coalition for Environmental Justice
7. The Kennedy Center
8. Partnerships for Strong Communities
9. Connecticut Association for Community Transportation (CATC)
10. Connecticut Airport Authority/Bradley International Airport
11. Capital Workforce Partners
12. Transit for Connecticut Coalition
13. Department of Economic and Community Development
14. Connecticut Housing Coalition
15. Capitol Region Council of Governments (CRCOG)

Stakeholder Interview Questions

The interviews focused around a series of common introductory questions, but were open-ended and intended to start a conversion to better understand regional needs and challenges, as well as the needs of particular user groups. Interview questions included:

1. What is your organization's interest/involvement in transit service?
2. Have you personally ever ridden a CT***transit*** bus?
3. What do you consider to be greatest transit issues/challenges for your employees, customers, clients, organization, etc.?
4. What does CT***transit*** do best?
5. What could or should CT***transit*** do better?
6. What do you consider to be greatest transit issues/challenges facing Hartford?
7. Are there new types of service that you believe should be examined?
8. Are there particular areas in which transit needs to be improved?
9. What should bet he major considerations used by CT***transit*** to reconfigure transit service (i.e., cost-effectiveness, ridership increases, provide basic level of service, social equity, traffic reduction, economic development, etc.)?

FOCUS GROUPS

Five focus groups were held during the fall of 2014. Figure A-1 shows each focus group held, and describes the number and/or type of individuals in attendance.

Figure A-1 Focus Groups

NAME OF GROUP	DATE HELD	NUMBER/DESCRIPTION OF ATTENDEES
CT***transit*** drivers and other front line staff	10/15/14	Fifteen (15) attendees - Transportation (supervisors and drivers) - Planning - Customer Service
Students/Manchester Community College	11/12/14	Thirteen (13) Students and (1) faculty - Three (3) had regular experience using bus
Spanish Speakers	11/18/14	Six (6) individuals - Five residents of Hartford - One resident of South Windsor - All transit users
Hartford Young Professionals & Entrepreneurs (HYPE)	12/1/14	Nine (9) individuals - 6 downtown residents - 3 commuters to downtown - 2 reverse commuters
Major Employers	12/3/14	Eight (8) individuals representing: - Hartford Hospital, St. Francis Hospital, UConn Health - Waste Management - Aetna, The Hartford, Travelers, - Goodwin College

Focus Group Questions

The meetings used a series of common questions to initiate discussion, but were intended to be open-ended and informal conversations to better understand how people perceive and use transit service today, as well as to identify how they think the system might be improved. The common questions included:

1. What are some of the places you go to regularly?
2. Do you have any problems or challenges getting around?
3. Has anyone in the group ever used CT***transit***?
4. If you don't ride CT***transit***, how do you travel?
5. (For everyone) – why don't you ride the bus?
6. Have you ever used transit in another American city?
7. What could CT***transit*** do to make it easier for you to get on the bus?

8. How do you find about CT***transit*** service? For people who don't usually ride the bus, how would you find out how to do it?
9. Do you think the price/fare to use CT***transit*** is reasonable?

APPENDIX C
RIDER SURVEY ANALYSIS

RESULTS FROM RIDER/NON-RIDER SURVEY

OVERVIEW

The Capitol Region Council of Governments (CRCOG) and the Connecticut Department of Transportation (ConnDOT) retained a consulting team led by Nelson\Nygaard Consulting Associates to prepare a Comprehensive Service Analysis (CSA) focused on inventorying transit needs in the Greater Hartford area and reviewing existing services provided by CT***transit***'s Hartford Division to ensure they are matched with demand and operated as efficiently and effectively as possible. The CSA began in September 2014 and is scheduled to be completed in early 2016.

The CSA consists of several large tasks, including a review of existing conditions, an assessment of the demand for travel in the CT***transit*** service area, outreach with stakeholders and members of the public, a detailed evaluation of CT***transit***'s fixed-route services, and the development of service improvement recommendations. These recommendations will be developed as part of an open and transparent process, with numerous opportunities for stakeholder and public input.

This technical memo reports on the results of a survey conducted among CT***transit*** Hartford riders and residents in the CT***transit*** Hartford service area. The survey was administered between July 2015 and February 2016 and was designed to collect information about people's experiences with and perceptions of CT***transit*** services. The online survey was posted on the CT***transit*** website and paper surveys were distributed at Travelers. Surveys were also available at public meetings and drop-in sessions. The online survey was available in Spanish and English and paper copies of the survey were available in English.

KEY FINDINGS

- The majority of survey respondents reported being regular riders. Fourteen-percent of respondents ride CT***transit*** at least several times a week, with 39% using the service daily.
- Many respondents (41%) use CT***transit*** because taking the bus is more affordable than paying for gas and car maintenance. Additional reasons include to avoid traffic congestion (38%), a lack of parking or expensive parking at their destination (31%), and doing their part for the environment (31%).
- Among daily riders, most respondents (59%) use CT***transit*** because taking the bus is more affordable than paying for gas and car maintenance. Additional reasons include to avoid driving in traffic congestion (48%) and a lack of parking or expensive parking at their destination (44%).
- Most riders use CT***transit*** to commute to school or work, for recreational/social trips, and to do shopping or personal errands. Frequent users are more likely to take CT***transit*** for commuting purposes, while non-frequent riders are more likely to take CT***transit*** for social or recreational trips.
- Survey respondents prefer more frequent, faster, and longer weekday service, and features and information compatible and integrated with mobile devices. Service preferences with the highest level of agreement are: buses running more frequently but on fewer streets (70%), provide a mobile payment app to buy fares/passes (66%), provide real-time information on mobile apps (61%), and later or more frequent service on weekdays (61%).
- Daily riders and non-riders hold differing opinions on several key service preferences: daily riders prefer more service to and from downtown Hartford (60%), favor improving CT***transit***'s existing service (75%), and would prefer more neighborhood bus circulators (54%); non-riders prefer more

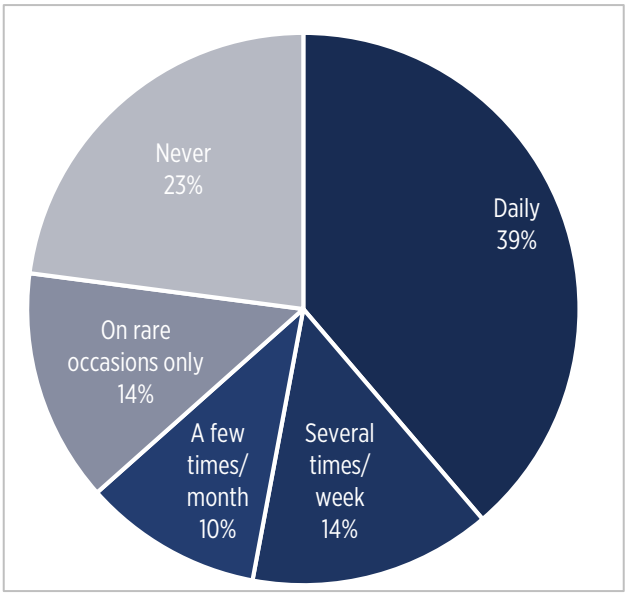
service between destinations other than downtown Hartford (65%), favor service expansion to new areas (70%), and prefer more park and ride locations (61%).

- All survey respondents agree on average that CT***transit*** fares are reasonable, CT***transit*** staff is professional and courteous, and that CT***transit*** service is dependable. Combined, daily riders rated CT***transit***'s services one average point higher than non-riders (3.78 to 2.78).
- Survey respondents rated real-time bus location information as the most useful proposed feature. Real time roadway traffic information and alerts and customizable service alerts for specific CT***transit*** routes, trips, and/or stops are also desired features.
- The University of Connecticut (Storrs), Manchester, and Bradley Airport received the most requests for increased or new service. The primary service requests are more frequent and extended service.

PROFILE OF RESPONDENTS

A total of 1,080 people responded to the survey, of which approximately 880 surveys, or 81% of the surveys, were completed online and the remaining 19% collected at Travelers or at public meetings. The target audience for the survey included existing *CT**transit*** Hartford customers as well as people with limited or no experience riding *CT**transit***. Results show that the majority of respondents (53%) use transit at least several times a week (see Figure 1). Another 14% of respondents ride transit on rare occasions only, while 23% of respondents state that they never use CT***transit***.

FIGURE 1 RESPONDENTS' USE OF TRANSIT



When asked about their primary reason for using transit, 41% of respondents stated that taking the bus is more affordable than paying for gas and car maintenance (see Figure 2). Among daily riders, close to 60% of respondents stated that their primary reason for taking transit is that taking the bus is more affordable than paying for gas and car maintenance. The second most popular reason for using transit among all respondents was to avoid driving in traffic congestion (38%), followed by expensive or nonexistent parking at their destination (31%) and environmental reasons (31%).

The most popular trip purpose among respondents is commuting to work (61%), followed by recreational/social trips (25%) and shopping or personal errands from home (24%) (see Figure 3). About 16% of respondents use CT***transit*** for medical appointments and about 11% use CT***transit*** during the day to complete shopping or personal errands from work or school.

The largest share of respondents (57%) indicated that they were between the ages of 36 and 64 (see Figure 4). Approximately 20% of respondents were between the ages of 26 and 35, 12% were over the age of 65, and 8% were between the ages of 19 and 25. Only 2% of respondents were between the ages of 14 and 18 and no respondents were under the age of 13.

FIGURE 2 REASON FOR USING TRANSIT

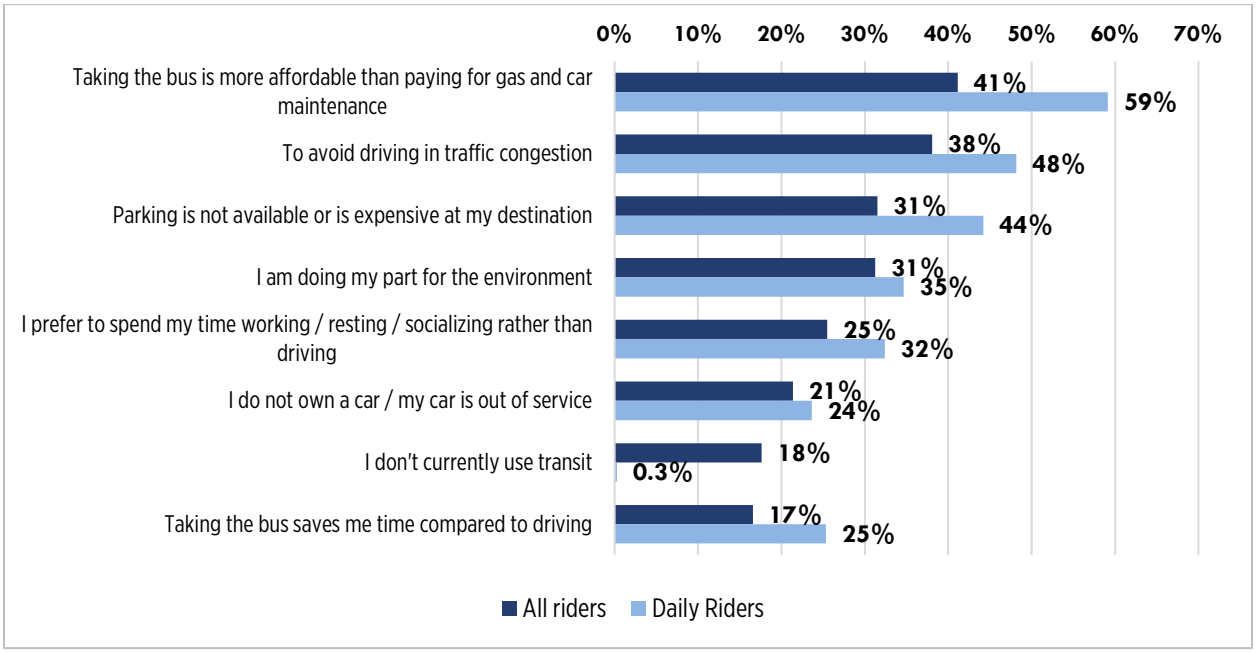
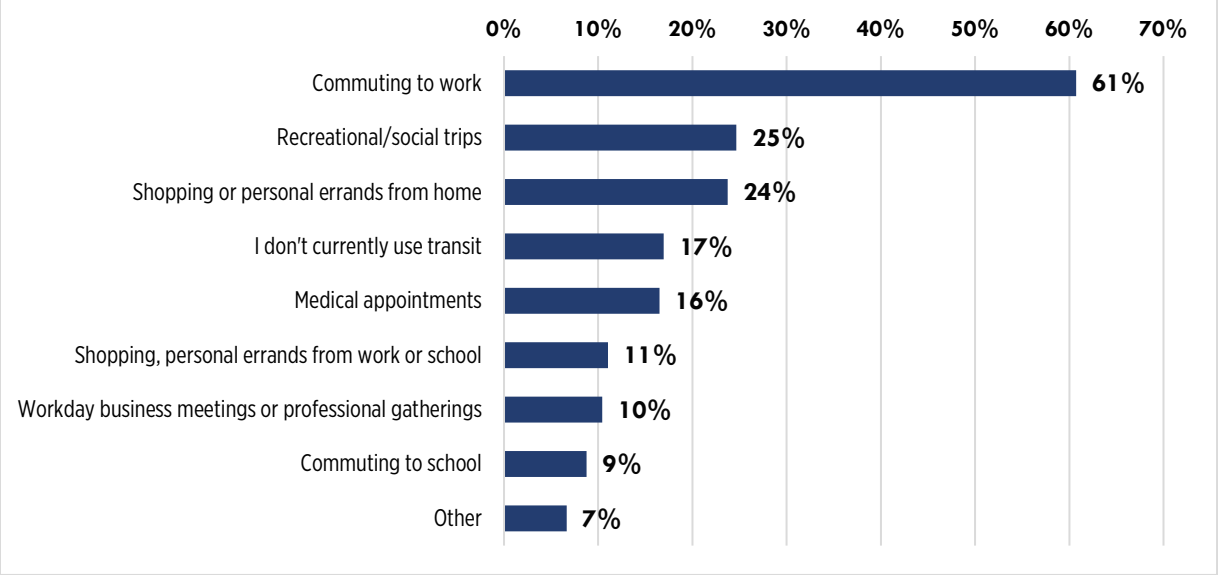


FIGURE 3 TRANSIT TRIP PURPOSE



26-35 year olds and 36-64 year olds were equally represented in the survey, with 21% and 22% of respondents, respectively. Eight-percent of respondents were between the ages of 14 and 18. Only 3% of respondents were over the age of 65.

Close to two-thirds of survey respondents (68%) identified as employed full time. About 14% of respondents indicated they were employed part time, while approximately 10% of respondents indicated they were retired. Nine-percent of respondents indicated they were students, while only 4% of respondents indicated that they were unemployed. It should be noted that respondents were allowed to select more than one response to describe their employment status.

FIGURE 4 AGE OF RESPONDENTS

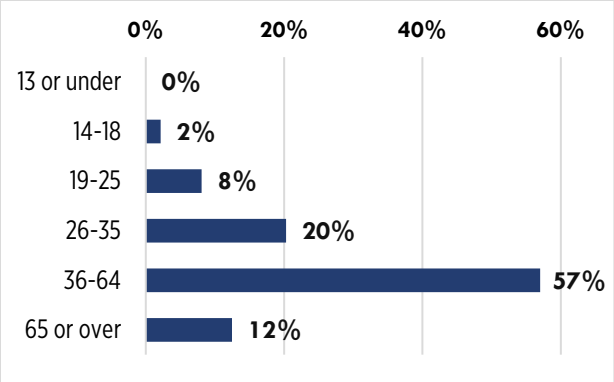
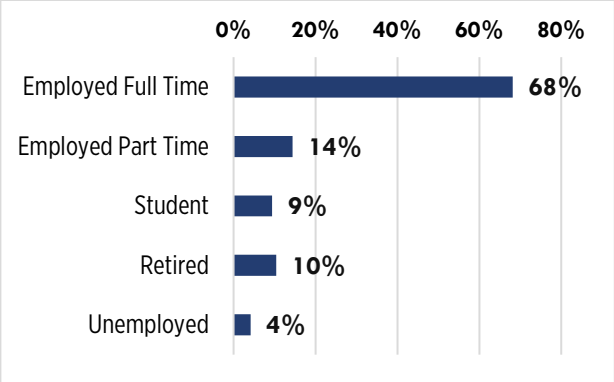


FIGURE 5 EMPLOYMENT STATUS OF RESPONDENTS



SERVICE PREFERENCES

Future service improvements can help raise CT***transit***'s public perception and boost ridership, and should be informed by the service preferences of survey respondents and system users. To gain a better understanding of the service improvements valued by CT***transit*** users and members of the community, survey respondents selected their preference between two theoretical service improvements; preference questions focused on service frequency, span of service, preferred destinations, coverage patterns, and bus stop and vehicle features (Figure 6). Several themes are evident in the service preferences responses. Overall, survey respondents value and prefer:

- More frequent, faster, and longer weekday service.
- Enhanced neighborhood service and service to destinations other than downtown Hartford.
- Features and information compatible and integrated with mobile devices.

Sixty-one percent of respondents use CT***transit*** to commute to work, and they prioritize weekday service accordingly. Fifty-seven percent of respondents prefer frequent weekday bus service instead of longer weekday service hours, and 61% of respondents prefer later or more frequent weekday service over more weekend service. Furthermore, respondents indicated a strong preference for decreased travel times, at the expense of expanded coverage and increased stop accessibility. Respondents overwhelmingly (70%) prefer buses running more frequently on fewer streets, as opposed to buses operating on more streets but less frequently, and 55% prefer fewer bus stops with faster service over more bus stops within shorter walking distances of their destinations.

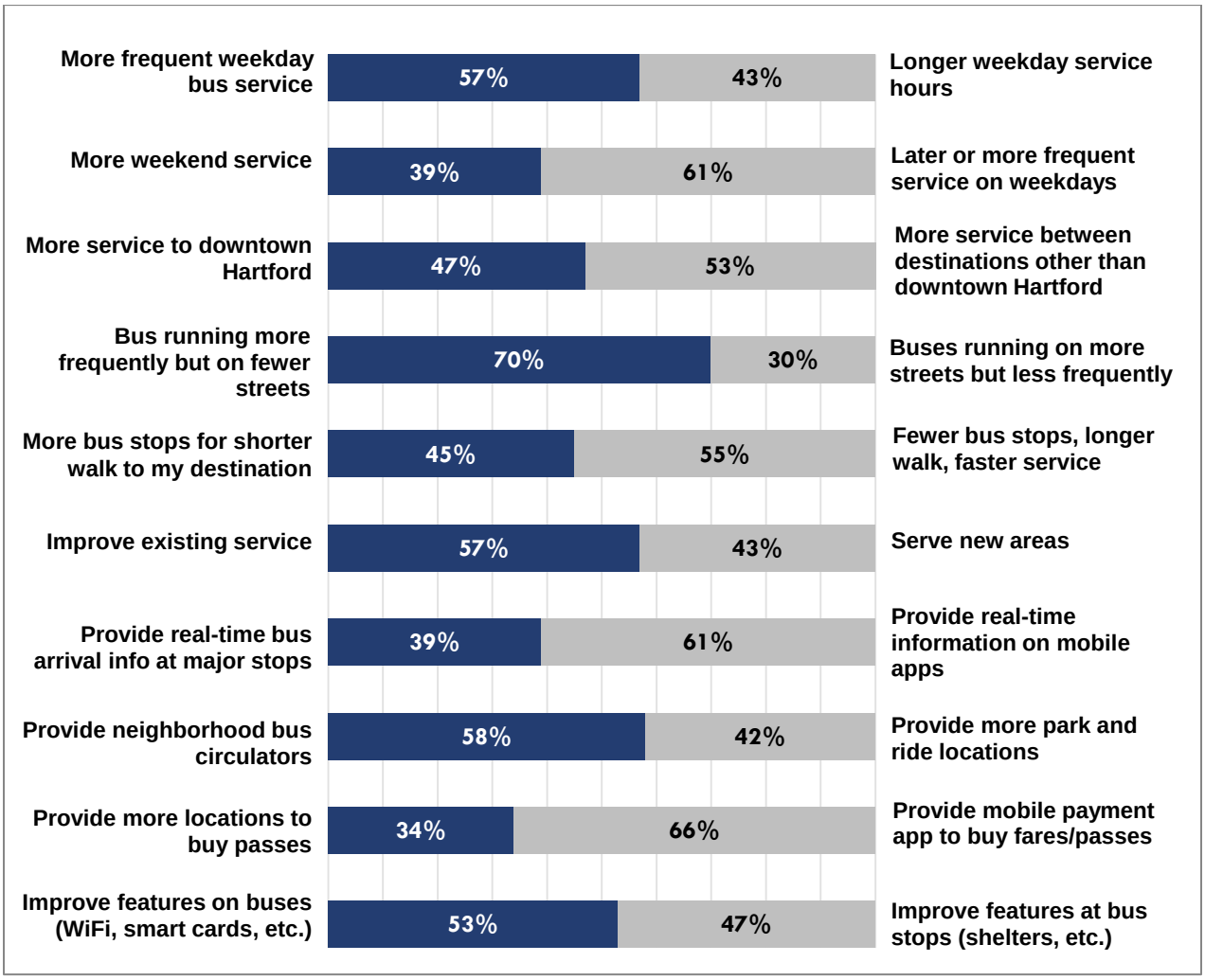
Increased mobility within the existing service area, specifically greater access to neighborhoods and destinations other than downtown Hartford, are favored. Respondents slightly preferred (53%) increased service between destinations other than downtown Hartford, as opposed to running additional service to downtown Hartford. Fifty-eight percent of respondents selected neighborhood bus circulators over more commuter park and ride facilities. However, only 43% of respondents preferred that CT***transit*** expand to serve new areas, while 57% are in favor of improving existing services.

Additionally, respondents favor a shift to more nimble and responsive transit services that feature integrated fare payment systems and real-time information available on mobile devices:

- 66% prefer a mobile payment app that allows passengers to purchase fares/passes remotely.
- 61% favor mobile apps that provide real-time information over real-time bus arrival information at major stops.

- 53% are in favor of improved features on buses, including WiFi and smart cards, while 47% prefer improved features at bus stops (shelters, lighting, etc.).

FIGURE 5 SERVICE PREFERENCE RESULTS (ALL RESPONDENTS)



To gain a better understanding of specific service demands and user preferences, responses were broken into two sub-categories – daily riders and non-riders – and analyzed comparatively. Daily riders accounted for 33% of all respondents (355 responses) and non-riders represented 19% of all respondents (210 responses).

Daily riders and non-riders agree on multiple service trade-off preferences, summarized below and detailed in Figures 1-10 of the technical appendix:

- Prefer more frequent bus service on weekdays, instead of later weekday service hours.
- Prefer more frequent bus service on weekdays, as opposed to increased weekend service.
- Prefer buses running more frequently on fewer streets over buses running on more streets but less frequently.
- Prefer fewer bus stops and a longer walk, but faster service on the bus, instead of more bus stops for shorter walk distance to my destination.

- Prefer real-time information about all routes on mobile apps, instead of real-time bus arrival information at major stops.
- Prefer mobile payment app that allows fare purchase or payment over more locations to buy passes.
- Prefer improved features on buses (WiFi, advanced fare boxes, etc.) over improving feature at bus stops (shelters, benches, lighting, etc.).

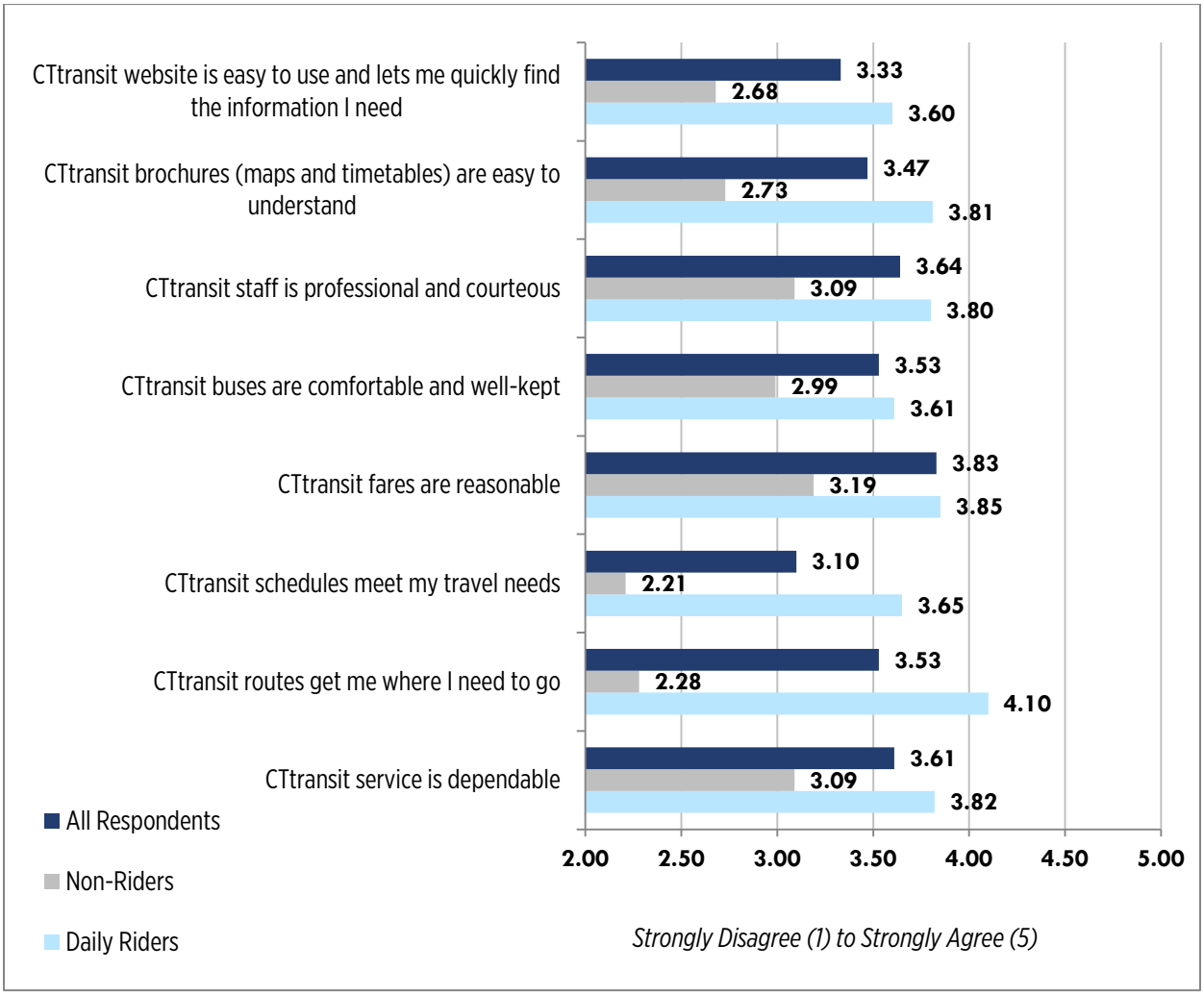
Sixty-percent of daily riders, who primarily use CT***transit*** for commuting purposes, prefer more service focused on getting to and from downtown Hartford; alternatively, 65% of non-riders favored more service between destinations other than downtown Hartford. Similarly, 70% of non-riders would prefer CT***transit*** service new areas, whereas 75% of daily riders favor improving CT***transit***'s existing service. Daily riders and non-riders disagree on the placement of neighborhood bus circulators and park and ride facilities: 54% of daily riders prefer neighborhood bus circulators that travel near passengers' homes, while 61% of non-riders favor more park and ride locations where users can park and transfer to a major route.

Survey respondents were also asked to rate eight elements of CT***transit***'s current service, including dependability, coverage, frequency, fares, comfort, and ease of use. The statements were rated on a five-point ordinal scale that measured levels of agreement and disagreement, with one indicating strong disagreement, three being neutral, and five representing strong agreement. The average level of agreement with each statement is shown in Figure 7.

Combined, all respondents agree on average that CT***transit*** fares are reasonable (3.83), CT***transit*** staff is professional and courteous (3.64), and that CT***transit*** service is dependable (3.61). However, the combined respondents only marginally agree that CT***transit*** schedules meet their travel needs (3.10).

Daily riders, which accounted for 33% of all responses, possess a more positive view of CT***transit***'s services, recording the highest levels of agreement for all eight statements. On average, daily riders most strongly agreed that CT***transit*** routes serve areas where they need to travel (4.10), that CT***transit*** fares are reasonable (3.83), and that CT***transit*** service is dependable (3.82). The least agreed statements among daily riders are that the CT***transit***'s website is easy to use and quickly find information (3.60) and that CT***transit*** buses are comfortable and well-kept (3.61).

FIGURE 6 LEVEL OF AGREEMENT WITH SERVICE CONDITIONS

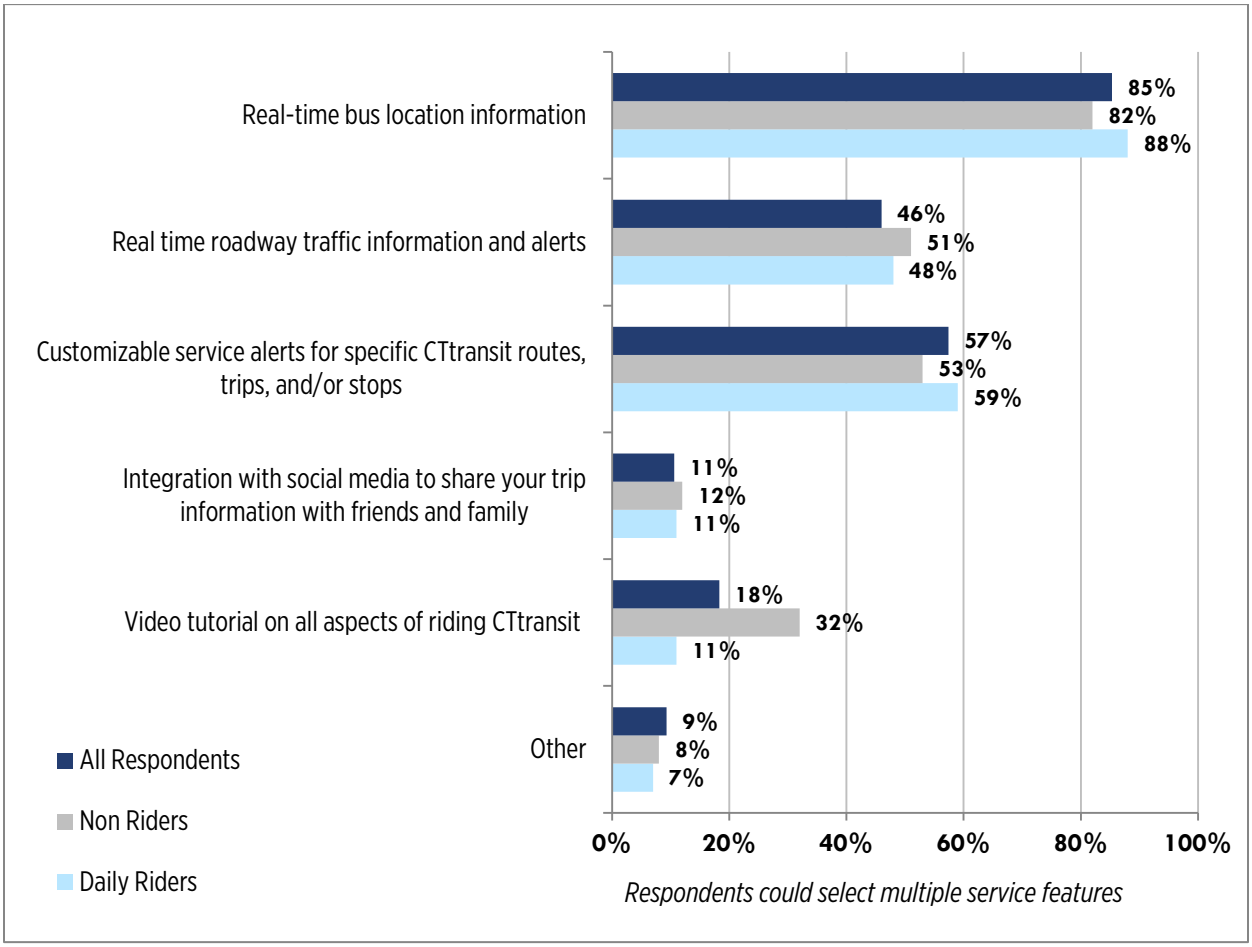


Non-riders, which totaled 19% of all responses, rated CT***transit***'s services significantly worse than daily riders. The strongest disagreement from daily riders is that CT***transit*** schedules meet their travel needs (2.21) and that CT***transit*** routes serve areas where they need to travel (2.28). Non-riders slightly agree that CT***transit*** staff is professional and courteous (3.09) and that CT***transit*** fares are reasonable (3.19). Combined, daily riders rated CT***transit***'s services approximately one average point higher (0.99) than non-riders.

Survey respondents also provided feedback on five service features that would be useful if provided by CT***transit*** (Figure 8). Service features included real-time bus location and roadway traffic information, customizable service alerts, integration with social media, and a video tutorial explaining how to ride CT***transit***. Real-time bus location information was overwhelmingly rated as the most useful feature, and is supported by 85% of all respondents. Customizable service alerts for specific CT***transit*** routes, trips, and/or stops was the second highest response, rated useful by 57% of all respondents. Real time roadway traffic information and alerts was rated as useful by 46% of all respondents, including 51% of non-riders.

Daily riders are most likely familiar with specific aspects of CT***transit***'s service; as such, only 11% indicated a video tutorial would be useful. Alternatively, 32% of non-riders supported the creation of a video tutorial on all aspects of riding CT***transit***. With only 11% support among all respondents, integration with social media was rated as the least useful feature.

FIGURE 7 USEFULNESS OF PROPOSED FEATURES



ADDITIONAL COMMENTS

Respondents were encouraged to provide additional comments regarding CT***transit***'s bus services, and the survey received over 400 comments. Comments were divided into three general categories: destinations that are underserved or not currently served by CT***transit***, requests for enhanced service, and parking comments.

Destinations

Respondents expressed interest in CT***transit*** expanding bus coverage to serve locations across the Hartford region, Connecticut, and extending to Springfield, Massachusetts. The most popular destinations were the University of Connecticut (Storrs), Manchester, and Bradley Airport.

- University of Connecticut (8)
- Manchester (7)
- Bradley Airport (5)
- Westfarms Mall (3)
- Mansfield (3)
- Storrs (3)

- Coltsville (3)
- Buckland Hills (3)
- Goodwin College (3)
- Somers (2)
- Stafford (2)
- Windsor Center (2)
- Wethersfield (2)
- Rocky Hill (2)
- Springfield, MA (2)
- Windsor (2)
- New Britain (2)
- New London (2)
- Farmington (2)
- Unionville (2)
- New Haven (2)
- Waterford
- Torrington
- Tunxis Community College
- Founders Plaza (East Hartford)
- Putnam Bridge Plaza
- Meriden
- Suffield
- Hammonasset Beach State Park
- Bishop's Corner
- Glastonbury
- Avon
- Ellington
- Tolland
- Middletown
- Newington
- Pratt & Whitney
- Southington

Service Requests

In general, higher service levels – more frequent and extended service – were the primary service requests. The most cited routes were Routes 61, 69, 92, and 153; each route received three specific service comments.

Route Number	Comment
14C	Not enough buses
18	More frequent stops at Church in Coventry
27	More weekday service
34	Morning inbound service is late
38	Add more trips and increase Sunday service
39W	Increase service
41	Do not remove service
46	Extend route beyond Elizabeth Avenue in Bloomfield
53	Need more service
56D	Excessive wait periods
61	Need Sunday service
	Increase service (2)
66	Do not change current route (2)
69	Add Sunday service
	Increase trip frequency
	Do not remove service
72F	Increase service in mornings and evenings
72/74	Run service every day
A76	Rarely on time at Central Row
82	Route should run every 30 minutes
84	Connect to the commuter parking lot at Exit 67
87	Schedule should be time to support work hours at Pratt & Whitney
88M	Some routes leave earlier than scheduled
92	Add Sunday service
	Should run on Sunday
	Add late night service Monday-Saturday and service on Sunday
95	More afternoon service to Putnam Plaza
	Schedule should be time to support work hours at Pratt & Whitney
95C	Should run every 30 minutes 24/7
96	Move time point eight to the MassConn industrial park at the end of Route 96
101/102	Preferred old 924 route alignment
102	Very long trip
144 CT*fastrak*	Increase service
153	Run more often during rush hour

	Do not change current route
	Increase service
903	Service is late in the evenings
	Two stops in same parking lot
905W	Add more trips between 7-8 a.m.
910	Return service to Century Hills Apartments
	Increase service in mornings and evenings
912	Buses are congested, need larger vehicles (and WiFi)
914	Early morning service is late
917	Express bus is not reliable
	Add a late morning/noon trip to Hartford from Vernon
917T	Change route times
918	Afternoon run on weekdays
919	Add more trips, consider merging with new service to Wallingford
	Add later service in the morning and earlier service in the evening
921	Service consistently 10-15 minutes late
	Slow service
924	Consistently late
950	Increase service to New Haven
Avon Route	Add an late evening trip

Parking

Comments regarding parking were primarily focused on the lack of existing parking at park and ride locations.

Comment
More parking available for local routes, provide park and ride at Bishop's Corner in West Hartford (3).
More parking spaces on some of the CT Fastrak parking stations (Cedar Street location).
More parking for CT Fastrak riders. Newington junction has limited parking spots.
The 102 has a very long commute. Not enough parking in New Britain.
More parking spots for 101.
More parking options in Newington; lot is filled by 7:15 am.
More parking or easier/cheaper/free parking downtown New Britain should have been considered.
I would like to take the CT***transit*** bus from around Tunxis Community college area to Hartford Downtown, but there are no reliable bus service and commuter parking.
More parking is needed at the two Newington Fasttrak stations.
Coordination of bus service with commuter car lots that allow for multi day affordable parking.
South of Hartford there are no places to park, or parking locations are notorious for car break ins.
Expand service to Tolland park & ride in Tolland at Exit 68.
More buses and buses available to more areas, building more park and rides is not the right idea.

I am pleasantly surprised with my switch from driving daily to taking CT***fastrak***. The only issue I've had is with finding parking at my local lot.
Add more parking, most of the lots are filled by workers by 9:00 am. Many more people would use the bus if parking was available!
Need to advertise locations of Park and Drive.

APPENDIX D

SCENARIO COMPARISONS BY ROUTE

HARTFORD AREA ROUTE CHANGE SHEETS

January 2016

CRCOG CAPITOL REGION COUNCIL OF GOVERNMENTS Working together for a better region

CTtransit

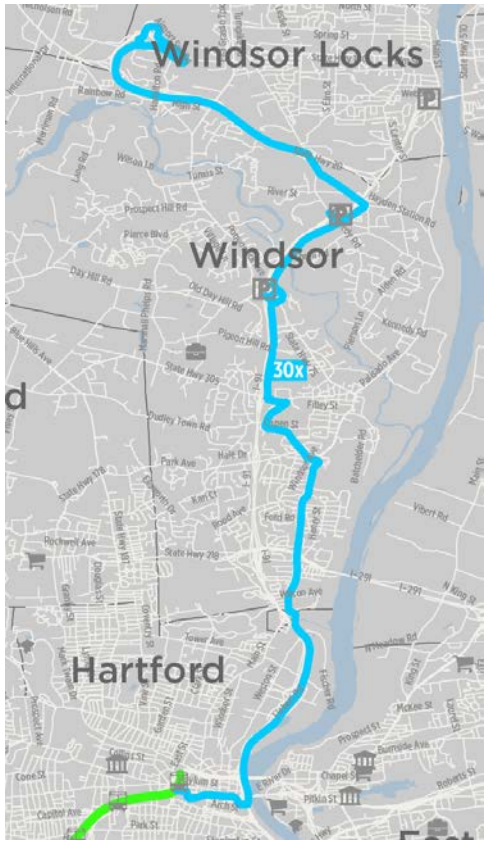
CONNECTICUT DEPARTMENT OF TRANSPORTATION

NELSON NYGAARD

ROUTE 30X: BRADLEY FLYER

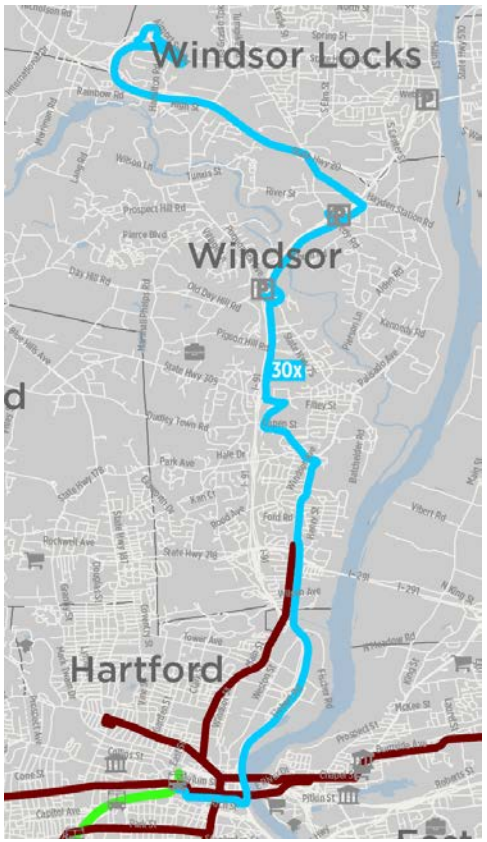
Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1



- Operate all trips as Route 30X with express service to Bradley Airport
- Operate from downtown Hartford to Bradley Airport via I-91, stopping only at the Poquonock Park-and-Ride Lot
- Eliminate the 30N variant
- A modified Route 34 would provide local service along North Main Street in Hartford, and along Kennedy Road and Ella Grasso Turnpike in Windsor Locks

SCENARIO 2



- Operate all trips as Route 30X with express service to Bradley Airport
- Operate from downtown Hartford to Bradley Airport via I-91, stopping only at the Poquonock Park-and-Ride Lot
- Eliminate the 30N variant
- A modified Route 34 would provide local service along North Main Street in Hartford, and along Kennedy Road and Ella Grasso Turnpike in Windsor Locks

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 31: PARK STREET - NEW PARK AVENUE

SCENARIO 1

- Truncate route at Charter Oak Marketplace (service to West Hartford Place available via transfer to a modified Route 37)
- Streamline route by eliminating service on Kane Street

SCENARIO 2

- Operate Arterial BRT service along Park Street and New Park Avenue following Route 31 alignment

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 32: WINDSOR AVENUE

Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1

- Operate all service as Route 32, via Windsor Avenue and Deerfield Avenue to Poquoncock Park-and-Ride
- Weekend service would operate same as weekday service above
- Discontinue all variants (32A, 32B, 32M). Weston Street would continue to be served by Route 38

SCENARIO 2

- Operate all service as Route 32, via Windsor Avenue to Poquoncock Park-and-Ride
- Weekend service would operate same as weekday service above
- Discontinue all variants (32A, 32B, 32M). Weston Street would continue to be served by Route 38
- Route 36 Day Hill Road is discontinued, with a new Day Hill Road Circulator service connecting the industrial area with Windsor Center
- Service levels may need to be increased to reflect that Routes 34 and 36 are no longer serving Windsor Avenue

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 33: PARK STREET - PARK ROAD

SCENARIO 1

- Truncate route at Quaker Lane (service to Westfarms Mall available via transfer to Routes 128 at Parkville Station)

SCENARIO 2

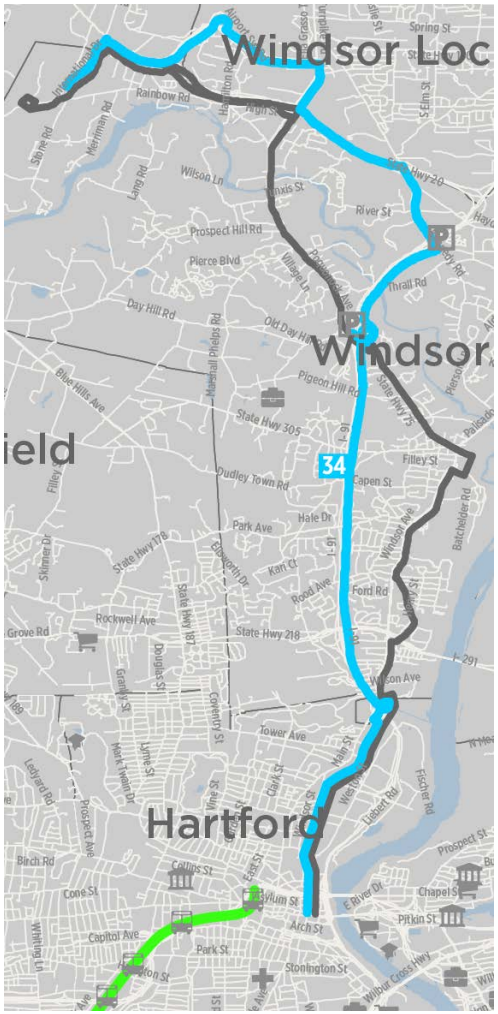
- Operate route between West Hartford Center and Parkville Station to connect to CT***fastrak*** service and potential Arterial BRT service along Farmington corridor and Park/New Park corridor
- Service to Westfarms Mall available via transfer to Routes 128 at Parkville Station
- Frequent service to downtown Hartford available via transfers to CT***fastrak*** or potential Arterial BRT along Farmington or Park/New Park corridors

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 34: WINDSOR AVENUE/RAINBOW

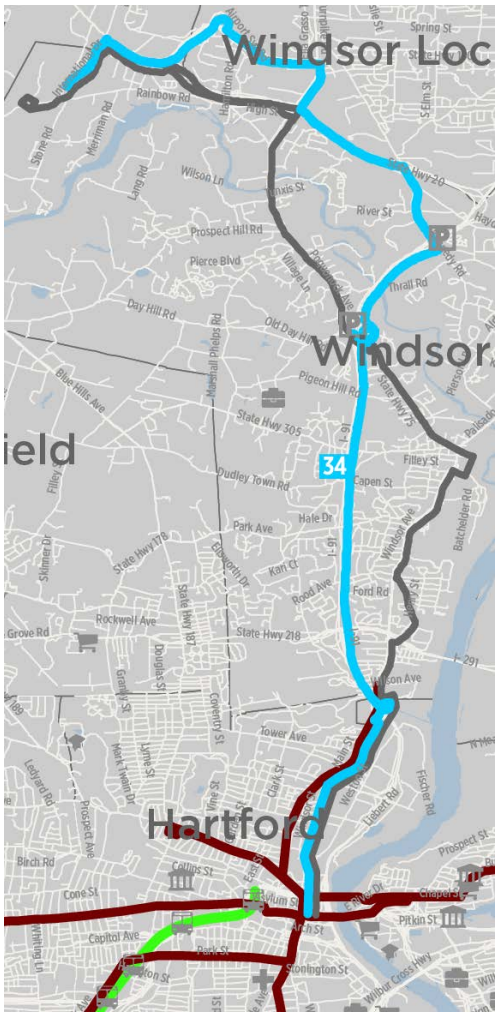
Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1



- To provide faster service to Windsor Locks, Route 34 would operate via North Main Street to I-91
- Route 34 would serve Poquonock Park-and-Ride, then continue to Kennedy Road via I-91
- Route would provide local service on Kennedy Road and Ella Grasso Turnpike, enabling modified Route 30X-Bradley Flyer to run faster more direct airport service
- Windsor Center would be served by modified Routes 32 and 36
- Note: Limited stop service on Route 34 along North Main Street may also be considered as a complement to Route 40

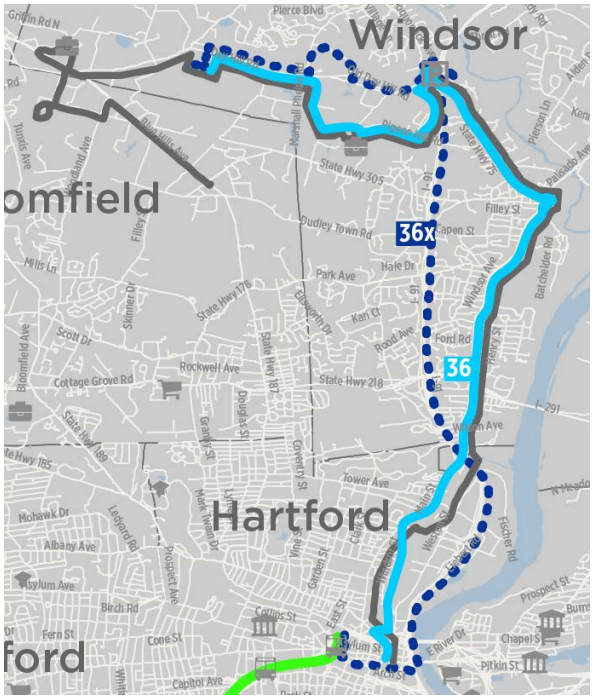
SCENARIO 2



- To provide faster service to Windsor Locks, Route 34 would operate via North Main Street to I-91
- Route 34 would serve Poquonock Park-and-Ride, then continue to Kennedy Road via I-91
- Route would provide local service on Kennedy Road and Ella Grasso Turnpike, enabling modified Route 30X-Bradley Flyer to run faster more direct airport service
- Windsor Center would be served by modified Routes 32 and 36
- Note: Limited stop service on Route 34 along North Main Street may also be considered as a complement to Route 40
- Windsor Center service provided by modified Route 32 and potential Day Hill Road Circulator

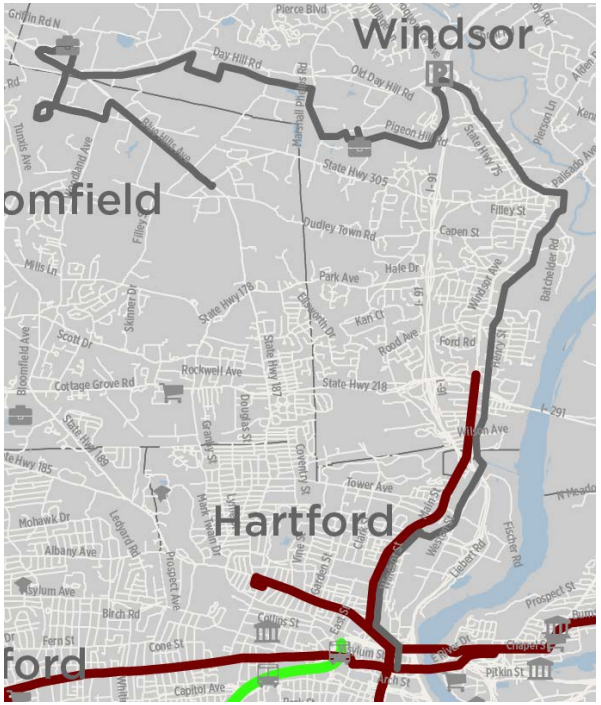
The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 36 AND 36X: WINDSOR - DAY HILL ROAD



SCENARIO 1 | SERVICE UPDATE

- Route 36/36X would operate similar to today
- Route 36 serves Addison Corporate Park, Route 36X serves Voya Financial; both would serve new Amazon distribution center
- Route 36 would continue to interline with Route 54 as it does today, with outbound trips switching at the new Amazon facility to operate inbound as Route 54 via Blue Hills Avenue



SCENARIO 2 | SERVICE OVERHAUL

- Discontinue Routes 36/36x
- Potential Day Hill Road Circulator would serve: Home Goods Distribution Center, Griffin Center, Amazon, Addison Corporate Park, Poquonock Park-and-Ride Lot, and Windsor Center (including future commuter rail)
- Voya Financial would be served by a new Route 54X
- Connections could be made at Poquonock Park-and-Ride lot to Bradley Airport (30X), Kennedy Road and International Drive (Route 34) and downtown Hartford via I-91

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 37: NEW BRITAIN AVENUE VIA JEFFERSON

SCENARIO 1

- Interline with a modified Route 37 at Charter Oak Marketplace in order to provide through-service connecting Charter Oak Marketplace, Flatbush Station, and West Hartford Place
- Streamline route by shifting service from Brookfield and Dart Street to Flatbush and Hillside Avenue
- Streamline route by shifting service from Jefferson Street to Retreat Street near Hartford Hospital

SCENARIO 2

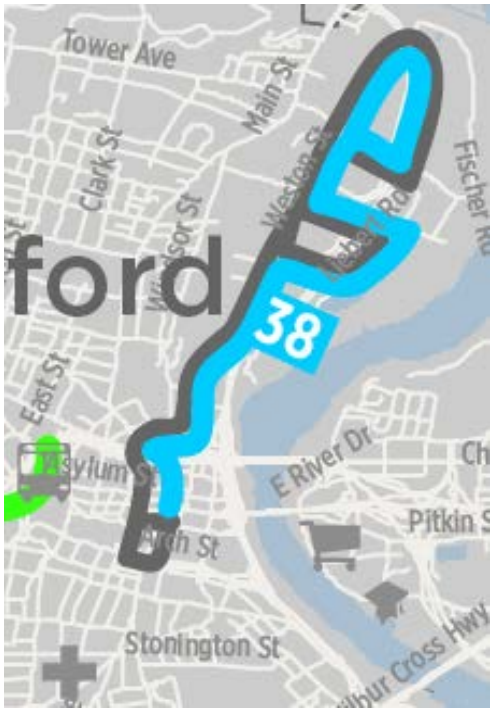
- Interline with a modified Route 37 at Charter Oak Marketplace in order to provide through-service connecting Charter Oak Marketplace, Flatbush Station, and West Hartford Place
- Streamline route by shifting service from Brookfield and Dart Street to Flatbush and Hillside Avenue
- Operate route between Charter Oak Marketplace and Hartford Hospital only (frequent service to downtown Hartford available via CT***fastrak*** service or potential Arterial BRT service along Park/New Park corridor or Franklin corridor

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 38: WESTON STREET

Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1



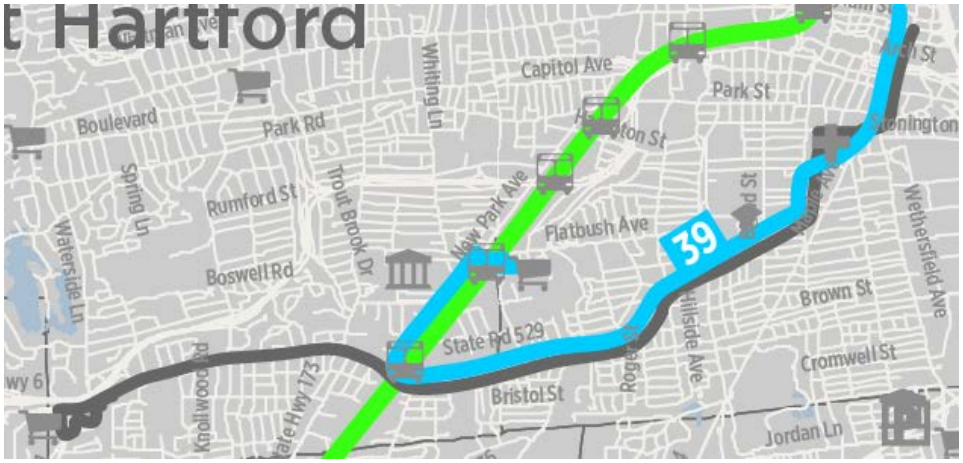
- Route 38 would follow the same alignment as today
- This route serves key activity centers in the North Meadows area, including CTtransit's main garage, the US Post Office and Hartford Correctional Center

SCENARIO 2

- Route 38 would follow the same alignment as today
- This route serves key activity centers in the North Meadows area, including CTtransit's main garage, the US Post Office and Hartford Correctional Center

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 39: NEW BRITAIN AVENUE VIA RETREAT



SCENARIO 1

- Interline with a modified Route 37 at Charter Oak Marketplace in order to provide through-service connecting Charter Oak Marketplace, Flatbush Station, and West Hartford Place
- Eliminate service to Westfarms Mall (service to Westfarms Mall available via transfer to Routes 128 at Flatbush or Elmwood Station)

SCENARIO 2

- Interline with a modified Route 37 at Charter Oak Marketplace in order to provide through-service connecting Charter Oak Marketplace, Flatbush Station, and West Hartford Place
- Eliminate service to Westfarms Mall (service to Westfarms Mall available via transfer to Routes 128 at Flatbush or Elmwood Station)
- Operate route between Charter Oak Marketplace and Hartford Hospital only (frequent service to downtown Hartford available via CT***fastrak*** service or potential Arterial BRT service along Park/New Park corridor or Franklin corridor

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 40: NORTH MAIN STREET

Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1

- Same alignment as today
- Introduce Sunday service (modified Route 32 Sunday service would no longer operate on North Main Street)

SCENARIO 2

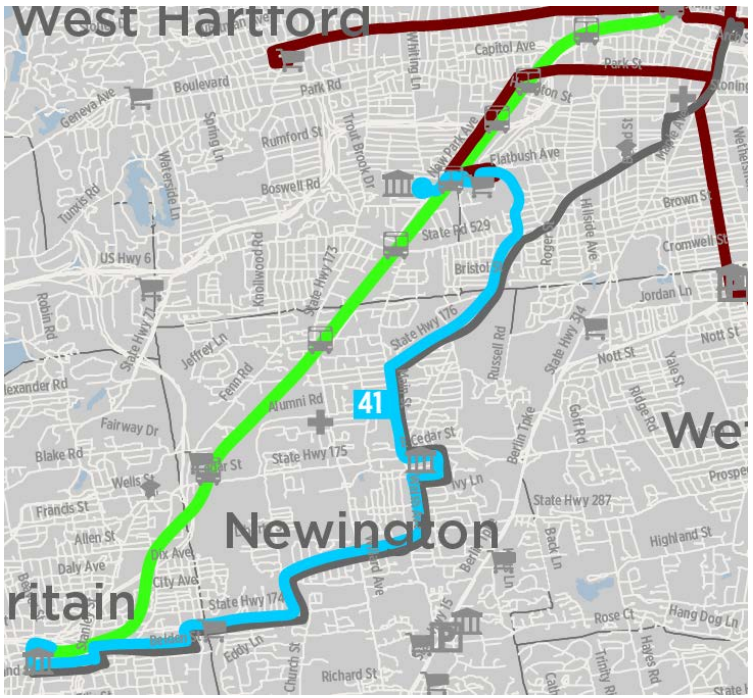
- Replace Route 40 with potential Arterial BRT service along the North Main Street corridor from downtown Hartford to Windsor Shopping Plaza where connections could be made to a modified Route 92 providing crosstown service

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 41: NEW BRITAIN/HARTFORD

SCENARIO 1

- Operate route between New Britain and West Hartford Place (via Charter Oak Marketplace and Flatbush Station) only (frequent service to downtown Hartford available via transfer to CT***fastrak*** service or potential Arterial BRT service along Park/New Park corridor)



SCENARIO 2

- Operate route between New Britain and West Hartford Place (via Charter Oak Marketplace and Flatbush Station) only (frequent service to downtown Hartford available via transfer to CT***fastrak*** service)

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 42: BARBOUR STREET

SCENARIO 1

- Combine Route 42/44 to operate as new Route 42 via Albany, Garden, Westland (essentially following the current Route 44 route) and then Barbour, Kensington, and Tower (along Route 42's terminal loop)
- Service frequencies would be similar to those on Route 42 today (higher than operated on Route 44 today)
- Service would follow same alignment, 7 days per week

SCENARIO 2

- Extend Route 42 to operate via Tower Avenue to Granby Street
- A modified Route 92 (Tower Avenue) would be realigned to operate via Putnam Highway, connecting Copaco Center and Buckland Hills Malls
- Connections to Route 92 available at the Windsor Shopping Center via the proposed arterial BRT service along N. Main St

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 43: CAMPFIELD AVENUE

SCENARIO 1

- Extend route to Jordan Lane Shopping Center to facilitate more reverse direction trips from neighborhoods along Campfield Avenue
- Realign route to operate on Campfield Avenue/Webster Street to Capitol Avenue to create more transfer opportunities

SCENARIO 2

- Extend route to Jordan Lane Shopping Center to facilitate more reverse direction trips from neighborhoods along Campfield Avenue
- Realign route to operate on Campfield Avenue/Webster Street to Capitol Avenue to create more transfer opportunities
- Extend route north of downtown Hartford to create through-ridership and interline opportunities

Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 44: GARDEN STREET

Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1

- Combined with Route 42, and operated as modified Route 42 at higher frequency and on weekends
- Modified Route 42 would operate via Albany, Garden, Westland Barbour, Kensington, and Tower

SCENARIO 2

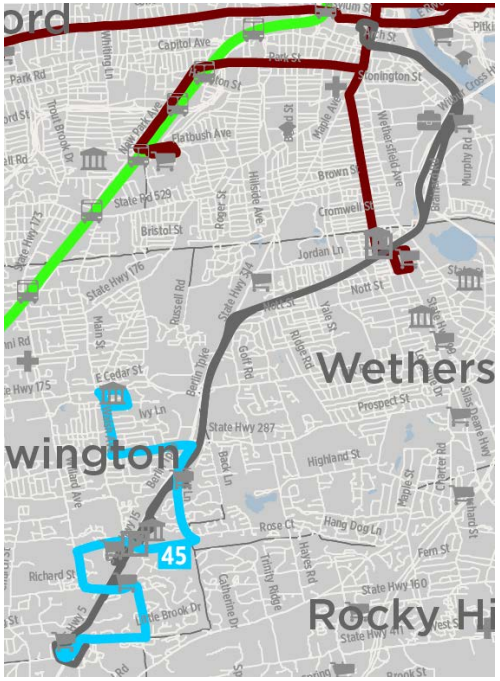
- Interline with Route 61 and operate as a modified Route 61 to provide cross-town service connecting Garden Street and the Albany Avenue area to Asylum Hill, CT*fastrak*, and Frog Hollow

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 45: BERLIN TURNPIKE FLYER

SCENARIO 1

- Restructure route as a circulator connecting apartment communities to retail destinations and Express service
- Operate route between Stew Leonard's and Newington Center only (service to downtown Hartford available via transfer to Express Route 907 or a modified Route 41)



SCENARIO 2

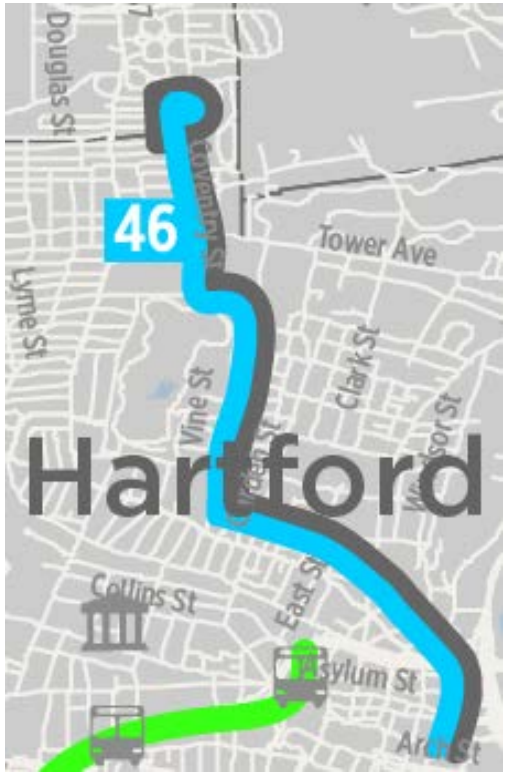
- Restructure route as a circulator connecting apartment communities to retail destinations and Express service
- Operate route between Stew Leonard's and Newington Center only (service to downtown Hartford available via transfer to Express Route 907 or a modified Route 41)

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 46: VINE STREET

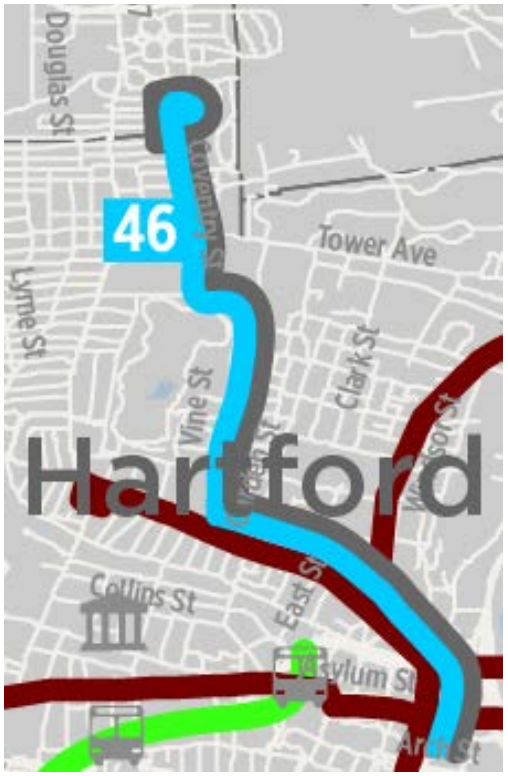
Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1



- Operate along the same alignment as today

SCENARIO 2



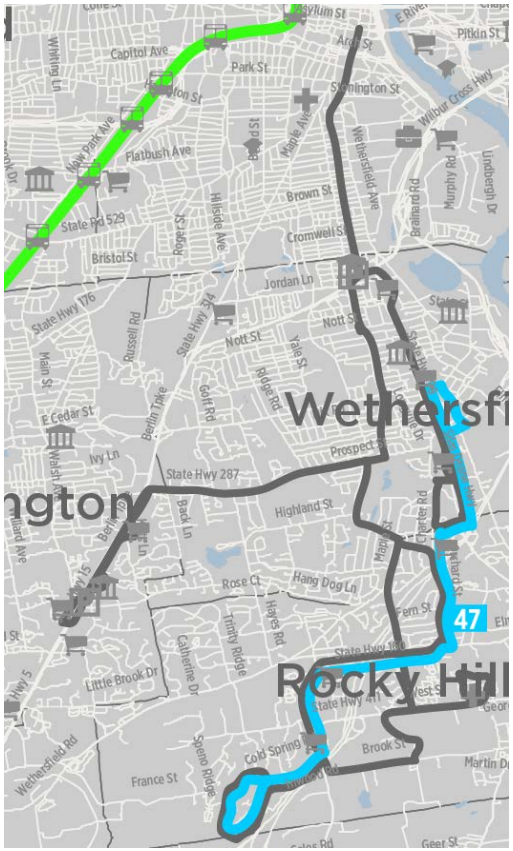
- Operate along the same alignment as today, taking advantage of potential Arterial BRT service along Albany Avenue corridor which could include corridor treatments intended to speed up service (bus stop consolidation, traffic signal prioritization, etc.)

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 47: FRANKLIN AVENUE

Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1



- Restructure route as a circulator connecting apartment communities to retail destinations and Express service
- Operate route between Century Hills and Wethersfield only (service to downtown Hartford available via a modified Route 53 and Express Route 910)
- Eliminate Berlin Turnpike service variant (local service in Berlin Turnpike corridor available via a modified Route 45)

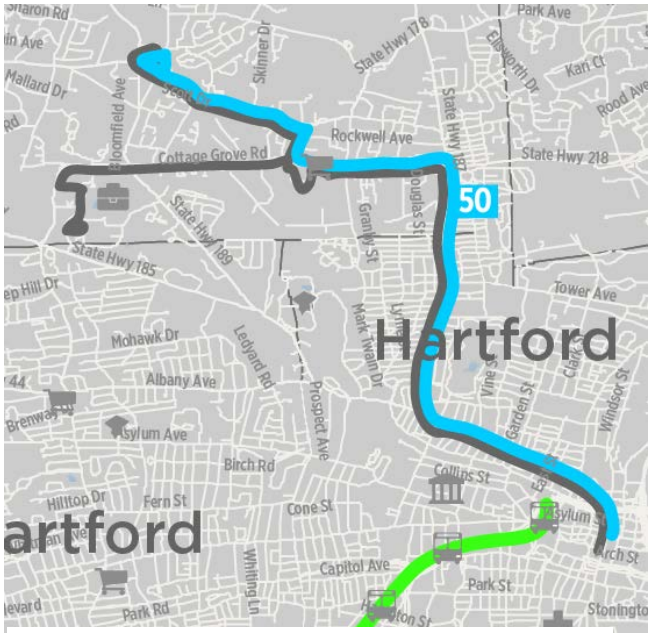
SCENARIO 2

- Operate as potential Arterial BRT service along Franklin Avenue following Route 31 alignment
- Service south of Jordan Lane replaced by modified Routes 53 and 55

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

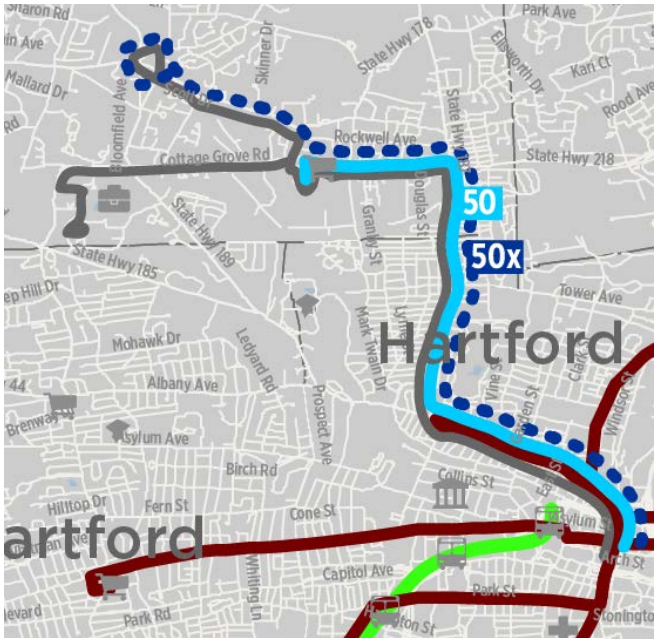
ROUTE 50 AND 50X: BLUE HILLS AVENUE - COTTAGE GROVE ROAD

Legend
- Potential Scenario
- Potential Limited Stop Service
- Existing Route
- Potential BRT
- CT*fastrak*



SCENARIO 1

- Discontinue Route 50A to Cigna campus (service to Cigna campus available via Route 153 and modified Route 72)
- All Route 50 trips would operate to Bloomfield Center. Route 92 trips would terminate at Copaco Center



SCENARIO 2

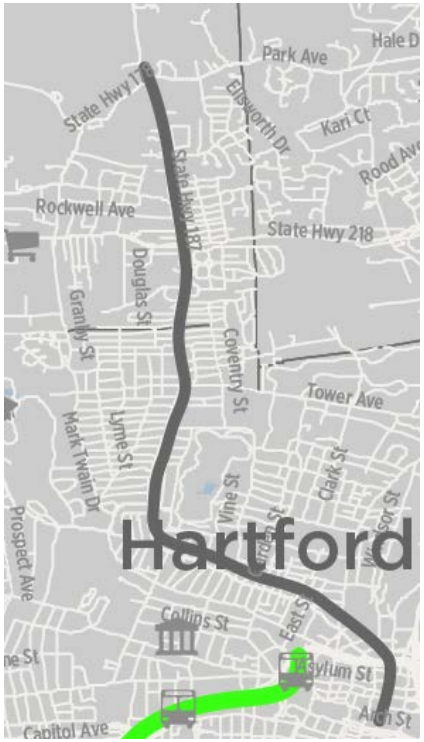
- Introduce new Bloomfield Circulator route to connect Dorothy Drive, Bloomfield Center, Copaco Center, Seabury Retirement Home and Wedgewood Apartments
- Operate Route 50 as 50X on weekdays, providing limited stop between Bloomfield Center, Copaco and Downtown via Blue Hills Avenue and Albany Avenue
- Route 50 would operate locally on Saturday (Routes 56 would be discontinued)

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 52: BLUE HILLS AVENUE

Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1



- Combine Routes 52 and 54, operating all trips as Route 54 to Griffin Ctr/Day Hill Road area
- Discontinue Wedgewood Apartments deviation; residents would pick up service on Blue Hills Avenue

SCENARIO 2

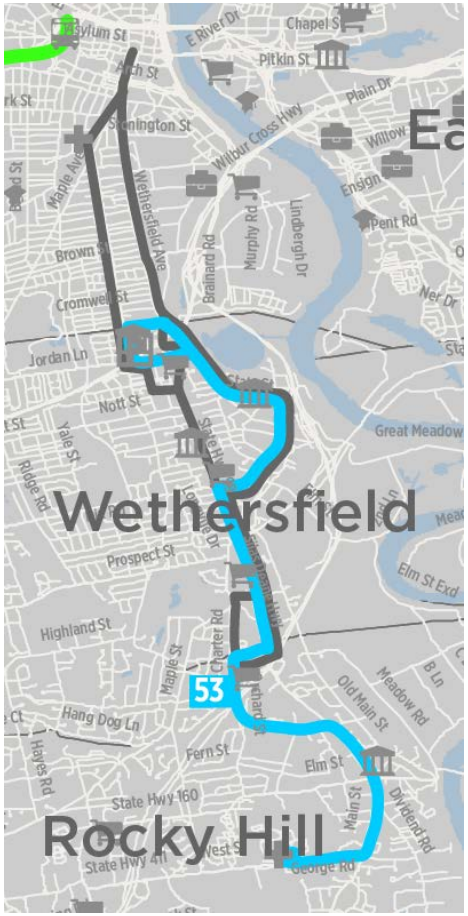
- Combine Routes 52 and 54, operating all trips as Route 54 to Griffin Ctr/Day Hill Road area
- Discontinue Wedgewood Apartments deviation;
- Wedgewood Apartments would be served by a new Bloomfield Circulator route

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 53: WETHERSFIELD AVENUE

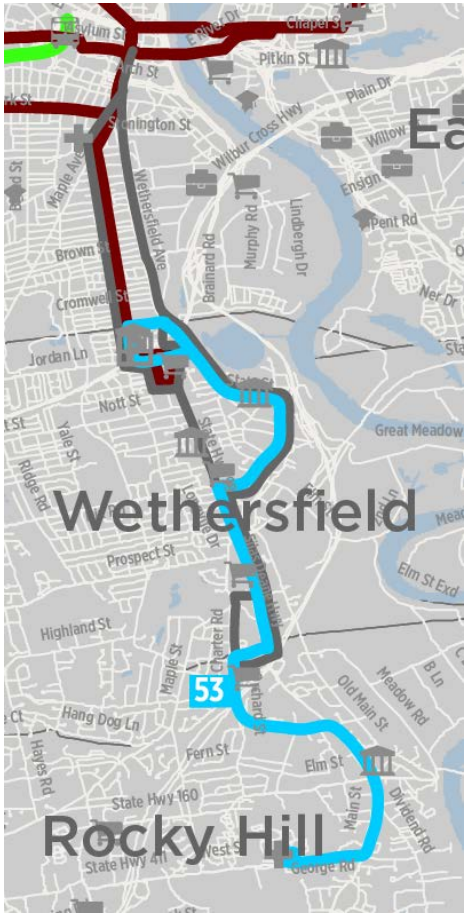
Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1



- Operate between Wolcott Hill Park-and-Ride and Veteran's Home only (service to downtown Hartford available via transfer to modified Route 55 and Express Route 950)
- Add service to Wal-Mart in Rocky Hill
- Streamline route by eliminating variants
- Becomes circulator connecting residential, retail, and Express bus service

SCENARIO 2



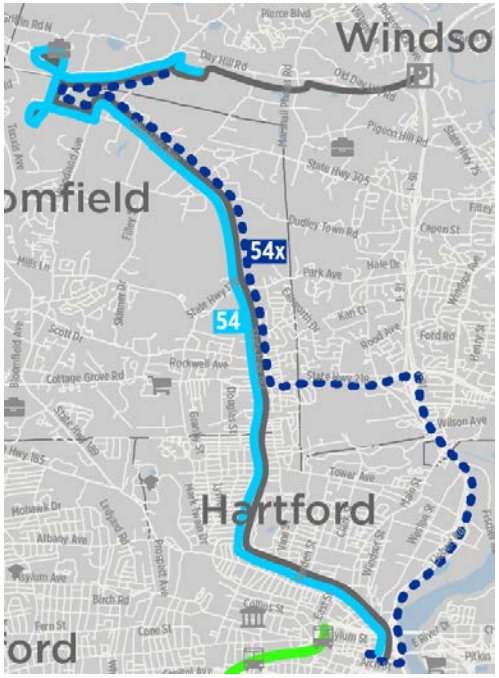
- Operate between Wolcott Hill Park-and-Ride and Veteran's Home only (service to downtown Hartford available via transfer to potential Arterial BRT service along Franklin Avenue corridor and Express Route 950)
- Add service to Wal-Mart in Rocky Hill
- Streamline route by eliminating variants
- Becomes circulator connecting residential, retail, potential Arterial BRT and Express bus service

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 54 AND 54X: BLUE HILLS AVE - BLUE HILLS EXTENSION

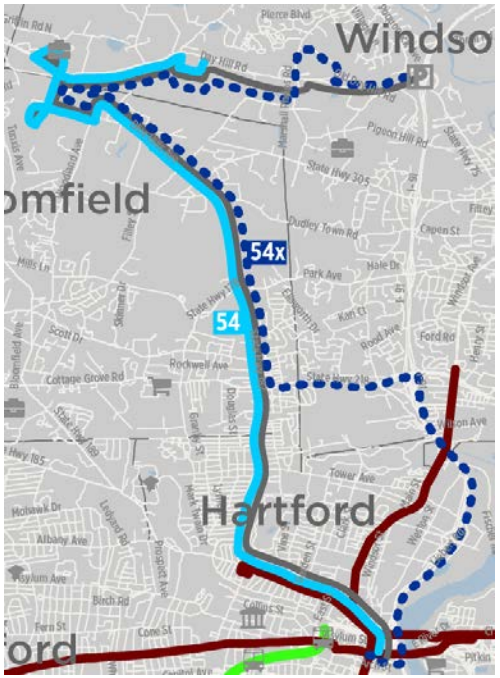
Legend
- Potential Scenario
- Potential Limited Stop Service
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1



- Combine Routes 54 and 52 and operate all local trips as Route 54 to Griffin Center and Day Hill Road.
- Operate Route 54X via I-91 and Putnam Turnpike, as recently implemented by CT*transit*
- Continue to interline Route 54 with Route 36 (route numbers would change at the new Amazon distribution facility on Day Hill Road, returning inbound as Route 36 via Windsor Avenue)
- Service to Addison Corporate Park provided by Route 36

SCENARIO 2



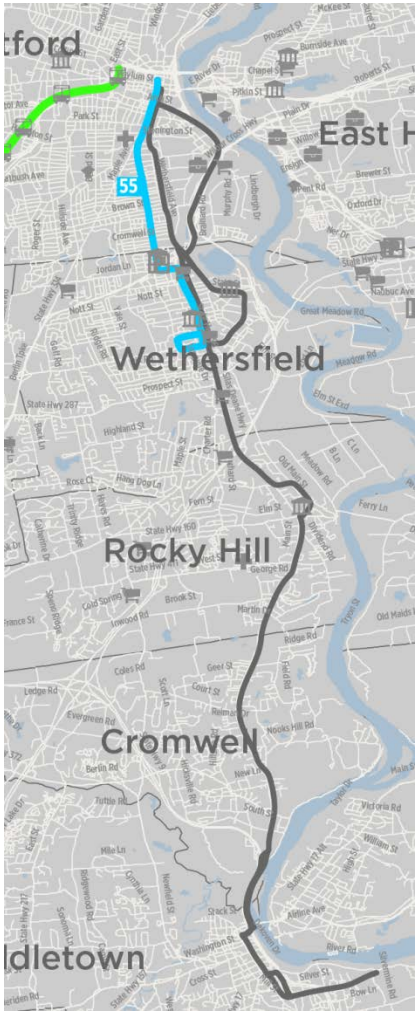
- Extend Route 54X to Poquonock Park-and-Ride via Voya Financial
- Route 54 would terminate at new Amazon facility on Day Hill Road (it would no longer interline with Route 36)
- Route 54 buses would run both inbound and outbound via Blue Hills Avenue
- Routes 54 and 54X would connect to potential new Day Hill Road Circulator

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 55: MIDDLETOWN

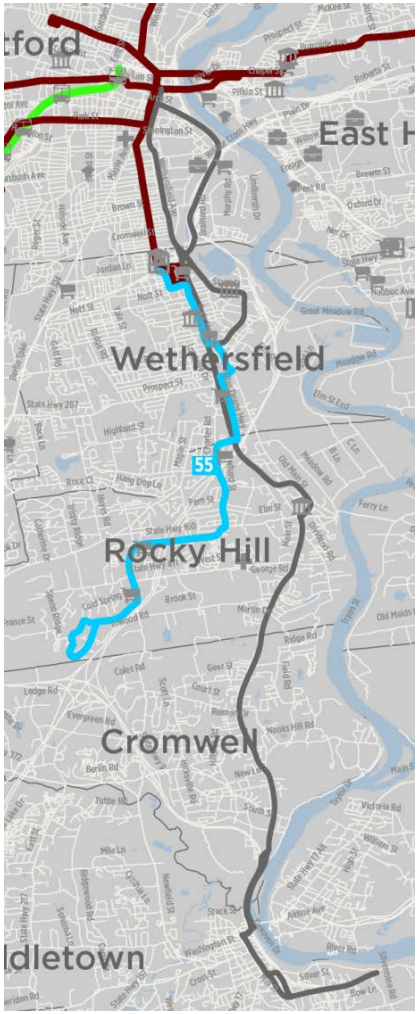
Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1



- Operate between Wethersfield Town Hall and downtown Hartford only (service to Rocky Hill available via transfers to modified Routes 53 and 47)
- Shift service from Wethersfield Avenue to Franklin Avenue to improve ridership potential

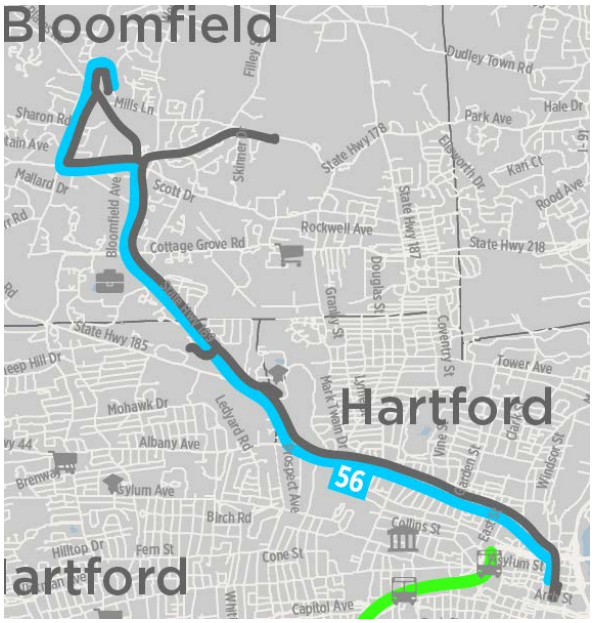
SCENARIO 2



- Operate between Jordan Lane and Century Hill, primarily along the Scenario 1 alignment of Route 47
- Service to downtown Hartford available via transfer to potential Arterial BRT service along Franklin Avenue corridor

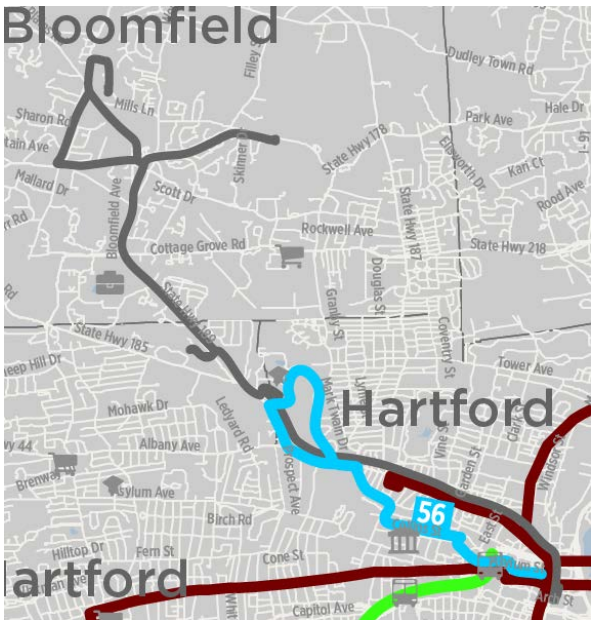
The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 56: BLOOMFIELD AVENUE



SCENARIO 1

- Restructure route to operate bi-directionally along Mountain Avenue, Brown Street and Dorothy Drive
- The Route 56F variant, serving the Federation Home on Wintonbury Avenue would be discontinued

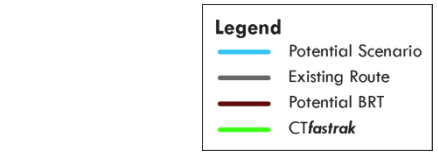


SCENARIO 2

- Restructure route to connect downtown Hartford and the University of Hartford via Ashley Avenue, Woodland St. and Homestead Avenue
- A potential Bloomfield Circulator route would provide local connections, serving Dorothy Drive, Bloomfield Center, Copaco Center, the Seabury Retirement Home and Wedgewood Apartments
- Route 50X would provide fast, limited stop service between Bloomfield Center, Copaco Center, Albany Avenue, and downtown Hartford
- Route 912 would also continue to serve the Sacred Heart Church Park-and-Ride Lot

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 58: ALBANY AVENUE



SCENARIO 1

- Operate along the same alignment as today

SCENARIO 2

- Operate along the same alignment as today, taking advantage of potential Arterial BRT service along Albany Avenue corridor which could include corridor treatments intended to speed up service (bus stop consolidation, traffic signal prioritization, etc.)

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 59: LOCUST STREET

SCENARIO 1

- Use Reserve Road to replace bi-directional service on the southern end of the route with a counter-clockwise loop in order to improve productivity and on-time performance

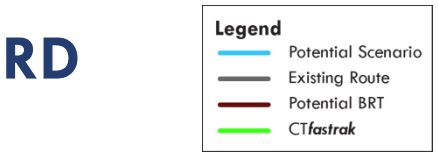
SCENARIO 2

- Use Reserve Road to replace bi-directional service on the southern end of the route with a counter-clockwise loop in order to improve productivity and on-time performance
- Restructure route to connect to potential Arterial BRT service along Franklin and Park Street corridors rather than serving downtown Hartford directly

Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

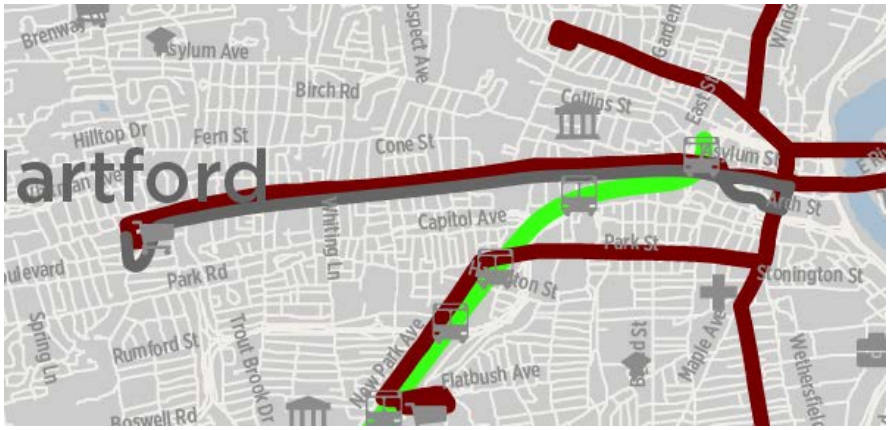
The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 60: FARMINGTON AVENUE/WEST HARTFORD CENTER



SCENARIO 1

- Operate along the same alignment as today



SCENARIO 2

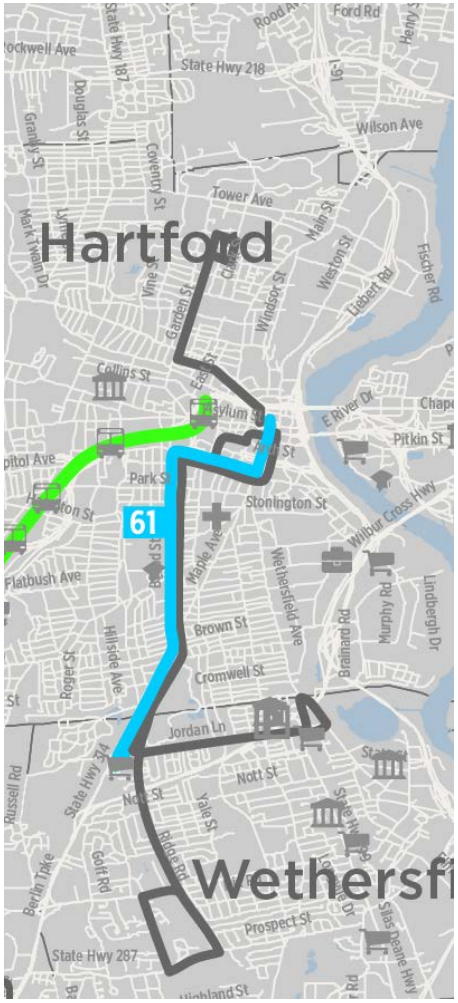
- Replace route with potential Arterial BRT service along Farmington Avenue corridor

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 61: BROAD STREET

Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1


Hartford
Wethersfi
61
Ford Rd
State Hwy 218
Wilson Ave
Tower Ave
Main St
Weston St
Fischer Rd
Collins St
Asylum St
E River Dr
Pitkin St
Park St
Stonington St
Wilbur Cross Hwy
Flatbush Ave
Brown St
Cromwell St
Jordan Ln
Nott St
Prospect St
State Hwy 287
Wethersfield Ave
Hillside Ave
Maple Ave
Murphy Rd
Brainard Rd
Lindbergh Dr
Berlin Turnpike
Golf Rd
Yale St
Stanley St
Lower Rd
Russell Rd
Roger St
Lisbert Rd
Windsor St
Garden St
Vine St
Coventry St
Douglas St
Granby St
Mark Twain Dr
Lockwell Ave
State Hwy 187
Rood Ave
Henry St
Chapel St
Pitol Ave
Huyshope Ave
Edgerton St
Bond St
Highland St
Stanley Quarter Park
Stanley Golf Course
Stanley Pond
Stanley Rd
Stanley Dr
Stanley Ln
Stanley Ct
Stanley Cir
Stanley Pl
Stanley Ter
Stanley Way
Stanley Blvd
Stanley Ave
Stanley St

ROUTE 62: FARMINGTON AVENUE/BISHOPS CORNER

SCENARIO 1

- Operate along the same alignment as today

SCENARIO 2

- Replace route with potential Arterial BRT service along Farmington Avenue corridor
- Service on North Main Street in West Hartford provided by Route 153

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

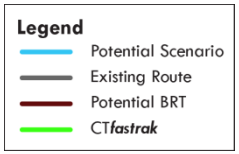
ROUTE 63: HILLSIDE AVENUE

SCENARIO 1

- Eliminate service to Charter Oak Market (frequent service to Charter Oak Market available via transfer to modified Routes 37 or 39)
- Truncate route at Sigourney Street Station (frequent service to downtown Hartford available via transfer to CT***fastrak*** service)

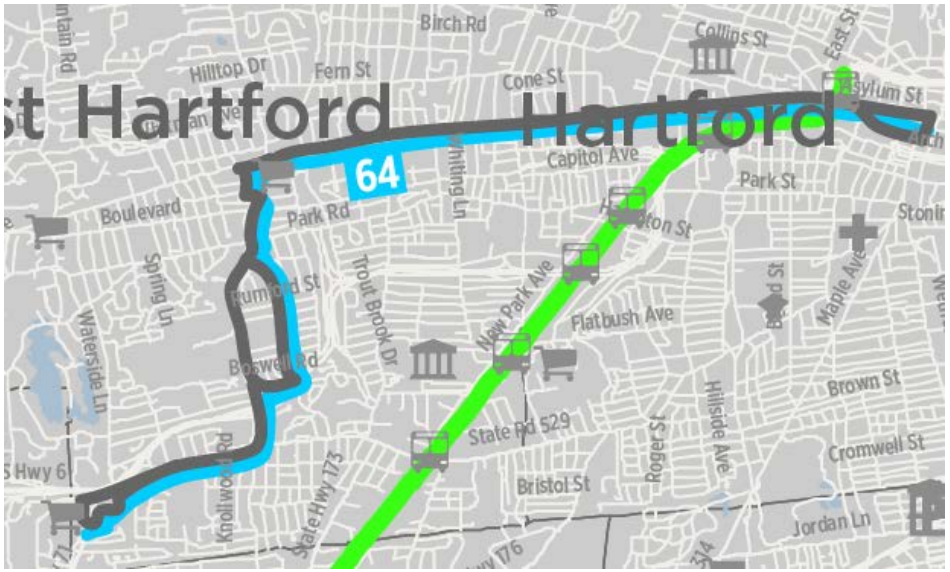
SCENARIO 2

- Eliminate service to Charter Oak Market (frequent service to Charter Oak Market available via transfer to modified Routes 37, 39, Crosstown Connector, or potential Arterial BRT service along Park/New Park corridor)
- Truncate route at Sigourney Street Station (frequent service to Hartford available via transfer to CT***fastrak*** service or potential Arterial BRT service along Park/New Park corridor)



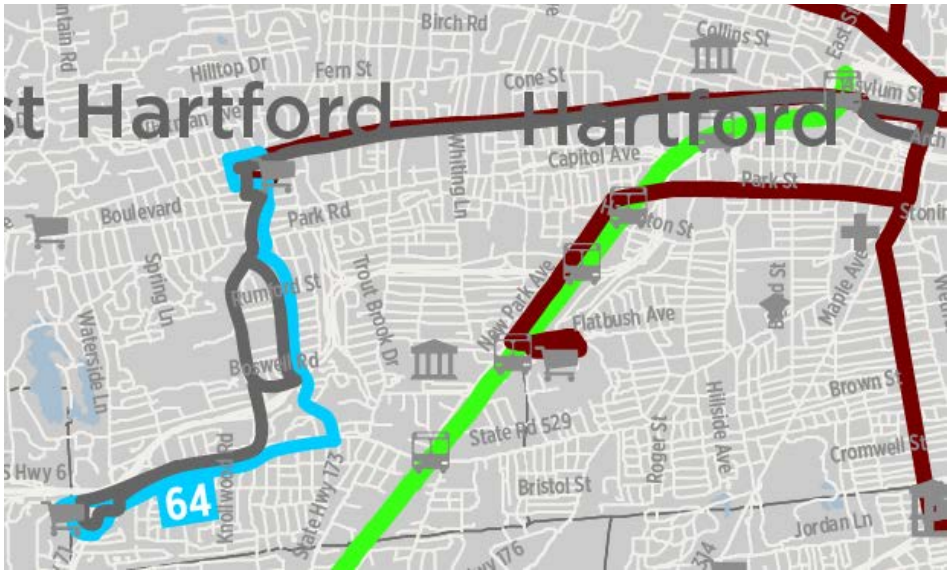
The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 64: FARMINGTON AVENUE/WESTFARMS MALL



SCENARIO 1

- Operate along the same alignment as today



SCENARIO 2

- Operate route between W. Hartford Center and the West Farms Mall only (frequent service to downtown Hartford available via transfer at West Hartford Center to potential Arterial BRT service along Farmington Avenue corridor)

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 66: FARMINGTON AVENUE/UCONN/UNIONVILLE

Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1

- Discontinue Route 66T variant to Tunxis Community College would be discontinued (service to Tunxis Community
- Route 66H (UConn Health) and 66F (Unionville) would continue to operate
- Service to Tunxis Community College would be available via New Britain Transit Route 503)

SCENARIO 2

- Service in the Farmington Avenue corridor between downtown Hartford and W. Hartford Center would be upgraded to fast, frequent potential Arterial BRT service
- Route 66H and 66F would operate from West Hartford to UConn Health or Unionville.
- Route 909 express trips and Route 121 would continue to operate

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 69: CAPITOL AVENUE

SCENARIO 1

- Restructure route as a circulator connecting CCSU, VA, apartment communities, Stop & Shop, Cedar Street Station, and CT***fastrak*** service
- Operate route between Cedar Street Station and Newington Junction Station only (frequent service to downtown Hartford available via transfer to CT***fastrak*** service)

SCENARIO 2

- Restructure route as a circulator connecting CCSU, VA, apartment communities, Stop & Shop, Cedar Street Station, and CT***fastrak*** service
- Operate route between Cedar Street Station and Newington Junction Station only (frequent service to downtown Hartford available via transfer to CT***fastrak*** service)

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 70: FERN STREET (PREVIOUSLY ROUTE 72F)

Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1

- Route 72F would be renamed Route 70, to separate and distinguish it from Route 72A and better tailor each schedule to passenger demand
- The new Route 70 would be redirected to terminate in W. Hartford Center, turning south from Fern Street onto North Main Street rather than continuing on Fern where ridership is low
- Route 72A would be renamed Route 72 and operate as today

SCENARIO 2

- Service along Fern Street would be discontinued
- Service would continue to operate along Asylum Avenue with Route 72, and on North Main Street with Route 153

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 72: ASYLUM AVENUE

SCENARIO 1

- Route 72 would operate along current Route 72A alignment
- Route 72F would be renamed Route 70, separating the routes to better tailor schedule to passenger demand

SCENARIO 2

- Route 72 would operate along current Route 72A alignment
- Route 72F would be discontinued

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

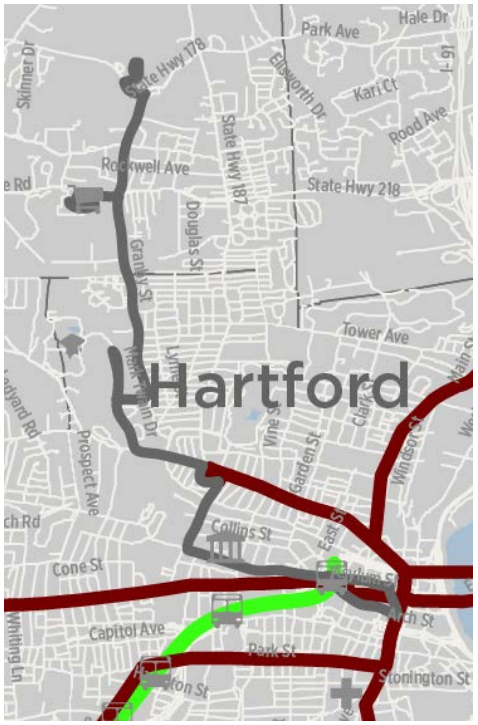
ROUTE 74: GRANBY STREET

Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1

- Route 74 would be realigned, along with Route 76 – Ashley Street
- Route 74 would no longer serve Copaco Center, but would operate directly from Granby Street to the Seabury Retirement Home
- All trips on Route 76 would be extended to Copaco

SCENARIO 2



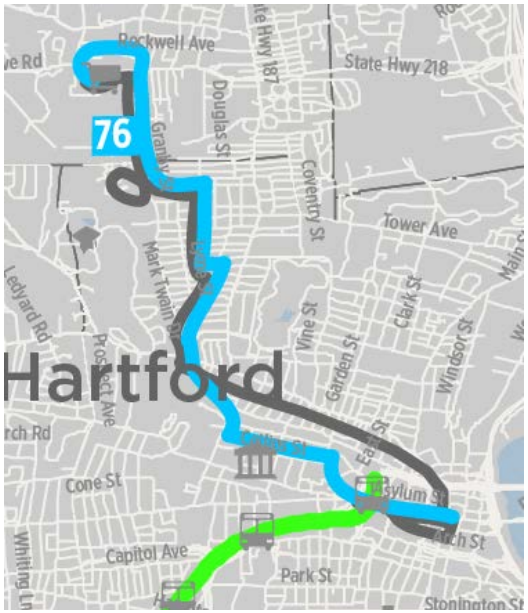
- Route 74 would be discontinued
- The Mark Twain and Granby Street area would be served by a modified Route 56
- A potential new Bloomfield circulator route would serve the Seabury Retirement Home

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 76: ASHLEY STREET

Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1



- All Route 76 trips would be extended to Copaco Center (Route 74 would no longer serve Copaco)
- Service would no longer circulate in Bowles Park

SCENARIO 2

- Route 76 would operate via Albany Street to Westbourne Parkway, then follow today's alignment via Cornwall Street, Palm and Burnham
- All trips would be extended via Granby Street to Copaco Center
- Route 76 would operate within a Potential Arterial BRT corridor along Albany Avenue
- Connections to the Asylum Hill area and CT*fastrak* could be made via a modified Route 56 on Mark Twain or via a new Crosstown Connector route on Blue Hills Avenue

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 80X: BUCKLAND FLYER

SCENARIO 1

- Provide direct service between downtown Hartford and Buckland Hills on weekdays via I-84

SCENARIO 2

- Provide direct service between downtown Hartford and Buckland Hills on weekdays via I-84

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 82: BUCKLAND HILLS

SCENARIO 1

- Shift service in East Hartford from Tolland Street to Park Avenue (between Main Street and School Street) to pick up coverage from eliminated Route 94
- Tolland Street destinations would be service by a modified Route 88 one block away on Burnside Avenue
- Streamline route by servicing JC Penny distribution center from Tolland Turnpike

SCENARIO 2

- Shift service in East Hartford from Tolland Street to Park Avenue (between Main Street and School Street) to pick up coverage from eliminated Route 94
- Tolland Street destinations would be service by potential Arterial BRT service along Burnside corridor
- Streamline route by servicing JC Penny distribution center from Tolland Turnpike

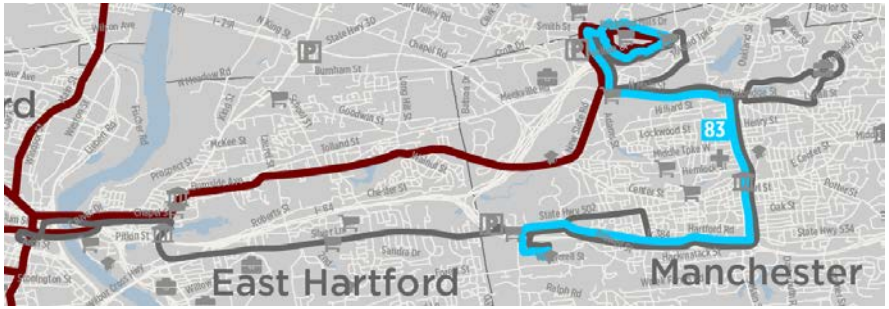
The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 83: SILVER LANE

Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1

- Restructure route as a local service in Manchester linking MCC with the Manchester Business Park and Buckland Hills Mall via Hartford Road, Main Street, and Buckland Street
- Service to downtown Hartford available via transfer to Route 121, or modified Routes 82 and 88
- Service to Manchester Business Park provided by a modified Route 86

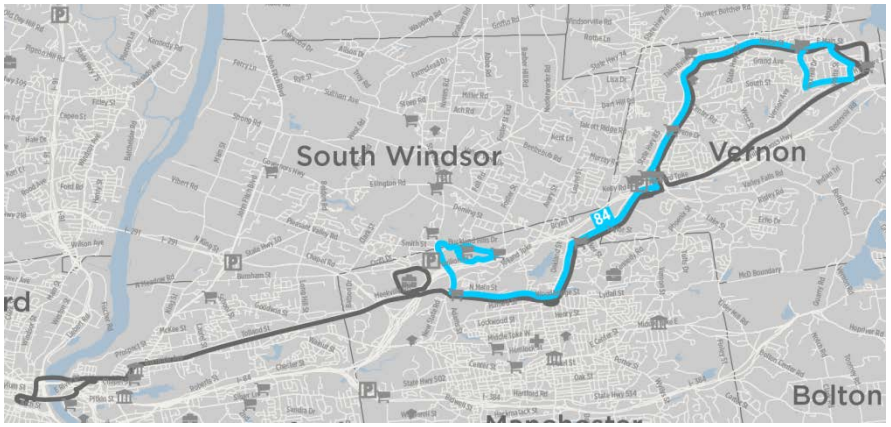


SCENARIO 2

- Restructure route as a local service in Manchester linking MCC with the Manchester Business Park and Buckland Hills Mall via Hartford Road, Main Street, and Buckland Street
- Service to downtown Hartford available via transfer to Route 121, or potential Arterial BRT service along Burnside corridor
- Service to Manchester Business Park provided by a modified Route 86

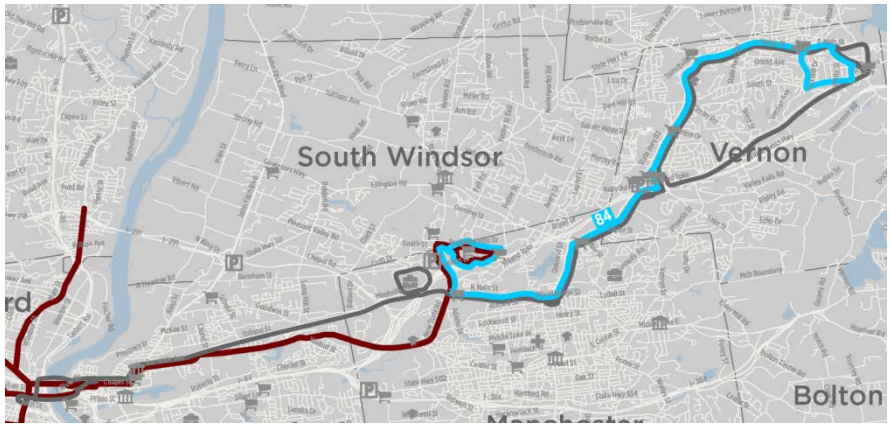
The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 84: TOLLAND STREET - ROCKVILLE



SCENARIO 1

- Operate route between Vernon and Buckland Hills area only (service to downtown Hartford available via transfer to Express Route 917 or a modified Routes 82)
- Expand Vernon loop to serve more apartment communities



SCENARIO 2

- Operate route between Vernon and Buckland Hills area only (service to downtown Hartford available via transfer to Express Route 917 or potential Arterial BRT service along Burnside corridor)
- Expand Vernon loop to serve more apartment communities

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 85X: MCC FLYER

SCENARIO 1

- Continue to operate direct service between downtown Hartford and Manchester Community College via I-84

SCENARIO 2

- Continue to operate direct service between downtown Hartford and Manchester Community College via I-84

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 86: BURNSIDE AVENUE – MAYBERRY VILLAGE

Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1

- Restructure route as a local service in Manchester linking MCC with the Manchester Business Park and Buckland Hills Mall via Center Street, Broad Street, and Parker Street
- Service to downtown Hartford available via transfer to Route 121, or modified Routes 82 and 88
- Mayberry Village service provided by a modified Route 91

SCENARIO 2

- Restructure route as a local service in Manchester linking MCC with the Manchester Business Park and Buckland Hills Mall via Center Street, Broad Street, and Parker Street
- Service to downtown Hartford available via transfer to Route 121 at MCC, or potential Arterial BRT service along Burnside corridor at Buckland Hills Mall
- Mayberry Village service provided by a modified Route 91

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 87: BREWER STREET

SCENARIO 1

- Restructure route as a circulator connecting apartment communities to major employers (Coca-Cola, Pratt & Whitney), and educational institutions (Goodwin College, Two Rivers Magnet School)
- Operate route between Goodwin College and Connecticut Boulevard only (service to downtown Hartford available via transfer to Route 121)
- Residential neighborhoods near Forest Street, Hill Street, and Oak Street could be served by potential Flex service

SCENARIO 2

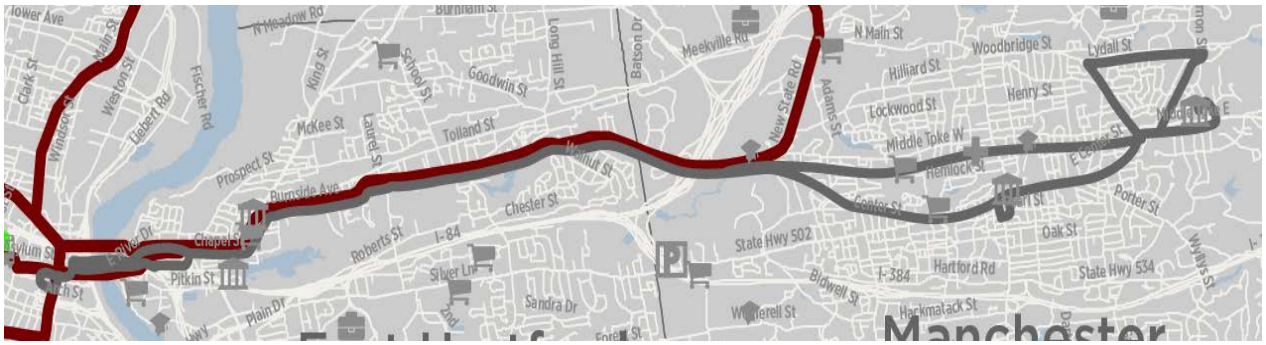
- Restructure route as a circulator connecting apartment communities to major employers (Coca-Cola, Pratt & Whitney), and educational institutions (Goodwin College, Two Rivers Magnet School)
- Operate route between Goodwin College and Connecticut Boulevard only (service to downtown Hartford available via transfer to Route 121 and potential Arterial BRT service along Burnside corridor)
- Residential neighborhoods near Forest Street, Hill Street, and Oak Street could be served by potential Flex service

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 88: BURNSIDE AVENUE

SCENARIO 1

- Streamline route to operate along Burnside Avenue / Middle Turnpike
- Extend route to Department of Social Services in Manchester
- Center Street served by modified Routes 83 and 86
- Manchester Business Park served via a modified Route 86



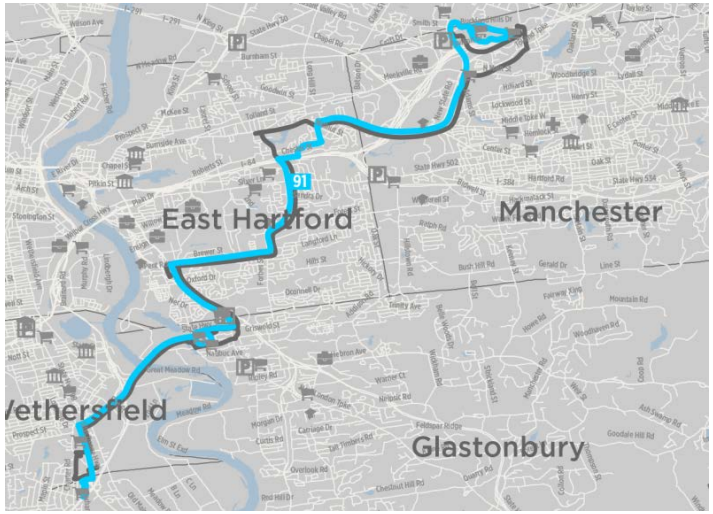
SCENARIO 2

- Eliminate Route 88
- Service along Middle Turnpike provided by a modified Route 91
- Service along Burnside Avenue provided by a potential Arterial BRT service

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

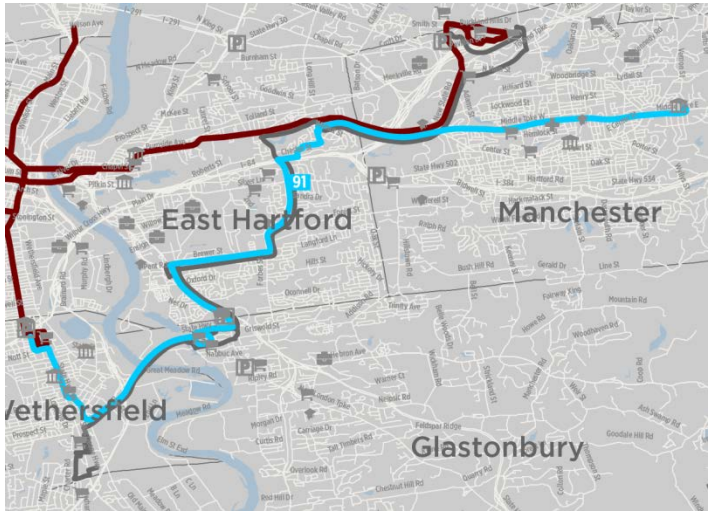
ROUTE 91: FORBES STREET CROSSTOWN

Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*



SCENARIO 1

- Streamline service along Silas Deane for faster service to Wal-Mart
- Operate service through Mayberry Village to help streamline Route 88



SCENARIO 2

- Operate service through Mayberry Village to help streamline Route 88
- Reroute service in Wethersfield to connect to potential Arterial BRT service along Franklin Avenue corridor

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 92: TOWER AVENUE CROSSTOWN

Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1

- In the South Windsor area, Route 92 would be streamlined and realigned to operate along Pleasant Valley Road, Clark Street, and Chapel Road (a modified Route 96 would cover Buckland Road to Oakland Road)
- West of the Connecticut River, Route 92 would operate largely as it does today but would no longer be extended to Bloomfield Center on Saturdays (Route 56 would continue to serve Bloomfield Center on Saturday)

SCENARIO 2

- Route 92 would be reoriented on both sides of the Connecticut River to provide faster, more direct crosstown service between Copaco Center and Buckland Hills
- Route 92 would operate from Copaco Center along Cottage Grove Road and the Putnam Highway to the Windsor Avenue Shopping Center, where connections could be made with potential Arterial BRT service on North Main Street
- Route would then travel to Buckland Hill via I-291, Chapel Road, Clark Street, and Pleasant Valley Road

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 94: PARK AVENUE

Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1

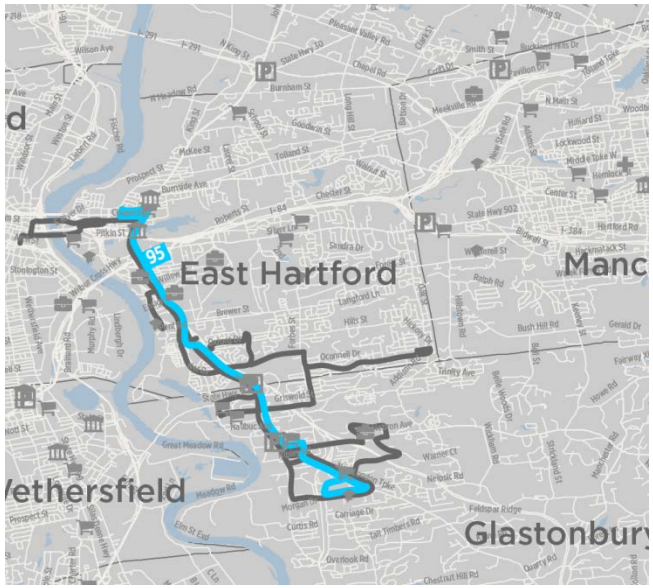
- Discontinue route
- Service along Tolland Street provided by a modified Route 82

SCENARIO 2

- Discontinue route
- Service along Tolland Street provided by a modified Route 95

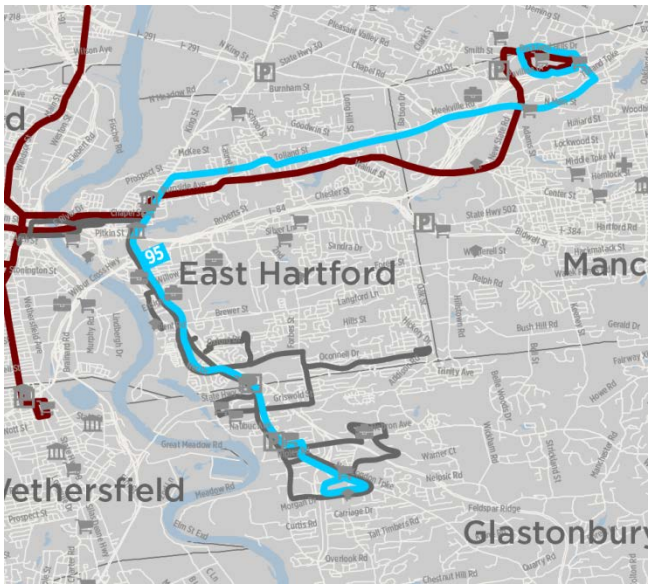
The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 95: GLASTONBURY



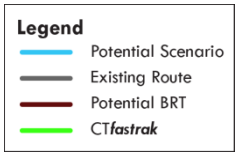
SCENARIO 1

- Streamline route to serve Main Street Corridor between Connecticut Boulevard and Glastonbury High School
- Route operates like a circulator to connect apartments, employers, and educational institutions to Express Route 904 and Route 121



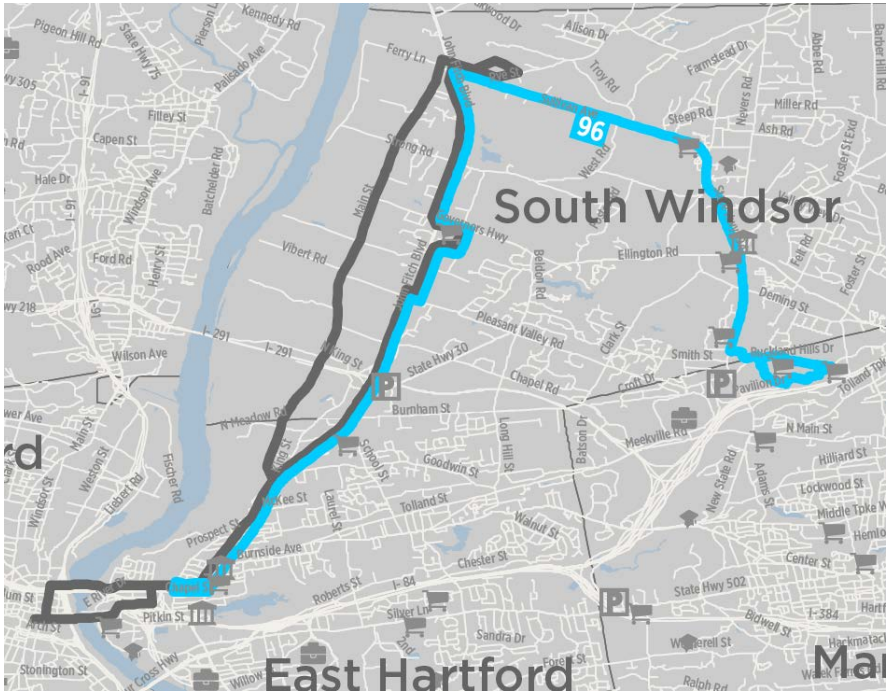
SCENARIO 2

- Combine Route 95 with Route 82 and operate as Route 95 from Buckland Hills to Glastonbury High School
- Frequent service to downtown Hartford available via potential Arterial BRT service along Burnside Avenue corridor



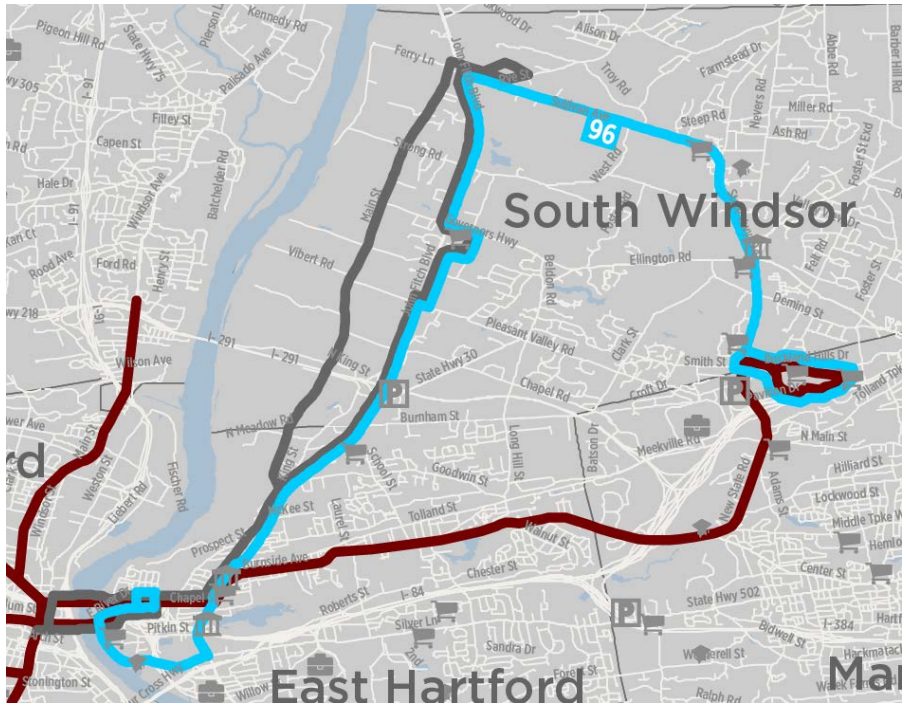
The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

ROUTE 96: JOHN FITCH BOULEVARD



SCENARIO 1

- Extend route to Buckland Hills Mall via Sullivan Avenue and Buckland Road
- Eliminate service on Main Street due to low ridership
- Provide bi-directional service along John Fitch Boulevard corridor
- Truncate route at Connecticut Boulevard (frequent service to downtown Hartford available via transfer to modified Routes 82 or 88)



SCENARIO 2

- Extend route to Buckland Hills Mall via Sullivan Avenue and Buckland Road
- Eliminate service on Main Street due to low ridership
- Provide bi-directional service along John Fitch Boulevard corridor
- Extend route to River Drive to facilitate connections to potential Arterial BRT service along Burnside corridor

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

BLOOMFIELD CIRCULATOR: NEW

Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1

- In Scenario 1, Bloomfield is served by modified Routes 50, 54, 74 and 92 and 153. Copaco Center is served by modified Routes 50, 76 and 92
- The Bloomfield Circulator route is proposed only in Scenario 2

SCENARIO 2

- A potential Bloomfield Circulator route would operate from Dorothy Drive to Bloomfield Center via Mountain Avenue and Brown Street; to Copaco Center via Park Avenue, and to the Seabury Retirement Home and Wedgewood Apartments via School Street and Wintonbury Avenue
- Connections at Copaco Center could be made to downtown Hartford (Routes 50X, 76) and to South Windsor/Buckland Hills (Route 92)
- Route 50X would provide limited-stop service between Bloomfield Center, Copaco Center and downtown Hartford

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

DAY HILL ROAD CIRCULATOR: NEW

Legend
- Potential Scenario
- Existing Route
- Potential BRT
- CT*fastrak*

SCENARIO 1

- In Scenario 1, Day Hill Road is served by modified Routes 36, 36X, 54 and 54X
- The Day Hill Road Circulator route is proposed only in Scenario 2

SCENARIO 2

- A potential new route called the Day Hill Road Circulator would connect the Windsor Center rail station to the Poquonock Park-and-Ride Lot, the Addison Corporate Park, Day Hill Road, the new Amazon facility, Griffin Center and the Home Goods distribution center
- Connections could be made at the Poquonock Park-and-Ride Lot with express services to the airport (Route 30X) and to downtown Hartford (Route 36X)
- The potential Day Hill Road Circulator would also connect with modified Routes 32, 34 and 54

The changes shown above represent ideas being considered to modify this route, but no specific changes are proposed at this time.

APPENDIX E

PUBLIC MEETING FEEDBACK

Public Comments submitted during Hartford CSA Public Outreach Meetings

January 19-21, 2016

BUS ROUTE	TOWN	ZIP	LIKE SCENARIO 1	LIKE SCENARIO 2	LIKE BOTH	LIKE NEITHER	WHICH IDEAS DO YOU LIKE?	WHICH IDEAS DO YOU NOT LIKE?	OTHER IDEAS/ COMMENTS	EMAIL	NAME
30X, 60					X		Like the faster Bradley Flyer.		Bradley Flyer should be branded and use higher quality Fstrak buses. Farmington Avenue has too many stops and is too slow. Need better information, maps, schedules to make it easier to live car free in Hartford.		
30X, 32	Windsor						It is good to have service between Windsor Center and Poquonock park ride on a regular basis, now there is a gap. I like the faster 30X		I don't use 32M so have no opinion.		
32	Windsor				X		I like the hub at Windsor shopping center		Need more buses on Route 32 on Sunday.		
32M	Windsor					X		Don't want to discontinue 32M	Route 32M needs more service not less to serve LP Wilson Community Center. Many transit dependent clients going to food bank and GED classes cannot get there with current bus schedule. There is also a Head Start program on Palisado north of Windsor Center (near Kennedy Road) that should be served.		

BUS ROUTE	TOWN	ZIP	LIKE SCENARIO 1	LIKE SCENARIO 2	LIKE BOTH	LIKE NEITHER	WHICH IDEAS DO YOU LIKE?	WHICH IDEAS DO YOU NOT LIKE?	OTHER IDEAS/ COMMENTS	EMAIL	NAME
32, DHC	Windsor	06095		X			Like consolidation of routes to Windsor Center. Day Hill Road Circulator makes important connection from train station to Corporate Park and Bradley Flyer. Like that Route 32 operates via only one alignment on Windsor Avenue. Concentrated service on Windsor is easier to track and would be faster.		Increase evening service on Route 32 and operate later. Add evening service on weekends (at least 11 PM) so Windsor residents can attend events in downtown Hartford.	dmouradzz@gmail.com	Dave Mourad
30X, 34, 47	Hartford				X		Live in South end of Hartford and work in Windsor Locks. I like faster 34 on I-91 and more express service to Poquoncok. I also like Franklin Ave BRT, and think people would be OK walking from Wethersfield to Franklin. I ride the 47 down to Brown Street.		I take 30X or 34 to get to Dollar Tree warehouse job on Internatioal Drive. On Sunday, I get out late on Sunday and need to take Uber. Need late night service on 30X or 34. And, 30X has a big gap on weekdays 11:30 am- 1 pm		
32	Windsor				X		Like either option. Like the focus of Windsor Service to be Windsor Center. Like the idea of a hub at Windsor Shopping center.	Deerfield Road might need service. There is senior housing, Easter Seals and Standyne at southern end.			Windsor Econ. Dev. Director
32, 42, 92, DHC	Windsor		X				Prefer 92 on Tower Ave to serve Senior Center and the Health Center on Coventry, but it could be OK to shift it if the 42 served these sites	Need service on Palisado in Windsor. Maybe the Day Hill Road route could continue up here			
42/44, 44/61, 50X	Hartford	06120		X			Like the 50X with faster service to Copaco	Do not like the combined 42/44, since I live closer to Main Street and it would be less convenient. I would not use the 44/61	I go to West Farms via Route 37. Had never heard about Route 128 until today, but will use it now.		
50X, 56	Bloomfield		X				I live off Mountain Road and Scenario 1 gets me direct ride to Copaco and downtown. I do like the 50X which would be faster to both Copaco and downtown.'				

BUS ROUTE	TOWN	ZIP	LIKE SCENARIO 1	LIKE SCENARIO 2	LIKE BOTH	LIKE NEITHER	WHICH IDEAS DO YOU LIKE?	WHICH IDEAS DO YOU NOT LIKE?	OTHER IDEAS/ COMMENTS	EMAIL	NAME
56, 74	Hartford				X		Would use 74 via Woodland to get to school under Scenario 1, or Route 56 under Scenario 2. I live off of Collins Street and go to Watkinson High School. I also like the Crosstown service which would be faster than going downtown				
60, 92	Hartford	06103		X			I take Route 92 between Buckland and Copaco. I also like the BRT corridor on Farmington Ave.				
66			X				Existing routes suite my needs. Don't want to have to transfer. I like Route 66 which goes direct from Hartford to Westgate supermarket without changing buses with groceries				
66, 72F	W. Hartford	06107	X				I take 72F today, but sometimes walk to better service on 66. Under Scenario 1, I would walk to 66. But under Scenario 2, I would need to transfer. I am OK with dropping 72F				
31, CTC	Hartford	06106		X			Easier to get from Parkville to West Farms Mall. I also like the Crosstown route to Copaco.		I like Fastrak because it is faster. I used to ride Route 31, but now take Fastrak. I would like to see more arterial BRT		
33, 128	Hartford	06106							We used to ride 33 to mall, but now we take the 128, so no opinion on the route 33 changes.		

BUS ROUTE	TOWN	ZIP	LIKE SCENARIO 1	LIKE SCENARIO 2	LIKE BOTH	LIKE NEITHER	WHICH IDEAS DO YOU LIKE?	WHICH IDEAS DO YOU NOT LIKE?	OTHER IDEAS/ COMMENTS	EMAIL	NAME
31, 33, 37, 39, 44, 61	Hartford	06112		X			Like both the 61/44 combination as a crosstown and the new Crosstown Connector. I live on New Britain Ave and am OK with changes to the 31, 33, 37 and 39				
33, 39, 87, 128, CTC	Hartford	06106					I go to Copaco sometimes and would use the new Crosstown route. I use the 128 to go to West Farms Mall, so would be ok with changes to Route 33. I also take the 87 to Goodwin College but think it would be quicker to take the 121 to 87, because 121 is more reliable.	I live on Park St in Parkville and if Route 39 were changed it would be less convenient to get to BJ's, but I could get there.			
33	Hartford	06106		X			Like Route 33 service to connect with Route 64 or West Hartford Center so I don't need to backtrack to get to West Farms Mall				
33	Hartford	06106		X			Like 33 going to West Hartford to better connect to West Farms mall.				
33			X				Don't want to transfer, but I like higher frequency on key arterials.		I like Route 33 going to West Hartford center		
37, 39	Hartford	06106		X			Like the 37-39 loop		I use 128 to go to Mall instad of 64. Live near Parkville on Evergreen Ave		
37/39, 52, 54, 128, CTC	Hartford			X			Like the new Crosstown Route to from Flatbush to Blue Hills. I already take the 128 instead of the 37/39 because the 128 runs on time. I live off Park Street.		I don't like the Route 52/54 service today. The schedule on Blue Hills Avenue is irregular.		
37, 39, 95, 128				X			Like BRt on Park and streamlining of 37/39. OK with transferring to 128 to get to west farms mall.		Want to extend Route 95 a bit father into Glastonbury		

BUS ROUTE	TOWN	ZIP	LIKE SCENARIO 1	LIKE SCENARIO 2	LIKE BOTH	LIKE NEITHER	WHICH IDEAS DO YOU LIKE?	WHICH IDEAS DO YOU NOT LIKE?	OTHER IDEAS/ COMMENTS	EMAIL	NAME
41	New Britain				X		Either - I live in New Britain and work on North Martin Road in Newington. Route 41 would still work even if it stopped in Flatbush. Otherwise, I just ride Fastrak				
41, 53	Meriden					X		Route 53 should be kept as is and beefed up, it should run every 15 minutes. There are lots of seniors and schools along Wethersfield and it is too far to walk to Franklin. Leave 41 going downtown, a lot of people still use it from New Britain.	From Meriden to Hartford it is faster to fastrak instead of the 41 or 53, but I still use 41 to visit friends in Newington.		
41, 61,63, CTC	New Britain			X			I like Crosstown route, but it seems similar to Route 161.		I go from New Britain to St. Francis hospital and service works today. I like 41, but it is not convenient, so I take Route 61 to Fastrak which is faster and more convenient. I used to take 63 to Walmart		
47, 31, 33, 64	Hartford			X			I already walk to Franklin Avenue from Wethersfield. Jordan Lane is a good hub. I am OK with 31 to end at Flatbush. That is smart. I am OK with ending 47 at Jordan Lane - most people take the bus from there.		I use 33 to mall, but prefer Fastrak and 128. Route 64 takes too long to get to mall.		
47, 53	Wethersfield						Like concept of Jordan Lane hub. Seems like the right place for hub.	There is a need to get from Wethersfield to Middletown. Needs to be more service on Berlin Turnpike.	Berlin Turnpike is dangerous walking environment, especially around Salvation Army. People take Route 47 to Prospect and walk north along Berlin Tpk (opposite McDonalds). Need better transit signage (e.g. Wethersfield Shopping Center routes). Need more marketing in suburbs about how Cttransit works.		Kathleen Bagley, Town of Wethersfield

BUS ROUTE	TOWN	ZIP	LIKE SCENARIO 1	LIKE SCENARIO 2	LIKE BOTH	LIKE NEITHER	WHICH IDEAS DO YOU LIKE?	WHICH IDEAS DO YOU NOT LIKE?	OTHER IDEAS/ COMMENTS	EMAIL	NAME
53	Meriden	06450	X					Like the OLD way with 53 bus, but more increased service. Ridership has gone up and 30 minutes is not logical, needs improvement ASAP. Don't want to take bus away from Wethersfield Ave to Franklin. There are too many senior citizens and handicapped people on Wethersfield who take the 53		tonytterranova@gmail.com	Santo Antonio Terranova
61, 63	Hartford	06105						Need better service for Hillside Avenue - Route 63	Need to increase all services for parents taking kids to school between 7-10 AM and 3-8 PM. Bus 61 and 63 need more North End service time, 7 days a week, later than 6 pm. Sunday service is terrible.	klarceedart@yahoo.com	
69, 128					X		Like the 69 circulator idea in both. 69 should run later and more often		Run route 128 more frequently on weekends!		
82	East Hartford	06108			X		I ride the 82. Like BRT on Burnside, but would prefer to see CTfastrak on Burnside		Would like to see a bus leave Buckland Mall at 9:15-9:30 PM	cherylmills2@yahoo.com	Cheryl Mills
82, 84, 95	Vernon			X			Like Route 84 in Vernon going straight instead of loop. Like 82/95 combined because I go from Vernon to Glastonbury. I also go to MCC				
83, 88	Manchester	06040			X		I live on Main Street in Manchester. Could take the 83 to the 88 to get to Hartford or the Mall.		I travel from Manchester to Blue Hills Ave and/or Hillside Ave in Hartford, so anything that makes that easier.		
91	East Hartford	06108		X			It will be faster to ride the bus and I like the BRT idea		I mostly use Route 91 to get to the Buckland Mall		
121	East Hartford								Route 121 is too slow, and it overlaps with other services. Most Goodwin College students come from East Hartford or Manchester and need easy way to get there.		

BUS ROUTE	TOWN	ZIP	LIKE SCENARIO 1	LIKE SCENARIO 2	LIKE BOTH	LIKE NEITHER	WHICH IDEAS DO YOU LIKE?	WHICH IDEAS DO YOU NOT LIKE?	OTHER IDEAS/ COMMENTS	EMAIL	NAME
128				X			It is similar to Route 128. I like service that is fast, similar to the 128 BRT bus.				
CTC, 153	Hartford	06126		X			Like crosstown connector. I now take Route 153 to Copaco and new route would be faster.		I live on New Britain Avenue and like 153 and CTfastrak. I use it to go to Bishops Corner and Copaco. I also go to Newington and take 128 to the Mall and 161 to St. Francis.		
	New Britain	06053		X			Networks tend to work better	The concept of truncating service bothers me because there are significant portions of disadvantaged populations who choose their living location based on access. They can't move and might lose their job if bus moves too far			
	S. Windsor	06074							TO work with towns to get sidewalk and bike patch connections to bus stops		
	Hartford	06106		X			Prioritize transit over cars, with faster trip times, regular bus intervals. Encourage ridership and reduce car trips. I like dedicated lanes, signal priority and bus way.	I dislike current blue buses, they are dark and uninviting.	I like the nod to improved and simpler branding to make transit inviting, easy to understand and start attracting upscale demographic too. Good signage at all stops with route infor, apps/SMS links. More shelters. Simple color scheme (3-4 max service types)	accounts@timcourtney.net	Tim Courtney
				X			Need for logical mass transit		Need to study it more		
	New Britain								I would like the bus to go all the way into store parking lots especially Walmart by West Farms mall		
	Hartford	06105		X			BRT seems like it would be a much faster service and easier to switch over to Fastrak.	Don't like stop consolidation. Add extra stops in main areas (Farmington Ave, Park ST)		Wsmith0616@gmail.com	Winston Smith Jr.

BUS ROUTE	TOWN	ZIP	LIKE SCENARIO 1	LIKE SCENARIO 2	LIKE BOTH	LIKE NEITHER	WHICH IDEAS DO YOU LIKE?	WHICH IDEAS DO YOU NOT LIKE?	OTHER IDEAS/ COMMENTS	EMAIL	NAME
	W. Hartford	06110		X			Like the idea of trying to mitigate downtown traffic and also taking the buses out of traffic			lizwalczok@gmail.com	Liz Spencer
	Hartford								Should contact Hartford Housing about the mixed use development about to go forward at Westbrook Village. Maybe developer would accommodate a bus turnaround.	chapd001@hartford.gov	Don Chapman City of Hartford Planner
	W. Hartford	06119		X			Scenario 2 seems to have more thought put into it and appears to have a solid chance at increasing ridership. It also seems more user friendly which travelers and tourists would appreciate. I like the suggestion to coordinate buses for transfer or increasing frequency. That is a major issue today.				
	Hartford	06103		X			Would service more people who do not live on regularly scheduled routes now.	Would.	I appreciate the new shelters at downtown stops. I find CTtransit customer service very helpful and can get to most destinations with no problem.		
	Berlin	06037		X			I like BRT, the relay route system		Accurate GPS with mobile technology service	Frank.luongo@gmail.com	Frank Luongo
	E. Granby						Like the faster Bradley Flyer.		Need park-ride lots near airport and/or Griffin Center. I live in East Granby and drive to Poquonock because service is better than the Simsbury express route which is slow.		

Additional Comments Voiced at Meeting

- Want real time bus arrival information
- Which routes would be truncated? (Answer: In S1, truncate where ridership is low to increase productivity. In S2, truncate where routes meet BRT)
- Too many transfers seems to make service slower.
- Desire for Manchester to Bradley Airport route
- CT***fastrak*** is popular and successful, need new ways to get to CT***fastrak***. E.g. service from CT***fastrak*** to New Britain Museum of Art
- Need better marketing to attract new riders. Make family of services simpler. Make it easy to sign up for fare products and to get information
- I like arterial BRT with transit and pedestrians receiving priority in these corridors
- The Bradley Flyer route is fine, but the service is late, buses are old and dim. The GPS app was wrong when I tried it. Service needs to be more inviting
- Focus should be on speed and avoiding traffic. Dedicated lanes are important and should be used wherever they can be added, even downtown.

Additional Written Comments

- Service should run later on Sunday evenings. Many people walk along the 60-series route alignment at this time, indicating there may be demand for later service on Sunday.
- On-time performance is a problem, and is particularly unpleasant when one is waiting out in the cold or heat. Vehicles should be cleaner, especially compared to other transit systems.
- Concerned about the integrity of ridership data when looking to re-route or eliminate routes. Consider using smaller vehicles as well.

APPENDIX F
AIRPORT TRANSIT CASE STUDIES

AIRPORT TRANSIT PARK-AND-RIDE CASE STUDIES

Atlanta: Hartsfield-Jackson International Airport

The Metropolitan Atlanta Rapid Transit Authority (MARTA) operates the Gold and Red rapid rail lines, which provide service from Sandy Springs and Midtown Atlanta to Hartsfield-Jackson International Airport. MARTA manages long-term park-and-ride facilities at 10 stations, available for $5-$8 daily; free, daily parking (less than 24-hours) is available at 23 stations. Long-term structured parking is available for up to 45 days at the College Park station, located one-stop from Hartsfield-Jackson International. In total, the College Park station includes 221 long-term parking spaces ($8 per day) and 1,835 free, daily spaces.

A significant number of daily airport employees park at the College Park station and travel to Hartsfield-Jackson International via the Red or Gold Line. As a result, MARTA regularly experiences parking shortages at the College Park station park-and-ride. If parking is unavailable at College Park, MARTA actively directs park-and-ride users to nearby stations with parking availability. Additionally, MARTA has experienced regulatory complications, with long-term airport passengers parking in free daily park-and-ride lots. To combat this practice, daily parking violators are issued warning tickets and repeat offenders are issued citations. No additional policies are operated by MARTA to control or limit parking by airport-bound passengers or employees.

Cleveland: Cleveland Hopkins International Airport

The Greater Cleveland Regional Transit Authority (GCRTA) operates the Red Line between University Circle, downtown Cleveland, and Cleveland Hopkins International Airport. Eight stations along the Red Line feature free, daily park-and-ride lots, and three stations are designated for overnight, long-term park-and-ride users (up to five days): Louis Stokes Station at Windermere (333 free, 12 long-term), Puritas (558 free, 12 long-term), and Brookpark (600 free, 12 long-term). Long-term park-and-ride users are required to provide notification of vehicles parked for an extended period of time, including license plate information and a vehicle description. As noted by GCRTA, the majority of passengers using the park-and-ride facilities are daily commuters that work downtown. GCRTA has not experienced any parking shortages at park-and-ride facilities due to high number of airport-bound passengers or employees.

Dallas: Dallas/Fort Worth International Airport

Dallas Area Rapid Transit (DART) operates the Orange Line light rail line between downtown Dallas and Dallas/Fort Worth International Airport (DFW). Two stations east of DFW on the Orange Line feature park-and-ride facilities: Belt Line (597 parking spaces) and North Lake College (194 parking spaces). Typical occupancy rates are 20% at Belt Line and 55-60% at North Lake College.

Parking at all DART park-and-ride lots is free; overnight parking is prohibited, but this is generally not enforced. Ample parking is available at all park-and-ride locations on the Orange Line, connecting to DFW; only one station currently exceeds 50% parking utilization. DART has noticed that TSA employees working at Dallas/Fort Worth International park at the Belt Line station and commute to DFW, but no parking shortages have been observed at nearby park-and-ride lots due to airport-bound passengers or employees. As such, no specific park-and-ride policies exist for airport-bound passengers or employees.

Denver: Denver International Airport

The Regional Transportation District (RTD) operates three SkyRide bus routes that connect park-and-ride locations in Aurora, Boulder, Denver, and Thornton with Denver International Airport. RTD also operates the University of Colorado A Train, a commuter rail line linking Union Station in downtown Denver with Denver International Airport, which opened in April 2016.

Long-term parking is available for up to 30 consecutive days at 14 park-and-ride facilities. Parking for local vehicles (with license plates registered to addresses within RTD's boundaries) is free for the first 24-hour period; a $2 daily fee applies for subsequent days. Non-local vehicles (with license plates located outside RDT's geographical boundaries) are charged a $4 daily fee, and cannot park for free during the first 24 hours.

Two park-and-ride facilities are significantly used by airport employees. However, the current parking impact from airport-bound passengers is minimal and does not warrant specific park-and-ride policies.

Minneapolis-St. Paul: Minneapolis-St. Paul International Airport

Two stations on Metro Transit's Blue Line feature park-and-ride facilities. Parking is free at all park-and-ride locations, but parking is prohibited beyond 24 hours. Over 1,000 parking spaces are located at the Fort Snelling Station park-and-ride, north of Minneapolis-St. Paul International Airport; in 2015, 78% of parking spaces were utilized on average. The 28th Avenue Station is located south of the airport, includes 1,380 parking spaces, and featured a utilization rate of 62% in 2015. Airport parking is also encouraged in downtown Minneapolis via the "Ramp-Ride-Fly" program, which offers a cost-effective alternative to parking at Minneapolis-St. Paul International Airport. Parking via the "Ramp-Ride-Fly" program is $3 per day, and is located adjacent to the Target Field Station. No specific park-and-ride policies exist for airport bound passengers or employees.

Portland: Portland International Airport

TriMet operates the MAX Red Line light rail, which provides service from downtown Portland and multiple regional locations to Portland International Airport. No park-and-ride facilities are available at the two stations closest to Portland International Airport, Mt. Hood and Cascades. Free parking (24-hour limit) is available at two park-and-ride facilities near the airport, at Parkrose/Sumner Transit Center (193 parking spaces) on the Red Line and at the Gateway/NE 99th Avenue Transit Center (695 parking spaces) on the Max Blue, Green, and Red Lines. No conflicts between airport-bound passengers using park-and-ride locations have been noted by TriMet.

Pittsburgh: Pittsburgh International Airport

The Port Authority of Allegheny County operates the 28X Airport Flyer from the Oakland neighborhood of Pittsburgh, through downtown, and to Pittsburgh International Airport. West of downtown Pittsburgh the Airport Flyer operates on the West Busway, a two-lane dedicated transit guideway. Free, daily parking for commuters is available at four park-and-ride lots: Bell (34 spaces), Idlewood (33 spaces), Crafton (106 spaces), and Sheraden (177 spaces). Overnight parking is prohibited at all park-and-ride facilities served by the Airport Flyer, which is used primarily by workers commuting to downtown Pittsburgh. Parking is well utilized at the four park-and-ride lots served by the Airport Flyer, but the only limitations on parking by airport-bound passengers are restrictions on overnight parking.

Salt Lake City: Salt Lake City International Airport

The Utah Transit Authority (UTA) operates the TRAX Green Line light rail, which was extended to connect downtown Salt Lake City to Salt Lake City International Airport in April 2013. To minimize

negative impacts to airport parking facilities, Salt Lake City and the UTA agreed to prohibit long-term parking at the six TRAX Green Line stations located along the airport extension. UTA instituted a long-term parking policy in June 2013 that allows unlimited long-term parking at 30 of the 38 park-and-ride lots that serve UTA's light rail (TRAX) and commuter rail (FrontRunner) systems. Currently, UTA policy dictates that long-term parking is limited to stations served by fixed guideway modes.

According to a 2014 survey conducted by UTA, the most utilized park-and-ride locations for passengers traveling to the airport were located along the FrontRunner commuter rail line (including Provo), which offers a transfer to the TRAX Green Line at the North Temple Bridge station. With these policies in place, UTA has not experienced parking shortages at park-and-ride facilities due to airport-bound passengers.

Seattle: Seattle-Tacoma International Airport

Sound Transit (ST) operates the Central Link light rail line from Seattle-Tacoma International Airport (Sea-Tac) north to downtown Seattle and the University of Washington, as well as the ST Express Bus (Route 574), which provides service between Lakewood, Tacoma, and Sea-Tac. Sound Transit generally does not manage transit-provided park-and-ride facilities, but the agency actively enforces a 24-hour maximum parking limit (violators are towed). Sound Transit has experienced parking shortages at multiple park-and-ride lots, but the agency does not attribute this demand to airport-bound passengers or employees.

Six hundred parking spaces are available at the park-and-ride facility at Tukwila International Boulevard Station, the closest Central Link stop to Sea-Tac. Ridership data indicates there is not disproportionate use by airport employees at this facility. Route 574 serves four park-and-ride facilities: Federal Way Transit Center (1,190 parking spaces), I-5/SR-512, Kent-Des Moines (370 parking spaces), and Star Lake (540 parking spaces). The bus service is well utilized by airport employees and a smaller number of airport-bound passengers, but Sound Transit has not designed specific policies to deter use by these groups.

Sound Transit will begin offering permit parking for high-occupancy vehicles (two or more transit riders) and solo drivers at select park-and-ride lots and garages in 2016, which will likely impact future park-and-ride management policies. The Federal Way and Tukwila International Boulevard park-and-ride facilities will potentially be included in this program.

St. Louis: Lambert-St. Louis International Airport

The MetroLink Red Line light rail line provides service to Lambert-St. Louis International Airport from downtown St. Louis. Free, daily parking is available at the park-and-ride lot at the North Hanley MetroLink Station (1,583 parking spaces), which is the final station before the airport. However, long term park-and-ride use is prohibited at this station. Currently, approximately 1,000 spaces are occupied at this station on normal weekdays. Long-term parking is available at nine MetroLink stations with park-and-ride lots (seven on the Red Line and two on the Blue Line) for up to 14 days in designated long-term parking spaces. No long-term parking facilities are located on the Missouri side of the Red Line, closer to Lambert-St. Louis International Airport.

Summary of Airport Transit Park Ride Case Studies

- In the cities evaluated above, most parking at transit stations leading to airports is free, but limited to 24 hours or no overnight parking. This requires spot checks by the transit agency or a local parking enforcement agent.
- Many cities offer a mix of free daily parking (oriented to daily commuters) and fee-based longer term parking (oriented to air travelers). This can be done by designating a few long-term spots

within the daily lots, but often only a few lots are designated for longer term parking (allowing for more efficient enforcement).

- Only two of 10 cities interviewed reported parking supply problems on airport transit lines: Atlanta and Seattle. Atlanta attributed some of the problem to airport employees or travelers; Seattle attributed it to generally high demand at all parking facilities. Salt Lake City was experiencing a problem but has addressed it by designating only certain lots for long-term parking.
- Many are aware that free daily parking is being utilized by airport employees, but this is not seen as overburdening supply and fits with the intended purpose of park-and-ride lots.

Figure 1 | Example Management Policies in Place at Various Airport Transit Park-and-Ride Lots

City/Region	Agency	Airport Served	Transit Route(s) Serving Airport	Park-and-Ride Facilities	Park-and-Ride Policies
Atlanta	Metropolitan Atlanta Rapid Transit Authority (MARTA)	Hartsfield-Jackson International	Gold/Red Lines (Rail rapid transit)	Free, daily parking allowed at 23 stations	Park-and-ride paid parking allowed at 10 stations
Cleveland	Greater Cleveland Regional Transit Authority (GCRTA)	Cleveland Hopkins International	Red Line (Rail rapid transit)	Three overnight park-and-ride lots on Red Line	Overnight park-and-ride allowed for 5 days at select stations/lots
Dallas	Dallas Area Rapid Transit (DART)	Dallas/Fort Worth International	Orange Line (Light rail)	Two nearby park-and-ride lots	Overnight parking at park-and-ride lots is prohibited
Denver	Regional Transportation District (RTD)	Denver International	SkyRide (Bus) University of Colorado A Line* (Rail rapid transit)	14 SkyRide park-and-ride lots	$2 daily parking fee for local vehicles at SkyRide park-and-ride lots ($4 daily for non-local vehicles)
Minneapolis-St. Paul	Metro Transit	Minneapolis-St Paul International	Blue Line (Light rail)	Two park-and-ride facilities on Blue Line	No specific polices for airport passengers
Pittsburgh	Port Authority of Allegheny County	Pittsburgh International	28X Airport Flyer (Bus)	Four park-and-ride lots on 28X route	Overnight parking at park-and-ride is prohibited
Portland	TriMet	Portland International	MAX Red Line (Light rail)	Two nearby park-and-ride lots on Red Line	24-hour maximum parking limit for park-and-ride lot
Salt Lake City	Utah Transit Authority (UTA)	Salt Lake City International	TRAX Green Line (Light rail)	No park-and-ride lots on Green Line extension	Unlimited long-term parking at 30 of the 38 park-and-ride lots serving TRAX and FrontRunner
Seattle	Sound Transit	Seattle-Tacoma International	Route 574 (Express bus)	Route 574 serves four park-and-ride lots	No specific policies for airport passengers or employees
			Central Link (Light rail)	One park-and-ride lot near airport	24-hour maximum parking limit for park-and-ride lots
St. Louis	Metro Transit	Lambert-St. Louis International	Red Line (Light rail)	No park-and-ride lots near airport	No specific policies for airport passengers or employees

APPENDIX G
COMMUTER EXPRESS SERVICE

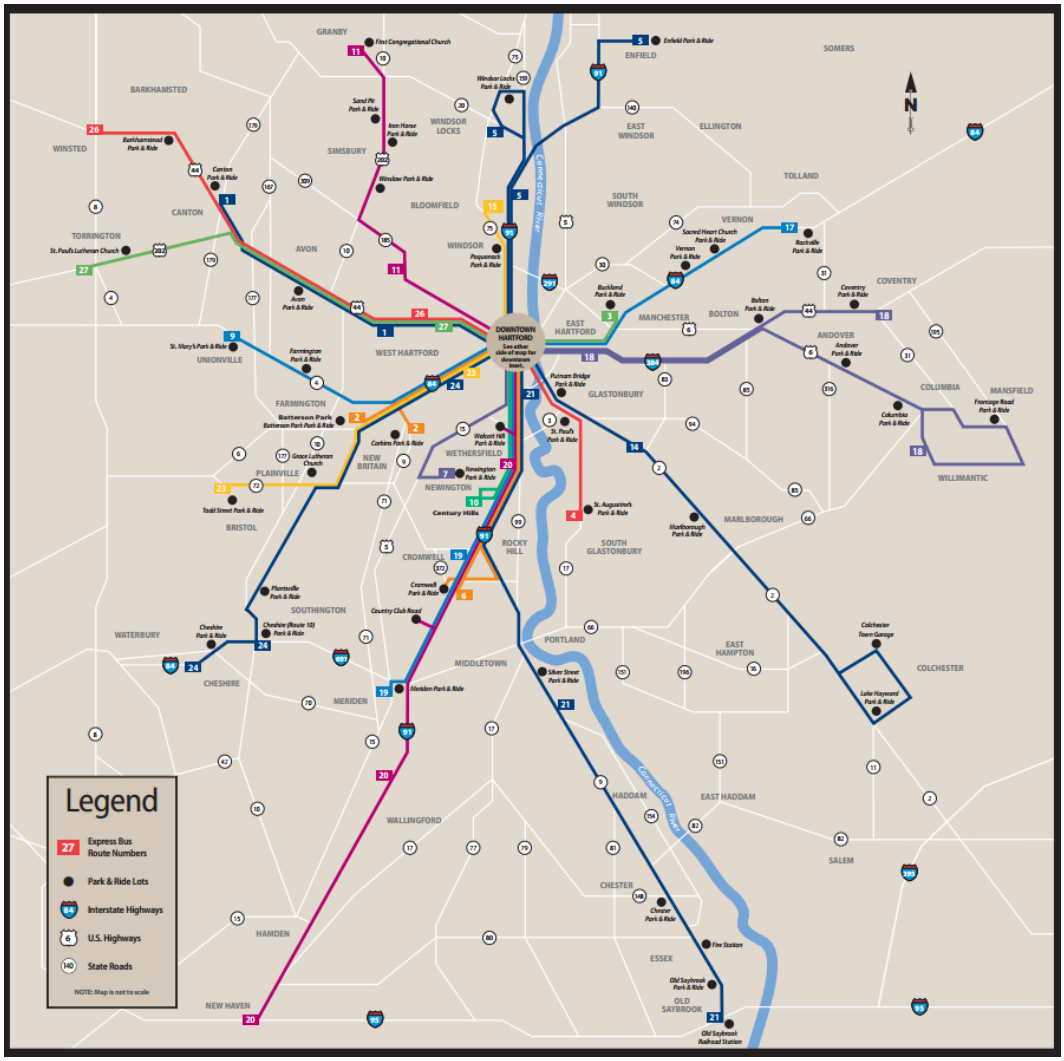
Route Evaluation

COMMUTER EXPRESS SERVICE

Service Design

CT***transit*** express routes are designed to provide fast and direct service to downtown Hartford. Many trips also connect with employment areas near Bushnell Park including Travelers, Hartford City Hall, and various state agencies. The express routes generally operate on weekdays only and most trips are scheduled around a traditional work day. In total, there are 23 express routes in the CT***transit*** network. Twelve of these routes (901-915) are operated by the CT***transit*** Hartford Division and eleven (917-950) are privately operated. Figure 1 provides a map of Hartford area express services.

FIGURE 1 | GREATER HARTFORD COMMUTER EXPRESS NETWORK MAP



Source: CT*transit* (note: map uses older express route numbering system.)

Other common characteristics of CT***transit***'s express route network are that the routes are designed with limited stops, primarily serve park and ride lots, and travel fast and direct along high-speed arterials and corridors. As discussed, most of the service is also oriented around commuter travel with most trips scheduled between 6:00 am and 9:00 am and between 3:00 pm and 6:00 pm. Many express routes, however, also offer some midday service. Midday trips can be effective at creating opportunities for non-commuters to use the service to travel into downtown Hartford or to the suburban destination for half-day needs.

Beyond these common characteristics, the level of service varies considerably among individual routes. Some routes, such as the Windsor Locks-Enfield Express, provide a very high level of service with 30 outbound and 28 inbound trips per day (see Figure 2). Other routes, such as the Farmington-Unionville Express and the Windsor Express, provide between six and nine one-way trips per day. Of the 12 routes included in this analysis, fifteen have 20 or fewer daily one-way trips; six routes have between 21 and 40 daily one-way trips and two routes have more than 40 daily one-way trips. The variation reflects a combination of anticipated demand and other services operating in the area.

FIGURE 2 | SERVICE CHARACTERISTICS

ROUTE NO.	EXPRESS ROUTE NAME	TRIPS PER DAY (OUT/IN)	AM PEAK DIRECTION	MID-DAY SERVICE (Y/N)	REVENUE HOURS PER DAY	REVENUE MILES PER DAY	OPERATING COST PER DAY
901	Avon-Canton Express	10 / 10	Bi-directional	Yes	16.6	296.1	$2,127
902	Corbins-Farm Springs Express	8 / 9	Bi-directional	No	8.7	162.9	$1,114
903	Manchester-Buckland Express	19 / 22	Bi-directional	Yes	14.0	324.3	$1,790
904	Glastonbury Express	12 / 10	Bi-directional	No	8.3	165.1	$1,062
905	Windsor Locks-Enfield Express	30 / 28	Bi-directional	Yes	39.9	1,106.0	$5,103
906	Cromwell Express	13 / 13	Bi-directional	Yes	12.3	393.1	$1,574
907	Newington Express	5 / 5	Bi-directional	No	4.2	84.8	$531
909	Farmington-Unionville Express	3 / 3	Bi-directional	No	4.3	86.2	$553
910	Rocky Hill-Century Hills Epxress	6 / 6	Bi-directional	No	7.2	173.6	$915
912	Simsbury-Granby Express	12 / 11	Bi-directional	Yes	22.6	456.6	$2,889
914	Marlborough-Colchester Express	14 / 15	Bi-directional	Yes	19.0	669.4	$2,430
915	Windsor Express	5 / 4	Inbound	Yes	3.2	52.1	$403
917	Tolland-Vernon Express	13/10	Inbound	Yes	39.8	748	$3,340
918	Willimantic/Coventry (Peter Pan)	6/5	Inbound	Yes	32.5	760	$3,348
919	Meriden Express	2/2	Inbound	No	5.2	102.6	$1,052
921	Middletown/Old Saybrook Express	5/4	Inbound	Yes	15.5	437.7	$2,514
923	Bristol Express	9/8	Inbound	Yes	21.7	469.8	$3,194
924	Southington-Cheshire Express	5/5	Inbound	Yes	16.3	340.1	$1,815
925	Cheshire-Waterbury Express	5/5	Inbound	Yes	16.3	340.1	$1,815
926	Winsted Express	2/2	Inbound	No	5.3	101.2	$858
927	Torrington Express	2/2	Inbound	No	5.3	119.2	$858
928	Southington-Cheshire-Waterbury	17/19	Bi-directional	Yes	58.1	1209.2	$6,452
950	New Haven-Hartford (Peter Pan)	7/7	Bi-directional	Yes	32.5	988	$3,235

Ridership and Service Performance

Consistent with local service, express routes were evaluated based on a series of ridership and service characteristics, including the numbers of passengers carried on each trip, the number of passengers carried per revenue hour of service, and the operating cost per passenger. Generally speaking, express routes are less productive and more expensive to operate than local transit services. Express routes travel longer distances, which means they must carry more riders to compensate for the increased travel costs. In addition, for express routes operating in both the inbound and outbound direction, productivity is often challenged by the fact that demand is usually (but not always) significantly stronger in one direction than the other. As a result, even though an express route may carry large volumes traveling inbound in the morning, there may only be a handful of riders traveling outbound in the morning. This service imbalance can erode service productivity.

On average, express routes operated directly by CT***transit*** carry 12.2 riders per trip and 21.6 riders per revenue hour of service. The average cost per passenger is $6.70. When privately operated express routes are included, on average all routes carry an average of 13.6 riders per trip and 16.3 riders per revenue hour of service. The average cost per passenger is $11.35 (see Figure 3). These averages do not include data for Route 925 Cheshire - Waterbury Express or Route 928 Southington – Cheshire -Waterbury Express, which began operations in March 2015 with the introduction of CT***fastrak***.

FIGURE 3 | RIDERSHIP AND SERVICE PERFORMANCE

ROUTE NUMBER	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	PASSENGERS PER REVENUE VEHICLE HOUR	PASSENGERS PER REVENUE VEHICLE MILE	OPERATING COST PER PASSENGER	% LATE ARRIVALS
901	394	19.7	23.7	1.3	$5.40	5.8%
902	112	6.6	12.9	0.7	$9.94	4.0%
903	684	17.1	48.9	2.1	$2.62	4.2%
904	205	10.3	24.7	1.2	$5.18	7.7%
905	823	13.9	20.6	0.7	$6.20	5.4%
906	256	9.5	20.8	0.7	$6.15	5.4%
907	52	5.2	12.5	0.6	$10.22	4.1%
909	67	11.2	15.5	0.8	$8.25	10.6%
910	151	12.6	21.1	0.9	$6.06	2.7%
912	343	14.3	15.2	0.8	$8.42	3.0%
914	397	13.7	20.9	0.6	$6.12	7.9%
915	72	12.0	22.9	1.4	$5.60	5.1%
917	553	24.0	13.9	0.7	$6.04	Not avail.
918	192	17.5	5.9	0.3	$17.44	Not avail.
919	55	13.8	10.5	0.5	$19.13	Not avail.
921	200	22.2	12.9	0.5	$12.57	Not avail.
923	281	16.5	13.0	0.6	$11.37	Not avail.
924	198	19.8	12.1	0.6	$9.17	Not avail.
925	*Route 925 initiated operations March 2015; data not available*					
926	46	11.5	8.8	0.5	$39.45	Not avail.
927	34	8.5	6.5	0.3	$25.24	Not avail.
928	*Route 928 initiated operations March 2015; data not available*					
950	182	13.0	5.6	0.2	$17.77	Not avail.
Sum / Average	5,297	13.6	16.3	0.8	$11.35	5.7%

The highest performing routes are Routes 901 and 903.

- Route 903, the Manchester – Buckland Express, is the second highest route in terms of passengers per trip (17.1), but is the strongest in terms of passengers per revenue hour (48.9) and has the lowest operating cost per passenger ($2.62). The Manchester-Buckland Express provides above-average service, with 41 one-way daily trips. Service is heavily oriented around the peak direction, with most morning trips traveling inbound to Hartford and most afternoon trips traveling from Hartford to Buckland Hills.
- Route 901, the Avon - Canon Express, carries the most riders per trip (19.7) and is one of the top performers in terms of passengers per revenue vehicle hour and cost per passenger.

The lowest performing route is Route 926 - the Winsted Express. The route carries 4.6 riders per trip, 2.8 riders per hour and the operating cost per passenger is $39.45. Route 927, the Torrington Express, also performs at the bottom of the pack. The route carries 8.5 riders per trip, 6.5 riders per hour and the operating cost per passenger is $25.24. In total, ten routes have operating costs that exceed $9.00 per passenger. This includes two routes operated directly by CT***transit*** - the Route 907 Newington Express and the Route 902 Corbins/Farm Springs Express.

Ridership by Stop

Express routes, as discussed, typically make only a handful of stops and travel direct between destinations and thus ridership tends to cluster at a handful of stops. Ridership by stop data is available only for Routes 901-915, and this data is mapped in Figure 4. As shown, the greatest demand in the express network comes from service to Manchester and the Windsor Locks/Enfield routes. Both of these routes travel via the interstate system and have access to high occupancy vehicle (HOV) lanes for segments of their travel. Some of the outer ends of the network (Granby, Avon, Farmington and Colchester) have relatively lower ridership as compared to the park and ride lots located closer to downtown Hartford.

For routes operated directly by CT***transit***, ridership information by stop was mapped and evaluated to better understand productivity and ridership of the individual routes (see Figures 5 – 11). This data is not available for Routes 917-950.

- **Route 901 Avon Canton Express:** Route 901 travels between the Canton Park and Ride lot and downtown Hartford and Travelers Insurance via Avon and Bishop's Corner (see Figure 5). The route makes 10 inbound and 10 outbound weekday trips. Sixteen of these trips begin/end at the Canton Park and Ride lot and four begin/end at the Avon Park and Ride lot. Route 901 travels on local roads for most of its service and makes local stops in addition to serving the park and ride lots. Ridership is stronger at the Avon Park and Ride lot than at Canton. Travel on the local roads means the route does not offer passengers significant travel time savings. For example, Route 901 takes roughly 45 minutes to complete, about 15 minutes longer than a similar trip by private automobile.
- **Route 902 Corbins-Farms Springs Express**: Route 902 makes 17 weekday trips (eight inbound and nine outbound). The route travels from the Corbins Park and Ride Lot into downtown Hartford via Bushnell Park. There are also six daily trips (three inbound/three outbound) that begin/end service at the Farms Spring Park and Ride Lot and also serve the Bank of America. This park and ride lot has very low ridership and adds considerable distance to the service (see Figure 6). Service to the Farms Spring Park and Ride lot was likely intended to create two-way demand by serving Bank of America, but ridership data shows not many riders are using this stop.

- **Route 903 Manchester Buckland Hills Express:** Route 903 is one of CT*transit*'s most frequent express routes with 22 inbound and 19 outbound trips. The trips are heavily oriented towards the peak direction of travel; of the 22 inbound trips, there are 16 trips in the morning and three in the afternoon. (The outbound trips follow a similar pattern with three morning trips and 16 afternoon trips.) The route serves the Buckland Hills Park and Ride Lot and travels via I-84 to downtown Hartford; several trips continue on to Bushnell Park (see Figure 7). One AM and one PM trip also serve a stop at the intersection of Tolland and Buckland and two PM trips serve the Shoppes at Buckland Hills. Ridership is very strong at Buckland Hills but the trip to Tolland and Buckland does not carry many riders.
- **Route 904 Glastonbury Express:** Route 904 travels between park and ride lots in Glastonbury (Saint Augustine, St. Paul's and the Putnam Bridge) and downtown Hartford with some trips continuing to the Bushnell Park area. The service is oriented towards the peak direction, so of the ten inbound trips, six are in the morning and four in the afternoon. All morning inbound trips serve St. Paul's and four of the six AM inbound trips also serve Saint Augustine. In the afternoon, two trips travel to both St. Paul's and Saint Augustine. Ridership from the St. Paul's park and ride is significantly stronger than Saint Augustine's (see Figure 7).
- **Route 905 Windsor Locks-Enfield Express:** Route 905 travels between destinations in Enfield and Windsor Locks and downtown Hartford and Bushnell Park. There 58 daily trips on Route 905 and service is available on weekdays and weekend days. The route consists of several sub-routes: 905 Hartford Express, 905 Windsor Locks-Enfield Express; 905W Windsor Locks Express; 905E Enfield Express; 905S Enfield Somers Express, 905/915 Windsor-Windsor-Locks-Enfield Express.

  These routes include service with different combinations of stops at the Mass Mutual facility in Enfield; Enfield Town Hall, Enfield Square Park and Ride Lot, Windsor Park and Ride Lot, East Windsor Prospect Hill and Poquonock Park and Ride Lot. Trips that stop at Windsor Park and Ride also stop at North Street and Kennedy Road in Windsor. Most of the riders traveling inbound get on Route 905 at the Enfield Plaza, Windsor Locks and Poquonock park and ride lots (see Figures 4 and 8). The stop at Mass Mutual also attracts some riders. Service to North Street and Kennedy Road, however, does not serve many riders.
- **Route 906 Cromwell Express:** Route 906 has 13 inbound and 13 outbound trips. The route travels between the Cromwell Apartments and the Cromwell Park and Ride lot. Inbound trips are fairly evenly divided between morning and afternoon trips. Ridership at the Cromwell Park and Ride lot is fairly strong (see Figure 9). However, trips that travel via West Street and Berlin Road to the Cromwell Park and Ride Lot do not generate much ridership.
- **Route 907 Newington Express:** Route 907 consists of ten weekday trips between the Newington Park and Ride Lot and downtown Hartford. Some trips continue on to employment near Bushnell Park. The service is fairly simply designed with one park and ride lot and direct service into downtown. Trips are generally scheduled around the peak direction of travel. Of the five inbound trips, four are in the morning and one is in the afternoon. Despite these advantages, ridership on Route 907 is relatively low (see Figures 4 and 10).
- **Route 909 Farmington – Unionville Express:** Route 909 travels between park and ride lots in Farmington at St. Mary's and Unionville Center to employment near Bushnell Park and continuing to downtown Hartford. There are three inbound and three outbound trips. The inbound service consists of two morning trips and one afternoon trip; outbound service follows a similar pattern. Demand on the route is low, with most riders boarding at St. Mary's (see Figures 4 and 5).
- **Route 910 Rocky Hill – Century Hills Express:** Route 910 travels between the Century Hill Park and Ride lot and downtown Hartford via the Rocky Hill Park and Ride lot. At the outbound

end, Route 910 makes local stops at state employment offices in the Rocky Hill area. The route makes six inbound and six outbound trips, which are evenly balanced between morning and afternoon service. Demand on Route 910 is relatively low (see Figures 4 and 9) and the route also parallels some of the service provided on Route 906.

- **Route 912 Simsbury – Granby Express:** Route 912 travels from a park and ride lot at the First Congregational Church in Granby to downtown Hartford via the University of Hartford and Bushnell Park. The route also includes local stops. There are 12 outbound and 11 inbound weekday trips. Service is heavily oriented around the peak direction of travel; for example, of the 11 inbound trips, seven are in the morning peak and four are in the afternoon. Demand on Route 912 is moderate given the distance traveled (see Figures 4 and 10). While a handful of riders travel to/from the First Congregational Church Park and ride in Granby, more riders board/alight from 912 at the Winslow Place Park and Ride, which is much closer to downtown Hartford.
- **Route 914 Marlborough – Colchester Express:** Route 914 provides service between park and ride lots in Colchester, Marlborough and downtown Hartford. Many trips also continue on to Bushnell Park. The service is not oriented towards peak directional travel (inbound and outbound trips are evenly divided between morning and afternoon service). Route 914 is one of the longest routes in the express network. Most riders board the route in Marlborough and only a handful use the park and ride lot service in Colchester (see Figures 4 and 11).
- **Route 915 Windsor Express:** Route 915 is integrated with Route 905 (Windsor Locks – Enfield Express) and provides a handful of trips between Enfield Express and downtown Hartford. Some trips also stop at the Poquonock Park and Ride Lot. Generally speaking demand at these park and ride lots is strong (see Figures 4 and 8).
- **Route 917 Tolland – Vernon Express:** Route 917 has 10 inbound and 13 outbound trips daily, only in the peak direction. Seven inbound and nine outbound trips begin and end in at the Tolland Park and Ride lot; all others begin or end at the Rockville Park and Ride Lots. All trips use I-84 and stop at two lots in Vernon. Most trips continue through downtown Hartford to Union Station and Aetna on Sigourney Street. Two mid-day outbound trips are operated as a combined 903/917 via Buckland Park and Ride Lot in Manchester.
- **Route 918 Willimantic – Coventry Express:** This route runs four inbound and five outbound trips to/from Willimantic and one to/from Coventry, all via I-384 and I-84. Service operates in the peak direction. Willimantic trips originate on Main Street and travel via State Routes 195 and 6, making seven local stops including the Andover and Bolton Park and Ride Lots. The Coventry trip starts at the Congregational Church lot on State Route 44 and also serves the Bolton Park and Ride Lot. All trips travel through downtown by Bushnell Park and serve Sigourney Street and Capitol Avenue.
- **Route 919 Meriden Express:** Two Route 919 trips operate in the peak direction each weekday. Inbound trips begin at Centennial Plaza and make seven local stops including the Bee Street Park and Ride Lot, before traveling I-91. In downtown Hartford, Route 919 stops on Market Street prior to the primary Central Row North stop, then continues west of downtown to serve Aetna and Farmington Avenue. Outbound trips follow a similar route.
- **Route 921 Middletown – Old Saybrook Express:** Route 921 has four inbound and five outbound trips daily, operating in the peak direction. Trips start and end at the rail station in Old Saybrook and serve Old Saybrook center and park and ride lots in Old Saybrook, Essex, Chester and Middletown. Service circulates in downtown Hartford from Central Row to Sigourney Street and Capitol Avenue. The scheduled one-way trip time is 90 minutes, making this one of the longest express routes in the system.
- **Route 923 Bristol Express:** Route 923 operates eight inbound and nine outbound trips in the peak direction, plus an additional inbound trip at 1:42 PM. All inbound trips begin at Bristol City

Hall and serve the Lake Avenue and Todd Street park and ride lots before continuing via State Route 72 and CT***fastrak*** into downtown Hartford. Outbound service operates in a similar manner.

- **Route 924 Southington – Cheshire Express:** Route 924 operates five inbound and five outbound trips in the peak direction from the Cheshire Milldale Park and Ride Lot on State Route 10. All trips serve the Southington Park and Ride Lot before continuing via CT***fastrak*** into downtown Hartford. Outbound service operates in a similar manner. Service is coordinated with Route 925, which serves the same segment before continuing on to Waterbury.
- **Route 925 Cheshire – Waterbury Express:** Route 925 was introduced in March 2015 when the CT***fastrak*** guideway opened. Five inbound and five outbound trips are operated in the peak direction each weekday, essentially representing the Hartford bound trips otherwise operated during non-peak times as Route 928. All inbound trips begin at Metro North's Waterbury rail station and serve Waterbury Green, St. Mary's Hospital and park and ride lots on Hamilton Avenue and State Route 70 in Cheshire. Service continues via I-84, State Route 72 and CT***fastrak*** into downtown Hartford. Unlike Route 928, Route 925 does not serve the Cheshire Milldale or Southington Plantsville park and ride lots.
- **Route 926 Winsted Express:** Route 926 operates two inbound and two outbound trips in the peak direction. Trips begin and end at Northwestern CT Community College in Winsted and travel via State Route 44/Albany Avenue and Asylum Avenue and into downtown Hartford. Local stops are made at the Barkhamsted Park Ride Lot, in New Hartford and in downtown Hartford.
- **Route 927 Torrington Express:** Route 927 operates two inbound and two outbound trips in the peak direction. Trips begin and end on John Street in Torrington and also stop at St. Paul's Church. The service then operates express via State Routes 202 and 44 into downtown Hartford. The scheduled one-way trip time is about 85 minutes, making this one of the longest express routes in the system.
- **Route 928 Southington – Cheshire – Waterbury Express:** Route 928 was introduced in March 2015 when the CT***fastrak*** guideway opened. The service operates seven days a week in both directions between Metro North's Waterbury Station and Hartford. All inbound trips begin at Metro North's Waterbury rail station and serve Waterbury Green, St. Mary's Hospital and the Hamilton Avenue, State Route 70, Cheshire Milldale and Southington Plantsville park and ride lots. It then continues via I-84, State Route 72 and CT***fastrak*** into downtown Hartford. Service is operated on an hourly basis, with a total of 19 inbound and 17 outbound trips on weekdays, 19 round trips on Saturdays and 14 roundtrips on Sundays. On weekdays, peak period Hartford bound trips are operated as Route 925 and do not serve the Cheshire Milldale and Southington Plantsville park and ride lots.
- **Route 950 New Haven Hartford Express:** Route 950 operates 7 weekday roundtrips between New Haven's Union Station and Hartford's Union Station. Three roundtrips are in the peak period and one operates mid-day. Two or three additional local New Haven stops are made, as well as stops at park and ride lots in North Haven, Middletown and Wethersfield. The service stops at Central Row and on Pearl Street on its way to Union Station in Hartford.

FIGURE 4 | EXPRESS SERVICE INBOUND RIDERSHIP BY STOP MAP (ROUTES 901 – 915 ONLY)

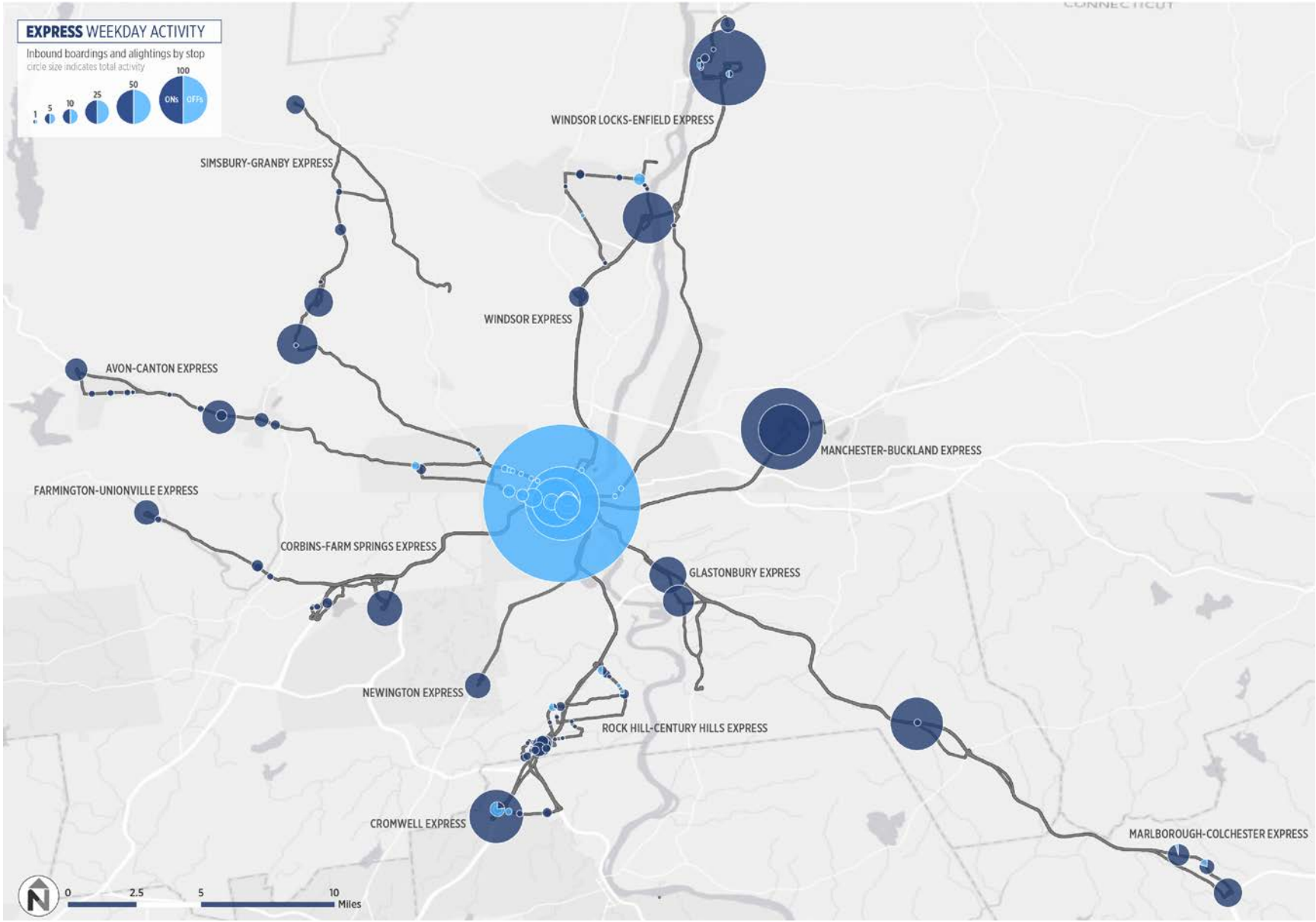


FIGURE 5 | ROUTE 901 AND ROUTE 909 WEEKDAY INBOUND RIDERSHIP BY STOP MAP

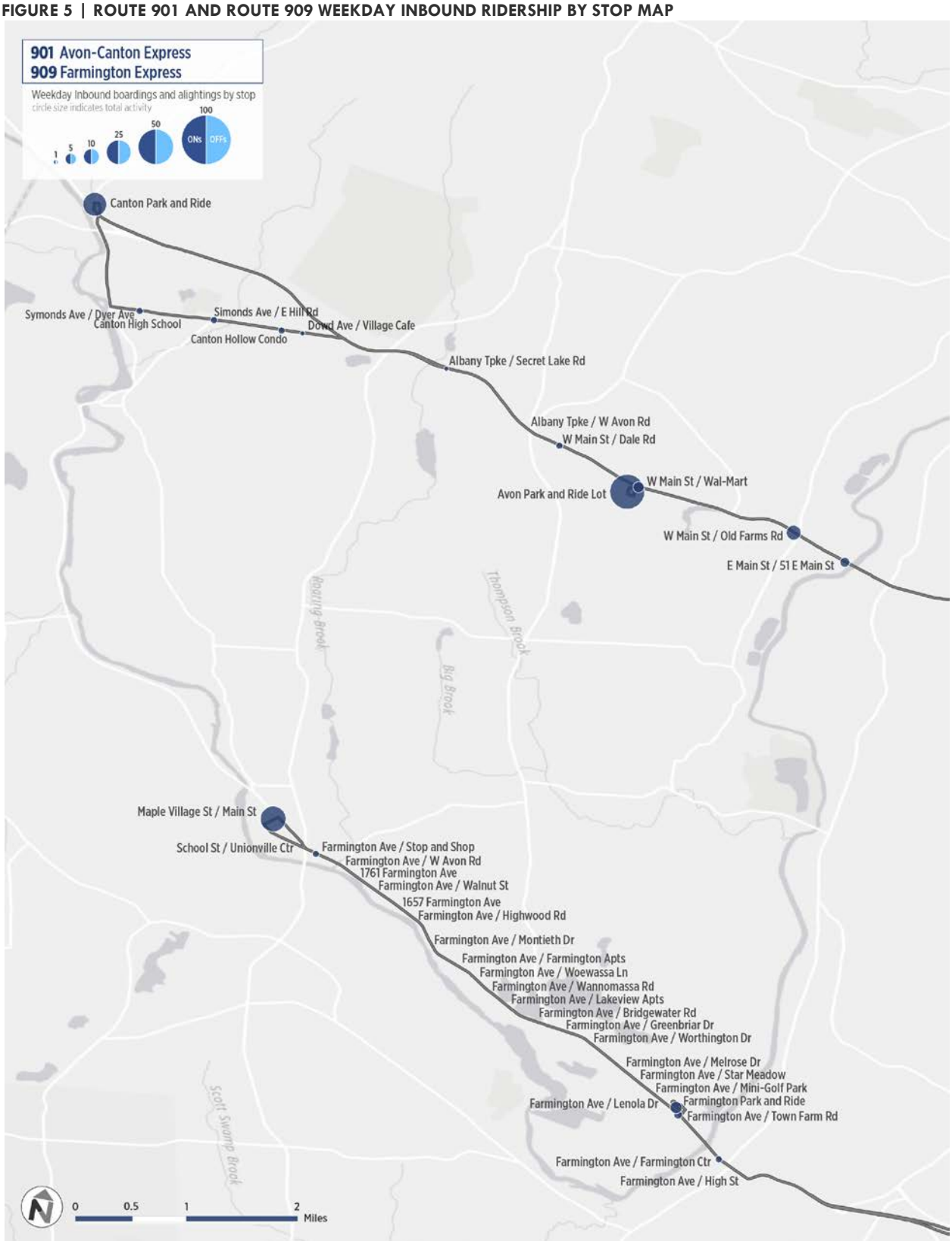


FIGURE 6 | ROUTE 902 WEEKDAY INBOUND RIDERSHIP BY STOP MAP

FIGURE 7 | ROUTE 903 AND ROUTE 904 WEEKDAY INBOUND RIDERSHIP BY STOP MAP

FIGURE 8 | ROUTE 905 AND ROUTE 915 WEEKDAY INBOUND RIDERSHIP BY STOP MAP

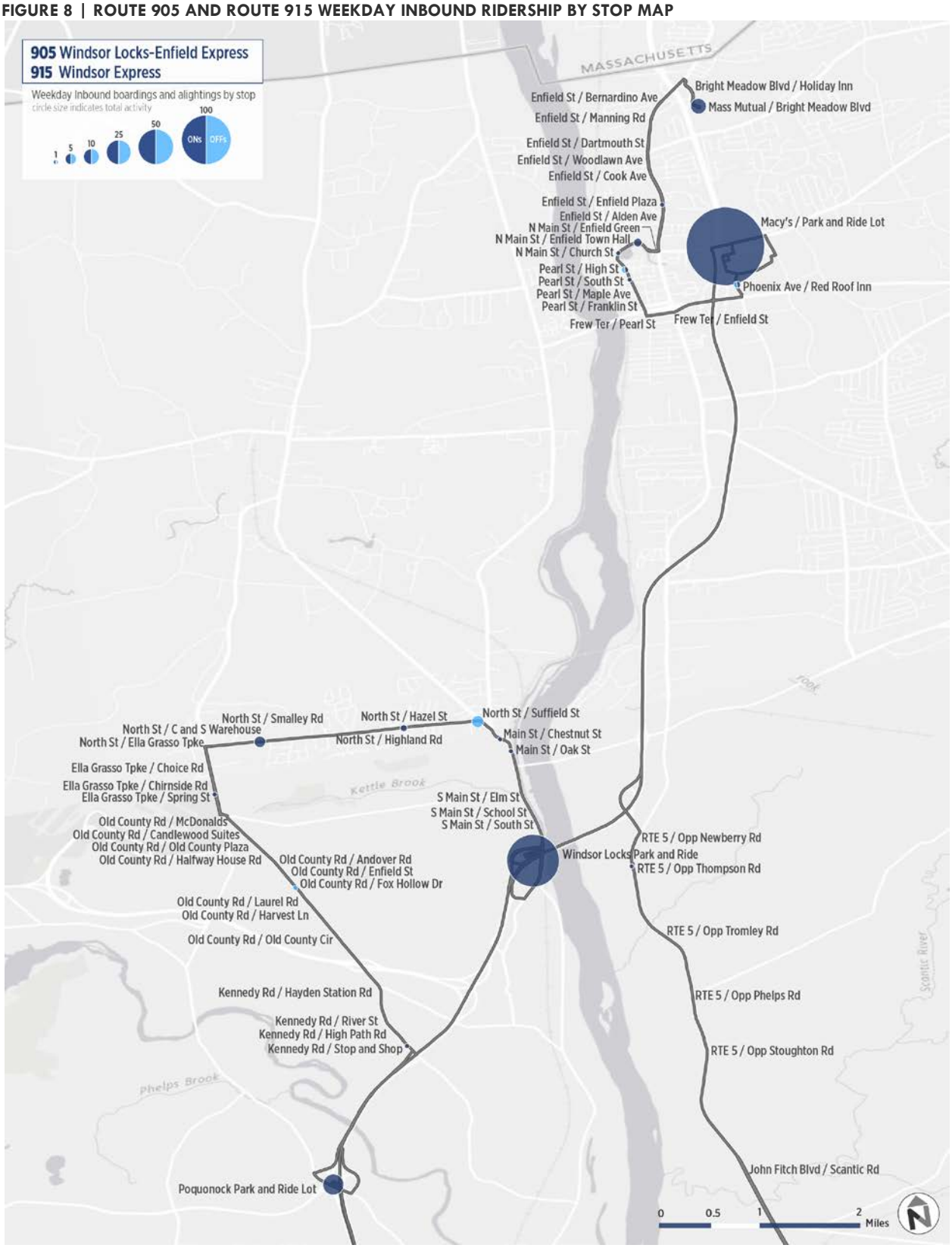


FIGURE 9| ROUTE 906, ROUTE 907 AND ROUTE 910 WEEKDAY INBOUND RIDERSHIP BY STOP MAP

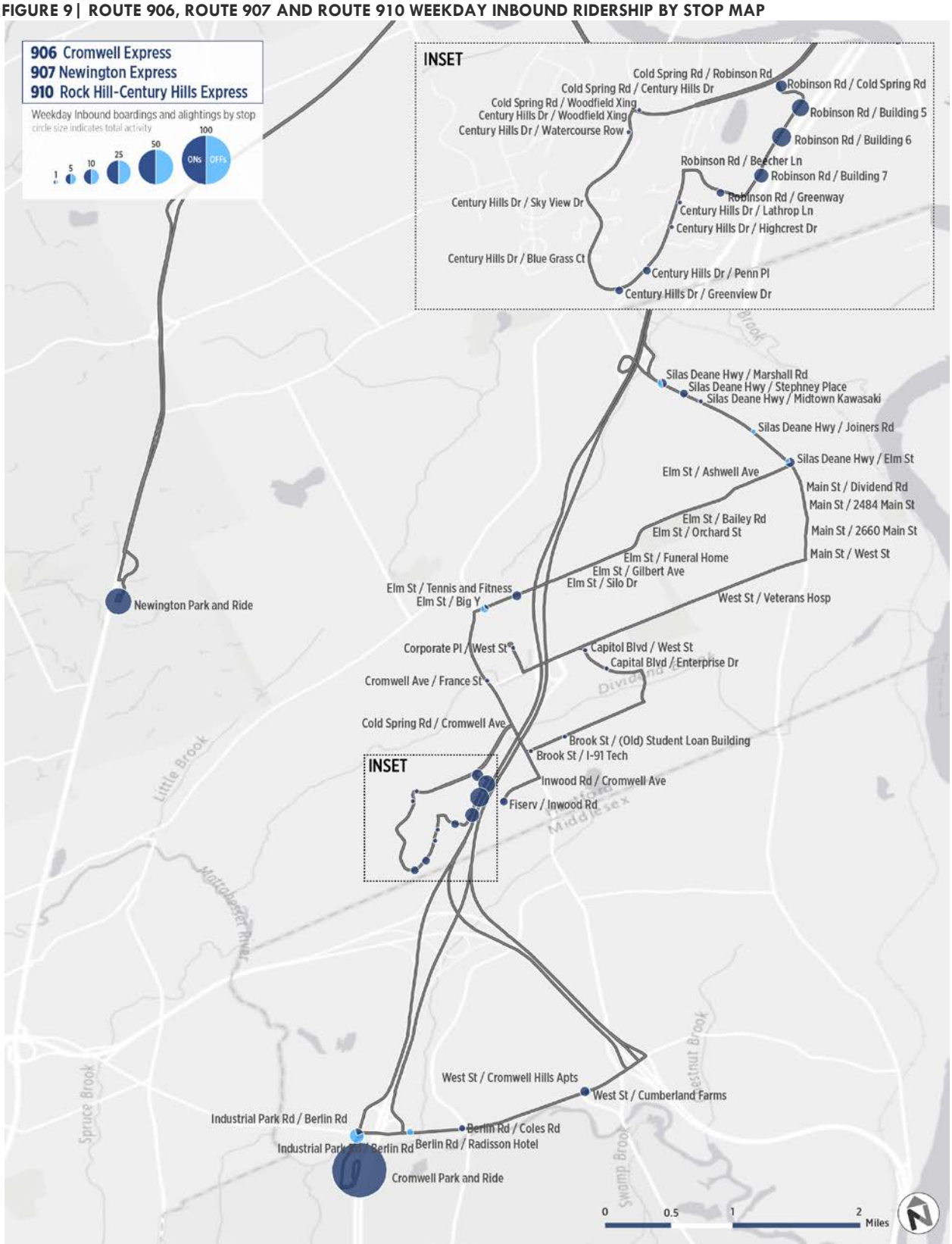


FIGURE 10 | ROUTE 912 WEEKDAY INBOUND RIDERSHIP BY STOP MAP

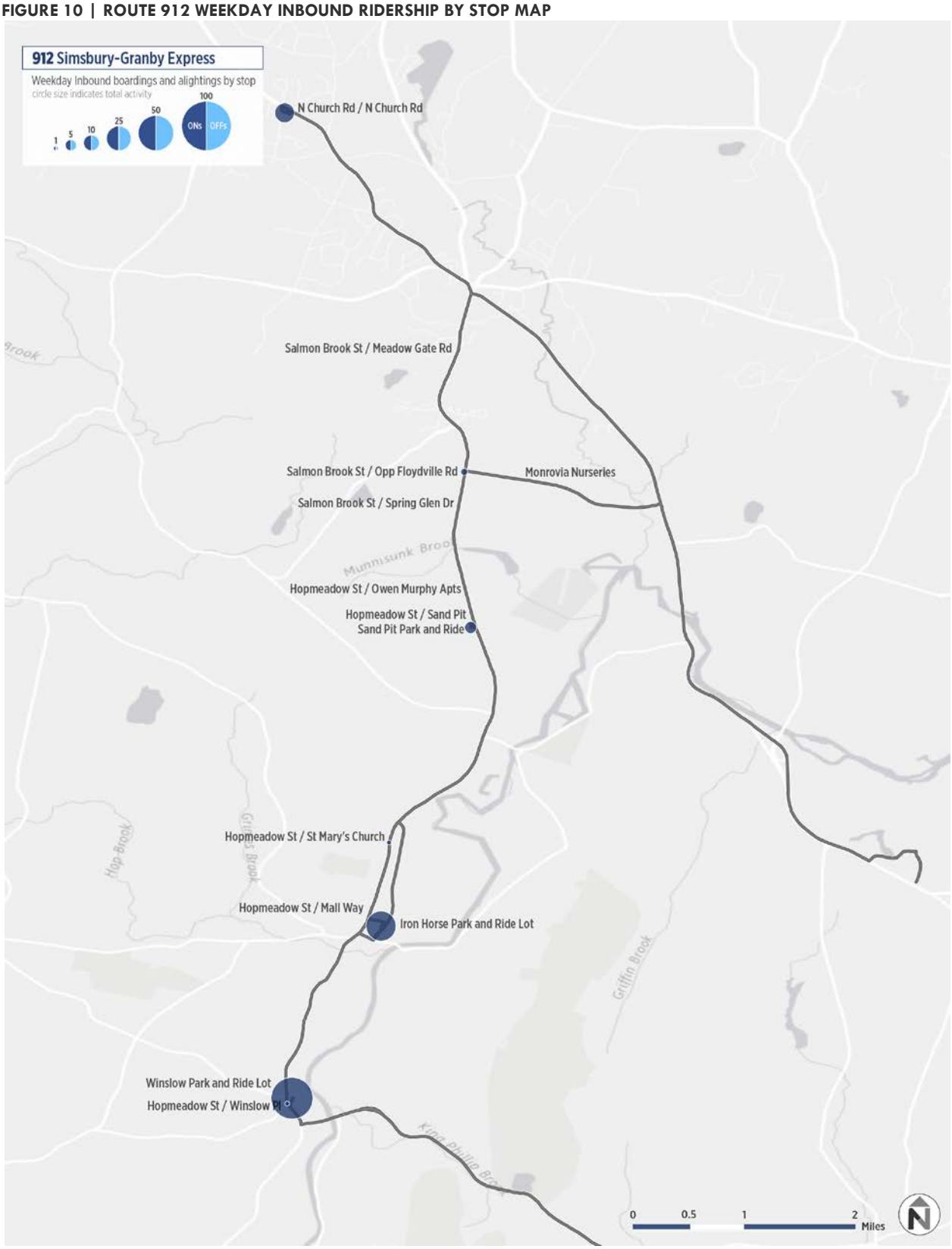


FIGURE 11 | ROUTE 914 WEEKDAY INBOUND RIDERSHIP BY STOP MAP

Service Utilization

In addition to looking at stop level data, ridership by trip was also evaluated. The following series of charts examine the number of riders boarding each trip (by time of day) for inbound and outbound travel.

ROUTE 901: AVON – CANTON EXPRESS

Ridership on Route 901 is heavily oriented towards the peak direction of travel. Ridership is strong traveling outbound in the afternoon and inbound in the morning (see Figures 12 and 13). Many of the peak directional trips have between 15 and 25 trips. There is one midday trip in each direction; this trip carries about 10 riders per trip. Overcrowding is not an issue on Route 901 because maximum loads never exceed 25 riders.

FIGURE 12 | ROUTE 901 WEEKDAY OUTBOUND RIDERSHIP BY TRIP

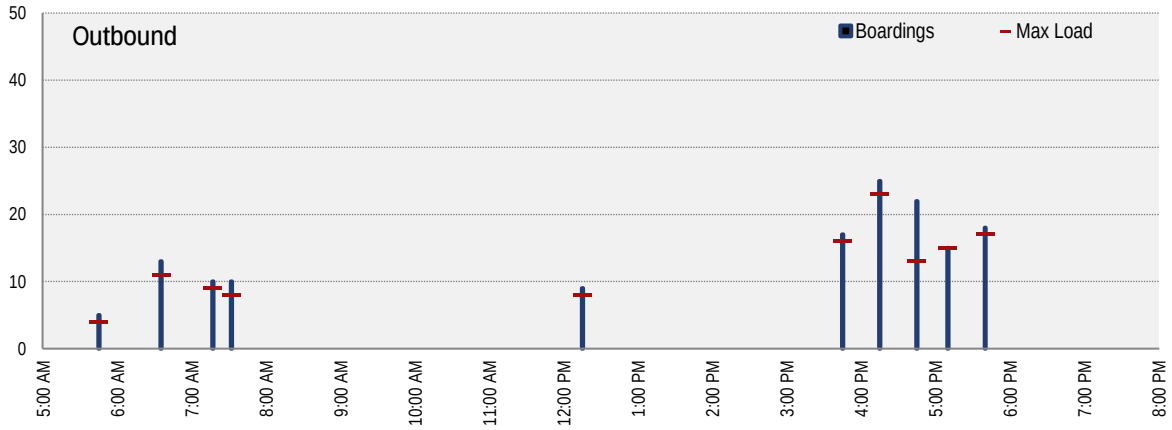
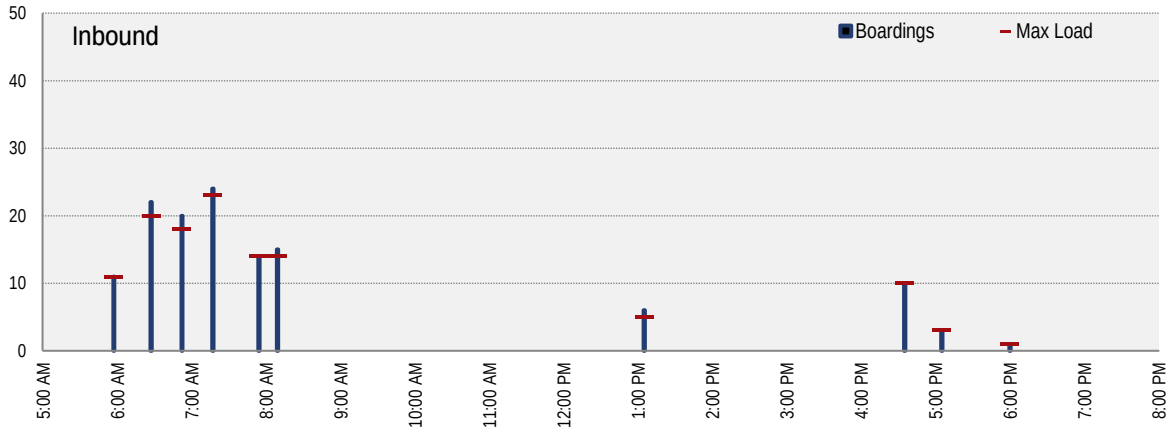


FIGURE 13 | ROUTE 901 WEEKDAY INBOUND RIDERSHIP BY TRIP



ROUTE 902: CORBINS-FARMS SPRING ROAD

Demand on Route 902 is low overall. None of the trips carries more than 15 riders. Demand is also oriented towards the peak direction of travel with more riders using the service to travel outbound in the afternoon and inbound in the morning (see Figures 14 and 15). However, there is one trip in the nonpeak direction in the outbound service that is higher than other trips; this trip serves the Bank of America facility. However, the inbound trips serving the Bank of America do not show the same level of demand (4:08 pm and 5:08 pm). Overcrowding is not an issue on Route 902.

FIGURE 14 | ROUTE 902 WEEKDAY OUTBOUND RIDERSHIP BY TRIP

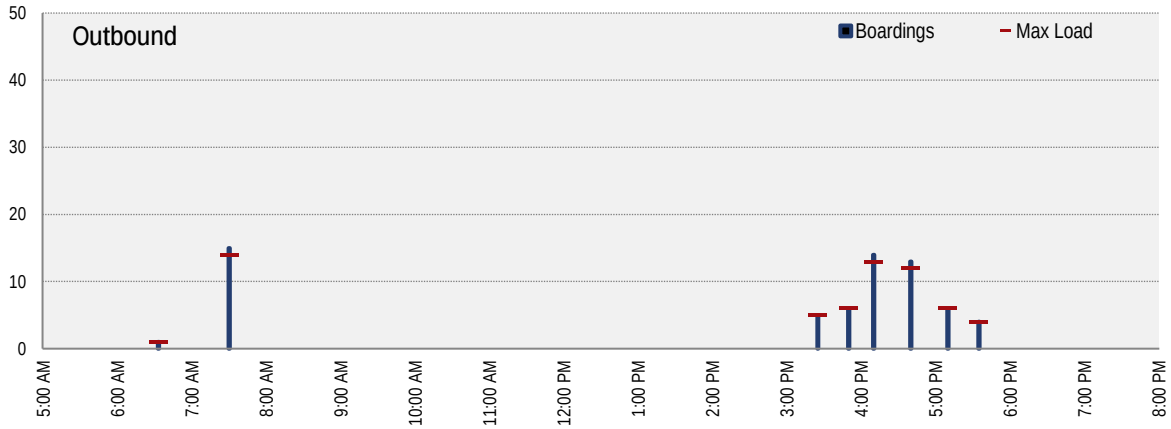
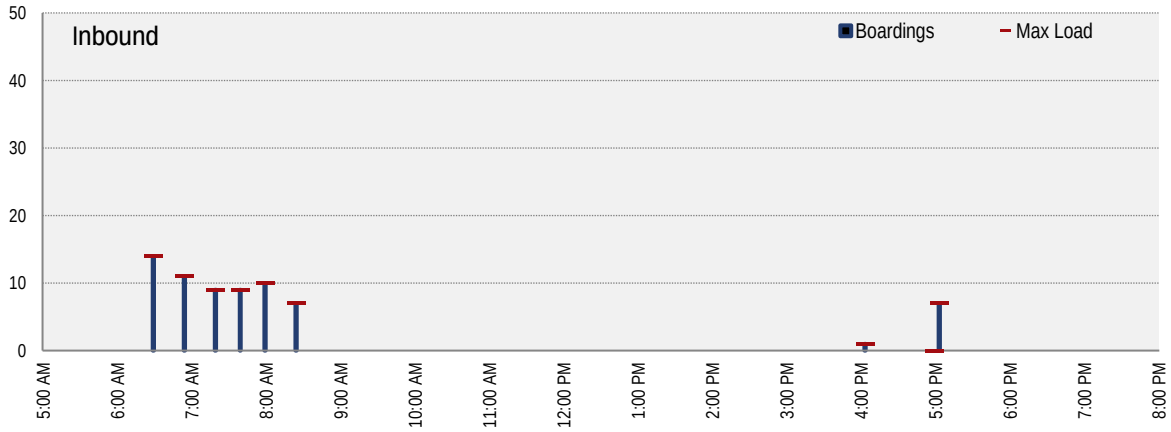


FIGURE 15 | ROUTE 902 WEEKDAY INBOUND RIDERSHIP BY TRIP



ROUTE 903: MANCHESTER BUCKLAND HILLS

Demand on Route 903 is strong and is very heavily oriented towards the peak direction of travel with more riders using the service to travel outbound in the afternoon and inbound in the morning (see Figures 16 and 17). Demand on the non-peak direction is very low, with trips carrying only one or two passengers; some trips have no riders.

Many trips peak directional carry more than 20 riders. There is also one outbound trip with nearly 40 riders; and three inbound trips with ridership close to or greater than 40 riders. However, with seating capacity of 55 on express buses, overcrowding does not appear to be an issue.

FIGURE 16 | ROUTE 903 WEEKDAY OUTBOUND RIDERSHIP BY TRIP

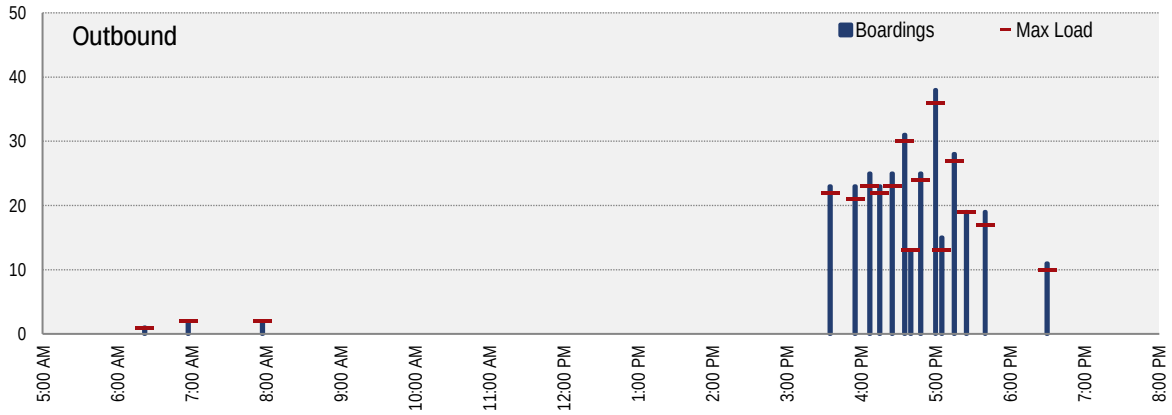
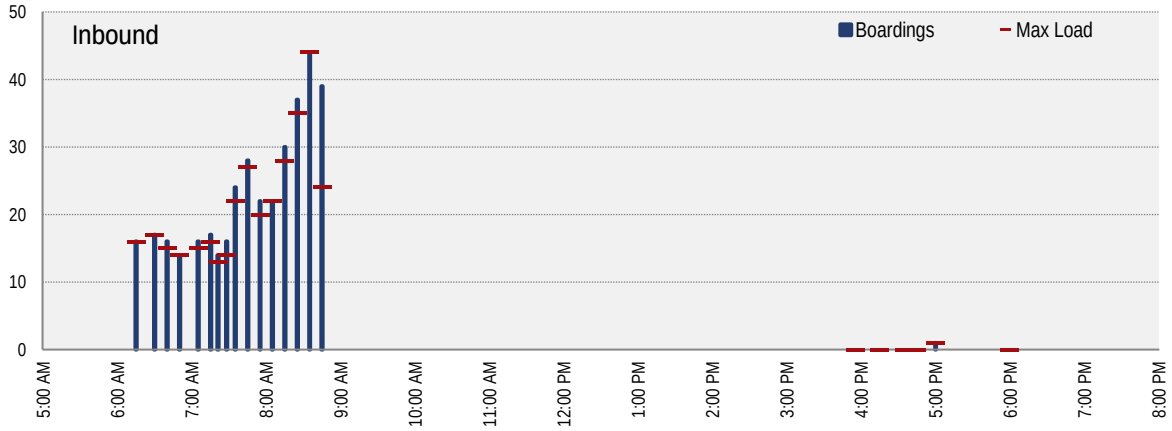


FIGURE 17 | ROUTE 903 WEEKDAY INBOUND RIDERSHIP BY TRIP



ROUTE 904: GLASTONBURY EXPRESS

Ridership on Route 904 is heavily oriented around the peak direction of travel such that the inbound trips have good ridership in the morning (see Figure 19) and outbound trips have good ridership in the afternoon (see Figure 18). Buses traveling in the off-peak direction carry hardly any riders, with many trips not carrying any.

FIGURE 18 | ROUTE 904 WEEKDAY OUTBOUND RIDERSHIP BY TRIP

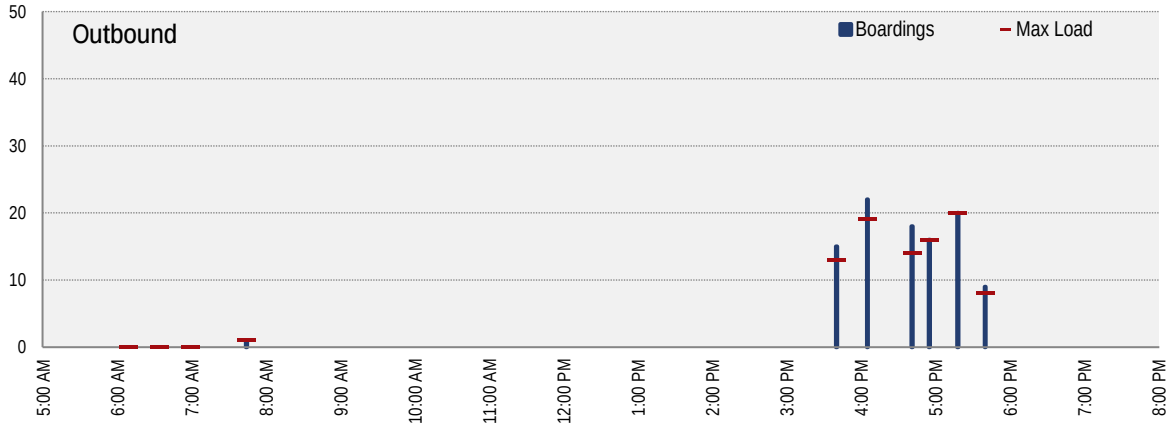
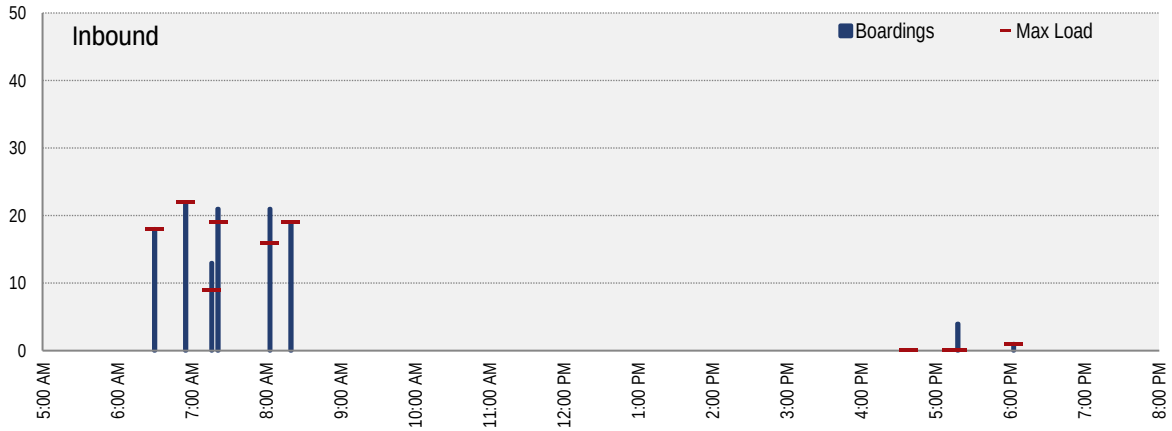


FIGURE 19 | ROUTE 904 WEEKDAY INBOUND RIDERSHIP BY TRIP



ROUTE 905: WINDSOR LOCKS-ENFIELD EXPRESS

Consistent with other Express Routes, ridership is heavily oriented towards the peak direction. Demand in the peak direction is strong, with most trips carrying 20 or more riders and a handful of outbound afternoon and inbound morning trips carrying 30 or more passengers. Ridership on several trips is more than 30 riders, but with seating capacity of 55 riders, overcrowding does not appear to be an issue.

Ridership in the off-peak direction varies. Several off-peak (morning) outbound trips carry a handful of riders, with some trip carrying 10 or more passengers (see Figure 20). This compares with the off-peak (morning) inbound service, which have very low ridership (see Figure 21). Route 905 also provides one midday trip and this trip carries around ten riders.

FIGURE 20 | ROUTE 905 WEEKDAY OUTBOUND RIDERSHIP BY TRIP

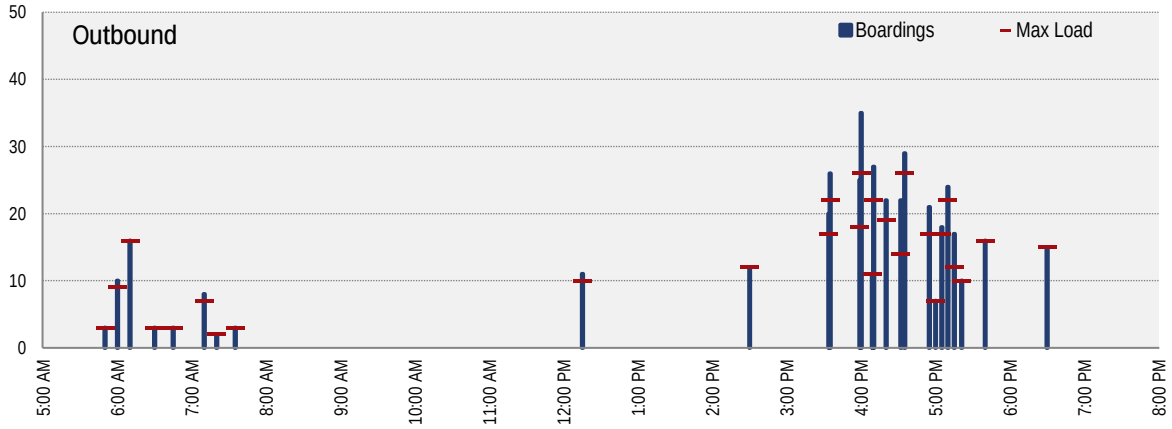
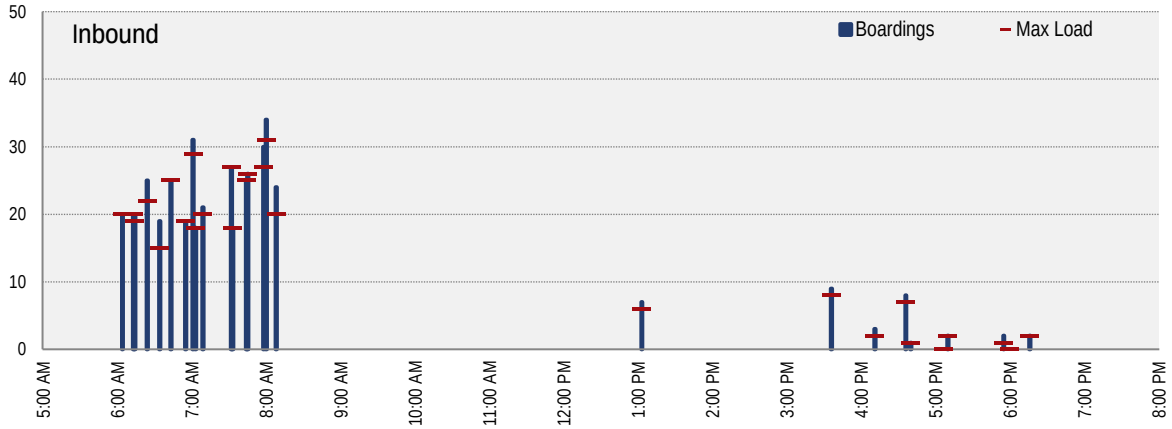


FIGURE 21 | ROUTE 905 WEEKDAY INBOUND RIDERSHIP BY TRIP



ROUTE 906: CROMWELL EXPRESS

Like many other express routes, ridership on Route 906 is heavily oriented around the peak direction of travel such that the inbound trips have strong ridership in the morning (see Figure 22) and outbound trips have good ridership in the afternoon (see Figure 23). Ridership is also stronger traveling inbound as compared with the outbound trips. Buses traveling in the off-peak direction, however, carry hardly any riders, with many trips not carrying any.

FIGURE 22 | ROUTE 906 WEEKDAY OUTBOUND RIDERSHIP BY TRIP

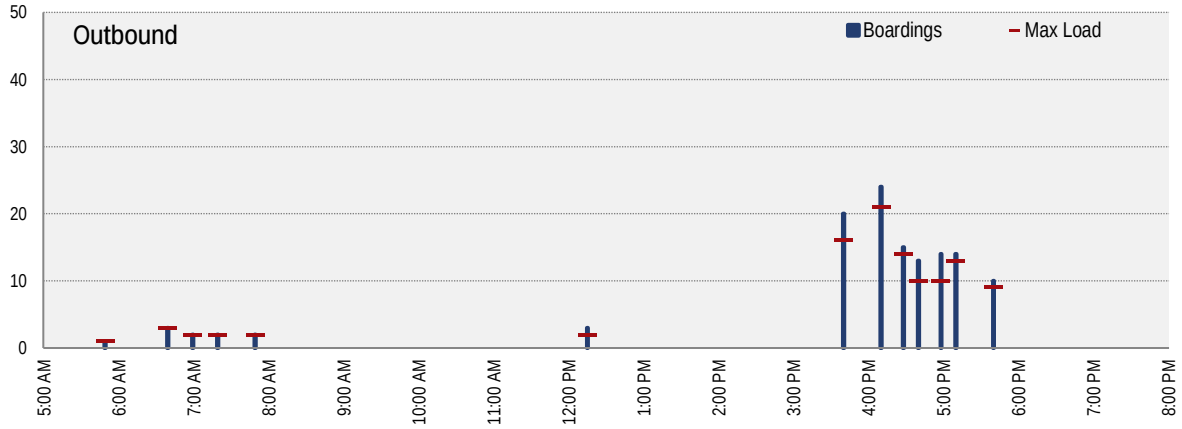
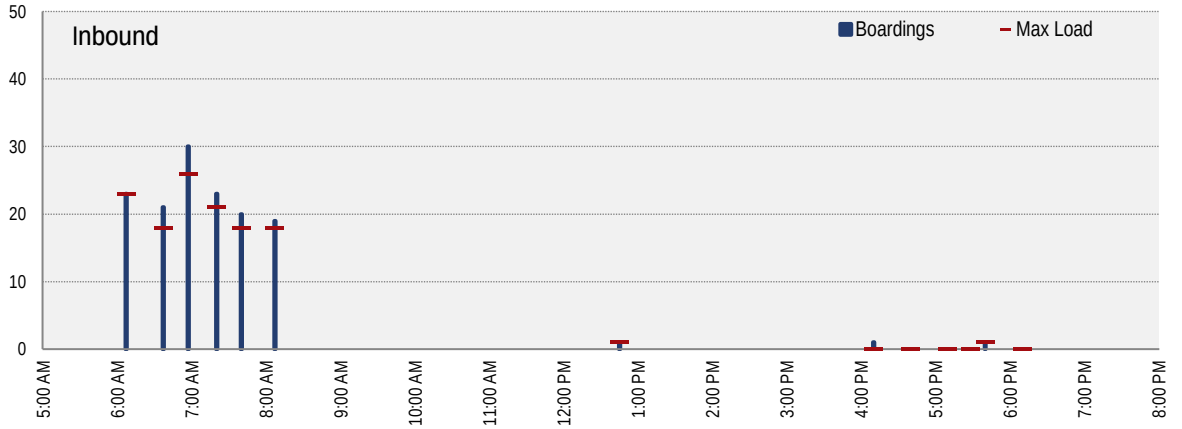


FIGURE 23 | ROUTE 906 WEEKDAY INBOUND RIDERSHIP BY TRIP



ROUTE 907: NEWINGTON EXPRESS

Route 907 operates ten trips per day, five in each direction. Overall ridership is very low traveling outbound with all trips carrying ten or fewer riders (see Figures 24). Inbound ridership is slightly higher (see Figure 25) with three of the four trips carrying ten or more riders. The off-peak direction trips, in both directions, have no ridership.

FIGURE 24 | ROUTE 907 WEEKDAY OUTBOUND RIDERSHIP BY TRIP

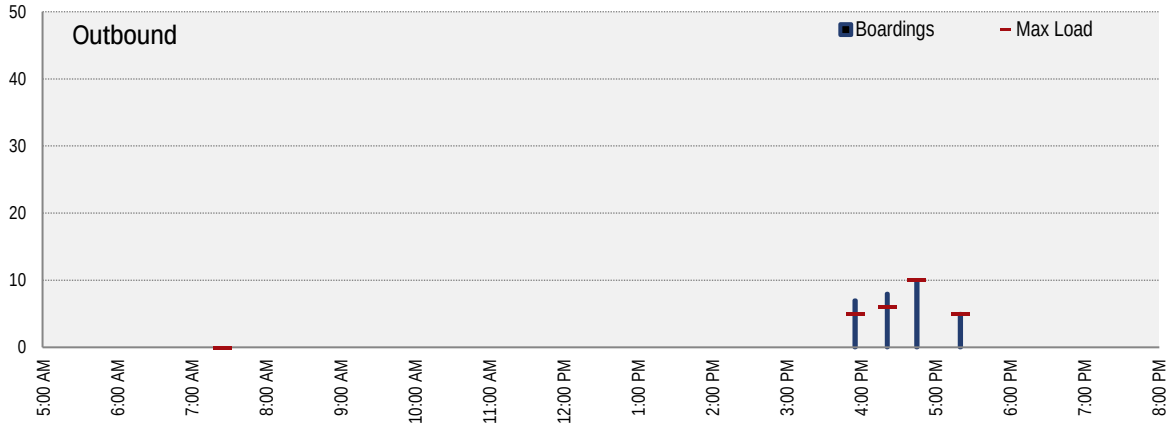
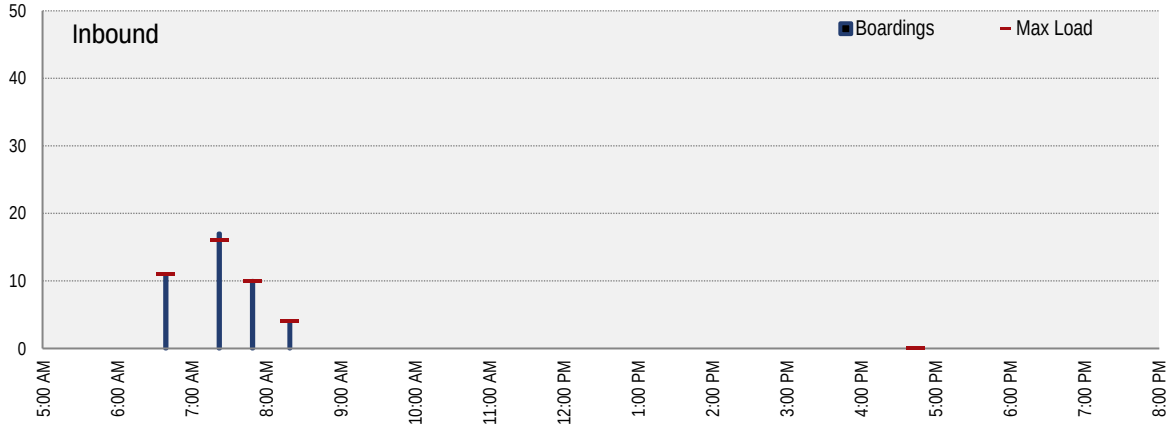


FIGURE 25 | ROUTE 907 WEEKDAY INBOUND RIDERSHIP BY TRIP



ROUTE 909: FARMINGTON-UNIONVILLE EXPRESS

Route 909 has three trips in each direction. Demand on the peak directional trips is strong. Traveling outbound one trip carries more than 20 riders and the other more than ten (see Figure 26). Demand on the inbound service is stronger with both trips carrying more than 20 people (see Figure 27). However, the data suggests there are no riders on the off-peak directional trips.

FIGURE 26 | ROUTE 9 WEEKDAY OUTBOUND RIDERSHIP BY TRIP

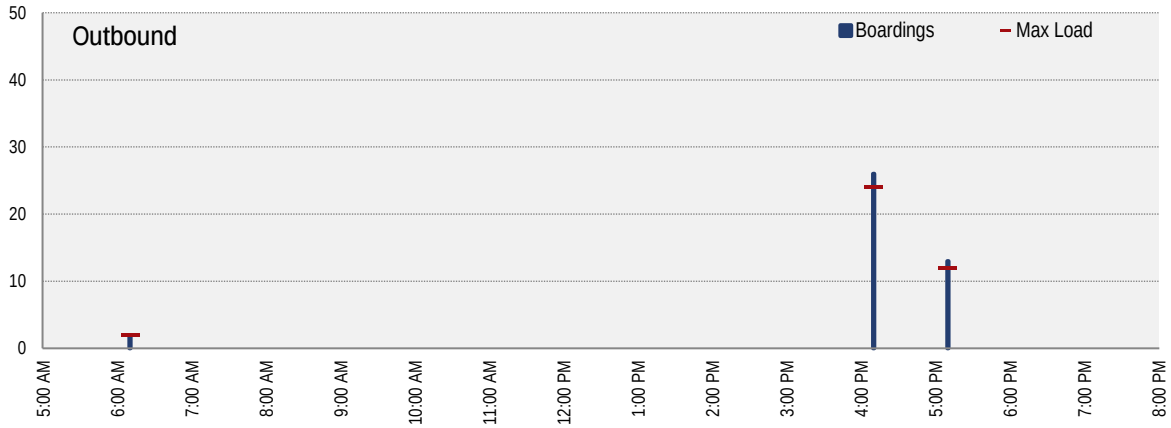
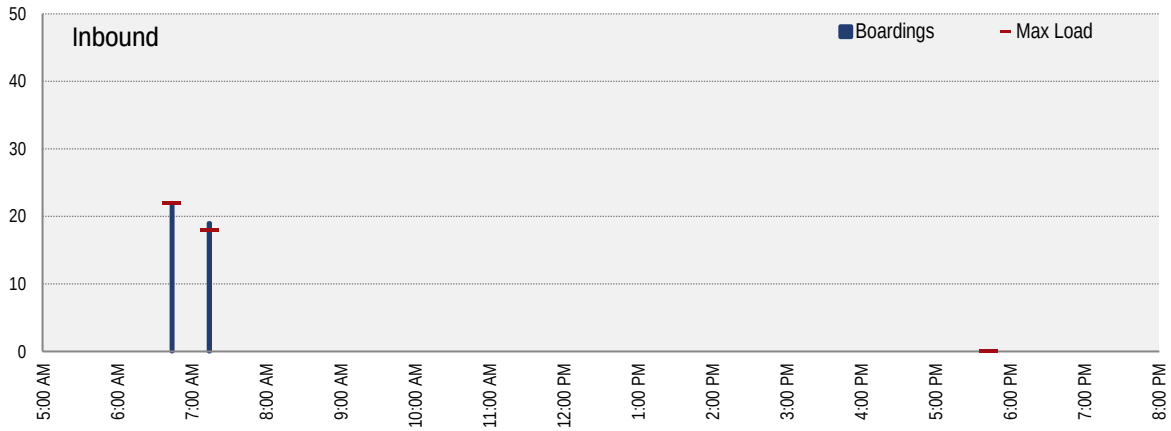


FIGURE 27 | ROUTE 9 WEEKDAY INBOUND RIDERSHIP BY TRIP



ROUTE 910: ROCK-HILL CENTURY HILLS EXPRESS

Route 901 is very similar to other express routes in terms of the balance of demand. Outbound service has more riders traveling in the peak direction, but two of the three off-peak directional trips carry ten or more riders (see Figure 28). Inbound service has stronger peak directional travel with one trip carrying 35 riders. Depending on the seating configuration of the vehicle, there may overcrowding on this single trip. High ridership in the peak direction compares with ridership on the off-peak trips, which is very low (see Figure 29).

FIGURE 28 | ROUTE 910 WEEKDAY OUTBOUND RIDERSHIP BY TRIP

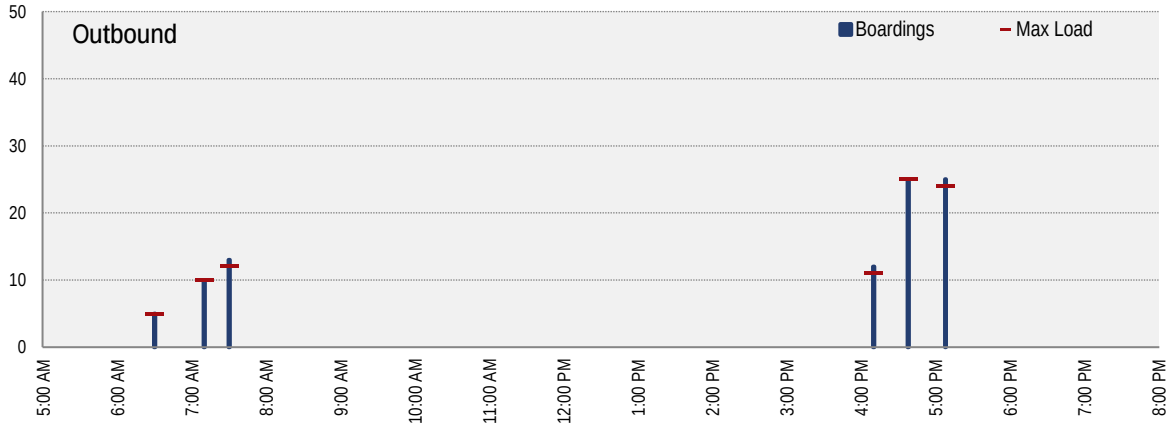
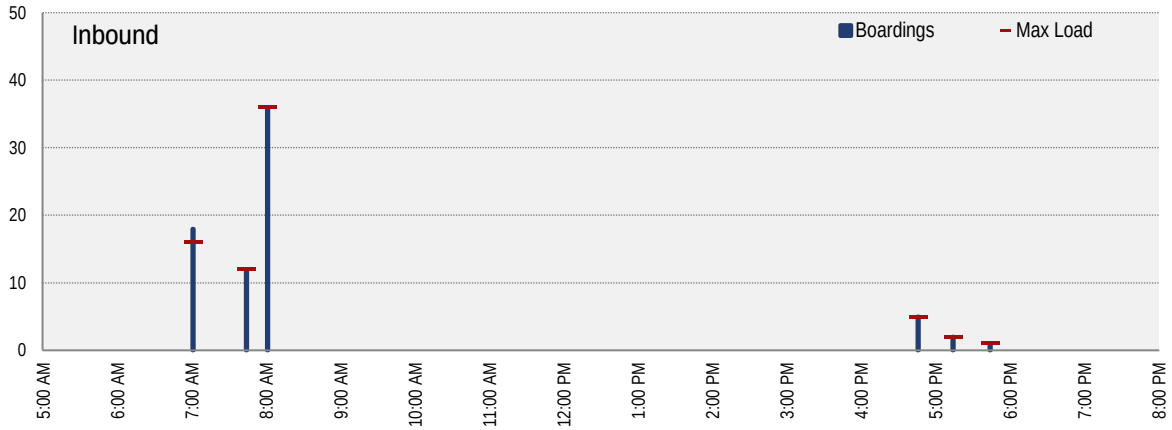


FIGURE 29 | ROUTE 910 WEEKDAY INBOUND RIDERSHIP BY TRIP



ROUTE 912: SIMSBURY GRANBY EXPRESS

Route 912 has several trips per day; while trips are clustered around the peak period, there are also two midday trips in each direction. Outbound trips carry fewer riders overall, but all trips carry some riders, including non-peak and midday trips (see Figure 30). Inbound trips, on the other hand, have strong demand in the peak direction but very low demand in the non-peak direction and during the midday (see Figure 31). Capacity is not a concern with Route 912 because no trips currently carry more than 30 riders.

FIGURE 30 | ROUTE 912 WEEKDAY OUTBOUND RIDERSHIP BY TRIP

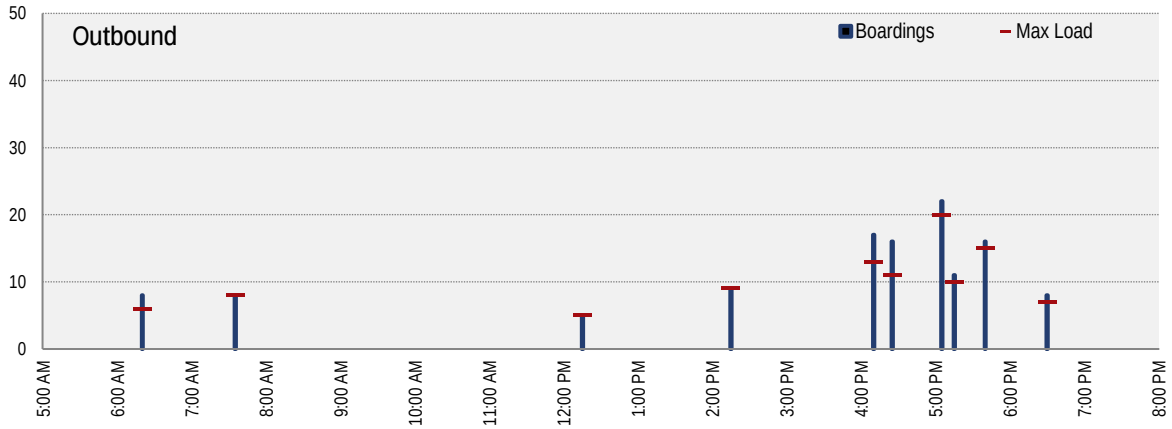
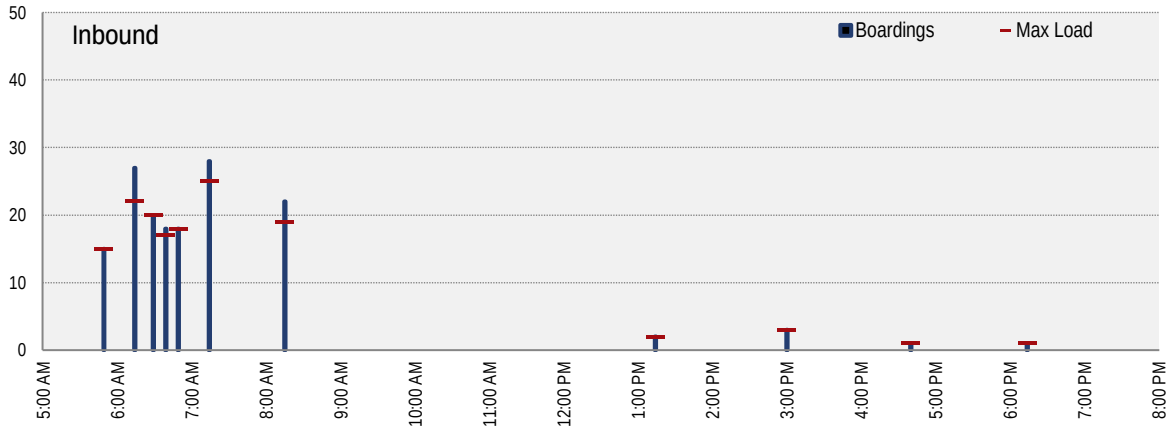


FIGURE 31 | ROUTE 912 WEEKDAY INBOUND RIDERSHIP BY TRIP



ROUTE 914: MARLBOROUGH – COLCHESTER EXPRESS

Ridership on Route 914 is heavily oriented towards the peak direction and time of day, i.e. outbound service in the afternoon and inbound service in the morning. Demand is very strong; especially in the morning inbound trips (see Figures 32 and 33). Several trips carry 30 or more riders, suggesting some trips are starting to get crowded. Demand on the outbound trips is strong, but not as high as the inbound service and no trips carry more than 30 riders. Demand for trips in the non-peak direction is very low, with some trips carrying one passenger and some carrying none.

FIGURE 32 | ROUTE 914 WEEKDAY OUTBOUND RIDERSHIP BY TRIP

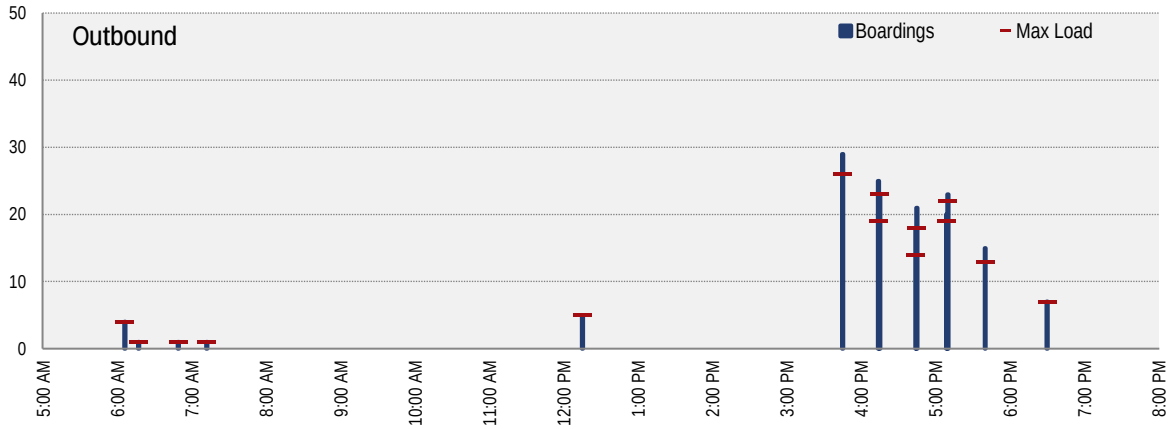
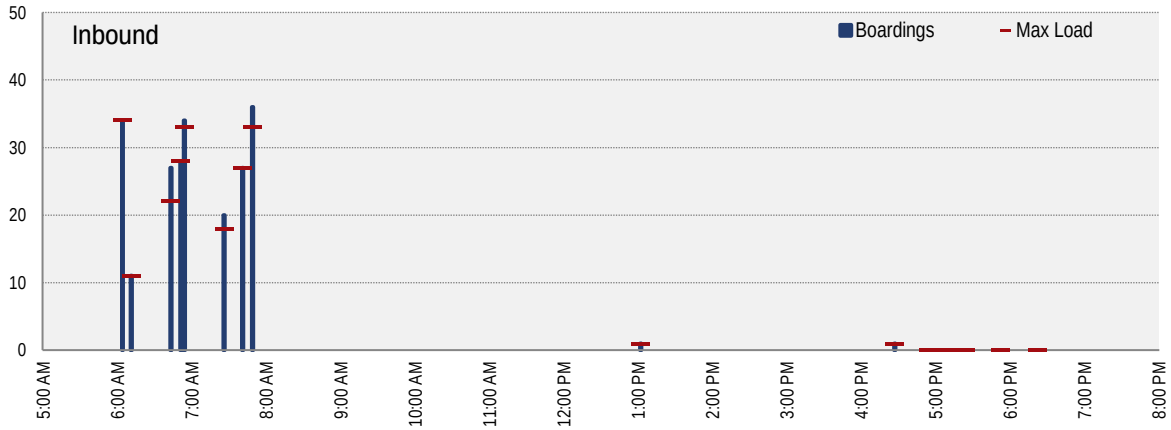


FIGURE 33 | ROUTE 914 WEEKDAY INBOUND RIDERSHIP BY TRIP



ROUTE 915: WINDSOR EXPRESS

Route 915 is scheduled in conjunction with Route 905. Route 905 serves park and ride lots in both Enfield and Windsor, Route 915 only stops in Windsor. The route provides three trips in each direction and all trips are in the peak direction of travel. Demand is low overall (see Figure 34 and 35). The inbound service carries slightly more riders than the outbound trips, but the strongest trip only carries 15 riders.

FIGURE 34 | ROUTE 915 WEEKDAY OUTBOUND RIDERSHIP BY TRIP

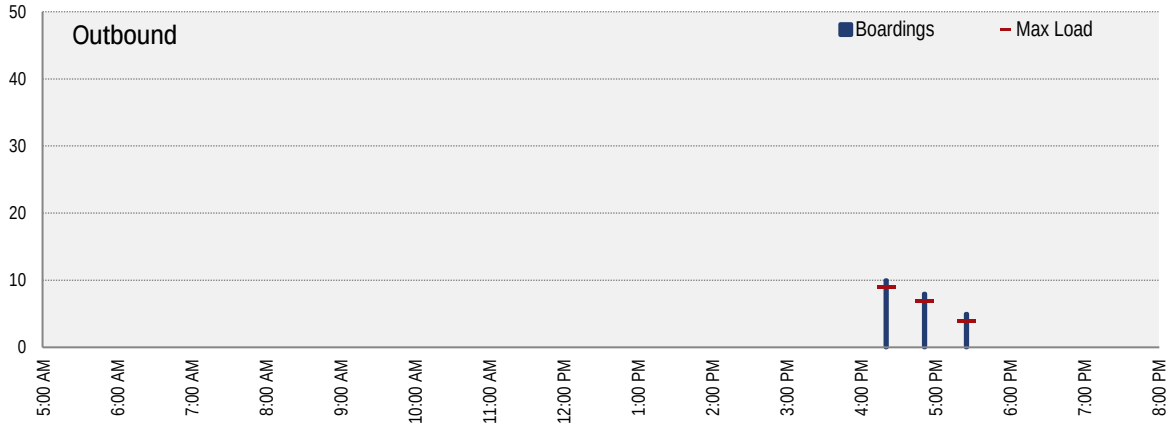
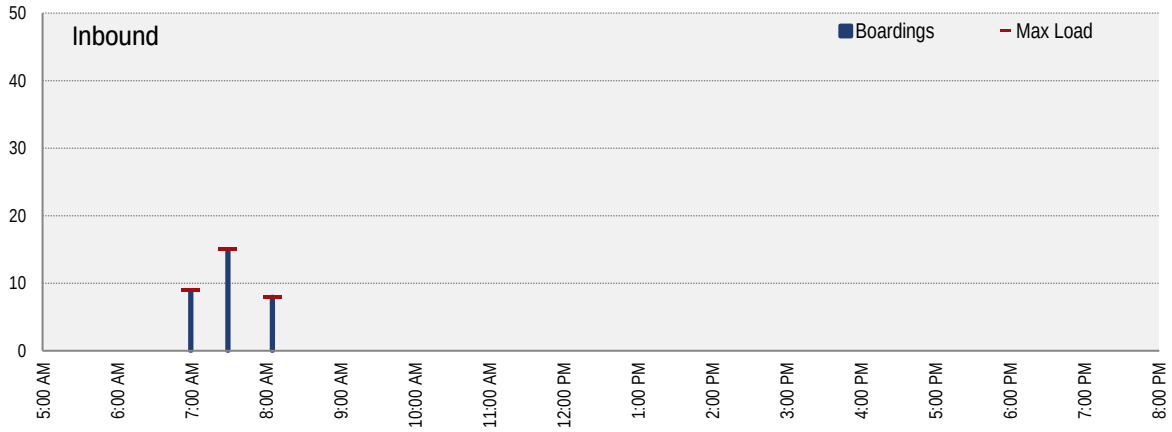


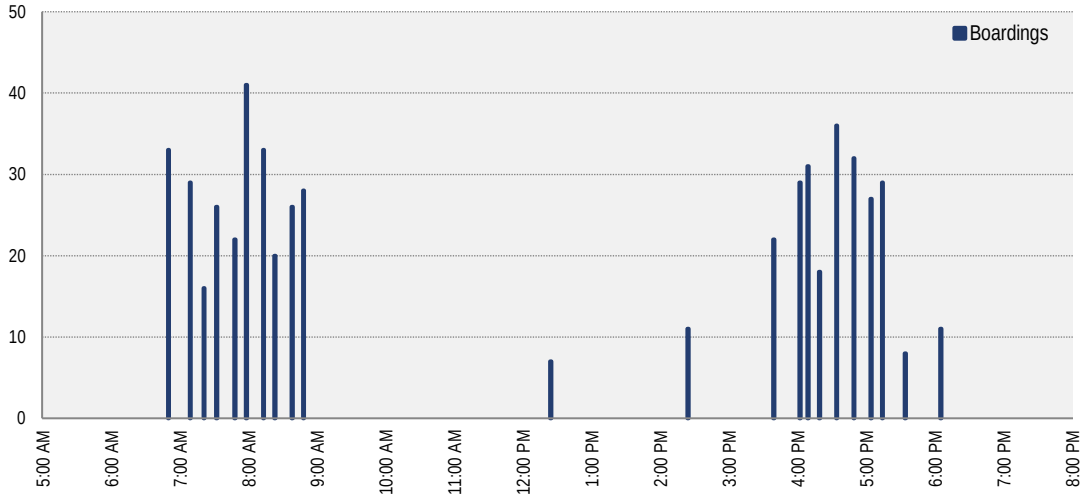
FIGURE 35 | ROUTE 915 WEEKDAY INBOUND RIDERSHIP BY TRIP



ROUTE 917: TOLLAND – VERNON EXPRESS

Route 917 provides 10 inbound trips in the AM and 13 outbound trips in the PM in the peak direction of travel. Demand is strong overall with most trips carrying more than 20 riders, and several carrying more than 30 riders (see Figure 36). Late afternoon trips out of Hartford are less attractive with only 8 to 11 riders, similar to mid-day off-peak outbound service.

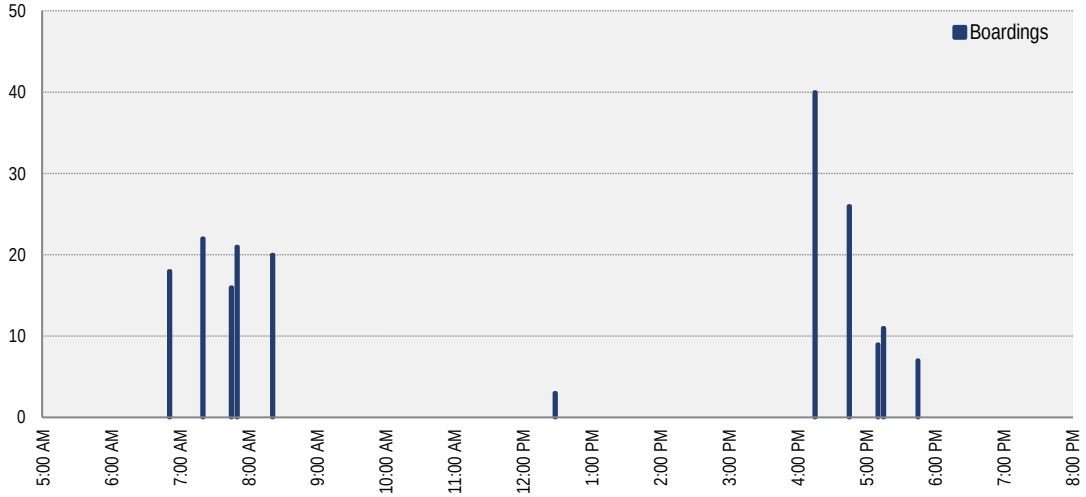
FIGURE 36 | ROUTE 917 WEEKDAY RIDERSHIP BY TRIP



ROUTE 918: WILLIMANTIC - COVENTRY

Route 918 operates five inbound trips in the AM and six outbound trips. A 7:10 AM trip and a 5:43 PM trip serve Coventry. Demand is average, with about 20 riders per trip going into Hartford. Outbound demand is heavily oriented toward earlier trips, with about 40 riders using the first outbound PM peak trip from Hartford (see Figure 37). The data below is from 2014 and afternoon service has since been shifted to earlier hours.

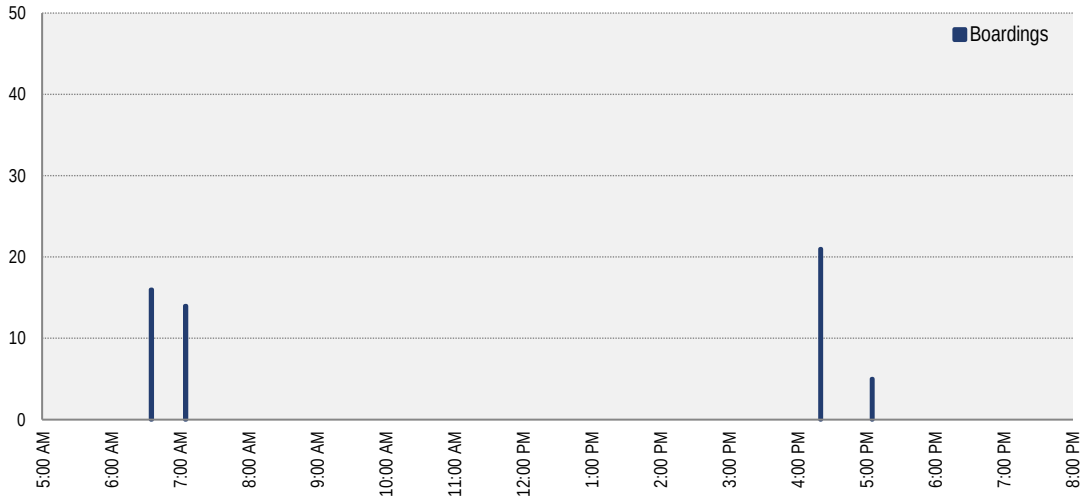
FIGURE 37 | ROUTE 918 WEEKDAY RIDERSHIP BY TRIP



ROUTE 919: MERIDAN EXPRESS

Route 919 provides two trips in each direction and all trips are in the peak direction of travel. Demand is relatively low (see Figure 38), with about 15 riders on each trip headed inbound and most riders (21) using the first outbound trip from Hartford.

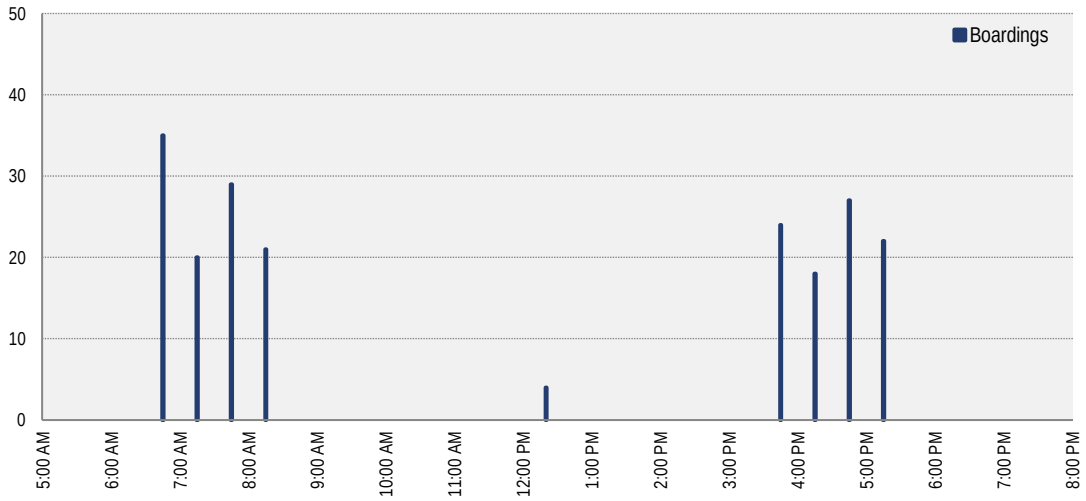
FIGURE 38 | ROUTE 919 WEEKDAY RIDERSHIP BY TRIP



ROUTE 921: MIDDLETOWN – OLD SAYBROOK EXPRESS

Route 921 provides four inbound and five outbound trips, all in the peak direction of travel. Demand is strong, with most trips carrying more than 20 riders (see Figure 39). The first inbound trip of the day carries 35 riders and is likely the most attractive due to the long (90 minutes) trip time into downtown Hartford.

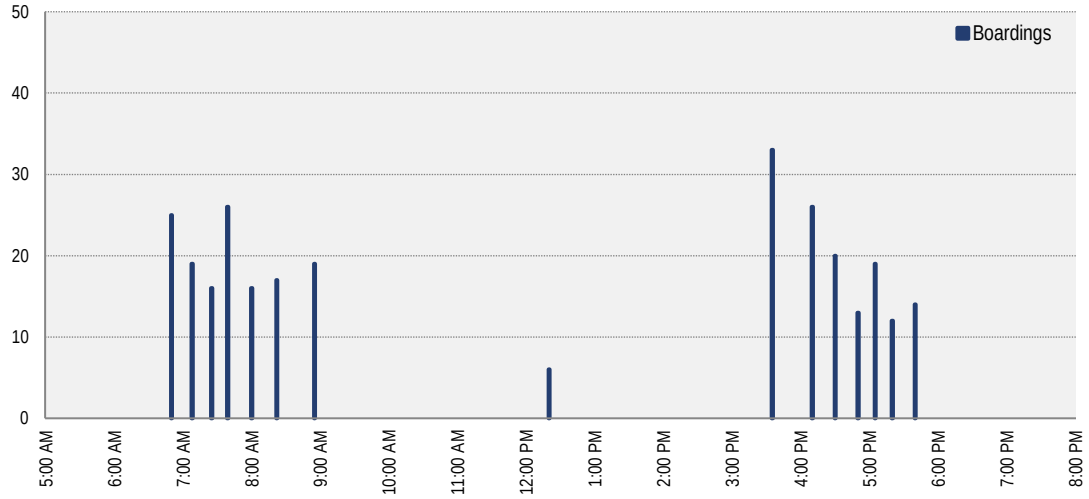
FIGURE 39 | ROUTE 921 WEEKDAY RIDERSHIP BY TRIP



ROUTE 923: BRISTOL EXPRESS

Route 923 provides eight inbound trips and nine outbound trips in the peak direction of travel, including an early afternoon inbound trip. Outbound service also starts in the afternoon. Demand is moderate with most trips carrying 15-20 riders (see Figure 40 which does not reflect service adjusts made when CT***fastrak*** was initiated). The first outbound trip of the day carries the most riders, with a total of 33.

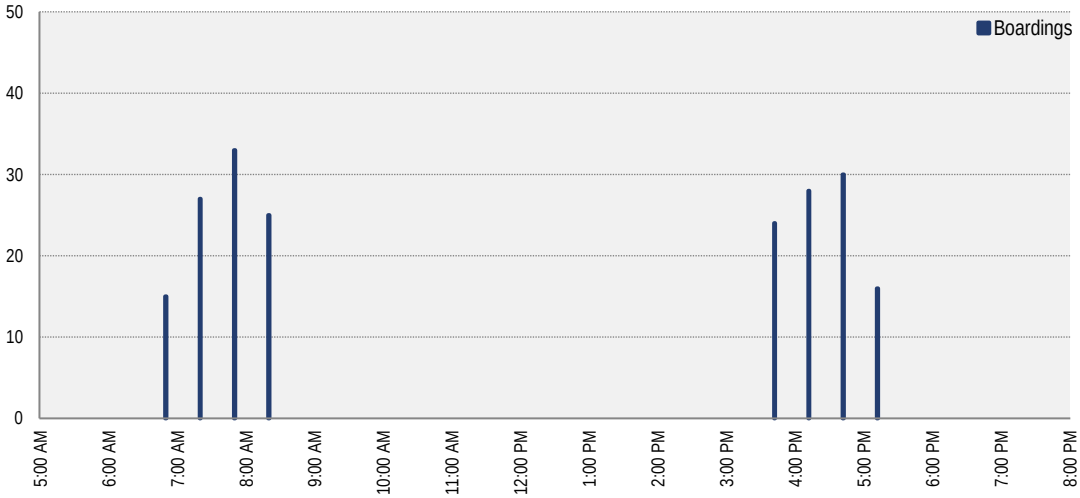
FIGURE 40 | ROUTE 923 WEEKDAY RIDERSHIP BY TRIP



ROUTE 924: SOUTHINGTON – CHESHIRE EXPRESS

Route 924 provides five trips in each direction, all in the peak direction of travel (see Figure 41 which only includes data for four trips). Demand is moderate, with the majority of trips carrying more than twenty riders. Data shown is from 2014 and does not reflect the introduction of CT***fastrak***.

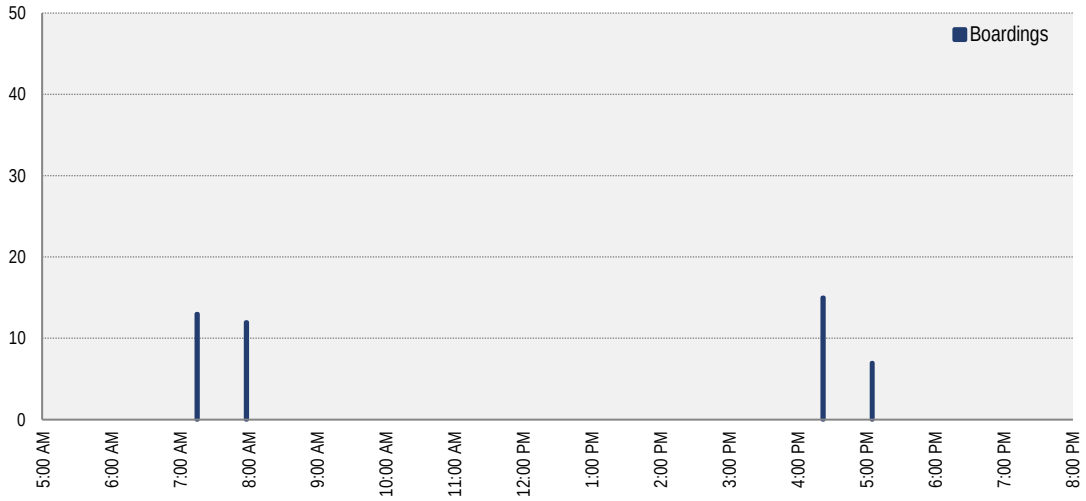
FIGURE 41 | ROUTE 924 WEEKDAY RIDERSHIP BY TRIP



ROUTE 926: WINSTED EXPRESS

Route 926 provides two trips in each direction, both in the peak direction of travel. Demand is relatively low (see Figure 42) and ranges between 12 – 15 riders per trip, with the exception of the 5:05 PM outbound which only carries 7 riders.

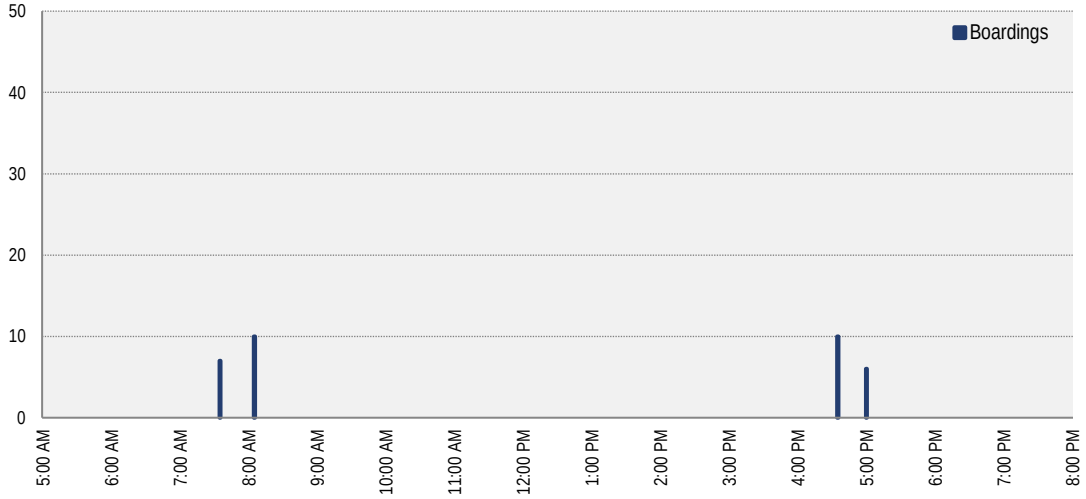
FIGURE 42 | ROUTE 926 WEEKDAY RIDERSHIP BY TRIP



ROUTE 927: TORRINGTON EXPRESS

Route 927 provides two trips in each direction, both in the peak direction of travel. Demand is low overall (see Figure 43), with all trips carrying 10 or fewer passengers.

FIGURE 43 | ROUTE 927 WEEKDAY RIDERSHIP BY TRIP



ROUTE 950: NEW HAVEN – HARTFORD EXPRESS

Route 950 operates in both directions, providing three peak period trips in each direction as well as a mid-day trip in each direction. Demand is well balanced, but shows slightly more demand for commute trips into Hartford, with more riders going inbound in the AM and outbound in the PM (see Figure 44 and 45). In general, peak period trips carry between 10 and 20 riders.

FIGURE 44 | ROUTE 950 WEEKDAY OUTBOUND RIDERSHIP BY TRIP

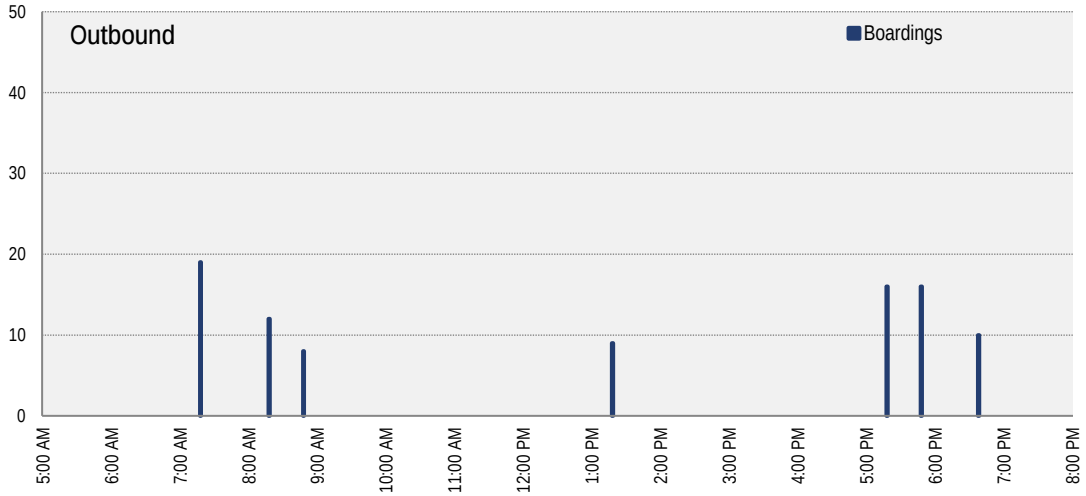
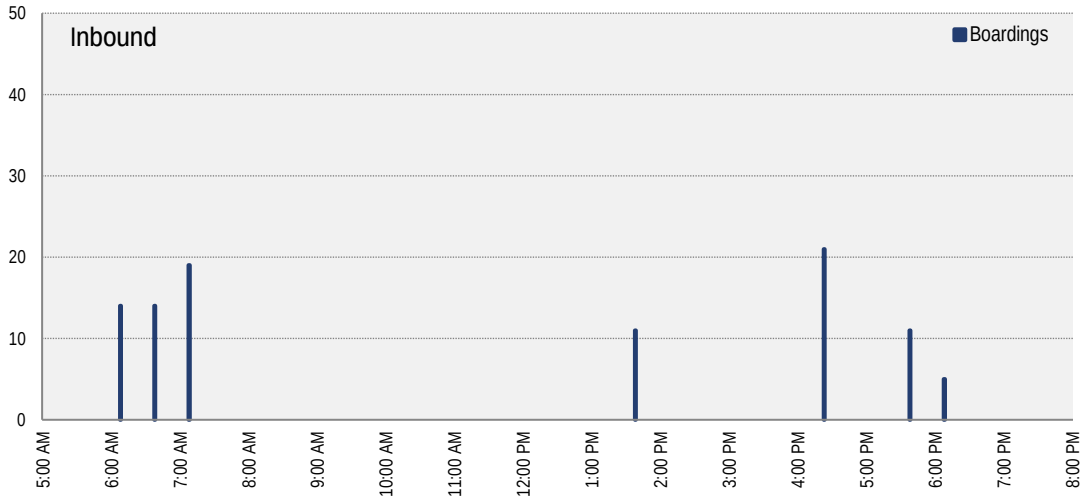


FIGURE 45 | ROUTE 950 WEEKDAY INBOUND RIDERSHIP BY TRIP



SERVICE IMPROVEMENT OPTIONS

CT***transit***'s express network provides connections from several points around the region into downtown Hartford; several trips also continue on to serve the employment sites located near Bushnell Park and on Asylum Hill. Overall, the service network is comprehensive and ensures that people living in the outlying communities have access to the job centers in and around downtown Hartford. Some routes show relatively low demand in the off-peak direction, perhaps reflecting the difficulty that reverse commuters may face in reaching employment sites from outlying stops at park and ride lots. CT***transit*** interlines many trips as a strategy to avoid empty buses traveling in the non-peak direction however, where there are non-peak directional trips, many of these trips carry a few and sometimes no riders.

Express routes are designed to attract choice riders, many of whom reliably have access to a private automobile. Attracting choice riders to transit requires that the service offer comparable convenience or the opportunity to avoid costs associated with the trip, such as expensive trips costs due to long travel distances, parking charges at the destination or unreliable commutes due to congestion. CT***transit***'s express network largely achieves this level of service and high ridership on many routes attests to an effective service design.

The strengths of the network are the fact that is it is comprehensive, and many of the routes use the interstate system to travel quickly and efficiently into downtown. Many of the interstates also have high occupancy vehicle (HOV) lanes ensuring that the service is reliable. The HOV network also helps explain why most routes have an on-time performance rate greater than 90%. Other network strengths include a comprehensive park and ride lot system, with lots close to the freeways. The express vehicle fleet is also a strength; it is largely comprised of over the road coaches, offering more available and comfortable seating than regular transit vehicles. Many vehicles also offer WiFi for their riders.

Another strength of the express network is that routes serve multiple points in downtown Hartford including employment areas along Main Street, near Bushnell Park and on Asylum Hill. Not every trip circulates downtown, but passengers may transfer to a local route or the free downtown commuter shuttle to make connections. Finally, CT***fastrak*** will further strengthen the attractiveness of certain express routes by offering a dedicated guideway for vehicles traveling into downtown.

The weakness of the system primarily reflects its complexity. Many trips are not evenly spaced and, as a result, some trips are crowded while other trips on the same route have very low ridership. Likewise, some express routes have complicated schedules that lack clear and easy patterns for riders to remember.

Specific service improvement options by route include:

- **Route 901 Avon-Canton Express**: The route is generally productive and performs well. Additional local stops in the off-peak direction slow overall travel time, but are considered effective to provide greater opportunity for reverse peak commutes.
- **Route 902 Corbins-Farm Springs Express**: Route 902 has poor productivity, with operating costs of $9.94 per passenger. Service may be improved by eliminating service to the Bank of America facility. While one trip suggests riders use the route, the ridership does not justify the additional distance travelled. Eliminating this stop and just serving the Corbins Commuter Lot would strengthen the route overall. Another option would be to terminate the service at CT***fastrak***'s Cedar Street Station.
- **Route 903 Manchester – Buckland Express**: Route 903 performs well and is the most productive express route in the network. There are minor opportunities to improve the route namely by eliminating service to the stop at Tolland and Buckland, or adding an additional inbound trip later in the morning. Off-peak directional service may be strengthened by better integrating Express route service with pick-ups at the Shoppes at Buckland Hills.

- **Route 904 Glastonbury Express**: Route 904 performs moderately well – operating costs per passenger are better than average. The service, however, may be strengthened by eliminating service to Saint Augustine's Park and Ride lot. The lot is at the outer most point of the route and carries few riders, eroding the route's productivity.
- **Route 905 Windsor Locks – Enfield Express**: This route performs well because it carries a relatively high amount of riders on many trips. However, the route has too many variants and is not well coordinated with Route 915; as a result the route is confusing. In Enfield, the park and ride lot at Enfield Plaza is the only productive stop. Limited service to Mass Mutual may be justified, but local Enfield community transit routes provide circulator service. Most trips should serve only the Plaza park and ride lot. In Windsor Locks, service to North Street and Kennedy Road erode service productivity as the local deviation serves only a small number of riders. Express service in the area should be better coordinated with local routes 34, 36 and 96 (East Windsor). In addition, new commuter rail service in Windsor Locks will be introduced in 2016. Express trips should operate direct service between the Enfield Plaza, Windsor Locks and Poquonock park and ride lots. Local circulator service could connect these lots and the new rail station to local destinations in Windsor Locks and employment sites on International Drive.
- **Route 906 Cromwell Express**: Route 906 performs relatively well with operating costs per passenger slightly below the system average. The first few local stops in Cromwell pick up very few riders, but this service does not affect the overall travel time or convenience for the majority of passengers boarding at the park and ride lot off I-91.
- **Route 907 Newington Express**: Route 907 has very high operating costs per passenger because the ridership generated on the trip does not justify the long travel distance. In addition, demand in the non-peak direction is very low. The route, however, is direct and does not make local stops so there are limited opportunities to strengthen productivity. The decision to keep the route may be based on the need to provide coverage and lifeline connections to employment areas along the Berlin Turnpike. The route should be better coordinated with Route 45 Berlin Flyer and Route 47 Franklin Avenue to ensure each of these routes serves distinctive markets in the Berlin Turnpike area.
- **Route 909 Farmington Unionville Express**: Like the Newington Express, Route 909 is an express route that has limited stops and travels directly, but uses local roads and consequently does not provide significant advantages over travel by private automobile. This is also the route with the lowest on-time performance, likely reflecting travel on local streets. The route also faces competition from other Farmington Avenue routes. Consequently, productivity is not good, with operating costs per passenger of $8.25. The need to operate Route 909 for coverage or lifeline service may be warranted, but from a demand perspective the resources may be better invested otherwise.
- **Route 910 Rocky Hill-Century Hill Express**: Route 910 performs relatively well with operating costs per passenger lower than the express network average. The route could be improved if the travel path was straightened which would make the route faster and more direct, however there are no park and ride lots in the area. CTDOT has considered introducing a lot at their maintenance facility on Route 3, but land is limited. Currently demand is sufficient to operate the route, particularly in the Century Hills area; straightening it in a manner to include Century Hills and/or a new park and ride lot would likely attract more riders and make the service more productive.
- **Route 912 Simsbury-Granby Express**: Route 912 carries just over 15 passengers per trip, but the operating cost per passenger is $8.42, higher than the express network average. The greatest opportunity to improve the route would be to eliminate service to the outer end of the route in

Granby. This park and ride lot at the First Congregational Church is very low and the distance travelled is considerable. The route would be strengthened by starting it at the Iron Horse Park and Ride lot and stopping at the Winslow Park and Ride en route to downtown Hartford, or by operating as far as the Avon Park and Ride Lot to meet the Route 901 Avon – Canton Express.

- **Route 914 Marlborough Colchester Express:** Route 914 is relatively productive with nearly 14 passengers per trip and operating costs less than the network average. The route is direct and fast with a handful of stops in Colchester and in Marlborough as it travels inbound to Hartford. No service improvements are recommended at this time.
- **Route 915 Windsor Express:** Route 915 is a productive route that only provides a handful of unique trips per day. The route is incorporated with Route 905, which provides more trips to destinations east of Windsor, including Enfield. While the route is productive, as discussed previously, the overall corridor may be better served by streamlining the two routes and limiting stops to Mass Mutual (handful of trips only); Enfield Town Plaza; Windsor Locks and Poquonock Park and Ride and introducing local circulator service.
- **Route 917 Tolland - Vernon Express:** Route 917 is an attractive and relatively productive service, likely due to the fact that it can utilize HOV lanes on I-84 and provide fast service into downtown Hartford. It could be considered for future expansion of CT***fastrak*** East, and evaluation of ridership information by stop may suggest it would be effective to operate trips that only serve two of the four outlying park and ride lots. This would shorten travel time for most passengers and attract more riders to the service.
- **Route 918 Willimantic - Coventry Express:** Route 918 trips attract moderate ridership, but long distances affect the overall productivity of the route. One way to improve productivity might be to consolidate the last two outbound Willimantic trips of the evening into one trip.
- **Route 919 Meriden Express:** This route offers only two trips per day and has relatively low demand. Productivity may be improved if the route stopped at another park and ride lot along I-91, or if the two departures which are only 20 minutes apart were further spread out. Conversely, the two trips could be combined into one departure and still accommodate all riders.
- **Route 921 Middletown –Old Saybrook Express:** Route 921 has moderate ridership and provides an important regional connection between southeastern CT and Hartford. No changes are recommended.
- **Route 923 Bristol Express:** This route was modified in March 2015 to use the new CT***fastrak*** guideway. It has consistent demand during peak periods and recent schedule changes have included earlier outbound service. Additional mid-day service in the inbound direction may be warranted.
- **Route 924 Southington – Cheshire Express:** This route was modified in March 2015 to use the new CT***fastrak*** guideway. The service is coordinated with Route 925: both serve the same alignment, but Route 925 continues beyond the Cheshire Milldale Park and Ride Lot to Waterbury. Although Route 924 is operated by Dattco and Route 925 is operated by CT***transit***, the service from the Milldale and Southington park and ride lots would be more intuitive if operated under one route designation. Ridership data by trip and location should be further evaluated to determine if these lots warrant the deviation on Route 925.
- **Route 925 Cheshire - Waterbury Express / Route 928 Southington – Cheshire – Waterbury Express:** Data is not available for these routes, which were initiated in March 2015. Route 925 provides peak period service in the peak direction into downtown Hartford and stops at the two additional park and ride lots (Milldale and Southington) served by Route 924.

Ridership data by trip at these locations should be evaluated to determine whether the deviation is merited. Otherwise, Routes 925/924 would be more intuitive if operated under one route number.

- **Route 926 Winsted Express:** Route 926 operates two peak period trips in each direction, carrying an average of 11.5 passengers per trip. Route 926 has the highest cost per passenger of the express route network and is one of three relatively unproductive express services operated from northwest of Hartford along the Route 44 corridor. Routes 912, 926 and 927 would be more productive if all service ran only as far as the Avon Park and Ride Lot, where frequent service to downtown could be accessed. Alternatively, Route 926 service could be consolidated into one daily trip.
- **Route 927 Torrington Express:** Route 927 carries 10-15 passengers per trip and has the second highest operating cost per passenger in the express network. It is one of three relatively unproductive express services operated from northwest of Hartford along the Route 44 corridor. Routes 912, 926 and 927 would be more productive if all service ran only as far as the Avon Park and Ride Lot, where frequent service to downtown could be accessed. Alternatively, Route 927 service could be consolidated into one daily trip.
- **Route 950 New Haven Hartford Express:** Route 950 has moderate ridership and provides an important regional connection between New Haven and Hartford. However, this service should be adjusted when NHHS commuter rail service begins in 2016. Schedules should be timed to provide complementary service to fill in the gap of commuter trains schedules (e.g. mid-day and later evening).

APPENDIX H
ROUTE PROFILES

Route Evaluation

BRADLEY FLYER

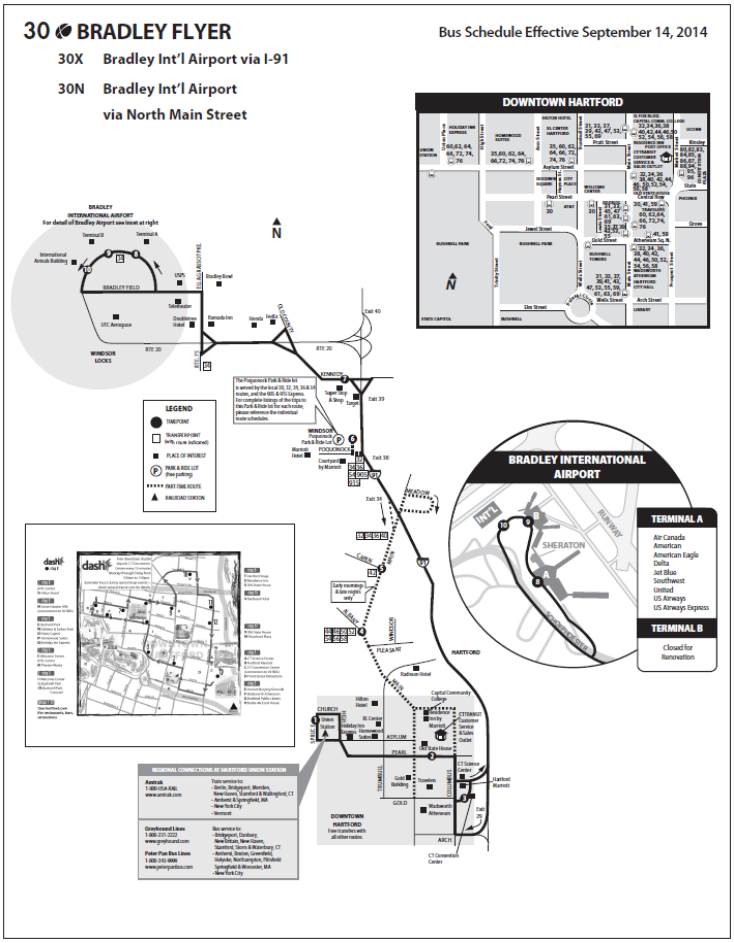
30X | Bradley International Airport via I-91

30N | Bradley International Airport via North Main Street

Service Design

Route 30 Bradley Flyer connects Union Station, downtown Hartford, and Bradley International Airport. The route includes two services: Route 30X trips that travel express from downtown via the Convention Center and Interstate 91 to Kennedy Road and the Airport Connector. Most Route 30X trips also serve the Poquonock Park & Ride; and Route 30N, which operates locally along Main Street to I-91 to Kennedy Road and the airport.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

The Bradley Flyer originates in downtown Hartford, where riders can connect to most CT***transit*** routes as well as regional bus and Amtrak service. Both Routes 30X and 30N also connect with Routes 32, 34 and 36 either on the Bradley Airport Connector, at Poquonock Park & Ride (30X) or on Main Street (30N). Route 30X also connects with Route 54 and Express Routes 905 and 915 at Poquonock (see Figure 2). Route 30N buses also connect with Albany Avenue bus routes on Main Street.

FIGURE 2 | TRANSFER OPPORTUNITIES (ROUTE 30X AND 30N)

TRANSFER TO	SERVING
Route 32	Windsor Avenue
Route 34	Windsor Avenue – Poquonock (30N and 30X)
Route 36	Windsor – Day Hill Road
Route 40	North Main Street
Route 44	Garden Street
Route 46	Vine Street
Route 50	Blue Hills Avenue – Cottage Grove Road
Route 52	Blue Hills Avenue
Route 54	Blue Hills Avenue – Blue Hills Extension
Route 56	Bloomfield Avenue
Route 58	Albany Avenue
Route 905	Enfield-Somers/Windsor Locks Express
Route 915	Windsor Express

Alignments and Service Patterns

Bradley Flyer outbound trips begin at Union Station, although Route 30X and Route 30N follow different alignments through downtown Hartford and to Bradley Airport:

- Route 30X travels east on Pearl Street across downtown Hartford, then turns south on Columbus Boulevard by the Convention Center and gets onto I-91 northbound; most 30X trips stop at the Poquonock Park & Ride off I-91 in Windsor. Buses turn off I-91 and continue west on Kennedy, Old Country, and Route 20, then travel north on Ella Grasso Turnpike and enter Bradley International Airport, circulating through the airport before returning to Ella Grasso Turnpike southbound. Inbound buses follow the same alignment back into downtown Hartford.
- Route 30N outbound buses depart Union Station and also travel east on Pearl Street, but turn north on Main Street and continue along North Main Street and Windsor Avenue to I-91. Route 30N trips do not serve Poquonock Park & Ride, but exit I-91 at Kennedy Road and follow the Route 30X alignment to Bradley. Inbound buses follow nearly the same alignment back into downtown Hartford, but travel along Chapel Street, Columbus Boulevard, and Pearl Street to return to Union Station.

Service Schedule

Bradley Flyer service operates seven days a week, with outbound trips beginning at 4:05 a.m. daily and inbound trips departing until midnight. Buses generally operate every 60 minutes, with less frequent

service later in the evening. Almost all trips operate as Route 30X. On weekdays and Saturdays, five trips operate as Route 30N including the first two outbound trips, the first early morning inbound trip and the last two inbound trips. On Sundays, there are 10 Route 30N trips that provide local service; these trips are scheduled in the early morning and late night.

FIGURE 3 | SCHEDULE OVERVIEW

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	4:05 AM – 12:49 AM	60/60 (irregular)	20/20
Saturday	4:05 AM – 12:35 AM	60	14/14
Sunday	4:05 AM – 12:35 AM	60-120	14/14

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Together, Route 30X and 30N carry 703 daily passengers, or about 17.6 passengers per trip. This average is consistent with other local routes in the CT***transit*** Hartford Division[1]. On Saturday, the combined routes carry 371 passengers, or about 13.3 passengers per trip, which is somewhat below the division average. Sunday's ridership of 287 daily passengers, or 11 passengers per trip, falls farther below the division average.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 30	ROUTE 30	DIVISION AVG
Weekday	703	17.6	17.7
Saturday	371	13.3	16.3
Sunday	287	11.0	17.6

Source: CTtransit performance data

Ridership by Stop

The most heavily used stop on Route 30X/30N is the downtown stop at Central Row and the Old State House, where the majority of inbound passengers disembark. Outside of the downtown, there are only two stops, the Bradley Airport stop at Terminal A and the Kennedy Road/Stop & Shop stop, that generate more than 50 or more boardings or alightings per day (see Figure 5 and 6).

[1] *Routes 39X and 30N are more appropriately compared with other express routes. Once the data becomes available, the report will be updated.*

FIGURE 5 | ROUTE 30 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Central Row and Old State House	1 / 267	Downtown Hartford and other CT*transit* routes
Kennedy Road and Stop & Shop	54 / 3	Stop & Shop, Target, industrial buildings
Bradley Airport – Terminal A	68 / 0	Bradley International Airport

Load profile data (see Figure 6) combines passenger activity by stop and shows the cumulative passenger load as the bus travels inbound along its route. Ridership by stop without the cumulative load is mapped in Figure 7. The data for Route 30X/30N shows high boardings at the Airport and a fair number of boardings at the hotels and other airport related businesses along Ella Grasso Turnpike, with inbound passenger loads peaking at the Stop & Shop on Kennedy Road before the bus turns onto Interstate 91. Some passengers get on and off at the Poquonock Park-Ride stops on 30X, before traveling inbound to downtown Hartford. There is relatively little passenger activity along Main Street on Route 30N trips.

FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

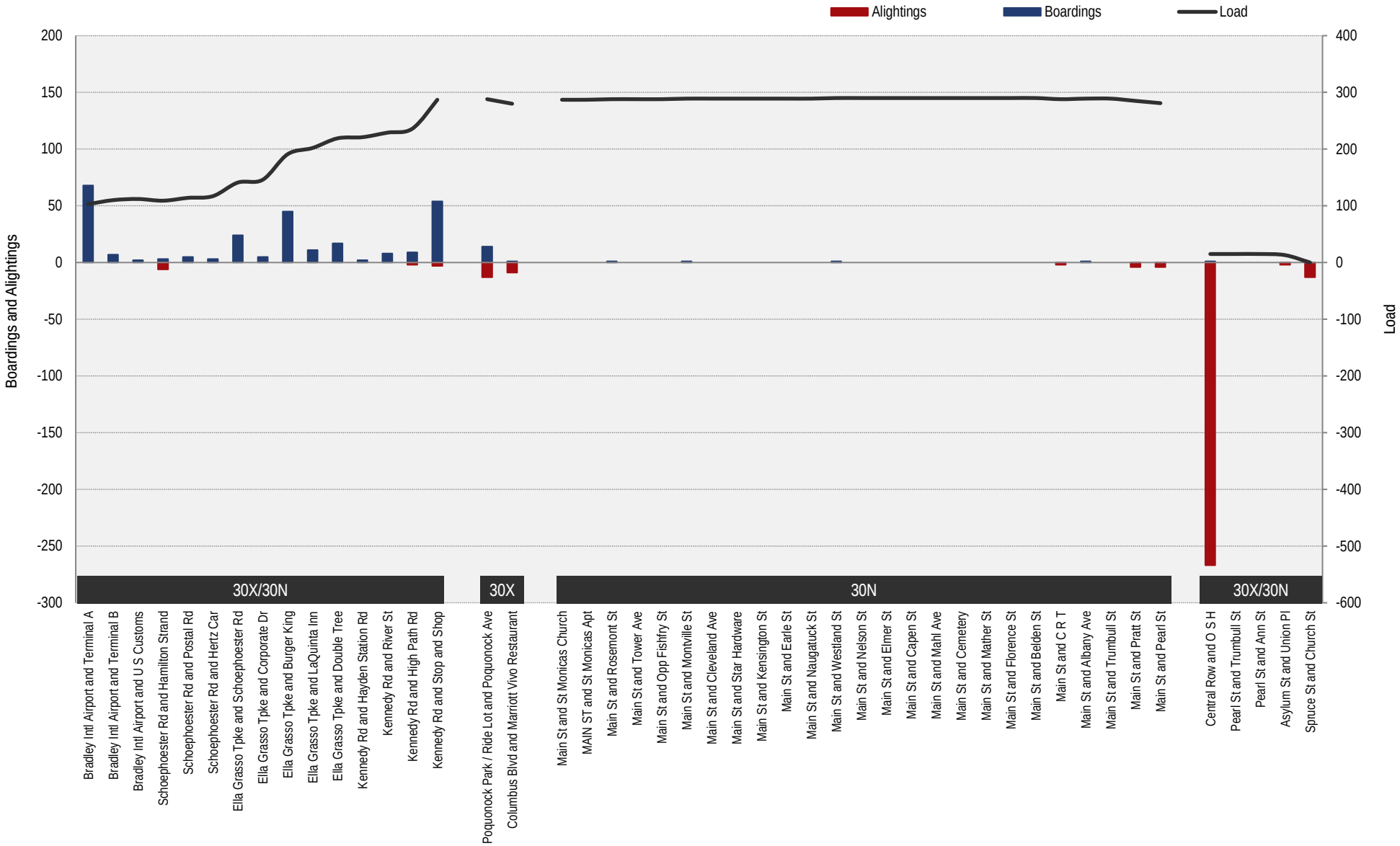
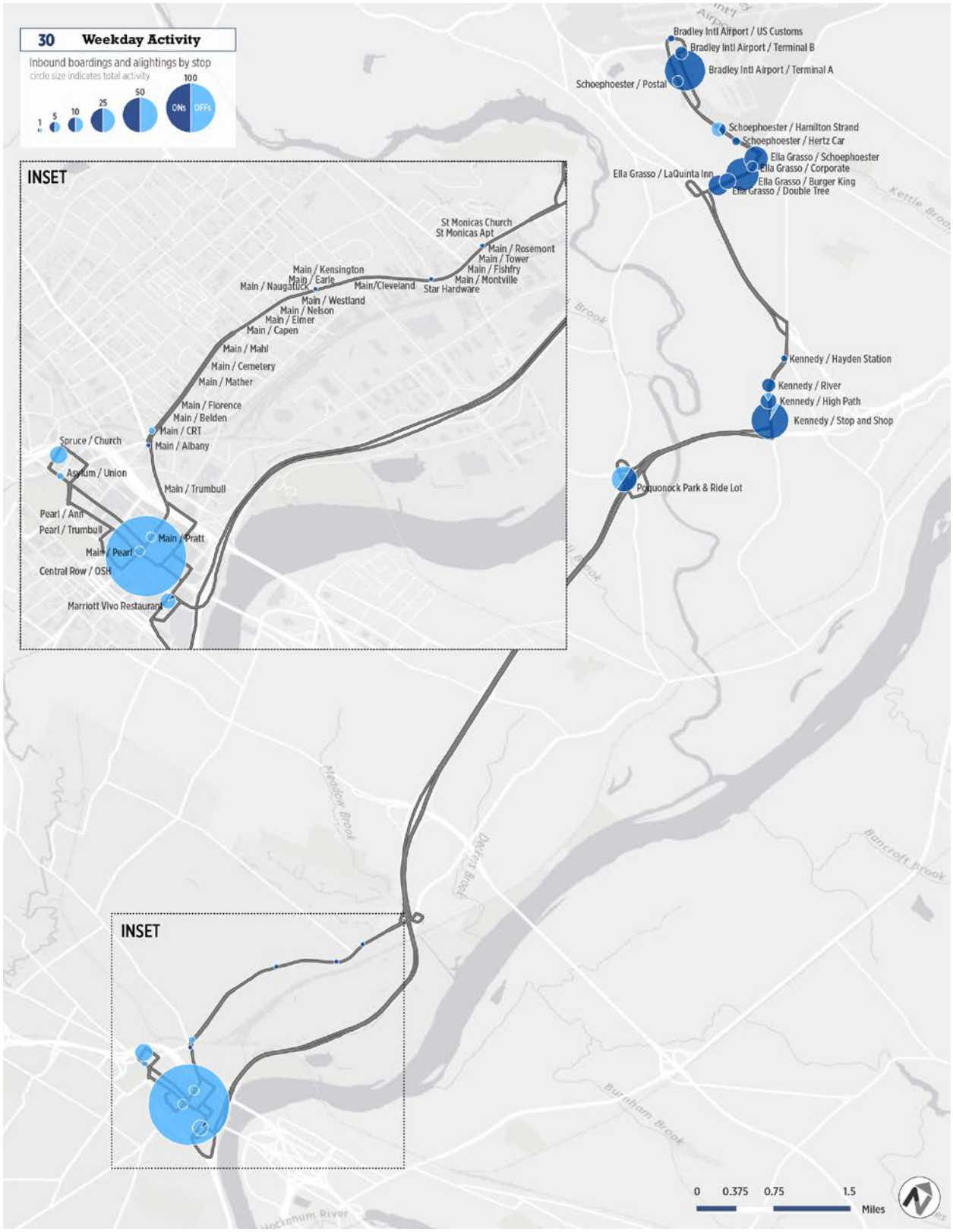


FIGURE 7 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Demand is strongest heading outbound to the Airport during the morning peak period and fairly strong in both directions during the afternoon peak periods (see Figures 8 and 9). Ridership is generally above 10 passengers per trip, with the exception of some early AM and late night trips after 10 PM.

FIGURE 8 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

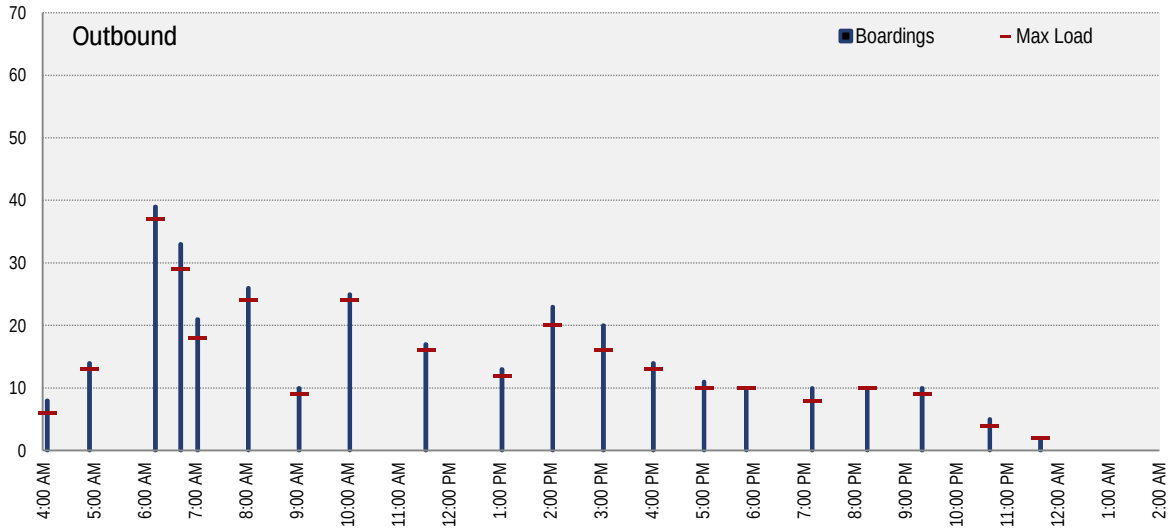
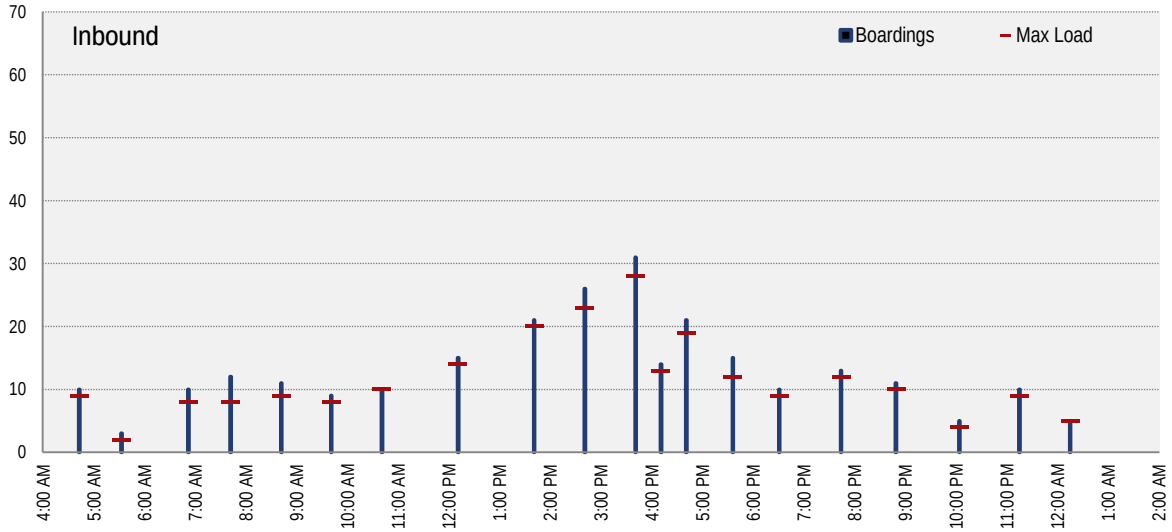


FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Similar to weekdays, demand is strongest in the outbound direction in the morning. Heading inbound, demand is fairly well balanced throughout the day (note: that data was not available for the 4 PM outbound or the 4:39 inbound trips).

FIGURE 10 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

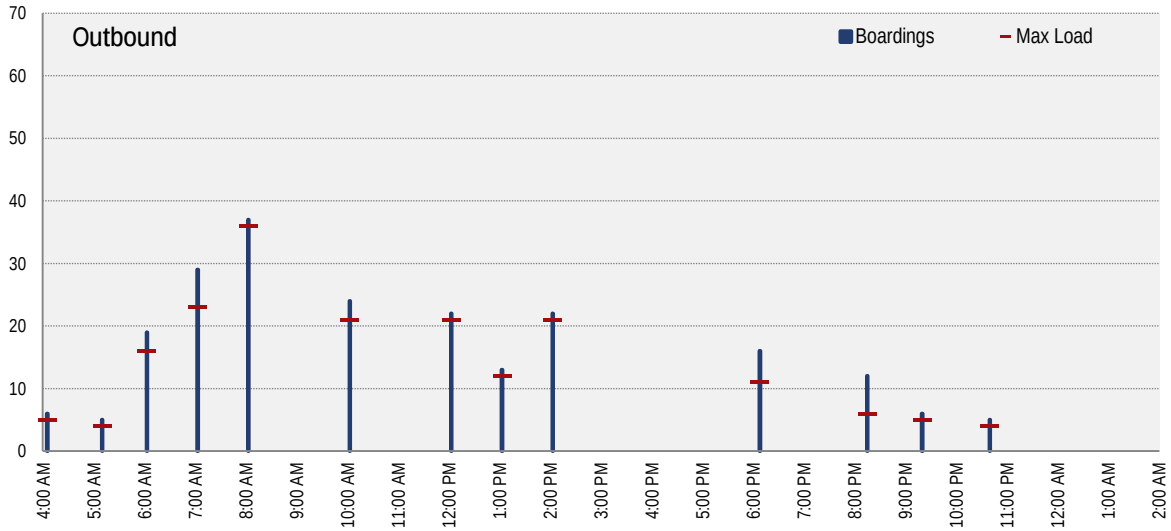
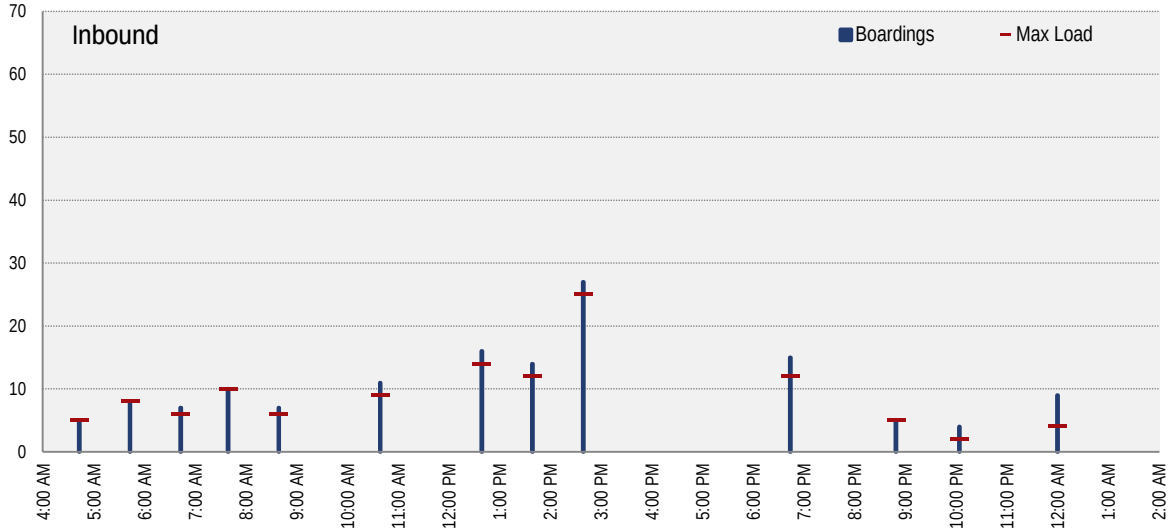


FIGURE 11 | SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

There is high demand for the 8 AM outbound trip which is the first express Route 30X of the day. Earlier trips in both directions have relatively low ridership indicating less service or another express trip may be warranted.

FIGURE 12 | SUNDAY OUTBOUND RIDERSHIP BY TRIP

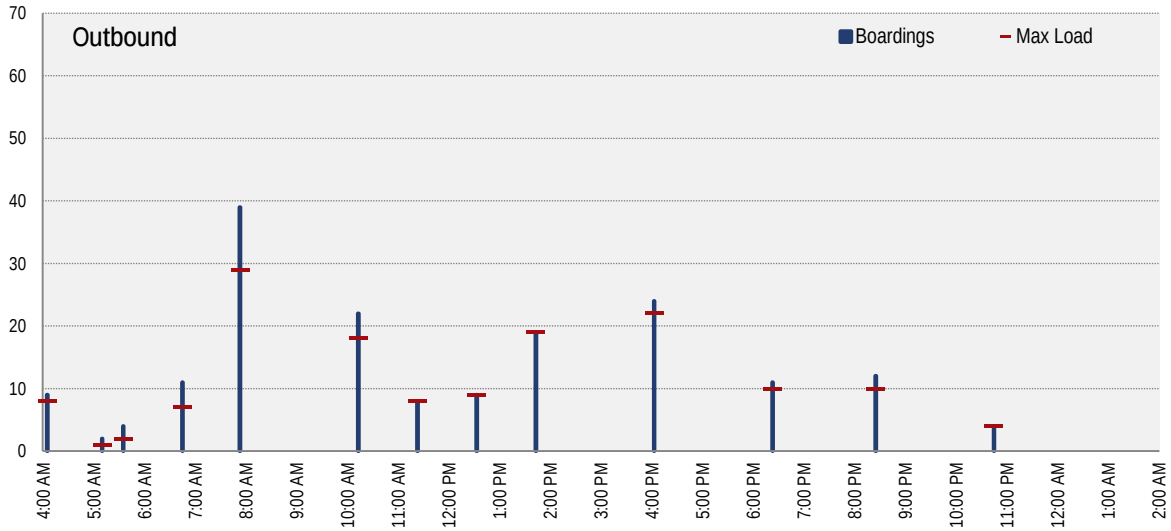
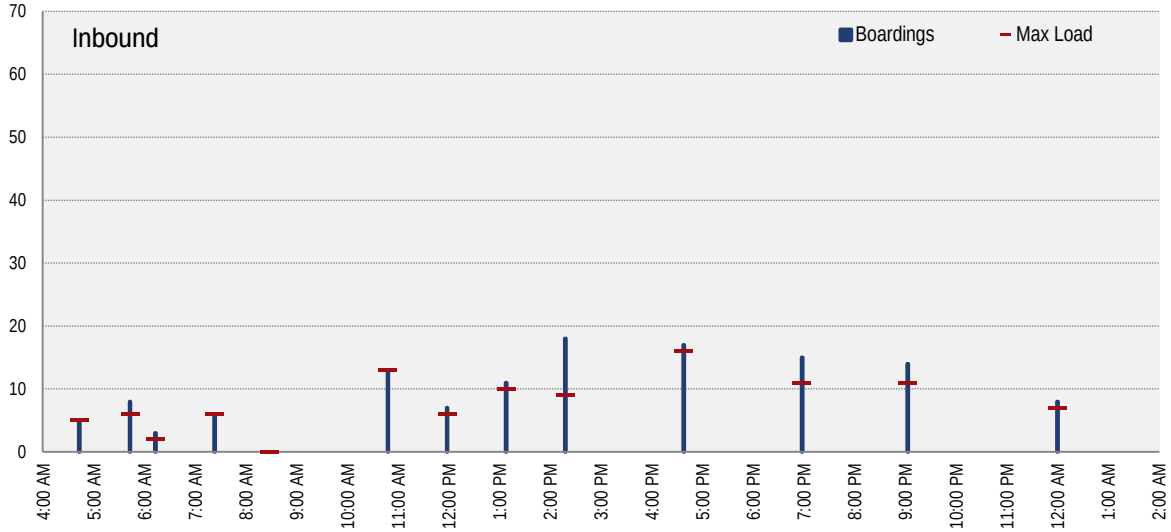


FIGURE 13 | SUNDAY INBOUND RIDERSHIP BY TRIP



Performance

Route 30 performs somewhat below the Hartford Division average for all CT***transit*** routes in terms of average weekday passengers per revenue vehicle hour (see Figure 14)[2]. For all other measures, including weekend passengers per revenue vehicle hour and passengers per revenue vehicle mile, Route 30 performs well below the division average.

In terms of overall on-time performance, Route 30 is consistent with the average for the Hartford District (Figure 15).

FIGURE 14 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 30	DIVISION AVG	ROUTE 30	DIVISION AVG	ROUTE 30	DIVISION AVG
Operating Cost per Passenger	$5.05	$4.84	$7.61	$6.37	$8.22	$6.66
Passengers per Revenue Vehicle Hour	25.3	28.9	16.8	27.0	15.6	29.7
Passengers per Revenue Vehicle Mile	1.1	2.6	0.8	2.4	0.7	2.9

Source: CTtransit performance data

FIGURE 15 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 30	DIVISION AVG
Early	0.0%	0.2%
Late	20.4%	18.9%
On-Time	79.6%	80.9%

Source: CTtransit performance data

[2] *As noted previously, Route 30 is more appropriately compared with other CTtransit express routes rather than local routes. At the time this analysis was prepared, express route data was not available. Once the data is available, the report will be updated.*

FIGURE 16 | WEEKDAY OPERATING COST PER PASSENGER

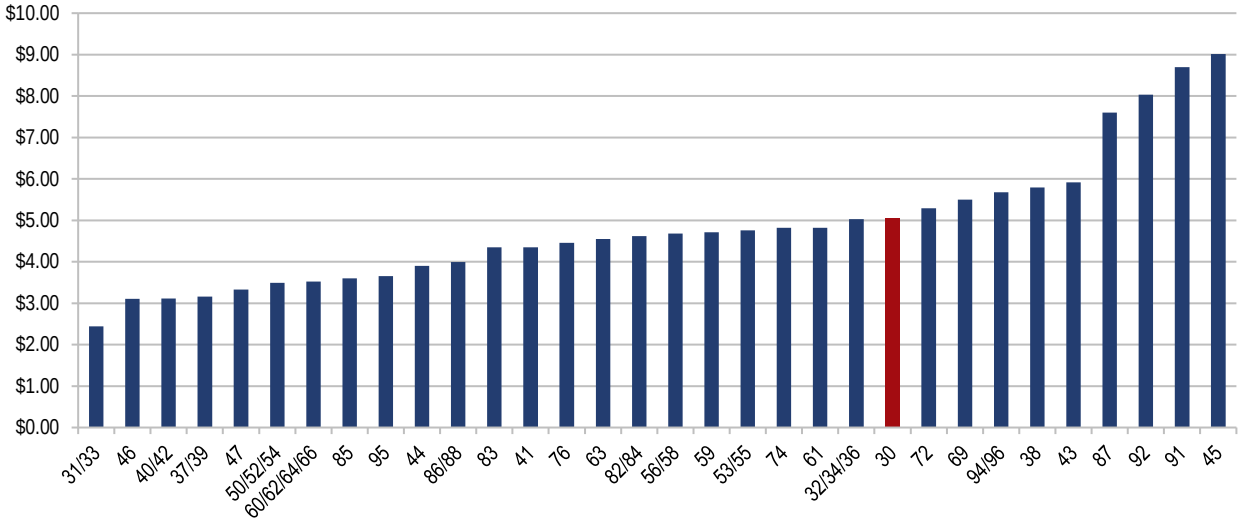
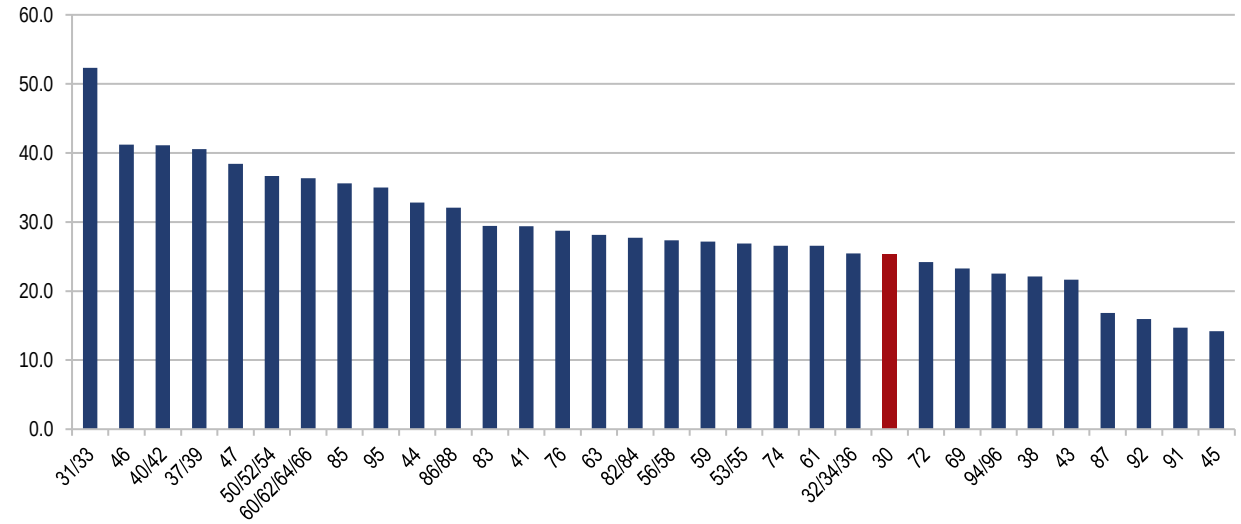


FIGURE 17 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Route 30N/30X serve Bradley Airport, which is located about 15 miles north of downtown Hartford. As a reference, Bradley Airport is the second largest airport in New England with approximately 350 flights; this compares with Logan Airport in Boston, which has approximately 925 daily flights[3]. Route 30X operates almost entirely on I-91, while early morning and late evening trips are operated locally as Route 30N via Main and North Main Streets to I-91 in Windsor. The route is also partially funded as a jobs access route and is designed to ensure access to employment at Bradley Airport.

Opportunities to strengthen the route further include the following:

- **Combine Routes 30N and 30X and operate all service as Route 30X.** The majority of all of Route 30's trips are operated as 30X, with only five weekday trips operated as 30N (two outbound and three inbound). Consolidating the two services would simplify the service – both for passenger and operations – and would likely strengthen ridership. In addition, there are only about five boardings or alightings on Route 30N trips north of downtown along Main Street and North Main Street. These riders can connect from Route 30X to Main Street by transferring at the Poquonock Park & Ride.
- **Operate weekday service with more consistent frequencies.** Route 30N/30X are scheduled to operate on a 60 minute headway for much of the day, but several trips are scheduled at a slighter higher or lower frequency. Creating consistent service frequencies would standardize arrival and departure times, which simplify the service and make it easier for passengers to use. Airport service could also be more effectively branded (see below), if operated at a consistent hourly frequency (at a minimum).
- **Increase frequency during peak periods.** Demand suggests that there may be potential to increase service frequency to 30-minute service during peak periods. For this route, peak periods should be structured to reflect employment shifts at the airport and clusters of airplane arrivals and departures, rather than normal business hour commuting. Service expansion may be scheduled for both weekday and weekend day peak service.
- **Adjust schedule to better match demand.** The data suggests that there are some times of the day when there is not enough service, such as in the early morning and other times when there is too much service, such as late night on weekdays. Shifting the schedule to provide more morning service and less late night service could help the route better match demand and improve the productivity of the route.
- **Improve Marketing/Branding.** Although the route is named the Bradley Flyer, which clearly ties the route to the airport, there are additional opportunities to create a service brand that includes schedules, signage and marketing and potentially the vehicles. This strategy is used by transit agencies around the country as a way to make the service easy to find, understand and use. (Note: Current passenger schedules show service to Terminal B, which is temporarily under construction.)
- **Improve Signage and Visibility at the Airport and Union Station.** Consistent with the potential for service branding, there is also potential to increase awareness of the service and make it as easy as possible to use by improving signage and wayfinding. This strategy would require working with the Airport to provide wayfinding signage and schedule information within the airport, as well as clear signage marking the Bradley Flyer bus stop and potentially locating bus stops in an easy to find location (with shelter).

[3] *Massport Logan Airport website; Bradley International Airport website*

- **Interline Route 30 with one or more CTf*astrak* routes.** By interlining certain routes from New Britain, Waterbury or other destinations, CT*transit* could offer attractive (one-seat), fast service to Bradley Airport from destinations south and west of Hartford. Such services could serve park-ride lots with the capacity to accommodate multi-day airport trips.
- **Create New Bradley Flyer Route from Manchester/South Windsor.** There is also potential to expand the Bradley Flyer brand and add a new express airport service along Interstate 84 linking communities in the east (Manchester and South Windsor among others) to the Airport. Service could originate/terminate at the Buckland Hills Park & Ride lot and/or at South Windsor. It could use I—291 and I-91 to access the airport, or could potentially be diverted to serve the Windsor Rail Station and connect with Amtrak and NHHS commuter rail. This route would also allow commuters from the east to make connections to the Day Hill Road area.

Route Evaluation

PARK STREET

31 | West Hartford Place

31A | West Hartford Place via Kane Street

31B | West Hartford Place—Charter Oak Marketplace

33 | South Quaker Lane

33W | Westfarms

Routes 31 and 33 provide radial service between downtown Hartford and key retail destinations in West Hartford. From downtown, both routes operate along Main Street and Park Street to New Park Avenue. Route 31 then turns southwest along New Park to West Hartford Place. Some trips also serve Kane Lane, while others continue past West Harford Place to Charter Oak Marketplace. Route 33 continues along Park Street and terminates either at South Quaker Lane or at Westfarms Mall, depending on the variant.

Route 31 and Route 33 will both serve the Parkville CT***fastrak*** station. Route 31 will also serve CT***fastrak*** Kane Street and Flatbush Stations, with occasional service to Elmwood Station.

System Interaction and Transfer Opportunities

Routes 31 and 33 begin and end in downtown Hartford where riders can transfer to most CT***transit*** services. There are also several locations along the route where riders can transfer to other CT***transit*** routes.

In addition, when service on CT***fastrak*** begins in the spring of 2015, riders on Route 31 and 33 will also be able to transfer to access CT***transit*** service at the stations.

FIGURE 1 | ROUTE MAP

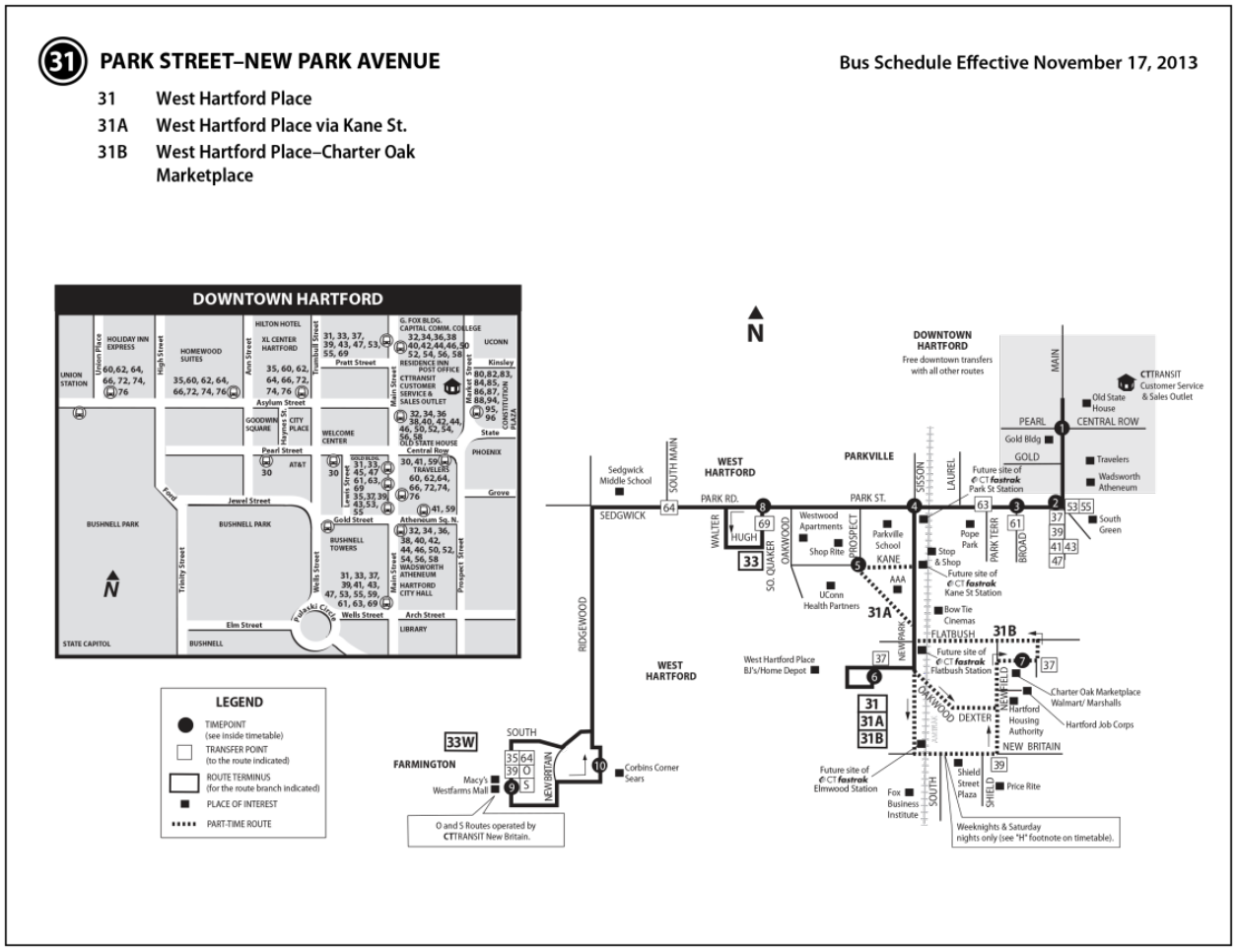


FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Hartford Division	
Route 35	Westfarms Flyer
Route 39	New Britain Avenue via Retreat
Route 37	New Britain Avenue via Jefferson
Route 41	New Britain / Hartford
Route 43	Campfield Avenue
Route 47	Franklin Avenue
Route 53	Wethersfield Avenue
Route 55	Middletown
Route 61	Broad Street
Route 63	Hillside Avenue
Route 64	Farmington Avenue / Westfarms Mall
Route 69	Capitol Avenue
New Britain Division	
O	Oak Street
S	Stanley Street

Alignments and Service Patterns

All trips on Route 31 and 33 travel outbound from downtown Hartford, beginning near Main Street and Pearl. From downtown, both routes operate along Main Street and Park Street, before diverging at New Park Avenue. On weekdays, most Route 31 trips operate as Route 31 and continue southwest along New Park Avenue and terminate at West Hartford Place. Eleven trips per day operate as Route 31A and serve West Hartford Place via a deviation along Kane Street and Prospect Avenue. Route 31A trips begin mid-morning and are scheduled at roughly 40 minutes apart. Route 31B has 10 daily trips with service past West Hartford Place to Charter Oaks Marketplace. All Route 31B trips occur in the afternoon between 3:30 PM and midnight.

Route 33 has two service alignments, one that terminates at South Quaker Lane (Route 33) and another that continues on to Westfarms Mall (Route 33W). Although not entirely consistent, most trips alternate between Route 33 and 33W.

On Saturdays, service alternates between Route 31 to West Hartford Place and Route 33W to Westfarms Mall until approximately 5:00 PM. After 5:00, Route 31 trips continue to Charter Oaks Marketplace (Route 31B) until about midnight, with the last 33W trip leaving downtown at 6:00 PM.

On Sundays, all but the first and last trip of the day operate as Route 31B to Charter Oaks Marketplace. The first and last trips operate as Route 31 to West Hartford Place.

Service Schedule

Route 31 and 33 operate seven days a week. There are 81 outbound and 84 inbound trips per weekday, operating every 10 minutes on the common segment for approximately 6:00 AM to 5:00 PM. After 5:00, service frequency gradually declines to every 15, 20, 30, and ultimately 60 minutes.

On Saturdays, service operates every 15 minutes until 6:15 and then gradually declines after that. Most Sunday trips operate at 70-minute intervals.

FIGURE 3 | SCHEDULE OVERVIEW

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	4:31 AM – 1:04 AM	10/20	81/84
Saturday	4:46 AM – 12:45 AM	15	51/55
Sunday	4:45 AM – 12:45 AM	70	16/16

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

CT***transit*** tracks ridership for Route 31 and Route 33 together, so the following analysis of ridership and productivity treats the two routes as a single service. Route 31/33 carries 4,766 daily passengers or 29.1 passengers per trip on an average weekday, which is nearly 65% higher than the Hartford Division average of 17.7 weekday passengers per trip.

Saturday and Sunday ridership per trip are also high relative to the division average (see Figure 4). This is a reflection of the retail destinations served by both Route 31 and 33, which are popular weekend destinations.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 31/33	ROUTE 31/33	DIVISION AVG
Weekday	4,766	29.1	17.7
Saturday	3,051	29.3	16.3
Sunday	715	23.8	17.6

Source: CTtransit performance data

Ridership by Stop

The most heavily used stop on Route 31/33 is at Main Street and Atheneum Square in downtown Hartford. Outside of the downtown, there are several stops that generate 50 or more boardings or alightings per day (see Figure 5 and 6).

FIGURE 5 | ROUTE 31/33 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Westfarms Mall	120 / 0	Several major retailers
Charter Oak Market / Wal-Mart	91 / 0	Wal-Mart and several other retailers
New Park Avenue / Foley Street	54 / 0	Neighborhood retail
Park Road / Prospect Avenue	100 / 10	Prospect Shopping Plaza
New Park Avenue / Stop & Shop	95 / 7	Stop & Shop Supermarket
Park Street / New Park Avenue	118 / 16	Dwight Library and New Park Avenue School
Park Street / Hazel Street	193 / 11	Neighborhood retail
Park Street / Bartholomew Avenue	65 / 6	1429 Park mixed-use development
Park Street / Pope Park Drive	93 / 27	Save-A-Lot and Family Dollar
Park Street / Zion Street	96 / 33	Neighborhood retail and surrounding residential neighborhoods
Park Street / Putnam Street	79 / 34	Neighborhood retail and surrounding residential neighborhoods
Park Street / Broad Street	263 / 104	Neighborhood retail and surrounding residential neighborhoods
Park Street / Broad Street	93 / 36	Neighborhood retail and surrounding residential neighborhoods
Park Street / Washington Street	471 / 126	Hartford Superior Court, post office, and neighborhood retail
Park Street / Main Street	113 / 384	Transfer point for Routes 37, 39, 41, 43, 47, 53, and 55
Main Street / Buckingham Street	59 / 100	Hands on Hartford food and housing services
Main Street / Arch Street	29 / 101	Hartford Public Library and Hartford City Hall
Main Street / Old State House	34 / 488	Connecticut's Old State House

Load profile data (see Figure 6) combines passenger activity by stop and shows the cumulative passenger load as the bus travels inbound along its route. Ridership by stop without the cumulative load is mapped in Figure 7. The data for Route 31/33 shows inbound passenger loads peak near Park Street and Hudson Street, and decline quickly as buses enter downtown.

The load profile in Figure 6 is not continuous because some stops are served by all variants of both routes, while others are served by one or two varients of Route 31 or 33 only. Each variant is labeled accordingly in Figure 6.

Figure 7 shows that with the exception of Westfarms Mall, ridership activity along the 33W branch of Route 33 is very light.

FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

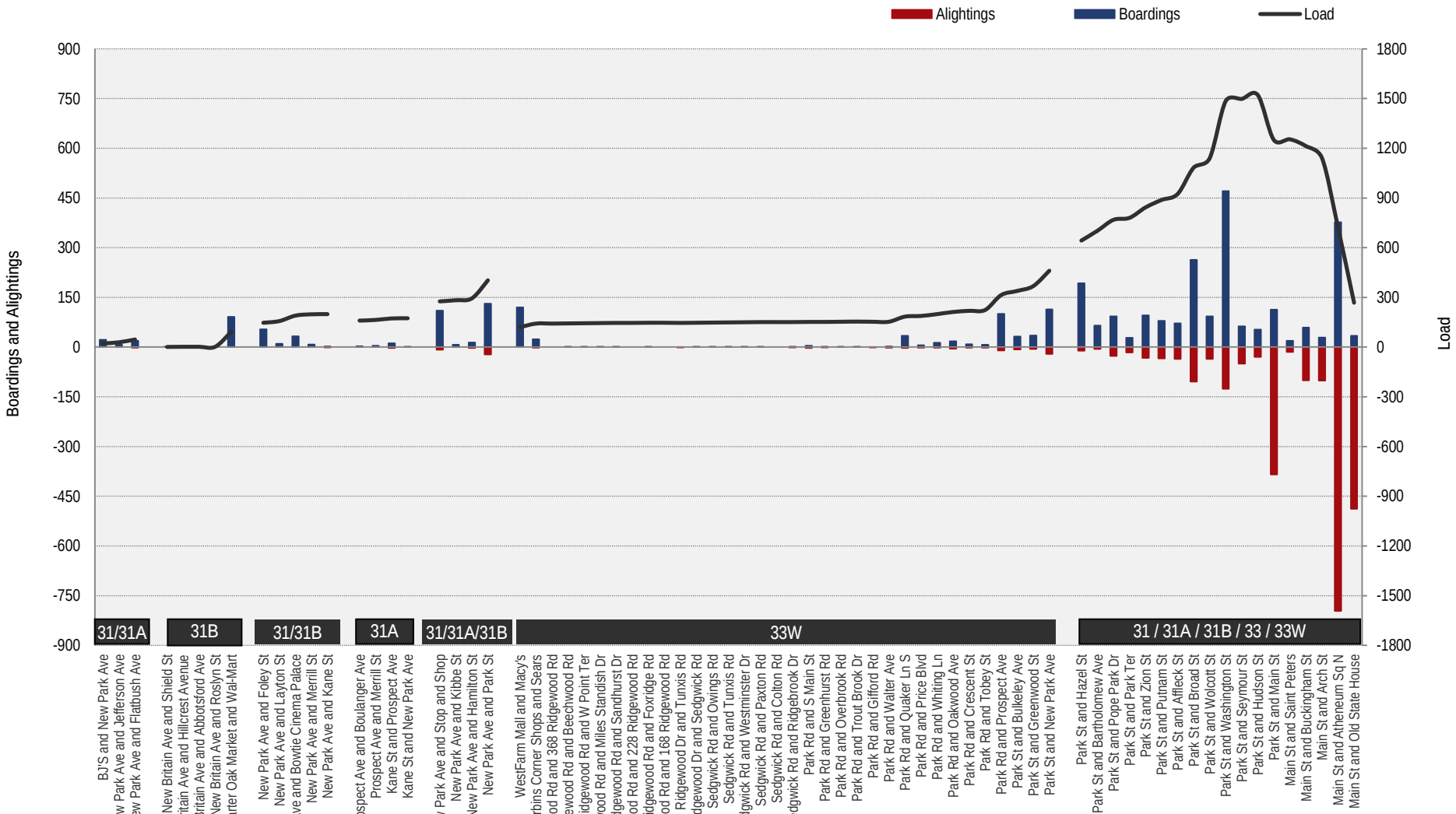


FIGURE 7 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

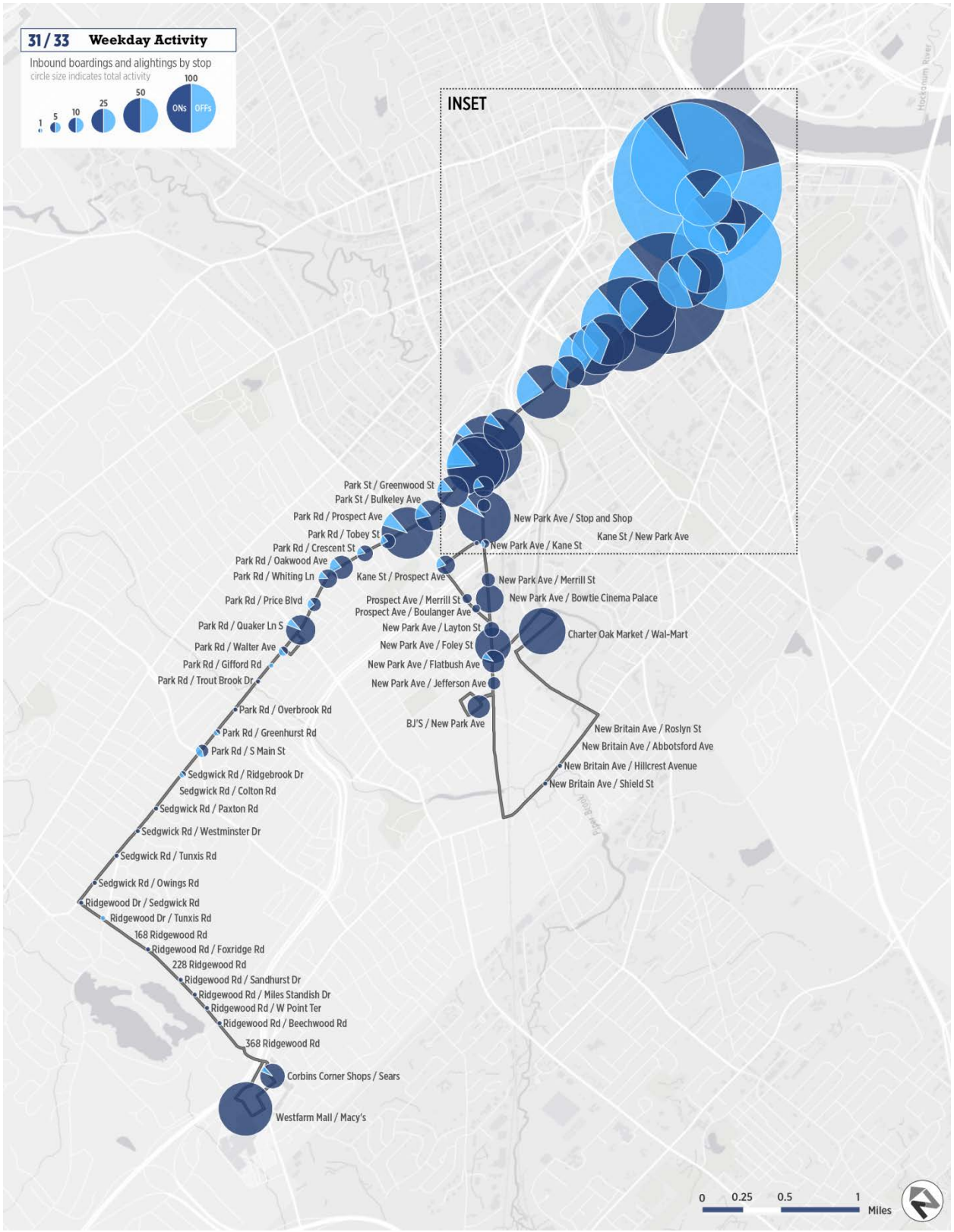
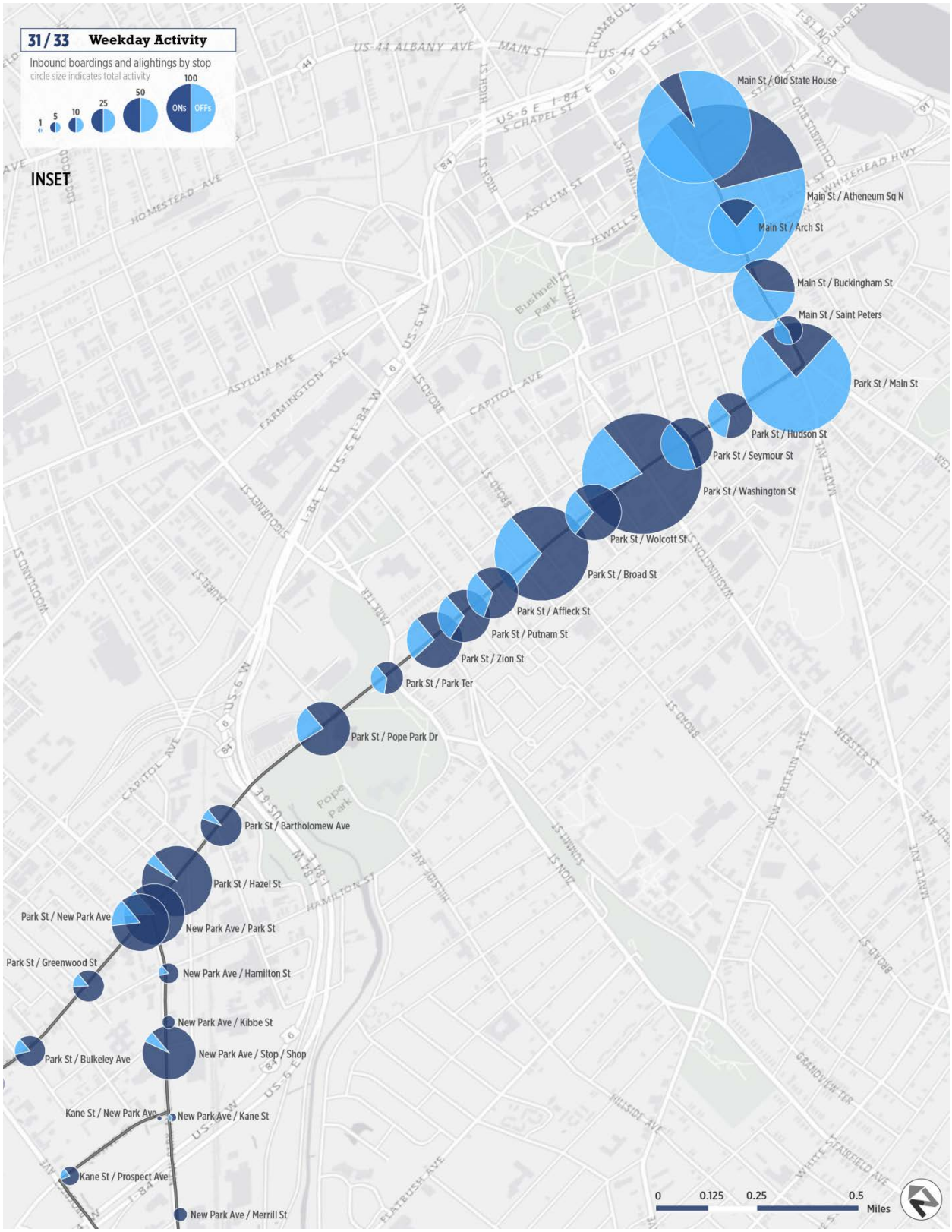


FIGURE 8 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP (INSET 2)



Ridership by Trip

Weekday

Route 31/33 carries an average of 28.9 passengers per trip on weekdays. This is among the highest passenger per trip figure in the Hartford division, and is particularly impressive given the very high service frequency of Route 31/33 for much of the day. Nearly every trip between 7:00 AM and 11:00 PM carries at least 20 passengers (see Figures 9 and 10). However, maximum loads never exceed 40 passengers, indicating a high degree of passenger turn-over along the route, particularly between Park and Hazel Street and downtown.

Passengers per trip and maximum loads do not significantly change after service frequency is reduced in the evening. This suggests that the level of service being provided at all times of the day is in line with the demand for service.

FIGURE 9 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

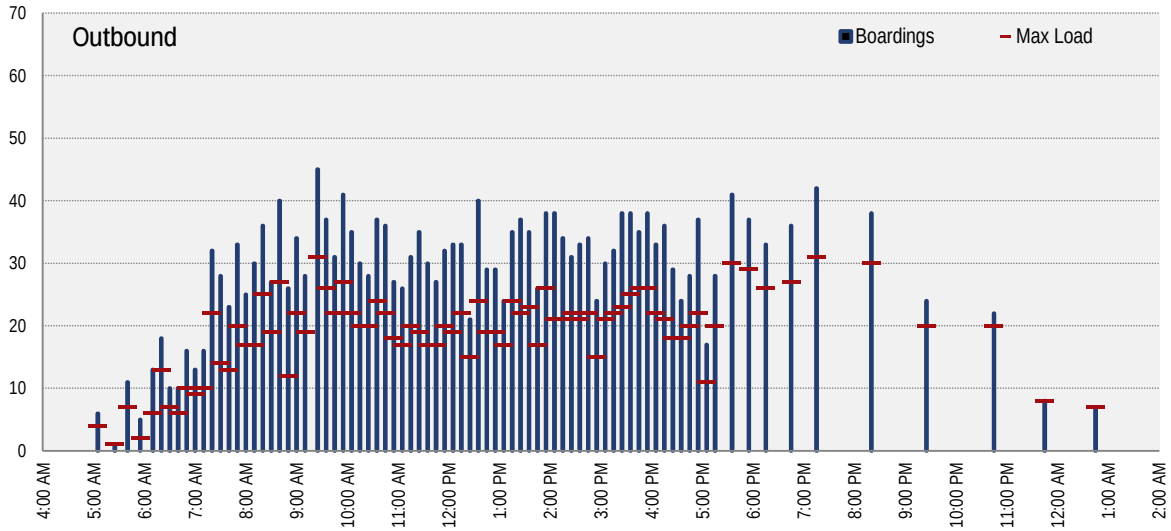
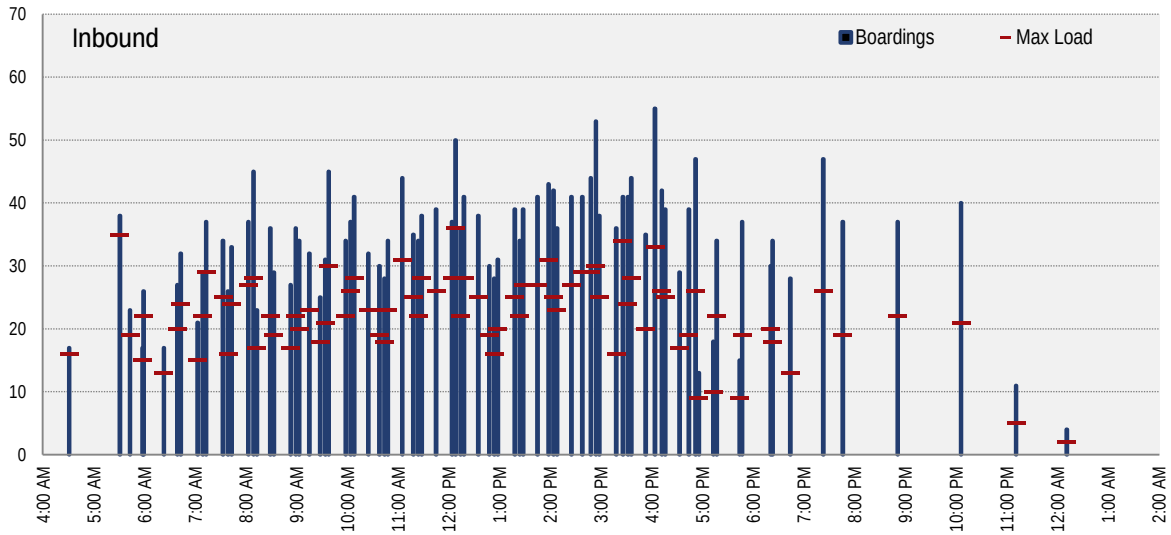


FIGURE 10 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Consistent with weekday service, nearly every Saturday trip carries at least 20 passengers, and maximum loads never exceed 40 passengers (see Figures 11 and 12). Ridership is particularly high on the first inbound trip after service frequency is reduced from approximately 20 to 60 minutes. This suggests that 20-minute service should continue for at least one additional hour on Saturdays to meet existing demand.

FIGURE 11 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

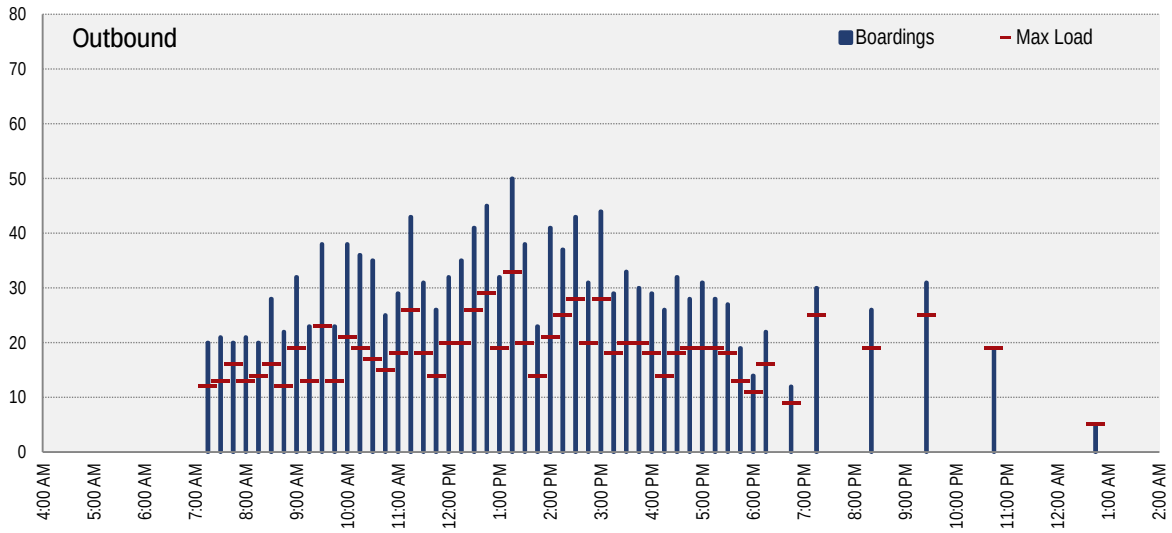
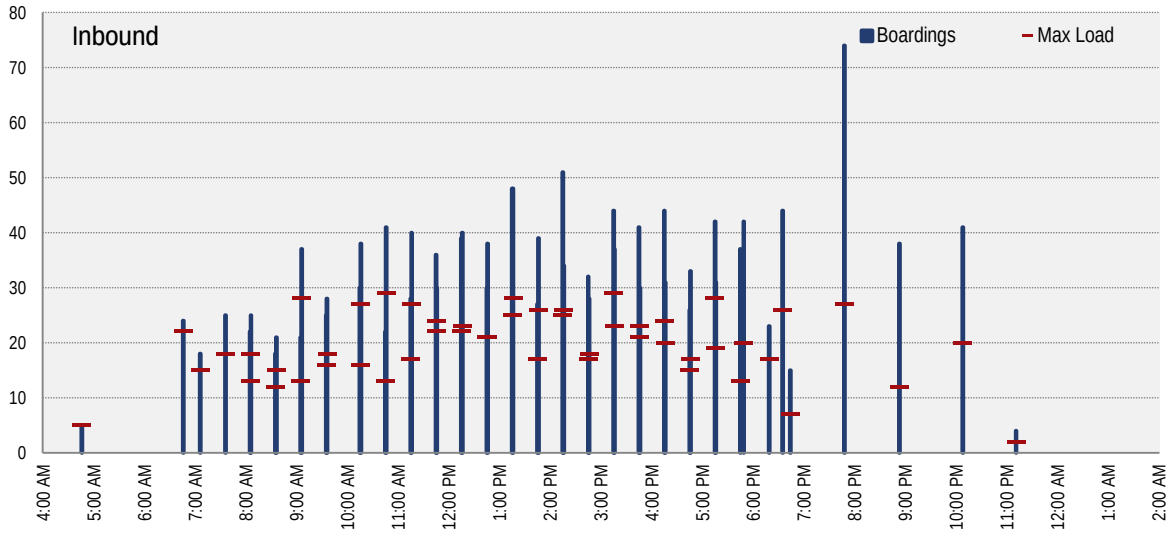


FIGURE 12 | SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

Sunday ridership is high, even though services are reduced with 70-minute service frequency (see Figures 13 and 14). Route 33 does not operate on Sundays, but Route 31B provides connections from neighborhoods along Park Avenue and New Park Avenue to West Hartford Place and Charter Oaks Marketplace (including Wal-Mart and BJ's). Sunday service with more than 30 passengers per trip indicates that higher service frequency indicates that higher frequency would likely be well received by passengers.

FIGURE 13 | SUNDAY OUTBOUND RIDERSHIP BY TRIP

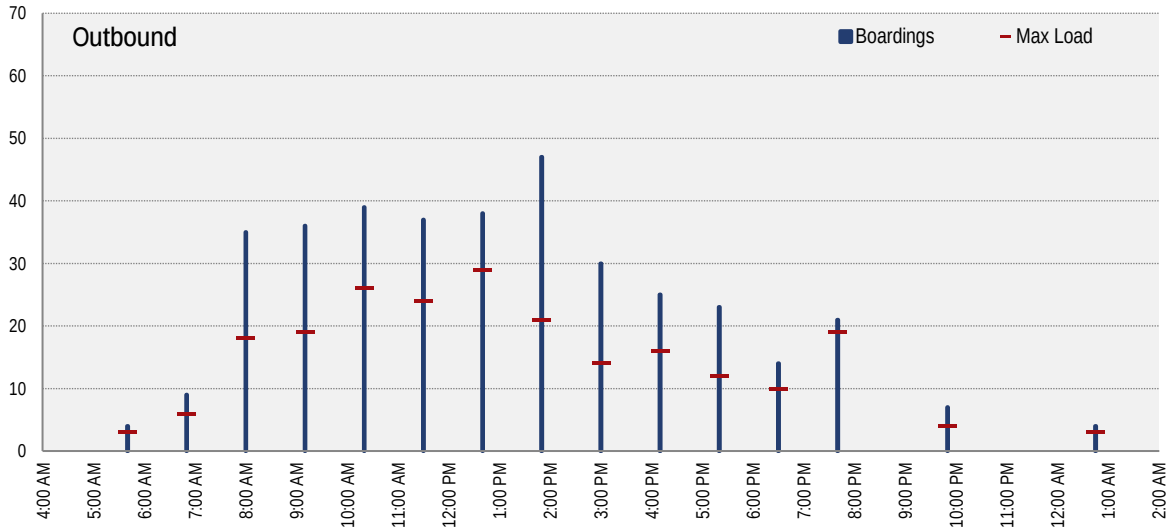
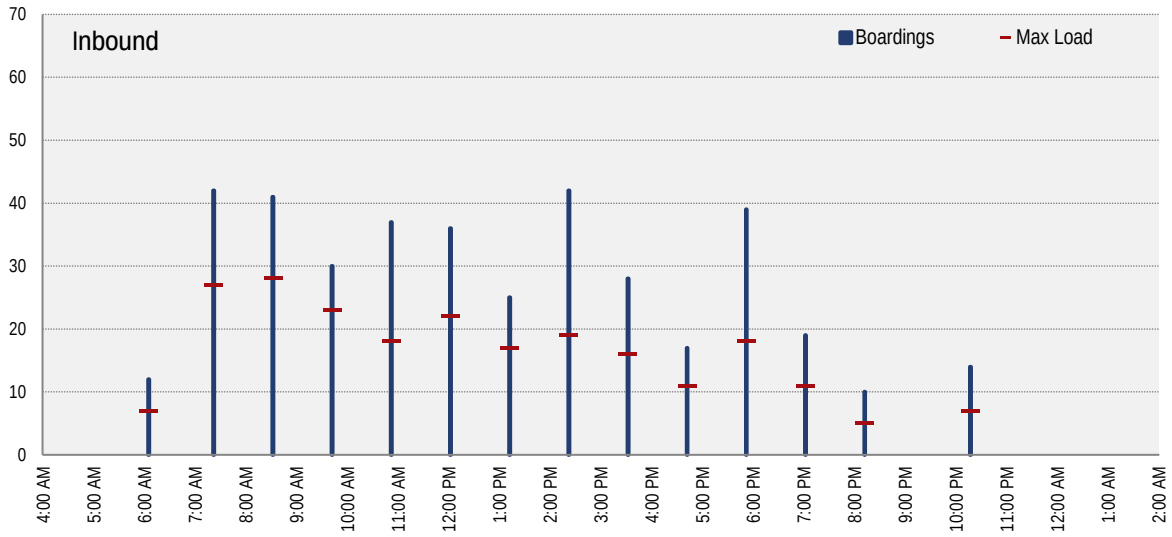


FIGURE 14 | SUNDAY INBOUND RIDERSHIP BY TRIP



Performance

Route 31/33 has the lowest weekday operating cost per passenger and the highest weekday ridership per revenue hour and revenue mile among all CT***transit*** Hartford Division routes (see Figures 17 and 18). The route performs significantly better than the division average for all three metrics on weekends as well (see Figure 15.

FIGURE 15 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 31/33	SYSTEM AVG	ROUTE 31/33	SYSTEM AVG	ROUTE 31/33	SYSTEM AVG
Operating Cost per Passenger	$2.45	$4.84	$2.41	$6.30	$2.92	$6.66
Passengers per Revenue Vehicle Hour	52.3	28.9	53.1	27.0	43.9	29.7
Passengers per Revenue Vehicle Mile	6.0	2.6	5.4	2.4	4.6	2.9

Source: CTtransit performance data

Route 31/33 has a 78.8% on-time arrival rate, which is slightly lower than the Hartford Division average. More than 20% of Route 31/33 trips finish more than 5 minutes late (see Figure 16). The route's high passenger turn-over is likely a contributing factor to it's below- average on-time performance.

FIGURE 16 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 31/33	DIVISION AVG
Early	0.1%	0.2%
Late	21.1%	18.9%
On-Time	78.8%	80.9%

Source: CTtransit performance data

FIGURE 17 | WEEKDAY OPERATING COST PER PASSENGER

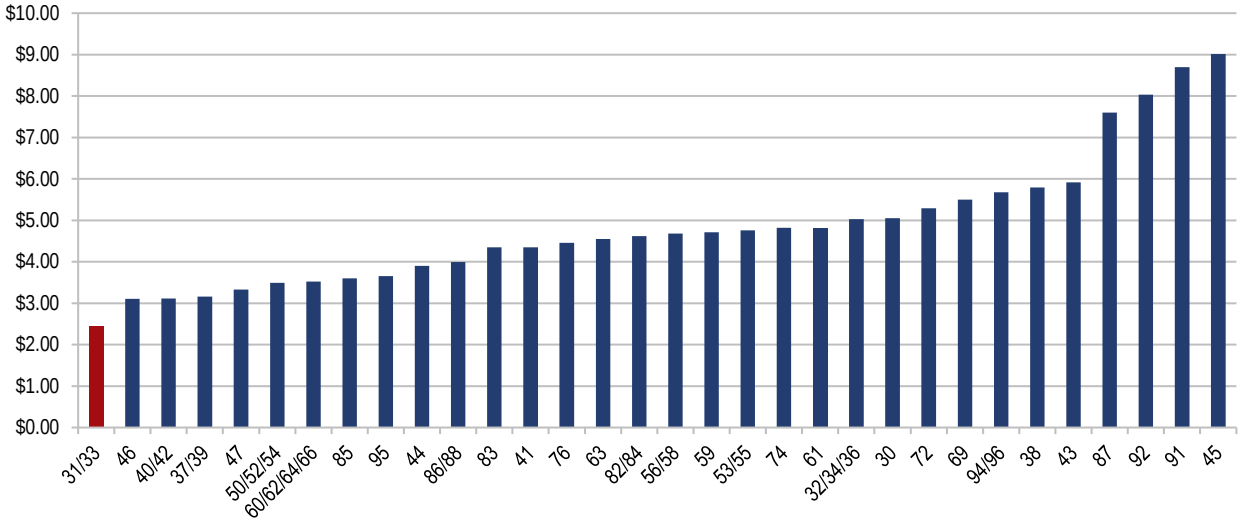
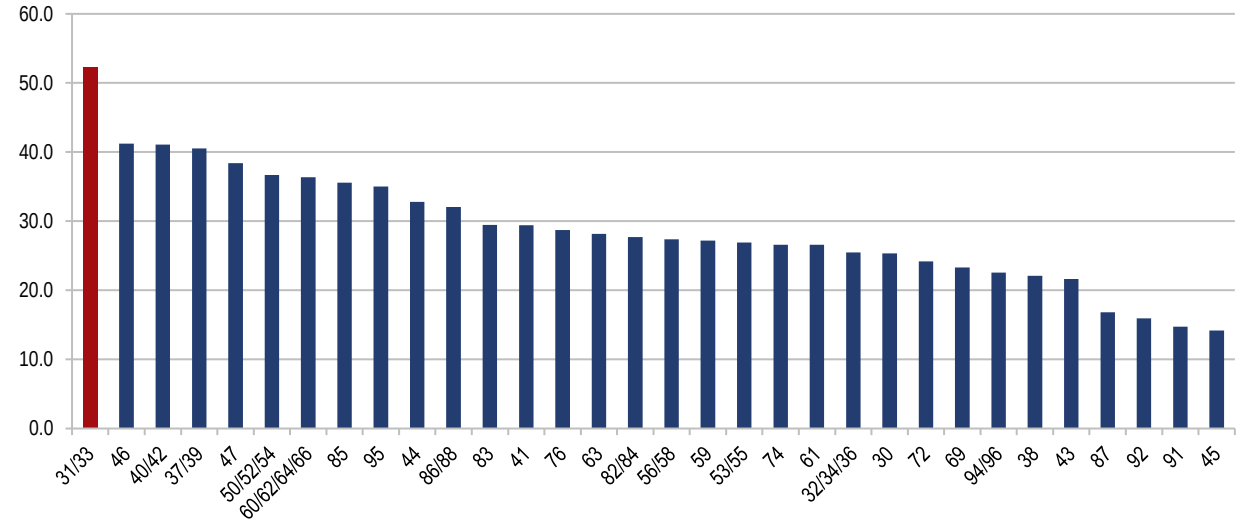


FIGURE 18 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Route 31/33 is the most productive route operated by CT***transit***'s Hartford Division. Service in the common segment of the route between downtown and Park Street at New Park Avenue includes at least 12 stops with 50 or more boardings per day. The route's heavy ridership can be attributed to a number of factors including high service frequency, supportive land-use with a mix of neighborhood retail and high-density residential areas, and strong anchors such as Westfarms Mall and West Hartford Place. The route also serves some of Hartford's most transit dependent corridors and neighborhoods. It is also partially funded by CRCOG's jobs access program.

Route 31/33 struggles with relatively poor on-time performance. The poor on-time performance can be attributed to a combination of high passenger volumes, high passenger turn-over and congested travel conditions along Park Street. Another opportunity associated with Route 31/33 is that despite the over-all

high ridership on the route, there is very little ridership generated along a long stretch of Route 33W, between Park Road at Quaker Lane and Ridgewood Road at I-84.

CT*fastrak*

Parts of Route 31/33 operate parallel to CT***fastrak***, but much of the route's ridership is local to the Park Street corridor, and thus demand for the route will likely remain strong even after CT***fastrak*** service begins. The biggest impact to Route 31/33 ridership will be from passengers traveling between downtown Hartford and destinations near Parkville, Kane, Flatbush, and Westfarms Mall stations. These trips will be better served by new CT***fastrak*** service, even if a "last-mile" connection is required to reach near-by retail centers. In fact, Route 31/33 may take on the role of last-mile connector for many passengers traveling to destinations such as Wal-Mart at Charter Oaks Marketplace.

CT***fastrak*** service impacting Route 31/33 includes:

- Routes 101: Routes 101 is designated as local service and will serve all CT***fastrak*** stations, providing all day, fast, frequent service between downtown New Britain and downtown Hartford. The route will operate daily with high frequencies. On weekdays, service is scheduled every 7 to 8 minutes in the peak, 12 minutes in the mid-day and 20 minutes in the evening. Saturday service is scheduled with 15 minute service during the day and 20 minutes in the evening. Sunday service has service every 20 minutes all day. Route 101 will operate daily and be available from 4:00 AM to 12:45 AM on weekdays, 4:52 AM to 12:45 AM on Saturdays, and 6:31 AM to 8:51 PM on Sundays.
- Route 128: The CT***fastrak*** service plan includes a new local Route 128 that will connect downtown Hartford with the Westfarms Mall, traveling via CT***fastrak*** to Flatbush Station and then operating to Westfarms Mall via New Park and New Britain Avenues. From Westfarms Mall, Route 128 will continue to New Britain. The service is scheduled to operate daily with weekday service operating from 4:20 AM to 11:40 PM; frequencies are scheduled for 20 minutes peak, 30 minutes mid-day and 60 minutes in the evening. Saturday service is also extensive; service begins at 4:10 AM and continues until 11:40 PM with 30 minute service all day and 60 minutes in the evening. Sunday's schedule is somewhat shorter (6:40 AM to 8:40 PM) with hourly service all day.

Service Improvement Options

Despite being one of CT***transit***'s strongest routes, there are a number of potential service improvements that could strengthen Route 31/33:

- **Create a transit corridor on Park Street.** Park Street is one of Hartford's most important transit corridors, because it is both a densely developed corridor and serves transit dependent neighborhoods. The corridor is narrow slowing down the buses and making service unreliable. CT***transit*** has mitigated some of the unreliability of service, in part, by providing more service frequency. Vehicle speeds, however, are still slow. Given the high ridership on the route, there is potential to improve the travel corridor through a combination of roadway and service improvements. Roadway improvements may include limiting parking to one side of the street, dedicating travel to transit vehicles only, installing queue jump lanes at critical intersections and/or adding signal prioritization to increase travel speeds. Potential service improvements included level boarding platforms and/or pre-paid boarding to reduce dwell times. CT***transit*** may also consider consolidating stops to reduce delays and help focus passenger amenities investment.

- **Eliminate Route 31A variant.** Ridership on the Route 31A variant is fairly low and the deviation is not especially far from the primary alignment. Both of these factors make the variant a candidate for elimination. Eliminating Route 31A would simplify the route overall, making it easier to use. Eliminating the variant may also help improve the route's on-time performance with more consistent routing.
- **Operate all Route 31 service to CT*fastrak* Flatbush Station.** If Route 31's A variant is eliminated, Route 31 may operate all service as a consistent alignment terminating at CT***fastrak*** station. This alignment would serve the majority of the riders and simplify the route so it is easier to understand and use. Operating Route 31 with a consistent alignment may also improve the route's on-time performance.
- **Operate all Route 31 service to CTfastrak Charter Oak Marketplace.** If Route 31 can be operated with a consistent alignment, another option is to terminate the service at Charter Oak Marketplace. Ridership at this location is high and continuing on from Flatbush Station could also help with local circulation around the Flatbush station. It would also make the route easier to understand and use and potentially improve the route's on-time performance.
- **Operate all Route 33 trips to South Quaker Lane.** South of South Quaker lane, ridership is low. In addition, while riders use Route 33W to get to the Westfarms Mall, there are other routes that also travel to the mall, including the new CT***fastrak*** Route 128. Terminating Route 33 at South Quaker Lane would help make the route more productive and concentrate service on the highest ridership segments of the route.
- **Use Route 33 to travel between Westfarms Mall and Parkville Station (without traveling into downtown).** Ridership on the unique segment of Route 33 is generally low, with the exception of riders traveling to the Westfarms Mall. Operating Route 33 between Westfarms Mall and Park Street Station will reduce service miles on the route and allow for a more appropriate service frequency for the level of ridership demand expected from the route's service area. Any reduction in service along Main and Park Streets, however, would need to be replaced by an increase in service on Route 31.
- **Operate high-frequency service until 8:00 PM on weekdays and Saturdays.** High frequency service (10-15 minute) on both Route 31 and Route 33 is available until approximately 6:00 on weekdays and Saturdays. However, ridership figures show that ridership demand begins to subside after 7:00 PM. Thus, maintaining higher service frequency until approximately 8:00 PM should be considered. This would also be more consistent with the level of service provided along CT***fastrak***.

Route Evaluation

WINDSOR AVENUE

32 | Windsor Center

32A | Windsor Center via Weston Street

32B | Windsor Center-Bloomfield Av via Weston St

32M | Windsor Center via Matianuck Av and Weston St

34 | International Drive

36 | Griffin Center

36X | Voya-Griffin Center via I-91

Service Design

Routes 32, 34, and 36 are radial routes that travel north from downtown Hartford to Windsor Center and points north and west. Although they are scheduled as independent routes, they travel the same corridor for much of their alignment. As a result, they are evaluated as a package of routes rather than independent routes. Route 32 ends in Windsor, while Route 34 continues to East Granby and Route 36 ends at the Griffin Office Park in Bloomfield. See Figure 1 for Route 32 and Figure 2 for Routes 34 and 36.

FIGURE 1 | ROUTE 32 MAP

32 WINDSOR AVENUE

Bus Schedule Effective September 14, 2014

32 Windsor Center
32A Windsor Center via Weston St
32B Windsor Center–Bloomfield Av via Weston St
32M Windsor Center via Matianuck Av & Weston St

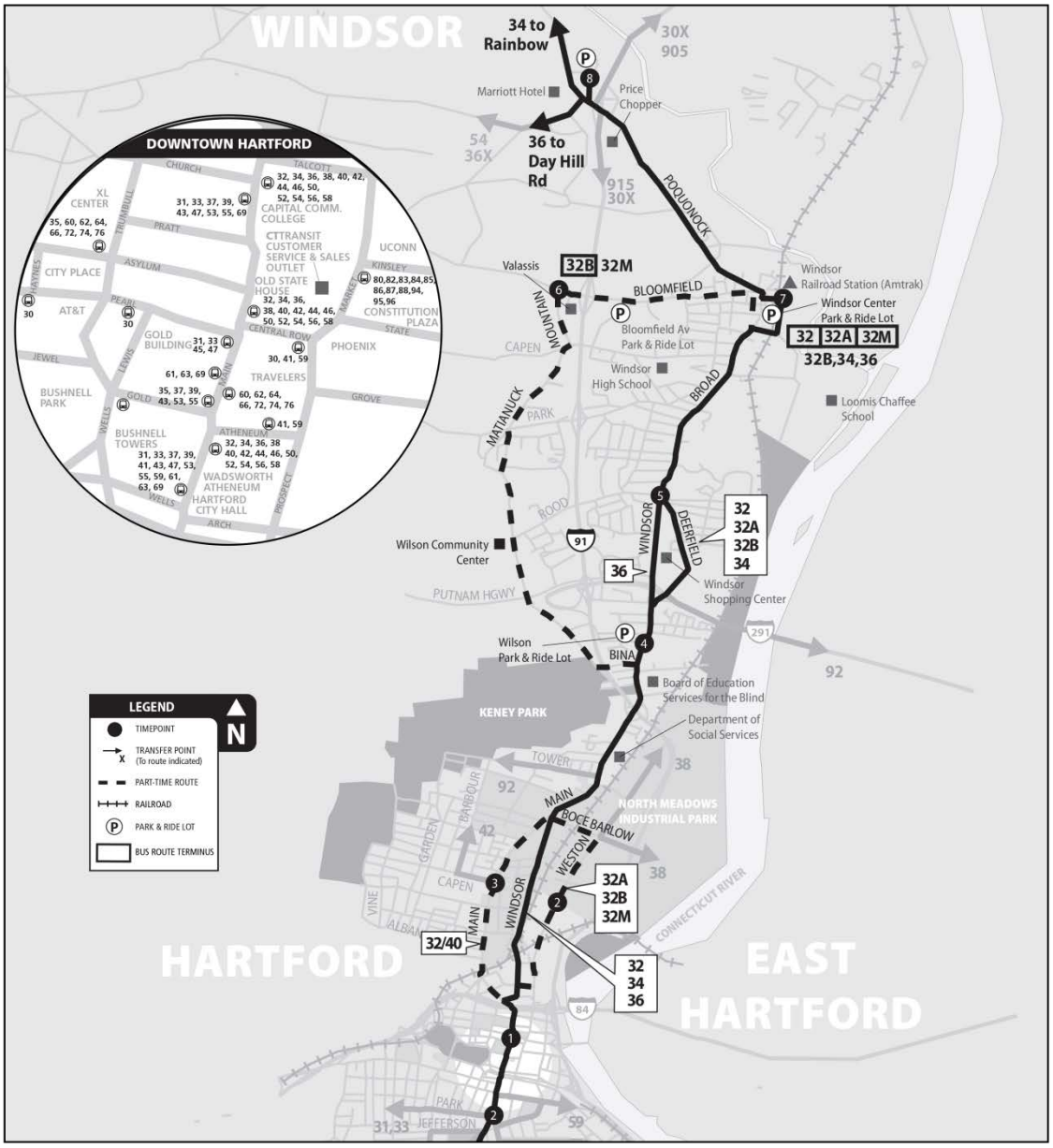


FIGURE 2 | ROUTE 34/36 MAP

34 WINDSOR AVENUE/RAINBOW

Bus Schedule Effective September 14, 2014

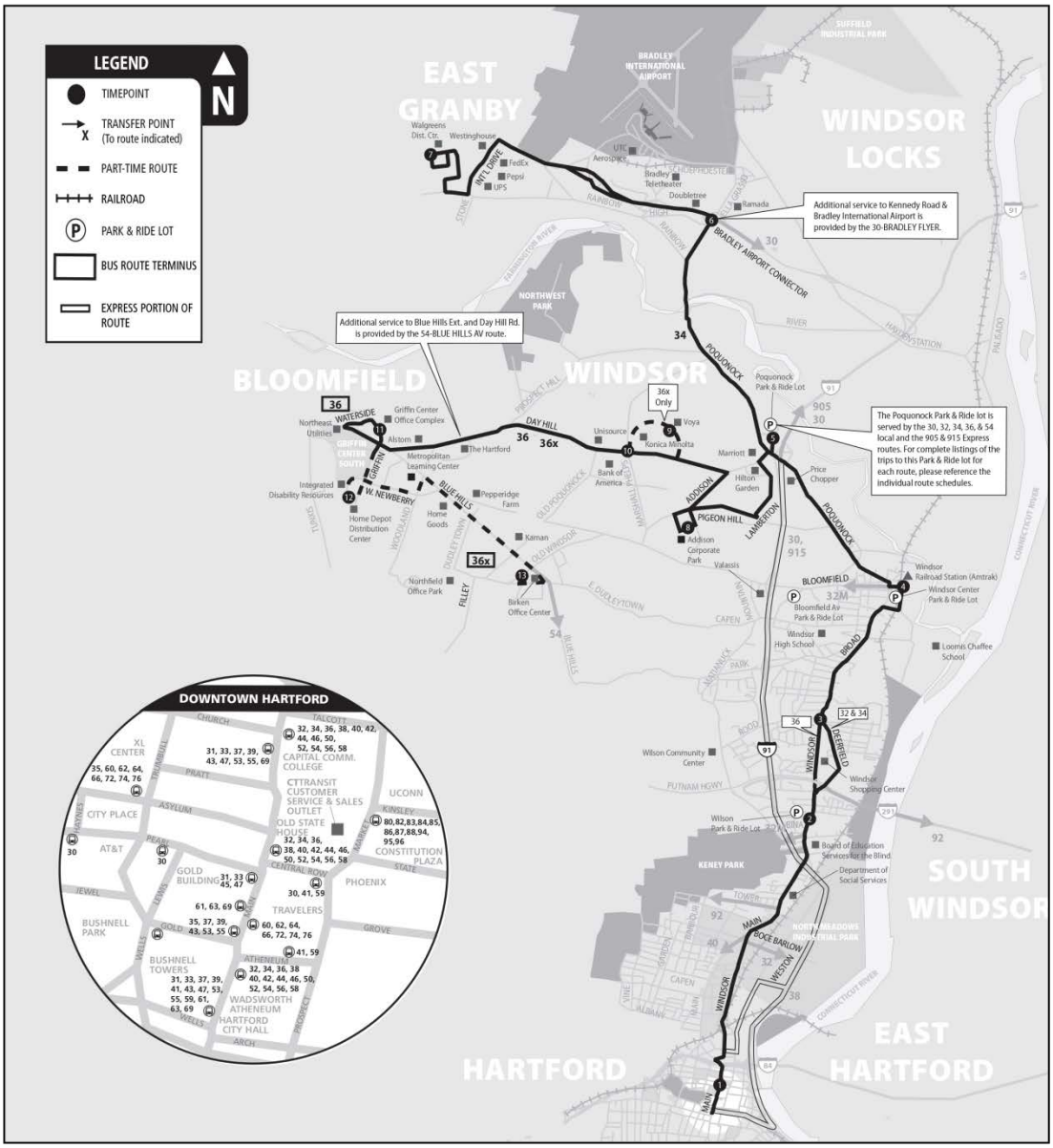
34 International Drive

36 WINDSOR AVENUE/DAY HILL RD

36 Griffin Center

36X Voya–Griffin Center via I-91

Additional service to Windsor provided by 32 Route.



System Interaction and Transfer Opportunities

Routes 32, 34 and 36 begin and end in downtown Hartford where riders can transfer to nearly most CT***transit*** services. In addition, there are several locations where riders can transfer to other CT***transit*** routes (see Figure 2).

FIGURE 3 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 30	Bradley Flyer
Route 31	Park Street - New Park Avenue
Route 32	Windsor Avenue
Route 33	Park Street - Park Road
Route 38	Weston Street
Route 42	Barbour Street
Route 54	Blue Hills Avenue - Blue Hills Extension
Route 59	Locust Street
Route 92	Tower Avenue Crosstown
EXPRESS ROUTES	
Route 905	Enfield-Somers/Windsor Locks Express
Route 915	Windsor Express

Alignments and Service Patterns

Routes 32, 34 and 36 provide transit service between downtown Hartford and the Windsor Rail Station/Windsor Center. The primary alignment for most variants is for outbound buses to depart from Main Street in downtown Hartford, cross I-84 and then travel via Trumbull Avenue to Windsor Avenue, following Windsor until it merges back in with Main Street. Buses then follow Main Street, which turns back into Windsor Avenue at the Hartford/Windsor line and then Broad Avenue as buses enter Windsor Center. Routes 34 and 36 continue on to serve the Poquonuck Park and Ride Lot. Route 34 serves Poquonock Avenue, Rainbow Drive and International Drive, while Route 36 serves Day Hill Road and the Griffin Office Park.

Within this primary alignment, however, there are several variants using different roadways to travel through Hartford and into Windsor (see Figure 4). All routes and variants, except for Route 36 follow the same alignment in the inbound direction to return to downtown Hartford. Most Route 36 and 36X trips are interlined with Route 54N, with outbound trips continuing beyond the Birken Office Park as inbound Route 54N trips, and inbound trips operating as an extension of Route 54N outbound trips.

FIGURE 4 | WEEKDAY OUTBOUND ALIGNMENT PATTERNS

Route Variant	Hartford Alignment	South Windsor	Terminus	Weekday Trips
32/40	Main Street	Deerfield Avenue	Windsor Rail Station	2
32	Windsor Avenue	Deerfield Avenue	Windsor Rail Station or Poquonock Park & Ride Lot	6
32A	Weston Street	Deerfield Avenue	Windsor Rail Station or Poquonock Park & Ride Lot	8
32B	Weston Street	Deerfield Avenue	Mountain and Bloomfield	2
32M	Windsor Avenue	Matianuck Street	Windsor Rail Station	5
34	Windsor Avenue or Weston Street	Deerfield Avenue	International Drive (East Granby)	9
36	Windsor Avenue	Windsor Avenue	Day Hill Road/Blue Hills Avenue Ext. (Bloomfield)	10
36X	I-91	I-91	Day Hill Road/Blue Hills Avenue Ext. (Bloomfield)	3 AM outbound 3 PM inbound

Service Schedule

Route 32 operates seven days a week, while Routes 34 and 36 operate on weekdays only (see Figure 5). The services are coordinated so that on weekdays a bus travels along the primary alignment (Windsor Avenue) every 15 minutes during peak periods and every 30 minutes during off-peak times. The unique portions of the routes, however, have much reduced service levels, with some corridors served once or twice per weekday (see also Figure 5).

Combined, weekday service on Routes 32/32A operates roughly on an hourly headway all day, with some additional peak period trip service. Routes 32B and 32M operate only during peak periods. On weekdays, Route 34, operates eight peak periods roundtrips, plus one mid-day roundtrip. Route 36X operates peak period reverse commute service (from downtown to Day Hill Road) with three morning outbound trips and three afternoon inbound trips.

On Saturdays, hourly service is operated as Route 32A via Weston Street to the Poquonuck Park & Ride Lot. In addition, there are two evening trips operated as Route 32/40 via Main Street to the Windsor rail station.

On Sundays, the first two outbound trips and first inbound trip operate as Route 32A to Windsor Center via Weston Street. After 8:30 AM, trips operate as Route 32/40 via Main Street until 7:30 PM. Service departs roughly every 70 minutes all day.

FIGURE 5 | SCHEDULE OVERVIEW (ALL ROUTES 32, 32A, 32B, 32M, 34, 36, AND 36X)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:25 AM – 12:07 AM	15/30	40/35
Saturday	6:58 AM – 8:00 PM	60	24/23
Sunday	6:50 AM – 7:30 PM	70	11/11

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Combined, Routes 32, 34 and 36 carry about 1,541 passengers per weekday or about 20.8 passengers per trip. This is above the Hartford Division average of 17.6 passengers per trip (see Figure 6). On weekends, only Routes 32 is in operation. Saturday service carries about 13.2 passengers per trip, and Sunday service carries about 15.2 passengers per trip, both of which are somewhat below the division averages.

FIGURE 6 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 32/34/36	ROUTE 32/34/36	DIVISION AVG
Weekday	1,541	20.8	17.7
Saturday	356	13.2	16.3
Sunday	334	15.2	17.6

Source: CTtransit performance data

Ridership by Stop

The most heavily used stops on Routes 32, 34 and 36 are in downtown Hartford. Together these stops generate about 506 daily boardings and alightings, or roughly one-third of all trips. No other stops along these routes generate more than 50 boardings per day, and only four stops generate more than 30 boardings or alightings per day (see Figure 7).

FIGURE 7 | ROUTE 32/34/36 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Main Street and Pratt Street	6 / 122	Downtown Hartford and transfers to other CT*transit* routes
Main Street and Gold Street	10 / 291	Downtown Hartford and transfers to other CT*transit* routes
Central Row and Old State House	0 / 77	Downtown Hartford and transfers to other CT*transit* routes

Load profile data combines passenger activity by stop and shows the cumulative passenger load as the bus travels inbound along its route. The load profile for Route 32 is shown in Figure 8; load profiles for Routes 34 and 36 are shown in Figure 9. These profiles are not continuous because some stops are served by all variants, while others are served by one or two variants only and are labeled accordingly. Ridership by stop without the cumulative load is mapped in Figure 10. This data demonstrates:

- The most productive segment of the route is beween downtown Hartford to Windsor Center. The entire corridor has relatively strong ridership, although there is little turnover on the route, suggesting many riders travel to the end points of the route.
- The common segment through north Hartford on Windsor Avenue is the most productive of the three alignments. However, it also has the most service.
- Routes 32 and 32A show very little ridership activity north of Windsor Center, where nine trips extend to or from the Poquonuck Park & Ride Lot.
- The Route 32B segment along Bloomfield Avenue west of Windsor Center serves about 17 daily riders. The Route 32M segment along Matianuck Avenue serves about 19 daily riders. The busiest stop along these two segments is at Matianuck Avenue and W. Wolcott Avenue, where four riders board daily.
- The Route 34 segment north of the Poquonuck Park & Ride Lot serves 20 daily riders, with 9 of these boarding and alighting at the Walgreens terminal point.
- Ridership activity on Route 36 and 36X between Griffin Office Park and Birken Office Center is captured under Route 54's data. A moderate amount of activity occurs as the routes head inbound from the Griffin Park, with 173 passengers boarding or alighting between there and the Poquonuck Park & Ride Lot. There is more ridership activity at the Park & RIde Lot shown on the Route 34/36 profile, likely due to the availability of Route 36X express service via I-91.

FIGURE 8 | ROUTE 32 WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

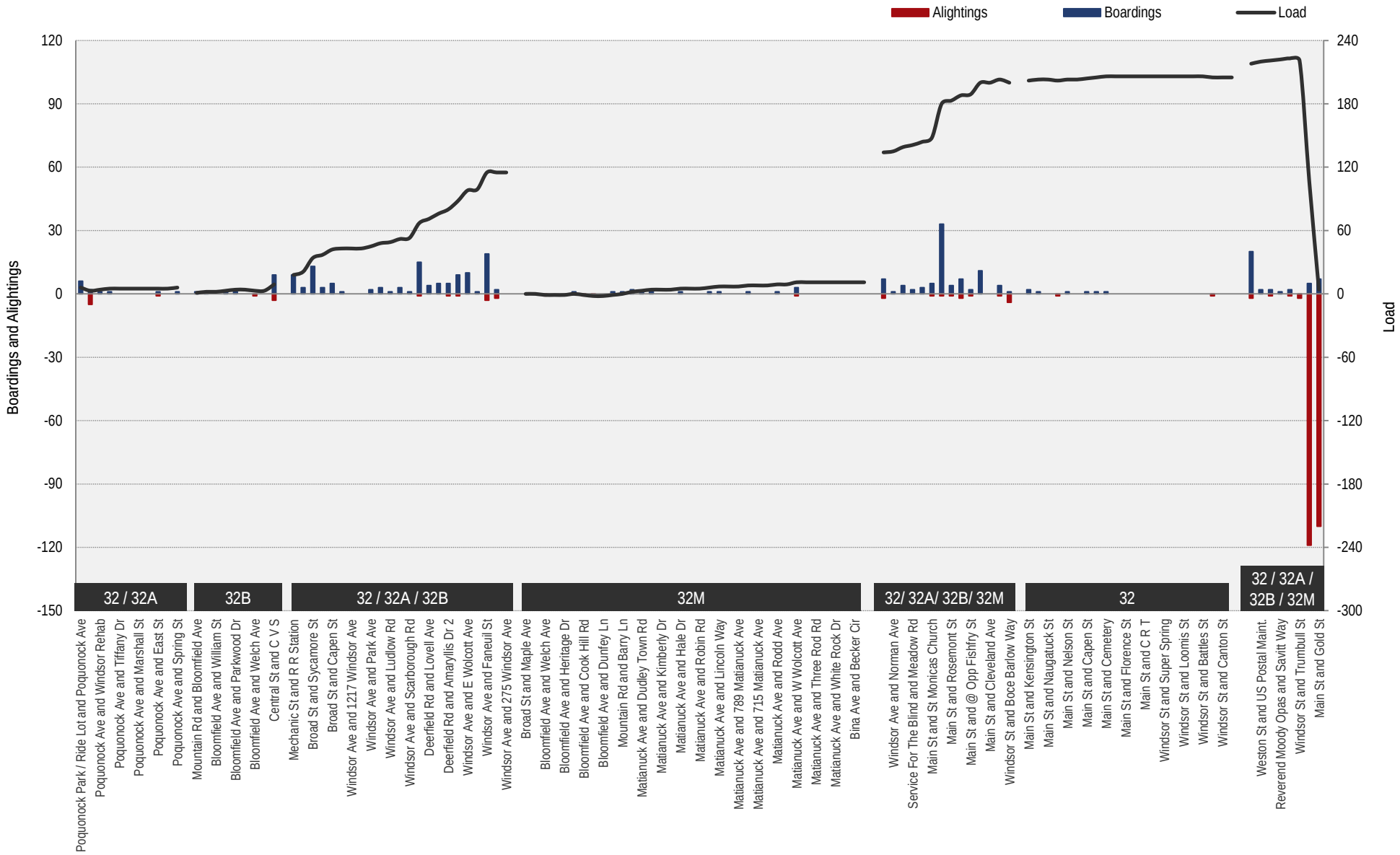


FIGURE 9 | ROUTE 34/36 WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

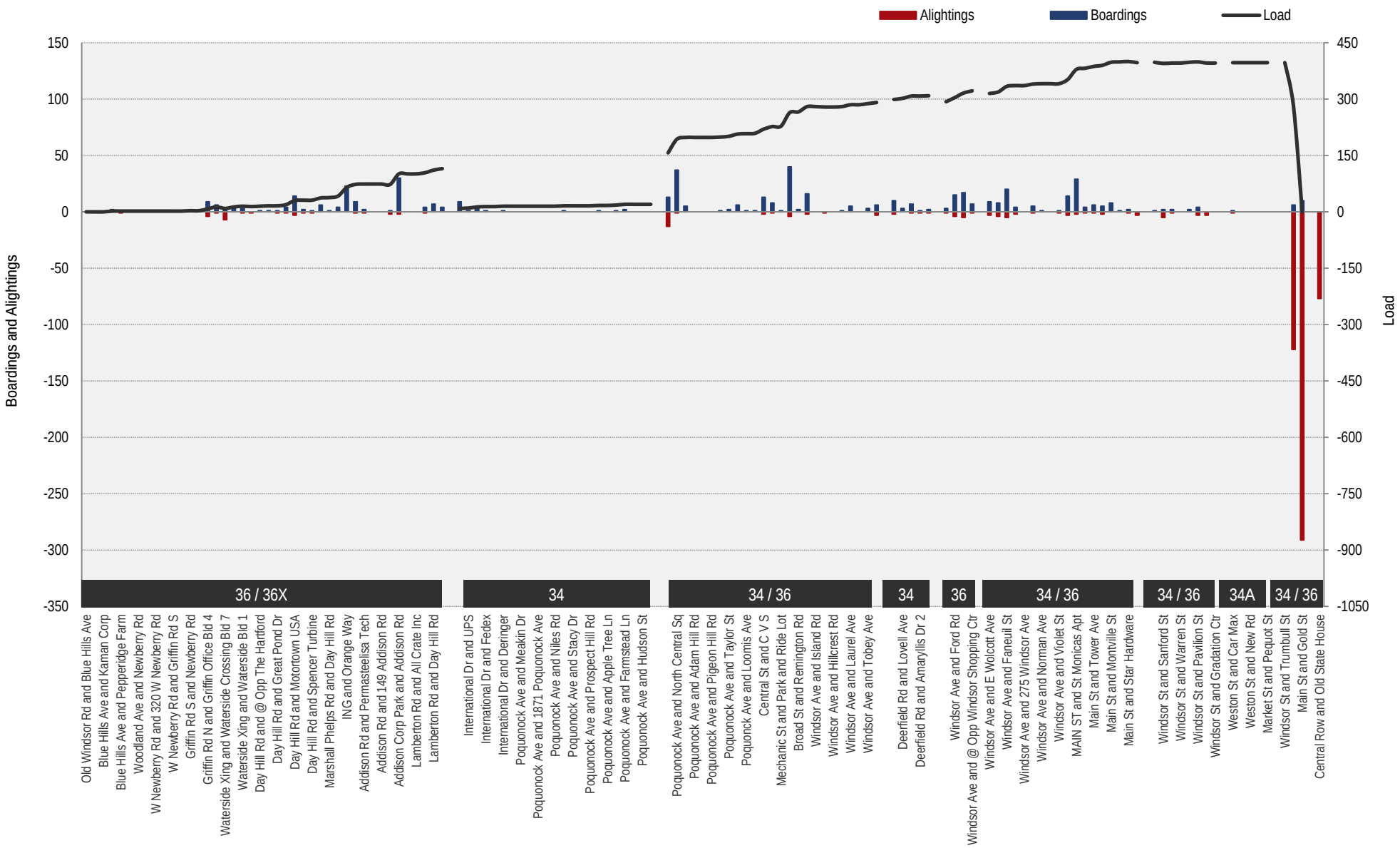


FIGURE 10 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

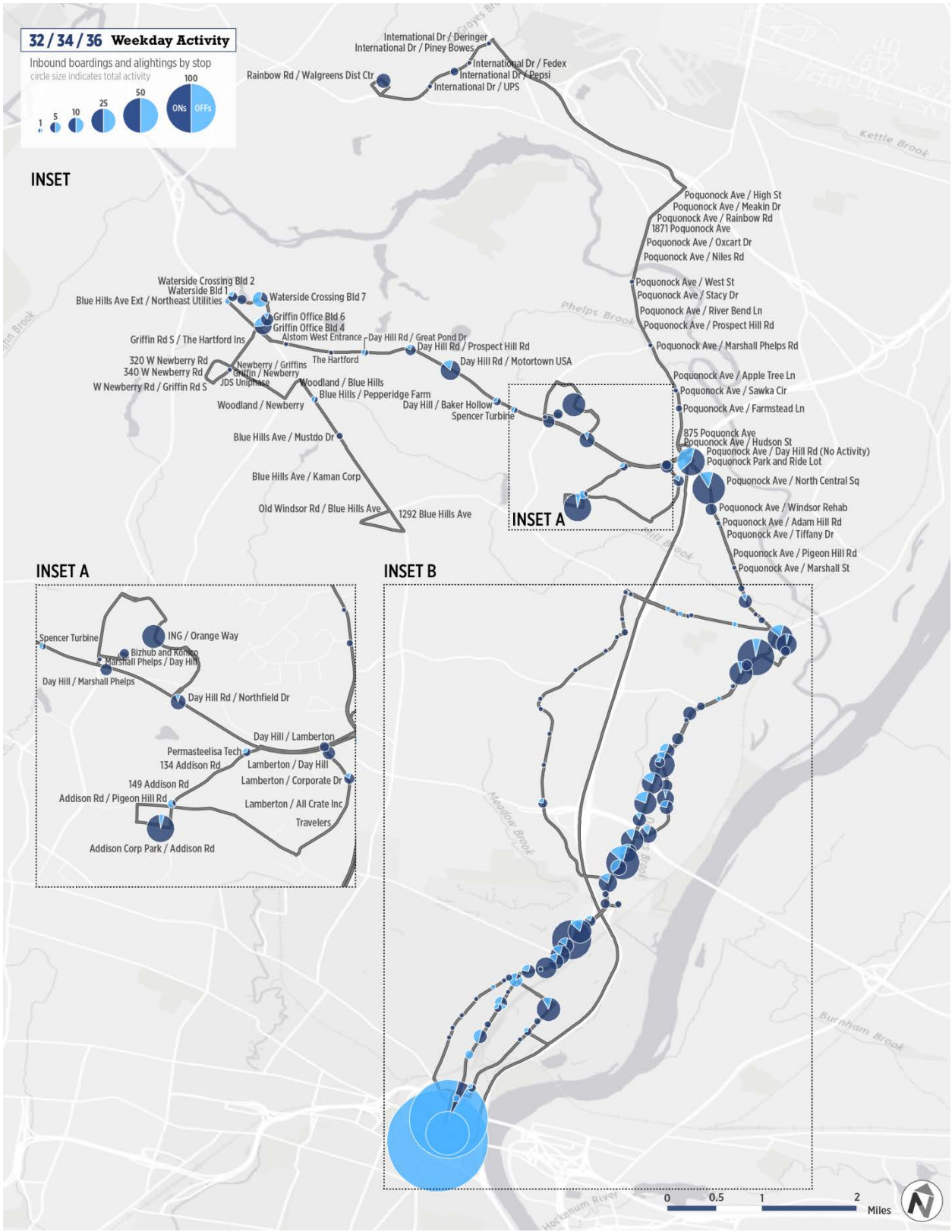


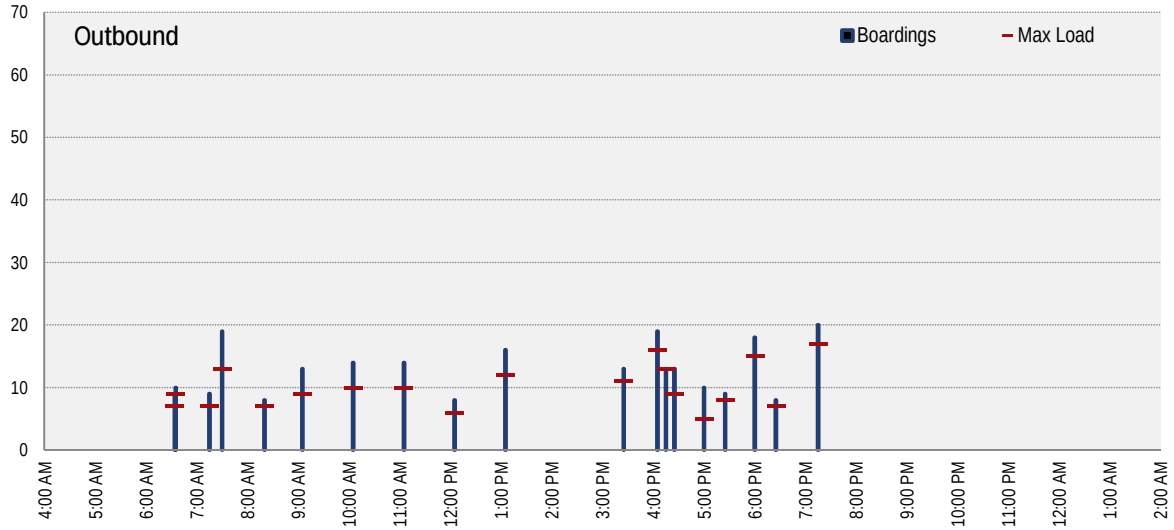
FIGURE 11 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP (INSET B)

Ridership by Trip

Weekday - Route 32

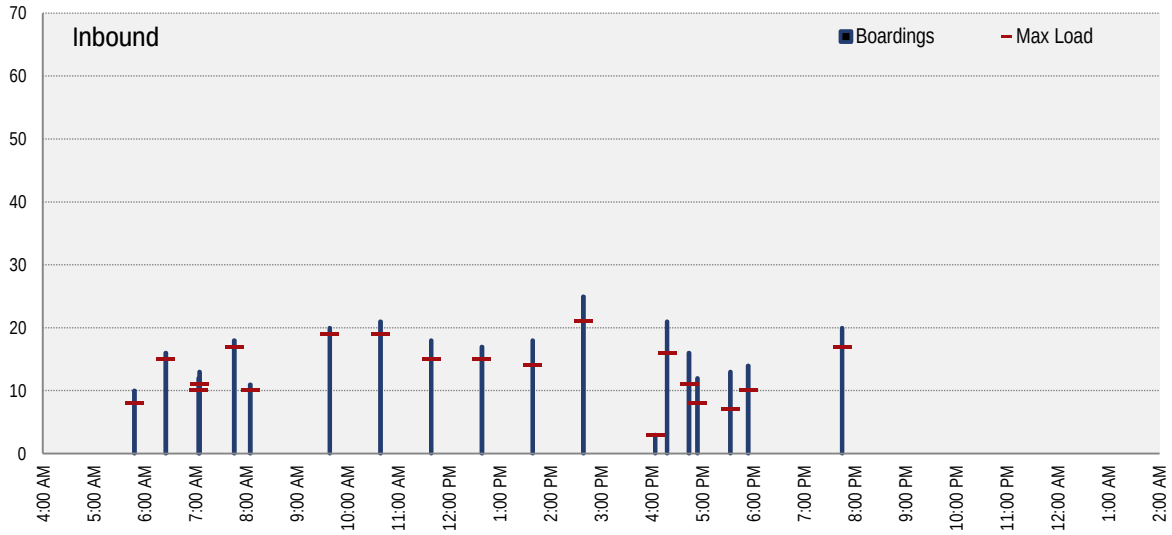
Ridership by trip for Route 32 is shown in Figures 11 and 12. Ridership on Route 32 is well balanced throughout the day. Demand is slightly higher on the inbound service, with trips generally carrying between 10 and 20 riders. Ridership on the outbound service carry around 10 and 15 riders, with a handful carrying 20 people. Passenger activity remains steady until the last evening trips, indicating later service may be warranted.

FIGURE 12 | ROUTE 32 WEEKDAY OUTBOUND RIDERSHIP BY TRIP



Note: Both Routes 32 and 32B have a 6:35 AM outbound trip.

FIGURE 13| ROUTE 32 WEEKDAY INBOUND RIDERSHIP BY TRIP

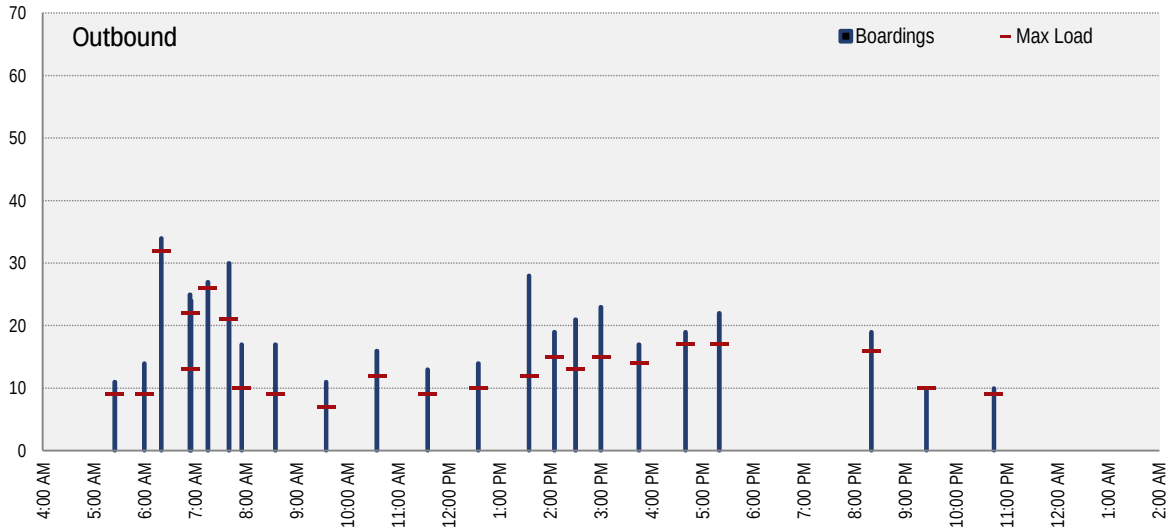


Note: The 6:58 AM and 7:58 AM inbound trips operate as Route 32M.

Weekday - Routes 34 and 36

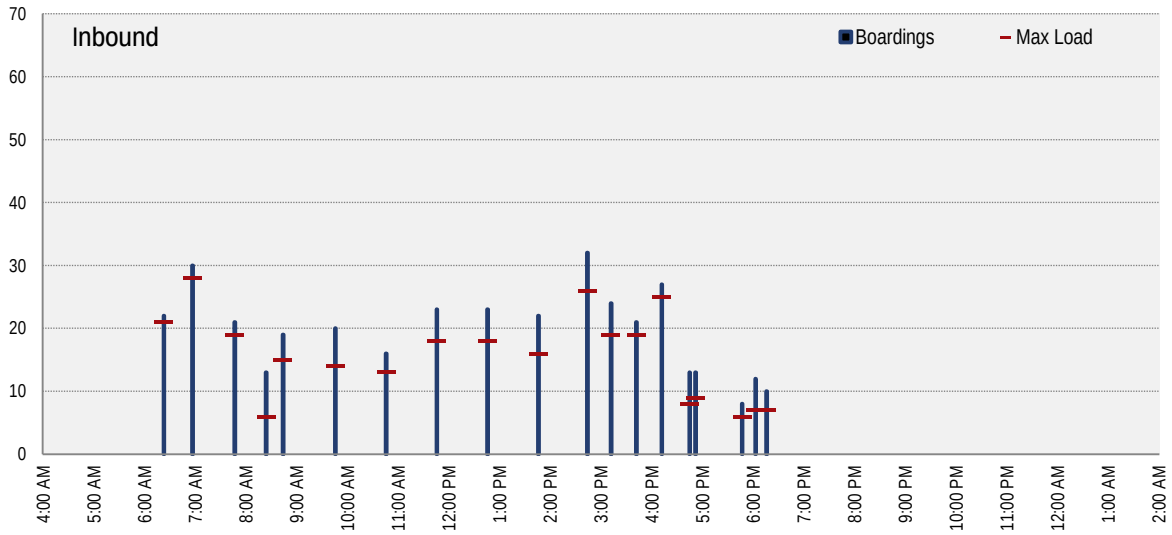
Demand on Routes 34 and 36 has a strong peak period orientation, with stronger demand in both directions (see Figures 14 and 15). This is likely due to both the peak period focus of Route 34 trips, as well as both first and second shift workers traveling to employment sites along Day Hill Road and International Drive. Early morning service on Route 36/36X also has very strong demand; the 6:20 AM trip has peak loads of 32 passengers, suggesting more morning outbound service may be warranted.

FIGURE 14 | ROUTE 34/36 WEEKDAY OUTBOUND RIDERSHIP BY TRIP



Note: Both Route 34 and Route 36X have 6:55 AM outbound trips.

FIGURE 15 | ROUTE 34/36 WEEKDAY INBOUND RIDERSHIP BY TRIP



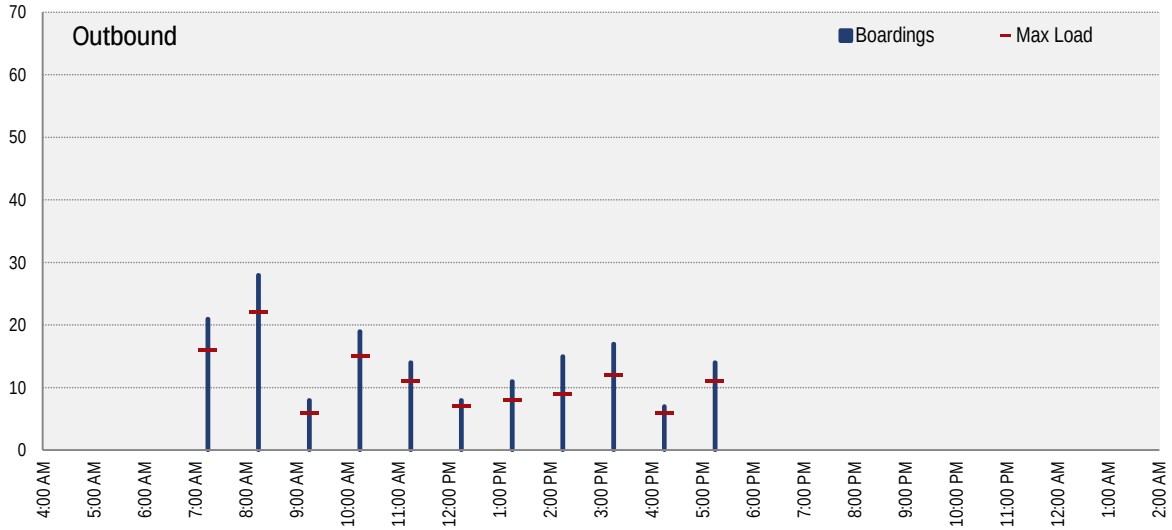
Note: No data available for the 9:15 PM inbound trip.

Saturday

Only Route 32 operates on Saturday and carries an average of 13.2 passengers per trip. With the exception of the last two evening trips in each direction, all trips operate as Route 32A to the Poquonuck Road Park & Ride Lot via Weston Road. The evening trips operate on a Route 32/40 alignment.

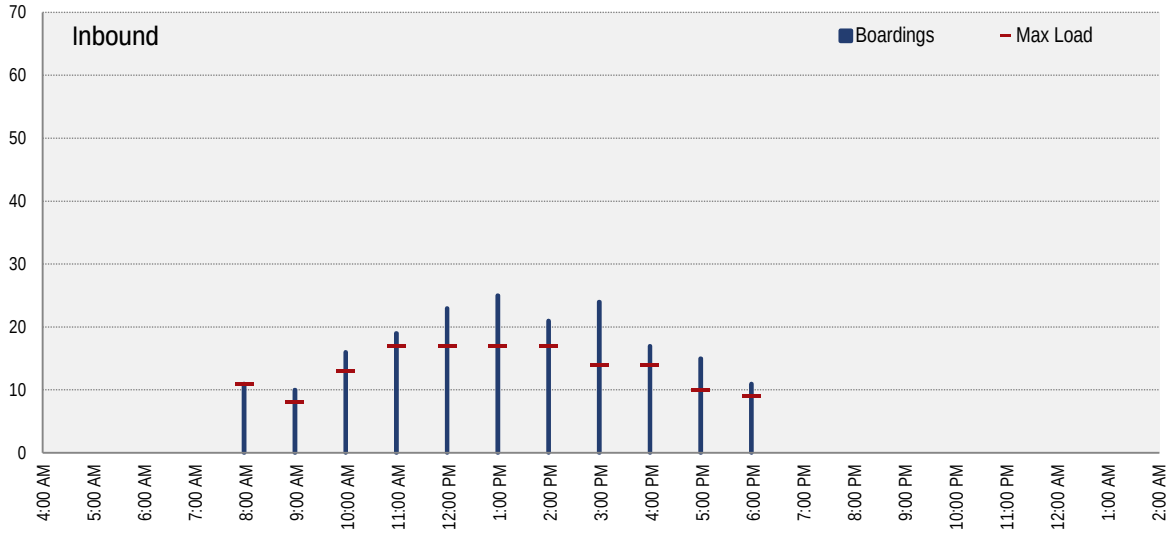
Ridership by trip is shown in Figures 16 and 17 and shows a slight reverse peak pattern with more riders traveling outbound in the morning and returning inbound in the afternoon. Peak passenger loads exceed 20 passengers only on the 8:15 AM outbound trip.

FIGURE 16 | ROUTE 32 SATURDAY OUTBOUND RIDERSHIP BY TRIP



Note: No data available for the 6:15 PM and 7:15 PM outbound trips.

FIGURE 17 | ROUTE 32 SATURDAY INBOUND RIDERSHIP BY TRIP



Note: No data available for the 6:58 AM, 6:37 AM and 7:37 PM inbound trips.

Sunday

On Sundays, Route 32 carries an average of 15.2 passengers per trip. Ridership has a slight reverse commute pattern, with slightly higher ridership traevling in bound in the morning and outbound in the afternoon. An exception to this pattern in the 8:00 AM outbound trip; this is the strongest trip of the day (see Figures 18 and 19). Overall, passenger activity is relatively light throughout the day, with peak loads never exceeding 17 passengers on any one trip.

FIGURE 18 | ROUTE 32 SUNDAY OUTBOUND RIDERSHIP BY TRIP

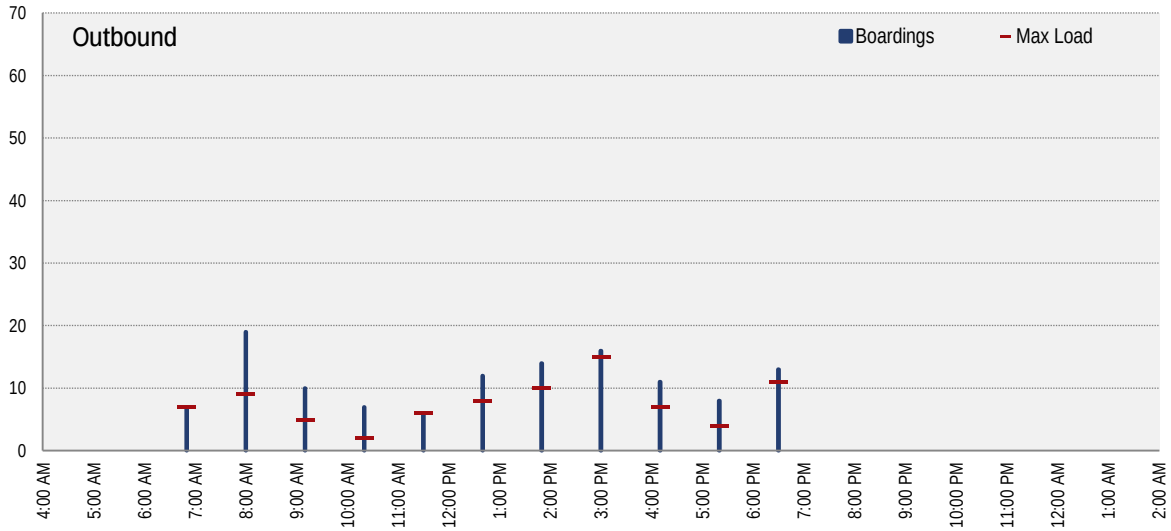
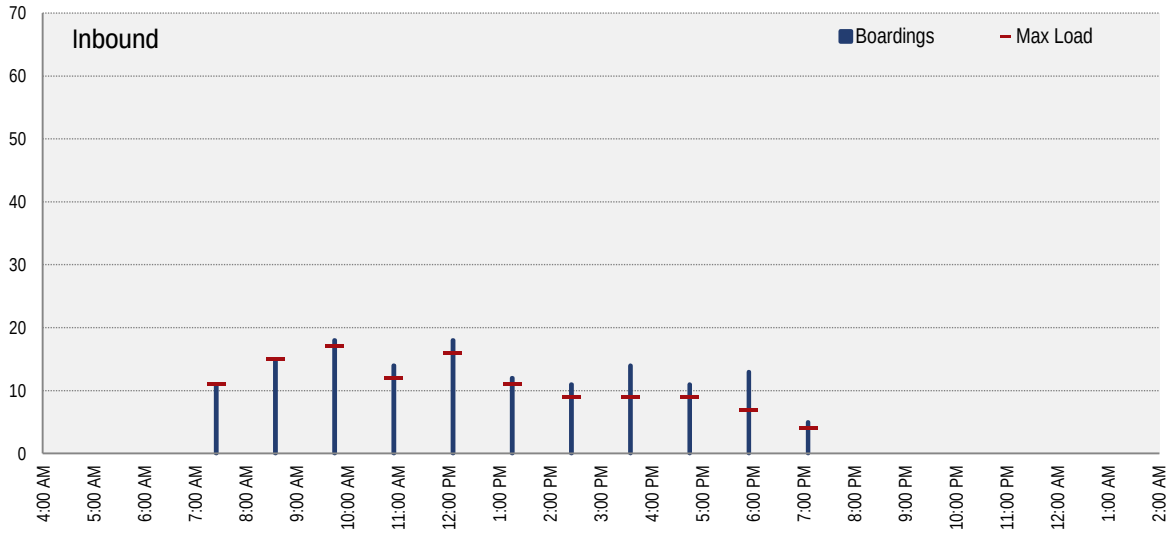


FIGURE 19 | ROUTE 32 SUNDAY INBOUND RIDERSHIP BY TRIP



Performance

Combined, Routes 32, 34 and 36 perform below the Hartford Division average by all measures with the exception of operating cost per passenger on weekends (see Figure 20). While weekday service includes the longer and relatively unproductive Route 34 and 36 segments, weekend service operates only as a shorter Route 32A to Windsor Center or the Poquonuck Park & Ride Lot. The route has fewer passengers per revenue hour than the Division Average, and much lower costs per revenue vehicle mile – again due to the long route segments associated with Routes 34 and 36. Figures 22 and 23 chart the combined Routes 32, 34 and 36 performance against all other Hartford Division routes, showing lower than average performance in terms of both weekday cost per passenger and passengers per revenue vehicle mile.

FIGURE 20 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 32/34/36	DIVISION AVG	ROUTE 32/34/36	DIVISION AVG	ROUTE 32/34/36	DIVISION AVG
Operating Cost per Passenger	$5.03	$4.84	$5.50	$6.30	$4.89	$6.66
Passengers per Revenue Vehicle Hour	25.5	28.9	23.3	27.0	26.2	29.7
Passengers per Revenue Vehicle Mile	1.6	2.6	1.6	2.4	2.2	2.9

Source: CTtransit performance data

Combined, Routes 32, 34 and 36 have on-time performance that is just below the Hartford Division average, with 80.5% of time point checks showing buses on schedule (see Figure 21).

FIGURE 21 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 32/34/36	DIVISION AVG
Early	0.4%	0.2%
Late	19.1%	18.9%
On-Time	80.5%	80.9%

Source: CTtransit performance data

FIGURE 22 | WEEKDAY OPERATING COST PER PASSENGER

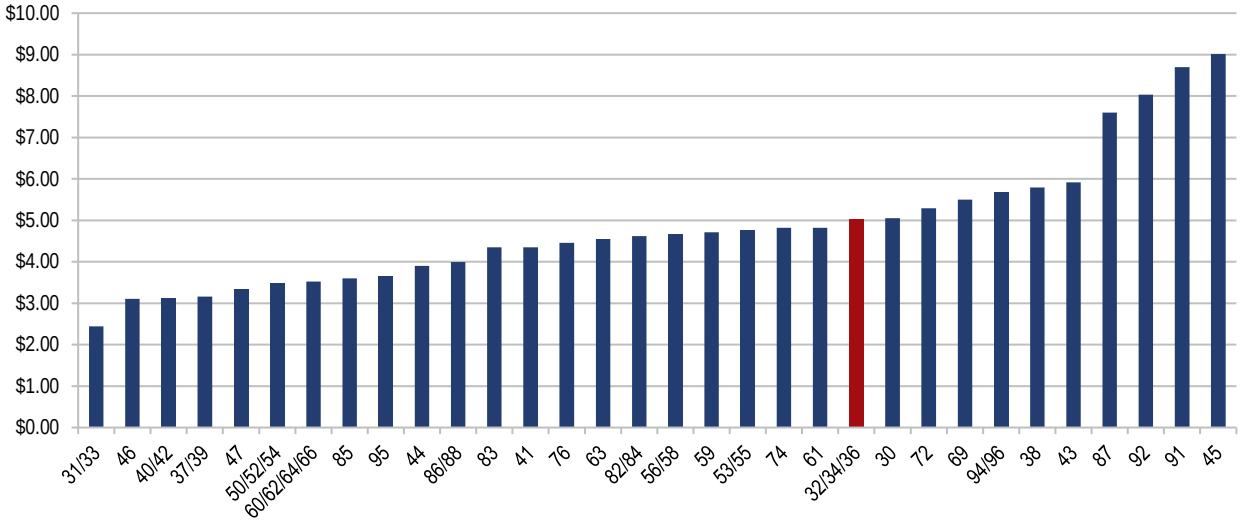
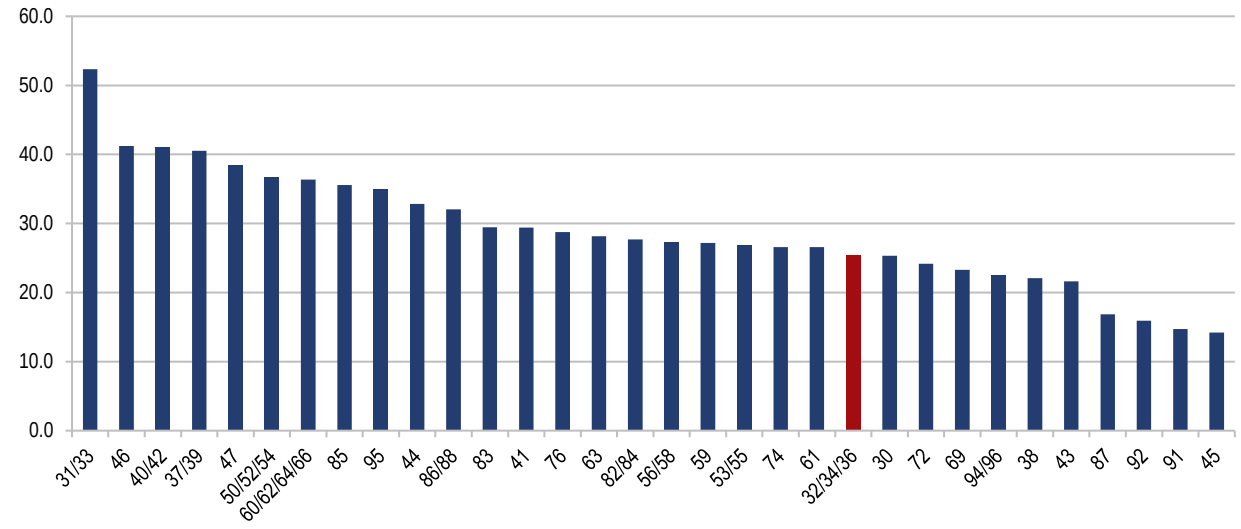


FIGURE 23 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Routes 32, 34 and 36 are radial routes connecting downtown Hartford with the North Meadows area, Northeast Hartford, Windsor, and employment centers along Day Hill Road in Bloomfield and Rainbow Drive in Windsor Locks and East Granby. The routes largely travel in a shared corridor between downtown and Windsor Center. Generally speaking, the corridor is employment rich and the services are partially funded by CRCOG's job access program. It is also worth noting that Route 40 operates in this corridor as far north as Faneuil Road in Windsor, and beginning in late 2016 NHHS commuter rail service will serve Windsor rail station.

Ridership on Routes 32, 34 and 36 is stronger than the Hartford Division overall, but long travel times and distances mean the routes do not perform as well as other routes. The routes also suffer from a very complicated service design that is difficult to understand and very infrequent service on some route segments. Many of the service improvement ideas, therefore, are designed to simplify the route.

- **Eliminate Route 32A Service on Weston Street**. Route 32A operates roughly eight trips per day on Weston Street. However, another CT***transit*** route, Route 38 already provides service on Weston Street every 30 minutes during the peak and 60 minutes off-peak. The combined service provided by Route 32A and 38 create a minimum of 30 minute service all day on Weston Street, which over serves the corridor. Instead of operating on Weston Street, Route 32A could travel on Main or Windsor Avenue. On weekends, Route 38C would need to be rerouted via Weston Street to Boce Barlow Way to the CT***transit*** garage to provide coverage on Weston Street.
- **Increase Service Levels on Main Street.** As discussed, instead of operating via Weston Street, Route 32A could operate along Main Street, strengthening the service on that corridor. Main Street has a more dense residential neighborhood as compared with Windsor Street and increased service should help strengthen ridership. In addition, operating all Route 32 service on Main Street creates a logical operating pattern since Routes 32/40 are already paired on weekends. Local Route 34/36 service could continue to operate on Windsor Street, along with other Route 32B or 32M variants.
- **Operate Route 34 as Express Service to Poruonock Park & Ride.** Route 34 is nearly 14 miles long and takes 45-50 minutes to travel from downtown to International Drive. With local service on Windsor Avenue provided by Routes 32 and 36, Route 34 may be shifted to I-91 to provide fast and direct all day service between downtown and the Poquonuck Park & Ride. It could then provide local service to Windsor Locks and International Drive. Operating Route 34 as an express route would also allow the Bradley Flyer (30X) to skip the Poquonuck lot and provide faster, more direct service between downtown and the airport.
- **Operate Route 34 on Windsor Avenue (instead of Deerfield Road).** Routes 32 and 34 deviate from Windsor Avenue to serve Deerfield Road. Although service is about hourly on each segments, ridership is higher along on Route 36 along the Windsor Road segment and likely faster. If Route 34 service (essentially peak period service) remains local, it could be shifted to the more direct Windsor alignment, leaving only Route 32 (the local Windsor service) on Deerfield Road.
- **Operate some Saturday service on Routes 34X/36X.** Many of the large distribution centers and other employers along Day Hill Road, Blue Hills Avenue Extension and International Drive likely have Saturday shifts. Saturday service could be operated with just a few trips designed to serve early AM and afternoon shifts.
- **Terminate Route 32's Saturday service in Windsor Center (instead of the Poquonuck Park & Ride Lot).** Operating Saturday service on Route 34 or 36 and stopping at

the Poquonock Park & Ride Lot would allow Route 32 Saturday service to terminate at Windsor Center.

- **Discontinue Route 32 Variant Service.** Route 32 is extremely complicated with five variants (32/40, 32, 32A, 32B and 32M). This much variant service make the route difficult to understand and use and also means that many of the variants are served infrequently. Route 32B, for example, has four peak period trips and carries 17 daily riders west of Windsor Center, or about four passengers per trip. Likewise, Route 32M has five trips and carries about 19 daily riders or four per trip. (Route 32A is discussed above.) CT***transit*** would lose some riders by eliminating the variant service, but streamlining the service will simplify it and likely attract more riders than it would lose.
- **Extend Route 32 service later on weekday evenings.** Passenger activity remains strong on the last evening trips in both directions after 7:00 PM, indicating later service may be warranted.
- **Expand Route 36/36X Service.** Early morning trips traveling outbound have strong demand, suggesting there is likely demand for an earlier trip. Additionally, the data suggests the service supports second shift workers traveling to the Day Hill Road area; a later evening inbound trip may be warranted to bring workers back towards downtown.
- **Start service on Route 34 earlier.** The first two inbound trips (6:23 and 6:57 AM) on Route 34 have strong ridership indicating an earlier trip may be warranted.
- **Develop Employment Shuttles from Windsor Center and/or the Poquonuck Park & Ride.** Although CT***transit*** buses provide important job access service to employment along International Drive and Day Hill Road, demand along these areas is very low. In addition, the land use patterns along Day Hill Road, International Drive and Blue Hills Avenue Extension make serving these destinations difficult. Vehicles travel at high speeds along the corridor, there is limited pedestrian infrastructure and it is difficult to cross the street. Instead of operating 'big bus' service, the employment parks may be better served with shuttles or flex routes that bring people to/from the front door of their office. Flex service would likely be more efficient as compared with scheduled fixed route service.
- **Create Shuttle Services when NHHS Rail Service begins in late 2016.** There will be twelve roundtrip trains per day between Windsor and Hartford. While more Windsor area commuters may shift to rail service, the level of service is such that complementary bus service may be desired for commuters who travel at off hours or miss a train at one end of their trip.
- **Potential updates to CT*transit* maps.**
    - A number of Route 32 trips extend to the Poquonuck Park & Ride Lot. This service is shown on the Route 34/36 map, but not on the Route 32 map.
    - The Route 36 map shows service terminating at Waterside Drive, but buses continue on to the Birken Office Center. If Route 54 and 36 continue to be interlined, it is suggested that both schedule maps show the service in one of two ways: 1) as it is portrayed on the larger systemwide map, with Routes 54 and 36 overlapping on Day Hill Road and Blue Hills Extension; or, 2) with one set point where service transitions from Route 54 to 36 and vice versa.
- **Minor schedule updates.**
    - On Saturdays, there are two evening trips operated as Route 32/40 via Main Street, but published times on the Route 32 and Route 40 schedules are not in sync for stop times along Main Street.

- On Sundays, most trips operate as Route 32/40 via Main Street, yet these trips do not show up on the Route 40 schedule.

Route Evaluation

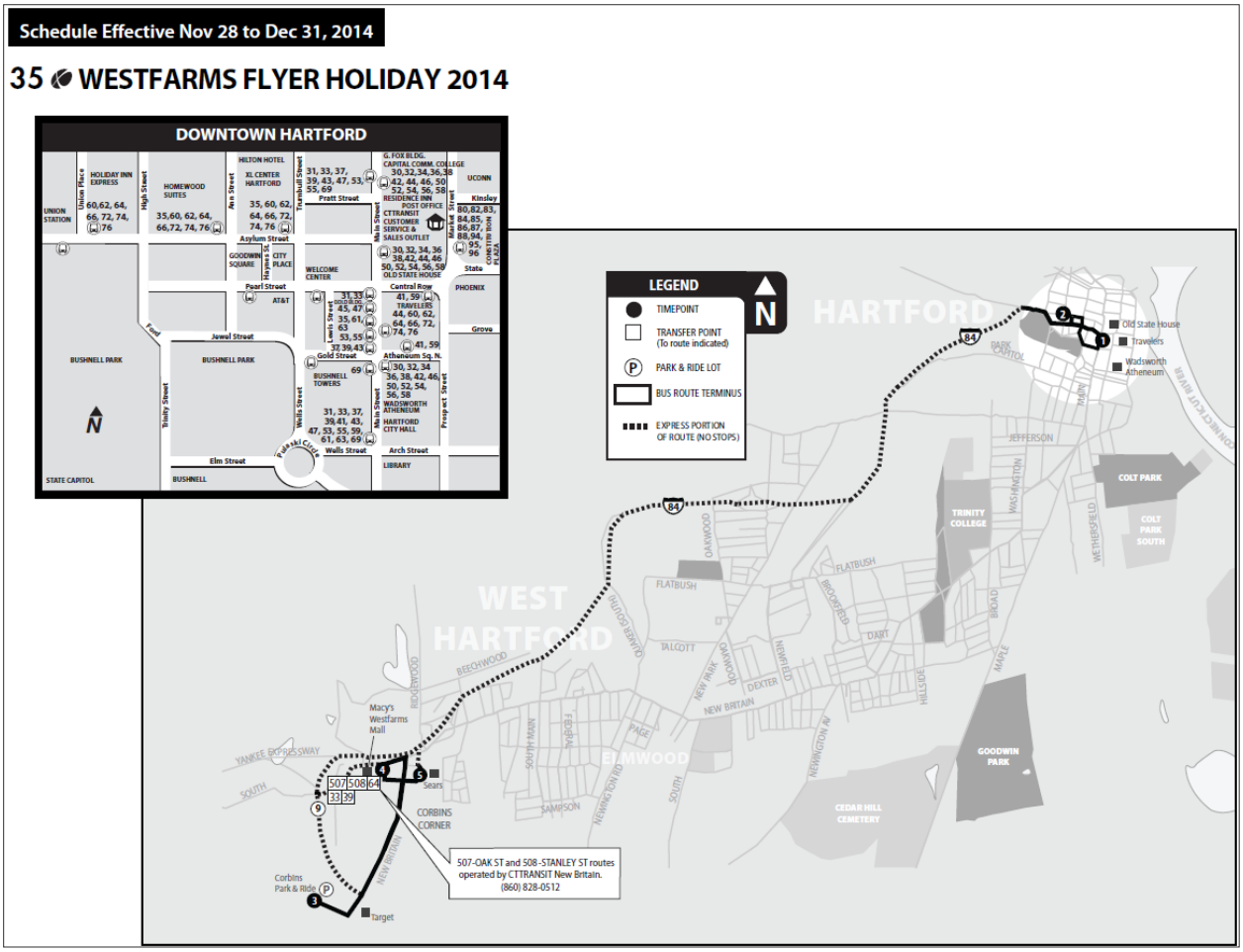
WESTFARMS FLYER

35 | Westfarms Flyer

Service Design

Route 35 is one of the Hartford Division's five Flyer routes, providing express service between downtown Hartford and park-and-ride and retail destinations along I-84 and Route 9 in West Hartford (see Figure 1). The route operates on weekends only, with two trips (each direction) on Saturday evenings and regular service throughout the day on Sundays. During the holiday season, the Westfarms Flyer runs hourly service Monday through Saturday in addition to regular Sunday service.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 35 originates in downtown Hartford, where riders can connect to almost all CT***transit*** service. Riders can also connect with three other CT***transit*** - Hartford routes (Routes 33, 39 and 64) at Westfarms Mall (see Figure 2). In addition, riders at Westfarms Mall can connect to Route 507 and Route 508 operated by CT***transit***-New Britain.

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 33	Park Street and Park Road
Route 39	New Britain Avenue
Route 64	Farmington Avenue

Alignments and Service Patterns

Route 35 originates in downtown Hartford, beginning at Main Street and Gold Street, and stops at the XL Center before getting onto I-84 and traveling southwest nonstop towards Westfarms Mall in West Hartford. Buses first stop at the Corbins Park & Ride, then travel northeast on New Britain Avenue and stop at the Westfarms Mall in front of Macy's. On Saturdays, buses depart from the Westfarms Mall and return northeast on I-84 to downtown Hartford, traveling along a slightly different alignment into downtown, due to one-way streets. On Sundays, buses make an additional stop after Westfarms Mall, at the Sears in Corbins Corner, before traveling back into downtown Hartford.

Service Schedule

The Westfarms Flyer runs on weekends, with two outbound trips and two inbound trips on Saturday evening and service every 70 minutes on Sunday. Service increases significantly between the day after Thanksgiving through New Year's Eve day. Holiday service operates every hour all day on Saturday and on weekdays, with 12 inbound trips and 12 outbound trips per day beginning at 10:30 AM Monday through Saturday.

During non-holiday periods, Route 35 schedule is designed to supplement Route 33 when it does not serve Westfarms Mall on Saturdays and Sundays.

FIGURE 3 | SCHEDULE OVERVIEW

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	-	-	-
Saturday	7:15 PM – 9:12 PM	2 trips	2/2
Sunday	10:20 AM – 7:25 PM	70	8/8

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Route 35 carries an average of 15 passengers on the four (two round trips) Saturday trips (3.8 passengers per trip) and 175 passengers, or 10.9 passengers per trip, on Sundays. Productivity is considerably lower

than the Hartford Division averages for all service days (see Figure 4)[1]. During holiday periods, ridership is likely higher with the addition of weekday service and more weekend trips.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 35	ROUTE 35	DIVISION AVG
Weekday	-	-	17.7
Saturday	15	3.8	16.3
Sunday	175	10.9	17.6

Source: CTtransit performance data

Ridership by Stop

The most heavily used stops on Route 35 are the two end-of-line stops at Westfarms Mall and downtown Hartford (see Figure 5), with 32 boardings and 45 alightings on Sundays, respectively. No other stop generates more than seven boardings or alightings per day on Sundays, the heaviest ridership day (see Figure 5 and 6).

[1] *The Westfarm Flyer is more appropriately compared with other express route service. At the time this analysis was prepared, a full data set for express routes was not available.*

FIGURE 5 | SUNDAY INBOUND RIDERSHIP BY STOP GRAPH

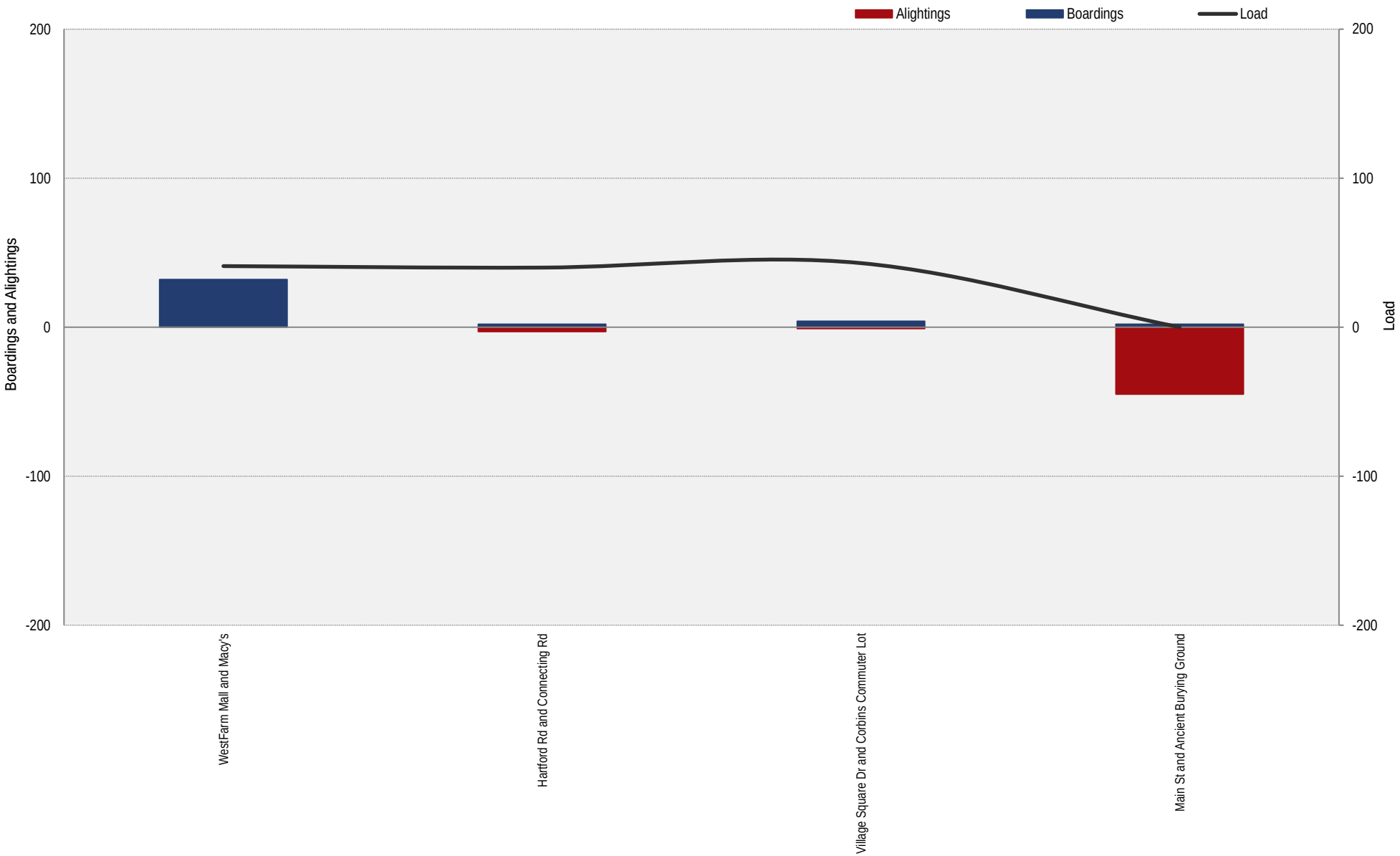
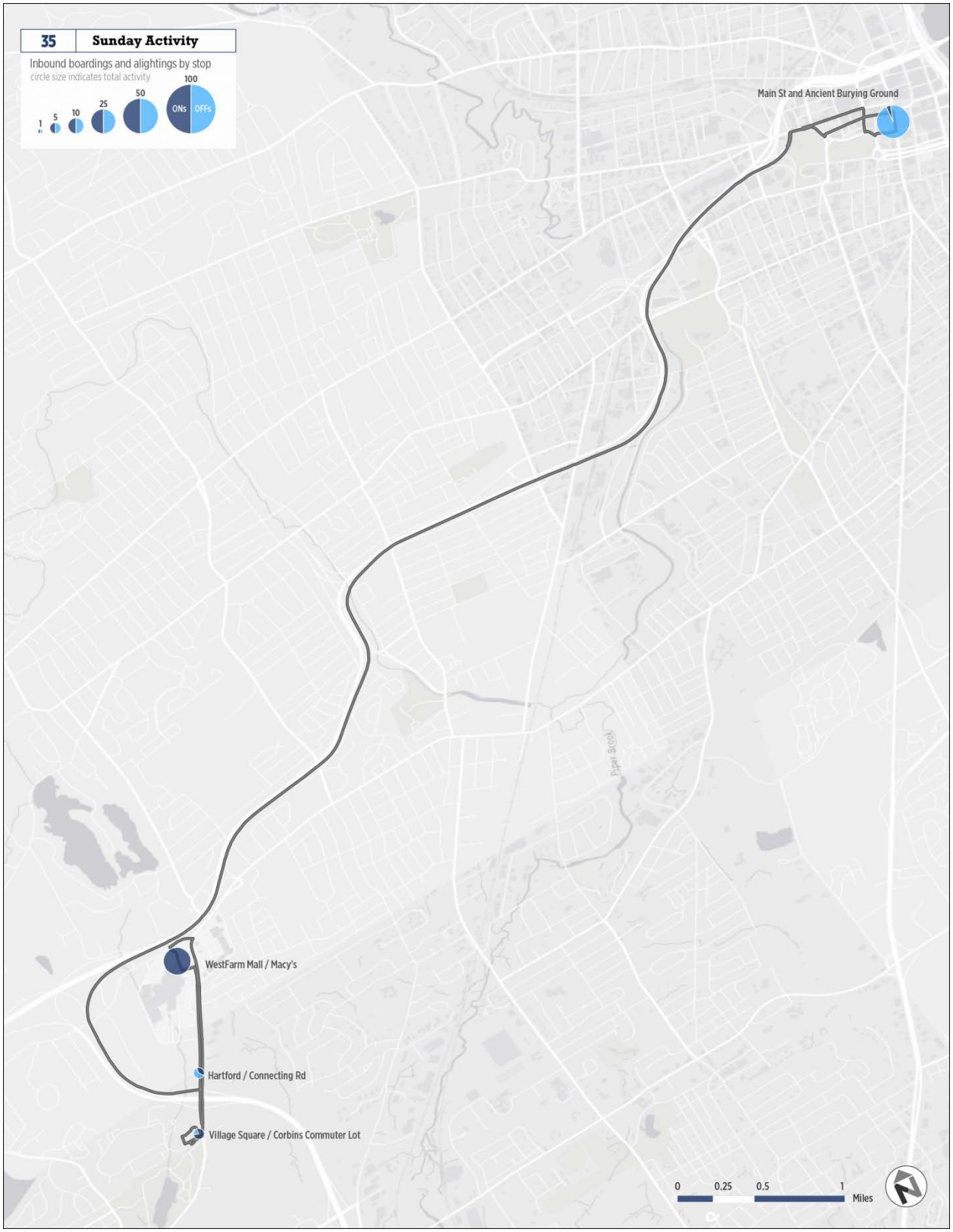


FIGURE 6 | SUNDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Saturday

Ridership on the two Route 35 Saturday trips is very low in the outbound direction (see Figure 7). Ridership is stronger traveling inbound on 7:42 PM trip. This compares with the second inbound trip, which carries fewer than five passengers.

FIGURE 7 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

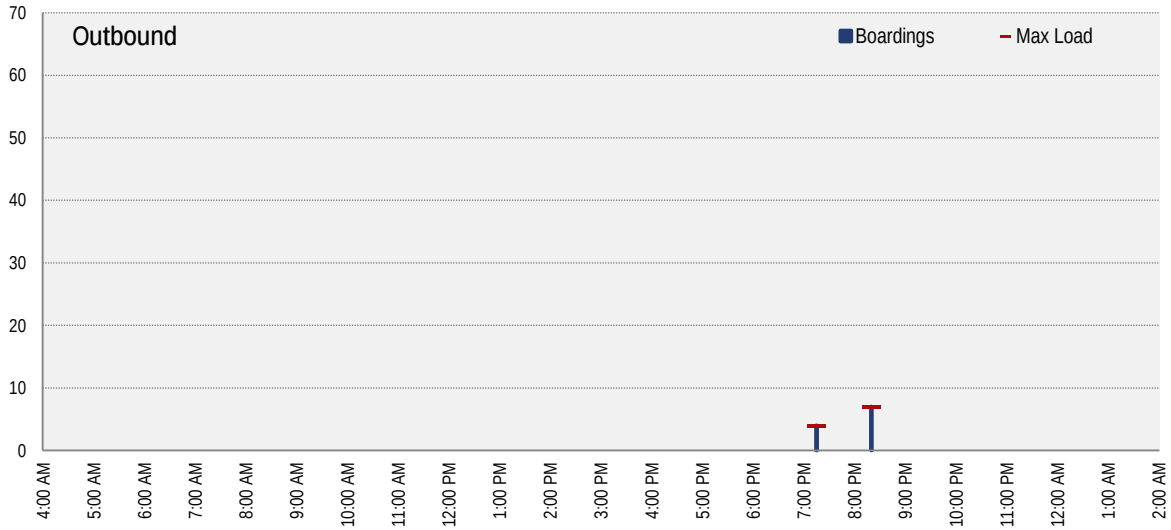
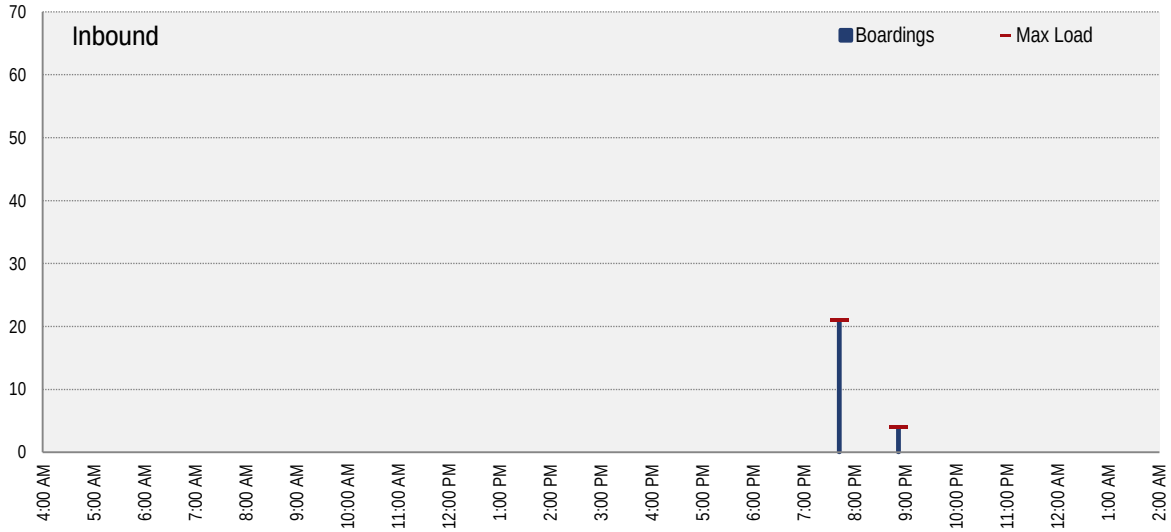


FIGURE 8 | SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

On Sundays, outbound ridership is strongest in the morning and early afternoon, while inbound ridership is highest on later afternoon and evening trips. This is likely a reflection of trips to Westfarms Mall and other nearby retail destinations.

FIGURE 9 | SUNDAY OUTBOUND RIDERSHIP BY TRIP

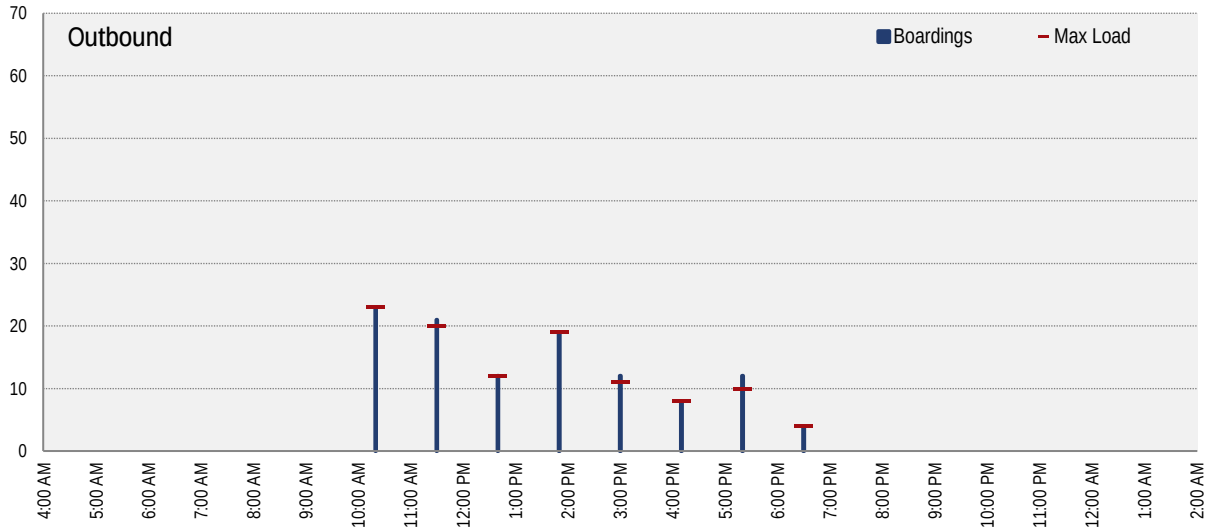
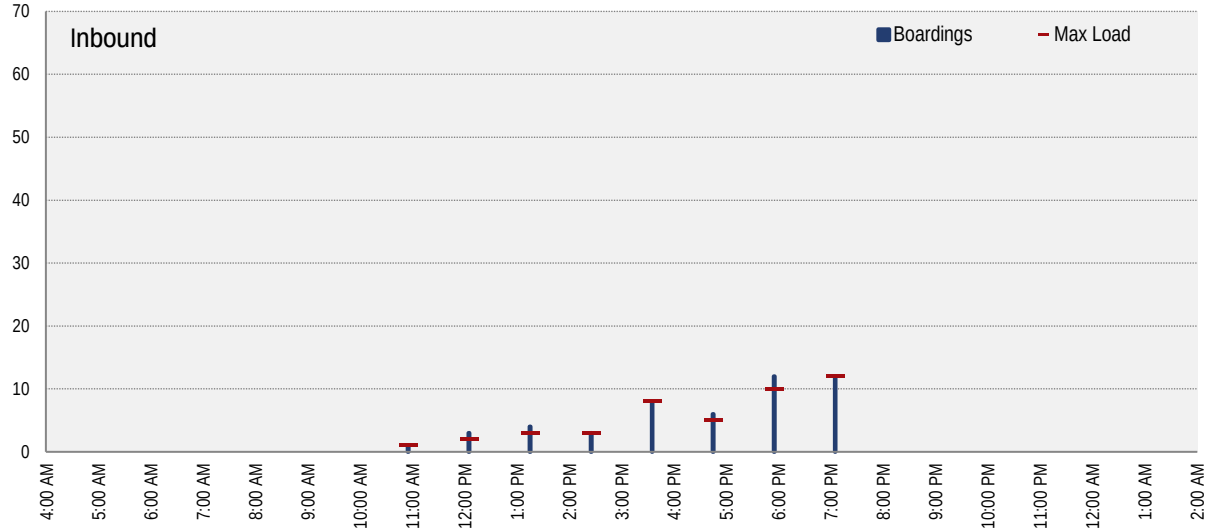


FIGURE 10 | SUNDAY INBOUND RIDERSHIP BY TRIP



Performance

Route 35's performance is lower than the Hartford Division average for all service performance metrics on Saturdays and Sundays. The route likely performs much better during holiday periods.

FIGURE 11 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 35	DIVISION AVG	ROUTE 35	DIVISION AVG	ROUTE 35	DIVISION AVG
Operating Cost per Passenger	-	$4.84	$18.49	$6.30	$6.35	$6.66
Passengers per Revenue Vehicle Hour	-	28.9	6.9	27.0	20.2	29.7
Passengers per Revenue Vehicle Mile	-	2.6	0.4	2.4	1.1	2.9

Source: CTtransit performance data

Route 35 has a 65.5% on-time arrival rate, with a significantly higher percentage of late buses than the Hartford Division average (see Figure 12). Given that ridership is not particularly high on Route 35, poor on-time performance suggests insufficient recovery time to consistently provide on-time service on the route.

FIGURE 12 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 35	DIVISION AVG
Early	0.0%	0.2%
Late	34.5%	18.9%
On-Time	65.5%	80.9%

Source: CTtransit performance data

FIGURE 13 | SUNDAY OPERATING COST PER PASSENGER

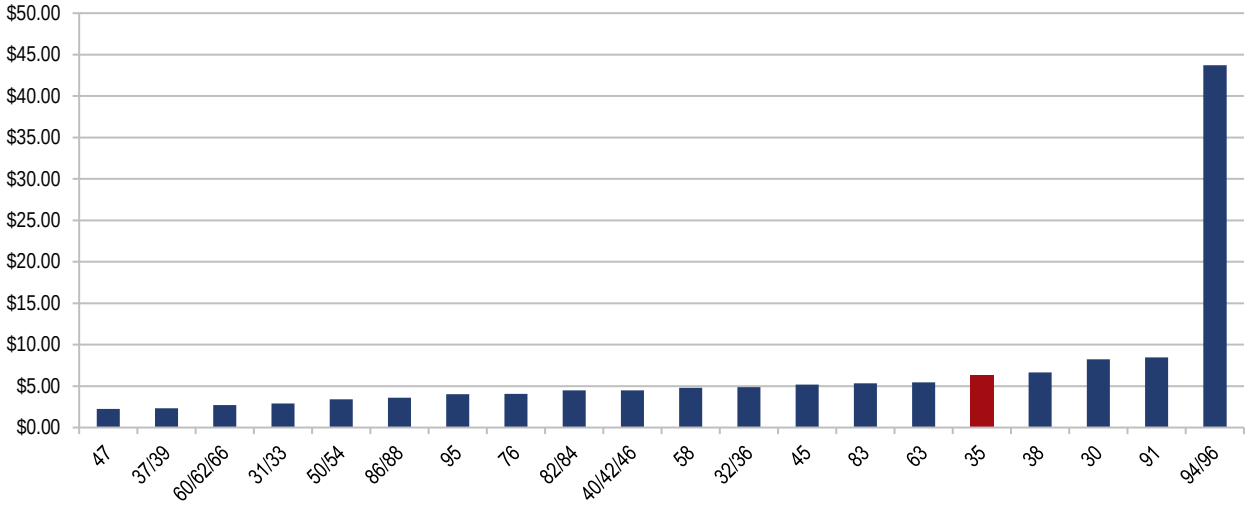
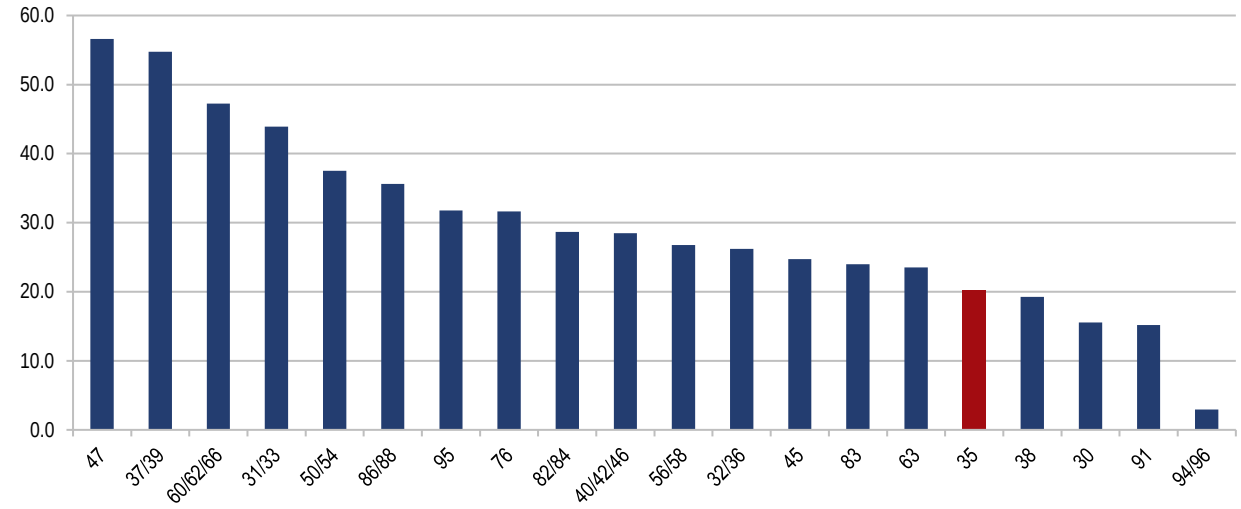


FIGURE 17 | SUNDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Route 35 is a Flyer route that facilitates shopping and employment trips to Westfarms Mall and nearby retail destinations on weekend days. The service is designed to supplement other CT***transit*** service (Route 39) on weekends, when the routes do not serve, or provide considerably less service, to Westfarms Mall. In addition, a more comprehensive service schedule is implemented during the holiday season to facilitate holiday shopping and additional employment that is scheduled during that time. During the non-holiday period, only two trips in each direction are provided on Saturdays and ridership on these trips is very low. Sunday ridership is higher, as service is available from approximately 10:00 AM to 7:00 PM, but is still below the Hartford Division average for Sunday service. The service is also supported, in part, with Job Access funds and is specifically designed to support access to employment.

CT*fastrak*

The CT***fastrak*** service plan, which is scheduled for implementation in March 2015, has changes that will impact Route 35.

- Route 128: the CT***fastrak*** service plan includes a new local Route 128 that will connect downtown Hartford with the Westfarms Mall, traveling via CT***fastrak*** to Flatbush Station and then operating to Westfarms Mall via New Britain Avenue. From Westfarms Mall, Route 128 will continue to New Britain. The service is scheduled to operate daily with weekday service operating from 4:20 AM to 11:40 PM; frequencies are scheduled for 20 minutes peak, 30 minutes mid-day and 60 minutes in the evening. Saturday service is also extensive; service begins at 4:10 AM and continues until 11:40 PM with 30-minute service all day and 60 minutes in the evening. Sunday's schedule is somewhat shorter (6:40 AM to 8:40 PM) with hourly service all day.
- Route 144: the CT***fastrak*** service plan includes a new feeder Route 144 that will connect Westfarms Mall with Wethersfield via the CT***fastrak*** Cedar Street station. The service is scheduled to operate daily with hourly service from roughly 5:10 AM to 11:10 PM on weekdays, 6:10 AM to 11:10 PM on Saturdays and 7:10 AM to 8:10 PM on Sundays.

Service Improvement Options

Given the CT***fastrak*** investment in service to the Westfarms Mall, Route 35 is a strong candidate for elimination. Another potential service improvement opportunity for the route is to offer service as a holiday overlay:

- **Eliminate Route 35 service.** Route 35 provides a fast and convenient connection to Westfarms Mall, but ridership levels do not warrant continued investment in the service, especially with CT***fastrak*** Route 128 and 144. While the new routes may result in longer travel times for some riders, riders will benefit from expanded service hours and increased service frequency.
- **Operate Route 35 during holiday period only.** Demand for Route 35 is low, especially on Saturdays, but also for several of the Sunday trips. One potential service improvement option would be to rely on CT***fastrak*** Routes 128 and 144 to offer the primary connecting service to Westfarms Mall and use Route 35 to provide additional service during the peak demand months.

Route Evaluation

NEW BRITAIN AVENUE

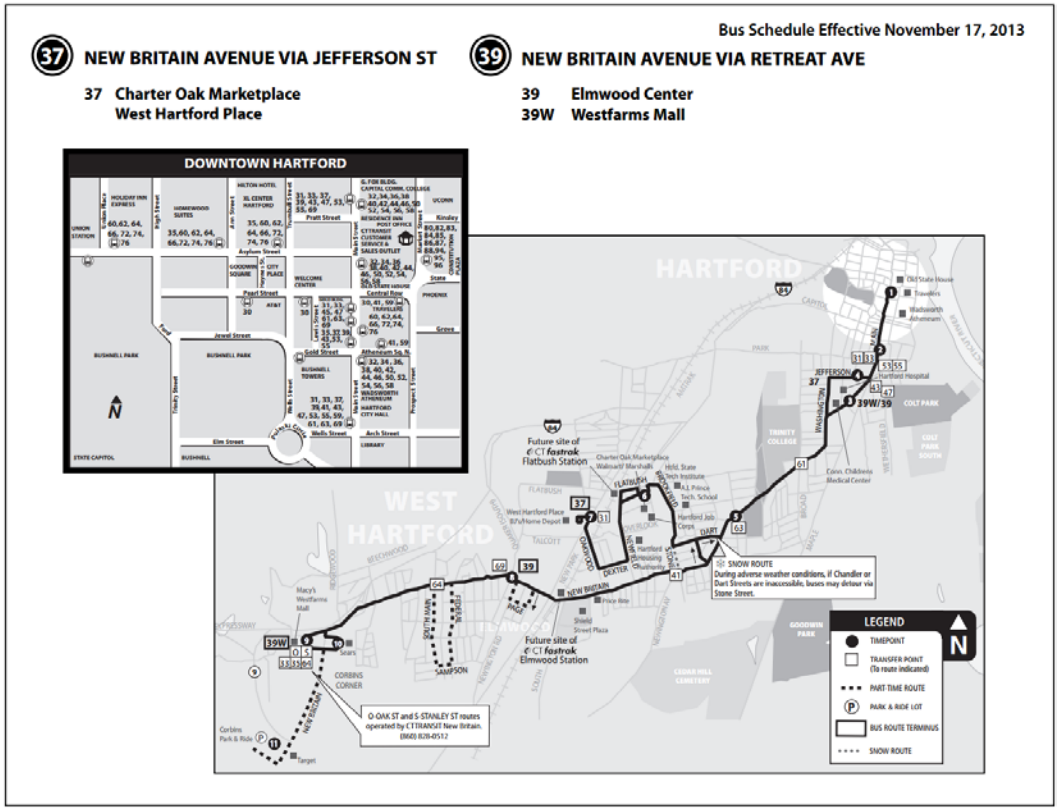
37 | New Britain Ave via Jefferson

39 | New Britain Ave via Retreat Avenue

Service Design

Routes 37 and 39 operate along New Britain Avenue providing radial service between downtown Hartford and the Town of West Hartford (see Figure 1). The two routes function as variants of a single service, with a common alignment and unique outer ends. Route 37 travels west as far as Chandler Avenue, where it turns north to serve the Charter Oak Marketplace and West Hartford Place. Route 39 continues along New Britain Avenue, serving Elmwood Center and Westfarms Mall. Both Route 37 and Route 39 will serve CT***fastrak*** stations: Route 37 will stop near Flatbush Station near the Charter Oak Marketplace and Route 39 will serve Elmwood Station near Shield Street Plaza.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Routes 37 and 39 begin/end in downtown Hartford where riders can transfer to nearly most CT***transit*** services. In addition, Route 37 serves Charter Oak Marketplace/West Hartford Place in West Hartford, where there are transfer opportunities to Route 31; this location will also become the CT***fastrak*** Flatbush Station, allowing riders to connect to CT***fastrak*** service. Passengers traveling on Route 39 can connect to CT***fastrak*** service at Elmwood Station or continue to Corbins Corner/Westfarms Mall, where there are connections to several CT***transit*** Hartford service (Routes 33, 35, and 64) as well as CT***transit*** New Britain service (Routes O and S). In addition, there are several locations along New Britain Avenue where riders can transfer to other CT***transit*** routes (see Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 31	Park Street and New Park Avenue
Route 33	Park Street and Park Road
Route 41	New Britain
Route 43	Campfield Avenue
Route 47	Franklin Avenue
Route 53	Westherfield Avenue
Route 55	Middletown
Route 61	Broad Street
Route 63	Hillsdale Avenue

Alignments and Service Patterns

Both Route 37 and Route 39 travel outbound from downtown Hartford beginning near the Center Church at Main and Gold Street. Buses operate primarily along Main Street, Jefferson Street, Washington Street, and New Britain Avenue. Route 37 heads northwest off of New Britain Avenue at Dart Street, and continues on Brookfield Street, Mahoney Drive, Newfield Avenue, Dexter Avenue, and Oakwood Avenue. Route 39 includes two alignments: Route 39 and 39W. Route 39 continues on New Britain Avenue and ends at Elmwood Center. Route 39W continues west to the Westfarms Mall Transit Hub. Buses only operate as Route 39W when traveling outbound to Westfarms; inbound buses from both Westfarms and Elmwood Center operate as Route 39.

Inbound trips for both routes follow a nearly identical alignment with only two slight deviations due to one way street segments. Saturday and Sunday trips follow the same alignment as weekday trips.

Service Schedule

Route 37 and Route 39 operate seven days a week. There are 57 total outbound trips per weekday (22 on Route 37, 9 on Route 39, and 26 on Route 39W), and 62 inbound trips (25 on Route 37 and 37 on Route 39). Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM. Along the common alignment, peak period frequency is between 10 and 20 minutes. Midday service operates every 20 minutes. Service levels are lower on the unique portions of the individual routes (i.e. to Westfarms Mall).

There are 37 outbound trips (11 on Route 37 and 26 on Route 39W) and 42 inbound trips (13 on Route 37 and 29 on Route 39) on Saturdays, meaning a bus leaves each stop roughly every 20 minutes. There are also two additional outbound and inbound trips on Saturdays between Thanksgiving and December 31.

Route 39W operates 10 outbound trips and 11 inbound trips on Sundays, with one additional inbound trip between Thanksgiving and December 31. Route 37 only operates a single outbound trip and a single inbound trip on Sundays, with one additional trip per direction between Thanksgiving and December 31.

FIGURE 3 | SCHEDULE OVERVIEW (ALL ROUTES 37, 39 AND 39W)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	4:29 AM – 12:21 AM	10 / 20	22/25
Saturday	7:51 AM – 12:08 PM	20 / 30	11/13
Sunday	7:40 AM – 9:10 PM	70	1/1

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

CT***transit*** tracks ridership for Route 37 and Route 39 (and 39W) together, so the following analysis of ridership and productivity treats the two routes as a single service. Route 37/39 carries 3,018 daily passengers or 25.6 passengers per trip on an average weekday, which is more than 40% higher than the Hartford Division average of 17.7 weekday passengers per trip.

Saturday and Sunday ridership per trip are also high relative to the division average (see Figure 4). This is a reflection of the retail destinations served by both Route 37 and 39, which are popular weekend destinations.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 37/39	ROUTE 37/39	DIVISION AVG
Weekday	3,018	25.6	17.7
Saturday	1,801	23.4	16.3
Sunday	732	31.8	17.6

Source: CTtransit performance data

Ridership by Stop

The most heavily used stop on Route 37/39 is its downtown terminus of Main Street and Gold Street. Outside of the downtown, there are several stops that generate 50 or more boardings or alightings per day (see Figure 5 and 6).

FIGURE 5 | ROUTE 37/39 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Westfarms Mall	224 / 0	Several major retailers
Corbins Corner Shops / Sears	66 / 11	Sears, Trader Joe's and several other retailers
New Britain Avenue / Newington Road	72 / 19	Elmwood Senior Center and Walgreens
New Britain Avenue / South Street	85 / 97	Shield Street Plaza
New Britain Avenue / Hillcrest Avenue	93 / 11	PriceRite Supermarket
Charter Oak Market / Wal-Mart	7 / 71	Wal-Mart and several other retailers
New Britain Avenue / Hillside Avenue	153 / 48	Hartford Public Library branch and a neighborhood retail strip
New Britain Avenue / Zion Street	43 / 12	Southwest Recreation Center
New Britain Avenue / Broad Street	60 / 49	Transfer point for Routes 61 and 41
New Britain Avenue / Washington Street	76 / 51	Institute of Living mental health facility
100 Retreat Avenue	36 / 16	Hartford Hospital
Main Street / Park Street	97 / 128	Transfer point for Routes 31, 33, 37, 39, 53, and 55
Main Street / Buckingham Street	39 / 55	Hands on Hartford food and housing services
Main Street / Arch Street	22 / 64	Hartford Public Library and Hartford City Hall
Main Street / Athenaeum Square N	237 / 599	Wadsworth Athenaeum Museum of Art
Main Street / Old State House	1 / 260	Connecticut's Old State House

Load profile data (see Figure 6) combines passenger activity by stop and shows the cumulative passenger load as the bus travels outbound along its route. Ridership by stop without the cumulative load is mapped in Figure 5. The data for Route 37/39 shows inbound passenger loads peak near Hartford Hospital and Connecticut Children's Medical Center, and decline quickly as buses enter downtown.

The load profile in Figure 6 is not continuous because some stops are served by all variants, while others are served by Route 37 or Route 39 only. Each variant is labeled accordingly in Figure 6.

Figure 7 shows that ridership activity is higher at the Wal-Mart on Route 37 than at Westfarms Mall on Route 39. This is significant to note because Route 39 (consisting of two sub-varients) is served more than twice as often as Route 37.

FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

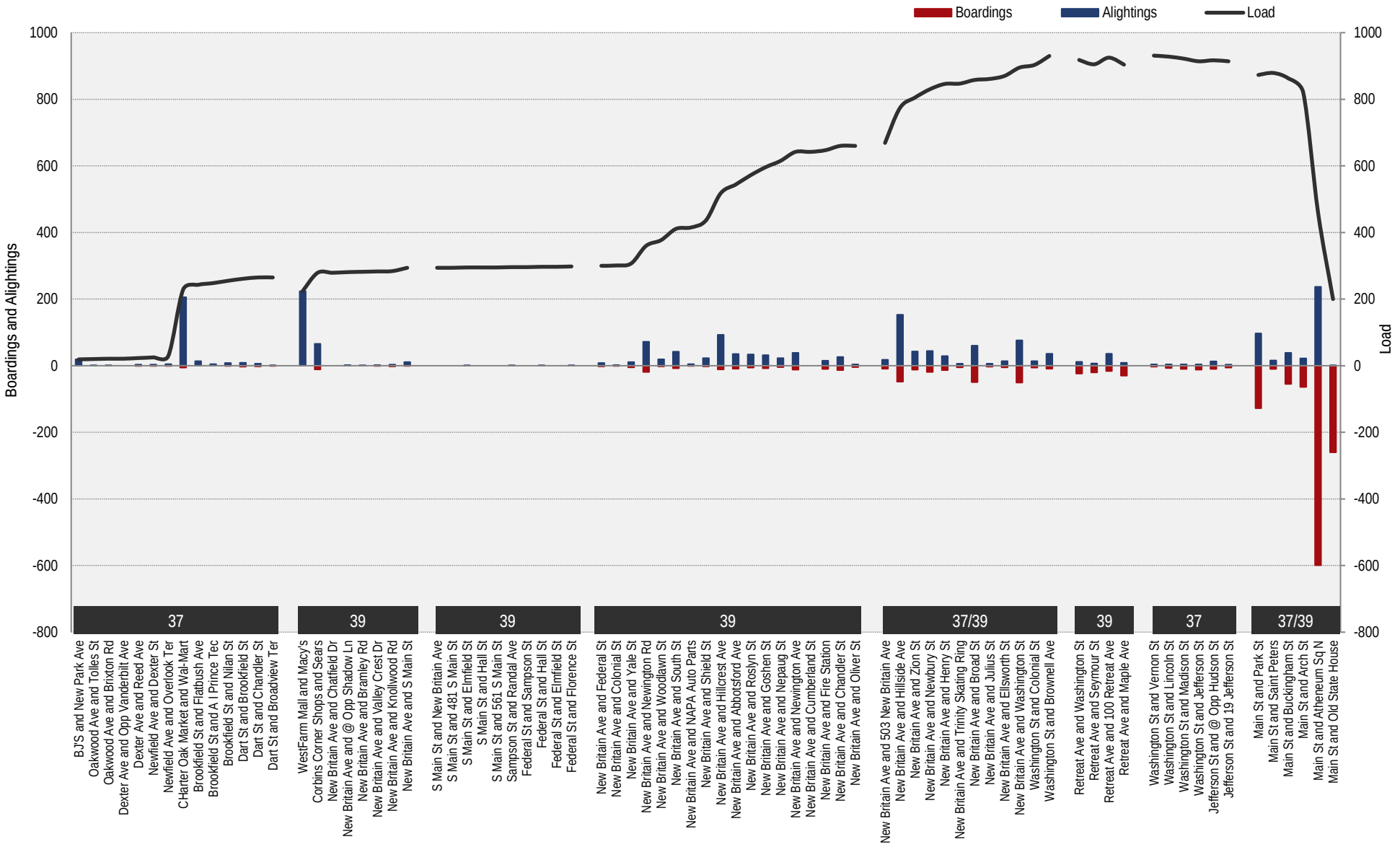
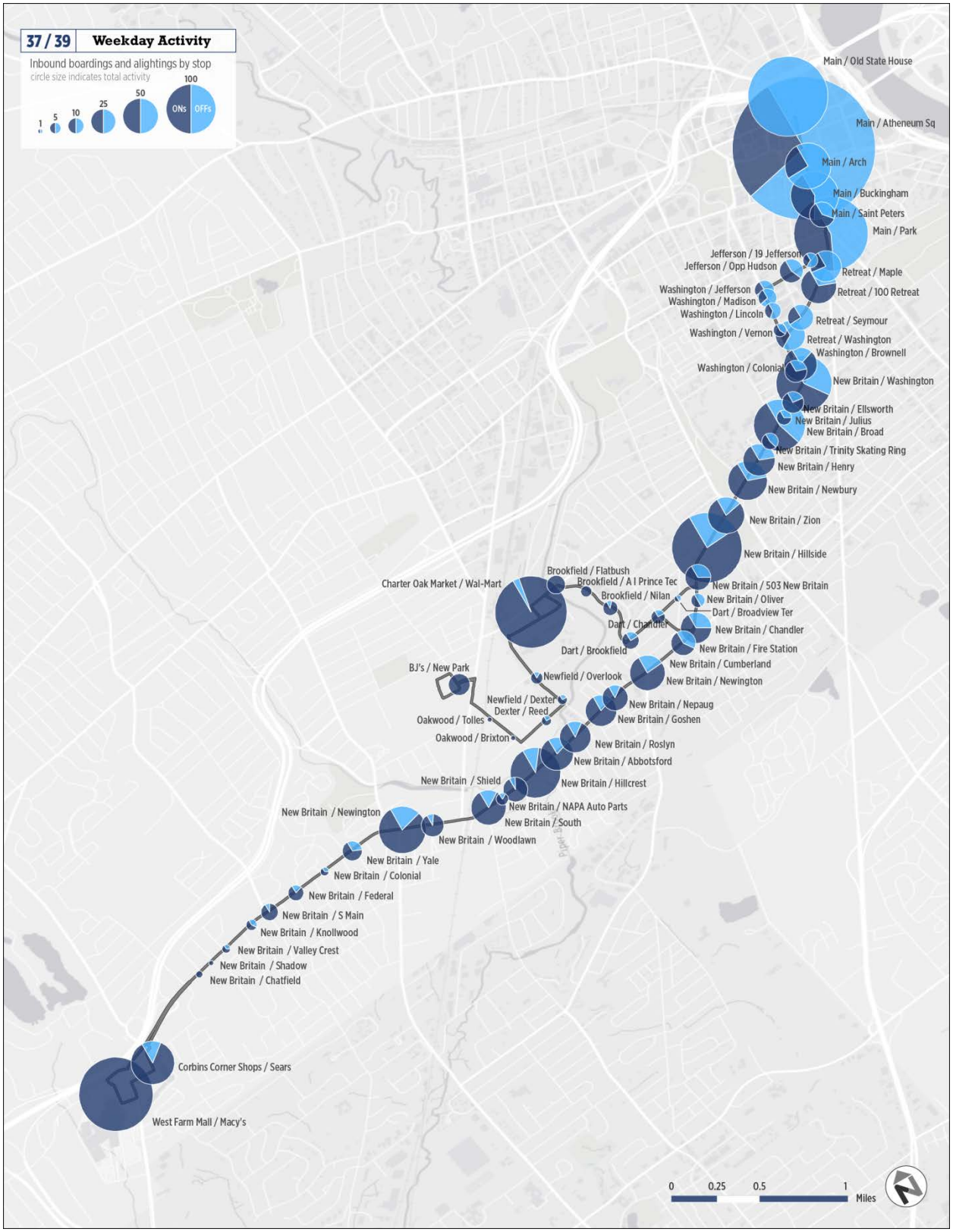


FIGURE 7 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Route 37/39 carries an average of 25.6 passengers per trip on weekdays. Demand is well balanced between inbound and outbound for most of the day (see Figures 8 and 9). Ridership is also fairly heavy throughout the day, except for early morning and late night trips. Constant activity throughout the day suggests Route 37/39 serves trips types and users.

Although some trips have more than 50 boardings, maximum loads never exceed 40 passengers, which is the typical seating capacity of a 40-foot transit bus.

FIGURE 8 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

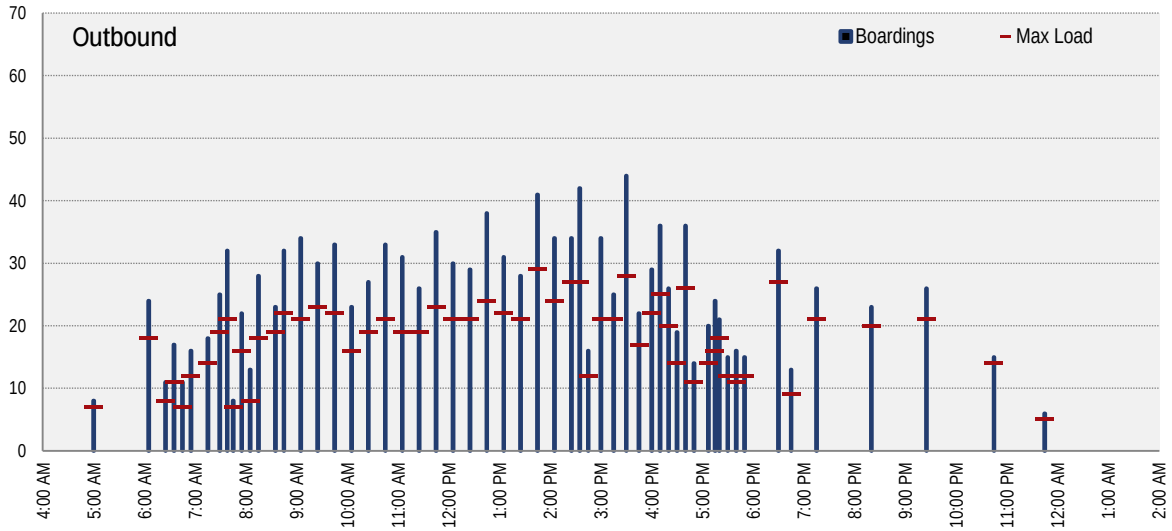
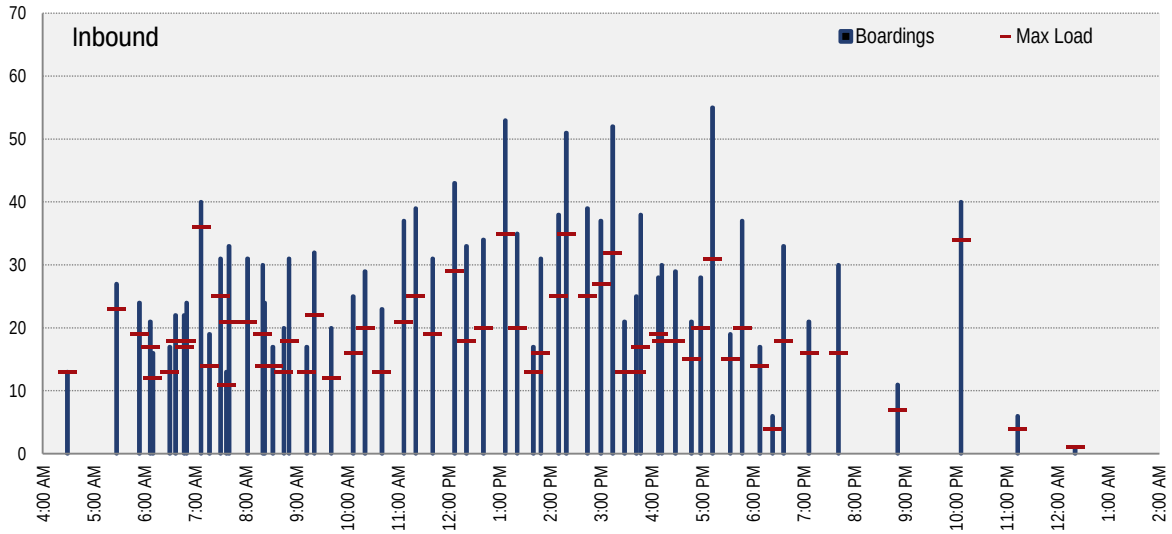


FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Saturday service is strong with most trips carrying between 20 and 30 riders. Demand is also relatively constant in the outbound direction. Data for the inbound trips show that ridership is heavier towards the end of the day, potentially reflecting passengers returning from the retail destinations where they work and shop. Ridership is highest on the last inbound trip of the day, suggesting demand for even later service on Saturdays. Ridership is also high on the first inbound trip of the day, indicating a need for earlier service.

FIGURE 10 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

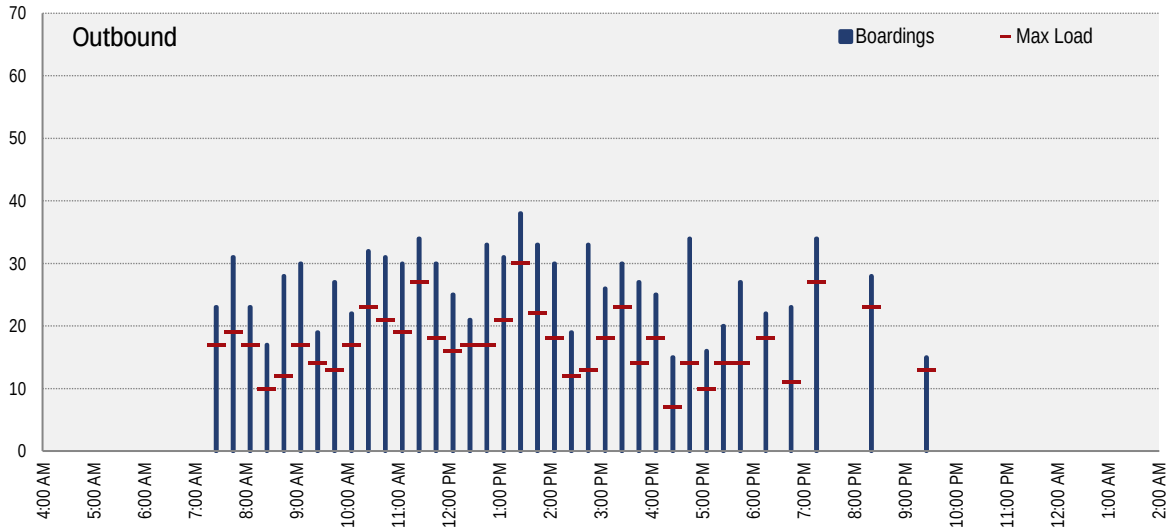
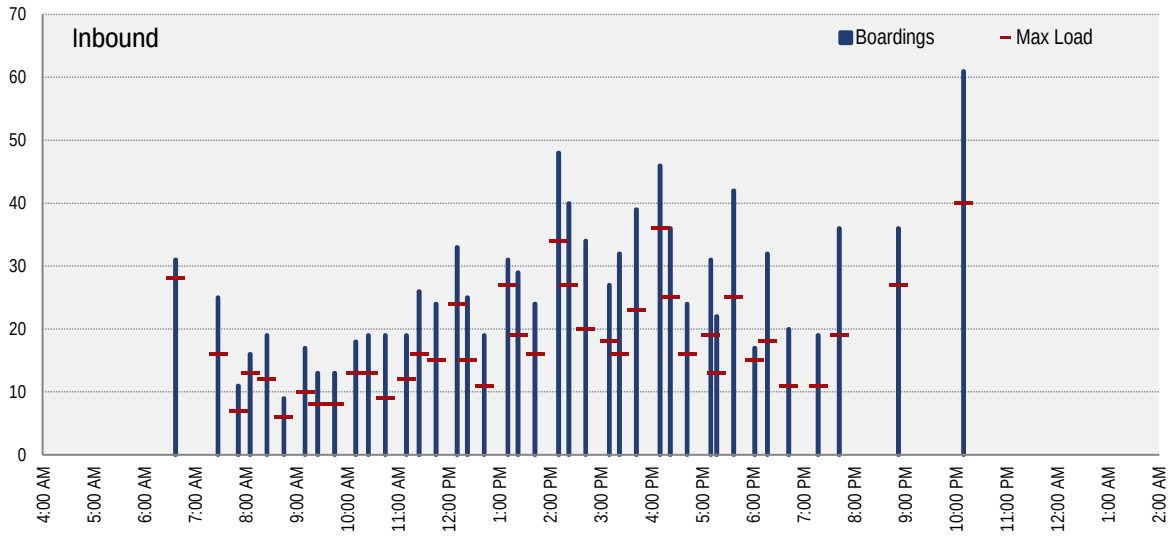


FIGURE 11 | SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

Sunday ridership follows a similar pattern with the Saturday service; outbound ridership peaks in the morning and inbound ridership peaks in the afternoon. Outbound demand is also high on the first trip of the day, suggesting a need for an earlier trip, while inbound demand is strongest in late afternoon. The last trip of the day carries fewer than ten riders.

FIGURE 12 | SUNDAY OUTBOUND RIDERSHIP BY TRIP

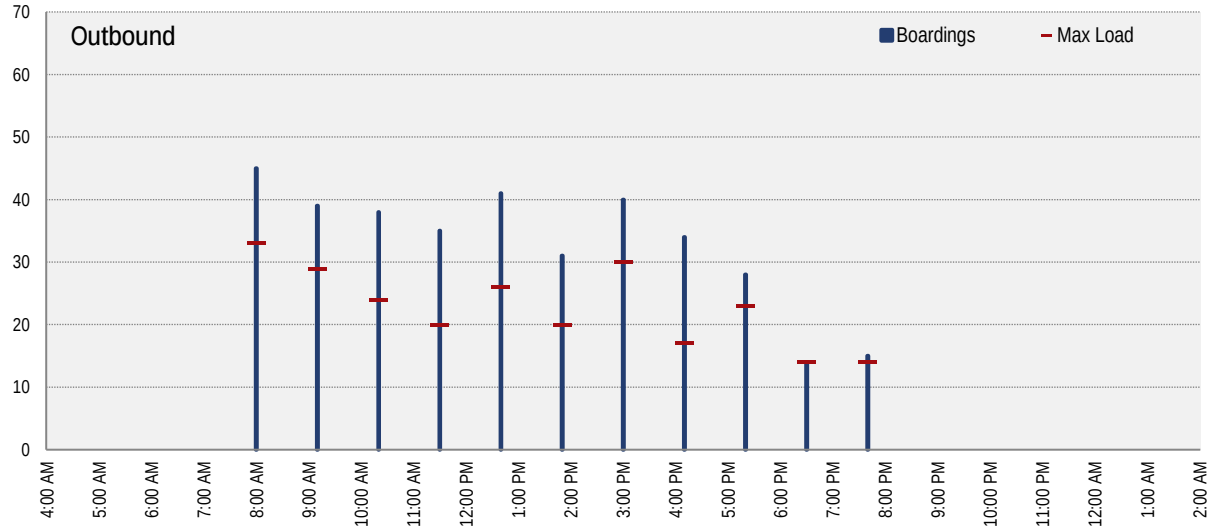
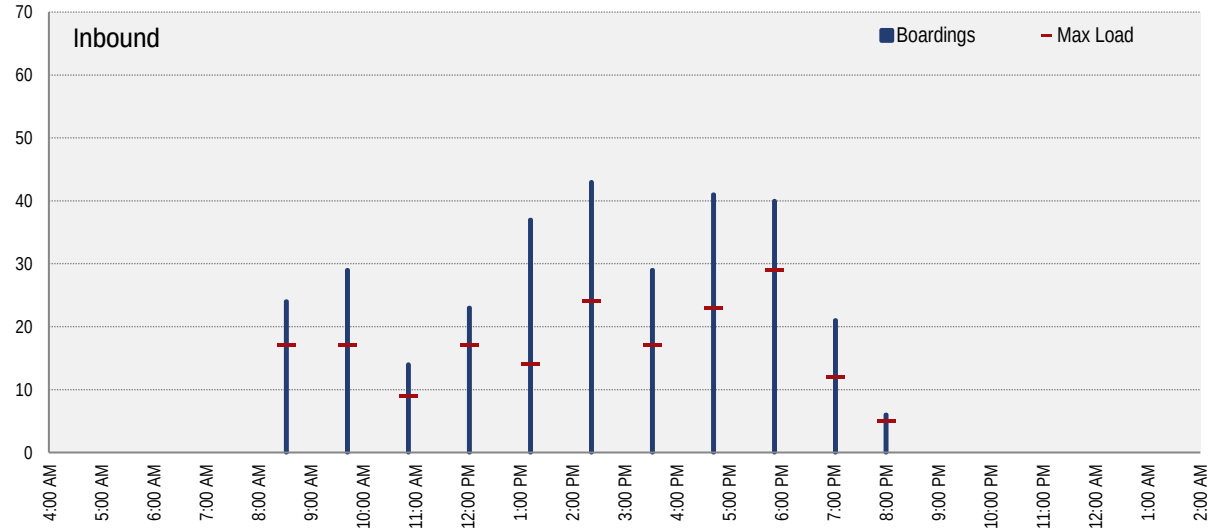


FIGURE 13 | SUNDAY INBOUND RIDERSHIP BY TRIP



Performance

Route 37/39 exceeds the Hartford Division average for both passengers per revenue hour and passengers per revenue miles on all service days (see Figure 14). The route also has a significantly lower cost per passenger than the division average, particularly on weekends. Again, this is a function of the route's ability to attract weekend shoppers.

FIGURE 14 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 37/39	DIVISION AVG	ROUTE 37/39	DIVISION AVG	ROUTE 37/39	DIVISION AVG
Operating Cost per Passenger	$3.16	$4.84	$3.32	$6.30	$2.34	$6.66
Passengers per Revenue Vehicle Hour	40.5	28.9	38.6	27.0	54.8	29.7
Passengers per Revenue Vehicle Mile	4.4	2.6	3.9	2.4	5.3	2.9

Source: CTtransit performance data

Route 37/39 has a 78% on-time arrival rate, with a slightly higher percentage of late buses than the Hartford Division average (see Figure 15). This may suggest insufficient recovery time to consistently provide on-time service on the route.

FIGURE 15 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 37/39	DIVISION AVG
Early	0.1%	0.2%
Late	21.9%	18.9%
On-Time	78.0%	80.9%

Source: CTtransit performance data

FIGURE 16 | WEEKDAY OPERATING COST PER PASSENGER

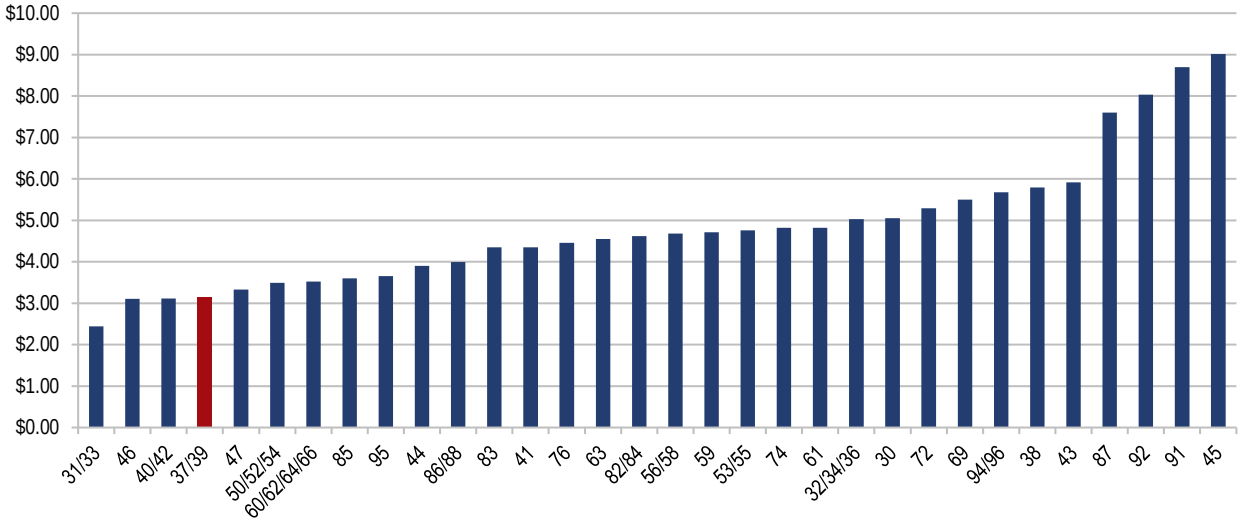
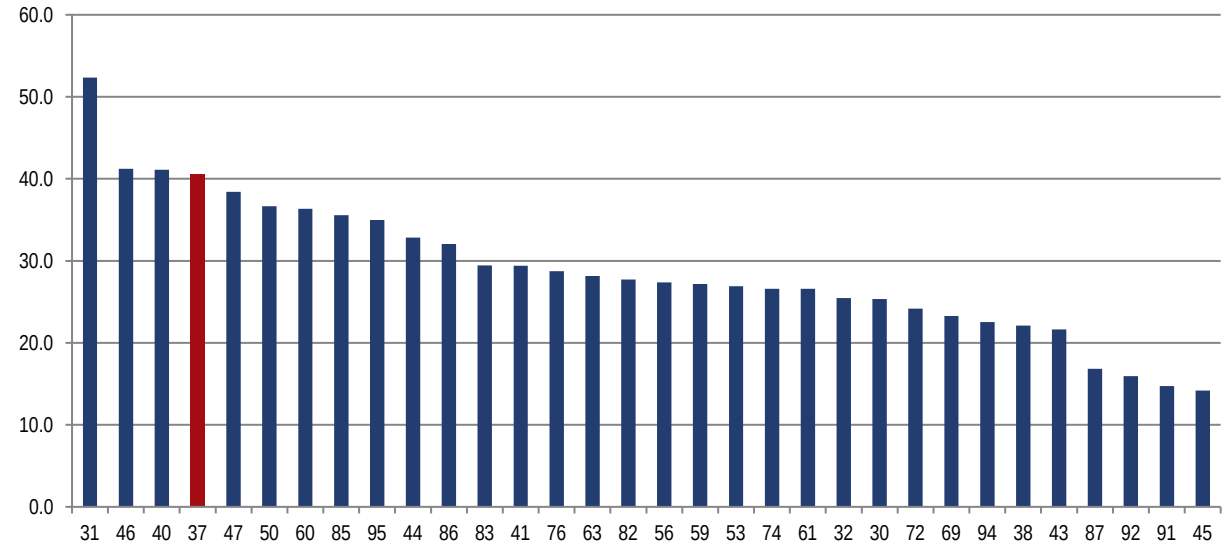


FIGURE 17 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT

Route 37/39 is a radial route that is productive and carries many riders. The route is direct and easy to understand. The common alignment between downtown Hartford and Chandler/Dart Streets has very strong ridership. The Charter Oak Market is also a strong destination and, outside of downtown Hartford, is the highest ridership stop along the route. Route 39's unique alignment along New Britain Avenue is also carries a lot of riders. It is also worth noting that Route 37/39 receives some funding through CRCOG's job access program.

CT*fastrak*

Implementation of CT***fastrak*** will impact Route 37/39 as the route will connect with CT***fastrak*** at the Flatbush and Elmwood stations. The biggest impact maybe to Route 37, as riders destined for Charter Oak Market may choose to use CT***fastrak*** for faster, more direct service; a smaller group of riders destined for the Elmwood area may also choose CT***fastrak***. Most other riders, however, will likely continue to use Route 37/39 for connections to destinations along New Britain Avenue.

Another impact associated with the opening of CT***fastrak*** is the new local Route 128. This route will travel on the CT***fastrak*** until Flatbush Station and then will travel via New Park Avenue and New Britain Avenue to Westfarms Mall.

- Route 128: the CT***fastrak*** service plan includes a new local Route 128 that will connect downtown Hartford with the Westfarms Mall, traveling via CT***fastrak*** to Flatbush Station and then operating to Westfarms Mall via New Park and New Britain Avenues. From Westfarms Mall, Route 128 will continue to New Britain. The service is scheduled to operate daily with weekday service operating from 4:20 AM to 11:40 PM; frequencies are scheduled for 20 minutes peak, 30 minutes mid-day and 60 minutes in the evening. Saturday service is also extensive; service begins at 4:10 AM and continues until 11:40 PM with 30 minute service all day and 60 minutes in the evening. Sunday's schedule is somewhat shorter (6:40 AM to 8:40 PM) with hourly service all day.

Service Improvement Options

Given the CT***fastrak*** investment in service along the western end of Route 37, opportunities to strengthen the route further include the following:

- **Truncate Route 37 variant at the future Flatbush Station**. Ridership on Route 37 falls off significantly past Wal-Mart. Service along Newfield Avenue, Dexter Avenue, Oakwood Avenue, and to the BJ's Wholesale Club would be more appropriate as a stand-alone circulator anchored at Flatbush Station (see below). Service west of Flatbush Station will be served by CT***fastrak*** Route 128.
- **Eliminate Route 39 W variants off of New Britain Avenue.** Route 39W currently travels off of New Britain Avenue twice: 1) to serve Page Street and 2) to serve Sampson Street. There are a handful of riders getting on/off Page Street and because the neighborhood is served as part of a terminal loop on Route 39, few passengers are inconvenienced. However, there are hardly any riders getting on/off on the Sampson Street deviation; this segment could be eliminated, improving the route's speed and reliability.
- **Serve area around Flatbush Station with Flex Route or Community Circulator.** Route 37 currently travels through the neighborhood between New Britain Avenue and Charter Oak Marketplace. Part of this alignment is located roughly one block from New Britain Avenue. While Route 37 should still travel to Charter Oak Marketplace, the portion of the route through the neighborhood may be served by a Flex Route or community circulator. Generally ridership on

neighborhood streets is low. Riders traveling inbound to Hartford could access faster service by walking one block to New Britain Avenue. A Flex Route or community circulator could serve people traveling from neighborhoods to the shopping at Charter Oak as well as provide connections to Flatbush Station.

- **Combine all three services into a single route with three deviations, i.e. 37 A Charter Oaks/Flatbush Station; 37 B Elmwood Center/Elmwood Station; and 37 C Westfarms Mall.** Tying the three routes together with a single name and labeling each variant with a separate letter (and name) would make the route easier to understand and use for riders.
- **Coordinate schedules.** If routes are combined into a single route, or even if they are not, the schedules of the three routes could be coordinated and operated with a clockface schedule. This means that Route 39 would operate at (for example) 9:00, Route 39 at 9:20 and Route 39 W at 9:40. While each route would have hourly frequency, the common alignment along New Britain Avenue would have 20 minute service.
- **Eliminate weekday service after 11:00 pm.** Ridership figures show that later service is lightly used. Eliminating these trips can improve the overall productivity of the route.
- **Increase weekend service.** Ridership data suggests there is demand for additional early morning service on both Saturdays and Sundays and later service on Saturday nights. High demand on the first or last trip of the day suggests pent-up demand for additional service.

Route Evaluation

WESTON STREET

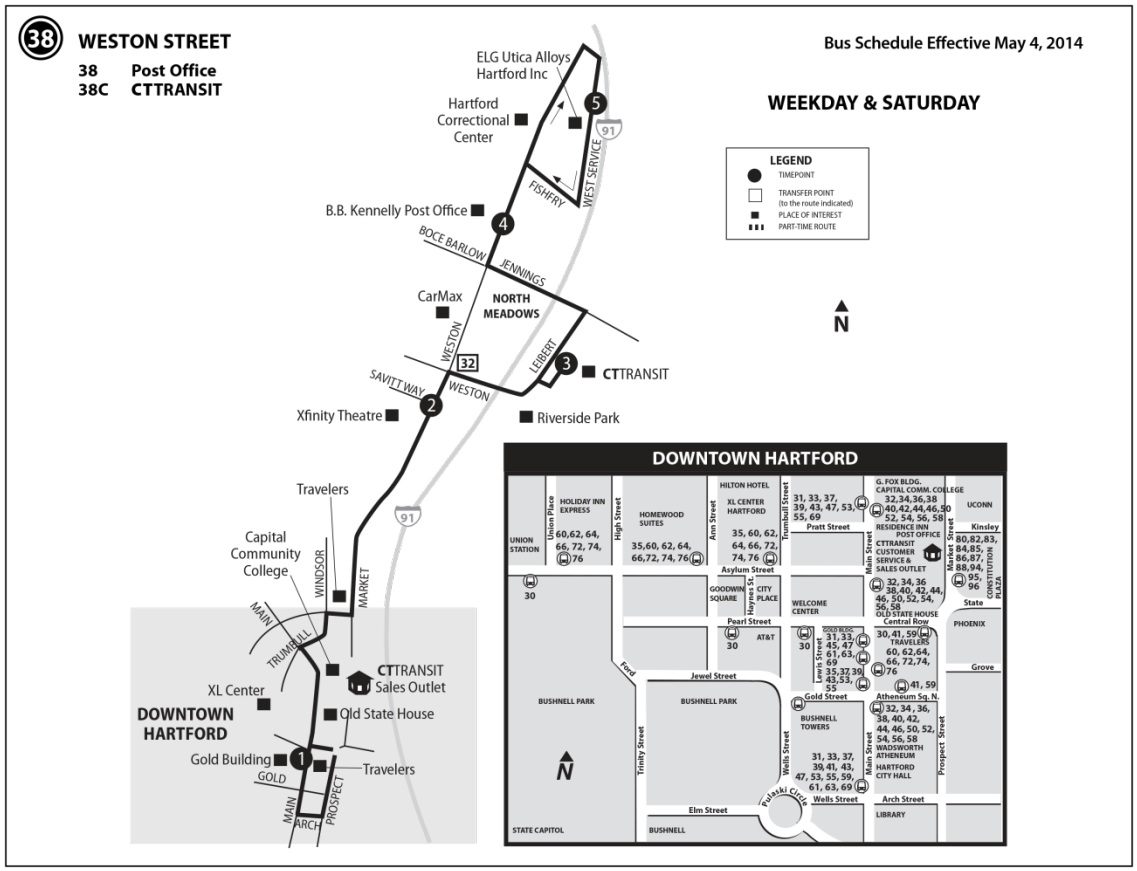
38 | Post Office

38C | CTTRANSIT

Service Design

Route 38 is a radial route that travels from downtown Hartford to the North Meadows neighborhood. The route serves the CT*transit* offices and garage, the B.B. Kennelly Post Office, the Hartford Correctional Center and ELG Utica Alloys. The route has one shorter variant, 38C, which terminates at CT*transit*.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 38 originates in downtown Hartford, where riders can connect to most CT*transit* routes. In addition, riders can connect to Route 32 at the intersection of Weston Street and Boce Barlow Way.

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 32	Windsor Avenue

Alignments and Service Patterns

All outbound trips on begin in downtown Hartford at the Old State House and travel north via Main Street. Buses turn right on Trumbull Street, left on Windsor Street, right on Pleasant Street, and left to head north on Market Street. Both variants continue north on Market Street past the Xfinity theatre, turning right on Leibert Road and pulling into the CT***transit*** offices and garage. Route 38C terminates at the garage and returns inbound via the same route.

Route 38 trips continue north of CT***transit*** by turning right on Leibert Road, left on Boce Barlow Way and right on Weston Street. The northernmost portion of the route operates as a loop, traveling north on Weston Street past the Hartford Correctional Institute, then turning right to head south via a loop on W. Service Road and Fishfry Street to return to Weston Street. Buses then continue inbound via the CTt***ransit*** offices on Leibert Road and into downtown using the same route.

Service Schedule

Route 38 operates seven days a week. On weekdays, there are 35 total outbound trips (20 on Route 38 and 15 on Route 38C) and 35 total inbound trips (20 on Route 38 and 15 on Route 38C). Service operates every 30 minutes during the morning and then operates every 20 minutes from 10:00 a.m. to 3:00 p.m. During the evening peak, frequency returns to every 30 minutes. The shorter 38C variant terminating at the CT***transit*** facility mostly runs during the mid-day hours, with one early inbound AM trip and several evening outbound trips after 6 PM.

Saturday and Sunday service operates exclusively as 38C. On Saturday, there are 23 outbound trips and 22 inbound trips, meaning a bus leaves each stop approximately every 30 minutes. On Sunday, there are 8 outbound trips and 8 inbound trips, which operate every 70 minutes.

FIGURE 3 | SCHEDULE OVERVIEW (ALL ROUTES 38 AND 38C)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:00 AM – 7:22 AM	30/20	35/35
Saturday	7:05 AM – 11:20 PM	30	23/22
Sunday	7:30 AM – 8:05 PM	70	8/8

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

*Source: CT**transit** route schedules*

Ridership by Service Day

Routes 38/38C carries about 517 passengers per weekday or about 7.4 passengers per trip. This is significantly below the Hartford Division average of 17.6 passengers per trip (see Figure 4). On Saturday,

Route 38C carries only 2.6 passengers per trip, which is extremely low compared to the division average. On Sunday, Route 38C carries about 10.5 passengers per trip, which is still low, but higher than both the weekday and Saturday averages. This is perhaps due to the limited number of trips and the fact several relatively strong trip generators are located in the North Meadows area.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 38	ROUTE 38	DIVISION AVG
Weekday	517	7.4	17.7
Saturday	117	2.6	16.3
Sunday	168	10.5	17.6

Source: CTtransit performance data

Ridership by Stop

The most heavily used stops on Route 38 are in downtown Hartford at Main Street and Pratt Street, and on Central Row. In total, about 363 passengers board or alight at downtown stops, indicating nearly all riders originate or end their trips downtown.

Two other stops generate 50 or more boardings or alightings per day (see Figure 5). These include the Hartford Correctional Center on Weston Street, and the CT***transit*** administrative offices and main garage facility on Leibert Road. An opioid rehabilitation center on Weston Street (inbound from the CT***transit*** garage) generates about 47 boardings and alightings per day.

FIGURE 5 | ROUTE 47 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Weston Street @ Correctional Center	71 / 0	State Correctional Facility
CT*transit* and 100 Leibert Road	66 / 0	CT*transit* administrative offices and main garage
Main Street / Pratt Street	19 / 162	Downtown Hartford and other CT*transit* routes
Central Row at Travelers	13 / 129	Downtown Hartford and other CT*transit* routes

Load profile data (see Figure 6) combines passenger activity by stop and shows the cumulative passenger load as the bus travels inbound along its route. Ridership by stop without the cumulative load is mapped in Figure 7. The data for Route 38 shows most boarding activity at the Correctional Center and CT***transit*** garage, and passenger loads peak on Trumbull Street before buses enter downtown Hartford.

The load profile in Figure 6 is not continuous because some stops are served by all variants, while others are served by one or two varients only. Each variant is labeled accordingly in Figure 6.

FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

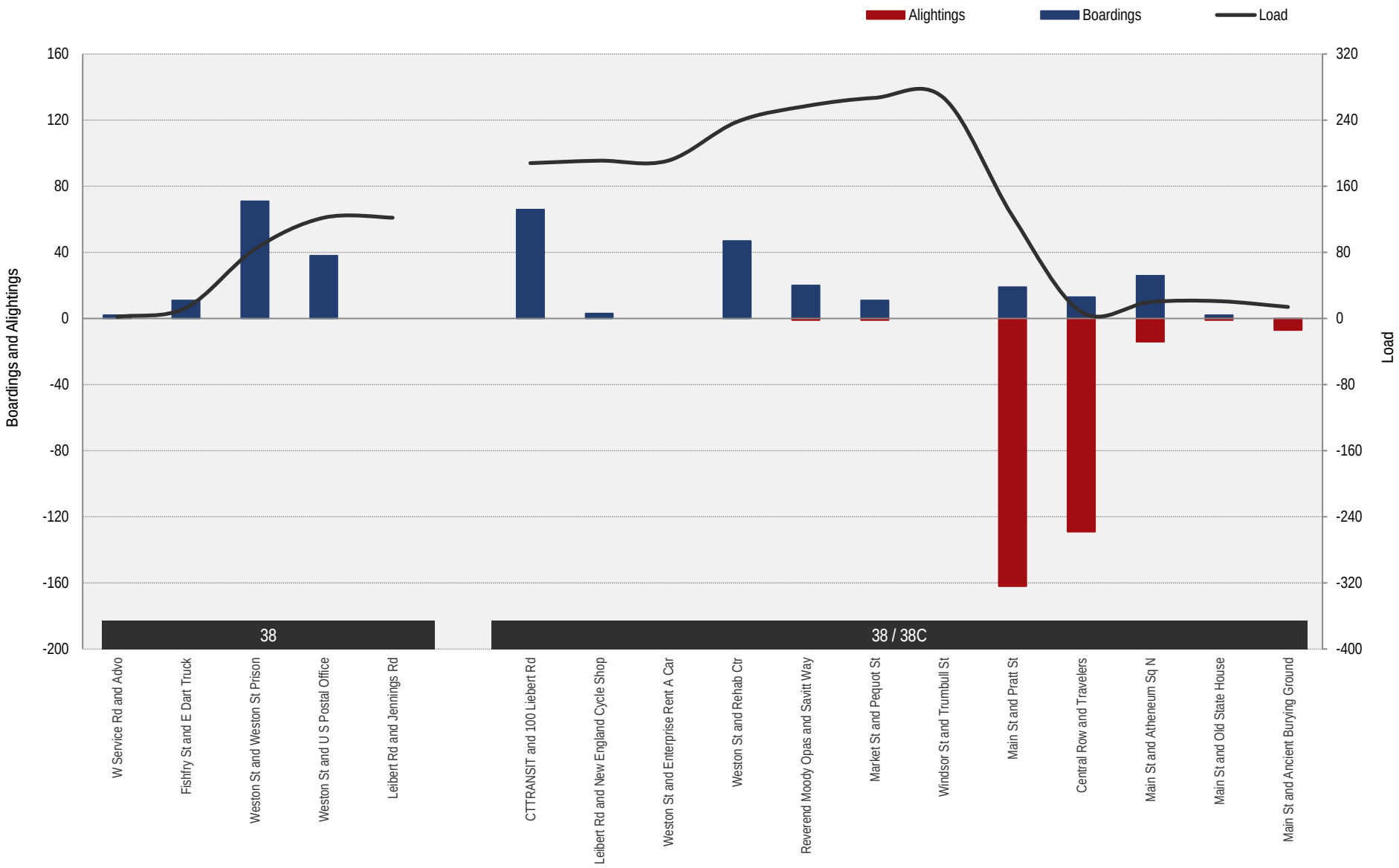
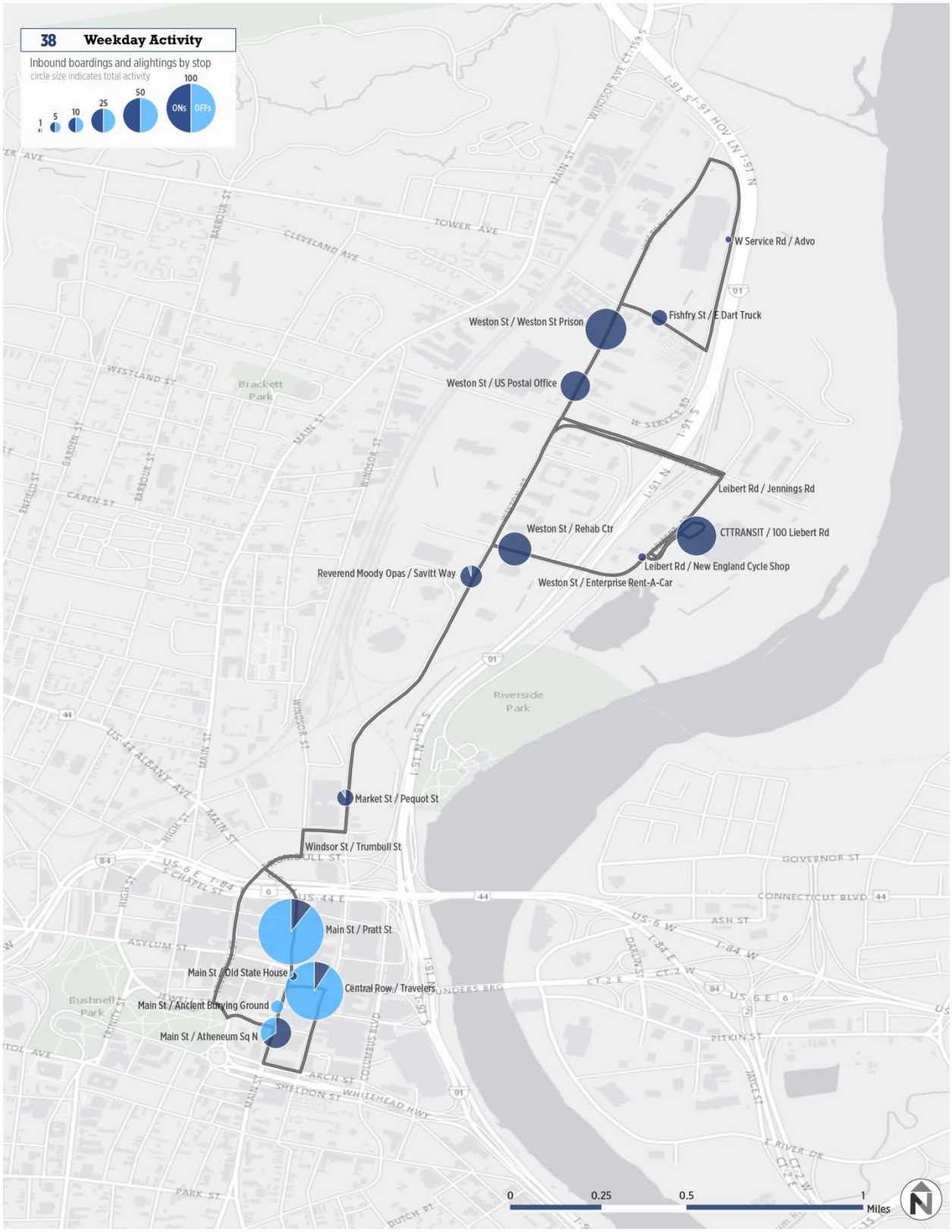


FIGURE 7 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Average weekday ridership per trip on Route 38 is 7.4 passengers. Demand peaks during the AM peak. This trend is true for travel in both directions, although it is stronger for outbound travel. Demand may reflect shift times at the correctional facility, workers headed to employment in the North Meadows neighborhood, and early morning visits to the opioid rehabilitation center. Demand stays fairly steady during the mid-day hours, particularly in the inbound direction.

Maximum loads are generally in the range of 10-15 passengers; with one AM outbound and one AM inbound trip exceeding 20 passengers.

FIGURE 8 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

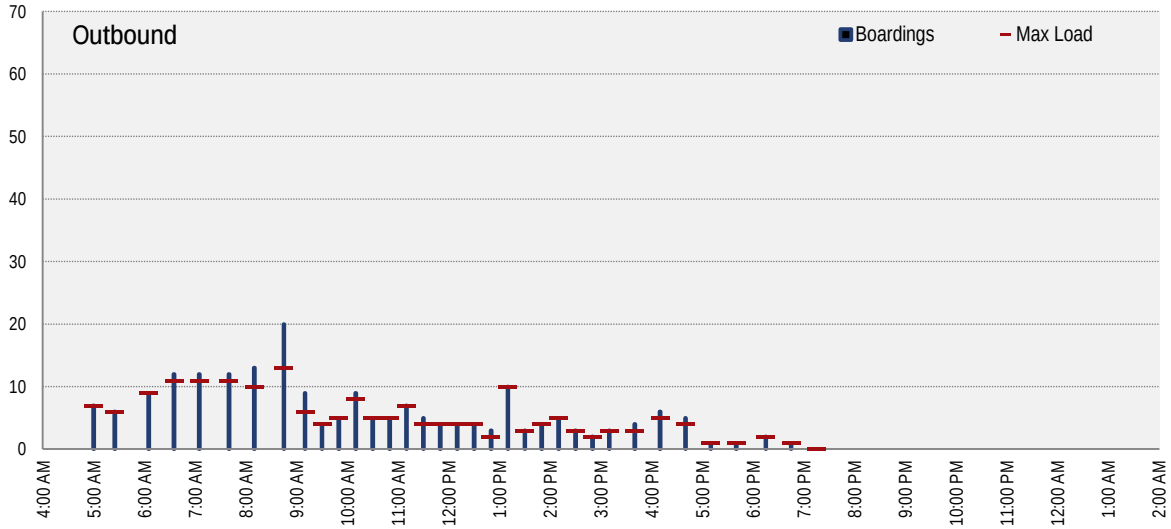
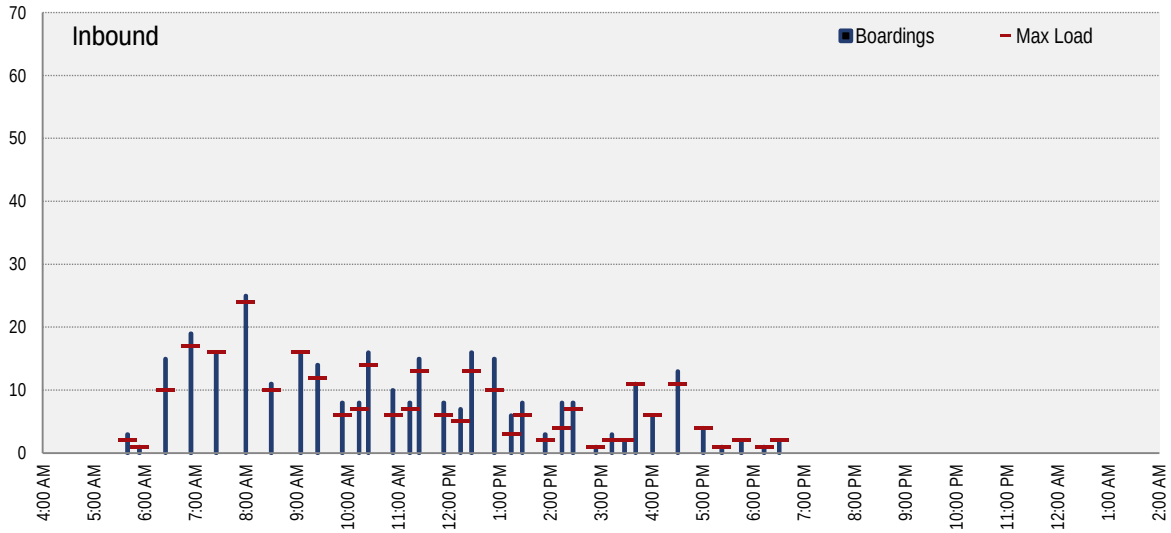


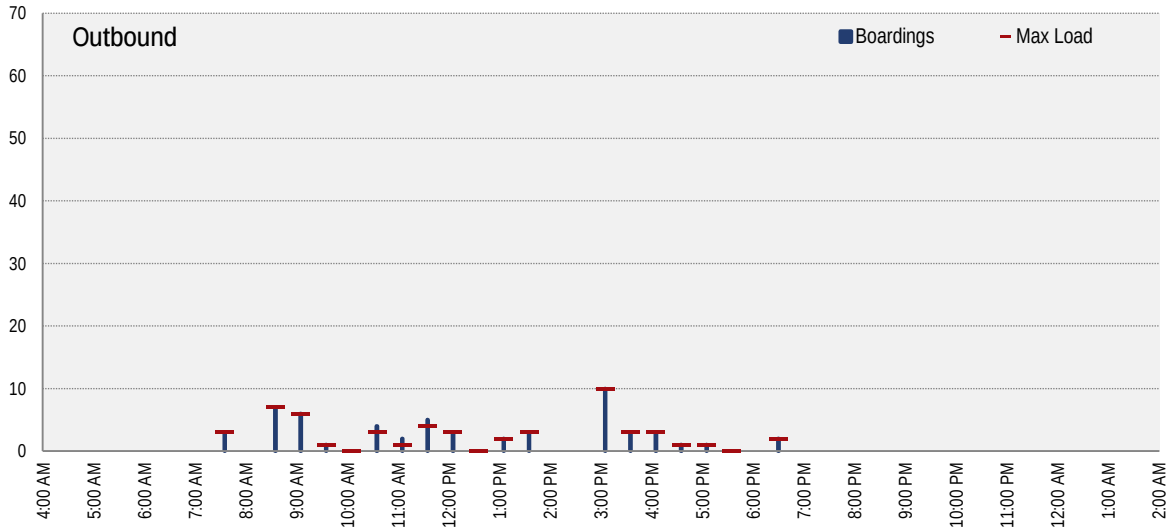
FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

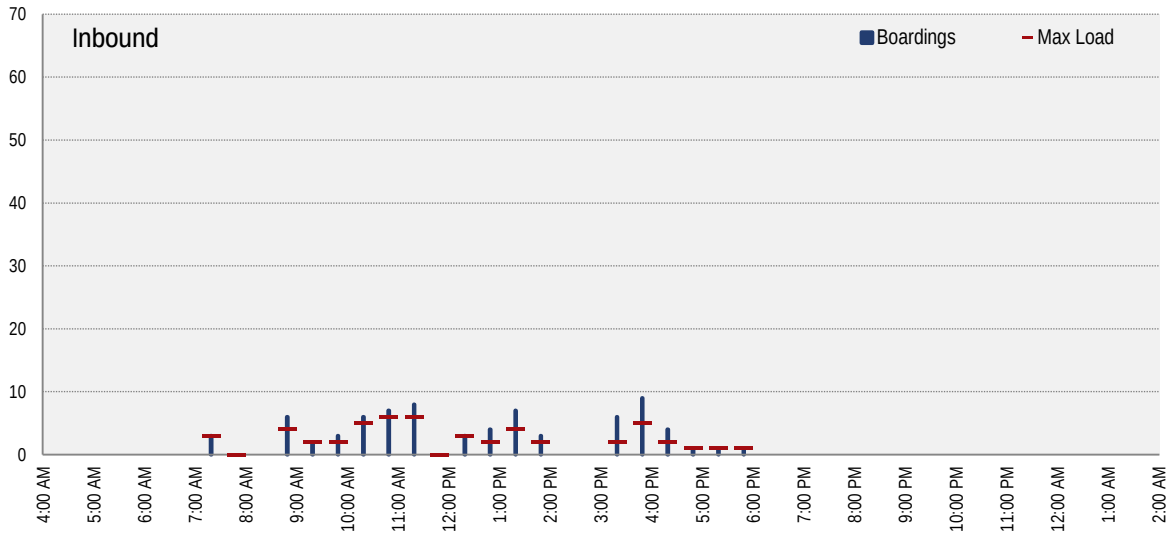
On Saturdays, all trips operate as Route 38C and carry an average of 2.6 passengers per trip. While not all trips are reflected in the charts below, ridership is extremely low and several trips have no riders. Only the 3:00 PM outbound trip carries 10 passengers.

FIGURE 10 | SATURDAY OUTBOUND RIDERSHIP BY TRIP



Note: Data missing for four outbound trips at 8:05 AM, 2:05 PM, 2:35 PM, and 6:05 PM.

FIGURE 11 | SATURDAY INBOUND RIDERSHIP BY TRIP

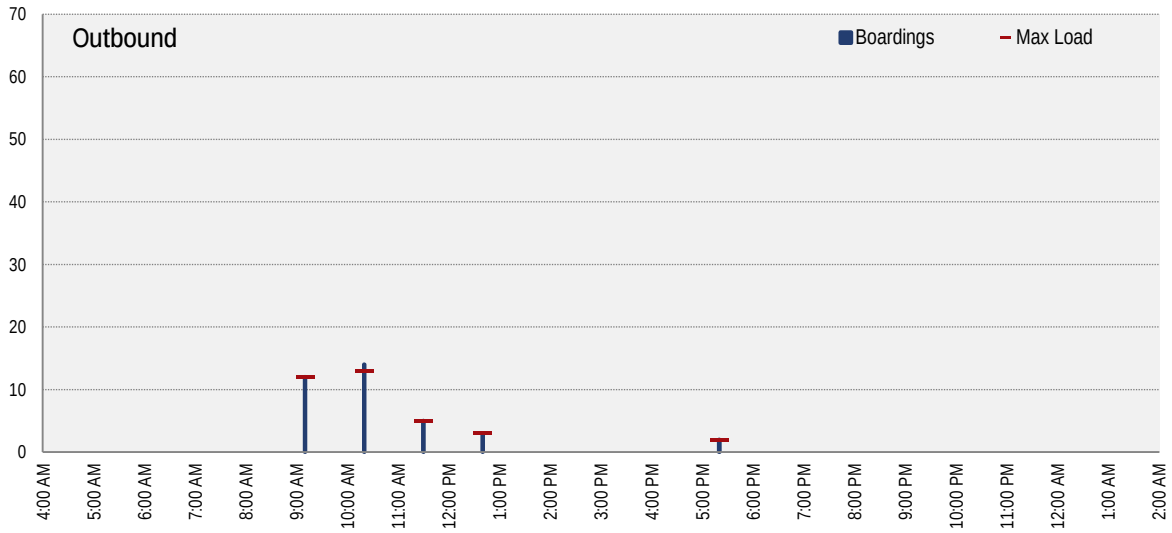


Note: Data missing for three inbound trips at 8:19 AM, 2:19 PM, and 2:49 PM.

Sunday

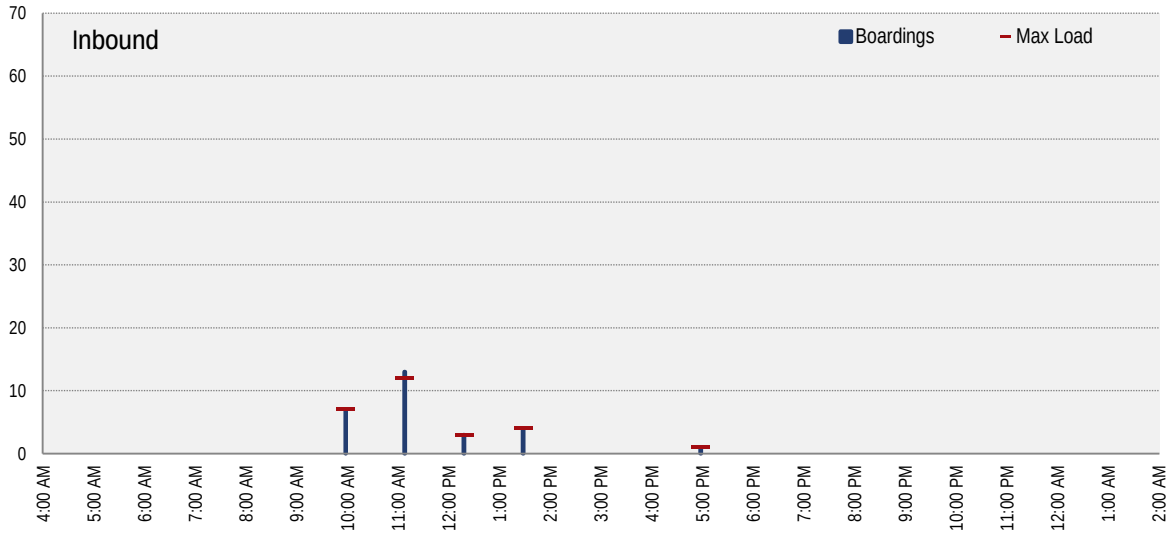
On Sundays, all trips operate as Route 38C and carry an average of 10.5 passengers per trip. While ridership is very low, only eight outbound and eight inbound trips are operated, resulting in passenger loads that are somewhat higher than on Saturday (and with several trips carrying more than 10 passengers).

FIGURE 12 | SUNDAY OUTBOUND RIDERSHIP BY TRIP



Note: No data for the 1:50 PM, 3:00 PM, and 4:10 PM outbound trips.

FIGURE 13 | SUNDAY INBOUND RIDERSHIP BY TRIP



Note: No data for the 8:48 AM, 2:38 PM, and 3:48 PM inbound trips.

Performance

With very low ridership, Route 38 performs well below the systemwide average in nearly all categories (see Figure 14). However, due to its short route, it is not as unproductive as might be expected. This is a result of the relatively short distance traveled by the route, and displayed in the relatively high passengers per vehicle mile. Sundays also compare favorably to other Hartford Division local routes, a likely result of the few trips offered and the presence of relatively strong Sunday trip generators in the North Meadows area.

FIGURE 14 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 38	DIVISION AVG	ROUTE 38	DIVISION AVG	ROUTE 38	DIVISION AVG
Operating Cost per Passenger	$5.79	$4.84	$12.03	$6.30	$6.65	$6.66
Passengers per Revenue Vehicle Hour	22.1	28.9	10.6	27.0	19.2	29.7
Passengers per Revenue Vehicle Mile	2.3	2.6	1.1	2.4	3.4	2.9

Source: CTtransit performance data

Overall, Route 38 has on-time performance that is slightly below other routes in the Hartford Division (see Figure 15); an estimated 23% of all trips on this route are late.

FIGURE 15 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 38	DIVISION AVG
Early	0.0%	0.2%
Late	23.0%	18.9%
On-Time	77.0%	80.9%

Source: CTtransit performance data

Figures 16 and 17 chart the combined weekday performance for Route 38 relative to other local routes in the Hartford Division, displaying weekday performance in terms of operating cost per passenger and passengers per revenue hour that well below average.

FIGURE 16 | WEEKDAY OPERATING COST PER PASSENGER

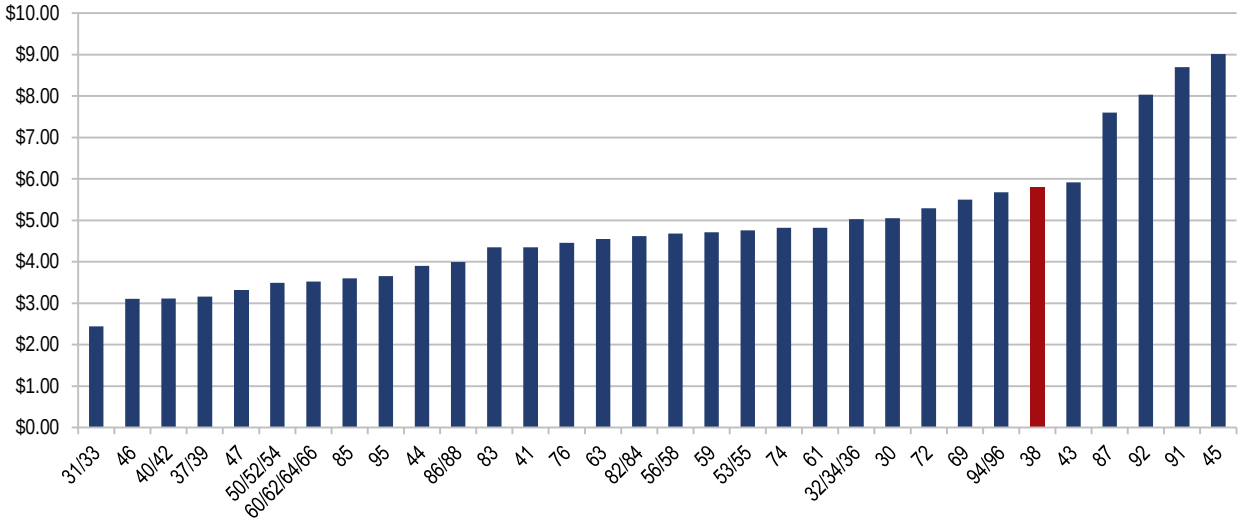
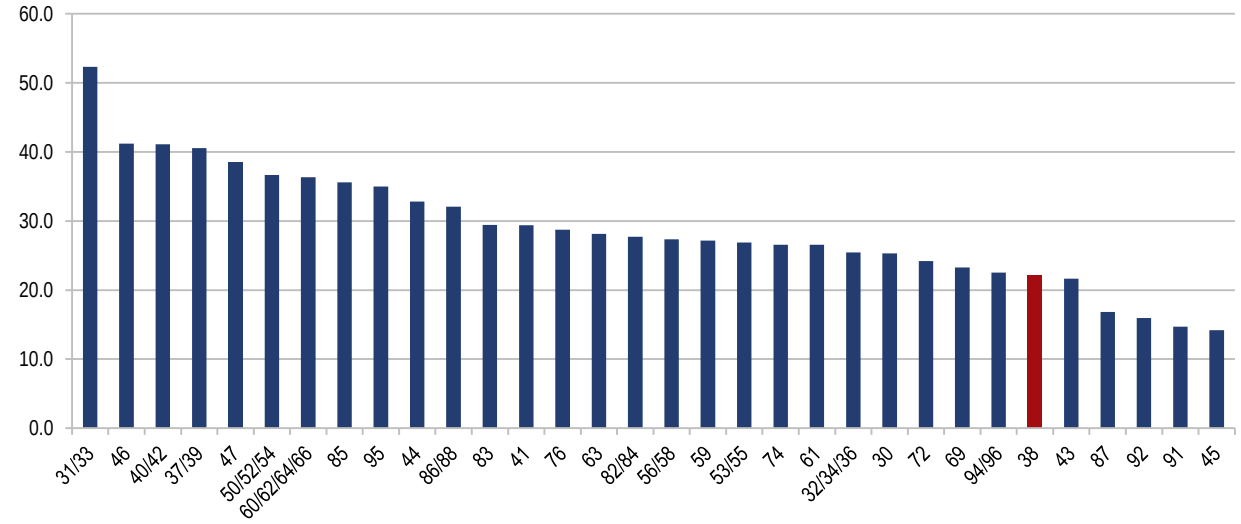


FIGURE 17 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Route 38 is a radial route with low ridership and productivity. However, the route serves a number of important destinations including a correctional facility, a rehabilitation center and the CT***transit*** garage on Leibert Road. Nearby service on Windsor Street does not present an option for riders, as the North Meadows neighborhood is isolated betweenI-91 and the Amtrak rail corridor.

It is assumed that many Route 38 trips, particularly the Route 38C variants, are operated "in place of deadheading' or as a way to get buses to and from the garage while in productive service. Because of this operational nuance, productivity is less of a concern as it is on other CT***transit*** routes.

Opportunities to strengthen the route further include the following:

- **Terminate Route 38 trips at the Correctional Center.** Only 13 riders board or alight on the 1.25 mile loop at the north end of Weston Road and W. Service Road. Furthermore, all but two of these riders use a Fishfry Street stop located several hundred feet from the Correctional Center. Terminating in the Correctional Center driveway would shorten the route by about 1.25 miles, but would require the 2 riders boarding at the ELG Utica Alloys plant to walk about ½ mile.
- **Terminate all trips at CT*transit's* facility, but operate via Weston Road to Boce Barlow Way.** Traveling via Weston Road would create a shorter, more productive route for all trips, while still passing within close walking distance of all major trip generators. Outbound service would operated north on Weston Street, east on Boce Barlow Way and south on Leibert Road to CTtransit. Inbound trips would operate in the opposite direction. This would require a ¼ mile to 1/3 mile walk to the Correctional Center from Boce Barlow Way, but would still provide direct service to the rehabilitation center, post office and CT***transit*** garage.
- **Reduce Saturday frequency**. Saturday trips have very low ridership, averaging 2.6 passengers per trip. Service levels could be significantly reduced. However, this option only makes sense if CT***transit*** is putting service on the street specifically for this route; if buses are simply "deadheading" to and from the garage as Route 38C, then Saturday service should continue to operate in this manner.

Route Evaluation

NORTH MAIN STREET AND BARBOUR STREET

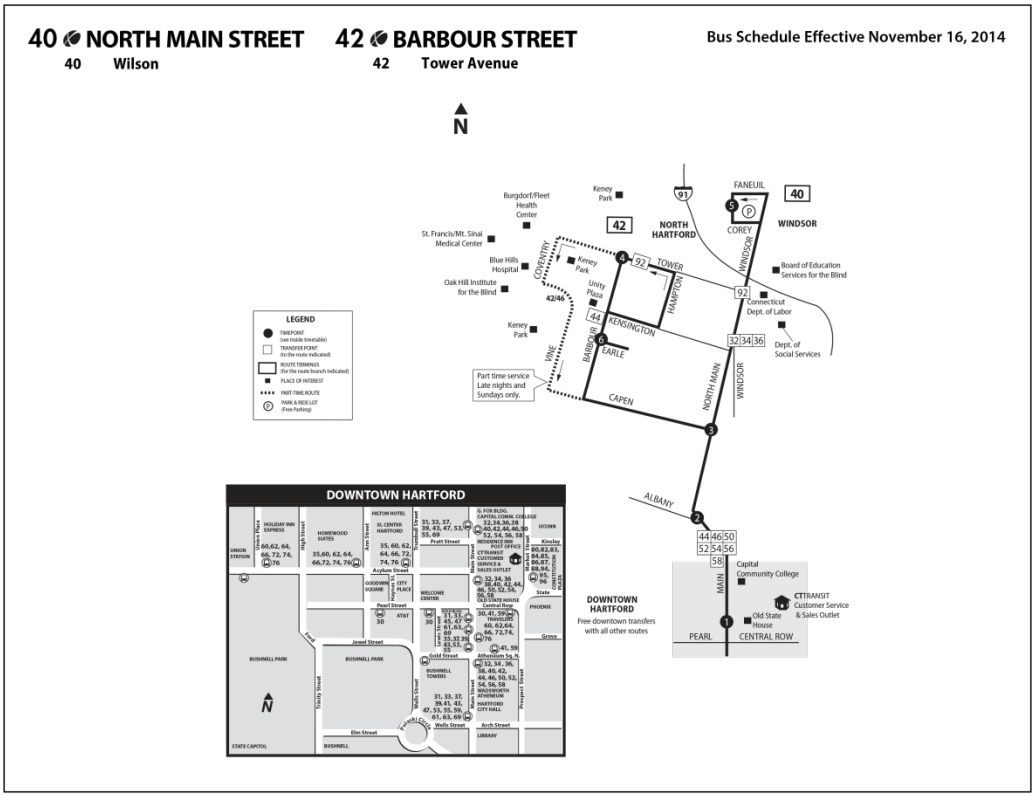
40 | Wilson

42 | Tower Avenue

Service Design

Routes 40 and 42 are radial routes that travel north from downtown Hartford to the North End area (Route 40) and Windsor (Route 42), sharing a common alignment on North Main Street. Schedules are coordinated to offer 10 minute weekday headways along the shared stretch of North Main Street.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Routes 40 and 42 begin and end in downtown Hartford where riders can transfer to most CT***transit*** services. In addition, there are several locations where riders can transfer to other CT***transit*** routes (see Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 32	Windsor Avenue
Route 34	Windsor Avenue - Poquonock
Route 36	Windsor - Day Hill Road
Route 44	Garden Street
Route 46	Vine Street
Route 50	Blue Hills Avenue - Cottage Grove Road
Route 54	Blue Hills Avenue - Blue Hills Extension
Route 56	Bloomfield Avenue
Route 58	Albany Avenue
Route 92	Tower Avenue Crosstown

Alignments and Service Patterns

Route 40 outbound trips begin on Main Street in downtown Hartford by the Old State House. The route continues north on Main Street, crossing I-84, Albany Avenue and I-91 into Windsor, where it continues on Windsor Avenue before turning left to loop around Faneuil, Bussey and Corey streets in a terminal loop. Route 40 returns inbound along the same Windsor Avenue/Main Street alignment.

Route 42 outbound trips follow the same initial outbound alignment as Route 40, heading north on Main Street from downtown Hartford. North of Albany Avenue, the route turns left on Capen Street, then turns right to head north on Barbour Street. It also terminates in a loop by turning right on Kensington Street, left on Hampton Street, and left on Tower Avenue to return inbound via Barbour, Capen and Main.

Late night and Sunday service on Route 42 is combined with Route 46, operating outbound as above, but returning inbound via a large loop along Tower, Coventry, Vine and Capen Streets.

Service Schedule

Route 40 operates on weekdays and Saturdays, while Route 42 operates seven days a week. Service alternates between Route 40 and Route 42 on weekdays such that buses fun along the common alignment (Main Street) every 10 minutes throughout the day until 7:00 p.m. followed by hourly service in the evening (Figure 3).

On Saturdays, Routes 40 and 42 also operate alternating trips, with service running along their common alignment every 15 minutes until 6:30 p.m., followed by hourly service in the evening. On weekdays and Saturdays, late night trips operate as Route 42/46, providing inbound service along Coventry Street and Vine Street rather than on Barbour Street.

Sunday outbound service operates exclusively along the combined Route 42/46 alignment, running every 70 minutes. There is no Sunday service on Route 40, although early AM and late evening service on Route 30N Bradley Airport operates along Main Street and Windsor Avenue.

An additional evening inbound trip and an additional evening outbound trip operate to Barbour Street and Tower Avenue on Saturdays and Sundays between Thanksgiving and December 31.

FIGURE 3 | SCHEDULE OVERVIEW (ALL ROUTES 40 AND 42)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	4:15 AM – 1:26 AM	10	90/90
Saturday	6:45 AM – 11:15 PM	15	53/51
Sunday	7:15 AM – 8:15 PM	70	13/13

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Combined, Routes 40 and 42 carry about 3,004 passengers per weekday or about 16.7 passengers per trip. This is marginally below the Hartford Division average of 17.7 passengers per trip (see Figure 4). Saturday service also carries about 16.6 passengers per trip, which is slightly above the Saturday average of 16.3. Sunday service falls below the division average, carrying only 370 passengers or 15.4 passengers per trip.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 40/42	ROUTE 40/42	DIVISION AVG
Weekday	3,004	16.7	17.7
Saturday	1,710	16.6	16.3
Sunday	370	15.4	17.6

Source: CTtransit performance data

Ridership by Stop

The most heavily used stops on Routes 40/42 are the downtown stops along Main Street at Pratt and Pearl streets, each with over 500 weekday boardings and alightings. North of downtown, the shared segments of these routes along Main Street south of Capen show the highest ridership (see Figure 5). The Capen Street stop has the 3rd highest level of activity with about 178 daily riders. Six additional intersections between Capen and downtown show more than 50 boardings or alightings per day.

Six stops served by Route 40 north of Capen Street generate 50 or more boardings and alightings per day, particularly in the area near St. Monica's Church and apartments on Main Street. Five stops on Route 42 along Barbour Avenue show 50 or more boardings and alightings per day.

FIGURE 5 | ROUTE 40/42 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Faneuil Street and Connecting Road	64 / 0	Residential neighborhoods
Main Street and St. Monica's Church	54 / 1	St. Monica's soup kitchen
Main Street and St. Monica's Apartment	145 / 1	CT Department of Social Services
Main Street and Earle Street	59 / 5	Parker Community Center
Main Street and Westland Street	51 / 5	Hartford Communities that Care (Northeast)
Main Street and Nelson Street	56 / 8	Residential neighborhoods
Barbour Street and Tower Avenue	54 / 0	Connections to Route 92 Crosstown (Copaco Ctr.)
Barbour Street and Risley Street	48 / 3	Unity Plaza shopping center, post office
Barbour Street and Westland Street	63 / 2	Residential, small retail and religious institutions
Barbour Street and Judson Street	68 / 3	Residential, small retail and religious institutions
Barbour Street and Nelson Street	53 / 3	Residential
Main Street and Capen Street	161 / 17	Olive Church Ministries, other religious institutions
Main Street and Mahl Avenue	95 / 30	Family Dollar store, religious institutions
Main Street and Cemetery	45 / 8	Retail and residential
Main Street and Mather Street	58 / 23	S.A.N.D School, residential
Main Street and Florence Street	126 / 24	Women's League, House of Restoration Church
Main Street and C R T	12 / 129	Community Renewal Team
Main Street and Albany Avenue	37 / 17	Mixed uses, transfers to Albany Ave. bus routes
Main Street and Pratt Street	102 / 441	Downtown Hartford and connections to other CT*transit* routes
Main Street and Pearl Street	58/ 523	Downtown Hartford and connections to other CT*transit* routes

Load profile data combines passenger activity by stop and shows the cumulative passenger load as the bus travels inbound along its route on weekdays (Figure 6) and Sundays (Figure 7). Weekday inbound ridership by stop without the cumulative load is mapped in Figure 8.

Passenger loads are highest along Route 40/42's shared Main Street alignment. Loads peak near Florence Street, before crossing Albany Avenue and approaching downtown. North of Capen Street, Route 40 travels a longer distance and picks up more riders than Route 42 (see Figure 8). The highest levels of activity on Route 40 is near the Fanueil Street terminus and the Department of Social Services by St. Monica's. Boardings and alighting are more consistent south of Earle Street. Route 42 carries fewer riders, but has consistently good weekday ridership at stops along Barbour Street.

On Sundays, the combined Route 42/46 alignment attracts relatively few riders (Figure 9). While 18 riders board at Barbour and Earle, heading north and west to make local connections, overall Sunday ridership is very low and it appears many Barbour Street riders may be walking to Capen Street, rather than ride the bus on its 3 mile loop inbound to downtown Hartford.

FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

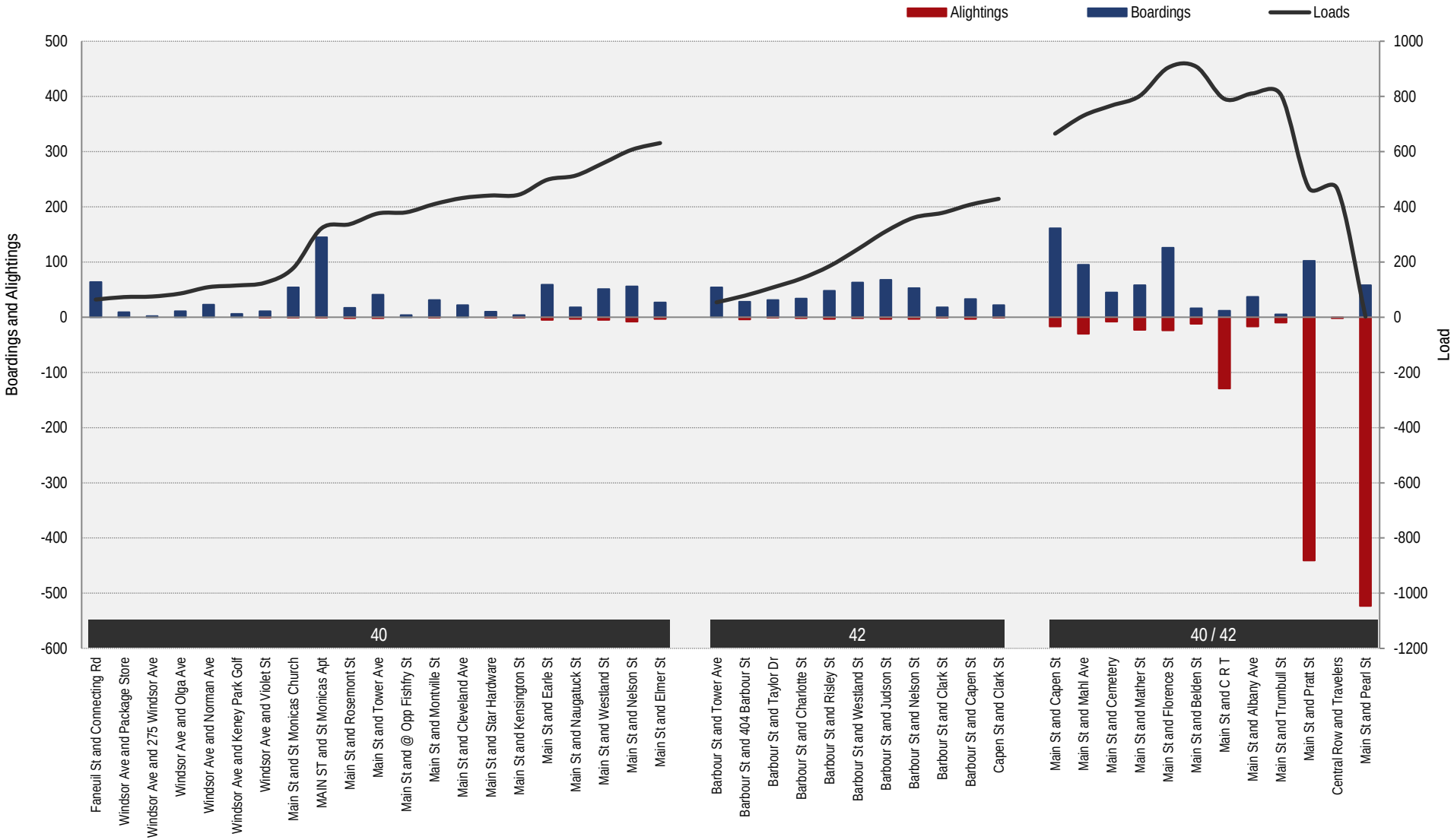


FIGURE 7 | SUNDAY INBOUND RIDERSHIP BY STOP GRAPH

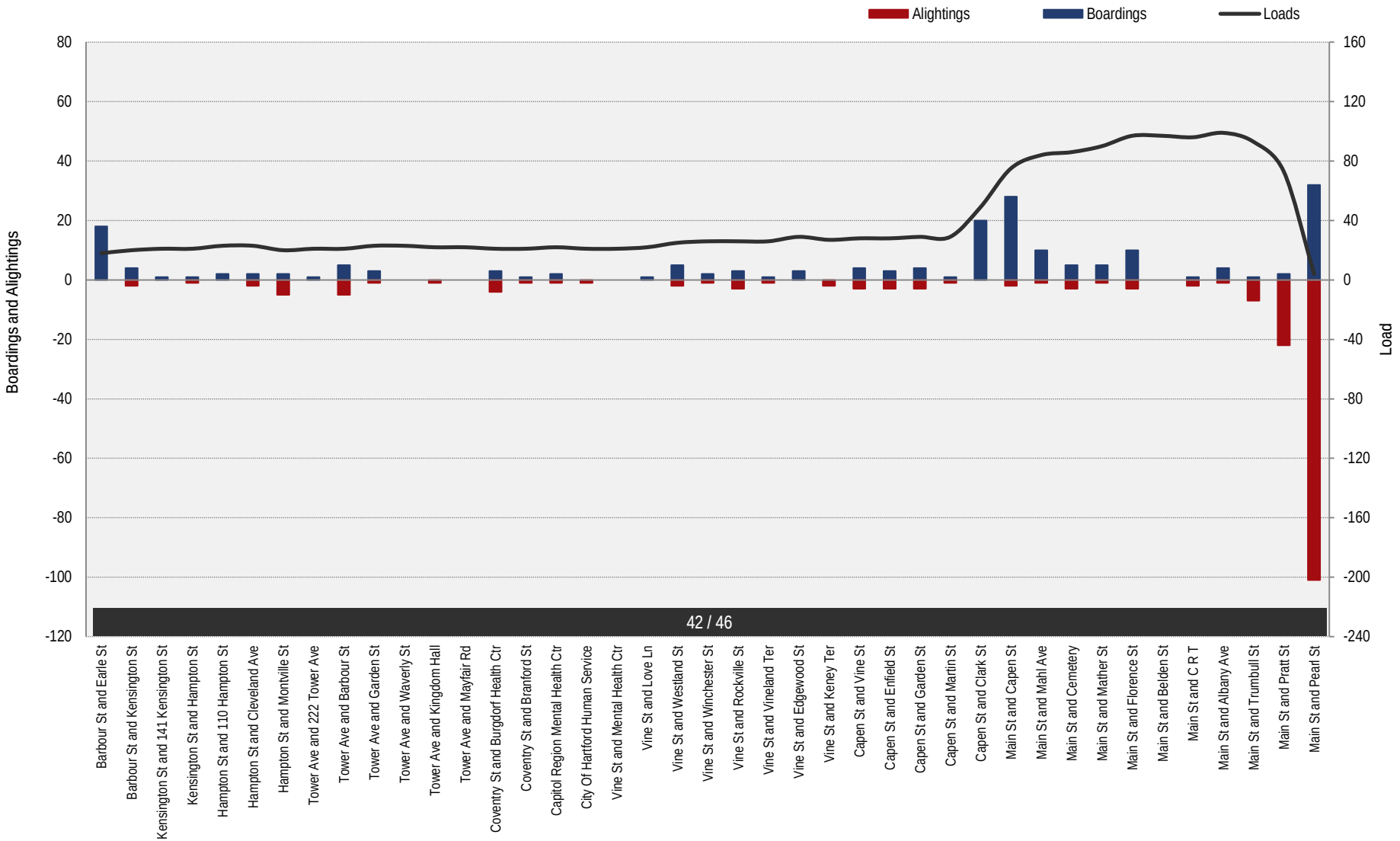


FIGURE 8 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

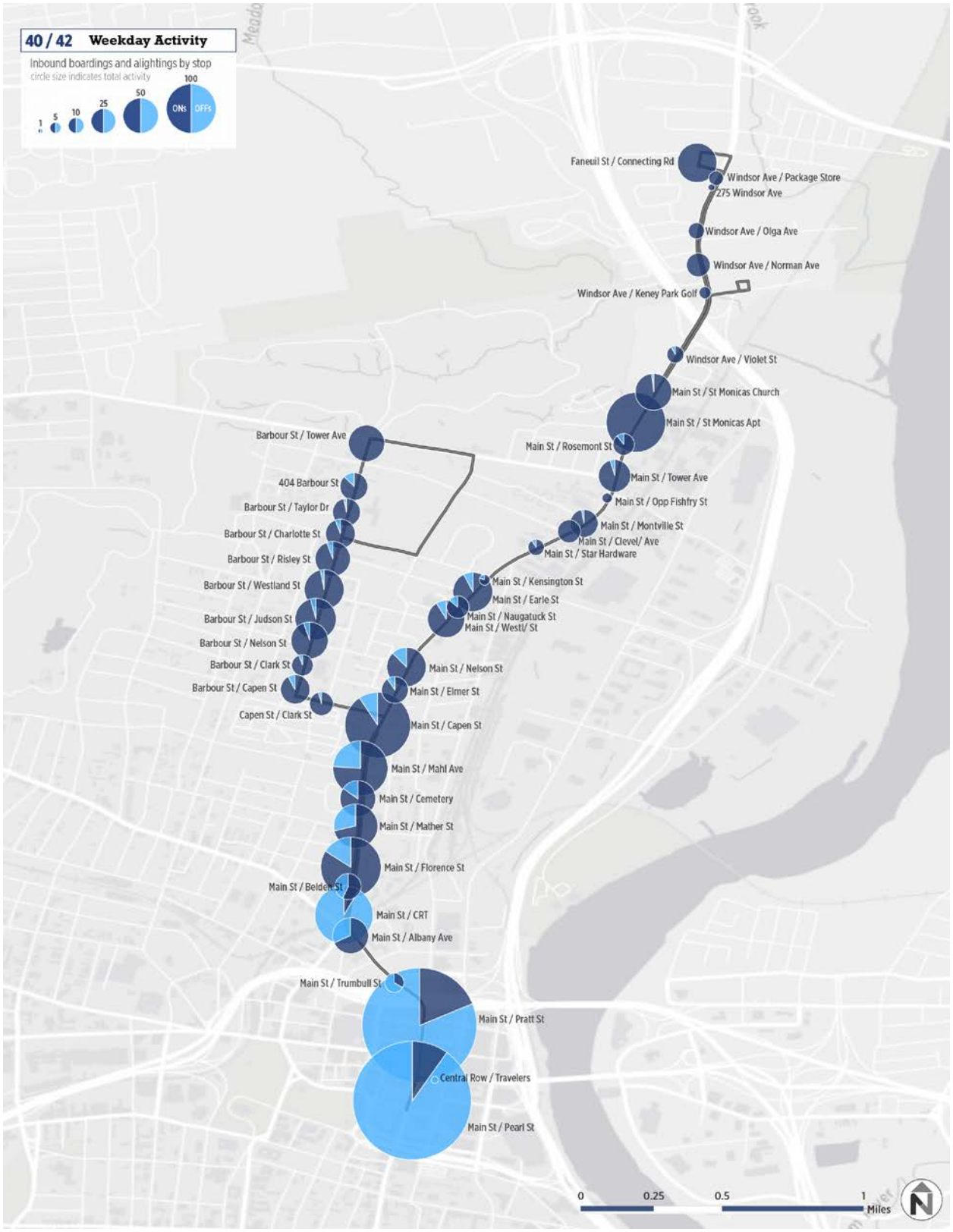
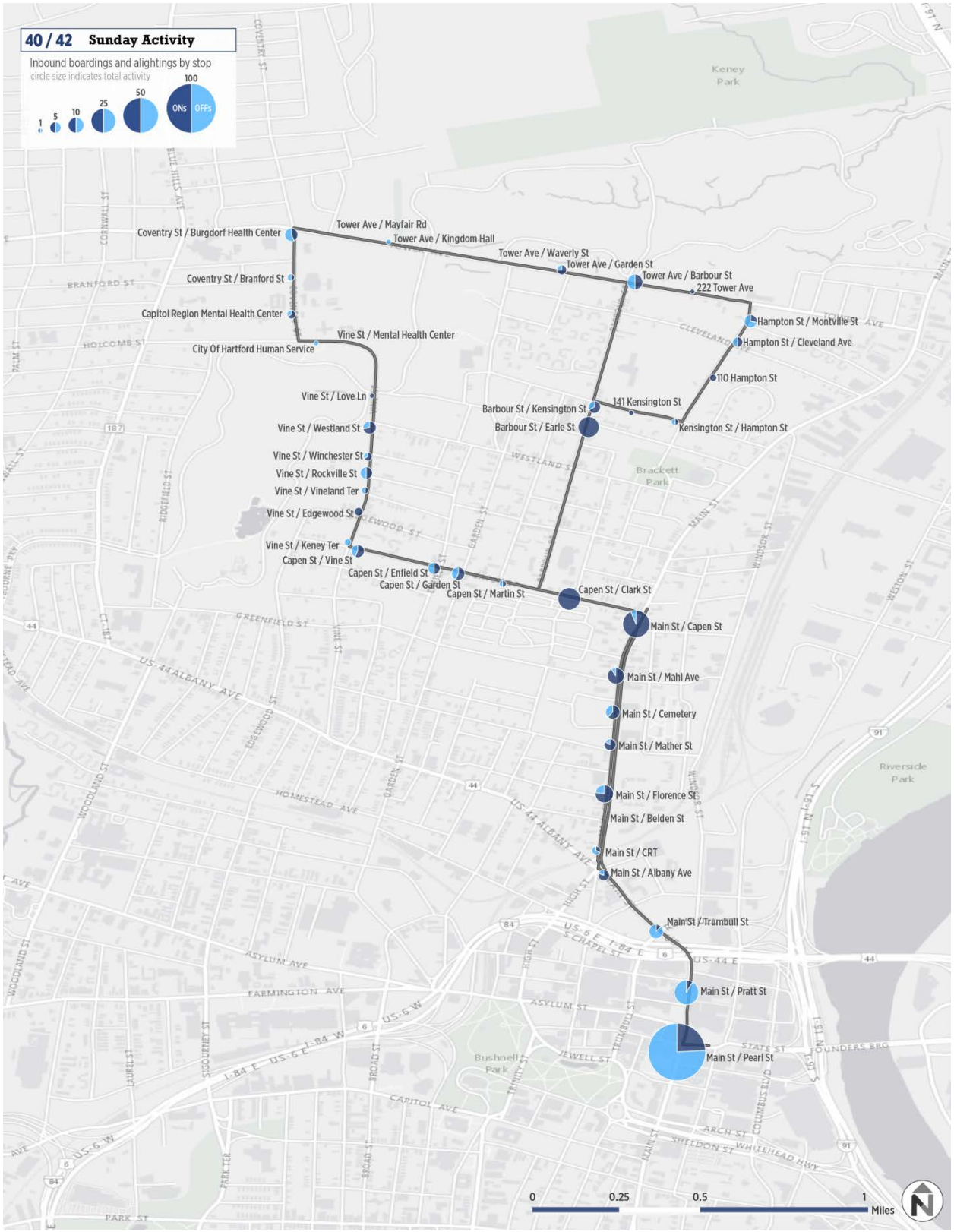


FIGURE 9 | SUNDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Ridership is well balanced throughout the day in both directions (see Figures 10 and 11). Six inbound trips have over 30 passengers (all but one operating as Route 40). However, most weekday trip carry around 20 or fewer passengers; and overcrowding is not an issue. Inbound ridership is stronger than outbound ridership, a result indicative of the fact that both these routes operate in corridors where there are other options.

Ridership demand begins to drop off after service frequency is reduced around 7 PM, and demand is quite low on very late night trips in both directions suggesting service could end earlier. Ridership on the first two weekday outbound trips is operated as Route 30N and is also very low.

FIGURE 10 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

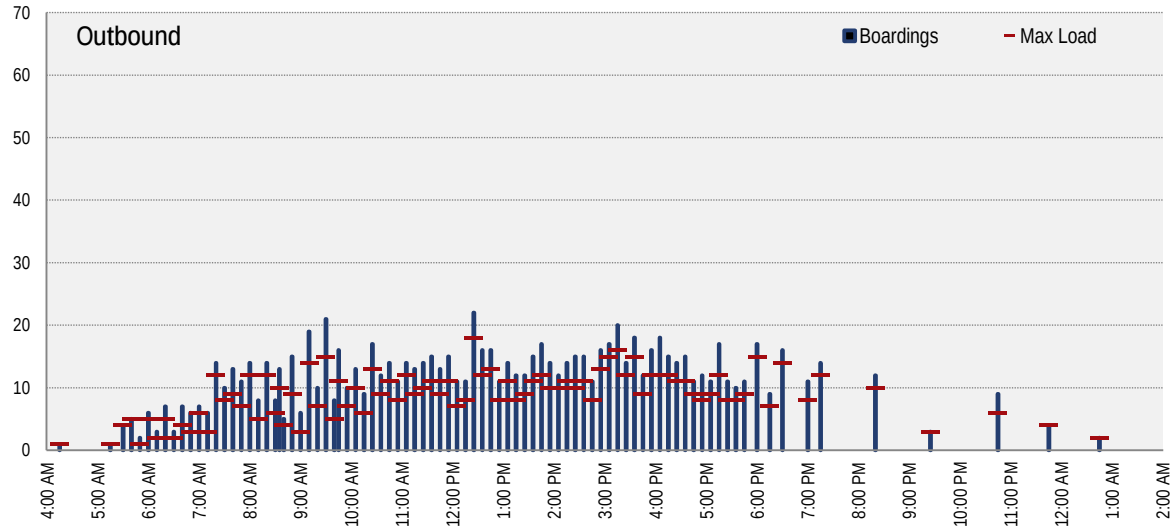
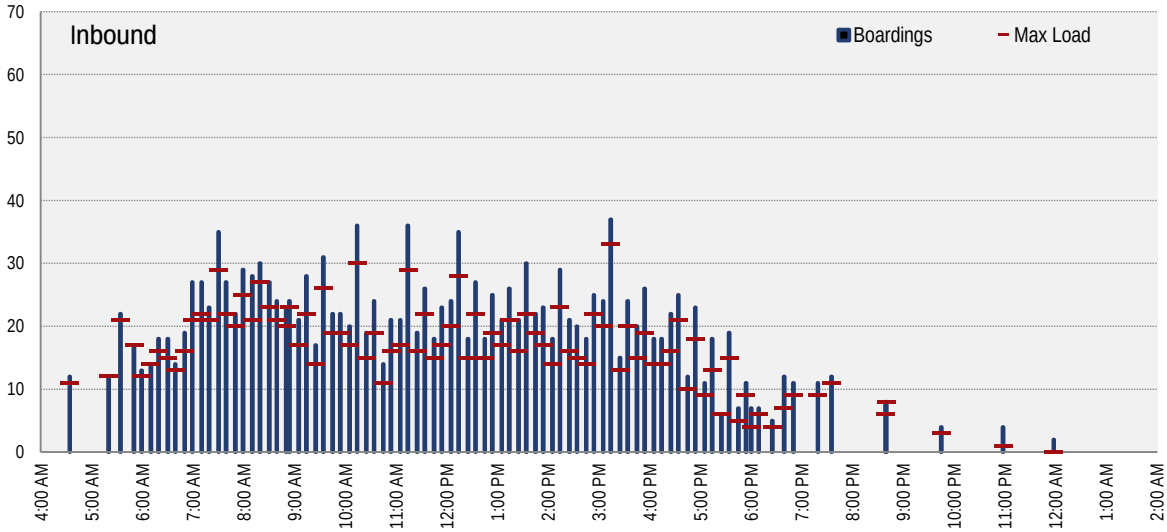


FIGURE 11 | WEEKDAY INBOUND RIDERSHIP BY TRIP

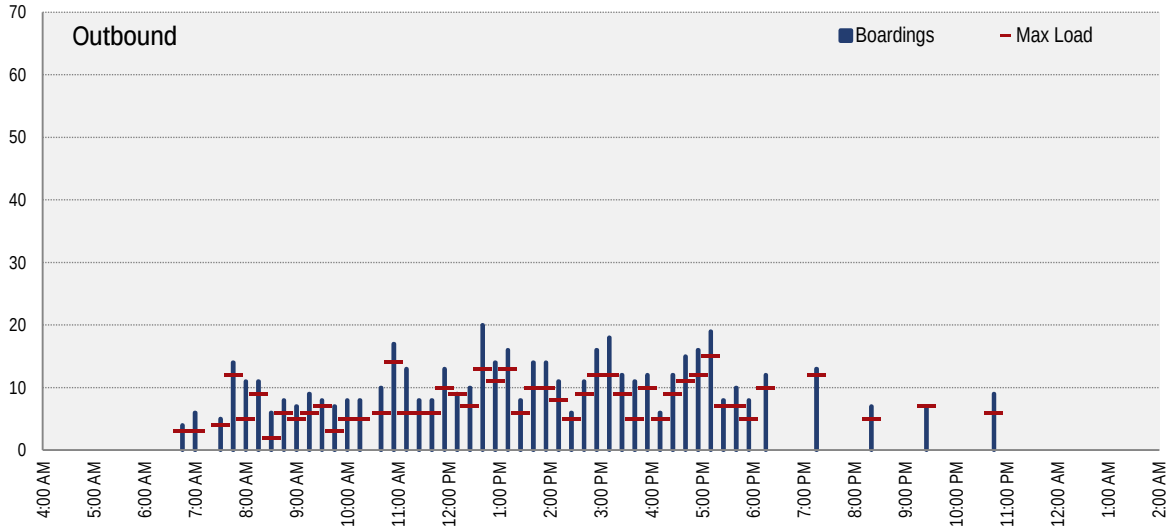


Saturday

Combined, average Saturday ridership on Routes 40 and 42 is similar to weekdays, with an average of 16.8 passengers per trip. Ridership is well balanced throughout the day in both directions (see Figures 12 and 13). As seen on weekdays, inbound ridership is stronger than outbound ridership, with few trips carrying more than 20 passengers.

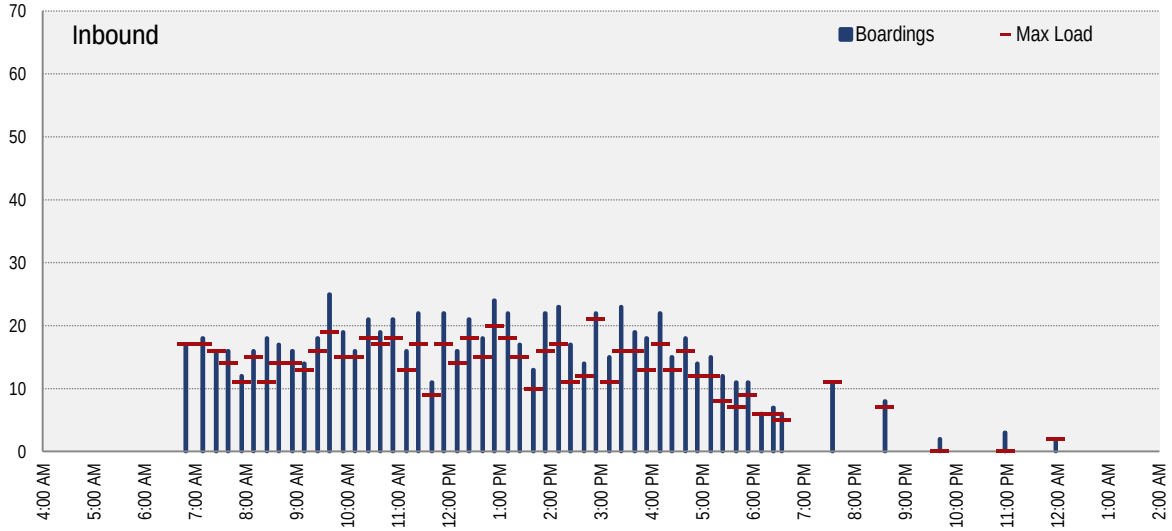
Ridership demand begins to drop off after service frequency is reduced in the evening, particularly on inbound service after 9 PM.

FIGURE 12 | SATURDAY OUTBOUND RIDERSHIP BY TRIP



Note: No data for Saturday outbound trip at 11:45 PM.

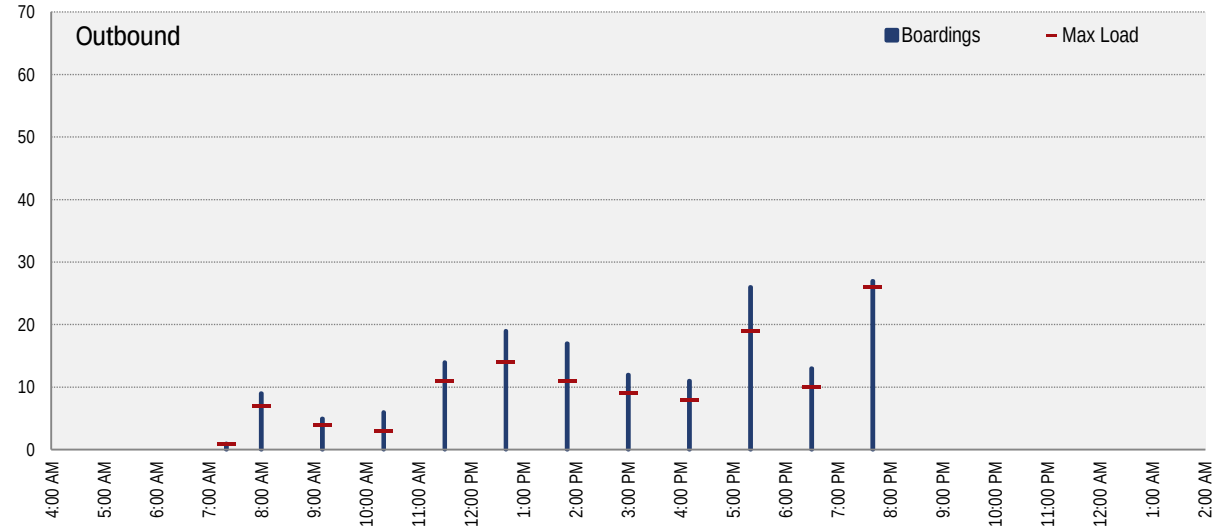
FIGURE 13 | SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

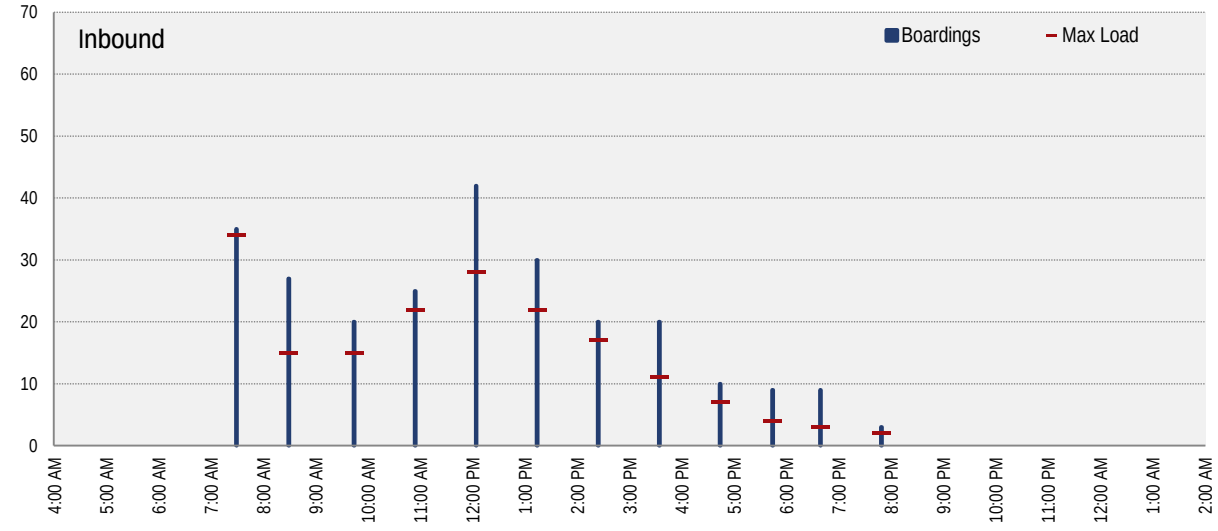
There is no Sunday service on Route 40 to Windsor. Route 42 Sunday service operates along a combined Route 42/46 alignment, with an average of 15.2 riders per trip. Higher loads in the inbound direction reflect the fact that all activity along Coventry and Vine streets (Route 46) is considered inbound service (see Figures 14 and 15).

FIGURE 14 | SUNDAY OUTBOUND RIDERSHIP BY TRIP



Note: No data for Sunday outbound trip at 8:50 PM.

FIGURE 15 | SUNDAY INBOUND RIDERSHIP BY TRIP



Note: No data for Sunday inbound trip at 8:59 PM.

Performance

Combined, Routes 40/42 performs better than the Hartford Division average according to all measures with the exception of Sunday passengers per revenue vehicle hour which falls slightly below average (see Figure 16). With the exception of Sundays, the route has fairly strong and consistent passenger demand along both routes. Weekdays and Saturdays perform particularly well and, as shown in Figures 18 and 19 below, are some of the most effective routes in the Hartford system.

FIGURE 16 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 40/42	DIVISION AVG	ROUTE 40/42	DIVISION AVG	ROUTE 42/46	DIVISION AVG
Operating Cost per Passenger	$3.11	$4.84	$3.11	$6.30	$4.50	$6.66
Passengers per Revenue Vehicle Hour	41.1	28.9	41.1	27.0	28.5	29.7
Passengers per Revenue Vehicle Mile	5.1	2.6	5.1	2.4	4.4	2.9

Source: CTtransit performance data

Routes 40/42 have an on-time performance record that is just slightly below the division average, with 77.9% of trips running on time and 21.9% of time point checks showing buses running at least five minutes behind schedule (see Figure 17). More recovery time may be needed to consistently provide on-time service.

FIGURE 17 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 40/42	DIVISION AVG
Early	0.2%	0.2%
Late	21.9%	18.9%
On-Time	77.9%	80.9%

Source: CTtransit performance data

FIGURE 18 | WEEKDAY OPERATING COST PER PASSENGER

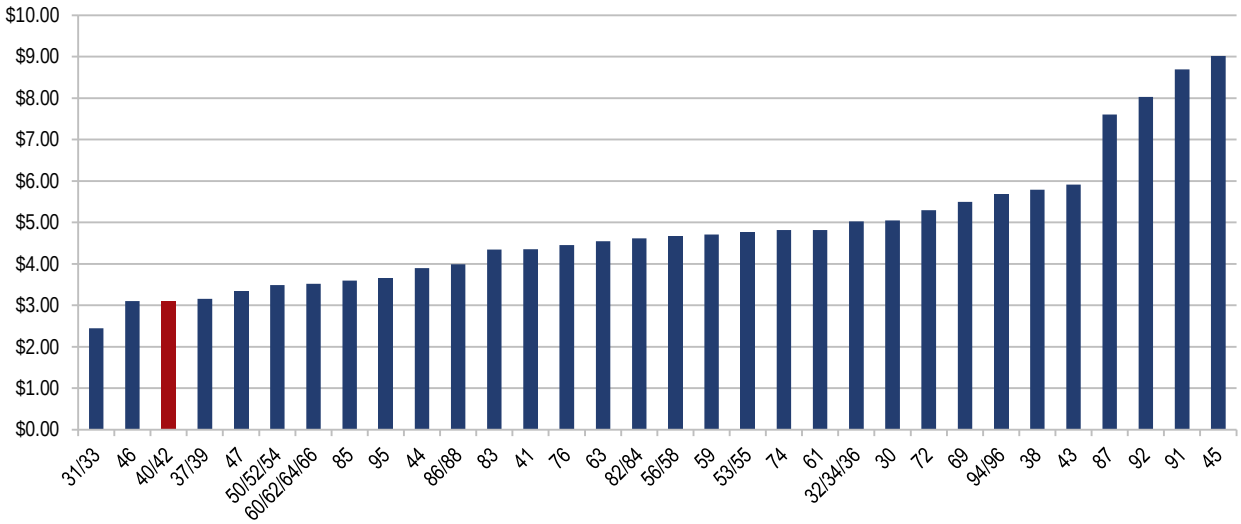
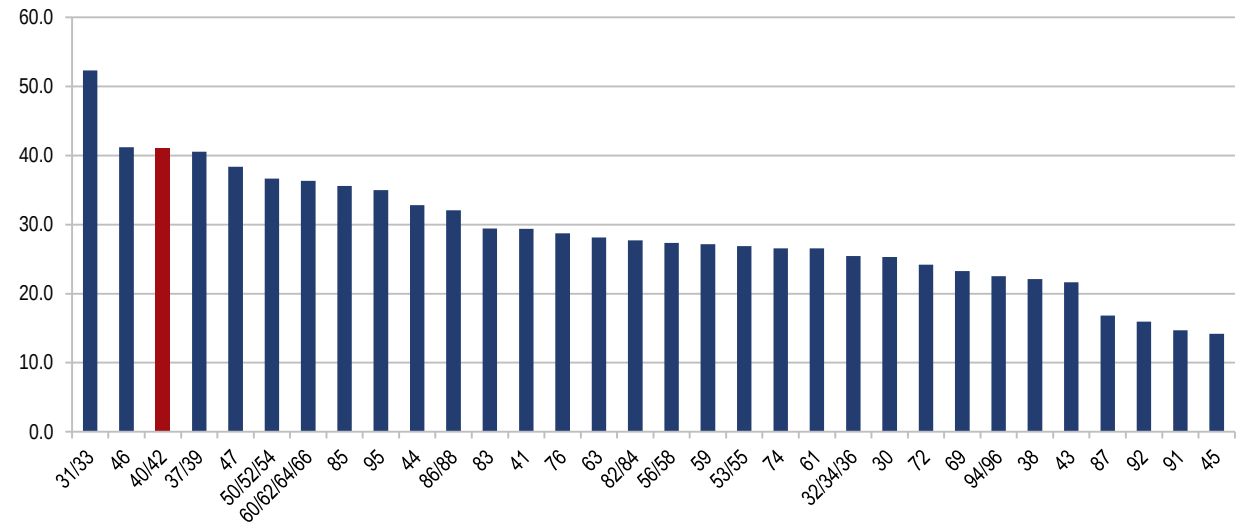


FIGURE 19 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Routes 40 and 42 are two radial routes serving the north end of Hartford, with Route 40 crossing into the Town of Windsor. They operate in an alternating service pattern along their shared Main Street segment, offering 10 minute service along this stretch on weekdays, and 15 minute service on Saturdays. The routes are productive and perform better than most in the Hartford Division. Route 42 is also partially funded by CRCOG's jobs access program.

Routes 40 and 42 share a common segment along North Main Street, and also operate in close proximity to other routes. Routes 32, 34 and 36 operate along Windsor Street, two-tenths of a mile to the east of Main Street. Route 42 is paralleled by Route 44 on Garden Street, two-tenths of a mile to the west. These routes also share a common alignment along a short two-block section of Barbour Street. In addition, Route 40 faces competition and overlap with Routes 32-36 and to a lesser extent, 50-54.

Opportunities to strengthen Routes 40 and 42 include suggestions to realign resources to offer more attractive and convenient service to meet a high level of ridership demand in Hartford's north end. There are also opportunities to strengthen service in the Town of Windsor. Service improvement options include:

- **Create a transit corridor on North Main Street/Albany Avenue.** Several CTI routes travel along North Main Street and ridership along the corridor is very strong along North Main Street to Capen Street and relatively strong between Capen Street and downtown Windsor. The corridor is relatively densely developed corridor and also serves transit dependent neighborhoods. Recognizing the importance of the corridor to existing transit service as well as anticipating increased importance of the corridor when commuter rail services open, CT***transit*** may consider creating roadway improvements to improve transit service. Roadway improvements may include dedicating a lane for transit (either the full length of the corridor, parts of the corridor, or during peak periods), limiting parking to one side of the street, installing queue jump lanes at critical intersections and/or adding signal prioritization to increase travel speeds. Other improvements may include building level boarding platforms and/or offering pre-paid boarding (ticket vending machines) to reduce vehicle dwell times. CT*transit* may also consider consolidating stops to reduce delays and help focus passenger amenities investment. These improvements would improve the speed and reliability of Route 40 and 42, generate operational savings and attract additional riders.
- **Realign Route 42 with Route 44.** North of Capen Street, there are three local CT*transit* routes operating parallel within one mile of each other (Routes 42, 44 and 46). In particular, Route 42 is only two-tenths of a mile from Route 44; Route 44 operates more frequently and attracts significantly more riders. On option to strengthen service would be to realigned Route 42 to operate via Albany Avenue, Garden Street, Capen Street and Barbour Street (at 20 or 30 minute frequency). Service on Capen Street would operate between Garden and Barbour as opposed to Barbour and Main. Passengers in the Capen Street area would have a short walk to the realigned Route 42 or to Route 40 on Main Street. Realigning Route 42 may also help with on-time performance issues.
  - **Increase frequency on Route 40.** If Route 42 were realigned to operate via Albany Avenue, Garden Street and Barbour, frequency on the shared Main Street segment of Routes 40/42 would be reduced. This segment of Main Street, between Albany Avenue and Kensington Street merits a high level of service, which could be achieving by increasing frequency on Route 40.
  - **Realign/reallocate Main Street and Windsor Street services**. If Route 42 were realigned to operate via Albany Avenue, increased frequency on the Route 40 route along

Main Street would be warranted. Frequency could be increased on Route 40 (see above), or there could be a realignment of one of the Windsor Street routes (e.g. 32, 34, 36) to Main Street.

- **Lengthen Route 40 to serve the New Haven-Hartford-Springfield Rail Station in Windsor Town Center**. In 2016, commuter rail service is scheduled to operate between New Haven, Hartford and Springfield. The new rail service would provide fast connections between the three hubs and include a stop in Windsor. When rail service begins, Route 40 could be extended into Windsor Town Center; this would allow riders to use Route 40 to get to/from rail service. It would also provide a stronger outbound anchor to Route 40. However, service would need to be coordinated with Route32-36 to avoid redundancies.
- **Operate bi-directional Sunday service.** On Sundays, Route 42 operates on a combined Route 42/46 alignment. This service has low ridership and it appears many riders are walk to Capen Street to avoid the longer route via Tower, Coventry and Vine. There is no Sunday service on Route 44 or Route 40. Strong ridership demand in Hartford's north end indicates more convenient Sunday service may be warranted.
  - **Operate Sunday service on combined Route 42/44.** Realigning Route 42 and combining it with Route 44 offers the opportunity to offer bi-directional Sunday service along the new alignment. A 60 minute frequency is suggested, coordinated to alternate with 60 minute service on Route 46.
  - **Operate Sunday service on Route 46.** This route has moderate Saturday ridership, although it is recommended frequency be reduced from 20 minutes. Sunday service should also be considered, at 60 minute frequency, coordinated to alternate with Route 44 above.
  - **Operate Sunday service on Route 40 or the Main Street corridor.** If Route 42 is realigned to Albany and Garden, there would be no Sunday service on Main Street. Sunday service should be provided on Route 40, or on a realigned Windsor Street route (32, 34, and 36).
- **Eliminate late night variations.** Several late night trips follow the combined Route 42/46 alignment and, like Sundays, have very low ridership. Bi-directional service on Route 42, Route 46 or a new combined Route 42/44 on Garden Street might better serve passengers.

Route Evaluation

HARTFORD/NEW BRITAIN

41 | Hartford/New Britain via Newington Center

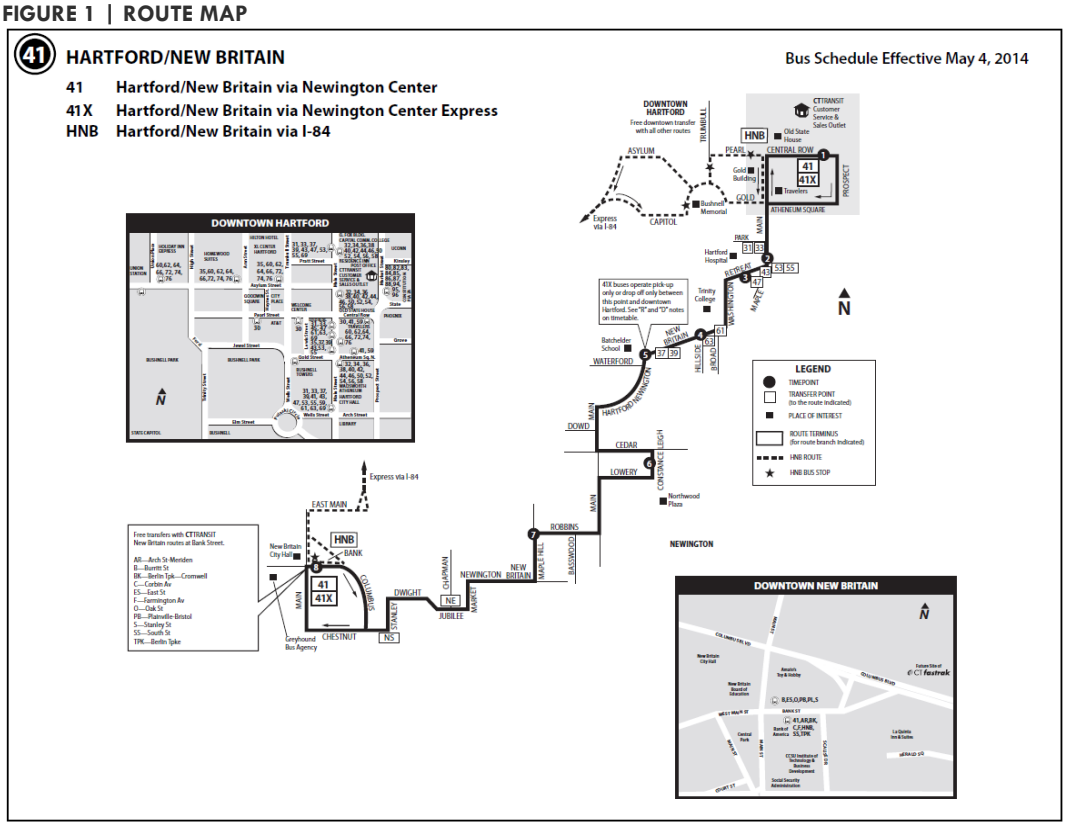
41X | Hartford/New Britain via Newington Center Express

HNB | Hartford/New Britain via I-84

Service Design

Route 41 is a radial route connecting Hartford with New Britain via Newington Center. The route has three variants that include local service (Route 41), limited-stop service (Route 41x), and express service (Route HNB) (see Figure 1). The vast majority of the service is operated as Route 41. Routes 41X and HNB are operated on weekdays as peak directional service only (inbound in the morning and outbound in the afternoon).

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 41 originates in downtown Hartford, where riders can connect to most CT***transit*** routes. Outside of downtown, there are several locations along the route where riders can transfer to other CT***transit*** routes (see Figure 2). In addition, Route 41 connects with most CT***transit***-New Britain routes in downtown New Britain.

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
HARTFORD DIVISION	
Route 31	Park Street and New Park Avenue
Route 33	Park Street and Park Road
Route 37	New Britain Avenue
Route 39	New Britain Avenue
Route 43	Campfield Avenue
Route 47	Franklin Avenue
Route 53	Wethersfield Avenue
Route 55	Middletown
Route 61	Broad Street
Route 63	Hillsdale Avenue
NEW BRITAIN DIVISION	
Route AR	Arch Street-Meriden
Route B	Burritt Street
Route BK	Berlin Turnpike–Cromwell
Route C	Corbin Avenue
Route ES	East Street
Route F	Farmington Avenue
Route O	Oak Street
Route PB	Plainville-Bristol
Route S	Stanley Street
Route SS	South Street
Route TPK	Berlin Turnpike

Alignments and Service Patterns

Route 41 serves Hartford and New Britain via Newington Center. On Routes 41 and 41X, outbound trips from Hartford begin on Central Row South in downtown, and then travel south on Prospect and west on Atheneum to Main Street. Buses travel south and west towards Newington, primarily along Main, Retreat, New Britain Avenue, Newington Avenue, and Hartford Avenue, then turn south onto Main Street in Newington and stop at Newington Shopping Center. Outbound buses continue south on Main Street and Maple Hill Avenue, then travel west into downtown New Britain along New Britain Avenue, Newington Avenue, Jubilee Street, and Chestnut Street. Buses stop at Main Street and Bank Street in downtown New

Britain, and travel east along Columbus Boulevard and Chestnut Street to make a return trip to downtown Hartford. Inbound buses follow an identical alignment back into Hartford, except downtown where buses travel north on Main Street and then turn east to stop on Central Row South.

In Hartford, much of the Route 41 alignment overlaps with Route 37/39.

HNB service travels along I-84 instead of local streets, and follows a slightly different alignment in both downtown Hartford and downtown New Britain to access I-84.

Service Schedule

Route 41 operates on weekdays and Saturdays, while, as discussed, Routes 41X and HNB operate on weekdays only and with only a handful of peak directional trips. Route 41's weekday service includes departures every 20 to 30 minutes during peak hours and every 30 to 40 minutes during off-peak hours. The schedule has slightly irregular frequencies. The peak directional service on Route 41X consists of five inbound trips in the morning and five outbound trips in the afternoon. There are two HNB trips per day at 7:00 AM and 8:00 AM, and one trip from Hartford to New Britain at 4:45 PM.

On Saturdays, buses operate every 30 to 40 minutes throughout the day, with service ending just after 7:00 PM.

FIGURE 3 | SCHEDULE OVERVIEW

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	4:57 AM – 8:12 PM	20/40 (irregular)	28/31
Saturday	6:45 AM – 7:04 PM	30-40	21/21
Sunday	-	-	-

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Route 41 carries 967 daily passengers or 16.4 passengers per trip on an average weekday. This is 7% lower than the Hartford Division average of 17.7 weekday passengers per trip (see Figure 4). Saturday ridership per trip is both higher than on weekdays and the Division average for Saturdays. Route 41 does not operate on Sundays.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 41	ROUTE 41	DIVISION AVG
Weekday	967	16.4	17.7
Saturday	595	17.6	16.3
Sunday	-	-	17.6

Source: CTtransit performance data

Ridership by Stop

The most heavily used stops on Route 41 are in downtown Hartford and downtown New Britain. Outside of the two downtowns, only one stop at Main Street and Park Street in Hartford generates 50 or more boardings or alightings per day (see Figure 5 and 6).

FIGURE 5 | ROUTE 41 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Bank Street and Main Street, New Britain	295 / 0	Downtown New Britain
Main Street and Park Street, Hartford	16 / 78	Transfer point for Routes 31, 33, 37, 39, 41, 53, and 55
Main Street and Athenaeum Square, Hartford	9 / 183	Wadsworth Athenaeum Museum of Art, Travelers Insurance
Central Row and Travelers, Hartford	15 / 194	Hartford Central Business District

Load profile data (see Figure 6) combines passenger activity by stop and shows the cumulative passenger load as the bus travels inbound along its route. Ridership by stop without the cumulative load is mapped in Figure 7. The data for Route 41 shows inbound passenger loads peak at Washington Street and Brownell Avenue, and decrease rapidly between Hartford Hospital and the end of the line in downtown Hartford.

FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

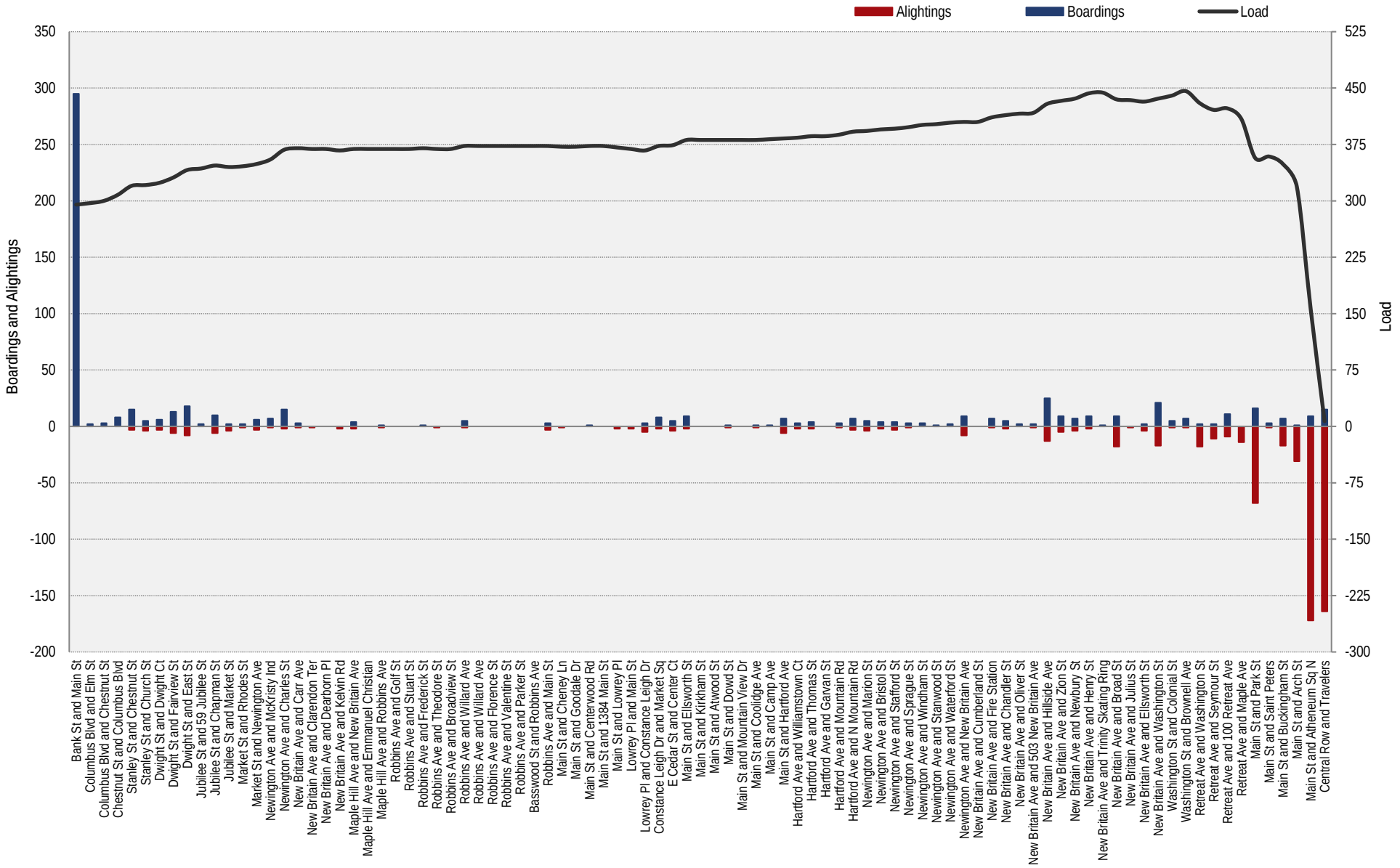
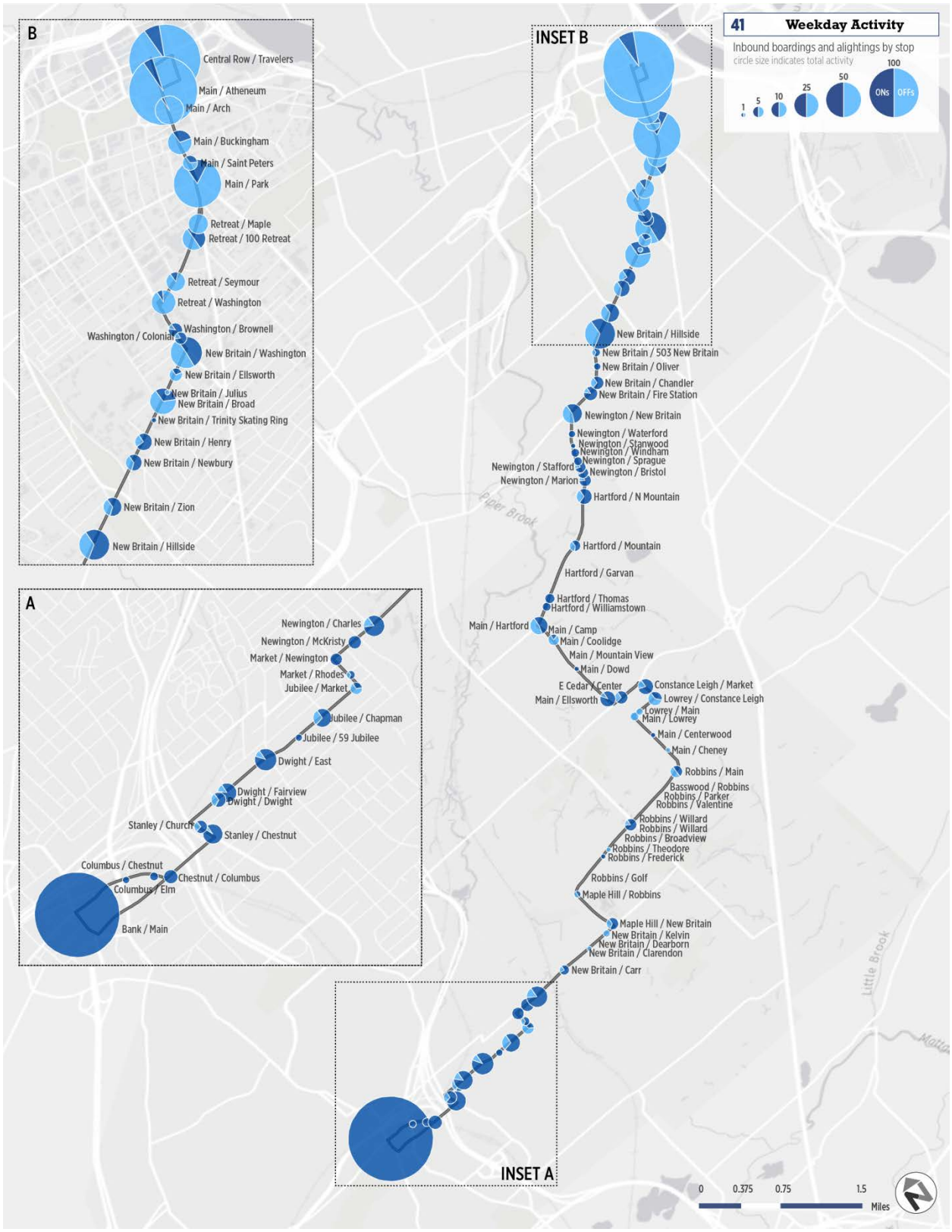


FIGURE 7 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Route 41 carries an average of 25.4 passengers per trip on weekdays; ridership by trip, however, varies from that average. Ridership is evenly balanced in both directions and throughout the service day. The highest ridership occurs on the last outbound trip of the day, suggesting demand for later service in the outbound direction (see Figures 8 and 9). Demand is also lower on the last inbound trips of the day.

Maximum loads on Route 41 do not exceed 35 passengers. The typical seating capacity of a 40-foot transit bus is 40 passengers, so overcrowding is not an issue on this route, and service frequency appears to be in line with demand.

FIGURE 8 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

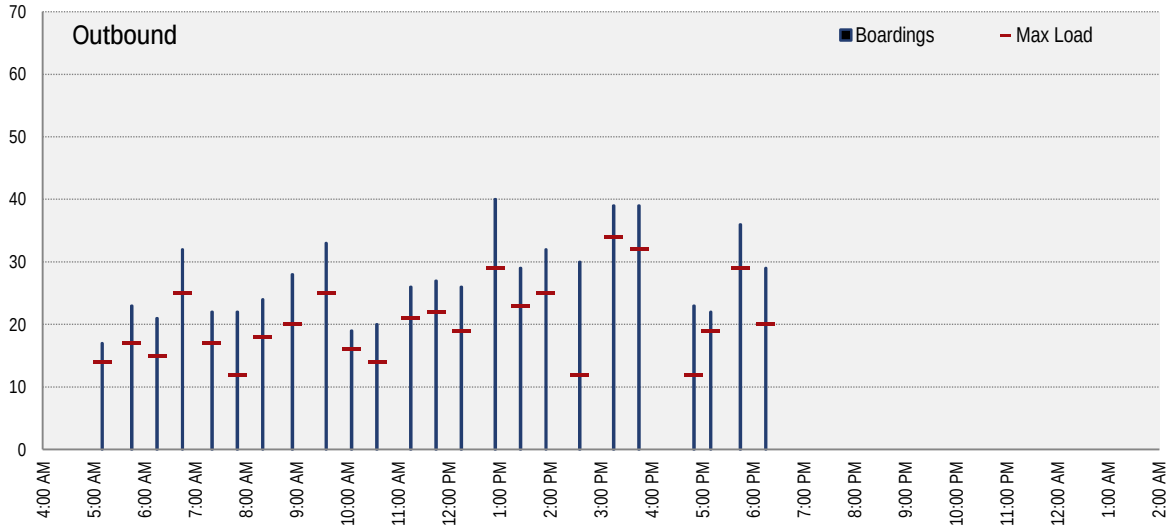
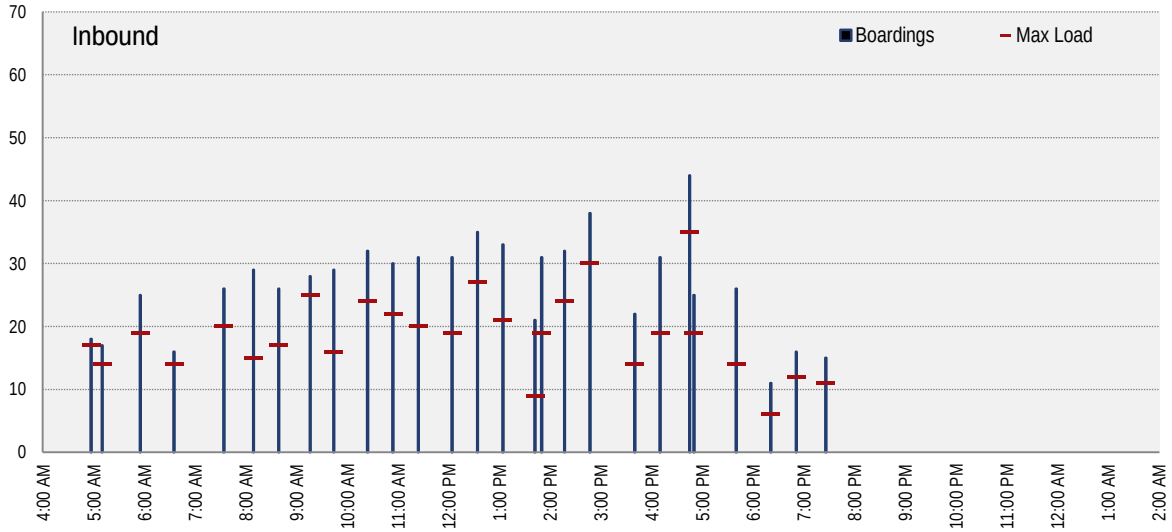


FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Saturday ridership is lower than on weekdays, and averages 21.3 passengers per trip (see Figures 10 and 11). Demand is well distributed throughout the day. Ridership is generally higher and more consistent for inbound trips, although not significantly higher. Only a handful of trips carry more than 20 riders per trips and all trips have loads below 20 passengers, with the exception of two inbound trips. Thus, service frequency and capacity appear to be appropriate for the level of ridership demand on the route.

FIGURE 10 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

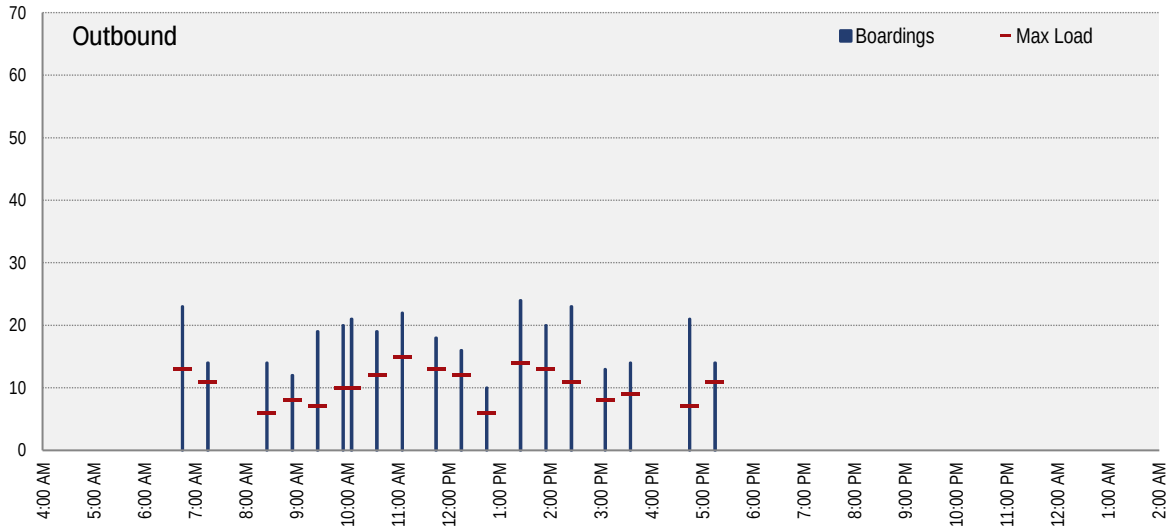
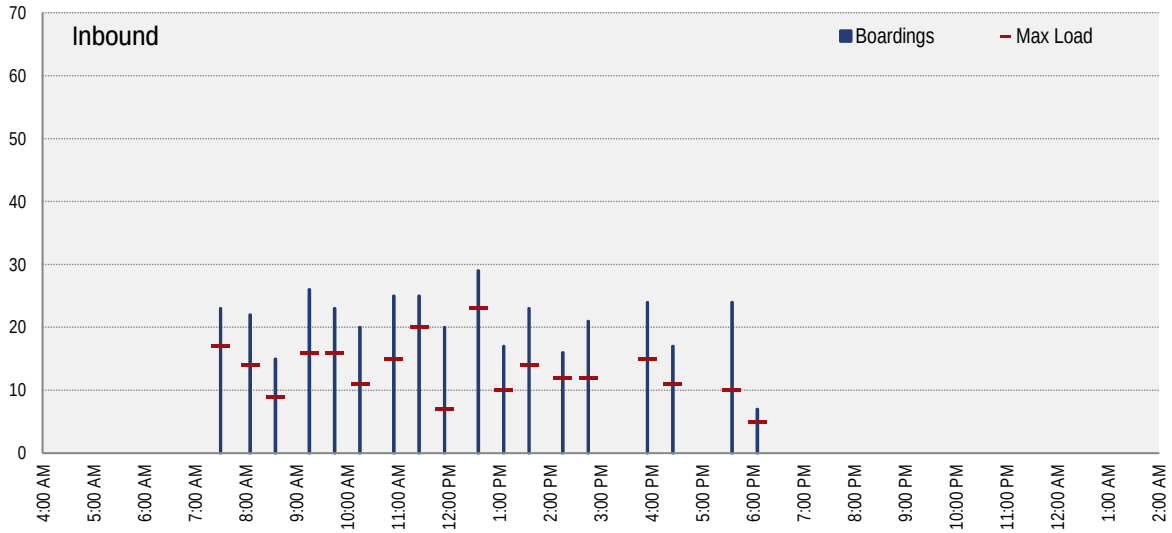


FIGURE 11 | SATURDAY INBOUND RIDERSHIP BY TRIP



Performance

On weekdays, Route 41 performs above average in terms of passengers per revenue hour, but below average for passengers per revenue mile (see Figure 12). This combination suggests that Route 41 has a relatively fast average operating speed and potentially due to the fact that there are a handful of express trips included in the service.

Service productivity drops on Saturdays; the amount of service available is also reduced. Route 41 has a lower operating cost per passenger than the Harford Division average on weekdays and Saturdays.

FIGURE 12 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 41	DIVISION AVG	ROUTE 41	DIVISION AVG	ROUTE 41	DIVISION AVG
Operating Cost per Passenger	$4.35	$4.84	$4.98	$6.30	-	$6.66
Passengers per Revenue Vehicle Hour	29.4	28.9	25.7	27.0	-	29.7
Passengers per Revenue Vehicle Mile	2.2	2.6	1.9	2.4	-	2.9

Source: CTtransit performance data

Route 41 has very strong on-time performance, with a 90.4% on-time arrival rate. Only 9.2% of the timepoint checks showed buses running at least five minutes behind schedule (see Figure 13).

FIGURE 13 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 41	DIVISION AVG
Early	0.5%	0.2%
Late	9.2%	18.9%
On-Time	90.4%	80.9%

Source: CTtransit performance data

FIGURE 14 | WEEKDAY OPERATING COST PER PASSENGER

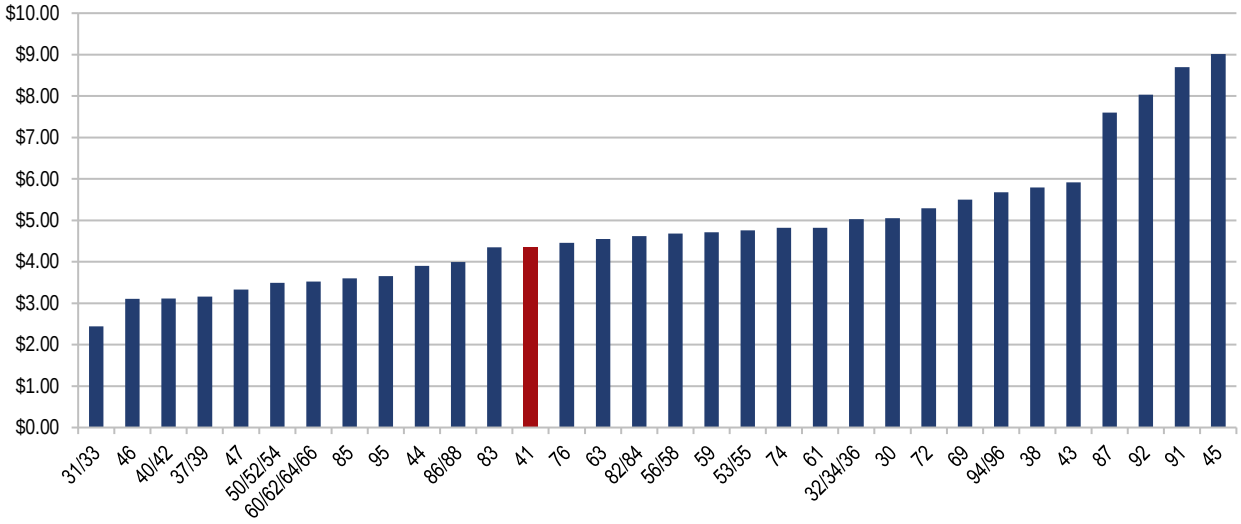
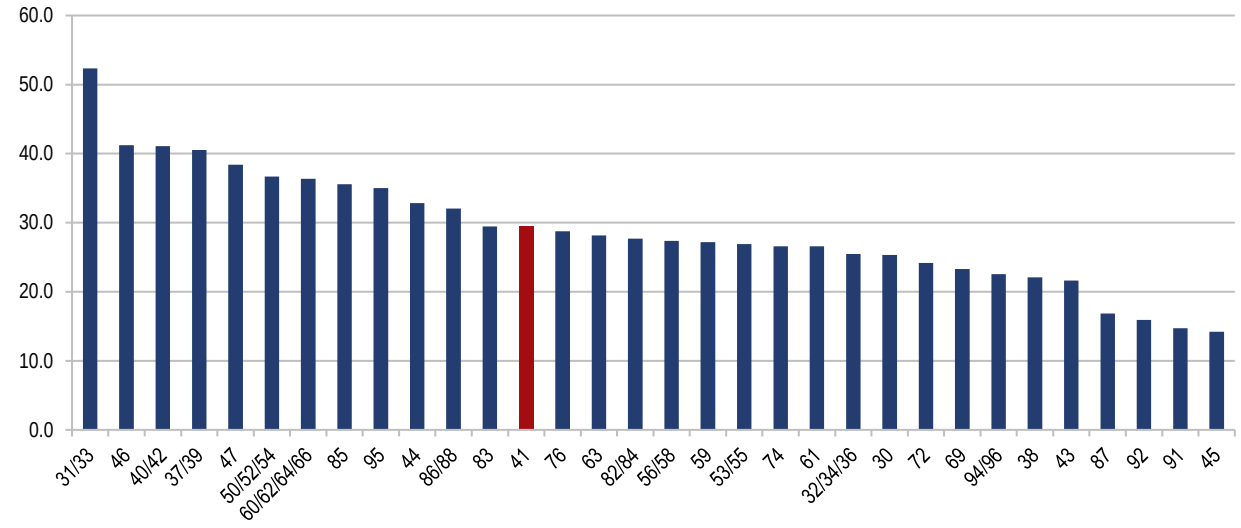


FIGURE 15 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT

Route 41 is a radial route connecting Hartford with New Britain via Newington Center. The route is quite long, traveling more than seven miles on local roads. Ridership is concentrated on the far ends of the route, suggesting many riders use the service to travel between Hartford and New Britain, rather than to other destinations along the route. In addition, much of Route 41 overlaps with Route 37/39.

This also suggests that the new CT***fastrak*** facility, which will provide direct, fast service between Hartford and New Britain, may erode some of Route 41's ridership.

CT*fastrak*

Implementation of CT***fastrak*** service plan will significantly increase options for travel between Hartford and New Britain. The new services will provide significantly more service (more frequency), that is faster and operates for longer hours every day. In addition, the new CT***fastrak*** Route 141 will duplicate much of the unique portions of Route 41.

CT***fastrak*** service impacting Route 41 includes:

- Routes 101: Routes 101 is designated as local service and will serve all CT***fastrak*** stations, providing all day, fast, frequent service between downtown New Britain and downtown Hartford. The route will operate daily with high frequencies. On weekdays, service is scheduled every 7 to 8 minutes in the peak, 12 minutes in the mid-day and 20 minutes in the evening. Saturday service is scheduled with 15 minute service during the day and 20 minutes in the evening. Sunday service has service every 20 minutes all day. Route 101 will operate daily and be available from 4:00 AM to 12:45 AM on weekdays, 4:52 AM to 12:45 AM on Saturdays, and 6:31 AM to 8:51 PM on Sundays.
- Route 144: The CT***fastrak*** service plan includes a new feeder Route 144 that will connect Westfarms Mall with Wethersfield and Newington Center via the CT***fastrak*** Cedar Street station. The service is scheduled to operate daily with hourly service from roughly 5:10 AM to 11:10 PM on weekdays, 6:10 AM to 11:10 PM on Saturdays and 7:10 AM to 8:10 PM on Sundays.

Service Improvement Options

Given the significant CT***fastrak*** investment in service between downtown Hartford and downtown New Britain, service considerations related to Route 41 include the following:

- **Anchor Route 41 to Cedar Street Station.** Existing ridership data suggests that Newington Center is not a strong anchor for Route 41. The planned Route 144 would provide a connection from Newington Center to Cedar Street Station, but this service would only operate hourly, resulting in potentially long waits for transferring Route 41 passengers. Extending Route 41 from Newington Center to Cedar Street Station would strengthen the connection between CT***fastrak*** and Newington Center and provide a one-seat ride for Route 41 passengers traveling to Cedar Street Station, where connections are available to important regional destinations such as CCSU, UConn Health Center, and Westfarms Mall.

- **Eliminate Route 41.** Ridership patterns on Route 41 suggest that the majority of riders use the route for trips between Hartford and New Britain. Intermediate stops, including in Newington Center have relatively low ridership. For most passengers traveling between Hartford and New Britain, CT***fastrak*** will offer faster, more direct and more reliable service when it opens in 2016. In addition, the Hartford portion of Route 41 is largely redundant with Route 37/39. These

suggest that Route 41 as it currently operates may not be needed after CT***fastrak*** opens in spring 2015.

Route Evaluation

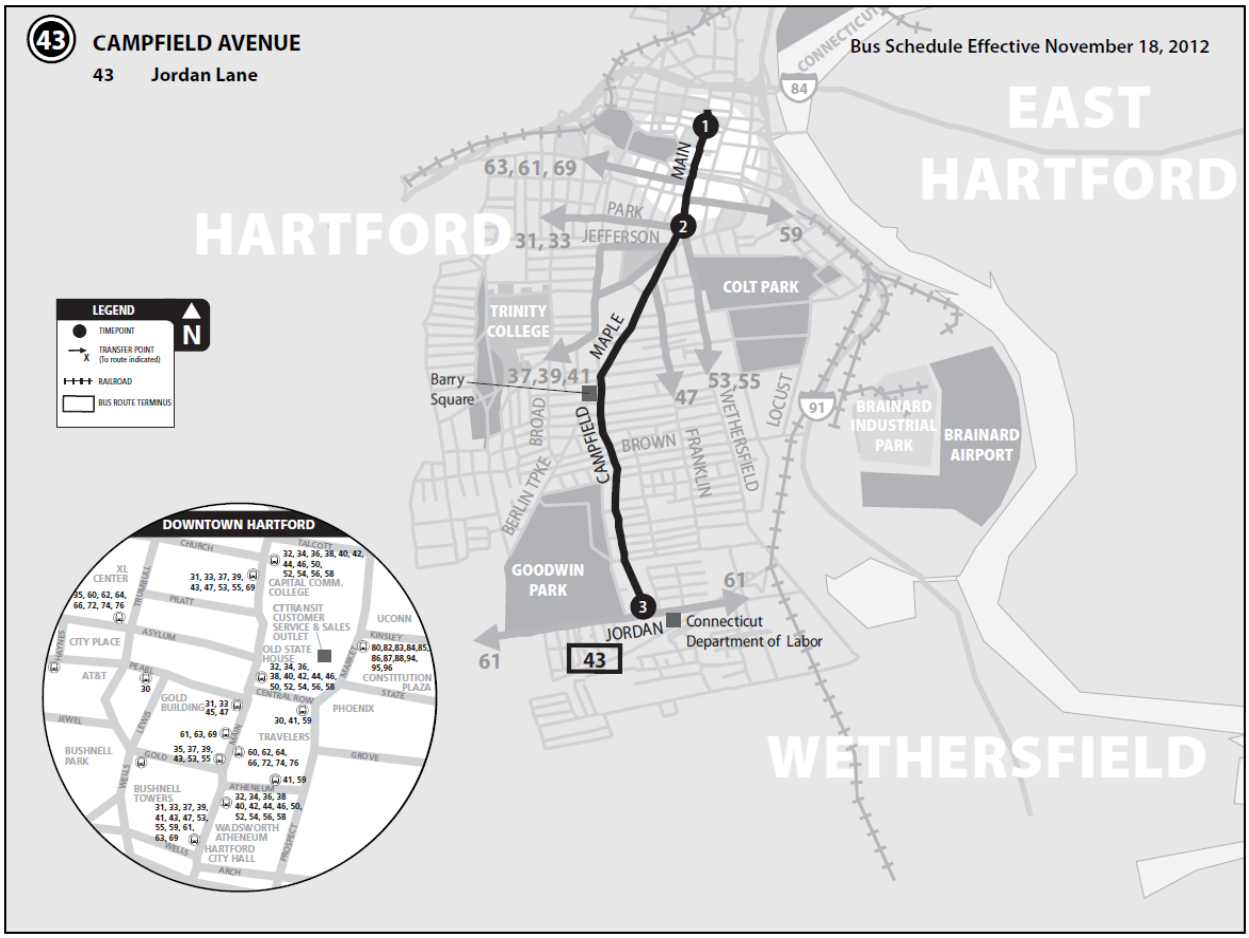
CAMPFIELD AVENUE

43 | Jordan Lane

Service Design

Route 43 is a radial route that primarily operates along Main Street, Maple Avenue, and Campfield Avenue between downtown Hartford and Jordan Lane in south Wethersfield (see Figure 1).

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 43 originates in downtown Hartford, where riders can connect to most other CT*transit* routes. In addition, there are several locations along Main Street and Maple Avenue where riders can transfer to other CT*transit* service. Connections to Route 61 are available at Jordan Lane and Folly Brook Boulevard (see Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 31	Park Street and New Park Avenue
Route 33	Park Street and Park Road
Route 37/39	New Britain Avenue
Route 41	New Britain
Route 47	Franklin Avenue
Route 61	Broad Street

Alignments and Service Patterns

Route 43 operates the same alignment for all trips and follows the same path traveling inbound and outbound. Outbound trips on Route 43 begin in downtown Hartford at Main Street and Gold Street, and travel southwest along Main Street and Maple Avenue. Buses turn south onto Campfield Avenue and continue south along Folly Brook Boulevard, terminating at Folly Brook and Jordan Lane. Inbound trips follow an identical alignment back north into downtown Hartford, ending in front of the Old State House.

Service Schedule

Route 43 operates six days a week, with service ending before 7:00 p.m. each day. Weekday service operates every 20 minutes during peak hours and every half hour during off-peak hours, with 29 outbound trips and 29 inbound trips. On Saturdays, service runs every hour, with 11 outbound trips and 12 inbound trips.

FIGURE 3 | SCHEDULE OVERVIEW

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:38 AM – 6:40 PM	20/30	29/29
Saturday	6:55 AM – 6:15 PM	60	11/12
Sunday	-	-	-

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Route 43 carries 483 daily passengers or 8.3 passengers per trip on an average weekday. This means the route is roughly half as productive as than the Hartford Division average (17.7) in terms of weekday passengers per trip (see Figure 4).

On Saturdays the route carries 256 passengers, but with less than half as many departure as on weekdays, productivity increases to 11.1 passengers per trip. This compares more favorably with the Hartford Division average of 15.3 Saturday passengers per trip. Route 43 does not operate on Sundays.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 43	ROUTE 43	DIVISION AVG
Weekday	483	8.3	17.7
Saturday	256	11.1	16.3
Sunday	-	-	17.6

Source: CTtransit performance data

Ridership by Stop

Only two stops on Route 43 generate 50 or more boardings or alightings per day. Both of these stops are in downtown Hartford (see Figure 5).

FIGURE 5 | ROUTE 43 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Main Street and Old State House	8 / 74	Transfer to routes 32, 34, 36, 38, 40, 42, 44, 46, 50, 52, 54, 56, 58
Main Street and Atheneum Square North	72 / 80	Travelers Insurance

Load profile data (see Figure 6) combines passenger activity by stop and shows the cumulative passenger load as the bus travels inbound along its route. Ridership by stop without the cumulative load is mapped in Figure 7. The data for Route 42 shows that riders board throughout the inbound trip, but very few riders get off the bus. Inbound passenger loads peak at Main Street and Buckingham Street, just south of downtown Hartford. The passenger load then declines as alightings excees boardings through downtown.

FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

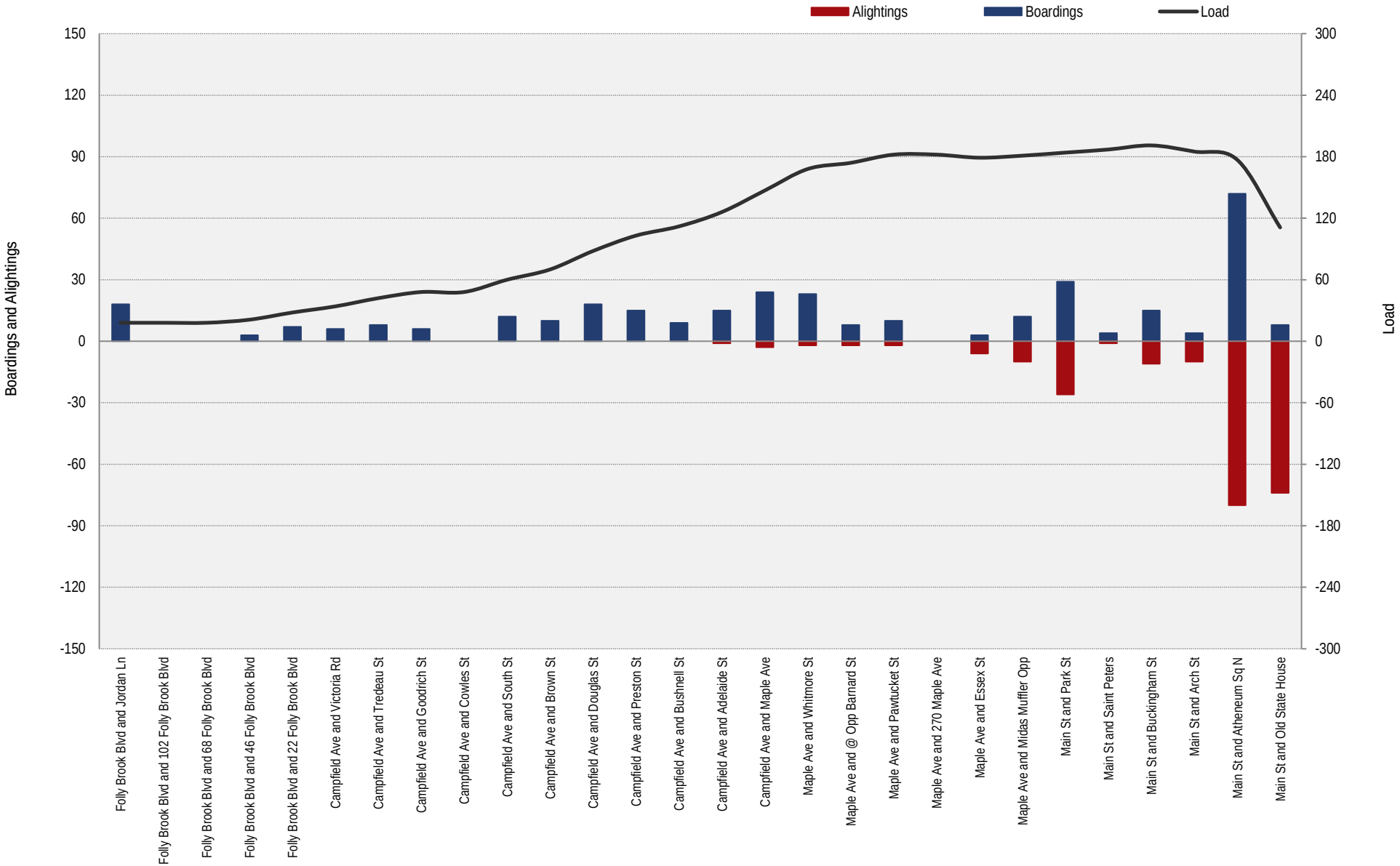
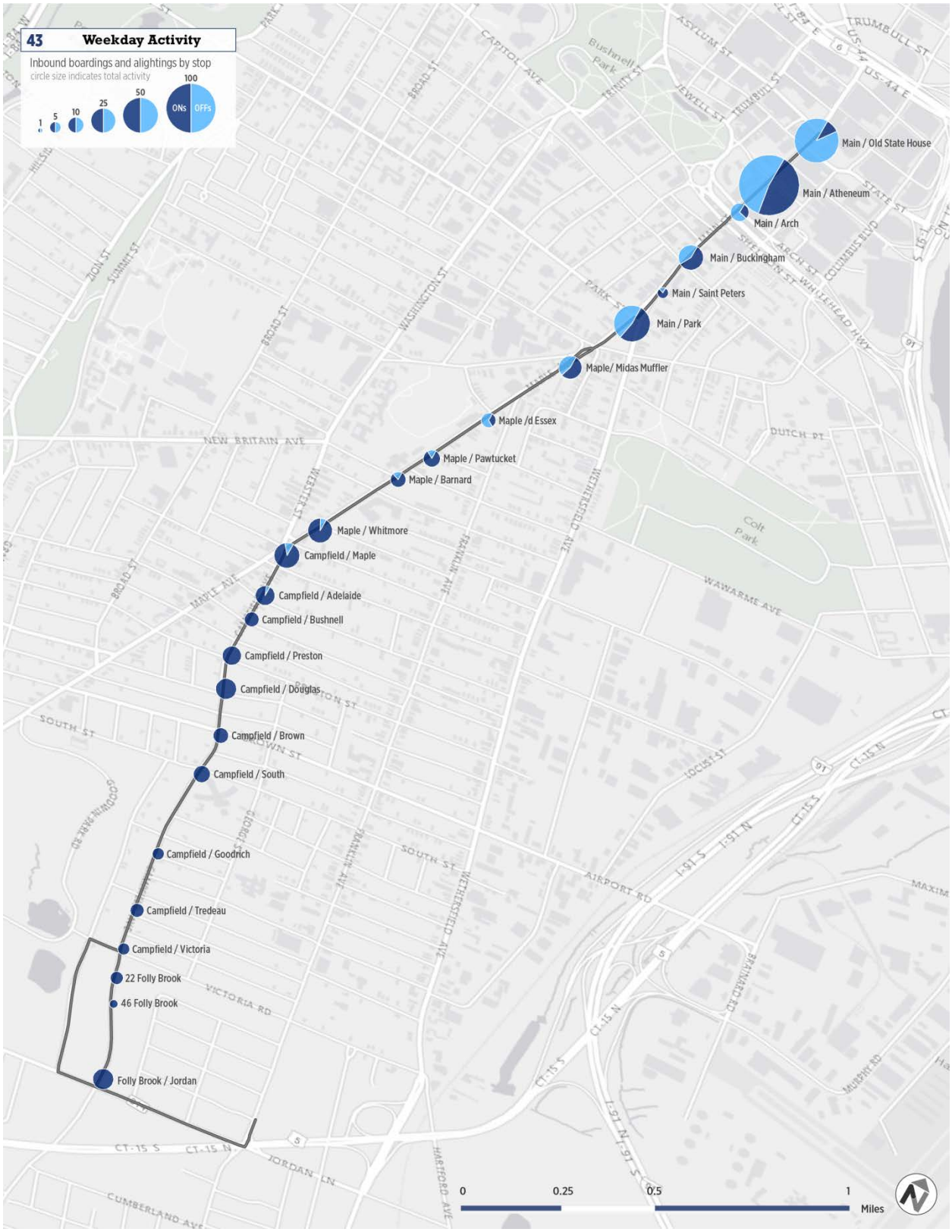


FIGURE 7 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Route 43 carries an average of 8.3 passengers per trip on weekdays. Inbound ridership peaks during traditional morning commute times, and outbound ridership peaks in the late afternoon (see Figures 8 and 9). This suggests that many Route 43 riders are downtown commuters and passengers transferring to other CT***transit*** routes downtown.

Maximum loads on Route 43 only exceed 20 passengers on one trip. The typical seating capacity of a 40-foot transit bus is 40 passengers, so overcrowding is not an issue on this route and service frequency is sufficient for demand.

FIGURE 8 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

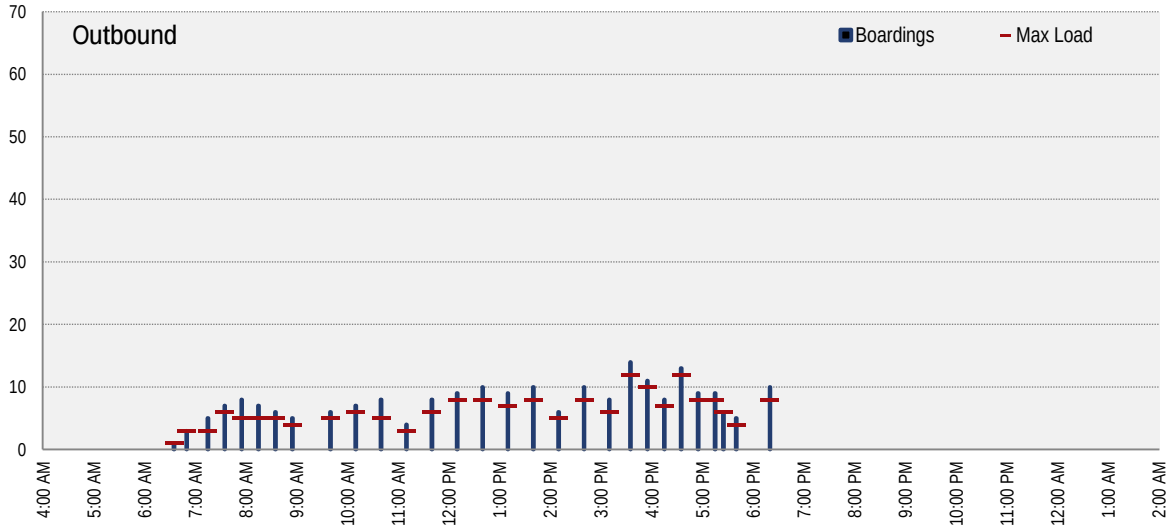
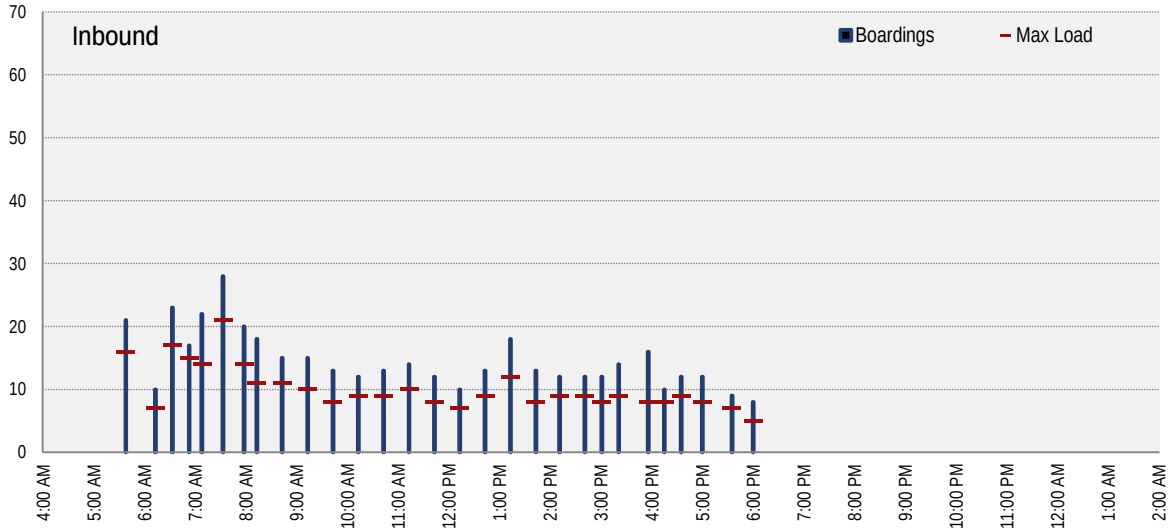


FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Saturday ridership by trip is generally low, with the exception of the first inbound trip of the day (see Figures 10 and 11). This suggests that there is likely demand for an earlier inbound trip on Saturdays. Maximum loads do not exceed 15 passengers on any trip, so capacity is not an issue on Route 43 on Saturdays.

FIGURE 10 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

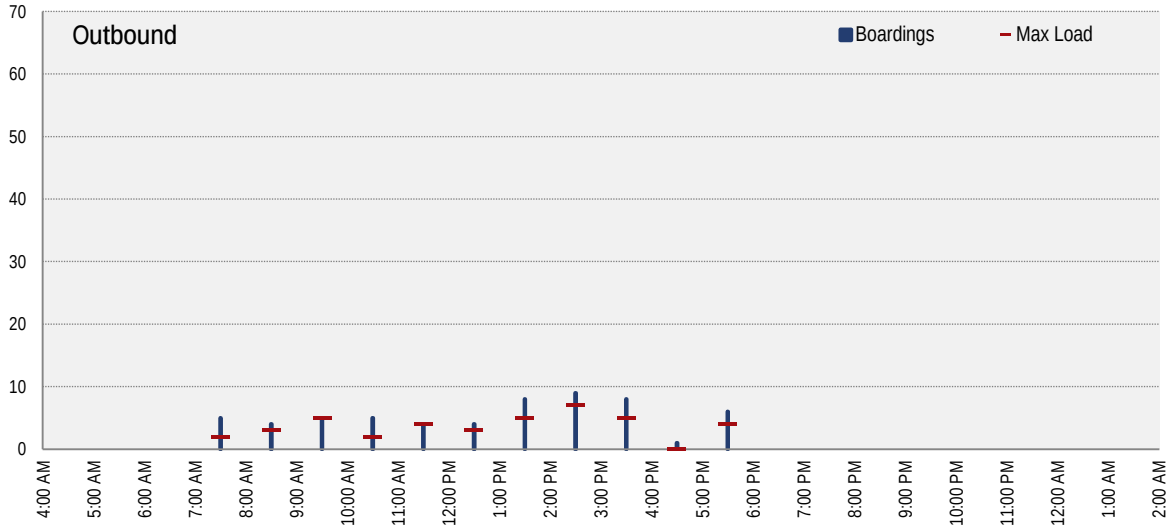
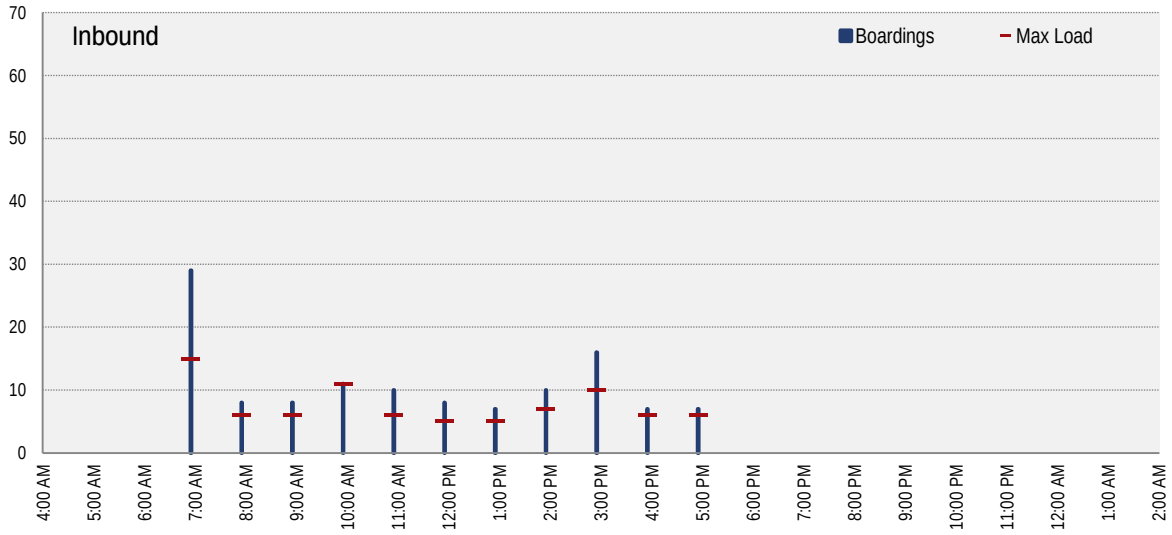


FIGURE 11 | SATURDAY INBOUND RIDERSHIP BY TRIP



Performance

On weekdays, Route 43 performs 25% below the Hartford Division average for passengers per revenue hour, but on par with the division average for passengers per revenue mile. This suggests that the route has a relatively slow operating speed for the route. Weekend service performance follows a similar pattern

(see Figure 14). Due to its relatively low ridership, Route 43 has a higher than average operating cost per passenger on weekdays. Less than half as many trips operate on Saturdays, resulting in an operating cost that is both below the weekday figure and below the Division average for Saturdays.

FIGURE 14 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 43	DIVISION AVG	ROUTE 43	DIVISION AVG	ROUTE 43	DIVISION AVG
Operating Cost per Passenger	$5.91	$4.84	$5.25	$6.30	-	$6.66
Passengers per Revenue Vehicle Hour	21.6	28.9	24.4	27.0	-	29.7
Passengers per Revenue Vehicle Mile	2.6	2.6	3.4	2.4	-	2.9

Source: CTtransit performance data

Route 43 has a very strong 93.6% on-time arrival rate. Only 5.8% of time point checks showed buses running at least five minutes behind schedule (see Figure 13).

FIGURE 15 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 43	DIVISION AVG
Early	0.6%	0.2%
Late	5.8%	18.9%
On-Time	93.6%	80.9%

Source: CTtransit performance data

FIGURE 15 | WEEKDAY OPERATING COST PER PASSENGER

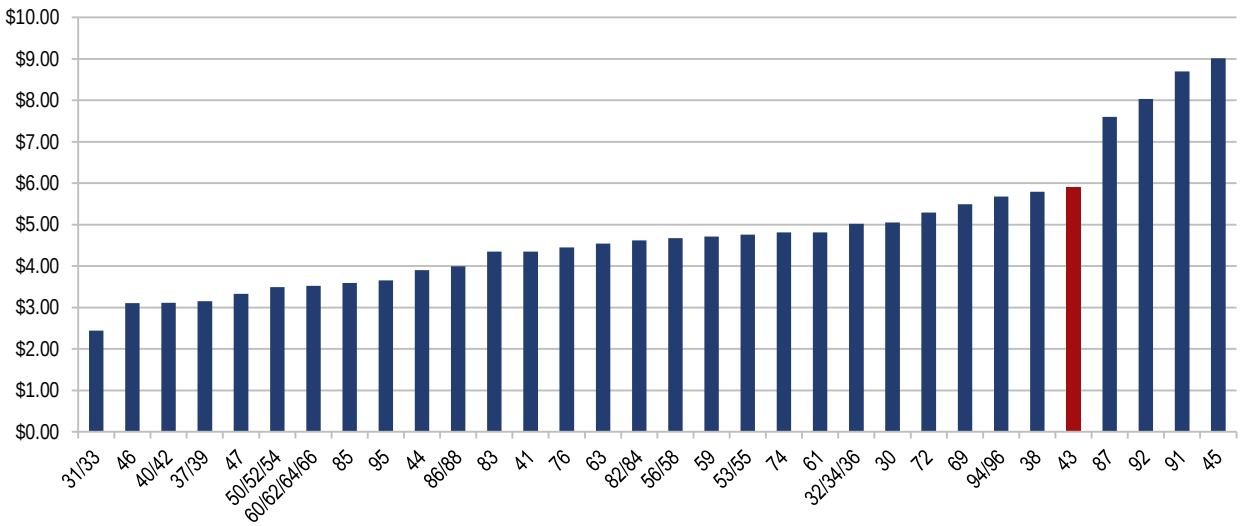
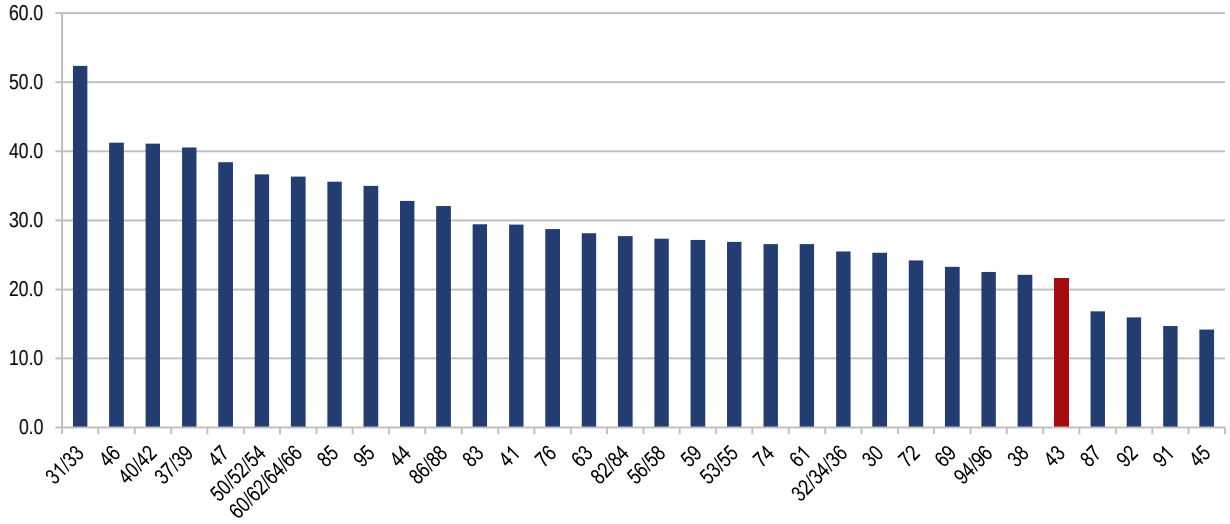


FIGURE 16 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Route 43 is a very direct radial route that provides convenient service into downtown Hartford for residents along Campfield Avenue and Maple Avenue. However, the route lacks a strong anchor on its outer end, and non-peak direction ridership is low, as is weekend service. As a result, Route 43 performs below most other CT***transit*** routes.

Opportunities to strengthen the route include the following:

- **Extend Route 43 to retail destinations along Jordan Lane**. Extending Route 43 to either Super Stop & Shop at Jordan Lane and Berlin Turnpike or PriceRite at Jordan Land and Silas Dean Highway could strengthen Route 43's outer end anchor and encourage more off-peak and "reverse direction" ridership.
- **Consolidate bus stops**. Route 43 makes stops on nearly every block of Folly Brook Boulevard and Campfield Avenue. Some blocks have multiple stops. While spacing bus stops means some riders will have a shorter walk, it also slows the bus down and makes it a less attractive option for other travelers. Consolidating stops and shortening the travel time offers potential to both increase ridership and save money for CT***transit***.
- **Install bus stop signs along Folly Brook Boulevard**. Many bus stops along Folly Brook Boulevard and Campfield Avenue are unmarked, or only marked with a "no parking" sign or white paint on a telephone pole. Without visual references, it is difficult for riders to know the service exists or where/how to use it. Fewer, but better marked stops can help improve both service awareness and service efficiency for Route 43.
- **Eliminate Saturday service**. Only a handful of riders use Route 43 on weekend days; these resources may be better invested in other parts of the system.

Route Evaluation

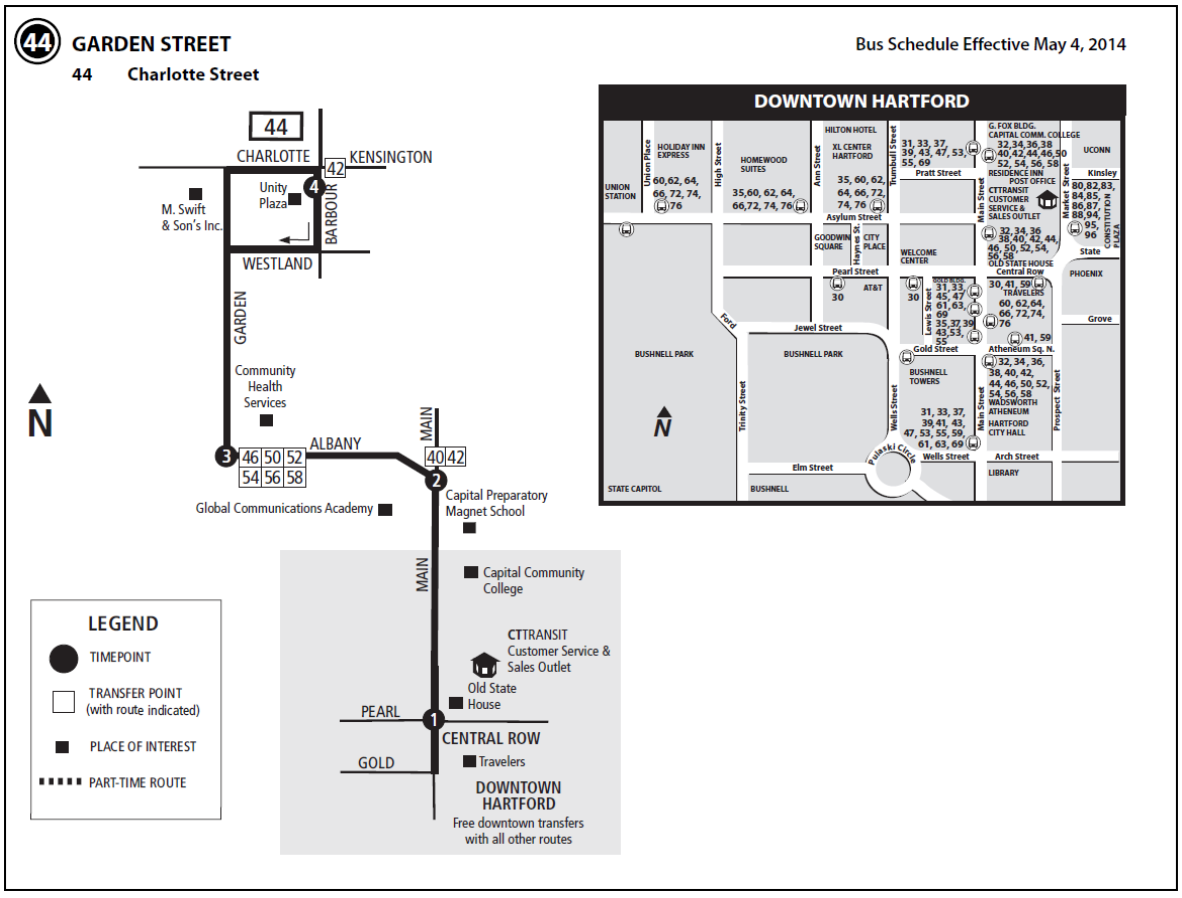
GARDEN STREET

44 | Charlotte Street

Service Design

Route 44 is short and direct route that travels between downtown Hartford and the North End area, serving Main Street, Albany Avenue, and Garden Street.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 44 originates in downtown Hartford, where riders can connect to almost all CT*transit* services. Riders can also connect to a number of other CT*transit* routes along Main Street or Albany Avenue, and can connect to Route 42 at Unity Plaza on Barbour Street. (see Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 30N	Bradley Airport
Route 40	North Main Street
Route 42	Barbour Street
Route 46	Vine Street
Route 50	Blue Hills Avenue and Cottage Grove Road
Route 52	Blue Hills Avenue
Route 54	Blue Hills Avenue and Blue Hills Extension
Route 56	Bloomfield Avenue
Route 58	Albany Avenue

Alignments and Service Patterns

Outbound trips begin in downtown Hartford at the Old State House, and travel north along Main Street, west on Albany Avenue, and north on Garden Street. Route 44 completes a terminal loop turning east onto Charlotte Street, south on Barbour Street past Unity Plaza, and west on Westland Street, then back south on Garden Street. Inbound trips continue south on Garden and follow the same alignment back into downtown Hartford.

Service Schedule

Route 44 operates six days a week. On weekdays, service operates every half hour during peak hours and once an hour during off-peak hours, with 17 outbound trips and 18 inbound trips. Saturday service operates every hour, with 11 outbound trips and 11 inbound trips.

FIGURE 3 | SCHEDULE OVERVIEW

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	6:15 AM – 6:33 PM	30/60	17/18
Saturday	7:30 AM – 6:03 PM	60	11/11
Sunday	-	-	-

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Route 44 carries 408 daily passengers or about 10.7 passengers per trip on an average weekday. On Saturdays, Route 44 carries 197 daily passengers, or about 9 passengers per trip (see Figure 4). These averages are almost half (60%) of the daily average for all routes in CT*transit*'s Hartford Division.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 44	ROUTE 44	DIVISION AVG
Weekday	408	10.7	17.7
Saturday	197	9.0	16.3
Sunday	-	-	17.6

Source: CTtransit performance data

Ridership by Stop

The busiest stops on Route 44 are the downtown Hartford stops on Central Row and Main Street, with just over 50 boardings and alightings each. This is significantly less than observed on other CT***transit*** routes serving downtown. Only one other stop along Route 44 has more than 50 daily boardings and alightings: Garden Street at Nelson Street (see Figure 5 and 6).

FIGURE 5 | ROUTE 44 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Central Row and Travelers	11 /42	Downtown Hartford and connections to other CT*transit* routes
Main Street and Pratt Street	3 / 50	Downtown Hartford and connections to other CT*transit* routes
Garden Street/Nelson Street	51 / 2	High density residential neighborhood

Load profile data (see Figure 6) combines passenger activity by stop and shows the cumulative passenger load as the bus travels outbound along its route. Ridership by stop without the cumulative load is mapped in Figure 7. The data for Route 46 shows inbound passenger loads climb steadily as the bus travels south, peaking at Main Street and Trumbull just before the bus enters downtown Hartford. However, the bus reachs close to peak loads along Albany Avenue, as some passengers alight for local destinations along this thoroughfare or to transfer to other routes.

FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

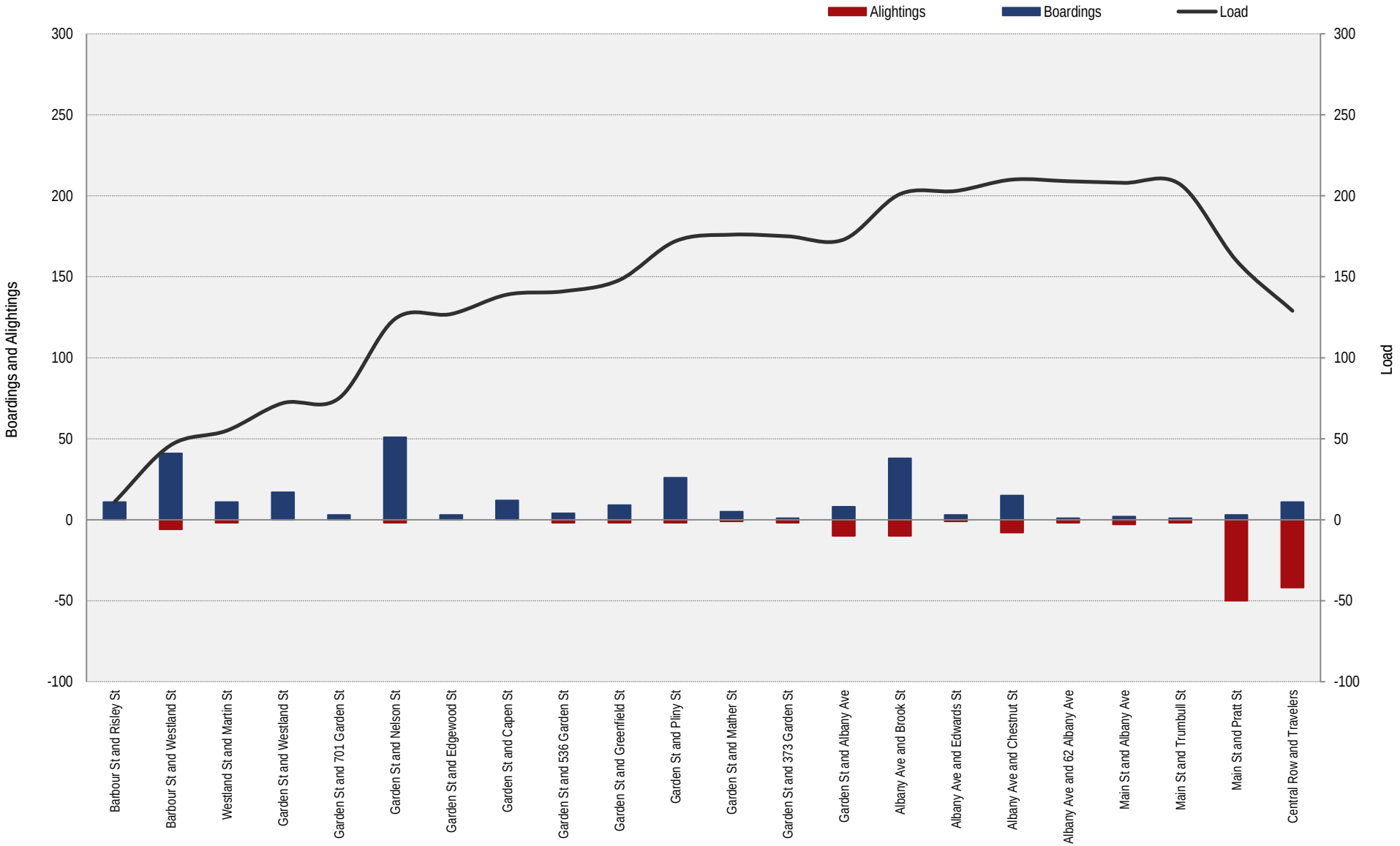
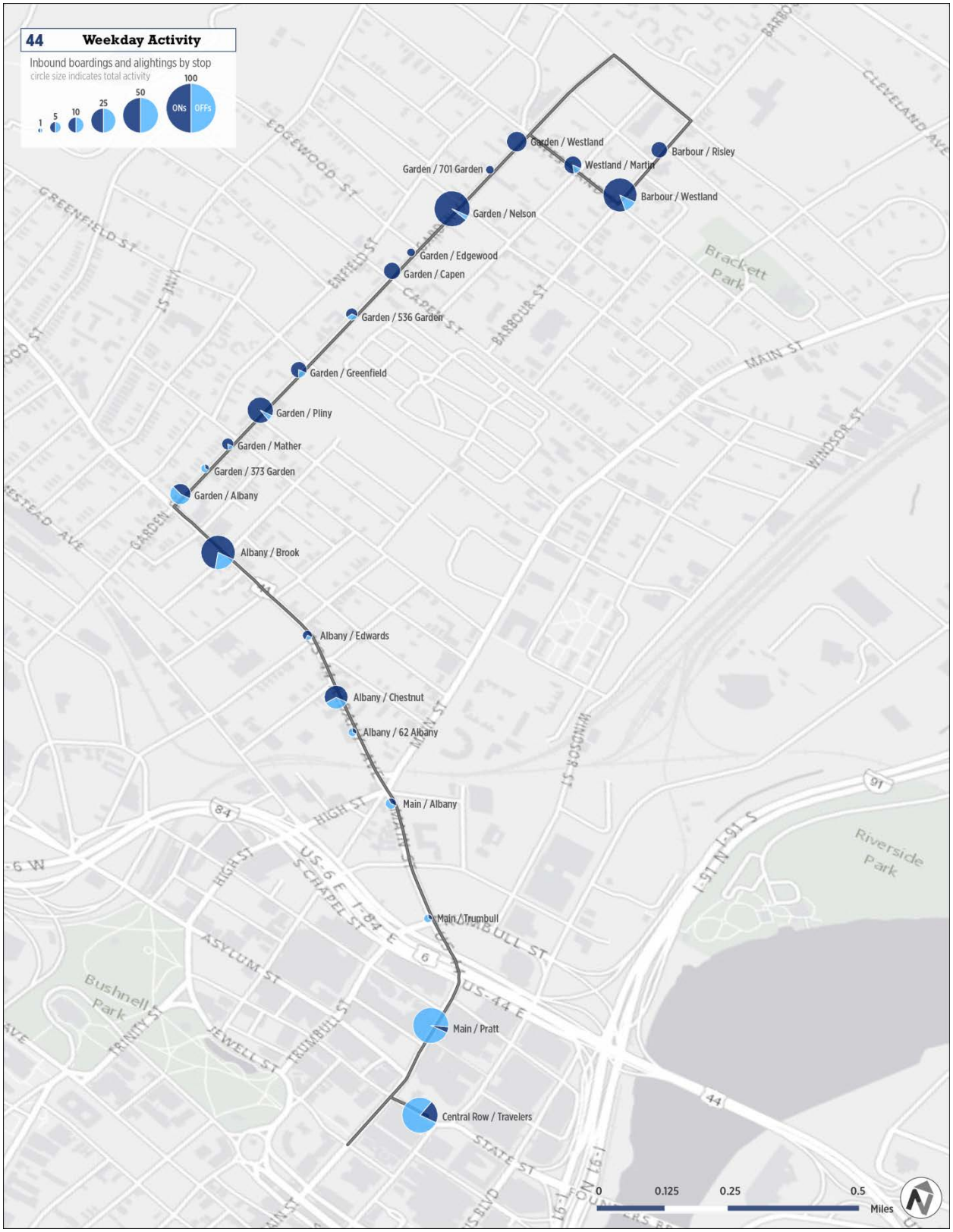


FIGURE 7 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

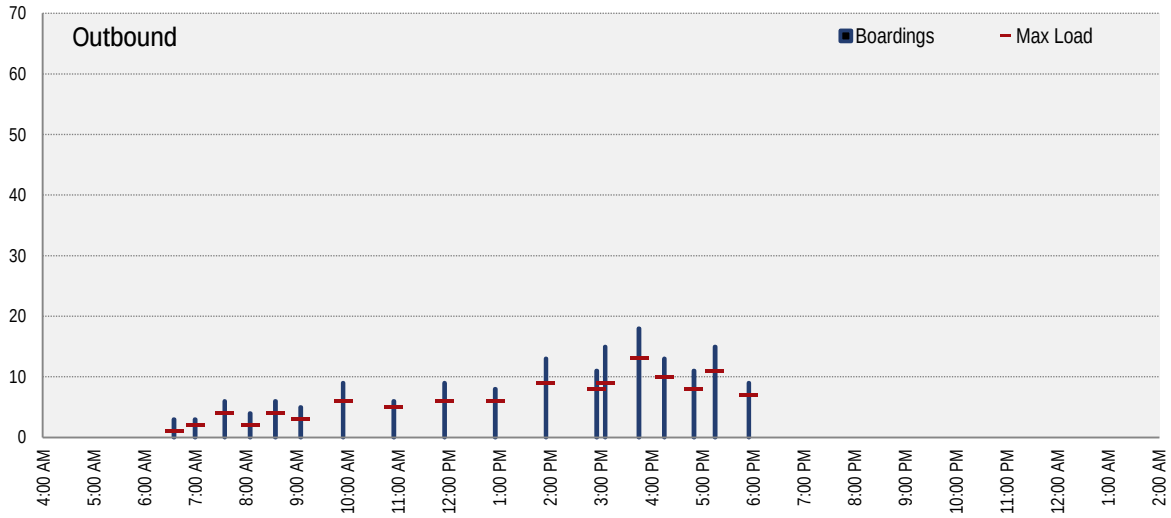


Ridership by Trip

Weekday

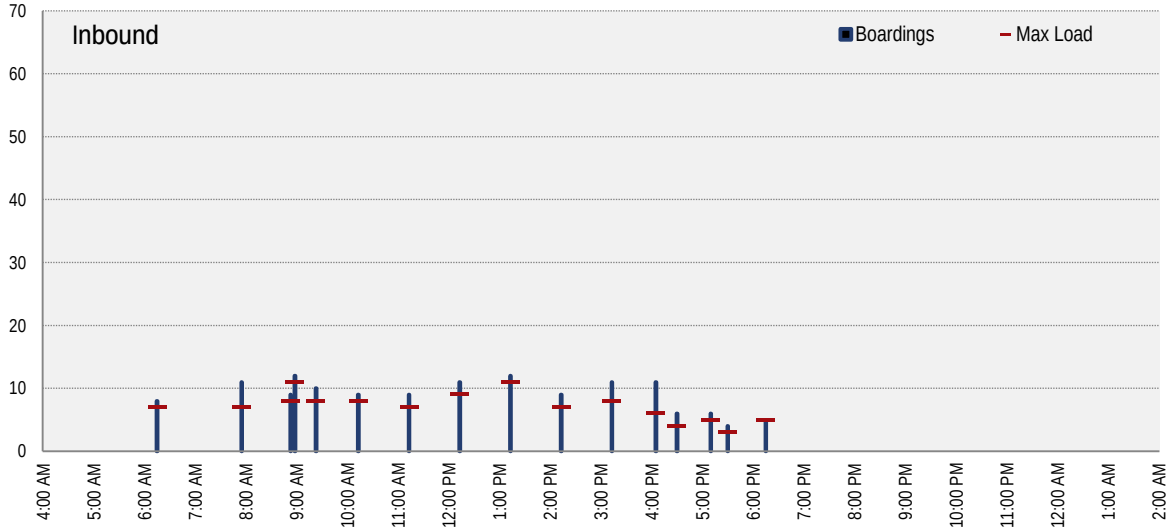
Route 44 carries an average of 10.7 passengers per trip on weekdays. Passenger loads are generally light, but highest in the afternoon peak in the outbound direction (see Figure 8). However, the 3:45 PM outbound trip is the only weekday trip carrying more than 15 passengers. Passenger loads in the inbound direction (See Figure 9) never exceed 11 riders per trip.

FIGURE 8 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP



Note: No data for three scheduled weekday outbound trips at 6:55 PM, 7:20 PM and 8:25 PM..

FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Note: No dataa for the 6:55 AM weekday inbound trips.

Saturday

On Saturday, ridership demand is low; with only three trips carrying more than 10 passengers (5:30 PM outbound, and 7:48 AM and 2:48 PM inbound). The busiest trip of the day is the first 7:48 AM inbound trip, with 18 passengers, (equal to the busiest weekday trip). Early Saturday morning outbound trips carry few riders, suggesting the service should start with an inbound trip.

FIGURE 10 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

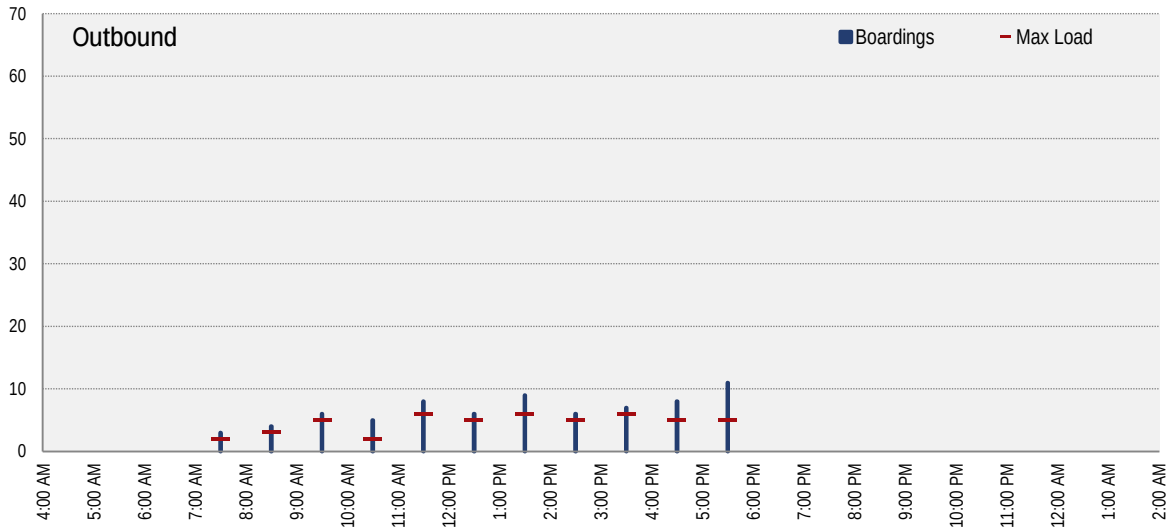
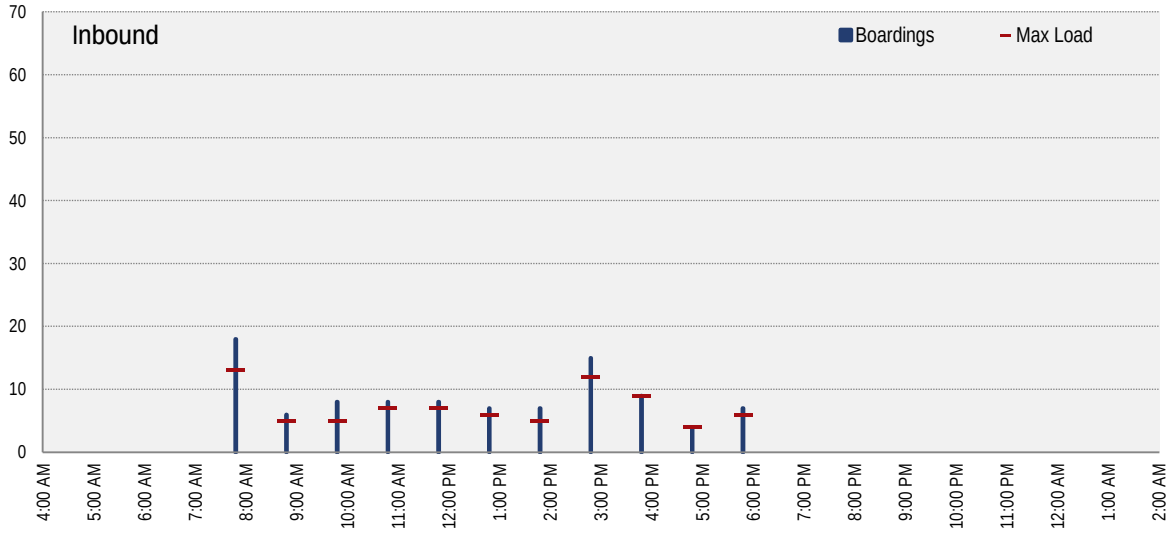


FIGURE 11 | SATURDAY INBOUND RIDERSHIP BY TRIP



Performance

Route 44 performs slightly better than the average for local routes in CT*transit*'s Hartford division. The cost per passenger is $3.90 on weekdays and $4.15 on Saturdays (Figure 12), which compare favorably to the division averages of $4.84 and $6.30, respectively. Passenger productivity also exceeds division averages.

FIGURE 12 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 44	DIVISION AVG	ROUTE 44	DIVISION AVG	ROUTE 44	DIVISION AVG
Operating Cost per Passenger	$3.90	$4.84	$4.15	$6.30	-	$6.66
Passengers per Revenue Vehicle Hour	32.8	28.9	30.9	27.0	-	29.7
Passengers per Revenue Vehicle Mile	4.7	2.6	3.6	2.4	-	2.9

Source: CTtransit performance data

Route 44 has a high percentage of late trips, with more than one-quarter of all trips arriving late and resulting in overall on-time performance that is significantly below the system average (see Figure 13). This is surprising given the relatively low number of boardings and short-distance of the route (2.8 miles).

FIGURE 13 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 44	DIVISION AVG
Early	0.0%	0.2%
Late	27.7%	18.9%
On-Time	72.3%	80.9%

Source: CTtransit performance data

FIGURE 14 | WEEKDAY OPERATING COST PER PASSENGER

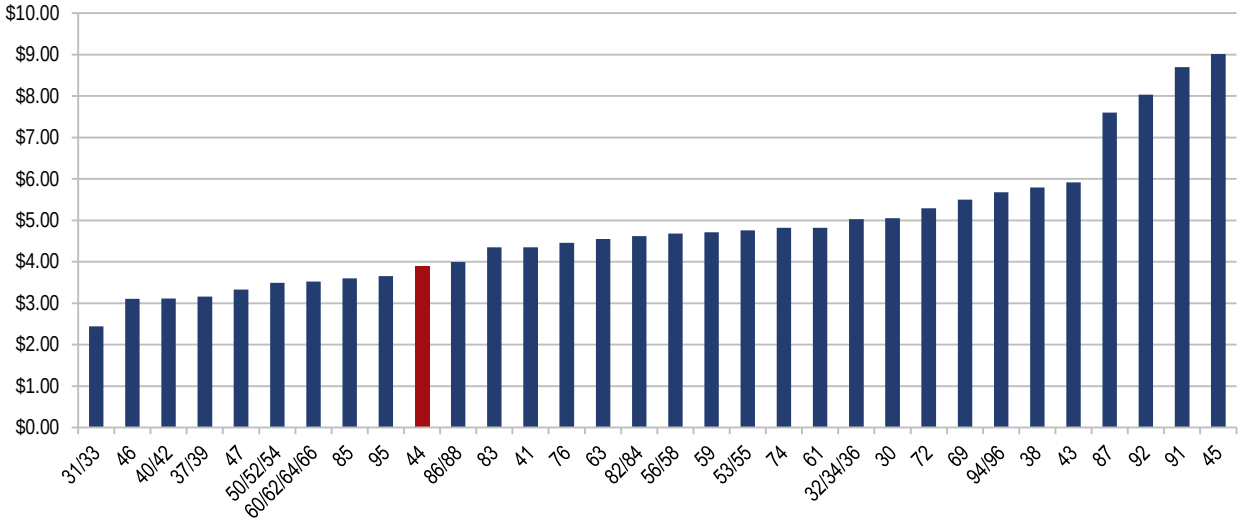
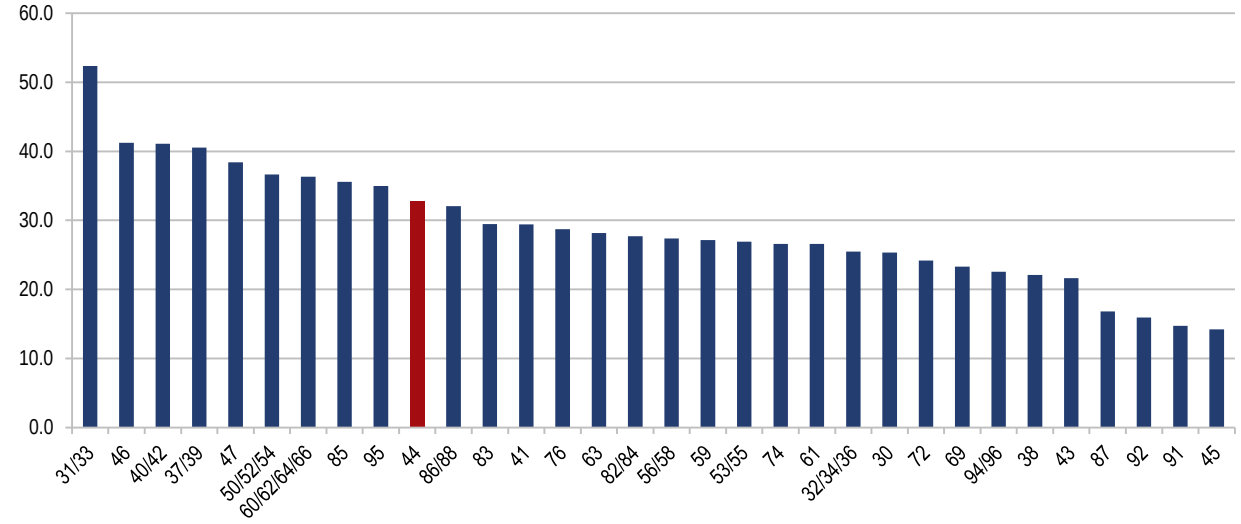


FIGURE 15 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Route 44 is a radial route serving the north end of Hartford. Despite having low ridership, the route performs well in terms of the cost metrics due to the fact that it serves a neighborhood corridor with high transit demand, has a short route (2.8 miles) and runs at a relatively low frequency (30 minute peak/60 minute off-peak).

The main improvement opportunities associated with Route 44 are associated with improving the on-time performance and coordinating service with nearby routes. Reasons for the on-time performance problems are unclear, because as mentioned, the route is short, ridership is manageable and the route does not travel along notoriously congested roadways.

In terms of service coordination, the southern segment of this route, along Main Street and Albany Avenue, Route 44 operates parallel with a number of other local routes (Routes 40, 42, 46, 50, 52, 54, 56 and 58), many of which are less than one-mile apart. For example, north of Albany Avenue, Route 44 is paralleled by Route 46 on Vine Street about ¼ mile to the west, and by Route 42 on Barbour Street about two-tenths of a mile to the east. Thus, within ¾ of a mile, there are three local routes within a similar corridor. Route 40 operates further to the east, following Main Street into Windsor, and a number of routes operate further to the west along Blue Hills Avenue.

Opportunities to strengthen Route 44 include suggestions to realign resources to offer the most direct, convenient service for riders in this north end corridor. These include the following:

- **Coordinate Routes 42, 44 and 46.** There are three routes (42, 44, and 46) that are within ¾ of a mile. Routes 42 and 44, in particular, operate in close to each other and share a short segment along Barbour Street. Thus, while the neighborhood has a lot of transit riders, it is over-served. Route 44 has significantly less ridership than Route 42 and 46, as it operates less frequently and riders have options to use other services. One potential strategy would be to designate one of the three corridors (potentially Barbour Street) as the primary corridor and operate service with the highest frequency on this corridor. The other corridors, Garden and Vine Streets, may also be served but with less frequent service.
- **Offer bi-directional Sunday service.** The north end of Hartford is a productive market for CT*transit*. The route is productive on weekdays and Saturdays. Route 44 does not operate Sunday service, but Route 42 operates Sunday service as a combined Route 42 and 44 and travels via a large terminal loop. Ridership on the Sunday service at the end of the route is low (see Route 40-42 evaluation). An opportunity to strengthen Sunday service would be to follow a similar strategy described above, where a primary transit route is identified and that route provides bi-directional service.
- **Reduce peak period frequency**. Route 44 weekday service currently operates every 30 minutes during peak periods, and 60 minutes during the off-peak. Passenger loads are relatively low throughout the day, even during the morning and afternoon peaks when frequency is higher. The data suggests a 60 minutes frequency all day would be sufficient to meet passenger demand on Route 44. Savings from reducing peak period service may be invested in the higher frequency transit corridor.
- **Discontinue Saturday service.** On Saturday, ridership demand on Route 44is low, with only three trips carrying more than 10 passengers**.** This service could be discontinued, making Route 44 a weekday-only service. Passengers would be better served if one route in the North End neighborhood offered higher frequency service as compared with three routes operating lower frequency service in close proximity. Consistent with reducing peak period service, any savings

associated with reducing Saturday service on Route 44 may be invested in the identified high capacity transit corridor.

- **Discontinue Route 44**. Ridership on Route 44 is significantly less than on Routes 42 and 46, both of which extend farther to the north connecting to Tower Avenue. If Route 44 were discontinued, more resources could be directed to Routes 42 and 46, and former Route 44 riders would be in walking distance to these other routes.
- **Create transit investment corridor along Albany Avenue.** Albany Avenue is served by seven different CT*transit* routes, several of which have problems with their on-time performance. A potential strategy to both strengthen ridership and improve operational efficiency is to invest in corridor infrastructure to help improve transit speed and reliability. Albany Avenues has a large number of traffic signals, and only one travel lane in the westbound direction (but two travel lanes and parking in the eastbound direction). Identifying Albany as a "key bus route" corridor and making relatively small roadway improvements, such as signal priority, queue jump lanes, bus pullouts, stop consolidation and other corridor improvements would improve transit operations (and save operating costs) and help attract more riders.

Route Evaluation

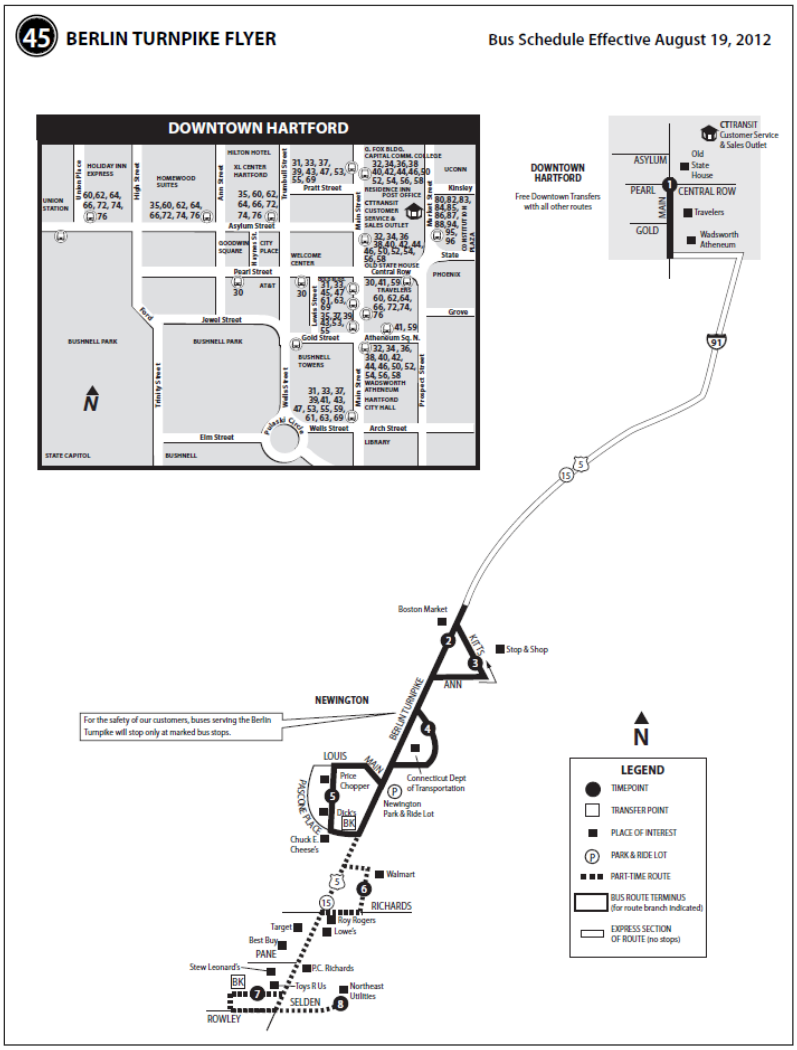
BERLIN TURNPIKE FLYER

45 | Berlin Turnpike Flyer

Service Design

Route 45 is one of the Hartford Division's five Flyer routes, providing express service from Newington and downtown Hartford with stops at a park-and-ride and several shopping centers along Berlin Turnpike.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

The Berlin Turnpike Flyer originates in downtown Hartford, where riders can connect to most CT***transit*** routes. Riders can also connect to CT***transit***-New Britain's BK Route in Newington, for service to downtown New Britain.

Alignments and Service Patterns

On weekday mornings, all Berlin Turnpike Flyer trips begin in downtown Hartford at the corner of Main Street and Pearl Street. Buses depart Hartford and travel southwest along Berlin Turnpike without making any stops until Kitts Lane, where they serve Stop & Shop and other retail destinations. Buses then continue south along the Berlin Turnpike corridor, deviating off the turnpike to serve the Connecticut Department of Transportation building, Price Chopper, and other retail destinations. Weekday morning trips are outbound only.

The last weekday morning trip, all afternoon weekday trips, and all Saturday and Sunday trips extend further south along Berlin Turnpike to Rowley Street. These trips serve several additional retail locations including Target, Best Buy, and Stew Leonard's. Buses then return northbound on Berlin Turnpike to serve Lowes's and Wal-Mart. The last weekday morning trip also serves Northeast Utilities on Selden Street.

Inbound trips are limited to weekday afternoons and weekends only. These trips generally begin at Stew Leonard's and serve Wal-Mart, Price Chopper, and Stop & Shop before continuing non-stop to downtown Hartford. One weekday inbound trip begins at Price Chopper, and two weekday inbound trips serve Northeast Utilities in addition to the various retail destinations. These three non-standard trips also serve the Connecticut Department of Transportation building.

Service Schedule

The Berlin Turnpike Flyer operates seven days a week. On weekdays, the route provides three outbound trips from Hartford in the morning. In the afternoon and evening, the route includes two outbound and five inbound trips. Only four trips operate on Saturdays; this service includes two round trips, all of which operate in the evening. On Sunday, the route completes six round trips, three of which operate in the morning and three in the afternoon.

Route45 is somewhat unusual in that it has a more robust schedule on Sundays than on Saturdays. This schedule is likely intended to fill a service gap along Berlin Turnpike that exists on Sundays when CT***transit*** - New Haven Route BK does not operate. Route BK provides circulation service between the various retail destinations along the turnpike between Rowley Street and Griswoldville Avenue.

FIGURE 2 | SCHEDULE OVERVIEW

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	4:29 AM – 10:35 PM	3 AM trips/7 PM trips	5/5
Saturday	7:15 PM – 10:35 PM	4 PM trips	2/2
Sunday	8:00 AM – 7:25 PM	6 AM trips/6 PM trips	6/6

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Route 45 carries 84 daily passengers or 8.4 passengers per trip on an average weekday. This is less than half the Hartford Division average of 17.7 weekday passengers per trip (see Figure 3)[1].

The route's two round-trips on Saturdays carry a total of 45 passengers. The more robust Sunday schedule results in 167 passengers, or 13.9 passengers per trip.

FIGURE 3 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 45	ROUTE 45	DIVISION AVG
Weekday	84	8.4	17.7
Saturday	45	11.3	16.3
Sunday	167	13.9	17.6

Source: CTtransit performance data

Ridership by Stop

The most heavily used stop on Route 45 is its downtown terminus at Main Street and Pearl Street, with 20 alightings per day. No other stops generate more than 7 boardings or alightings per day.

Load profile data (see Figure 4) combines passenger activity by stop and shows the cumulative passenger load as the bus travels outbound along its route. Ridership by stop without the cumulative load is mapped in Figure 6. The data for Route 45 shows inbound passenger loads peak at Kitts Lane as the bus begins its non-stop service to downtown Hartford.

[1]*Comparison is with the Hartford Division service overall, including local service.*

FIGURE 4 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

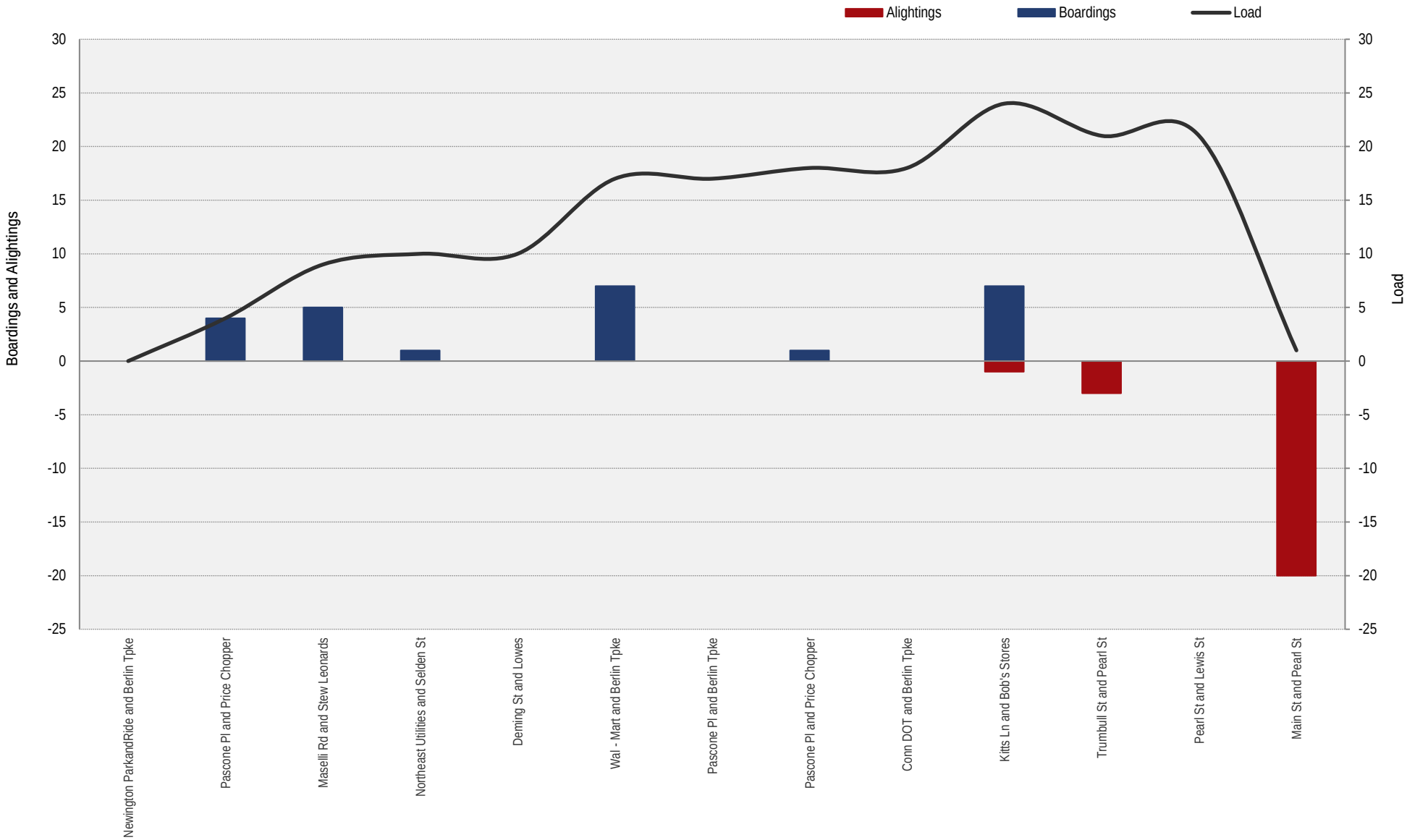


FIGURE 5 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

Ridership by Trip

Weekday

Route 45 carries an average of 8.4 passengers per trip on weekdays. Outbound ridership is relatively consistent on each of the three morning trips, but is very low in the afternoon. Inbound ridership is highest on the first trip of the afternoon, but is very low after the first two trips. High ridership on the first trips of the day suggests there may be opportunities for earlier service. Maxim loads do not exceed 11 passengers on any trips, so overcrowding is not an issue on Route 45.

FIGURE 6 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

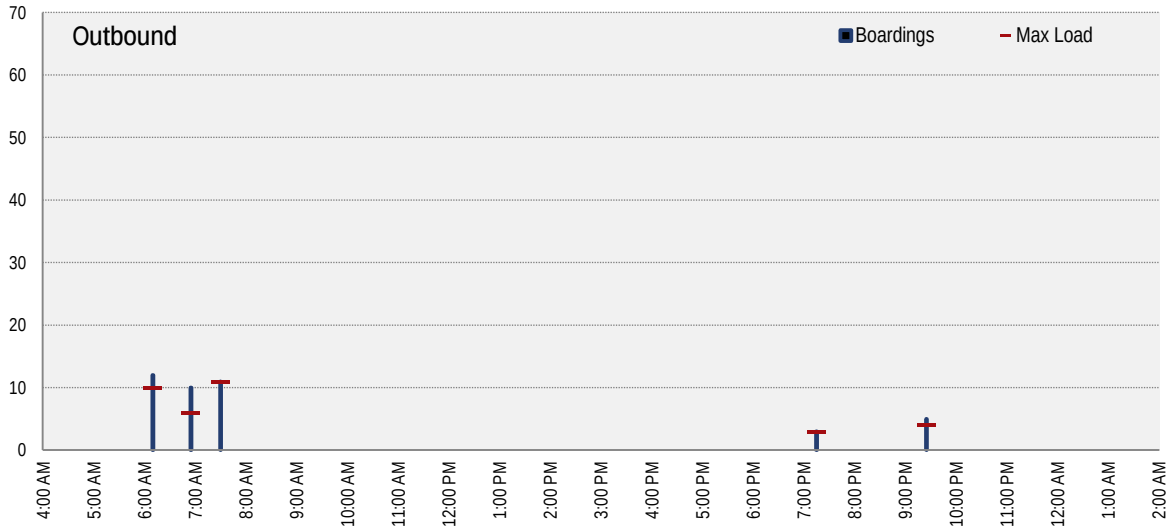
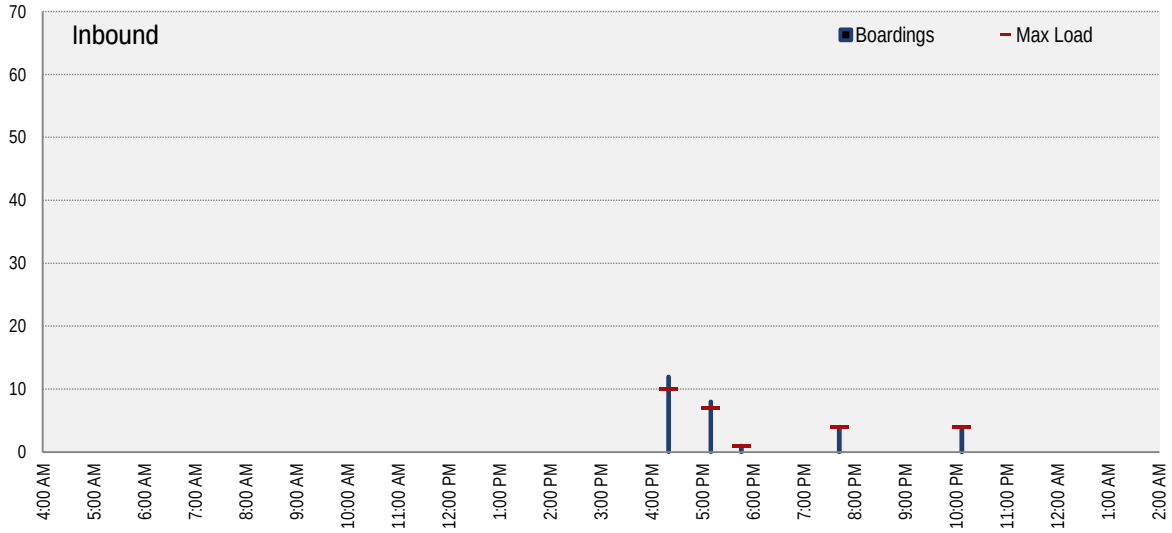


FIGURE 7 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Saturday ridership data was only available for one of the two round trips for the day. Neither ridership nor maximum load exceeded 8 passengers on Saturday.

FIGURE 8 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

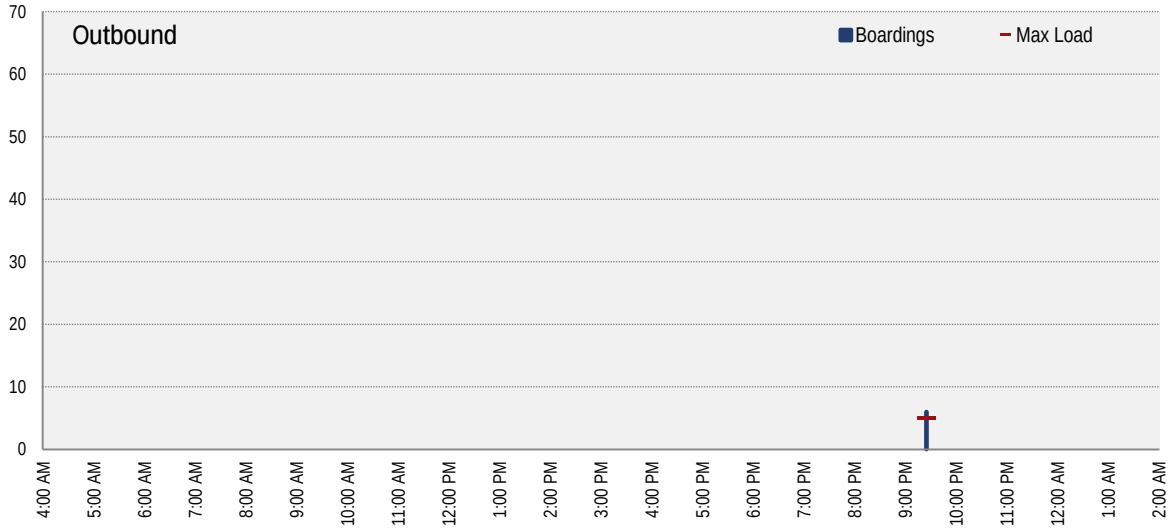
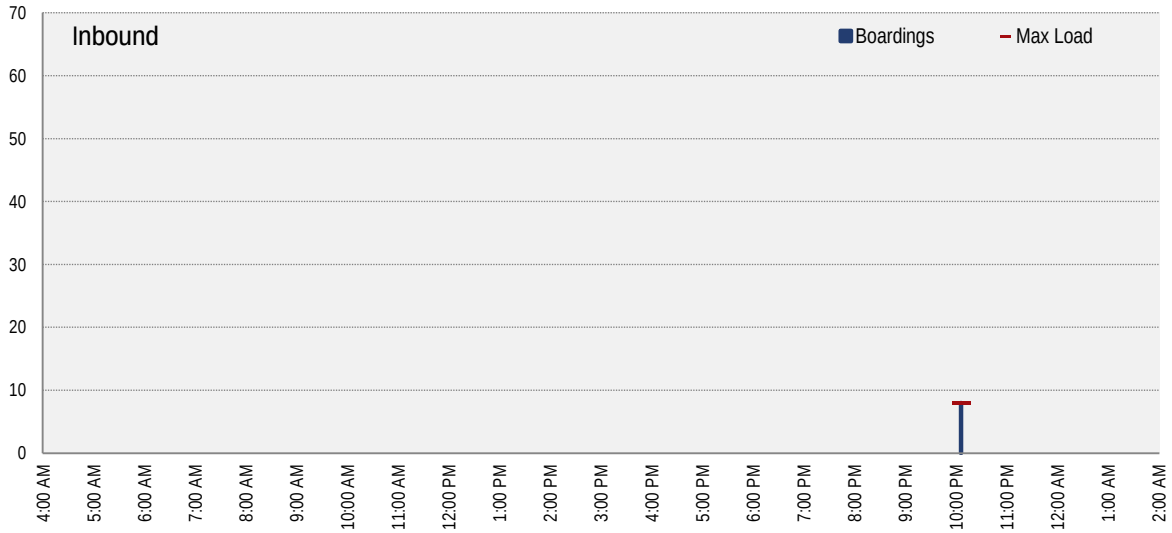


FIGURE 9 | SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

On Sundays, ridership is highest on the first outbound trip in the morning, with 15 boardings and a maximum load of 13 passengers. This suggests that a earlier departure time may be well received by existing riders. The last trip of the day in both directions has very low ridership.

FIGURE 10 | SUNDAY OUTBOUND RIDERSHIP BY TRIP

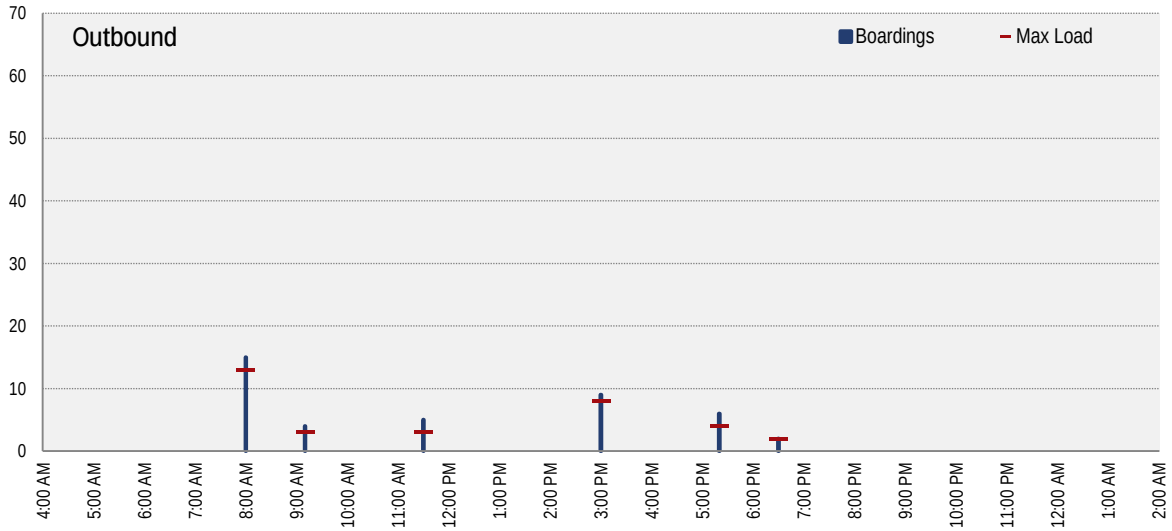
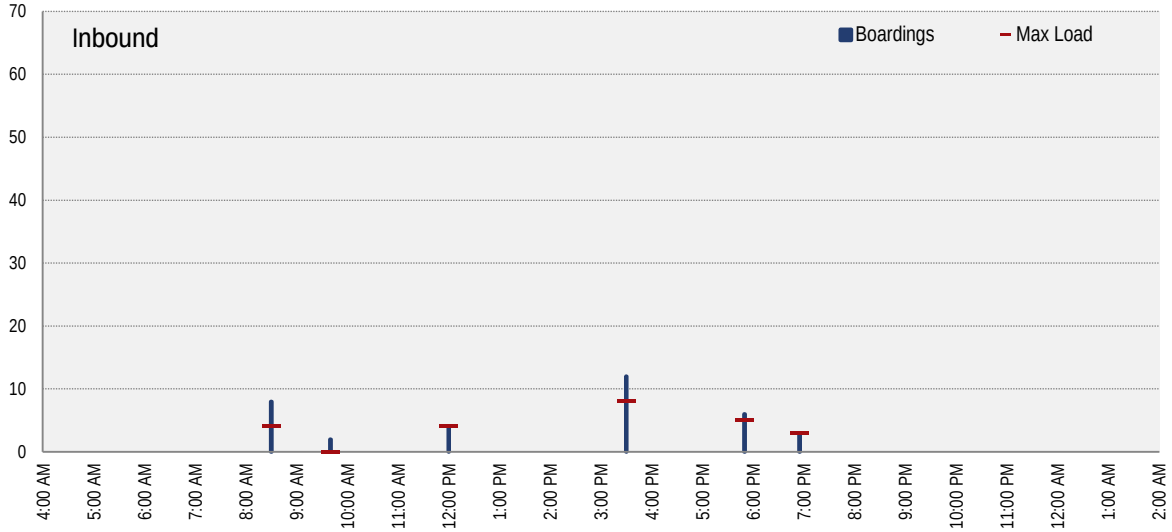


FIGURE 11 | SUNDAY INBOUND RIDERSHIP BY TRIP



Performance

The productivity of Route 45 is weaker as compared with the Hartford Division average for all service performance metrics on weekdays and weekends (see Figure 12). The route's productivity is highest on Sundays when it fills in for Route BK in providing circulation service between several retail destinations along Berlin Turnpike. Overall, Route 45 has the highest weekday operating cost per passenger and lowest ridership per revenue hour among all CT***transit*** – Hartford routes.

FIGURE 12 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 45	DIVISION AVG	ROUTE 45	DIVISION AVG	ROUTE 45	DIVISION AVG
Operating Cost per Passenger	$9.02	$4.84	$5.93	$6.30	$5.17	$6.66
Passengers per Revenue Vehicle Hour	14.2	28.9	21.6	27.0	24.7	29.7
Passengers per Revenue Vehicle Mile	0.7	2.6	1.1	2.4	1.3	2.9

Source: CTtransit performance data

Route 45 has a 76.7% on-time arrival rate, with a higher percentage of late buses than the Hartford Division average (see Figure 15). Given that ridership is not particularly high on Route 45, poor on-time performance suggests insufficient recovery time to consistently provide on-time service on the route.

FIGURE 13 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 45	DIVISION AVG
Early	0.0%	0.2%
Late	23.3%	18.9%
On-Time	76.7%	80.9%

Source: CTtransit performance data

FIGURE 14 | WEEKDAY OPERATING COST PER PASSENGER

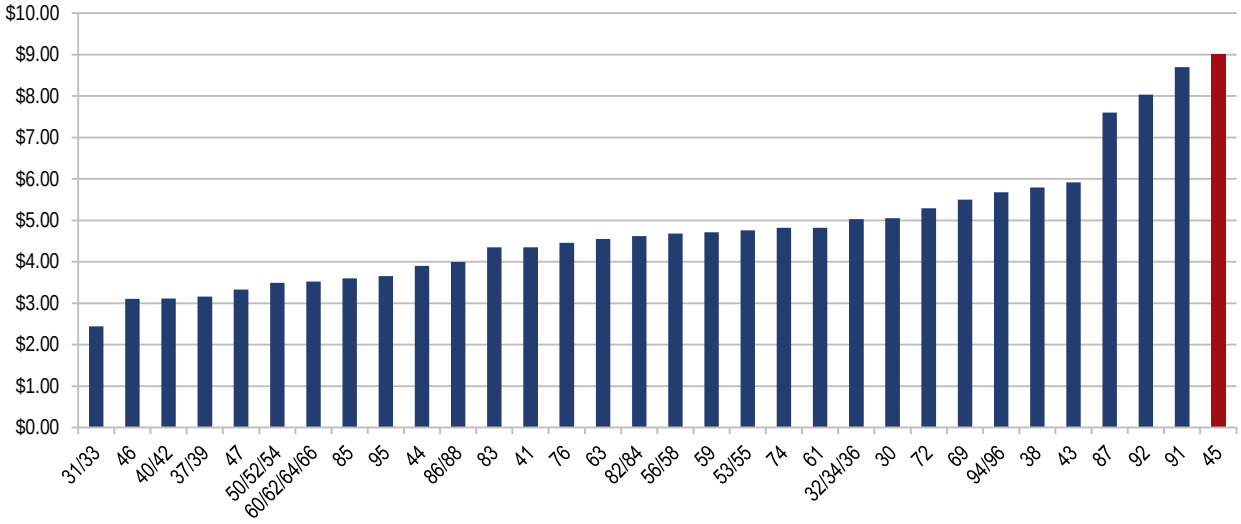
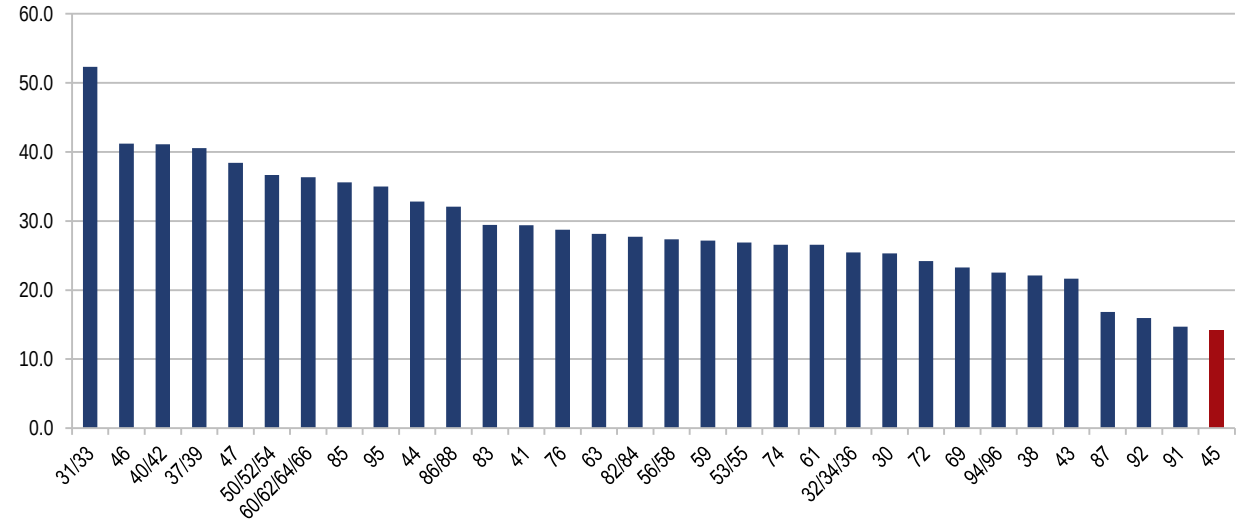


FIGURE 15 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Route 45 is a Flyer route that facilitates reverse-commute trips to retail and other destination along Berlin Turnpike in Newington. On weekends, the route is designed to fill a service gap along the turnpike when CT***transit*** – New Britain Route BK is not operating. However, on weekdays the route is redundant with Routes 47 and 907. Route 45 has the highest cost per passenger and lowest ridership per hour of any CT***transit*** – Hartford route. However, it is worth noting that a portion of Route 45 is funded through CRCOG's Job-Access program and thus, is specifically intended to provide access to employment.

Opportunities to strengthen the route include the following:

- **Eliminate Route 45 and reinvest its resources elsewhere.** Route 45 provides fast and direct service to the destinations that it serves in Newington, but ridership and productivity is poor. Given its low ridership, Route 45 should be considered for elimination. Resources invested in Route 45 may be better invested in the system by strengthening other area service such as Route 907. Additional reverse-commute trips on Route 907 would provide a similar service to Route 45, but may be more successful at attracting riders as an Express route than Route 45 has been able to as a Flyer route.
- **Anchor Route 45 at a CT*fastrak* Station.** Route 45 operates "closed door" from downtown Hartford to Kitts Lane. As a result, there are very few boarding opportunities. The destinations served by Route 45 are not strong enough ridership generators to support this service model. A shorter route, anchored at either the Cedar Street or Newington Junction CT***fastrak*** stations and operating on arterial streets rather than freeways, may make the route more productive. This approach would also introduce cross-town service in Newington, making local trips more direct and convenient.
- **Rebrand Route 45 trips as a variant of another route.** Route 45 operates an unusual schedule with very limited weekday and Sunday service and only one trip per direction on Saturdays. As a result, awareness of the service is likely low among CT***transit*** passengers. Rebranding Route 45 trips as a variant of Route 47, for example, would bring the service to the attention of more users, and would likely have a positive impact on ridership.

Route Evaluation

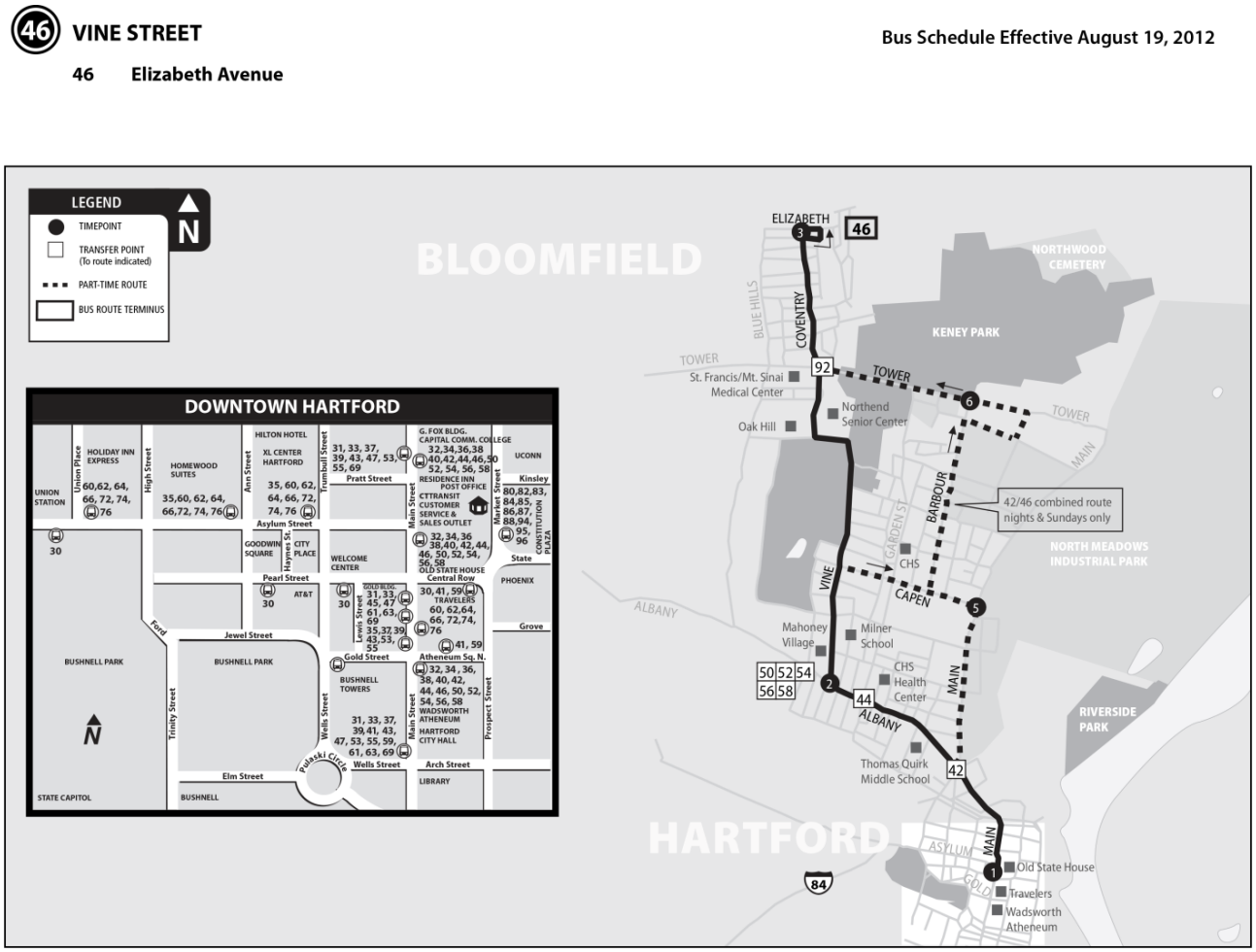
VINE STREET

46 | Elizabeth Avenue

Service Design

Route 46 originates in downtown Hartford and travels north along primarily on Main Street, Albany Avenue, and Vine Street (see Figure 1), terminating just over the Bloomfield border on Coventry Street and Elizabeth Avenue (just south of Cottage Grove Road). It is combined with Route 42 after 10 pm on weeknights and on Sundays. AT these times, Route 46 operates largely on the Route 42 alignment.

FIGURE 1 | ROUTE MAP



SYSTEM INTERACTION AND TRANSFER OPPORTUNITIES

Route 46 begins and ends in downtown Hartford where riders can transfer to most CT***transit*** services. Riders may also connect with other local CT***transit*** services along Albany Avenue, or with the Route 92 crosstown service on Tower Avenue (see Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 30N	Bradley Airport
Route 40	North Main Street
Route 42	Barbour Street and North Hartford
Route 44	Garden Street
Route 50	Blue Hills Avenue
Route 52	Blue Hills Avenue
Route 54	Blue Hills Avenue and Day Hill Road
Route 56	Bloomfield Avenue
Route 58	Albany Avenue
Route 92	Windsor, South Windsor, and Manchester

Alignments and Service Patterns

Route 46 outbound trips begin in downtown Hartford at the Old State House. Buses travel north, via Main Street, Albany Avenue, Vine Street, and Coventry Street, and complete a terminal loop along Merriam, Greenwood, and Elizabeth avenues before returning south along Coventry. Inbound trips follow the same alignment back into downtown Hartford.

On weekday nights (two trips after 10 pm) and Sundays, Route 46 operates as a combined Route 42/46. These trips depart the Old State House and continue north on Main Street past Albany Avenue, following Route 42's alignment (west on Capen Street, north on Barbour Street, east on Kensington and north on Hampton). The combined route then travels west on Tower Avenue to return inbound via the Route 46 alignment using Coventry, Vine, Albany and Main Street. Essentially, this Sunday service operates as a large counterclockwise loop.

Service Schedule

Route 46 operates seven days a week, with Sunday service operating as a combined Route 42/46. There are 57 outbound trips and 57 inbound trips on weekdays. Service during weekday peak periods operates every 10 minutes and off-peak service operates between 20 to 30 minutes. Saturday service runs every 20 minutes, with 35 outbound trips and 35 inbound trips. The combined Route 42/26 on Sundays operates every 70 minutes. In addition, between Thanksgiving and December 31, Route 42/46 operates an additional outbound trip later in the evenings on Sundays.

FIGURE 3 | SCHEDULE OVERVIEW (ALL ROUTES 37, 39 AND 39W)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:10 AM – 12:15 AM	10/30	57/57
Saturday	7:00 AM – 8:55 PM	20	35/35
Sunday*	7:20 AM – 8:05 PM	70	13/12

** On Sunday, Route 46 operates as combined Route 42/46 that follows a modified alignment.*

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Route 46 carries 1,886 daily passengers, or about 16.5 passengers per trip on an average weekday, which is just slightly below the Hartford Division average of 17.7 weekday passengers per trip (see Figure 4). Saturday service carries 935 daily passengers, or 13.4 passengers per trip, which is also below the division average of 16.3 passengers per trip for Saturday. Sunday service, operated as a combined Route 40/42 carries 370 daily passengers, or 15.4 riders per trip, which is well below the division average.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 46	ROUTE 46	DIVISION AVG
Weekday	1,886	16.5	17.7
Saturday	935	13.4	16.3
Sunday*	370	15.4	17.6

** On Sunday, Route 46 operates as combined Route 42/46 that follows a modified alignment. Ridership and productivity data for Sunday represents this combined Route 42/46.*

Source: CTtransit performance data

Ridership by Stop

The most heavily used stops along Route 46 are the downtown Hartford stops at the Old State House and at Main and Church streets. Outside of downtown, there are a number of stops along Albany Avenue and Coventry Street that generate 50 or more boardings or alightings each day (see Figure 5).

FIGURE 5 | ROUTE 46 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (OUTBOUND)

BUS STOP	OUTBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Main Street and Gold Street	33 / 299	Downtown Hartford and connections to other CT*transit* routes
Main Street and Pratt Street	65 / 290	Downtown Hartford and connections to other CT*transit* routes
Albany Avenue and Brook Street	55 / 5	YMCA, small retail, multi-family residential
Albany Avenue and Garden Street	99 / 11	Community Health Center, small retail, multi-family residential
Albany Avenue and Irving Street	50 / 7	Small retail, multi-family residential
Albany Avenue and Vine Street	39 / 41	Liberty Christian Center/Church, retail, multi-family residential
Vine Street and Edgewood Street	43 / 7	Residential
Coventry Street at CRMHC	1 / 88	Capitol Regional Mental Health, Oak Hill
Coventry Street @ Burgdorf Health Center	49 / 0	Burgdorf Health Center, senior housing

Load profile data (see Figure 6) combines passenger activity by stop and shows the cumulative passenger load as the bus travels outbound along its route. Ridership by stop without the cumulative load is mapped in Figure 7. The data for Route 46 shows both boarding and alighting activity along Vine and Albany street, shows inbound ridership steadily increasing as the bus approaches downtown Hartford, with passenger loads peaking at Main Street and Trumbull Street.

FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

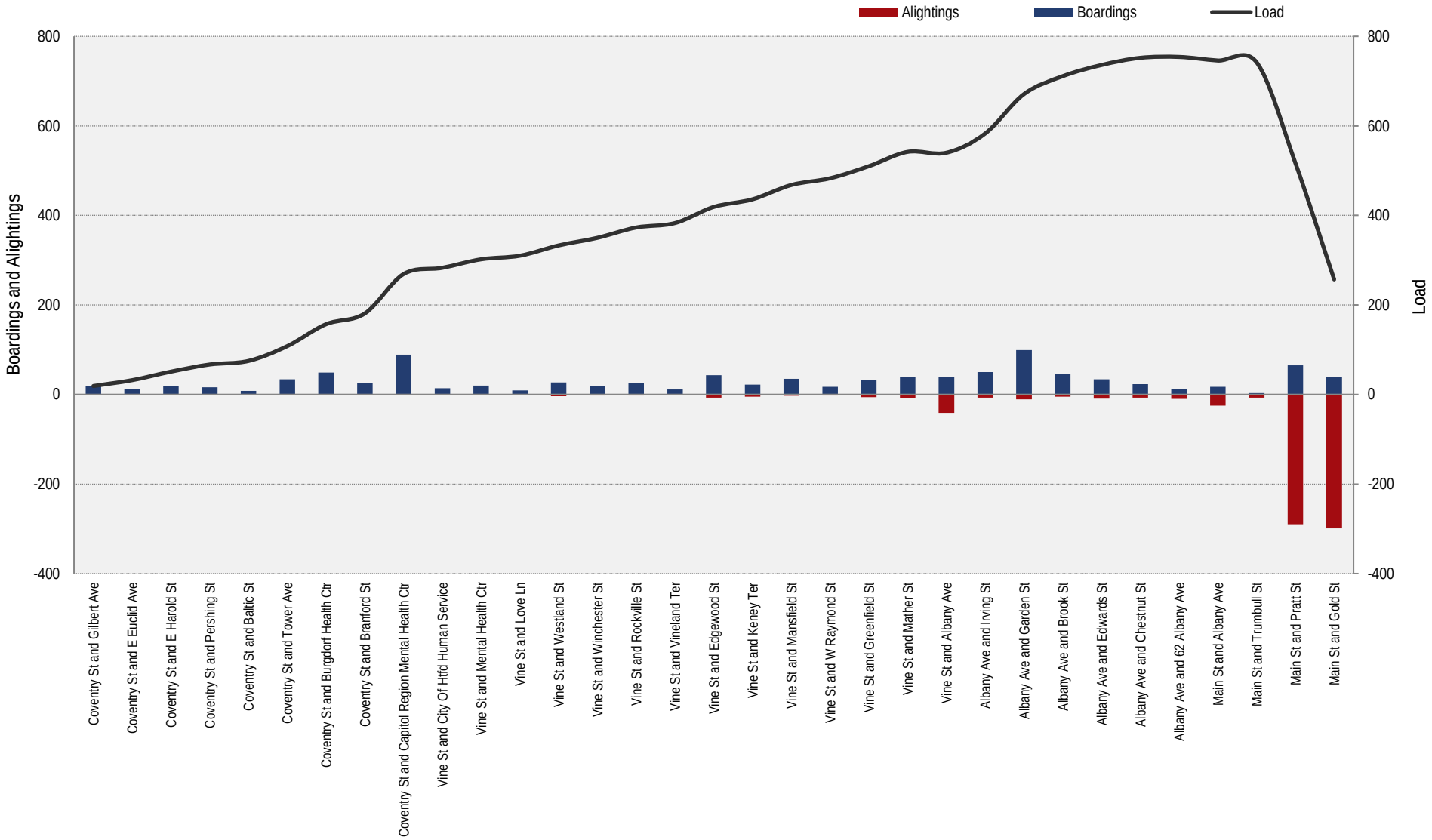
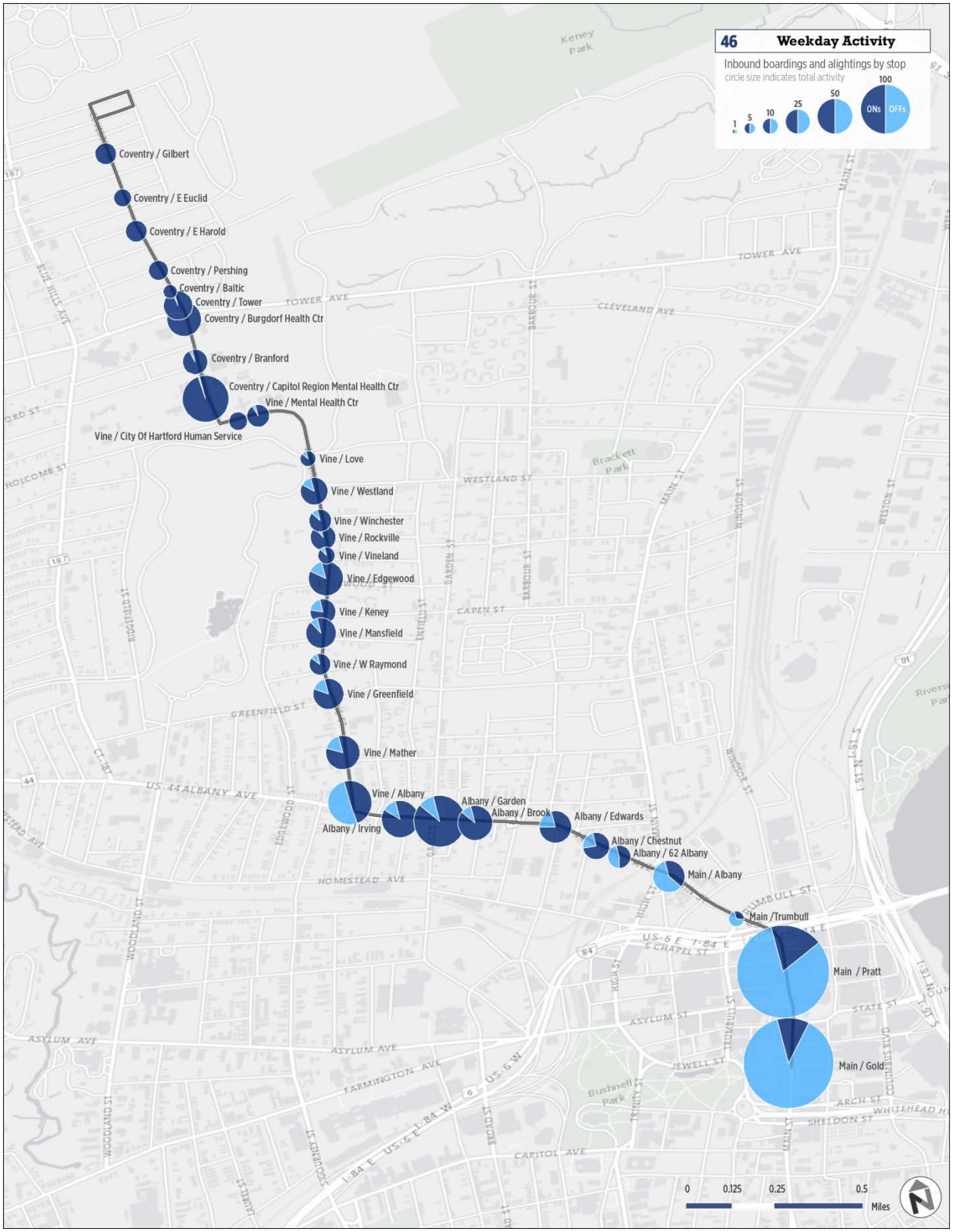


FIGURE 7 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Route 46 carries an average of 16.5 passengers per trip on weekdays. As shown in Figures 8 and 9, demand is fairly balanced throughout much of the day, on both inbound and outbound trips. However, maximum loads and the number of riders per trip are generally lower during peak periods when service operates every 10 minutes. This suggests that this higher level of peak period service may not be warranted. Also, ridership appears stronger in the inbound direction, suggesting riders are using alternate routes in the outbound direction to return to the north end of Hartford.

FIGURE 8 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

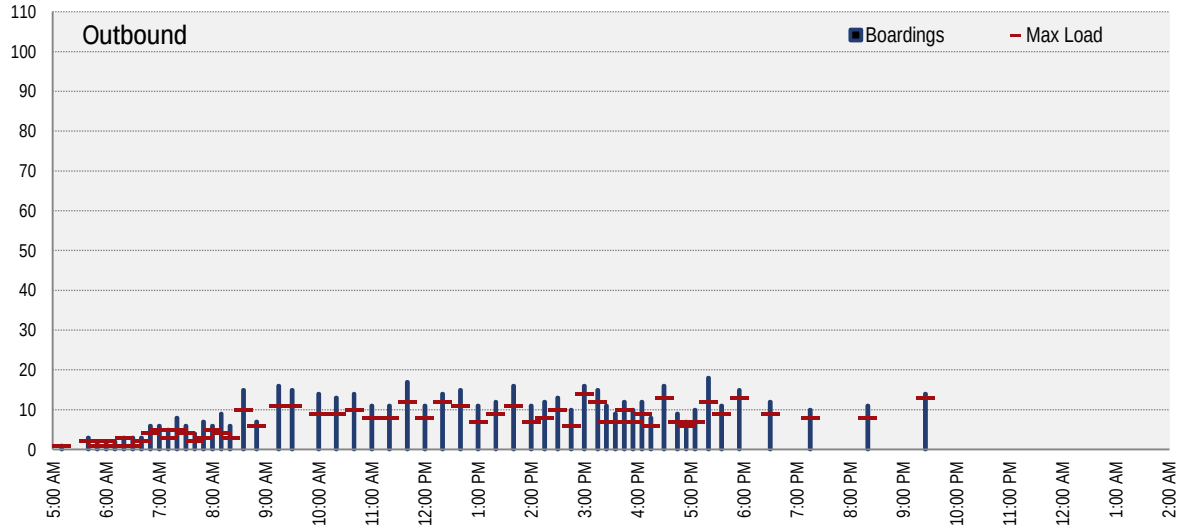
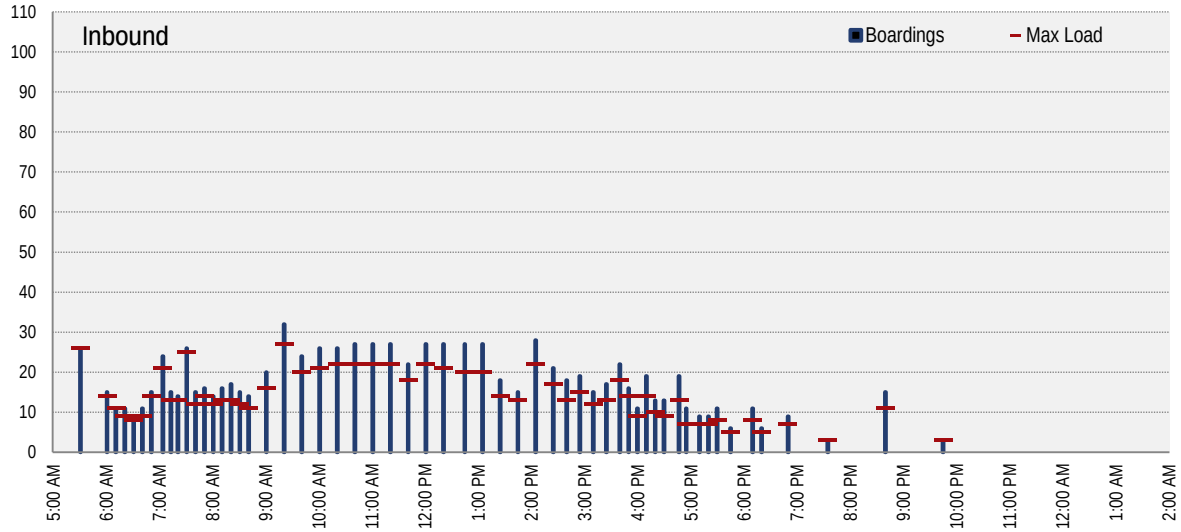


FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Route 46 carries an average of 13.4 passengers per trip on Saturdays. Ridership patterns are similar to weekdays (see Figures 10 and 11); with fairly balanced demand that is stronger in the inbound direction (suggesting riders may return home on different routes). Demand is fairly low, suggesting the 20 minute frequency might be reduced. In particular, there is lower demand on trips operating prior to noon.

FIGURE 10 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

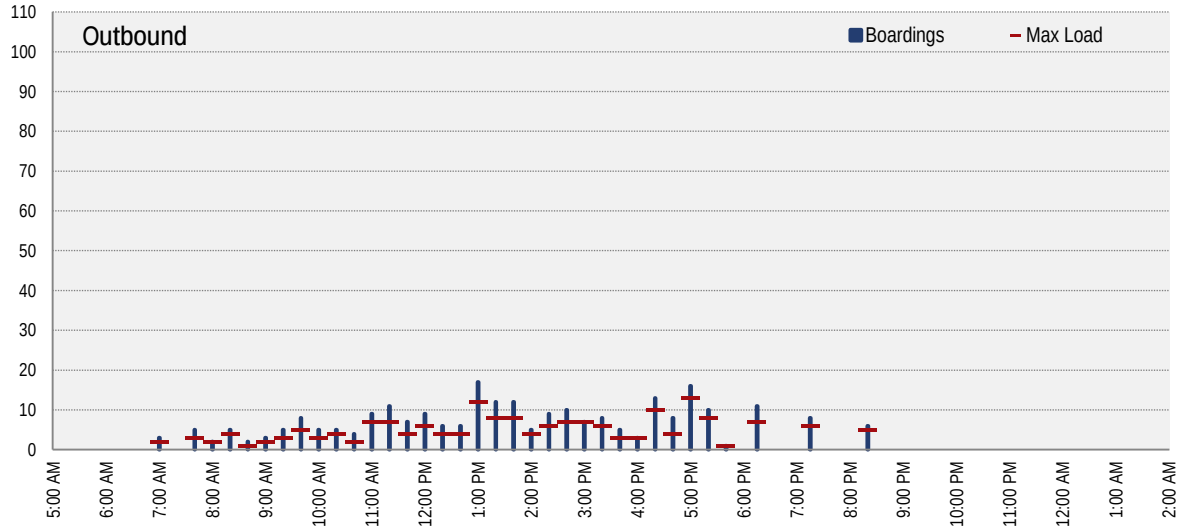
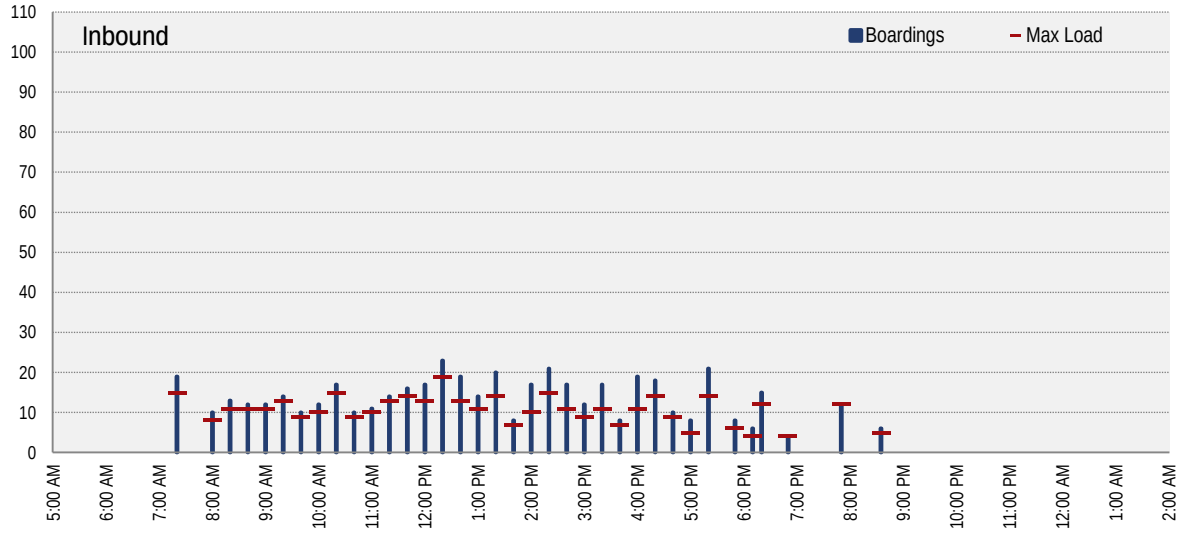


FIGURE 11 | SATURDAY INBOUND RIDERSHIP BY TRIP



Performance

Route 46 performs well when compared to other local routes in CT*transit*'s Hartford Division (see Figure 12), particularly on weekdays. The cost per passenger is $3.10 which is well below the average of $4.84; passenger productivity is also well above division averages. On Saturdays, the cost per passenger is also very low and the number of riders carried per hour and mile continue to be higher than the division averages. This is likely due to the relatively short length of the route. On Sundays, when combined with Route 42, the route also performs relatively well.

Overall, Route 46 has the second lowest operating cost per passenger and carries the second-most passengers per hour in the Hartford Division (see Figures 14 and 15).

FIGURE 12 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 46	DIVISION AVG	ROUTE 46	DIVISION AVG	ROUTE 42/46	DIVISION AVG
Operating Cost per Passenger	$3.10	$4.84	$3.78	$6.30	$4.50	$6.66
Passengers per Revenue Vehicle Hour	41.2	28.9	33.8	27.0	28.5	29.7
Passengers per Revenue Vehicle Mile	4.4	2.6	3.5	2.4	4.4	2.9

Source: CTtransit performance data

Route 46 has on-time performance in line just below the Hartford Division average. It is runs early and late slightly more than other routes.

FIGURE 13 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 46	DIVISION AVG
Early	1.5%	0.2%
Late	19.1%	18.9%
On-Time	79.3%	80.9%

Source: CTtransit performance data

FIGURE 14 | WEEKDAY OPERATING COST PER PASSENGER

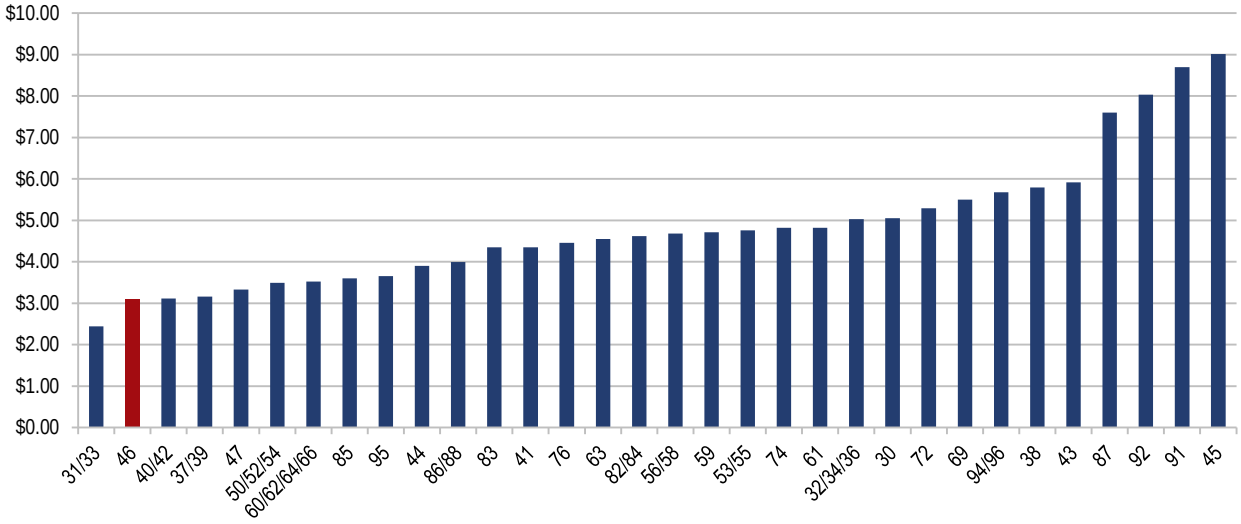
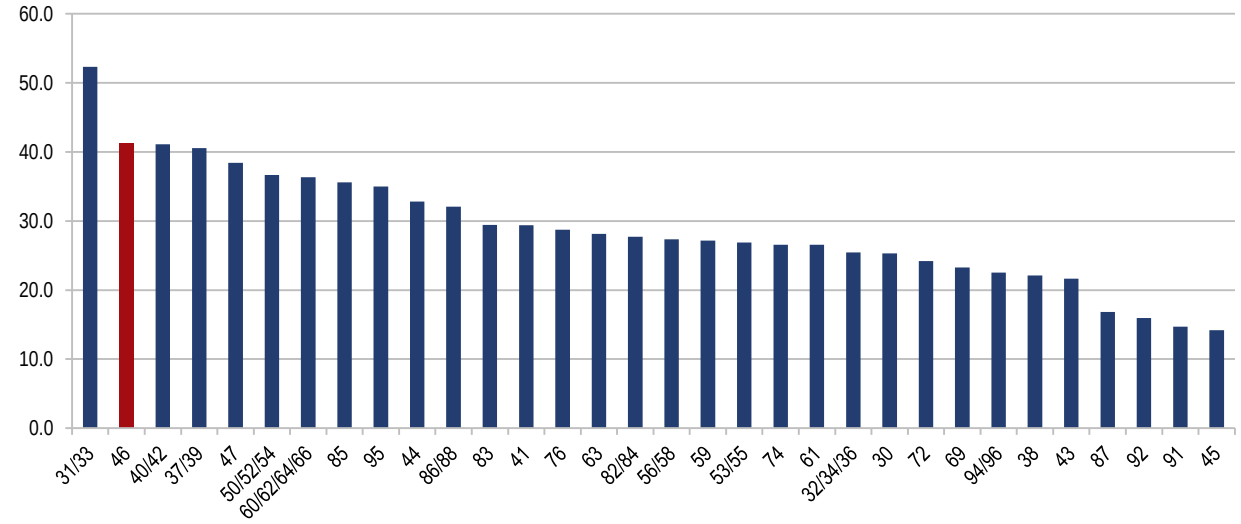


FIGURE 15 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Route 46 is a radial route serving the north of Hartford that has excellent performance when compared to other routes in the Hartford Division. For much of its route, it operates with a number of other routes along Main Street and Albany Avenue. Its high performance given the level of competing service in this corridor demonstrates the high level of transit demand to the North End of Hartford.

Opportunities to strengthen Route 46 further include the following:

- **Reduced peak period frequency on weekdays**. Weekday service operates every 10 minutes during peak periods. However, only about 5 peak period trips in both the inbound and outbound directions carry loads of more than 20 passengers. Reducing this frequency to every 20 or 30 minutes, more consistent with the mid-day service could be considered.
- **Operate reduced headways on Saturdays.** Route 46 service on Saturday is operated every 20 minutes throughout the day. However, only 3 inbound trips carry more than 20 passengers, and most outbound trips carry fewer than 10 passengers. Reducing Saturday frequency to 30 minutes appears sufficient to meet passenger demand.
- **Discontinue first outbound trip on weekdays and Saturdays:** Only one rider uses the 5:10 AM outbound service on weekdays. Service could begin with the 5:30 AM inbound trip which is well utilized. Likewise, the 7 AM outbound trip on Saturdays could be discontinued (2 riders), with service beginning with the 7:20 AM inbound trip.
- **Coordinate schedules with other Albany Avenue.** There is a significant difference in passenger demand on inbound and outbound Route 46 trips. It appears many may board the service along Coventry, Vine or Albany, but take the "first bus home" from downtown (e.g. Route 44, 50, 52, 54, 56 or 58) and opt to walk from Garden Street, Blue Hills Avenue or Albany Avenue. This suggests that coordination of routes along Albany and Blue Hills Avenue might make service convenient for a large number of riders.
- **Operate independent, bi-directional Sunday service.** Sunday service is operated via a large loop on a combined Route 42/46 alignment. Although fairly productive, ridership is low. A realignment of CT*transit* routes in the area north of Albany Avenue, between Main Street and Blue Hills Avenue, is suggested (Routes 40, 42, 44, 46). In particular, Routes 42 and 44 operate on parallel streets, and Route 44 has limited service and very low ridership. Combining Route 42 and 44 would strengthen service in the Garden Street/Barbour Street corridor. The operation of independent Sunday service on the new 42/44 alignment and on Route 46 could be considered, and possibly coordinated to offer alternating 60 minute service on each route.
- **Combine Routes 46 and 50:** Three local *CTtransit* routes operate on Blue Hills Avenue: Routes 50, 52 and 54. Blue Hills Avenue is about ½ mile west of Route 46/Vine Street on Albany Avenue, but only ¼ mile west of Route 46 north of Tower Avenue. A realignment of Route 50 (or other Blue Hills route) could be considered to operate via the Route 46 alignment, joining Blue Hills Avenue north of Elizabeth Street.
- **Create transit investment corridor along Albany Avenue.** Albany Avenue is served by seven different CT***transit*** routes, several of which have problems with their on-time performance. A potential strategy to both strengthen ridership and improve operational efficiency is to invest in corridor infrastructure to help improve transit speed and reliability. Albany Avenues has a large number of traffic signals, and only one travel lane in the westbound direction (but two travel lanes and parking in the eastbound direction). Identifying Albany as a "key bus route" corridor and making relatively small roadway improvements, such as signal priority, queue jump lanes, bus pullouts, stop consolidation and other corridor improvements would improve transit operations (and save operating costs) and help attract more riders.

Route Evaluation

FRANKLIN AVENUE

47 | Jordan Lane

47B | Berlin Turnpike

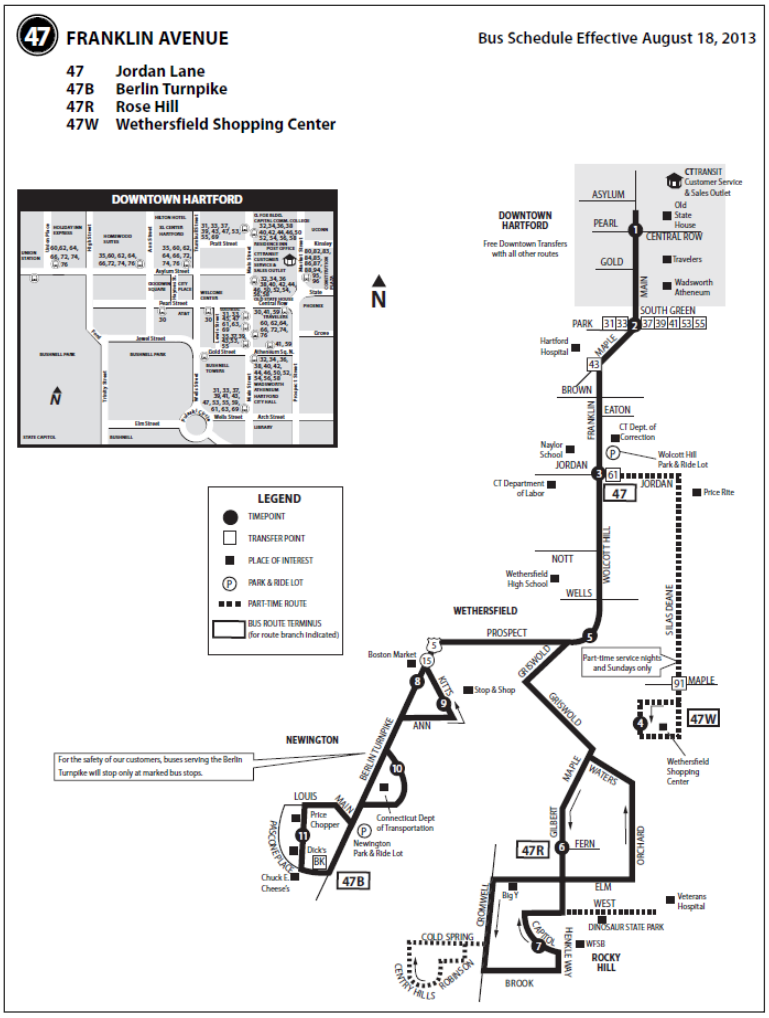
47R | Rose Hill

47W | Wethersfield Shopping Center

Service Design

Route 47 is a radial route that travels south from downtown Hartford. The common alignment of the route operates along Franklin Avenue from downtown Hartford to Wolcott Hill Road and Jordon Lane; this is Route 47. In addition to the Franklin Avenue service, Route 47 has three variants that serve the Berlin Turnpike (47B), Rose Hill (47R), and Wethersfield Shopping Center (47W) (see Figure 1).

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 47 originates in downtown Hartford, where riders can connect to most CT***transit*** routes. In addition, there are several locations where riders can transfer to other CT***transit***-Hartford and New Britain routes (see Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 31	Park Street and New Park Avenue
Route 33	Park Street and Park Road
Route 37	New Britain Avenue via Jefferson
Route 39	New Britain Avenue via Retreat
Route 41	New Britain/Hartford
Route 43	Campfield Avenue
Route 53	Westherfield Avenue
Route 55	Middletown
Route 61	Broad Street
Route 91	Forbes Street Crosstown
NEW BRITAIN ROUTES	
BK	Berlin Turnpike

Alignments and Service Patterns

The primary or "trunk" alignment of Route 47 operates along Main Street, Maple Avenue, and Franklin Avenue, terminating at Wolcott Hill Road and Jordan Lane. Variants 47B, 47R, and 47W all run along this trunk alignment as well, before branching out to serve different final destinations.

From Jordan Lane, routes 47B and 47R both continue southbound on Wolcott Hill Road to Prospect Street. Route 47B turns west onto Prospect and then south onto Berlin Turnpike, serving the Connecticut Department of Transportation, Price Chopper, and other retail destinations. Inbound buses return downtown along the same alignment.

Route 47R turns east onto Prospect Street briefly and travels south on Griswold Road. The route then travels one-way along a routing that primarily serves Gilbert Avenue, Elm Street, Cromwell Avenue, and Orchard Street. One trip per day on weekdays also serves Century Hills via Cold Spring Road and Robinson Road; two trips per day on weekdays also serve the Veterans Hospital in Rocky Hill. Once they complete the one-way end-of-the-line circuit, inbound 47R buses return to downtown Hartford via Griswold Road, Wolcott Hill Road, and Franklin Avenue.

Route 47W buses only operate during evenings and on Sundays. Outbound buses follow the trunk Route 47 alignment to Jordan Lane, then travel east on Jordan Lane and south on Silas Deane Highway, serving the Wethersfield Shopping Center. Route 47W buses complete a small terminal loop at Wethersfield and travel inbound along Silas Deane Highway and Franklin Avenue to return downtown.

Service Schedule

Route 47 operates seven days a week. On weekdays, service operates every 10 minutes throughout most of the day. This means there are roughly six trips per hour. Four of the trips operate as Route 47 and the variants service Route 47B and 47R have one trip each.

Saturday service operates every 15 minutes. Route 47 operates three times an hour, while Route 47B has one trip per hour. Evening service, on both weekdays and Saturdays, is operated as Route 47W with roughly 60-65 minute service.

Sunday service operates exclusively as Route 47W, and runs every 70 minutes. One additional trip operates on Saturdays and Sundays during the holiday season.

FIGURE 3 | SCHEDULE OVERVIEW (ALL ROUTES 47, 47B, 47R, AND 47W)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:21 AM – 1:15 AM	10/10	81/83
Saturday	7:05 AM – 11:20 PM	15	48/49
Sunday	7:30 AM – 8:05 PM	70	12/12

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Route 47 carries 3,245 daily passengers or 19.7 passengers per trip on an average weekday. This is 12% above the Hartford Division average of 17.7 weekday passengers per trip (see Figure 4).

Saturday and Sunday ridership per trip further exceeds the Division average by 22% and 70%, respectively. This can be attributed to fewer over-all trips on weekdays and the weekend appeal of shopping destinations served by the route.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 47	ROUTE 47	DIVISION AVG
Weekday	3,245	19.7	17.7
Saturday	1,809	18.8	16.3
Sunday	703	32.0	17.6

Source: CTtransit performance data

Ridership by Stop

Like most CT***transit***-Hartford routes, the most heavily used stops on Route 47 are in downtown Hartford. However, the route is somewhat unusual in the number of stops outside of downtown that generate 50 or more boardings or alightings per day (see Figure 5 and 6). In addition, ridership at many of the most heavily used stops along Franklin Avenue appears to be generated by neighborhood retail and surrounding residential areas, rather than major regional destinations such as shopping malls or large

employers. In essence, Franklin Avenue is a very good transit corridor, with supportive pedestrian infrastructure, and is surrounded by a mix of local retail and high-density residential neighborhoods. The outer ends of Route 47 and its variants, however, have low ridership.

FIGURE 5 | ROUTE 47 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Wolcott Hill Road / Jordan Lane	62 / 3	Connecticut Department of Corrections and Wolcott Hill Road Park and Ride
Franklin Avenue / Eaton Street	62 / 1	Naylor School, Joseph Merrit & Company, and Franklin Avenue Recreation Center
Franklin Avenue / South Street	129 / 5	Belizzi Middle School, neighborhood retail, and surrounding residential neighborhoods
Franklin Avenue / Brown Street	76 / 6	Neighborhood retail, and surrounding residential neighborhoods
Franklin Avenue / Preston Street	95 / 5	Neighborhood retail, and surrounding residential neighborhoods
Franklin Avenue / Bliss Street	65 / 7	Neighborhood retail, and surrounding residential neighborhoods
Franklin Avenue / Adelaide Street	122 / 16	Neighborhood retail, and surrounding residential neighborhoods
Franklin Avenue / Barker Street	97 / 8	Bulkeley High School, neighborhood retail, and surrounding residential neighborhoods
Franklin Avenue / Bond Street	78 / 8	Community Renewal Team Family Services, and surrounding residential neighborhoods
Franklin Avenue / Elliott Street	155 / 18	Bulkeley High School, neighborhood retail, and surrounding residential neighborhoods
Franklin Avenue / Shultas Place	100 / 15	Bulkeley High School and surrounding residential neighborhoods
Franklin Avenue / Annawan Street	60 / 12	Bulkeley High School and surrounding residential neighborhoods
Main Street / Park Street	120 / 233	Transfer point for Routes 31, 33, 37, 39, 53, and 55
Main Street / Athenaeum Square N	348 / 510	Wadsworth Athenaeum Museum of Art
Main Street / Old State House	70 / 330	Connecticut's Old State House

Load profile data (see Figure 6) combines passenger activity by stop and shows the cumulative passenger load as the bus travels inbound along its route. Ridership by stop without the cumulative load is mapped in Figure 7. The data for Route 47 shows inbound passenger loads peak at Franklin Avenue and Maple Avenue and then decrease quickly as buses pass Hartford Hospital and enter downtown Hartford.

The load profile in Figure 6 is not continuous because some stops are served by all variants, while others are served by one or two varients only. Each variant is labeled accordingly in Figure 6.

FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

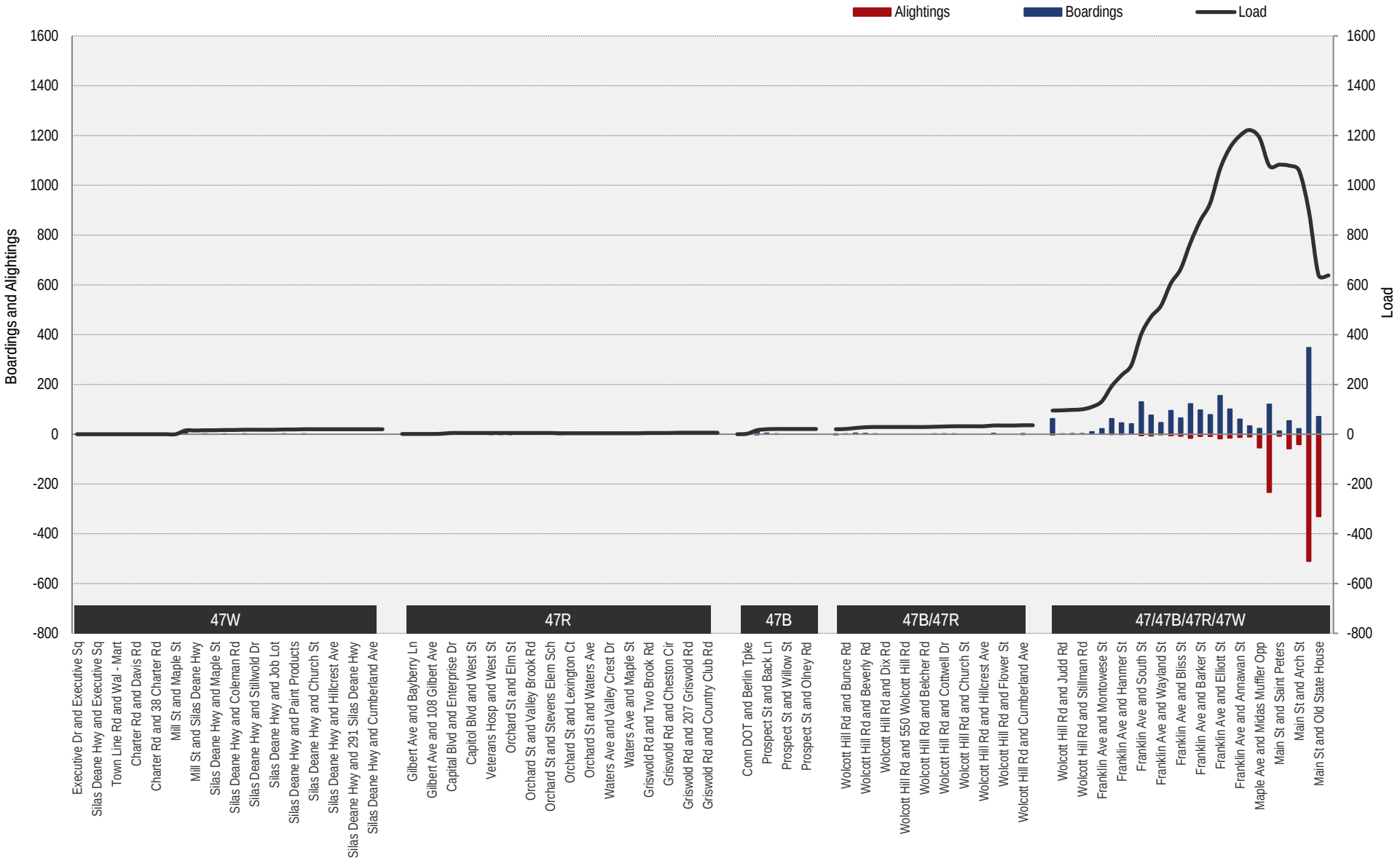


FIGURE 7 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

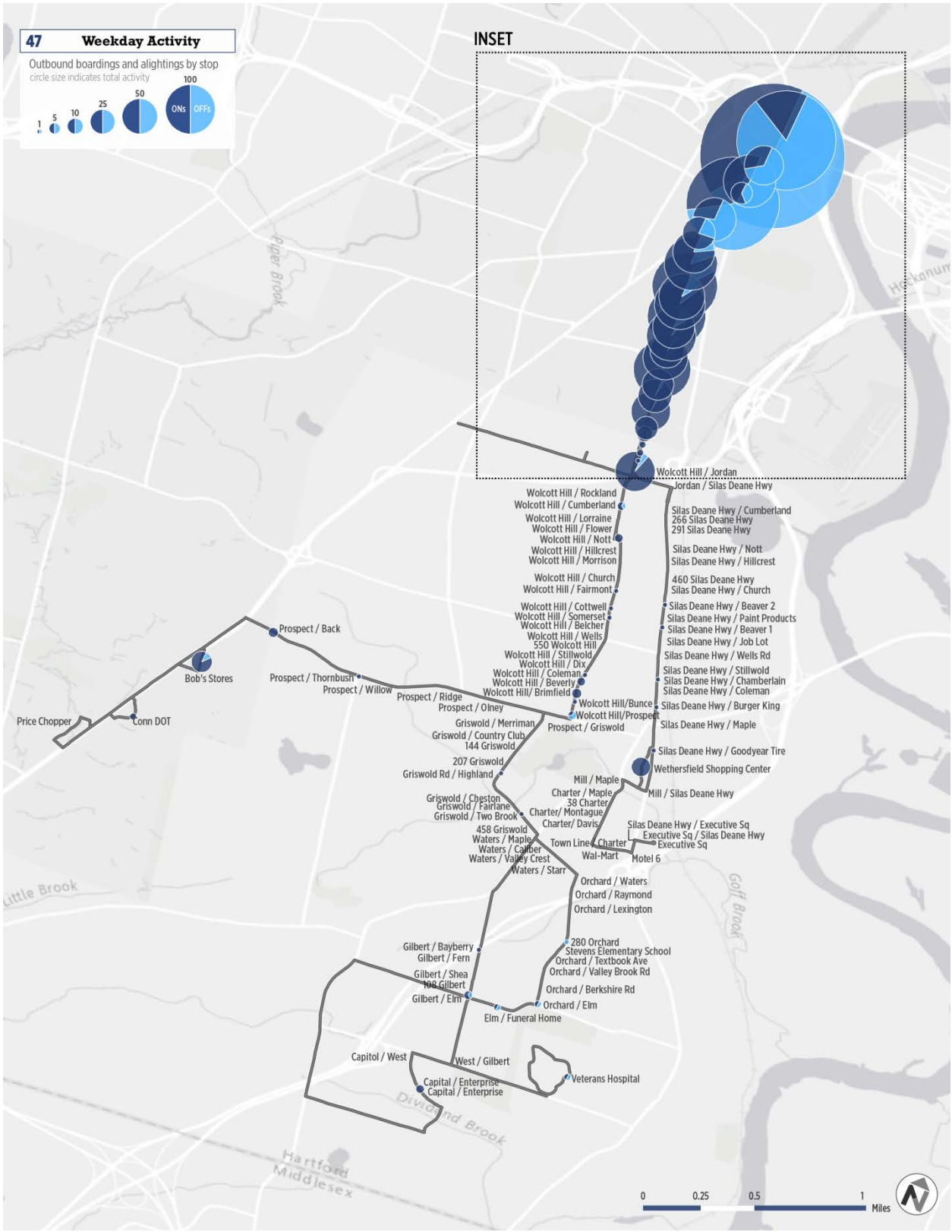
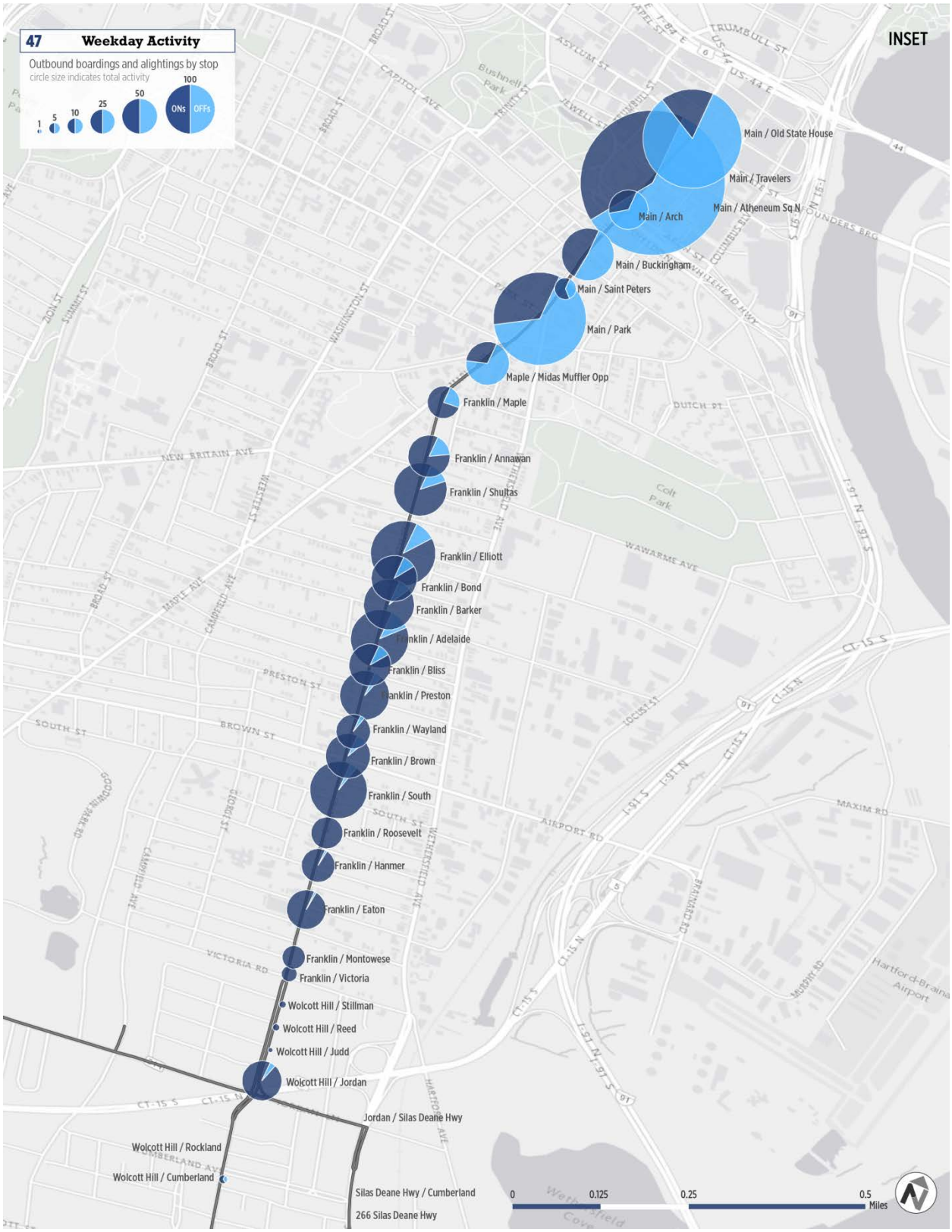


FIGURE 8 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP (INSET)



Ridership by Trip

Weekday

Route 47 carries an average of 19.7 passengers per trip on weekdays. The most prevalent travel pattern on Route 47 is inbound in the morning and outbound in the afternoon and evening. Outbound ridership is also relatively heavy, but Route 47 frequency is so high that passenger loads to not get a chance to build up (see Figure 9 and 10). Passenger loads are highest on inbound trips, with several morning trips experiencing maximum loads of between 30 and 40 passengers. The typical seating capacity of a 40-foot transit bus is 40 passengers. The highest passenger load on weekdays is on the first inbound trip of the day, with 37 passengers. This trip departs for downtown Hartford at 5:21 am, but the high ridership suggests an even earlier departure may be well received.

FIGURE 9 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

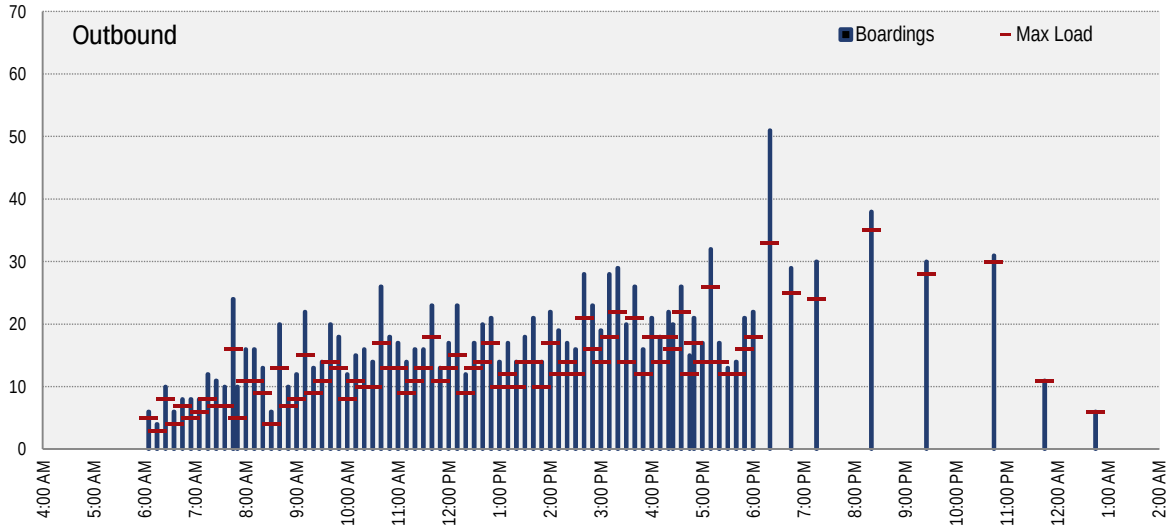
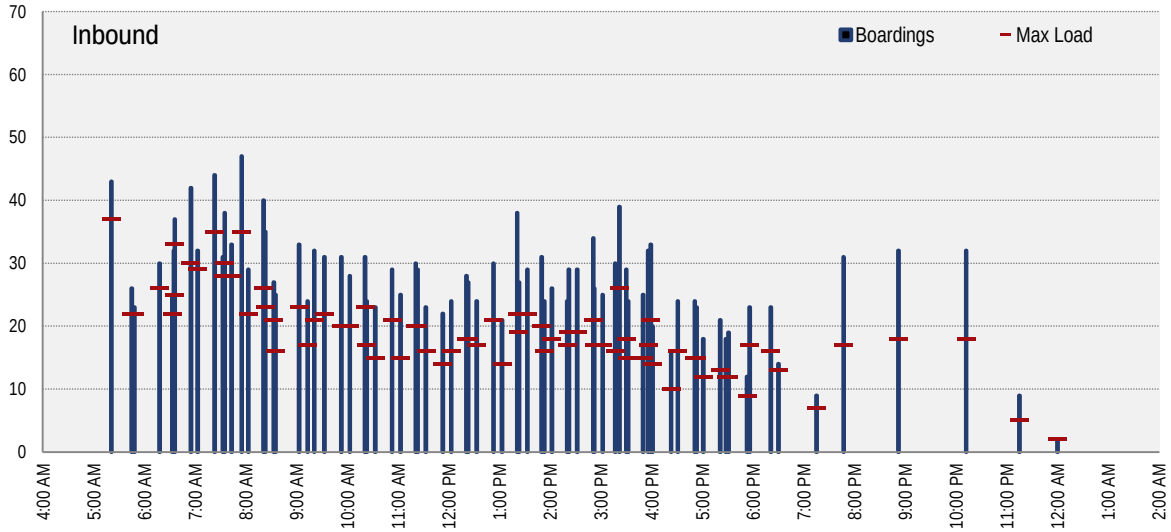


FIGURE 10 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Saturday ridership patterns are similar to weekdays, although frequency is reduced. Ridership is stronger in the inbound direction for much of the day, with a surge in outbound ridership in the evening. The 7:15 pm outbound departure is nearly at its seating capacity with 38 passengers. This ridership spike is likely a result of the reduction in service frequency that precedes the trip.

FIGURE 11 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

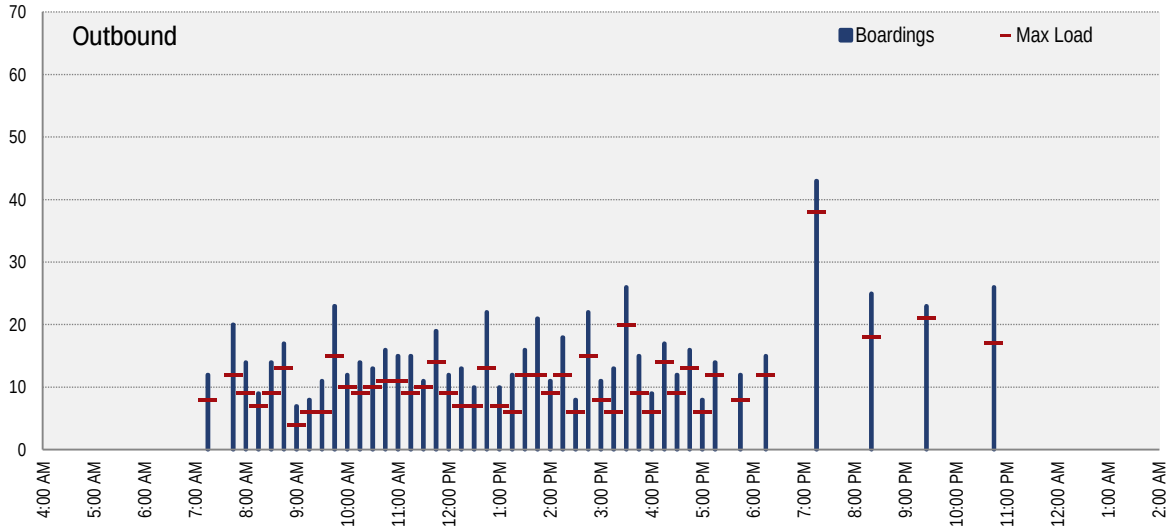
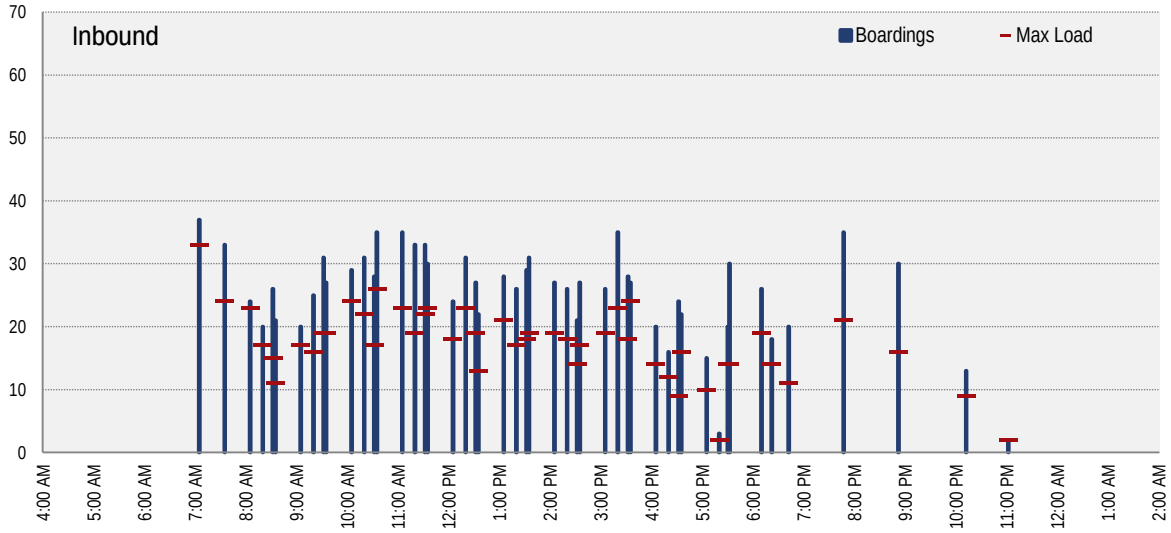


FIGURE 12 | SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

Some trips experience very high passenger loads on Sundays, especially in the inbound direction. The first inbound trip of the day has an average maximum load of 41 passengers, which means that this trip likely has standees on some Sundays. The high ridership on the first trip of the day also suggests a pent up demand for earlier service.

FIGURE 13 | SUNDAY OUTBOUND RIDERSHIP BY TRIP

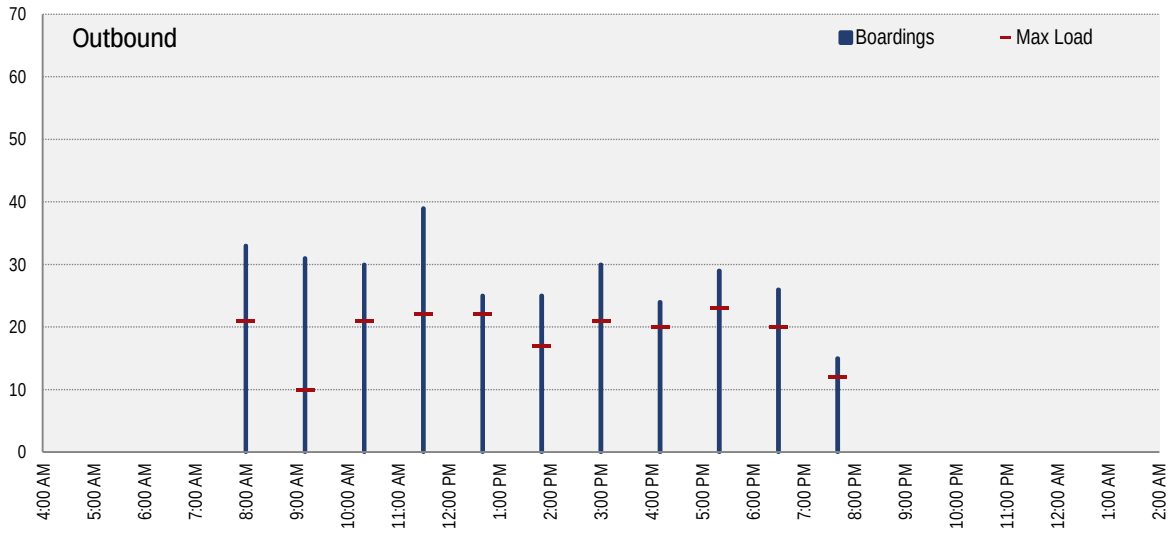
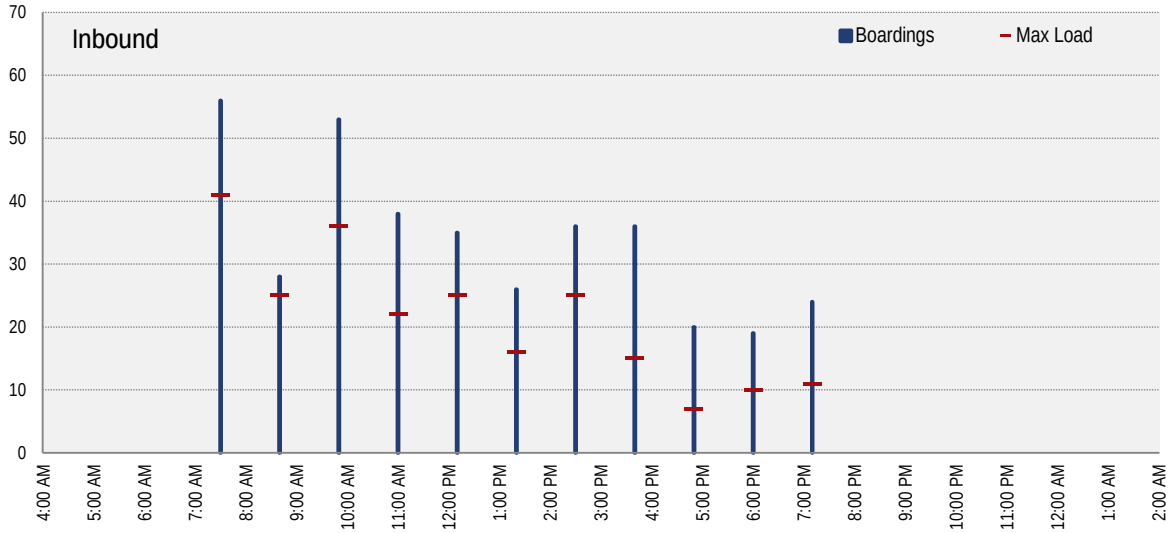


FIGURE 14 | SUNDAY INBOUND RIDERSHIP BY TRIP



Performance

Route 47 performs well on all measures of productivity, with a lower than average operating cost per passenger on all service days, and much higher than average ridership per revenue hour and revenue mile (see Figure 15). The route's service performance is driven by its very strong daily ridership.

FIGURE 15 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 47	DIVISION AVG	ROUTE 47	DIVISION AVG	ROUTE 47	DIVISION AVG
Operating Cost per Passenger	$3.33	$4.84	$3.03	$6.30	$2.26	$6.66
Passengers per Revenue Vehicle Hour	38.4	28.9	42.3	27.0	56.6	29.7
Passengers per Revenue Vehicle Mile	3.6	2.6	4.0	2.4	5.6	2.9

Source: CTtransit performance data

Route 47 has relatively strong on-time performance, with an 82.8% on-time arrival rate. Buses are late more often than early, but late arrivals on Route 47 happen less frequently than the Hartford Division average for late arrivals (see Figure 16).

FIGURE 16 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 47	DIVISION AVG
Early	0.0%	0.2%
Late	17.2%	18.9%
On-Time	82.8%	80.9%

Source: CTtransit performance data

FIGURE 17 | WEEKDAY OPERATING COST PER PASSENGER

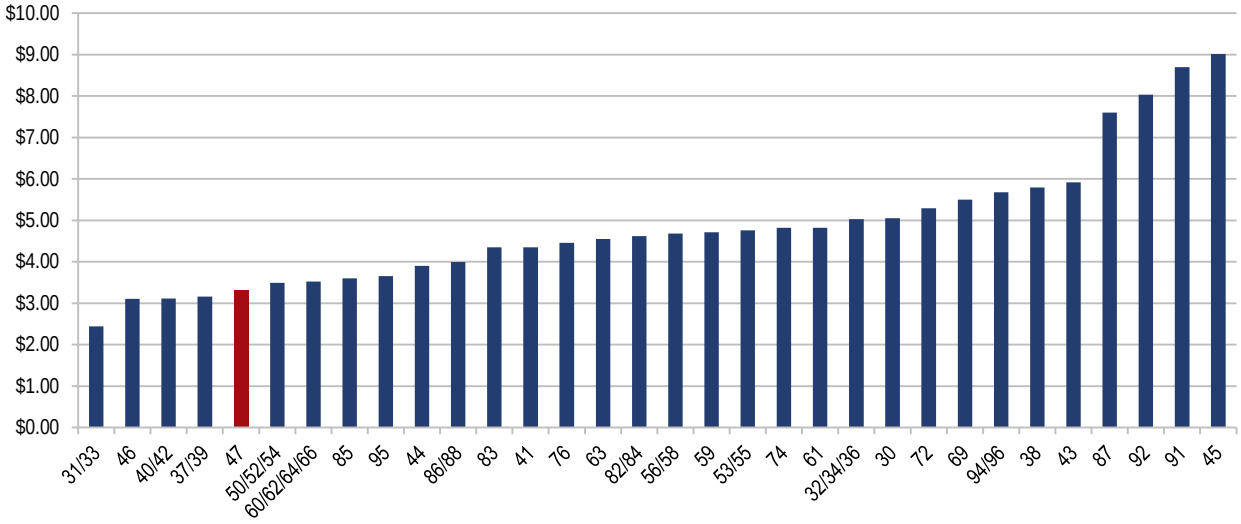
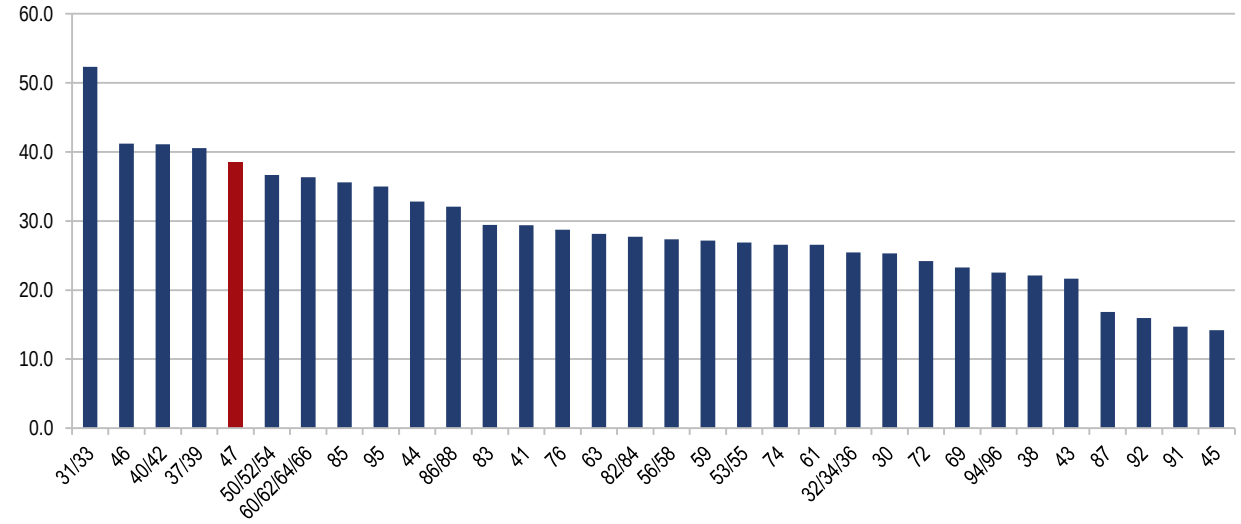


FIGURE 18 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Route 47 is a radial route with very high ridership and productivity. The weekday service is also partially funded through CRCOG's Job-Access program meaning the route is specifically intended to provide access to employment. It is the fifth-highest route in the Hartford Division in terms of passengers per revenue hour and the fifth lowest in terms of operating cost per passenger. However, the vast majority of the route's ridership is concentrated in the "trunk" segment between Jordan Lane and downtown Hartford. Beyond this point the route has three branches serving various final destinations at various frequencies.

Opportunities to strengthen the route further include the following:

- **Implement Bus Rapid Transit (BRT) or Enhanced Bus service between Jordan Lane and downtown.** Ridership and service frequency are already very strong along the trunk portion of Route 47. Introducing BRT or Enhanced Bus treatments along the corridor could improve the passenger experience and improve ridership further. Implementing this type of service would likely require capital investment only as the service level is already consistent with Enhanced Bus. Examples of BRT or Enhanced Bus treatments include dedicated lanes, signal prioritization, enhanced passenger amenities, bus stop bulb-outs, real-time vehicle arrival information, and higher-capacity vehicles. The more of these elements there are the closer a service is to BRT on the BRT-Enhances Bus continuum.
- **Relocate Wolcott Hill Park and Ride to PriceRite Shopping Center.** The trunk portion of Route 47 generates strong ridership with its mix of high-density neighborhoods and neighborhood retail. The route does not provide service to a large grocery store, which may be of interest to the residential population along Franklin Avenue. Integrating a park & ride and transit center into the northern end of the PriceRite shopping center at Jordan Lane and Silas Dean Highway would create a strong anchor for a BRT or Enhanced Bus corridor and create an opportunity to truncate less productive branches of Route 47 outside of downtown. The proposed location would provide faster access for buses and commuters coming from I-91 or Highway 5, compared to the current park and ride location.
- **Provide more service on Route 47.** Route 47 has strong demand throughout the day on weekdays and weekend days. On weekend days especially the ridership patterns suggest a need for earlier and later service as well as increased frequency. On weekday evenings, demand is also sufficiently strong to suggest service frequency may also be increased. One opportunity to strengthen the service, therefore, may be to increase the hours of service on weekend days and increase the frequency of service eon weekday evenings and weekend days.
- **Eliminate Route 47 branch service (Routes 47B, 47R and 47W).** The various branches of Route 47 make for an overly complicated route map and schedule, and distract for an otherwise very simple and direct trunk route. They also generate relatively little ridership and reduce the over-all productivity of the service. One alternative would be to eliminate the branch service, streamline the service and reinvest resources into Route 47's service span on weekdays or weekend days.
- **Spin off branches of Route 47 into separate routes anchored at Wolcott Hill Park & Ride.** The various branches of Route 47 make for an overly complicated route map and schedule, and distract for an otherwise very simple and direct trunk route. They also generate relatively little ridership and reduce the over-all productivity of the service. Variant Route 47R could itself be split into two routes with one operating from Century Hills to Wolcott Hill Park and Ride vial Gilbert Avenue and Griswold Road and the other traveling to the Park and Ride via Orchard Street and Silas Dean Highway, serving Wal-Mart near I-91 in the process. This would allow for bi-directional service along the current coverage area of Route 47R, and would also integrate the

47W coverage area into the route serving Wal-Mart. Route 47B could be truncated at the Wal-Mart near I-91 or be interlined with Route 91 to improve cross-town service in the southern tier of the Hartford Division study area.

- **Provide earlier Sunday service.** The first inbound trip on Sundays departs Wethersfield Shopping Center at 7:30 am. This trip has an average maximum load of more than 40 passengers, which suggests that there is likely pent up demand for an earlier departure on Sundays.

Route Evaluation

BLUE HILLS AVENUE

50A | CIGNA/MetLife

50B | Bloomfield Center

50C | Copaco

52 | Rockwell Corner

52W | Wedgewood

54 | Blue Hills Extension

54X | Blue Hills Ext. Express

Service Design

Routes 50, 52, and 54 are radial routes that travel northwest from downtown Hartford to Bloomfield (Routes 50 and Route 52) and Windsor (Route 54). All trips serve the Albany Avenue and Blue Hills Avenue corridors through Hartford. Three separate variants of Route 50 use Cottage Grove Road to terminate at Cigna/MetLife (50A), Bloomfield Center (50B) or Copaco Center (50C) (see Figure 1). Route 52 continues north on Blue Hills Avenue to Rockwell Corner, while Route 52 continues another mile north to terminate at the Wedgewood Apartments. Routes 54 and 54X continue north to Griffin Center and then follow Day Hill Road to terminate at the Poquonock Park & Ride Lot off Interstate 91 (see Figure 2).

FIGURE 1 | ROUTE 50 MAP

50 BLUE HILLS AVENUE–COTTAGE GROVE

Bus Schedule Effective November 17, 2013

50A CIGNA/MetLife
50B Bloomfield Center
50C Copaco

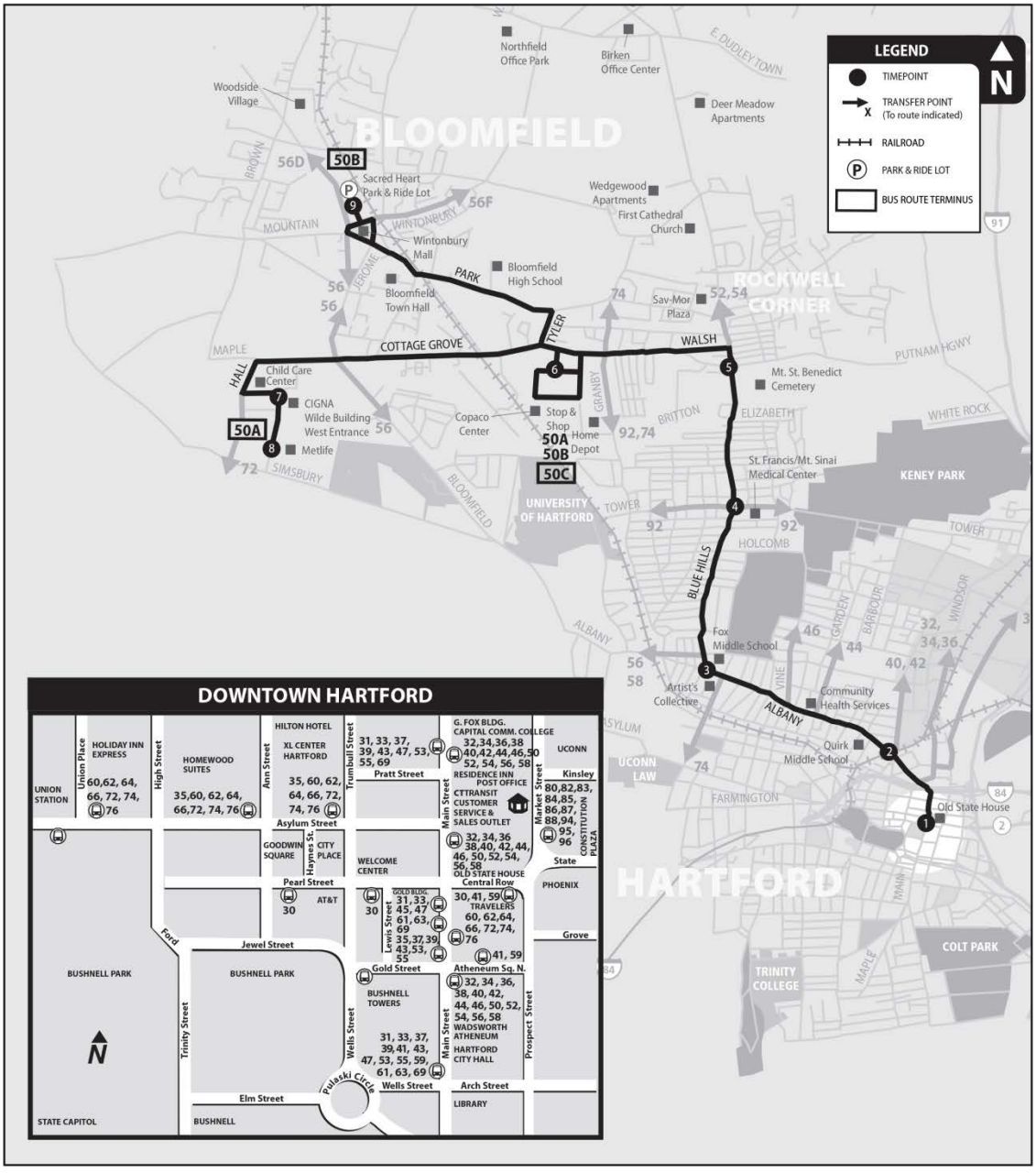


FIGURE 2 | ROUTE 52/54 MAP

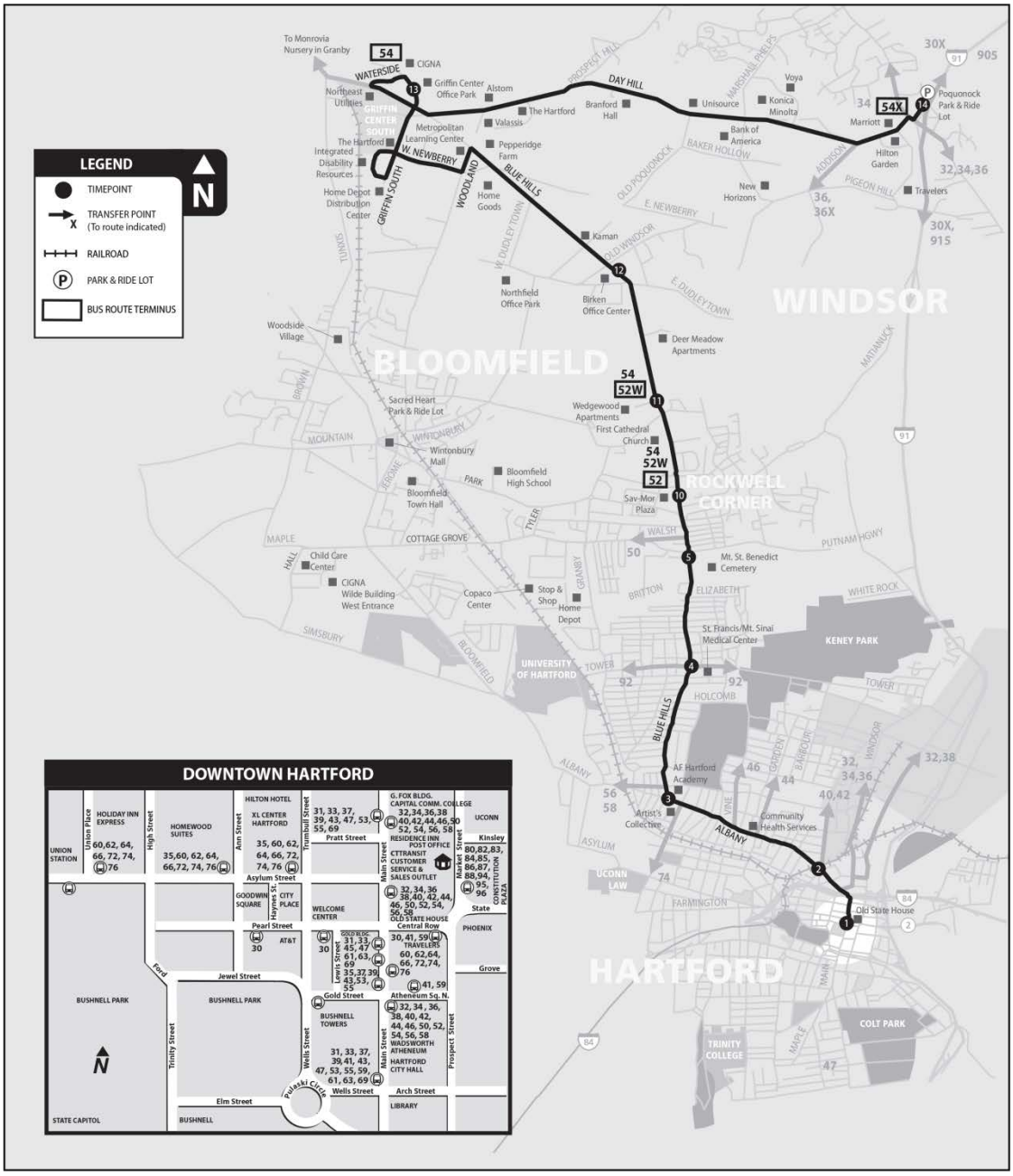
Bus Schedule Effective September 14, 2014

52 BLUE HILLS AVENUE

52 Rockwell Corner
52W Wedgewood

54 BLUE HILLS AVENUE

54 Blue Hills Ext.
54X Blue Hills Ext. Express



System Interaction and Transfer Opportunities

Routes 50, 52 and 54 begin and end in downtown Hartford where riders can transfer to most other CT***transit*** services. There are also several locations along these routes where riders can connect to other CT***transit*** routes (see Figure 3), including the planned CT***fastrak*** Route 153.

FIGURE 3 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 30	Bradley Flyer
Route 32	Windsor Avenue
Route 34	Windsor Avenue - Poquonock
Route 36	Windsor - Day Hill Road
Route 38	Weston Street
Route 40	North Main Street
Route 42	Barbour Street
Route 44	Garden Street
Route 46	Vine Street
Route 56	Bloomfield Avenue
Route 58	Albany Avenue
Route 72	Asylum Avenue
Route 74	Granby Street
Route 92	Tower Avenue Crosstown
Route 153	CT*fastrak*: Flatbush/Copaco via Bishops Corner
EXPRESS ROUTES	
Route 905	Enfield-Somers/Windsor Locks Express
Route 915	Windsor Express

Alignments and Service Patterns

All outbound trips on Routes 50, 52 and 54 begin in downtown Hartford at the Old State House. All routes travel north via Main Street, Albany Avenue and Blue Hills Avenue, sharing one alignment until Walsh Street in Bloomfield (just north of Cottage Grove Road).

Route 50 has three alignment variations, with all outbound trips turning west from Blue Hills Avenue onto Walsh Street and connecting with Cottage Grove Road to serve Copaco Center.

- Route 50A continues on Cottage Grove, turning south on Hall Boulevard to the Cigna campus.
- Route 50B turns north on Tyler Street then follows Park Avenue west into Bloomfield Center, terminating at the Wiltonbury Mall.
- Route 50C terminates at Copaco Center.

Route 52 outbound trips continue north on Blue Hills Avenue, with two alignment variations:

- Route 52 terminates at the Save-Mor supermarket plaza north of Park Avenue in Bloomfield.

- Route 52W trips continue about one mile further north, turning left on Wedgewood Drive to terminate at the Wedgewood Apartments.

Route 54 outbound trips continue north on Blue Hills Avenue into Windsor. Buses circulate through the Griffin Center office park by turning south on Woodland Avenue and west on W. Newbury Road to the Home Depot distribution center, then north on Griffin Road to serve The Hartford. The route turns south on Waterside Crossing and returns east on Blue Hills Avenue to Day Hill Road. It follows Day Hill Road to the Poquonock Park & Ride Lot off of I-91. There are two additional Route 54 variations:

- Route 54N trips are interlined with Route 36, turning south off of Day Hill Road onto Addison Road to serve the Addison Corporate Park before returning to downtown Hartford via Pigeon Hill Road, Lamberton Road and the Poquonock Park & Ride Lot. The majority of Route 54 trips operate in this manner.
- Route 54X trips follow the Route 54 alignment, but operate express between downtown and the Hartford/Bloomfield border. South of this point (Blue Hills Avenue at Euclid Street); express trips only stop to discharge passengers.
- The first outbound 54X of the day doesn't serve Poquonock Park & Ride, but continues west of Griffin Center on Day Hill Road to terminate at Monrovia Nurseries.

All inbound trips on Routes 50 and 52 following the same alignment back into Hartford. Most Route 54 trips are interlined with Route 36 (operated as Route 54N) and return to Hartford via Poquonock Road.

Service Schedule

All variants of Routes 50, 52 and 54 operate on weekdays. Route 50C (serving Copaco Center) and Routes 52/52W only operate on Saturdays. On Sundays, Routes 50B and 50C only operate.

The effective frequency of service along the common alignment on Albany and Blue Hills Avenues (see Figure 4) is roughly every 10 minutes or more throughout the day until 7:15 PM., followed by hourly service in the evening. Service levels are lower on the unique portions of the individual routes.

- Route 50 trips operate hourly and alternate between 50A-50B-50C, providing 20 minute service on the shared alignment to Copaco. Service is less frequent prior to 8:30 AM and after 5:45 PM.
- Both Routes 52 and 52W operate roughly every 30 minutes during the peak and 60 minutes during the off-peak, and generally alternate. However, Route 52/52W schedules are not coordinated (i.e., there is *not* consistent 15 minute peak and 30 minute off-peak service).
- Route 54 trips operate every 60 minutes. Additionally, four Route 54X trips are operated in each reverse peak direction on weekdays.

On Saturdays, Route 50c and Route 52/52W alternate trips through the day; service on the shared alignment operates every 15 minutes until 6:15 p.m. Route 50C continues to operate later in the evening, although with a reduced frequency. On Sundays, Route 50B/50C offers hourly service primarily to Bloomfield Center (50B), with a handful of trips terminating at Copaco Center (50C), with most scheduled after 6 PM.

An additional evening inbound and outbound trip operates to Copaco on Saturdays and Sundays between Thanksgiving and December 31.

FIGURE 4 | SCHEDULE OVERVIEW (ALL ROUTES 50A, 50B, 50C, 52, 52W, 54 AND 54X)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	4:30 AM – 1:25 AM	10	90/100
Saturday	6:40 AM – 11:40 PM	15	50/52
Sunday	6:30 AM – 8:40 PM	70	13/13

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Combined, Routes 50, 52 and 54 carry about 4,734 passengers per weekday or about 25.0 passengers per trip. This is well above the Hartford Division average of 17.7 passengers per trip (see Figure 5). On Saturday, Routes 50 and 52 are in operation and carry about 23 passengers per trip. On Sunday, Routes 50B/C carries about 30.5 passengers per trip. Ridership by trip on Saturday and Sunday both significantly exceed the division averages.

FIGURE 5 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 50/52/54	ROUTE 50/52/54	DIVISION AVG
Weekday	4,734	25.0	17.7
Saturday	2,301	23.0	16.3
Sunday	733	30.5	17.6

Source: CTtransit performance data

Ridership by Stop

The most heavily used stops on Routes 50, 52 and 54 are in downtown Hartford along Main Street, with more than 600 boardings and alightings per day. Copaco Center generates the next highest ridership; two stop locations in the center combined to attract about 380 riders per day. Three stops along Albany Avenue generate more than 150 boardings and alightings per day, at Garden Street, Blue Hills Avenue and Edgewood Street. The Blue Hills Avenue /Tower Avenue stop at Mt. Sinai Medical Center generates about 140 riders per day.

Other stops that generate 50 or more boardings or alightings per day are shown in Figure 6 below, and include stops along both Blue Hills Avenue and Albany Avenue in Hartford. Other than Copaco Center in Bloomfield, there are no stops that generate more than 50 boardings or alightings per day. (The Home Goods Distribution Center south of Day Hill Road and served by Routes 54/54X generates about 49 riders per day.) All other stop locations on Routes 54/54X generate ten or fewer riders per day.

FIGURE 6 | ROUTE 50/52/54 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Stop & Shop @ Copaco Center	294 / 12	St. Francis Hospital Urgent Care, retail center
Burlington Coat at Copaco Center	72 / 1	Retail/shopping center
Blue Hills Avenue and Porter Avenue	72 / 3	Residential. (Northernmost stop served by 50/52/54)
Blue Hills Avenue and Euclid Street (west)	77 / 21	Multi-family residential, small commercial
Blue Hills Avenue and Boothbay Street	79 / 16	Family Dollar store, residential neighborhood
Blue Hills Avenue and Tower Avenue	119 / 22	Mt. Sinai Medical Center, transfers to Route 92
Blue Hills Avenue and Branford Street	51 / 9	CVS, residential neighborhood
Blue Hills Avenue and Westbourne Parkway	30 / 20	Residential neighborhood, Keney Park
Blue Hills Avenue and Norfolk Street	35 / 20	Residential neighborhood
Blue Hills Avenue and Albany Avenue	90 / 84	Public library, Bravo supermarket, Rite Aid, transfers to Routes 56 and 58
Albany Avenue and Woodland Street	213 / 70	Artists Collective, post office, retail, transfers to Route 74,
Albany Avenue and Oakland Terrace	80 / 30	Mixed use commercial/residential
Albany Avenue and Edgewood Street	120 / 33	Mixed use commercial/residential
Albany Avenue and Sigourney Street	28 / 22	Mixed use commercial/residential
Albany Avenue and Burton Street	79 / 61	Mixed use, Liberty Church, transfers to Route 46
Albany Avenue and Irving Street	64 / 37	Mixed use commercial/residential
Albany Avenue and Garden Street	154 / 74	Community Health Services, transfers to Route 44
Albany Avenue and Brook Street	58 / 24	YMCA
Albany Avenue and Edwards Street	35 / 37	Global Communications Academy
Albany Avenue and Chestnut Street	38 / 25	Mixed use commercial/multi-family residential
62 Albany Avenue	23 / 30	Small retail center, multi-family residential
Main Street and Albany Avenue	28 / 74	Transfers to Routes 30, 40 and 42
Main Street and Pratt Street	64 / 612	Downtown Hartford and transfers to other CT*transit* routes
Main Street and Pearl Street	42 / 601	Downtown Hartford and transfers to other CT*transit* routes

Load profile data (see Figure 7) combines passenger activity by stop and shows the cumulative passenger load as the bus travels inbound along its route. Ridership by stop without the cumulative load is mapped in Figures 8 and 9. The data for these routes show:

- Routes 54/54X have light passenger activity along Day Hill Road, with boarding activity picking up in Griffin Center and to the south along Blue Hills Avenue, particularly at the Home Goods Distribution Center. *(Note: some activity along these segments may be recorded as Route 36).*
- Along the shared Route 52/54 alignment on Blue Hills Avenue in Bloomfield, ridership activity increases, with each stop showing in the range of 10-20 boardings or alightings per day.
- Routes 50A and 50B have low ridership west of Copaco Center, with 34 and 56 boardings and alightings per day, respectively. Riders may be using alternate routes (e.g. Routes 56, 72 or 92) to access the Cigna/Met campus and Bloomfield Center.
- There are an estimated 379 boardings and alightings at Copaco Center each day on Route 50 variants.
- About 75 riders per day use the Blue Hills Avenue and Porter Avenue stop which has no major ridership generators, but is the northermost stop on shared Routes 50, 52 and 54 alignment, demonstrating that riders are attracted by the high frequency service throughout the day.
- There is consistently high ridership activity along the shared alignment on Blue Hills Avenue and Albany Avenue. More than twenty stops in these corridors serve over 100 riders per day. Peak passenger loads occur on Albany Avenue and Chestnut Street just before buses join Main Street and passengers begin to alight for downtown destinations.

FIGURE 7 | ROUTE 50 WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

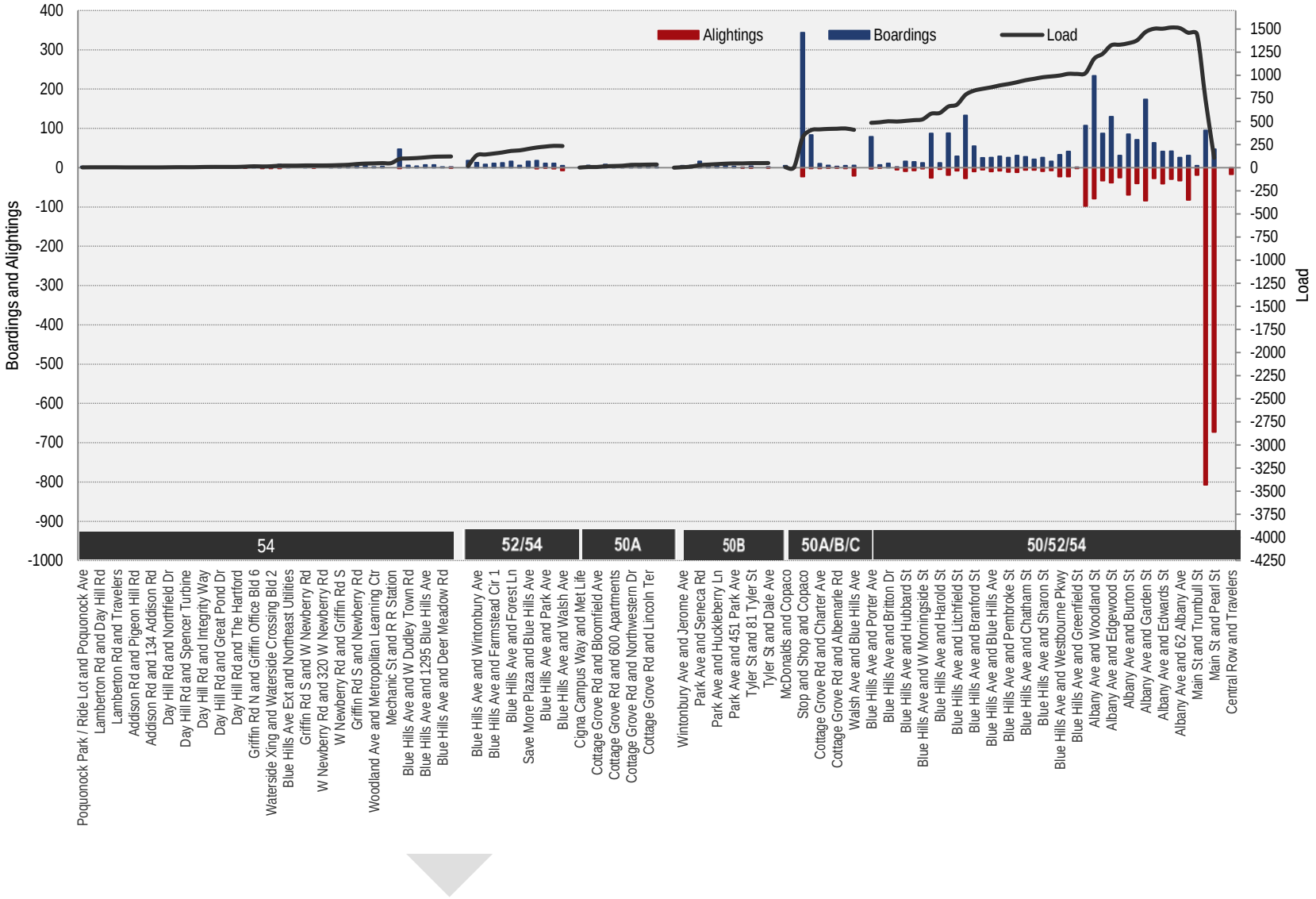


FIGURE 8 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

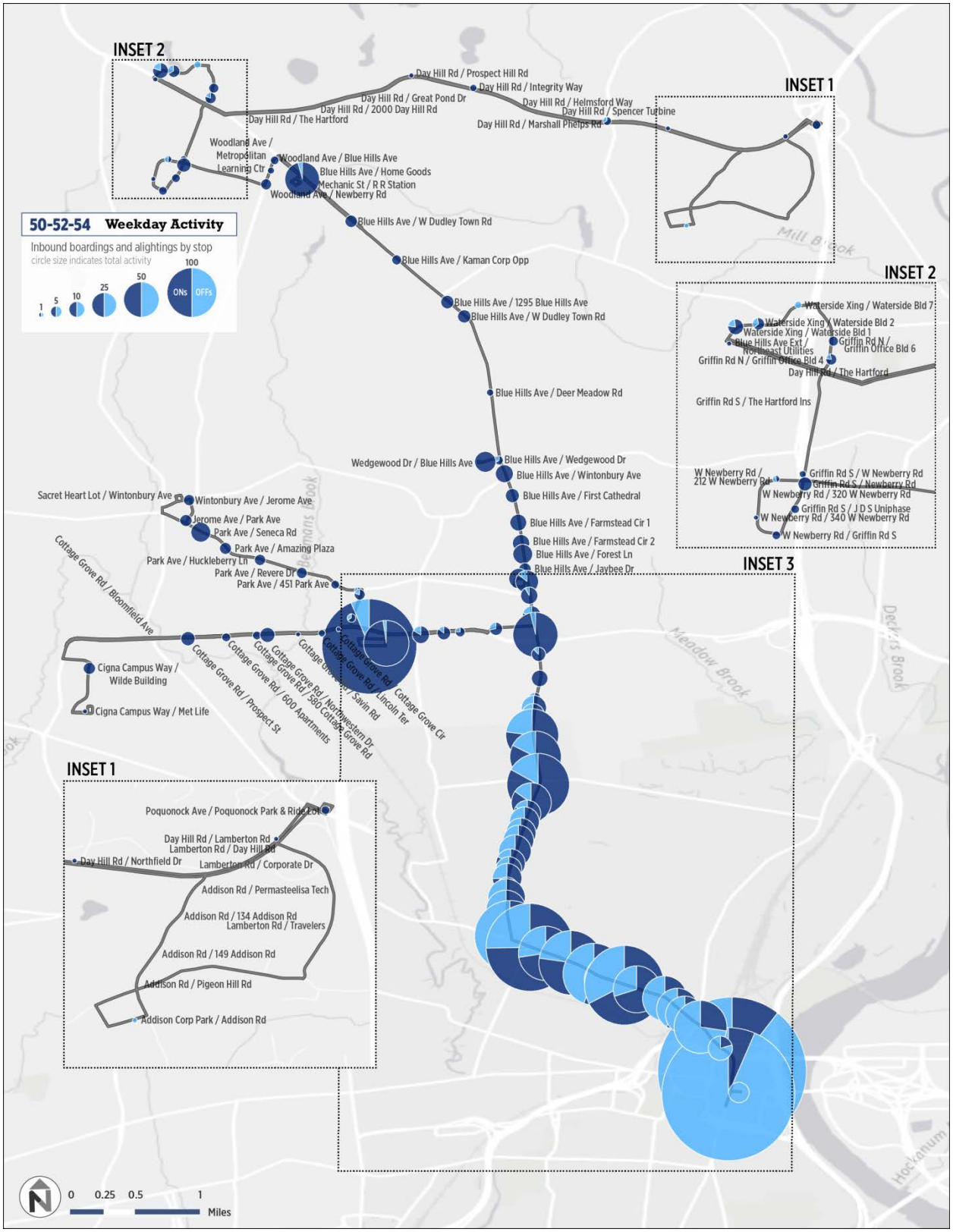
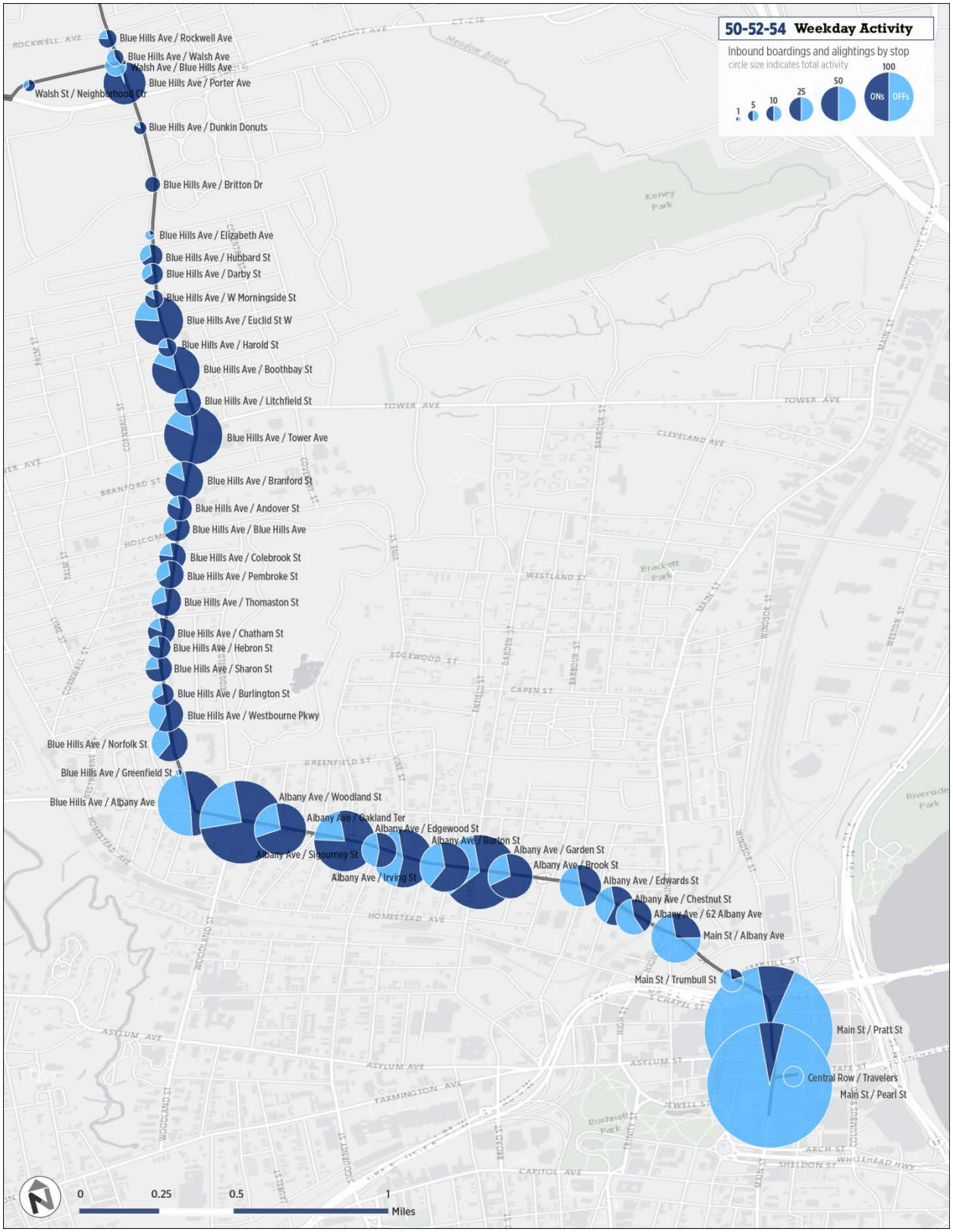


FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP INSET



Ridership by Trip

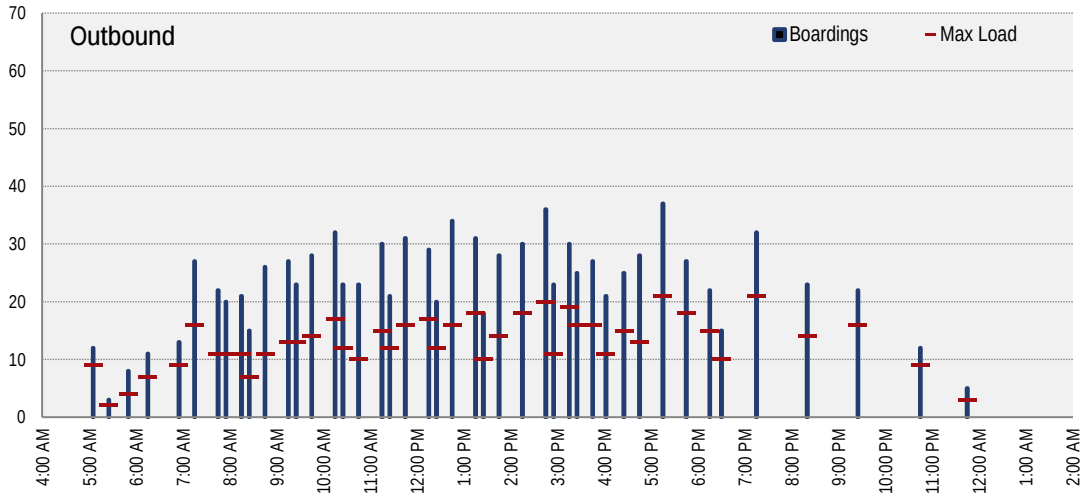
Weekday

Combined, Routes 50, 52 and 54 carry an average of 24.9 passengers per trip on weekdays. Ridership by trip day is presented separately for Route 50 and for Routes 52/54.

Route 50

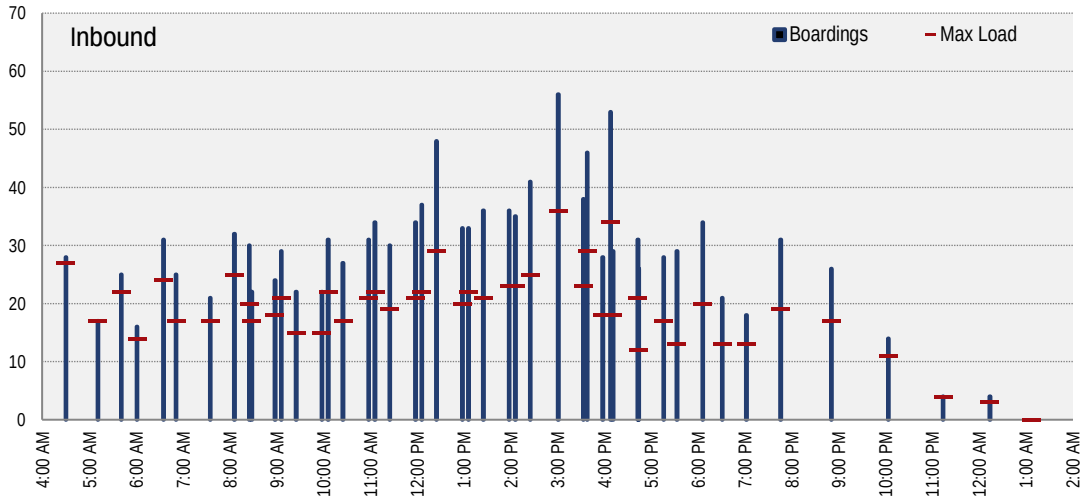
Ridership on Route 50 is well balanced throughout the day and in both directions (see Figures 10 and 11). The highest demand is in the afternoon and for inbound travel. Ridership also remains fairly strong until after 11 PM, but after 11 PM, demand drops considerably. Five inbound afternoon trips carry over 40 riders, with trips at 3:01 PM and 4:08 PM having peak loads that approach the 38-seat capacity of a CT***transit*** bus. This suggests that, although not every trip is overcrowded, some will be.

FIGURE 10 | ROUTE 50 WEEKDAY OUTBOUND RIDERSHIP BY TRIP



Note: In order to show all trips in this summary, trips with the same start time were adjusted by one-minute.Certain trips also correspond to older schedule data.

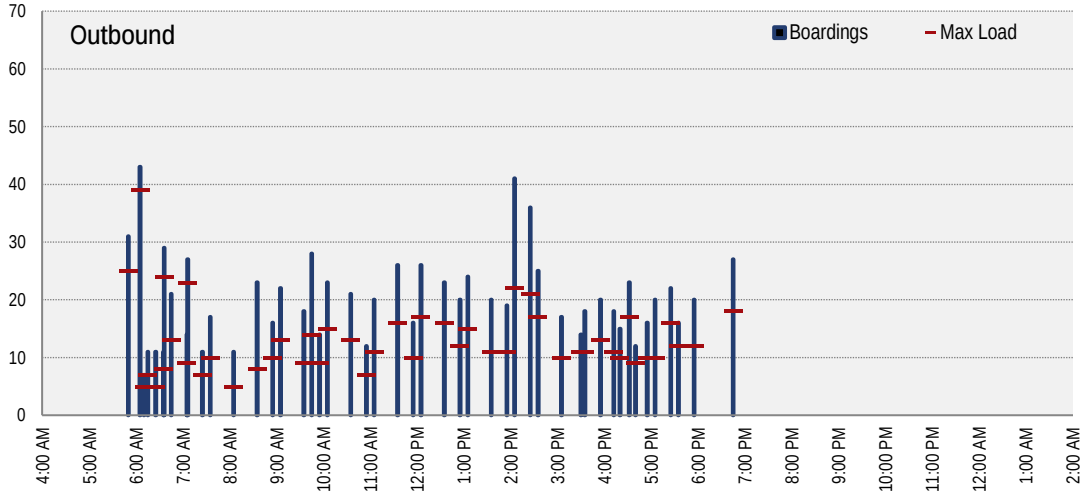
FIGURE 11 | ROUTE 50 WEEKDAY INBOUND RIDERSHIP BY TRIP



Route 52 - 54

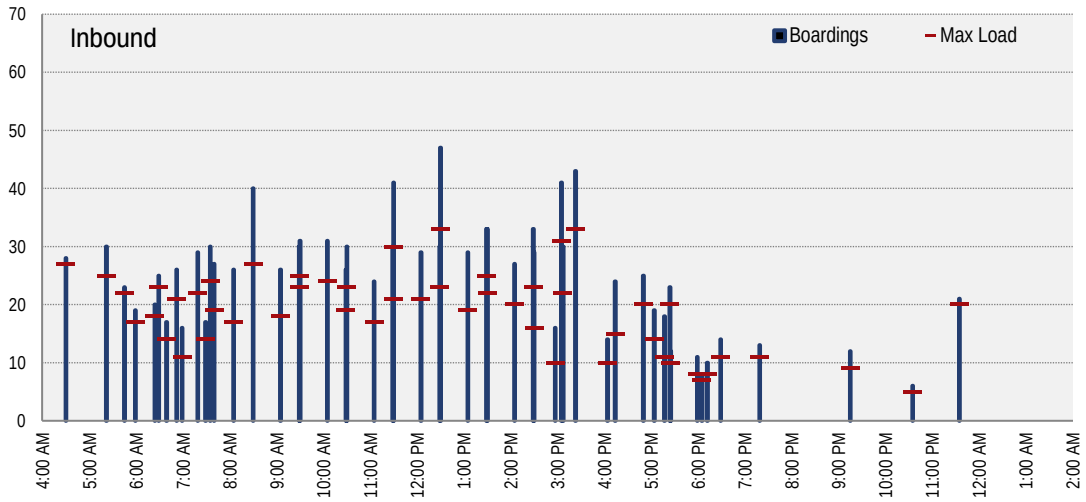
Ridership on Routes 52 and 54 is strong throughout the day and in both directions (see Figure 12 and 13). Demand shows stronger peak period commuting travel, with a strong reverse direction demand, so that ridership is strong outbound in the morning and inbound in the afternoon. This reflects the employment destinations in Windsor; likewise, strong ridership on the last inbound run of the day may reflect second shift workers returning home from Windsor. *Also note that some activity in the inbound direction is likely shown in data for Route 36.*

FIGURE 12 | ROUTE 52-54 WEEKDAY OUTBOUND RIDERSHIP BY TRIP



Note: In order to show all trips in this summary, trips with the same start time were adjusted by one-minute.

FIGURE 13| ROUTE 52-54 WEEKDAY INBOUND RIDERSHIP BY TRIP



Note: In order to show all trips in this summary, trips with the same start time were adjusted by one-minute.Certain trips also correspond to older schedule data.

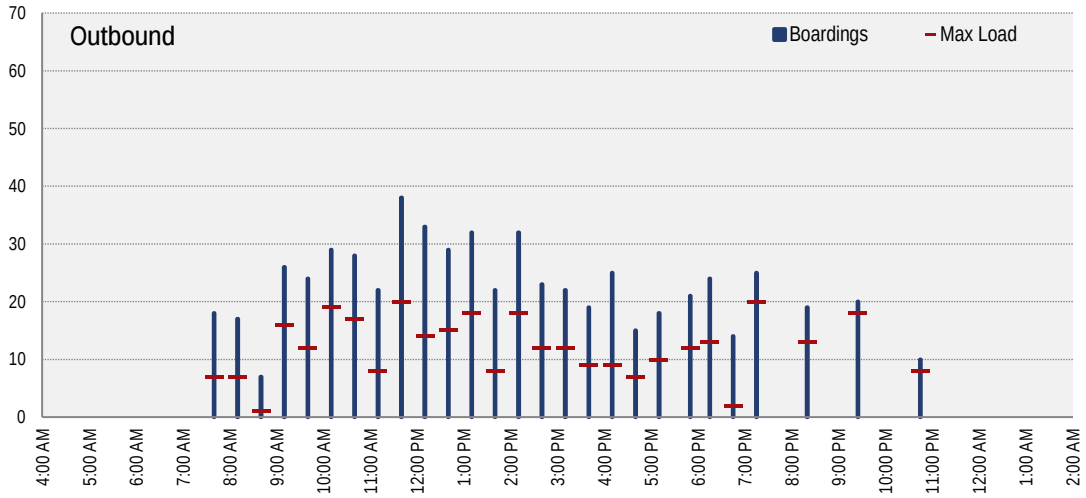
Saturday

Combined, Routes 50 and 52 carry an average of 24 passengers per trip on weekdays; there is no Route 54 service on Saturday.

Route 50

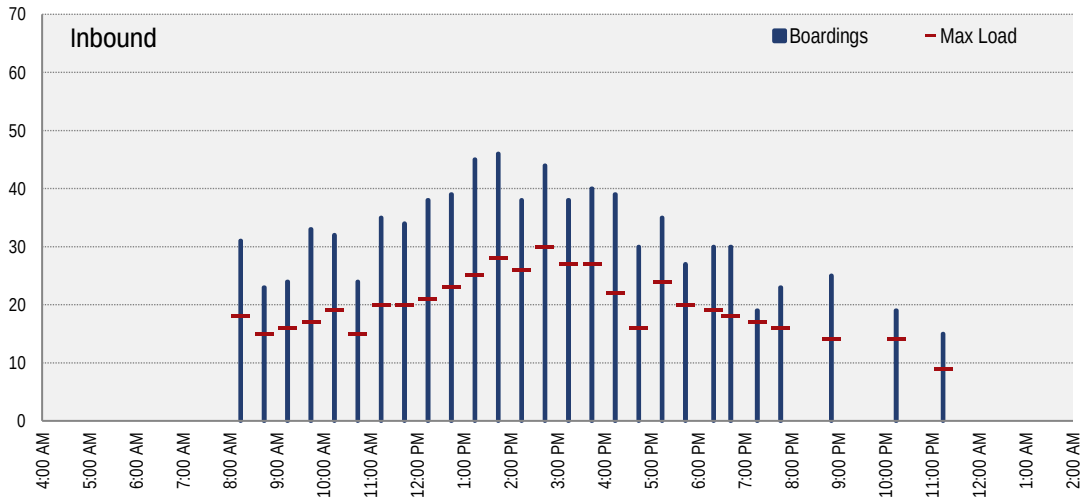
All Route 50 Saturday trips are operated as Route 50C and terminate at Copaco Center. Ridership data shows strong relative strong demand throughout the day and in both directions (see Figures 14 and 15). Demand for inbound service is stronger than outbound service and has a strong midday peak.

FIGURE 14 | ROUTE 50 SATURDAY OUTBOUND RIDERSHIP BY TRIP



Note: No data for Saturday outbound trip at 11:45 PM (seasonal).

FIGURE 15 | ROUTE 50 SATURDAY INBOUND RIDERSHIP BY TRIP



Note: No data included for Saturday inbound trip at 12:14 AM (seasonal).

Route 52

Demand on Route 52 is fairly well balanced throughout the day, but demand is stronger for travel inbound as compared to outbound (see Figures 16 and 17). In addition, demand is considerably lighter than demand on Route 50, suggesting a stronger desire for trips destined for Copaco Center. The first trips in each direction carry the largest passenger loads of the day, indicating an earlier trip could be warranted.

FIGURE 16 | ROUTE 52 SATURDAY OUTBOUND RIDERSHIP BY TRIP

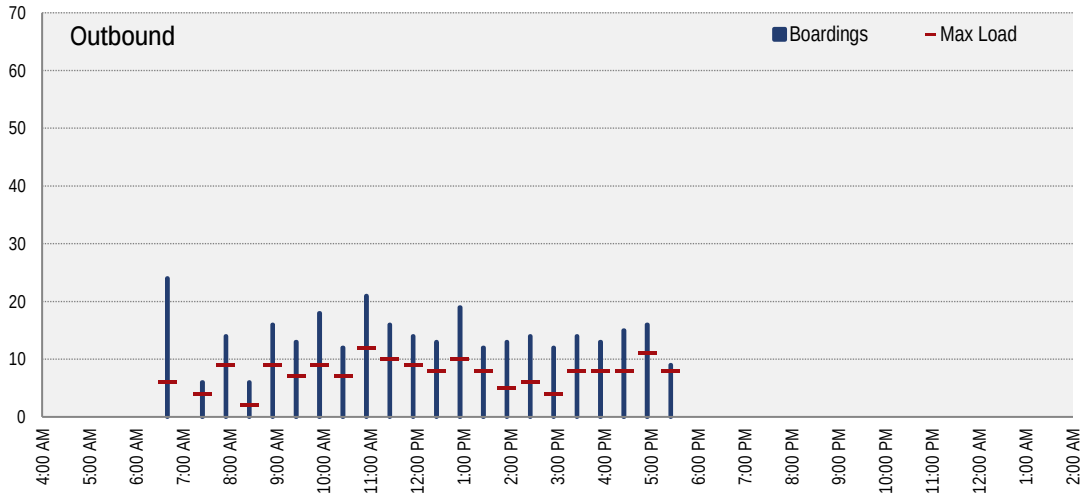
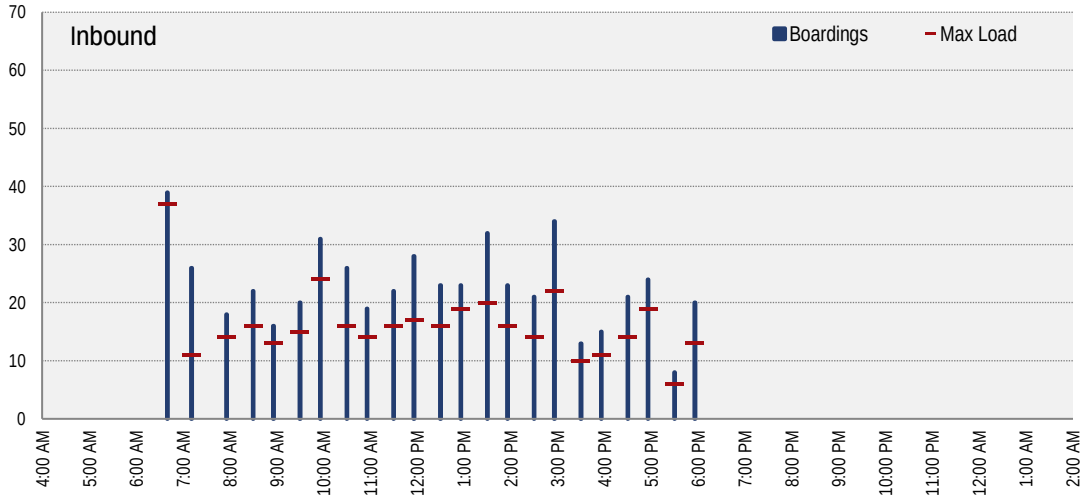


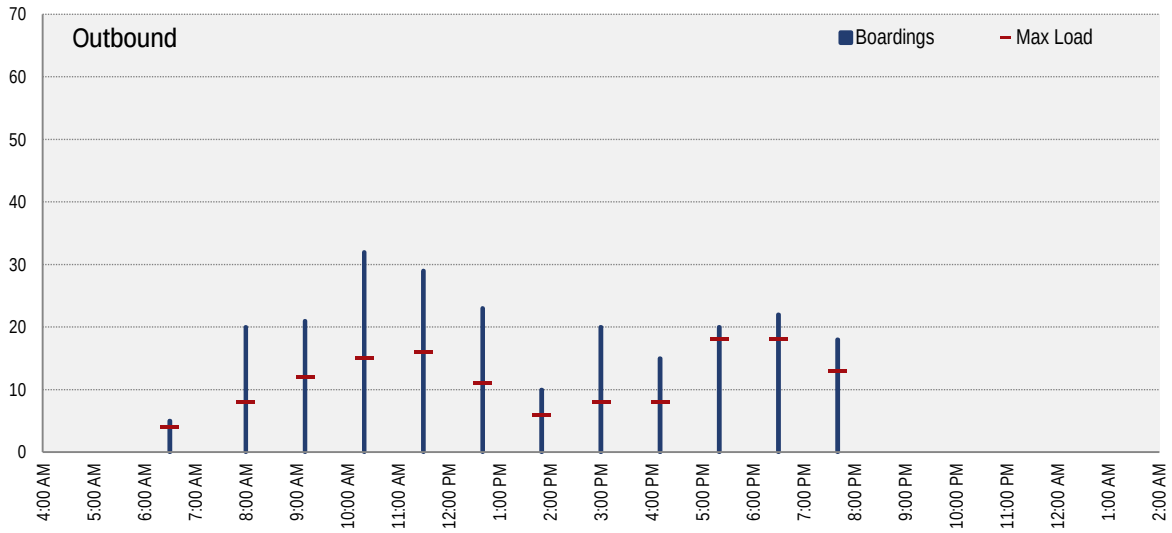
FIGURE 17 | ROUTE 52 SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

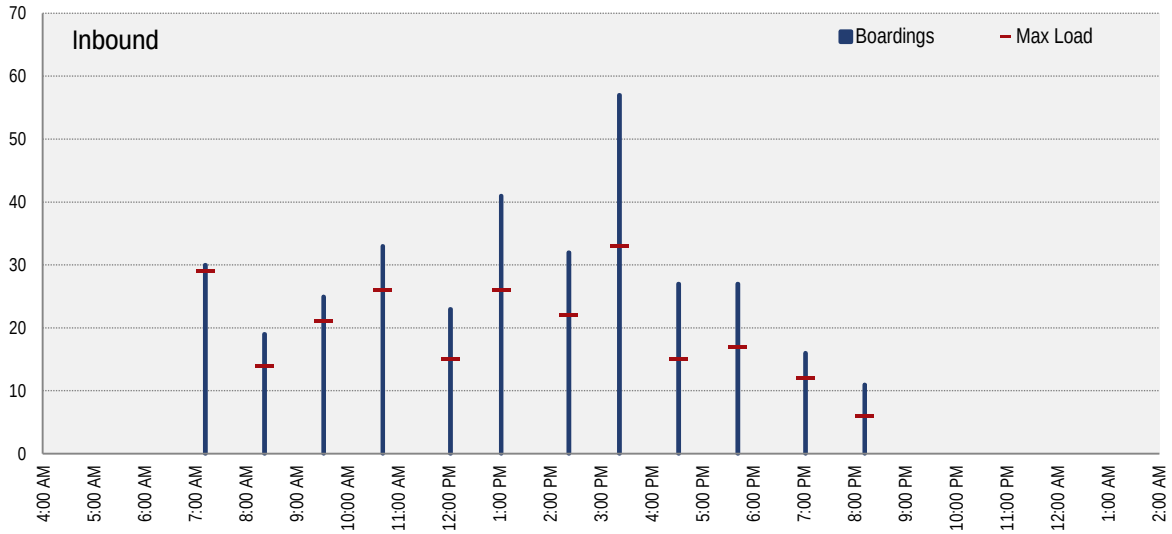
Of the three routes, only Routes 50B and 50C operate on Sundays. Most trips extend to Bloomfield Center (50B), with a handful of trips in the midday and evening terminating at Copaco Center (50C). Ridership displays a reverse peak pattern; with more riders heading outbound during the AM and returning inbound in the PM (see Figure 18 and 19). This suggests Copaco Center be more of a draw for Sunday riders than downtown Hartford.

FIGURE 18 | ROUTE 50 SUNDAY OUTBOUND RIDERSHIP BY TRIP



Note: No data for Sunday outbound trip at 8:50 PM (seasonal).

FIGURE 19 | ROUTE 50 SUNDAY INBOUND RIDERSHIP BY TRIP



Note: No data for Sunday inbound trip at 9:22 PM (seasonal).

Performance

Combined, Routes 50, 52 and 54 perform significantly better than the Hartford Division average by all measures (see Figure 20). Their combined costs per passenger are lower than the division average on all days. Saturdays and Sundays perform particularly well, likely due to the fact that the longer routes (54 and 50A) are not in operation and Copaco Center is a strong generator of weekend ridership.

FIGURE 20 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 50/52/54	DIVISION AVG	ROUTE 50/52/54	DIVISION AVG	ROUTE 50/52/54	DIVISION AVG
Operating Cost per Passenger	$3.49	$4.84	$3.03	$6.30	$3.41	$6.66
Passengers per Revenue Vehicle Hour	36.7	28.9	42.3	27.0	37.5	29.7
Passengers per Revenue Vehicle Mile	3.4	2.6	4.2	2.4	4.4	2.9

Source: CTtransit performance data

Combined, Routes 50, 52 and 54 have on-time performance that is essentially the same as the Hartford Division average, with 81% of time point checks showing buses on schedule (see Figure 21).

FIGURE 21 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 50/52/54	DIVISION AVG
Early	0.2%	0.2%
Late	18.8%	18.9%
On-Time	81.0%	80.9%

Source: CTtransit performance data

Figures 22 and 23 show how a combined Routes 50/52/54 perform on weekdays relative to other routes in the system. The combined performance is well above average in terms of both operating cost per passenger and passengers per revenue vehicle mile.

FIGURE 22 | WEEKDAY OPERATING COST PER PASSENGER

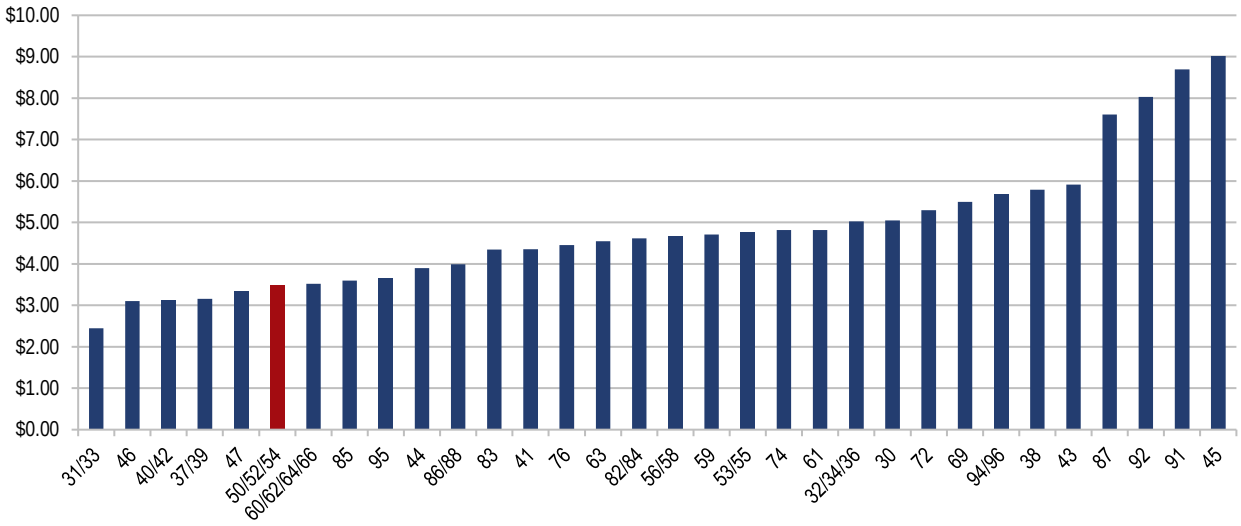
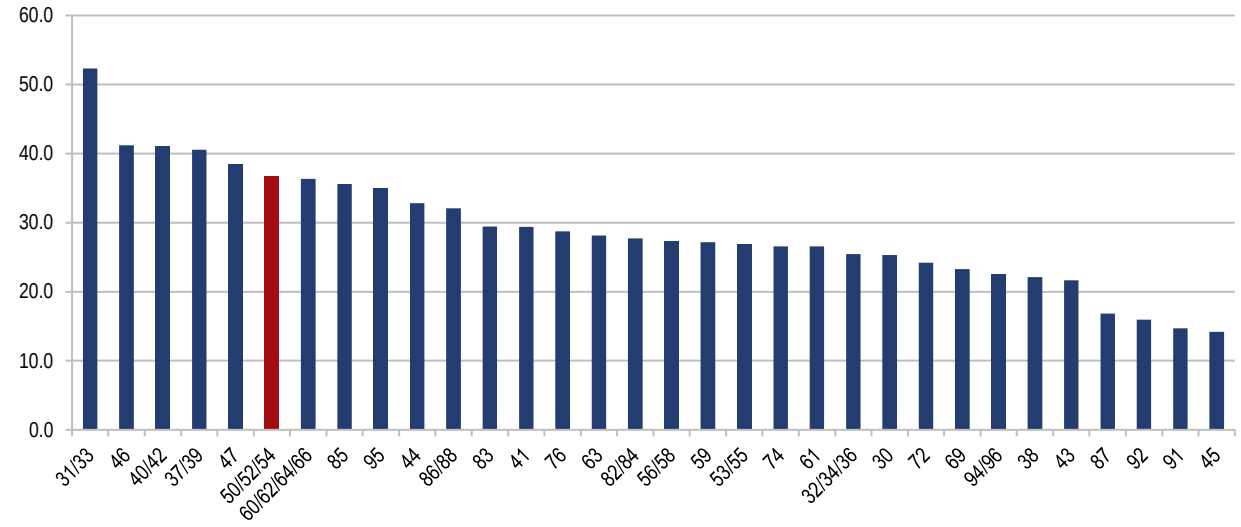


FIGURE 23 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT

Routes 50, 52 and 54 are radial routes that travel through the Upper Albany and Blue Hills neighborhoods north of downtown Hartford. The outer ends of the routes provide access to employment and services in Bloomfield and Windsor. The routes share a common alignment between downtown and the intersection of Blue Hills Avenue and Walsh Street in Bloomfield, just north of Cottage Grove Road. Route 50 heads west to Copaco Center, Bloomfield Center and the Cigna campus. Route 52 serves Rockwell Corner and the Wedgewood Apartments. Route 54 continues into Windsor to serve Griffin Center, locations along Day Hill Road and the Poquonock Park and Ride Lot. It is worth noting that funding for weekday service on Route 54X and weekend service on Route 50 is provided by the CRCOG's job access program.

All three routes are strong performers in all metrics. The routes' strengths also include operating through some of Hartford's most dense and transit dependent neighborhoods. The success of the routes help position the services and corridors for more improvements, including the addition of CT***fastrak*** service (see below) and connections to the planned commuter rail station in Windsor.

Each of the three routes also suffer from low demand at their outer ends. This is especially true for Route 54, which travels along and indirect route to employment along Day Hill Road. In addition, while the overlap and integration of the routes is one of the troika's strengths, it also makes understanding the service, especially at the outer end challenging.

CT*fastrak*

CT***fastrak*** service is scheduled for implementation in March 2015. A new Route 153 will provide service along shared segments of Route 50's alignment and may impact Route 50's ridership:

- Route 153: A new CT***fastrak*** feeder Route 153 will connect Copaco Center in Bloomfield with Flatbush Station. Along with Route 50, it will operate along Hall Boulevard and Cottage Grove Road in Bloomfield between the Cigna Campus access road and Copaco Center. Route 153 is scheduled to operate daily and provide hourly service between 5:30 AM and 11:30 PM on weekdays, 6:30 AM and 11:30 PM on Saturday and 7:30 AM to 8:30 AM on Sundays.

Riders' response to the new CT***fastrak*** service is not yet known. It will be slightly faster to travel from downtown to Copaco Center on Route 50 (29 minutes) compared to a trip from Flatbush Station to Copaco on Route 153 (38 minutes). Conversely, it will be slightly faster to travel to the Cigna campus from Flatbush Station on Route 153 (31 minutes) or from downtown on Route 72 (27 minutes) as compared to traveling to Cigna from downtown on Route 50A (36 minutes). Route 50 will remain more attractive to riders from going to Copaco Center or Cigna from neighborhoods north of downtown.

Service Improvement Options

Together, Routes 50-52-54 serve some of the most productive corridors in the Hartford system along Albany Avenue and Blue Hills Avenue, and including Copaco Center. Based on existing data, opportunities to further strengthen the productivity of these routes include:

Improve Corridor Infrastructure

- **Create transit investment corridor along Albany Avenue.** As suggested on other route evaluations, the Albany Avenue corridor is served by several other CT*transit* routes, all of which have strong ridership and several of which have problems with their on-time performance. A potential strategy to both strengthen ridership and improve operational efficiency is to invest in corridor infrastructure to help improve transit speed and reliability. Albany Avenues has a large number of traffic signals, and only one travel lane in the westbound direction (but two travel lanes and parking in the eastbound direction). Identifying Albany as a "key bus route" corridor and

making relatively small roadway improvements, such as signal priority, queue jump lanes, bus pullouts, stop consolidation and other corridor improvements would improve transit operations (and save operating costs) and help attract more riders.

- **Extend transit investments along Blue Hills Road.** The transit investment corridor strategy may be extended to Blue Hills Road all the way into downtown Hartford. Although demand is not as strong as Albany Avenue, designating a transit corridor to Windsor can provide faster and more reliable connections to/from the planned train station in downtown Windsor. This may also help direct and encourage development along the corridors. The potential treatments are the same and include a series of relatively small roadway improvements, such as signal priority, queue jump lanes, bus pullouts, stop consolidation and other corridor improvements would improve transit operations (and save operating costs) and help attract more riders.
- **Create transit "super stop" at Copaco Center.** Demand for service to/from Copaco is currently strong enough to warrant a "super stop" that offers passengers more and better amenities, such as an enclosed waiting area, real-time route information, printed schedule information and potential bicycle facilities. The need for a super stop will increase with CT***fastrak*** service provides faster and more direct connections between neighborhoods south of downtown Hartford with the regional shopping facility.

Service Changes – Route 50

- **Discontinue Route 50A.** Route 50 extends west from Copaco Center to the Cigna and Met Life campus. This destination is also served by Route 72. Data shows roughly 58 riders use Route 72 to access the Cigna/Met Life campus as compared to seven riders on Route 50A. In spring 2015, CT***fastrak*** Route 153 will also travel along Cottage Grove Road and Hall Boulevard and although Route 153 will not enter the Cigna campus, it is a short walk (¼ mile) to access the Cigna campus from Hall Boulevard. Met Life is slightly further requiring a ½ mile walk from Hall Boulevard. Route 72, via Asylum Avenue, would still enter Cigna's campus. One option, therefore, is to discontinue Route 50A after CT***fastrak*** opens.
- **Coordinate service to Bloomfield Center (Routes 50B, 56 and 92).** Currently Bloomfield Center is served by Routes 50B, 56 and 92. Route 50B and 56 operate along Albany Avenue and operate with 30 minute service during the peak and 60 minute off-peak. Route 56 travels along Bloomfield Road and serves the University of Hartford, but does not serve Copaco Center. Route 92 is a cross town route that begins in Manchester and continues through downtown Hartford to Bloomfield Center. The multiple services create redundancies and demand may not warrant so much service. It would also be easier for riders if one route (Route 50B or 56) provided higher frequency service the potential for coordination includes both weekdays and weekend days.
- **Realign Route 50B to serve Bloomfield Center via Seabury Retirement Village and the Federation Home.** The Seabury Retirement Village and Bloomfield Federation Home are ½ mile apart on Wintonbury Avenue, but are served by two different routes. If Route 92 were used to connect Copaco and Bloomfield Center, Route 50B could be realigned to bypass Copaco and extend along Route 74's route (School Street) to serve Seabury Retirement, the Federation Home and Bloomfield Center. Or, Route 74 or 76 could be reconfigured in this fashion.
- **Operate 50C as high frequency connection to Copaco Center.** If changes to 50A and or 50B were made as proposed above, high ridership demand to Copaco Center would need to be met by high frequency service on Route 50C. Today, combined service offers 20 minute headways on Routes 50A/50B/50C and this frequency should be maintained.

Service Changes – Route 52 and 54

- **Better coordinate schedules on Routes 52 and 54.** Route 50's three variations are well coordinated, but Route 52, 52W, 54 and 54X do not operate on regular headways. The overall service would benefit if the schedules were coordinated to offer more consistent headways along the corridor.
- **Combine Route 52 and 54 and terminate in Rockwell Corner.** Ridership drops dramatically on Routes 52 and 54 north of Windsor Center. Route productivity would likely increase if service were terminated in Rockwell Corner.
- **Eliminate Route 54 service to Day Hill Road corridor.** Another option would be to eliminate Route 54 to the Day Hill Road corridor. Ridership on the outer end of Route 54 is very low and does not warrant the level of service provided. In addition, there are other routes that provide faster and more direct service to the Day Hill Road corridor via I-91.
- **Serve Day Hill Road with Flex Service.** The downside of eliminating Route 54 service to the Day Hill Road would occur when commuter rail service begins in 2016 and commuters look to get from the train station to destinations along and near the Day Hill Road corridor. One alternative, therefore, would be to operate flex service from Windsor Town Center, with arrivals and departures scheduled to meet Route 54. The flex route would give passengers the flexibility of door-to-door service along Day Hill Road (which is not easily navigated by pedestrians) combined with the reliability of scheduled service from Windsor Center.
- **Combine Route 52 and 54 and reduce service frequency.** Although Routes 52 and 54 are productive, the majority of their ridership is generated along the segments closer to downtown Hartford. Ridership drops off dramatically at Cottage Grove Road and then again north of Rockwell Corner. As a result, while higher frequency service is needed along Blue Hills Avenue, the level of service provided north of Cottage Grove Road may be reduced to better match demand. This may include 15 or 20 minute service during the peak and 30 minutes during the office peak.
- **Start Saturday service to Griffin Center earlier.** There is no service north of Wedgewood apartments on weekends, but warehousing operations along Blue Hills Road and at Griffin Center likely have weekend shifts. Strong demand for early morning Saturday trips on Route 52 suggest demand for additional service.
- **Eliminate Route 52W - Wedgewood Apartment.** If Route 52 and 54 were combined, all service would stay on Blue Hills Avenue and would not turn into the Wedgewood Apartments. A total of 21 riders board within the apartment complex each weekday; the walk from the furthest building in the complex to Blue Hills Avenue is less than ¼ mile.
- **Maintain high frequency service on Blue Hills:** If Routes 52, 52W and 54 were combined to run at lower frequency, Route 50C service to Copaco Center or other routes would need to be further enhanced to maintain high frequency along Blue Hills Avenue.
- **Use Blue Hill Avenue resources to serve Coventry Street.** Route 46 Vine Street operates via Coventry Street which ranges from about ¼ to ½ mile east of Blue Hills Avenue and Routes 50, 52 and 54. The segment of Blue Hills Avenue directly west of Route 46 between Tower Avenue and Albany Avenue has less ridership than Blue Hills Avenue segments north of Tower Avenue; thus one Blue Hill Avenue route could be realigned to serve Coventry Street in this section, freeing up Route 46 resources to be more effectively directed (or coordinated with Route 40, 42 and 44) elsewhere in this corridor.

Route Evaluation

WETHERSFIELD AVENUE AND HARTFORD/MIDDLETOWN

53 | Jordan Lane

53W | Wethersfield Shopping Center

55 | Middletown via Silas Deane Highway

55X | Middletown via Silas Deane Highway Express

Service Design

Routes 53 and 55 are radial routes that operate from downtown Hartford to Wethersfield and Middletown, respectively. CT***transit*** tracks ridership on these routes together, so they are evaluated as a combined pair. The two routes are inter-related with variants of each route sharing parts of their alignment with at least one variant of the other route.

Route 53 has two variants; one terminating at Jordan Lane (53) and the other traveling via State Street to old Wethersfield and terminating at Wethersfield Shopping Center (53W) along the Silas Deane Highway. Route 55 also has two variants: Route 55 trips travel to Middletown via Wethersfield Avenue and parts of the Silas Deane Highway. Route 55X by-passes most of Hartford with express service along Wilbur Cross Highway and State Street in Wethersfield before rejoining the Silas Deane Highway and continuing to Middletown.

FIGURE 1 | ROUTE 53 MAP

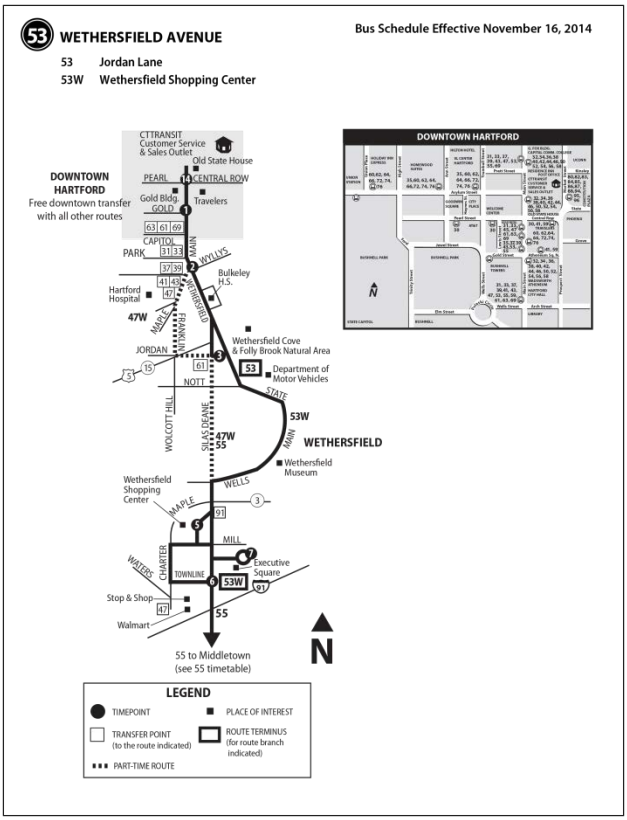
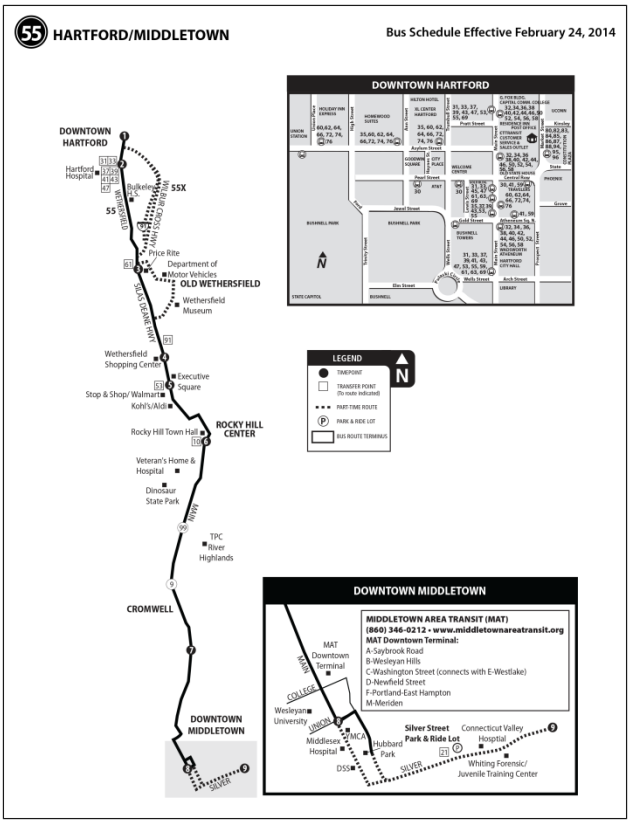


FIGURE 2 | ROUTE 55 MAP



System Interaction and Transfer Opportunities

Routes 53 and 55 begin and end in downtown Hartford where riders can transfer to most CT***transit*** services. In addition, there are several locations outside of downtown where riders can transfer to other CT***transit***-Hartford and Stamford routes (see Figure 3).

FIGURE 3 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 31	Park Street – New Park Avenue
Route 33	Garden Street
Route 37	New Britain Avenue via Jefferson
Route 39	New Britain Avenue via Retreat
Route 41	New Britain/Hartford
Route 43	Campfield Avenue
Route 47	Franklin Avenue
Route 61	Broad Street
Route 63	Hillside Avenue
Route 69	Capitol Avenue
Route 91	Forbes Street Crosstown
STAMFORD ROUTES	
Route 21	West Avenue
EXPRESS ROUTES	
Route 10	Rocky Hill—Century Hills Express

Alignments and Service Patterns

On weekdays, 19 of the trips on Route 53 operate as Route 53W and terminate at Wethersfield Shopping Center. The remaining six trips (three in the morning and three in the afternoon) operate as Route 53 and terminate at Jordon Lane. In both cases, the service travels south along Main Street to Wethersfield Avenue, and then continues along State Street, Main Street, and Wells Road to Silas Deane Highway. Route 53W buses deviate from Silas Deane to serve Westfield Shopping Center, Mill Street, Charter Road and Town Line Road before terminating at Executive Square.

In the mid-day, Route 53W trips alternate with Route 55 trips to serve Main Street and Wethersfield Avenue in Hartford. From Wethersfield Avenue, Route 55 trips continue to Middletown via the Silas Deane Highway / Main Street corridor. Morning and afternoon trips on Route 55 operate express service as Route 55X. These trips bypass Wethersfield Avenue, and instead travel from downtown Hartford to Silas Dean and Jordan Lane via Wilbur Cross Highway before continuing to Middletown.

Saturday service primarily alternates between Route 53 and 53W, with just three Route 55 trips to Middletown during the service day. Neither Route 53 nor 55 operates on Sundays, but much of the coverage area from downtown Hartford to Wethersfield Shopping Center is picked up by Route 47W.

Service Schedule

Routes 53 and 55 operate on weekdays and Saturdays. There are 41 outbound trips (25 on variants of Route 53 and 16 on variants of Route 55) and 42 inbound trips (25 on variants of Route 53 and 17 on variants of Route 55) per weekday. Along the common alignment on Wethersfield Avenue, peak period frequency is 5 to 20 minutes, while midday service operates every 30 minutes. Service levels are lower on the unique portions of the individual routes.

There are 23 outbound trips (8 on Route 53, 12 on Route 53W, and 3 on Route 55) and 23 inbound trips (8 on Route 53, 12 on Route 53W, and 3 on Route 55), meaning a bus leaves each stop every 30 minutes throughout the day.

FIGURE 4 | SCHEDULE OVERVIEW (ALL ROUTES 53, 53W, 55, AND 55X)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:35 AM – 11:31 PM	20/30	41/42
Saturday	7:20 AM – 11:31 PM	30	23/23
Sunday	-	-	-

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

CT***transit*** tracks ridership for Route 53 and Route 55 together, so the following analysis of ridership and productivity treats the two routes as a single service. Route 53/55 carries 1,689 daily passengers or 20.3 passengers per trip on an average weekday, which is 15% higher than the Hartford Division average of 17.6 weekday passengers per trip. Saturday ridership per trip is approximately on par with the division average (see Figure 5).

FIGURE 5 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 53/55	ROUTE 53/55	DIVISION AVG
Weekday	1,689	20.3	17.6
Saturday	733	15.6	16.3
Sunday	-	-	17.6

Source: CTtransit performance data

Ridership by Stop

Ridership is highest on Route 53/55 in downtown Hartford and downtown Middletown. The only stop outside of these urban centers that generates more than 50 boardings or aligtings per day is at Main Street and Wethersfield Avenue in Hartford (see Figures 6-10).

FIGURE 6 | ROUTE 53/55 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Main Street near Trinity Church	59 / 3	Middletown central business district
Main Street and Wethersfield Avenue	17 / 85	Transfer point for Routes 31, 33, 37, 39, 41, 43, and 47
Main Street / Athenaeum Square N	42 / 310	Travelers Insurance
Main Street / Old State House	6 / 133	Connecticut's Old State House

The ridership data shows that the majority of the ridership activity occurs between downtown Hartford and Wethersfield with relatively high ridership at both Jordon Lane and Wethersfield Center. Ridership in downtown Middleton is also relatively strong and rates as one of the highest ridership stops noted on Figure 6. The ridership by time of day data (see Figures 10-17) suggests that the combined routes are not as well used for traditional commuting purposes (traditional office jobs) as they are for service oriented trips, including retail (jobs and shopping).

FIGURE 7 | ROUTE 53 WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

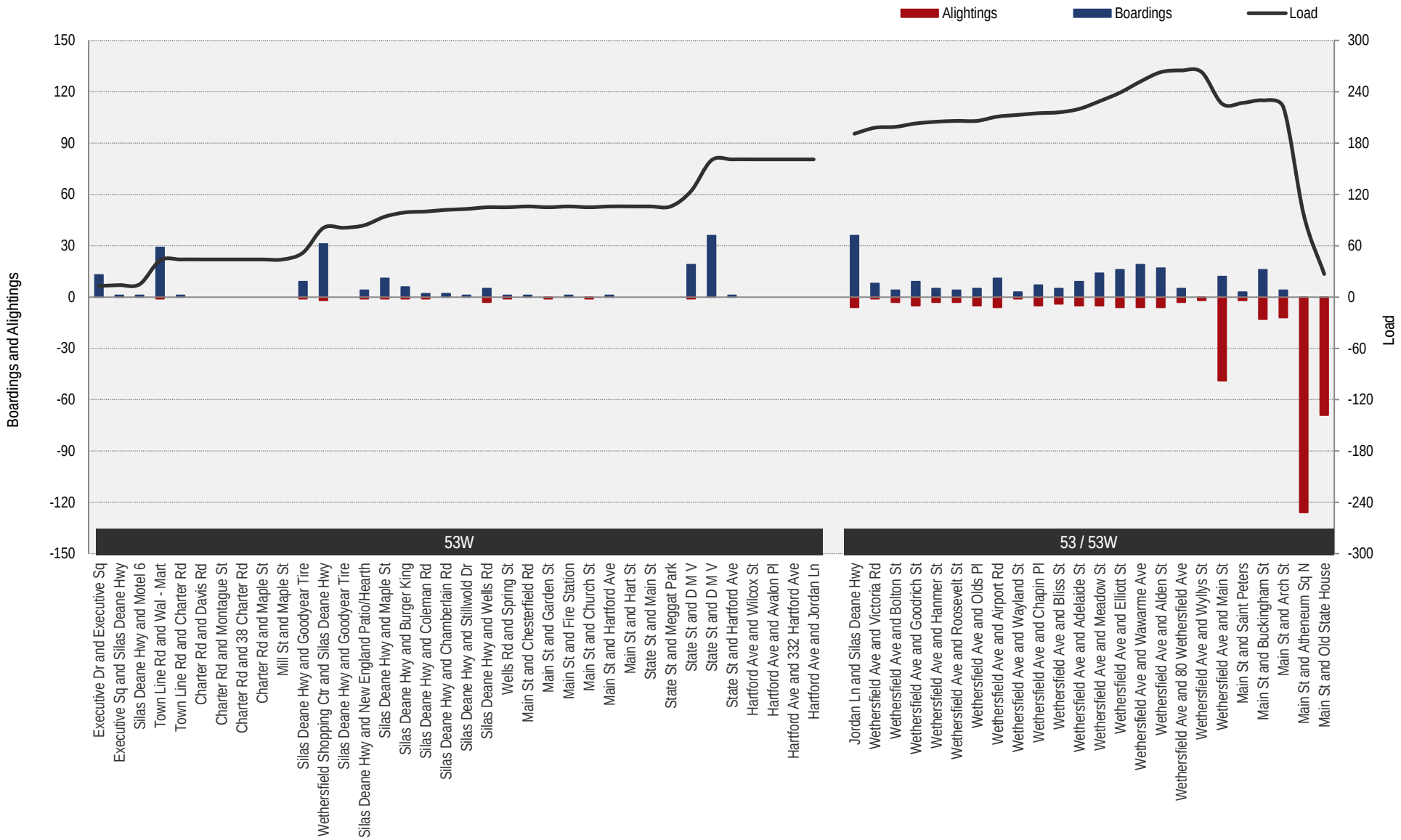


FIGURE 8 | ROUTE 55 WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

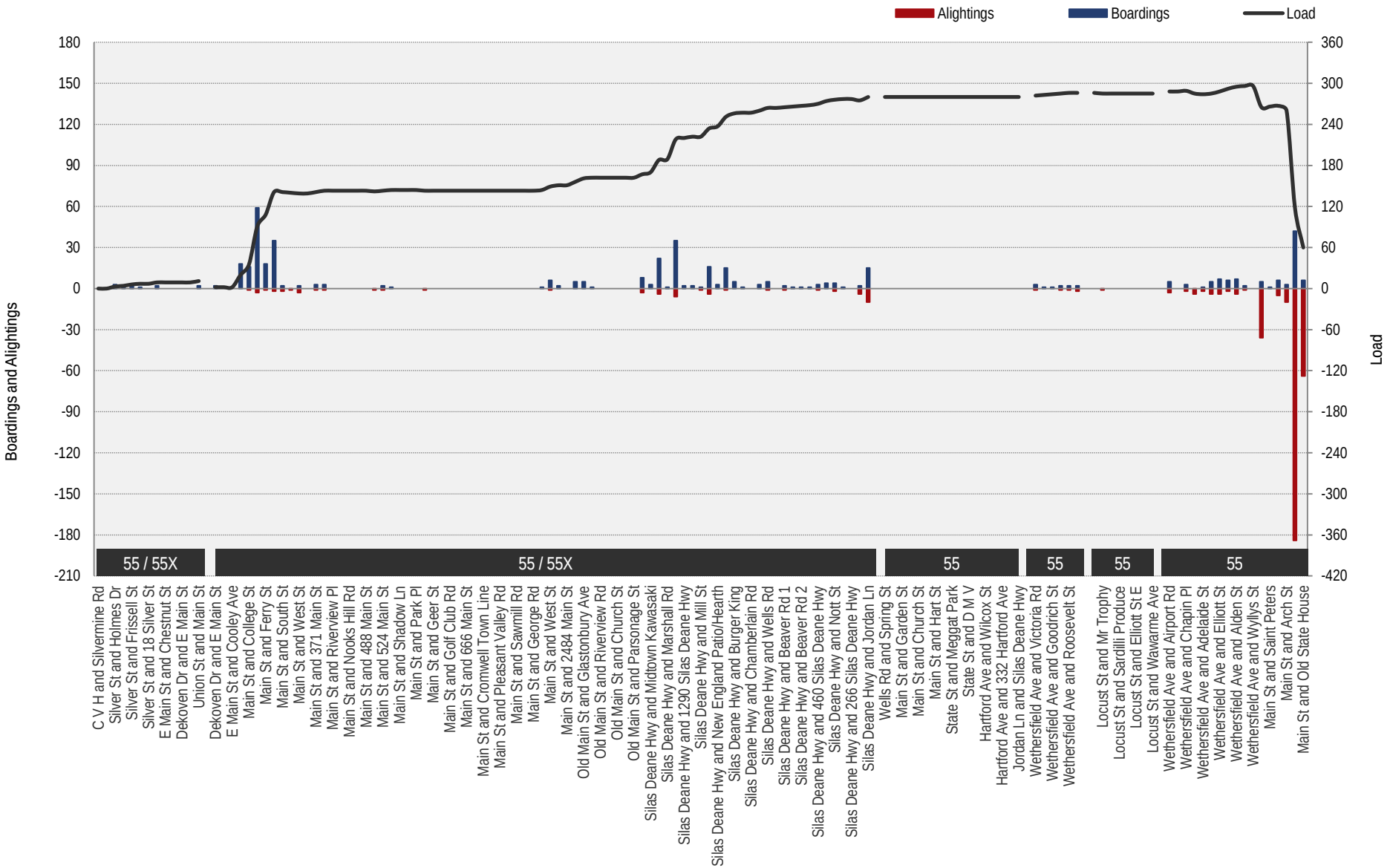


FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

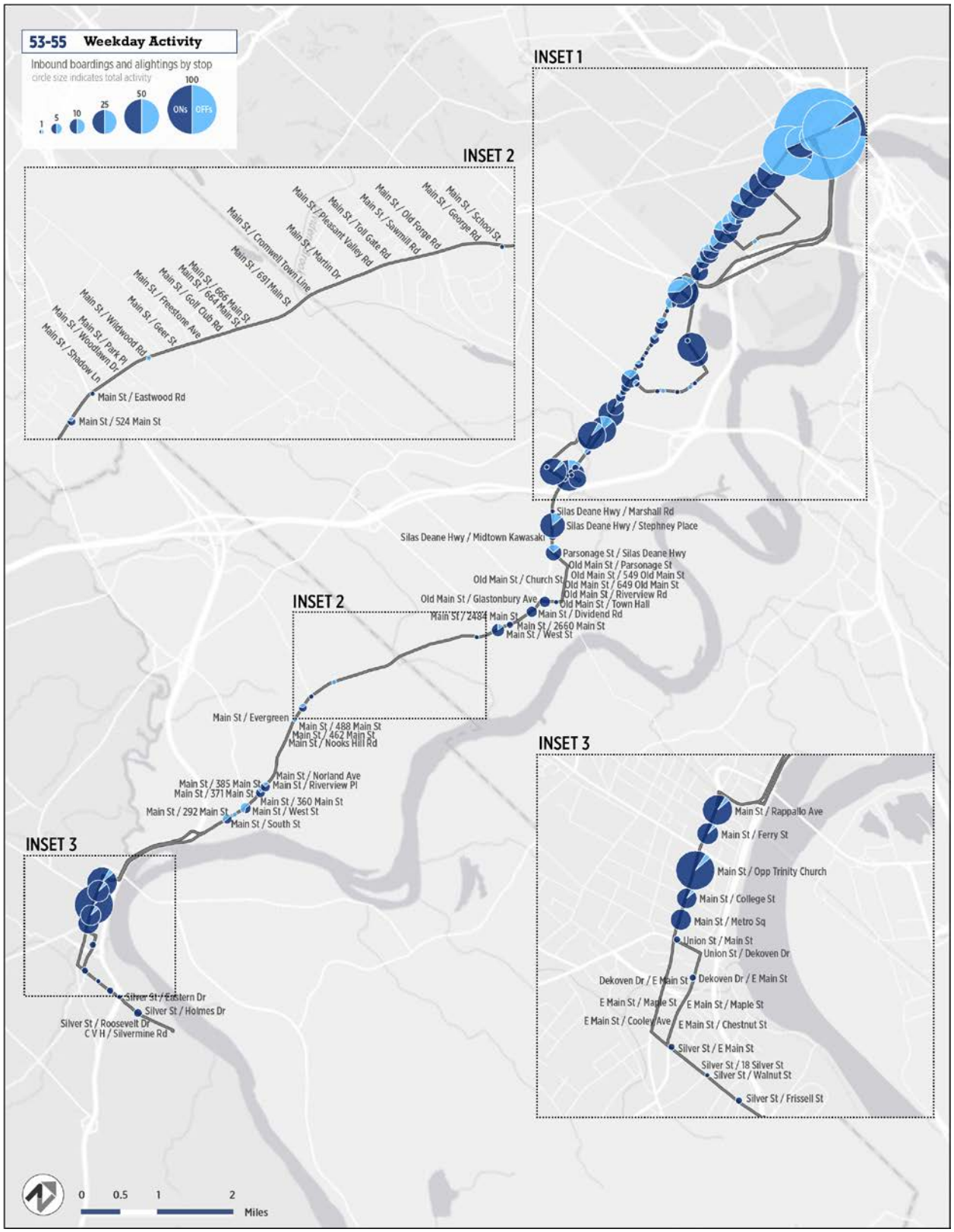


FIGURE 10| WEEKDAY INBOUND RIDERSHIP BY STOP INSET MAP

Ridership by Trip

Weekday

Route 53/55 carries an average of 20.3 passengers per trip on weekdays. Ridership is highest on both the Route 53 and Route 55 variants during the mid-day (see Figures 10-13). Maximum loads are also highest in the mid-day, but no trips have a maximum load near 40 passengers, the typical seating capacity of a 40-ft transit bus. The high mid-day ridership suggests trips are not oriented around peak-period commuting and instead are more oriented around services, including retail jobs and shopping.

FIGURE 10 | ROUTE 53 WEEKDAY OUTBOUND RIDERSHIP BY TRIP

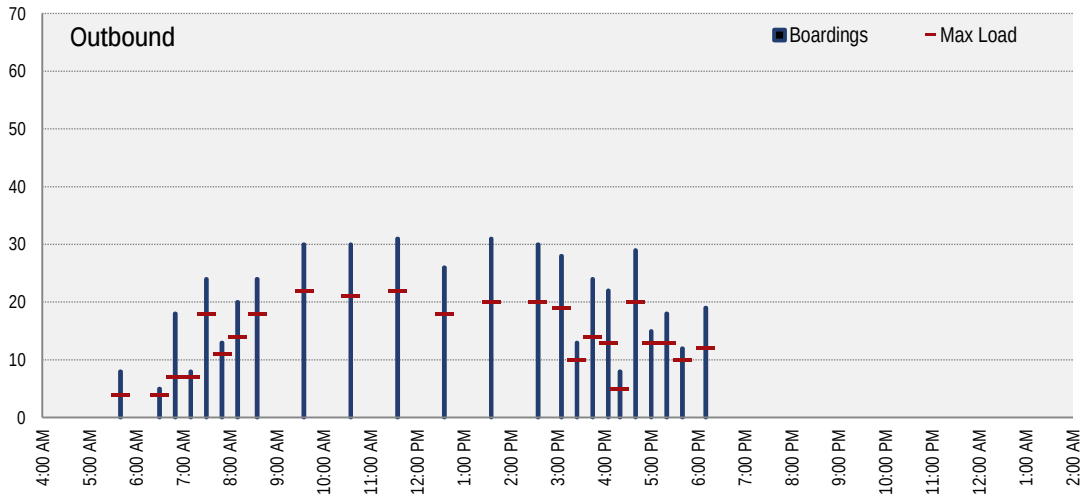


FIGURE 11 | ROUTE 53 WEEKDAY INBOUND RIDERSHIP BY TRIP

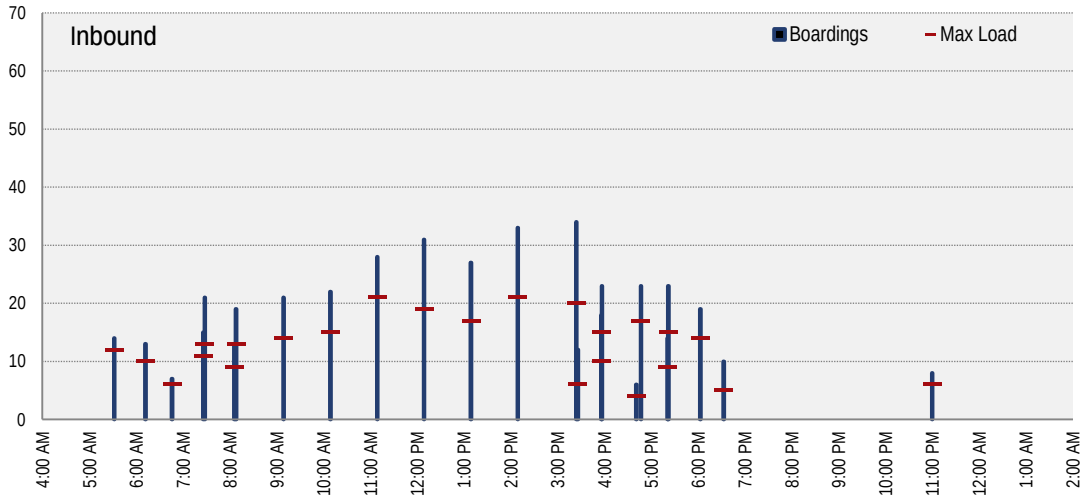


FIGURE 12 | ROUTE 55 WEEKDAY OUTBOUND RIDERSHIP BY TRIP

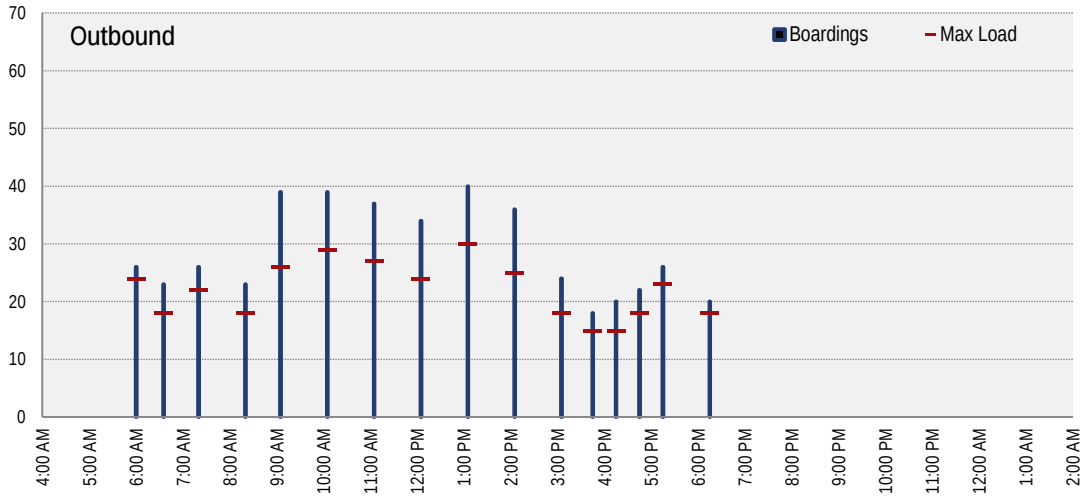
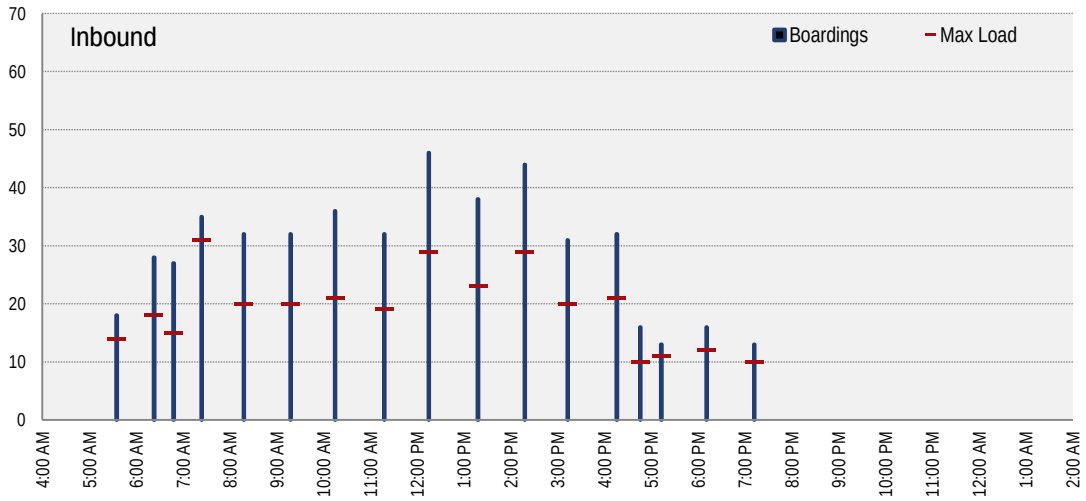


FIGURE 13 | ROUTE 55 WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Saturday ridership patterns are also strong in the midday, with highest ridership occurring between 9:00 AM and 4:00 PM (see Figures 14-17). Route 55 service, while limited has fairly strong ridership, especially on the first few trips of the day.

Maximum loads are below 20 passengers on most trips, so capacity on Saturdays does not appear to be an issue.

FIGURE 14 | ROUTE 53 SATURDAY OUTBOUND RIDERSHIP BY TRIP

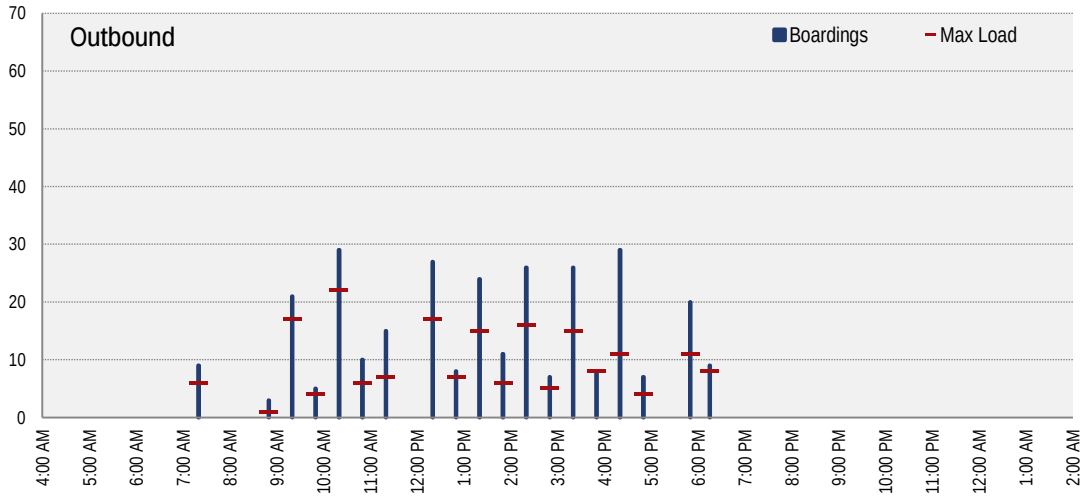


FIGURE 15 | ROUTE 53 SATURDAY INBOUND RIDERSHIP BY TRIP

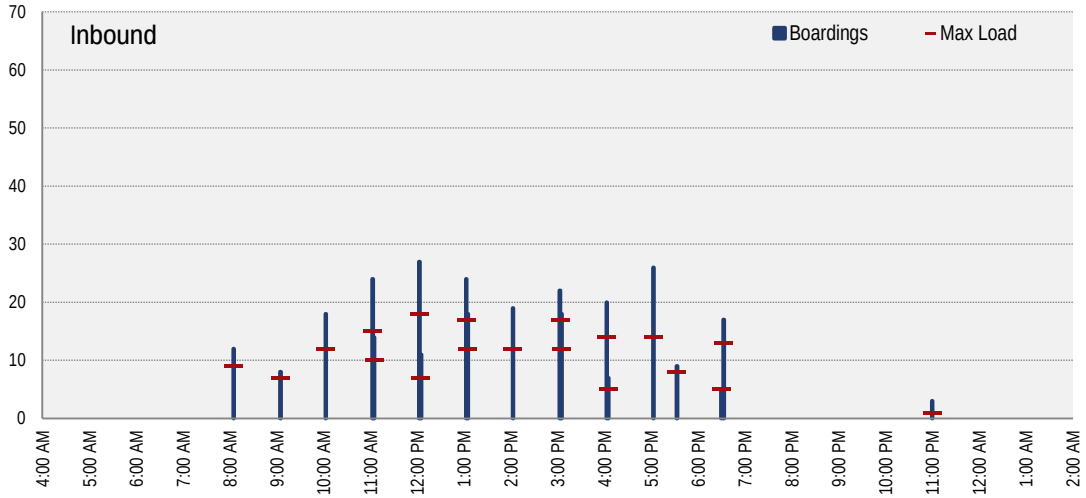


FIGURE 16 | ROUTE 55 SATURDAY OUTBOUND RIDERSHIP BY TRIP

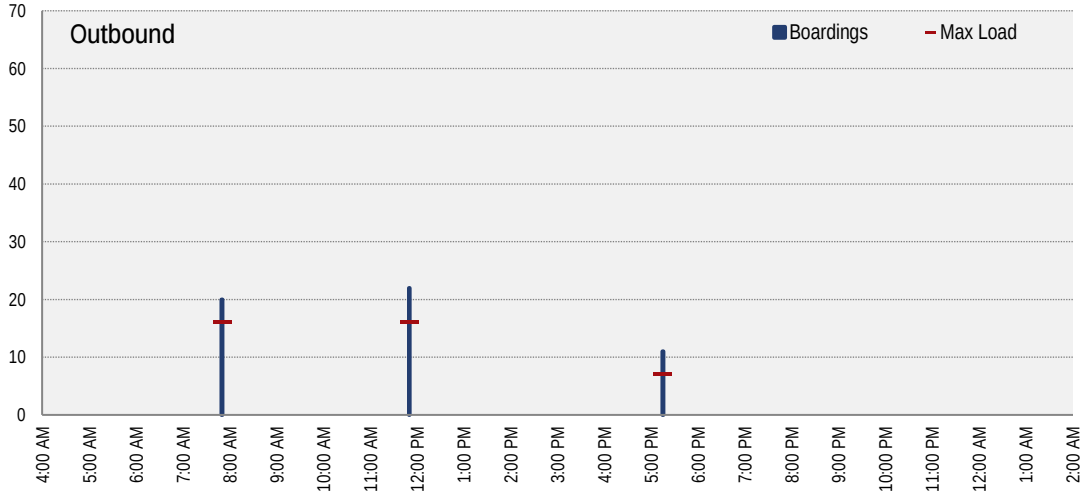
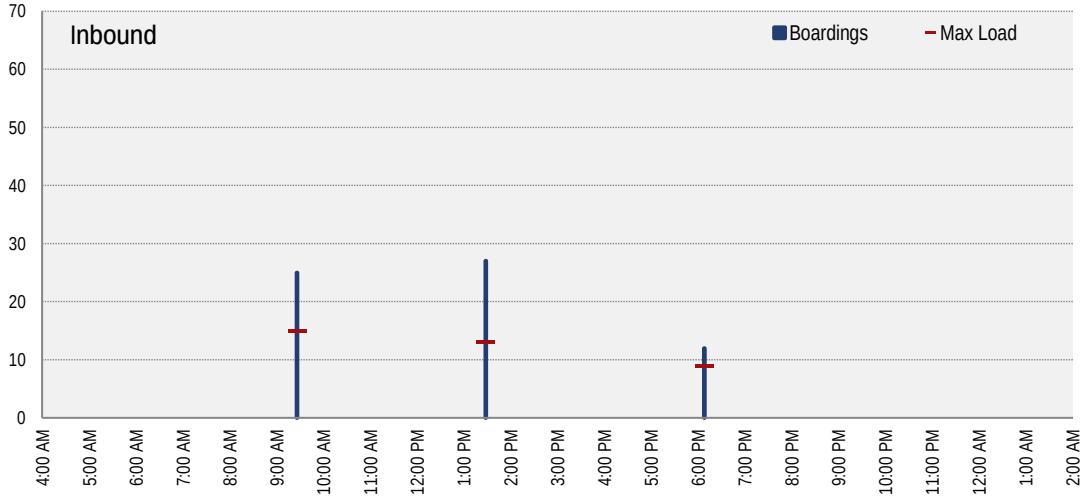


FIGURE 17 | ROUTE 55 SATURDAY INBOUND RIDERSHIP BY TRIP



Performance

Although Route 53/55 has a weekday ridership per trip that is slightly higher than the Hartford Division average, the performance of Route 53/55 in terms of cost per passenger and passenger per revenue hour is just below the division average (see Figure 18). The slightly weaker performance reflects the distance traveled on Route 55 and to a lesser extent Route 53. The long distance of the route partially erodes the impact of relatively high ridership in terms of cost, riders per hour and riders per mile.

Fewer trips travel to Middletown on Saturdays, thus improving the route's ridership per revenue mile. Ridership per revenue hour remains close to average on Saturday, while the operating cost per passenger is significantly below the Hartford Division average for Saturdays.

FIGURE 18 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 53/55	DIVISION AVG	ROUTE 53/55	DIVISION AVG	ROUTE 53/55	DIVISION AVG
Operating Cost per Passenger	$4.76	$4.84	$4.97	$6.30	-	$6.66
Passengers per Revenue Vehicle Hour	26.9	28.9	25.8	27.0	-	29.7
Passengers per Revenue Vehicle Mile	1.9	2.6	2.2	2.4	-	2.9

Source: CTtransit performance data

Route 53/55 has an 87.3% on-time arrival rate, which is higher than the Hartford Division average (see Figure 19). Based on available data, 12.7% of Route 53/55 trips finish more than 5 minutes late, and no trips depart the start of the route early.

FIGURE 19 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 53/55	DIVISION AVG
Early	0.0%	0.2%
Late	12.7%	18.9%
On-Time	87.3%	80.9%

Source: CTtransit performance data

FIGURE 20 | WEEKDAY OPERATING COST PER PASSENGER

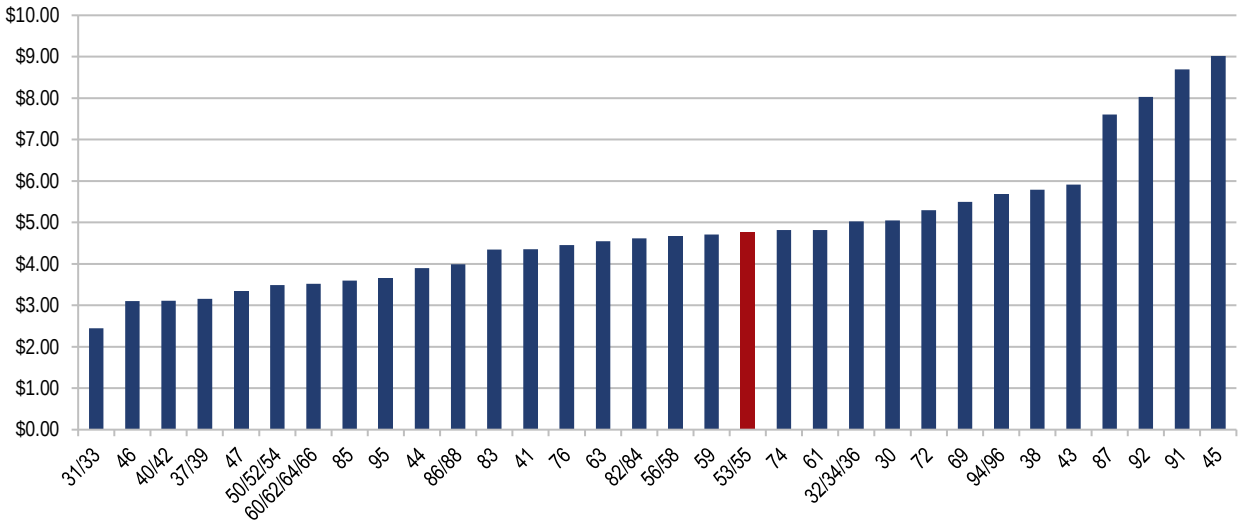
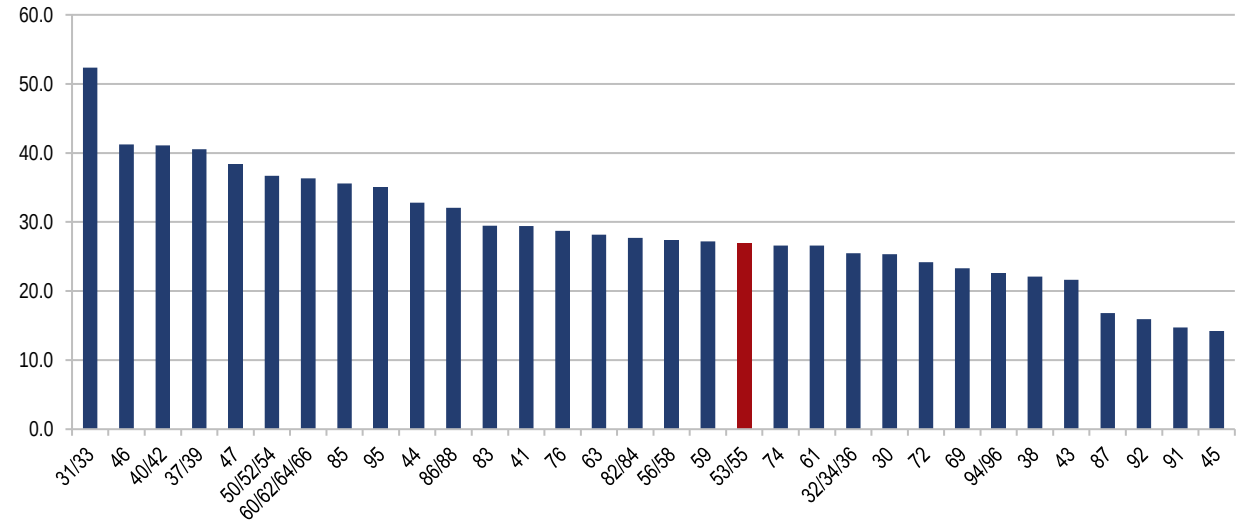


FIGURE 21 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Routes 53 and 55 serve one of the key radial routes south of downtown Hartford. Route 53 serves neighborhoods and destinations along Main Street and Wethersfield Avenue and continuing south to Wethersfield Center, including the Pennywise Shopping Center at Jordon Lane and Route 53W continuing into old Wethersfield on State Street and ending the Wethersfield Shopping Center.

Route 55 shares a common alignment with Route 53 between downtown Hartford and Jordon Lane; local service stays along the Silas Deane Highway to Middletown, while the express service skips parts of downtown Hartford but travels through old Wethersfield and serves the Department of Motor Vehicles (DMV) on State Street.

While the destinations along the route are attractive and ridership per trip strong, the route suffers because the balance between variant services is 1) not always well matched with demand and 2) the integration of the two routes create a very complicated service that is difficult to understand and use. Opportunities to strengthen the route focus on these two deficiencies, and include:

- **Combine Route 53 and Route 55.** Perhaps the easiest step to simplifying the service would involve merging the two routes into a single route and publishing a single schedule to communicate the service.
- **Reduce variant service.** Both Route 53 and Route 55 have a dominant variant (Route 53W and Route 55) that has the majority of the service and carries the majority of the riders. The non-dominant variant may be collapsed and coordinated into one route that provides service to Wethersfield and the other to Middleton. The two variants would serve the high ridership segment between downtown Hartford and Jordon Lane and offer less frequent service to old Wethersfield and downtown Middletown:
  - Local Service to Jordon Lane, old Wethersfield and Wethersfield Shopping Center. Route 53 to Jordon Lane provides six trips as compared with 19 trips operating as Route 53W to Wethersfield Shopping Center. The six Route 53 trips short-turn at Jordon Lane. (The majority of the Route 55 service operates as 55X and does travel into old Wethersfield). The distance traveling to the Wethersfield Shopping Center via Old Wethersfield is approximately three miles. If the variants are combined, Route 53W could become the local route that travels along Main Street, Wethersfield Avenue and State Street to the Wethersfield Shopping Center.
  - Operate all Route 55 trips as Route 55. Route 55X offers a complicated alignment that uses the Wilbur Cross Highway to bypass downtown Hartford, but gives up this time advantage by traveling along local routes through old Wethersfield instead of along Silas Deane Highway. As part of collapsing the variant service, Route 55 could operate directly south via Wethersfield Avenue and the Silas Deane Highway into Middletown. Riders who want to travel to/from destinations along State Street in old Wethersfield can transfer at either Jordon Lane or the Wethersfield Shopping Center.
- **Eliminate Route 55X/Operate Route 55 directly along the Silas Deane Highway.** Ridership on the unique portions of Route 55X (Wilbur Cross Highway) is low. The data is not conclusive regarding the number of riders getting on/off Route 55X at the DMV on State Street in Wethersfield. Ridership at this location is fairly strong, but it is unclear if riders are using Route 55X or 53W. However, given the hours and number of trips on Route 55X, it is likely that most riders going to the DMV are not using the express service to travel between downtown Hartford and the DMV. This change would also make Route 55 more direct and easier to understand; it is also likely that time savings lost by traveling along the Wilbur Cross Highway are saved by

eliminating service along State Street. Operating 16 trips per day between downtown Hartford and Middletown, or roughly hourly service, is expected to be consistent with demand.

- **Combine Route 53 and Route 55 passenger schedules.** Even if no changes are made to the route, the passenger information should be collapsed into a single route map and schedule. This relatively minor step would make the service significantly easier to understand. The existing passenger schedules are very confusing because the individual schedules for Route 53 and Route 55 show the same time point but reference different locations. In addition, Route 53's map is missing Time Point 4 (although it is referred to in the timetable). Showing both services on one map will help users more clearly understand their travel options along the entire Hartford to Middletown corridor.
- **Establish shared-use park-and-ride at/near Wethersfield Shopping Center**. As part of combining Routes 53 and 53W, as well as Routes 55 and 55X, CT*transit* may invest in on-street transfer infrastructure, such as a park and ride lot near the Wethersfield Shopping Center. This infrastructure will support passengers who need to transfer to get to the DMV on State Street as well as support passengers traveling into downtown Hartford or to Middletown. The park-and-ride could help generate ridership at peak times, potentially improving ridership and productivity. The Silas Deane Wal-Mart is a particularly good location for a park-and-ride as it is easily accessible both for I-91 commuters and for residents of the numerous single-family home neighborhoods to the east and south.
- **Strengthen pedestrian infrastructure/Increase street presence along Jordan Lane**. The pedestrian environment along the Silas Deane Highway is challenging. Although there are sidewalks on much of the highway, travel speeds are high and the long blocks mean bus riders must walk relatively long distances to safely cross the street. Not surprising demand on the high speed sections of the highway is low. Given this, CT***transit*** may want to identify a handful of bus stops and strengthen those with clear markings, shelters and crossing infrastructure (crosswalks and pedestrian lights). In addition, most bus stops along Route 53/55 south of Jordan Lane are either unmarked or only marked with white paint on a telephone pole. This may be contributing to the low ridership at many stops, as prospective passengers may not be aware that the bus stops exist. Clearly marking each stop with a bus stop sign will help improve awareness of service along the Silas Deane Highway corridor.

Route Evaluation

BLOOMFIELD AVENUE AND ALBANY AVENUE

56B | Bloomfield Center

56D | Dorothy Drive Woodside Village

56F | Federation Home

58 | Bishops Corner

Service Design

Route 56 and 58 are radial routes that travel west and north from downtown Hartford. All route variants serve the Albany Avenue corridor through Hartford. Route 56 then travels north to Bloomfield via Bloomfield Avenue, with three separate variants terminating at Bloomfield Center (56B), Woodside Village on Dorothy Drive (56D), or the Federation Home on Wintonbury Avenue (56F). Route 58 continues west terminating at Bishops Corner in West Hartford, serving the Big Y supermarket in Crossroads Plaza.

FIGURE 1 | ROUTE 56 MAP

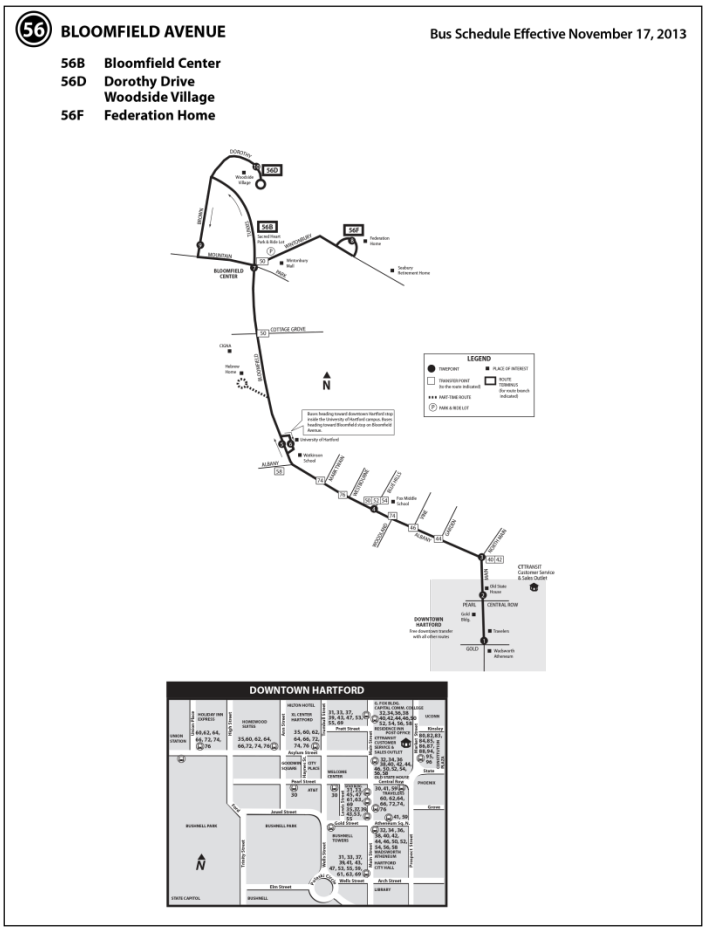
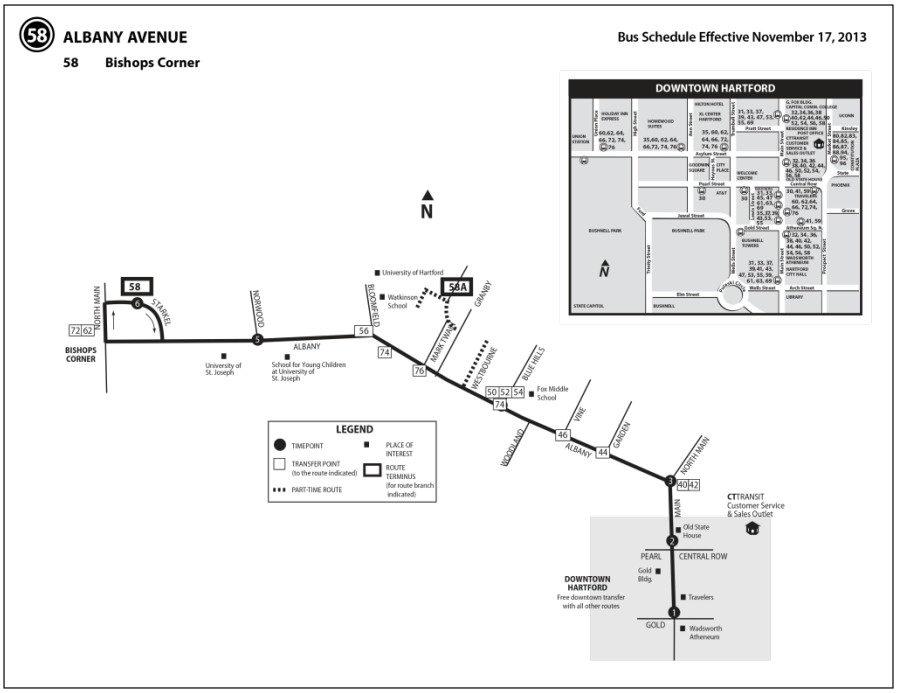


FIGURE 2 | ROUTE 58 MAP



System Interaction and Transfer Opportunities

Routes 56 and 58 begin and end in downtown Hartford where riders can transfer to most CT***transit*** services. In addition, there are several locations north of downtown where riders can also transfer to other CT***transit*** routes (see Figure 2), including CT***fastrak*** Route 153, which will be introduced in March 2015.

FIGURE 3 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 40	North Main Street
Route 42	Barbour Street
Route 44	Garden Street
Route 46	Vine Street
Route 50	Blue Hills Avenue – Cottage Grove Road
Route 52	Blue Hills Avenue
Route 54	Blue Hills Avenue – Blue Hills Extension
Route 56	Bloomfield Avenue
Route 62	Farmington Avenue/Bishops Corner
Route 72	Asylum Avenue
Route 74	Granby Street
Route 76	Ashley Street
Route 153	CT*fastrak*: Flatbush/Copaco via Bishops Corner

Alignments and Service Patterns

All outbound trips on Routes 56 and 58 begin in downtown Hartford at the Old State House and travel north out of downtown via Main Street and turn west on Albany Avenue. All buses on Routes 56 and 58 share a common alignment between downtown and the intersection of Albany and Bloomfield Avenues; this common segment is consistent for both inbound and outbound trips.

Service on Route 56 continues north along Bloomfield Avenue across Cottage Grove Road into Bloomfield Center. Some trips on Route 56 also deviate off of Bloomfield Avenue to serve the Hebrew House. At Bloomfield Center, Route 56 has three branches:

- Route 56B trips terminate at the Sacred Heart Park and Ride Lot, traveling through Bloomfield Center and turning right on Wintonbury Avenue.
- Route 56D trips continue north from Bloomfield Center to serve Woodside Village. The bus travels on Tunxis Avenue to Dorothy Drive and returns via Tunxis Drive, but continues south on Brown Street, taking a right on Mountain Avenue to return to Bloomfield Center via a large terminal loop.
- Route 56F turns right on Wintonbury Avenue in Bloomfield Center and travels east to terminate at the Federation Home.

Route 58 has a single alignment and stays on Albany Avenue, terminating at Bishops Corner in West Hartford.

Service Schedule

Route 56 operates on weekdays and Saturdays and Route 58 operates every day. There are 39 total outbound trips per weekday (20 on Route 56 and 19 on Route 58) and 40 total inbound trips per weekday (20 on each Route 56 and Route 58). Both Routes 56 and 58 operate with 30 minute peak headways, and 60 minute off-peak. Along the common Albany Avenue alignment, peak period frequency is roughly every 15 minutes (see Figure 4). Midday service operates every 30 minutes. Service levels are lower on the unique portions of the individual routes.

Most weekday trips on Route 56 are operated as Route 56D to Dorothy Drive . There is one Route 56B trip in the AM peak (serving the Wintonbury Avenue park and ride lot) and three 56B trips in the PM peak, including the last trip each weekday. There are four mid-day 56F trips serving the Federation Home.

On Saturdays, there are 24 outbound trips (11 on variants of Route 56 and 13 on Route 58) and 24 inbound trips (11 on variants of Route 56 and 13 on Route 58) on Saturdays. Both Route 56 and 58 operate on hourly headways, effectively providing 30 minute frequency on the shared Albany Avenue alignment. Routes 56D and 56F alternate, providing service every other hour to Dorothy Drive and the Federation Home ; there are no Saturday Route 56B park and ride trips.

Route 58 operates 11 outbound and 10 inbound trips on Sundays with a 70 minute frequency.

FIGURE 4 | SCHEDULE OVERVIEW (ROUTES 56 AND 58)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:35 AM – 10:38 PM	15/30	39/40
Saturday	7:15 AM – 10:38 PM	30	24/24
Sunday	6:50 AM – 7:20 PM	70	11/10

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Together, Routes 56 and 58 carry 1,297 daily passengers or about 16.4 passengers per trip. The combined ridership is roughly equivalent to the Hartford Division. Weekday and Sunday ridership is slightly lower as compared with the division average, while Saturday ridership is slightly higher (see Figure 5).

FIGURE 5 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 56/58	ROUTE 56/58	DIVISION AVG
Weekday	1,297	16.4	17.7
Saturday	742	15.5	16.3
Sunday	353	16.8	17.6

Source: CTTransit performance data

Ridership by Stop

The most heavily used inbound stops on Route 56 and 58 are along Main Street stops in downtown Hartford. There are three additional stops along Albany Avenue that generate 50 or more boardings or alightings per day, as well as the terminus of Route 58 at Bishops Corner (see Figure 6). The University of Hartford is also another major trip generator on Route 56 with 45 boardings and alightings per day.

FIGURE 6 | ROUTE 56/58 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Starkel Road and Bishops Corner	61 / 0	Big Y supermarket, other Bishops Corner retail, connections to Route 72
Albany Avenue and Woodland Street	86 / 13	Artists Collective, post office, retail, transfers to Routes 50, 52, 54 and 74
Albany Avenue and Garden Street	84 / 21	Community Health Services, transfers to Routes 44, 50, 52, 54
Albany Avenue and Edgewood	50 / 10	Mixed-use commercial/residential
Main Street and Pratt Street	31 / 214	Downtown Hartford and transfers to other CT*transit* routes
Main Street and Gold Street	15 / 239	Downtown Hartford and transfers to other CT*transit* routes

Load profile data combines passenger activity by stop and shows the cumulative passenger load as the bus travels inbound along its route. The load profile for Route 56 is mapped in Figure 7, and Route 58 is mapped in Figure 8. (The load profile for Route 56 is not continuous because some stops are served by all variants, while others are served by one or two varients only and are labeled accordingly). Ridership by stop without the cumulative load is mapped in Figure 9.

Most of the riders on Route 56 and 58 is along the common segment along Albany Avenue, with a lot of riders using the route to travel inbound as well as bewteen destinations along the corror. This is also the location where service is highest. The outer ends of the routes serve significantly fewer riders. Ridership on the unique segment Route 56 primarily relates to the University of Hartford and Bloomfield Center. A comparison of the three variants on Route 56 show service to Woodside Village carries the most riders, although that variant also has the most sevice.

With the exception of Bishops Corner, riderhsip activity on the unique portion of Route 58 is also relatively light. There are two stops on Albany Avenue, at Norwood Road and Colony Road, which have attract more riders as compared to other stops.

The data used to prepare this anlaysis suggests four riders are boarding or alighting at the Hebrew Home on Abrahms Boulevard. But it is unclear from the route schedules if this deviation is still being used.

FIGURE 7 | ROUTE 56 WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

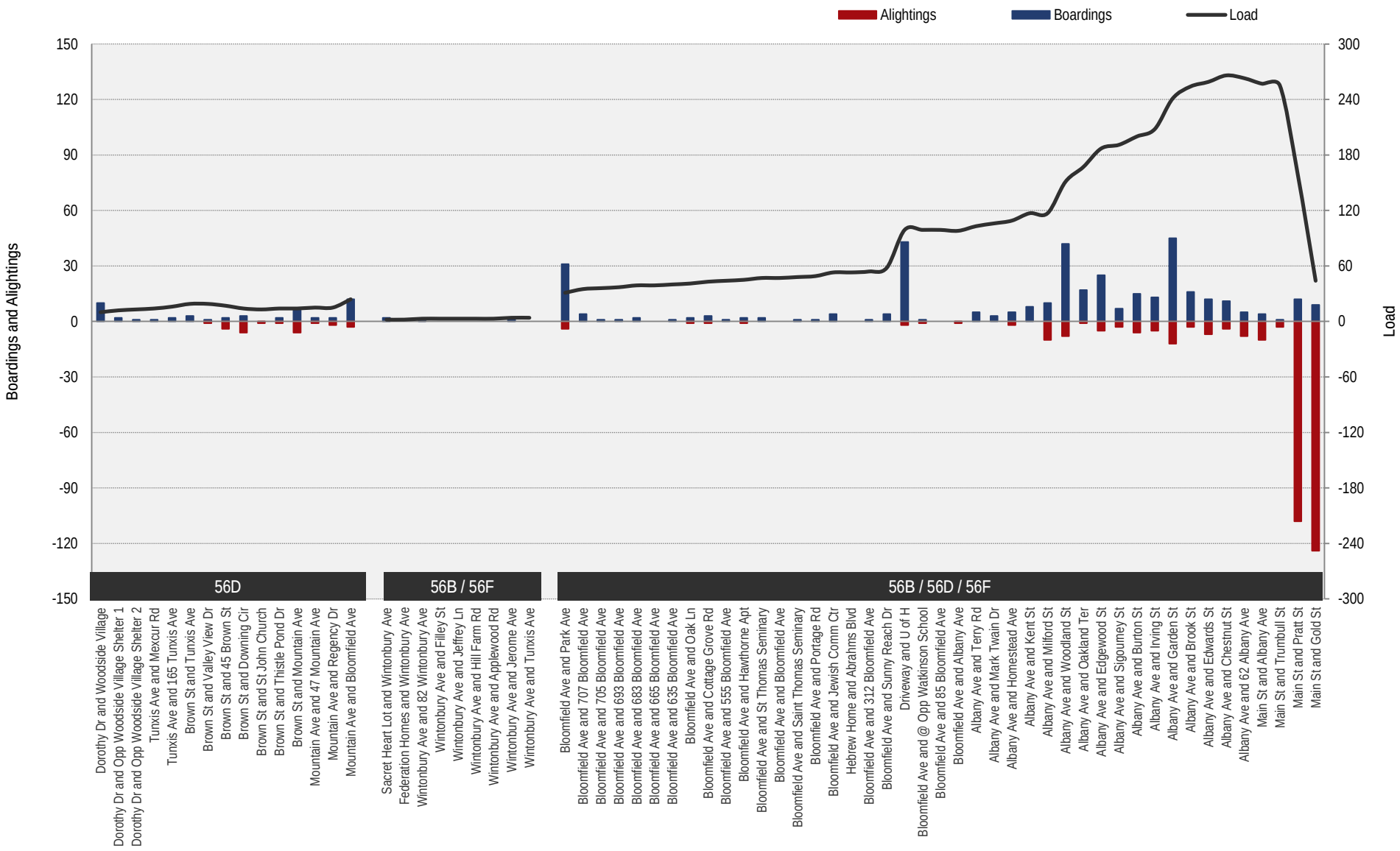


FIGURE 8 | ROUTE 58 WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

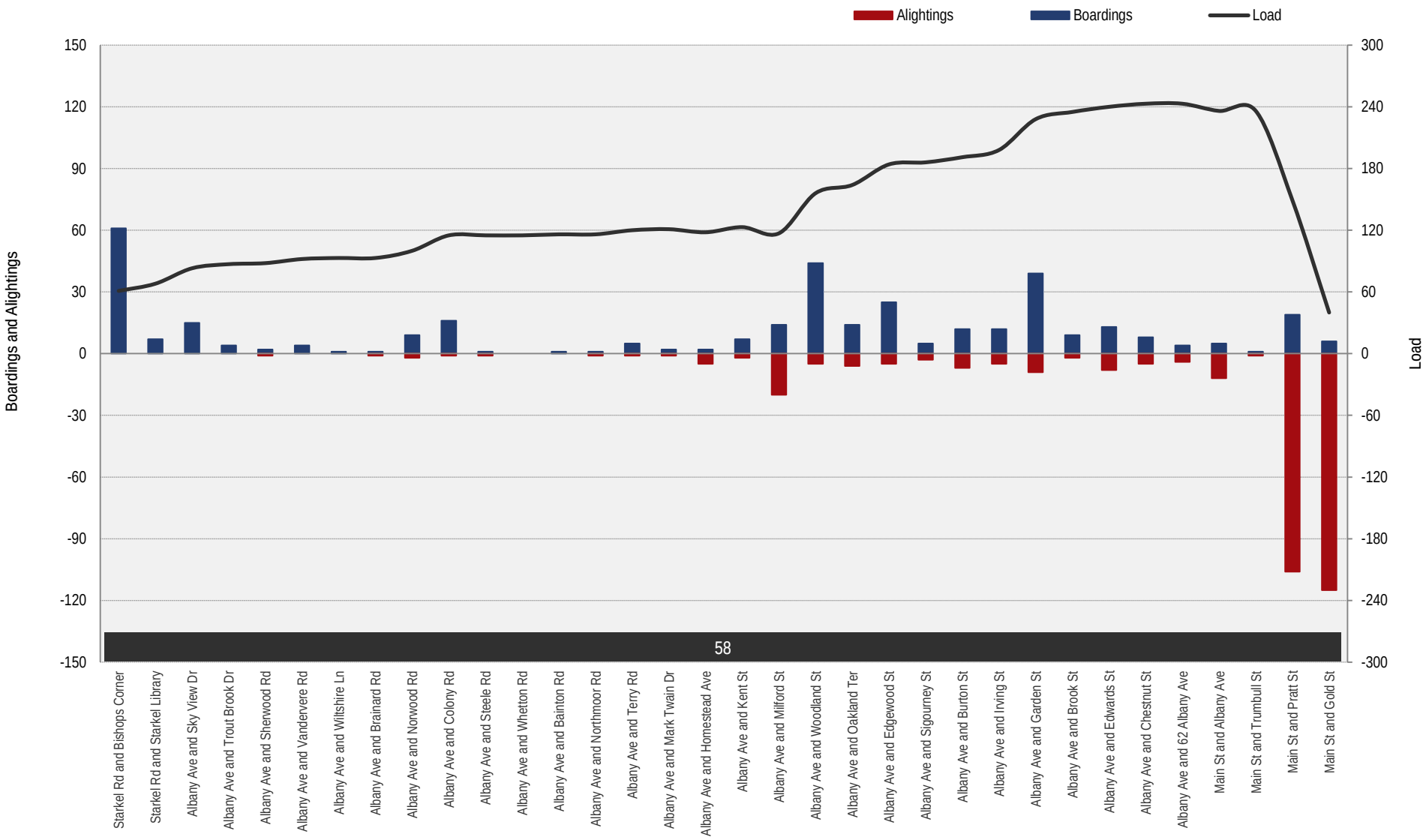


FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

Ridership by Trip

Weekday

Route 56

Demand on Route 56 is relatively well balanced throughout the day, with slightly more riders in the afternoon and slightly more passengers traveling inbound than outbound (see Figures 10 and 11). With the exception of a few extra riders in the afternoon, ridership is as strong in the mid-day as it is during peak periods. Capacity is not an issue on Route 56

FIGURE 10 | ROUTE 56 WEEKDAY OUTBOUND RIDERSHIP BY TRIP

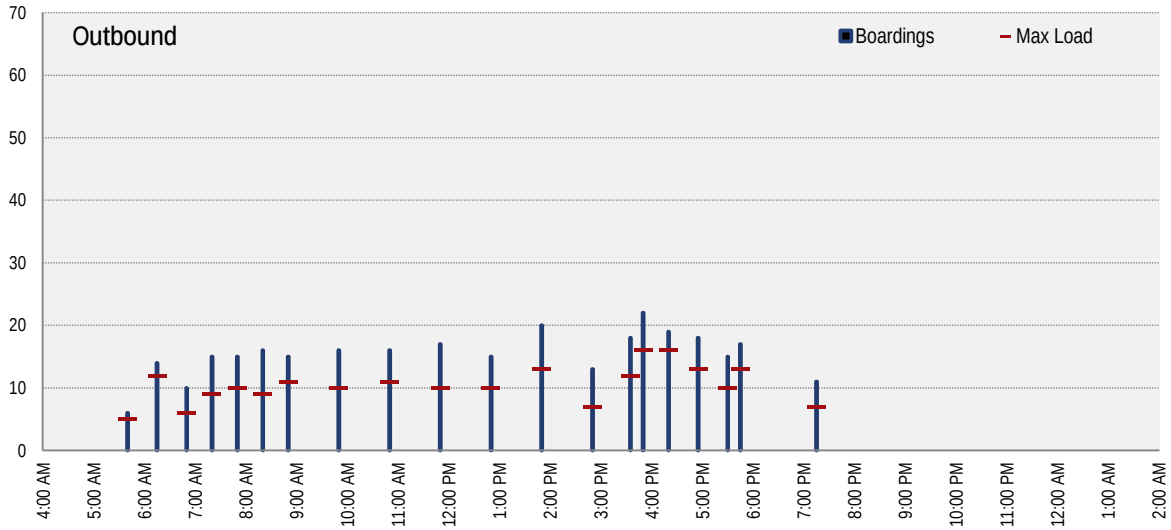
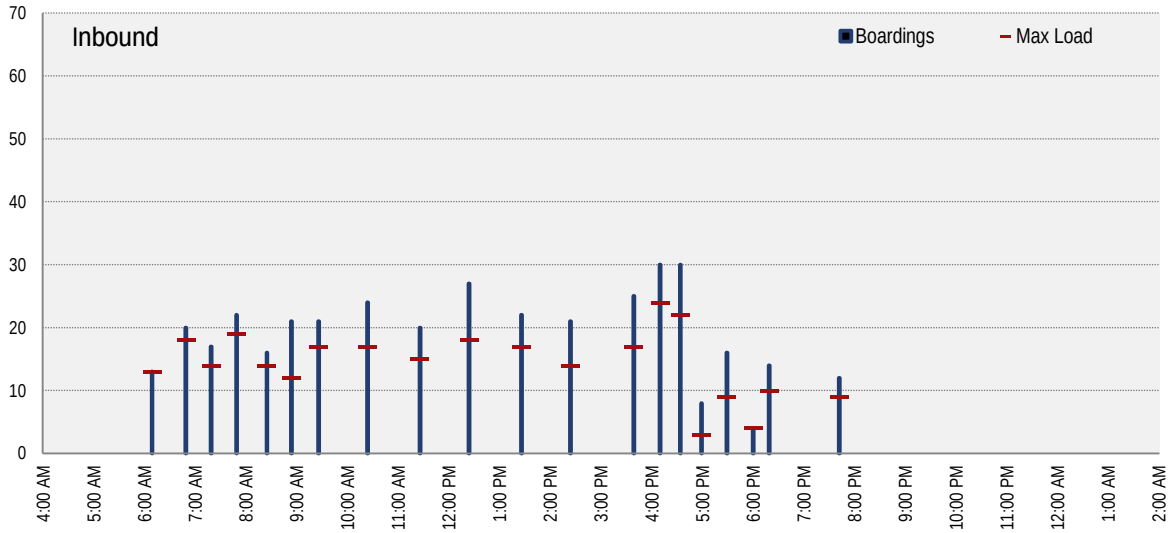


FIGURE 11 | ROUTE 56 WEEKDAY INBOUND RIDERSHIP BY TRIP

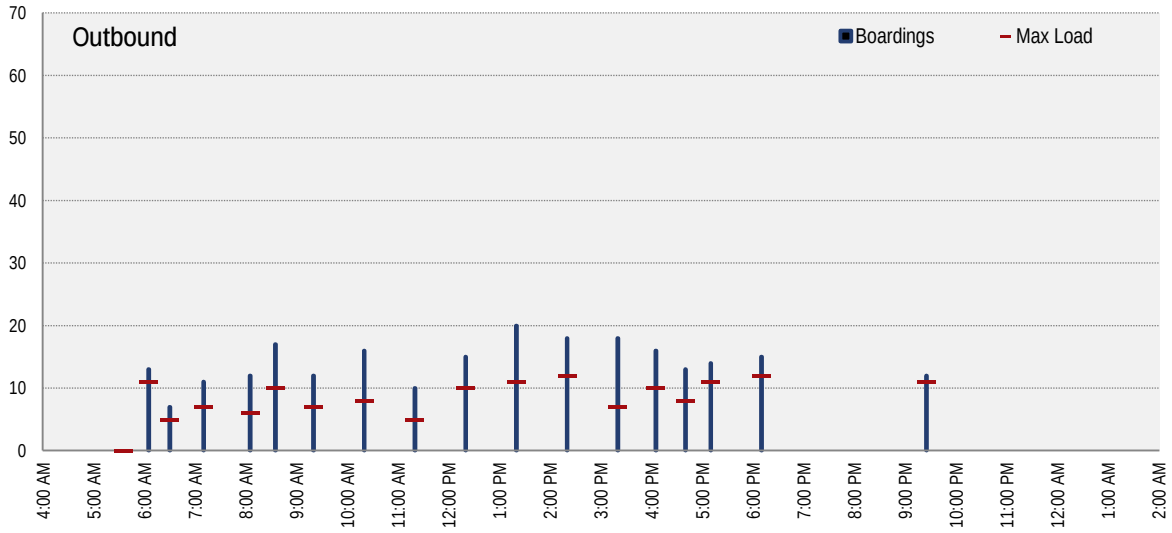


Route 58

Ridership on Route 58 is also fairly well balanced throughout the day, with slightly more riders using the service in the afternoon and more people traveling inbound as compared with outbound (see Figures 12 and 13). There is no clear demand peaks associated with traditional commuter times.

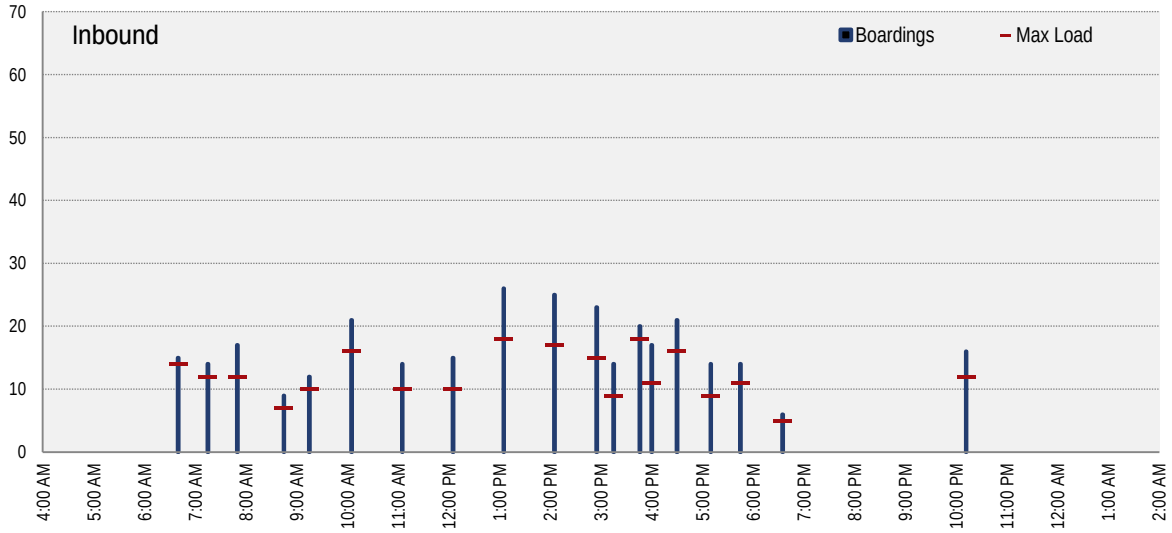
Peak loads never exceed 18 riders on any one trip, so capacity is not an issue on Route 56

FIGURE 12 | ROUTE 58 WEEKDAY OUTBOUND RIDERSHIP BY TRIP



Note: No data for the 7:35 AM outbound trip.

FIGURE 13 | ROUTE 58 WEEKDAY INBOUND RIDERSHIP BY TRIP



Note: No data for the 8:15 AM inbound trip.

Saturday

Route 56

Saturday ridership on Route 56 is fairly steady throughout the day with slightly more riders traveling inbound as compared to outbound (see Figures 14 and 15). Service alternates between Route 56D and Route 56F, with Route 56D trips generally carrying more riders.

FIGURE 14 | ROUTE 56 SATURDAY OUTBOUND RIDERSHIP BY TRIP

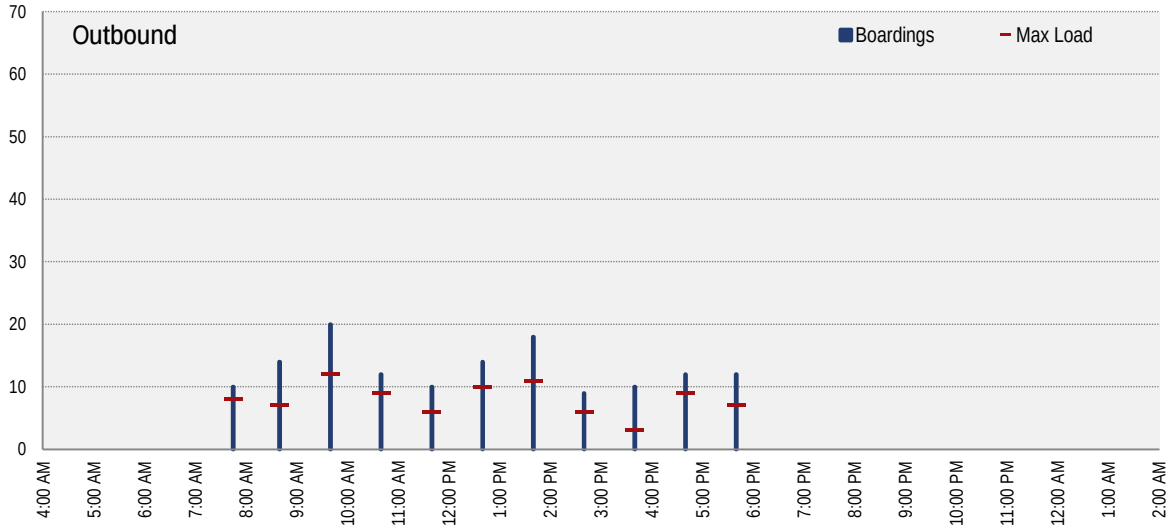
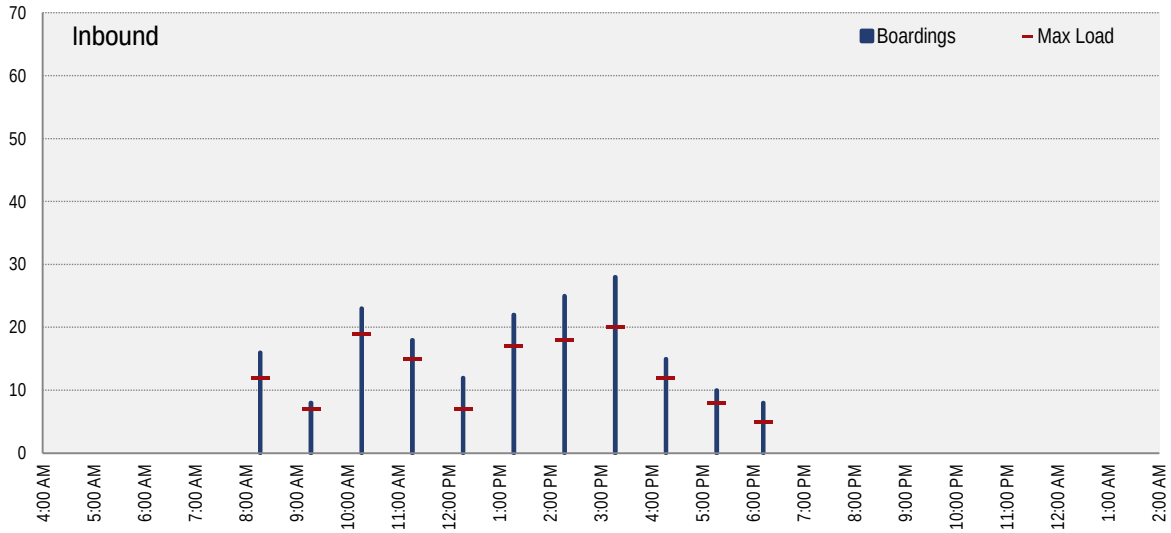


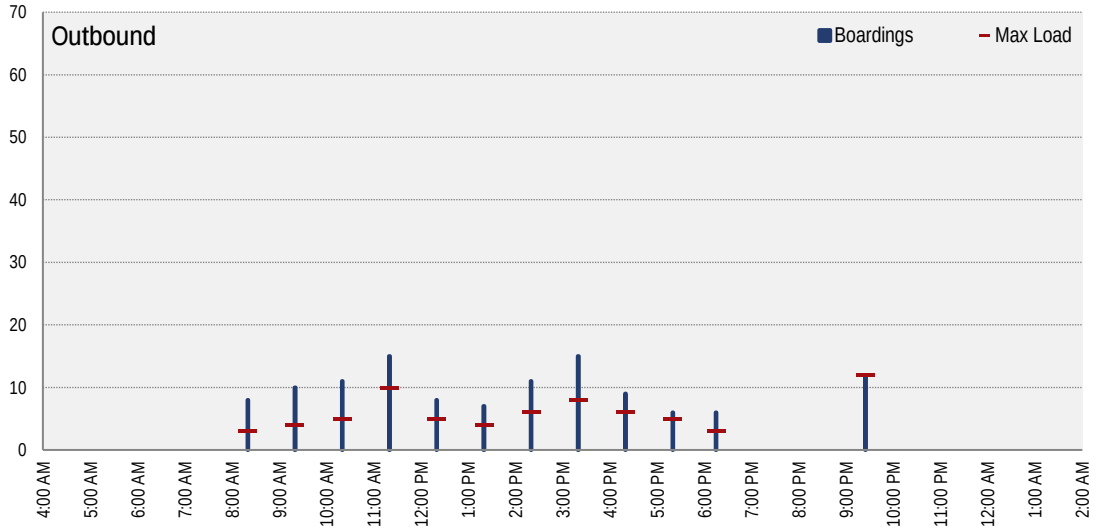
FIGURE 15 | ROUTE 56 SATURDAY INBOUND RIDERSHIP BY TRIP



Route 58

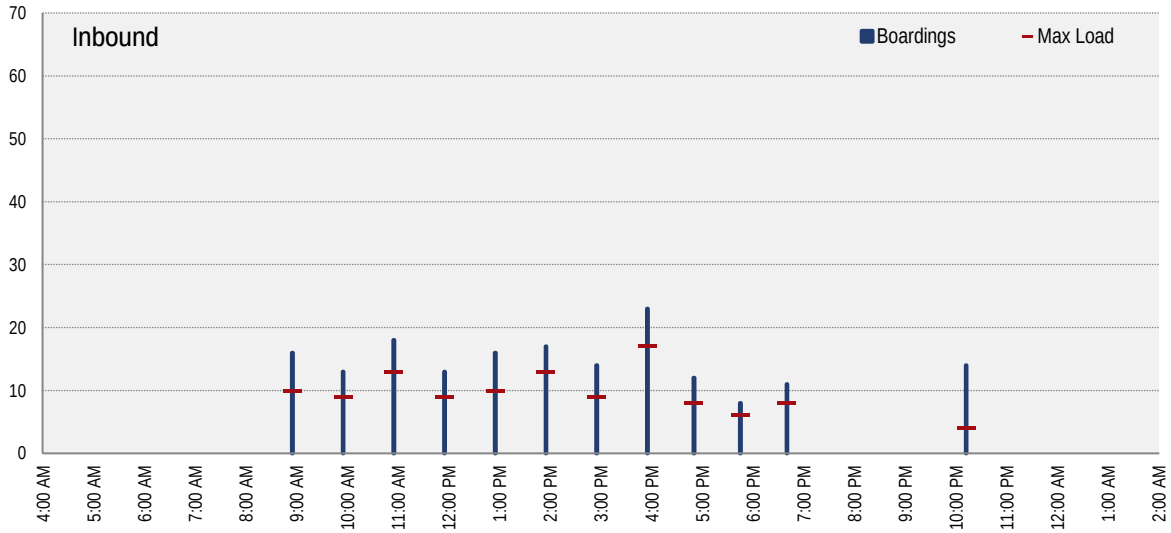
Ridership on Route 58 is lower than Route 56 (see Figures 16 and 17) on Saturdays. The pattern of stronger ridership inbound as compared with outbound persists. Only one trip, the 3:55 PM inbound, carries more than twenty riders, with most trips carrying 15 riders or less.

FIGURE 16 | ROUTE 58 SATURDAY OUTBOUND RIDERSHIP BY TRIP



Note: No data for the 7:15 AM outbound trip.

FIGURE 17 | ROUTE 58 SATURDAY INBOUND RIDERSHIP BY TRIP

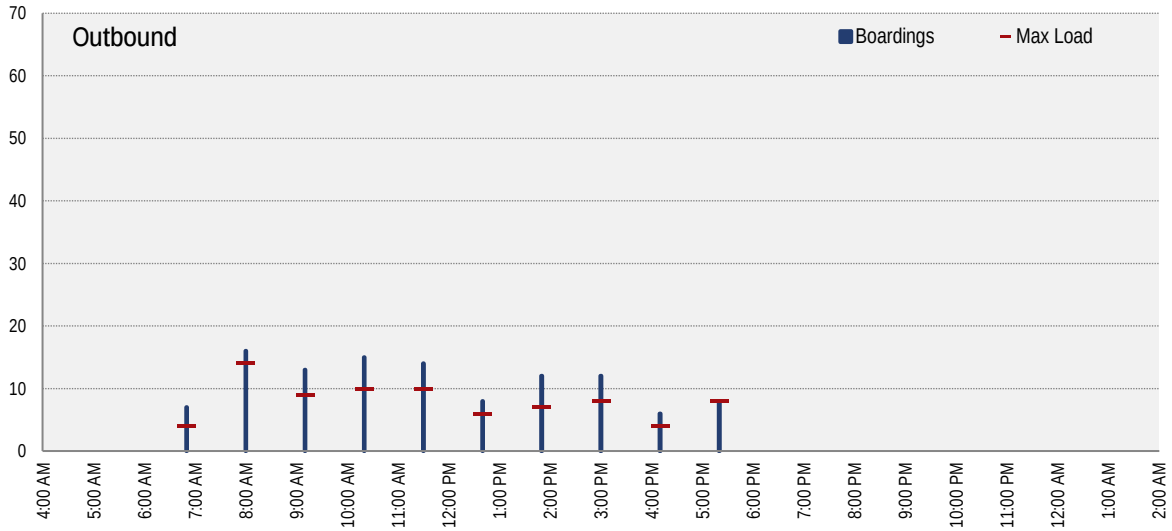


Note: No data for the 7:55 AM inbound trip.

Sunday

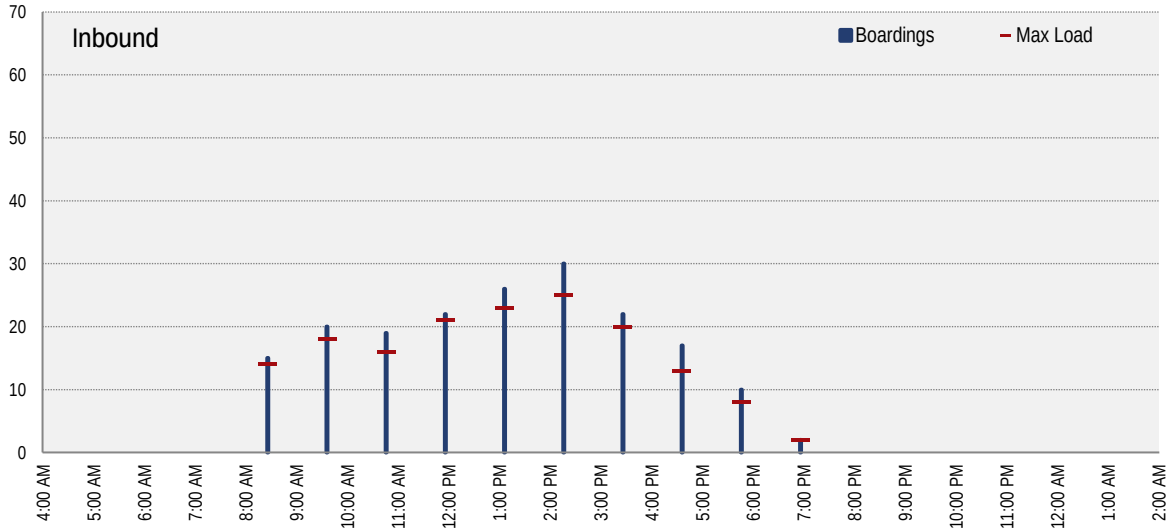
Only Route 58 operates on Sunday and this service carries about 16.8 passengers per trip (see Figures 18 and 19). Generally speaking, demand is evenly balanced throughout the day and consistent with other days of the week; outbound trips carry more riders than inbound trips.

FIGURE 18 | ROUTE 58 SUNDAY OUTBOUND RIDERSHIP BY TRIP



Note: No data for the 6:30 PM outbound trip.

FIGURE 19 | ROUTE 58 SUNDAY INBOUND RIDERSHIP BY TRIP



Performance

Combined, Routes 56 and 58 perform better than other Hartford Division routes in terms of operating cost per passenger (see Figure 20), with Saturday and Sunday performing significantly better than other CT*transit* Hartford routes. In terms of riders per hour and per mile, Route 56/58 is very close to the Hartford Division average, sometimes slightly higher and sometimes slightly lower.

FIGURE 20 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 56/58	DIVISION AVG	ROUTE 56/58	DIVISION AVG	ROUTE 58	DIVISION AVG
Operating Cost per Passenger	$4.68	$4.84	$4.44	$6.30	$4.79	$6.66
Passengers per Revenue Vehicle Hour	27.4	28.9	28.8	27.0	26.7	29.7
Passengers per Revenue Vehicle Mile	2.7	2.6	2.5	2.4	3.5	2.9

Source: CTtransit performance data

Combined, Routes 56 and 58 have on-time performance that is slightly below the Hartford Division average, with 78.7% of time point checks showing buses on schedule (see Figure 21).

FIGURE 21 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 56/58	DIVISION AVG
Early	0.0%	0.2%
Late	21.3%	18.9%
On-Time	78.7%	80.9%

Source: CTtransit performance data

Figures 22 and 23 chart the combined weekday performance for Routes 56/58 relative to other local routes in the Hartford Division, displaying weekday performance in terms of operating cost per passenger and passengers per revenue hour that are in the mid-range when compared to all other routes.

FIGURE 22 | WEEKDAY OPERATING COST PER PASSENGER

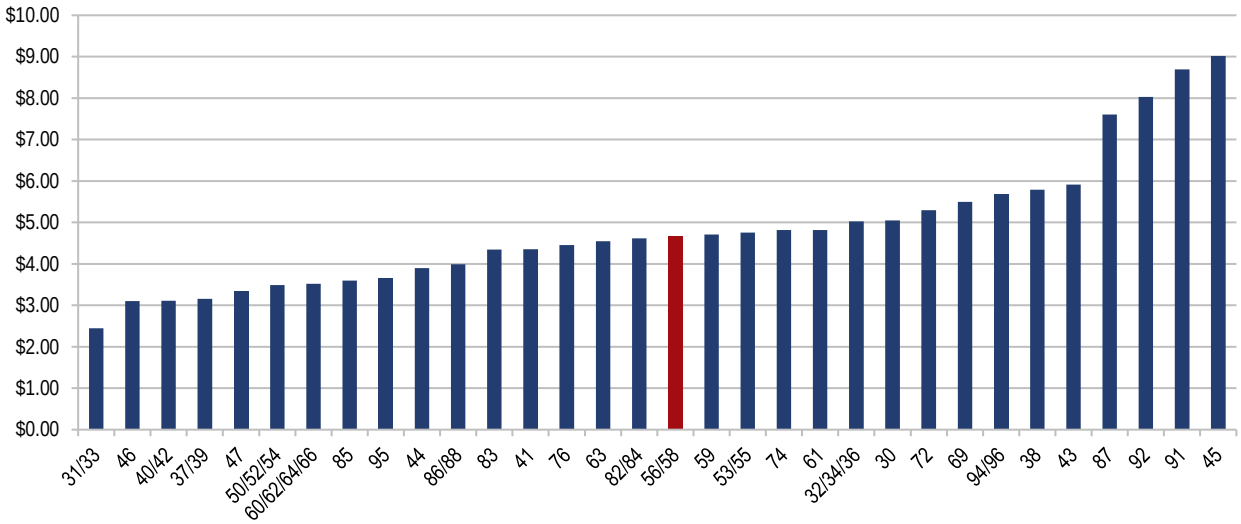
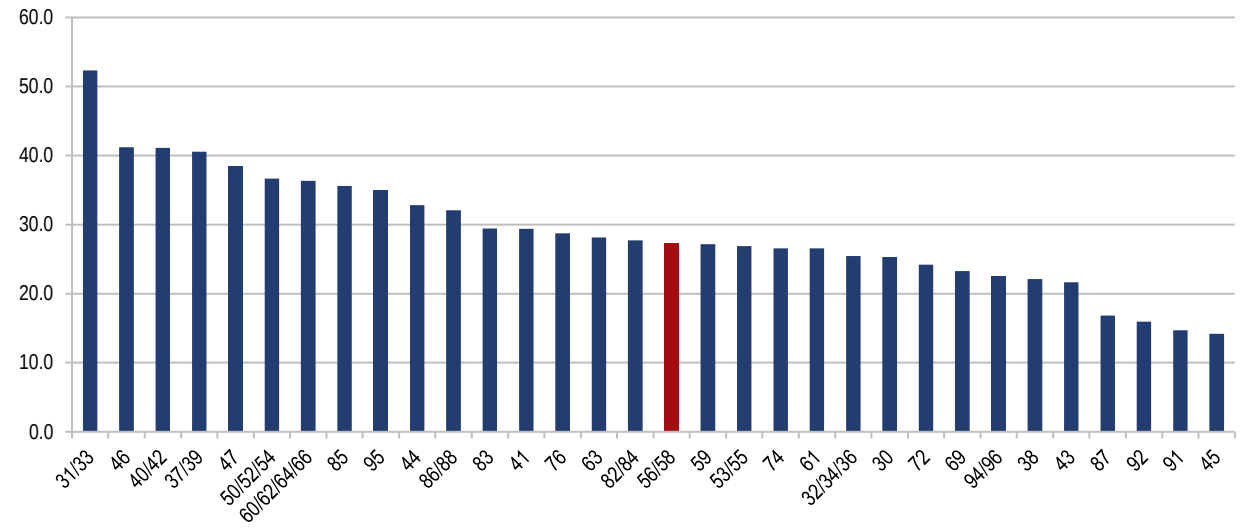


FIGURE 23 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT

Routes 56 and 58 are radial route serving downtown Hartford, Albany Avenue, West Harford and Bloomfield Center. The two routes split at Albany Avenue and Bloomfield Avenue: Route 56 follows Bloomfield Avenue into Bloomfield Center, where the route splits into three variant services. Route 58 continues on Albany Avenue to Bishops Corner in West Hartford.

Generally speaking Routes 56 and 58 perform well, although most of the ridership is generated at the common segment between downtown Hartford and the intersection of Albany and Bloomfield Avenues. Ridership data shows that despite the fact that service frequency is higher during the peak periods (timed with traditional commute periods); ridership is fairly constant throughout the day.

CT*fastrak*

CT***transit*** will open CT***fastrak*** service in March 2015. This service will include a new route, Route 153, will impact Route 56 and 58. Route 153 will travel from Copaco Center in Bloomfield to Flatbush Station in West Hartford and provide cross-town connections. Route 153 will connect with Route 56 at Cottage Grove Road, creating opportunities for people to travel from Bloomfield Center to both Copaco Center and the Cigna and MetLife campuses, as well as to Bishop's Corner and West Hartford Center. Route 153 will connect with Route 58 at Bishop's Corner, creating opportunities for riders to travel north, south and east. The challenge with these potential connecting opportunities is relatively low service frequencies, especially on Route 153.

- Route 153: the CT***fastrak*** service plan includes a new feeder Route 153 that will connect Copaco Center in Bloomfield with the Flatbush Station in West Hartford. Route 153 is scheduled to operate daily and provide hourly service between 5:30 AM and 11:30 PM on weekdays, 6:30 AM and 11:30 PM on Saturday and 7:30 AM to 8:30 AM on Sundays.

Riders' response to the new CTf***astrak*** service is not yet known, but the connection will likely strengthen both Route 56 and 58 by providing locations where people can travel to a variety of important suburban locations (Copaco Center, MetLife, Signa, West Hartford Center and Charter Oak Marketplace) without traveling into downtown.

Service Improvement Options

There are variety of potential opportunities to strengthen the productivity of Routes 56 and 58:

- **Coordinate Routes 56 and 58 with CT*fastrak* Route 153.** As discussed, the addition of Route 153 will strengthen Routes 56 and 58 by providing additional opportunities to reach important suburban destinations without traveling into downtown. However, the service level on Route 153 is relatively low, with hourly service. As a result, coordinating services so transfers are as convenient as possible is essential. In some locations, such as Bishop's Corner where multiple routes connect providing passenger facilities and ideally sufficient passenger information so riders can see their travel options and know when buses will arrive, would strengthen the effectiveness of the cross town connections.
- **Discontinue variant Route 56F to the Federation Home.** Four midday trips to the Federation Home (Route 56F) yield four daily trips. Eliminating this service variant, therefore, would inconvenience only a handful of riders. In addition, there are opportunities to serve both the Federation Home and the Seabury Retirement community along Wintonbury Avenue via an extension of Route 74 or Route 50B. Only limited frequency would be warranted.
- **Operate Route 56D via Mountain Road and Brown Road in both directions.** There is more ridership activity along Brown and Mountain Roads (and more residential density) than

along Tunxis Road. Operating Route 56D to Dorothy Drive along the same route in both directions would be more convenient for these riders and likely attract additional riders.

- **Reduce weekday peak period frequency.** Routes 56 and 58 both operate with 30 minute service during the peak periods and 60 minute service during the off-peak frequency (on weekdays). However, ridership data shows that the demand is nearly constant throughout the day. This suggests that operating hourly service during the peak would likely be sufficient to handle ridership demand.
- **Reduce weekend frequency.** Although the productivity of weekend ridership is in range with other Hartford division routes, much of this ridership occurs along the Albany Avenue corridor. Hourly frequency to Bloomfield and Bishops Corner could be reduced to two-hour frequency, while still maintaining high frequency service on the Albany Avenue corridor which is served by a number of other routes.
- **Discontinue the Hebrew Home variant on Route 56.** There are only four daily boardings or alightings at this location which does not merit a deviation from the main Bloomfield Avenue corridor into the Hebrew Home access road. The deviation inconveniences a large number of riders for a handful of people. Although it is not clear from the ridership data or schedules that this deviation is still in operation, it should be removed from the route map.
- **Consolidate bus stops on Albany Avenue. Up to nine CT*transit* routes travel along** Albany Avenue and the corridor has many bus stops, some of which are less than 500 feet apart. One strategy for improving bus speed and service reliability and making the service easier to understand and use would be to consolidate stop, space them evenly and support the bus stops with infrastructure, such as shelters. Bus stops with high ridership (e.g. Woodland, Garden, etc.) could be identified for a higher level of bus stop amenities to serve the larger number of passengers using these locations.

Route Evaluation

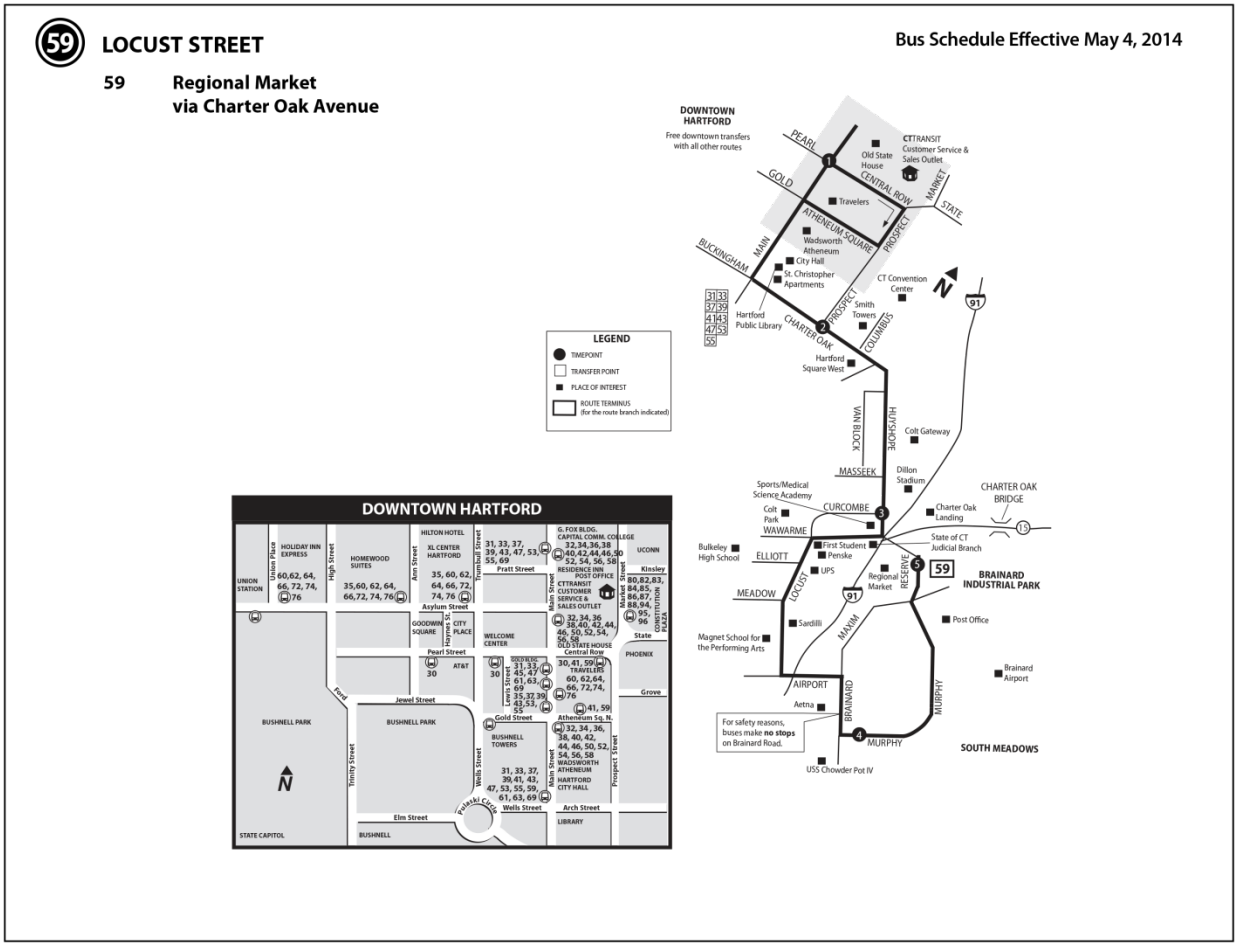
LOCUST STREET

59 | Regional Market via Charter Oak Avenue

Service Design

Route 59 is a radial route that originates in downtown Hartford and serves Hartford Regional Market and Brainard Industrial Park in South Meadows (Figure 1). The route operates primarily along Main Street, Charter Oak Avenue, Huyshope Avenue, Locust Street, and Murphy Road.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 59 begins and ends in downtown Hartford where riders can transfer to most CT***transit*** services. Outside of downtown, the only other transfer opportunity is at Main Street and Charter Oak Avenue, where riders can transfer to several route (see Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 31	Park Street and New Park Avenue
Route 33	Park Street and Park Road
Route 37	New Britain Avenue via Jefferson Street
Route 39	New Britain Avenue via Retreat Avenue
Route 41	New Britain
Route 43	Campfield Avenue
Route 47	Franklin Avenue
Route 53	Westherfield Avenue
Route 55	Middletown

Alignments and Service Patterns

Outbound trips from downtown Hartford begin from Central Row at Prospect Street, and travel southeast to Hartford Regional Market. Buses operate south and east primarily along Main Street, Charter Oak Avenue, Huyshope Avenue, Wawarme Avenue, Locust Street, Airport Road, and Brainard Road, then travel northbound along Murphy Road and Reserve Road. Inbound trips follow an identical alignment back to downtown Hartford and end at the Old State House. Saturday trips follow the same alignment as weekday trips. On weekdays only, midday and evening trips traveling inbound end at Central Row South instead of at the Old State House.

Service Schedule

Route 59 operates six days a week. There are 18 outbound and 19 inbound trips per weekday, operating every 30 minutes during peak periods and every 60 minutes off-peak. There are 12 outbound and 11 inbound trips on Saturdays, with service provided every 60 minutes. There is no service on Sundays.

FIGURE 3 | SCHEDULE OVERVIEW

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	6:10 AM – 7:08 PM	30/60	18/19
Saturday	7:20 AM – 6:31 PM	60	12/11
Sunday	-	-	-

*Source: CT**transit** route schedules*

Ridership by Service Day

Route 59 carries 432 daily passengers or 11.7 passengers per trip on an average weekday. This is almost 35% lower than the Hartford Division average of 17.7 weekday passengers per trip (see Figure 4).

On Saturdays, the route carries about half as many passengers per trip as the division average. This is likely a reflection of the route's role in facilitating access to industrial jobs along Locust Street and in the South Meadows and Brainard Industrial Park areas.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 59	ROUTE 59	DIVISION AVG
Weekday	432	11.7	17.7
Saturday	168	7.3	16.3
Sunday	-	-	17.6

Source: CTtransit performance data

Ridership by Stop

The most heavily used stop on Route 59 is its downtown terminus of Main Street and Old State House. Outside of the downtown, there are no stops that generate 50 or more boardings or alightings per day (see Figures 5 and 6). The two inbound stops with the highest levels of activity are Hartford Regional Market (23 boardings) and the corner of Wawarme Avenue and Huyshope Avenue (26 boardings).

FIGURE 5 | ROUTE 59 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Regional Market and Reserve Road	23 / 0	Hartford Regional Market
Wawarme Avenue and Huyshope Avenue	26 / 0	State of Connecticut Judicial Branch, Sports/Medical Science Academy
Main Street and Atheneum Square North	24 / 80	Travelers Insurance
Main Street and Old State House	11 / 66	Transfer to routes 32, 34, 36, 38, 40, 42, 44, 46, 50, 52, 54, 56, 58

Load profile data (see Figure 6) combines passenger activity by stop and shows the cumulative passenger load as the bus travels inbound along its route. Ridership by stop without the cumulative load is mapped in Figure 7. The data for Route 59 shows outbound passenger loads peak at Charter Oak Avenue and Smith Tower, shortly before the bus enters downtown Hartford. The largest number of alightings occurs at Main Street and Atheneum Square North.

FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

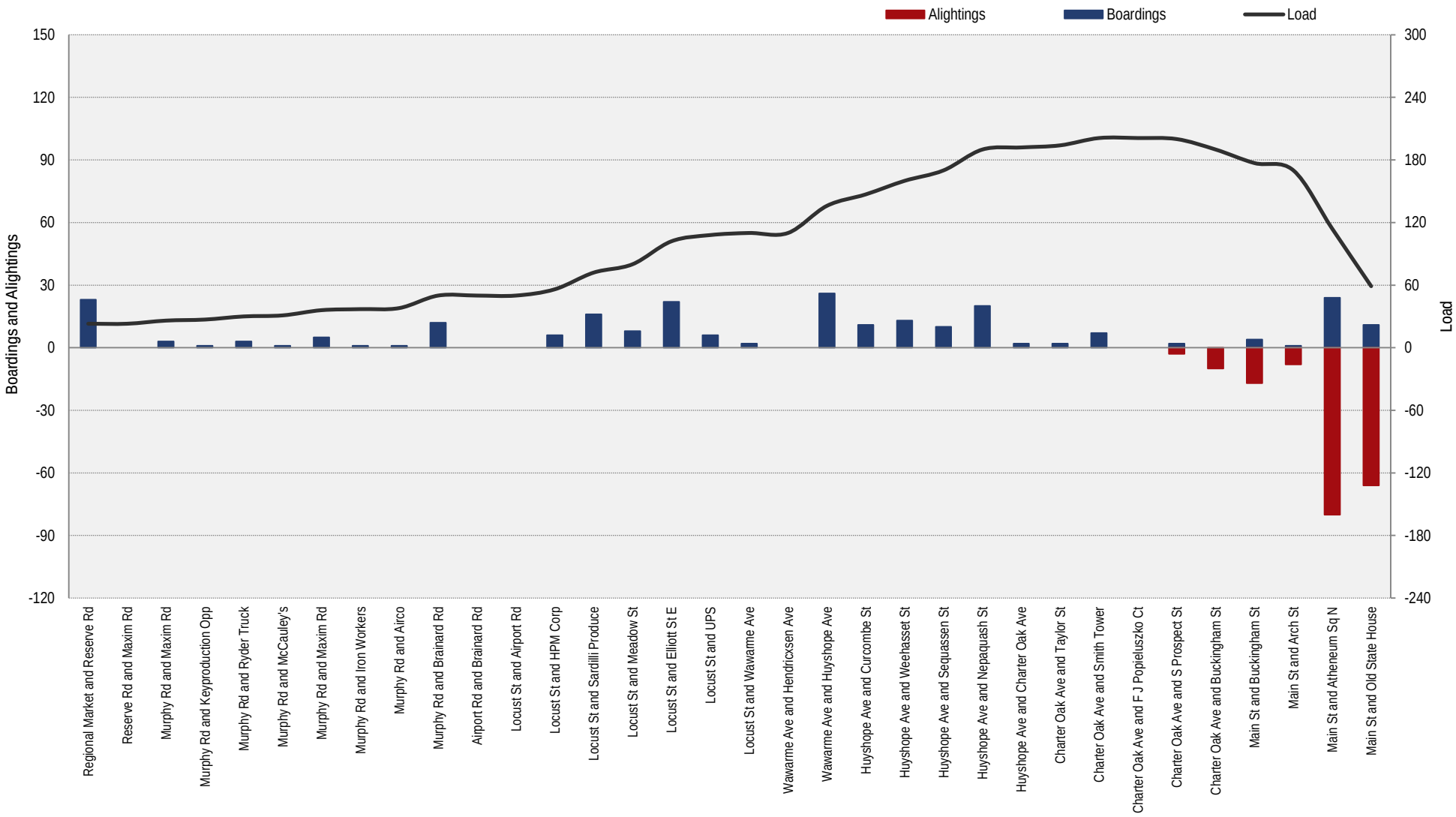
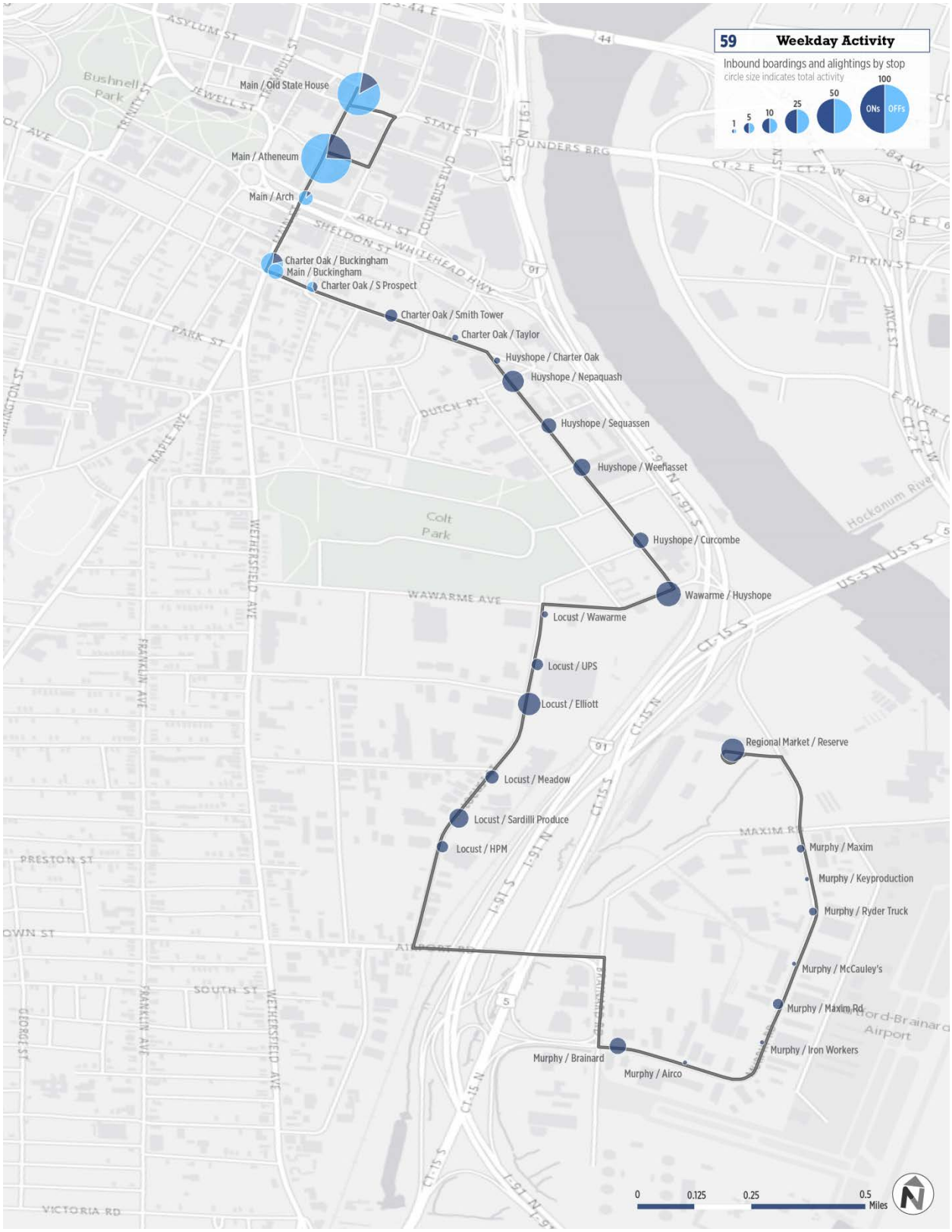


FIGURE 5 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Route 59 carries an average of 11.7 passengers per trip on weekdays. Ridership peaks during traditional morning and evening commute times, but morning ridership is highest in the outbound direction (away from downtown) and evening ridership is highest in the inbound directions (see Figures 6 and 7). This suggests that Route 59 primarily serves commuters, with riders using the route as a "last leg" connector to the industrial park jobs. It also suggests that passengers transfer from other services in downtown Hartford.

Maximum loads on Route 59 do not exceed 30 passengers. The typical seating capacity of a 40-foot transit bus is 40 passengers, so overcrowding is not an issue on this route.

FIGURE 6 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

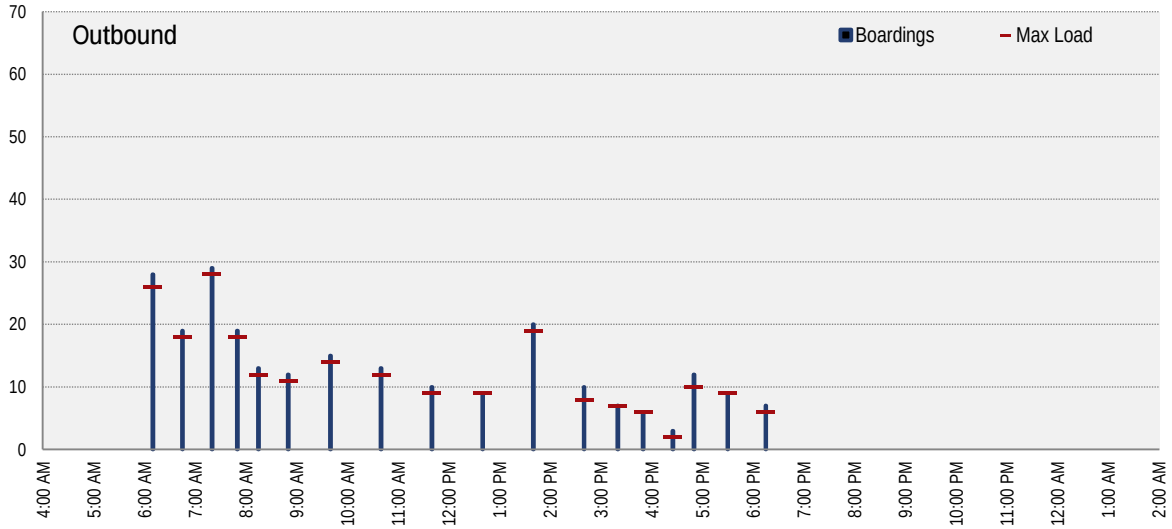
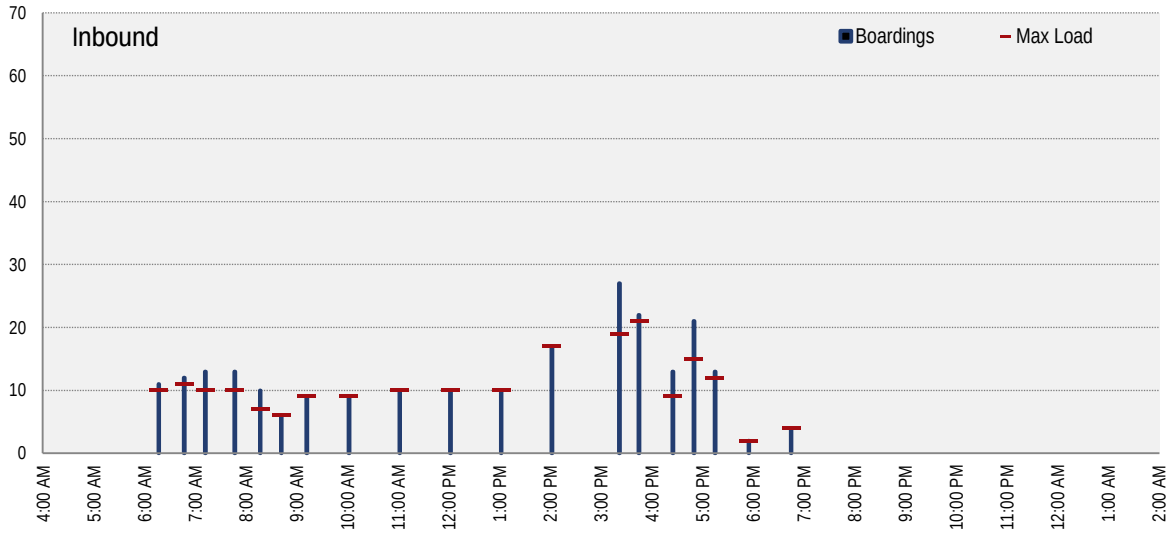


FIGURE 7 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Saturday ridership by trip is low; with only a handful of trips attracting more than five passengers (see Figures 8 and 9). In Figure 9, the last inbound trip shown for the day also has the highest ridership. This typically suggests there is pent up demand for later inbound service. However, there is actually one additional trip departing Regional Market at 5:50 that is not shown on the graph. It is possible that the ridership spike on the 4:40 trip is a data error, with ridership from the last two trips being combined.

FIGURE 8 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

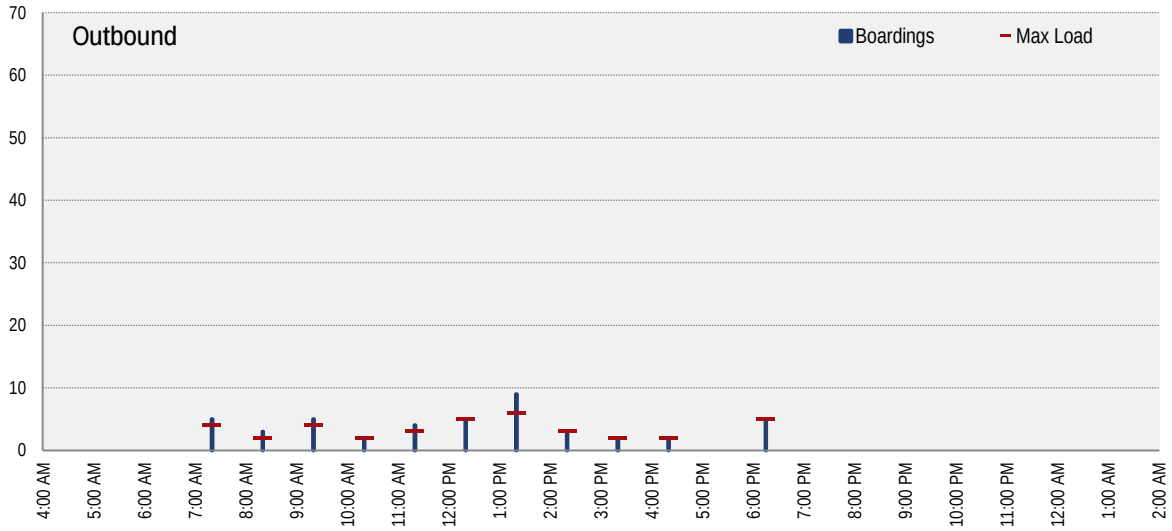
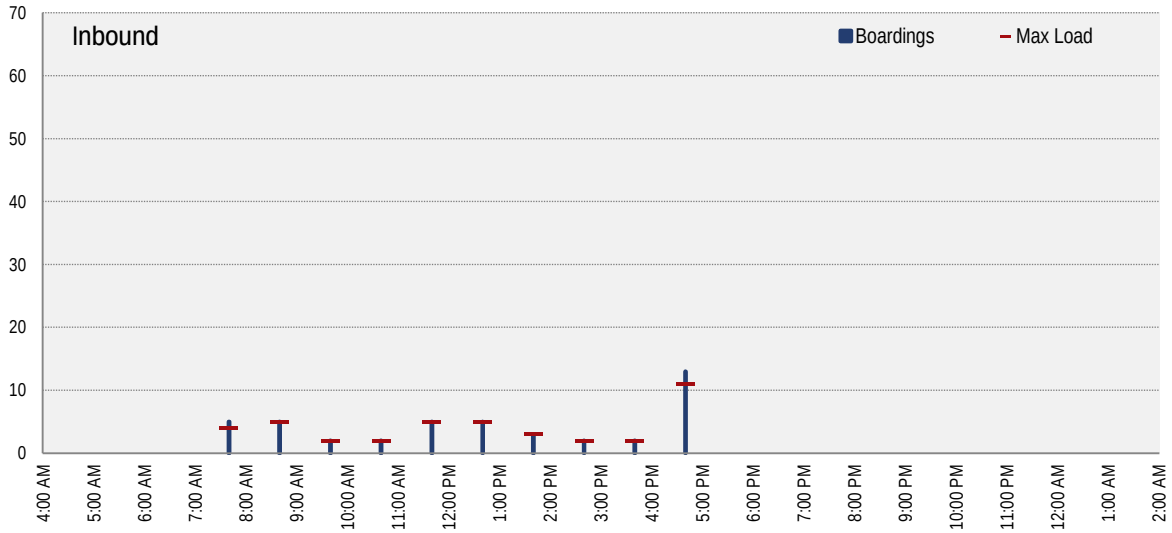


FIGURE 9 | SATURDAY INBOUND RIDERSHIP BY TRIP



Performance

Route 59 performs slightly below average in terms of passengers per revenue hour and revenue mile on weekdays. The productivity drops further below average on weekends as demand for service to the industrial areas decreases.

However, when interpreting Route 59's Saturday passengers per revenue hour average of 21.4, note that this number far exceeds the ridership of any individual trip on Saturday (Figures 8 and 9) even though Saturday service operates once per hour. The higher number reflects the fact that Route 59 is interlined with Route 74, so some of the riders shown in Figure 12 include riders on both Route 59 and Route 74.

Operating costs for Route 59 are lower than the Division average for weekdays and Saturdays. This may also be attributed to extensive use of interlining which results in an optimized use of resources.

FIGURE 12 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 59	SYSTEM AVG	ROUTE 59	SYSTEM AVG	ROUTE 59	SYSTEM AVG
Operating Cost per Passenger	$4.71	$4.84	$5.98	$6.30	-	$6.66
Passengers per Revenue Vehicle Hour	27.2	28.9	21.4	27.0	-	29.7
Passengers per Revenue Vehicle Mile	2.7	2.6	1.7	2.4	-	2.9

Source: CTtransit performance data

Route 59 has an 81.7% on-time arrival rate, with a slightly lower percentage of late buses than the Hartford Division average (see Figure 15). Early departures do not appear to be an issue for this route.

FIGURE 13 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 59	DIVISION AVG
Early	0.0%	0.2%
Late	18.3%	18.9%
On-Time	81.7%	80.9%

Source: CTtransit performance data

FIGURE 14 | WEEKDAY OPERATING COST PER PASSENGER

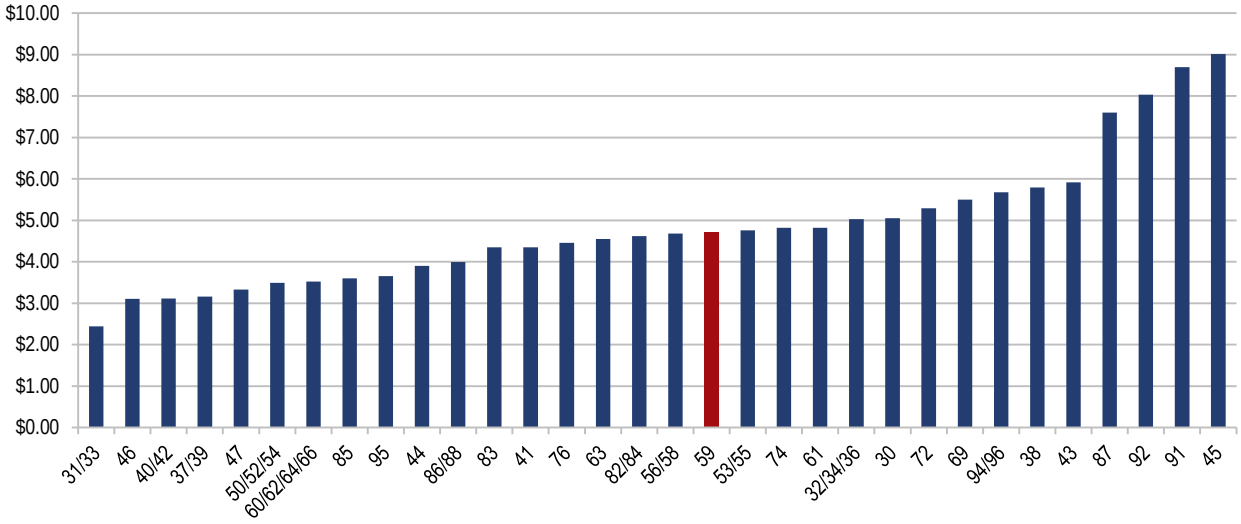
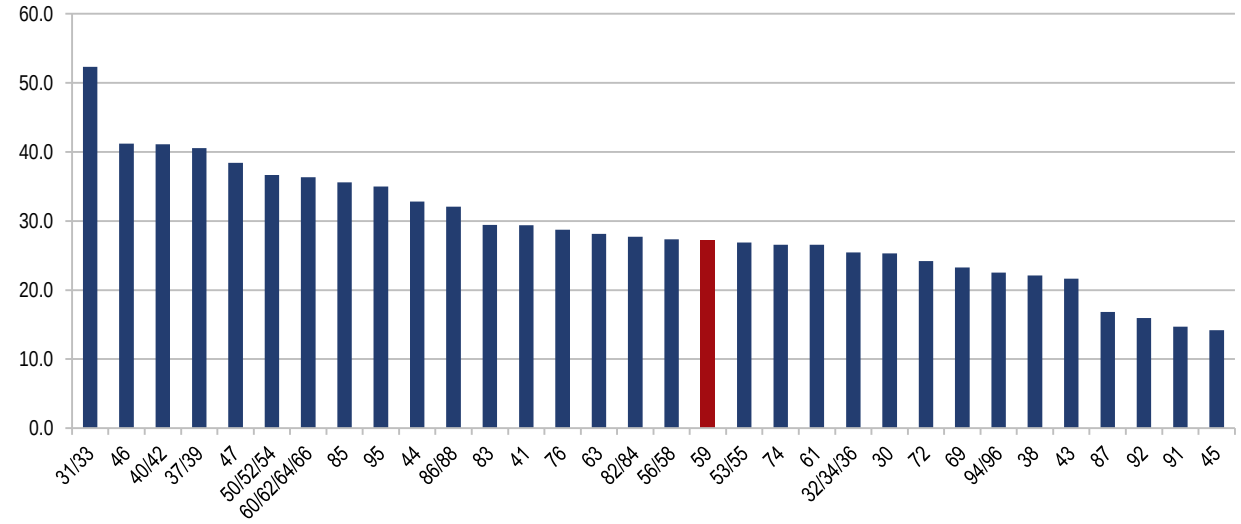


FIGURE 15 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Route 59 is a radial route that provides critical job-access connections to several industrial parks along the I-91 corridor, south of downtown. The route performs close to average on several weekday productivity measures, but is below average in terms of passengers per revenue mile, passengers per revenue hour, and cost per passenger on Saturdays.

Opportunities to strengthen the route include the following:

- **Replace bi-directional service south of Wawarme Avenue with terminal loop**. Bi-directional service is generally preferable to one-way loops, but in the case of Route 59, an exception may be warranted. Route 59 primarily serves to connect passengers transferring from other routes downtown to employment opportunities on the southern end of the route. Very few

passengers are traveling between stops that are both south of Wawarme Avenue. By continuing the route north along Reserve Road and closing the loop at Wawarme Avenue, a significant amount of time can be shaved off the route. This may allow for either higher service frequency or fewer vehicles assigned to the route. With fewer vehicles, the route's service productivity would increase.

- **Eliminate service along Locust Street**. With the exception of the UPS Customer Center at Locust and Elliot Street, ridership along Locust Street is very low. The route could be realigned onto Curcombe Street to allow for a stop serving the UPS at Curcombe and Wawarme Avenue. Buses could then continue on Wawarme Avenue to the east side of I-91, serving Regional Market and the South Meadows area. This would reduce the route length, and could improve the service productivity.
- **Eliminate Saturday service**. Route 59 has relatively low ridership and productivity on Saturdays, at just over seven passengers per trip. Many stops on the east side of I-91 are in relatively close proximity to other routes that offer Saturday Service, including Routes 53 and 55 on Wethersfield Avenue. The portion of the route that would be most negatively impacted by the loss of Saturday service would be portion serving Regional Market and the South Meadows area, but these stops primarily attract weekdays commuters.

Route Evaluation

FARMINGTON AVENUE

60 | West Hartford Center

62 | Bishops Corner

64 | Webster Hill Boulevard

64W | Westfarms Mall

66 | Westgate

66F | Unionville

66H | UCONN Health Center

66T | Tunxis Community College

Service Design

Routes 60, 62, 64, and 66 operate primarily along Farmington Avenue, providing radial service between downtown Hartford and the towns of West Hartford (Routes 60, 62, and 64) and Farmington (Route 66). The four routes function as variants of a single service, with a common alignment and unique outer ends. The four routes include:

- Route 60, which serves only the common alignment along Farmington Avenue before terminating at West Hartford Center (Figure 1).
- Route 62 travels north from West Hartford Center via North Main Street, terminating at Bishops Corner on Starkel Road (Figure 2).
- Route 64 travels south from West Hartford Center via South Main Street, with one variant continuing onto Webster Hill until Boswell and another variant continuing along South Main Street and New Britain Avenue before terminating at Corbin's Corner (Figure 3).
- Route 66 continues on Farmington past West Hartford Center, with variants serving Westgate Plaza (66), the UCONN Health Center (66H), Unionville on School Street and South Main Street (66F) and Tunxis Community College (66T).

FIGURE 1 | ROUTE 60 MAP

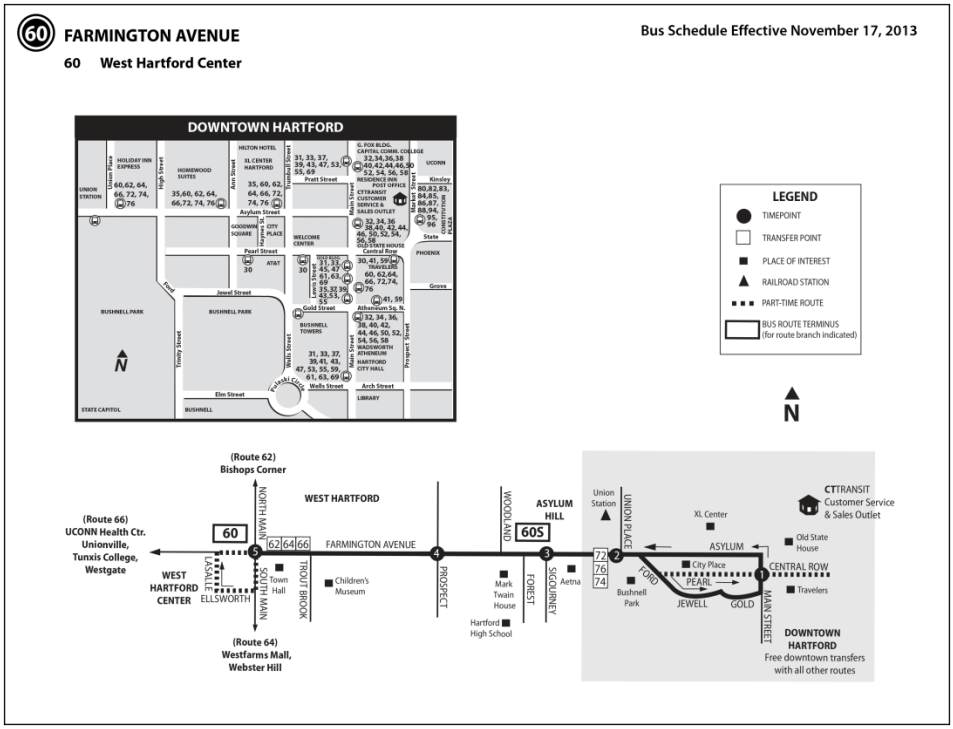


FIGURE 2 | ROUTE 62 MAP

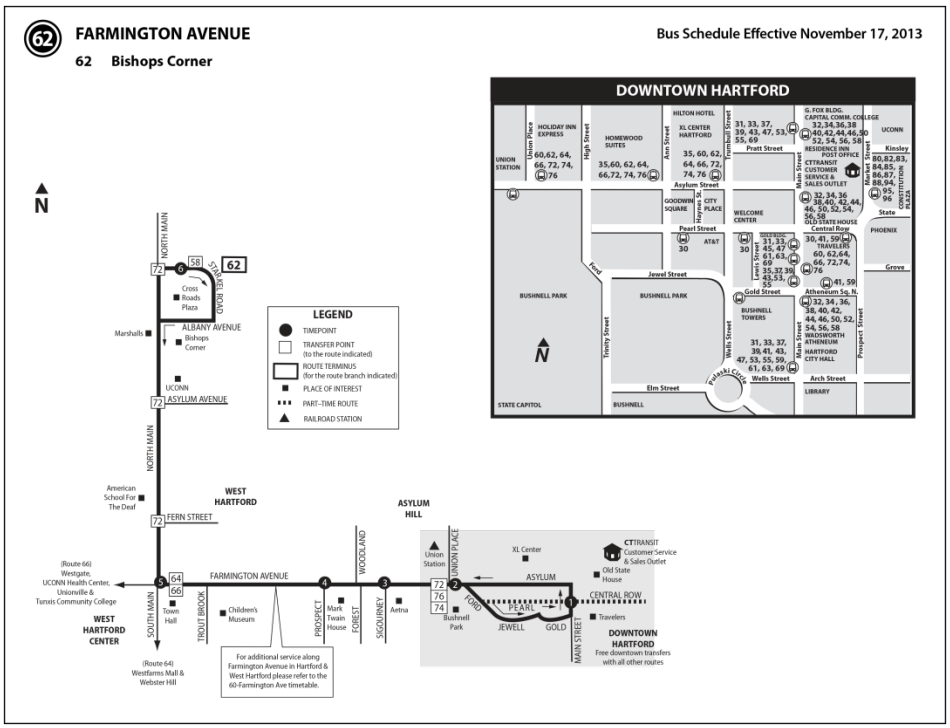


FIGURE 3 | ROUTE 64 MAP

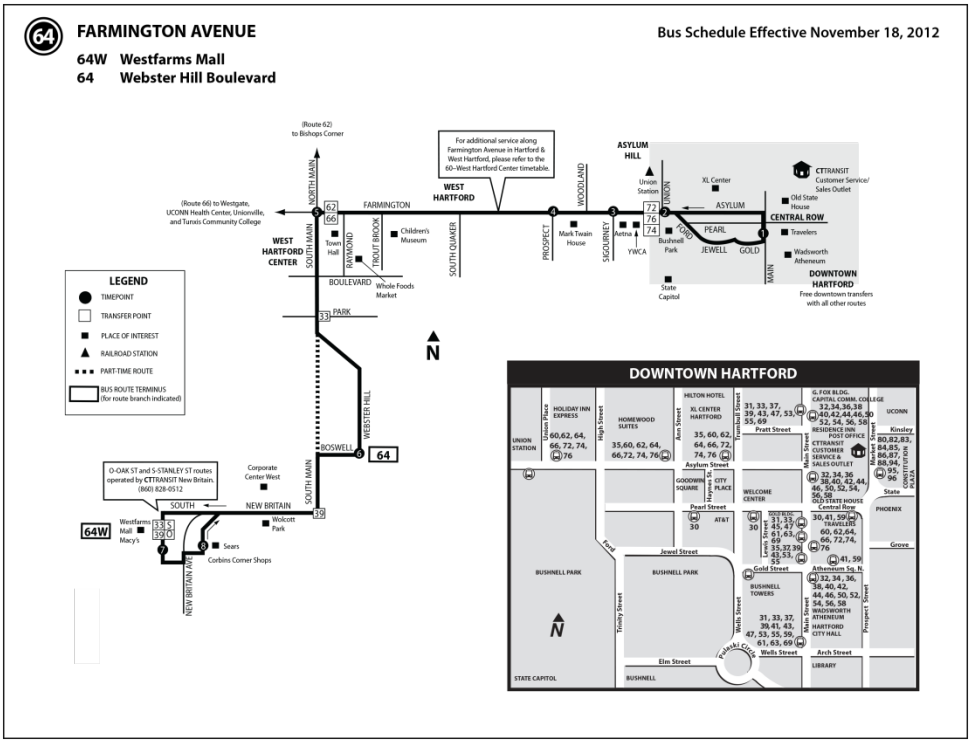
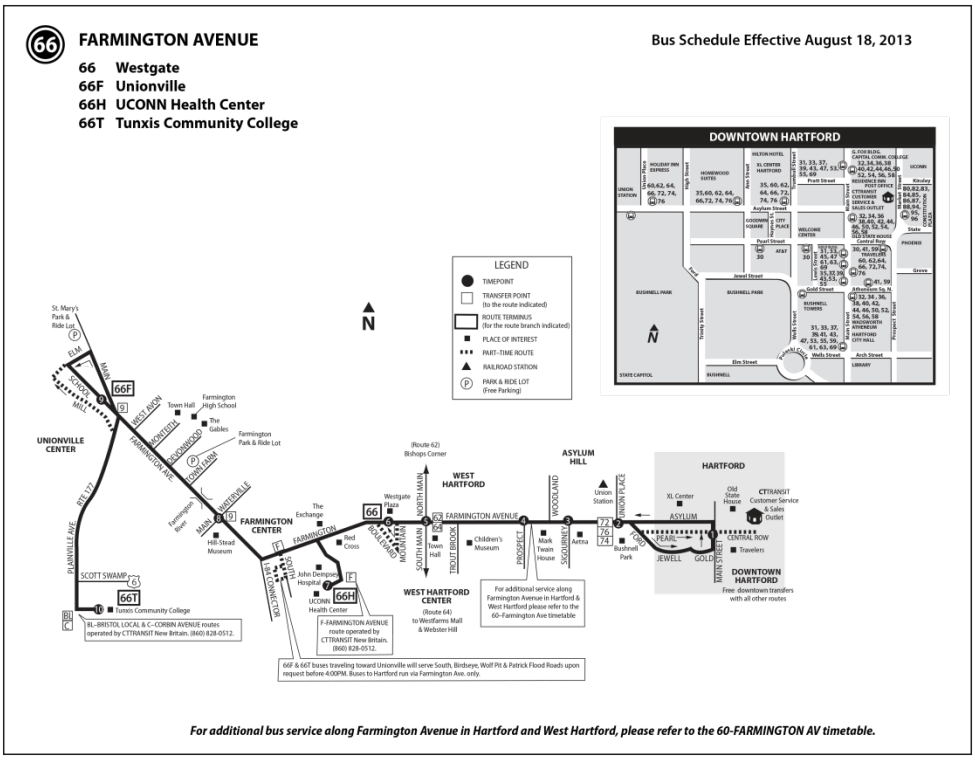


FIGURE 4 | ROUTE 66 MAP



System Interaction and Transfer Opportunities

Routes 60, 62, 64 and 66 begin/end in downtown Hartford where riders can transfer to nearly most CT***transit*** services, including CT***fastrak*** routes at Union Station. Connections with other CT***fastrak*** routes can be made at Sigourney Street (102 and 161), West Hartford Center (153) and UConn Health (121). Route 66H also connect with New Britain Route 506 (Farmington Avenue), and Route 66T connects with New Britain Route 503 (Corbin Avenue) and Bristol route 541 (Bristol Local).

FIGURE 5 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 58	Albany Avenue
Route 72	Asylum Avenue
Route 74	Granby Street
Route 76	Ashley Street
EXPRESS ROUTES	
Route 909	Farmington – Unionville Express
CT*FASTRAK* ROUTES	
Route 102	CT*fastrak*: Hartford/New Britain/Bristol
Route 121	CT*fastrak*: Manchester CC/Hartford/UConn Health
Route 128	CT*fastrak*: Hartford/Westfarms Mall/New Britain
Route 153	CT*fastrak*: Flatbush/Copaco via Bishops Corner
NEW BRITAIN ROUTES	
Route 503	Corbin Avenue
Route 506	Farmington Avenue
BRISTOL ROUTES	
Route 541	Bristol Local

Alignments and Service Patterns

All outbound trips begin on Main Street in downtown Hartford and turn west onto Asylum Avenue, stopping at Union Station. After crossing I-84, buses bear left onto Farmington Avenue and all variants continue about three miles west to West Harford Center. Route 60 terminates in West Hartford Center by turning left on South Main Street and circling back around to Farmington Road to return inbound.

Other variants extend from West Hartford Center as described below:

- Route 62 turns right onto North Main Street in West Hartford Center. It continues north past Albany Road turning right on Starkel Road to terminate in the Cross Roads Shopping Plaza in Bishops Corner. It returns inbound via the same alignment.
- Route 64 turns south onto South Main Street then left onto Webster Hill Boulevard, terminating at the corner of Webster Hill and Boswell Road. Route 64W trips continue beyond by turning right on Boswell Road, left on South Main Street and right on New Britain Avenue to serve the West Farms Mall and Corbins Corner.

- Route 66 continues west on Farmington Avenue about 1.5 miles beyond West Hartford Center to terminate at Westgate Plaza at the intersection with Mountain Road. Three Route 66 variants continue further west:
    - Route 66H continues two miles beyond Westgate Plaza in Farmington and enters the UConn Health Center campus to serve John Dempsey Hospital and outpatient facilities.
    - Route 66F continues on Farmington Avenue (SR 4) about six miles to the west, through Farmington Center to Unionville. Buses loop through Unionville on Main, Elm and School streets.
    - Route 66T continues south from Unionville via for about four miles via Plainville Avenue (SR 177) to terminate at Tunxis Community College at the intersection of SR 6.
    - Route 66F and 66T will deviate down South Road between UConn Health and Farmington Center, upon request.

All inbound trips return via the same alignment to Farmington Avenue into downtown Hartford.

Service Schedule

Weekdays

Routes 60, 62, and 66 operate seven days a week, while Route 64 operates weekdays and Saturdays. Combined the four routes operate 90 outbound and 100 inbound trips on weekdays. Along the common alignment, weekday frequency is between 3 and 20 minutes until 7:15 PM (see Figure 6). Service levels are lower on the unique portions of the individual routes:

- Only twelve trips per day (six inbound/six outbound) operate as Route 60, beginning or ending in West Hartford Center. These are generally early morning or late evening trips. Most of the service along the common segment, therefore, is provided by other routes.
- Route 62 operates at about 30 minutes headways all day (26 trips each direction).
- Route 64 operates at about 30 minutes headways all day (31 inbound, 32 outbound), with hourly service after 7:15 PM. Almost all service operates as 64W to Westfarms Mall, with only seven daily trips terminating at Boswell Avenue.
- Route 66 operates on 30 minute headways all day (27 inbound, 30 outbound). Only four trips per day start or end at Westgate Center (66). Otherwise, trips alternate between 66T and 66H until 6 PM; after 6 PM, all trips start and end in Unionville (66F).

Saturdays

All four routes operate on Saturdays and provide a combined 71 outbound and 80 inbound trips. Among the 71 inbound trips, 20 are on Route 60, 14 are on Route 62, 25 are on variants of Route 64, and 12 on variants of Route 66. Of the 80 outbound trips 24 are on Route 60, 14 are on Route 62, 27 are on variants of Route 64, and 13 are on variants of Route 66). Along the common alignment, buses run at 10 minute frequencies throughout the day until 6:00 p.m., followed by frequencies varying from 20 minutes to 80 minutes.

On Saturday, Route 62 runs roughly hourly to Bishops Corner, with more frequent AM outbound trips, and Route 64W runs every 30 minutes to Westfarms Mall. Almost all Saturday Route 66 service operates as Route 66H to UConn Health and provides hourly service; there is no Saturday service to Unionville or Tunxis Community College.

Sundays

Routes 60, 62 and 66 operate on Sundays. Routes 62 and 66 operate with 70 minute headways; there is no Route 66H, 66F or 66T service beyond Westgate. There are 19 total outbound trips (2 on Route 60, 10 on Route 62, and 7 on Route 66) and 20 total inbound trips (1 on Route 60, 11 on Route 62, and 8 on Route 66). This means buses run at 35 minute frequencies along the common alignment all day until 4:45 p.m., followed by 70 minute frequencies.

An additional outbound trip to West Hartford Center operates on Saturdays and Sundays and an additional inbound trip to West Hartford Center operates on weekdays and Saturdays between Thanksgiving and December 31.

FIGURE 6 | SCHEDULE OVERVIEW (ALL ROUTES 60, 62, 64, 64W, 66, 66F, 66H AND 66T)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:00 AM – 1:05 AM	10	90/100
Saturday	5:59 AM – 12:04 AM	10	71/80
Sunday	6:19 AM – 7:57 PM	35	19/20

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Combined, Routes 60, 62, 64, 66 carry about 5,639 passengers per weekday or about 29.8 passengers per trip. This is significantly higher than the Hartford Division average of 17.6 passengers per trip (see Figure 7). On Saturdays, the four routes carry about 21.1 passengers per trip and, on Sunday, Routes 62 and 66 carry about 24.3 passengers per trip; both of these ridership levels are well above the division averages.

FIGURE 7 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 60/62/64/66	ROUTE 60/62/64/66	DIVISION AVG
Weekday	5,639	29.8	17.7
Saturday	3,096	21.1	16.3
Sunday	998	24.3	17.6

Source: CTtransit performance data

Ridership by Stop

The most heavily used stops on Routes 60, 62, 64 and 66 are the downtown Hartford stops at Gold and Lewis Streets, and Main Street at Travelers Insurance. About 1,300 passengers get on or off Farmington Avenue routes at these downtown stops each day.

As shown in Figure 8, a number of additional stops generate 50 or more boardings or alightings per day, and most are located along the primary Farmington Avenue alignment between West Hartford Center and

downtown. Four stops outside of downtown generate more than 200 riders per day: West Hartford Center (217 boardings and alightings), Sigourney Street (209), Westfarms Mall (201), and Girard Avenue (200).

FIGURE 8 | ROUTE 60/62/64/66 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Tunxis Community College/Plainville Ave.	61 / 0	Tunxis Community College, connections to Bristol and New Britain
UConn Med Center and Main Road	59 / 6	UConn Health and related facilities
UConn Med Center, Main and Circle Roads	57 / 2	UConn Health and related facilities
Farmington Avenue and Mountain Road	66 / 3	Westgate apartments, Stop & Shop
Westfarms Mall and Macy's	201 / 0	Westfarms Mall / major retailers
Starkel Road and Bishops Corner	50 / 0	Crossroads Plaza / major retailers
North Main Street and Marshalls	62 / 0	Wal-Mart, Marshalls and other retailers
Farmington Avenue and S. Main Street	168 / 49	West Hartford Town Center, retail and mixed-use
Farmington Avenue and Prospect Avenue	48 / 24	Walgreens; residential/commercial mixed use
Farmington Avenue and Oxford Street	42 / 12	Residential/commercial mixed use
Farmington Avenue and S. Whitney Street	96 / 40	Residential/commercial mixed use
Farmington Avenue and Girard Avenue	165 / 35	Residential/commercial mixed use
Farmington Avenue and Denison Street	60 / 12	Residential/commercial mixed use
Farmington Avenue and Owen Street	46 / 6	Residential/commercial mixed use
Farmington Avenue and Woodland Street	93 / 33	Hartford High School, Mark Twain Museum
Farmington Avenue and Gillett Street	85 / 28	Residential/commercial mixed use
Farmington Avenue and S. Marshall Street	112 / 21	Residential/commercial mixed use
Farmington Avenue and Laurel Street	133 / 27	Offices, commercial businesses
Farmington Avenue and Imlay Street	42 / 11	Offices, commercial businesses
Farmington Avenue and Sigourney Street	143 / 66	Lincoln Tech Institute, Aetna
Asylum and Garden Street	41 / 16	The Hartford, YMCA
Asylum and Union Place	13 / 70	Union Station bus and rail connections
Gold Street and Lewis Street	0 / 244	Downtown and connections to other CT*transit* routes
Main Street at Travelers Insurance	28 / 1040	Downtown and connections to other CT*transit* routes

Load profile data combines passenger activity by stop and shows the cumulative passenger load as the bus travels inbound along its route. The load profile for Routes 60, 62 and 64 is shown in Figure 9, and the profile for Route 66 is shown in Figure 10. These profiles are not continuous because some stops are served by all variants, while others are served by one or two variants only and are labeled accordingly.

Ridership by stop without the cumulative load is mapped in Figure 11 for Routes 60, 62 and 64, and in Figure 12 for Route 66.

The data shows that ridership is strongest between downtown Hartford and West Hartford Center where the service is also most frequent. Ridership beyond West Hartford Center are considerably lower. While the terminal points of Route 64 at Westfarms Mall, Route 62 at Bishops Corner, and Route 66 variants at Tunxis Community College and UConn Health generate significant ridership, the segments along these corridors generally have relatively low ridership activity. In particular,

- Route 66T between Tunxis and Unionville generates 10 boardings or alightings (not including Tunxis Community College).
- Route 66T/F between Unionville and Farmington Center generates 51 daily riders, and another 35 riders between Farmington Center and UConn Health.
- Routes 66T/F/H generate 15 riders between UConn Health and Westgate Center.

Another difference between the common alignment and the outer portions of the route is turnover on the route. Although the routes do generate both boardings and alightings in these sections, most riders on the outer ends of the service board and get off along Farmington Avenue or in downtown. This compares with Farmington Avenue, which has higher turnover on the route, with lots of riders getting on and off along this segment. Peak loads on the Farmington Avenue routes are achieved between Sigourney Street and Asylum Avenue, when passengers begin disembarking for downtown destinations.

FIGURE 9 | ROUTE 60/62/64 WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

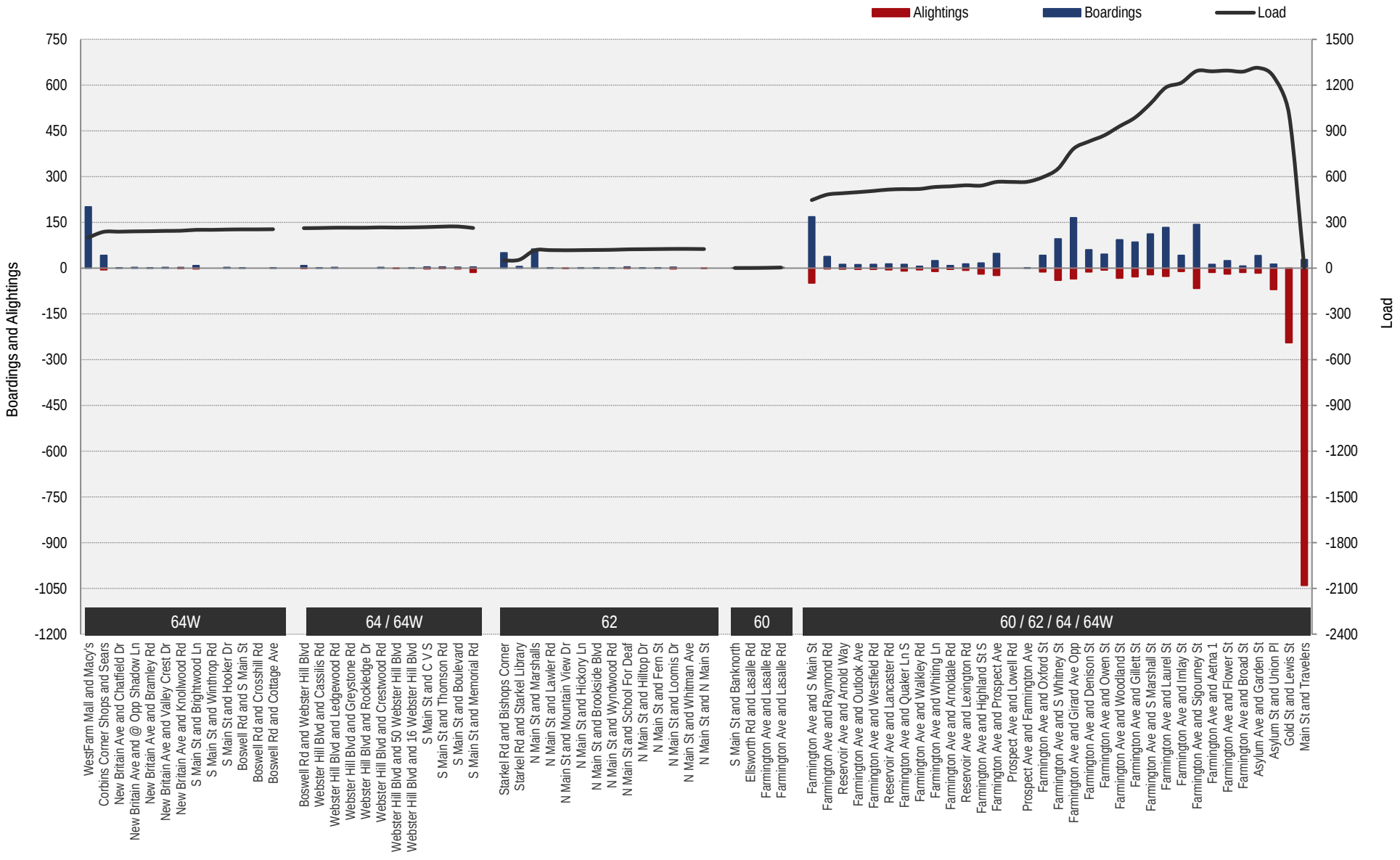


FIGURE 10 | ROUTE 66 WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

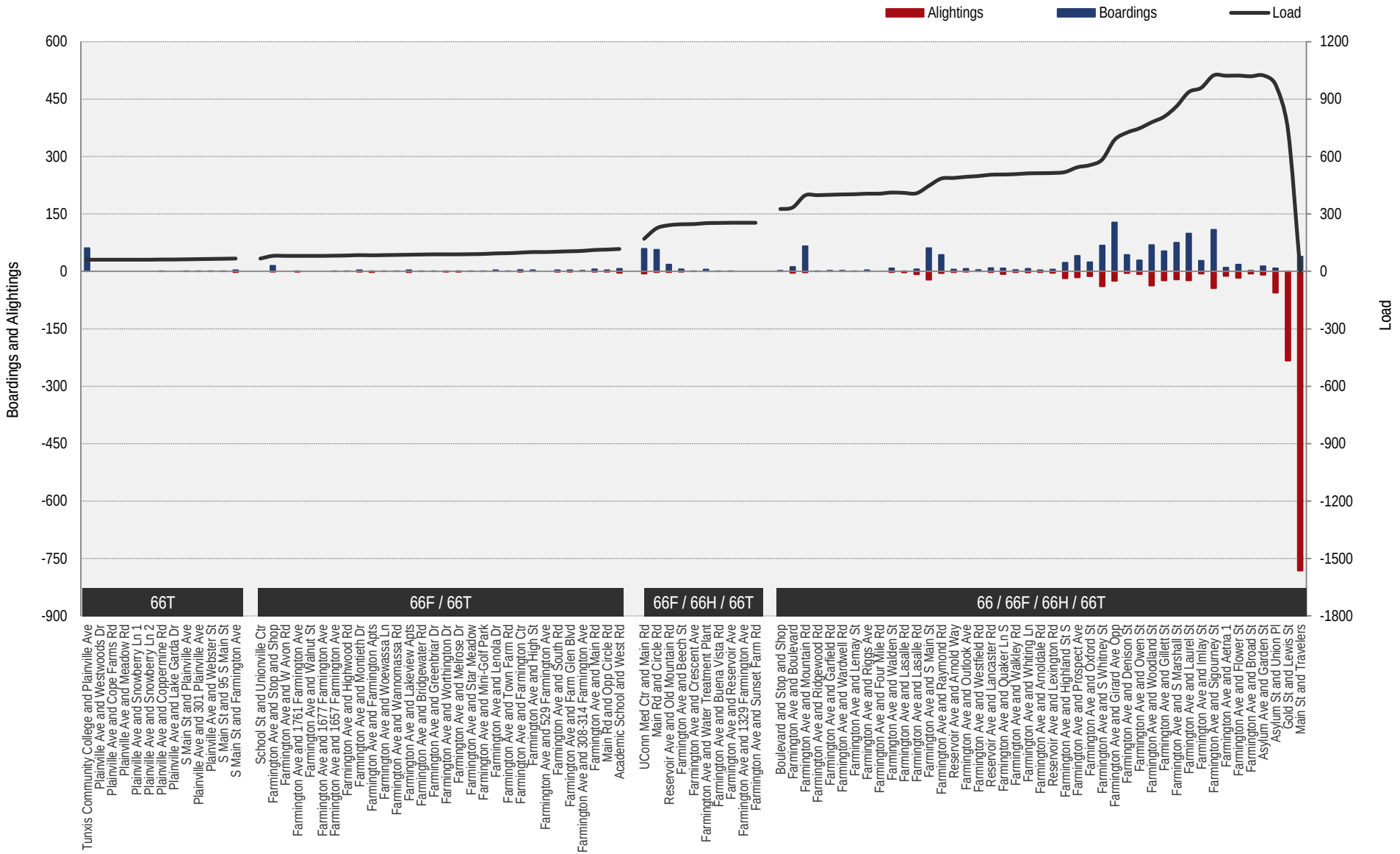


FIGURE 11 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

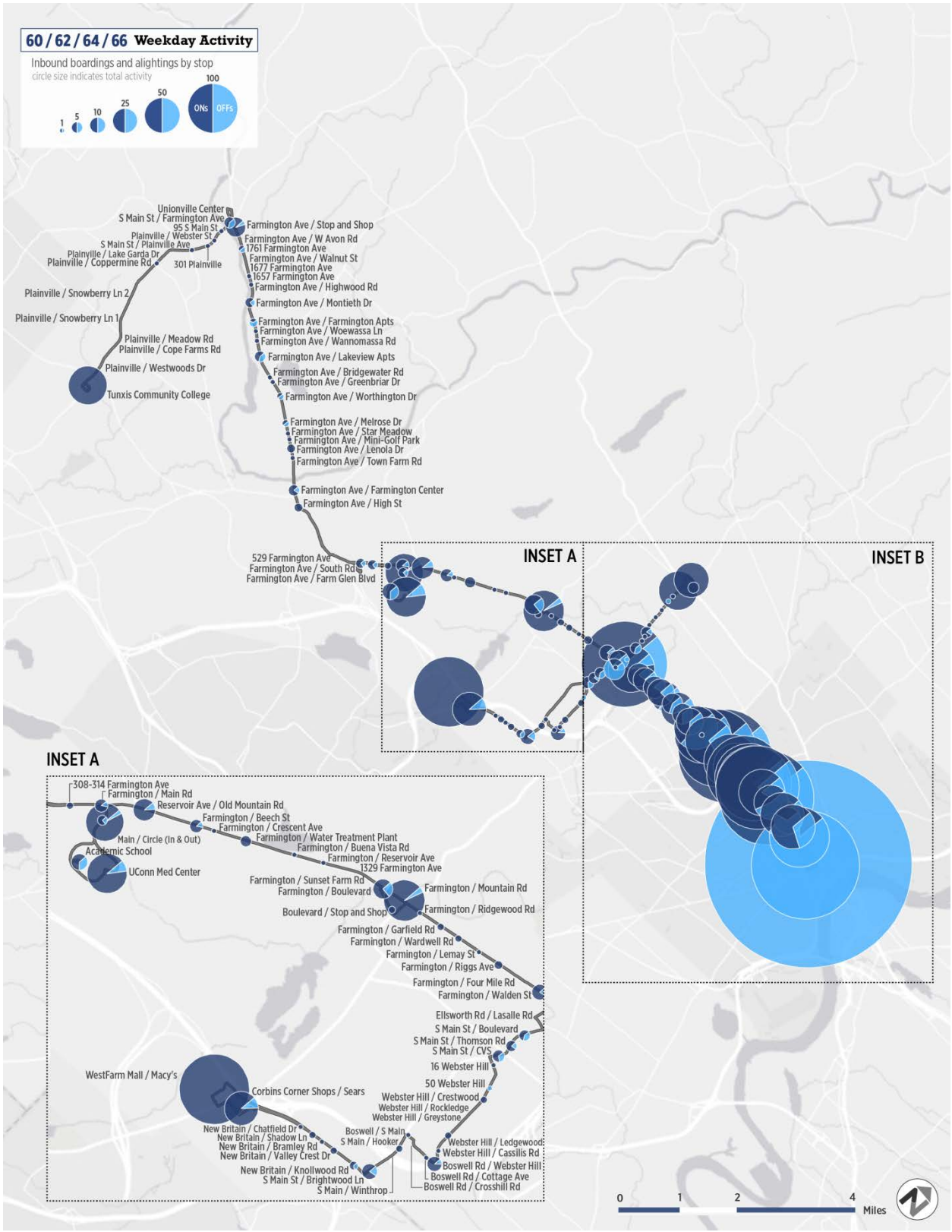
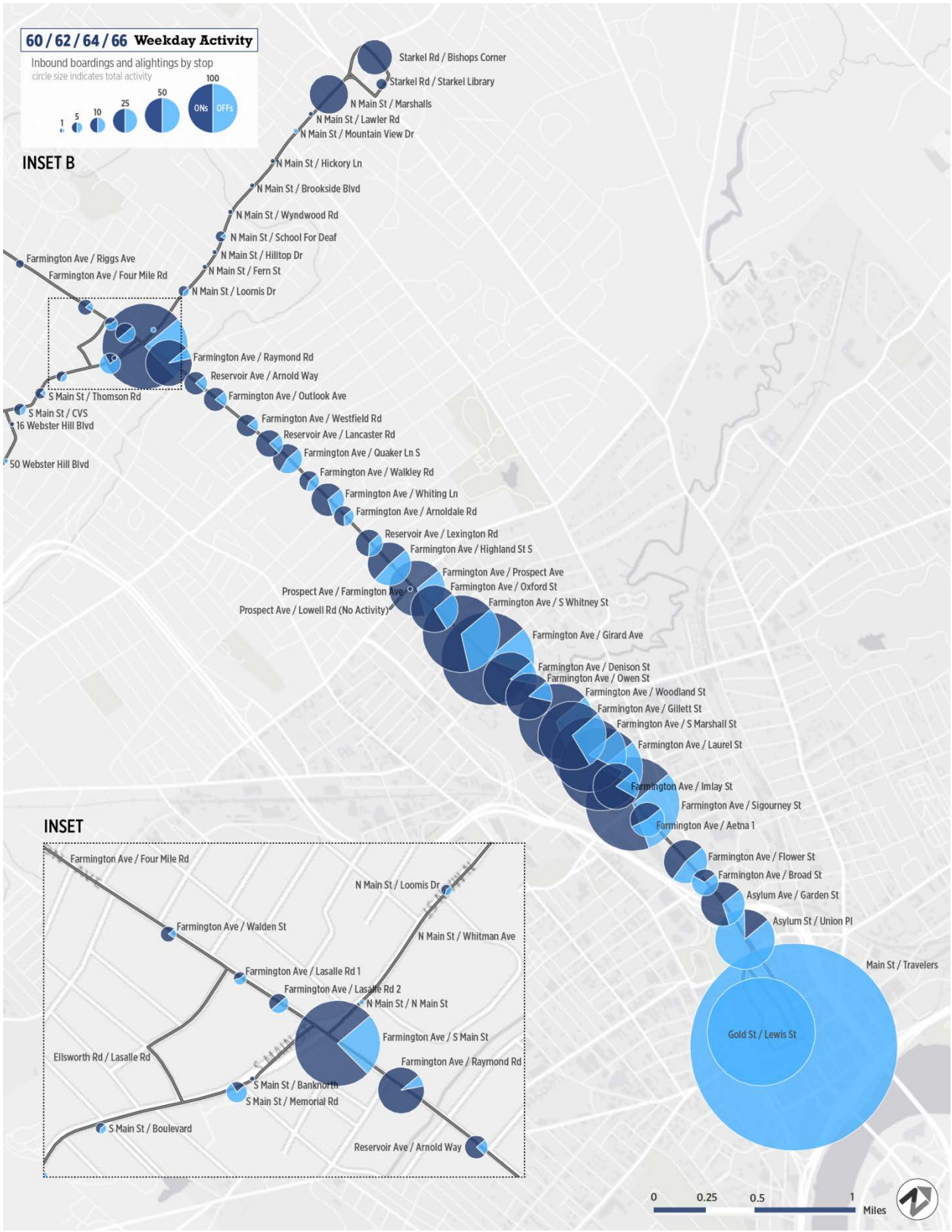


FIGURE 12 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP (INSET B)



Ridership by Trip

Weekday - Routes 60 and 62

Ridership on Routes 60 and 62 is strong overall and well balanced throughout the day and inbound and outbound (see Figures 13 and 14). The data shows a slight peaking pattern with the highest ridership trips occurring during commute times and in both directions.

Strong demand leads to several trips with more than 30 riders and a handful that peak near 40 riders per trip. Peak loads, however, rarely exceed 30 passengers, so crowding does not appear to be a problem.

The gap in service between 7:00 and 11:00 PM is filled by Route 64 trips. The 11:00 PM trips on Route 62/62 shown below are well utilized, but ridership after 11:00 PM is low.

FIGURE 13 | ROUTE 60/62 WEEKDAY OUTBOUND RIDERSHIP BY TRIP

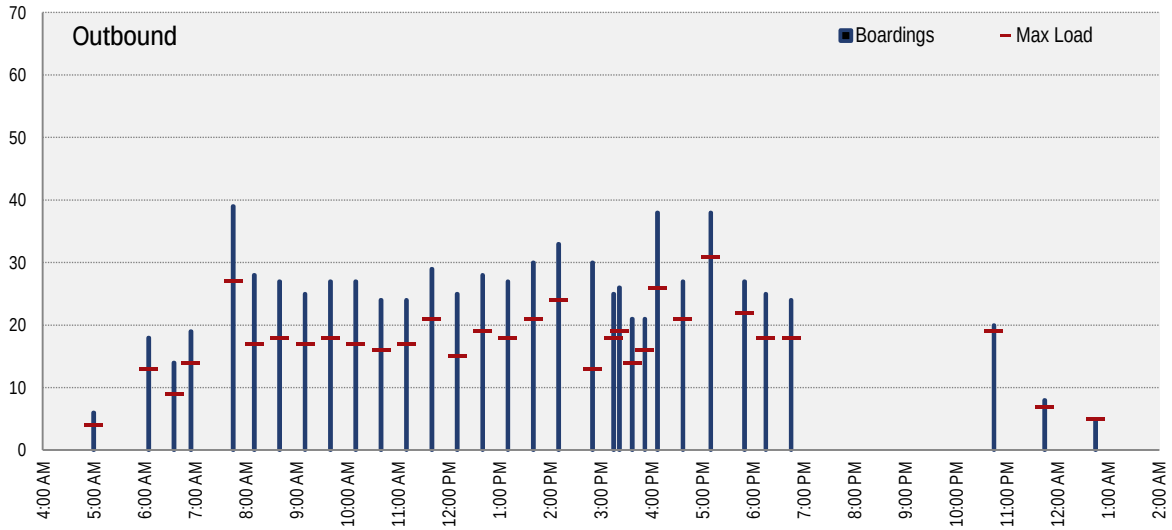
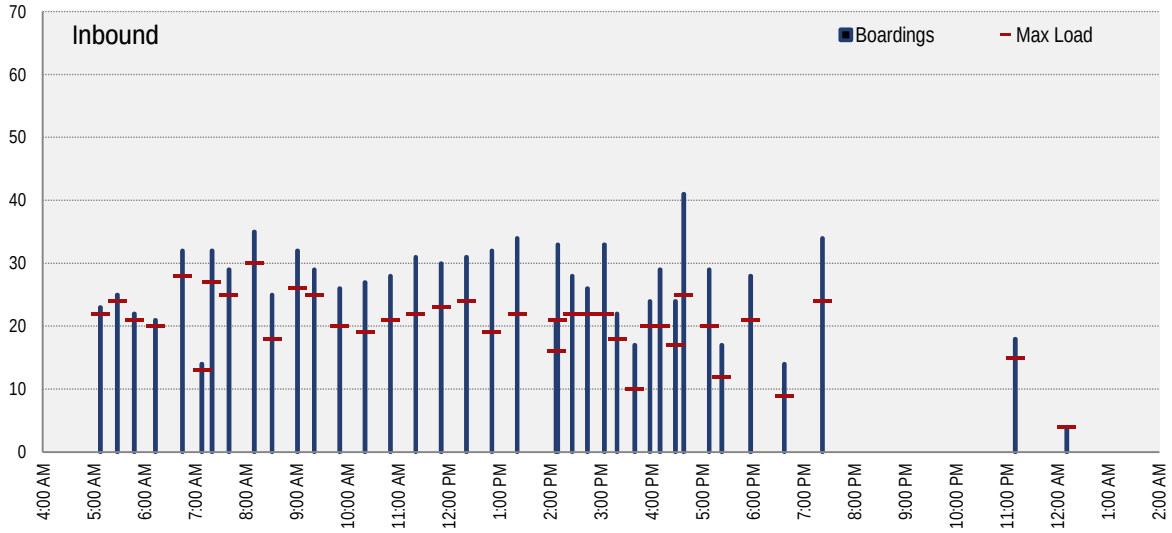


FIGURE 14 | ROUTE 60/62 WEEKDAY INBOUND RIDERSHIP BY TRIP



Weekday - Route 64

Consistent with Routes 60 and 62, ridership on Route 64 is strong throughout the day and in both the inbound and outbound direction (see Figures 15 and 16). The demand profile, however, does not align with commuter travel times and instead, demand is strongest on the afternoon and evening trips.

A handful of have very high ridership, with individual trips carrying more than 40 passengers. While peak loads are manageable overall, there are a number of trips (8:15 AM, 8:42 PM inbound and 8:20 PM outbound) that appear to be overcrowded on a regular basis, with peak loads averaging 40 passengers. The standard capacity of CT***transit***'s 40' New Flyer vehicles is roughly 38 passengers; trips with 40 passengers, therefore, carry standees. Late evening trips carry more than 30 passengers, demonstrating that more frequent evening service would be warranted. Note that the charts below do not include late night holiday season service on Route 64.

FIGURE 15 | ROUTE 64/64W WEEKDAY OUTBOUND RIDERSHIP BY TRIP

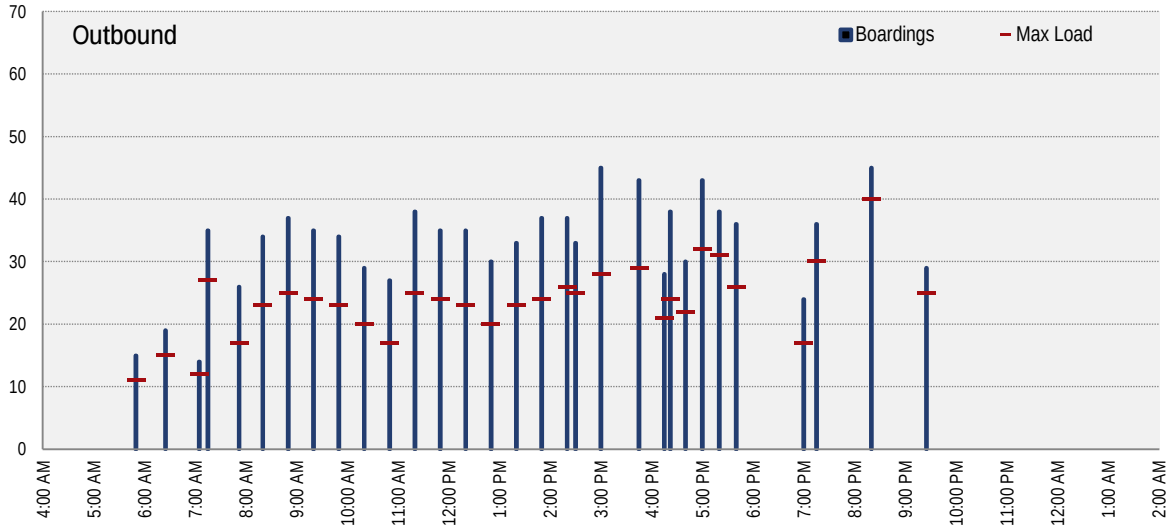
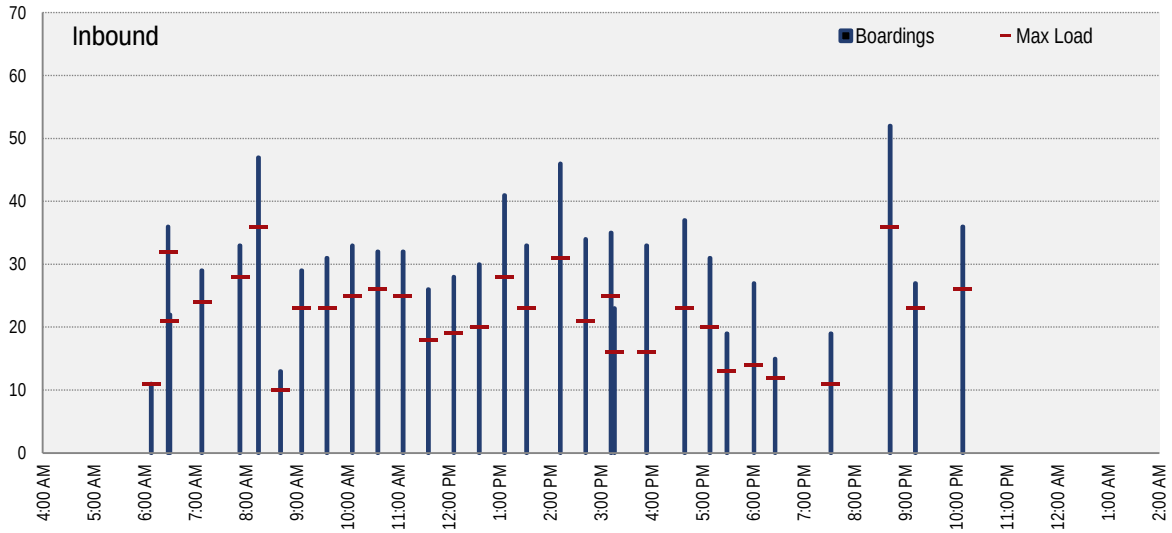


FIGURE 16 | ROUTE 64/64W WEEKDAY INBOUND RIDERSHIP BY TRIP



Weekday - Route 66

Weekday ridership by trip for Route 66, serving Westgate Center, UConn Health, Farmington, Unionville, and Tunxis Community College, is shown in Figures 17 and 18. Ridership on Route 66 is also strong throughout the day and is well balanced between inbound and outbound travel. The data shows a slight reverse commute peaking pattern, with demand peaking on the 7:35 AM outbound trip and a handful of the inbound afternoon trips.

Most Route 66 trips carry between 30 and 40 riders, but the majority of the peak loads do not exceed 30 riders. However, two trips have overcrowding problems; the 7:35 AM outbound (66T) trip, which has an average of 73 riders and peak loads of 49 riders, which are well in excess of the 38 passenger seating capacity of a CT***transit*** bus. In addition, peak loads on the 6:35 AM inbound trip, average 35 passengers, which is nearing seating capacity.

FIGURE 17 | ROUTE 66 WEEKDAY OUTBOUND RIDERSHIP BY TRIP

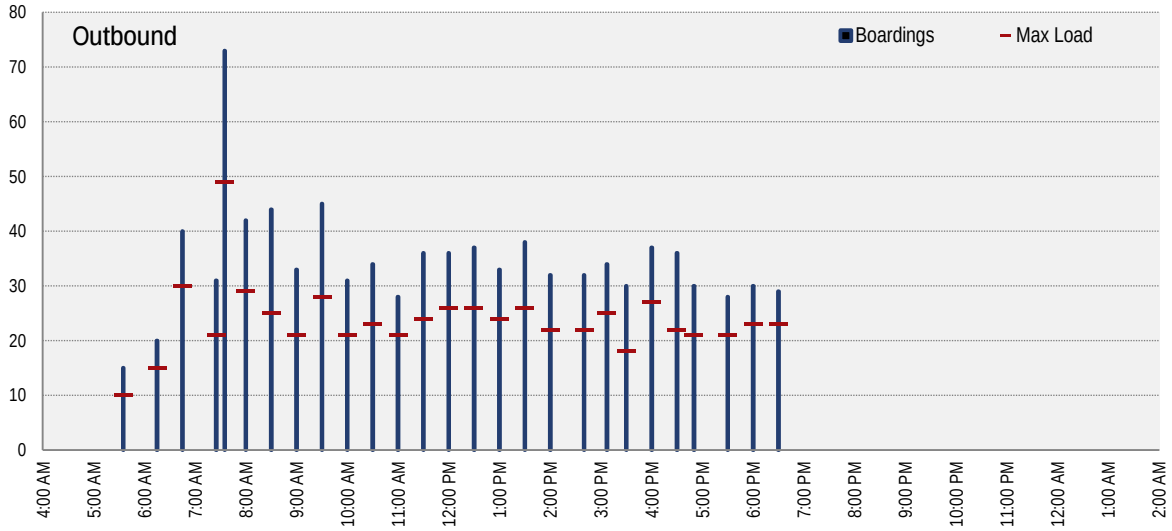
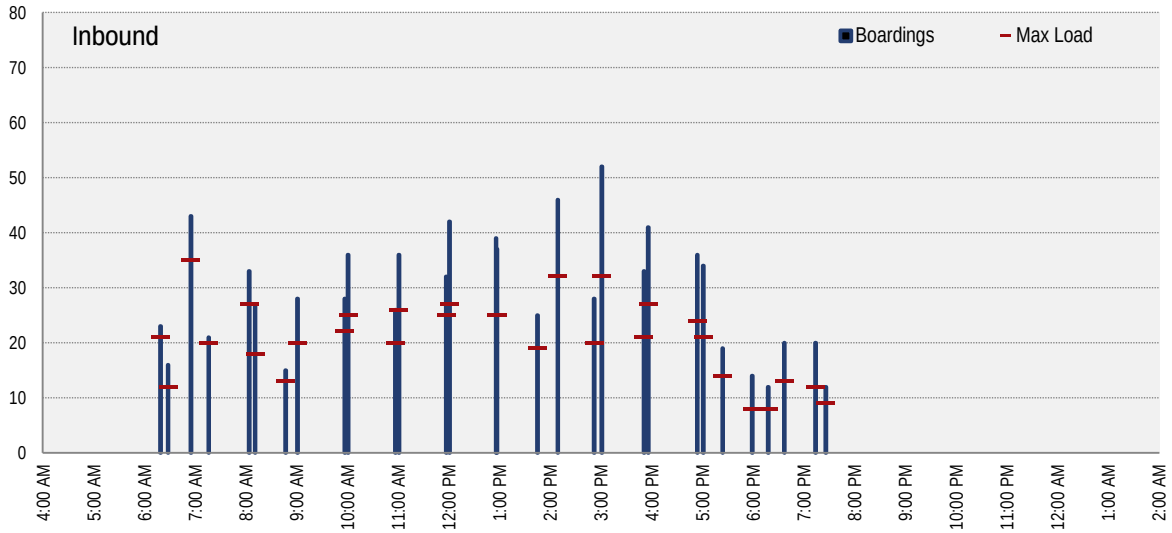


FIGURE 18 | ROUTE 66 WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday – Route 60

Saturday ridership by trip for Route 60, which terminates in West Hartford Center, is shown in Figures 19 and 20. These trips carry fewer passengers than the longer routes that extend beyond West Hartford Center (see charts on following pages), but carry relatively consistent passenger loads throughout the day. Demand on the inbound service is stronger than demand on the outbound service.

The gap in evening trips is covered by trips on Routes 62, 64 and 66. However, the last trip of the day is operated as Route 60 and ridership is low on this trip. Given the higher evening loads on other route segments, this last trip may be better operated as Route 62 or 64. Note that late night holiday service is not included below.

FIGURE 19 | ROUTE 60 SATURDAY OUTBOUND RIDERSHIP BY TRIP

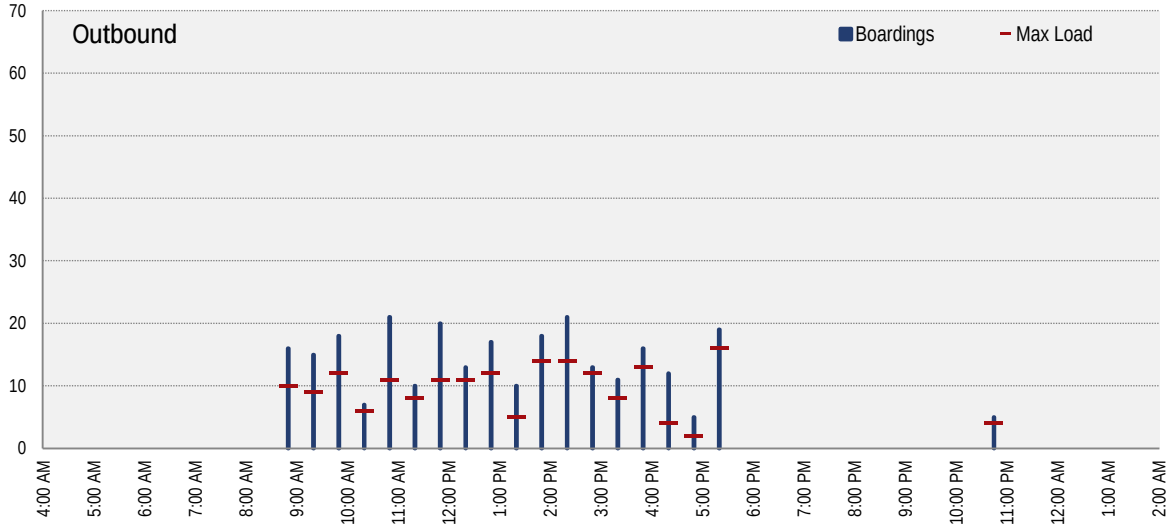
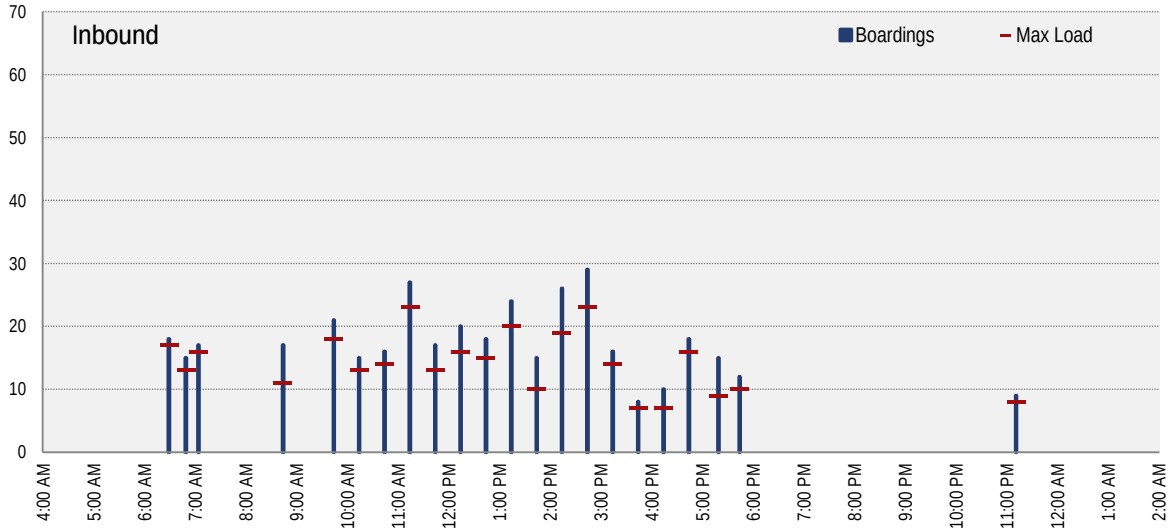


FIGURE 20 | ROUTE 60 SATURDAY INBOUND RIDERSHIP BY TRIP



Note: Data is missing data for Route 60 inbound trips at 5:59 AM and 9:14 AM on Saturday.

Saturday – Routes 62 and 66

Saturday ridership by trip on Routes 62 and 66 (see Figures 21 and 22) is strong and relatively consistent throughout the day. Demand is slightly stronger for riders traveling outbound as compared to inbound.

Most trips carry between 20 and 30 rides, but there are a handful of trips that carry 40 or more riders and one trip (8:20 PM outbound) that carries 40 riders and has a peak load of 34 passengers. This trip is nearing seating capacity on the bus. This indicates a later Route 62 trip to Bishops Corner may be warranted.

FIGURE 21 | ROUTE 62/66 SATURDAY OUTBOUND RIDERSHIP BY TRIP

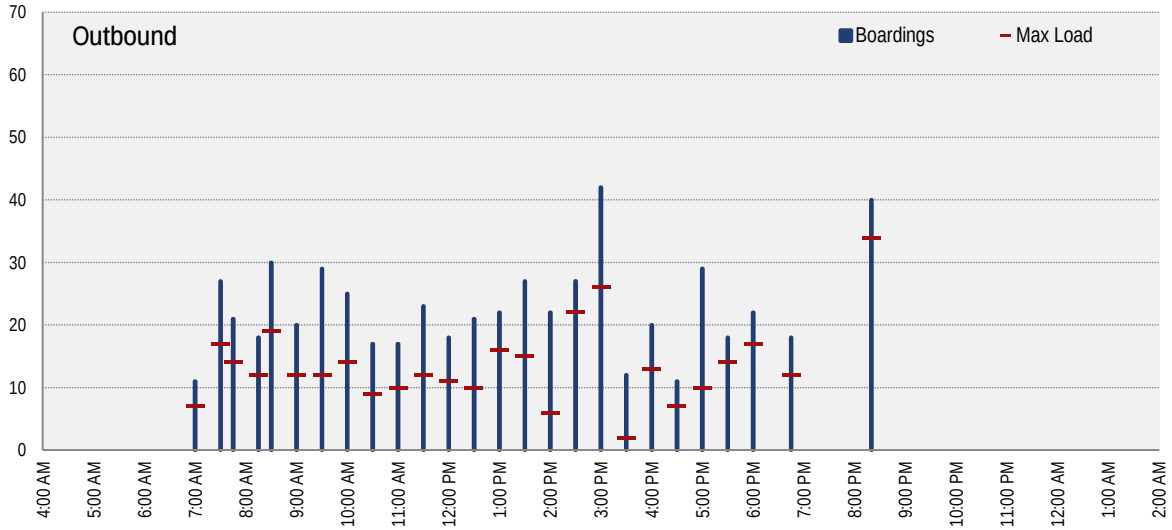
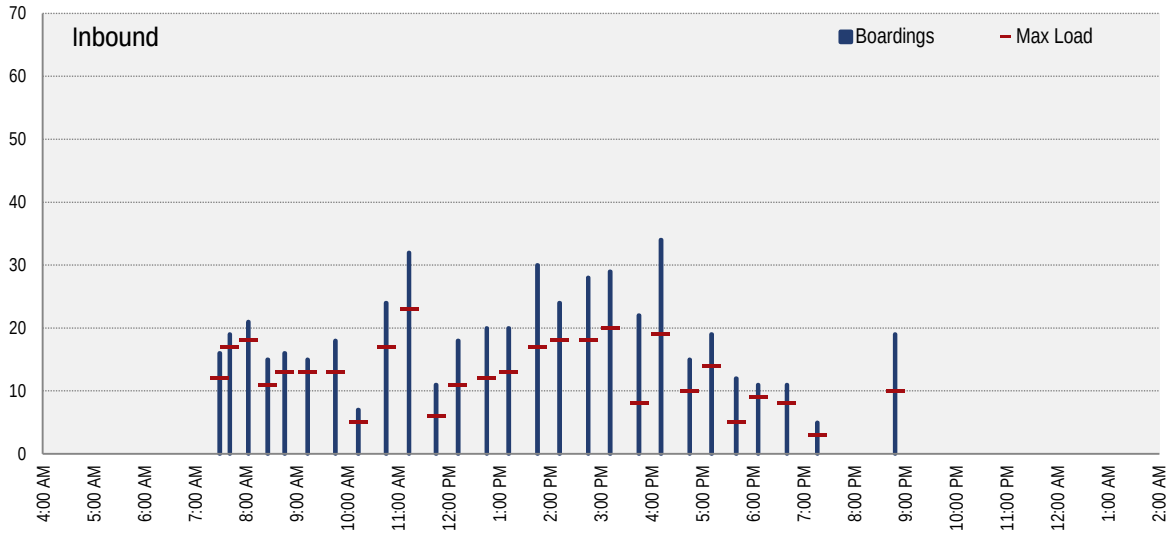


FIGURE 22 | ROUTE 62/66 SATURDAY INBOUND RIDERSHIP BY TRIP



Saturday – Route 64

Saturday ridership by trip for Route 64 is shown in Figures 23 and 24. These trips are well balanced throughout the day. Demand is slightly stronger for travel heading inbound than outbound. As noted with Route 62 service above, the last trips of the day carry 30 passengers, indicating a later Route 64 trip may be warranted. Note that late night holiday season trips are not included below.

FIGURE 23 | ROUTE 64 SATURDAY OUTBOUND RIDERSHIP BY TRIP

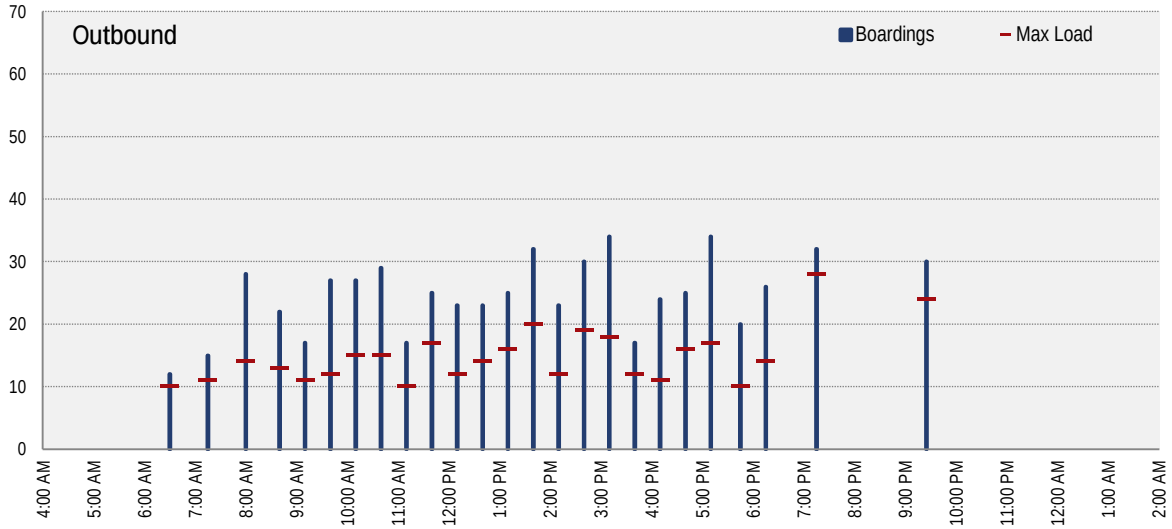
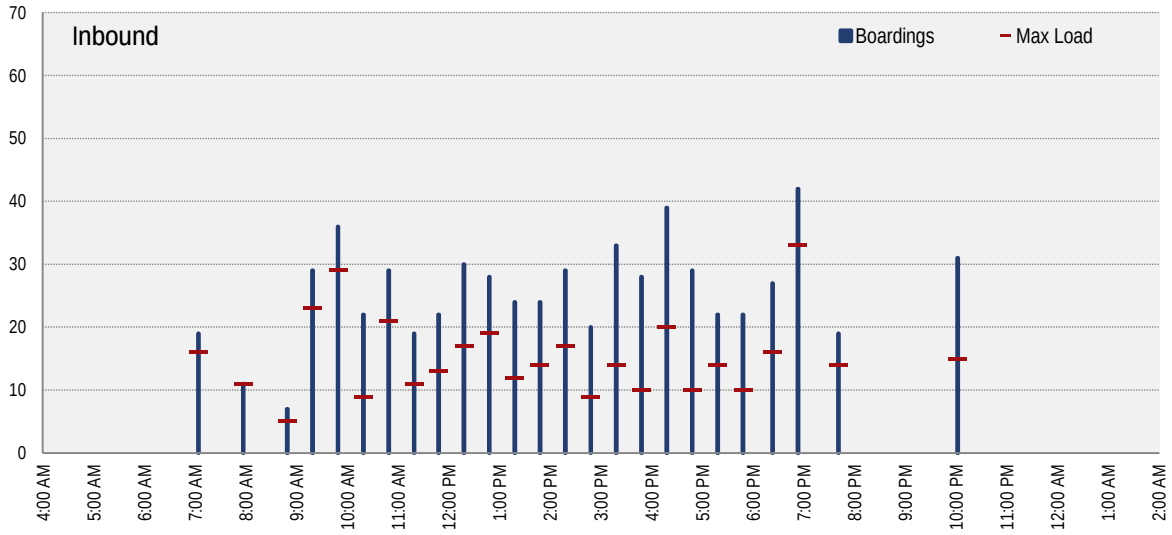


FIGURE 24 | ROUTE 64 SATURDAY INBOUND RIDERSHIP BY TRIP



Note: Data is missing for the Route 64 inbound trip at 8:17 AM on Saturday.

Sunday – Routes 60, 62 and 64

Sunday service on Farmington Avenue is provided by Routes 60, 62 and 66. Ridership by trip is shown in Figures 25 and 26. The service alternates between Route 62 and 66 trips, with the last two outbound trips operated as Route 60. This service structure is reflected in the ridership data; trips on Route 62 to Bishops Corner carry more riders than trips on Route 66, which travels to Westgate Shopping Center.

With relatively strong demand for the first Route 62 trips, it appears than an earlier Sunday AM trip to Bishop's Corner may be warranted. Extending the last two Route 60 trips to Bishops Corner may also attract more riders. Note that holiday season service is not included below.

FIGURE 25 | ROUTE 60/62/66 SUNDAY OUTBOUND RIDERSHIP BY TRIP

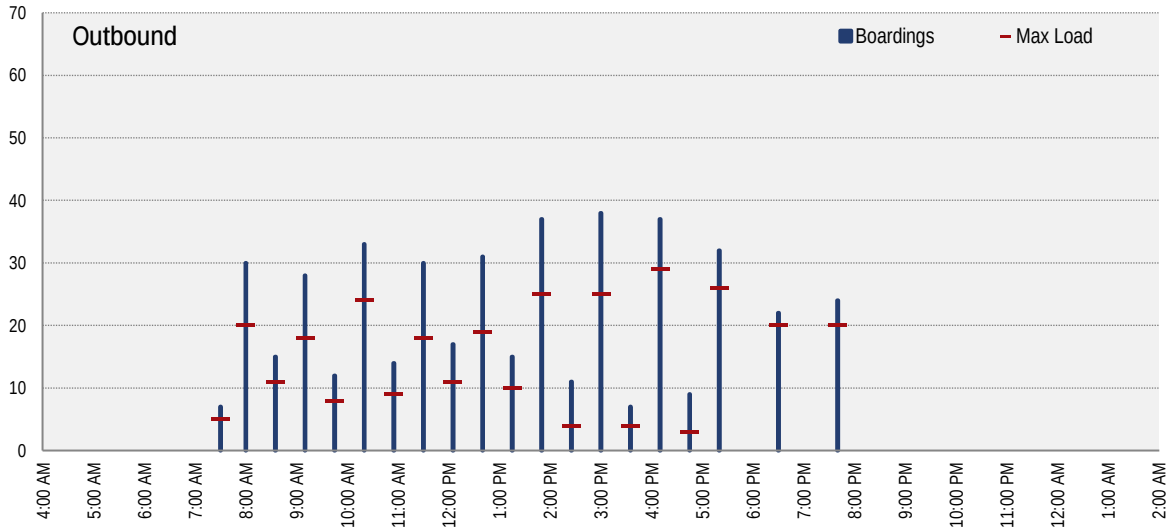
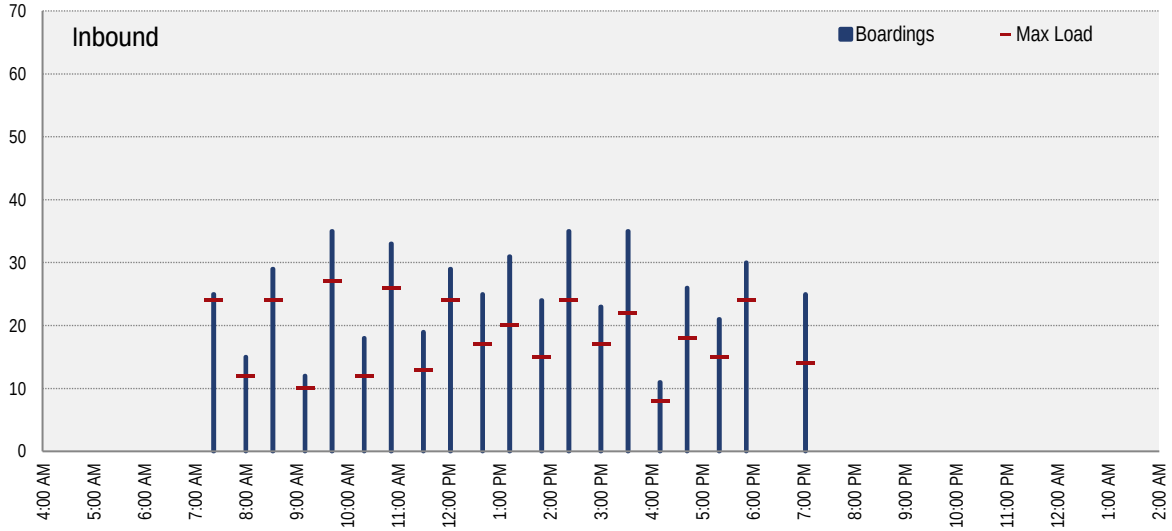


FIGURE 26 | ROUTE 60/62/66 SUNDAY INBOUND RIDERSHIP BY TRIP



Note: Data is missing for the Route 60 inbound trip at 6:19 AM on Sunday.

Performance

Combined, Routes 60, 62, 64 and 66 perform well above the Hartford Division average by all measures (see Figure 27). Operating cost per passenger on weekdays is $3.52, which is below the division average of $4.84. On Saturday, the cost per passenger is nearly half that for the division and on Sunday the cost is 40% of the division average. The number of passengers per revenue vehicle hour and vehicle mile also greatly exceed the division averages, demonstrating that the Farmington Avenue corridor is highly productive for transit.

FIGURE 27 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 60/62/ 64/66	DIVISION AVG	ROUTE 60/62/ 64/66	DIVISION AVG	ROUTE 60/62/ 64/66	DIVISION AVG
Operating Cost per Passenger	$3.52	$4.84	$3.51	$6.30	$2.71	$6.66
Passengers per Revenue Vehicle Hour	36.3	28.9	36.5	27.0	47.3	29.7
Passengers per Revenue Vehicle Mile	3.6	2.6	3.5	2.4	4.5	2.9

Source: CTtransit performance data

Combined, Routes 60, 62, 64 and 66 have on-time performance that is marginally better than the Hartford Division average, with roughly 17% of time point checks showing buses on schedule (see Figure 28).

FIGURE 28 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 60/62/64/66	DIVISION AVG
Early	0.3%	0.2%
Late	16.8%	18.9%
On-Time	82.9%	80.9%

Source: CTtransit performance data

FIGURE 29 | WEEKDAY OPERATING COST PER PASSENGER

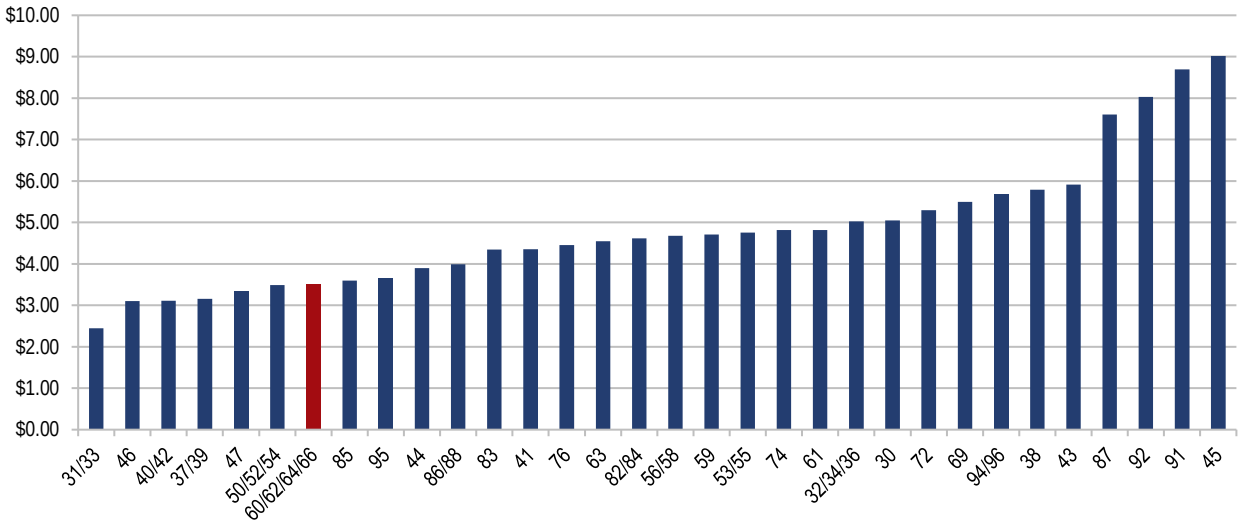
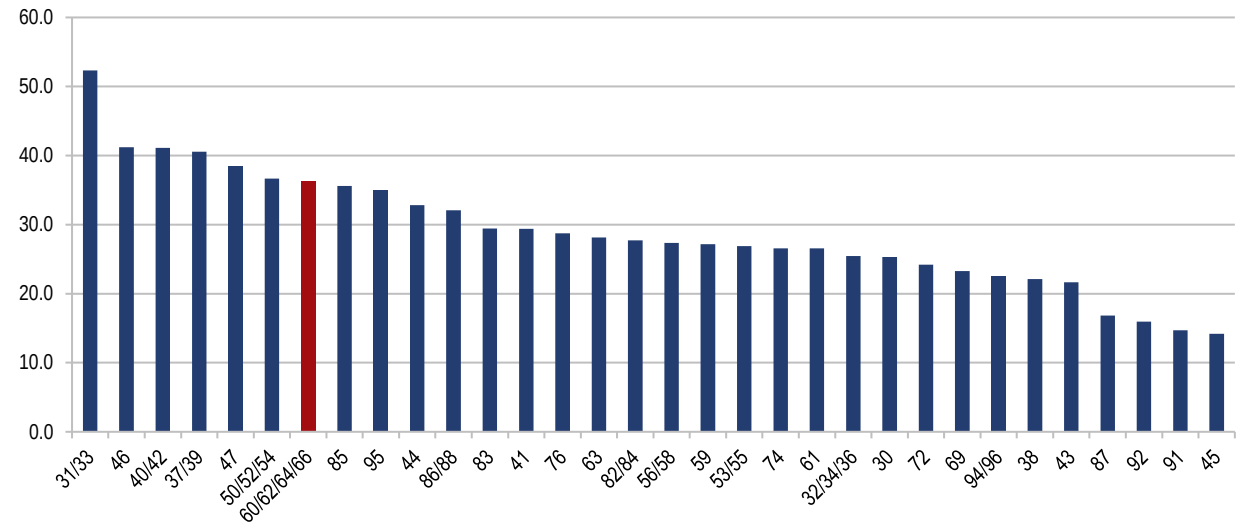


FIGURE 30 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT

Farmington Avenue connecting downtown Hartford with West Hartford Center is one of the region's most transit oriented corridor, with a high density of population and employment. It is also a corridor filled with retail and has an excellent pedestrian environment. CT***transit*** serves this corridor with a series of routes, Routes 60, 62, 64 and 66, which share a common alignment between downtown Hartford and West Hartford Center. From West Hartford Center, routes diverge to serve Bishops Corner (62) Westfarms Mall (64), Westgate Shopping Center (66), UConn Health (66H), Unionville (66F) and Tunxis Community College (66T). Together, these routes are highly productive, particularly along the shared Farmington Avenue corridor. Outer segments each serve highly productive trip generators at the end of the line, but are less productive along the corridors leading to these destinations.

Strong ridership on Routes 60, 62, 64 and 66 reflect the physical assets along Farmington Avenue as well as the fact that service is direct, frequent and fast. In addition, while the routes branch off at West Hartford Center, the branches serve distinct markets. The challenges facing transit service along Farmington Avenue, largely involve ensuring there is both sufficient transit capacity (enough seats at the right times), not over-serving the outer ends of the individual routes and balancing the productivity of the 60 series routes with introduction of CT***fastrak***.

CT*fastrak*

CT***fastrak*** service is scheduled for implementation in March 2015. Implementation will include four new routes that will provide service along shared segments of Route 60, 62, 64 or 66 alignments or intersect with these routes at key points and possibly impact ridership. These include:

- Route 102: the CT***fastrak*** service plan includes a new Route 102 that will connect Hartford, New Britain and Bristol. It will operate on Asylum and Farmington avenues, as far west as Sigourney Street, then travel south on Sigourney Street to enter CT***fastrak*** at Sigourney Station. The service is scheduled to operate daily with weekday service operating from 4:35 AM to 12:15 AM; frequencies are scheduled for 30 minutes peak and 60 minutes in the mid-day and evening. Saturday service is also extensive; service begins at 5:15 AM and continues until 12:15 AM with 60 minute service all day. Sunday's schedule is somewhat shorter (7:10 AM to 8:15 PM) with hourly service all day.
- Route 121: the CT***fastrak*** service plan includes a new local Route 121 that will connect Manchester Community College and downtown Hartford with the UConn Health campus in Farmington, traveling on CT***fastrak*** from Sigourney Station to New Britain then via Route 9 and I-84 to the UConn campus in Farmington. The service is scheduled to operate daily with weekday service operating from 5:00 AM to 12:15 AM; frequencies are scheduled for 20 minutes peak, 30 minutes mid-day and 60 minutes in the evening. Saturday service is also extensive, operating from 5:30 AM and until 12:15 AM with 30 minute service all day and 60 minutes in the evening. Sunday's schedule is somewhat shorter (6:30 AM to 9:20 PM) with hourly service all day.
- Route 128: the CT***fastrak*** service plan includes a new local Route 128 that will connect downtown Hartford with the Westfarms Mall, traveling via CT***fastrak*** to Flatbush Station and then operating to Westfarms Mall via New Britain Avenue. From Westfarms Mall, Route 128 will continue to New Britain. The service is scheduled to operate daily with weekday service operating from 4:20 AM to 11:40 PM; frequencies are scheduled for 20 minutes peak, 30 minutes mid-day and 60 minutes in the evening. Saturday service is also extensive; service begins at 4:10 AM and continues until 11:40 PM with 30 minute service all day and 60 minutes in the evening. Sunday's schedule is somewhat shorter (6:40 AM to 8:40 PM) with hourly service all day.

- Route 153: the CT***fastrak*** service plan includes a new feeder Route 153 that will travel from CT***fastrak*** Flatbush Station to West Hartford and Copaco Center, traveling via Flatbush Avenue, Quaker Lane South, Park Road north on Main Street in West Hartford. Along with Route 62, it will operate along North Main Street in West Hartford between Flatbush Avenue and Bishops Corner. Route 153 is scheduled to operate daily and provide hourly service between 5:30 AM and 11:30 PM on weekdays, 6:30 AM and 11:30 PM on Saturday and 7:30 AM to 8:30 PM on Sundays.

These CT***fastrak*** routes will give riders an alternative route to several of Routes 60, 62, 64 and 66's highest ridership destinations including UConn Health, Westfarms Mall, West Hartford Center and Bishops Corner. Riders' response to the new CT***fastrak*** service is not yet known, however it is likely some riders will switch to new services. A comparison of travel times on new CT***fastrak*** services versus existing Routes 60, 62, 64 and 66 finds that CT***fastrak*** offers a competitive travel time for some routes but not all (see Figure 31). In addition, Route 66H 66F and 66T provide local connections between West Harford, UConn Health, Farmington, Unionville and Tunxis College. And, Route 64W provides local connections from Farmington Avenue and West Hartford Center to the Westfarms Mall. It is likely different riders will make travel choices based on their point of origin and other considerations, including boarding the first bus available. CT***fastrak*** routes may also offer more frequent and/or later service that will meet specific needs.

FIGURE 31 | COMPARISON OF TRAVEL TIMES FROM DOWNTOWN HARTFORD

Destination	Travel Time – Existing	Travel Time – CTfastrak	Notes
UConn Health	38-41 minutes (Route 66)	33-34 minutes (Route 121)	
Westfarms Mall	36-43 minutes (Route 64W)	25-37 minutes (Route 128)	
Tunix Community College	60-67 minutes (Route 66T)	65-70 minutes (Route 503)	CT*fastrak* requires transfer

Service Improvement Options

Most segments of Routes 60, 62, 64 and 66 will continue to provide unique service to a number of destinations and will continue to be an important part of the Hartford system. Based on existing data, opportunities to strengthen Route 72 include:

- **Create Transit Emphasis Corridor on Farmington Avenue.** With peak operating frequencies of 15 minutes or less along Farmington Avenue, CT***transit*** may want to coordinate with the CTDOT and the cities of Hartford and West Hartford to make roadway improvement to speed the flow of buses in this corridor. Ideally, this would involve designating a travel lane for buses on Farmington Avenue. Other improvements could include limiting the number of bus stops, strictly enforcing no parking at bus stops, and transit signal priority.
- **Created a Branded Service along Farmington Avenue.** Given high ridership along Farmington Avenue, CT***transit*** may want to "brand" the Farmington Avenue routes by strengthening the current naming convention and adding additional unique service features such as distinctive passenger facilities, higher quality passenger amenities, and improved information systems, such as real time passenger information.
- **Operate Bigger Vehicles on Farmington Avenue.** Although most trips on Routes 60, 62, 64 and 66 are not overcrowded, many trips are. Overcrowding may also discourage some riders from using the service. Adding capacity by adding more vehicles may not be possible, especially during peak periods. An alternative to adding the number of vehicles is operating larger vehicles.
- **Create more visible, transit stops on Main Street in West Hartford Center.** There are CT***transit*** stops with shelters on Farmington Avenue near its intersection with South and North

Main Streets in West Hartford Center. However, with the addition of CT***fastrak*** Route 153 and other potential improvements to the corridor, this intersection may become a more frequent transfer point. CT***transit*** may want to work with the town of West Hartford to identify locations just north and south of Farmington Avenue to develop a more visible bus stop/transfer point.

- **Convert Route 62 service to Route 60, 64W, or 66.** Route 62 is productive and appears to warrant later evening service, however, some of this demand will be accommodated by CT***fastrak*** Route 153, which will offer hourly service to Bishops Corner until 11:30 PM on weekday and Saturdays, and until 8:30 PM on Sundays. Later evening Saturday evening service and earlier Sunday morning service on Route 153 may be warranted, as the last Route 62 trips on Saturday between 9:30 and 10:00 PM carry high ridership, as do the first Sunday AM trips at 8:00 AM.
- **Increase Evening Service on Route 64W.** The Farmington Avenue corridor is highly productive throughout the day and trips operating between 7:00 and 10:00 PM have very high ridership. (Note that very late evening trips after 11:00 PM are operated as Route 60, and are not well utilized). The last Route 60 outbound trip on Saturday evening should also be extended to Westfarms Mall as Route 64 (on request, as done during the week).
- **Introduce Sunday service on Route 64W.** Only 60, 62 and 66 operate on Sundays. Although CTfastrak Route 128 will provide service from downtown to Westfarms Mall, Route 64W provides this connection for riders living along Farmington Avenue and in West Hartford. Route 62 Sunday trips could be converted to Route 64W trips.
- **Discontinue Route 66H, reduce frequencies to UConn Health.** Trips from downtown Hartford to UConn Health may be up to 10 minutes faster via CT***fastrak*** Route 121, and many commuters will likely opt to use the new route. However, Routes 66H, 66T and 66F provide connections to this major employment center from the highly populated residential areas along Farmington Avenue, and some service should be preserved. Today service operates to UConn every 30 minutes, with every other trip continuing to Unionville and Tunxis Community College. If Route 66H were discontinued, Route 66T would continue to offer hourly service to UConn Health, as well as to Unionville and Tunxis.
- **Serve Tunxis Community College via CT*fastrak* Route 102 and New Britain 503.** With many riders likely shifting off Route 66 trips serving the UConn Health campus, the very long distance Route 66T route will likely become less productive. Route 66T travels more than 12 miles beyond Westgate Shopping Center and about 10 miles beyond UConn. Given that students traveling from downtown or anywhere along the CT***fastrak*** corridor would have an equally attractive alternative via CT***fastrak*** and New Britain Route 503, the Route 66T variant could be discontinued.
- **Operate more Route 66F trips to Unionville.** Building upon the two options above, if Route 66H and 66T were discontinued, Route 66F service could be operated on an hourly basis maintaining local connections between Unionville, Farmington Center, UConn Health, West Hartford Center and downtown. This is essentially the same frequency of service provided to Unionville today, but with trips terminating here rather than continuing on to Tunxis.
- **Discontinue Route 66T and 66H, but offer more Express Route 909 service.** Today, Route 909 operates three inbound and three outbound trips daily from the St. Mary's Park & Ride lot in Unionville (two trips in the peak direction and one in the off-peak direction). Additional Route 909 trips could be offered in place of running Route 66H trips.

Route Evaluation

BROAD STREET

61 | Jordan Lane

61R | Ridge Road

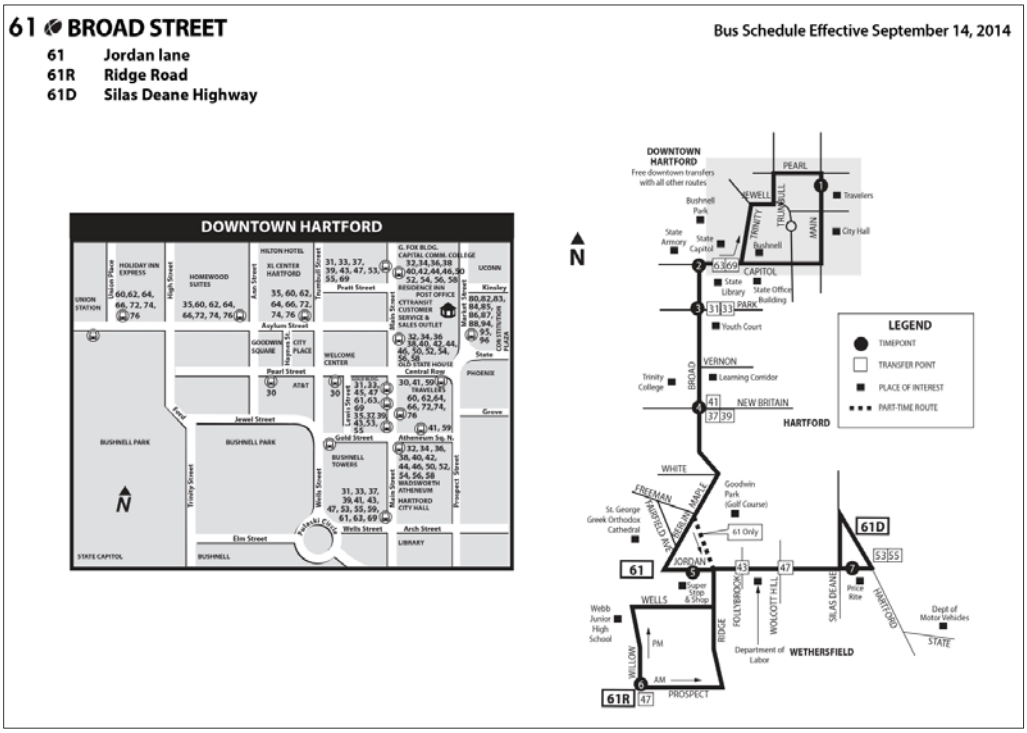
61D | Silas Deane Highway

Service Design

Route 61 is a radial route that begins in downtown Hartford, and travels south along Broad Street to Wethersfield. The route has three separate variants that terminate near Super Stop & Shop on Jordan Lane (61), Price Rite on Jordan Lane (61D), and the intersection of Prospect Street and Willow Street (61D) (see Figure 1). All three variants serve the Broad Street entrance of Trinity College.

Route 61D provides an element of cross-town service to the mostly radial CT***transit*** Hartford network, allowing passengers to transfer between several north-south corridors without traveling all the way to Park Street or downtown Hartford.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 61 begins and ends in downtown Hartford where riders can transfer to most CT***transit*** services. In addition, there are several locations along the route where riders can transfer to other CT***transit*** routes.

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 31	Park Street and New Park Avenue
Route 33	Park Street and Park Road
Route 37	New Britain Avenue
Route 39	New Britain Avenue
Route 41	New Britain
Route 43	Campfield Avenue
Route 47	Franklin Avenue
Route 53	Westherfield Avenue
Route 55	Middletown
Route 63	Hillsdale Avenue
Route 69	Capitol Avenue

Alignments and Service Patterns

Outbound trips from downtown Hartford begin at Main Street and Pearl Street, and travel south along Main Street and west along Capitol Street before reaching Broad. All buses travel south along Broad Street, serving Trinity College, and then continue onto Maple Avenue. The Route 61 variant turns southeast onto Ridge Road and completes a terminal loop along Jordan Lane and Berlin Turnpike. The Routes 61D variant and the Route 61R variant continue along Maple until it turns into Berlin Turnpike, then turn east onto Jordan Lane until Ridge Road. Route 61D continues along Jordan Lane and completes a clockwise terminal loop along Silas Deane Highway, Hartford Avenue, and Jordan Lane. Route 61R turns south onto Ridge Road and completes a loop along Ridge, Prospect, Willow, and Wells (counterclockwise during AM hours, clockwise during PM hours) to serve Webb Junior High School before traveling back north on Ridge.

Inbound trips follow a nearly identical alignment, with a slight variation upon entering downtown, turning north on Trinity and traveling along Jewell, Trumbull, and Pearl before reaching the trip end at Main and Pearl. Route 61 and 61D Saturday trips follow the same alignment as weekday trips. Route 61R operates on weekdays only.

Service Schedule

Route 61 operates six days a week. There are 34 outbound and 39 inbound trips per weekday, operating every 20 minutes during peak hours and every 30 minutes during off-peak. Of the 34 outbound trips, 12 follow the Route 61 alignment, seven trips follow Route 61R and 15 trips use the 61D alignment. During peak periods service alternates between Route 61R and 61D with no trips following the 61 alignment. Off-peak the service pattern generally follows two trips on Route 61, followed by two trips on 61D. There is one 61R trip at 11:30 AM but otherwise, Route 61R operates during peak periods only. The last trips of the day operate as Route 61.

On Saturdays, Route 61 provides 23 outbound trips and 22 inbound trips, with service every half-hour. Fourteen of those trips operate as Route 61 and nine as Route 61D; roughly every third trip is scheduled as Route 61D.

FIGURE 3 | SCHEDULE OVERVIEW

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:28 AM – 1:13 AM	20/30	34/39
Saturday	7:20 AM – 6:41 AM	30	23/22
Sunday	-	-	-

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Route 61 carries 1,012 daily passengers or 13.9 passengers per trip on an average weekday. This is more than 20% lower than the Hartford Division average of 17.7 weekday passengers per trip (see Figure 4).

Saturday ridership is about half of weekday levels, and is just about 25% lower than the division average for Saturday riders per trip.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 61	ROUTE 61	DIVISION AVG
Weekday	1,012	13.9	17.7
Saturday	555	12.3	16.3
Sunday	-	-	17.6

Source: CTtransit performance data

Ridership by Stop

Two of the most heavily used stops on Route 61 are at Trumbull Street and Pearl Street, and Main Street and Ancient Burying Ground, along the route's downtown loop. Outside of the downtown, stops serving the Juvenile Detention Center in Hartford and the Super Stop & Shop in Wethersfield are the only two that generate 50 or more boardings or alightings per day (see Figure 5 and 6).

FIGURE 5 | ROUTE 61 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Jordan Lane and Super Stop & Shop	102 / 7	Wethersfield Super Stop & Shop
Broad Street and Park Street	28 / 52	Juvenile Detention Center
Trumbull Street and Pearl Street	2 / 64	Hartford Central Business Districts
Main Street and Ancient Burying Ground	9 / 199	Travelers Insurance

Load profile data (see Figure 6) combines passenger activity by stop and shows the cumulative passenger load as the bus travels inbound along its route. Ridership by stop without the cumulative load is mapped in Figure 7. The data for Route 61 shows inbound passenger loads peak at Broad Street and Lincoln Street before beging a decline as the route approaches downtown. Ridership appears to be extreemly low on the outer ends of both the 61D and 61R variants. This may be the result of the lack of bus stop signage. Most stops along Jordan Lane and Ridge Road are either unmarked, or marked only with white paint on a utility pole.

FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

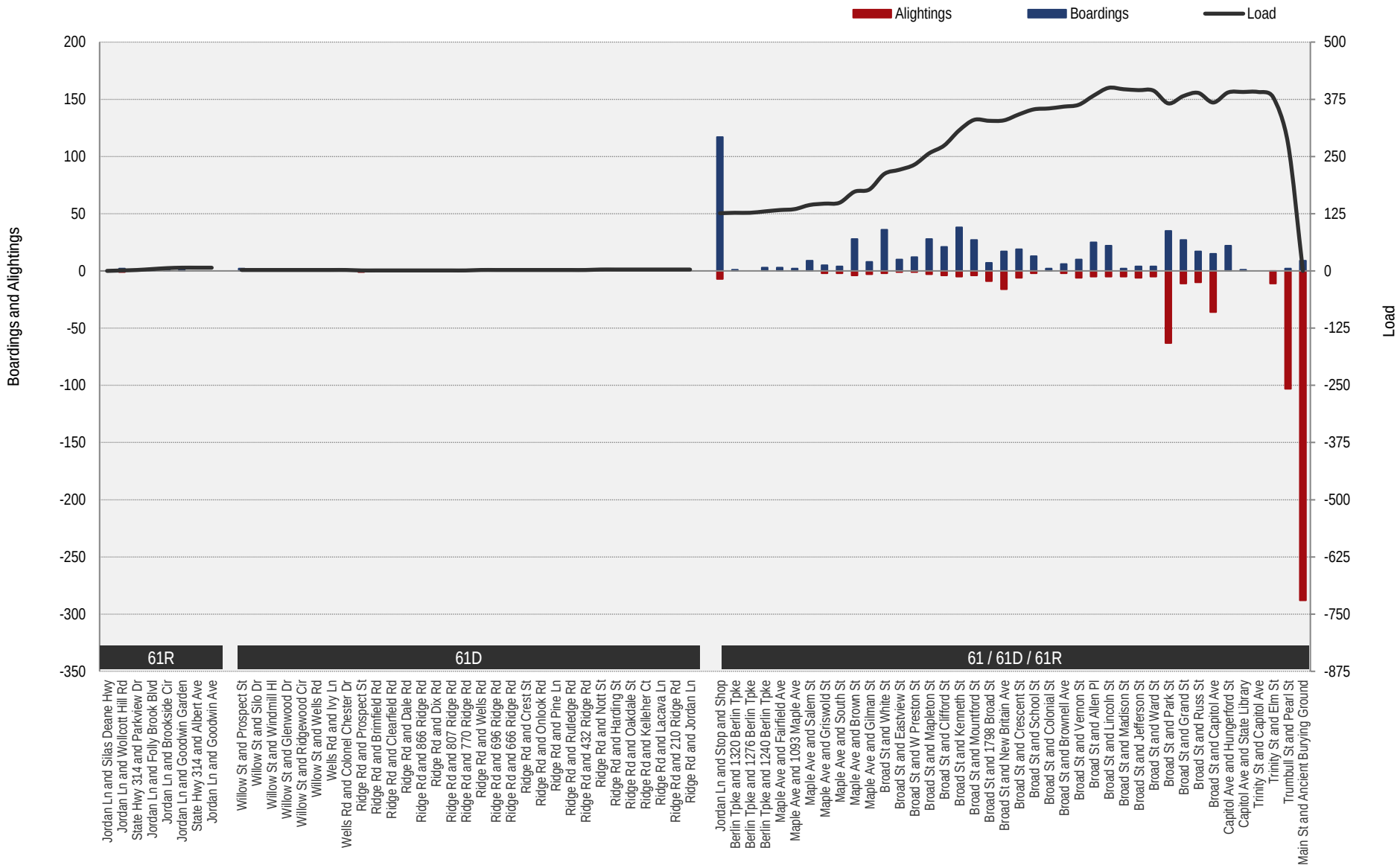


FIGURE 7 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

Ridership by Trip

Weekday Ridership by Trip

Route 61 carries an average of 13.9 passengers per trip on weekdays. Ridership appears to be a mix of peak period commuting trips and mid-day non-work trips. Inbound service has a concentrated period of elevated ridership between approximately 6:00 AM and 8:00 AM, while outbound ridership increases as the day goes on and peaks in the early afternoon.

Maximum loads on Route 61 generally do not exceed 30 passengers. The typical seating capacity of a 40-foot transit bus is 40 passengers, so overcrowding is not an issue on this route.

FIGURE 8 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

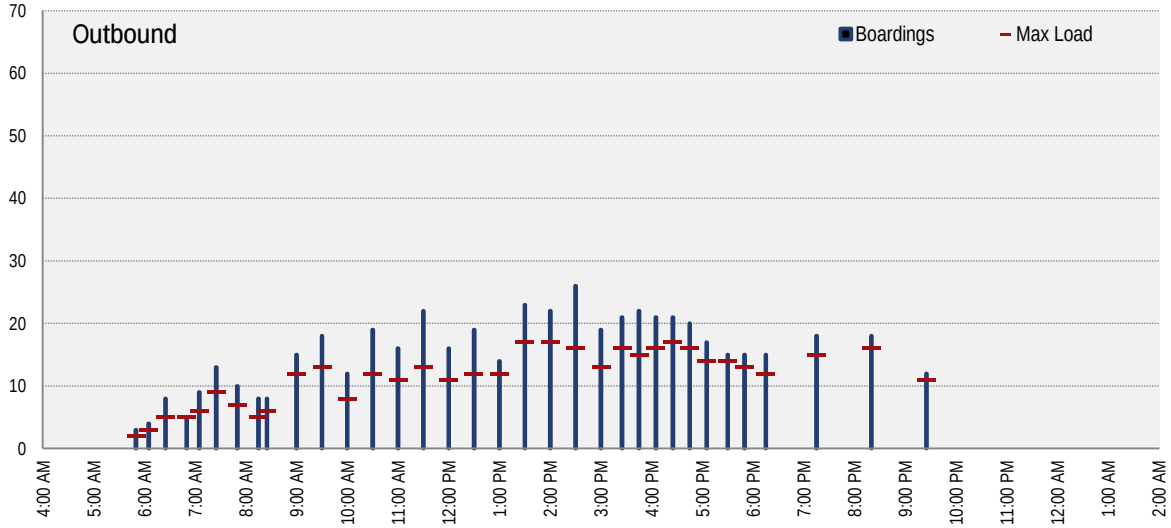
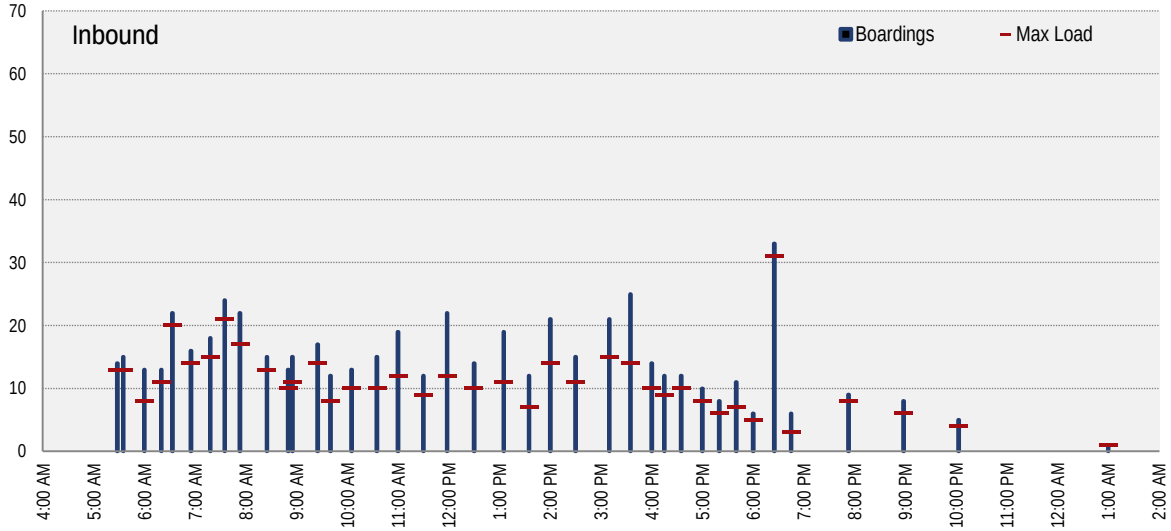


FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday Ridership by Trip

On Saturdays, most trips carry 20 or fewer passengers, with maximum loads topping out at 14 passengers at any one time. One of the highest passenger loads occurs on the last outbound trip of the day, suggesting that there may be demand for later service on Saturdays.

FIGURE 10 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

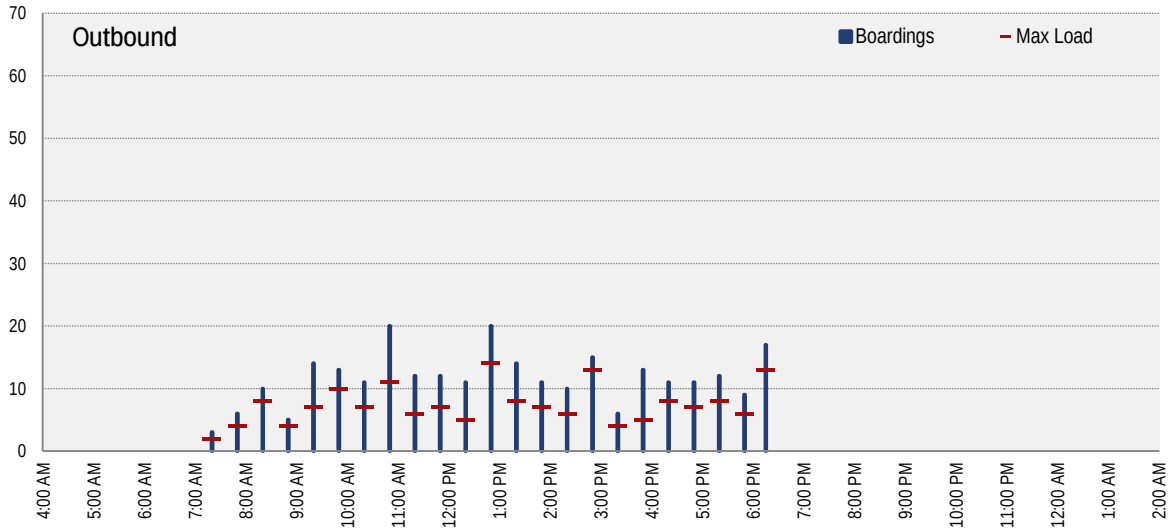
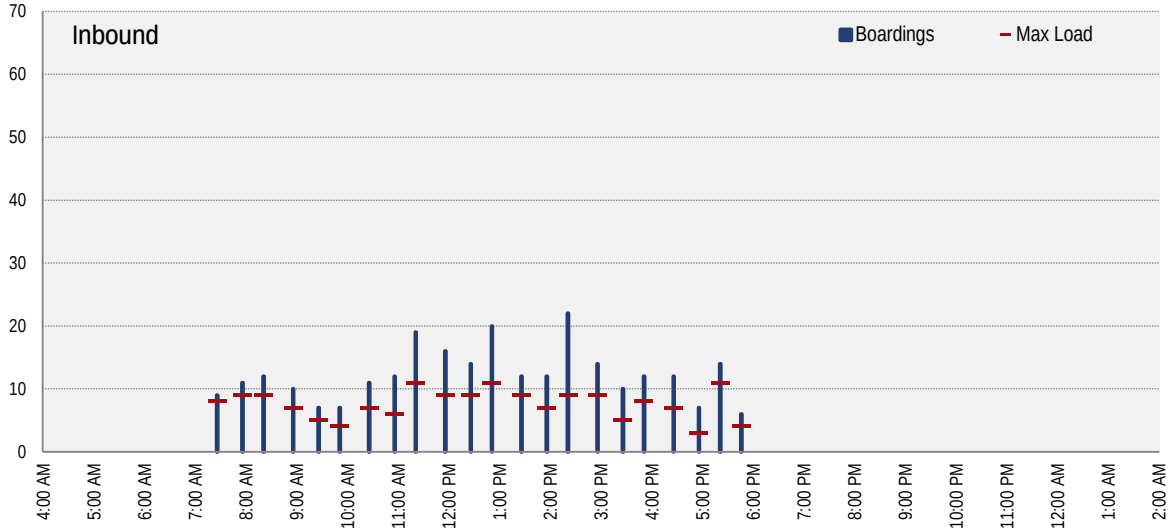


FIGURE 11 | SATURDAY INBOUND RIDERSHIP BY TRIP



Performance

Route 61 performs slightly below average in terms of passengers per revenue hour on weekdays and Saturdays. The route carries 2.5 passengers per revenue mile both on weekdays and on Saturdays, which is slightly below the Hartford Division weekday average, but slightly above the Saturday average (see Figure 12). Saturday service productivity benefits for the fact that the Route 61R variant, which adds a mile but very few riders to the route, does not operate on Saturdays (see Figure 12). On weekdays, Route 61 has an operating cost per passenger that is nearly on par with the Hartford Division average. Cost per passenger increases on Saturdays, but is below the division average.

FIGURE 12 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 61	SYSTEM AVG	ROUTE 61	SYSTEM AVG	ROUTE 61	SYSTEM AVG
Operating Cost per Passenger	$4.82	$4.84	$5.11	$6.30	-	$6.66
Passengers per Revenue Vehicle Hour	26.6	28.9	25.0	27.0	-	29.7
Passengers per Revenue Vehicle Mile	2.5	2.6	2.5	2.4	-	2.9

Source: CTtransit performance data

Route 61 has relatively strong on-time performance, with an 88% on-time arrival rate. Buses are late more often than early, but late arrivals on Route 61 happen less frequently than the Hartford Division average for late arrivals (see Figure 13).

FIGURE 13 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 61	DIVISION AVG
Early	0.8%	0.2%
Late	11.3%	18.9%
On-Time	88.0%	80.9%

Source: CTtransit performance data

FIGURE 14 | WEEKDAY OPERATING COST PER PASSENGER

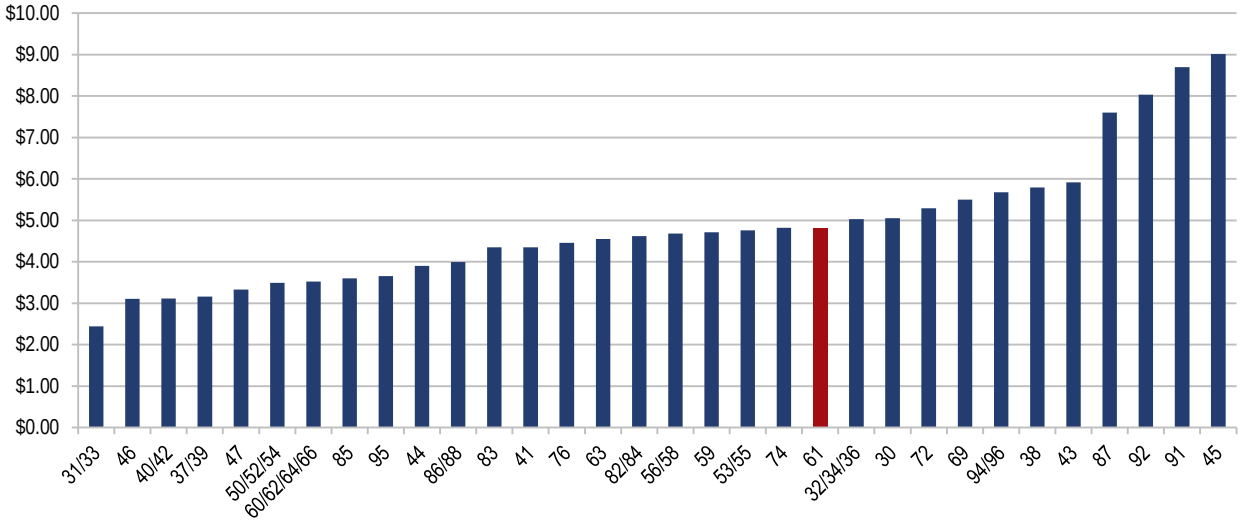
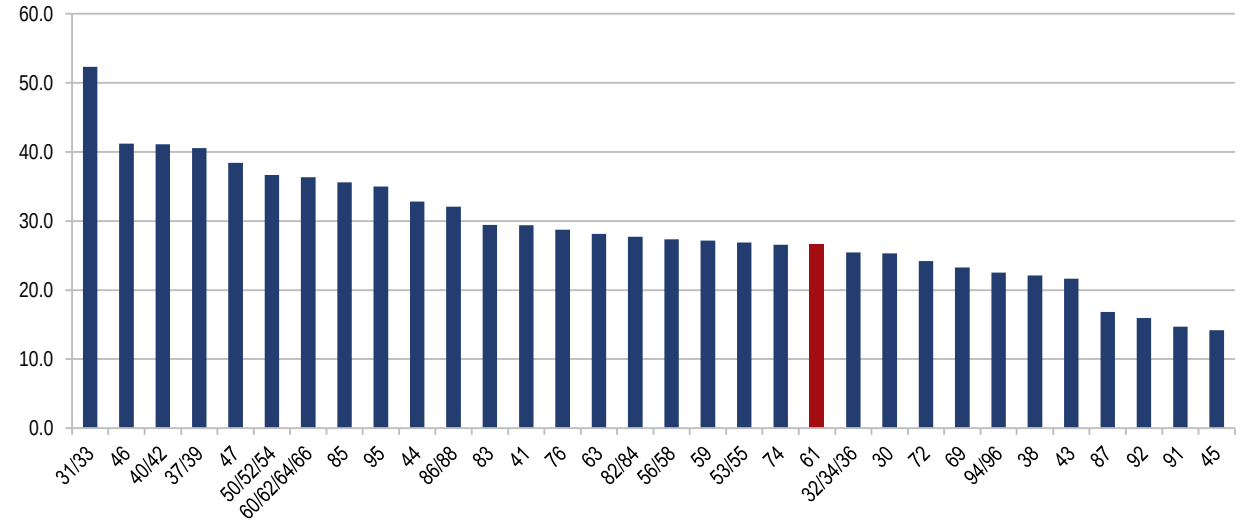


FIGURE 15 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Route 61 is a relatively frequent, direct, and moderately productive route between downtown Hartford and Jordan Lane, where it splits into three variants. Based on available ridership data, neither the 61R branch to Ridge Road, nor the 61D branch to Silas Deane Highway generate more than a handful of passengers per day. These low-ridership branches weigh on the over-all productivity of the service.

Opportunities to strengthen the route include the following:

- **Simplify Route 61 by eliminating Route 61R and 61D variants**. Both variants have low ridership, with ridership levels too low to warrant the service investment. The variants also complicate the route for riders and operations. Eliminating the variants and operating between downtown Hartford and the Super Stop and Shop on Jordon Lane would simplify the route, make it easier to use and understand and be less expensive and easier to operate. Revenue hours

"saved" by eliminating the variants may be reinvested in Route 61 so the route could operate with 20 minute frequency all day, or to increase service hours (operate to 7:00 PM or 8:00 PM).

- **Extend Route 61 to the Village at Wethersfield.** Extending Route 61 service further south (roughly .5 mile) along Berlin Turnpike would provide service to the Village at Wethersfield, a large multi-family housing complex that is currently unserved by any route.
  - Another possible extension from the Village at Wethersfield would be to create a terminal loop, so the route travels south on the Berlin Turnpike, east on Wilbur Cross Highway and north on Ridge Road. This alignment would provide partial coverage for the proposed elimination of the 61R variant as well as provide some cross-town connections to CT***transit*** routes 43, 47, 53 and 55. However, the terminal loop alignment reduces the usefulness of the service to the Village at Wethersfield in an attempt to increase coverage. This trade-off may not be beneficial overall.
- **Add later Saturday service.** On Saturdays, one of the highest passenger loads on Route 61 occurs on the last outbound trip of the day. This suggesting that at least one additional evening trip per direction would likely be well received.
- **Increase street presence along Ridge Road and Jordan Lane**. One potential explanation for low ridership along the 61R and 61D branches of Route 61 may be low due to a lack of awareness of the service. Bus stops along Ridge Road and Jordan Lane are either unmarked or only marked with white paint on a telephone pole. If service along these segments is preserved, then bus stops should be clearly marked to improve awareness of the service.
- **Create Flex Route anchored at Jordon Lane Super Stop & Shop.** Ridership levels on the Route 61R and 61D branches of Route 61 are sufficiently low that the service may be eliminated altogether. However, one option to retaining service would be to operate the route as a flexible demand response service anchored at the Jordon Lane Super Stop & Shop. Flex routes are designed to serve areas that generate between 5 and 7 riders per hour, which may be better matched with demand in Wethersfield.

Route Evaluation

HILLSIDE AVENUE

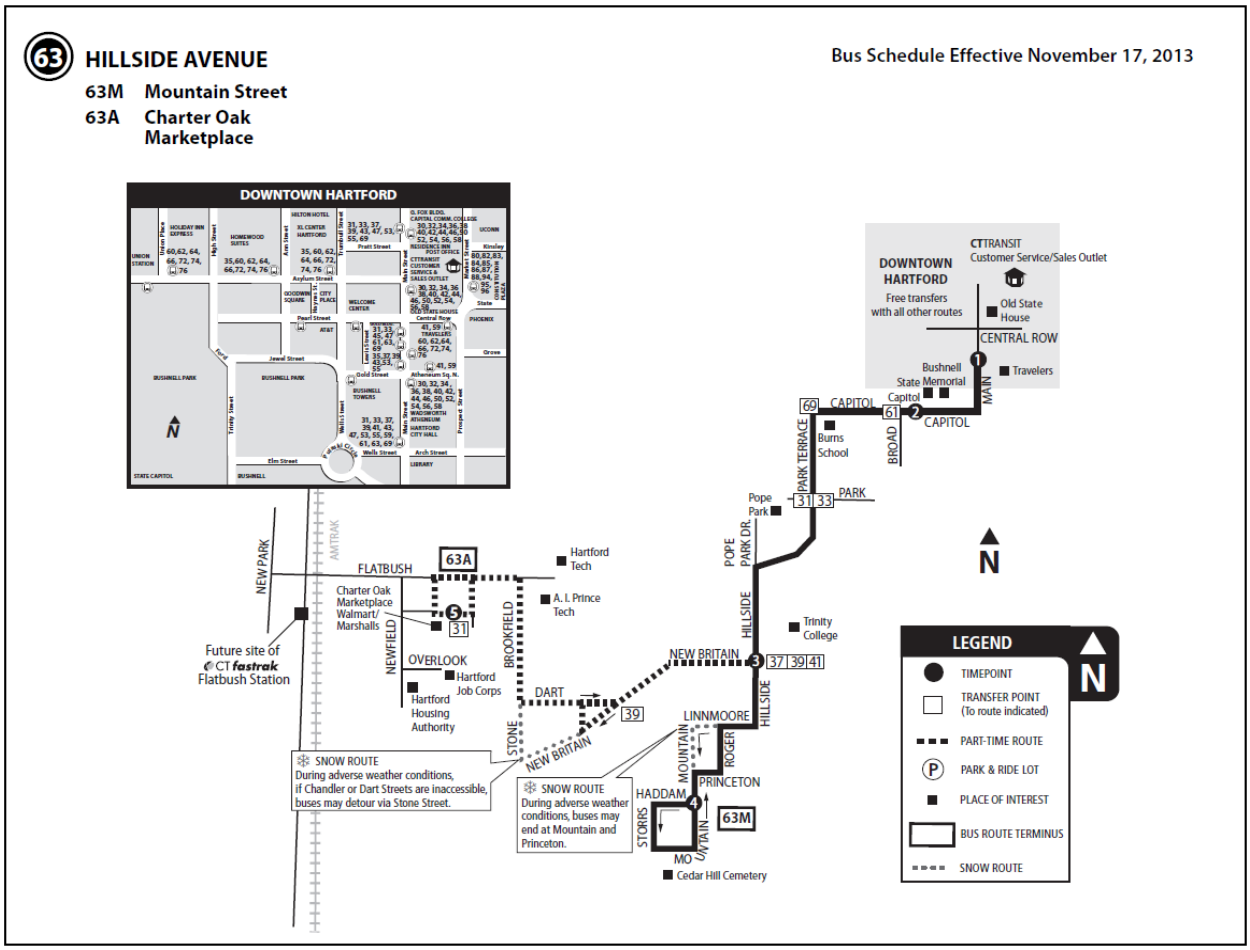
63M | Mountain Street

63A | Charter Oak Marketplace

Service Design

Route 63 is a radial route that originates in downtown Hartford and serves Hillside Avenue. The route has two variants; 63M, which is the primary alignment and serves the South West neighborhoods in Hartford; and 63A, which serves the Charter Oak Marketplace (see Figure 1).

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 63 originates in downtown Hartford, where riders can connect to most CT***transit*** routes. There are also several other locations where riders can transfer to other CT***transit*** routes (see Figure 2). The larger transfer opportunities include connecting with Routes 61 and 69 on Capitol Avenue; to Routes 31 and 33 on Park Terrace; and with Routes 37, 39, and 41 at Hillside and New Britain Avenue. Riders can also connect to Route 31 at Charter Oak Marketplace. The Charter Oak Marketplace is close to the location of a future CT***fastrak*** station.

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 31	Park Street and New Park Avenue
Route 33	Park Street and Park Road
Route 37	New Britain Avenue via Jefferson
Route 39	New Britain Avenue via Retreat
Route 41	New Britain
Route 61	Broad Street
Route 69	Capitol Avenue

Alignments and Service Patterns

Route 63 outbound trips begin in downtown Hartford on Main Street between Pearl Street and Gold Street. Buses travel south on Main Street, west on Capitol Avenue, south on Park Terrace, and south on Hillside Avenue. 63M buses continue south on Hillside Avenue, then travel southeast along Linnmoore, Roger, Princeton, and Haddam, before completing a counterclockwise terminal loop along Haddam, Storrs, and Mountain. Inbound buses travel north along Mountain and return inbound to downtown along the same alignment.

Route 63A buses travel to Charter Oak Marketplace. Buses turn west from Hillside Avenue onto New Britain Avenue, then turn north on Chandler and west on Dart until turning and traveling north on Brookfield Avenue. At Flatbush Avenue, buses turn west and travel in a small loop through Charter Oak Marketplace. Inbound trips return to Flatbush Avenue and travel east, and follow the same alignment back to Hillside Avenue and into downtown Hartford. Between Hillside Avenue and Charter Oak Marketplace, the route overlaps with Route 37.

The primary weekday service pattern is 63M. All peak period and half of the mid-day service follows the 63M alignment. There are only seven weekday trips to Charter Oak Marketplace (63A), which are scheduled in the middle of the day between 9:30 AM and 3:30 PM. On Saturdays, service alternates between the two branches. On Sundays all buses go to Charter Oak Marketplace.

Service Schedule

Route 63 operates seven days a week. Weekday service runs every 20 minutes during peak hours and every half hour during off-peak hours. Service operates every 60 minutes on Saturdays, and every 70 minutes on Sundays.

FIGURE 3 | SCHEDULE OVERVIEW

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:45 AM – 6:46 PM	20/30	31/33
Saturday	7:05 AM – 7:03 PM	60	12/12
Sunday	6:50 AM – 8:20 PM	70	11/11

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Route 63 carries 870 daily passengers or 13.6 passengers per trip on an average weekday. This is more than 20% lower than the Hartford Division average of 17.7 weekday passengers per trip (see Figure 4).

On Saturdays, the route carries approximately 367 passengers or 15.3 passengers per trip, which is slightly below the division average of 16.3 passengers per trip. Total ridership for Route 63 is lowest on Sundays, but per trip, Sunday ridership is about the same as on weekdays.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 63	ROUTE 63	DIVISION AVG
Weekday	870	13.6	17.7
Saturday	367	15.3	16.3
Sunday	302	13.7	17.6

Source: CTtransit performance data

Ridership by Stop

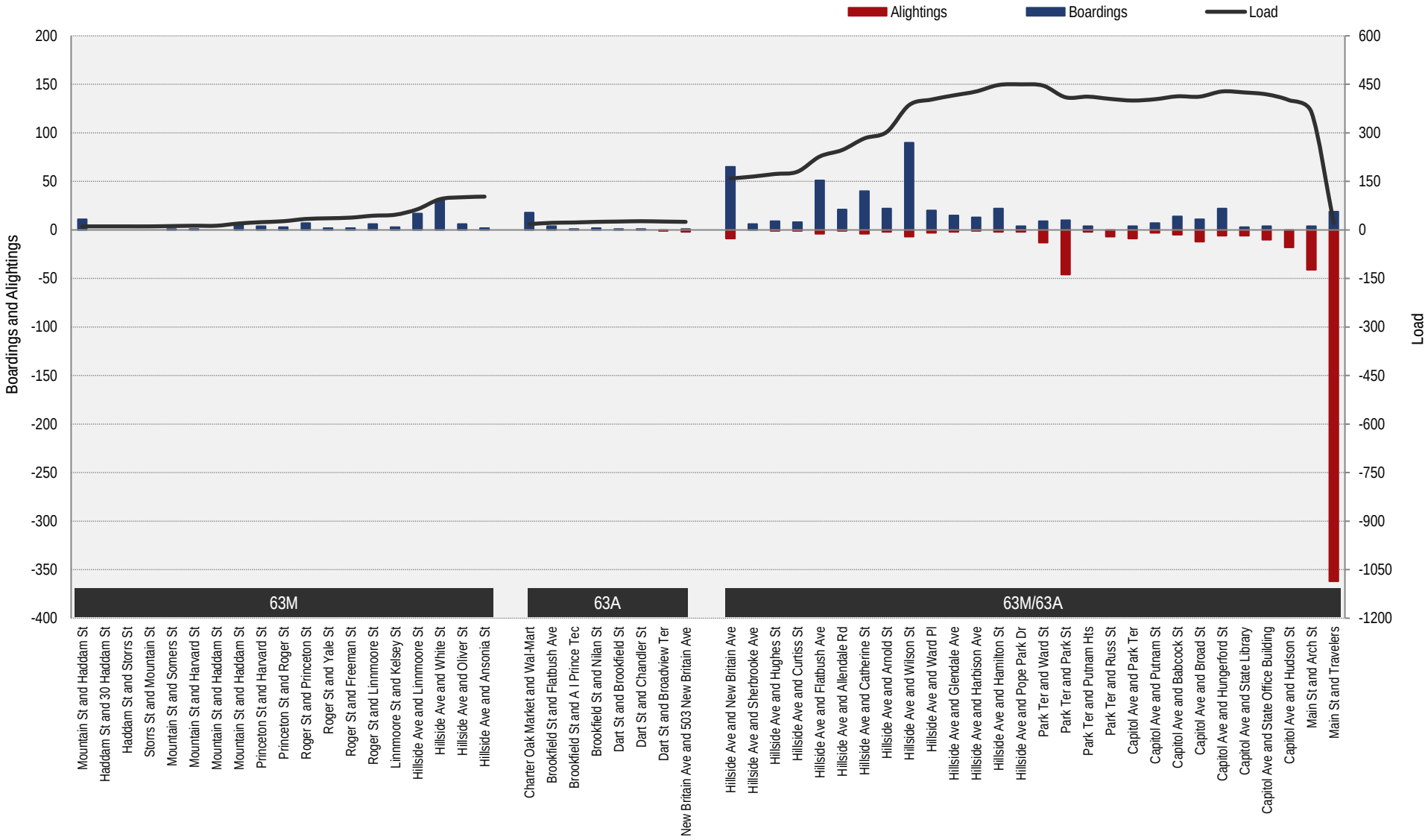
The most heavily used stop on Route 63 is its downtown terminus of Main Street near Traveler's Insurance. Outside of the downtown, several stops along Hillside Avenue generate 50 or more boardings or alightings per day (see Figure 5 and 6).

FIGURE 5 | ROUTE 63 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Hillside Avenue and New Britain Avenue	65 / 9	Hartford Public Library branch and a neighborhood retail strip
Hillside Avenue and Flatbush Avenue	51 / 4	Large apartment complex of Grafton Street
Hillside Avenue and Wilson Street	90 / 7	McDonough Expeditionary Learning School and Trinity Hill Nursing Home

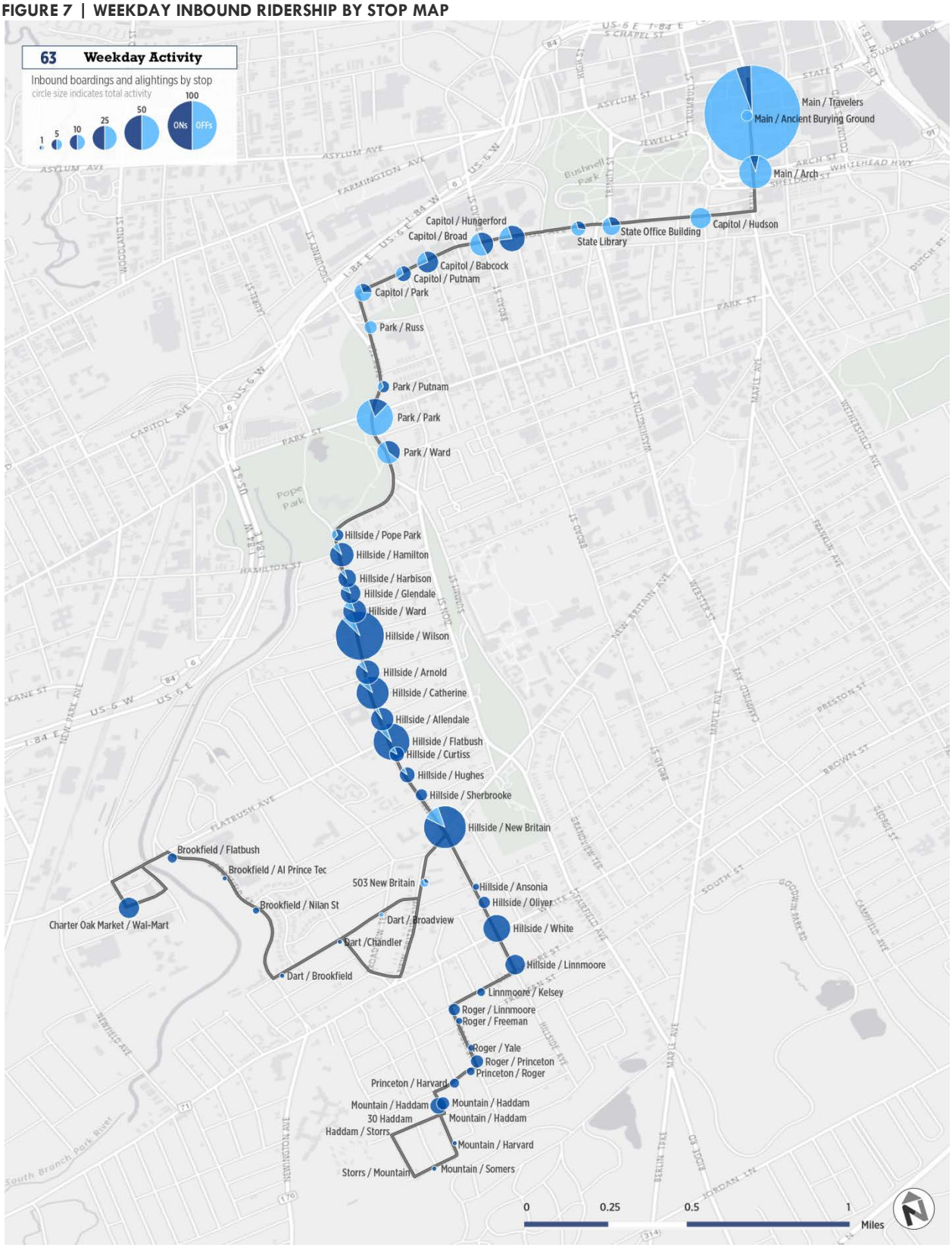
Load profile data (see Figure 6) combines passenger activity by stop and shows the cumulative passenger load as the bus travels outbound along its route. Ridership by stop without the cumulative load is mapped in Figure 7. The data for Route 63 shows inbound passenger loads peak near Pope Park, southwest of downtown Hartford.

FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH



** Saturday and Sunday only.*

FIGURE 7 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Route 63 carries an average of 13.6 passengers per trip on weekdays. Ridership patterns suggest that Route 63 serves many downtown commuters. Inbound service has a concentrated period of elevated ridership between approximately 6:00 AM and 8:00 AM, while outbound ridership is highest in the afternoon.

The highest maximum load on Route 63 is on 7:15 AM inbound trip, with 34 passengers. No other weekday trip exceeds a load of 30 passengers. The typical seating capacity of a 40-foot transit bus is 40 passengers, so overcrowding is not an issue on this route. However, the ridership spike on the last outbound trip of the day suggests strong demand for later outbound service on weekdays.

FIGURE 8 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

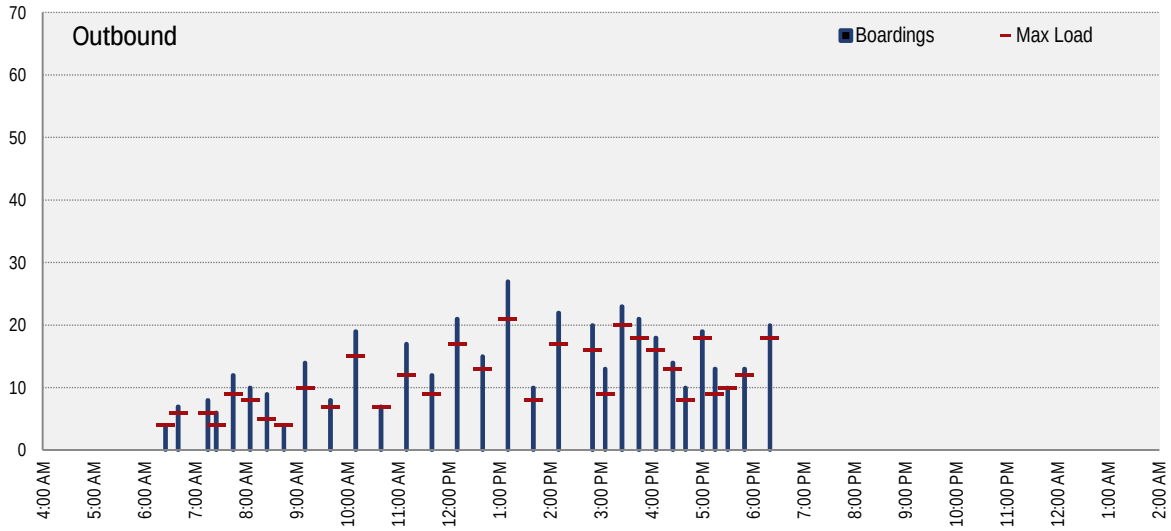
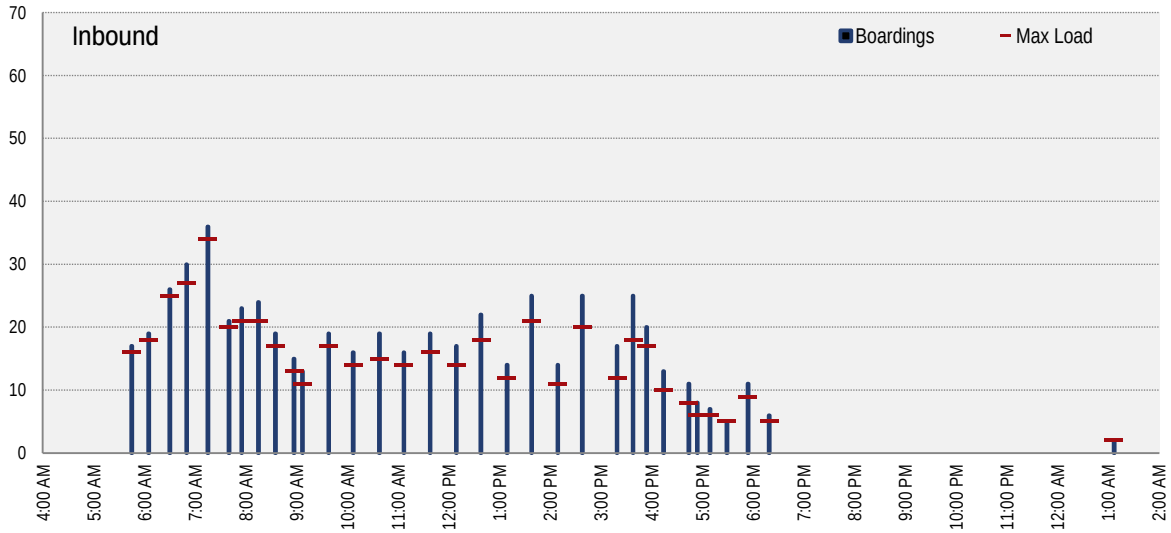


FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Saturday service is more balanced between inbound and outbound trips, reflecting the route's alternating service patters. Only one trip has a maximum load of more than 20 passengers, so vehicle capacity is not an issue on Saturdays.

FIGURE 10 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

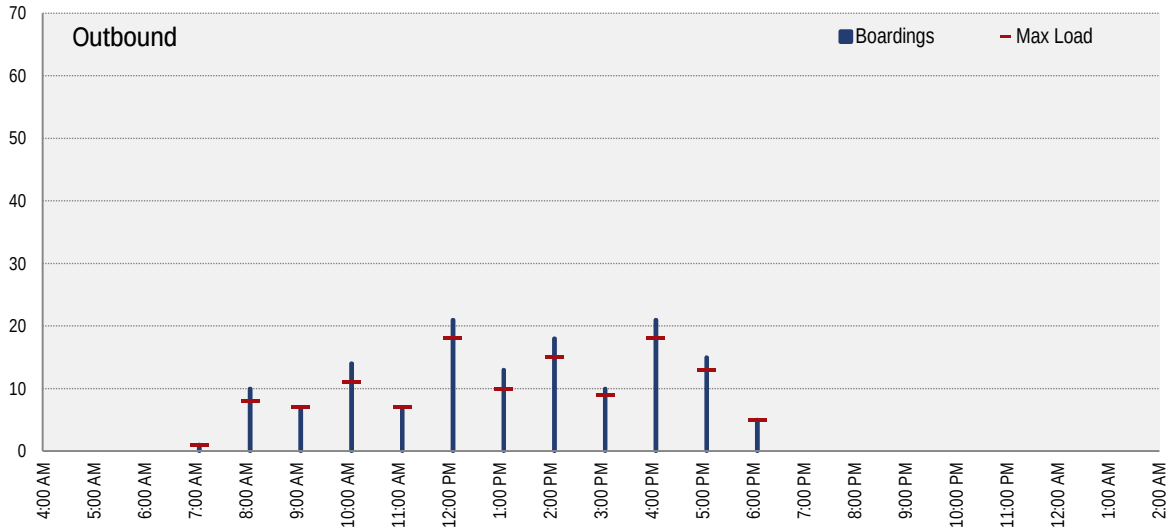
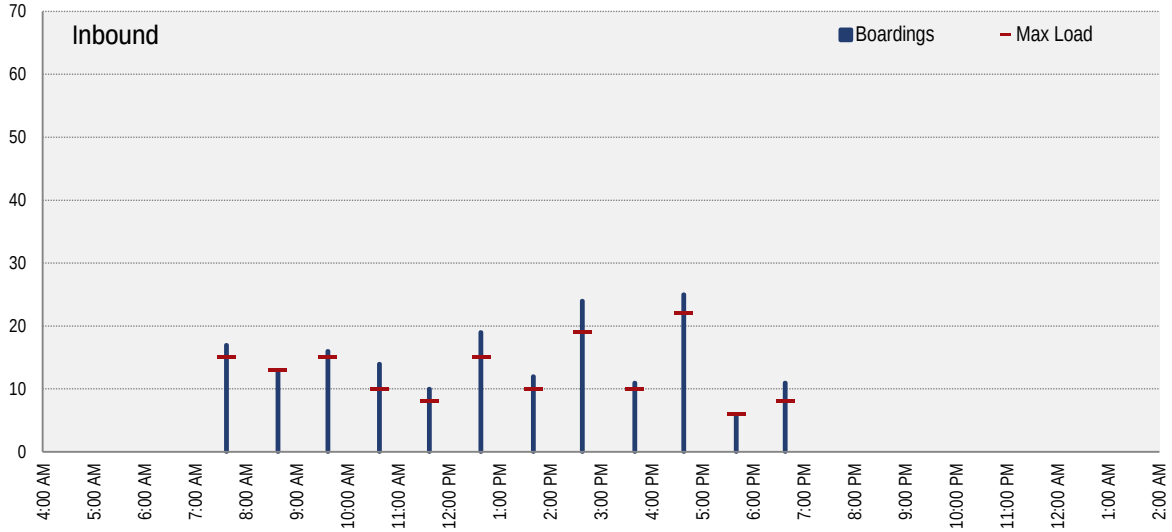


FIGURE 11 | SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

Sunday ridership patterns are similar to Saturdays. The highest maximum load occurs on the last outbound trip of the day, suggesting that there may be demand for later service.

FIGURE 12 | SUNDAY OUTBOUND RIDERSHIP BY TRIP

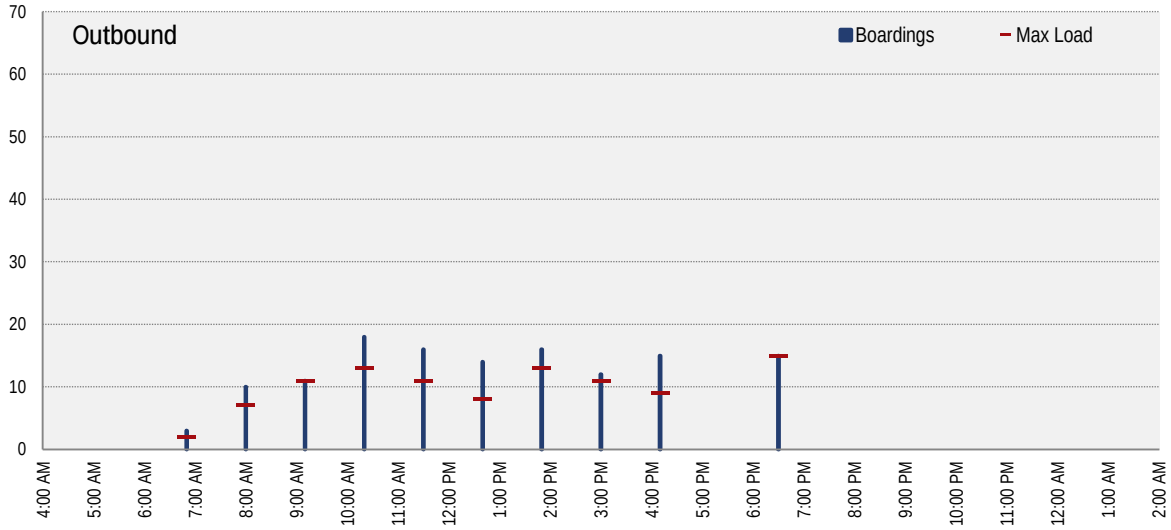
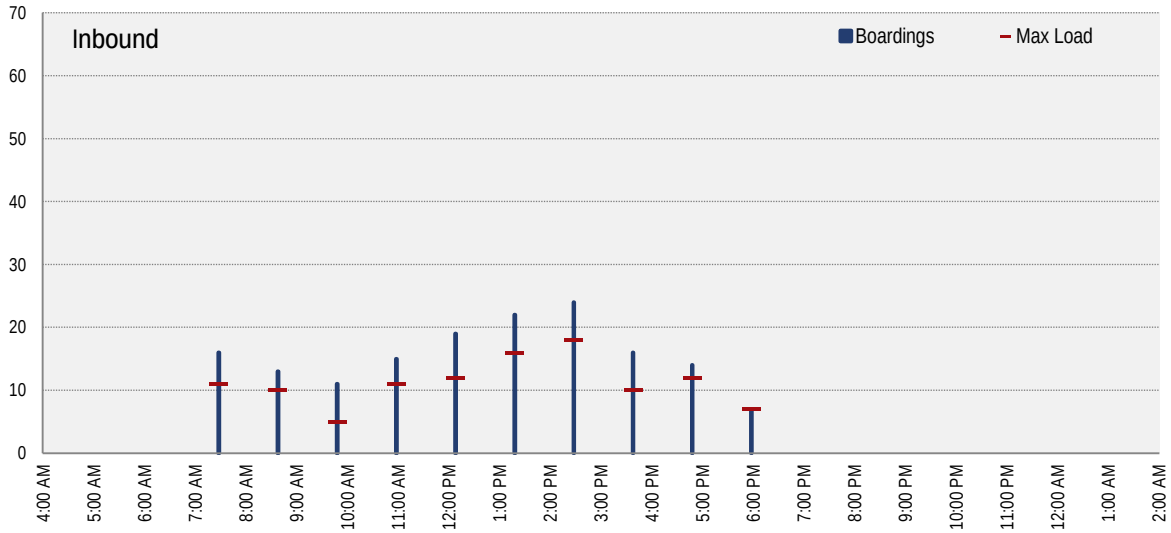


FIGURE 13 | SUNDAY INBOUND RIDERSHIP BY TRIP



Performance

On weekdays, Route 63 performs slightly below average in terms of passengers per revenue hour, but above average for passengers per revenue mile (see Figure 14). This can be attributed to the route's relatively short length compared to other Harford Division routes. The route has above average productivity on Saturdays. Sunday productivity follows a similar pattern to weekdays.

Route 63 has a lower cost per passenger than the Hartford Division average for all service days. This reflects both the relatively short length of the route, and the significant reduction in weekend service frequency.

FIGURE 14 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 63	DIVISION AVG	ROUTE 63	DIVISION AVG	ROUTE 63	DIVISION AVG
Operating Cost per Passenger	$4.55	$4.84	$4.17	$6.30	$5.44	$6.66
Passengers per Revenue Vehicle Hour	28.2	28.9	30.7	27.0	23.5	29.7
Passengers per Revenue Vehicle Mile	3.1	2.6	3.4	2.4	3.0	2.9

Source: CTtransit performance data

Route 63 has below average on-time performance, with a 77% on-time arrival rate. 23% of timepoint checks showed buses running at least five minutes behind schedule (see Figure 15). Route 63 is interlined with Route 72 on most weekday trips. Route 72 has an 82% on-time performance rate, so shifting some running time from Route 72 to Route 63 could help address on-time performance issues on Route 63. However, it appears that more recovery time is needed for both routes to consistently provide on-time service.

FIGURE 15 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 63	DIVISION AVG
Early	0.0%	0.2%
Late	23.0%	18.9%
On-Time	77.0%	80.9%

Source: CTtransit performance data

FIGURE 16 | WEEKDAY OPERATING COST PER PASSENGER

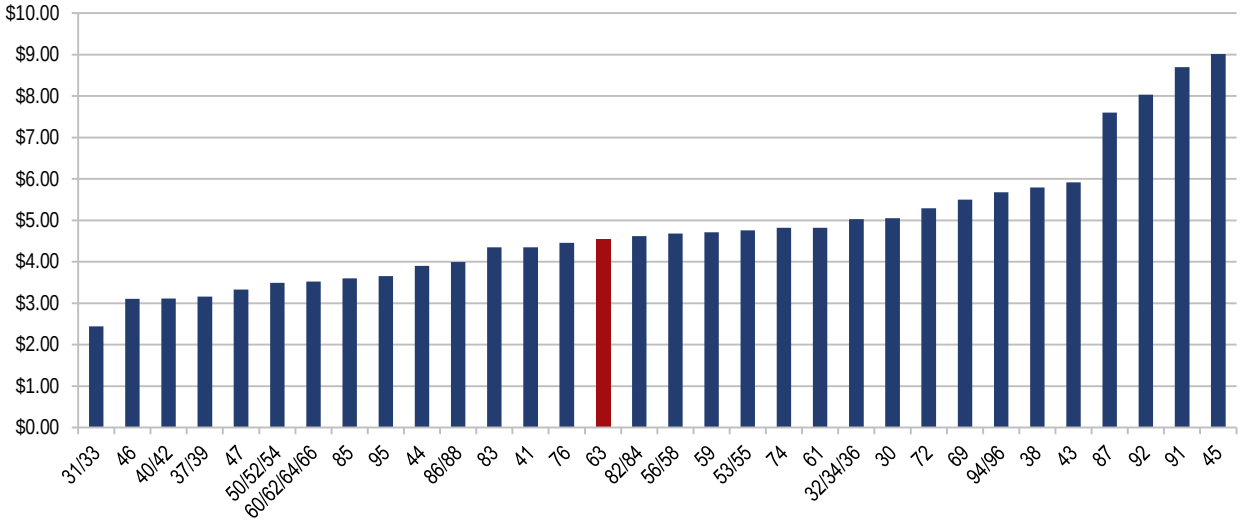
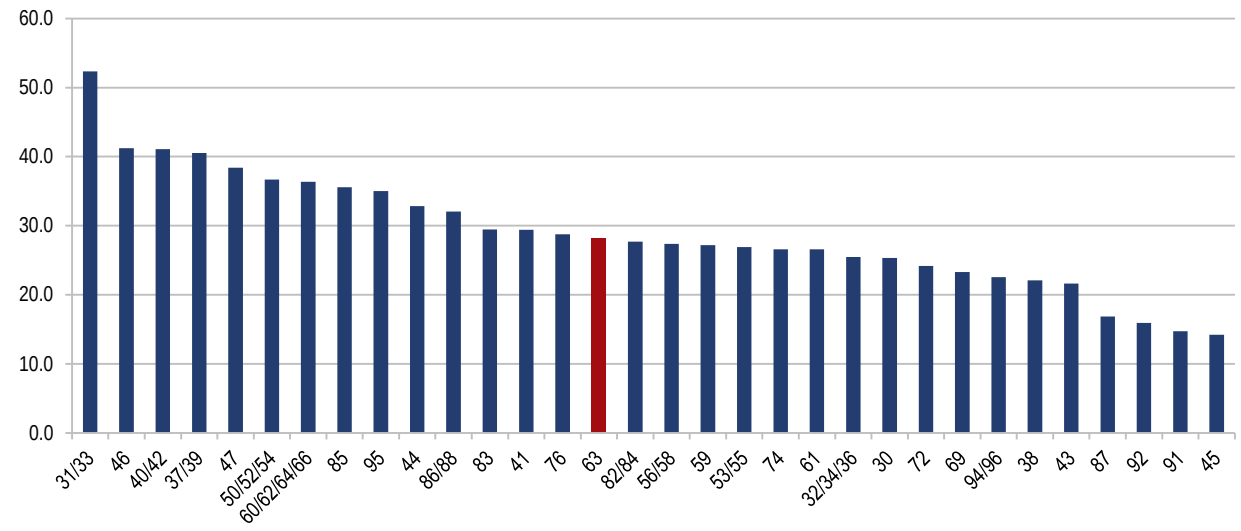


FIGURE 17 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Route 63 is a relatively frequent, direct, and moderately productive route linking downtown Hartford with the South West neighborhood of Hartford and Charter Oak Market Place. The route is most heavily used along Hillside Avenue, giving residents access to both downtown and Charter Oaks retail destinations. Between Hillside Avenue and Charter Oak Marketplace, the route overlaps with Route 37. The route is also partially funded by CRCOG's job access program.

CT*fastrak*

CT***fastrak*** service is scheduled for implementation in March 2015. Implementation will include several new routes that will travel between downtown Hartford and Flatbush Station. The ridership data shows that most of Route 63's ridership is along the local portion of the route, so Route 63 may not be significantly impacted by CT***fastrak*** service. Potential changes include the handful of riders who use Route 63 to travel to Charter Oak Marketplace, who will likely travel by CT***fastrak*** when it opens.

Service Improvement Opportunities

Opportunities to strengthen the route include the following:

- **Extend Route 63A to future Flatbush Station**. A short extension to Flatbush Station near the Charter Oak MarketPlace would connect the high-ridership Hillside Avenue corridor to CT***fastrak*** service. This extension could make Route 63A attractive as a feeder service to and from the station.
- **Split Route 63 into two routes anchored at future Flatbush Station.** From Flatbush Station, both routes (63 and 63A) could serve Charter Oak Marketplace. From there, one route could continue to downtown Hartford via Flatbush Avenue and Hillside Avenue, while the other route could serve the South West neighborhood of Hartford, also via Flatbush and Hillside. In addition to providing direct service from Hillside Avenue and South West Hartford to Charter Oaks retail destinations and Flatbush Station, this approach would also reduce redundancy with Route 37 and provide some cross-town service.
- **Provide later service on all days.** On weekdays and Sundays, route 63 ridership spikes on the last outbound trip of the day. This suggests a demand for later service. Passengers living in neighborhoods along Hillside Avenue and in South West Hartford may benefit from later departure times, especially if they are transferring from other CT***transit*** routes in downtown Hartford.
- **Eliminate the Route 63A variant on weekdays.** The data shows most riders use Route 63 to travel along Hillside Avenue. Both of the variant ends (63A Charter Oak Marketplace and 63M South West Hartford) have considerably lower ridership on the outer end of the route as compared with Hillside Avenue. Although Route 63A has fewer trips, ridership is low with few riders traveling from Hillside Avenue to the Charter Oaks Marketplace. In addition, the Charter Oak Marketplace is already well served by other routes (Route 37) and service will be greatly enhanced when CT***fastrak*** opens. This change may also help address some of the on-time performance issues, depending on how interlining is arranged. On weekend days, however, operating to Charter Oaks Marketplace may continue to make sense and provide a stronger anchor as compared with South West Hartford.

Route Evaluation

CAPITOL AVENUE

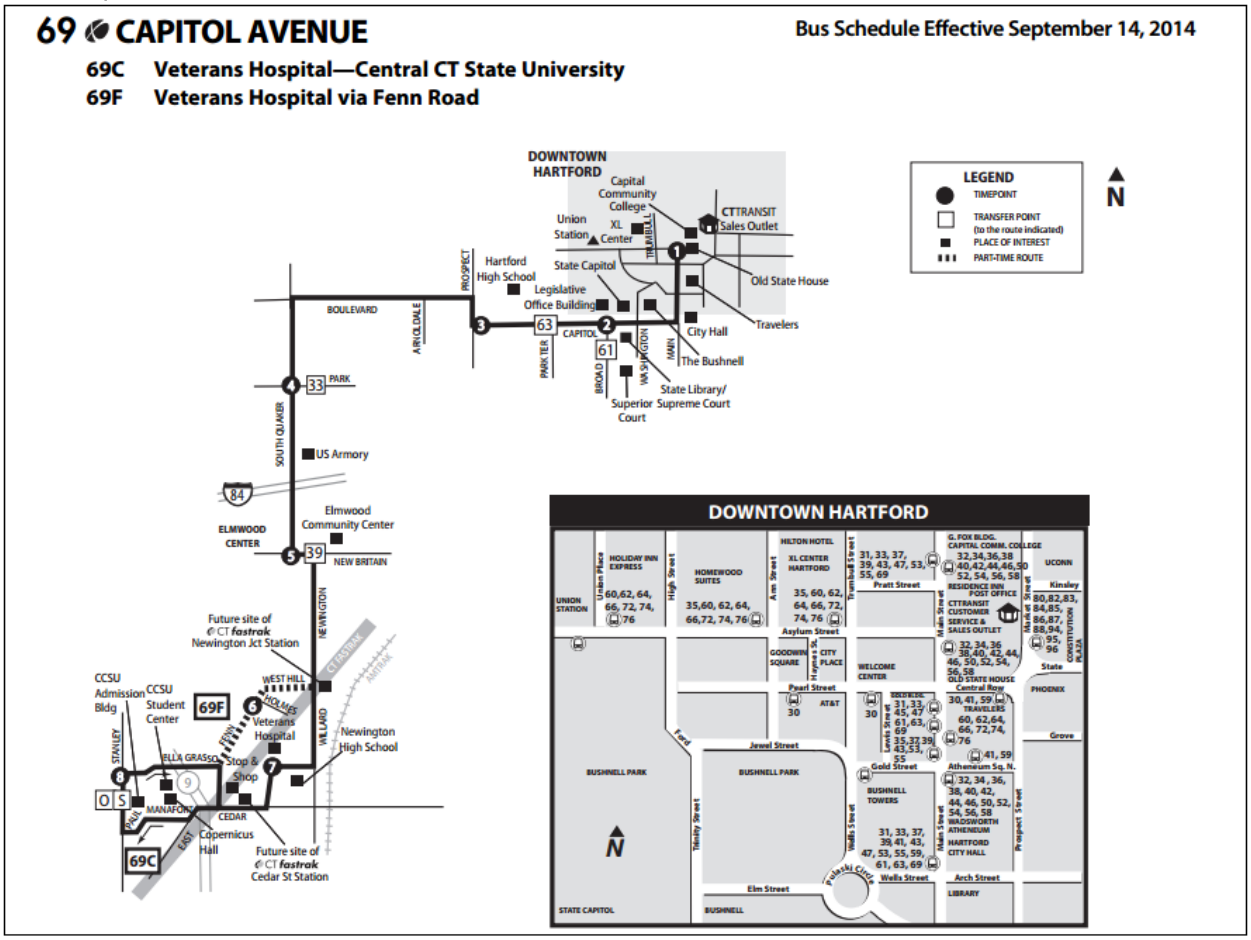
69C | Veterans Hospital – Central CT State University

69F | Veterans Hospital via Fenn Road

Service Design

Route 69 is a radial route with service between downtown Hartford and Central Connecticut State University (CCSU) in New Britain (see Figure 1). The route primarily operates along Capitol Avenue, South Quaker Lane, and Willard Avenue, with some trips also serving Veterans Hospital in Newington.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 69 originates in downtown Hartford, where riders can connect to most CT***transit*** routes. In addition, riders can connect with Route 61 and Route 63 along Capital Avenue, Route 33 along South Quaker Lane, and Route 39 along Newington Road (see Figure 2). Route 69 also connects with most CT***transit***-New Britain routes at Central Connecticut State University.

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
HARTFORD DIVISION	
Route 33	Park Street and Park Road
Route 39	New Britain Avenue
Route 61	Broad Street
Route 63	Hillsdale Avenue
NEW BRITAIN DIVISION	
Route O	Oak Street
Route S	Stanley Street

Alignments and Service Patterns

All Route 69 trips serve the Elmwood section of West Hartford via Capitol Avenue, Boulevard, and South Quaker Lane. Route 69C variants then continue to CCSU via Newington Road, Willard Avenue, Alumni Road and Cedar Street, completing a clockwise loop through the CCSU campus before turning east onto Cedar. Inbound buses continue along Cedar and follow the same alignment back into downtown Hartford.

Two trips per day operate as Route 69F rather than Route 69C, and do not serve CCSU. Instead, at Willard Avenue and West Hill Road (the site of the future CT***fastrak*** Newington Junction station), outbound 69F buses turn west on West Hill Road and then south on Fenn Road, east on Cedar and north on Memorial Road to Veterans Hospital. From Veterans Hospital Route 69F buses return to downtown Hartford along the same alignment including Fenn Road.

Service Schedule

Route 69 operates on weekdays and Saturdays. Weekday service operates every hour, with service every 30-40 minutes during peak hours. Saturday service operates every hour.

FIGURE 3 | SCHEDULE OVERVIEW

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	6:07 AM – 8:08 PM	40 / 60	18 / 19
Saturday	7:05 AM – 6:28 PM	60	11 / 11
Sunday	-	-	-

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Route 69 carries 628 daily passengers or 17.4 passengers per trip on an average weekday. This is nearly on par with than the Hartford Division average of 17.7 weekday passengers per trip (see Figure 4). Ridership drops considerably on Saturdays to 6.9 passengers per trip. Route 69 does not operate on Sundays.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 69	ROUTE 69	DIVISION AVG
Weekday	628	17.4	17.7
Saturday	152	6.9	16.3
Sunday	-	-	17.6

Source: CTtransit performance data

Ridership by Stop

The most heavily used stops on Route 69 are at Main Street and Athenaeum Square in downtown Hartford, and at Veterans Hospital in Newington. However, no stops along the route generate more than 50 boardings or alighting per day (see Figure 5).

Load profile data combines passenger activity by stop and shows the cumulative passenger load as the bus travels inbound along its route. The load profile for Route 69 is not continuous because some stops are served by both variants, while others are served by Route 69C or Route 69F only. Each variant is labeled accordingly in Figure 5. The data shows that inbound passenger loads peak at Capitol Avenue and Arbor Street, just west of I-84.

FIGURE 5 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

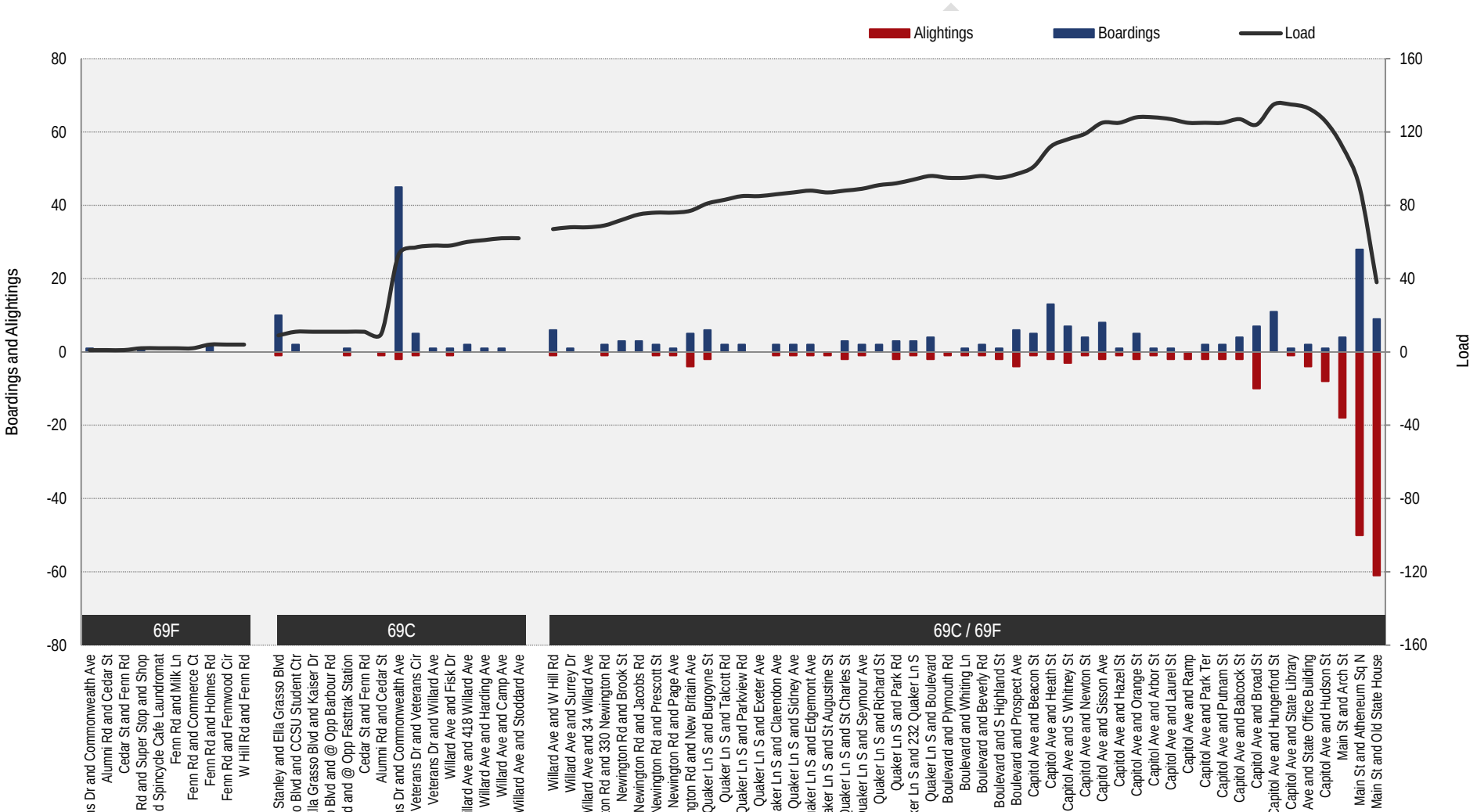
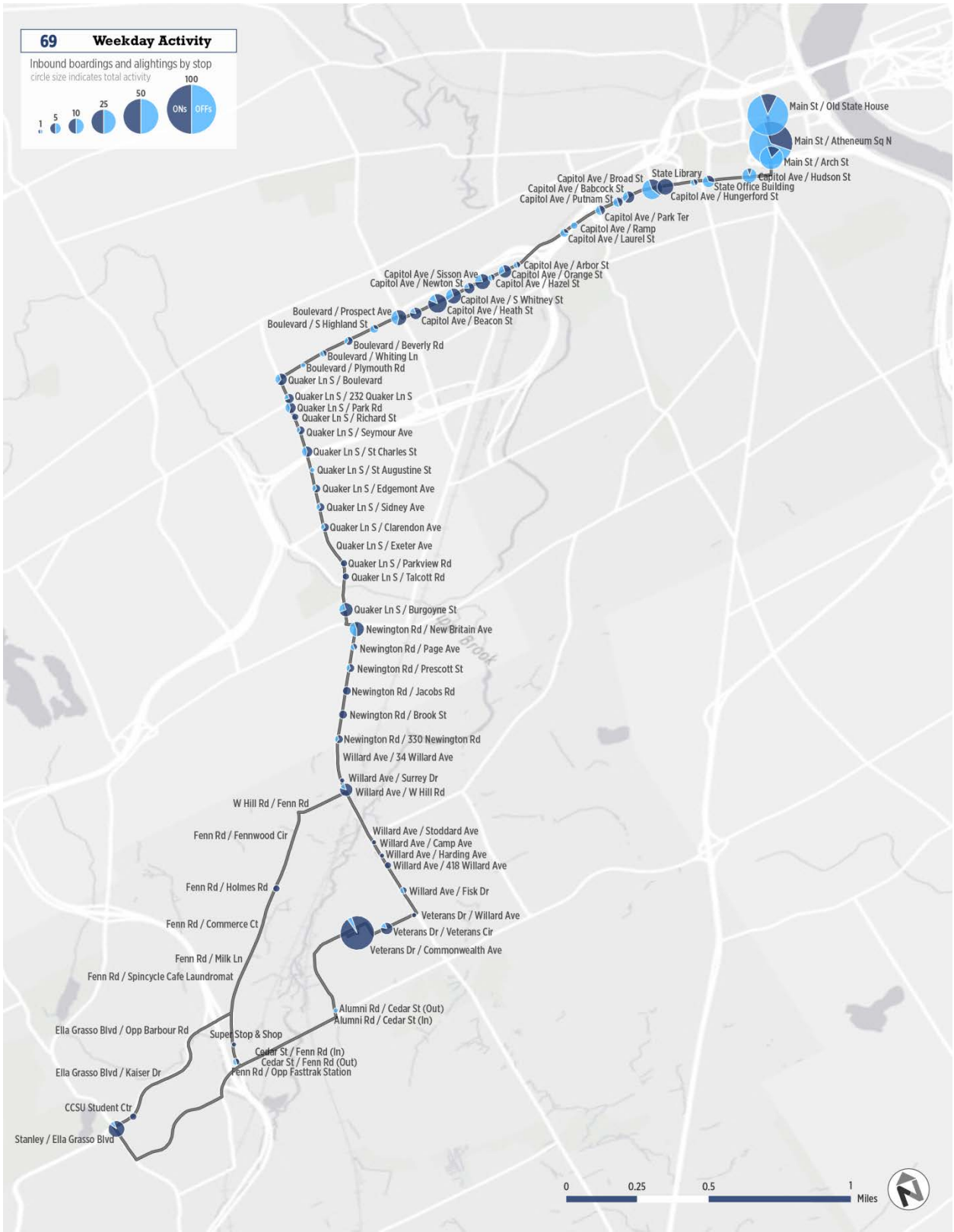


FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Route 69 carries an average of 17.4 passengers per trip on weekdays. Ridership is strongest during morning and afternoon peak periods, as well as on the noontime inbound trip. One of the highest ridership trips is the 8:20 outbound departure. This ridership spike is likely due to the fact that this is the last trip before service frequency drops to once per hour (see Figures 7 and 8).

Maximum loads on Route 69 do not exceed 25 passengers. The typical seating capacity of a 40-foot transit bus is 40 passengers, so overcrowding is not an issue on this route, and service frequency appears to be sufficient for demand.

FIGURE 7 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

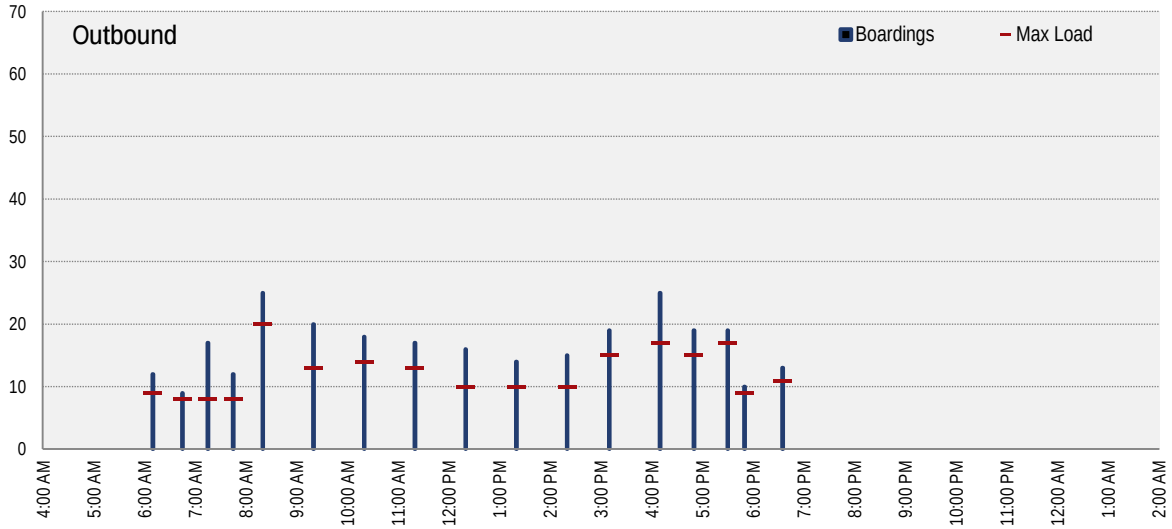
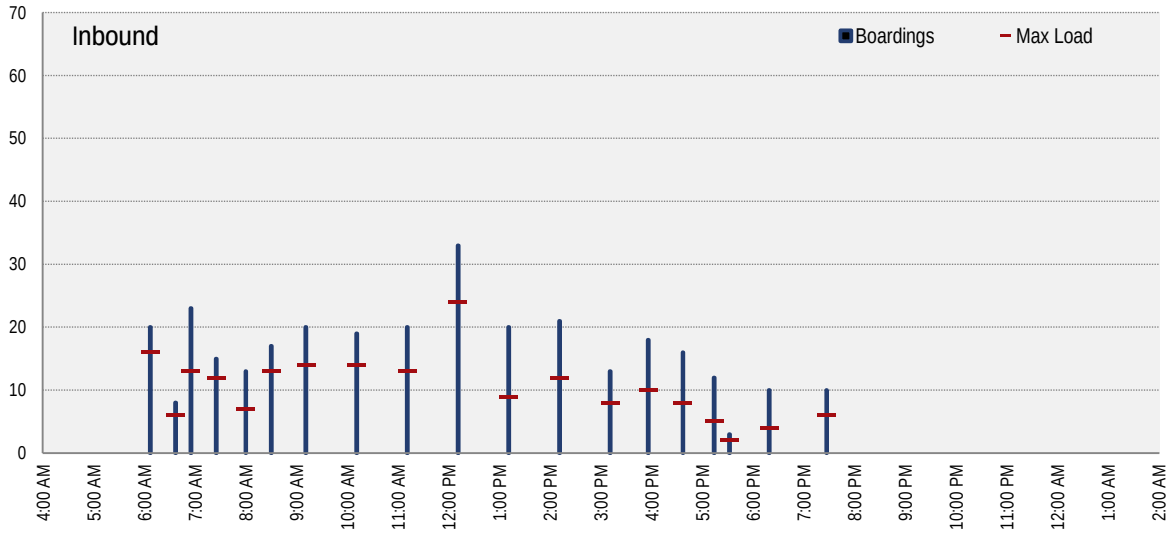


FIGURE 8 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Saturday ridership is generally low with no trip exceeding 15 boardings. Maximum loads are below 10 on all trips, so overcrowding is not an issue on Route 69 on Saturdays (see Figure 9).

FIGURE 9 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

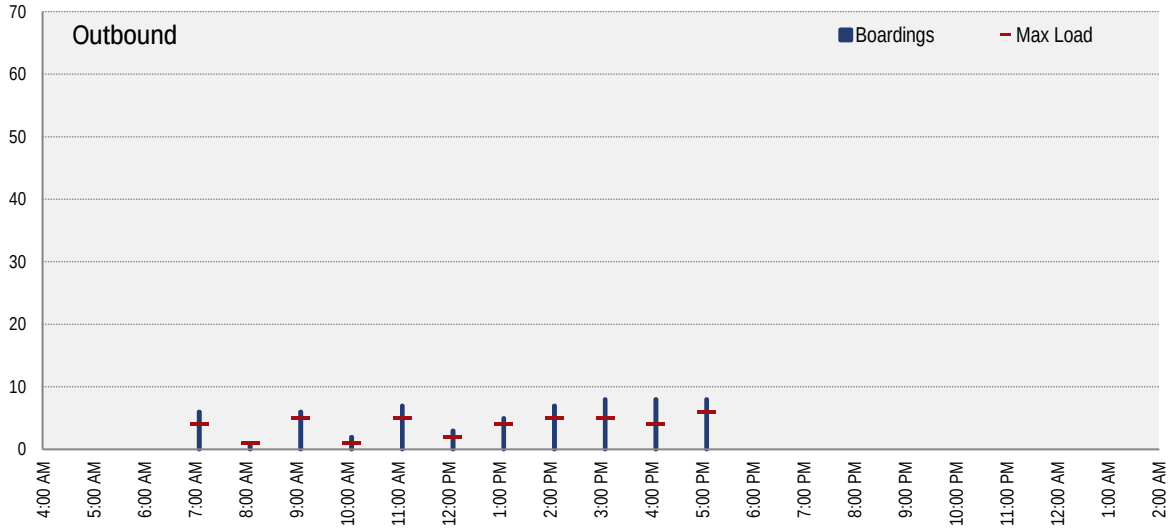
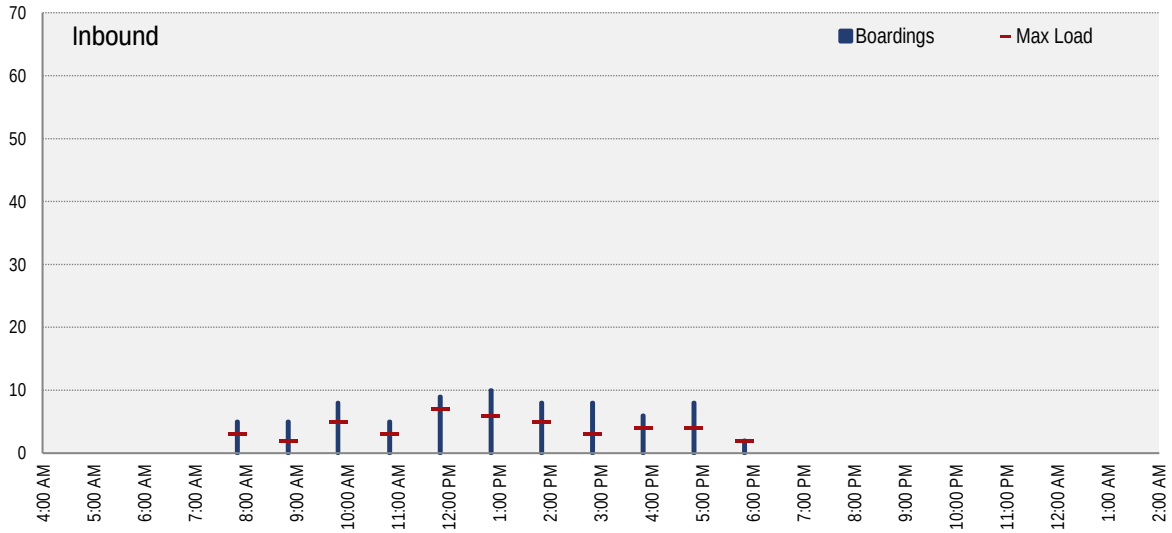


FIGURE 10 | SATURDAY INBOUND RIDERSHIP BY TRIP



Performance

The operating cost per passenger for Route 69 exceeds the weekday Division average by 14% and is more than double the Division average on Saturdays. Similarly, the route performs below average in terms of passengers per revenue hours and revenue miles on weekdays, and far below average for these metrics on Saturday (see Figure 11).

FIGURE 11 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 69	DIVISION AVG	ROUTE 69	DIVISION AVG	ROUTE 69	DIVISION AVG
Operating Cost per Passenger	$5.50	$4.84	$13.12	$6.30	-	$6.66
Passengers per Revenue Vehicle Hour	23.3	28.9	9.8	27.0	-	29.7
Passengers per Revenue Vehicle Mile	1.8	2.6	0.7	2.4	-	2.9

Source: CTtransit performance data

Route 69 has a 76.9% on-time arrival rate, with a higher percentage of late buses than the Hartford Division average (see Figure 12). Given that ridership is not particularly high on Route 69, poor on-time performance suggests insufficient recovery time to consistently provide on-time service on the route. Stop spacing may also be contributing to slow operating speeds, particularly along Capital Avenue, where stops are placed every block in some segments.

FIGURE 12 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 69	DIVISION AVG
Early	0.0%	0.2%
Late	23.1%	18.9%
On-Time	76.9%	80.9%

Source: CTtransit performance data

FIGURE 13 | WEEKDAY OPERATING COST PER PASSENGER

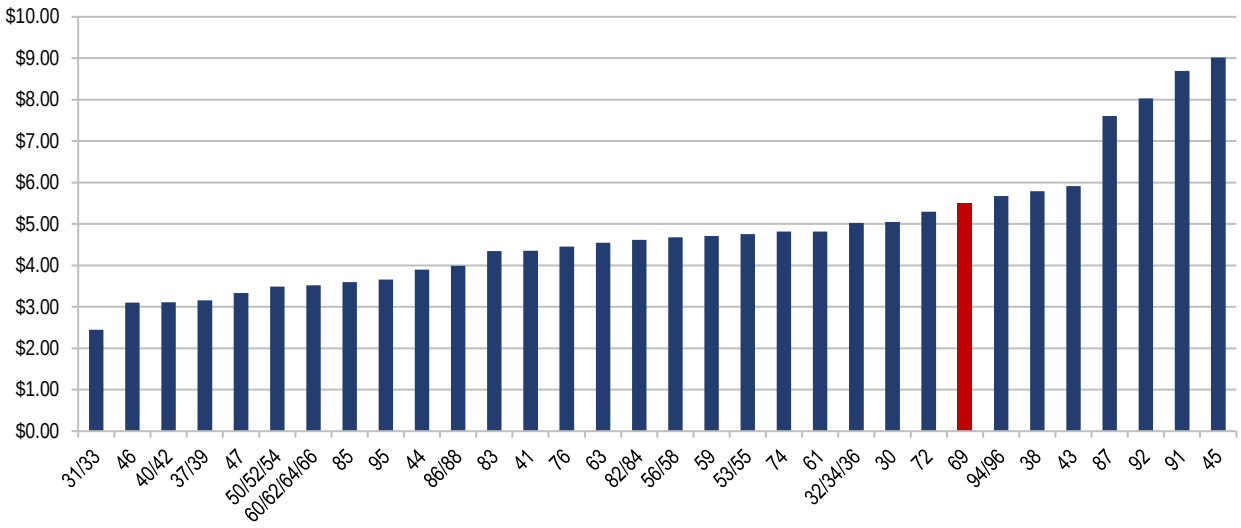
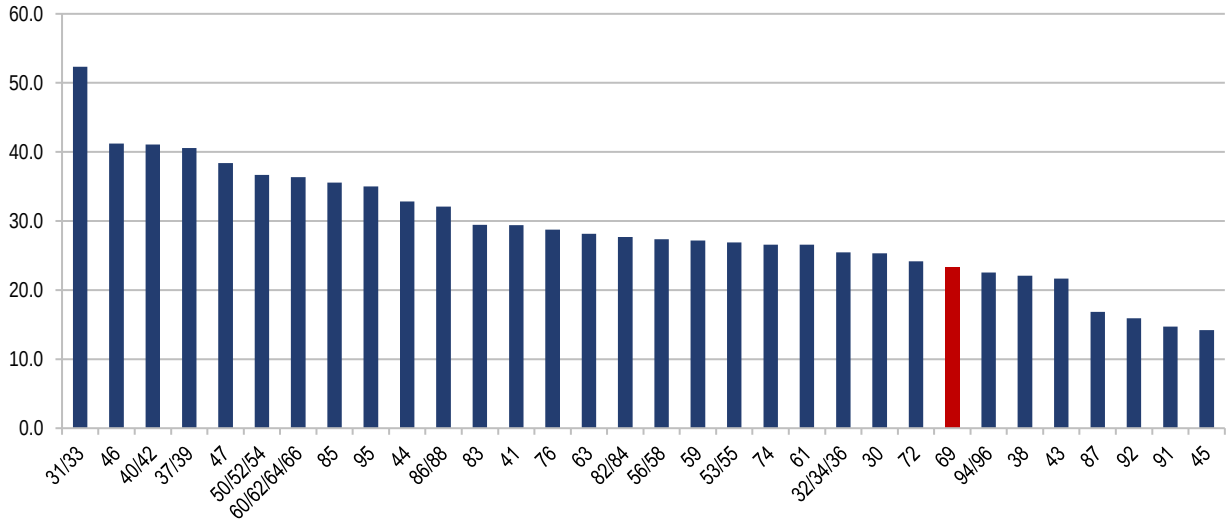


FIGURE 15 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT

Route 69 is a fairly direct radial route connecting downtown Hartford with the Elmwood area of West Hartford, CCSU, and Veterans Hospital. The route has relatively low ridership, especially considering the destinations it serves. The reasons for its poor performance likely have to do with competition from other routes and other modes.

The northern part of the route, along Boulevard and Capital Avenue competes with other CT***transit*** services operating along the parallel corridors of Farmington Avenue to the north and Park Street to the south. Both corridors provide more frequent service than Route 69 service along Boulevard and Capital Avenue. Similarly, for service between Elmwood Center and downtown Hartford, passengers can choose between Route 69 and Route 39, which operates more frequently. Portions of Route 69 that do not compete with other routes, such as Quaker Lane in West Hartford, tend to have relatively low transit propensity, as well as easy access to I-84.

CT*fastrak*

Route 69 parallels portions of the alignment of the CT***fastrak*** guideway and destinations on the outer end of the route would benefit from the faster service offered by CT***fastrak*** dedicated right of way. In addition, Route 140 will link CCSU to both East Street Station and Cedar Street Station, replacing Route 69 service to the University:

- Route 140: the CT***fastrak*** service plan includes a new feeder Route 140 that travel between Cedar Street Station, East Street Station and CCSU. The service is scheduled with 15 minute frequencies during weekday peak hours, 20 minutes on weekdays in the midday and Saturdays and every 30 minutes on weekday evenings, Saturday evenings and all day on Sundays.

Service Improvement Options

While portions of Route 69 parallels the CT***fastrak*** alignment, the highest ridership segments of the route along Capitol Avenue access not available by CT***fastrak***. The challenge for Route 69 moving forward involves leveraging CT***fastrak*** service to get people to some destinations, but retain some of the unique service and destinations, and potentially strengthening the route by connecting to CT***fastrak***. Potential service improvements include:

- Route 69 could be split into two separate feeder routes anchored at Flatbush Station / Wal-Mart as described below:
  - **Terminate service at Newington Junction Station.** Given CT***fastrak*** Route 141 will provide local access to CCSU and the VA Hospital, Route 69 could retain the local portion of the route and end at Newington Junction Station. This alignment would retain the unique portions as well as the highest ridership segments of the route.
  - **Terminate Route 69 at Cedar Street Station.** Another alternative would be to continue to operate Route 69 to the Cedar Street Station, traveling via the VA Hospital and the medical facilities on Willard Ave.
- **Shift service from Quaker Lane to Arnoldale Road / Oakwood Avenue and anchor route at Flatbush Station / Wal-Mart.** The Oakwood Avenue corridor offers a better mix of multi-family housing and retail destinations than Quakers Lane, and thus appears to be a more promising transit corridor. From Oakwood Avenue, buses could terminate at Flatbush Station or the adjacent Wal-Mart. These destinations would likely generate stronger ridership for a northern "spin-off" of Route 69.

- **Operate southern portion of route from Cedar Street Station to Flatbush Station / Wal-Mart only.** Cedar Street Station and Flatbush Station, along with their adjacent retail destinations (Super Stop & Shop and BJ's / Wal-Mart, respectively), make for strong anchors for a southern "spin-off" of Route 69.
- **Focus on marketing efforts at CCSU.** Central Connecticut State University has a student body of approximately 12,000 students, half of whom live off campus and must commute to school. Given these statistics, the campus generates surprisingly little ridership for the Hartford Division. The university currently has a limited U-Pass program, where only 500 U-Passes are available to students per semester. Developing a more comprehensive pass program, as well as the introduction of branded shuttle service connecting to CT***fastrak*** may help increase interest in transit at the campus.

Route Evaluation

ASYLUM AVENUE

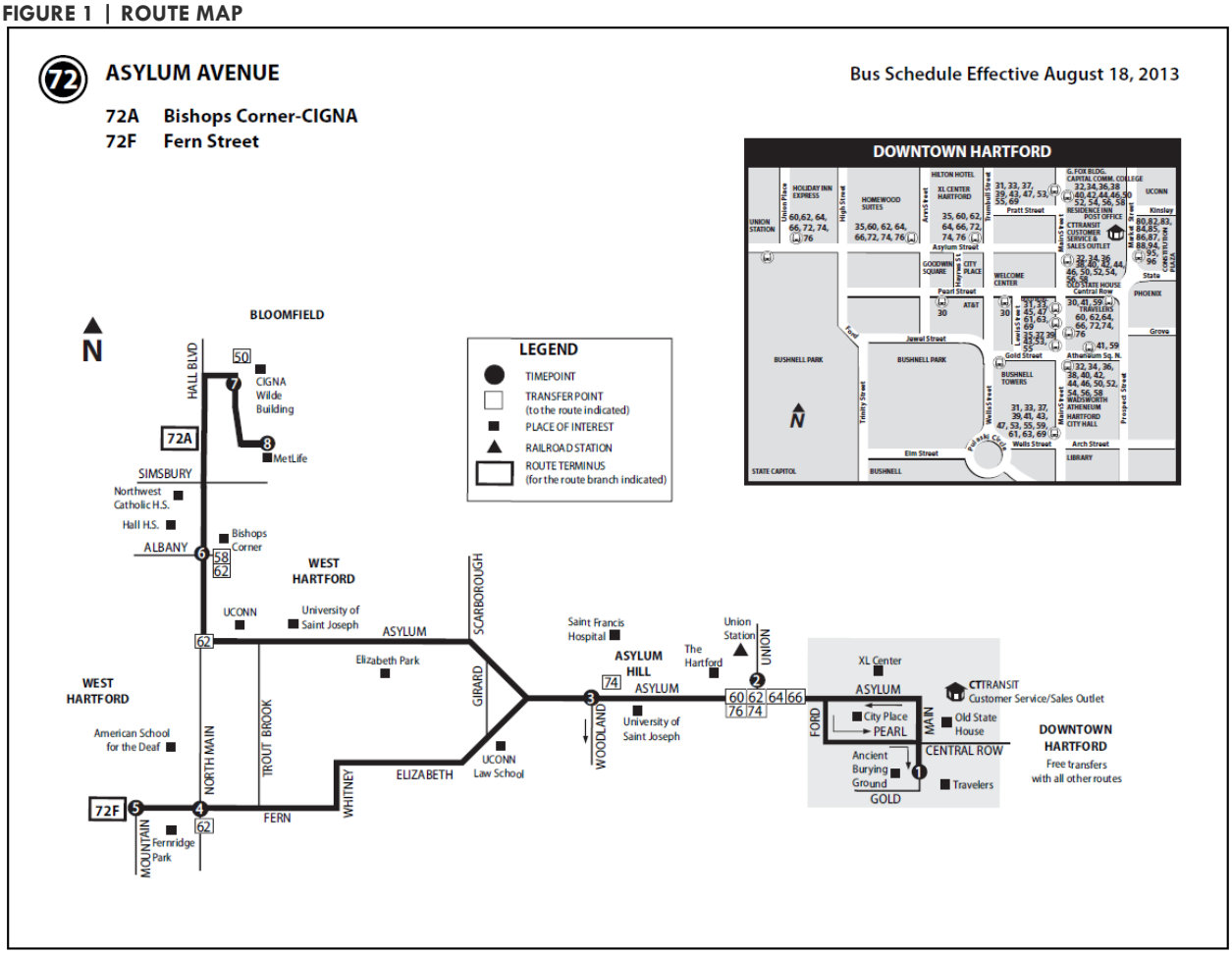
72A | Bishops Corner-CIGNA

72F | Fern Street

Service Design

Route 72 provides weekday service between Hartford and the Cigna campus off of Cottage Grove Road in Bloomfield via Asylum Avenue and West Hartford. Route 72A serves Main Street, the Bishops Corner shopping center, and the Cigna campus, while Route 72F operates via Fern Street in West Hartford.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 72 begins and ends in downtown Hartford, where riders can connect with most CT***transit*** routes, including CT***fastrak*** routes at Union Station. On Asylum Avenue, Route 72 will also connect with CT***fastrak*** Route 161 operating between St. Francis and Hartford hospitals. Other connections can be made in West Hartford along N. Main Street and at Bishops Corner, including Routes 58, 62 and the new CT***fastrak*** Route 153 Flatbush Station/Copaco. Connections to Route 50 can be made at the Cigna campus terminus (see Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 50	Blue Hills Avenue - Cottage Grove Road (72A only)
Route 58	Albany Avenue (72A only)
Route 60	Farmington Avenue/West Hartford Center
Route 62	Farmington Avenue/Bishops Corner
Route 64	Farmington Avenue/Westfarms Mall
Route 66	Farmington Avenue/UConn/Unionville
Route 74	Granby Street
Route 76	Ashley Street
Route 153	CT*fastrak*: Flatbush/Copaco via Bishops Corner
Route 161	CT*fastrak*: St. Francis Hospital/Hartford Hospital

Alignments and Service Patterns

Outbound trips for both Route 72A and Route 72F begin on Main Street in downtown Hartford and turn west onto Asylum Avenue, stopping at Union Station and continuing west until Elizabeth Street. Route 72A continues west along Asylum Avenue serving the University of St. Joseph's and UConn before turning north on Main Street in West Hartford, and continuing to the CIGNA and MetLife campuses just north of Simsbury Road. Route 72F turns off of Asylum onto Elizabeth, Whitney and Fern Streets, and travels west along Fern until Mountain Road. Both 72A and 72F operate inbound along the same alignments, with a slightly different alignment in downtown Hartford due to one-way streets.

Service Schedule

Route 72 operates on weekdays only, with service ending shortly before 7 PM each day. Peak hour service runs every 15 to 25 minutes, while off-peak service operates every 30 minutes. There are 34 outbound and 34 inbound trips daily, alternating between the Routes 72A and 72F alignments.

Ridership by Service Day

Together, Routes 72A and 72F carry 912 daily passengers or about 13.4 passengers per trip. This is below the division average of 17.7 passengers per trip (see Figure 4). There is no weekend service on Route 72A or 72F.

FIGURE 3 | SCHEDULE OVERVIEW

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	6:10 AM – 6:58 PM	20/30 (irregular)	34/34
Saturday	-	-	-
Sunday	-	-	-

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 72	ROUTE 72	DIVISION AVG
Weekday	912	13.4	17.7
Saturday	-	-	16.3
Sunday	-	-	17.6

Source: CTtransit performance data

Ridership by Stop

The most heavily used stops on Route 72 are its downtown stops at Pearl and Lewis, and on Main Street at the Ancient Burying Ground. Outside of the downtown, there are no stops that generate 50 or more boardings or alightings per day (see Figure 5 and 6), however the two stops on the Cigna campus combine to generate a total of 58 boardings a day.

FIGURE 5 | ROUTE 72 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Main Street and Ancient Burying Ground	16 / 160	Hands on Hartford food and housing services
Pearl Street and Lewis Street	2 / 73	Transfer point for Routes 31, 33, 37, 39, 53, and 55

Load profile data (see Figure 6) combines passenger activity by stop and shows the cumulative passenger load as the bus travels inbound along its route. Ridership by stop without the cumulative load is mapped in Figure 7. The data for Route 72 shows that boardings are relatively light along the outer segment of Route 72F, with higher loads on Route 72A due to a number of trip generators such as the Cigna campus, retail at Bishops Corner, and UConn's off Asylum Avenue. Boardings increase along Asylum Street, which benefits from the more frequent service after Routes 72A and 72F join together.

Inbound passenger loads peak at Asylum Avenue and Sumner Street, near The Hartford's company headquarters. Ridership loads decrease slowly as buses travel through downtown.

FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

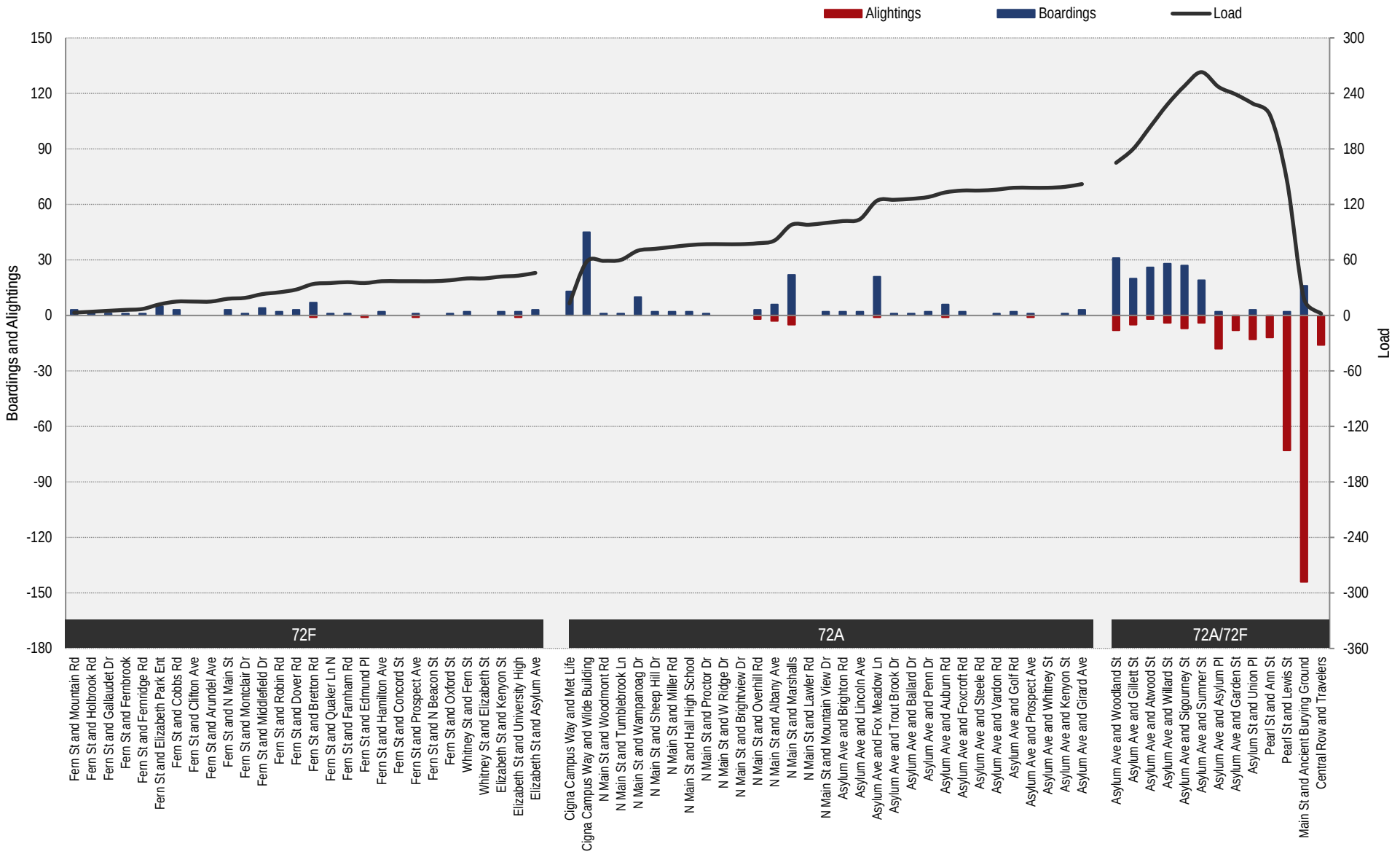
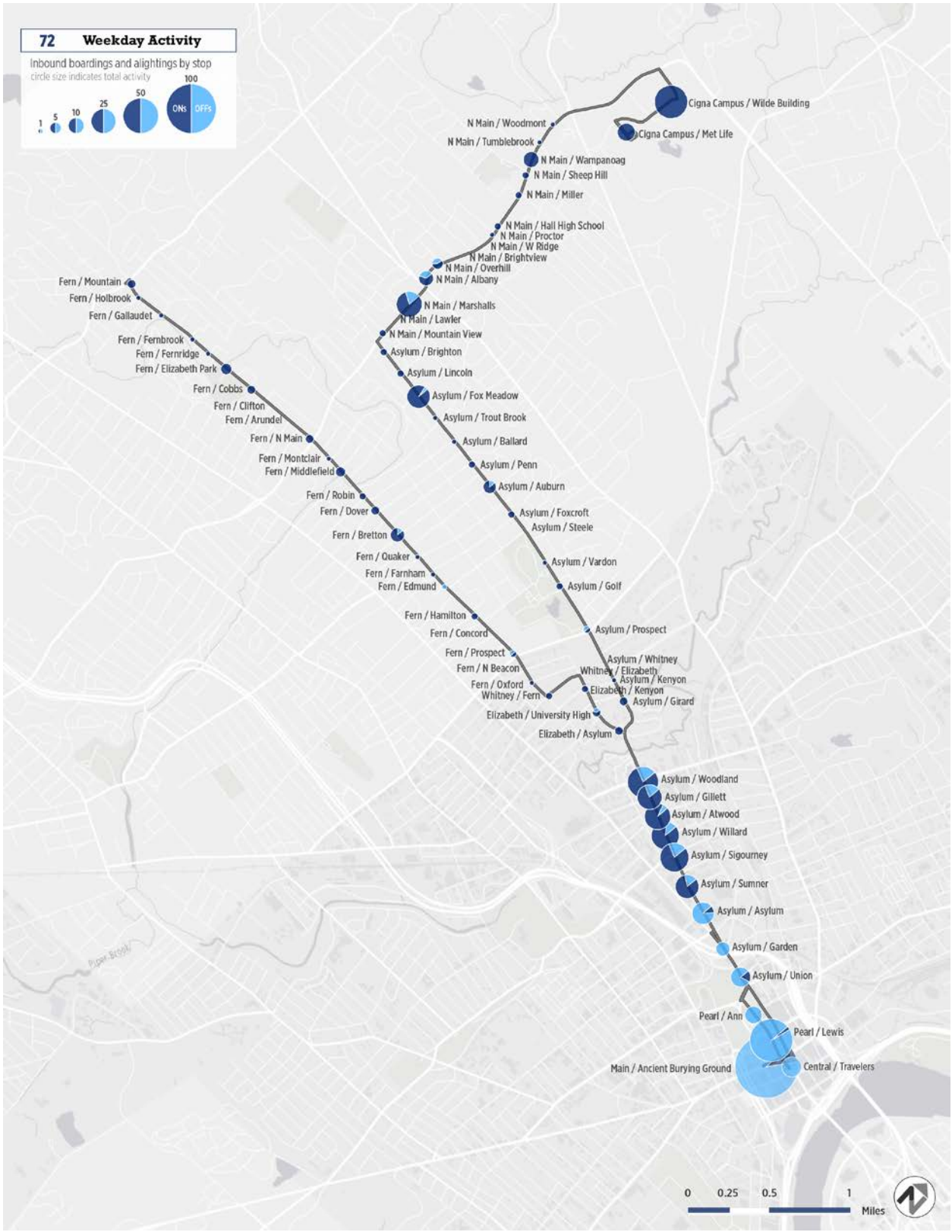


FIGURE 7 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Route 72 carries an average of 13.4 passengers per weekday. The route demonstrates a reverse commuting market, with greater demand on outbound trips during the AM peak and on inbound trips during the PM peak. However, demand is fairly well balanced throughout the day outside of these peaks.

Maximum loads on Route 72 are less than 30 passengers per trip, with the exception of the 8:45 AM outbound trips which carries about 33 passengers. The typical seating capacity of a CT***transit*** bus is 38 passengers, so overcrowding is not an issue on this route.

FIGURE 8 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

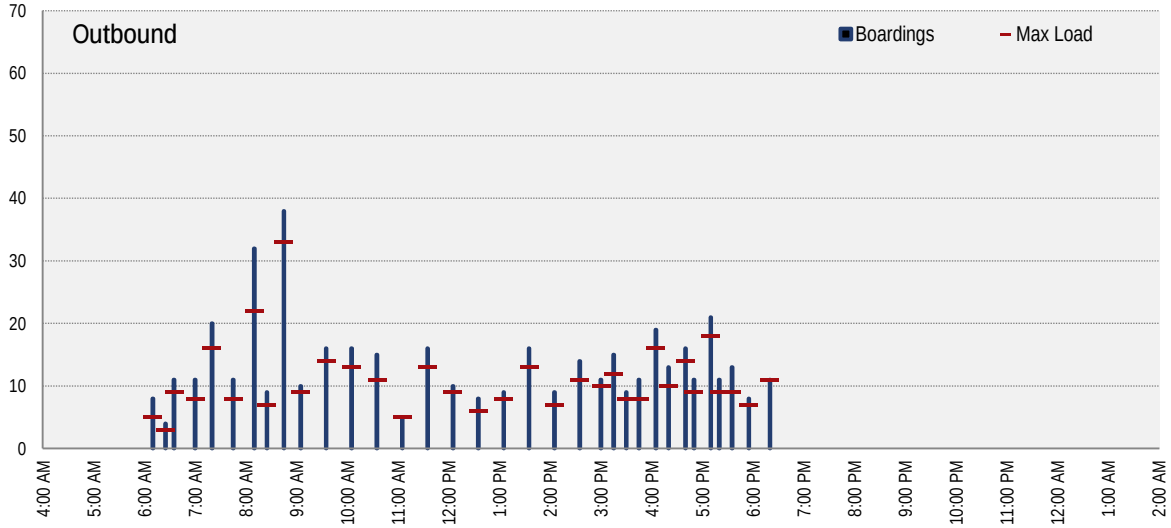
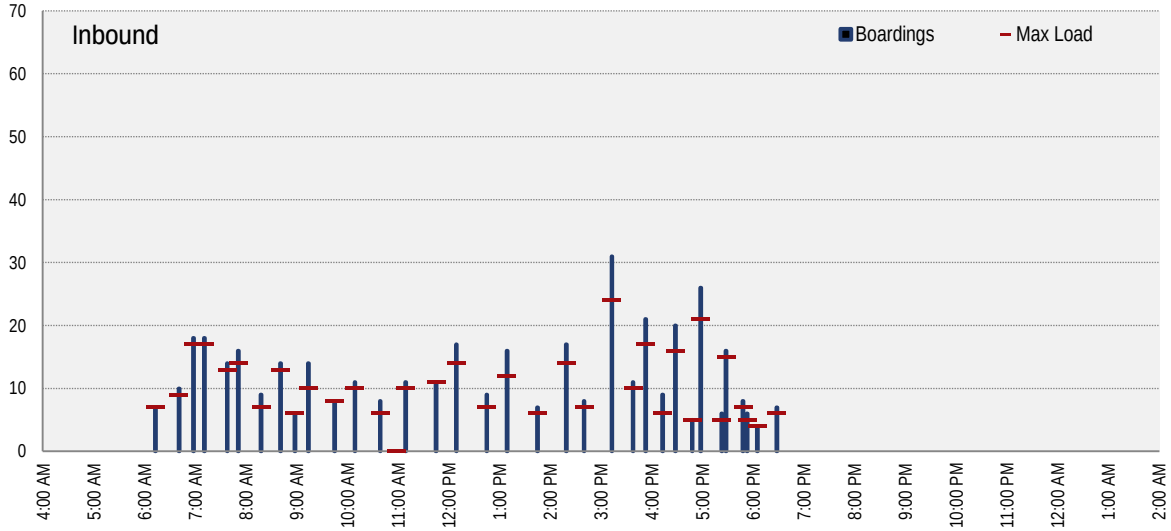


FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Performance

Route 72 performs somewhat below average when compared to other Hartford Division local routes. While performance data is not available for the separate Route 72A and 72F segments, it is likely based on ridership data that the Route 72A segment is outperforming the Route 72F segment.

Overall, Route 72 has slightly better on-time performance than other routes in the Hartford Division (see Figure 11).

Figures 12 and 13 chart Route 72's weekday performance relative to other local routes in the Hartford Division, displaying weekday performance in terms of operating cost per passenger and passengers per revenue hour that are below average.

FIGURE 10 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 72	DIVISION AVG	ROUTE 72	DIVISION AVG	ROUTE 72	DIVISION AVG
Operating Cost per Passenger	$5.29	$4.84	-	$6.30	-	$6.66
Passengers per Revenue Vehicle Hour	24.2	28.9	-	27.0	-	29.7
Passengers per Revenue Vehicle Mile	2.1	2.6	-	2.4	-	2.9

Source: CTtransit performance data

FIGURE 11 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 72	DIVISION AVG
Early	0.0%	0.2%
Late	17.4%	18.9%
On-Time	82.6%	80.9%

Source: CTtransit performance data

FIGURE 12 | WEEKDAY OPERATING COST PER PASSENGER

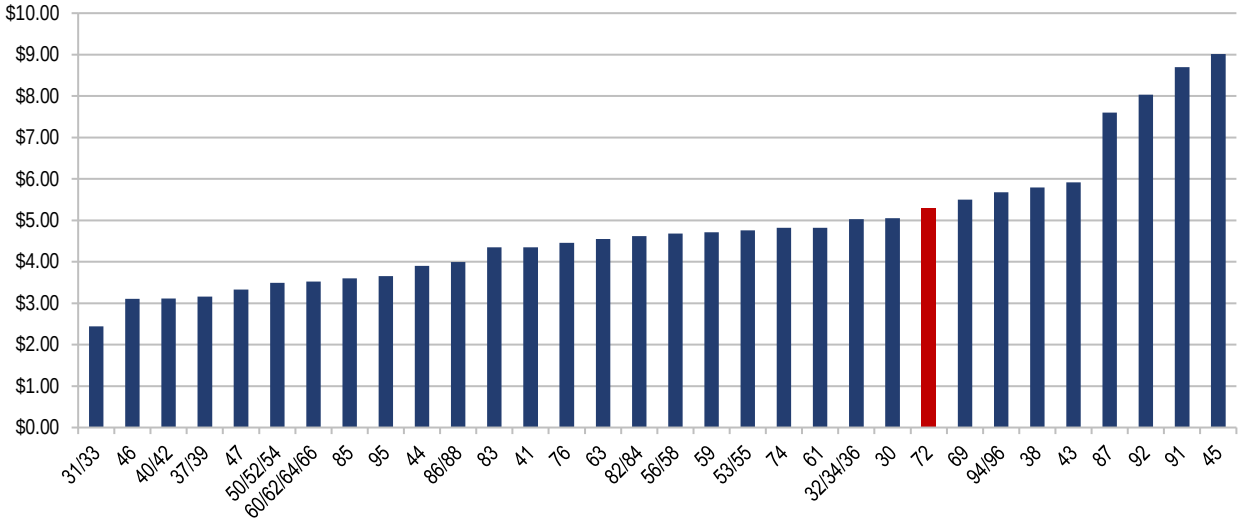
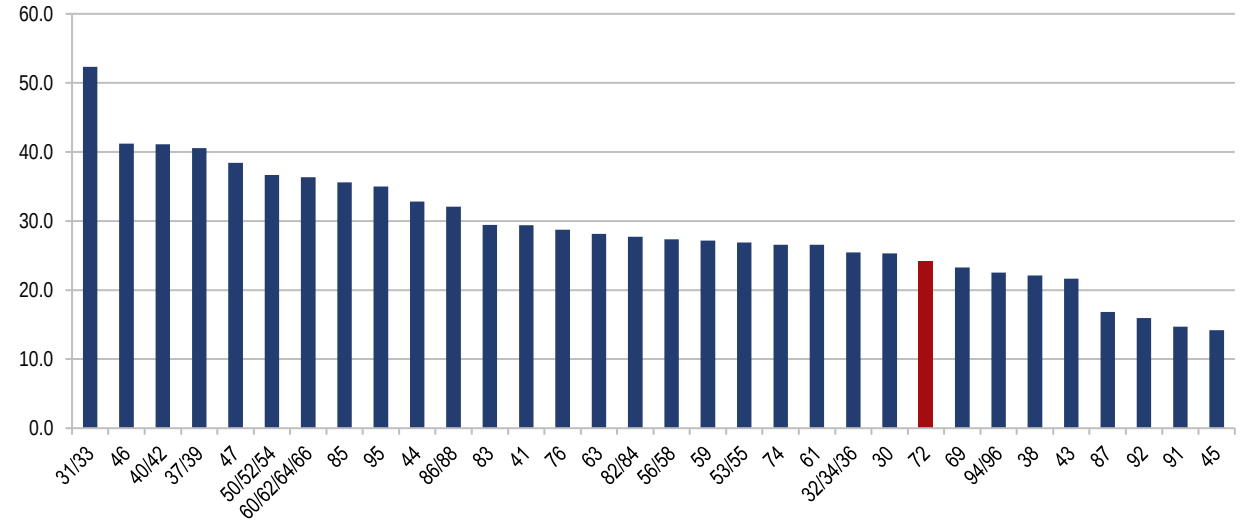


FIGURE 13 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT

Route 72 is a radial route serving downtown Hartford, Asylum Hill and West Harford. Two legs of the route split at Asylum Avenue and Elizabeth Street: Route 72A continues along Asylum turning on North Main Street in West Hartford to serve Bishops Corner and the Cigna campus. Route 72F operates along Fern Street terminating at Mountain Road in West Hartford. While the overall performance and productivity of the route is below average, the northern Route 72A segment is more productive.

CT*fastrak*

CT***fastrak*** service is scheduled for implementation in March 2015. Implementation will include two new routes that will provide service along shared segments of Route 72's alignment and may impact Route 72's ridership. These include:

- Route 153: the CT***fastrak*** service plan includes a new feeder Route 153 that will connect Copaco Center in West Hartford with the Flatbush Station. Along with Route 72, it will operate along North Main Street in West Hartford and Hall Road in Bloomfield between Asylum Avenue and the Cigna Campus access road. Route 153 is scheduled to operate daily and provide hourly service between 5:30 AM and 11:30 PM on weekdays, 6:30 AM and 11:30 PM on Saturday and 7:30 AM to 8:30 AM on Sundays.
- Route 161: the CT***fastrak*** service plan includes a new feeder Route 161 that will connect the new Sigourney Street Station and St. Francis Hospital. The new service will share only a short segment with Route 72, as it travels north on Sigourney Street and loops past St. Francis via Ashley Street, Woodland Street and Asylum. However, this will provide a new option to access high ridership destinations such as the insurance campuses and St. Francis Hospital. Route 161 service is scheduled to operate daily with a high level of service, or every 15 minutes during weekday peak periods, 20 minutes in the off peak and 30 minutes during the evenings. Service is scheduled to begin at 5:00 AM to 12:30 AM. On Saturdays, service will run every 20 minutes during the day and every 30 minutes in the evening. It will operate between 5:10 AM and 12:30 AM. Sunday service is scheduled with 30 minute service all day between 6:30 AM to 8:30 PM.

These CT***fastrak*** routes will give riders an alternative route to Route 72's highest ridership destinations, the Cigna Campus, Bishops Corner and Asylum Avenue at Sigourney Street. Riders' response to the new CT***fastrak*** service is not yet known, however it is likely some riders will use Route 153 to get to West Hartford and Cigna, and others will use Route 161 to access employment destinations on Asylum Hill. CT***fastrak*** services may be particularly more convenient for people traveling from the south.

Service Improvement Options

Most segments of Route 72 will continue to provide unique service to a number of destinations and the route will continue to be an important part of the Hartford system. The relocation of UConn's Asylum Avenue campus to downtown Hartford in 2017 is not expected to have a significant impact, as it appears that less than 25 daily riders currently board Route 72 near campus. Based on existing data, opportunities to strengthen Route 72 include:

- **Separate Routes 72A and 72F:** Route 72A has a number of key ridership generators (Cigna Campus, MetLife and St. Joseph's University) and its ridership is roughly three times higher than Route 72F. Route 72A would likely attract more riders to its key generators if more frequent service was offered. Route 72F has few strong ridership generators, and does not merit higher levels of service.

- **Increase Route 72A Peak Period Frequency**: There is a strong reverse peak commuting pattern on Route 72A, with rider from downtown Hartford accessing destinations for employment and school (e.g. CIGNA, UConn, St. Joseph's and the retail areas in West Hartford). Thirty-minute (30 minute) frequency during peak periods would better serve these riders.
- **Operate Route 72F as peak period only service:** Overall ridership is low on the Route 72F segment operating along Fern Street, with about 50 daily boardings and fewer than seven riders at any one stop. However, the American School for the Deaf and residential neighborhoods along Fern Street may benefit from peak-period service to support commuters.
- **Terminate Route 72F at American School for the Deaf**: Route 72F is a relatively long route with low ridership. The outer end of the route between North Main Street and Mountain Road is characterized by low density single-family neighborhoods and the Goldberg Center does not serve as a strong anchor destination (3 boardings a day). The route could be shortened and its productivity increased by turning north on North Main Street and terminating at the American School for the Deaf.
- **Terminate Route 72F at West Hartford Center/Blue Back Square**: Alternatively, Route 72F could be shortened and its productivity increased by turning south on North Main Street and terminating in West Hartford Center.
- **Discontinue Route 72F**: Route 72F along Fern Street in West Hartford has relatively low ridership, with about 50 boardings a day between Mountain Road and Asylum Avenue. Riders living off Fern Street are no more than ½ mile from service on Asylum Avenue (Route 72A) or Farmington Avenue (Routes 60, 62, 64, 66), and can make connections along North Main Street on Route 50.

Route Evaluation

GRANBY STREET

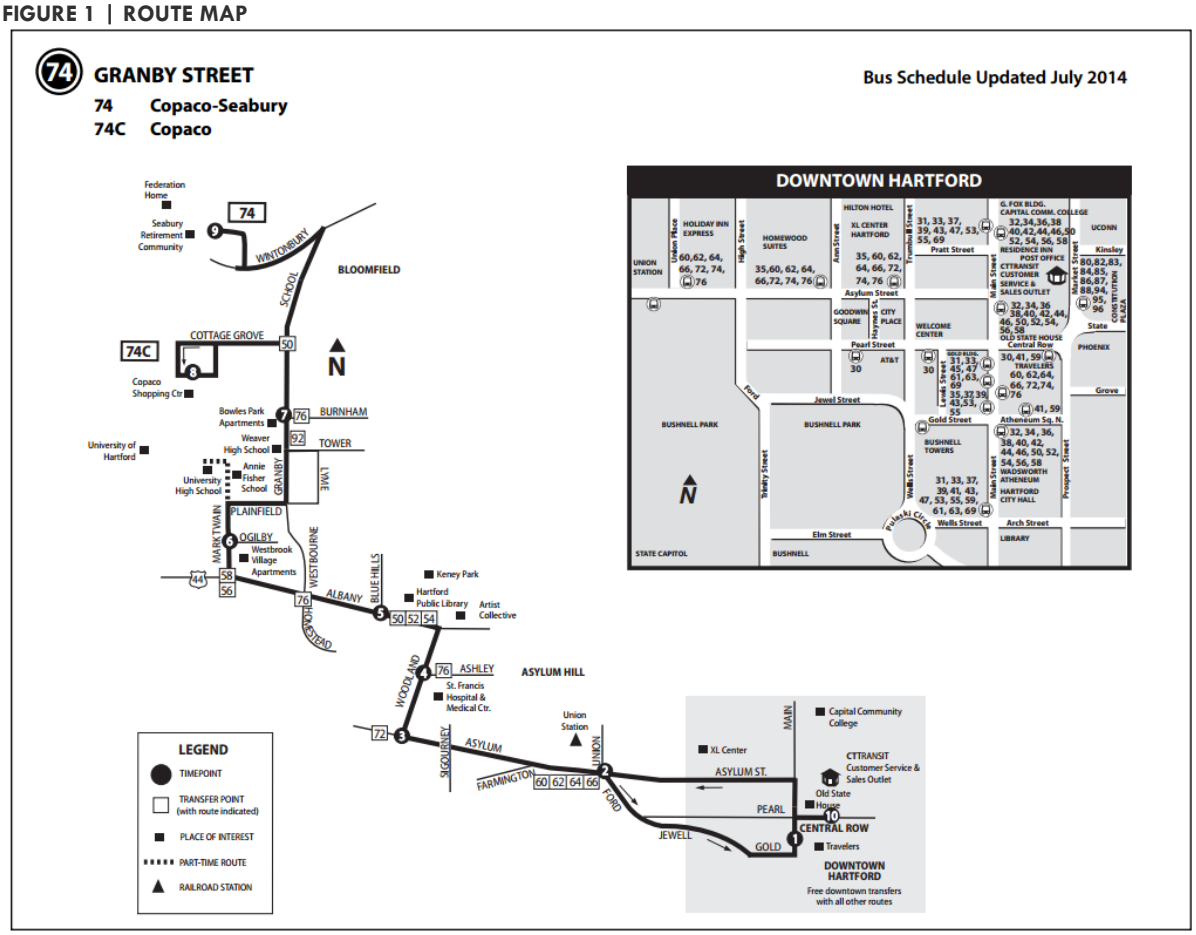
74 | Copaco - Seabury

74S | University High School

Service Design

Route 74 is a radial route connecting downtown Hartford to the Copaco Shopping Center and Seabury Retirement Center in Bloomfield. It serves Asylum Hill and the western side of downtown, before turning north towards Bloomfield. Route 74 has one variant (74S) that provides weekday service to University and Weaver high schools.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 74 begins and ends in downtown Hartford, where riders can connect with most CT***transit*** routes, including future CT***fastrak*** service at Union Station. Additional local connections can be made on Asylum Avenue, Albany Avenue and at the Copaco Shopping Center in Bloomfield (see Figure 2). Route 74 will connect to two CT***fastrak*** routes outside of downtown, including Route 161 which will operate between St. Francis and Hartford hospitals, and Route 153 Flatbush Station/ Copaco serving Copaco Center via the Cigna campus and Cottage Grove Road.

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 50	School Street / Cottage Grove Road (74 only)
Route 50 / 52 / 54	Albany Avenue / Milford Street
Route 56 / 58	Albany Avenue / Mark Twain Drive
Route 60 / 62 / 64 / 66	Asylum Street / Union Place
Route 72	Asylum Avenue / Woodland Street
Route 76	School Street / Burnham Avenue (74 only) Albany Avenue / Homestead Avenue Woodland Street / Ashley Street
Route 92	School Street / Tower Avenue (74 only)
Route 153	CT*fastrak*: Flatbush/Copaco via Bishops Corner
Route 161	CT*fastrak*: St. Francis Hospital/Hartford Hospital

Alignments and Service Patterns

Outbound trips begin on Main Street in downtown Hartford and turn west onto Asylum Avenue, stopping at Union Station and continuing west until Woodland Street. Route 74 heads north on Woodland Street serving St. Francis Hospital before turning west on Albany Avenue. It continues on Albany until Mark Twain Drive. The service heads north on Mark Twain to Plainfield and Granby Streets, with 74S trips deviating into University High School off Mark Twain and Weaver High School off Granby at Tower Avenue. Service continues north on Granby turning west on Cottage Grove Road to the Copaco Shopping Center. After serving Copaco, the service returns east on Cottage Grove and turns north on School Street to terminate at the Seabury Retirement Center.

Service Schedule

Route 74 operates on weekdays and Saturdays. Weekday service begins at 5:15 AM and ends shortly after 7 PM. Peak-period service operates about every 25-30 minutes. Off-peak service operates roughly every 45 minutes. Saturday service begins at 6:40 AM and ends around 7:30 PM, and operates on a consistent hourly basis except for the first and last trips of the day (see Figure 3). There are two inbound and two outbound trips each weekday operating as Route 74S; these trips serve local high schools.

FIGURE 3 | SCHEDULE OVERVIEW

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:15 AM – 7:13 PM	30 / 45 (Irregular)	23 / 23
Saturday	6:40 AM – 7:28 PM	60	12 / 12
Sunday	-	-	-

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Route 74 carries about 904 passengers per weekday or about 19.2 passengers per trip. This is slightly higher than the Hartford Division average of 17.7 passengers per trip (see Figure 4). Saturday service carries about 267 passengers per day, or an average of 11.1 per trip, which is a well below the division average.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 74	ROUTE 74	DIVISION AVG
Weekday	904	19.2	17.7
Saturday	267	11.1	16.3
Sunday	-	-	17.6

Source: CTtransit performance data

Ridership by Stop

The most heavily used stops on Route 74 are in downtown Hartford and at the Stop & Shop in Copaco Center. Other stops have 25 boardings per day or less.

FIGURE 5 | ROUTE 74 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Stop & Shop / Copaco	70 / 10	Copaco Shopping Center and other retail stores
Gold Street and Lewis Street	0 / 62	Downtown Hartford - Transfer points to multiple routes
Main Street and Travelers	6 / 200	Downtown Hartford - Transfer points to multiple routes

Load profile data (see Figure 6) combines passenger activity by stop and shows the cumulative passenger load as the routes travel inbound towards downtown Hartford. Ridership by stop without the cumulative load is mapped in Figure 7. The data for Route 74 shows inbound passenger loads spike at Copaco Center, then slowly increase until the peak load point at Asylum Avenue and Sumner Street, then decrease as the bus continues to the end of the line on Main Street in downtown Hartford.

FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

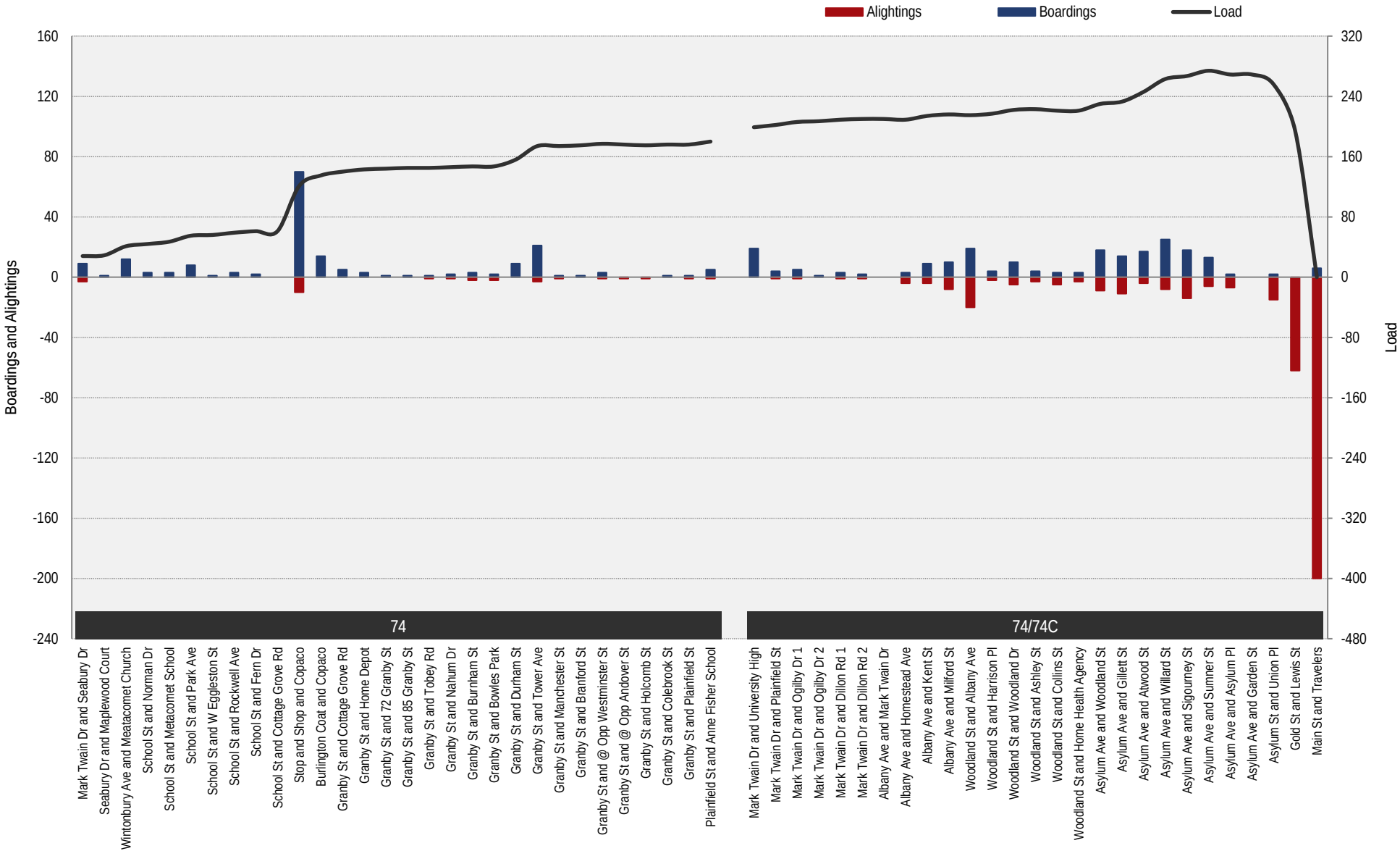
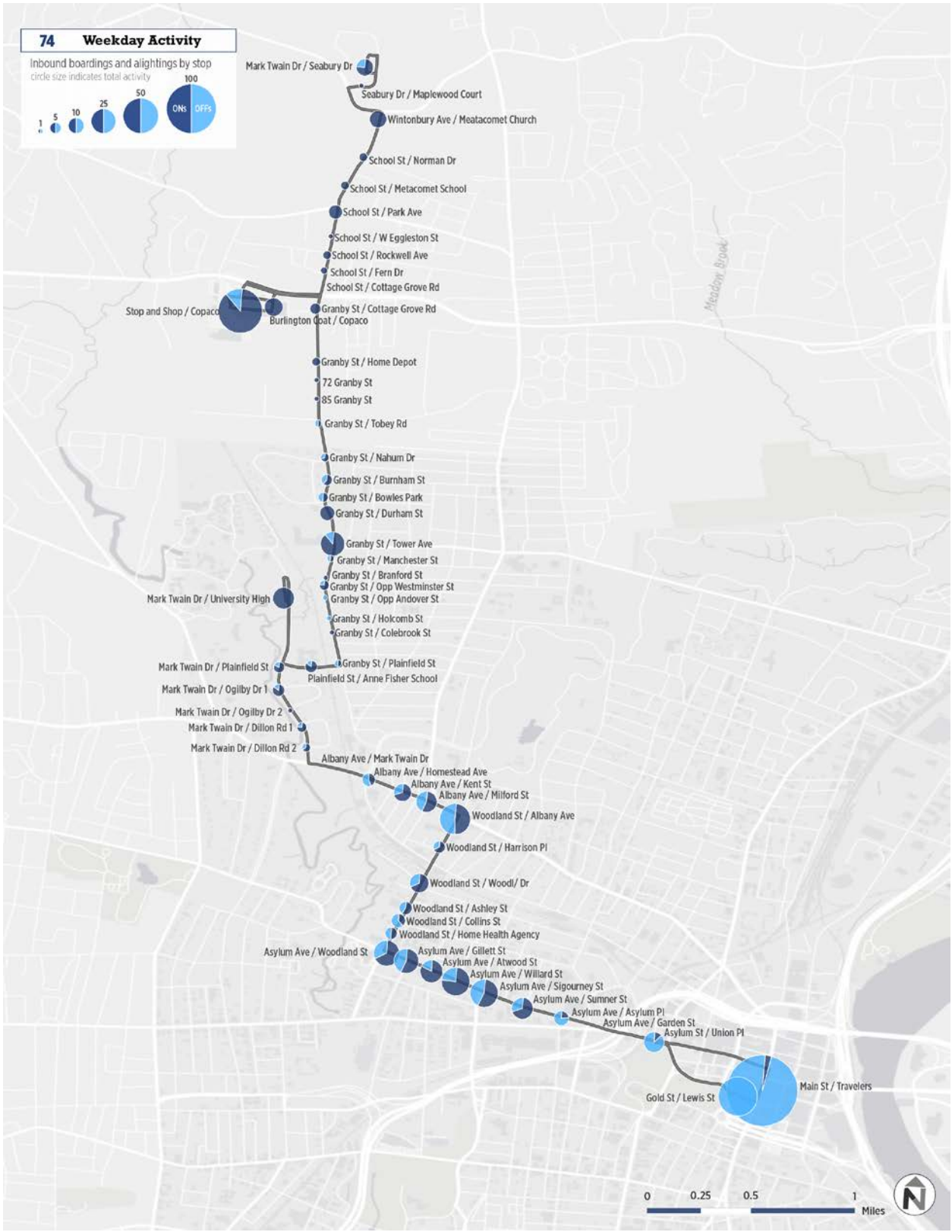


FIGURE 7 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

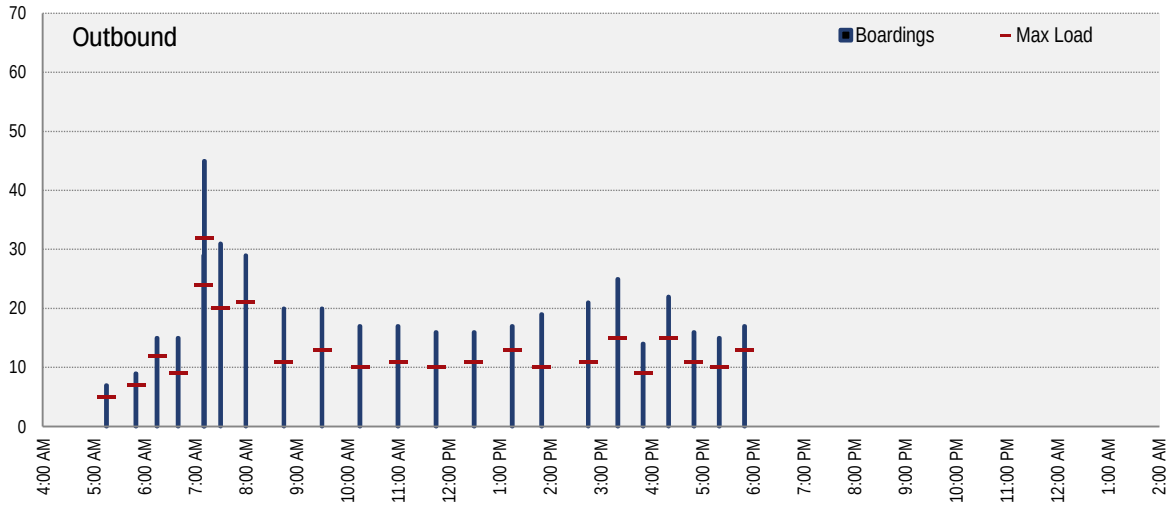


Ridership by Trip

Weekday

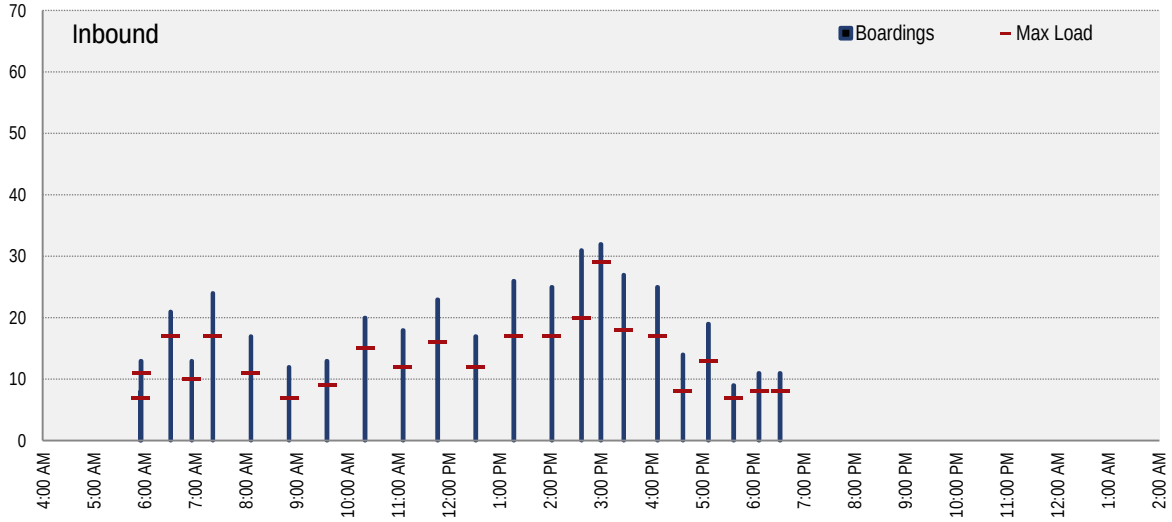
Route 74 carries an average of 19.2 passengers per weekday. The route demonstrates fairly consistent ridership in both directions, but also demonstrates a reverse-peak orientation (stronger demand outbound in the morning) with the demand likely coming from high school students and commuters going to work at St. Francis, Copaco Center or other sites along the route (see Figures 8 and 9). The highest ridership trips in each direction are the 7:10 AM outbound and 3:00 PM inbound that serve University and Weaver high schools. Maximum loads are between 10 and 20 passengers per trip, with the exception of these school trips which exceed 30 riders.

FIGURE 8 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP



Note: Extra 7:10 AM outbound trip into University High

FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY TRIP

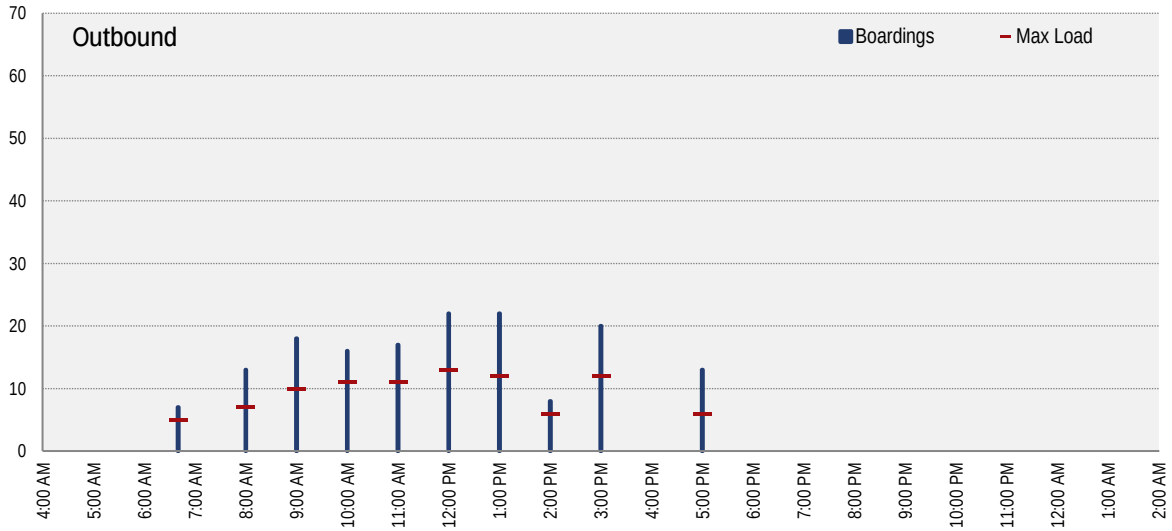


Note: 3:00PM inbound trip from University High

Saturday

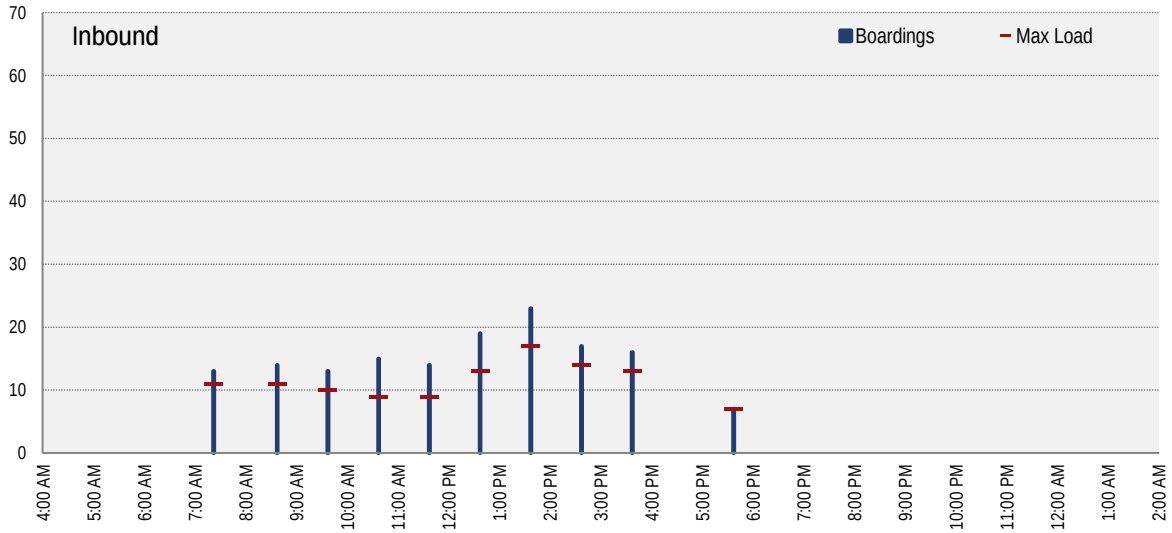
Saturday ridership is lower than on weekdays, averages 11.1 passengers per trip (see Figures 8 and 9). Maximum loads are generally between 10 and 20 passengers, meaning the frequency and capacity appear to be appropriate for the level of ridership demand on the route.

FIGURE 8 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP



Note: No data available for 4:00 PM and 6:15 PM outbound trips

FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Note: No data available for 4:37 PM and 6:52 PM inbound trips

Performance

Route 74's weekday service performs very close to the Hartford Division average, while Saturday service performs less well and falls significantly below the division average. Service productivity on Saturday is low even with reduced levels of service on the route (see Figure 10.)

Route 74 has an excellent on-time performance record, with 88.3% of trips considered on time as compared to 80.9% for the division as a whole.

Figures 12 and 13 chart Route 74's weekday performance relative to other local routes in the Hartford Division, showing costs and ridership to be just below average.

FIGURE 10 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 74	DIVISION AVG	ROUTE 74	DIVISION AVG	ROUTE 74	DIVISION AVG
Operating Cost per Passenger	$4.82	$4.84	$7.73	$6.30	-	$6.66
Passengers per Revenue Vehicle Hour	26.6	28.9	16.5	27.0	-	29.7
Passengers per Revenue Vehicle Mile	2.6	2.6	1.5	2.4	-	2.9

Source: CTtransit performance data

FIGURE 11 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 74	DIVISION AVG
Early	1.1 %	0.2 %
Late	10.7 %	18.9 %
On-Time	88.3 %	80.9 %

Source: CTtransit performance data

FIGURE 12 | WEEKDAY OPERATING COST PER PASSENGER

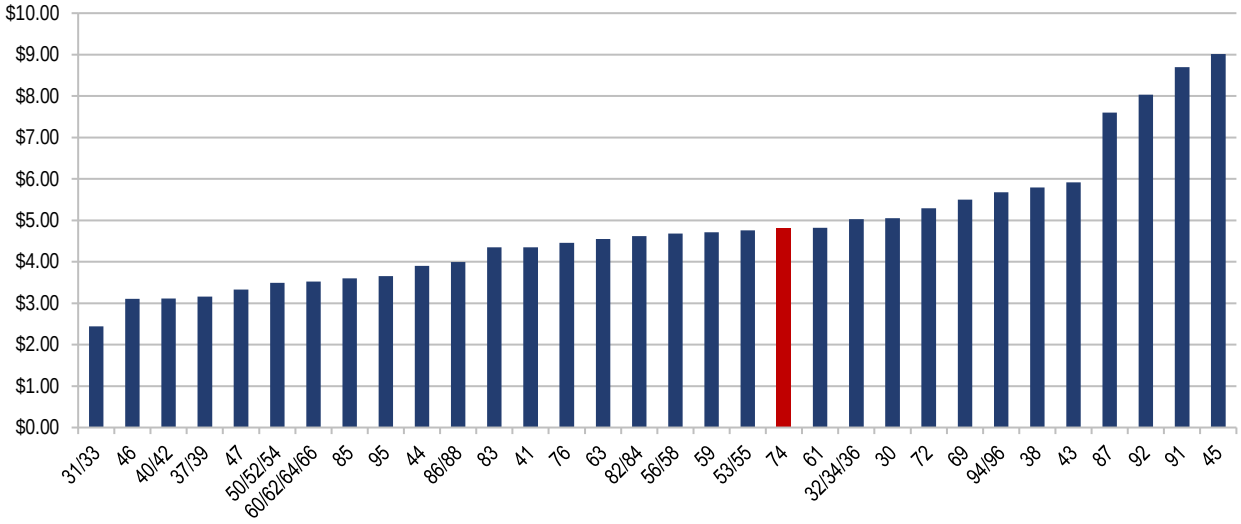
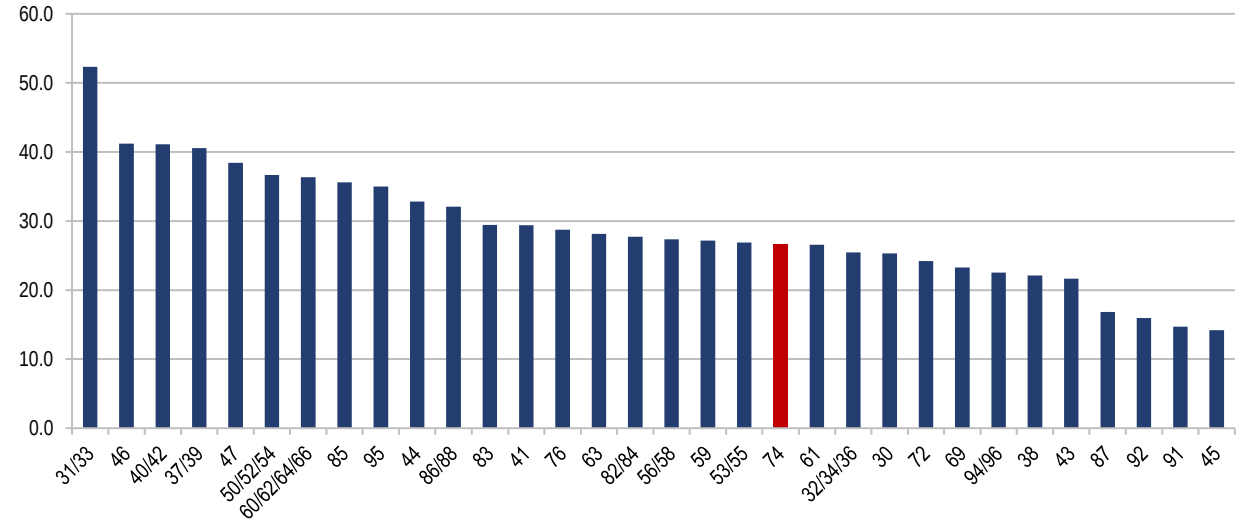


FIGURE 13 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT

Route 74 is a radial route connecting Hartford with Bloomfield via Asylum Avenue, Albany Avenue and Granby Street. The route is relatively long, at over eight miles, but serves a number of key trip generators including employers along Asylum Avenue (The Hartford, St. Francis Hospital), University High School, Weaver High School, Copaco Center and Seabury Retirement Center. Ridership is high along Asylum and Albany Avenues, and the route appears to partially serve as a crosstown route connecting Granby Street and Albany Avenue to the Asylum Hill neighborhood, and connecting these neighborhoods to Copaco Center.

CT*fastrak* Considerations

CT***fastrak*** service is scheduled for implementation in March 2015. Implementation will include two new routes that will interact with Route 74. These include:

- Route 153: the CT***fastrak*** service plan includes a new feeder Route 153 that will connect Copaco Center in West Hartford with the Flatbush Station. This will provide additional service to this major shopping and medical office destination, along with Route 74 (and Routes 50, 76 and 92). Route 153 is scheduled to operate daily and provide hourly service between 5:30 AM and 11:30 PM on weekdays, 6:30 AM and 11:30 PM on Saturday and 7:30 AM to 8:30 AM on Sundays. Route 74 ends service earlier in the evening (around 7:30 PM) and does not operate on Sundays.
- Route 161: the CT***fastrak*** service plan includes a new feeder Route 161 that will connect the new Sigourney Street Station and St. Francis Hospital. The new service will share only a short segment with Route 74, as it travels south on Woodland Street and along Asylum Avenue. However, this will provide a new option to access high ridership destinations such as the insurance campuses and St. Francis Hospital. Route 161 service is scheduled to operate daily with a high level of service, or every 15 minutes during weekday peak periods, 20 minutes in the off peak and 30 minutes during the evenings. Service is scheduled to begin at 5:00 AM to 12:30 AM. On Saturdays, service will run every 20 minutes during the day and every 30 minutes in the evening. It will operate between 5:10 AM and 12:30 AM. Sunday service is scheduled with 30 minute service all day between 6:30 AM to 8:30 PM.

These CT***fastrak*** routes will give riders an alternative route to Route 74's highest ridership destinations, namely Copaco Center and locations along Asylum Avenue. Riders' response to the new CT***fastrak*** service is not yet known, however it is likely some riders will use Route 153 to get to Copaco Center, and others will use Route 161 to access employment destinations on Asylum Hill. CT***fastrak*** services may be particularly more convenient for people traveling from the south.

Service Improvement Options

Despite the introduction of new CT***fastrak*** routes, much of Route 74's alignment will be unaffected by these services. Based on existing data, opportunities to strengthen Route 72 include the following:

- **Terminate all Route 74 trips at Copaco Center:** Daily ridership on the route segment north of Copaco Center is low, averaging about 40 riders per day – or about 10% of total ridership. Terminating service at Copaco would increase the productivity of the route. Destinations lost by eliminating the northern portion of the route, such as Seabury Retirement Village could be served via an extension of Route 52 Blue Hills Avenue or via a realignment of Route 50 to serve Seabury and the Wintonbury Mall. Some of these changes may be coordinated after CT***fastrak*** Route 153 is implemented.

- **Operate every other trip to Seabury Retirement Village:** Another option to serving the northern end of the route would be to terminate every other trip at Copaco. This operating pattern would increase the productivity of the route and better match demand and service levels. It also is a relatively simple method to continue service to Seabury and the Bloomfield residential neighborhood along School Street.
- **Extend only 74S trips to Seabury Retirement Village:** Operating only Route 74S trips to the Seabury terminus would provide reverse peak service to the retirement center, which may have a nursing shift similar to the 7 AM to 3 PM high school day. An additional Route 74S trip in each direction may be required to serve this work site, particularly given the high ridership on the 74S high school trips.
- **Extend Route 74 past Seabury to Federation Homes:** Extending Route 74 along Wintonbury Avenue to the Federation Home and/or Wintonbury Mall would allow Route 56 to be realigned.
- **Terminate Saturday service at Copaco Center:** Daily ridership on the route segment north of Copaco Center is very low on Saturdays, averaging about 2 riders per day. Terminating service at Copaco would increase the productivity of the route.
- **Realign Route 74 as a Crosstown Service:** Rather than serve downtown Hartford, Route 74 could be realigned to continue south on Woodland Avenue across Asylum Avenue, turning left on Farmington and south on Sisson Avenue and terminating at the Parkville CT***fastrak*** station. Realigning Route 74 in this way would allow the route to complement CT***fastrak*** Route 161 which connects Hartford Hospital to St. Francis via Sigourney and Woodland. This alignment also provides a direct connection to CT***fastrak*** from Albany Avenue.
- **Extend CTfastrak Route 161 along Woodland Avenue to Albany Street:** Alternatively, extending the new local CT***fastrak*** connection further north beyond St. Francis would provide a direct connection from the intersection of Albany and Blue Hills Avenue (a major transfer point for local buses) to CT***fastrak*** and Hartford Hospital.
- **Extend weeknight service until 8 or 9 PM:** Many stakeholders identified a need to run later evening service, particular to allow for after work shopping trips and to service 2nd shift workers at retail locations and St. Francis Hospital. Although the current demand patterns do not suggest a strong need for later service, there may be latent demand that is currently unserved.
- **Clarify Schedules:** The posted Route 74 schedule lists two variants: 74C terminating at Copaco Center and 74S serving University and Weaver High Schools. However, there are no 74C trips currently identified on the schedule. Also, some 74S trips serving the high school are noted with an asterisk (*), rather than as 74S.

Route Evaluation

ASHLEY STREET

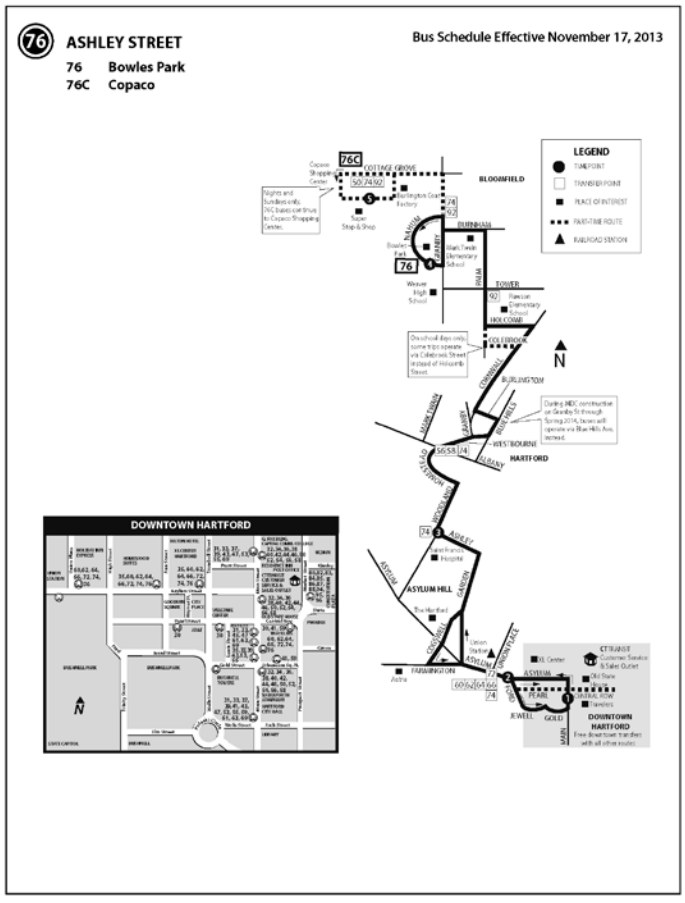
76 | Bowles Park

76C | Copaco

Service Design

Route 76 is a radial route that travels northwest from downtown Hartford. Most trips terminate at Bowles Park on Nahum Drive in Hartford, with the 76C variant serving the Copaco Shopping Center in Bloomfield (Figure 1). Route 76 operates seven days per week.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 76 originates in downtown Hartford, where riders can connect to most CT***transit*** routes, including future CT***fastrak*** services at Union Station. Outside of downtown, there are several locations along the route where riders can transfer to other CT***transit*** routes, including future CT***fastrak*** routes on Woodland Street and at Copaco Center (see Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 50	Blue Hills Avenue – Cottage Grove Road
Route 56	Bloomfield Avenue
Route 58	Albany Avenue
Route 60	Farmington Avenue/ West Hartford Center
Route 62	Farmington Avenue/ Bishops Corner
Route 64	Farmington Avenue/ Westfarms Mall
Route 66	Farmington Avenue/ UConn/ Unionville
Route 72	Asylum Avenue
Route 74	Granby Street
Route 92	Tower Avenue Crosstown
Route 153	CT*fastrak*: Flatbush /Copaco via Bishops Corner
Route 161	CT*fastrak*: St. Francis Hospital/Hartford Hospital

Alignments and Service Patterns

Outbound trips begin on Main Street in downtown Hartford and turn west onto Asylum Avenue, stopping at Union Station and then heading northwest via Garden Street, Ashley Street, Woodland Street, and Homestead Avenue. The route continues north on Homestead, crossing over Albany Avenue to Westbourne Parkway, and Cornwall Street. It turns west off of Cornwall onto Holcomb Street, right onto Palm Street and left onto Burnham Street, continuing west to it's terminal loop on Nahum Drive at Bowles Park. On weekday and Saturday evenings, and on Sundays, Route 74 continues north on Granby Street to Cottage Grove Road and the Copaco Shopping Center in Bloomfield. On school days, certain Route 74 afternoon trips operate via Colebrook Street instead of Holcomb Street.

Service Schedule

Route 76 operates seven days a week. On weekdays, Route 76 service operates every 10 to 15 minutes throughout the day. Route 76C also provides weekday service with four outbound trips and five inbound trips; all trips operate in the evening and begin/end at the Copaco Shopping Center. Trips on Route 76C are spaced roughly every 65 minutes. Outbound Route 76C trips serve Bowles Park only by request.

On Saturday, Route 76 also operates throughout the day with the Route 76C variant operating on evening trips. Saturday service is scheduled every 30 minutes, with Route 76C service every 65 minutes in the evening, terminating at the Copaco Shopping Center and serving Bowles Park on outbound trips only by request. Sunday service runs every 70 minutes with all trips scheduled as Route 76C and serving the Copaco Shopping Center.

An additional late evening trip to the Copaco Shopping Center operates on Saturday and Sundays between Thanksgiving and December 31.

FIGURE 3 | SCHEDULE OVERVIEW (ALL ROUTES 76 AND 76C)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:18 AM – 12:15 AM	15 / 20	51 / 53
Saturday	6:45 AM – 11:38 PM	30	28 / 28
Sunday	6:50 AM – 8:40 PM	70	12 / 12

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Route 76 carries about 1,615 passengers per weekday or about 15.5 passengers per trip. This is slightly below the Hartford Division average of 17.7 passengers per trip (see Figure 4). Saturday service carries about 13.7 passengers per trip, which is again below the division average of 16.3. However, Sunday service carries 18 passengers per trip, which is just above the division average.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 76	ROUTE 76	DIVISION AVG
Weekday	1,615	15.5	17.7
Saturday	713	12.7	16.3
Sunday	432	18.0	17.6

Source: CTtransit performance data

Ridership by Stop

The most heavily used stop on Route 76 is its downtown terminus on Main Street at Travelers Insurance. Other stops that generate 50 or more boardings or alightings per day are shown in Figure 5 below, and primarily include stops along Woodland and Ashley Streets on the inner portion of this route.

FIGURE 5 | ROUTE 76 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (OUTBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Palm Street / Tower Avenue	49 / 3	Residential neighborhood
Woodland Street / Woodland Drive	91 / 17	Woodland Village/Residential neighborhood
Ashley Street / Woodland Street	76 / 19	St. Frances Hospital
Ashley Street / May Street	61 / 9	Residential neighborhood
Ashley Street / Sigourney Street	116 / 16	Residential neighborhood
Ashley Street / Huntington Street	59 / 5	Residential neighborhood
Garden Street / Collins Street	49 / 8	The Hartford/Mass Mutual
Asylum Street / Union Place	8 / 49	Union Station
Gold Street / Lewis Street	0 / 128	Downtown Hartford and transfer point.
Main Street at Travelers	33 / 622	Downtown Hartford and transfer point.

Load profile data (see Figure 6) combines passenger activity by stop and shows the cumulative passenger load as the bus travels inbound along its route. Ridership by stop without the cumulative load is mapped in Figure 7. The data for Route 76 shows relatively light ridership activity north of Woodland Street, with the exception of the Tower Avenue stop on Palm Street. Activity is also light on the 76C variant from Copaco Center. Inbound passenger loads slowly increase between Bowles Park and Woodland Street, and peak at Asylum Avenue and Garden Street, near Union Station where passengers begin to alight for downtown destinations.

FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

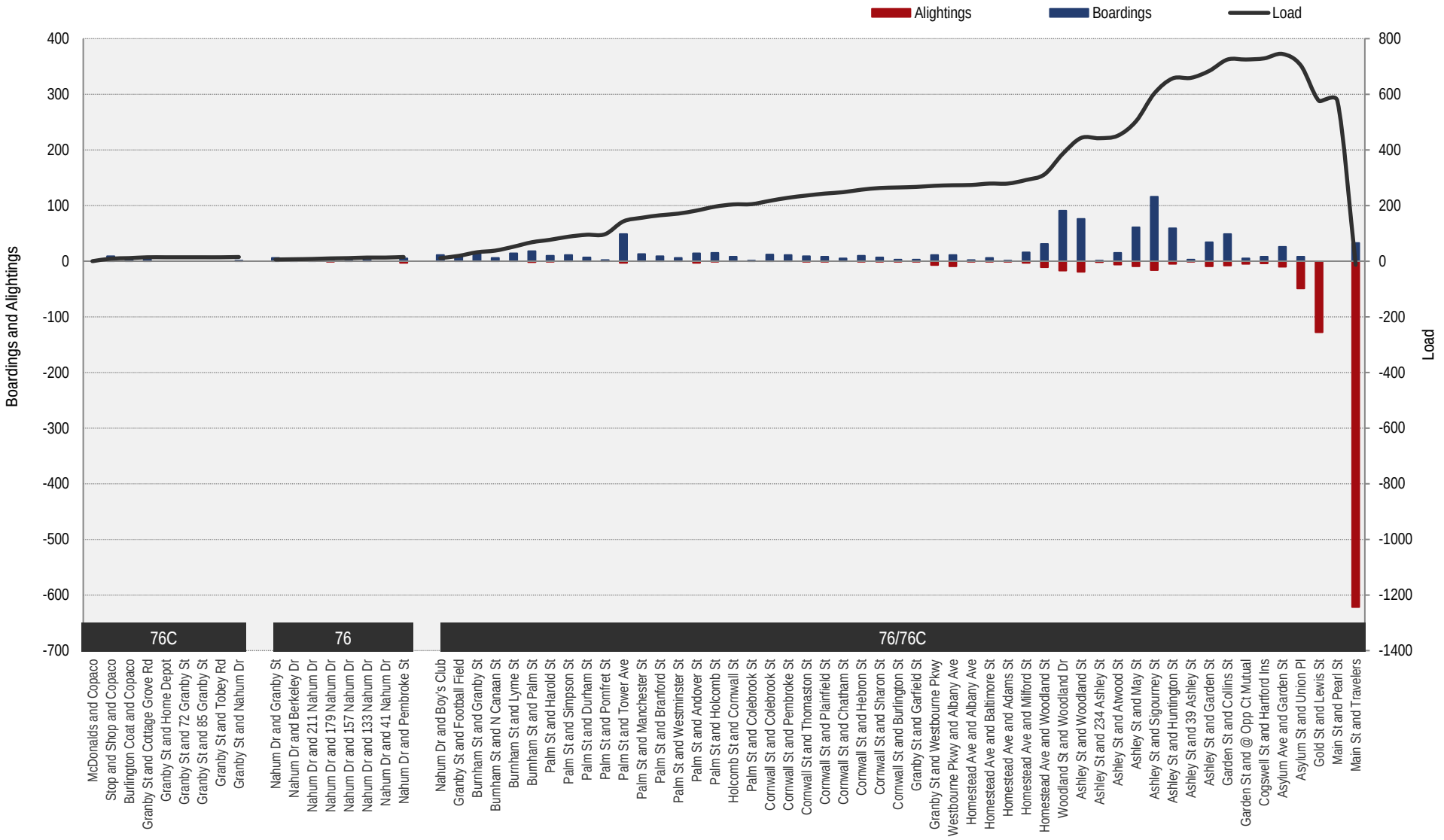
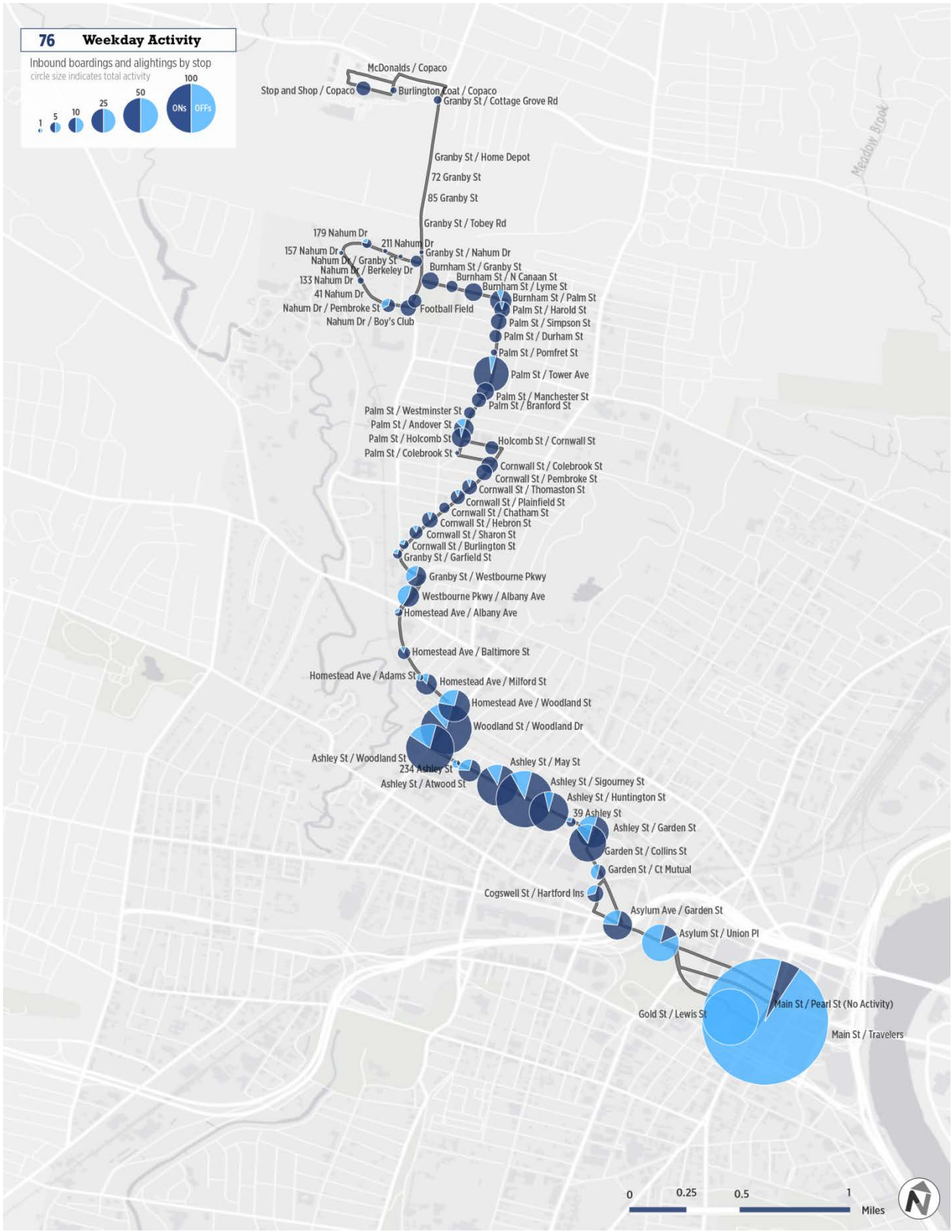


FIGURE 7 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Route 76 carries an average of 15.5 passengers per trip on weekdays. Ridership is well balanced throughout the day in both directions. The highest maximum load on Route 76 is the 7:00 AM inbound trip, with 37 passengers. No other weekday trip exceeds a load of 30 passengers. The typical seating capacity of a CT***transit*** bus is 38 passengers, so overcrowding is not an issue.

Ridership demand begins to drop off after 6 PM, suggesting that hourly evening service could begin earlier. Demand is also quite low on the last inbound and outbound trips of the day; this suggests the service could be shortened slightly. Likewise, low demand on the first two outbound weekday morning trips suggest that the first outbound trip could be discontinued.

FIGURE 8 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

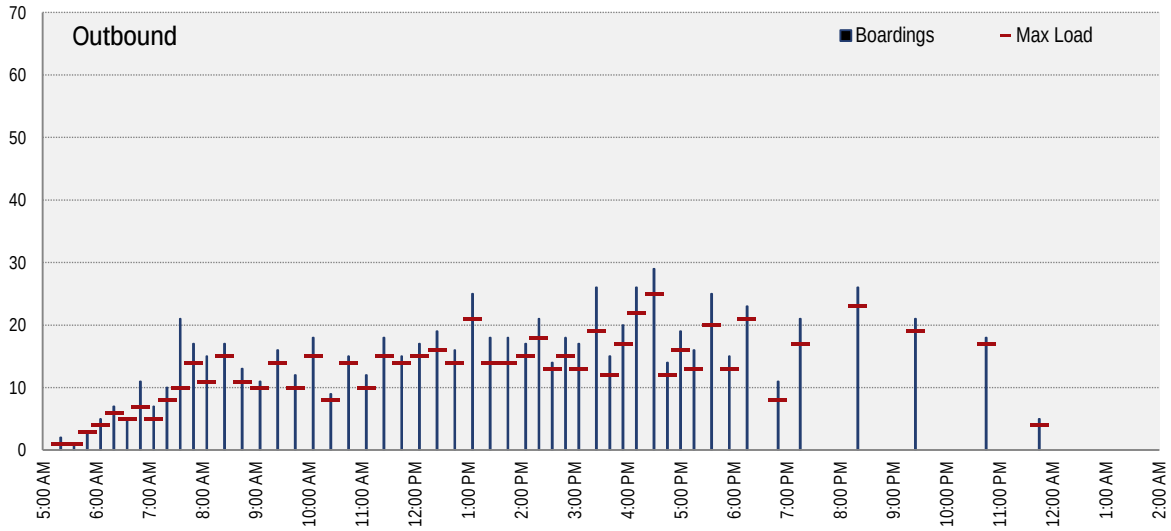
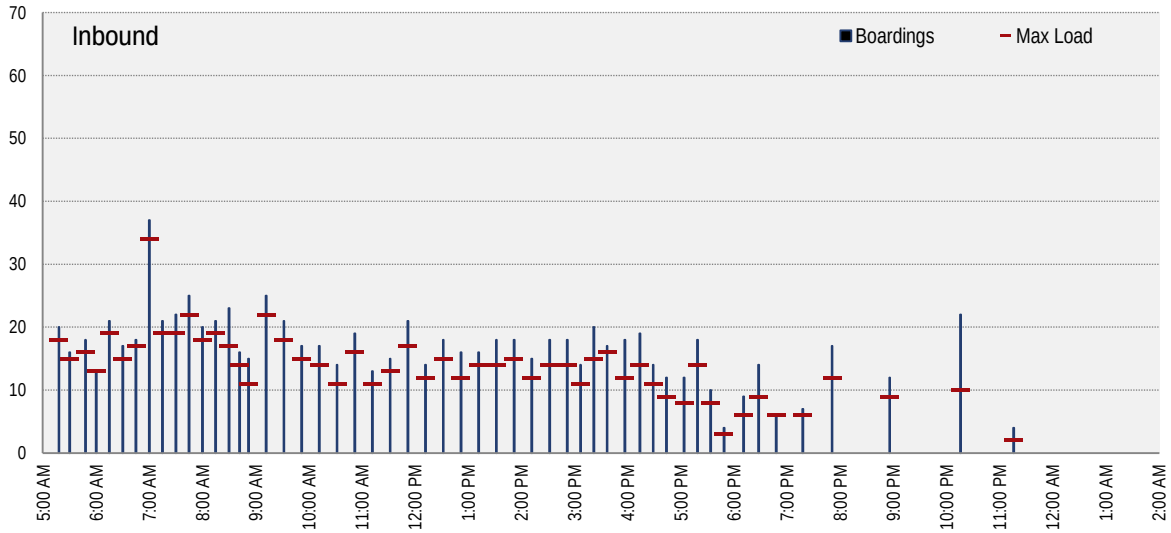


FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY TRIP

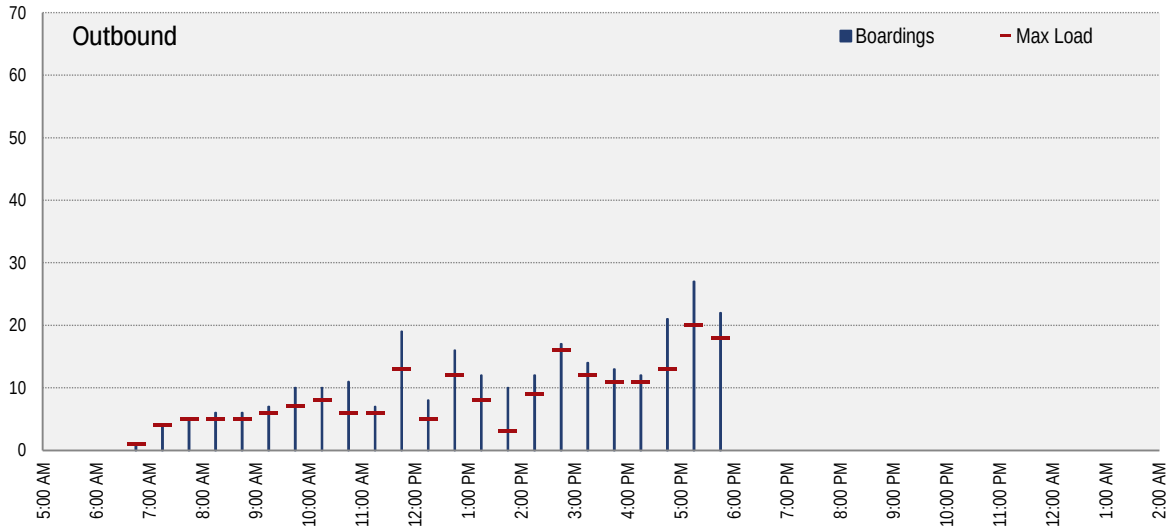


Saturday

Route 76 carries an average of 13.7 passengers per trip on Saturdays. Saturday service demonstrates more of a peak orientation and greater variation in maximum loads; there are more inbound riders early in the day and more outbound riders later in the day. Low ridership on the first few outbound trips each Saturday suggest that service could be reoriented to start in the inbound direction, delaying the first outbound trip.

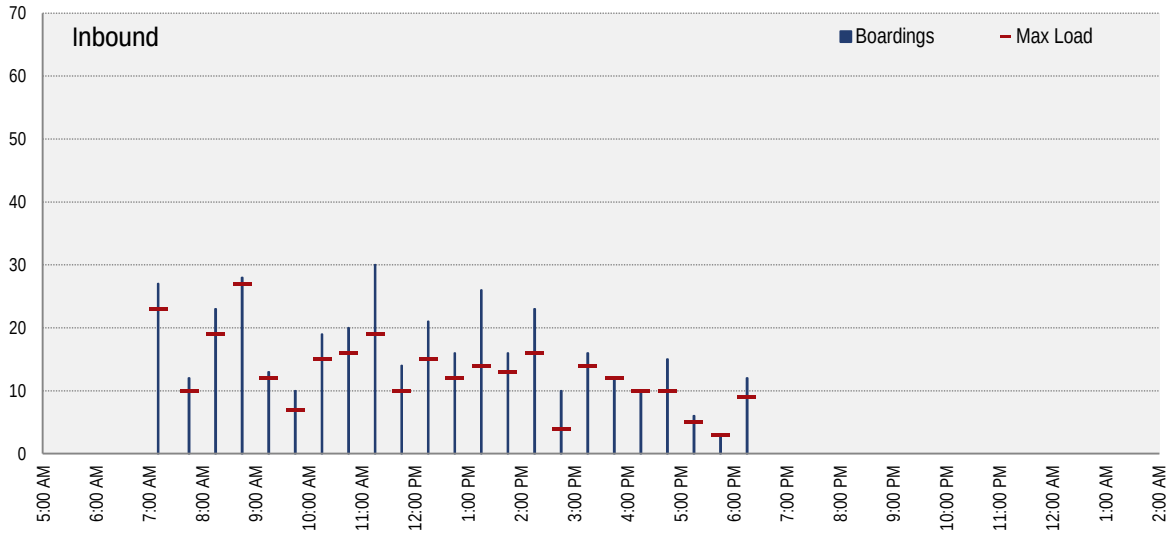
Data was not available for Saturday trips operating after 6:15 PM.

FIGURE 10 | SATURDAY OUTBOUND RIDERSHIP BY TRIP



Note: No data for Saturday outbound trips from 6:15 PM to 11:45 PM (6 trips)

FIGURE 11 | SATURDAY INBOUND RIDERSHIP BY TRIP

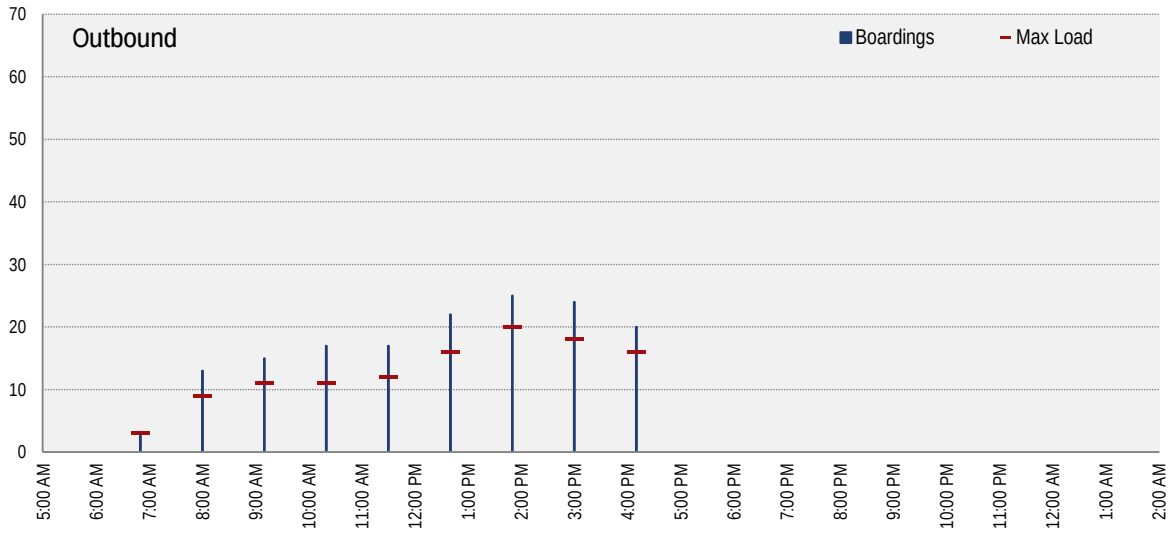


Note: No data for Saturday inbound trips from 6:40 PM to 11:16 PM (5 trips)

Sunday

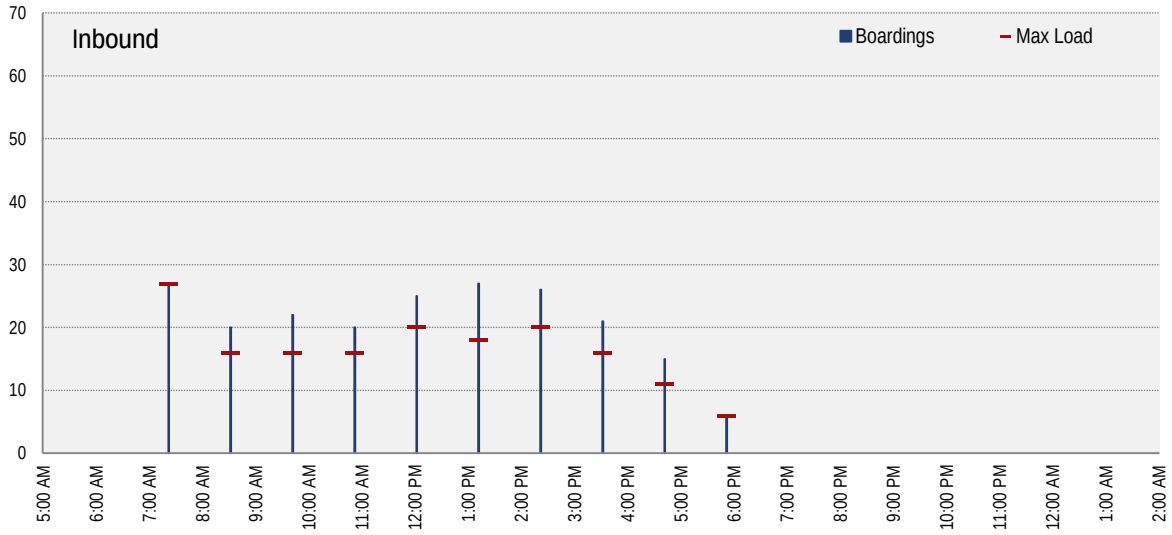
Route 76 carries an average of 18 passengers per trip on Sundays. Ridership is well balanced throughout the day, and although data was not available for evening trips, the high daily ridership average suggests these trips must continue to perform fairly well. Low ridership on the first outbound trip each Sunday suggests that service could be reoriented to start in the inbound direction.

FIGURE 12 | SUNDAY OUTBOUND RIDERSHIP BY TRIP



Note: No data for Sunday outbound trips from 5:20 PM to 8:50 PM (4 trips)

FIGURE 13 | SUNDAY INBOUND RIDERSHIP BY TRIP



Note: No data for Sunday inbound trips from 7:03 PM to 8:13 PM (2 trips)

Performance

Route 76 performs better than the Hartford Division average according to most measures (see Figure 14). The route has a lower cost per passenger than division average on all service days. Sunday performs particularly well, due in part to a reduced service schedule.

The number of passengers per revenue vehicle hour is just below average on weekdays and Saturdays, but above average on Sundays. The number of passengers per revenue vehicle mile is above average on all service days, an outcome due in part to the routes relatively short length.

FIGURE 14 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 76	DIVISION AVG	ROUTE 76	DIVISION AVG	ROUTE 76	DIVISION AVG
Operating Cost per Passenger	$4.45	$4.84	$5.08	$6.30	$4.05	$6.66
Passengers per Revenue Vehicle Hour	28.7	28.9	25.2	27.0	31.6	29.7
Passengers per Revenue Vehicle Mile	3.1	2.6	2.5	2.4	3.1	2.9

Source: CTtransit performance data

Route 76 has below average on-time performance, with 21.9% of time point checks showing buses running at least five minutes behind schedule (see Figure 15). More recovery time may be needed to consistently provide on-time service.

FIGURE 15 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 76	DIVISION AVG
Early	0.0%	0.2%
Late	21.9%	18.9%
On-Time	78.1%	80.9%

Source: CTtransit performance data

FIGURE 16 | WEEKDAY OPERATING COST PER PASSENGER

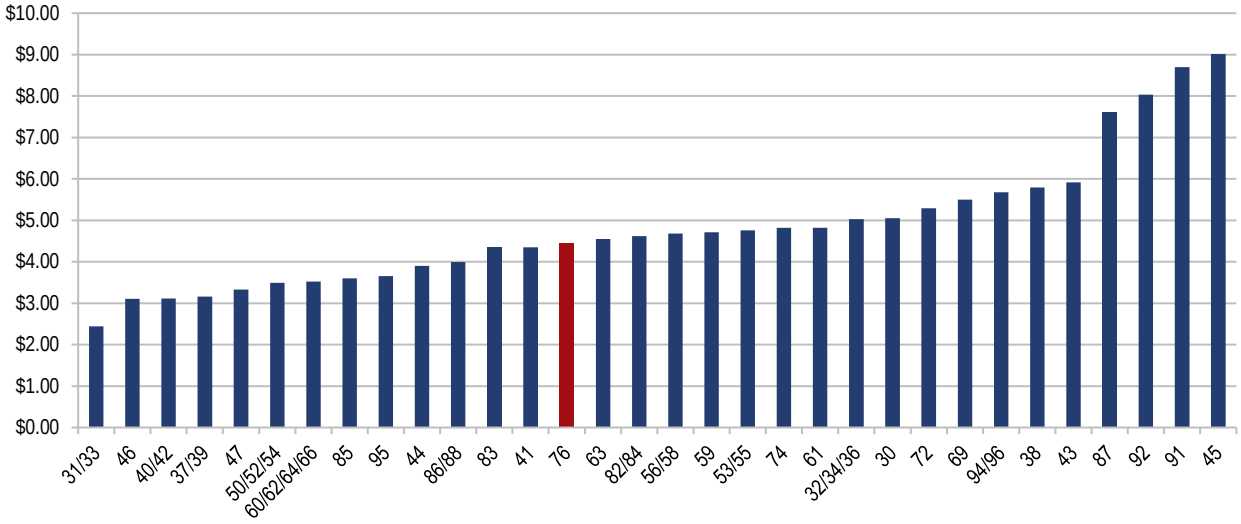
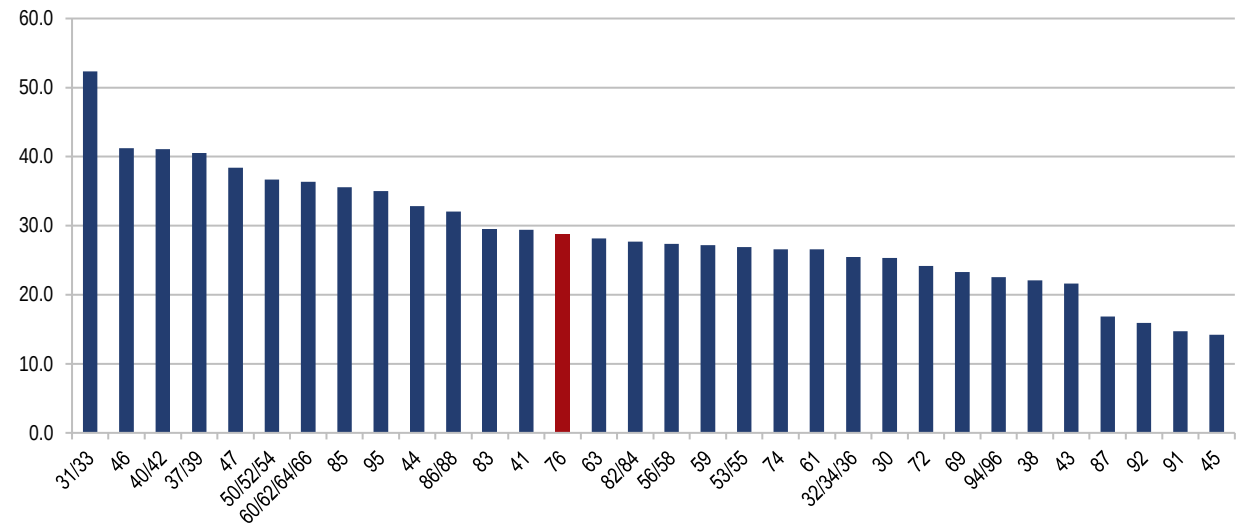


FIGURE 17 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT

Route 76 is a relatively frequent and moderately productive route connecting downtown Hartford with Asylum Hill, St. Francis Hospital, and residential neighborhoods to the northwest. It also provides late evening and Sunday service to Copaco Center in Bloomfield. The route is most heavily used between downtown and the hospital. While productive, the route is indirect and slow; the indirect routing is likely at least partially responsible for the on-performance challenges. It is also worth noting that Route 76 is partially funded by CRCOG's job access program.

CT*fastrak* Considerations

CT***fastrak*** service is scheduled for implementation in March 2015. Implementation will include new routes that will impact Route 76 because they provide additional service to two of Route 76's main destination (St. Francis Hospital) as well as one of the outer anchors (Copaco Center).

- Route 153: the CT***fastrak*** service plan includes a new feeder Route 153 that will connect Copaco Center in West Hartford with the Flatbush Station. There is not a lot of overlap in the routing of Route 153 and Route 76, but the feeder service will provide an alternative route to Copaco Center. Route 153 is scheduled to operate daily and provide hourly service between 5:30 AM and 11:30 PM on weekdays, 6:30 AM and 11:30 PM on Saturday and 7:30 AM to 8:30 AM on Sundays.
- Route 161: the CT***fastrak*** service plan includes a new feeder Route 161 that will provide service between CT***fastrak*** Sigourney Street Station and St. Francis Hospital. The new service will share only a short segment with Route 76, only Ashley Street on Asylum Hill. The service is scheduled to operate daily with a high level of service. On weekdays, service will run every 15 minutes during the peak periods, 20 minutes in the off peak and 30 minutes during the evenings. Service is scheduled to begin at 5:00 AM to 12:30 AM. On Saturdays, service is scheduled every 20 minutes during the day and every 30 minutes during evenings. It will operate between 5:10 AM and 12:30 AM. Sunday service is scheduled with 30 minute service all day between 6:30 AM to 8:30 PM.

CT***fastrak*** will give riders an alternative route to Route 76's highest ridership destination, St. Francis Hospital. Riders' response to the new CT***fastrak*** service is not yet known because the service has not opened; however it is likely some riders will use Route 161 to get to St. Francis Hospital, given the frequency of service available and the extended span of service. This path will also be more convenient for people traveling from the south. This service also opens destinations south of downtown Hartford to people living along northern portions of Route 76 (riders could transfer at St. Francis Hospital to avoid traveling into downtown Hartford).

Service Improvement Options

In addition, the portion of Route 76 between Garden Street and Ashley Street, west of Union Station, will be served uniquely by Route 76 as will destinations north of St. Francis Hospital. Route 76 will continue to be an important route and provide access to destinations Based on existing data, opportunities to strengthen the route include:

- **Offer consistent Copaco Center service:** Route 76 provides evening and Sunday service to Copaco Center in Bloomfield. Route 74, which operates parallel to Route 76 via Asylum, Woodland and Granby, provides weekday and Saturday service to Copaco Center ending around 6 PM. A potential improvement would be to designate either Route 74 or Route 76 (but not both) as serving Copaco service. This would reduce service variants and be clearer and easier to understand to riders.

- **Extend all trips to Copaco Center (in place of Route 74):** Another alternative would be to extend all Route 76 trips to Copaco. Identifying a single route and designating that route to provide frequent, consistent service throughout the day would make the route easier to understand and use. Route 74 could then be realigned to more directly serve Seaview Retirement Center and/or other Bloomfield locations.
- **Terminate service at Bowles Park:** The majority of Route 76's ridership is south of Bowles Park. Evening service to Copaco Center will be available CT***fastrak*** Route 153, plus potentially Route 50 or 74. This would allow Route 76 to end all trips at Bowles Park and potentially shorten the terminal loop to help address operational issues.
- **Discontinue weekday late night service:** Late night service on Route 76 is not well used. Given the additional service provided by CT***fastrak***, these evening trips could be eliminated, which would make Route 76 more productive.
- **Start less frequent service earlier in the evening**: Although weekday ridership drops off after 6:00 PM, relatively high frequencies are maintained until about 7:00 PM. Hourly late evening service could begin earlier in the evening at 6 PM.
- **Discontinue early morning trips on weekdays and Saturdays:** Route 76 is designed to operate its first trip of the day in the outbound direction. These trips are poorly used on weekdays and Saturdays. However, the first inbound trips of each day are fairly well utilized. The service would be more productive if the first run began with an inbound trip.
- **Clarify schedule variations**: The on-line schedule for Route 76 indicates that 76C is the Copaco variant, but not all Copaco trips are labeled as such (e.g. inbound trips). Schedule notes also include a different "C" variant that operates via Colebrook Street as a school trip on school days. It would be helpful if all Copaco trips were consistently labeled, and if the school trips was identified using a different letter.

Route Evaluation

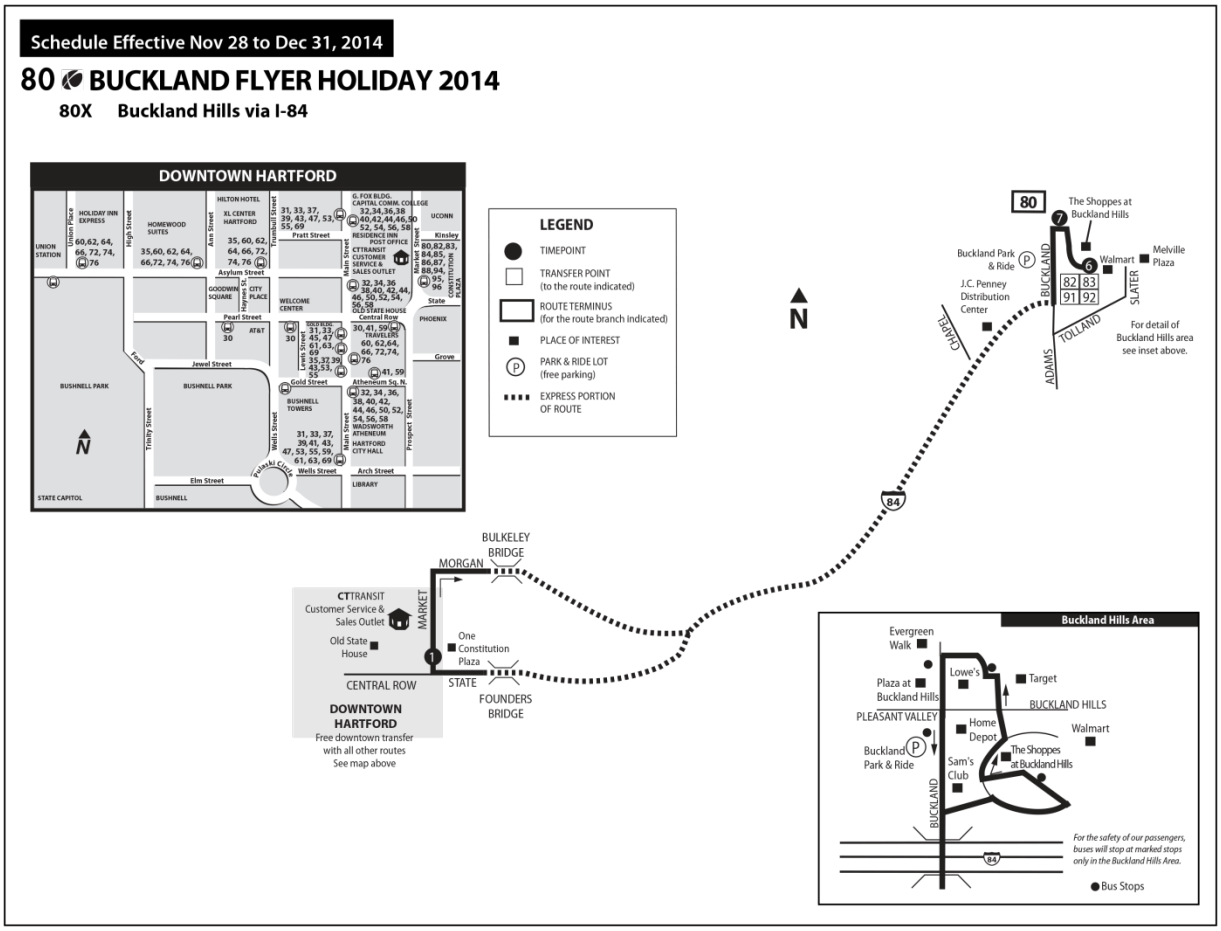
BUCKLAND FLYER

80X | Buckland Hills via I-84

Service Design

Route 80 is one of the Hartford Division's five Flyer routes, providing express service between downtown Hartford and retail stores located at Buckland Hills in Manchester (see Figure 1). Route 80X operates on Saturdays only.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 80 originates in downtown Hartford, where riders can connect to almost all CT***transit*** service. As a flyer service, Route 80 only stops at the Shoppes at Buckland Hills and Target/Lowe's Plaza, but there are opportunities to connect to other transit routes at these locations (see Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 82	Tolland Street and Buckland Hills
Route 83	Silver Lane
Route 91	Forbes Street Crosstown
Route 92	Tower Avenue Crosstown

Alignments and Service Patterns

Route 80 has one service alignment. The route travels between The Shoppes at Buckland Hills (Macy's), Target/Lowe's Plaza, and downtown Hartford via I-84. After reaching The Shoppes at Buckland Hills from downtown Hartford, the route lays over for 10 minutes before heading to Target/Lowe's Plaza and then immediately travels back downtown via I-84.

Service Schedule

The Buckland Flyer operates on Saturdays throughout the year and offers additional service days and times during the holiday season. On Saturday, service runs every 60 minutes throughout the day until 6:00 PM (see Figure 3), followed by service every 65 to 75 minutes in the evening. From 6:00 PM onward, outbound trips begin at Travelers on Main Street rather than on Market Street. From 5:30 PM onward, inbound trips terminate at Central Row North rather than at Market Street.

FIGURE 3 | SCHEDULE OVERVIEW

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	-	-	-
Saturday	1:00 PM – 9:23PM	60	8 / 9
Sunday	-	-	-

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Route 80 carries 349 daily passengers or 20.5 passengers per trip (average for Saturday). This is 31% above the Hartford Division average of 15.7 weekday passengers per trip (see Figure 4).

FIGURE 4 | RIDERSHIP STATISTICS

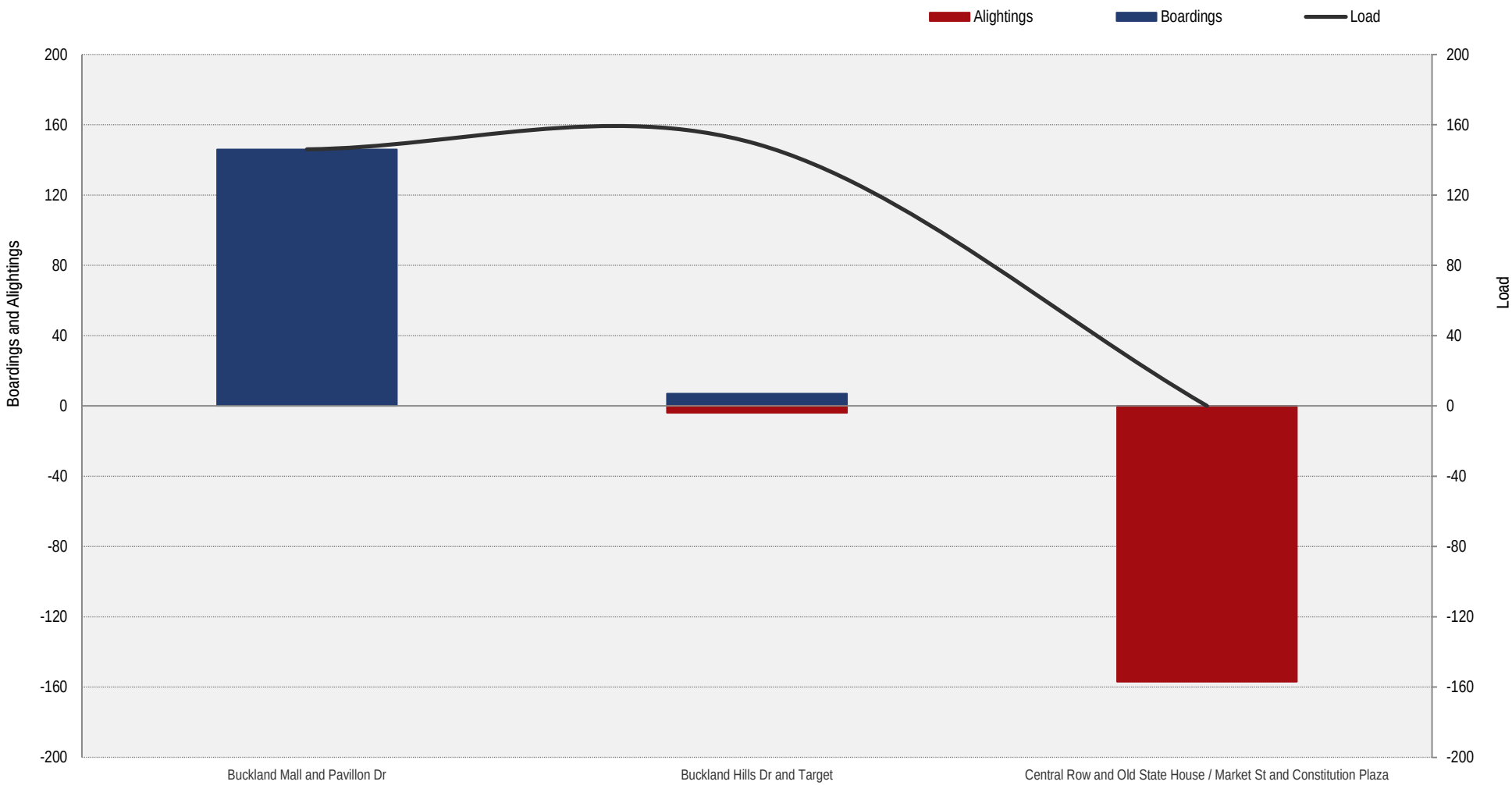
SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 80	ROUTE 80	DIVISION AVG
Weekday	-	-	17.7
Saturday	349	20.5	16.3
Sunday	-	-	17.6

Source: CTtransit performance data

Ridership by Stop

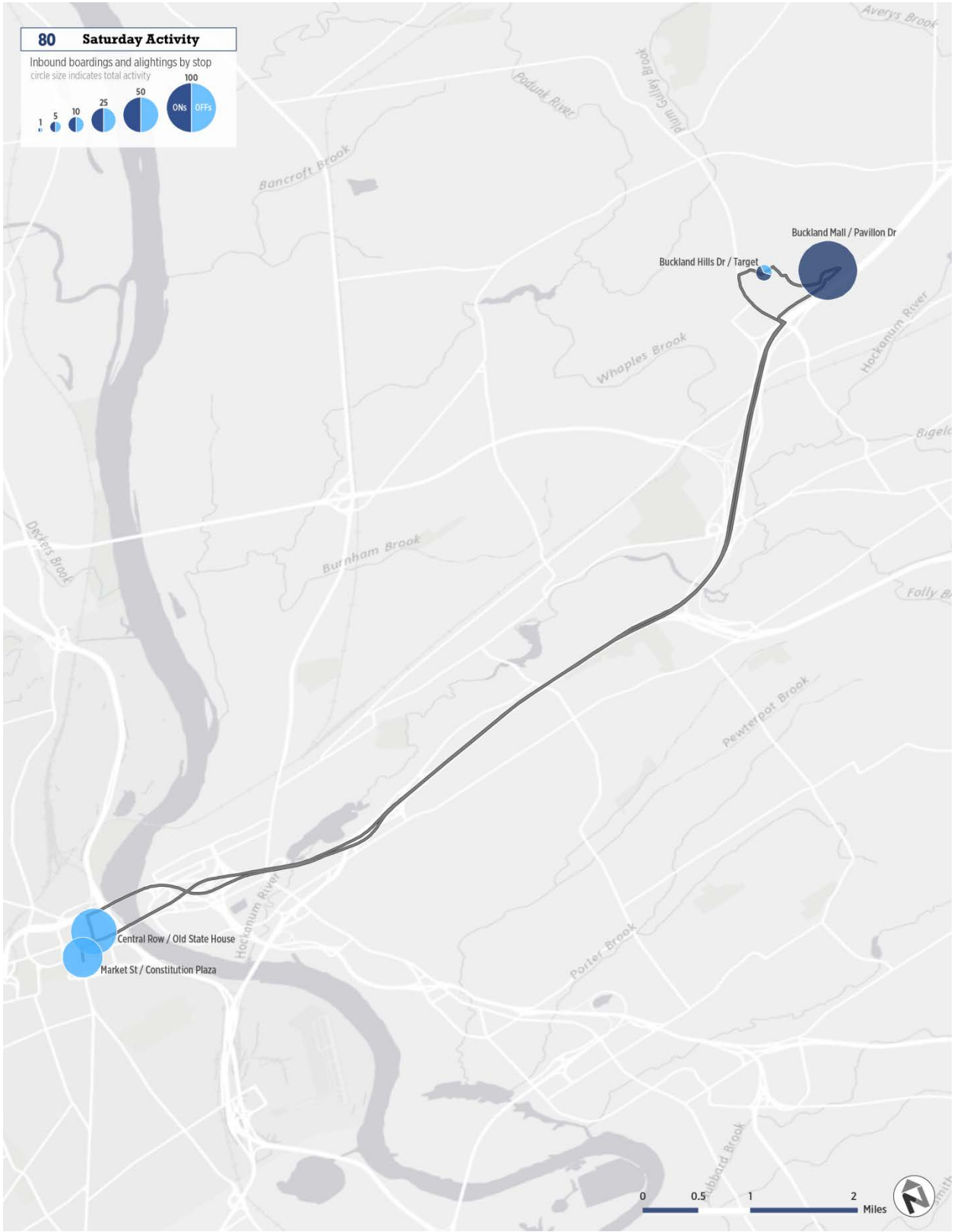
Over 97% of activity on Route 80 occurs in downtown Hartford (50%) or at The Shoppes at Buckland Hills (46%). Target/Lowe's Plaza generates less than 3%, with only 11 boardings and alightings per day. For inbound trips, this means that most riders board at Buckland Hills retail area and alight in downtown, as shown in Figure 5 and Figure 6.

FIGURE 5 | SATURDAY INBOUND RIDERSHIP BY STOP GRAPH



Note: Stop activities at Old State House and Constitution Plaza are combined.

FIGURE 6 | SATURDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Saturday

Ridership by trip on Saturdays follows a typical shopping trip pattern with outbound ridership strongest from 1:00 PM (the first trip) through 4:00 PM (see Figure 7). Each of the four trips during this period carry 20 or more passengers; ridership peaks at 30 boardings on the 3:00 PM trip. After this, ridership declines to fewer than 15 passengers on each of the remaining outbound trips. Inbound ridership slowly increases throughout the day, starting with around 15 passengers on the first trip at 1:25 PM and builds to over 40 passengers on the 5:30 PM trip (see Figure 8). Boardings then sharply decline and the next three trips carry fewer than 20 passengers. No data exists for the last inbound trip of the day at 9:05 PM; however, based on the trend throughout the day, it is likely that no more than 5-10 people utilize this trip.

Overcrowding on Route 80 is unlikely a problem with the maximum load on all but one trip under 35 passengers. The 5:30 PM inbound trip, which has the highest ridership of any trip, reaches a maximum load just under 40 passengers, but the capacity of a standard 40-foot bus is still sufficient for most passengers to find a seat.

FIGURE 7 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

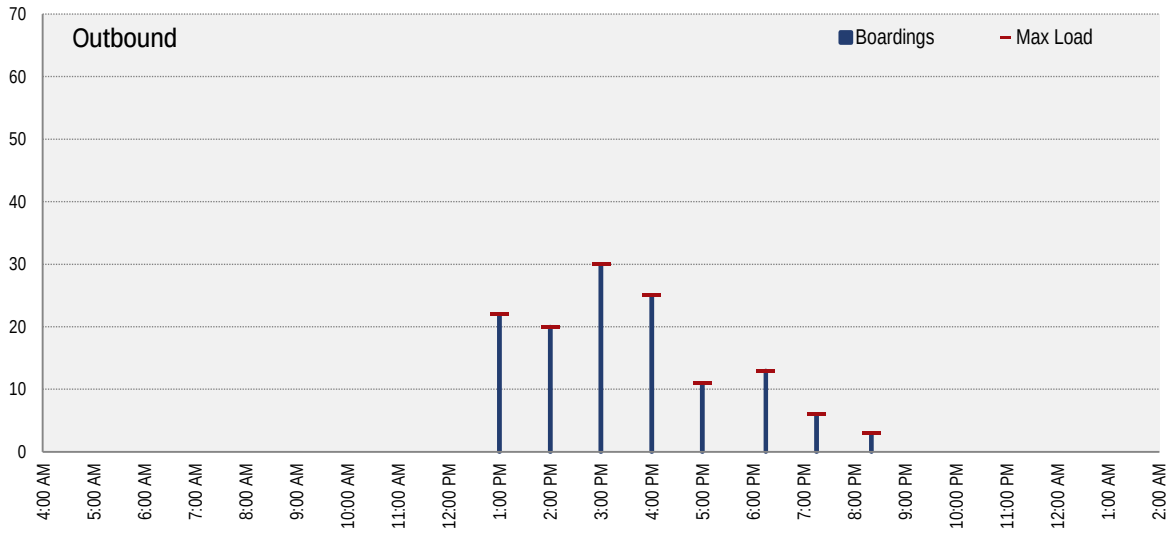
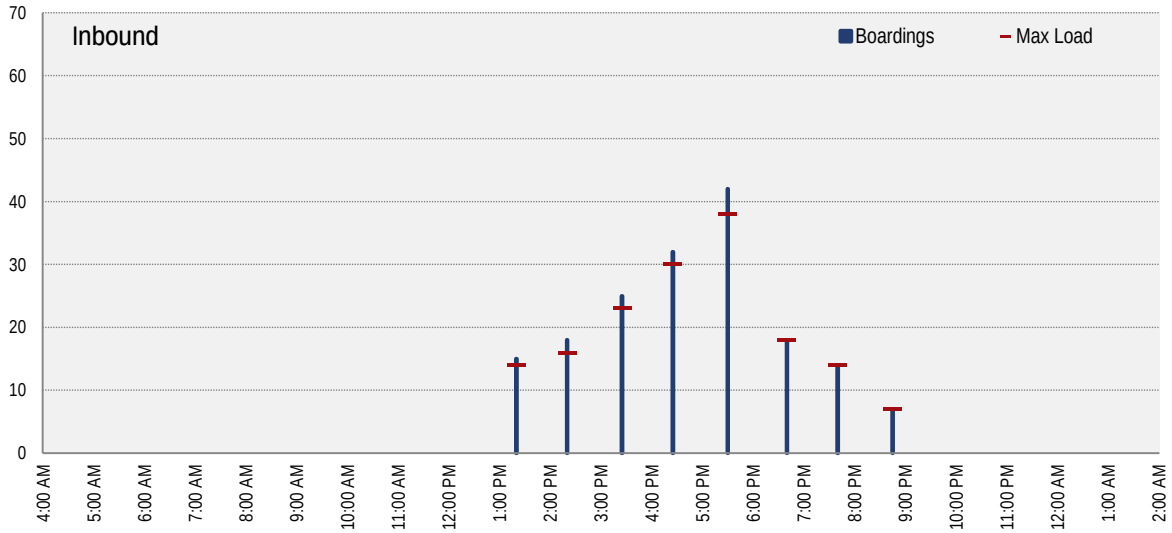


FIGURE 8 | SATURDAY INBOUND RIDERSHIP BY TRIP



Performance

Route 80 performs better than or near average on all Saturday performance measures, as shown in Figure 9. Operating costs per passenger are less than half of the Hartford Division average, while the number of passengers per revenue hour is 60% above. The average passengers per revenue mile on Route 80 is 2.4.

FIGURE 9 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 80	DIVISION AVG	ROUTE 80	DIVISION AVG	ROUTE 80	DIVISION AVG
Operating Cost per Passenger	-	$4.84	$3.07	$6.30	-	$6.66
Passengers per Revenue Vehicle Hour	-	28.9	41.6	27.0	-	29.7
Passengers per Revenue Vehicle Mile	-	2.6	2.4	2.4	-	2.9

Source: CTtransit performance data

Over half of Route 80 trips run late, which is much higher than the Hartford Division average of 18.9%. Only about 46% of trips on the route are on-time. With so few trips overall (17 total), even just a few trips falling outside of CT***transit***'s definition of "on-time" can cause poor performance. Moderate to heavy traffic around the Buckland hills retail area may cause delays when getting on or off I-84, and so these delays should be considered when scheduling the route. The current schedule allows for some slack.

FIGURE 10 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 80	DIVISION AVG
Early	0.0%	0.2%
Late	53.8%	18.9%
On-Time	46.2%	80.9%

Source: CTtransit performance data

SERVICE IMPROVEMENT OPTIONS

Route 80 is one of the Hartford Division's Flyer routes, traveling express between The Shoppes at Buckland Hills and downtown Hartford via I-84. The route provides a 15-18 minute trip between the retail area and downtown, with one additional stop at Target/Lowe's Plaza. Operating on Saturdays only, ridership on Route 80 is solid. The route serves a clear market and performs well overall, although it struggles with on-time performance.

- **Offset schedules for Route 80 and Route 82 by approximately 30 minutes.** Route 82 Tolland Street-Buckland Hills also serves the retail area of Buckland Hills on Saturdays with approximately the same frequency as Route 80. Travel times on Route 82, however, are longer (about 30-35 minutes depending on direction), but the span of service is longer (7:00 AM to 10:42 PM). The schedules for Route 80 and 82 are not well coordinated, so buses arrive and depart from the same location at similar times. Departures are currently scheduled roughly five minutes apart or less. As a result, the two routes don't increase passenger options and the services end up competing rather than complementing each other. Scheduling services to be off-set, so Flyer service departs on the half hour and regular service on the hour would increase the attractiveness of both routes, increase passenger options and strengthen ridership.
- **Maintain consistent hourly service.** The current schedule maintains hourly, clockface service from the start of service to about 5:30 PM but then deviates somewhat from there. While the frequency is still about 65-70 minutes, the inconsistency and loss of times on the clockface makes the schedule harder to read and remember.
- **Shift service one hour earlier.** Demand on Route 80 indicates that the performance and usefulness of the service might benefit from shifting operating hours to between noon and 8:00 PM. Outbound ridership is high on the first trip and drops to nearly zero on the last trip. Inbound ridership, though a bit higher in the evening, peaks by 5:30 PM, and so is unlikely to be affected much by this shift.
- **Eliminate the 9:05 PM inbound trip.** No data for this trip exists, so additional information is likely needed before it is cut. However, if daily inbound ridership trends continue, ridership at 9:05 PM is likely low. The Shoppes at Buckland Hills closes at 9:00 PM, so this is the last opportunity for employees of the retail area to reach downtown Hartford quickly. Route 82 and Route 83 offer later inbound trips but not until 9:54 PM. CT***transit*** should discuss the needs of employees with the mall to ensure that service is useful and productive for all involved.
- **Improve local circulation.** One of the long standing challenges with the Buckland Hills area is local circulation, especially for transit riders and pedestrians who have few options for moving between shopping centers and plazas. Creating a shuttle or flex service that provides connections between Route 80 and other facilities. It would also help strengthen Route 80.

Route Evaluation

TOLLAND STREET

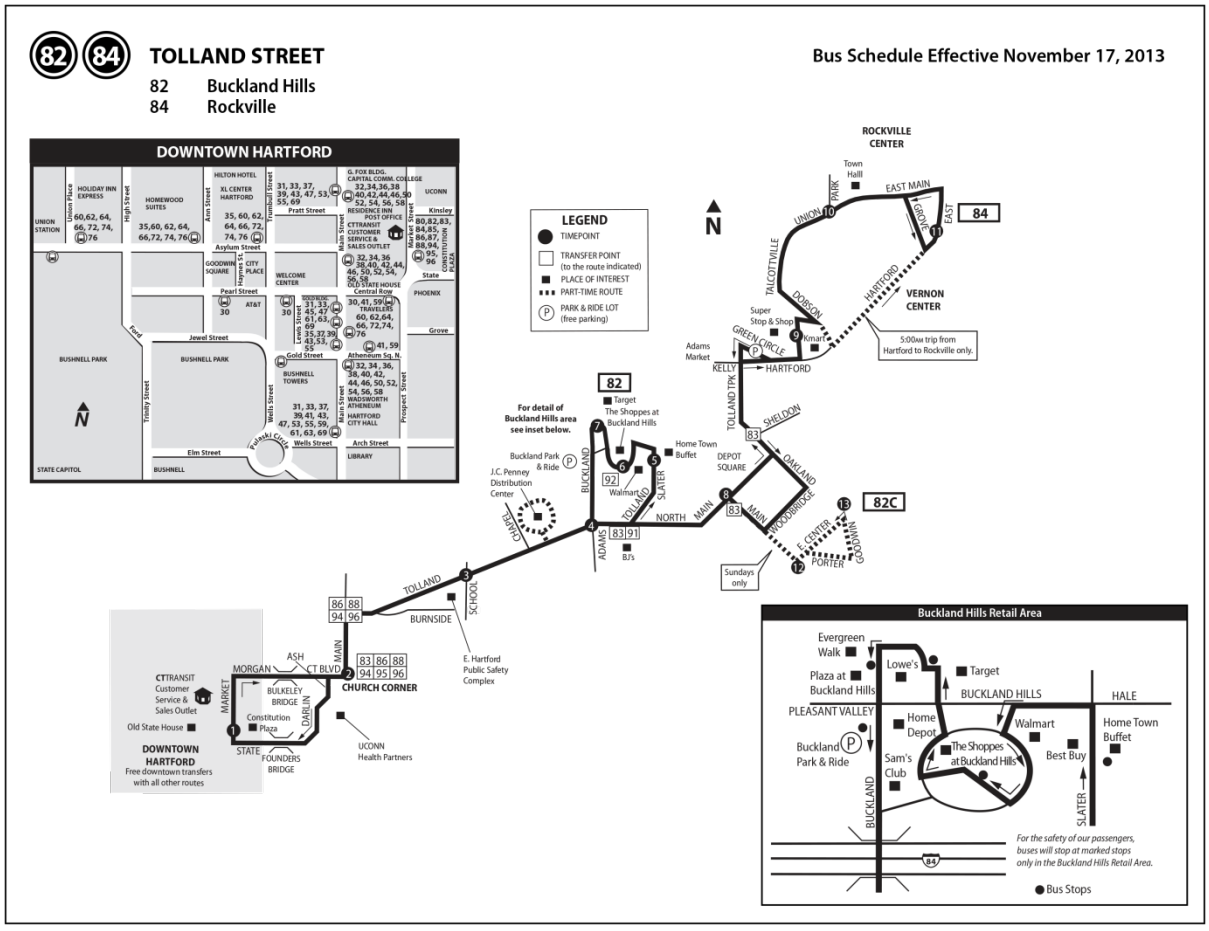
82 | Buckland Hills

84 | Rockville

Service Design

Routes 82 and 84 operate east along Tolland Street and Tolland Turnpike providing radial service between downtown Hartford and Manchester (Route 82) and Vernon (Route 84). The two routes function as variants of a single service, with a common alignment and unique outer ends (see Figure 1).

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Routes 82 and 84 begin/end in downtown Hartford where riders can transfer to nearly most CT***transit*** services. In addition, there are several locations where riders can transfer to other CT***transit*** Hartford routes (see Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 83	Silver Lane
Route 86	Burnside Avenue and Mayberry Village
Route 88	Burnside Avenue
Route 91	Forbes Street Crosstown
Route 94	Park Avenue
Route 95	Glastonbury
Route 96	John Fitch Boulevard

Alignments and Service Patterns

The common or trunk alignment for inbound Route 82 and Route 84 begins at Tolland Street and Buckland Street near the Buckland Hills retail area. Traveling along Tolland Street for a majority of the alignment, the routes complete a terminating loop in downtown Hartford via Main Street, State Street, and Market Street, and finish the loop when headed outbound on Connecticut Boulevard. Weekday service on Route 82 and Route 84 follow this common alignment plus:

- Route 82's alignment includes a loop at the Buckland Hills retail area. The inbound route begins at Slater Street and then continues west to serve The Shoppes at Buckland Hills, Target/Lowe's Plaza, and the Buckland Park & Ride before arriving at the intersection of Tolland and Buckland Streets.
- Route 84 inbound begins in Vernon near Rockville Center on East Main Street and follows this road west and south (with various name changes along the way) to Talcottville Road and eventually the Tolland Turnpike. The route operates south along Oakland Road to reach North Main Street and Depot Square before then also reaching the intersection of Tolland and Buckland Streets. Various trips on both routes have notes indicating that the trip begins or ends at a different location than most trips, such as the J.C. Penney Distribution Center, Central Row North, and Travelers on Main. The 5:00 AM outbound trip – the first trip of the day – travels to Vernon via the Hartford Turnpike to reach the inbound starting point.

On Saturdays, Routes 82 and 84 operate as a single route serves both the Buckland Hills retail area and continues on to Vernon. On Sundays, a variant of Route 82 operates (Route 82C). Traveling inbound Route 82C makes a loop at Porter, Goodwin, and East Center Streets in Manchester and then travels along Main Street in Manchester Center to Depot Square at North Main and Main Streets. From Main Street, Route 82C follows the regular Route 82 and 84 trunk alignment into downtown Hartford.

In addition to Route 83C, a Rockville Shuttle operates between Depot Square and East Main Street near Rockville Center. This alignment is consistent with Route 84's normal travel path. Riders can make a free transfer to Route 82 at Depot Square.

Service Schedule

Route 82 and Route 84 operate seven days a week (see Figure 3). There are 37 total inbound trips per weekday (15 on Route 82, 4 on Route 82/84, and 18 on Route 84) and 39 total inbound trips (16 on Route 82, 3 on Route 82/84, and 20 on Route 84). Morning trips are predominantly Route 84 trips operating at about 20 minute frequencies until 8:30 AM. Routes 82 and 84 then operate mostly alternating trips until about 6:00 PM at a frequency of every 30 minutes. Two morning outbound trips on Route 82 serve the J.C. Penney Distribution Center before serving the Buckland Hills retail area, and two midday inbound trips begin at the distribution center, skipping the retail area. After 6:00 PM, most trips operate as a combined Route 82 and 84 beginning at Travelers on Main (outbound) and ending at Central Row North (inbound). There is also one additional outbound and inbound trip on weekdays during the holidays.

There are 15 outbound trips (1 on Route 82 and 14 on Route 82/84) and 15 inbound trips (1 on Route 82 and 14 on Route 82/84) on Saturdays, with a frequency of roughly every 60 minutes. There is also one additional outbound and inbound trip on Saturdays between Thanksgiving and December 31.

On Sundays, there are 9 Route 82C trips traveling outbound (10 on the Rockville Shuttle) and 10 Route 82C trips traveling inbound, with one additional regular Route 82 trip per direction between Thanksgiving and December 31. Service operates every 70 minutes.

FIGURE 3 | SCHEDULE OVERVIEW (ALL ROUTES 82, 82/84, AND 84)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:00 AM – 10:42 PM	20/30	39/37
Saturday	7:15 AM – 10:42 PM	60	15/15
Sunday	7:48 AM – 7:30 PM	70	9/10

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Route 82/84 carries 2,120 daily passengers or 27.2 passengers per trip on an average weekday. This is about 55% higher than the Hartford Division average of 17.6 weekday passengers per trip (see Figure 4). Ridership on Saturdays and Sundays declines each day but remains much stronger per trip than average, with 44.7 and 24.2 passengers per trip, respectively.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 82/84	ROUTE 82/84	DIVISION AVG
Weekday	2,120	27.2	17.7
Saturday	1,341	44.7	16.3
Sunday	943	24.2	17.6

Source: CTtransit performance data

Ridership by Stop

The most heavily used stops on Route 82/84 outside of the downtown terminus include the Buckland Hills retail area, Church Corner (Connecticut Boulevard and Main Street), and Depot Square (North Main Street and North School Street), which all have activity (boardings and alightings) over 100 on an average day (see Figure 5). Tolland Street and School Street, East Main Street and Park Street, Central Roadway at the Super Stop & Shop, and Union Street and War Street also have activity over 50 riders.

All other stops have fewer than 50 boardings and alightings, though ridership remains fairly strong along a majority of Route 82/84. Around 10% of activity occurs at the Buckland Hills retail area (Route 82), 35% along the unique portion of Route 84, and about 27% along Tolland Street, with the remaining activity at the downtown terminus.

Load profile data (see Figure 6) combines passenger activity by stop and shows the cumulative passenger load as the bus travels inbound. Ridership by stop without the cumulative load is mapped in Figure 7 and Figure 8. Due to incomplete data at Slater Street at Home Town Buffet on inbound trips and Target/Lowe's Plaza on outbound trips, some ridership activity at the Buckland Hills retail area may be missing. The segment between the J.C. Penney Distribution Center and Tolland Street at Long Hill Drive has the weakest ridership along the route with an average of only about 20 boardings and alightings per day at all stops. The portion of the one morning trip that travels along Hartford Turnpike operates as "closed door" service and thus shows no ridership.

FIGURE 5 | ROUTE 82/84 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Buckland Mall & Pavilions Dr	145/2	The Shoppes at Buckland Hills
Church Corner (Connecticut Boulevard & Main Street)	60/45	Transfer point to Routes 83, 86, 88, 94, 95, 96
North Main Street & North School Street	31/68	Depot Square, transfer to Route 83
Tolland Street and School Street	48/19	Moderate density commercial and residential strip
East Main Street & Park Street	59/4	Downtown Rockville
Central Roadway @ Super Stop & Shop	31/26	Super Stop & Shop, Kmart, big box retail
Union Street and Ward Street	50/2	Downtown Rockville

FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

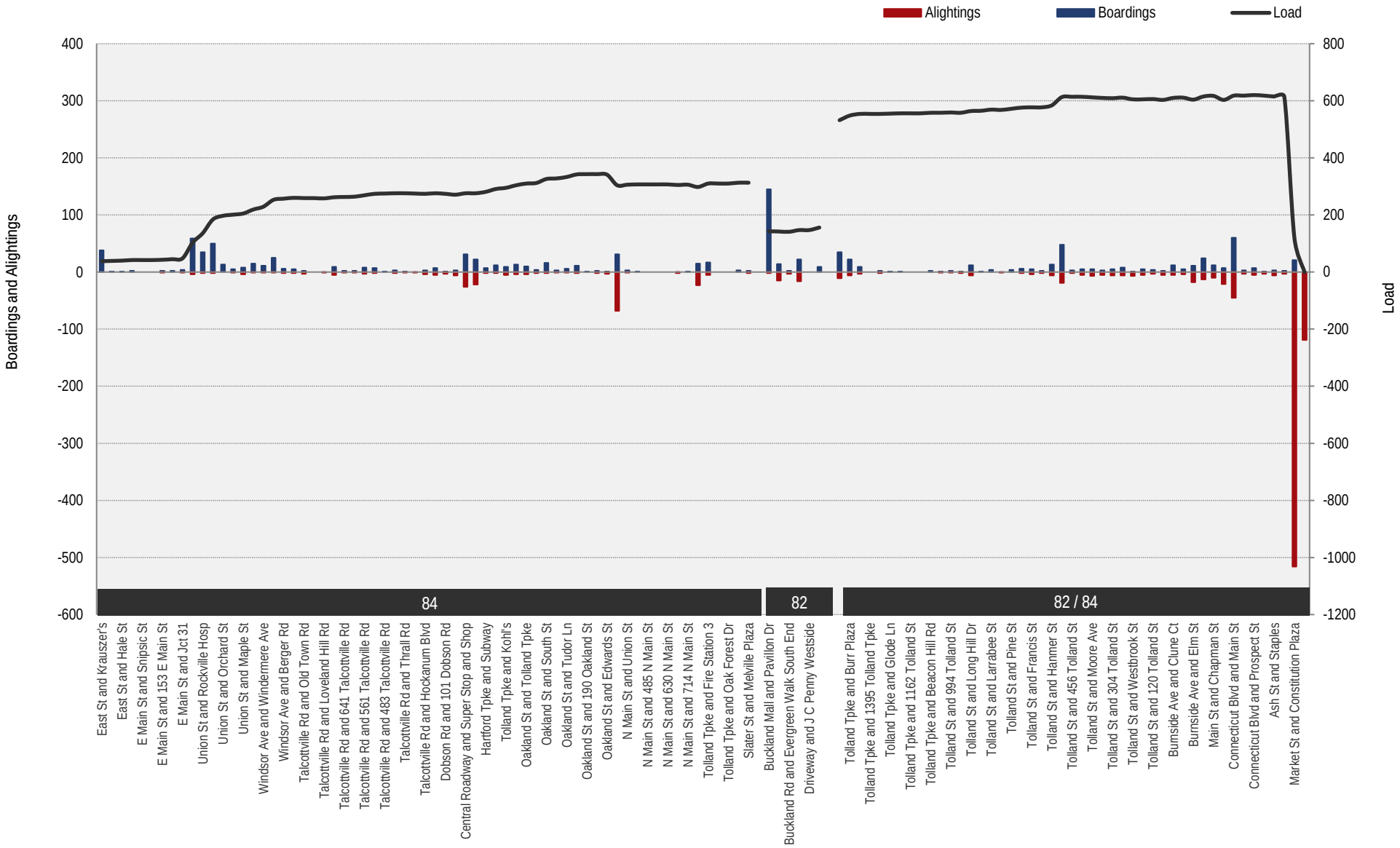


FIGURE 7 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

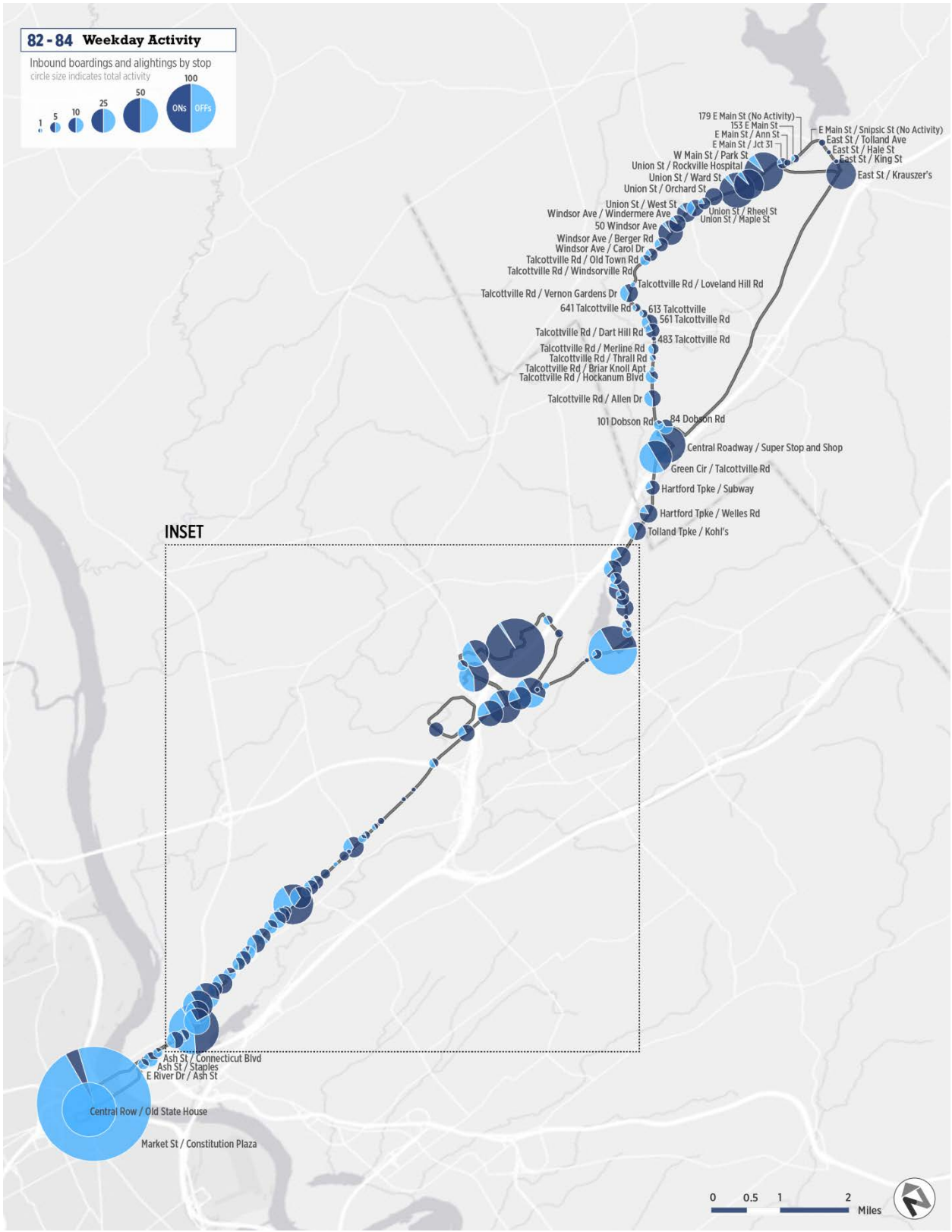
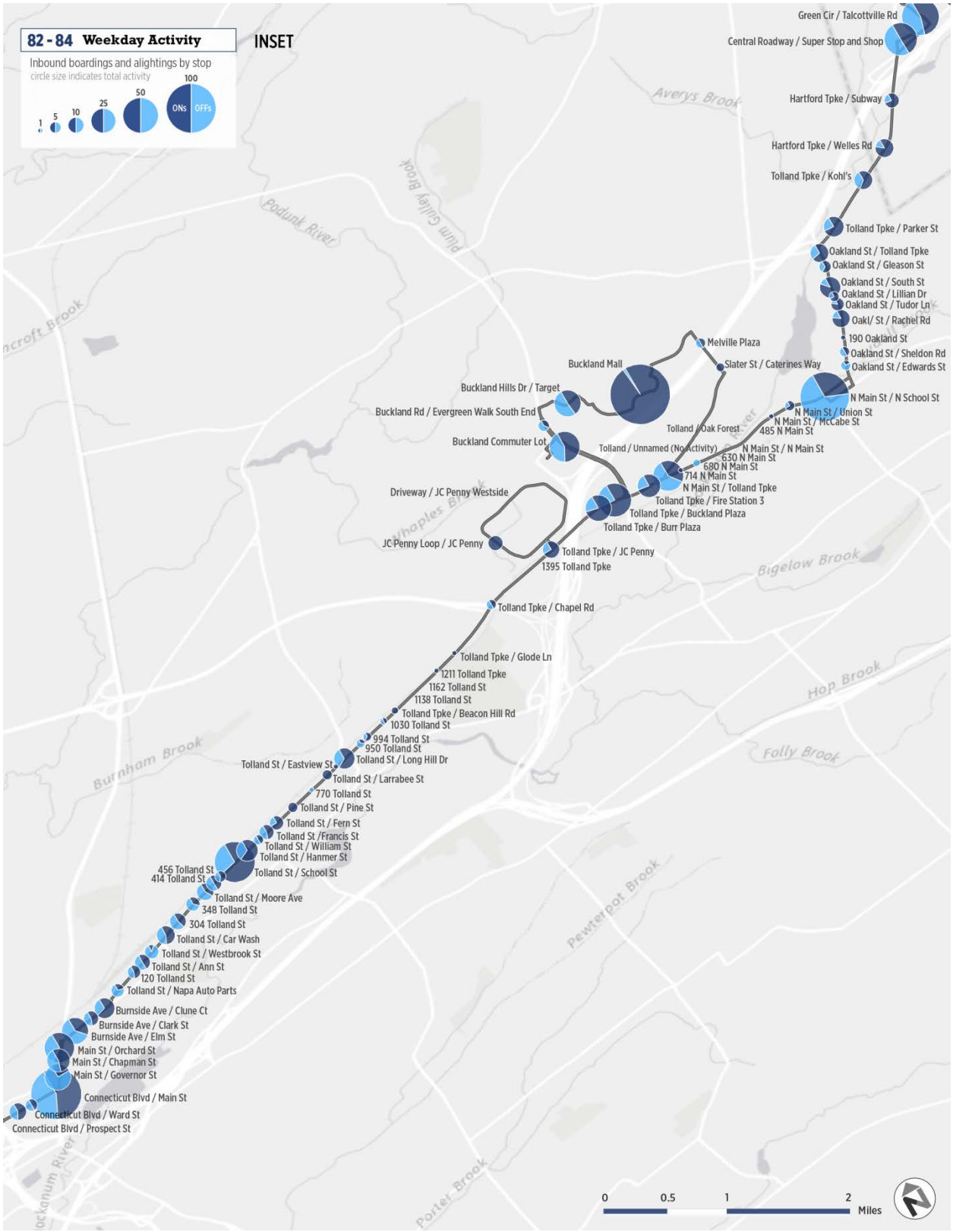


FIGURE 8 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP (INSET)



Ridership by Trip

Weekday

Ridership on Route 82 and Route 84 is strong and relatively well balanced throughout the day and for travel inbound and outbound. Outbound ridership is strongest between 9:00 AM and 5:00 PM; inbound ridership is strongest between 7:30 AM and 4:00 PM. This demand pattern suggests riders use the route for traditional commuting purposes, reverse commute trips as well as other trips types (shopping, recreational, etc.). Ridership also dips in the early evening in both directions but then recovers after 7:00 PM when service is less frequent (see Figures 9 and 10). In general, Route 84 has stronger ridership than Route 82, especially inbound, potentially because Route 84 is longer.

Although many trips carry more than 30 riders, peak loads on Route 82 and Route 84 exceed 30 passengers on a handful of trips only. As a result, overcrowding is not an issue on this route.

FIGURE 9 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

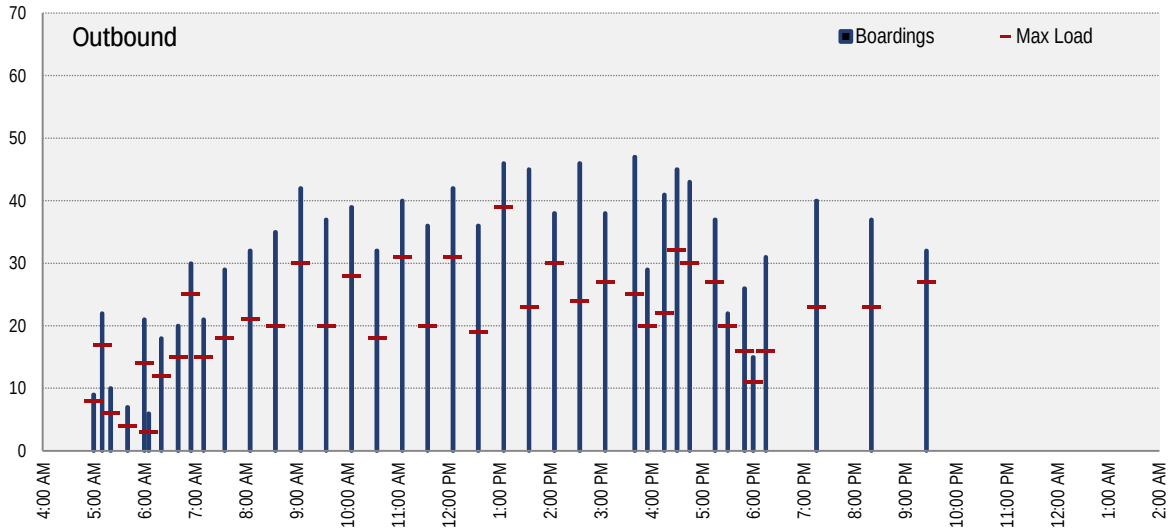
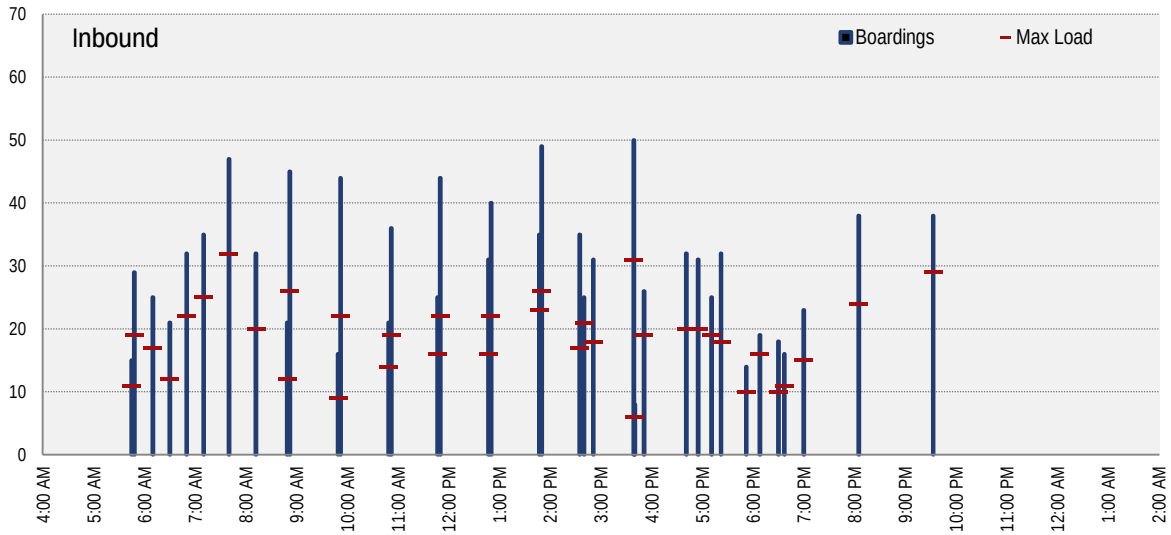


FIGURE 10 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Ridership per trip on Saturdays is very high with nearly every trip before 8:00 PM reaching 45 boardings or more in both directions. One trip in each direction reaches approximately 60 boardings. Data is missing for four afternoon and evening trips in each direction on Saturday, but if the trip pattern holds, most of these trips would have high ridership as well. Trips after 8:00 PM show fewer riders but ridership remains good. Capacity does not appear to be a problem on Route 82/84 (see Figures 11 and 12), since no trip has a maximum load above 40.

FIGURE 11 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

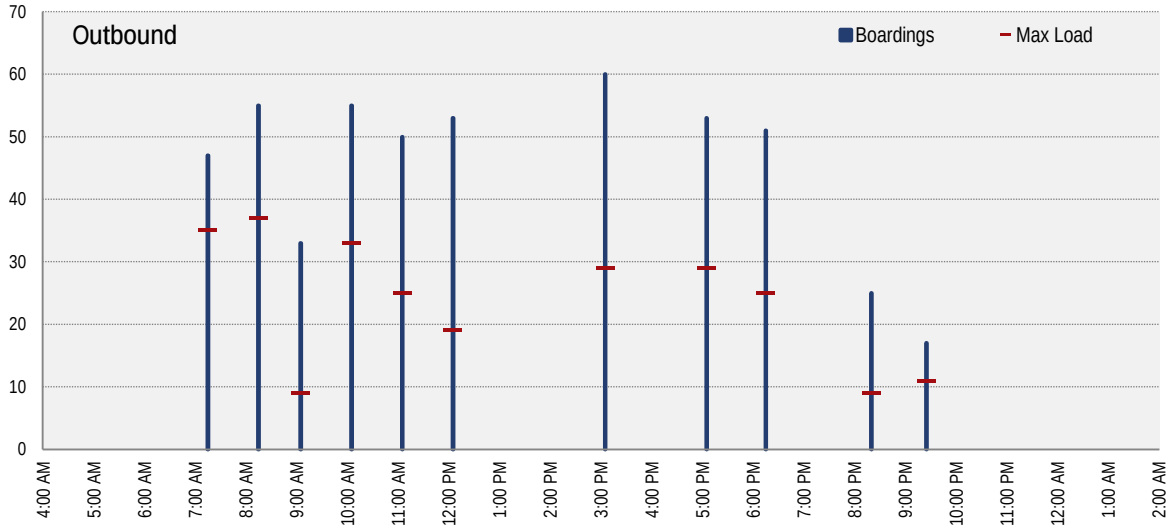
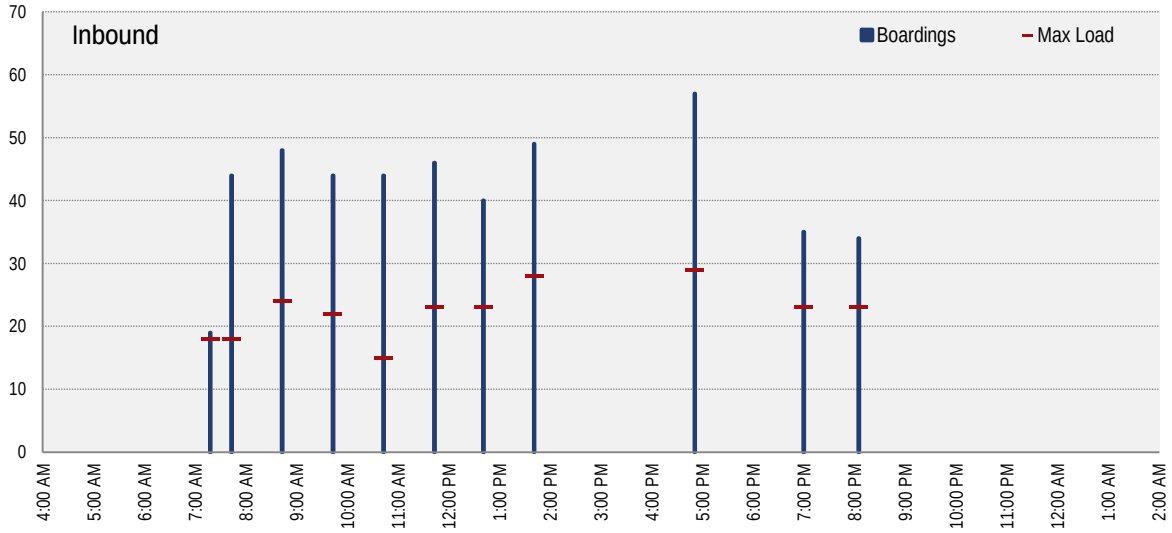


FIGURE 12 | SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

Ridership data in Figures 13 and 14 include both Route 82C and the Rockville Shuttle. The two routes average around 24 passengers per trip, but ridership on Route 82C is significantly stronger.

Demand on Route 82C is strong throughout the day, especially for outbound travel. With the exception of the first trip, inbound travel on Route 82C strengthens throughout the day inbound; and then remains high through the end of the day. The Rockville Shuttle generally has low ridership with an average of 10 passengers per trip.

Maximum loads on Route 82C rarely exceed 35 passengers, so overcrowding on Sundays is not a problem.

FIGURE 13 | SUNDAY OUTBOUND RIDERSHIP BY TRIP

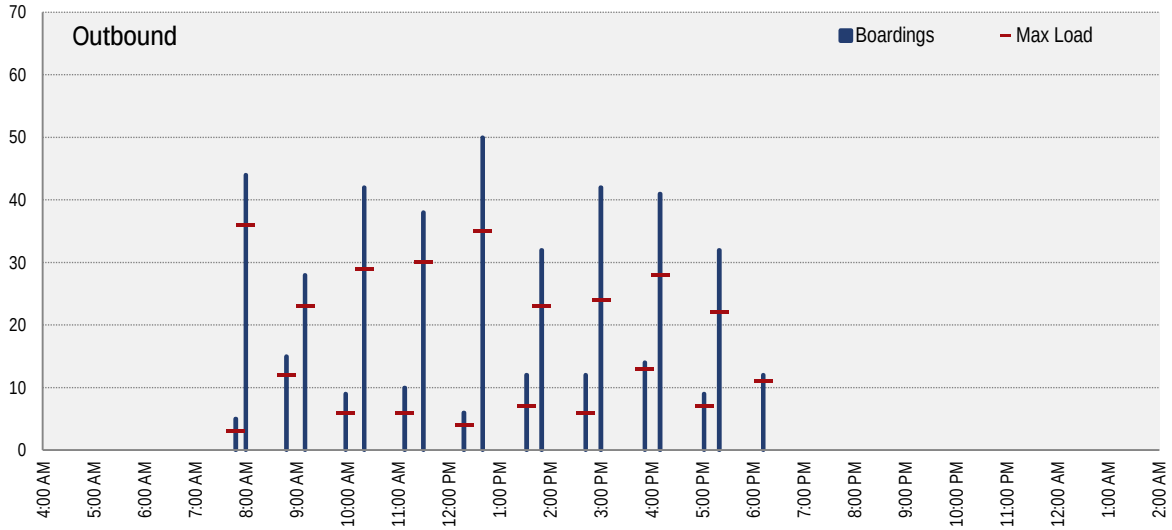
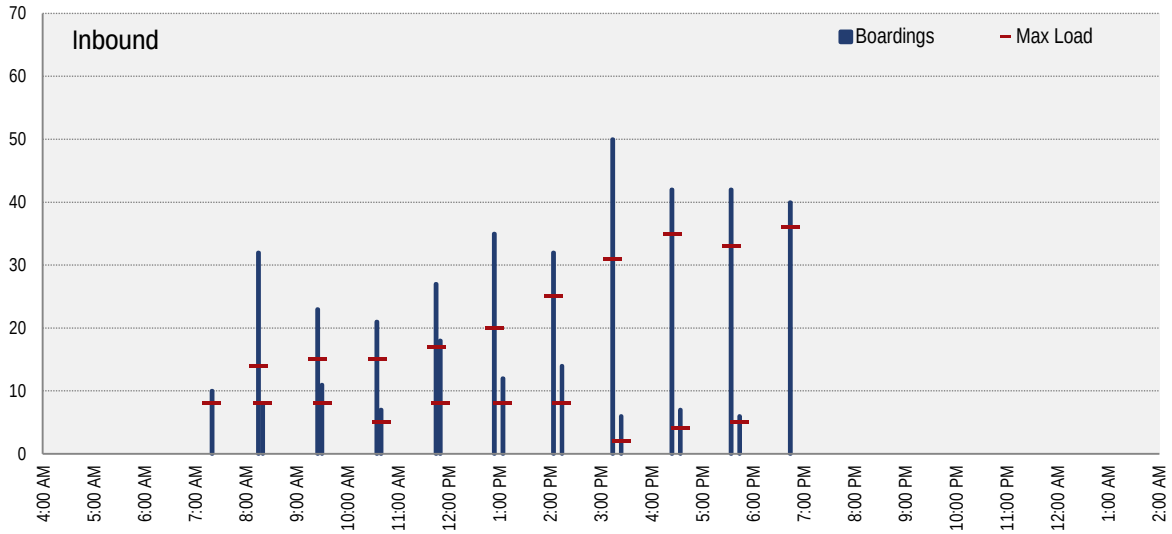


FIGURE 14 | SUNDAY INBOUND RIDERSHIP BY TRIP



Performance

Route 82/84 generally performs well across all measures and all days of the week, with operating costs per passenger, passengers per revenue hour, and passengers per revenue mile below or near the Hartford Division average (see Figures 15, 17, and 18). Saturday performance is especially strong, with an operating cost per passenger 36% below average and passengers per vehicle hour 22% higher than average. Passengers per revenue mile on each day is the weakest of all performance measure for Route 82/84, which can indicate a excessively long route; however, with good performance on an hourly basis.

FIGURE 15 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 82/84	DIVISION AVG	ROUTE 82/84	DIVISION AVG	ROUTE 82/84	DIVISION AVG
Operating Cost per Passenger	$4.62	$4.84	$4.06	$6.30	$4.47	$6.66
Passengers per Revenue Vehicle Hour	27.7	28.9	31.6	27.0	28.6	29.7
Passengers per Revenue Vehicle Mile	2.0	2.6	2.2	2.4	2.1	2.9

Source: CTtransit performance data

Route 82/84 has an on-time performance just above the Hartford Division average at 81.2% (see Figure 16). The remaining trips are late rather than early. While near average, an on-time performance close to 80% can frustrate riders and deter someone from choosing to ride. Route 82/84 has a stop roughly every 600 to 700 feet, about every tenth of a mile, which likely contributes to its on-time performance.

FIGURE 16 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 82/84	DIVISION AVG
Early	0.0%	0.2%
Late	18.8%	18.9%
On-Time	81.2%	80.9%

Source: CTtransit performance data

FIGURE 17 | WEEKDAY OPERATING COST PER PASSENGER

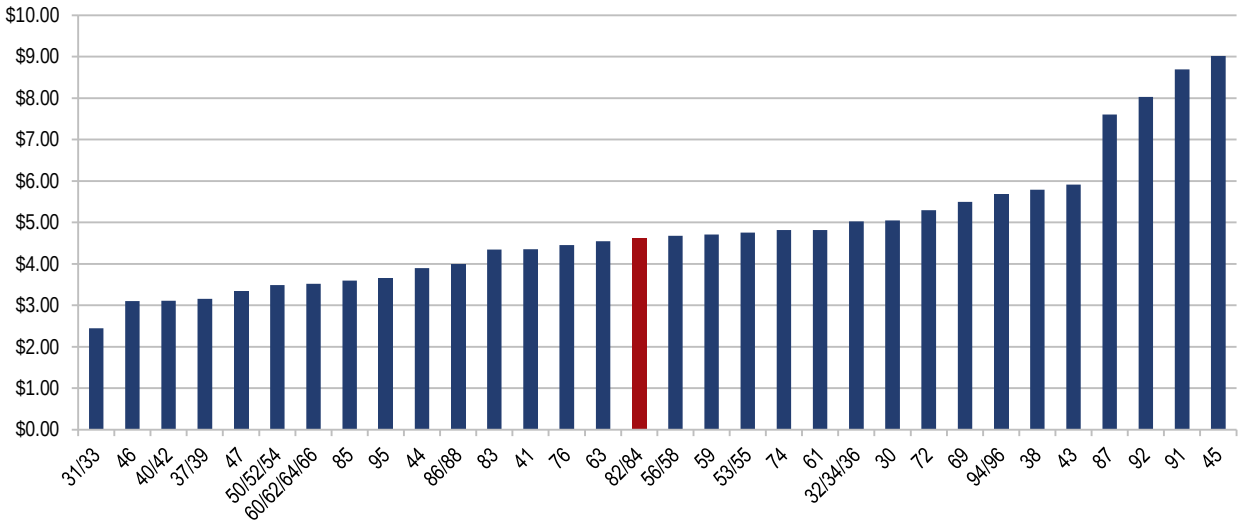
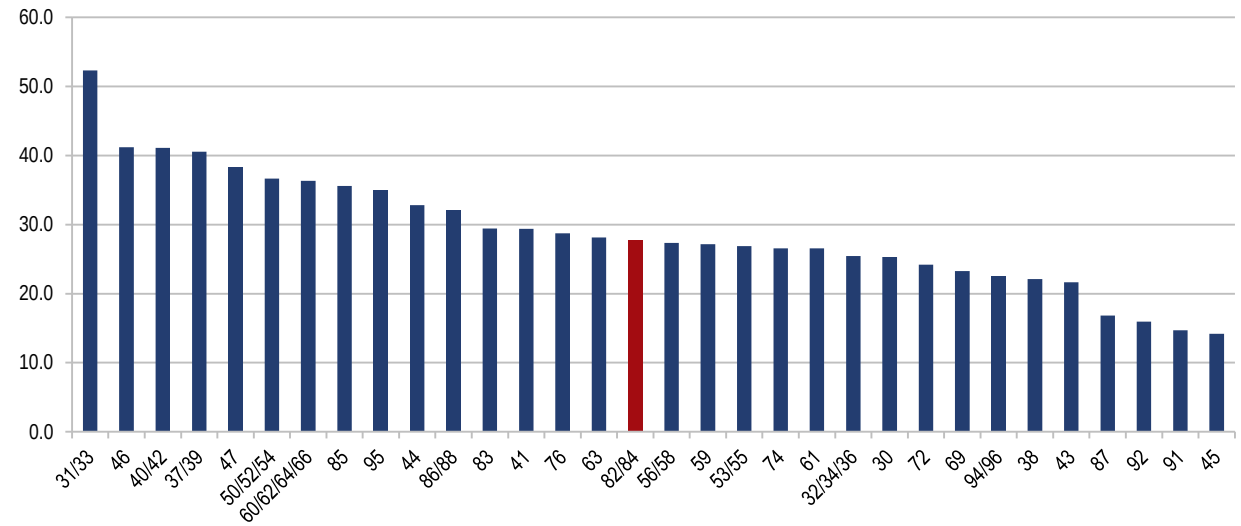


FIGURE 18 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Route 82 and Route 84 operate as two variants of the same route, though Route 84 serves Vernon, CT and is thus much longer than Route 82. The trunk alignment for these routes is primarily along Tolland Street. Both are relatively direct routes with straightforward schedules and alignments. Performance on Route 82 and 84 is strong, especially on weekend days.

Route 82 strengths include travel along a corridor with relatively high density close to downtown and a strong regional anchor (Buckland Hills). Route 84 benefits from the Route 82's assets but also serves Vernon, which has a relatively high density of transit dependent populations. This gives Route 84 strong anchors on both ends of the route (downtown Hartford and Vernon), plus a strong mid-route anchor (Buckland Hills).

Tolland Turnpike, however, includes a wide variety of land uses along its corridor, including moderate residential and employment density as well as some rural segments. Consistent with this, the pedestrian infrastructure also varies considerably along the corridor meaning transit demand is strong in some locations and weak in others. Route 82/84 also faces competition from Route 83 Silver Lane, which also serves the Buckland Hills retail area approximately every hour, similar to Route 82. Although the corridors parallel, they operate on opposite sides of I-84. However, travel via Route 82/84 is faster than Route 83 (about 35 minutes compared to about an hour).

Service Improvement Options

Opportunities to strengthen the route include the following:

- **Maintain a consistent 20-minute frequency during peak periods, 30-minute frequency during the midday, and 60-minute frequency in the evening.** Though existing service is relatively, maintaining a 20-minute peak-period frequency and 30-minute midday frequency throughout the day on the clock face will make the service easier-to-use and understand for the customer. Inconsistent frequencies are created when extra trips are added to the schedule and disrupt the alternating pattern between Route 82 and Route 84. A revised schedule should maintain 40- or 60-minute service to the Buckland Hills retail area and Vernon, though morning trips can be more heavily weighted towards Route 84 since most businesses around Buckland Hills will not open until later in the morning.
- **Coordinate schedule with Route 83 Silver Lane.** Demand for travel to Buckland Hills is very strong and sufficient to support both Route 82/84 and Route 83 (plus Flyer service on Saturdays). However, service could be improved by coordinating schedules between the two routes to offer 30-minute or better frequency to the retail area.
- **Extend evening service hours on weekdays.** Ridership is still strong at 9:30 PM in both directions on weekdays. If resources are available, service should be extended until 10:00 or 11:00 PM to accommodate later and/or non-typical shifts and schedules.
- **Start outbound weekend service earlier, end inbound weekend service later.** Demand also remains high headed outbound on the weekend early in the morning and headed inbound late in the evening. If resources exist, service should be extended until 6:00 or 7:00 AM headed outbound and 8:00 or 9:00 PM headed inbound.
- **Increase weekend frequency.** Service on Saturdays currently operates every 60 minutes, but existing ridership suggests the route could support a frequency of every 30 minutes. Overcrowding on trips is only an occasional issue, but additional frequency would likely attract more choice riders. Similarly, Sunday service operates every 70 minutes, but demand is high enough to increase frequency to every 60 minutes.

- **Eliminate service to the J.C. Penney Distribution Center.** Very little ridership exists at this location and serving it adds complexity to the route. Eliminating service would save time in the outbound direction and simplify the schedule in the inbound direction.
- **Consolidate stops to improve speed and reliability.** Route 82/84's on-time performance is roughly consistent with the system average, but is still late roughly 20% of the time. One of the likely reasons Route 82/84 has an on-time performance issue reflects bus stops spacing is closer than necessary in many locations. The data suggests several stops could be collapsed, potentially along Tolland Turnpike and Burnside Avenue. Spacing stops to save just a few minutes could mean that travel times improve to around 30 and 50 minutes to the mall and Rockville, respectively. This would allow the route to operate with clock face schedules and help the route compete more directly with car trips.

Route Evaluation

SILVER LANE

83A | Manchester Business Park via MCC

83B | Manchester Business Park via McKee Street

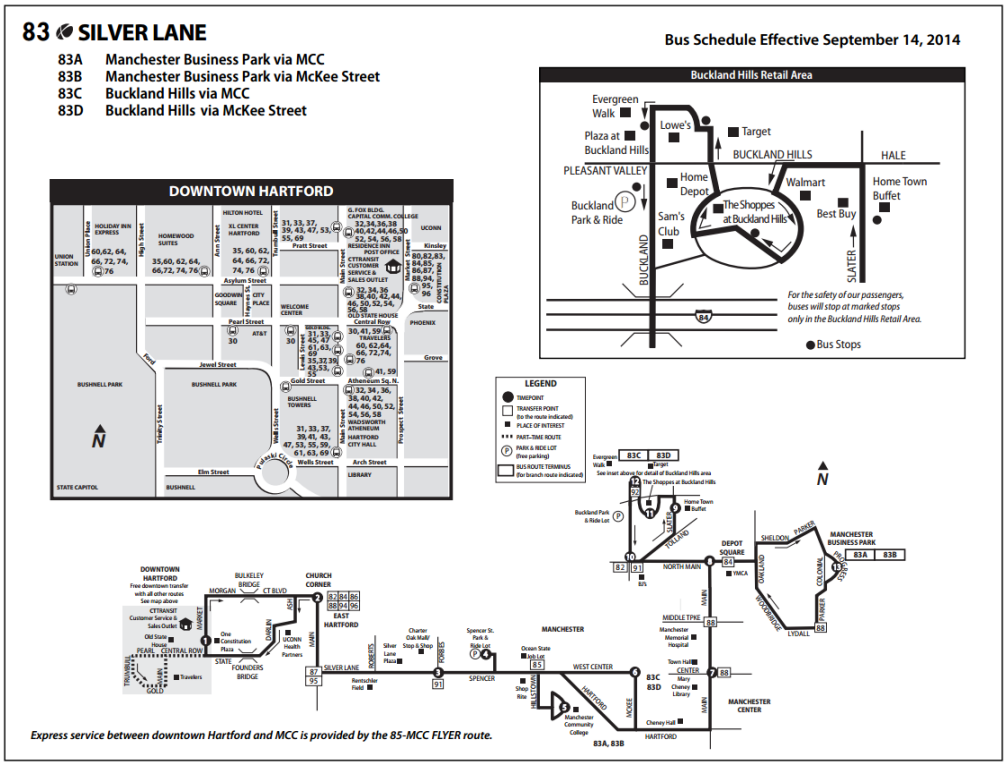
83C | Buckland Hills via MCC

83D | Buckland Hills via McKee Street

Service Design

Route 83 Silver Lane is a radial route originating in downtown Hartford and alternately serving Manchester Business Park and the Buckland Hills retail area of Manchester, with two variants serving Manchester Community College (see Figure 1). The route primarily operates along Silver Lane and West Center Street through East Hartford and Manchester.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 83 originates in downtown Hartford, where riders can connect to most CT***transit*** routes. Outside of downtown, there are several locations along the route where riders can transfer to other CT***transit*** routes (see Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 82	Tolland Street--Buckland Hills
Route 84	Tolland Street--Rockville
Route 85	MCC Flyer
Route 86	Burnside Avenue – Mayberry Village
Route 87	Brewer Street
Route 88	Burnside Avenue
Route 91	Forbes Street Crosstown
Route 92	Tower Avenue Crosstown
Route 94	Park Avenue
Route 95	Glastonbury
Route 96	John Fitch Boulevard

Alignments and Service Patterns

The route follows a common alignment between Downtown Hartford and Silver Lane and Forbes Street, but, beyond this, the alignment varies among trips. The two primary inbound variants, which operate from Monday through Friday, serve: 1) Manchester Business Park, Depot Square, Main Street and Center Park, and West Center Street and McKee Street (Route 83B), and 2) Buckland Hills retail area, Depot Square, Main Street and Center Park, and Manchester Community College (Route 83C). In the mornings, three trips operate as Route 83A, which serve Manchester Business Park and Manchester Community College. One morning trip serves the Buckland Hills retail area but skips Manchester Community College, and this is designated as Route 83D. All morning inbound trips before 8:50 AM, regardless of whether it is Route 83A, B, C, or D, also serve the Spencer Street Park & Ride Lot.

Saturday service essentially alternates between Route 83C and 83D, although most trips after 2:00 PM on both alignments begin at The Shoppes at Buckland Hills (Macy's) instead of on Slater Street at Home Town Buffet, the usual originating location. On Sundays, service only extends to West Center Street and McKee Street after Silver Lane and Forbes Street. Sunday service between Manchester Center and Buckland Hills is provided by Route 82 Tolland Street.

Service Schedule

Route 83 operates seven days a week, with service Monday through Saturday operating from early in the morning to late at night. Weekday service runs approximately every 30 minutes for most of the day on the common segment and every 20 minutes during the peak period, followed by hourly service in the evening (see Figure 3). After the peak morning period with varying alignments, service alternates between Routes 83B and 83C headed inbound during the weekdays.

On Saturday, Routes 83C and 83D run every 40 minutes on the common segment throughout the day. Sunday service runs every 70 minutes with reduced service hours and operates as Route 83.

An additional inbound trip from Buckland Hills operates on weekdays and Saturdays between Thanksgiving and December 31.

FIGURE 3 | SCHEDULE OVERVIEW

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:11 AM – 10:40 PM	20/30	31/34
Saturday	6:11 AM – 10:40 PM	40	20/21
Sunday	6:51 AM – 7:22 PM	70	11/11

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Route 83 carries 2,043 daily passengers or 31.4 passengers per trip on an average weekday. This is nearly double the Hartford Division average of 17.7 weekday passengers per trip (see Figure 4). Ridership on Saturdays, though less than a weekday in absolute terms, is even stronger by trip, with 49.1 passengers per trip. Sunday ridership drops considerably to 284 passengers and 12.9 passengers per trip, making Sunday the only day where ridership per trip is weaker than the Hartford Division average.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 83	ROUTE 83	DIVISION AVG
Weekday	2,043	31.4	17.7
Saturday	1,521	49.1	16.3
Sunday	284	12.9	17.6

Source: CTtransit performance data

Ridership by Stop

The most heavily used stops on Route 83 outside of the downtown terminus include Manchester Community College, The Shoppes at Buckland Hills, Church Corner (Connecticut Boulevard and Main Street), Depot Square (Main Street and Woodbridge Street), Stop & Shop on Silver Lane, and Manchester Center (Main Street and Center Park), as shown in Figure 5. All other stops have fewer than 100 boardings and alightings, though ridership remains strong along a majority of Route 83. Load profile data (see Figure 6) combines passenger activity by stop and shows the cumulative passenger load as the bus travels inbound. Ridership by stop without the cumulative load is mapped in Figure 7 and Figure 8.

Manchester Business Park shows the weakest ridership with an average of only about 40 boardings and alightings per day at all stops. Likely due to predominately low-density residential development, short segments along Silver Lane between Spencer and Forbes Streets and along West Center Street near McKee Street also show low ridership.

FIGURE 5 | ROUTE 83 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Manchester Community College	117/57	
Buckland Mall & Pavilions Drive	160/2	The Shoppes at Buckland Hills
Church Corner (Connecticut Boulevard & Main Street)	72/64	Transfer point to Routes 82, 84, 86, 88, 94, 96
Depot Square (Main Street & Woodbridge Street)	116/10	Robertson School, medical offices
Silver Lane and Stop & Shop	79/30	Charter Oak Mall, several major retailers
Manchester Center (Main Street & Center Park)	71/35	Center Memorial Park, Mary Cheney Library, several retailers and restaurants

FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

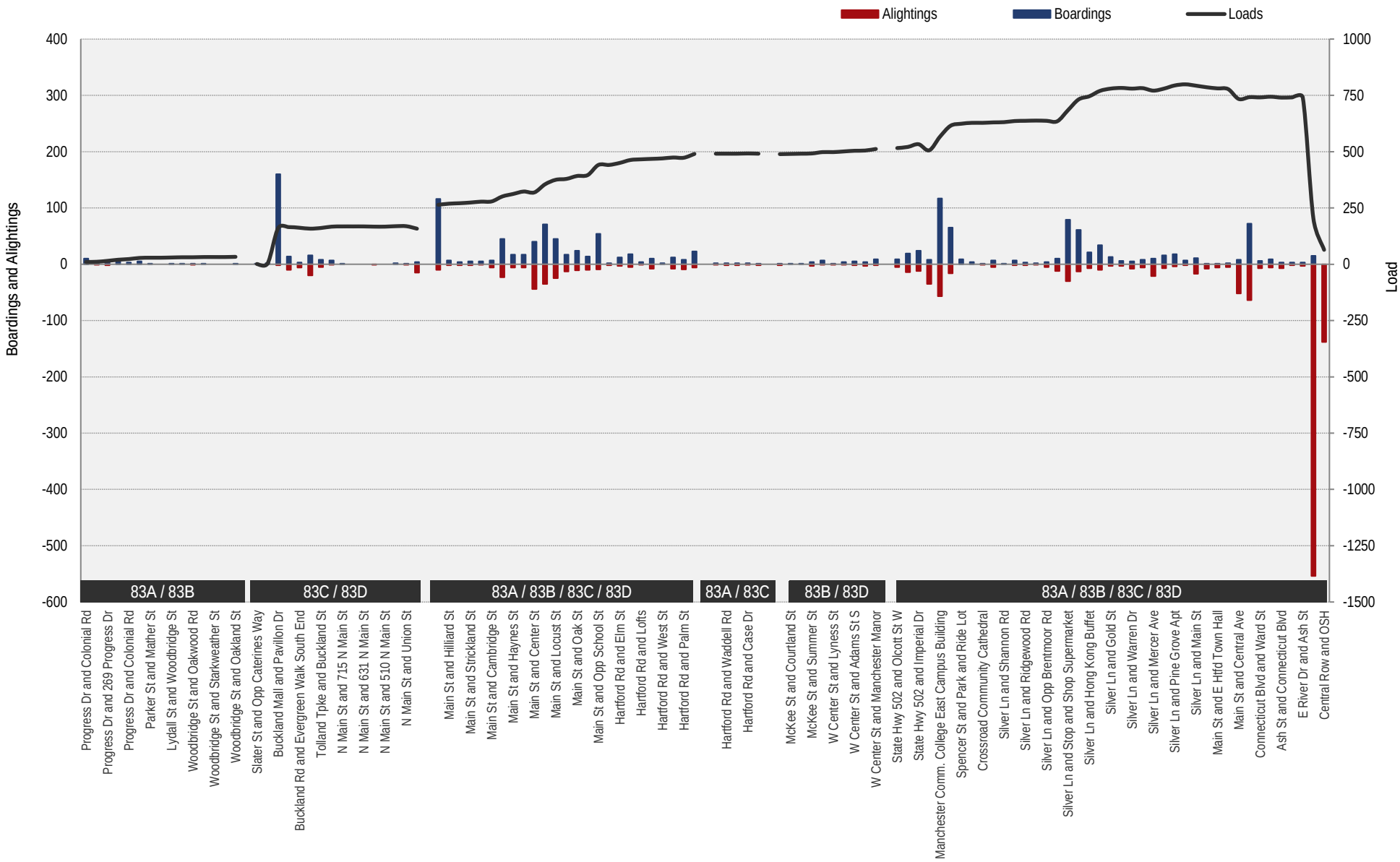


FIGURE 7 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

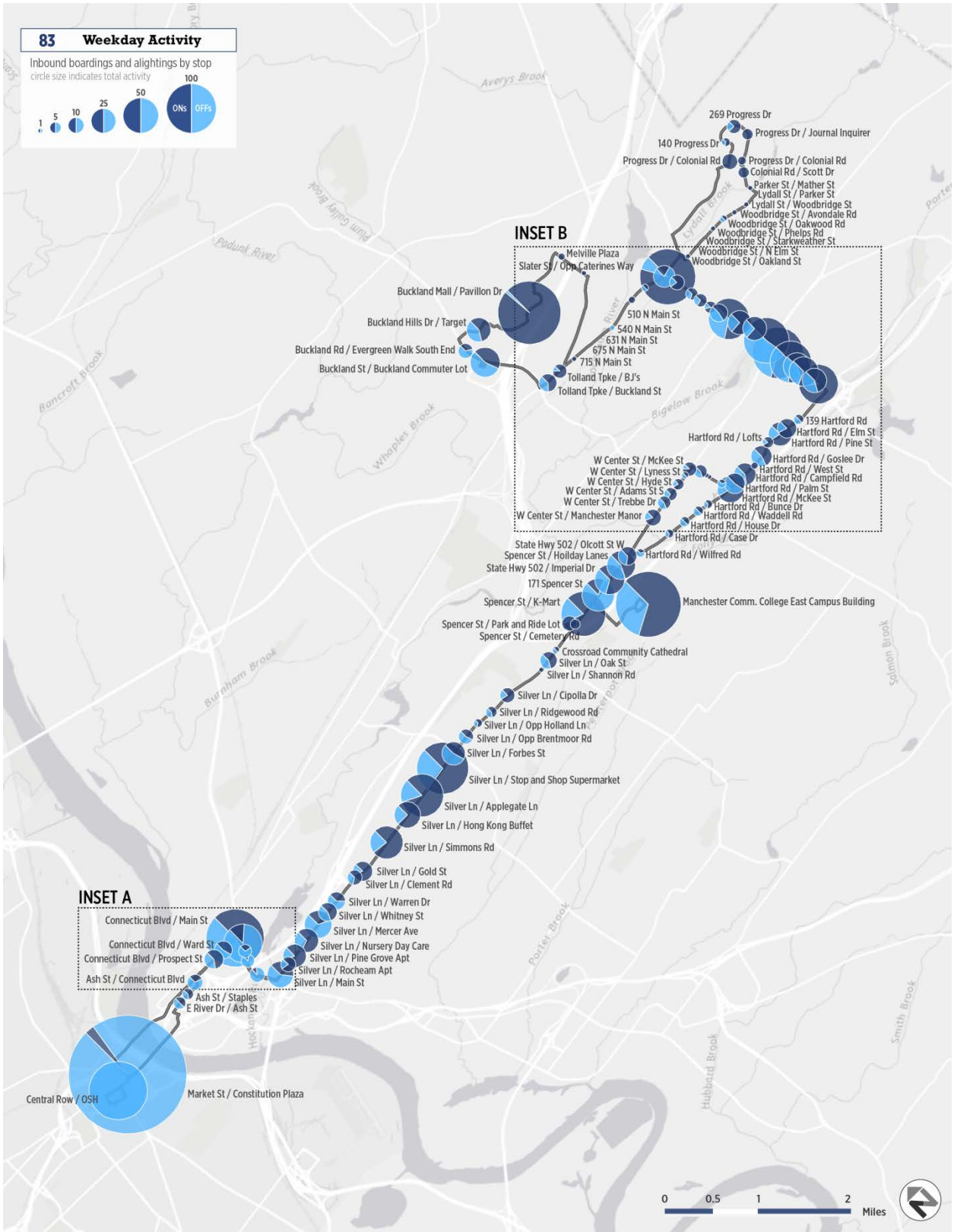
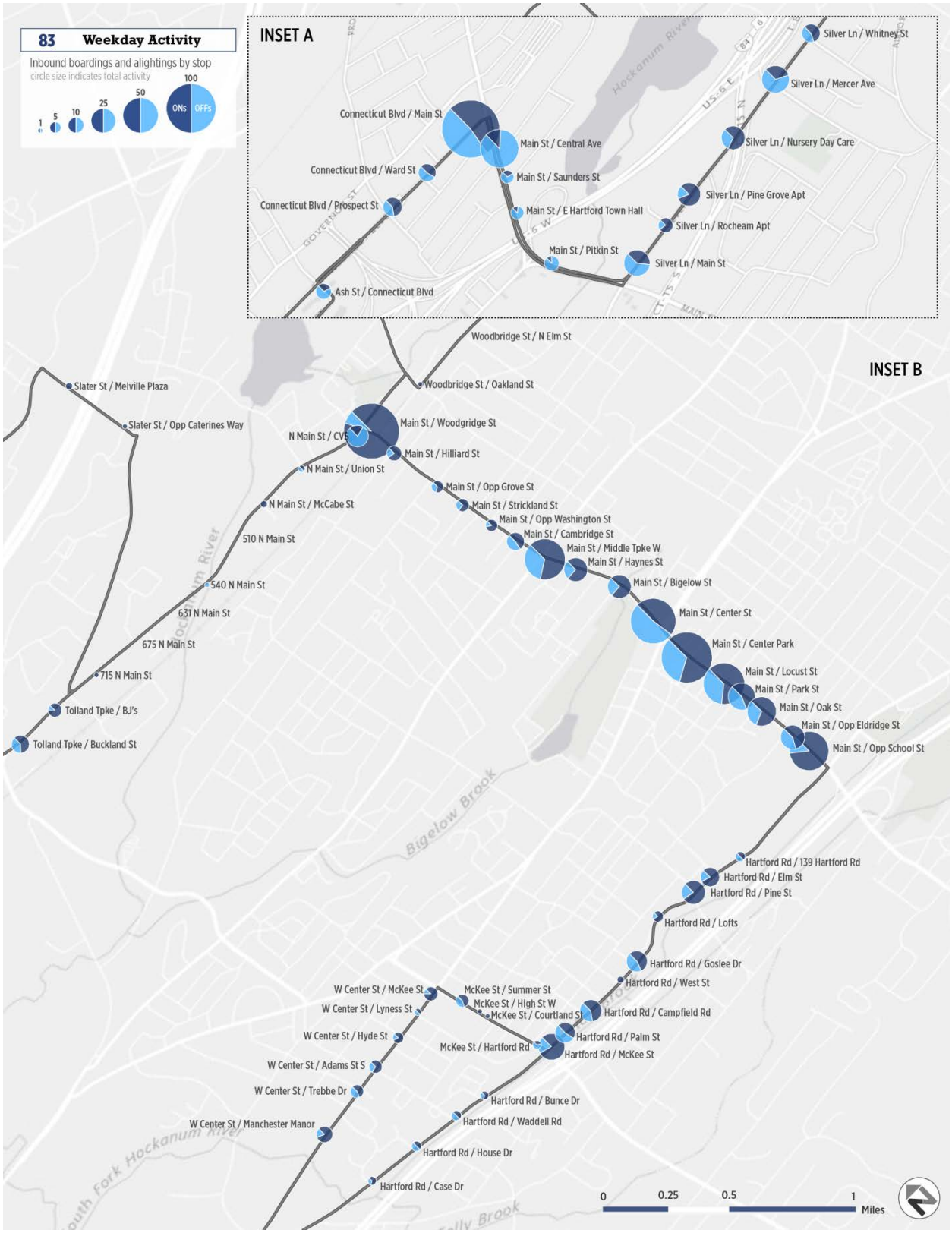


FIGURE 8 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP (INSET)



Ridership by Trip

Weekday

Route 83 carries an average of 31.0 passengers per trip on weekdays. Ridership per trip is strongest in both directions between noon and 4:00 PM. However, with greater frequency during the peak periods that spreads ridership over more trips, such that overall ridership during peak periods (headed inbound during the AM peak and headed outbound during the PM peak) is approximately equal to ridership levels between noon and 4:00 PM.

Outbound trips on Route 83C (Buckland Hills via Manchester Community College) consistently reach 50 or more total boardings after 8:00 AM until the PM peak, while Route 83B (Manchester Business Park via McKee Street) typically reaches between 30 and 40 total boardings during the same period. Inbound trips show more variability, but very similar trends in this direction on Routes 83B and C occur after about 10:00 AM (see Figures 9 and 10).

Maximum loads on Route 83 rarely exceed 30 passengers. The typical seating capacity of a 40-foot transit bus is 40 passengers, so overcrowding is not an issue on this route. With the exception of the early morning trips headed outbound, there is rarely a trip on Route 83 that carries fewer than 20 passengers, and most carry at least 30. Thus, demand is more than sufficient for the service frequency and hours supplied on this route, and opportunities may exist for longer operating hours and/or additional trips.

FIGURE 9 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

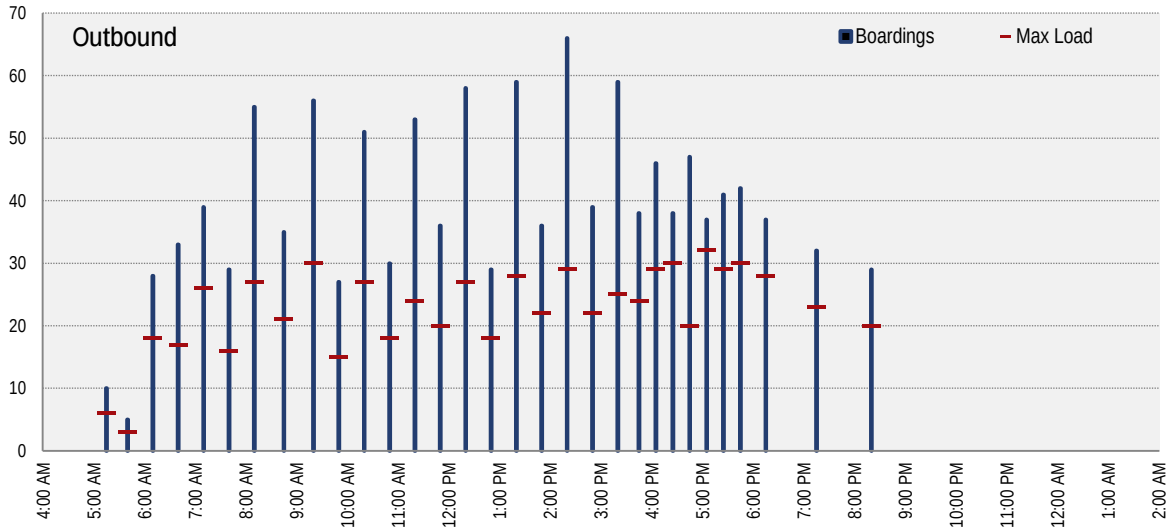
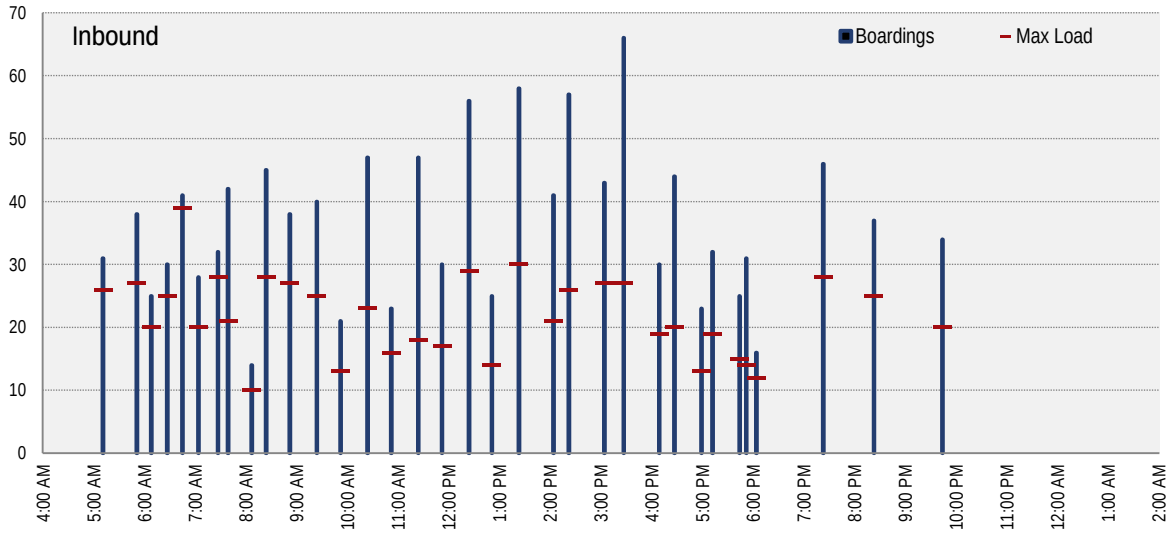


FIGURE 10 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Saturday service shows more ridership overall headed outbound than inbound, with four outbound trips reaching over 60 boardings and only two inbound trips reaching over 50 boardings. Ridership headed inbound consistently reaches between 30 and 40 boardings per trip, whereas outbound ridership varies between 20 and 70 boardings per trip. Only five trips (three outbound and two inbound) have over 30 boarding, so vehicle capacity is not an issue on Saturdays (see Figures 11 and 12).

FIGURE 11 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

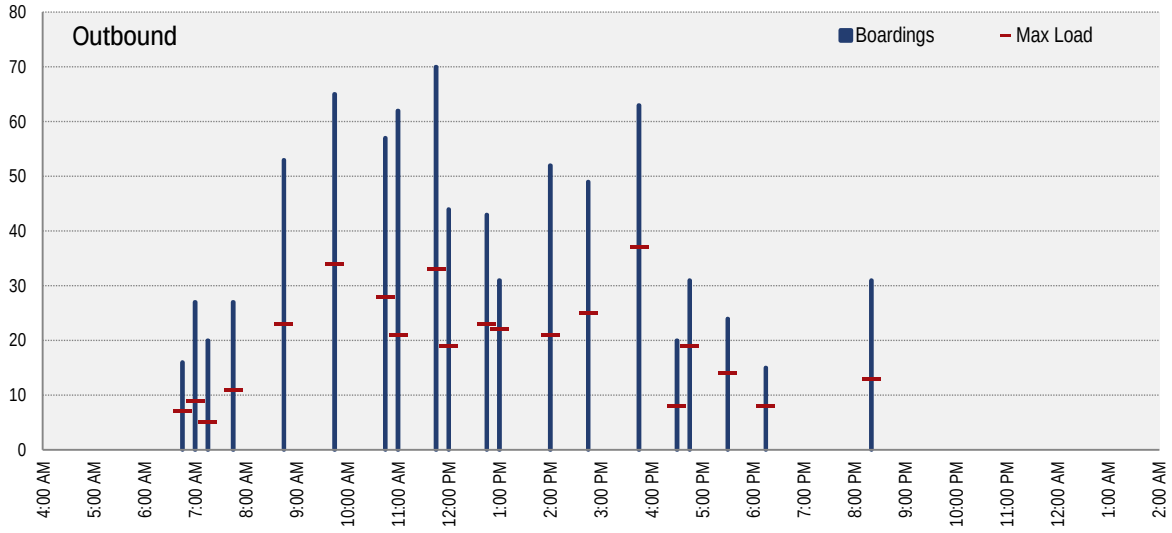
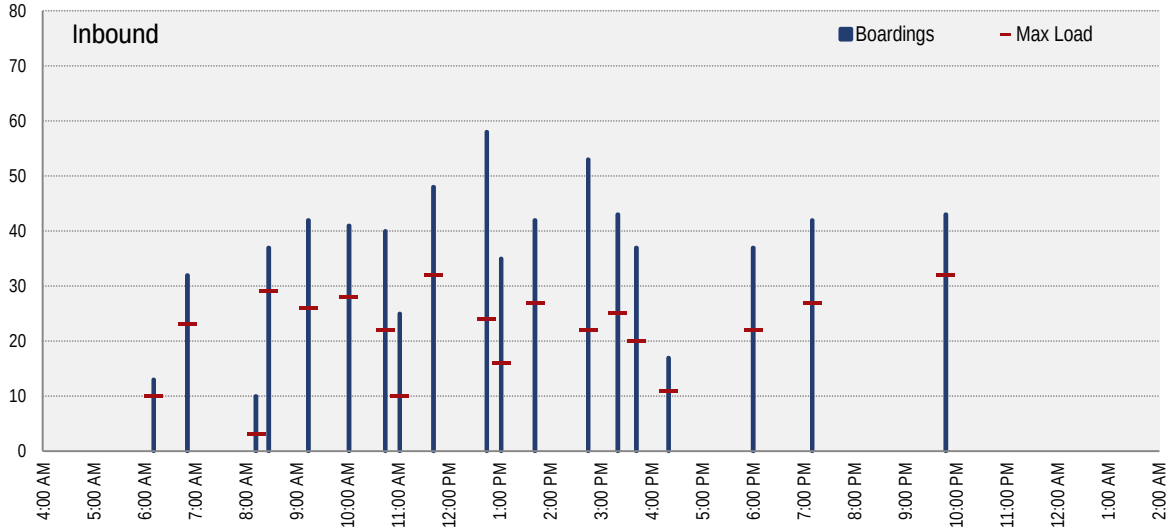


FIGURE 12 | SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

Sunday ridership in both directions hovers around 20 boardings per trip, though inbound ridership steadily declines in the evening and outbound ridership steadily increases in the morning. One outbound trip at 12:40 PM shows a spike in ridership with almost 35 boardings (see Figures 13 and 14).

FIGURE 13 | SUNDAY OUTBOUND RIDERSHIP BY TRIP

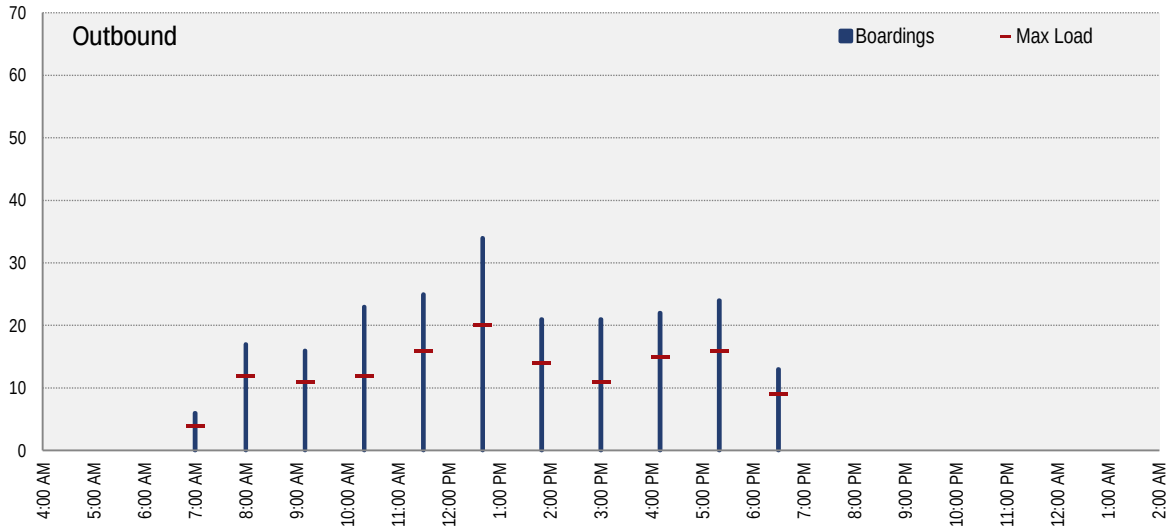
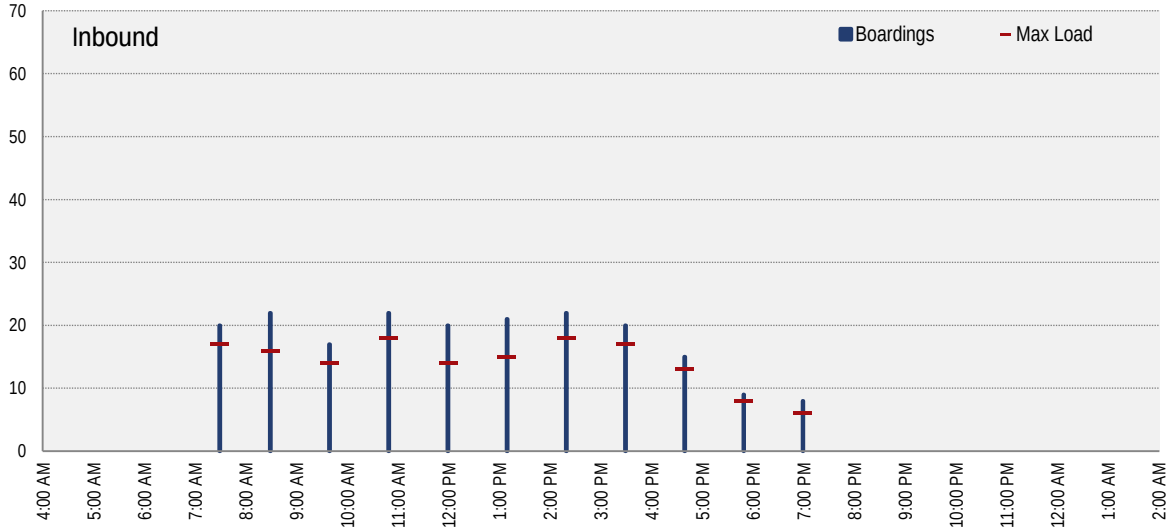


FIGURE 14 | SUNDAY INBOUND RIDERSHIP BY TRIP



Performance

The operating cost per passenger for Route 83 is lower than the Division average by 10% on weekdays, 55% on Saturdays, and 20% on Sundays. On Saturdays, Route 83 carries a significantly higher number of passengers per revenue hour (73%) and per revenue mile (39%) than the average. Sundays are somewhat the opposite, with the route performing below the average on both measures. Weekday performance is mixed – passengers per revenue hour is slightly higher than average (about 2%) while passengers per revenue mile is lower than average by 15% (see Figure 15). This often suggests that some deviations on the route may be unnecessary or that the route too long.

FIGURE 15 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 83	DIVISION AVG	ROUTE 83	DIVISION AVG	ROUTE 83	DIVISION AVG
Operating Cost per Passenger	$4.35	$4.84	$2.85	$6.30	$5.33	$6.66
Passengers per Revenue Vehicle Hour	29.4	28.9	45.0	27.0	24.0	29.7
Passengers per Revenue Vehicle Mile	2.2	2.6	3.2	2.4	1.6	2.9

Source: CTtransit performance data

Route 83 has an 80.3% on-time arrival rate, with a slightly higher percentage of late buses than the Hartford Division average (see Figure 16). High passenger volumes likely contribute to the late running times, though stop spacing may also contribute to slow operating speeds. For example, Silver Lane and Main Street in Manchester both have stops approximately every 700 feet on average.

FIGURE 16 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 83	DIVISION AVG
Early	0.1%	0.2%
Late	19.6%	18.9%
On-Time	80.3%	80.9%

Source: CTtransit performance data

FIGURE 17 | WEEKDAY OPERATING COST PER PASSENGER

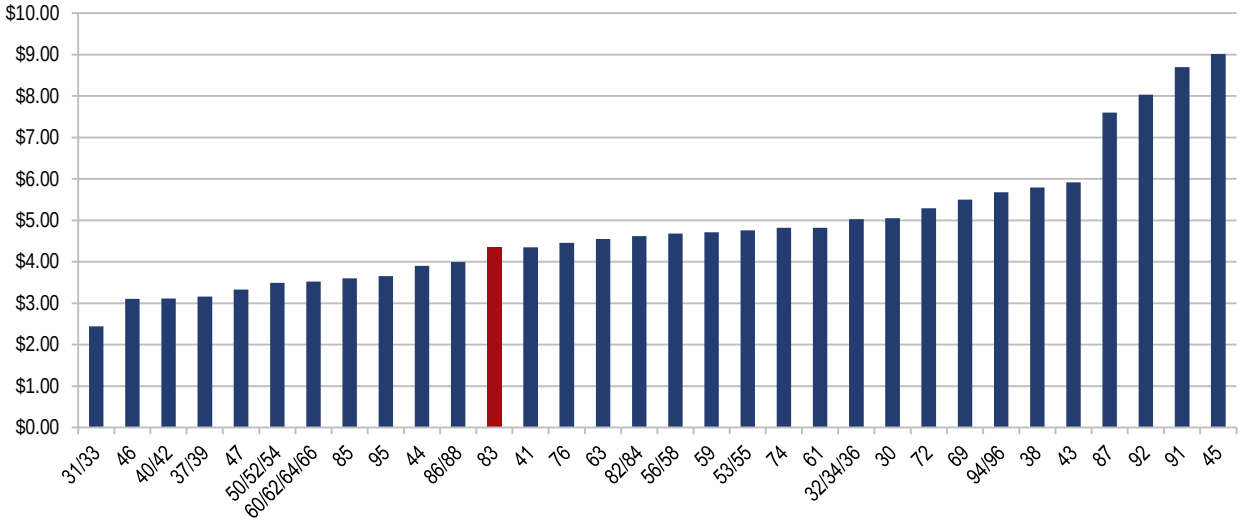
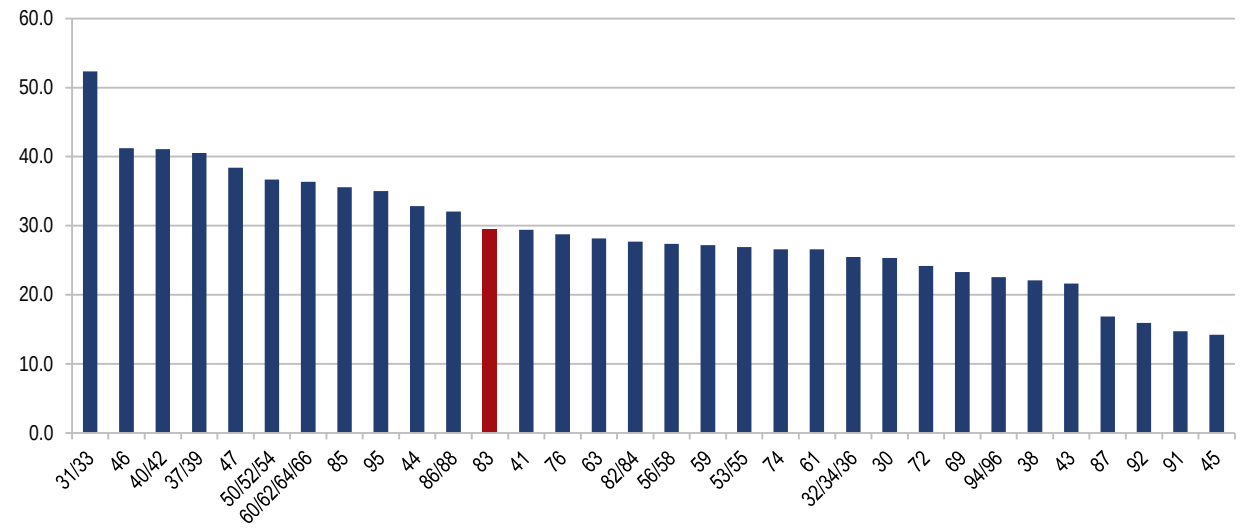


FIGURE 18 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Route 83 is a radial route connecting downtown Hartford with the Buckland Hills retail area, Manchester Business Park, Manchester Center, and Manchester Community College. The route has relatively high ridership, with most performance metrics above or near the Division average.

Despite high ridership and strong productivity, there are two fundamental challenges with Route 83:

1. **Complexity** – Route 83 is very complex with four published variants (A, B, C and D) plus additional service variations based on time of day (i.e., service to the Spencer Street Park and Ride Lot). Although the variants are designed to reflect ridership demand, the number of variations given the service level overly complicates the route. In addition (or potentially because of the service complexity), the printed schedule is difficult to read and understand.
2. **Competition** – While Route 83 serves a unique market, there is existing competition from Route 82 Tolland Street-Buckland Hills and Route 85 MCC Flyer. These two routes operate between downtown Hartford and Buckland Hills or Manchester Community College, respectively. Tolland Street runs nearly parallel to Silver Lane, and Route 82 provides significantly faster service as compared with Route 83 in part because Route 83 has more trip generators between downtown and the retail area, and therefore stops more frequently. Additional competition will be provided by the introduction of Route CT***fastrak*** 121.

CT*fastrak*

Implementation of CT***fastrak*** will impact Route 83 as new service provided by Route 121 will travel a similar path between downtown Hartford and Manchester Community College along the same route. Route 121 will make limited stops in East Hartford and Manchester and will provide frequent service. Thus, the CT***fastrak*** plan, which is scheduled for implementation in March 2015, will impact Route 83 ridership and productivity, though opportunities exist for the two routes to work in union.

- Route 121: CT***fastrak*** Route 121 will provide 20-minute service during the peak periods, 30-minute service during the midday, and 60-minute service in the evenings on weekdays. Service will operate between 4:55 AM and 12:14 AM. Saturday service will operate from 5:30 AM to 12:14 AM every 30 minutes during the day switching to 60 minutes during the evening, while Sunday service will operate every 60 minutes all day from 6:30 AM to 9:22 PM.

Service Improvement Options

Route 83 provides serves several important destinations including the Buckland Hills retail area, Manchester Center, and Manchester Community College. Though challenges exist to maintaining productivity on the route after CT***fastrak*** service begins, improvements can help attract a high level of ridership on Route 83:

- **Serve Manchester Business Park with peak period flex or shuttle service departing from the Spencer Park and Ride Lot.** With the addition of CT***fastrak*** Route 121, people living in Hartford will have fast and direct service to the Spencer Park and Ride Lot. Rather than run large buses to the Business Park, CT***transit*** may operate smaller vehicles as flex services. These vehicles could meet arriving CT***fastrak*** vehicles and provide door-to-door service between employers in the Manchester Business Park and the Spencer Park and Ride Lot. It would also help simplify Route 83.
- **Serve Manchester Business Park with peak period flex or shuttle service departing from the Buckland Hills Park and Ride Lot.** Alternatively, the Manchester Business Park may be served with by operating flex service departing from the Buckland Hills Park and Ride

Lot. Like Spencer Street, the Buckland Hills Park and Ride Lot has a lot of service operating in both directions; flex service could meet arriving CT***transit*** routes and provide door-to-door service between employers in the Manchester Business Park and the Buckland Hills Park and Ride Lot. Taking service off of Route 83 would simplify Route 83.

- **Eliminate service to Manchester Business Park.** A second option is to remove service to this area entirely. The business park generates only 1.4% of ridership activity, and with service approximately every 20 minutes in the morning and 60 minutes throughout the remainder of the day, the time and distance spent traveling to the park negatively affects productivity.
- **Serve Manchester Business Park with limited, peak period only service.** Ridership from Manchester Business Park is strongest headed inbound in the afternoon, which is typical for a reverse commute type pattern. Almost zero riders take Route 83 from the business park inbound during the morning, and the opposite is likely true for the outbound direction. With overall ridership also low, serving Manchester Business Park in the peak periods only (data suggests these might be slightly different from the defined peaks) or matched with shift times is a better use of resources.
- **Serve Buckland Hills retail area on every trip and operate weekday service alternating between Route 83C and 83D.** On Saturdays, Route 83 alternates its schedule between Routes 83C and 83D serving either MCC or operating via McKee Street; this schedule performs extremely well. Between Route 82 Tolland Street-Buckland Hills and Route 83, a rider can currently catch the bus about every 30 minutes from Buckland Hills, so demand supports 30-minute service. Manchester Community College would have front-door service on every other Route 83 trip, but with 20-minute frequency on the new Route 121, hourly service on the local route is likely sufficient.
- **Eliminate service to the Spencer Street Park & Ride Lot.** The Park & Ride Lot generates less than 1% of ridership activity on Route 83. Serving the lot adds complexity to the service and also slows down the route. In addition, the new Route 121 will serve this lot, which will be a more attractive service for users since reaching downtown Hartford will be faster and comfortable.
- **Maintain a consistent 30-minute frequency during the midday and 20-minute frequency during peak periods.** Outbound service on Route 83 maintains a relatively consistent 20- or 30-minute frequency throughout the day and operates on the clockface. However, inbound service jumps between 20-minute and 40-minute headways off the clockface. Consistent headways will make the service easier-to-use and understand for the customer.
- **Simplify Route 83's printed (hand) schedule.** Numerous variants exist in both directions that make the schedule difficult to read and comprehend. Often times, a single variant will have sub-variants that differ slightly, such as serving one extra stop or ending at a slightly different stop and time than the schedule indicates. Other times, a trip will have no apparent variant assigned and serve a different set of stops entirely from any other trip. Having fewer variants that are consistent and labeled clearly on the published schedules will make the route simpler and more useful.

Route Evaluation

MCC FLYER

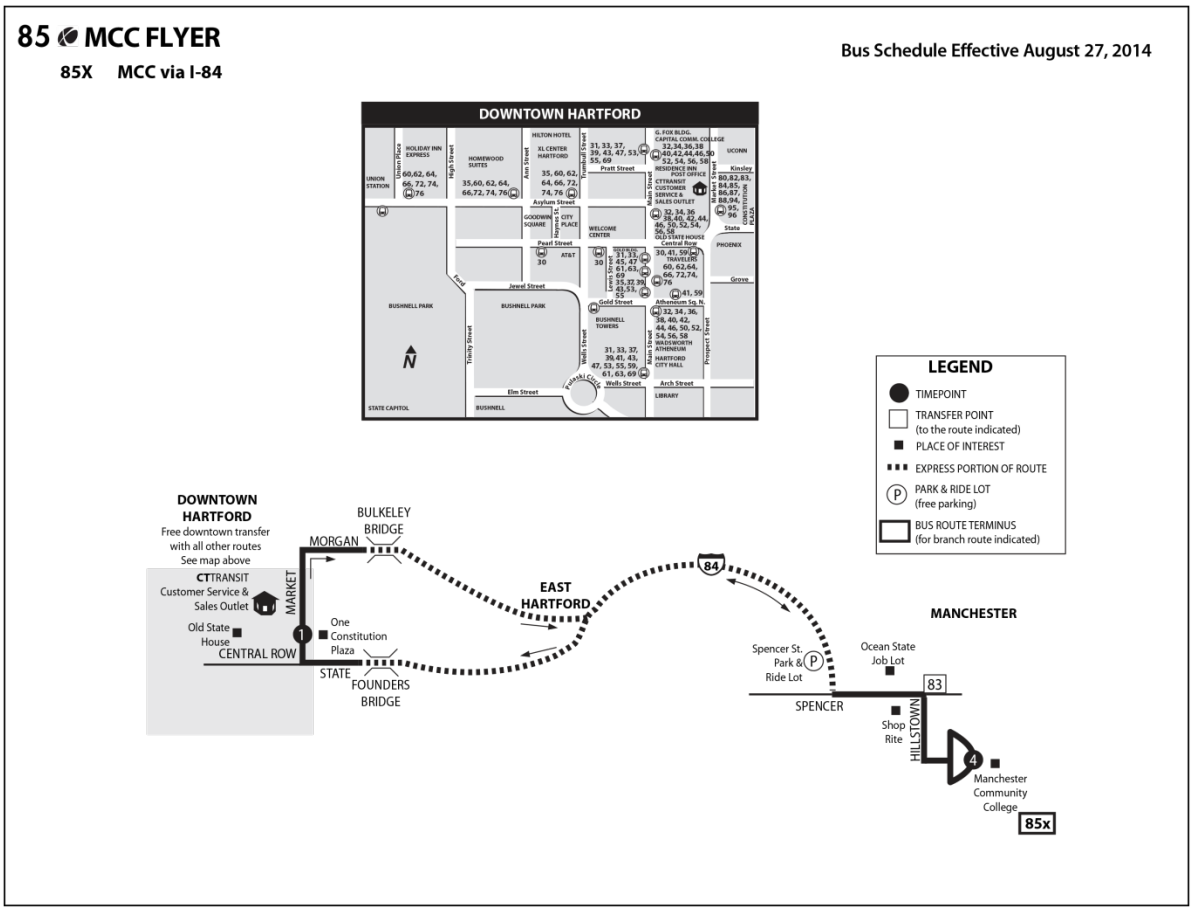
85X | MCC via I-84

Service Design

Route 85 is one of the Hartford Division's five Flyer routes, providing express service between downtown Hartford and Manchester Community College in Manchester (see Figure 1).

The MCC Flyer operates on weekdays only. The service is also tied to the academic calendar and operates only when MCC is in session.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 85 originates in downtown Hartford, where riders can connect to almost all CT*transit* service. Riders can also connect with Route 83 Silver Lane at the intersection of Hillston Road and Spencer Street.

Alignments and Service Patterns

Route 85 originates in downtown Hartford, beginning on Market Street by One Constitution Plaza then gets onto I-84 via Morgan Street and travels east toward Manchester Community College in Manchester. After completing a terminal loop at Manchester Community College, Route 85 returns to downtown Hartford using I-84 and State Street.

Service Schedule

The MCC Flyer runs on weekdays only during the school year (approximately mid-January through mid-May and September through mid-December); service is suspended for school holidays. Service is generally every 60 minutes throughout the day, though buses run slightly more or less frequently at the beginning and end of the day. There are 11 outbound trips and 12 inbound trips on Route 85, running from 7:30 AM to about 9:30 PM.

FIGURE 2 | SCHEDULE OVERVIEW

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	7:30 AM – 9:22 PM	60/60	11/12
Saturday	-	-	-
Sunday	-	-	-

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Route 85 carries 389 daily passengers or 16.9 passengers per trip on an average weekday, which is slightly lower than the Hartford Division average of 17.6 weekday passengers per trip (see Figure 3).

FIGURE 3 | RIDERSHIP STATISTICS

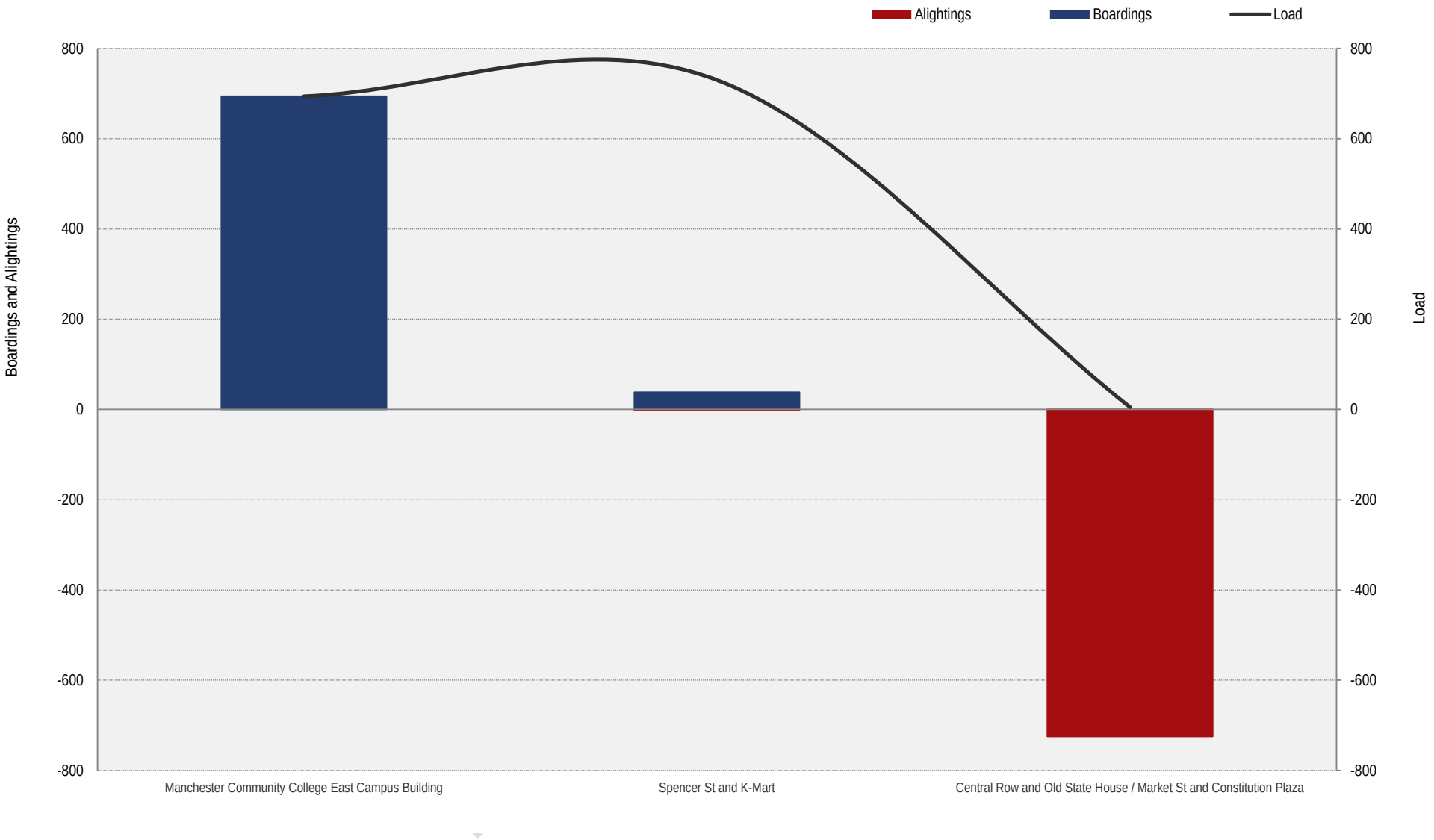
SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 85	ROUTE 85	DIVISION AVG
Weekday	389	16.9	17.7
Saturday	-	-	16.3
Sunday	-	-	17.6

Source: CTtransit performance data

Ridership by Stop

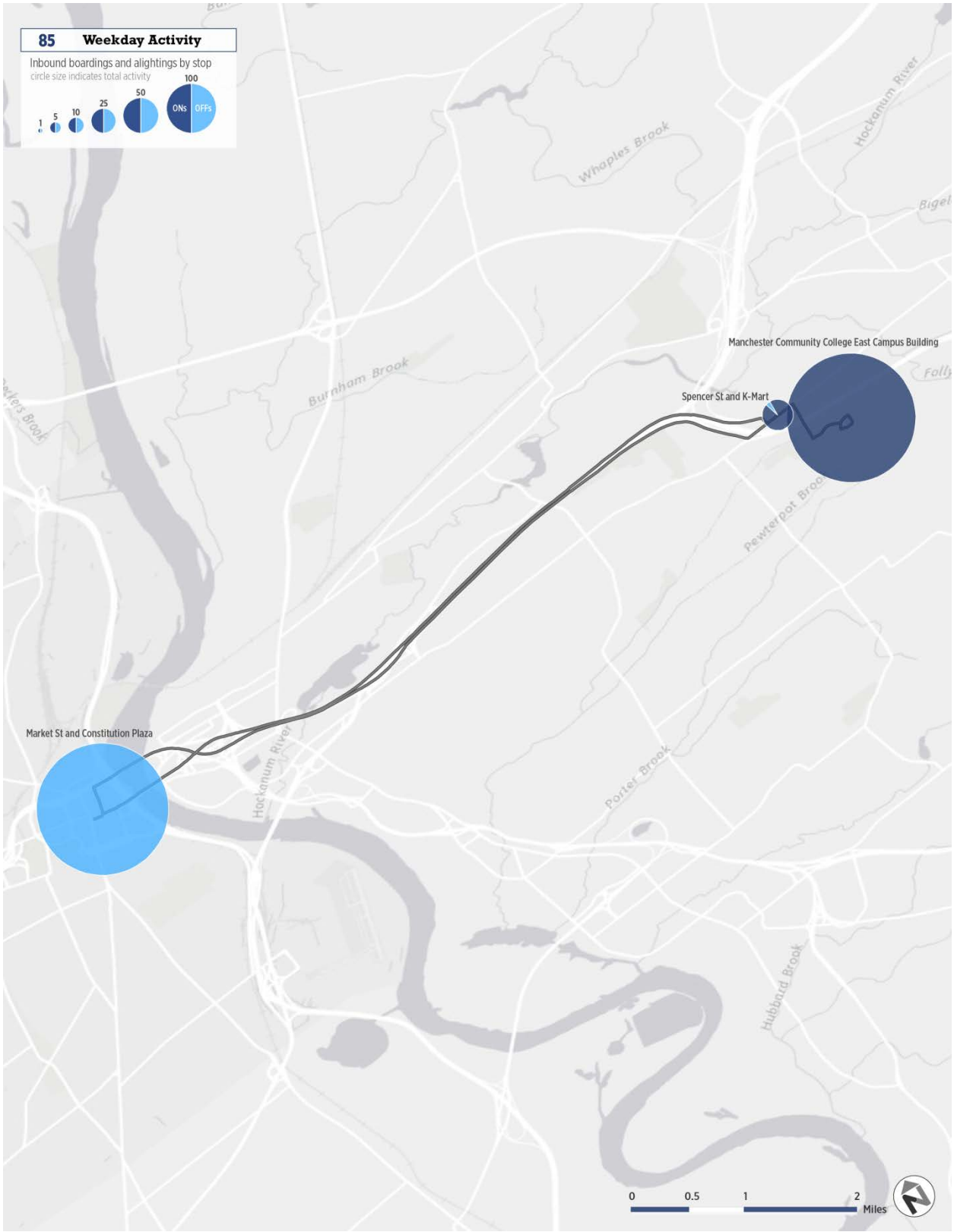
As an express route, Route 85 makes three stops: downtown Hartford, MCC and the stop on Spencer Street. Nearly all activity on Route 85 occurs at Manchester Community College (48%) or downtown Hartford (50%). The stop at Spencer Street accounts for less than 3% of activity, as shown in Figure 4 and Figure 5.

FIGURE 4 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH



Note: Stop activities at Old State House and Constitution Plaza are combined.

FIGURE 5 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Weekday ridership on Route 85 follows a typical reverse commute-type pattern with the highest ridership outbound during the morning and then traveling inbound during the afternoon (see Figures 6 and 7). However, inbound travel is stronger and more evenly distributed throughout the day as compared with outbound travel. Data is missing for the 6:15 PM outbound trip and the 7:00 PM inbound trip, but of the available data, 11 out of 21 (52%) total trips show between 20 and 40 boardings on a typical weekday for Route 85. The 9:10 PM inbound trip shows just two riders.

FIGURE 6 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

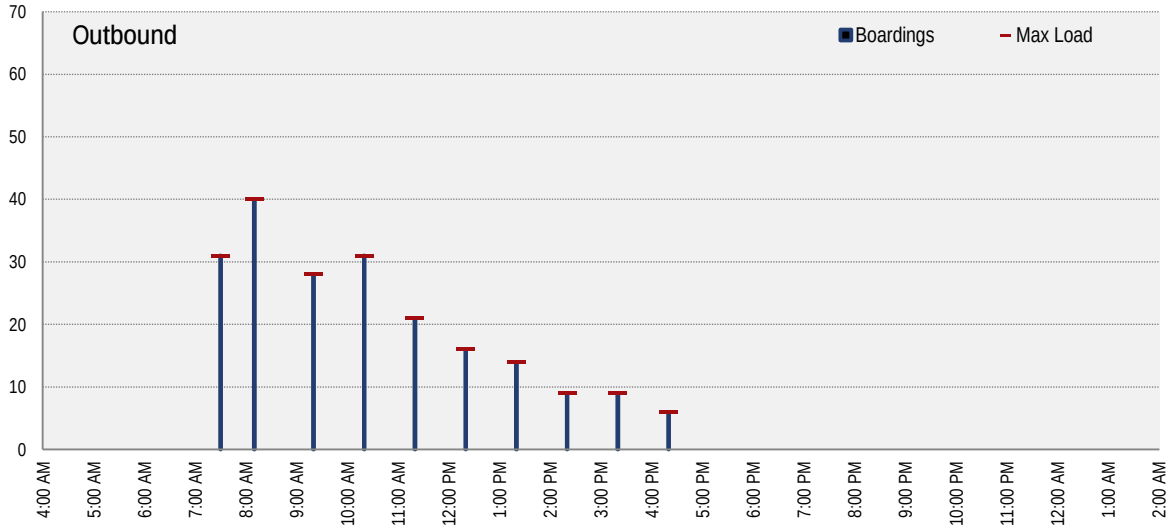
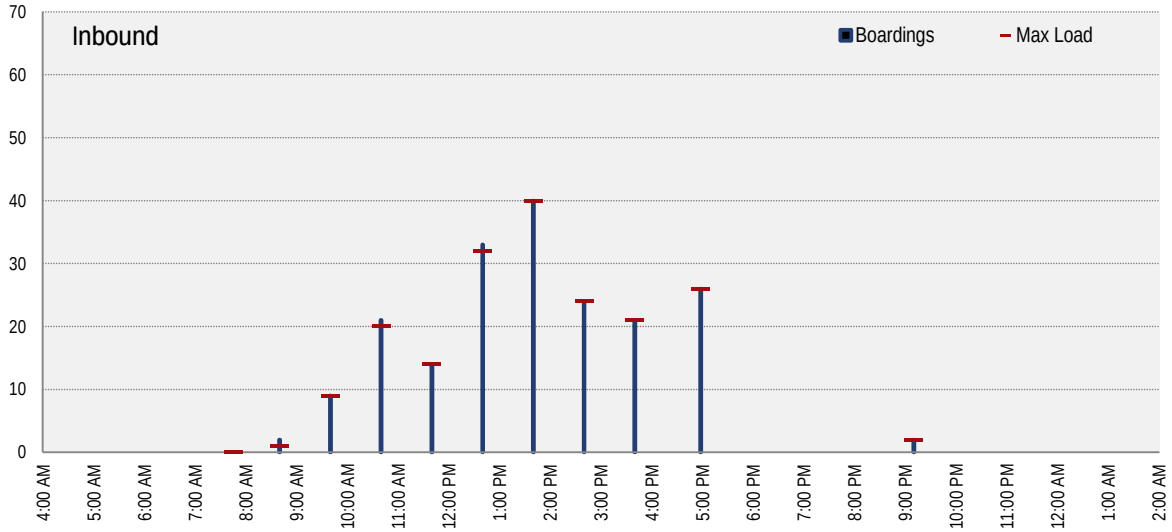


FIGURE 7 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Performance

Route 85 outperforms the Hartford Division average for operating cost per passenger and for ridership per revenue hour. Route 85's ridership per revenue mile is the same as the Hartford Division average (see Figure 8). Route 85 is among the top ten performing routes (see Figures 10 and 11) but offers a different type of service from many of the other top routes, making it hard to draw comparisons.

FIGURE 8 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 85	DIVISION AVG	ROUTE 85	DIVISION AVG	ROUTE 85	DIVISION AVG
Operating Cost per Passenger	$3.60	$4.84	-	$6.30	-	$6.66
Passengers per Revenue Vehicle Hour	35.6	28.9	-	27.0	-	29.7
Passengers per Revenue Vehicle Mile	2.6	2.6	-	2.4	-	2.9

Source: CTtransit performance data

Route 85 has excellent on-time performance at over 96%, or over 15 percentage points higher than the Division average (see Figure 9). Route 85 has a limited number of stops, operates via the highway, and has ample layover time on both ends, meaning that there is very little reason for the route to operate late outside of infrequent and uncontrollable traffic occurrences.

FIGURE 9 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 85	DIVISION AVG
Early	0.0%	0.2%
Late	3.7%	18.9%
On-Time	96.3%	80.9%

Source: CTtransit performance data

FIGURE 10 | WEEKDAY OPERATING COST PER PASSENGER

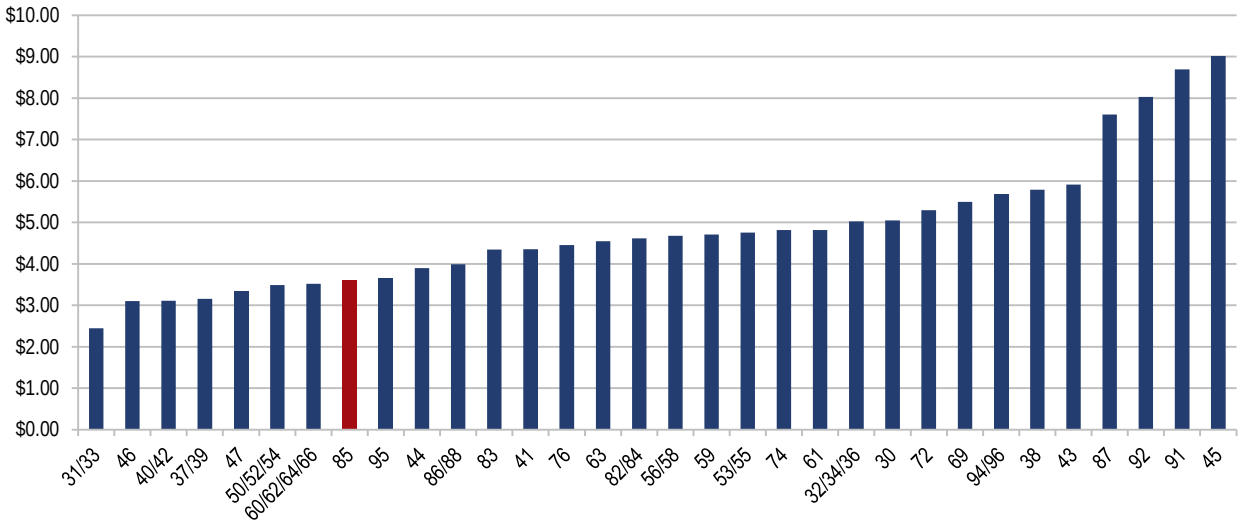
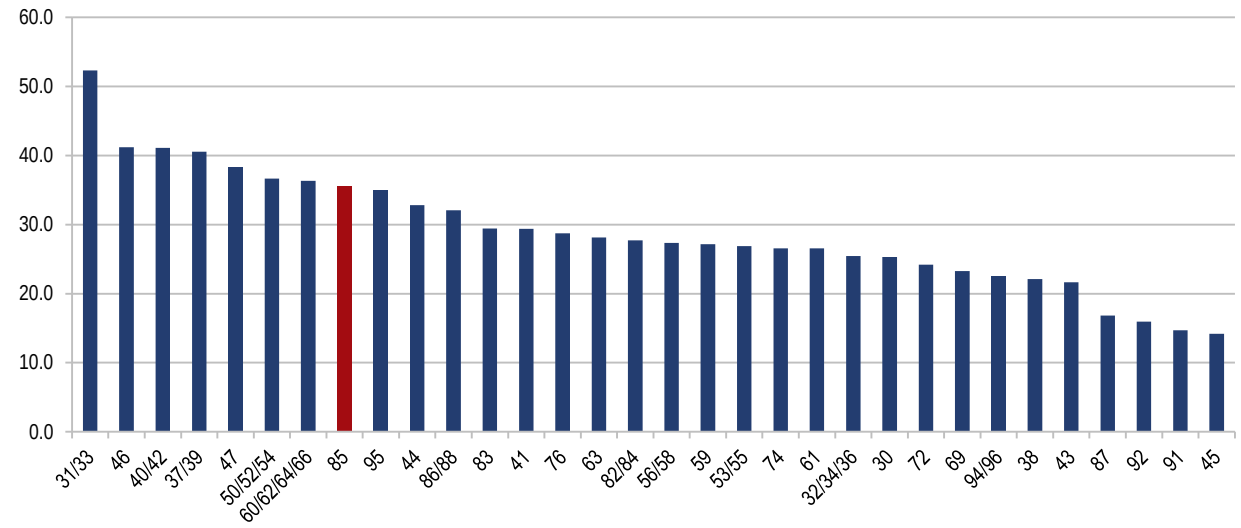


FIGURE 11 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Route 85 is one of the Hartford Division's Flyer routes, traveling express between Manchester Community College and downtown Hartford via I-84. The route provides a 12-13 minute trip between the college and downtown, with one to two additional stops on Spencer Street depending on direction. The route is directly tied to a specific market (MCC), operates only school is in session and has good ridership and performs well overall.

Route 85 currently competes with Route 83 for ridership; Route 83 also offers roughly hourly service to Manchester Community College, but is a local service with frequent stops. As a result, the travel time between downtown Hartford and MCC is around 25-30 minutes. This compares with Route 85 which travels between these two points in about 15 minutes.

CT*fastrak*

CT***fastrak*** will introduce a new route, Route 121, which will indirectly impact Route 85. Route 121 will travel between downtown Hartford and Manchester Community College via Silver Lane, making limited stops along the route and providing frequent 20-minute service. CT***fastrak*** Route 121 will also provide longer distance connections with service extending through Hartford to West Hartford, Newington and the UCONN Health Center. The planned travel times between downtown Hartford and MCC are still projected to be around 30 minutes, which is still twice as long as the MCC Flyer. Thus, higher service frequencies offered by the CT***fastrak*** service will likely draw riders from Route 85; opportunities exist for the two routes to work in union.

- Route 121: CT***fastrak*** Route 121 will provide 20-minute service during the peak periods, 30-minute service during the midday, and 60-minute service in the evenings on weekdays. Service will operate between 4:55 AM and 12:14 AM. Saturday service will operate from 5:30 AM to 12:14 AM every 30 minutes during the day switching to 60 minutes during the evening, while Sunday service will operate every 60 minutes all day from 6:30 AM to 9:22 PM.

Service Improvement Options

The success of Route 85 MCC Flyer is because it is tailored to a specific market and offers fast, direct service to the riders. The route has two challenges: 1) non-directional travel on the route is low; and 2) Route 85 will likely lose some riders to CT***fastrak*** 121. Opportunities to strengthen Route 85 including minor improvements to boost ridership and productivity:

- **Offer consistent 60-minute service between 7:00 AM and 7:00 PM.** The current schedule for Route 85 offers somewhat regularly scheduled service, but some morning and evening departures from MCC range from 40 minutes to almost 120 minutes. Class times at MCC range considerably, with classes ending at all times throughout the day. As a result, the best way to schedule bus service would be to create consistent, clockface (i.e. on the hour or half-past the hour) to make the route as user friendly as possible.
- **Coordinate schedules for CT*transit* service to Manchester Community College (MCC).** If service to MCC on Route 83 is maintained, the schedules for Routes 83, 95, and 121 should be considered together. Offset schedules, though sometimes difficult to work out, will offer very frequent service to the college, which has shown high demand on this route and others.
- **Eliminate stops on Spencer Street.** Demand along Spencer Street is extremely low and these stops add time to what is otherwise a very fast trip. The route should operate closed door between the college and downtown.
- **Eliminate the 9:10 PM inbound trip.** Ridership on this trip is low. In addition, evening and late night service is already provided by Route 83 and is scheduled for Route 121; riders are likely

to take the first bus that arrives, leaving few riders on Route 85. (Currently Route 121 is scheduled to depart MCC at 9:05 PM.) The last trip on Route 85 could be eliminated without impacting many riders.

Service Recommendations

BURNSIDE AVENUE

86 | Mayberry Village via Scotland Road

86R | Mayberry Village via Roberts Street

88 | Manchester Center

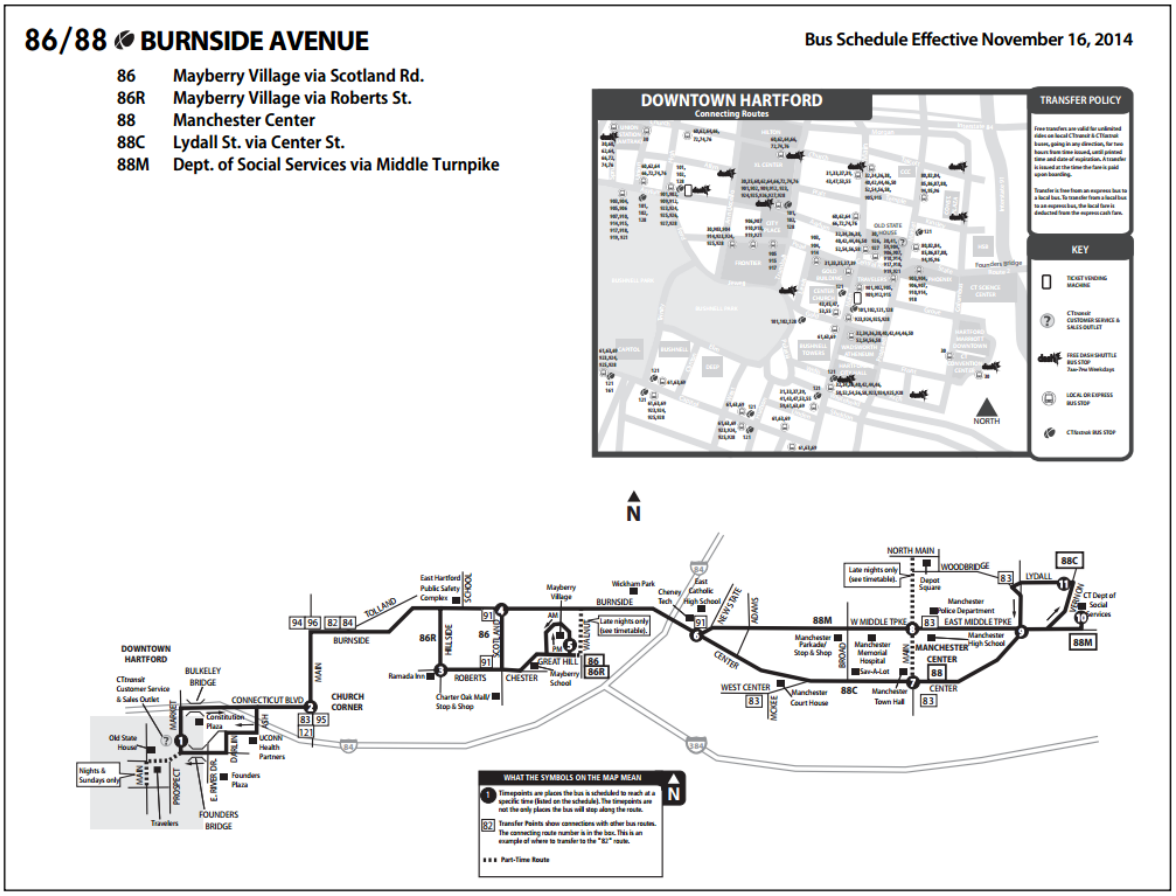
88C | Lydell Street via Center Street

88M | Department of Social Services via Middle Turnpike

Service Design

Routes 86 and 88 operate east and west along Burnside Avenue, providing radial service between downtown Hartford and East Hartford (Route 86) and Manchester (Route 88). The two routes function as variants of a single service, with a common alignment and unique outer ends.

FIGURE 1 | ROUTE MAP



Service Schedule

Route 88 operates seven days a week, while Route 86 operates Monday through Friday only. There are 55 total outbound trips and 59 total inbound trips per weekday:

- Route 86: 9 outbound (OB), 10 inbound (IB)
- Route 86R: 6 OB, 7 IB
- Route 88: 2 OB, 2 IB
- Route 88C: 21 OB, 21 IB
- Route 88M: 17 OB, 10 IB

Service on the corridor operates with Routes 86, 88C, and 88M alternating trips in the morning headed inbound. Peak period frequency is between 5 and 15 minutes along the common alignment. During the afternoon, Routes 86R, 88C and 88M alternate trips, with peak period frequency between 5 minutes and 15 minutes along the common alignment. Route 88 operates two outbound trips in the evening and one inbound trip in the morning and one in the evening.

On Saturday, there are 26 outbound trips and 28 inbound trips, with service every 30 minutes:

- Route 88: 1 OB, 2 IB
- Route 88C: 13 OB, 13 IB
- Route 88M: 12 OB, 12 IB

- One additional inbound evening trip is labeled as Route 86; however, the trip begins at Burnside Avenue and Scotland Road and does not serve Mayberry Village, essentially serving the trunk alignment only

Sunday service operates as Route 88, with 11 outbound and 12 inbound trips every 70 minutes. The last evening inbound trip serves the trunk alignment only, beginning at Burnside Avenue and Scotland Road.

FIGURE 3 | SCHEDULE OVERVIEW (ALL ROUTES 86, 86R, 88, 88C AND 88M)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	4:24 AM – 12:37 AM	10 /30	55/59
Saturday	6:22 AM – 10:44 PM	30	26/28
Sunday	6:50 AM – 7:55 PM	70	11/12

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

SERVICE PERFORMANCE

CT***transit*** tracks ridership for Route 86 and Route 88 together, so the following analysis of ridership and productivity treats the two routes as a single service. Route 86/88 carries 2,459 daily passengers or 21.6 passengers per trip on an average weekday, which is about 22% higher than the Hartford Division average of 17.6 weekday passengers per trip (see Figure 4).

Saturday and Sunday ridership also perform above the division average by 19% and 6%, respectively.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 86/88	ROUTE 86/88	DIVISION AVG
Weekday	2,459	21.6	17.7
Saturday	965	18.2	16.3
Sunday	457	19.9	17.6

Source: CTtransit performance data

Ridership by Trip

Weekday - Route 86

Ridership patterns on Route 86 are consistent with traditional commuter routes, with outbound PM peak trips and inbound AM peak trips showing the strongest ridership, even with increased frequency during these periods (see Figure 10 and 11). The average number of passengers per trip on this route according to Figure 4 is about 22; however, this is a combined average of Route 86 and Route 88. Route 86 shows significantly less ridership than Route 88 and likely brings this average down. Route 86 rarely has over 20 boardings per trip in either direction and many trips show fewer than 10 passengers, as shown in Figure 10 and Figure 11. Overcrowding is not an issue on this route. Weekend ridership activity is shown in Appendix X.

FIGURE 10 | ROUTE 86 WEEKDAY OUTBOUND RIDERSHIP BY TRIP

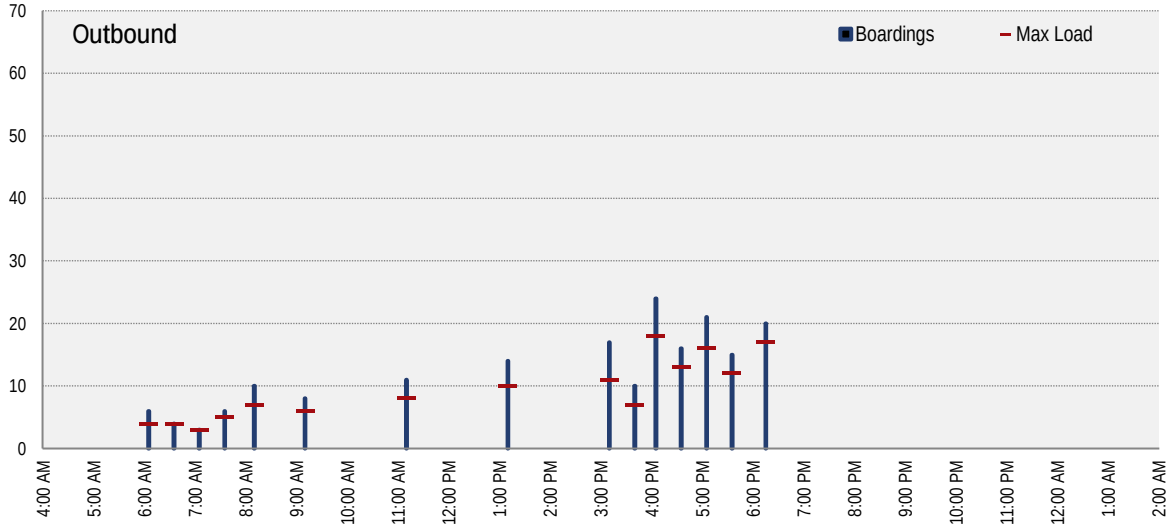
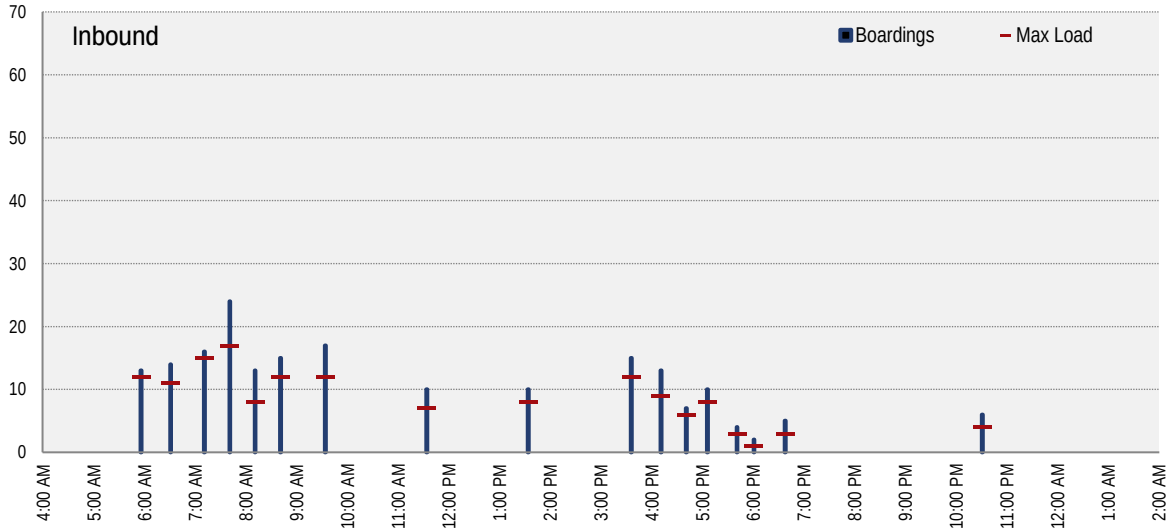


FIGURE 11 | ROUTE 86 WEEKDAY INBOUND RIDERSHIP BY TRIP



Weekday - Route 88

Ridership on Route 88 also follows a slight traditional commute pattern with stronger inbound demand in the morning and stronger demand traveling outbound in the afternoon. However, the pattern is not as strong as compared with Route 86, and ridership on Route 88 is strong throughout most of the day.

Most trips have at least 30 boardings between about 8:00 AM and 5:30 PM. A few have 40 or more boardings. Inbound ridership tapers off in the evening after 5:30 PM, while outbound ridership gradually increases before 8:00 AM, as shown in Figure 12 and Figure 13. Maximum loads on Route 88 exceed 30 passengers on only seven trips and no trips exceed a maximum load of 40 passengers. The typical seating capacity of CT***transit***'s 40-foot transit vehicles is 38 passengers, so overcrowding is unlikely an issue on this route. Weekend ridership activity is shown in Appendix X.

FIGURE 12 | ROUTE 88 WEEKDAY OUTBOUND RIDERSHIP BY TRIP

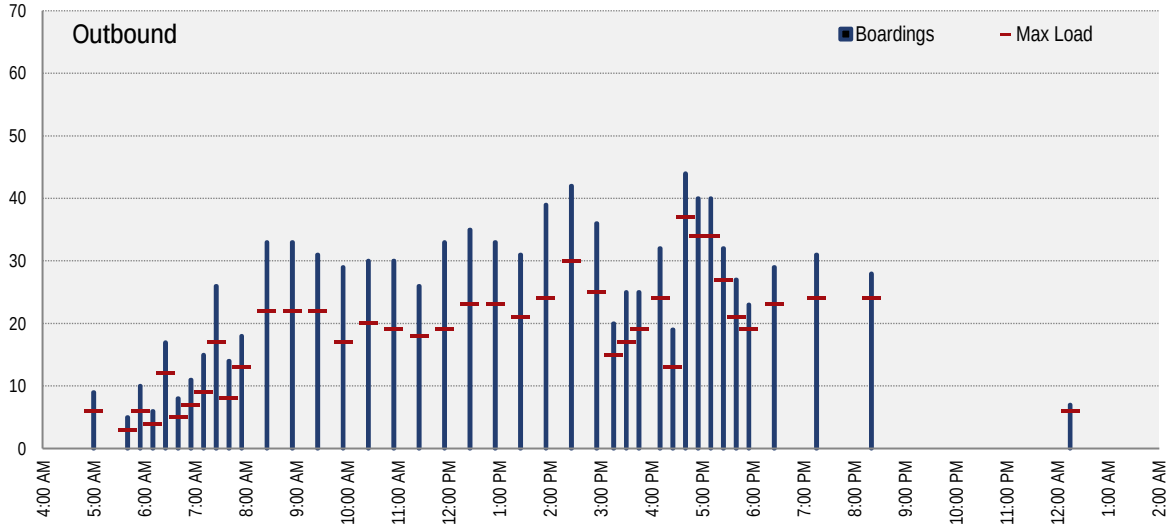
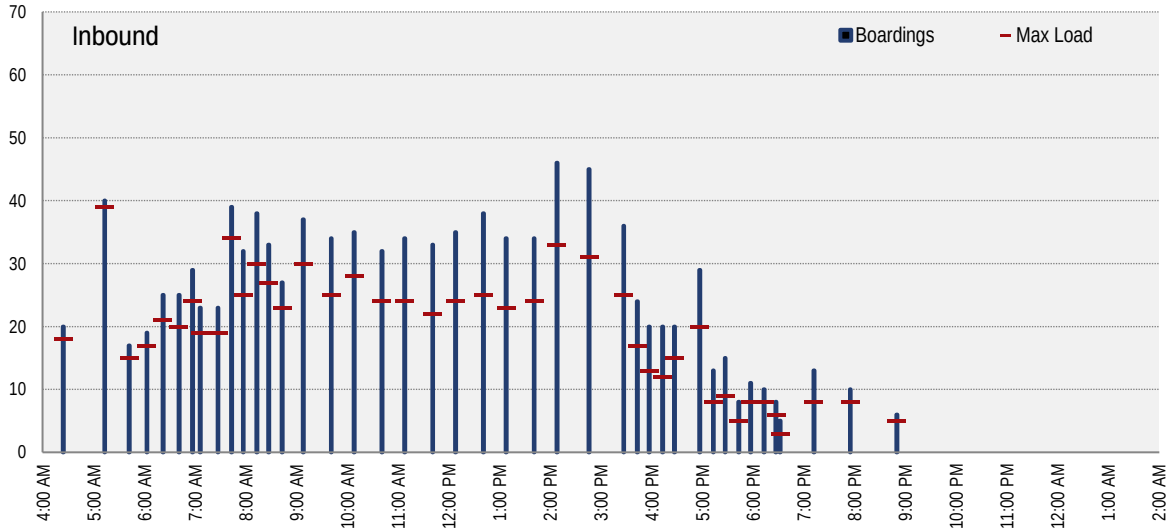


FIGURE 13 | ROUTE 88 WEEKDAY INBOUND RIDERSHIP BY TRIP



Ridership by Stop

The most heavily used stops on Route 86/88 outside of the downtown terminus include Church Corner (Connecticut Boulevard and Main Street), Burnside Avenue and William Street, Burnside Avenue and Walnut Street, and Center Street and Main Street (near Manchester Center), which all have activity (boardings and alightings) over 50 on an average day (see Figure 5). All other stops have fewer than 50 boardings and alightings, though ridership remains fairly strong along a majority of Route 88. Around 25% of all activity occurs along the trunk alignment served by both Route 86 and Route 88, about 4% on the unique portions of Route 86 (both variants), 11% on Route 88C, and 9% on Route 88M. The remaining activity occurs in downtown Hartford or along the common portion of Routes 88C and 88M. Load profile data (see Figure 6 and Figure 7) combines passenger activity by stop and shows the

cumulative passenger load as the bus travels inbound. Ridership by stop without the cumulative load is mapped in Figure 8 and Figure 9.

The weakest ridership along the route occurs on the unique portion of Route 86 and on the terminating loop of Route 88C (Vernon, Lydall, and Woodbridge Streets). An average of 80 boardings and alightings occur on the unique portion of Route 86 per day, most of those at Mayberry Village, while the Route 88C loop has an activity of 25 per day.

FIGURE 5 | ROUTE 86/88 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Church Corner (Connecticut Boulevard & Main Street)	51/63	Transfer point to Routes 82, 83, 84, 94, 95, 96
Burnside Avenue & William Street	81/17	Medium density residential area and some commercial strip development
Burnside Avenue & Walnut Street	64/9	Mayberry Village, medium to high density residential area and some commercial strip development
Center Street & Main Street	54/6	Manchester Town Hall, Manchester Center

FIGURE 6 | ROUTE 86 WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

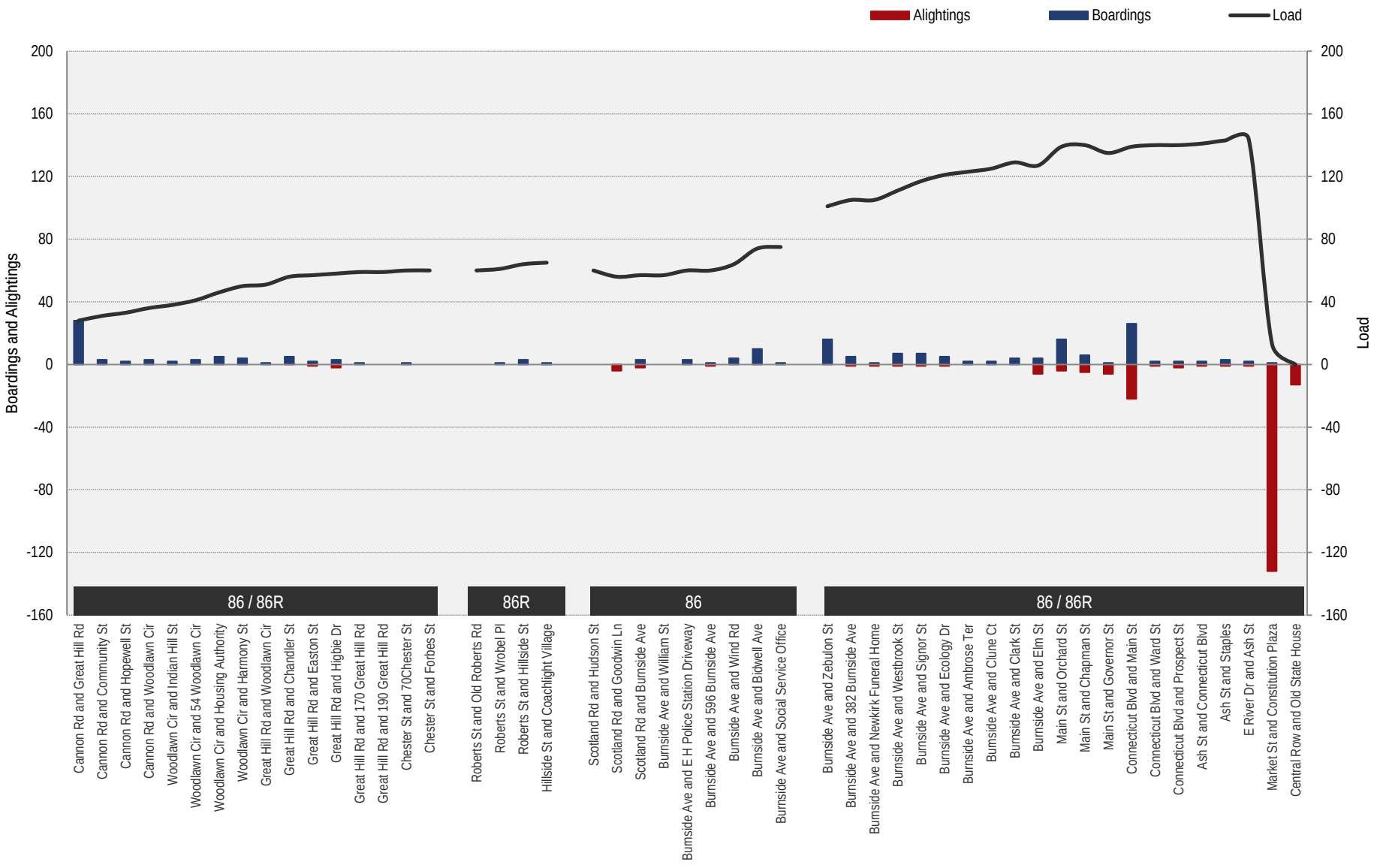


FIGURE 7 | ROUTE 88 WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

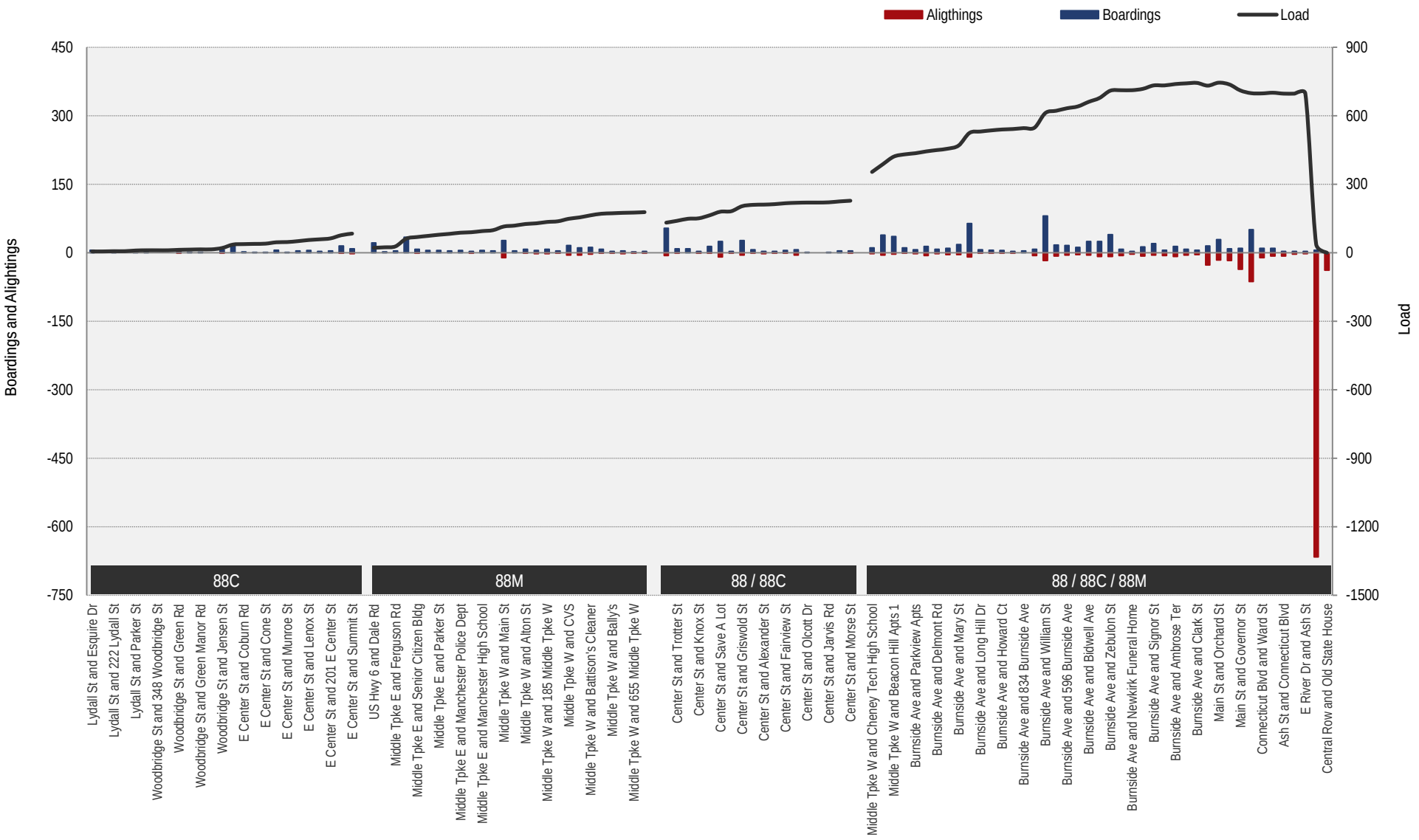


FIGURE 8 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

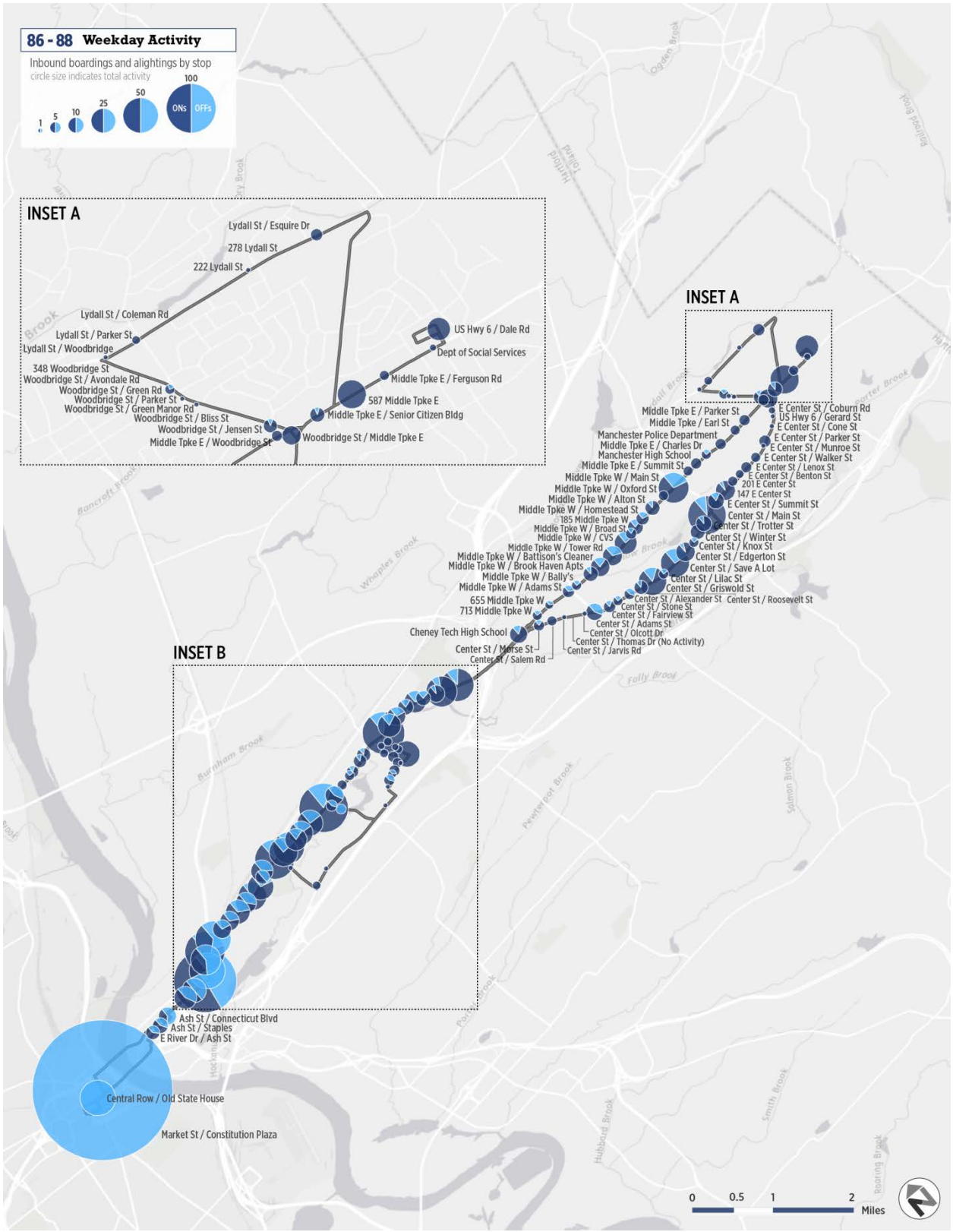


FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP (INSET)

Productivity and On-Time Performance

Route 86/88's productivity is a mixed when compared to the Hartford Division average. While Route 86/88 has a lower than average operating cost per passenger on all service days, the route has a lower than average ridership per vehicle hour on weekdays and Saturdays and lower than average ridership per vehicle mile on all service days (see Figure 18). Overall, Route 86/88 falls just outside of the top ten routes in the Hartford Division, as shown in Figure 20 and Figure 21.

FIGURE 18 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 86/88	DIVISION AVG	ROUTE 86/88	DIVISION AVG	ROUTE 86/88	DIVISION AVG
Operating Cost per Passenger	$4.62	$4.84	$5.01	$6.30	$3.59	$6.66
Passengers per Revenue Vehicle Hour	27.7	28.9	25.5	27.0	35.6	29.7
Passengers per Revenue Vehicle Mile	2.0	2.6	1.7	2.4	2.3	2.9

Source: CTtransit performance data

Route 86/88's on-time performance almost exactly matches the Hartford Division average. About 19% of buses are late and 81% are on-time. On Route 88, a stop occurs roughly every 750 feet, which could affect the route's on-time performance. A high number of stops often slows down a route and can cause delays.

FIGURE 19 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 86/88	DIVISION AVG
Early	0.1%	0.2%
Late	19.2%	18.9%
On-Time	80.8%	80.9%

Source: CTtransit performance data

FIGURE 20 | WEEKDAY OPERATING COST PER PASSENGER

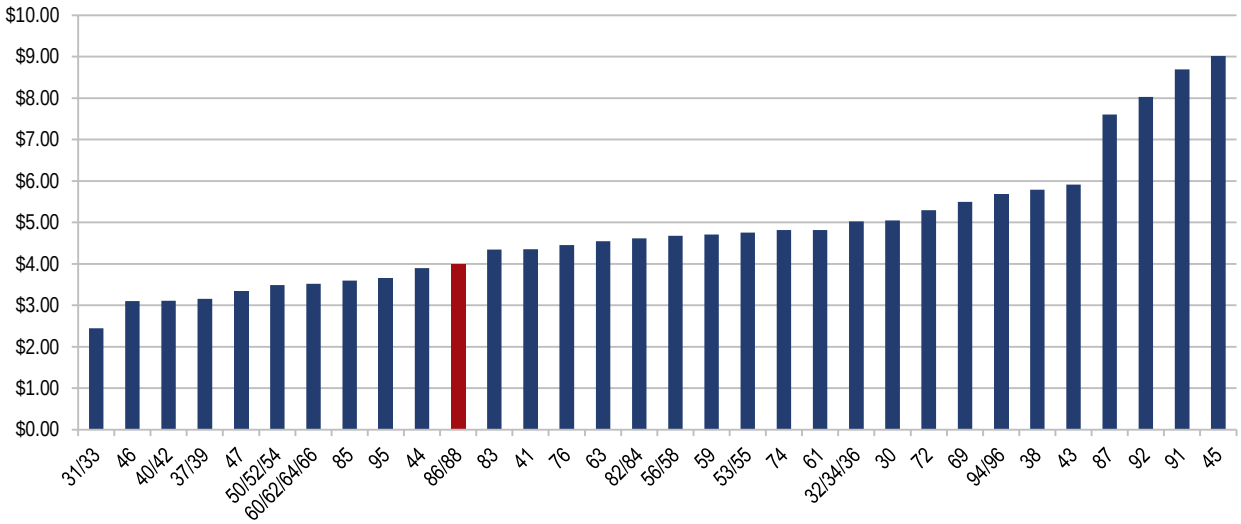
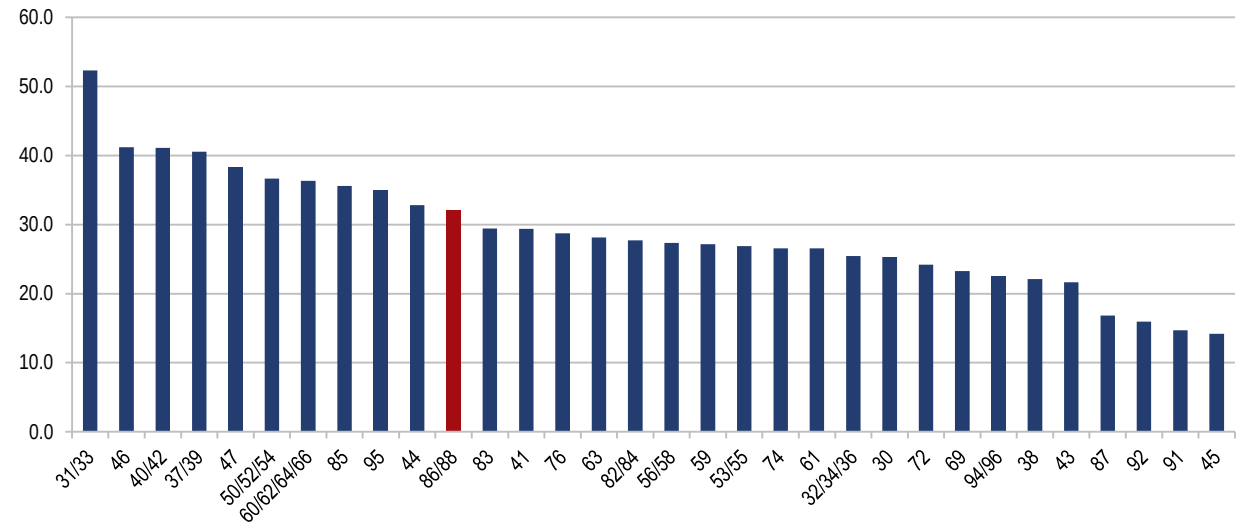


FIGURE 21 | WEEKDAY PASSENGERS PER REVENUE HOUR



SUMMARY OF ISSUES AND OPPORTUNITIES

Route 86 and Route 88 operate as variants of the same route, though Route 88 operates with greater frequency and is longer than Route 86. The trunk alignment for these routes is along Burnside Avenue, which is primarily a residential corridor but development is relatively dense and conducive to transit. Route 88 is a direct route and is anchored in downtown Manchester and the Connecticut Department of Social Services. Route 86, on the other hand, travels to Mayberry Village, which is not as strong an anchor. In addition, combining Route 86 with Route 88 creates a complicated schedule with a multitude of service alignments, making the route difficult to understand.

Route 88 provides important service to Manchester, CT and faces little competition from other transit service. Route 91, a crosstown route, operates along Burnside Avenue for a portion of its alignment but does not serve downtown Hartford. Route 88 also provides a connection with Route 83 Silver Lane in Manchester Center, so riders can also change direction and travel to either the Buckland Hills or Manchester Community College.

From the ends of the two primary variants on Route 88, travel times into downtown are around 35 minutes, which is relatively competitive with car trips but could be improved. Frequency is also high, especially during peak periods. Route 86 serves Mayberry Village, a moderately dense residential area just south of Burnside Avenue near Walnut Street. The route has very low frequency but provides a 20 minute ride into downtown Hartford.

Route Evaluation

BREWER STREET

87F | Forest & Oak

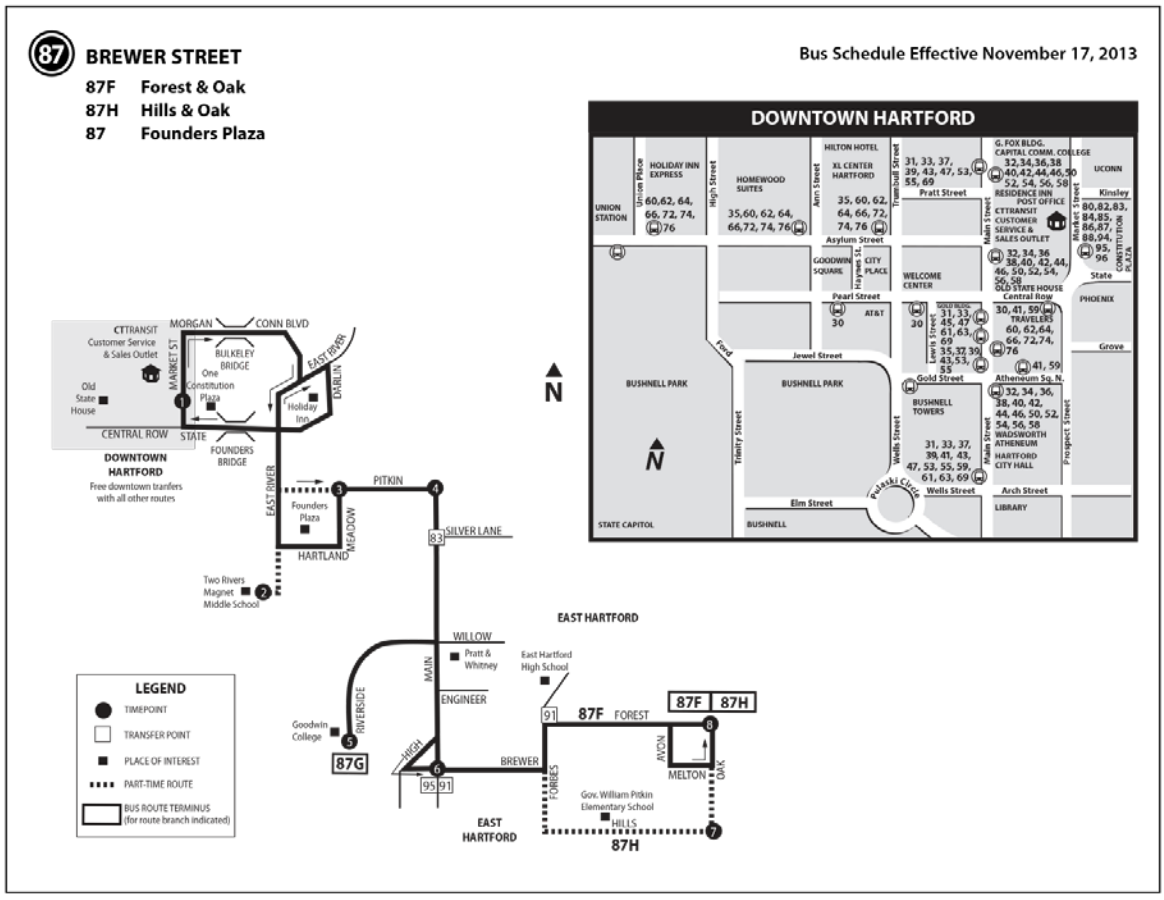
87H | Hills & Oak

87 | Founders Plaza

Service Design

Route 87 is a radial route that travels between downtown Hartford and East Hartford, serving Founders Plaza and Main Street in East Hartford (see Figure 1). Variant service includes service to Goodwin College (87G); Oak Street at Hills Street (87H); and Forest Street (87F, 87H) east of the college.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 87 originates in downtown Hartford, where riders can connect to most CT*transit* routes. In addition, there are a couple of locations where riders can transfer to other CT*transit* Hartford routes (see Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 83	Silver Lane
Route 91	Forbes Street Crosstown
Route 95	Glastonbury

Alignments and Service Patterns

The common or "trunk" inbound alignment of Route 87, beginning at the intersection of Main and Willow Streets, operates along Pitkin Street, Hartland Street, and East River Drive (serving Founders Plaza), terminating in two loops, the first in East Hartford and the second in downtown Hartford. Beyond this trunk, two primary inbound variants that operate Monday through Friday serve: 1) Goodwin College along Riverside Drive (Route 87G), and 2) Forest Street from Oak Street to Forbes Street (near East Hartford High School), Brewer Street, and Main Street before also serving Goodwin College (Route 87F) on most trips. Four inbound morning trips on Route 87F skip Goodwin College.

A third variant, Route 87H, begins at Forest and Oak Streets (similar to Route 87F), but serves Oak and Hills Streets to reach Governor William Pitkin Elementary School before also operating along Forbes and Brewer Streets. Only two AM inbound trips follow the Route 87H alignment, and these do not serve Goodwin College. Two PM outbound trips follow the Route 87H alignment, and these trips do travel to Goodwin College. In addition, one trip headed outbound in the morning and one trip headed inbound in the afternoon serve Two Rivers Magnet Middle School southwest of Founders Plaza.

Saturday service operates between downtown Hartford and Founders Plaza only. Service does not extend to Goodwin College.

Service Schedule

Route 87 operates on weekdays and Saturdays. There are 18 total outbound trips per weekday (nine on Route 87F, seven on Route 87G, and two on Route 87H) and 18 total inbound trips (ten on Route 87F, six on Route 87G, and two on Route 87H). Peak period frequency varies between 15 and 45 minutes, averaging around 25 minutes in the morning and 35 minutes in the afternoon, or about 30 minutes overall. Midday service generally operates every 60 minutes (see Figure 3). In general, peak period service is operated on Route 87F, while midday service is operated on Route 87G.

Saturday service operates exclusively as Route 87 and runs every 120 minutes.

FIGURE 3 | SCHEDULE OVERVIEW (ALL ROUTES 87, 87G, 87F, AND 87H)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:50 AM – 6:53 PM	30/60	18/18
Saturday	9:15 AM – 5:35 PM	120	5/5
Sunday	-	-	-

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Route 87 carries 303 daily passengers or 8.4 passengers per trip on an average weekday, which is more than 50% below the Hartford Division average of 17.7 weekday passengers per trip (see Figure 4). Ridership drops considerably on Saturdays to 0.8 passengers per trip, and eight passengers total. Route 87 does not operate on Sundays.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 87	ROUTE 87	DIVISION AVG
Weekday	303	8.4	17.7
Saturday	8	0.8	16.3
Sunday	-	-	-

Source: CTtransit performance data

Ridership by Stop

The most heavily used stops on Route 87 outside of the downtown terminus are at Goodwin College, Main and Brown Streets, and Main and Brewer Streets (time point 6 on Routes 87F and 87H). These three stops have ridership activity between 20 and 40 passengers per day while all other stops on Route 87 have fewer than 20 boardings and alightings, as shown in the load profile data in Figure 5.

The data shows that inbound passenger loads peak at Goodwin College. Overall, Main Street shows the strongest ridership, with the Coca-Cola Bottling plant, Pratt & Whitney headquarters, and medium-density residential development located on the corridor. Ridership east of Main and Brewer Streets is extremely low. Ridership by stop without the cumulative load is mapped in Figure 6.

FIGURE 5 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

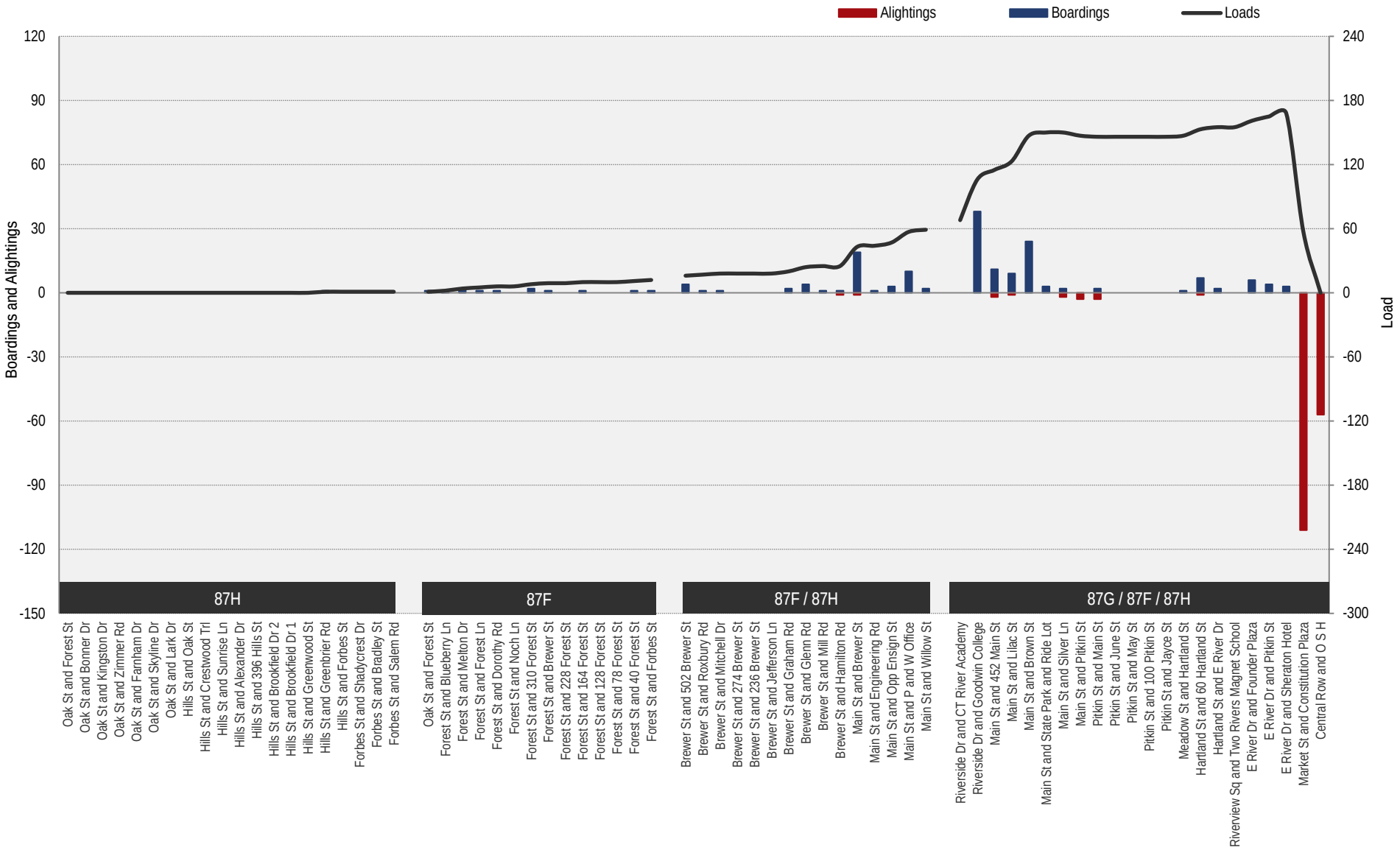


FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

Ridership by Trip

Weekday

Route 87 carries an average of 8.4 passengers per trip on weekdays, with about half of all trips in either direction reaching 10 or more boardings (see Figure 7 and Figure 8). Only one outbound trip at 7:25 AM reaches more than 20 boardings. Outbound weekday ridership is slightly stronger than the AM peak, while inbound ridership is highest in the AM peak and in the afternoon. Ridership is somewhat stronger overall headed inbound than outbound, while midday ridership in both directions is very low in general until about 1:30 PM.

These ridership patterns generally reflect a reverse commute pattern and are likely a result of meeting school and commuter schedules and shift times at the industrial plants along Main Street. With most peak period service operating on the Route 87F alignment and midday service operating on the Route 87G alignment, Route 87F is the strongest alignment for ridership and benefits from the additional stops on Main Street, more daily trips offered, and better scheduled trip times.

Maximum loads on Route 87 do not exceed 20 passengers, so overcrowding is not a concern on this route. Maximum loads for most trips tend to be very close to the total number of boardings for each trip, one indicator that most outbound passengers board and most inbound passengers alight at the downtown transit center, possibly to transfer to or from another bus. The service hours and frequency on this route are sufficient to meet demand.

FIGURE 7 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

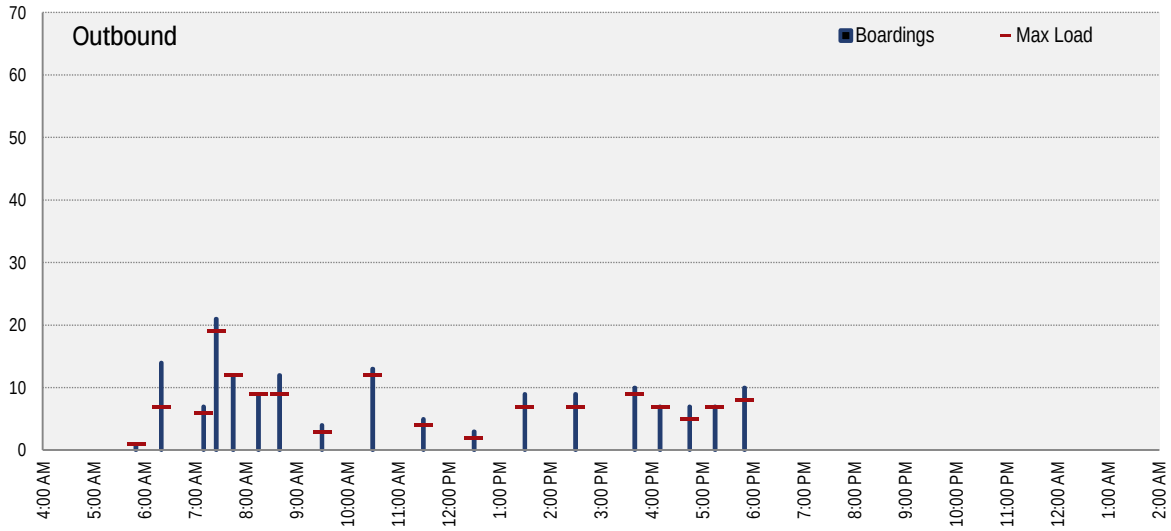
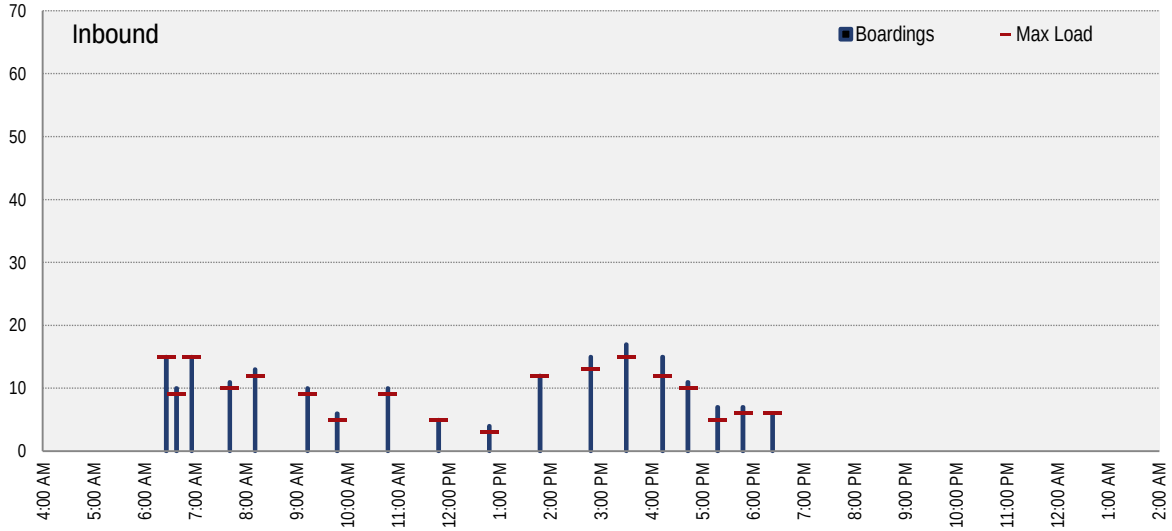


FIGURE 8 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Saturday ridership is extremely low with no trip exceeding four boardings (see Figure 9 and Figure 10). Only one trip in each direction has more than one boarding, and 60% of trips have zero riders.

FIGURE 9 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

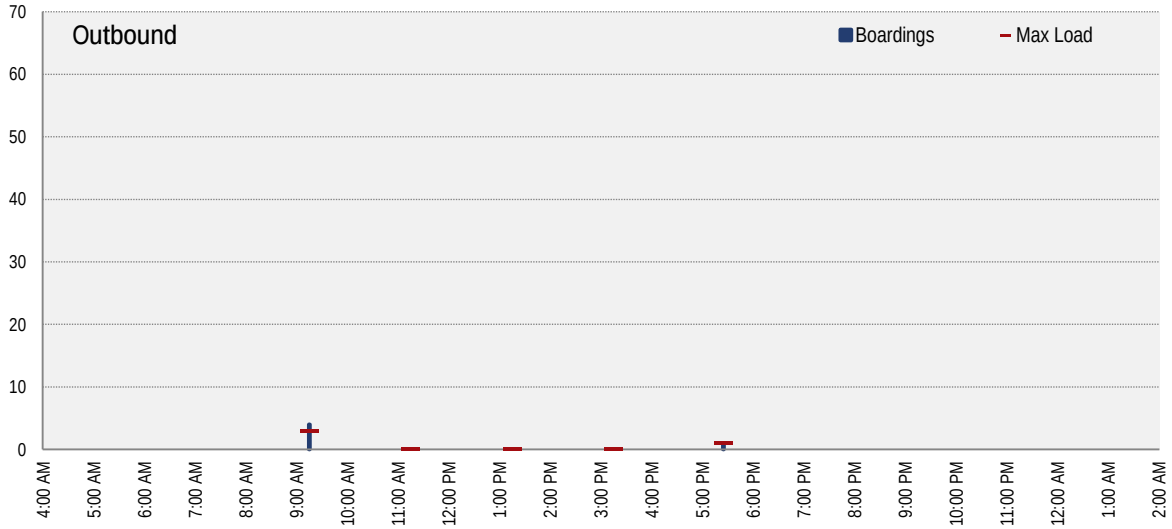
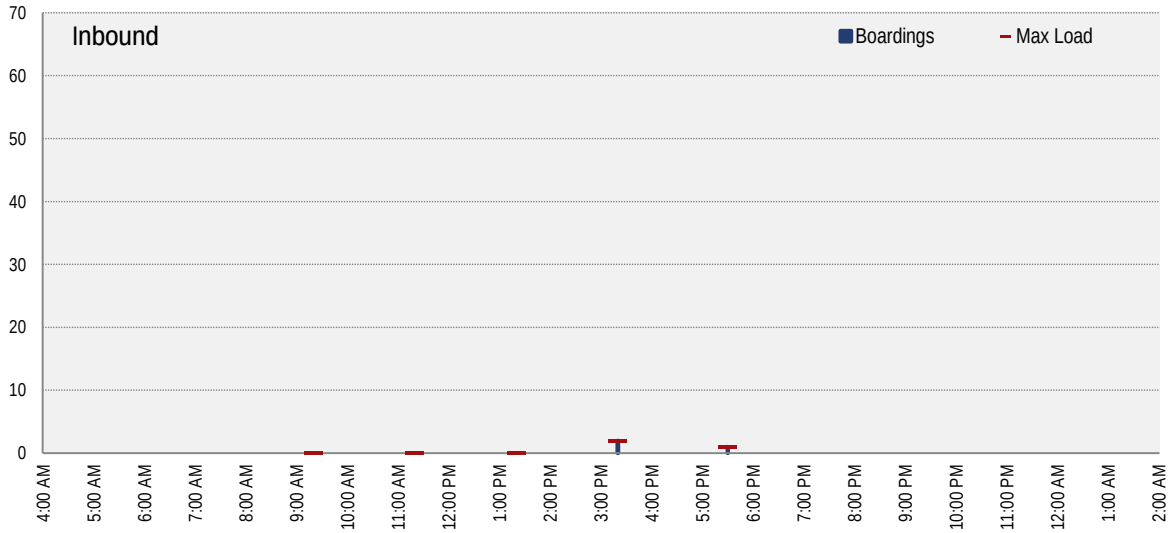


FIGURE 10 | SATURDAY INBOUND RIDERSHIP BY TRIP



Performance

Route 87 performs poorly on all measures of productivity, with an operating cost per passenger 57% higher than the division average on weekdays, a ridership per revenue hour 42% lower than average, and ridership per revenue mile 54% lower than average (see Figure 11). Similarly, on Saturdays, operating costs per passenger are over three times as high as the division average while ridership per revenue hour and revenue mile is very low. Route 87 is among the poorest four performers of all CT***transit*** Hartford routes, as shown in Figure 13 and Figure 14.

FIGURE 11 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 87	DIVISION AVG	ROUTE 87	DIVISION AVG	ROUTE 87	DIVISION AVG
Operating Cost per Passenger	$7.60	$4.84	$20.0	$6.30	-	$6.66
Passengers per Revenue Vehicle Hour	16.8	28.9	6.4	27.0	-	29.7
Passengers per Revenue Vehicle Mile	1.2	2.6	0.5	2.4	-	2.9

Source: CTtransit performance data

Route 87 has a 96.9% on-time arrival rate, with a much lower percentage of late buses than the Hartford Division average (see Figure 12). Low ridership and sufficient recovery time in the schedule likely contribute to the excellent on-time performance of Route 87.

FIGURE 12 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 87	DIVISION AVG
Early	0.0%	0.2%
Late	3.1%	18.9%
On-Time	96.9%	80.9%

Source: CTtransit performance data

FIGURE 13 | WEEKDAY OPERATING COST PER PASSENGER

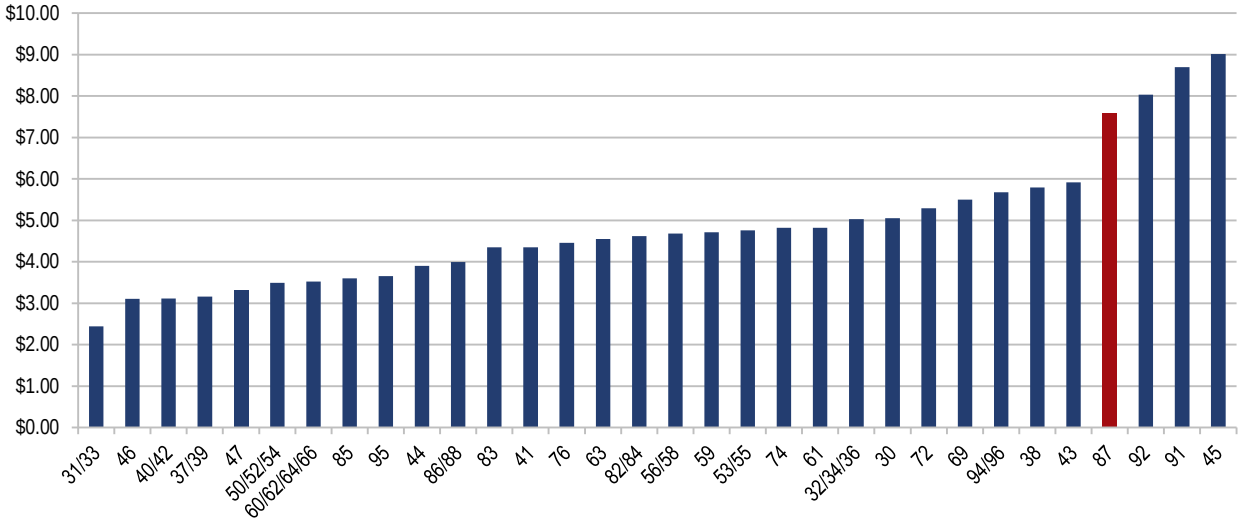
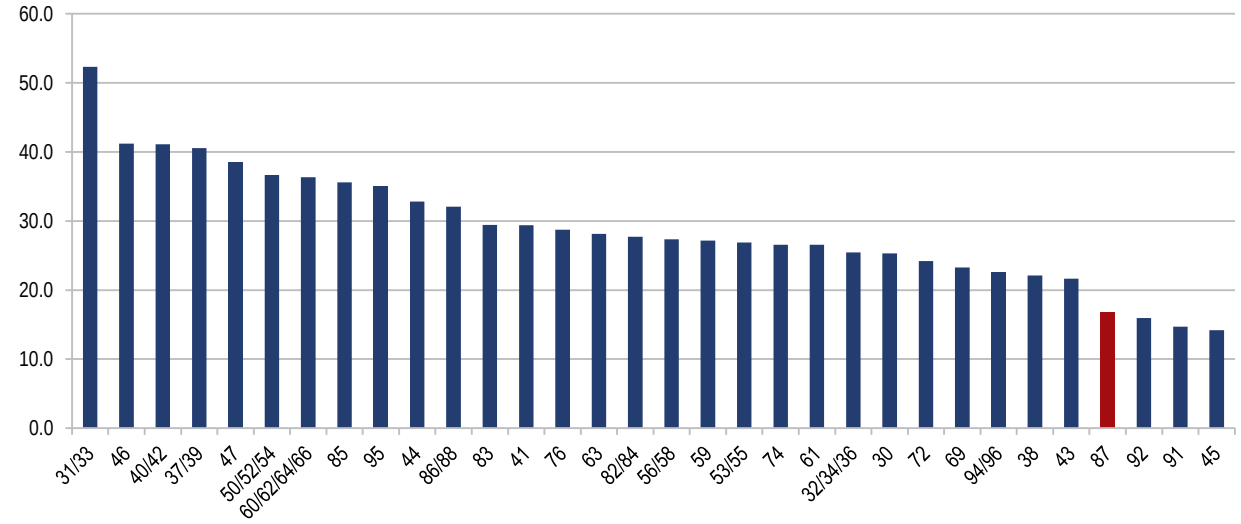


FIGURE 14 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Route 87 is a radial route connecting downtown Hartford and East Hartford. The route is designed to provide access to employment in East Hartford, including the office parks at Founders Plaza, small businesses and Pratt and Whitney along Main Street in East Hartford. Variants also provide service to Goodwin College, the Two Rivers Magnet Middle School and the neighborhoods off of Brewer Street. The route has low ridership and poor performance metrics, and is among the bottom performers of all CT***transit*** routes.

Route 87 suffers from a handful of challenges that impact its productivity. While the route serves a combination of employment, educational institutions and neighborhoods, the destinations are not generating large numbers of trips. People working at Founders Plaza and Pratt and Whitney, for example, are not using Route 87 to get to/from work. Likewise, people commuting to/from Goodwin College are also not using transit. Indeed Route 87 is not easy to use. The frequency and scheduling of trips is irregular and the variant patterns make it hard to understand. Neighborhood service, in particular, is irregular and lacks midday service. In addition, Route 87 competes with other CT***transit*** service, including Route 95, but also Routes 83, both of which also travel along Main Street and offer better frequency and travel times between destinations.

Service Improvement Options

In many ways Route 87 does not serve a clear market. The service is generally designed to provide connections from downtown Hartford to Founders Plaza with continuing service along Main Street to Goodwin College. These destinations are relatively well served and generate the majority of Route 87's ridership. The additional destinations served with variants, such as the neighborhoods off Brewer Street do not receive are not as well served and thus do not generate strong ridership. Opportunities to strengthen the service include:

- **Operate between downtown Hartford, Main Street and Goodwin College only.** The majority of Route 87's ridership is concentrated in downtown Hartford and along Main Street and at Goodwin College. Route 87 may be redesigned to focus service to this market by scheduling service to support class schedules at Goodwin and employment shifts along Main Street. Refocusing the service would make it better for existing riders, help attract additional ones and would strengthen route productivity.
- **Eliminate variant service to Two Rivers Magnet Middle School and Brewer, Forest and Hill Street neighborhoods.** Consistent with recommendations described above, service may be eliminated to the middle school, neighborhoods and potentially Founders Plaza. Ridership at the middle school and neighborhoods is very low, thus the loss of service would not impact many individuals. Eliminating service to these locations would make Route 87 more productive and the saved resources may be better invested in other parts of the system.
- **Eliminate Saturday service.** Route 87 primarily serves employment and Goodwin College, both of which have limited operations on Saturday. As a result, Route 87's Saturday service is unproductive and consequently, it is one of CT***transit***'s highest cost routes.
- **Operate with consistent frequencies and clock face schedule.** Neither the inbound nor outbound service maintains a consistent 30-minute service during the peak period. This makes the departure times difficult to remember and makes it hard for riders to understand and use the service. Route 87G during the midday does a better job at maintaining its 60-minute frequency. However, in general, the service would be improved by operating the route with consistent patterns (i.e. departs every 30 minutes rather than 27 or 33 minutes) and ideally timing departures with a "clock face" schedule (i.e. departing on the hour or half hour).

- **Improve Route 87's printed (hand) schedule.** Weekday and Saturday schedules on Route 87 list Route 87F Forest & Oak, 87H Hills & Oak, and 87 Founders Plaza at the top. However, on weekdays, no Route 87 exists; CT***transit*** operates this route on Saturdays only. Listing this "base" or weekend only service is inconsistent with other CT***transit*** routes. In addition, only two trips in each direction run on the Route 87H alignment, while unlisted Route 87G accounts for over a third of the weekdays trips. Printed schedules should be consistent as to which alignments they list on weekday and weekend schedules and should list all alignments.
- **Serve Brewer, Forest, and Hills Streets with peak period flex or shuttle service anchored along Main Street.** This east-west portion of Route 87 does not generate sufficient demand to warrant fixed route service. Rather than run large buses to this area, CT***transit*** may operate smaller vehicles as flex services. These vehicles could meet fixed route service along Main Street, which has enough employment and population density to warrant 30-minute service. Route 87 would then operate to Goodwin College and along Main Street only before turning around at Brewer Street and High Street. The flex service could connect with CT***transit*** at this location, connecting riders with the service into downtown Hartford or east to Manchester.
- **Focus marketing efforts with Goodwin College.** There are a number of characteristics that make Goodwin College a good candidate for increased transit marketing, including potentially a universal pass program: it already has relatively strong transit ridership, the school has a green initiative and most of the students commute to Goodwin from neighboring communities. Developing a more comprehensive transit program may help increase interest in transit at the campus.

Route Evaluation

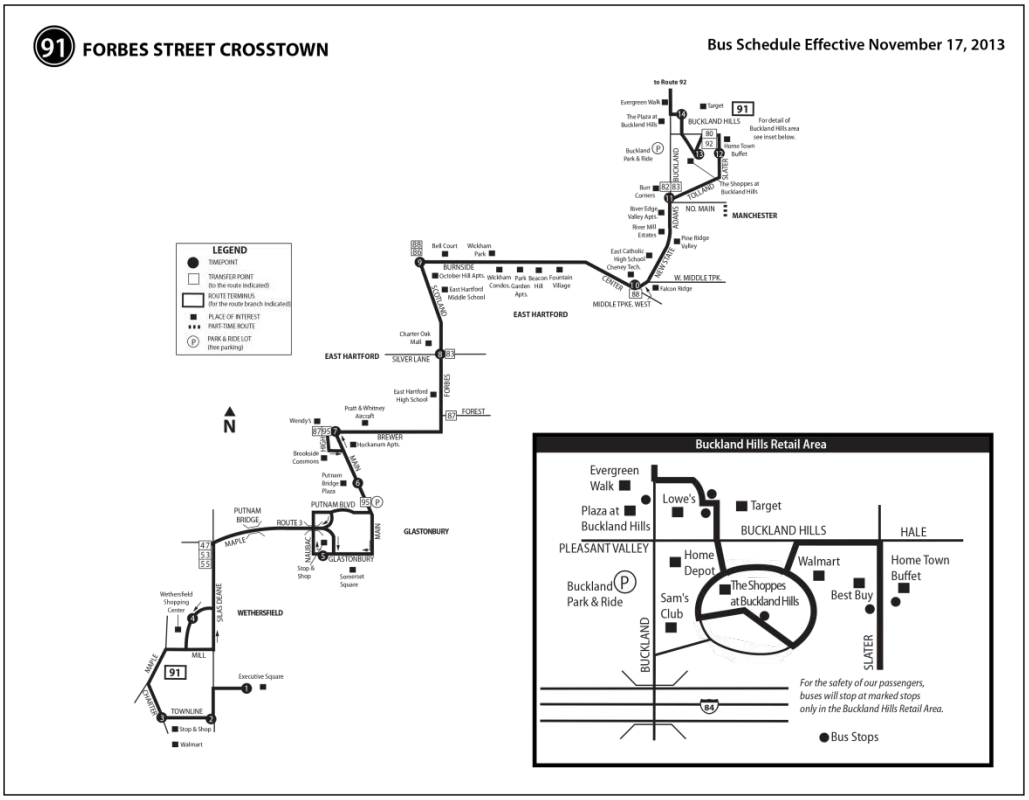
FORBES STREET CROSSTOWN

91 | Forbes Street Crosstown

Service Design

Route 91 is a crosstown route that travels from the Wethersfield Shopping Center in Wethersfield to Buckland Hills in Manchester via Glastonbury and East Hartford (Figure 1).

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

The main connecting point along Route 91 is at Buckland Hills. In addition, at the southern end of the route in Wethersfield, passengers can transfer to/from Routes 47, 53, and 55; and at the northeastern end of the route in Manchester, there are connections to several routes (82, 83, and 92). Route 91 also provides a handful of locations where riders can transfer to/from other CT***transit*** routes (see Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 47	Franklin Avenue
Route 53	Blue Hills Avenue and Cottage Grove Road
Route 55	Middletown
Route 80	Buckland Flyer
Route 82	Tolland Street and Buckland Hills
Route 83	Silver Lane
Route 86	Burnside Avenue – Mayberry Village
Route 87	Brewer Street
Route 88	Burnside Avenue
Route 92	Tower Avenue Crosstown
Route 95	Glastonbury

Alignments and Service Patterns

Route 91 has one alignment for the entire day (except for the last trip of the day headed north), across all days of the week, and in both directions. The route operates between the Wethersfield Shopping Center and the Buckland Hills retails area via a somewhat circuitous route. Heading north, Route 91 circulates around the Wethersfield shopping area, serving destinations such as Executive Square and the Stop & Shop, before traveling north on Silas Deane Highway and east on Maple Street. To cross the river, the route operates express (closed door, no stops) across the Putnam Bridge and completes a loop at the end of the bridge to serve the Stop & Shop in Glastonbury. In the opposite direction, the route has to complete the loop to enter the bridge via a slightly different alignment, so some stops may not be served in both directions in this area, but the Stop & Shop is always served. After this, Route 91 heads north on Main Street in Glastonbury, east on Brewer Street past the Pratt & Whitney headquarters, and north again on Forbes Street/Scotland Road until Burnside Avenue. By completing this alignment in Glastonbury and East Hartford, Route 91 travels either parallel to or perpendicular past Routes 80, 83, 85, 86, 87, 88, and 95. The route continues east along Burnside Avenue until reaching New State Road where it turns north to complete a terminating loop around the Buckland Hills retail area.

The last trip of the day headed northeast on all days of the week stops at Burnside Avenue and Scotland Road and becomes Route 86 to travel into downtown Hartford, skipping the Buckland Hills retails area.

Timed transfers to crosstown Route 92 are possible at Tolland Turnpike and Buckland Street.

Service Schedule

Route 91 operates seven days a week, with weekday and Saturday service running every 60 minutes for most of the day. Route 91 service on Sunday runs every 70 minutes. An additional trip from Buckland Hills to Wethersfield operates on weekdays, Saturdays and Sundays during the holidays.

FIGURE 3 | SCHEDULE OVERVIEW

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	6:13 AM – 10:57 PM	60	16/16
Saturday	7:21 AM – 10:57 PM	60	15/15
Sunday	8:25 AM – 8:10 PM	70	10/10

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Route 91 carries 505 daily passengers or 15.8 passengers per trip on an average weekday. This is about 13% lower than the Hartford Division average of 17.6 weekday passengers per trip (see Figure 4). Ridership on Saturdays increases slightly from the weekday, and the number of passengers per trip is about 27% higher than average. Sundays ridership, however, is about 15% lower than average.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 91	ROUTE 91	DIVISION AVG
Weekday	505	15.8	17.7
Saturday	583	19.4	16.3
Sunday	337	16.0	17.6

Source: CTtransit performance data

Ridership by Stop

The most heavily used stops on Route 91 are at The Shoppes at Buckland Hills and at Burnside Avenue and Scotland Road where riders can transfer to Route 86/88 (see Figure 5). All other stops have fewer than 50 boardings and alightings.

In general, Main Street in Glastonbury, Brewer Street, Forbes Street/Scotland Road, and Burnside Avenue show relatively strong ridership, however. The weakest portion of the route is along Middle Turnpike and New State Road. Load profile data (see Figure 6) combines passenger activity by stop and shows the cumulative passenger load as the bus travels outbound along its route. Ridership by stop without the cumulative load is mapped in Figure 7. Route 91 does not currently serve the Buckland Park & Ride Lot as shown in the figures, instead serving Target/Lowe's Plaza. Due to older data, ridership at Target/Lowe's Plaza is likely lower than the true ridreship.

FIGURE 5 | ROUTE 91 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Buckland Mall & Pavilions Drive	63/2	The Shoppes at Buckland Hills, Buckland Hills retail area
Burnside Avenue & Scotland Road	41/10	Transfer point for Routes 86, 88

FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

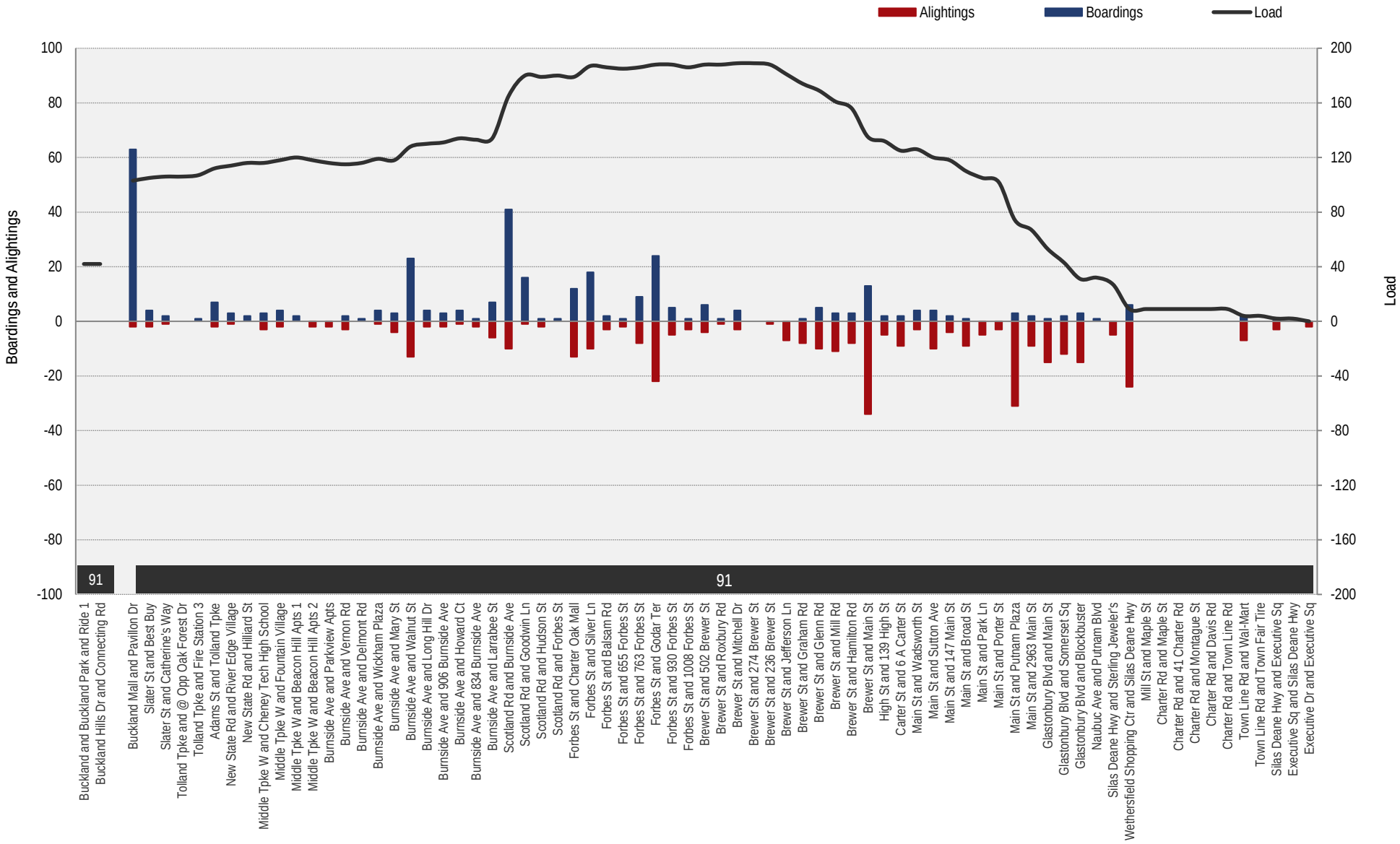


FIGURE 7 | WEEKDAY INBOUND (SOUTHWEST) RIDERSHIP BY STOP MAP

Ridership by Trip

Weekday

Most trips on Route 91 on weekdays hover around the average of about 15 passengers (see Figures 8 and 9). Three trips headed northeast and two trips headed southeast reach 20 passengers or more. Nearly all trips reach at least 10 passengers in both directions. However, ridership starts to declines after around 7:00 PM in both directions.

Maximum loads on Route 91 never exceed 20 passengers, so overcrowding is not an issue on this route. Service frequency also matches well with demand.

FIGURE 8 | WEEKDAY OUTBOUND (NORTHEAST) RIDERSHIP BY TRIP

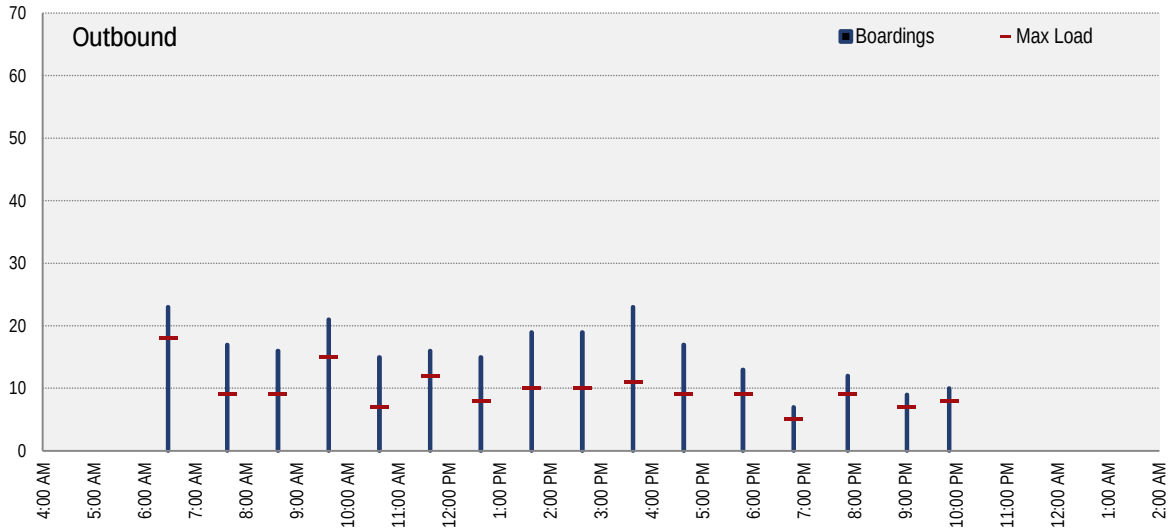
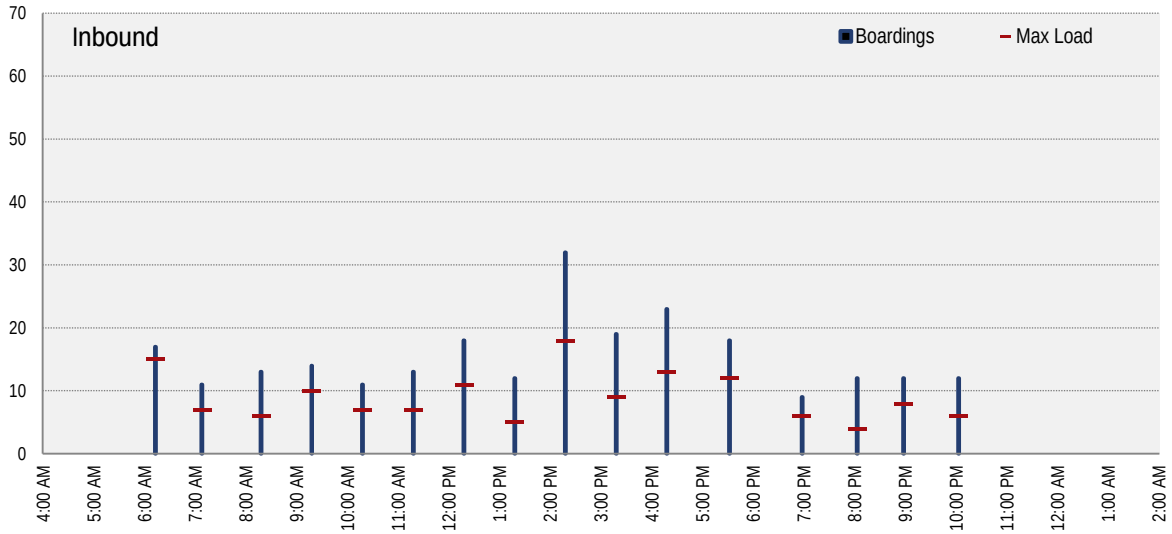


FIGURE 9 | WEEKDAY INBOUND (SOUTHWEST) RIDERSHIP BY TRIP



Saturday

Ridership per trip on Saturdays is more variable than on weekdays. On Saturdays, roughly three trips have 20 passengers or more, all but one of which occur in the middle of the day. The 8:00 PM inbound (southwest) trip also has relatively high ridership. Consistent with weekday service, ridership on trips scheduled after 7:00 PM (in both directions) drop considerably.

No data exists for the 2:38 PM trip headed northeast. Capacity is not a problem on Route 91 on Saturdays (see Figures 10 and 11), since no trip has a maximum load above 15.

FIGURE 10 | SATURDAY OUTBOUND (NORTHEAST) RIDERSHIP BY TRIP

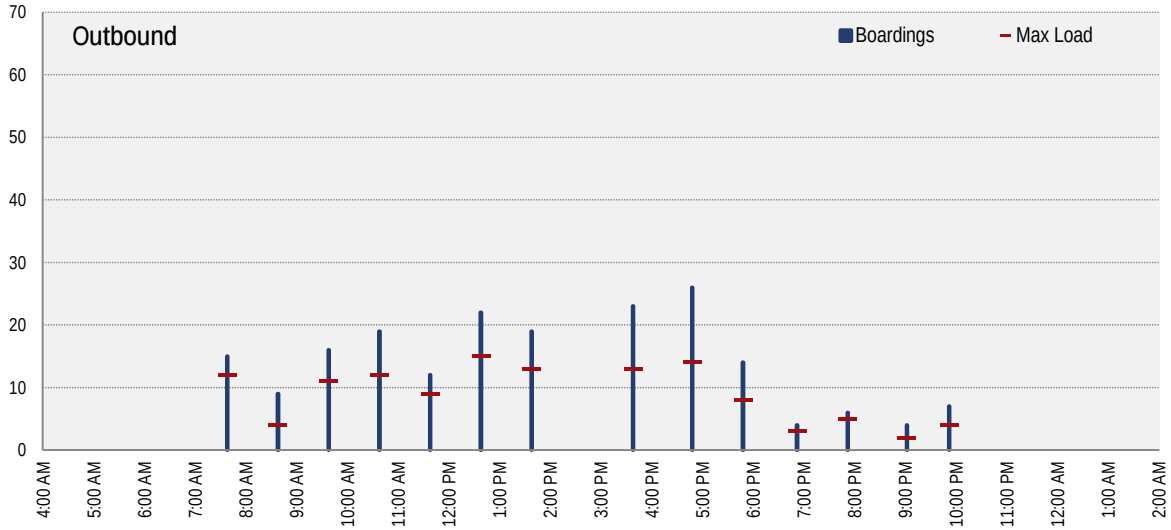
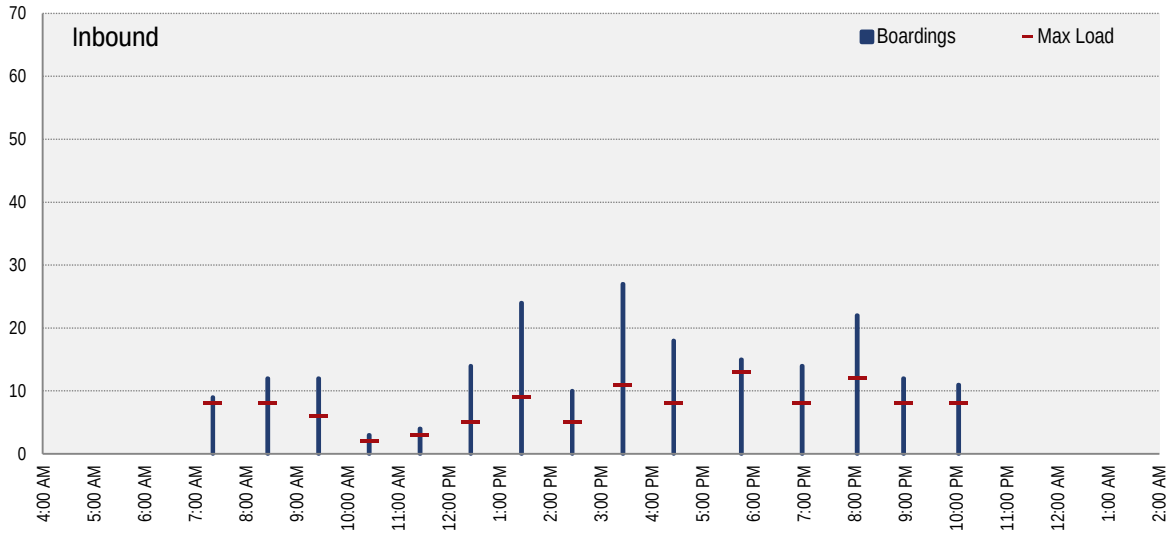


FIGURE 11 | SATURDAY INBOUND (SOUTHWEST) RIDERSHIP BY TRIP



Sunday

Route 91 on Sundays is similar to weekdays and Saturdays. Ridership is variable throughout the day, though ridership headed southwest reaches 18 passengers on six out of 10 trips. No trips headed northeast reach 20 passengers, but a majority carry 10 passengers or more. No data exists for the 7:02 PM trip headed northeast. Maximum loads on Route 91 do not exceed 16 passengers, so overcrowding on Sundays is not a problem (see Figures 12 and 13).

FIGURE 12 | SUNDAY OUTBOUND (NORTHEAST) RIDERSHIP BY TRIP

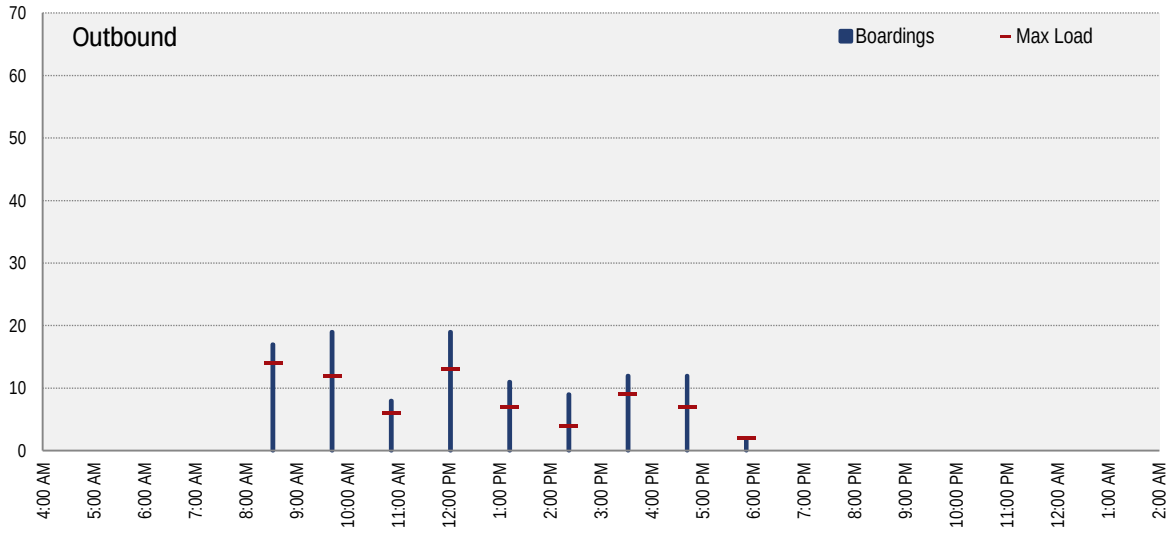
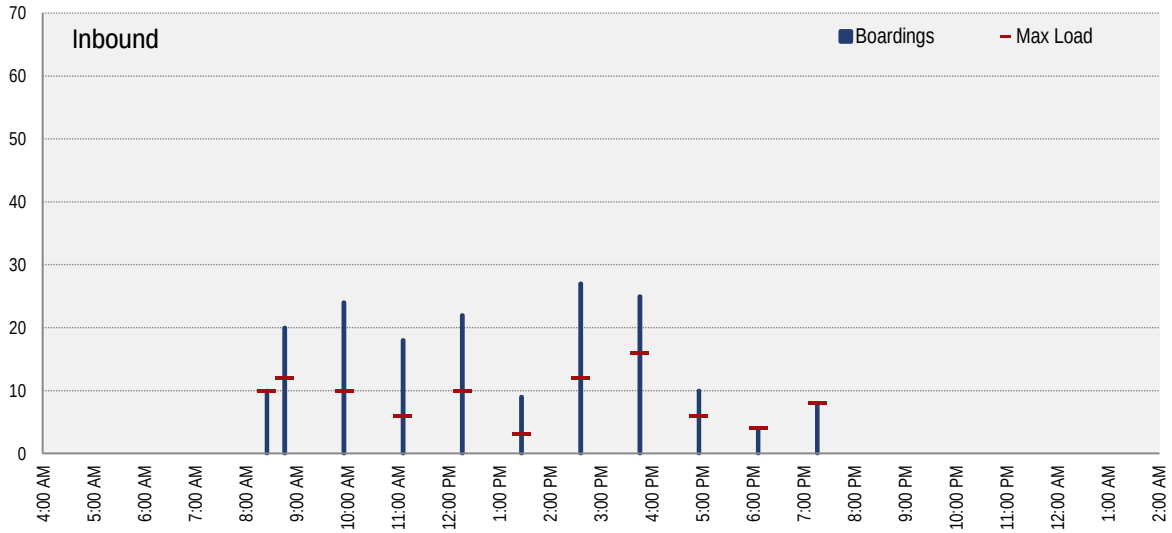


FIGURE 13 | SUNDAY INBOUND (SOUTHWEST) RIDERSHIP BY TRIP



Performance

Route 91 generally performs poorly, though this is not unexpected for a crosstown route. Without serving strong anchors on each end, such as a downtown, ridership on crosstown routes tend to be lower. On weekdays, operating costs per passenger on Route 91 are 80% higher than the Hartford Division average, and passengers per revenue hour and revenue mile are 49% and 65% lower than average, respectively. Saturday performance improves somewhat but is still worse than average on all measures. Sunday performance is very similar to weekday performance (see Figure 14). Overall, Route 91 is the second to worst performer of all routes operated by CT***transit*** in Hartford (see Figures 16 and 17).

FIGURE 14 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 91	DIVISION AVG	ROUTE 91	DIVISION AVG	ROUTE 91	DIVISION AVG
Operating Cost per Passenger	$8.70	$4.84	$6.68	$6.30	$8.44	$6.66
Passengers per Revenue Vehicle Hour	14.7	28.9	19.2	27.0	15.2	29.7
Passengers per Revenue Vehicle Mile	0.9	2.6	1.1	2.4	0.9	2.9

Source: CTtransit performance data

Route 91's on-time performance is slightly better than the Hartford Division average at 83.4% (see Figure 15). Operating closed door for a portion of the route and not traveling into downtown likely help the on-time performance of the route. The route also has a stop about every quarter mile on average, which is generally accepted as a best practice for stop spacing on local bus service.

FIGURE 15 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 91	DIVISION AVG
Early	0.0%	0.2%
Late	16.6%	18.9%
On-Time	83.4%	80.9%

Source: CTtransit performance data

FIGURE 16 | WEEKDAY OPERATING COST PER PASSENGER

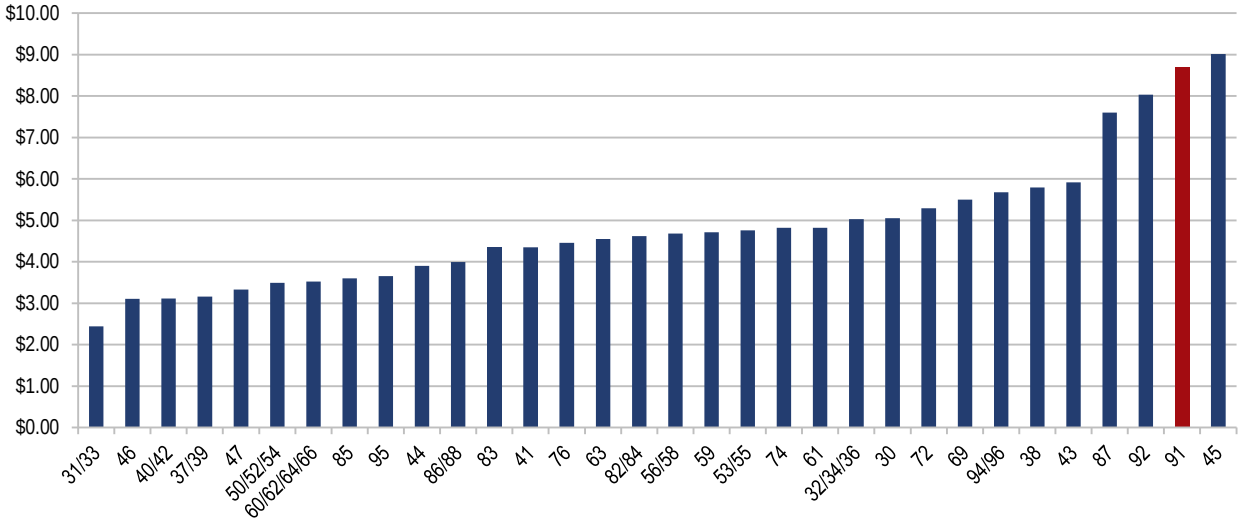
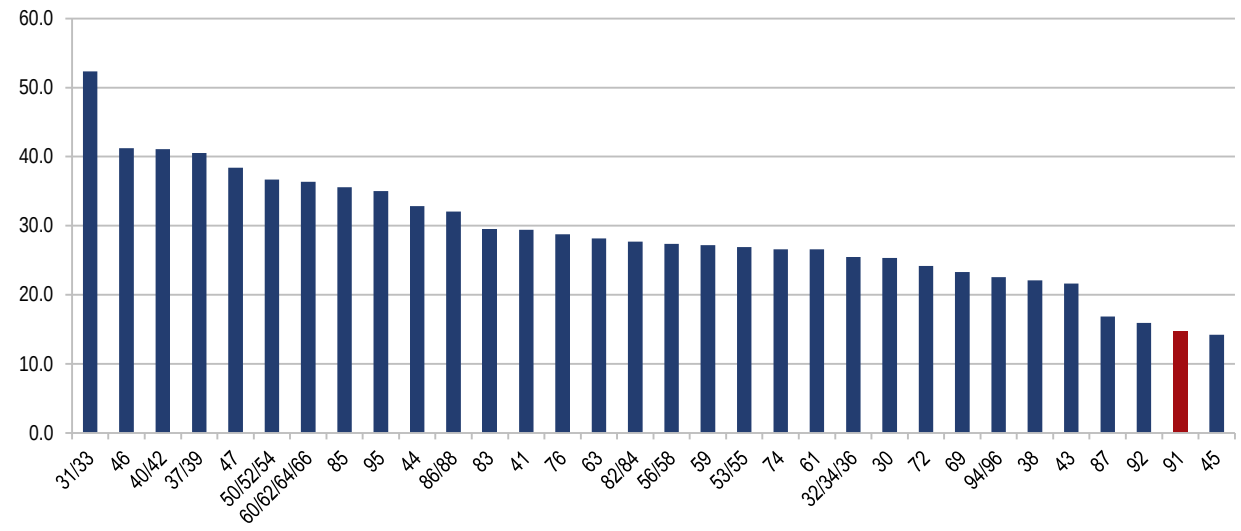


FIGURE 17 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Route 91 is a crosstown route that travels between the Wethersfield Shopping Center and the Buckland Hills retail area, with a travel time of about an hour. The route connects to many other routes in the system, as well as many residential and employment areas east of Hartford without making passengers travel into downtown to transfer. These include multiple shopping centers, Main Street in East Hartford and Glastonbury, and Burnside Avenue. Route 91 performs poorly compared to other routes in the Hartford CT***transit*** network.

Crosstown routes often struggle to be productive but are nonetheless important services in terms of providing connections and linkages. The consequences of cutting the route because of performance must be carefully weighed against the benefits provided to those who rely on the route to reach jobs and services within a reasonable amount of time.

No other routes compete directly for passengers with Route 91 due to the type of service provided, though a large portion of the route parallels other routes in the system. Passengers traveling only a short distance on one of these segments may choose to board the first route that arrives. Route 91 is about as direct as possible for this kind of route and has a simple schedule. While not frequent, the service supplied matches well with demand.

Service Improvement Options

Though low ridership on Route 91 may make it a candidate for elimination, the route provides important connectivity within the network and increases the convenience of riding transit. Opportunities to strengthen the route include the following:

- **Shorten route slightly to operate between Wethersfield Shopping Center only and Target/Lowe's Plaza.** Headed southwest, most riders board at The Shoppes at Buckland Hills or along Burnside Avenue and alight on Burnside Avenue, Forbes Street/Scotland Road, or Main Street in East Hartford/Glastonbury. The Wethersfield Shopping Center shows decent demand, but the retail area south of this center on Center Road, Townline Road, and Executive Drive shows little to no demand. Cutting this portion of the route may make it possible to operate a round trip on Route 91 in two hours with sufficient recovery/layover time. Currently, the travel times in each direction are about an hour, not leaving enough time for recovery.
- **Eliminate service to Wethersfield Shopping Center.** Another option to make the route faster and more direct is to eliminate service to Westhersfield Shopping Center and terminate Route 91 at Glastonbury. Although there is ridership at Westhersfield Shopping Center, the destination is served by other routes and the travel distance erodes the productivity of Route 91. The service hours saved by reducing service could either be re-invested in Route 91 (increased frequency) or used in other parts of the network.
- **Maintain consistent 60-minutes service on the clockface on all service days.** Route 91 currently has a frequency of 60-minutes on weekdays and Saturdays, but this is not maintained throughout the day. This adds unnecessary confusion to the schedule. Sunday service is also operated every 70 minutes, which a passenger cannot easily remember. Simplifying the schedule for the entire week could improve ease-of-use and attract additional riders to improve the productivity of the route.

Route Evaluation

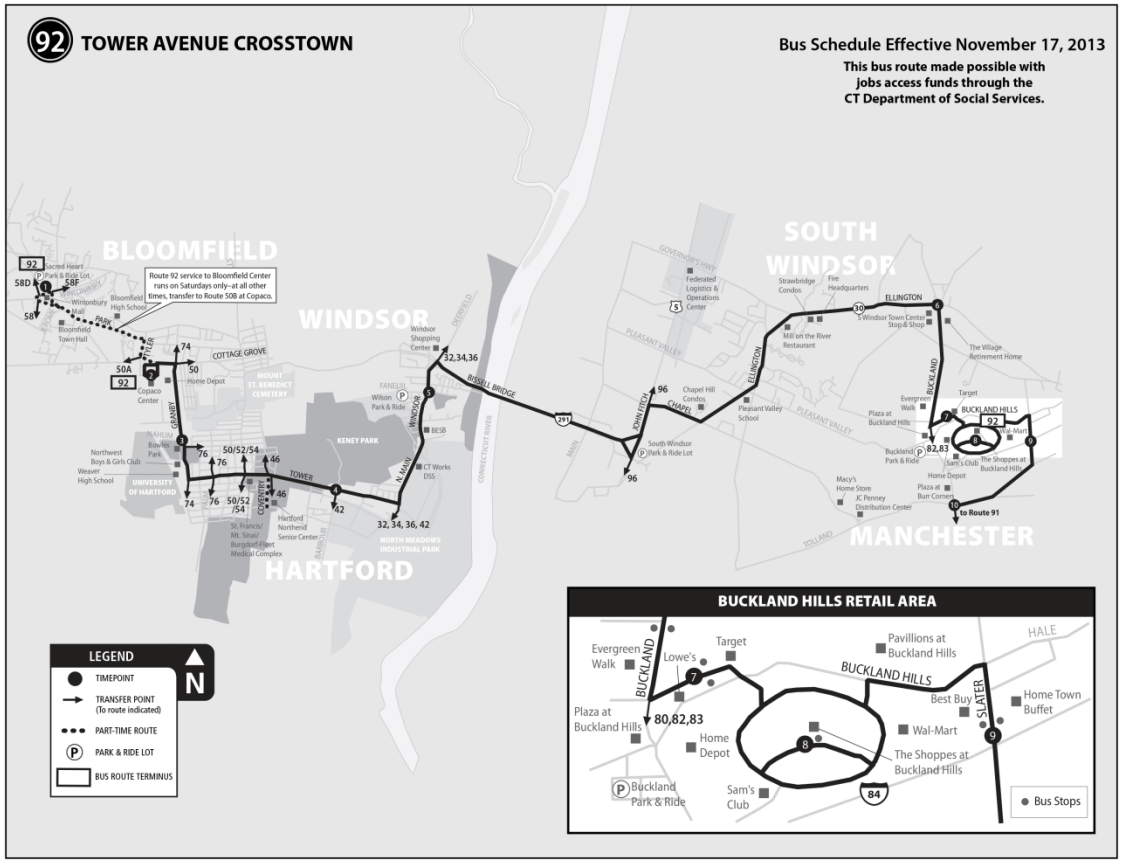
TOWER AVENUE CROSSTOWN

92 | Tower Avenue Crosstown

Service Design

Route 92 is a crosstown route that travels from the Copaco Shopping Center in Bloomfield to the Plaza at Burr Corners in Manchester (see Figure 1). This route is funded through the Connecticut Department of Social Services with job access funding to provide connections to local employment centers.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

There are a number of locations along Route 92 where riders can transfer to other CT*transit* routes (see Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 32	Windsor Avenue
Route 34	Windsor Avenue – Poquonock
Route 36	Windsor – Day Hill Road
Route 42	Barbour Street
Route 46	Vine Street
Route 50	Blue Hills Avenue – Cottage Grove Road
Route 52	Blue Hills Avenue
Route 54	Blue Hills Avenue – Blue Hills Extension
Route 58	Albany Avenue
Route 74	Granby Street
Route 76	Ashley Street
Route 82	Tolland Street--Buckland Hills
Route 83	Silver Lane
Route 91	Forbes Street Crosstown
Route 96	John Fitch Boulevard

Alignments and Service Patterns

Most trips on Route 92 follow the same alignment all day, Monday through Friday, and in both directions. On weekdays, Route 92 headed east begins as the Copaco Shopping Center on Cottage Grove Road and then heads south on Granby Street. To travel through Hartford and Windsor into South Windsor, the route follows Tower Avenue, Windsor Avenue, and I-291, crossing the river express via the Bissell Bridge (closed door, no stops). Following various smaller roads through South Windsor, Route 92 heads northeast along Ellington Road before traveling south on Buckland Street to serve the Buckland Hills retail area. The route terminates at the Plaza at Burr Corners on Tolland Turnpike and Buckland Street.

On Saturdays, Route 92 begins further west at Bloomfield Center, also serving the Sacred Heart Park & Ride Lot, and then follows the weekday alignment eastbound. To reach Bloomfield Center on weekdays, passengers must transfer to Route 50B at the Copaco Shopping Center.

Deviations from the primary alignment include:

- On weekdays, the last eastbound trip and first westbound trip of the day only travel between the Copaco Shopping Center and Windsor Avenue at Faneuil Street, staying west of the river.
- Six weekday midday trips in each direction serve the Hartford Northend Senior Center on Coventry Street, a short deviation off of Tower Avenue.
- On Saturdays, the first trip of the day in each direction does not serve Bloomfield Center, and the first trip headed westbound begins at Windsor Avenue and Faneuil Street.

- The last trip headed eastbound and the last three trips headed westbound on Saturdays also do not serve Bloomfield Center.

Service Schedule

Route 92 operates on weekdays and Saturdays. On weekdays, 14 eastbound and 14 westbound trips provide service from the Copaco Shopping Center to Plaza at Burr Corners every 60 minutes throughout the day. Though the hours of operation are slightly reduced on Saturdays, 12 eastbound and 14 westbound trips provide service every 60 minutes. No Sunday service exists on Route 92.

FIGURE 3 | SCHEDULE OVERVIEW

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (EASTBOUND/WESTBOUND)
Weekday	6:23 AM – 8:26 PM	60	14/14
Saturday	7:20 AM – 8:36 PM	60	12/14
Sunday	-	-	-

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTtransit route schedules

Ridership by Service Day

Route 92 carries 380 daily passengers or 13.6 passengers per trip on an average weekday. This is about 23% lower than the Hartford Division average of 17.6 weekday passengers per trip (see Figure 4). Ridership on Saturdays decreases from the weekday, and the number of passengers per trip is about 42% lower than average at 8.9.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 92	ROUTE 92	DIVISION AVG
Weekday	380	13.6	17.7
Saturday	232	8.9	16.3
Sunday	-	-	17.6

Source: CTtransit performance data

Ridership by Stop

Route 92 only has one stop – The Shoppes at Buckland Hills – that has 50 riders or more getting on/off the bus. Ridership at the Copaco Shopping Center reaches 46 riders, but all other stops on the route have 20 or fewer riders getting on/off the board (see Figures 5 and 6).

Tower Avenue accounts for 38% of activity on Route 92, meaning that 70% of route activity occurs at The Shoppes at Buckland Hills, the Copaco Shopping Center, or Tower Avenue. Some stops on the very north end of Windsor Avenue, including near the Wilson Park & Ride Lot, also show relatively high ridership. Route 92 data for the stops on Slater Street at Best Buy and Tolland Turnpike and Buckland Street does not exist, so ridership is likely somewhat low for the Buckland Hills retail area.

FIGURE 5 | WEEKDAY INBOUND (WESTBOUND) RIDERSHIP BY STOP GRAPH

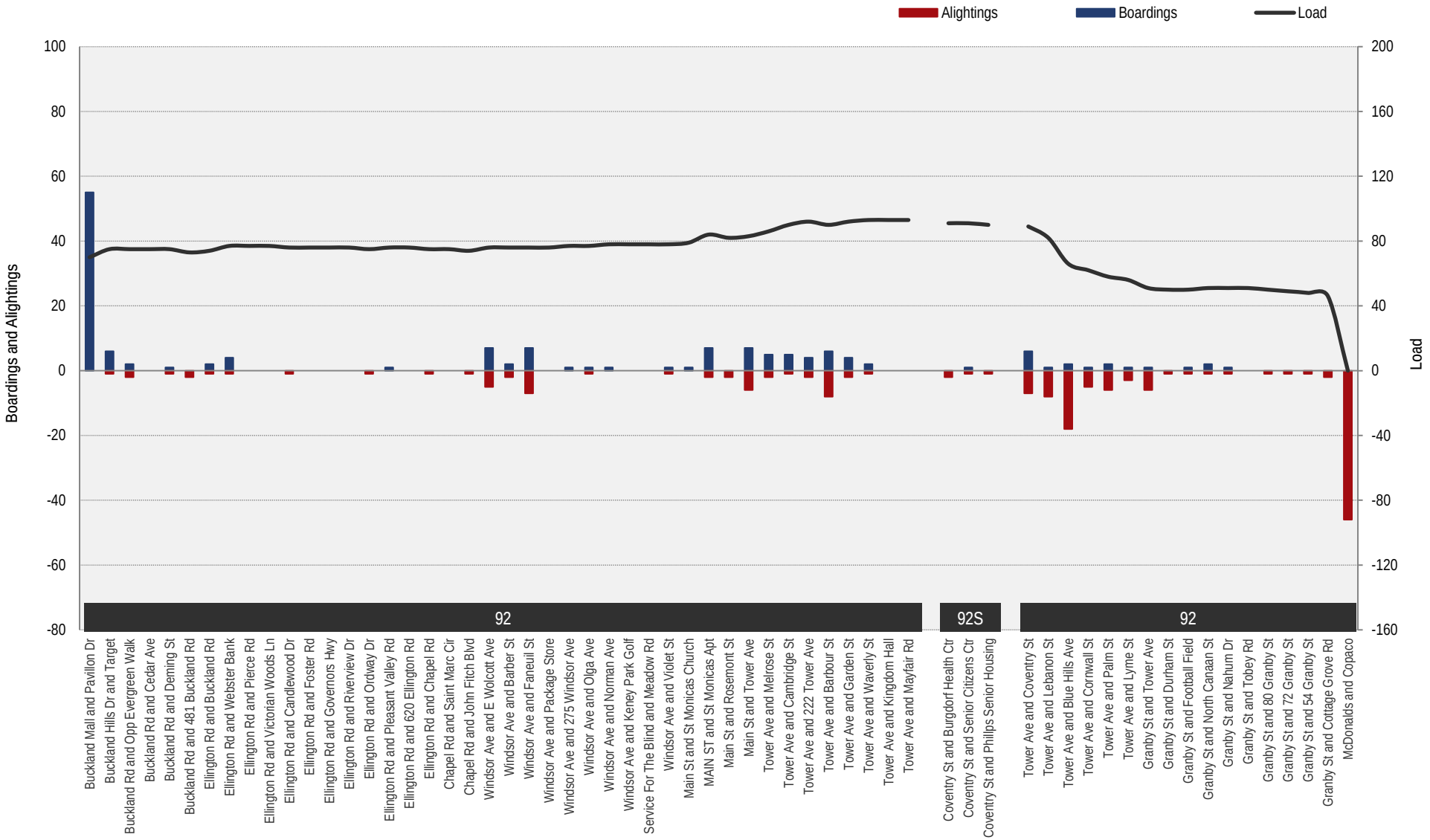
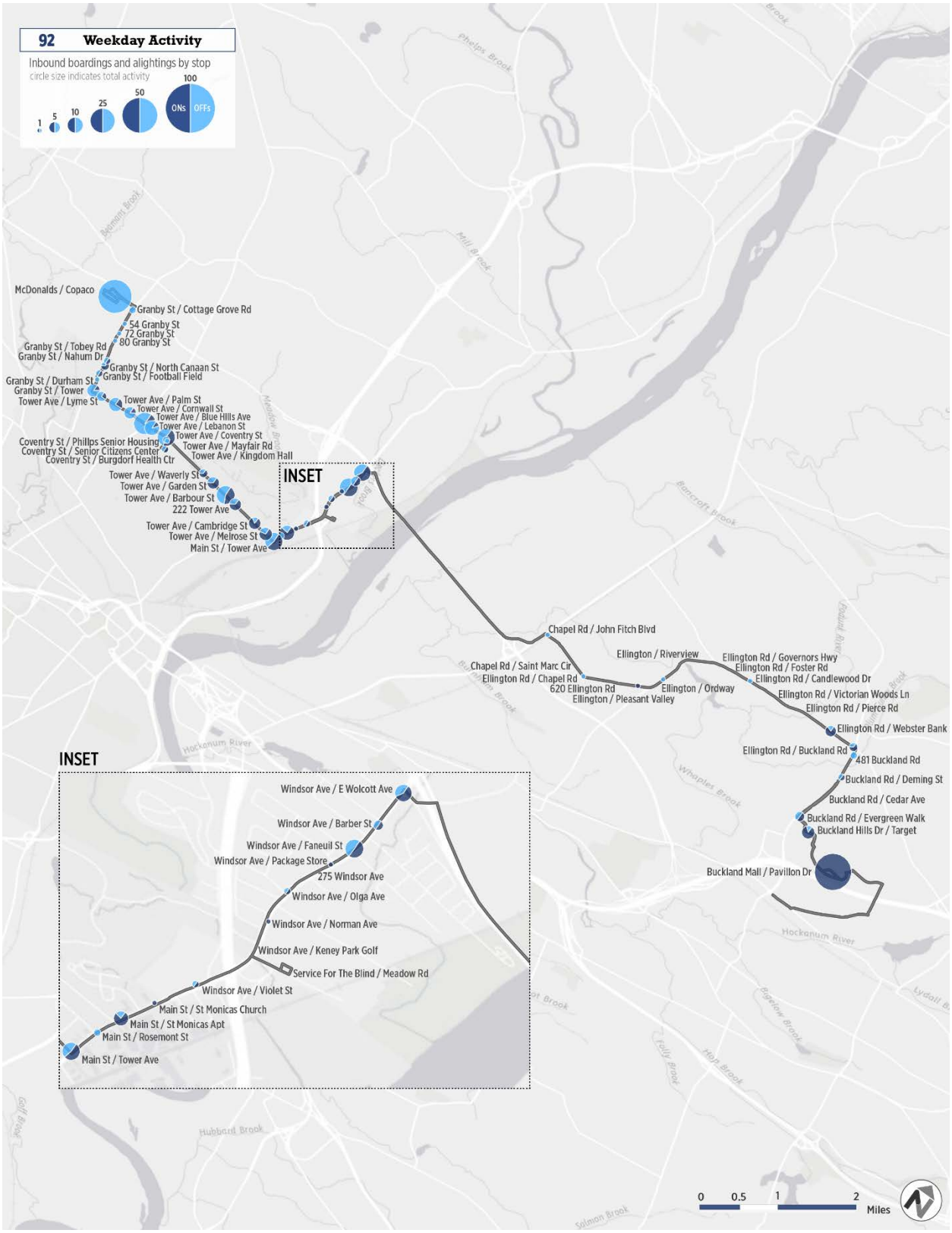


FIGURE 6 | WEEKDAY INBOUND (WESTBOUND) RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Route 92 has an average ridership of about 14 passengers per trip; most trips in both directions hover around this average (see Figures 7 and 8). Ridership, in both directions, is strongest between noon and 5:30 PM. Westbound ridership is weaker in the morning, whereas eastbound ridership remains more consistent during the morning.

Maximum loads on Route 92 never exceed 15 passengers, which means that overcrowding is not an issue on this route. Service frequency also matches well with demand.

FIGURE 7 | WEEKDAY OUTBOUND (EASTBOUND) RIDERSHIP BY TRIP

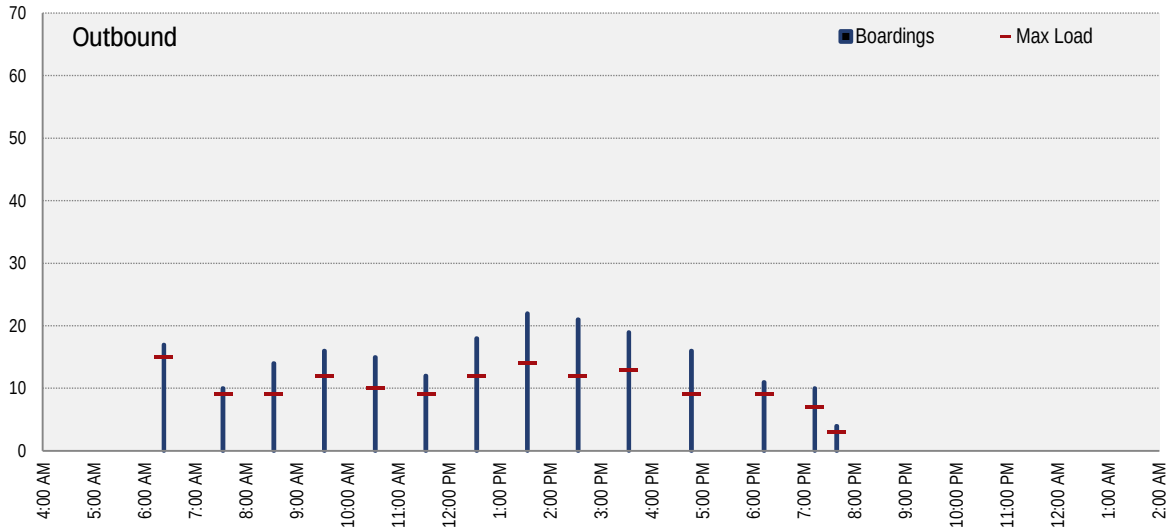
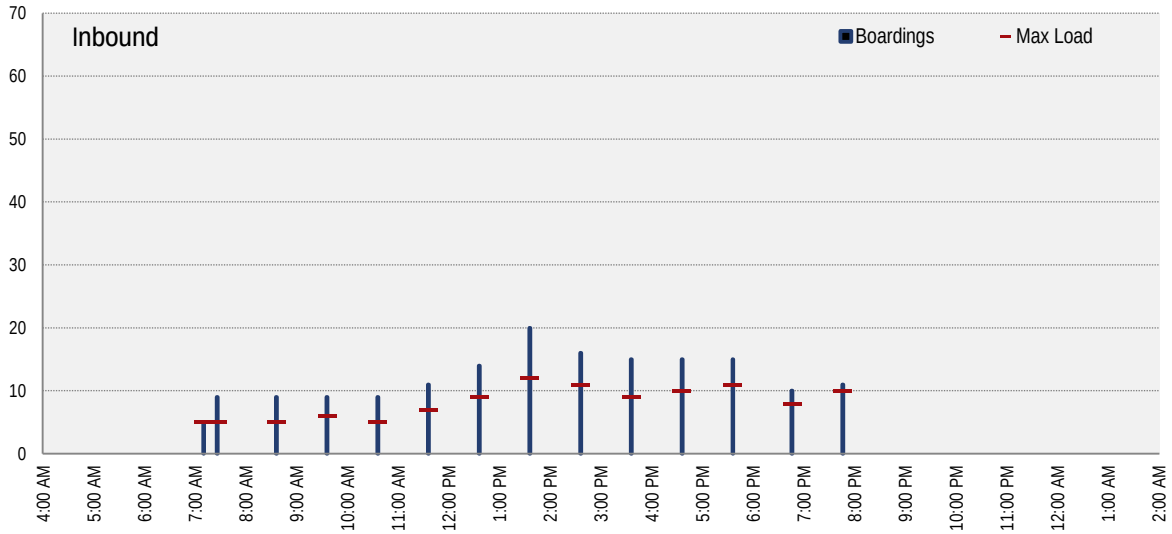


FIGURE 8 | WEEKDAY INBOUND (WESTBOUND) RIDERSHIP BY TRIP



Saturday

Ridership per trip on Saturdays is generally more variable than on weekdays. For example, demand is stronger headed eastbound than westbound (see Figure 9 and Figure 10). The data suggests many riders use Route 92 to travel east (towards Buckland Hills) in the morning and return west in the afternoon, with many riders taking the last trip of the day.

Capacity is not a problem on Route 92 on Saturdays, since no trip has a maximum load above 20.

FIGURE 9 | SATURDAY OUTBOUND (EASTBOUND) RIDERSHIP BY TRIP

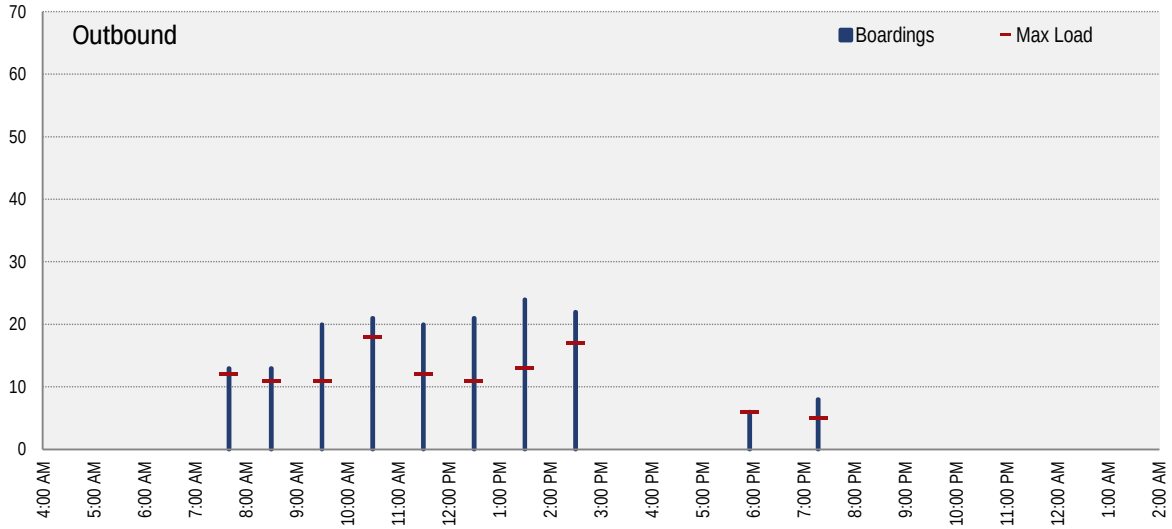
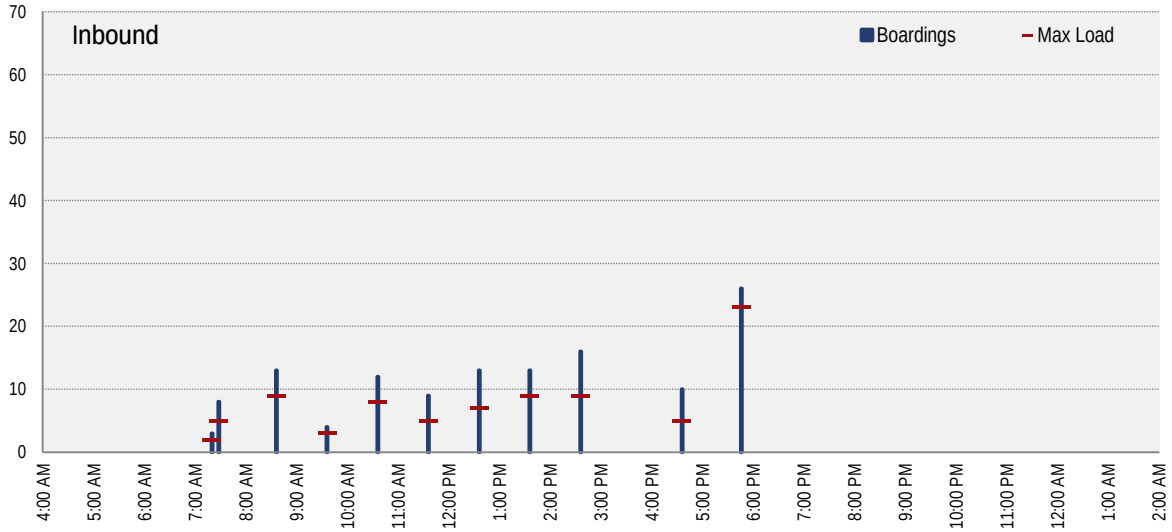


FIGURE 10 | SATURDAY INBOUND (WESTBOUND) RIDERSHIP BY TRIP



Performance

Route 92 generally performs poorly, though this is not unexpected for a crosstown route. Crosstown routes often lack strong anchors, which often impacts productivity. On weekdays, operating costs per passenger on Route 92 are 67% higher than the Hartford Division average, and passengers per revenue hour and revenue mile are 45% and 62% lower than average, respectively (see Figure 11). Saturday performance is also poor. Overall, Route 92 is the third to worst performer of all routes operated by CT***transit*** in Hartford (see Figures 13 and 14).

FIGURE 11 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 92	DIVISION AVG	ROUTE 92	DIVISION AVG	ROUTE 92	DIVISION AVG
Operating Cost per Passenger	$8.03	$4.84	$13.22	$6.30	-	$6.66
Passengers per Revenue Vehicle Hour	15.9	28.9	9.7	27.0	-	29.7
Passengers per Revenue Vehicle Mile	1.0	2.6	0.6	2.4	-	2.9

Source: CTtransit performance data

Route 92's on-time performance is much better than the Hartford Division average at 91.1% (see Figure 12). Low ridership, operating closed door for a portion of the route, and not traveling into downtown likely help the on-time performance of the route. The route also has a stop about every quarter mile on average, which is generally accepted as a best practice for stop spacing on local bus service.

FIGURE 12 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 91	DIVISION AVG
Early	0.0%	0.2%
Late	8.9%	18.9%
On-Time	91.1%	80.9%

Source: CTtransit performance data

FIGURE 13 | WEEKDAY OPERATING COST PER PASSENGER

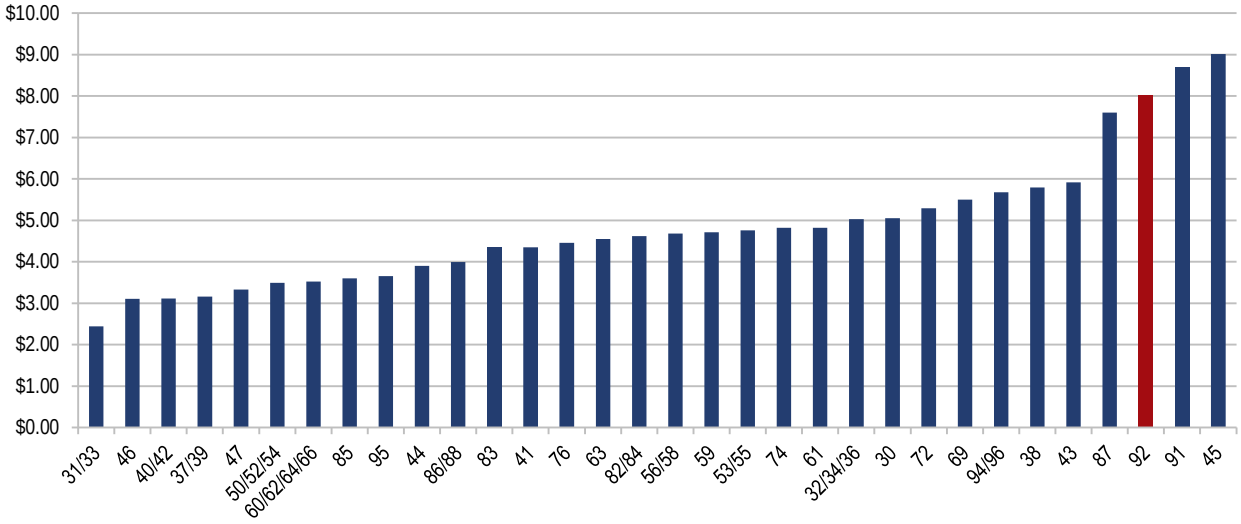
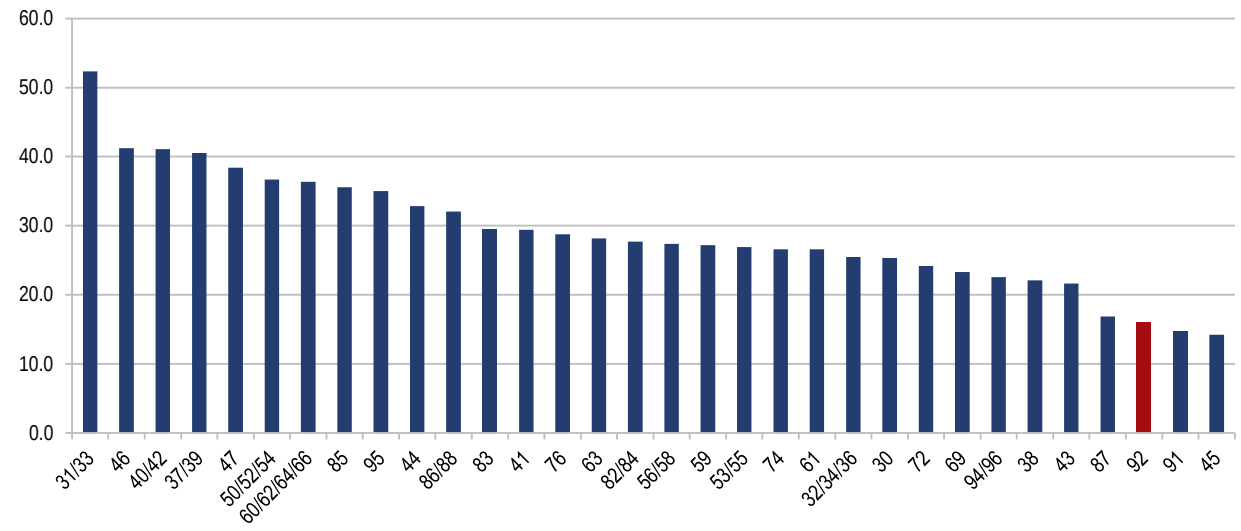


FIGURE 14 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Route 92 is a crosstown route that connects the Copaco Shopping Center and the Buckland Hills retail areas. The travel time on is about 53 minutes on weekdays. On Saturdays, Route 92 travels further west to Bloomfield Center; this increases travel time to 64 minutes. Route 92 allows people to makes east-west connections without having to travel into downtown Hartford, creating a faster, more direct link between residential and employment areas, including multiple shopping centers and Tower Avenue. It also supports transfers between routes.

However, Route 92 performs very poorly compared to all routes in the system. While unproductive, the consequences of cutting Route 92 must be considered because the route provides important connections to jobs and services. In addition, the route is funded through CRCOG jobs access program, which is meant to connect employment centers.

No other routes compete directly for passengers with Route 92 due to the type of service provided. In fact, Route 92 is the only route in the system that provides service to Tower Avenue. While not frequent, the service supplied matches well with demand.

Service Improvement Options

Low ridership on Route 92 may make it a candidate for elimination; however, the route provides important connectivity within the network and increases the convenience of riding transit. Opportunities to strengthen the route include the following:

- **Remove service from Ellington Road to shorten route.** Ellington Road in South Windsor has very little ridership and unnecessarily extends the routes long. An alternative such as Chapel Road or Pleasant Valley Road would create a faster, more direct route between Windsor and the Buckland Hills area. Depending on the alignment it would also serve Macy's Home Store and the JC Penny Distribution Center. Removing service from Ellington Road would remove service from South Windsor Town Center and Stop & Shop; however, almost no ridership exists at these locations currently though.
- **Eliminate service to the Hartford Northend Senior Center on Coventry Street.** Ridership data indicates that five passengers board or alight at the Hartford Northend Senior Center on an average day. Though the schedule indicates that deviating to this location does not take extra time, deviations dissuade riders by requiring them to travel out of direction to serve a handful of riders.
- **Offer travel training to seniors at the Hartford Northend Senior Center.** An alternative to cutting service to the Northend Senior Center is to provide travel training so seniors understand how to ride the bus and become more familiar with the service.
- **Maintain consistent 60-minutes service on the clockface on all service days.** Route 92 currently has a frequency of 60-minutes on weekdays and Saturdays, but some trips deviate from this schedule, mostly on the first or last few trips of the day. This adds unnecessary confusion to the schedule. Simplifying the schedule for the entire week could improve ease-of-use and attract additional riders to improve the productivity of the route.

Route Evaluation

PARK AVENUE AND JOHN FITCH BOULEVARD

94 | Prestige Park

96 | East Windsor Hill via Route 5 or Main Street

Service Design

Routes 94 and 96 operate east along Connecticut Boulevard and northeast along Main Street, providing radial service between downtown Hartford and the towns of East Hartford (Route 94) and South Windsor (Route 96). The two routes operate as variants of a single service, with a common alignment in downtown Hartford and along Main Street in East Hartford until the intersection at Park Avenue. Route 94 travels east along Park Avenue, serving the intersection of Prestige Park Road and Goodwin Street. Route 96 continues north, terminating at East Windsor Hill at the intersection of Main Street and Sullivan Avenue.

FIGURE 1 | ROUTE 94 MAP

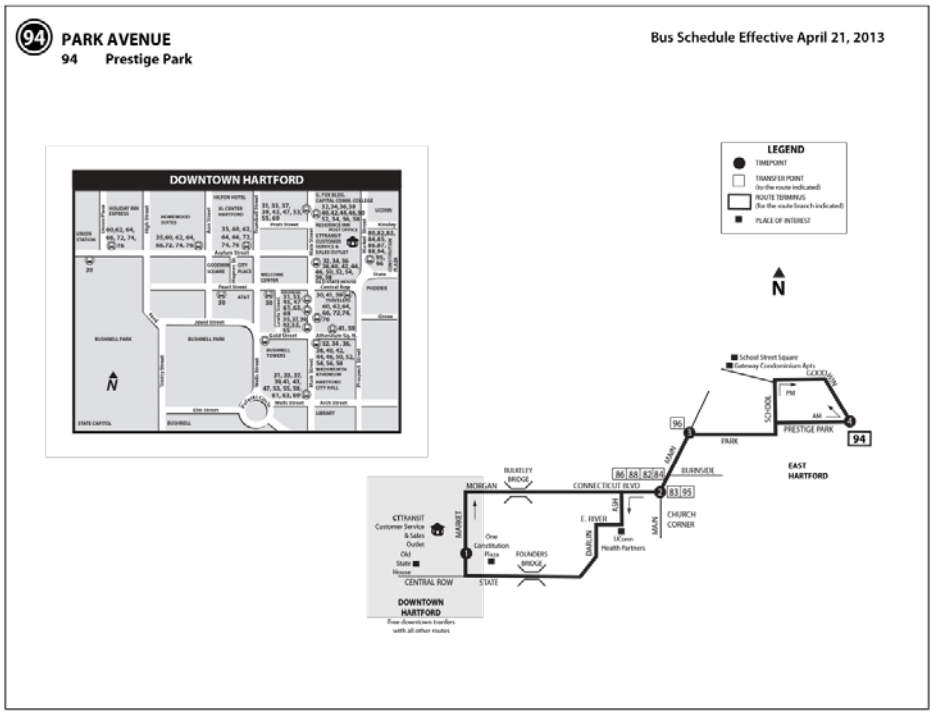
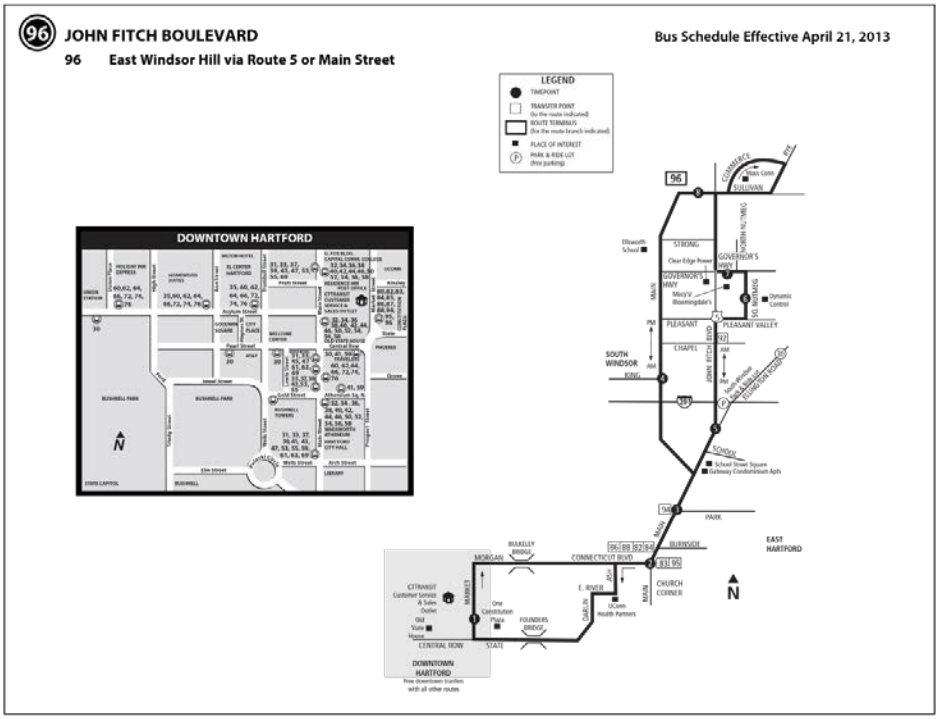


FIGURE 2 | ROUTE 96 MAP



System Interaction and Transfer Opportunities

Routes 94 and 96 begin/end in downtown Hartford where riders can transfer to most CT***transit*** services. In addition, both routes serve the intersection of Connecticut Boulevard and Main Street, where there are connections to Routes 83 and 95, and the intersection of Burnside and Main Street where there are connections to several routes (Routes 82, 84, 86, and 88).

FIGURE 3 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 82	Tolland Street and Buckland Hills
Route 83	Silver Lane
Route 84	Tolland Street and Rockville
Route 86	Burnside Avenue and Mayberry Village
Route 88	Burnside Avenue
Route 95	Glastonbury

Alignments and Service Patterns

Both Route 94 and Route 96 are routed through downtown Hartford in a counter clockwise loop that travels along Ash Street, Darlin Street, State Street, Market Street (Constitution Plaza), and finally along Connecticut Boulevard. Between Connecticut Boulevard and Park Avenue, both routes also travel along Main Street to head northeast/southwest.

From the intersection of Main and Park, Route 94 travels along Park Avenue and makes a terminal loop via Prestige Park Road, Goodwin Street and School Street. In the morning, outbound buses travel counter clockwise and during the afternoons and evenings, outbound buses operate the same loop in a clockwise direction.

Like Route 94, Route 96's also travels via a large terminal loop and reverses direction based on the time of day. From the intersection of Main and Park, on weekday morning's Route 96 continues along Main Street to Ellington Road and John Fitch Boulevard and returning on Main Street. Outbound trips deviate in two locations: 1) at Pleasant Valley Road to serve business and industry along Nutmeg Road South and Governor's Highway, and 2) heading east at Sullivan Avenue to serve employers along Commerce Way and Rye Street before heading west to terminate at East Windsor Hill. Weekday afternoon and evening trips follow a reverse pattern traveling clockwise loop along Main Street (outbound), deviating at Sullivan Avenue to begin the inbound trip, and continuing south along John Fitch Boulevard deviating again to serve Nutmeg Road South.

Saturday trips on Route 94 and Route 96 follow the same alignment as weekday trips. Route 96 has no Sunday service. Route 94 does include Sunday trips, but the outer end of the route is operated as Route 94, but as the bus travels into downtown Hartford, it becomes Route 95.

Service Schedule

Route 94 operates seven days a week and Route 96 operates weekdays and Saturdays. There are 24 one-way trips per weekday (11 on Route 94 and 13 on Route 96), for a total of 48 round trips. Service frequency along the common alignment varies widely during the peak period, with buses arriving at key stops between 5 and 40 minutes, averaging around 25 minutes (see Figure 4). Midday service operates every 60 minutes, though increases to peak period frequencies around 3:00 PM instead of 4:00 PM. Service levels are lower on the unique portions of the individual routes.

There are 11 outbound trips (six on Route 94 and five on Route 96) and 11 inbound trips (six on Route 94 and five on Route 96) on Saturdays, with a bus leaving each stop approximately every 60 minutes. Route 94 operates seven outbound trips and seven inbound trips on Sundays at a frequency of every 70 minutes.

FIGURE 4 | SCHEDULE OVERVIEW (ALL TRIPS ON ROUTES 94 AND 96)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:20 AM – 7:08 PM	25/60	24/24
Saturday	7:30 AM – 6:03 PM	60	11/11
Sunday	10:00 AM – 5:25 PM	70	7/7

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: CTTransit route schedules

Ridership by Service Day

CT***transit*** tracks ridership for Route 94 and Route 96 together, so the following analysis of ridership and productivity treats the two routes as a single service. Generally speaking Route 94/96 carries fewer riders than the Hartford Division average. Weekday ridership is nearly 38% lower than the systemwide average of 17.6 weekday passengers per trip (see Figure 5). Saturday and Sunday ridership per trip also perform significantly lower than the Division average by 39% and 96%, respectively.

FIGURE 5 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 94/96	ROUTE 94/96	DIVISION AVG
Weekday	526	11.0	17.7
Saturday	206	9.4	16.3
Sunday	10	0.7	17.6

Source: CTTransit performance data

Ridership by Stop

Outside of the downtown terminus, the most heavily used stop on both routes is along the common alignment between downtown and the intersection of Main Street and Park Avenue. The largest stops within this segment are at Connecticut Boulevard and Main Street, with 40 boardings and alightings at this location each day. All other stops on these routes have fewer than 25 boardings and alightings, with the daily activity at a majority of the stops reaching 10 or fewer (see Figure 6 and Figure 7).

On Route 94, the second highest ridership occurs at Park Avenue and Columbus Street, with 22 boardings and alightings per day. This area has some moderate to high density residential density.

Route 96 has strong ridership at the intersection of Nutmeg Road South and South Satellite Road, with 18 boardings and alightings per day, where numerous small to medium sized employers are located. Ridership is stronger along John Fitch Boulevard as compared with Main Street. The deviation to serve Nutmeg Road South is relatively productive, serving nearly 60 boardings and alightings per day.

FIGURE 6 | ROUTE 94 WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

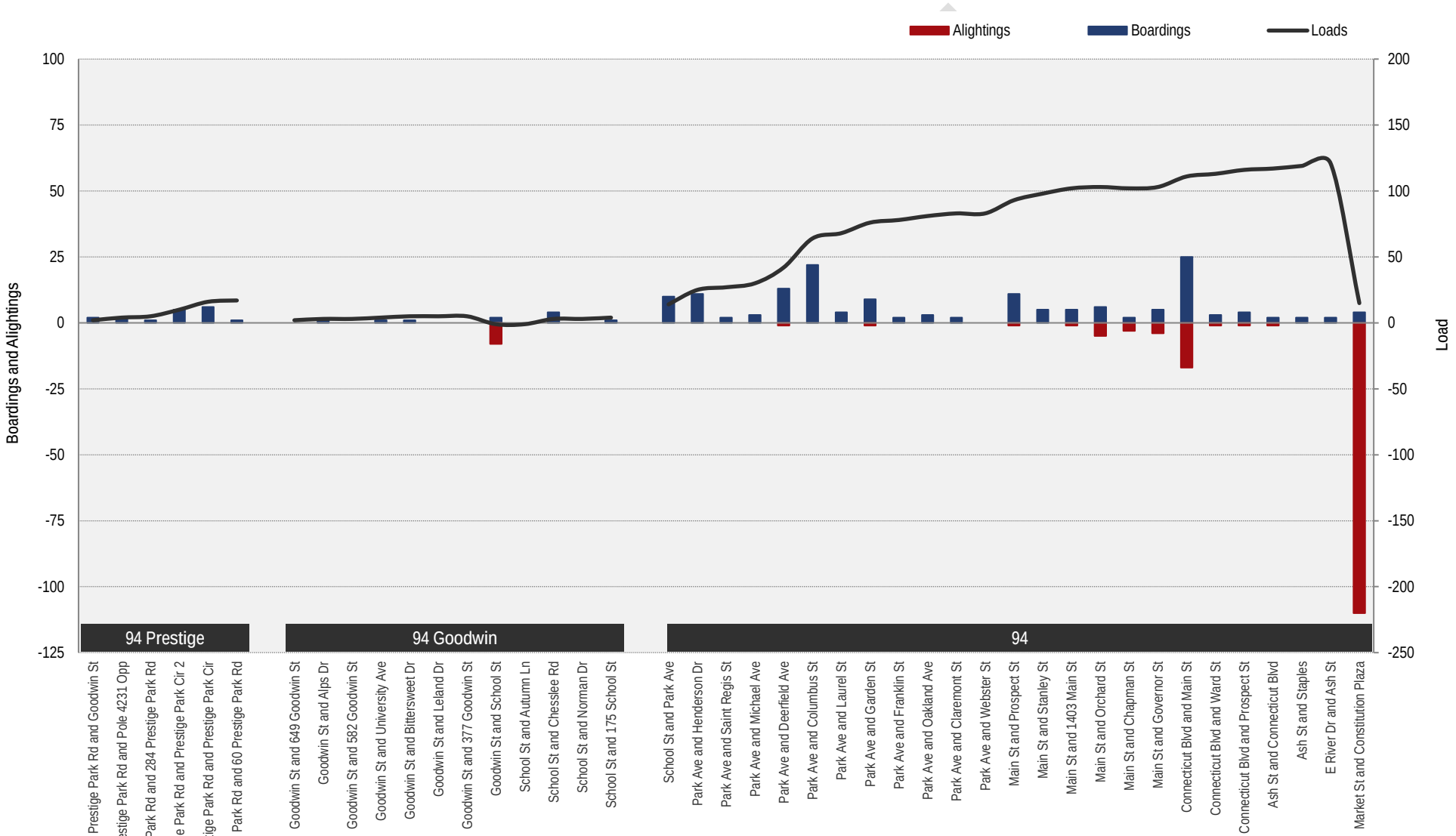


FIGURE 7 | ROUTE 96 WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

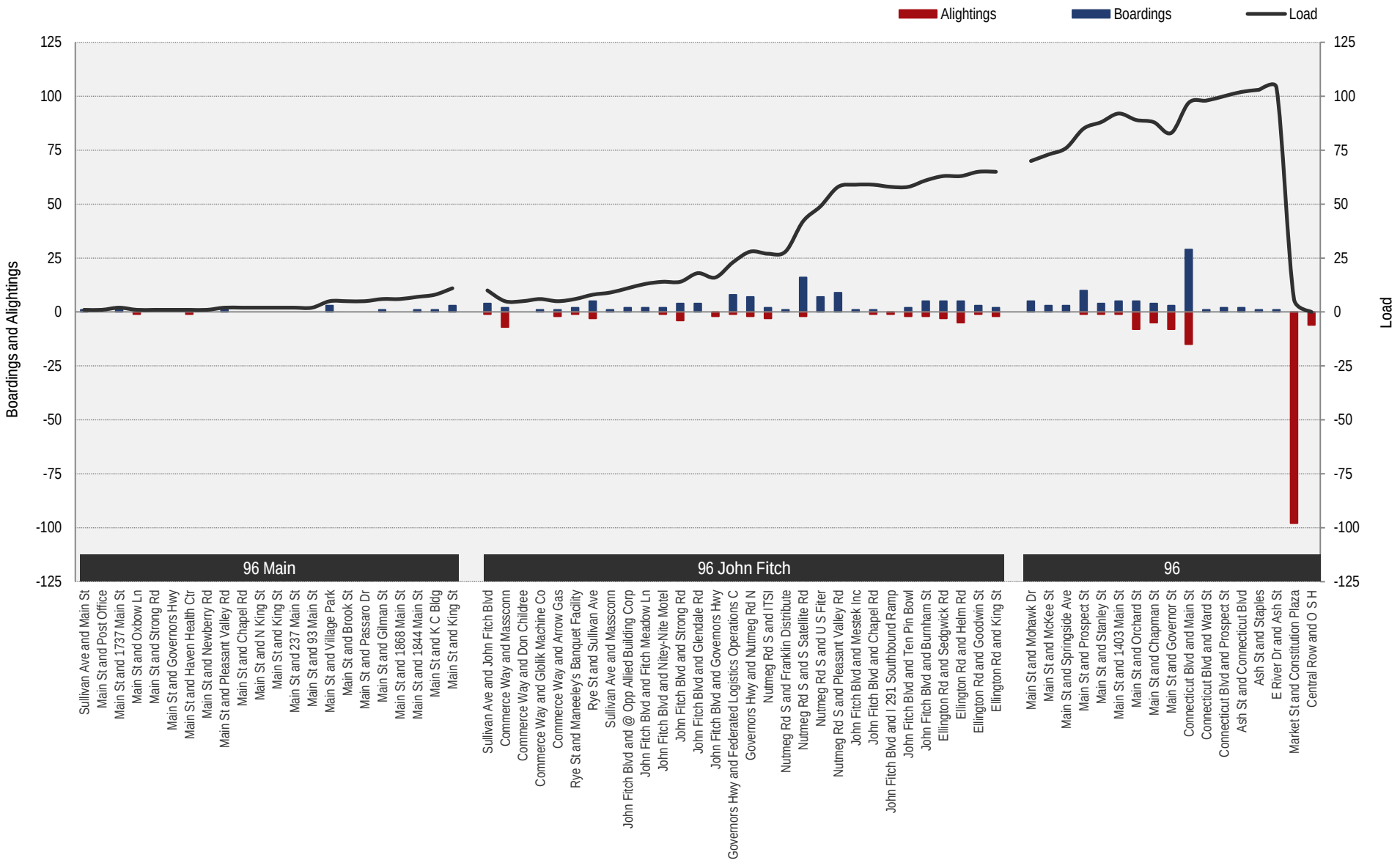


FIGURE 8 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

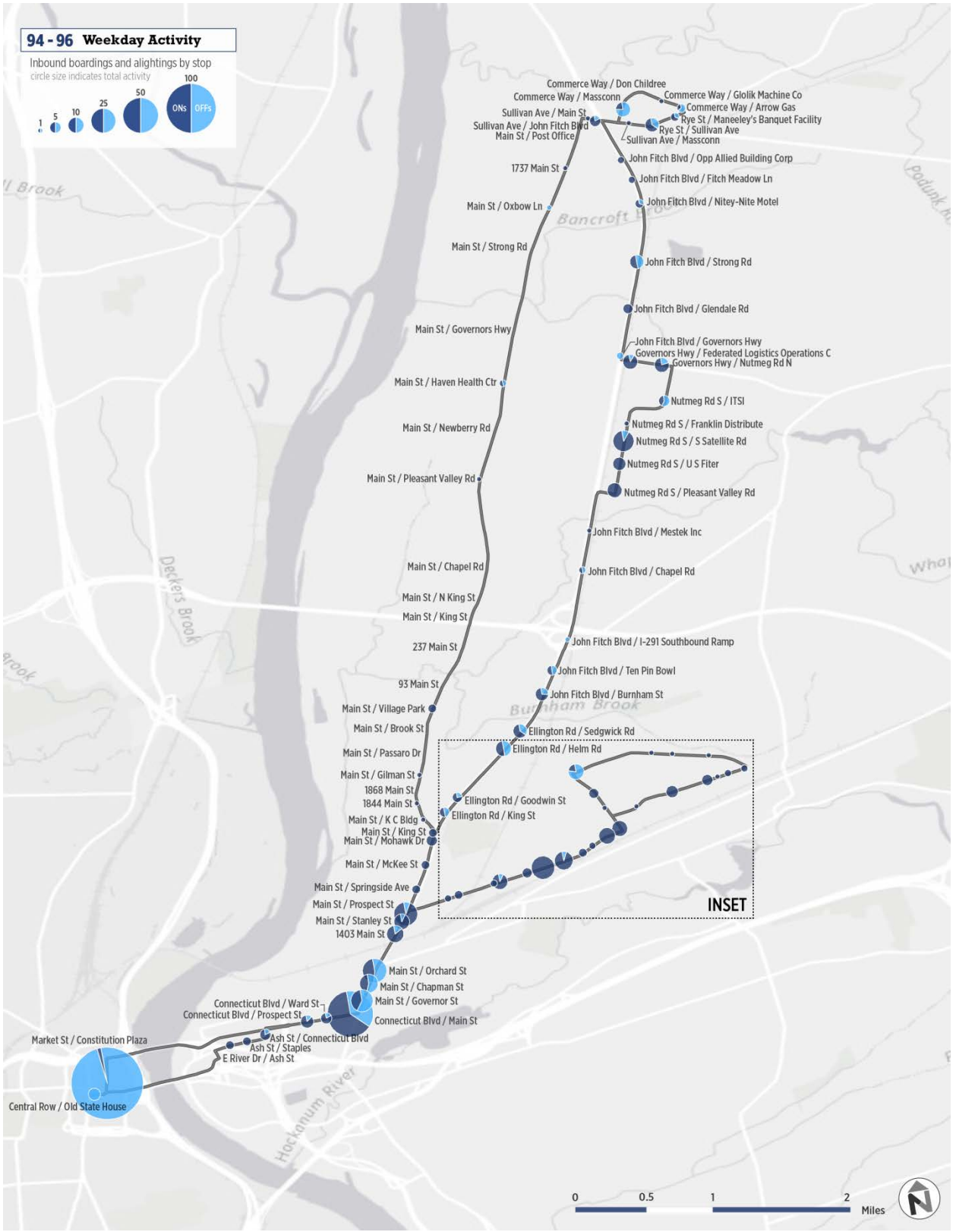
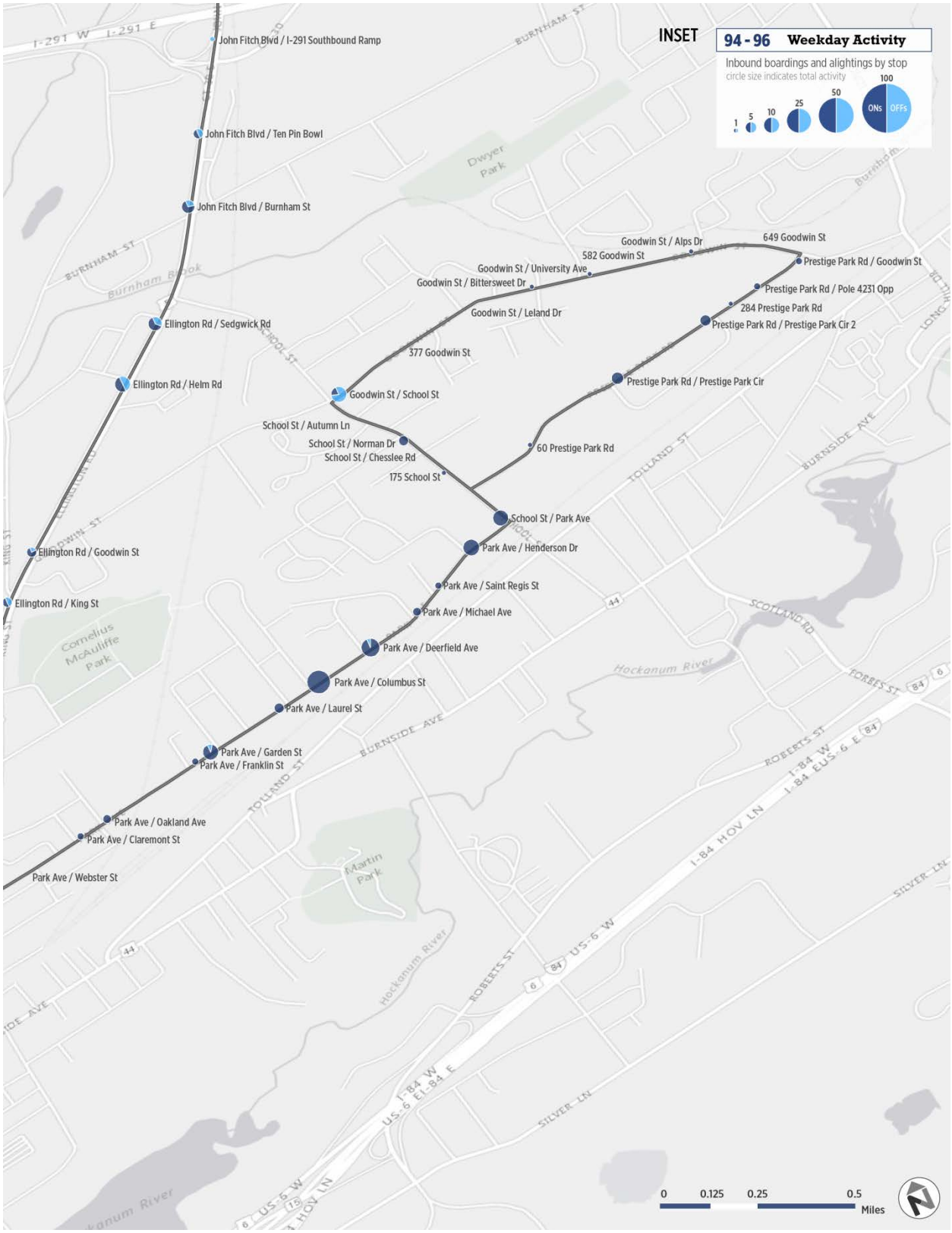


FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP (INSET)



Ridership by Trip

Weekday – Route 94

Route 94 ridership data by trip shows that the data is fairly well balanced throughout the day, although ridership is higher on the inbound trips as compared with the outbound trips. The data also shows very slight traditional commute patterns with slight peaks occurring during mornings and afternoons (See Figures 10 and 11).

Maximum loads on both routes suggest that overcrowding is not a problem on either route – only one trip reaches over 30 passengers at its maximum load, which is still within the capacity of a standard 40-foot bus.

FIGURE 10 | ROUTE 94 WEEKDAY OUTBOUND RIDERSHIP BY TRIP

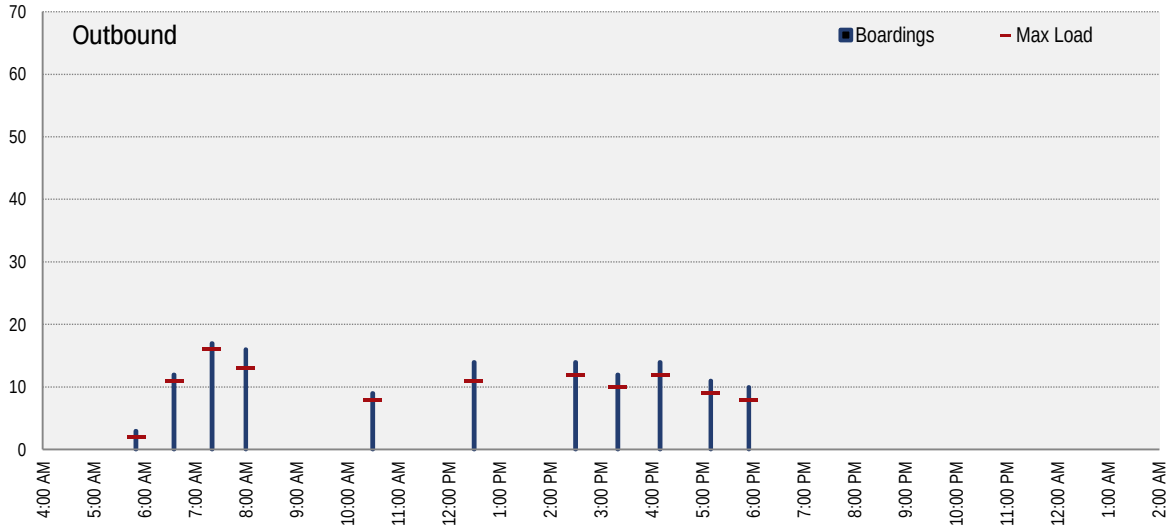
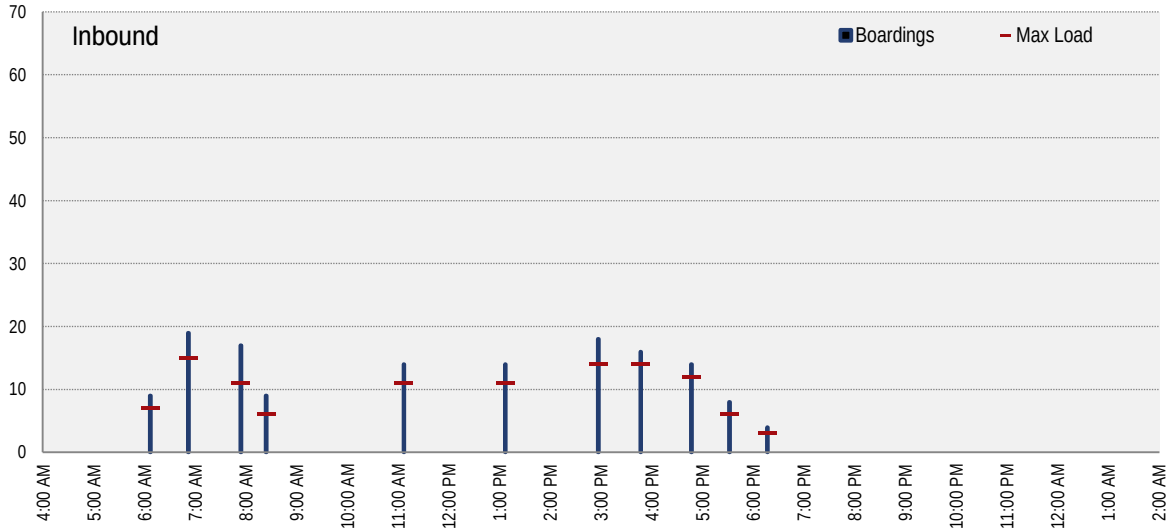


FIGURE 11 | ROUTE 94 WEEKDAY INBOUND RIDERSHIP BY TRIP



Weekday – Route 96

Ridership by trip on Route 96 shows a traditional reverse commute pattern, with ridership peaking in the early morning headed outbound and in the afternoon headed inbound (see Figures 12 and 13). Afternoon outbound ridership and morning inbound ridership is low.

FIGURE 12 | ROUTE 96 WEEKDAY OUTBOUND RIDERSHIP BY TRIP

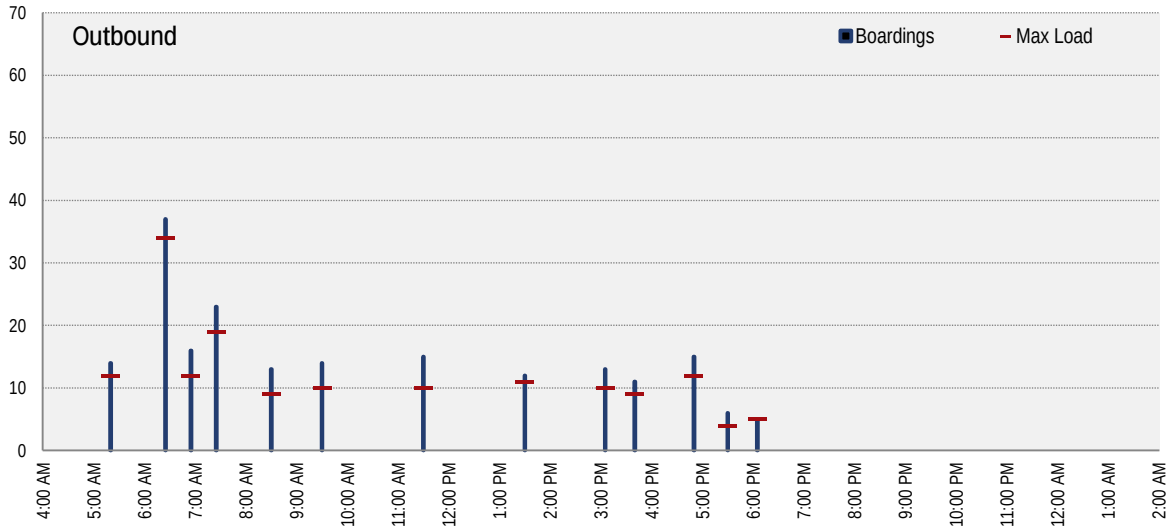
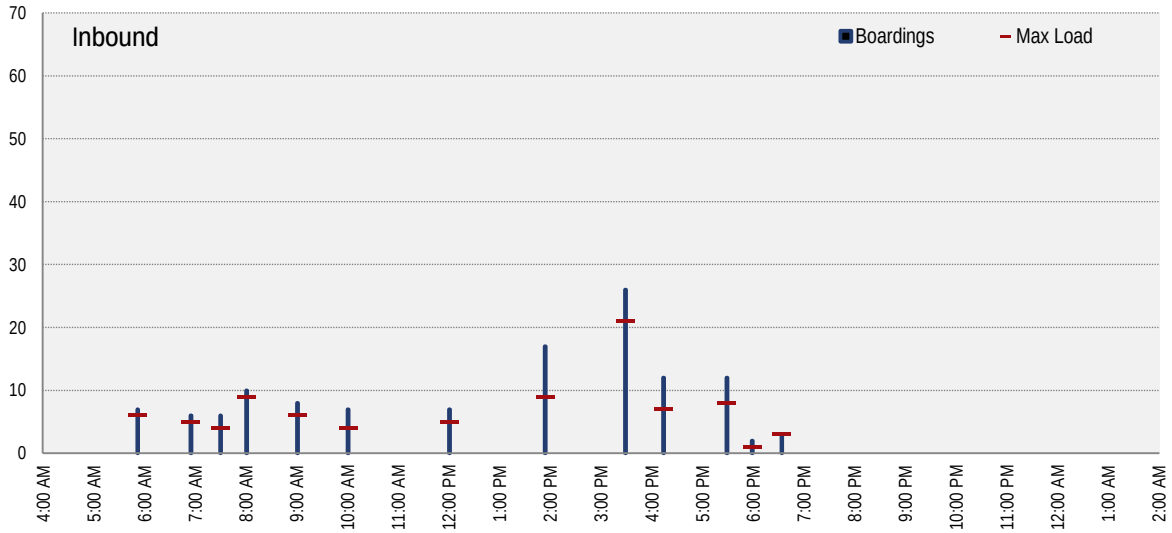


FIGURE 13 | ROUTE 96 WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday – Route 94

Ridership on Route 94's Saturday is very low with all but one trip carrying 10 or fewer riders (see Figures 14 and 15). The first and the last trips of the day have especially low ridership.

FIGURE 14 | ROUTE 94 SATURDAY OUTBOUND RIDERSHIP BY TRIP

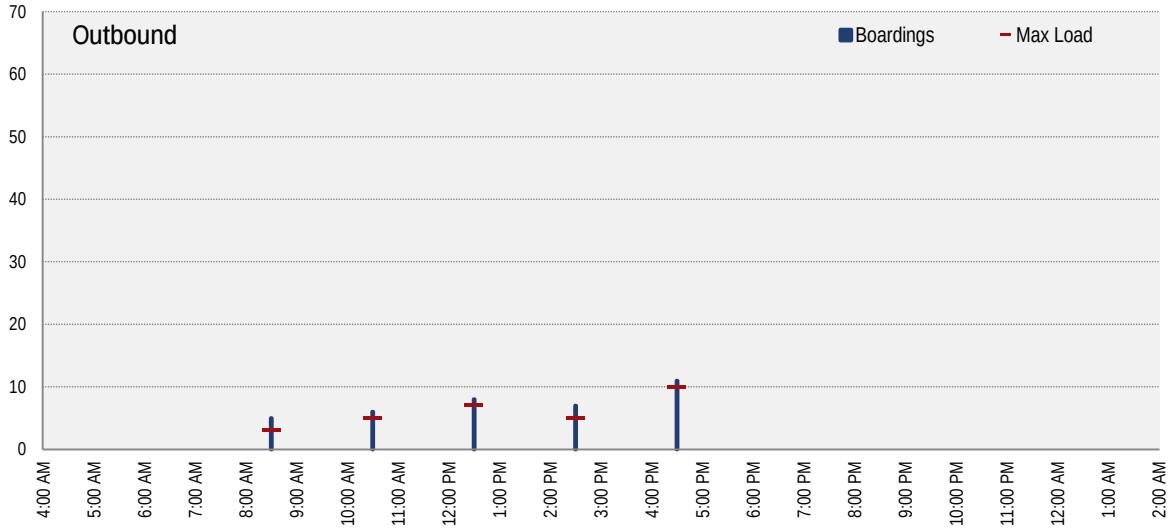
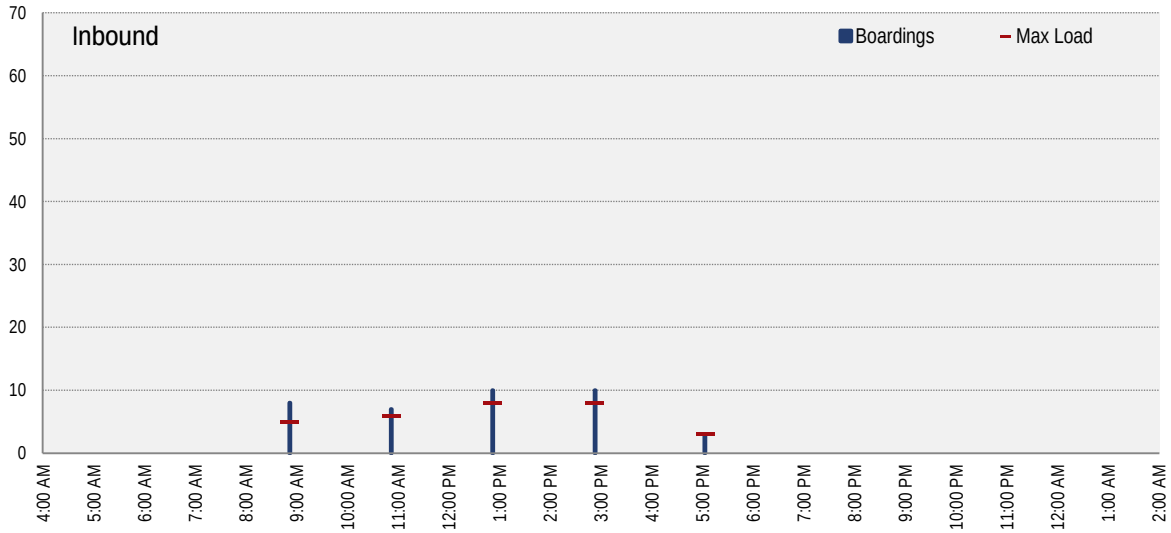


FIGURE 15 | ROUTE 94 SATURDAY INBOUND RIDERSHIP BY TRIP



Saturday – Route 96

Saturday ridership on Route 96 is also low except for the first trip of the day, which shows 35 riders boarding the bus. No corresponding spike happens in the afternoon in the reverse direction, so reasons for the spike are not well understood. However, only one sample for this trip exists in the dataset, so special circumstances on the day of the sample could have affected the results or data sampling errors could have occurred.

FIGURE 16 | ROUTE 96 SATURDAY OUTBOUND RIDERSHIP BY TRIP

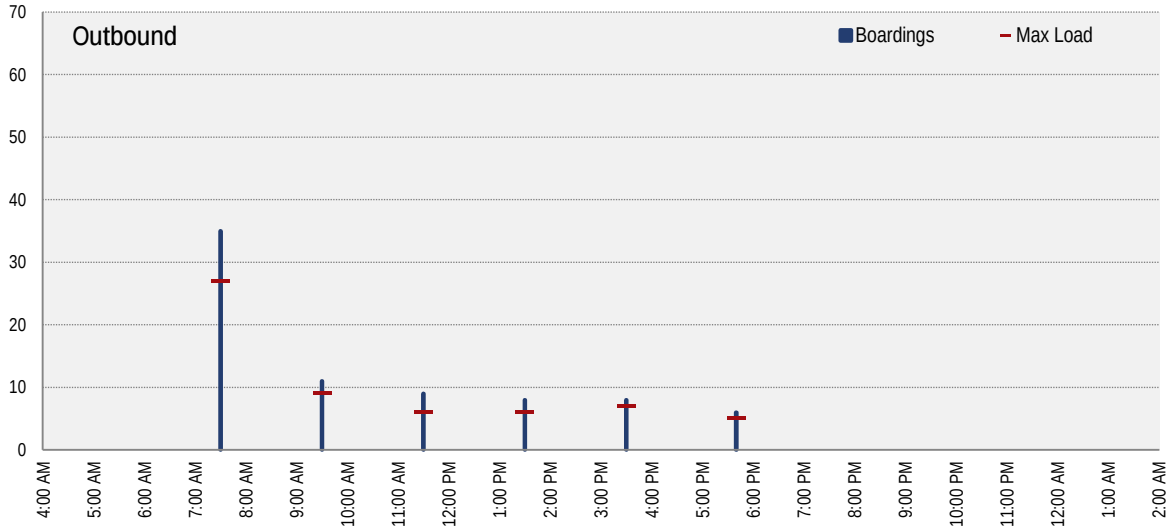
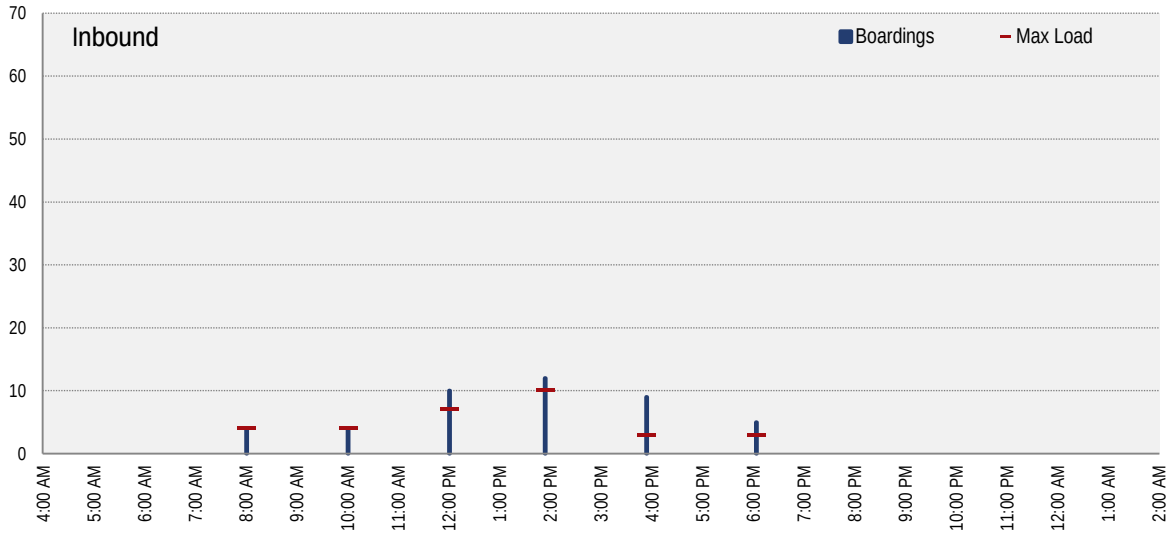


FIGURE 17 | ROUTE 96 SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

Sunday ridership on Route 94 is extremely low, never reaching more than four boardings in either direction. A majority of trips carry between one and three passengers (See Figures 18 and 19).

FIGURE 18 | ROUTE 94 SUNDAY OUTBOUND RIDERSHIP BY TRIP

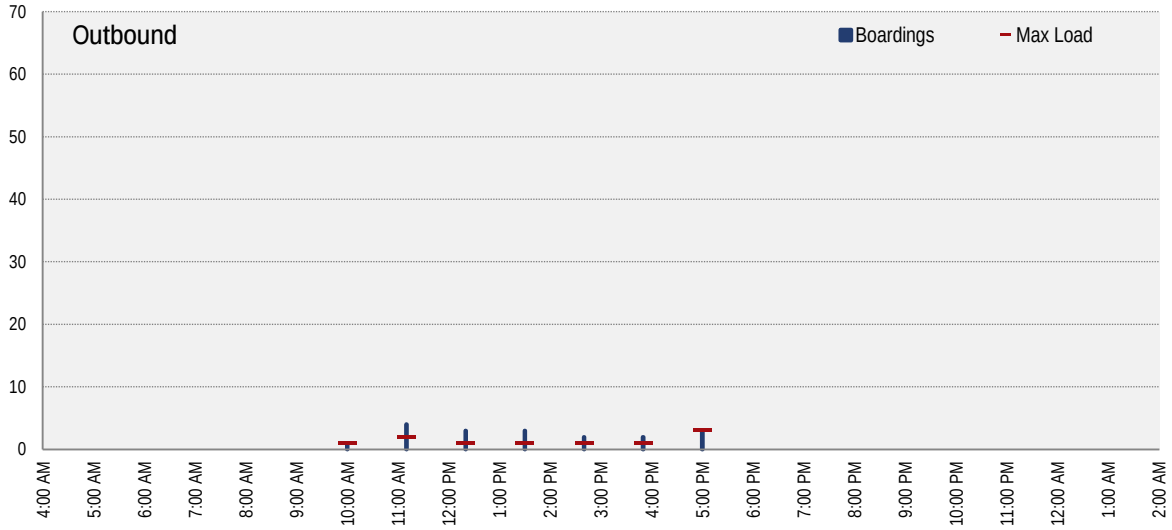
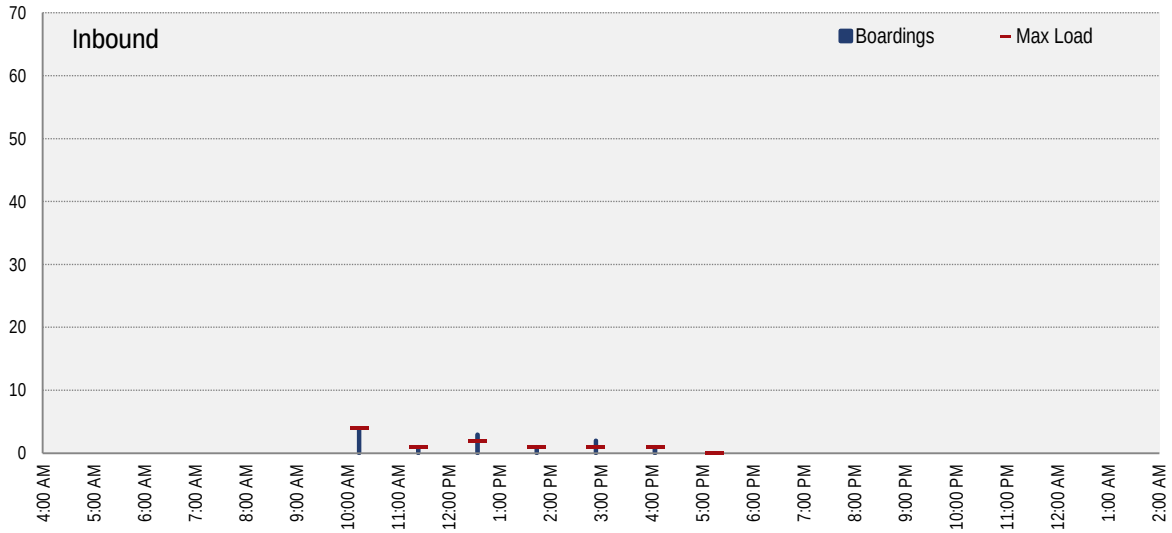


FIGURE 19 | ROUTE 94 SUNDAY INBOUND RIDERSHIP BY TRIP



Performance

Route 94/96 underperforms the Hartford Division average in all metrics and for all days of the week. An exception to this rule is the operating cost per passenger for Saturdays is slightly lower than the Division average. The cost per passenger on Sunday's is particularly and is measured at nearly $44 per passenger trip (See Figure 22 and Figure 23).

FIGURE 20 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 94/96	DIVISION AVG	ROUTE 94/96	DIVISION AVG	ROUTE 94/96	DIVISION AVG
Operating Cost per Passenger	$5.68	$4.84	$6.14	$6.30	$43.73	$6.66
Passengers per Revenue Vehicle Hour	22.5	28.9	20.8	27.0	2.9	29.7
Passengers per Revenue Vehicle Mile	1.5	2.6	1.3	2.4	0.2	2.9

Source: CTtransit performance data

Route 94/96's on-time arrival rate is better than the Hartford Division average (see Figure 21).

FIGURE 21 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 94/96	DIVISION AVG
Early	0.0%	0.2%
Late	7.9%	18.9%
On-Time	92.1%	80.9%

Source: CTtransit performance data

FIGURE 22 | WEEKDAY OPERATING COST PER PASSENGER

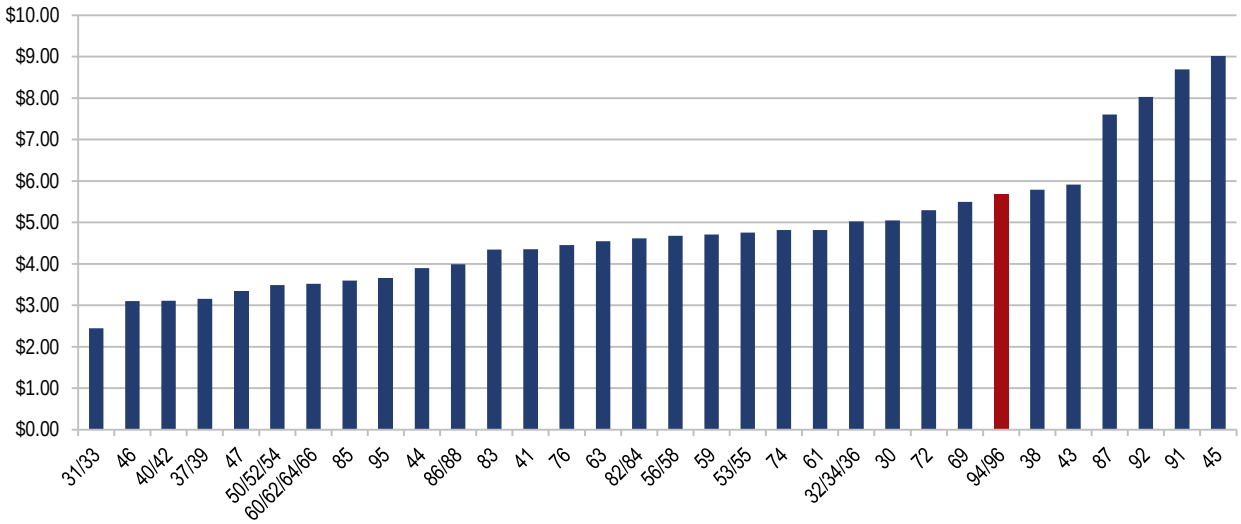
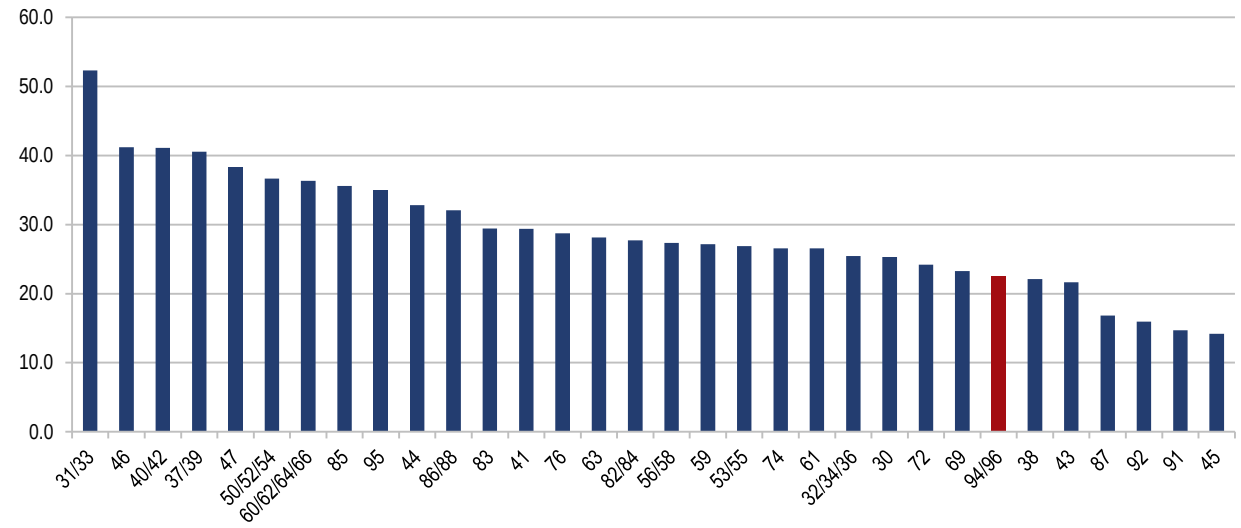


FIGURE 23 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Route 94 and Route 96 are two radial routes connecting downtown Hartford with employment and residential areas in the northern part of East Hartford and South Windsor, respectively. Both routes serve the northern portion of Main Street before splitting off to primarily serve the corridors of Park Avenue (Route 94) and John Fitch Boulevard (Route 96). The routes have low ridership and perform poorly as compared with the system overall on all metrics except on-time arrival.

Route 94.96 have a number of design flaws, including complicated service designs with terminal routes that change direction in different times of the day. In addition, the routes have weak anchors at the outer end of the route and serve only a moderate level of residential and employment density. The frequency also varies considerably on Route 94/96, making it hard for users to depend on.

Service Improvement Options

Opportunities to strengthen the route include the following:

- **Realign Route 96 to offer bi-directional service on John Fitch Boulevard.** Route 96's service design which travels along a large one-way loop that changes direction by time of day is a complicated design. It also limits access to local destinations because the one-way travel means someone would need to travel into downtown Hartford to travel between Main Street and John Fitch Boulevard. John Fitch Boulevard has a moderate level of employment density, mostly on its eastern edge, and Route 96 generates higher ridership along this segment of the route. But, it is also worth noting that John Fitch Boulevard is also a fast, divided arterial street, and though pedestrian infrastructure exists in some areas, it is missing in others and quality varies. Despite this, John Fitch carries more riders and serves a more distinct market as compared with the service on Main Street. Bi-directional service will also simplify the service, make it easier to use and will likely attract more riders.
- **Strengthen pedestrian infrastructure on John Fitch Boulevard.** As noted above, there is a moderate level of employment density along John Fitch Boulevard, but the roadway is a fast, divided arterial street. There is some pedestrian infrastructure along the route, but more is needed if the service is going to travel in both directions along the route. The current route configuration with one-way loops does not require passengers to cross the street. However, operating bi-directional service will require that riders can cross the street. To support the service, CT***transit*** will need to work with local officials develop crosswalks and passenger crossing signals at high ridership stops.
- **Expand John Fitch deviation to along Nutmeg Road to Strong Road.** John Fitch Boulevard is an employment corridor, but rail tracks that run parallel to the roadway's east side means people can't walk to employment just to the east of the rail line. The market analysis and current ridership data suggest extending service along Nutmeg Road North in addition to the deviation along Nutmeg Road South might be more productive. Extending the deviation would remove front-door service on the west side of John Fitch Boulevard for a total of about 1.5 miles.
- **Create transit mini-hub in East Hartford.** CT***transit*** operates several routes into East Hartford. The local street network is challenged because of the large freeway interchange and as a result, several routes travel along Connecticut Boulevard in East Hartford before continuing northeast or southeast. One or two of CT***transit*** use Pitkin Street in East Hartford. Currently service is not well coordinated from an operational perspective of a passenger perspective. However, given the region's density of both transit service and a relatively high transit need, it makes sense to organize service around a focal point, so that passengers can use that location to change direction, catch the next bus traveling into downtown Hartford and increasing awareness

of CTtransit generally. Potential locations for a transit mini-hub include near the intersection of Route 44 and Route 5 or at the intersection of Pitkin Street and Route 5.

- **Better coordinate Route 94 and Route 96's schedules and maintain consistent frequencies.** Although both Route 94 and Route 96 operate with the same frequency, schedules are not well coordinated and as a result, frequencies on the common segment of Route 94 and Route 96 vary greatly, especially during the peak period. Maintaining consistent frequencies will help coordinate service, but will degrade service slightly.
- **Operate Route 94/96 with 30 minute service during peak and 120 minutes during off peak.** Ridership data, however, suggests 30 minute peak is likely sufficient to meet ridership demand. However Route 94/96's peak period is slightly shorter and starts slightly earlier as compared with other radial routes in CT***transit***'s Hartford Division. Midday service on Route 94 and Route 96 should remain the same at 120-minute frequencies on each route creating a 60-minutes service on the common segment.
- **Eliminate Sunday service.** Sunday service is unproductive and could be eliminated. On average Route 96's Sunday service carries 10 people and costs, on average, nearly $44 per passenger. As a result, it is a costly service to provide and uses resources that are better spent elsewhere.

Route Evaluation

GLASTONBURY

95A | O'Connell Drive

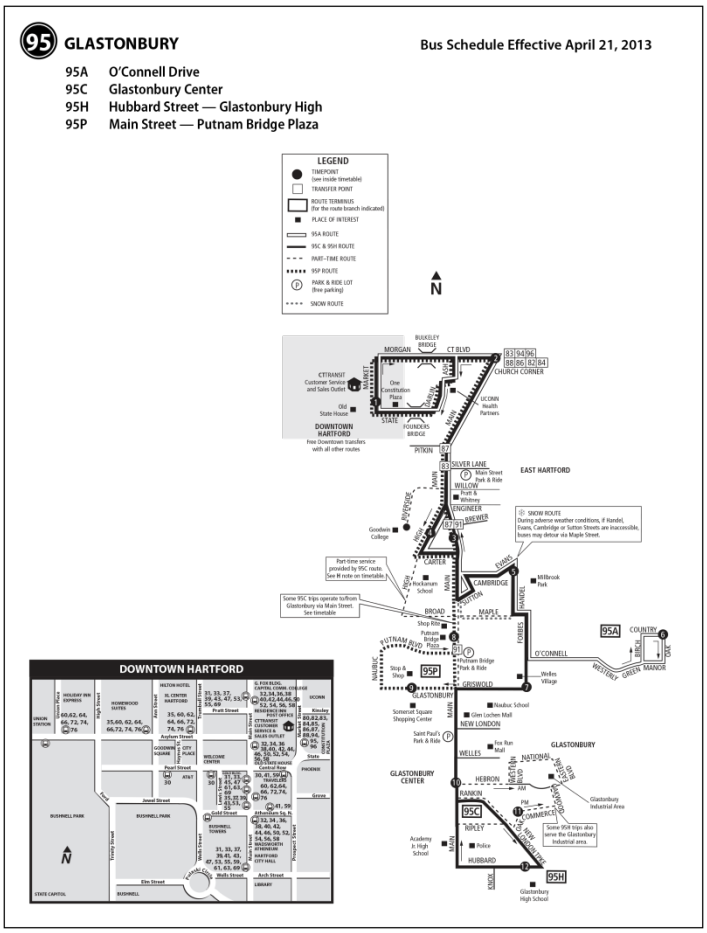
95C | Glastonbury Center

95H | Hubbard Street – Glastonbury High

95P | Main Street – Putnam Bridge Plaza

Service Design

Route 95 is a radial route that travels between downtown Hartford and Glastonbury. All trips serve the Main Street corridor through East Hartford. One variant (Route 95P) continues along Main Street and terminates at Putnam Bridge Plaza and the Stop & Shop on Glastonbury Boulevard. Route 95A continues further east to serve O'Connell Drive, while Route 95H continues south to serve Welles Village and Glastonbury High School via Main Street. The alignment on Route 95C varies, sometimes remaining on Main Street while other times also deviating to serve Millbrook Park, but the variant always continues south to serve Welles Village and Glastonbury Center via Main Street (see Figure 1).



System Interaction and Transfer Opportunities

Route 95 begins/ends in downtown Hartford where riders can transfer to most CT***transit*** services. In addition, there are several locations where riders can transfer to other CT***transit*** Hartford routes (see Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 82	Tolland Street and Buckland Hills
Route 83	Silver Lane
Route 84	Tolland Street and Rockville
Route 86	Burnside Avenue and Mayberry Village
Route 87	Brewer Street
Route 88	Burnside Avenue
Route 91	Forbes Street Crosstown
Route 94	Park Avenue
Route 96	John Fitch Boulevard

Alignments and Service Patterns

The primary or "trunk" alignment of Route 95 between downtown Hartford and Main Street and Sutton Avenue in East Hartford, operating along Connecticut Boulevard, Main Street, and, on outbound trips, High and Carter Streets. All variants run along this trunk alignment before branching out to serve different destinations.

Traveling inbound, all routes terminate in downtown by traveling along a loop that includes Ash Street and Darlin Street in East Hartford to State Street in Hartford before continuing to Market Street and beginning the outbound trip. The service variants include:

- Route 95A – inbound trips begin at Oak Street and County Lane and travel west on O'Connell Drive. To return to Main Street, Route 95A heads north on Forbes Street and Handel Road (near Millbrook Park) and west via Evans Avenue, Cambridge Drive, and Sutton Avenue. Route 95A then joins the trunk alignment into downtown.
- Routes 95C – most inbound trips begin at Glastonbury Center on Main Street and Hebron Avenue and head north on Main Street past Saint Paul's Park & Ride, Fox Run Mall, Glen Lochen Mall, and Naubuc School. At Griswold Avenue, some Route 95C trips head east towards Welles Village and then north on Forbes Street to follow the same alignment as Route 95A back to Main Street. Other trips continue north on Main Street, skipping Welles Village and Millbrook Park. Three outbound and four inbound afternoon Route 95C trips also serve the Glastonbury Industrial Park south of Glastonbury Center via a circuitous path of small local roads. One of the outbound evening Route 95C trips that serves the industrial park operates via High and Broad Streets past Hockanum School, skipping Millbrook Park.
- Route 95H – most inbound trips begin at Glastonbury High School on Hubbard Street and return to Main Street via a loop and following the Griswold Avenue alignment (as described for Route 95C) inbound. Two outbound and inbound morning Route 95H trips serve the Glastonbury Industrial Park. One of the inbound morning Route 95H trips that serves the industrial park operates via High and Broad Streets past Hockanum School, skipping Millbrook Park.

- Route 95P –trips begin at the Stop & Shop on Glastonbury Boulevard and travel inbound via a clockwise loop on Naubuc Avenue and Putnam Boulevard. Traveling past Putnam Bridge Plaza, Route 95P heads north on Main Street and continues on the trunk alignment described above. Three AM and three PM Route 95P outbound trips serve the Putnam Bridge Park & Ride Lot located at the beginning of the terminating loop upon request. One evening inbound trip serves Goodwin College, departing the college at 9:03 PM.

Route 95 is complicated by the fact that there are trips on all four variants that begin or end at slightly different locations from the ones listed on the schedule. These include ending at Central Row North, ending on Glastonbury Boulevard at the entrance to State Route 3 North (Route 95P only), and beginning at Travelers on Main Street in downtown Hartford.

On Saturdays, no trips follow the Route 95A variant along O'Connell Drive and no trips serve the Glastonbury Industrial Park. Otherwise, Routes 95C, 95H, and 95P all operate similarly to weekday service.

On Sundays, Route 95 buses travel direct along Main Street from Connecticut Boulevard and Main Street (Church Corner) to Putnam Bridge Plaza and does not serve downtown Hartford.

Service Schedule

Route 95 operates seven days a week, with 34 outbound trips and 36 inbound trips per weekday. The peak period frequency varies widely along the common alignment on weekdays, with buses arriving at stops between 5 and 40 minutes, averaging around 20 minutes (see Figure 3). Midday service is more consistent and operates about every 30 minutes. Service levels are lower on the unique portions of the individual routes. The last trip of the day in each direction, which only operates between downtown Hartford and High and Brewer Streets, are late night trips that leave about 3 to 3.5 hours after regular service hours.

There are 18 inbound and outbound trips on Saturdays, with a bus leaving approximately every 40 minutes along the common alignment. Route 95 operates six inbound and outbound trips on Sundays at a frequency of every 70 minutes. Service hours are reduced from weekdays on both Saturday and Sunday.

FIGURE 3 | SCHEDULE OVERVIEW (ALL ROUTES 95A, 95C, 95H AND 95P)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:10 AM – 12:28 AM	20/30	34/36
Saturday	6:25 AM – 7:08 PM	40	18/18
Sunday	10:30 AM – 4:55 PM	70	6/6

Note: Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM.

Source: Cttransit route schedules

Ridership by Service Day

Route 95 carries 1,629 daily passengers or 23.3 passengers per trip on an average weekday, roughly 32% higher than the Hartford Division average of 17.6 weekday passengers per trip (see Figure 4). While Saturday ridership exceeds the Division average by 41%, Sunday ridership per trip is 44% below the Division average.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 95	ROUTE 95	DIVISION AVG
Weekday	1,629	23.3	17.7
Saturday	774	21.5	16.3
Sunday	127	10.6	17.6

Source: CTtransit performance data

Ridership by Stop

Outside of downtown Hartford, four stops on Route 95 have activity of 50 or more boardings and alightings, all of which are located on the main trunk line of the route. These stops are shown in Figure 5 and include Connecticut Boulevard and Main Street, Main Street and Brewer Street, Main Street and Central Avenue, and Main Street and Brown Street.

Seven additional stops have ridership between 20 and 50 boardings and alightings, five of which are again on the main trunk line of the route. These stops include those near the Pratt & Whitney Headquarters, Coca-Cola Bottling plant, and Silver Lane, among others. The two stops not on the main trunk line with ridership at 20 or more include stops near Glastonbury Center at Hebron Avenue (Routes 95C and 95H) and Putman Bridge Plaza (Route 95P). Load profile data (see Figure 6) combines passenger activity by stop and shows the cumulative passenger load as the bus travels inbound. Ridership by stop without the cumulative load is mapped in Figure 7 and Figure 8.

With the exception of Main Street at Griswold Street, no other stops on the unique portions of Route 95 alignments have activity of more than 10 riders. This means that the trunk line accounts for 50% of ridership on Route 95 outside of downtown Hartford. The downtown terminus accounts for an additional 34%, which leaves about 16% of all ridership using the unique portions of the Route 95 variant service.

FIGURE 5 | ROUTE 95 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (OUTBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Church Corner (Connecticut Boulevard and Main Street)	62/57	Transfer point to Routes 82, 83, 84, 86, 88, 94, 96
Main Street and Brewer Street	97/4	Transfer point for Routes 87, 91; InterCommunity, Inc. Health Care, CLP Resources (employment agency), various other types of development
Main Street and Central Avenue	3/73	Moderate residential density, various churches, US Post Office and other small employment locations
Main Street and Brown Street	49/9	Coca-Cola Bottling Co, medium to high density residential area

FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

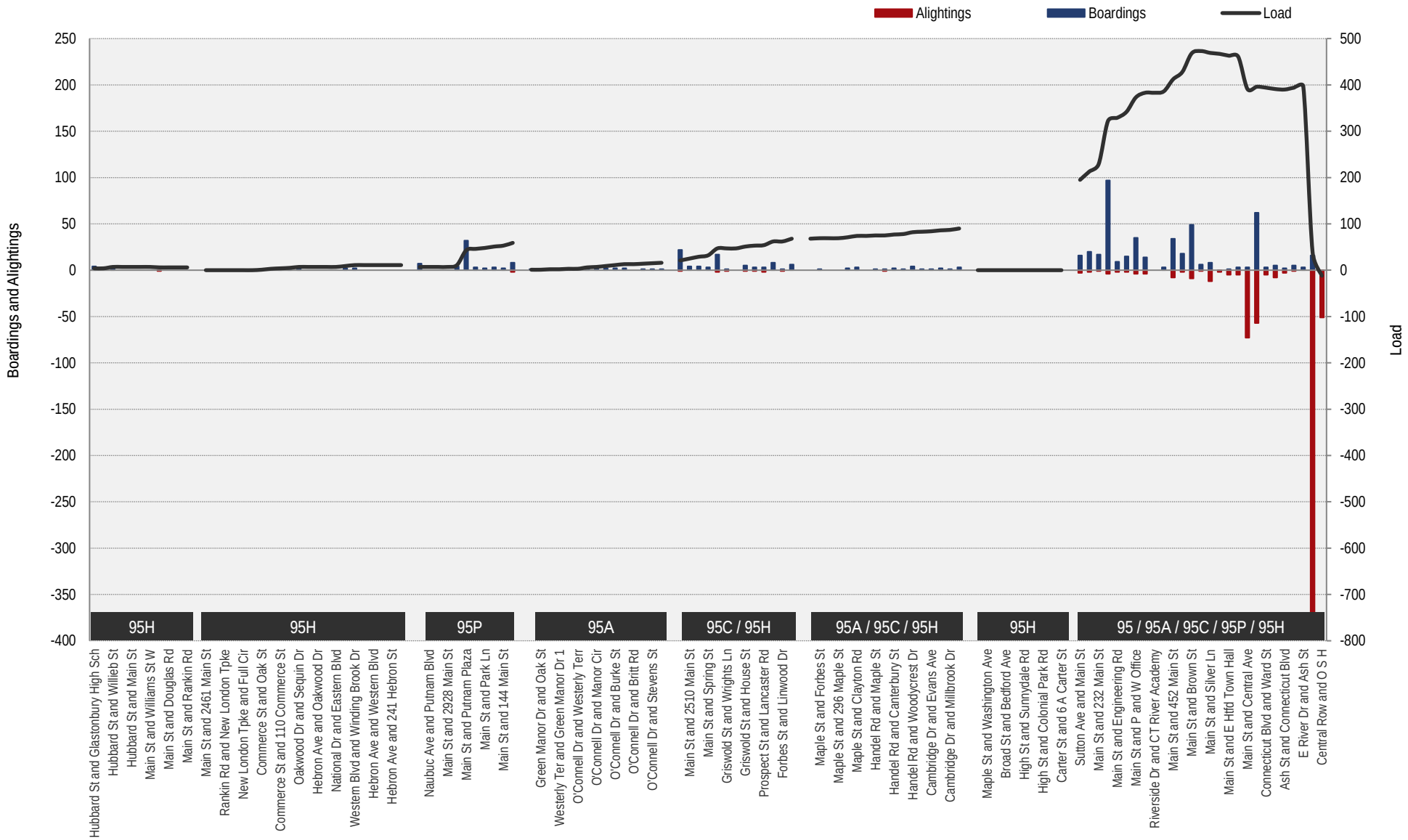


FIGURE 7 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

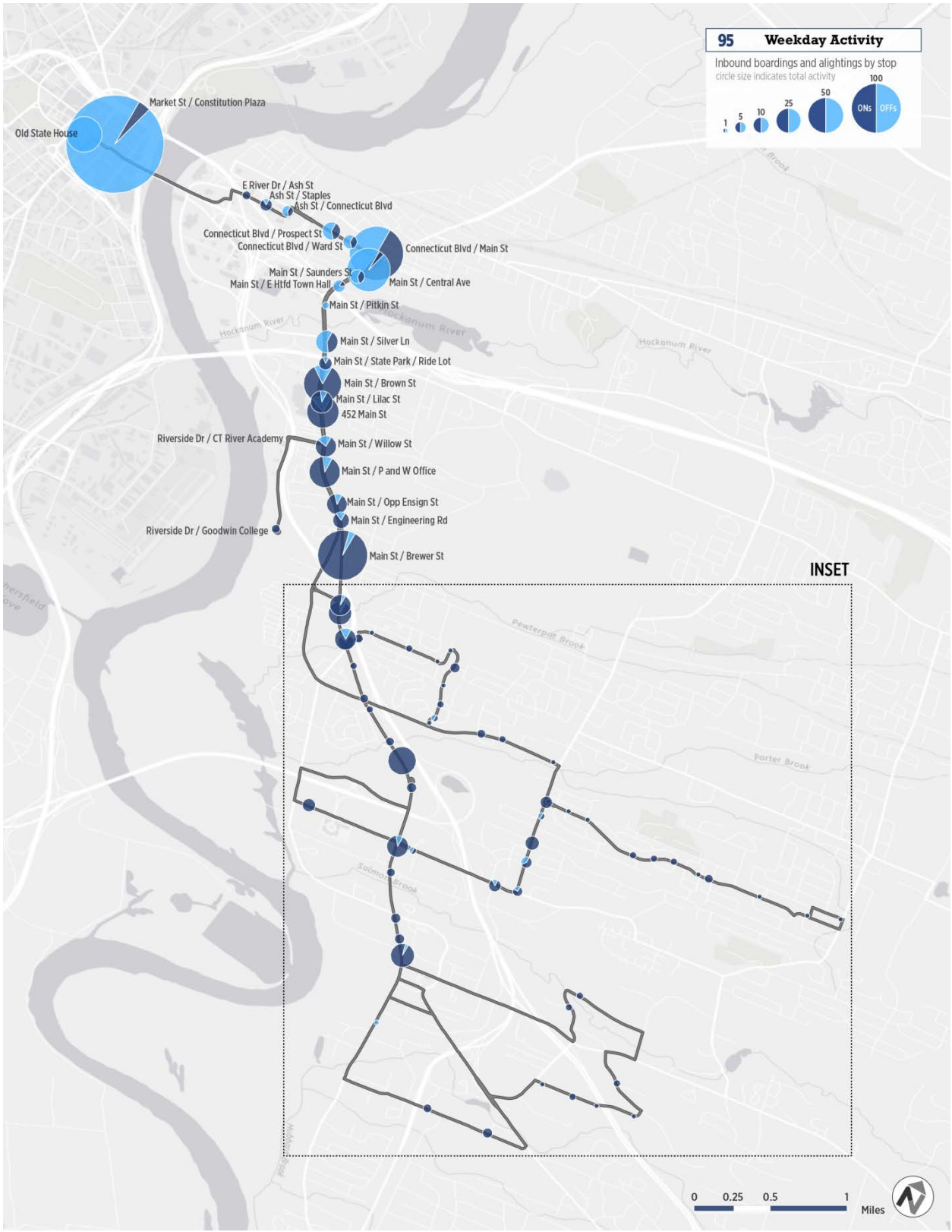
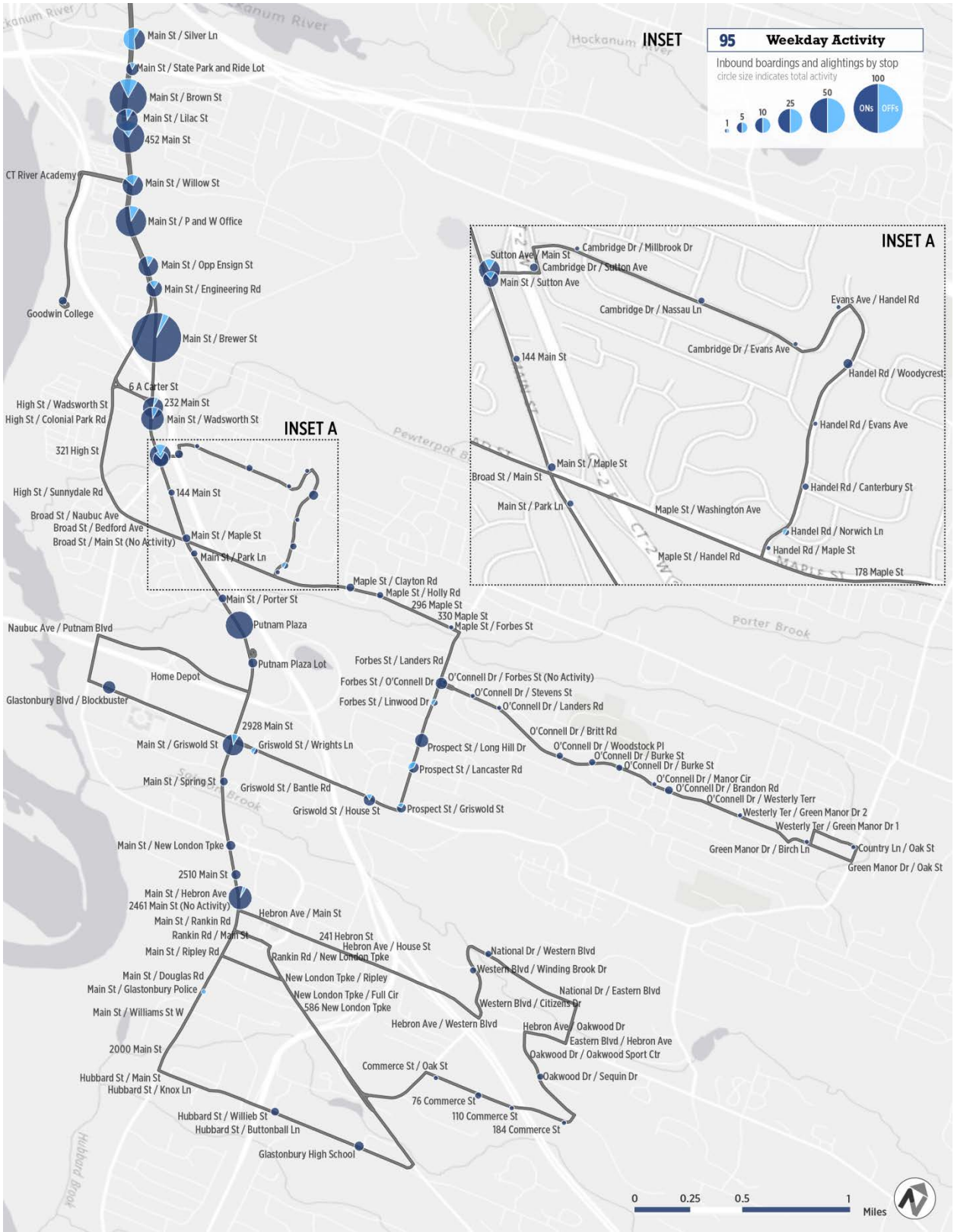


FIGURE 8 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP (INSET)



Ridership by Trip

Weekday

Ridership on Route 95 is strong throughout the day in both directions, with most trips carrying between 20 and 30 riders. Demand is consistent throughout the day, although ridership increases slightly in the mid-afternoon period exist. Inbound ridership declines noticeably after 5:00 PM, while outbound ridership is low before 6:00 AM.

Outbound trips on Route 95 consistently reach 18 or more total boardings for most of the day, with the exception of early morning Route 95A trips (see Figure 9). Inbound trips consistently reach 18 or more boardings all day; some early morning trips also have high ridership (see Figures 10). There is not much variation in ridership on the Route 95C, 95H, and 95P alignments, but ridership on Route 95A is typically very low. Maximum loads on Route 95 do not exceed 25 passengers.

FIGURE 9 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

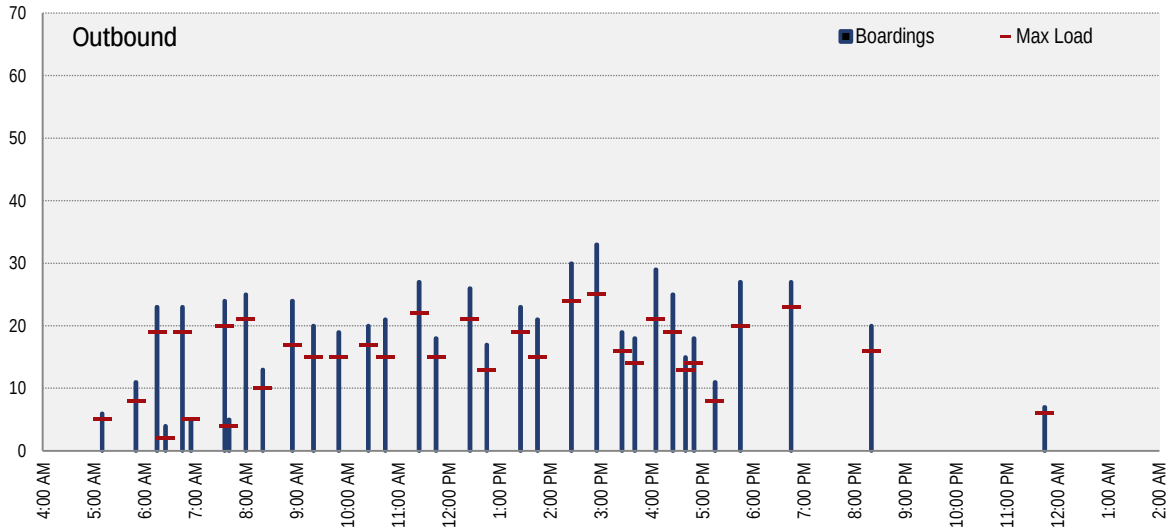
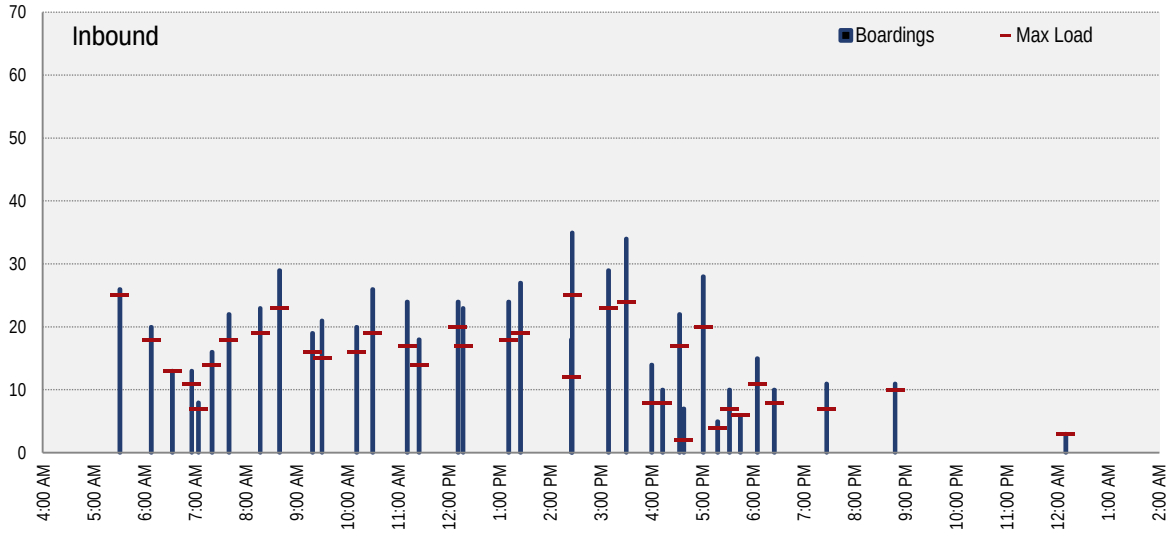


FIGURE 10 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Overall Saturday service has more riders traveling inbound than outbound, with seven inbound trips reaching 20 or more boardings as compared with three outbound trips reaching the same. Saturday ridership on Route 95 shows some typical commute type patterns with outbound ridership gradually increasing throughout the day and peaking around 5:00 PM while inbound ridership is strong before 1:00 PM but gradually decreases throughout the afternoon (see Figures 11 and 12).

FIGURE 11 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

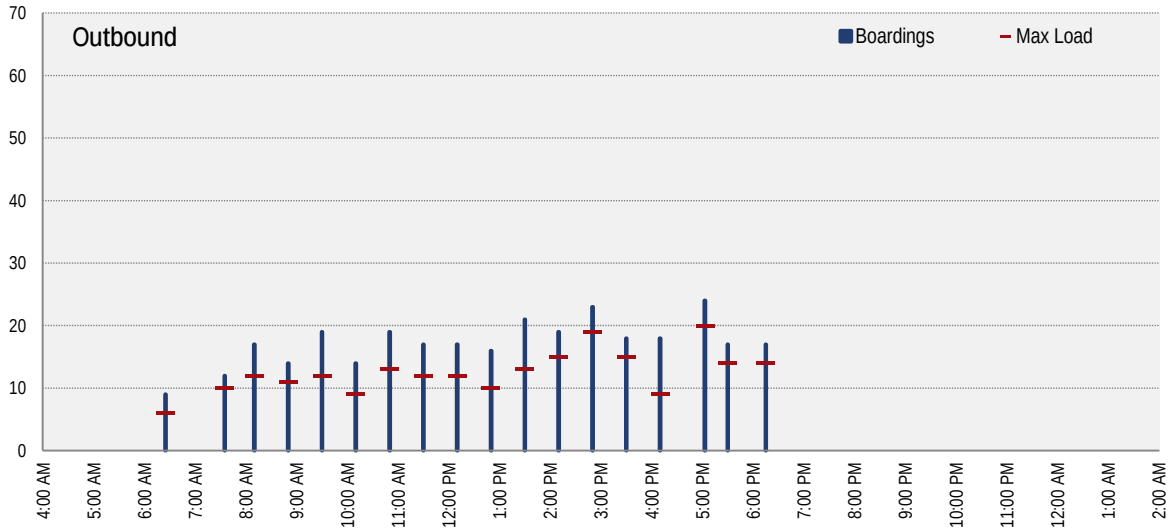
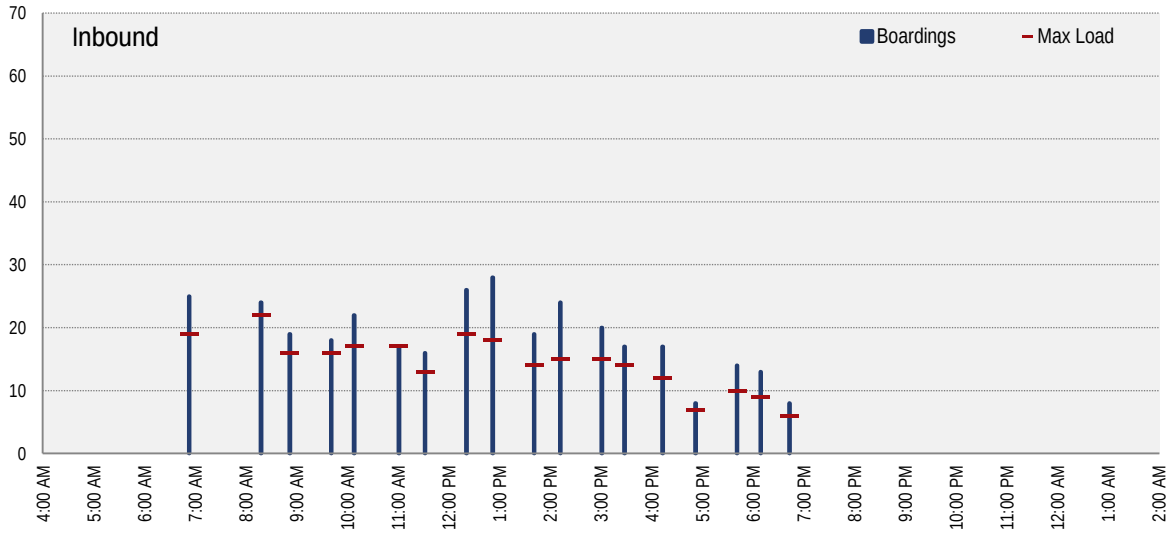


FIGURE 12 | SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

Ridership on Route 95's Sunday service is low overall, but consistent with Saturday service, ridership is stronger heading inbound as compared with outbound. Only one Sunday trip reaches more than 10 passengers – the first trip headed inbound (see Figures 13 and 14).

FIGURE 13 | SUNDAY OUTBOUND RIDERSHIP BY TRIP

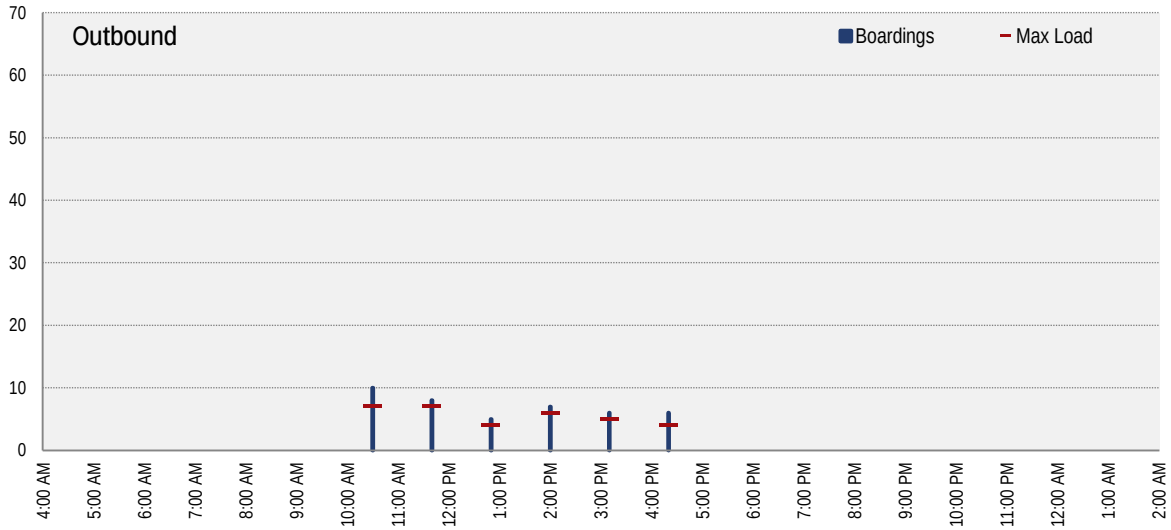
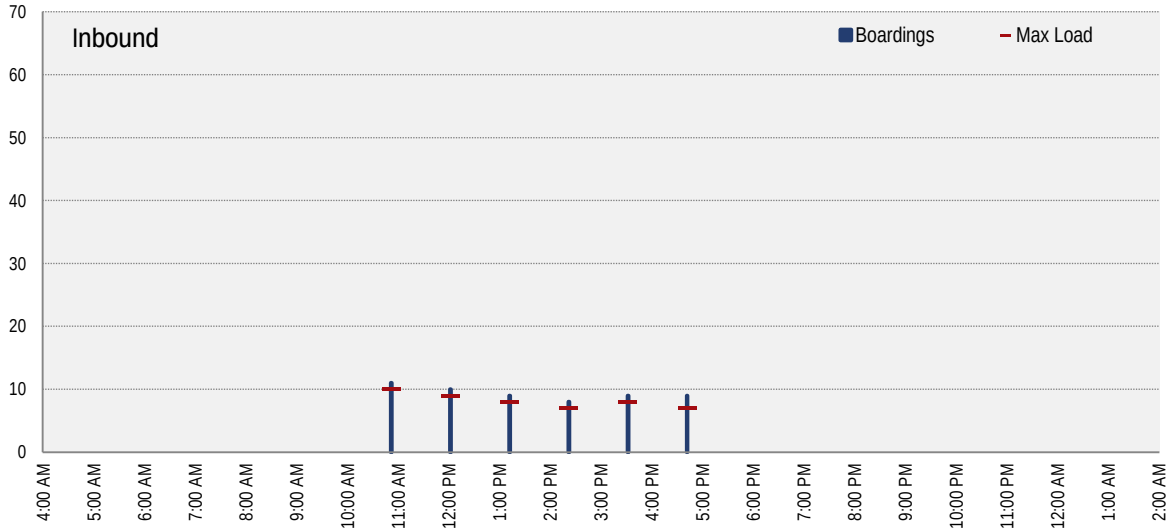


FIGURE 14 | SUNDAY INBOUND RIDERSHIP BY TRIP



Performance

Route 95 performs well on all measures of productivity, with a lower than average operating cost per passenger on all service days, higher than average ridership per revenue hour and slightly higher than average ridership per revenue mile (see Figure 15). The route is one of CT***transit*** Hartford's top ten performing routes (see Figures 17 and 18). Saturday is particularly strong at a 39% lower than average operating cost per passenger, 28% higher passengers per revenue hour, and 22% higher passengers per revenue mile.

FIGURE 15 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 95	DIVISION AVG	ROUTE 95	DIVISION AVG	ROUTE 95	DIVISION AVG
Operating Cost per Passenger	$3.66	$4.84	$3.83	$6.30	$4.03	$6.66
Passengers per Revenue Vehicle Hour	35	28.9	33.4	27.0	31.8	29.7
Passengers per Revenue Vehicle Mile	2.8	2.6	2.8	2.4	3.0	2.9

Source: CTtransit performance data

Route 95 has an 89.4% on-time arrival rate, with a lower percentage of late buses than the Hartford Division average (see Figure 16). With most ridership along the main trunk line and adequate layover time in the schedule, this result is not surprising.

FIGURE 16 | ON-TIME PERFORMANCE

PERFORMANCE	ROUTE 95	DIVISION AVG
Early	0.2%	0.2%
Late	10.4%	18.9%
On-Time	89.4%	80.9%

Source: CTtransit performance data

FIGURE 17 | WEEKDAY OPERATING COST PER PASSENGER

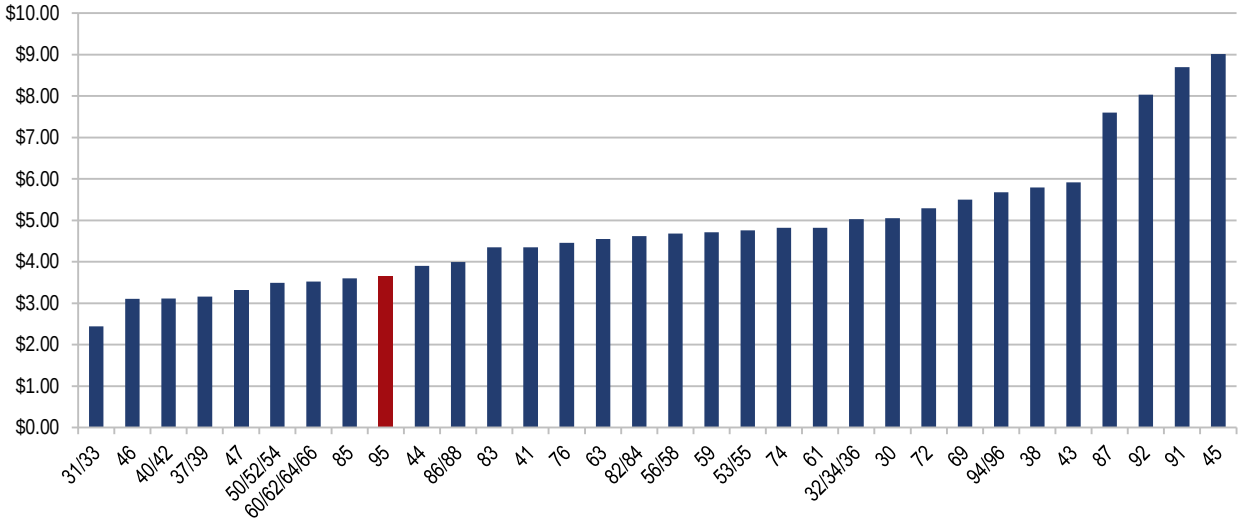
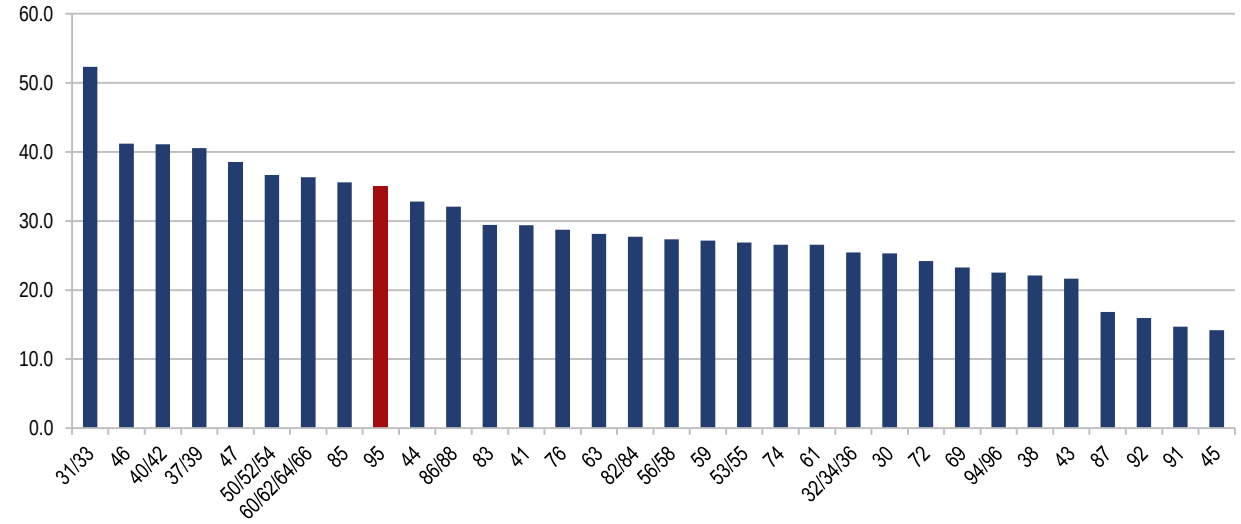


FIGURE 18 | WEEKDAY PASSENGERS PER REVENUE HOUR



SERVICE IMPROVEMENT OPTIONS

Route 95 is a radial route connecting downtown Hartford with East Hartford and Glastonbury. The route has moderate to high ridership, and performs well throughout the week.

Despite good ridership and relatively strong performance, Route 95 is extremely complex and likely could be a stronger performer with some improvements. The route has four published variants (C, H, P, and A) plus additional service variations based on time of day (e.g., service to the Glastonbury Industrial area). Although the variants are designed to reflect the needs of individual employment and activity centers along the corridor, the number of variations overly complicates the route. In addition (or potentially because of the service complexity), the printed schedule is difficult to read and understand, especially inbound. Some competition from Route 87 Brewer Street may exist, but Route 95 offers better frequency and travel times on the trunk alignment. With many of the variants adding significant time, the route likely competes mostly with car trips.

Service Improvement Options

Opportunities to strengthen the route include the following:

- **Eliminate all variants and operate on Main Street in East Hartford between Connecticut Boulevard and Hebron Avenue.** The unique portions of Route 95 variant service serve very little ridership overall and none of the individual alignments show enough demand to warrant fixed route transit service. Main Street is a strong transit corridor and consistent, direct service provides the best opportunity for CT***transit*** to optimize resources and increase productivity. Little ridership exists south of Glastonbury Center, and thus the route should terminate at Hebron Avenue.
- **Serve current deviations with flex or shuttle service anchored along Main Street.** Important destinations in East Hartford and Glastonbury, such as Glastonbury Industrial area and O'Connell Drive, that are currently along one of the four variants, may be best served by flex or shuttle services that would connect to Route 95 along Main Street. These types of services can provide door-to-door service to employers, schools, etc. in the area and would significantly simplify Route 95.
- **Maintain a consistent 30-minute frequency in both directions from 5:00 AM to 8:00 PM Monday through Friday and from 6:30 AM to 6:30 PM on Saturdays.** Midday service on Route 95 operates at a relatively consistent 30-minute frequency, but peak period service frequency varies widely. Even with the variations, peak period headways average out to only slightly better service at about 20 minutes. In consideration of Route 95's strong performance on Saturdays, which maintains a more consistent 40-minute frequency, weekday service would benefit from a more standardized schedule. Adequate demand on weekdays exists between 5:00 AM and 8:00 AM to maintain 30-minute frequencies all day. On Saturday, service hours can be shortened from the weekday by about 3 hours total to between 6:30 AM and 6:30 PM, but 30-minute frequencies are still warranted. While this schedule both improves and degrades service frequency on certain days and/or at certain times, riders will find the service much easier to use and more reliable, which have been shown to have a significant impact on ridership.
- **Expand Sunday service into downtown Hartford and operate on a 60-minute frequency.** Currently, parts of Route 95 and Route 94 are combined on Sundays and riders must transfer at Connecticut Boulevard and Main Street to go downtown. Route 94 ridership along Park Avenue is extremely low on Sundays. While ridership per trip on Route 95 is also fairly low on Sundays, absolute demand remains high. Removing service on Route 94 and taking Route 95

into downtown Hartford would likely provide a ridership boost. If possible, 60-minute frequencies during similar service hours could also help provide an additional increase.

- **Simplify Route 95's printed (hand) schedule.** Numerous variants exist in both directions that make the schedule difficult to read and comprehend. Often times, a single variant will have sub-variants that differ slightly, such as serving taking slightly different roads or ending at a slightly different stop and time than the schedule indicates. Other times, a trip will have no apparent variant assigned and serve a different set of stops entirely from any other trip. Removing variants and having 30-minute clockface headways will naturally improve the printed schedule.