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CONNECTICUT DEPARTMENT OF TRANSPORTATION

New Britain-Bristol Division Comprehensive Service Analysis

FINAL REPORT

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NELSON NYGAARD

IN ASSOCIATION WITH

AECOM

ASG PLANNING

JUNE 2018

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APPENDIX A
REVIEW OF PREVIOUS PLANNING STUDIES

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AUGUST 2016

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INTRODUCTION

Over the past ten years, a number of planning studies at the local and regional level have either directly focused on transit service in Central Connecticut, or have focused on related issues that can impact CT***transit***'s services and operations in the region. These documents provide context for the issues, challenges, and opportunities related to mobility in the New Britain/Bristol area.

The study team reviewed the following four documents that are directly relevant to the Comprehensive Service Analysis:

- Central Connecticut 2040 Long-Range Transportation Plan (2015 Minor Update)
- Central Connecticut State University Transportation Demand Management Plan (2013)
- Bristol Park-and-Ride User Survey (2012)
- Transit Development Plan for the Central Connecticut Region (2006)

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.

CENTRAL CONNECTICUT 2040 LONG-RANGE TRANSPORTATION PLAN (2015 MINOR UPDATE)

In 2015, the Central Connecticut Metropolitan Planning Organization (CCMPO) completed a Minor Update to the 2040 Long-Range Transportation Plan (LRTP) for Central Connecticut. The Plan lays out a broad vision for the region's transportation system through 2040, and includes a list of major improvements and upgrades to the region's transportation system for the next 25 years. These projects were all identified during the LRTP planning process as necessary to achieve the region's vision for transportation.

Major transit improvements in the Plan include:

- **Connect the region to the New York City, Stamford, Bridgeport, Waterbury, and Hartford areas.** Transit should be inter-regional. Extend the successful Bridgeport-Waterbury transit corridor through Bristol, Plainville, and New Britain to Hartford. Reconfigure local bus routes to fit service. *(Metro-North, CT**transit**)*
- **Run commuter rail along the New Haven-Hartford-Springfield corridor.** Reconfigure local bus routes to fit service. *(Amtrak, DOT)*
- **Rationalize local bus routes.** Eliminate detours and transfers where possible to improve system performance. *(CT**transit**)*
- **Use internet trip planning to improve usability.** Submit all transit routes in the region for inclusion and update. *(CT**transit**)*
- **Add signage to heighten visibility.** Post maps and schedules at time points or bus stops. *(CT**transit**)*
- **Intelligent transit system.** Improve transit and paratransit with technology. *(CCMPO, CT**transit**, contractors)*

The plan provides more detailed findings and recommendations for each of these improvements. For example, specific changes are noted under Bus Line Rationalization:

> **Rationalize local bus routes.** Despite changes in the region's economy and development patterns, CT***transit***'s New Britain/Bristol bus routes have only undergone minor changes. To improve service, capture operational efficiencies, and boost ridership, this Plan therefore calls for a thorough review of all bus routes in the system.
>
> *Improvements: Transfer Eliminations*
>
> - *Bristol-New Britain-Hartford direct service*. This is a critical need for the region, and the New Britain-Hartford Busway service plan as of writing calls for direct, frequent bus service between

downtown Bristol along the new Route 72 extension to New Britain and via the busway to Hartford.

- *New Britain-Middletown direct service*. Poor scheduling and transfers make travel via bus on the busy Route 9 corridor excessively arduous. Analysis undertaken for the Busway service plan suggests that direct bus service between New Britain and Middletown is feasible.

Improvements: Service Expansion

- *Waterbury-Bristol-New Britain-Hartford*. Congestion on area roads between these points, including I-84 and Routes 6, 72, and 229, indicate high potential demand for transit service. The New Britain-Hartford Busway should address this problem on I-84 west of Hartford. For longer-haul travel, and all travel west of New Britain, further bus, rail, or other transit services may be necessary to meet these needs.
- *Southington*. Explosive growth in housing as well as commercial and industrial properties has transformed Southington into one of the larger population and employment centers in Greater Hartford. This has contributed to increasing congestion, as there is no transit service in Southington aside from commuter express bus. Transportation options are necessary to alleviate this, as is fostering responsible land use practices (e.g. transit-oriented development).
- *Plymouth*. Terryville is a densely-populated village just across the city line from Bristol. The village has high levels of low-income and mobility-challenged households, as well as strong economic ties to the east, which congestion on Route 6 bears out. This Plan recommends that bus and/or rail be extended to the village. This service could consist of an extension of the busway's Bristol shuttle, a stop on the Integration with New York project, or something else altogether.
- *East and north of Hartford*. The New Britain-Hartford Busway is slated to terminate in Hartford. Yet much of the region's traffic does not end in Hartford but continues to points beyond. To give these persons an alternative to driving, and to boost the speed, reach, interconnectedness, and overall utility of the transit system, some buses on the busway should continue to destinations farther afield (e.g. Bradley International Airport, and major economic and activity areas in Windsor, East Hartford, Manchester, and Vernon/Rockville). Buses to and from many of these locations would be able to operate in the HOV lanes along I-91 north and I-84 east of Hartford.

CENTRAL CONNECTICUT STATE UNIVERSITY TRANSPORTATION DEMAND MANAGEMENT PLAN (2013)

Central Connecticut State University (CCSU) serves more than 12,000 students and employs more than 1,700 staff and faculty members. As a major destination and trip generator in central Connecticut with a high rate of automobile commuting, it also contributes to congestion in the region. The Central Connecticut Regional Planning Agency (CCRPA) prepared a Transportation Demand Management (TDM) Plan for CCSU, with work beginning in the summer of 2012.

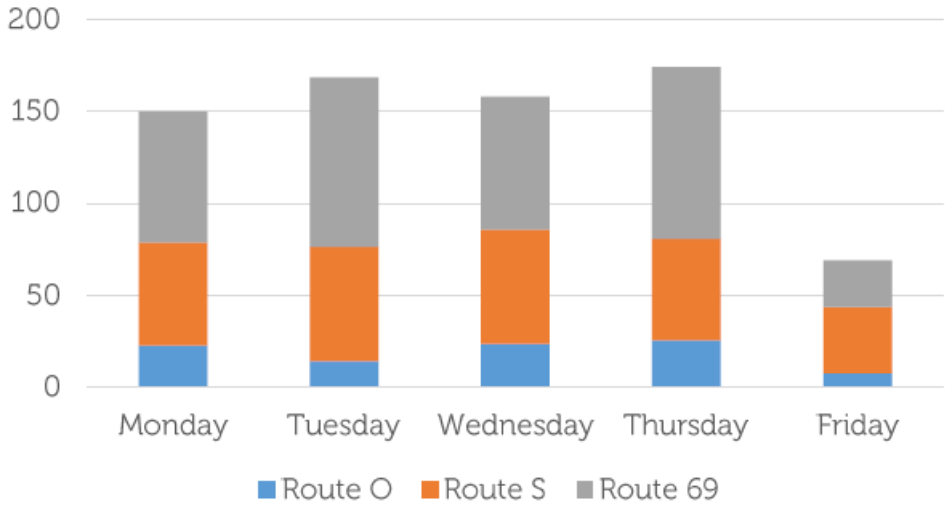
As part of the plan, CCRPA assisted with several studies and initiatives, including a study of shuttle and bus ridership and the introduction of a UPass program. The plan's transit recommendations focus on transit passes and infrastructure, with the goals of lowering costs, increasing information about transit options, and installing supportive infrastructure.

Bus Study

CCRPA staff conducted a study of ridership on CT***transit*** routes serving CCSU. Transit service at CCSU is provided by CT***transit*** Hartford Division Route 69 and CT***transit*** New Britain-Bristol Division Route O and Route S, in addition to a campus shuttle. Based on the transportation preference survey completed prior to this study, only 4% of CCSU students report taking the bus on a regular basis, and the same is true for only 2% of faculty and staff. Findings of CT***transit*** service ridership include the following:

- During a typical week, 11-14% of riders board the Route S bus at CCSU; between 5% and 8% of riders alight at CCSU. On Route O, just 4-8% of riders board, and 7-10% of riders alight, at CCSU. On the Route 69, however, 8-17% of riders get on and 11-17% alight at CCSU.
- Ridership is relatively spread out during the week. The most popular days to ride the bus are Tuesday and Thursday, with Monday and Wednesday following close behind. Fridays see few riders as there are few classes offered.
- The study team compared actual and scheduled arrival times to assess on-time performance. Both Route O and Route 69 were found to be fairly reliable. Route S demonstrated lower on-time performance, but this appeared to stem from ridership patterns and frequent stops: although both Route S and Route O operate as "flag down" routes, Route S made 22% more stops per mile than Route O buses.

FIGURE 1 | CT*TRANSIT* BOARDINGS AT CCSU BY DAY (CCRPA RIDERSHIP STUDY)



The study team also evaluated the campus shuttle service. The shuttle offers a limited amount of service (six trips per day), and service does not correlate with class schedules on campus. As a result, the shuttle misses peak class times when the most students need to reach campus. Key findings about the campus shuttle include:

- The shuttle carried an average of 115 unlinked trips per week. Assuming that students use the shuttle to complete a round trip, there are 58 round trips made by students each week.
- The shuttle costs approximately $20 per ride. This is significantly higher than the cost of providing a trip through the UPass program, which would cost the university $0.85 per trip.
- The shuttle has a much faster route between downtown Hartford and CCSU as compared to Route 69. It takes the shuttle 15-20 minutes to arrive on campus, while Route 69 takes approximately 40 minutes due to higher ridership and more frequent stops.
- Shuttle service was frequently unreliable, and often ran far behind schedule or departed from campus earlier than scheduled. The team determined that the driver altered the shuttle schedule based on their experience of the route. According to the findings, "The driver had given their cell phone number to the students who regularly ride the shuttle in case they wanted her to wait or to find out if it was running late."
- The route and stops were also not always consistent. During the study, there were many instances when these stops in downtown New Britain or Westfarms Mall were skipped over unless the driver was specifically asked to stop there.

Transit Recommendations

One of the most significant recommendations is the implementation of a UPass program, which provides interested CCSU students with an unlimited bus pass good for travel on all CT***transit*** fixed-route services. CCRPA facilitated a meeting between CCSU and CT***transit*** in the spring of 2013, which resulted in an agreement to implement the UPass program. The university would pay $0.80 per ride (instead of the full fare price at the time of $1.30), and would be responsible for paying no more than $65,000 per year (the current annual cost of CCSU shuttle service). Students would pay a fixed fee per semester to obtain a swipe card. Looking ahead, additional transit pass recommendations include:

- Expanding the UPass program to make more students eligible

- Selling transit passes at a location on campus (especially for faculty and staff)
- Continuing to collect and evaluate transit ridership data on an ongoing basis

The plan also includes infrastructure recommendations, primarily related to signage and information about bus service on campus. These recommendations include:

- **Install and maintain bus stop signs around campus:** At the time of the plan's release, CT***transit*** New Britain/Bristol routes ran as "flag down" services without fixed bus stops. The plan recommended installing signs around campus to make the system more visible to potential users.
- **Install and maintain information displays at bus shelters:** Two bus shelters were located near the CCSU campus at the time of this plan, on Stanley Street (served by CT***transit*** Hartford Route 69) and in front of Davidson Hall (served by the CCSU campus shuttle). Schedules, route maps, and information about transportation options should be posted in both shelters.
- **Install and maintain bus shelters around campus:** The Davidson Hall shelter serving the campus shuttle should be transferred to CT***transit*** as the university planned to phase out shuttle service, and maintained as a designated bus stop. Another appropriate location for a shelter was recommended at the existing stop on Paul Manafort Drive in front of Charter Oak State College.
- **Work with partners to develop a drop-off point in front of the student center:** Having a bus shelter in this area would dramatically improve the visibility of the system and convenience for riders. This stop could only be used by Route 69, operated by the CT***transit*** Hartford division. A drop-off point just to the east of the student center had been identified by the current bus operator and is currently used for chartered buses.

FIGURE 2 | IMPLEMENTATION OF TDM PLAN TRANSIT ACTIONS

ACTION	TIMEFRAME	PARTNERS	COST
Transit Passes			
Fully fund the UPass program	Short	CT***transit***, SGA	$0.85 per ride and less than $65,000 per year
Expand the UPass program	Medium	CT***transit***, SGA	Same as above
Sell transit passes on campus	Short	CT***transit***, Student Center, RECentral	N/A
Continue to assess transit ridership	Ongoing	CCRPA, CT***transit***	TBD
Infrastructure			
Install and maintain bus stop signs around campus	Short	CT***transit***, CCRPA	Already funded by CCRPA
Install and maintain information displays at bus shelters	Short	CT***transit***	<$100 per shelter
Install and maintain bus shelters around campus	Medium	CT***transit***	$15,000 per shelter installation
Work with partners to develop a drop-off point in front of the student center	Medium	CT***transit***, New Britain, CCRPA	Staff time (CCRPA and CT*transit*)

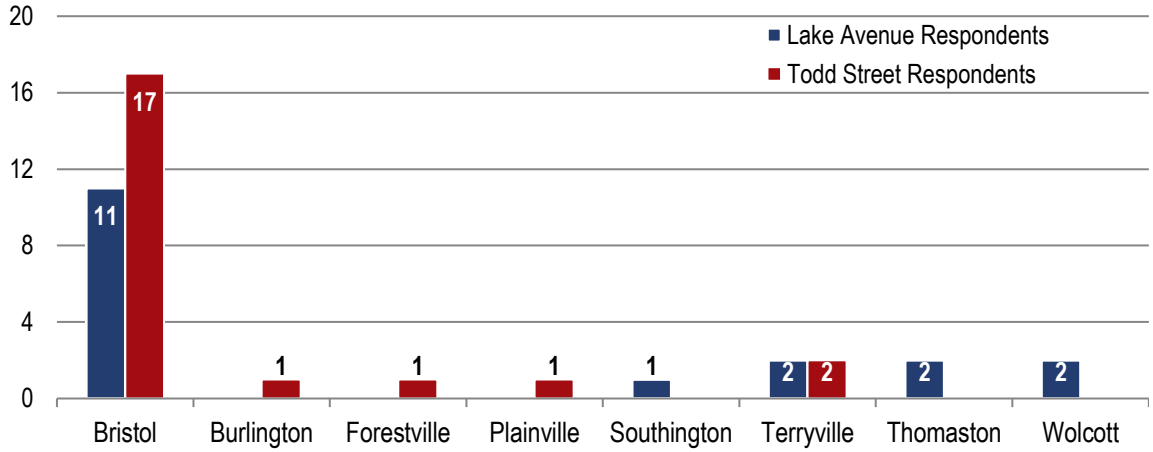
Short = within a year; Medium = within 3 years; Long = more than 3 years

BRISTOL PARK-AND-RIDE USER SURVEY (2012)

In May 2012, the Central Connecticut Regional Planning Agency (CCRPA) conducted a survey of riders at the Lake Avenue and Todd Street park-and-ride lots in Bristol. The survey was conducted to determine possible interest in having a park-and-ride lot located in Downtown Bristol, and asked respondents about their likelihood to use park-and-ride lots at different potential locations. CCRPA conducted the survey in support of an application for federal Congestion Mitigation and Air Quality (CMAQ) funding to provide new commuter express service to Plymouth, west of Bristol.

A total of 40 respondents at both park-and-ride lots completed the survey. All respondents were riders on CT***transit***'s commuter express services to and from Hartford. Most respondents indicated that they began their trip in Bristol (see Figure 3). However, some respondents at the Lake Avenue lot indicated that they came from Terryville, Southington, Thomaston, Wolcott, and Southington. Respondents at the Todd Street lot also came from Terryville (Plymouth), Burlington, Forestville (Bristol), and Plainville.

FIGURE 3 | RESPONDENTS' TOWN OF ORIGIN, AT LAKE AVENUE AND TODD STREET LOTS

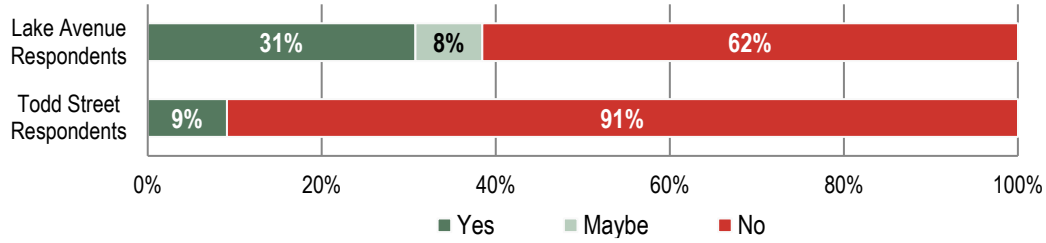


Respondents also indicated their interest in potential park-and-ride lots in Terryville, Bristol's West End, and Downtown Bristol. Interest in a Terryville lot was relatively low, with 62% of Lake Avenue respondents and 91% of Todd Street respondents indicating they would not use it (see

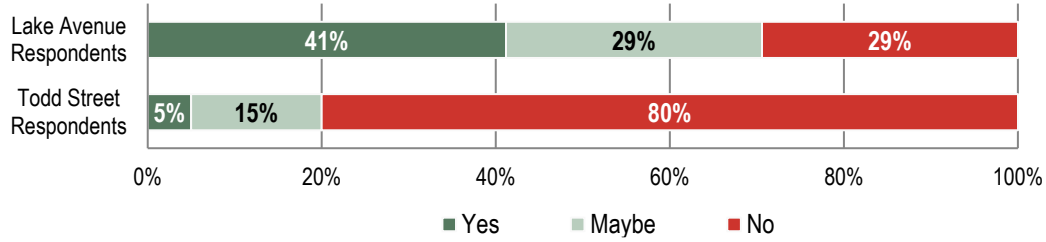
Figure 4). Interest in a West End lot was higher, particularly among respondents currently using the Lake Avenue lot. Interest was highest in a potential Downtown Bristol lot, with 89% of Lake Avenue users and 35% of Todd Street users responding “yes” or “maybe” to whether they would use it.

FIGURE 4 | RESPONDENTS' INTEREST IN POTENTIAL PARK-AND-RIDE LOTS

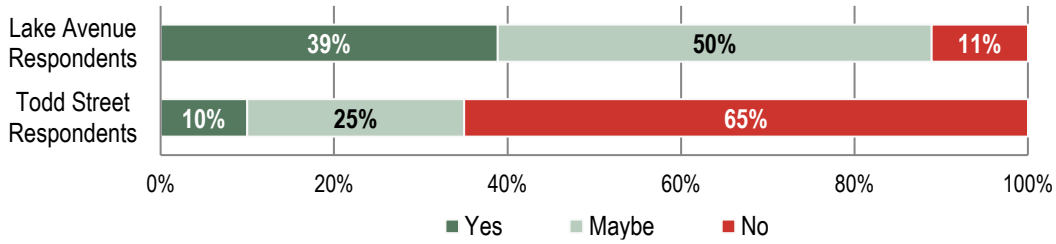
*If a future park-and-ride lot was offered in **Terryville**, would you use it?*



*If a future park-and-ride lot was offered in **West End Bristol**, would you use it?*



*If a future park-and-ride lot was offered in **Downtown Bristol**, would you use it?*



TRANSIT DEVELOPMENT PLAN FOR THE CENTRAL CONNECTICUT REGION (2006)

The Transit Development Plan for the Central Connecticut Region (TDP) was prepared by the Central Connecticut Regional Planning Agency (CCRPA) in 2006. The TDP provides a synthesis of the Agency's efforts to encourage a more balanced mix of mobility options within the Central Connecticut region, and presents many recommendations resulting from input from the public, agency members, municipalities, agency staff, and other regional transit stakeholders. Recommendations from related reports that have not yet been implemented are also included in this list.

Recommendations specific to bus transit in the region include:

- Connecticut Department of Transportation (CTDOT) should investigate the consolidation of the New Britain and Bristol fixed routes that are operated by New Britain Transportation Co. to reduce required administrative efforts which could allow for a lower subsidy.
- CTDOT, NBT, DATTCO, CCRPA and local transportation commissions/groups should continue to cooperate in order to maximize transit use.
- Future bus purchases should consider small buses for the Bristol fixed routes, with savings realized on the initial capital expenditure for replacement buses.
- A comprehensive Transit Marketing Program is needed to stimulate ridership. This program will be administered by the CCRPA using FTA Planning funds.
- Install bus route and transfer point signs with a 'theme' that allows for ready identification and ease of use. This can be funded through transit maintenance and/or marketing funds.
- Publicize the existence of commuter lots in the Region, especially the lots with express bus service.
- A schedule of bus shelter cleaning and maintenance should be established to help maintain existing ridership and encourage new ridership. CCRPA is willing to work with the municipalities to assist in establishing this schedule.
- The CCRPA strongly urges CTDOT to increase transit funding to the Central Connecticut Region and statewide. In addition to operating subsidies, CTDOT and CCRPA should seek funds for demonstration projects that have the potential to boost ridership and lower the per passenger subsidy.
- Commuter buses would also require coordinated scheduling to coincide with Busway operations.
- The majority of central Connecticut bus routes are recommended to become collectors; that is, they would actually run on the designated Busway line to Hartford at some point on their circuit.
- All bus stops should link riders to extensive sidewalk networks, not isolated sites with nonexistent or very limited sidewalk extent.

- Utilize the New Britain to Hartford Busway as the focal point of the region's public transportation system.
- Expand Commuter Express service beyond the AM and PM peaks.
- Recognize the Downtown New Britain Busway Station as the Transit Center, or major hub, for the Region, linking a variety of transportation modes together.
- Establish smaller satellite stations for the Busway in Downtown Bristol, at the Berlin Train Depot, and at the proposed Lake Avenue (Bristol) park-and-ride lot as points where several transportation modes converge, especially pedestrian modes.

Among these recommendations are several actions that the CCRPA will take, including:

- Utilize the Transit Enhancement Program and other sources to provide route signage with strip maps and informational kiosks at modal transfer points.
- Publish bus routes and schedules in a variety of community publications and the agency website.
- Submit community proposals for shelter replacement through the Transit Enhancement Program in cooperation with municipalities.
- Request review of the flag-down system versus the designated stop system, especially as it relates to safety.
- Remind municipalities to clear snow and ice and maintain sidewalks in the proximity of bus stops.
- Request an in-depth investigation into the feasibility of creating feeder routes to supplement the existing fixed-route system, to include demonstration projects, and to identify sources of short- and long-term funding and creative alternatives for establishing an auxiliary route for the towns of Plymouth and Southington.
- Request a feasibility study to identify the benefits and obstacles to system connectivity and creative solutions to provide transit access to the Waterbury area.
- Research, develop and distribute bus passenger security information and guidance.
- Seek to expand service to those areas with high concentrations of people lacking automobile access.
- Seek to expand the service span.
- Seek to increase service frequency.
- Seek to establish realignment of service days and hours of present fixed-route systems to match the Busway, including 30 minute headways on weekdays at peak hours, which would require additional buses.

APPENDIX B
PUBLIC COMMENTS

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PUBLIC COMMENTS

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PUBLIC COMMENTS

Below are the individual comments collected at public meetings and rider information sessions, as well as follow-up comments received during each round of public involvement.

COMMENTS ON POTENTIAL SCENARIOS (SPRING 2017)

April 2017 Public Meetings and Rider Information Sessions

- I take both Route 502 and CT***fastrak*** Route 102, whichever one comes first.
- Service in Plainville would be good
- No need to serve Bristol Hospital after 8 PM (when visiting hours end).
- Cutting Route 502 makes sense, can put that money elsewhere.
- New senior housing on Route 69 in Bristol, as well as low-income residents.
- Lots of housing off of Burlington Avenue.
- Dislike having to transfer from Route 543 to Route 541 to get anywhere. Extending Route 541 to Gaylord Towers is great.
- Timed transfers/coordination in Bristol (Routes 102, 541, 543)
- Service to Southington would be great.
- Use both Routes 502 and 102. Prefer CT***fastrak***, but take whatever comes first.
- Prefer Route 541 in Scenario 1 (traveling directly along Farmington Avenue instead of deviating)
- Having Route 102 only instead of 502 makes sense.
- Route 541 to Unionville would be great.
- More direct Route 503 (new Route 502) is good, instead of going through the neighborhoods (Scenario 1).
- Provide real-time information.
- New Routes 503 and 505 would save time.
- More direct Route 502 to TCC and more direct 541 on Farmington Ave to TCC would be good.
- More direct service to TCC would be great (new Route 502 in Scenario 1).
- Like proposed Route 510, makes sense that it should serve Berlin Turnpike.
- Route 510 schedule is tight today.
- Route 509 is always late.
- Route 510 to Berlin Turnpike and Walmart would be good. Splitting 512 into two routes is a good idea.
- More direct Route 507 is good.
- Route 509 takes too long and makes no sense

- Route 510 to Berlin Turnpike, common sense for the route to go out there.
- Move buses on Bank Street closer to the New Britain CT***fastrak*** station.
- Sell passes at the CT***fastrak*** station.
- Take Route 102 to get from New Britain to Bristol, and only take Route 502 if missed the 102.
- Routes should run on the same street in both directions. It's hard to know where the stop is or which one to wait at.
- Route 505 is too confusing to figure out how to use. I tried to use it once and gave up.
- Long waits between buses.
- More direct service to/from Slater Road would be nice.
- Route 501 via Farmington Avenue/Berlin Turnpike would be good.
- More direct Route 510 and service to Berlin Turnpike.
- Go to Southington/Queen Street, where the jobs are.
- Run more frequent service on Route 505.
- Need real-time information for New Britain buses.
- Prefer Southington service in Scenario 2. Extend south into Plantsville. Residents with disabilities, older adults. Serve Arc of Southington.
- Serve commercial areas in Southington along Route 10: Walmart, Price Chopper, Shop Rite
- Calendar House provides transportation (5310) – dial-a-ride
- NO other town in the state has a greater transit need than Southington.
- Interest in knowing what goes into the cost of service and where resources would come from.
- Southington's Commission on Disabilities did a survey and respondents identified transportation as their top challenge/issue.

Additional Comments Received

- Please continue to serve the Bristol Senior Center.
- Consider also serving the Plantsville Park-and-Ride with the new Southington Route.

COMMENTS ON DRAFT PREFERRED SCENARIO (WINTER 2017/2018)

December 2017 Public Meetings

- There are issues with congestion at the intersection of Main Street/West Main Street/Route 10 in Southington.
- Consider extending Route 542 to serve the Plantsville Park-and-Ride.
- Demand-response service is a good idea; look at "Go Go Grandparents" third-party vendor for Uber.
- Continue to operate Route 501 on Chamberlain Highway.
- Sell more types of tickets/passes at New Britain CT***fastrak*** Station.
- Provide restroom facilities at New Britain CT***fastrak*** Station?
- Route 512: Like that it would be more frequent than 90 minutes, and making the route symmetrical.

- Coverage in west end of New Britain?
- Route 501 is always late from Meriden, frequently miss connections in New Britain. Midstate Medical was added later – was schedule adjusted accordingly?
- Meriden service schedule is not coordinated with Route 501.
- Transfers in downtown New Britain are tight, a bit far to go between buses in a very short time.
- Post schedules at bus stops.
- Smartcards for fare payment? CTDOT is currently testing these.
- Can Route 501 deviate to serve municipal buildings?
- Day pass/24-hour pass option?
- There is a Healthtrax facility in Bristol (842 Clark Ave) that is widely used by persons with disabilities. There is a need for at least paratransit service there.
- There is a need to consider the increase/decrease in paratransit coverage area when discussing cost neutrality.
- You should look at connecting the Southington route to the park and ride lot.
- There is a need for travel training for elderly riders.
- Concern about buses turning at the Main/West Main intersection in Southington.
- You should look at actual dollar costs, not just percentages.

Additional Comments Received

- My grandson lives in New Britain and works in Southington. He does not have a car and recently lost his steady ride into Southington. He now has to use Uber at a cost of around $24 round trip. That is a huge expense for someone making minimum wage. If he had bus transportation from New Britain to Plainville and then Southington, he would save a substantial portion of his paycheck.
- Currently there is no public transportation in Southington to integrate the town into a connected transit network. I have lived in Southington for 65 years and I know many individuals who cannot seek employment in their careers because they cannot get to work. Without some form of affordable transportation these individuals, who cannot drive, are unable to sustain employment. We need bus transportation to enable our citizens to take part in activities outside our town whether it be employment or social/ cultural activities.
- As the retired former Director of Guidance and School Counseling at Southington High School, I was elated to read in today's Hartford Courant that bus service in Southington is being considered. Over the fourteen years working with adolescents in Southington I can recall many, many incidents where young people from lower income brackets could not access job opportunities on Queen Street or attend after school evening events at the high school because of lack of transportation. I always worried also when I learned of students walking in this high traffic area where there are no sidewalks. Teenagers living in the limited affordable housing located around the periphery of Queen Street from the Plainville town line to the Plantsville section of Southington without their own automobiles could not access jobs unless they chose to walk along this extremely dangerous high traffic area without sidewalks. Bus service would greatly benefit many teenagers of Southington. Thank you for this consideration.
- I believe cost efficiencies associated with deleting the redundancy of the 502 and 102 routes is a significant benefit offered by any phase of the Plan. Ridership projections are an uncertainty and that may warrant caution. A jump to phase 3 directly (which is my preference) might result in limited ridership and a reduced cost benefit ratio. I am an avid supporter of access via bus line

into downtown Southington. I think the draw of retail and medical services along the Southington portion of Rte. 10 will help to support strong ridership here.

- The realignment of the route to Tunxis is very good, providing faster service for students from New Britain center. The 503 is too long a route, as you know. Care has to be taken for a timely connection from the new 502 to head to Unionville Center, with little waiting.
- Please expand CT***transit*** bus service in the Southington area along Main Street, Queen Street, and West Street via Route 542. Also, please expand CT***transit*** bus service in the Bristol area between Downtown Bristol and the Tunxis Community College Campuses located in Farmington and Unionville.
- The Phase 1 portion of Route 542 would be VERY beneficial to me and keeping my job.
- Service along West Street in Southington under Phases 2/3 would be very helpful for patients attending a dialysis center along this route.
- After attending the Public Meetings for CRCOG's Comprehensive Transit Service Analysis for the New Britain/Bristol Division of CT***transit***, NVCOG staff have the following comments:
  - Phase I: NVCOG staff applaud the new transit coverage to southeast Bristol, particularly the direct service to Bristol Hospital and ESPN, two of the largest employers in the NVCOG region, and to Huntington Woods, one of the Environmental Justice communities for the NVCOG region.
  - The simplified and improved service to the Farmington Avenue shopping destinations is also a welcome addition to the local bus system.
  - The proposed reduced service area south of Bristol's downtown is less beneficial, particularly considering the density and transit usage of the population in Bristol's West End. Future studies should analyze the comparative impacts of providing high-frequency service to shorter routes versus the current and proposed low-frequency services covering large areas.
  - Phases II & III: The proposed service expansion to Unionville is much appreciated. The extension of the 542 down into Southington, particularly towards the shopping centers along I-84, should also significantly help Bristol residents.
  - Paratransit Implications: The additions to the paratransit service area through Southington and to ESPN should provide new shopping, social, and medical opportunities to existing transit-dependent populations in Bristol. However, before implementing a shift reducing service to multi-family housing along Route 69, CTDOT and CT***transit*** should discuss whether it is feasible to maintain direct paratransit service to these locations.

COMMENTS ON DRAFT PREFERRED SCENARIO (SPRING 2018)

The DRAFT Final Report was made available for review and comment by CRCOG Transportation Committee and Policy Board members; study stakeholders and interested parties; and members of the public. The document was released on May 10, 2018, with comments accepted through June 13, 2018. CRCOG staff responded directly to each commenter, but no changes to the body of the report were made as a result of the comments received.

Comments Received

- As a Mobility Manager who fields a lot of complaints in the Southington area it was great to see plans for service. Especially for the ADA consumers. Any idea when something might go into effect?
- Looks good and from what I recall, the routes appear to be what was discussed. Again, my only concern for Plainville is scheduling, but it appears that good coverage is provided and linkages are well defined.
- The Southington Commission on Disabilities offered the following comments:
  - The plan to restore bus service to the Town of Southington falls short in that Phase I only provides service the northern end of Southington. Using West Queen Street to transit east to west from Route 10 (Queen Street) to West Street only provides relief to the underserved residents of a small portion of the Town. One of the original plans presented at a public forum at the Southington Municipal Center called for the bus to come into the center of town and cross east to west over West Center Street to West Street. At that meeting and subsequent public meetings suggestions were offered that the route should go to Plantsville and then over West Main to West Street. That suggestion has become your Phase II for Southington.
  - It would appear that if Phase II would not occur for some time a better Phase I approach would be the original proposed route over West Center Street to West Street. That route would only add an additional five (5) miles to the route and cover a significant portion of the Town. It would appear that the small addition to the proposed Phase I would better serve the residents of Southington and allow a greater number of disabled residents to have access to para transit services.
  - Phase 1 has been termed “budget neutral.” What is the cost differential to add Phase II? What is the projected time line for proceeding to Phase II should Phase I be initiated as proposed.

APPENDIX C
SURVEY RESULTS

Comprehensive Transit Service Analys

New Britain/Bristol Division

Public Outreach Survey Results

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

CTtransit

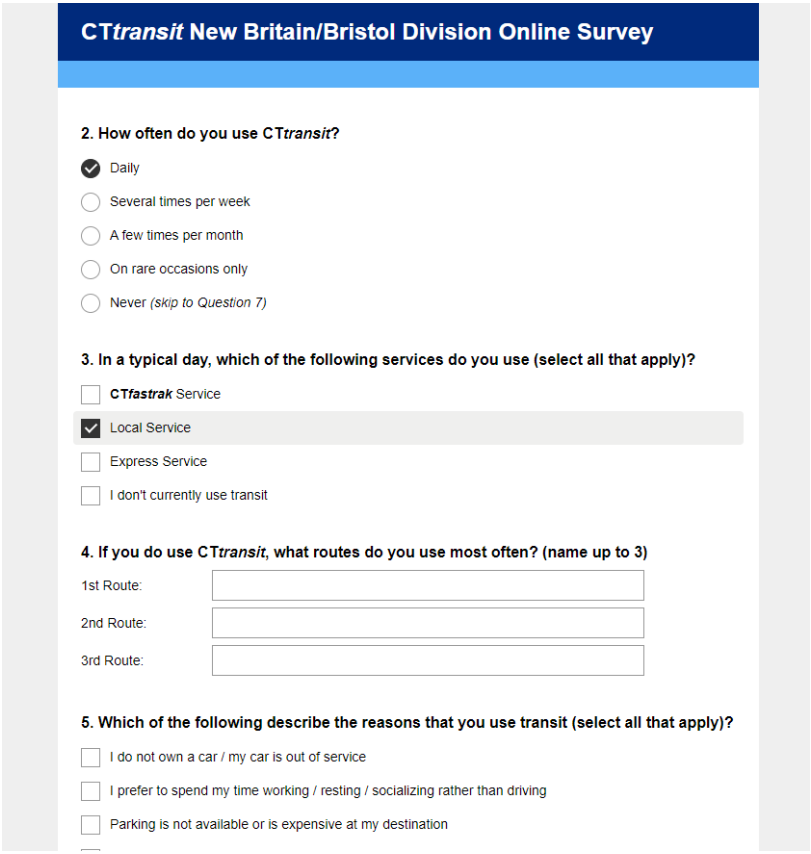
Overview

- About the Survey
- About the Respondents
- Transit Use
- Priorities for Improvements
- Attitudes about CT*transit*

About the Survey

- **Survey was open from March 24 to May 7, 2017**
  - Distributed at public meetings and outreach events
  - Available online on the project website
  - English and Spanish, with other language assistance available on request

- **Total Responses: 84**



CT*transit* New Britain/Bristol Division Online Survey

2. How often do you use CT*transit*?

- (●) Daily
- ( ) Several times per week
- ( ) A few times per month
- ( ) On rare occasions only
- ( ) Never *(skip to Question 7)*

3. In a typical day, which of the following services do you use (select all that apply)?

- [ ] **CT*fastrak*** Service
- [x] Local Service
- [ ] Express Service
- [ ] I don't currently use transit

4. If you do use CT*transit*, what routes do you use most often? (name up to 3)

1st Route: _____

2nd Route: _____

3rd Route: _____

5. Which of the following describe the reasons that you use transit (select all that apply)?

- [ ] I do not own a car / my car is out of service
- [ ] I prefer to spend my time working / resting / socializing rather than driving
- [ ] Parking is not available or is expensive at my destination

About the Survey

CTtransit CRCOG

CTtransit SURVEY

Please help CT*transit* improve bus service within the New Britain/Bristol Division by completing the survey below.

Sequence Number:

1. **How often do you use CT*transit* service?**
   - ☐ Daily
   - ☐ Several times per week
   - ☐ A few times per month
   - ☐ On rare occasions only
   - ☐ I do not use CT*transit* *(skip to Question 6)*

2. **In a typical day, which of the following services do you use (select all that apply)?**
   - ☐ CT*fastrak*
   - ☐ Local Service
   - ☐ Express Service

3. **What routes do you use most often (name up to 3)?**
   - 1st Route: _____
   - 2nd Route: _____
   - 3rd Route: _____

4. **Which of the following describe the reasons that you use transit (select all that apply)?**
   - ☐ I do not own a car / my car is out of service
   - ☐ I prefer to spend time working / resting / socializing rather than driving
   - ☐ Parking is not available or is expensive at my destination
   - ☐ Taking the bus is more affordable than paying for gas and car maintenance
   - ☐ Taking the bus saves me time compared to driving
   - ☐ To avoid driving in traffic congestion
   - ☐ I am doing my part for the environment
   - ☐ Other: _____

5. **What sort of trips do you make on CT*transit* (select all that apply)?**
   - ☐ Commuting to work
   - ☐ Commuting to school
   - ☐ Medical appointments
   - ☐ Recreational / social trips
   - ☐ Shopping or personal errands from home
   - ☐ Shopping or personal errands from work or school
   - ☐ Workday Business meetings or professional gathering
   - ☐ Other: _____

6. **What is your gender?**
   - ☐ Male ☐ Female

7. **What is your age?**
   - ☐ 13 or under ☐ 14-18 ☐ 19-25
   - ☐ 26-35 ☐ 36-64 ☐ 65 or over

8. **Which of the following best describes your employment status?**
   - ☐ Full-Time ☐ Part-Time ☐ Student
   - ☐ Retired ☐ Unemployed ☐ Other: _____

9. **Which category best describes your ethnic or racial background (select all that apply)?**
   - ☐ White ☐ Black/African American
   - ☐ Hispanic ☐ Native Hawaiian/Pacific Islander
   - ☐ American Indian or Alaskan Native
   - ☐ Do not care to respond
   - ☐ Other _____

10. **What is your Zip Code?**_____

11. **What is your approximate household income (optional)?**
    - ☐ Less than $25,000 ☐ $25,000-$44,999
    - ☐ $45,000-$64,999 ☐ $65,000-$84,999
    - ☐ More than $85,000 ☐ Do not care to respond

12. **Which of the following features would you find useful if provided by CT*transit* (select up to 3)?**
    - ☐ Real-time bus location information
    - ☐ Real-time roadway traffic information and alerts
    - ☐ Customizable service alerts for specific CTtransit routes, trips, and/or stops (as opposed to general service alerts that may not affect your specific route)
    - ☐ Integration with social media to share your trip information with friends and family
    - ☐ Video tutorial on all aspects of riding CTtransit (reading schedules, purchasing fares and passes, requesting a bus stop, loading and unloading bicycles, boarding with wheelchairs, etc.)
    - ☐ Other: _____

13. **How strongly do you agree with the following statements?**

	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
CT*transit* service is dependable	☐	☐	☐	☐	☐
CT*transit* routes get me where I need to go	☐	☐	☐	☐	☐
CT*transit* schedules meet my travel needs	☐	☐	☐	☐	☐
CT*transit* fares are reasonable	☐	☐	☐	☐	☐
CT*transit* buses are comfortable and well-kept	☐	☐	☐	☐	☐
CT*transit* staff is professional and courteous	☐	☐	☐	☐	☐
CT*transit* brochures (maps and timetables) are easy to understand	☐	☐	☐	☐	☐
CT*transit* website is easy to use and lets me quickly find the information I need	☐	☐	☐	☐	☐

Please see back for additional questions and comments.

14. **The following questions ask your preference. Please check ONE box per row only.**

MORE FREQUENT SERVICE - Increase service frequency, but operate for a shorter time frame.	☐ OR ☐	**LONGER SERVICE HOURS** - Decrease service frequency, but operate for a longer time frame.
MORE WEEKEND SERVICE - Provide less frequent weekday service in order to provide more weekend service.	☐ OR ☐	**MORE WEEKDAY SERVICE** - Provide less frequent weekend service in order to provide later or more frequent weekday service.
SERVE MORE DESTINATIONS - Buses running on more streets but less frequently than today.	☐ OR ☐	**PROVIDE FASTER SERVICE** - Buses running more frequently than today, but on fewer streets.
MORE NEIGHBORHOOD ROUTES - Provide neighborhood bus circulators that come close to my home and let me transfer to a major route.	☐ OR ☐	**MORE PARK AND RIDE LOCATIONS** - Provide more park and ride locations where I can park my car and transfer to a major route.
IMPROVE EXISTING SERVICE - Buses would come more frequently on existing routes.	☐ OR ☐	**SERVE NEW AREAS** - Extend service to areas currently without service.
MORE BUS STOPS - Provide stops near more destinations to minimize walking distance.	☐ OR ☐	**FEWER BUS STOPS** - Space stops further apart to speed up bus service.
REAL-TIME INFORMATION SIGNS - Provide real-time bus arrival information at major stops.	☐ OR ☐	**REAL-TIME INFORMATION APPS** - Provide real-time information about all routes on mobile apps.
MORE LOCATIONS TO PURCHASE FARES - Provide more locations where I can buy passes.	☐ OR ☐	**MOBILE PAYMENT APP**- Provide mobile payment app that lets me purchase my fare or pass on my phone.
IMPROVE FEATURES ON BUSES - Provide on-board amenities such as wifi, advanced fare boxes, smart cards, etc.	☐ OR ☐	**IMPROVE FEATURES AT BUS STOPS** - Provide curbside amenities such as shelters, benches, lighting, etc.

15. **If you do not currently use CT*transit* service, why not? Select all that apply.**
    - ☐ No service where I live
    - ☐ Can't get where I need to go
    - ☐ Doesn't run at the right times
    - ☐ Need a car for work
    - ☐ Not frequent enough
    - ☐ Takes too long
    - ☐ Not reliable
    - ☐ Other: _____
    - ☐ Makes me feel uncomfortable or unsafe
    - ☐ Hard to understand how to get where I need to go
    - ☐ I bike or walk most places

16. **What would encourage you to start taking transit, and for what types of trips would you want to use CT*transit* in the future?**

_____

_____

_____

Please provide any additional comments you have below.

_____

_____

_____

_____

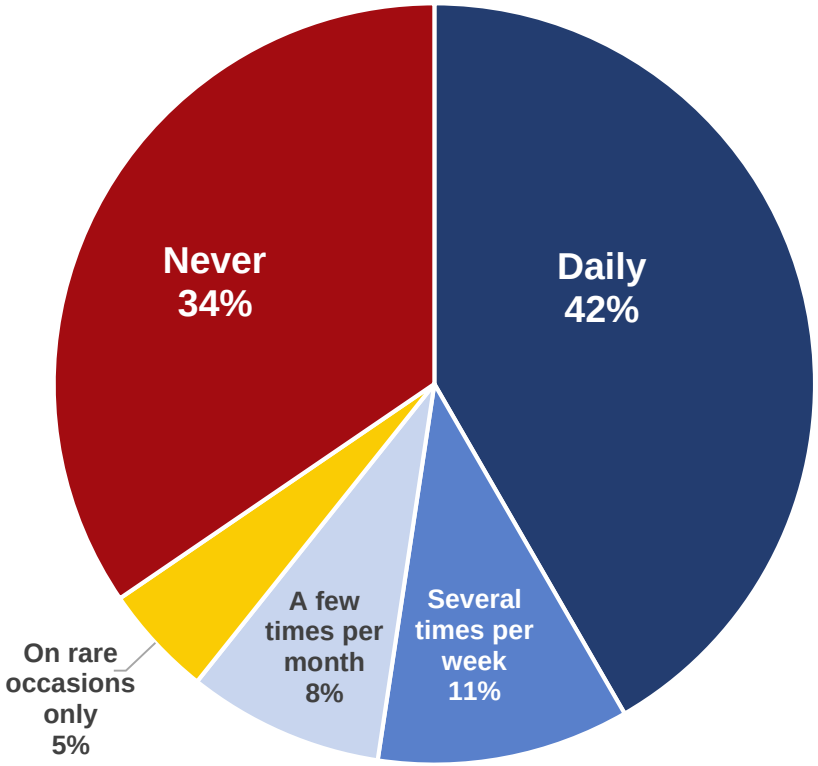
_____

Thank you for completing the CT*transit* Survey!

Your input will help us continue to improve the service.
Your responses will be kept strictly confidential.

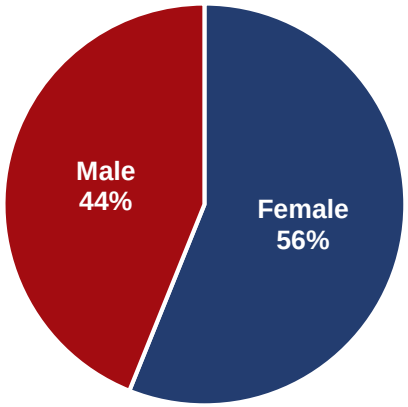
About the Respondents

How often do you use transit?

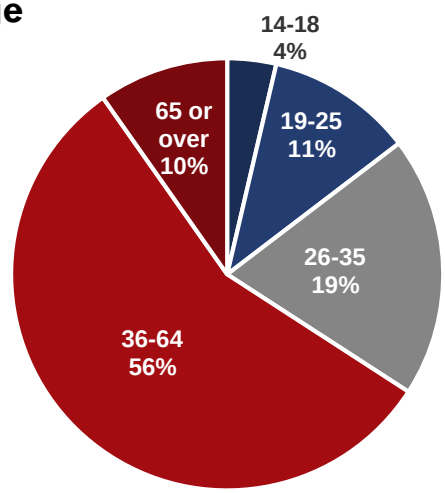


About the Respondents

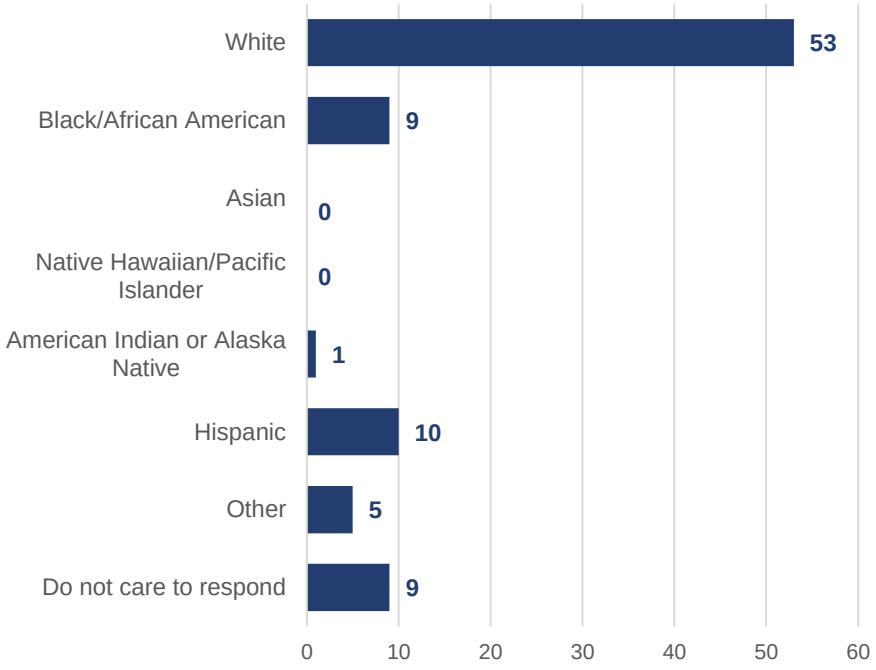
Gender



Age

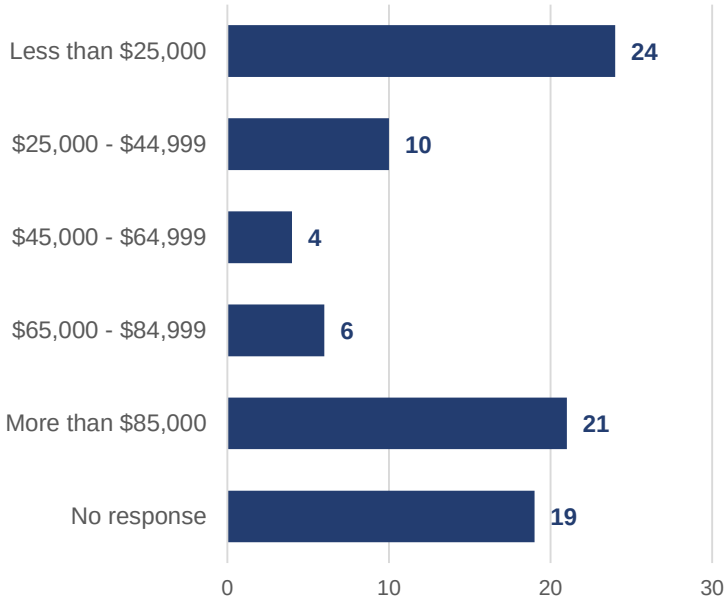


Race/Ethnicity

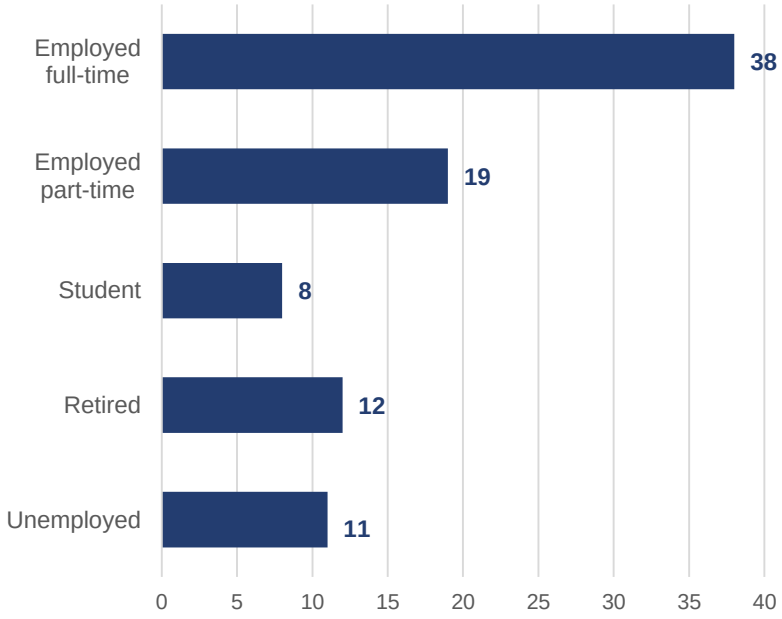


About the Respondents

Income

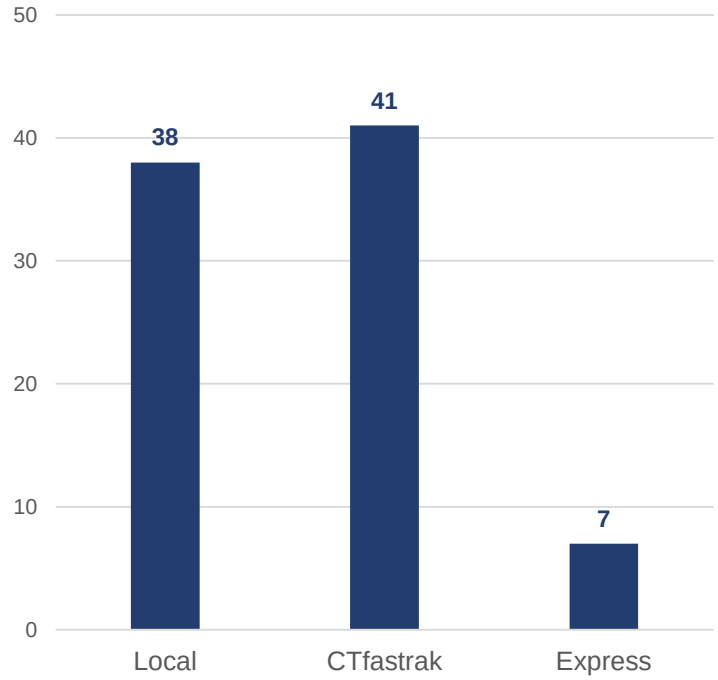


Employment Status

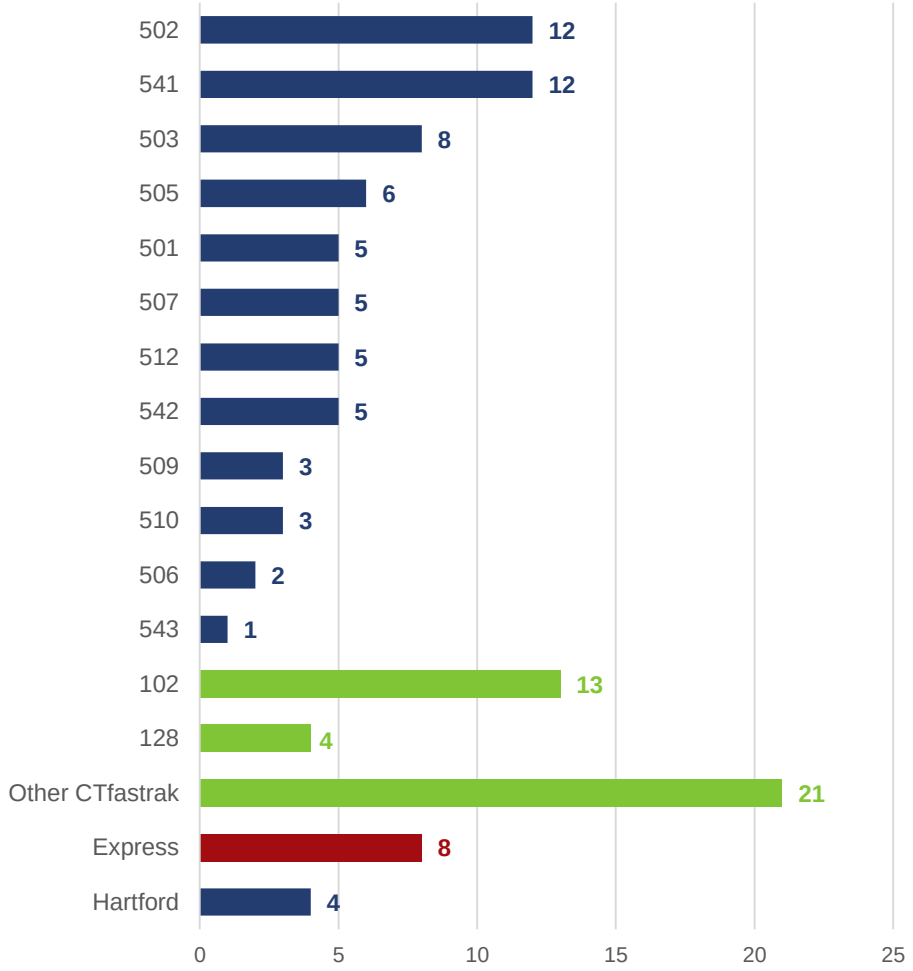


Transit Use

Which transit services do you typically use?

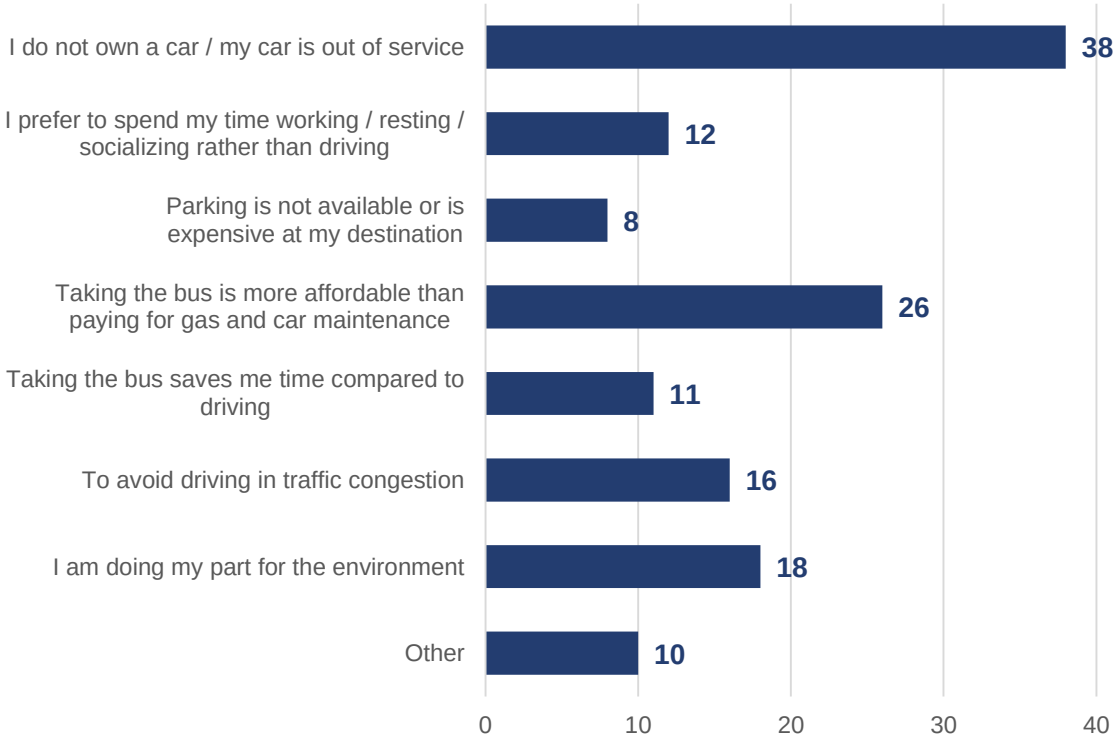


Which routes do you use most often?



Transit Use

Why do you use transit?

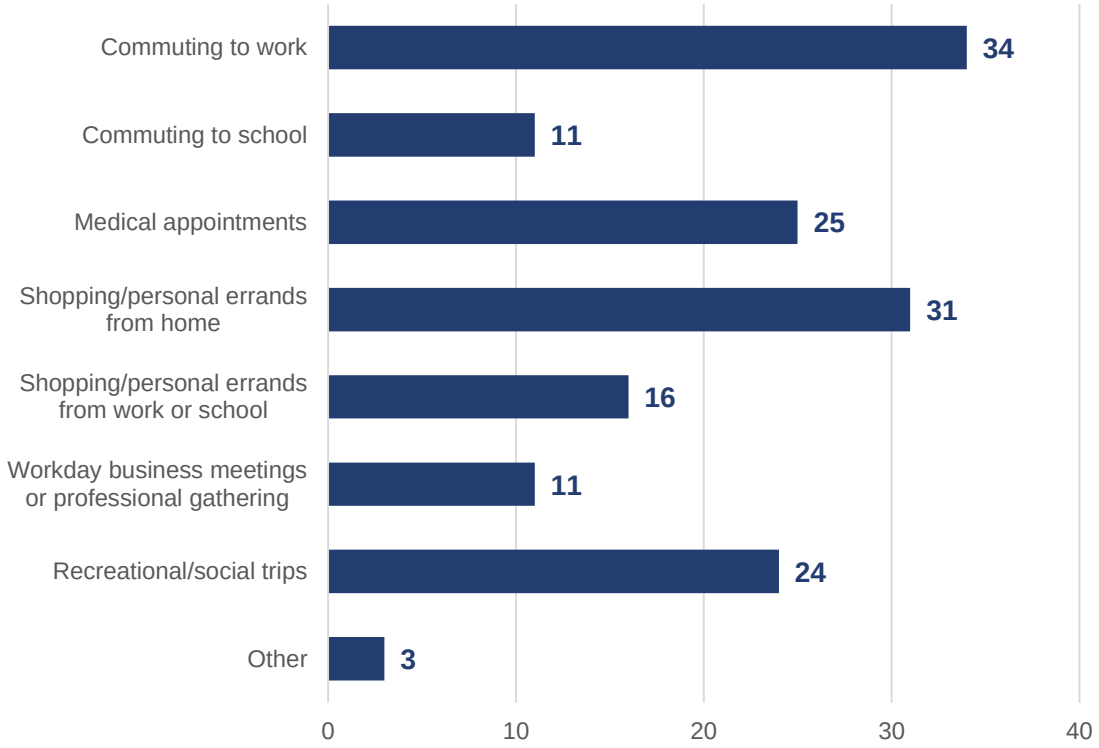


Other reasons include:

- Do not drive
- Do not enjoy driving/prefer to use transit
- Cannot drive due to disability
- Transit makes it easier to bike

Transit Use

What types of trips do you make using transit?

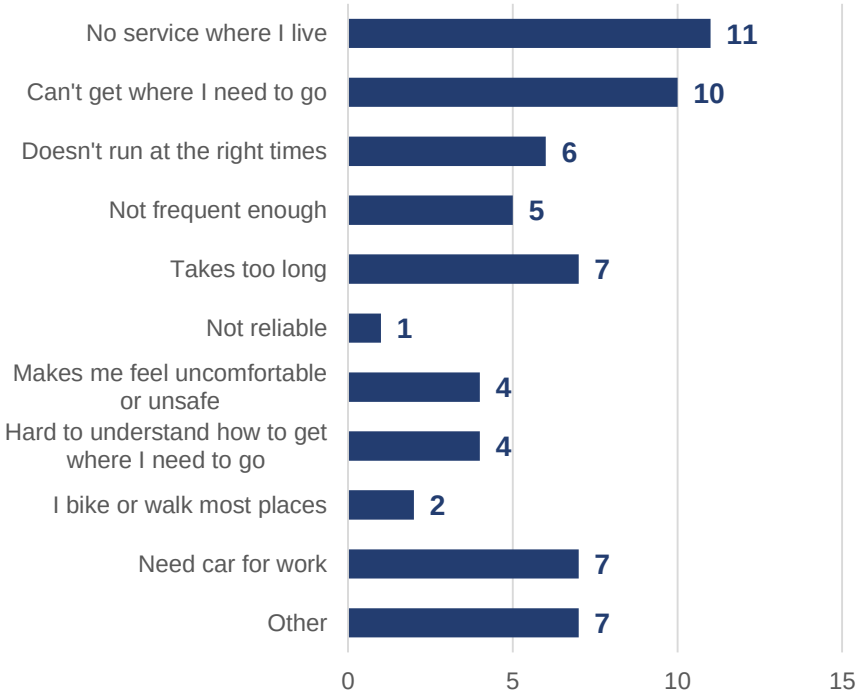


Other types of trips include:

- Church
- Other excursions

Transit Use

Why do you NOT use transit today?



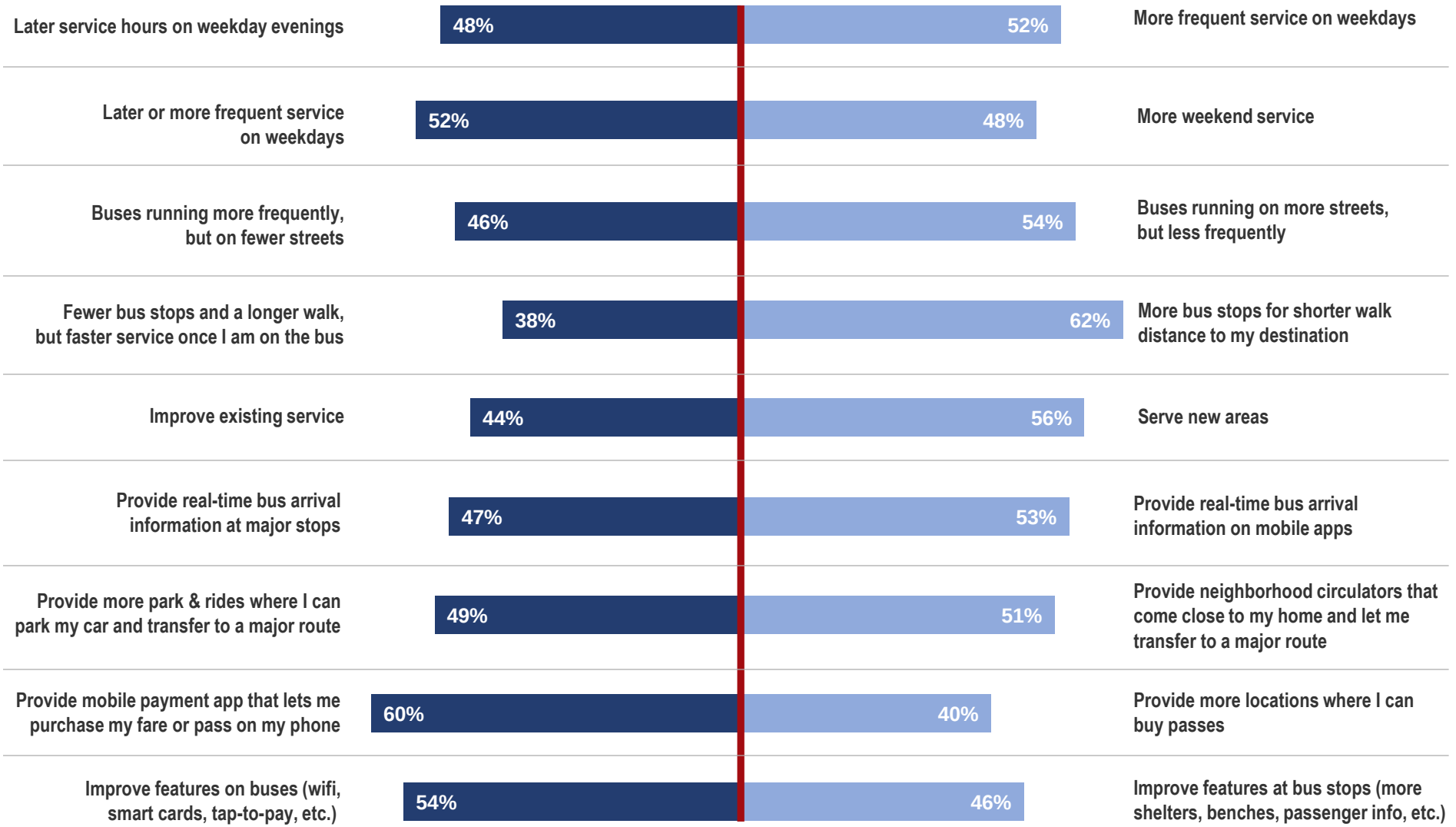
Other reasons include:

- Use ridehailing services instead (Uber, Lyft, etc.)
- Lack of signage/information about bus stop locations
- Prefer the convenience of personal vehicle

If you DO NOT currently use CT*transit* service, what would encourage you to start taking transit, and for what types of trips would you want to use CT*transit* in the future?

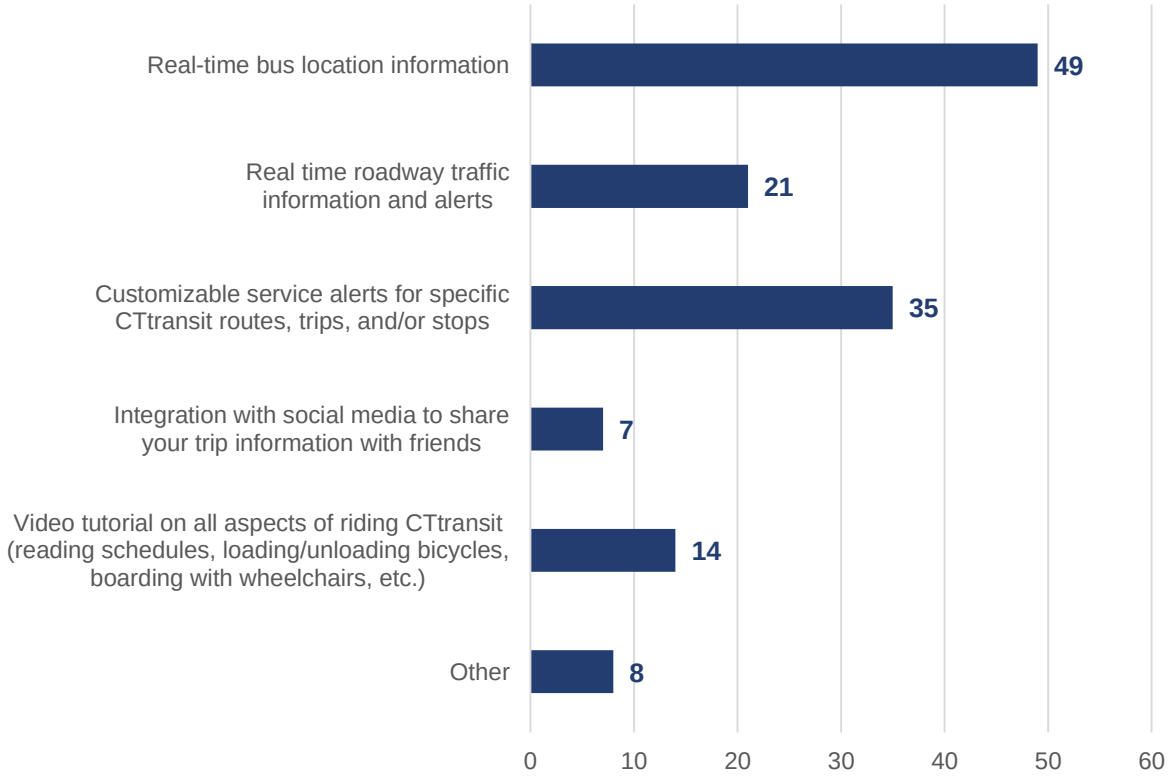
- Service in Southington
- More stops in southeast Bristol
- Better signage/information at bus stops about routes and destinations, schedule, etc.
- Would use if gas prices became high enough
- Would use for shopping trips, appointments, social trips

Priorities for Improvement: Tradeoffs



Priorities for Improvement: New Features

Which of the following features would you find useful if provided by CT*transit*?
(select up to 3)

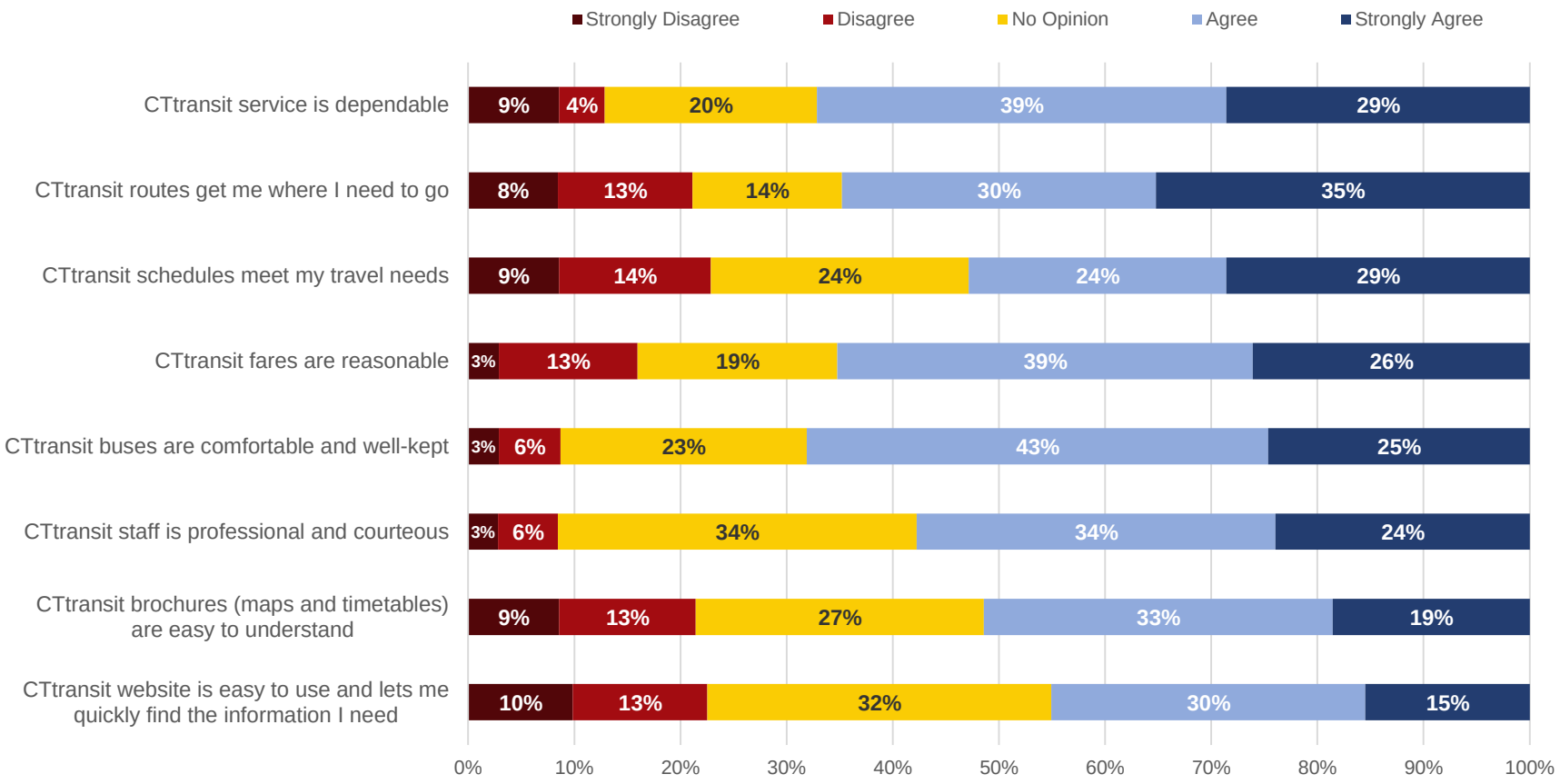


Other comments include:

- More shelters and benches at stops
- Signage and schedule information at stops
- More communication about delays
- Officers to patrol areas near stops for security

Attitudes about CT*transit*

How strongly do you agree with the following statements?



APPENDIX D
ROUTE PROFILES

Route Evaluation

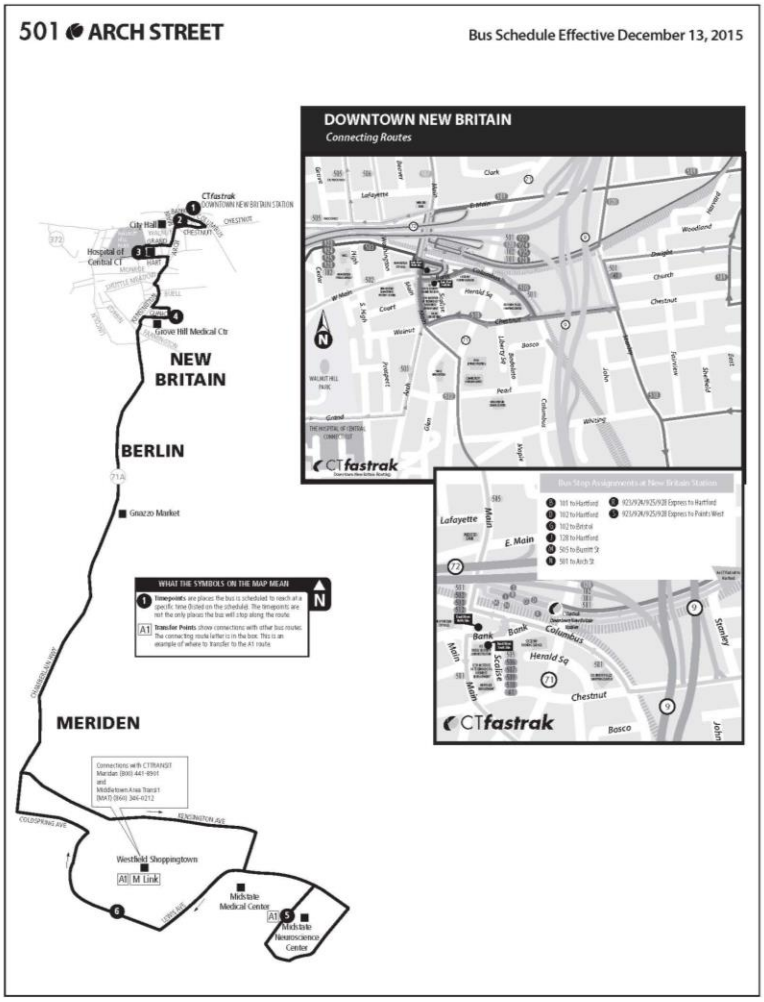
ARCH STREET

501 | Arch Street

Service Design

Route 501 is a radial route, providing service between the Downtown New Britain CT***fastrak*** station and Midstate Neuroscience Center in Meriden via Berlin. The route operates primarily on Arch Street, Kensington Avenue, High Road, and the Chamberlain Highway.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 501 begins/ends in downtown New Britain, where riders can transfer to nearly all other CT***transit*** routes serving New Britain as well as CT***fastrak*** for service onward to Hartford. In addition, Route 501 also has transfer opportunities at the Westfield Mall in Meriden to CT***transit*** Route A and Middletown Area Transit (MAT) Route M.

Transfer opportunities outside of downtown New Britain to the following routes are as follows (Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route A	Meriden
MAT Route M	Meriden, Middletown

Alignments and Service Patterns

Route 501 travels outbound from Downtown New Britain CT***fastrak*** station via Main Street, turning left on Arch Street. The service deviates via Grand Street to serve New Britain General Hospital, turns left on Linwood Street, and left on Hart Street before turning right back onto Arch Street. The route then turns left on Kensington Avenue. The service deviates a second time via a left turn on Walsh Street, right on Rackliffe Drive, and right on Clinic Drive to serve the Grove Hill Medical Center. The route returns onto Kensington Avenue, which continues as High Road and Chamberlain Highway. Once in Meriden, Route 501 operates along a large, clockwise one-way terminal loop to circle the Westfield Mall and the Midstate Medical Center. The loop begins via Kensington Avenue, right on Lewis Avenue, and left to enter the Midstate Medical Center. The route circles the Midstate Medical and Neuroscience Centers. Once leaving the complex, the route operates through the Westfield Mall parking lot, circling the building clockwise, before exiting the complex via Coldspring Avenue, rejoining Kensington Avenue to return inbound to New Britain.

During the early morning, one inbound trip begins at Grove Hill Medical Center. In the late evening, the last trip operates a short run to Grove Hill Medical Center. These trips are signed as variant 501C.

Service Schedule

Route 501 operates seven days per week. There are 18 outbound trips per weekday and 18 inbound trips. Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM. Service operates every 60 minutes during the peak periods and the midday. During the late evening, frequency drops to every 90 minutes.

On Saturdays, there are 16 outbound and 17 inbound trips. Service operates every 60 minutes throughout the day except for in the late evening when service decreases to every 90 minutes. On Sundays, there are 13 inbound and 13 outbound trips, with service operating every 60 minutes.

FIGURE 3 | SCHEDULE OVERVIEW (ROUTE 501)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:42 AM – 12:40 AM	60 / 60	18/18
Saturday	6:42 AM – 12:40 AM	60	17/17
Sunday	7:42 AM – 8:02 PM	60	13/13

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

Route 501 carries 512 passengers on an average weekday, the highest ridership of all New Britain-Bristol Division routes. The route carries 14.2 passengers per trip, which is nearly twice the division average of 7.5 weekday passengers per trip.

Saturday and Sunday ridership per trip are also high relative to the division average (see Figure 4). Overall, Route 501 has the second highest ridership per day of any route in the division for both Saturday and Sunday.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 501	ROUTE 501	DIVISION AVG
Weekday	512	14.2	7.5
Saturday	347	10.2	5.8
Sunday	183	7.0	4.2

*Source: CT**transit** performance data*

Ridership by Stop

The most heavily used stops on Route 501 are at the Meridian terminus at the Westfield Mall, and the downtown terminus of Bank Street and Main Street. Outside of downtown, no inbound stops generate 30 or more boardings or alightings per day (see Figure 5 and 6). Outbound trips begin at the New Britain Station (not shown below), which generates over 90 boardings.

FIGURE 5 | ROUTE 501 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (WEEKDAY INBOUND)

BUS STOP	RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Bank Street / Main Street	0 / 175	Downtown New Britain
Dick's / Westfield Mall	134 / 4	Westfield Mall

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 501 shows inbound weekday passenger loads peak near New Britain General Hospital, and decline rapidly 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 501 or Route 501C only. Each variant is labeled accordingly in Figure 6. Figure 7 shows that ridership activity is highest at the two route terminals.

FIGURE 6 | WEEKDAY OUTBOUND RIDERSHIP BY STOP GRAPH

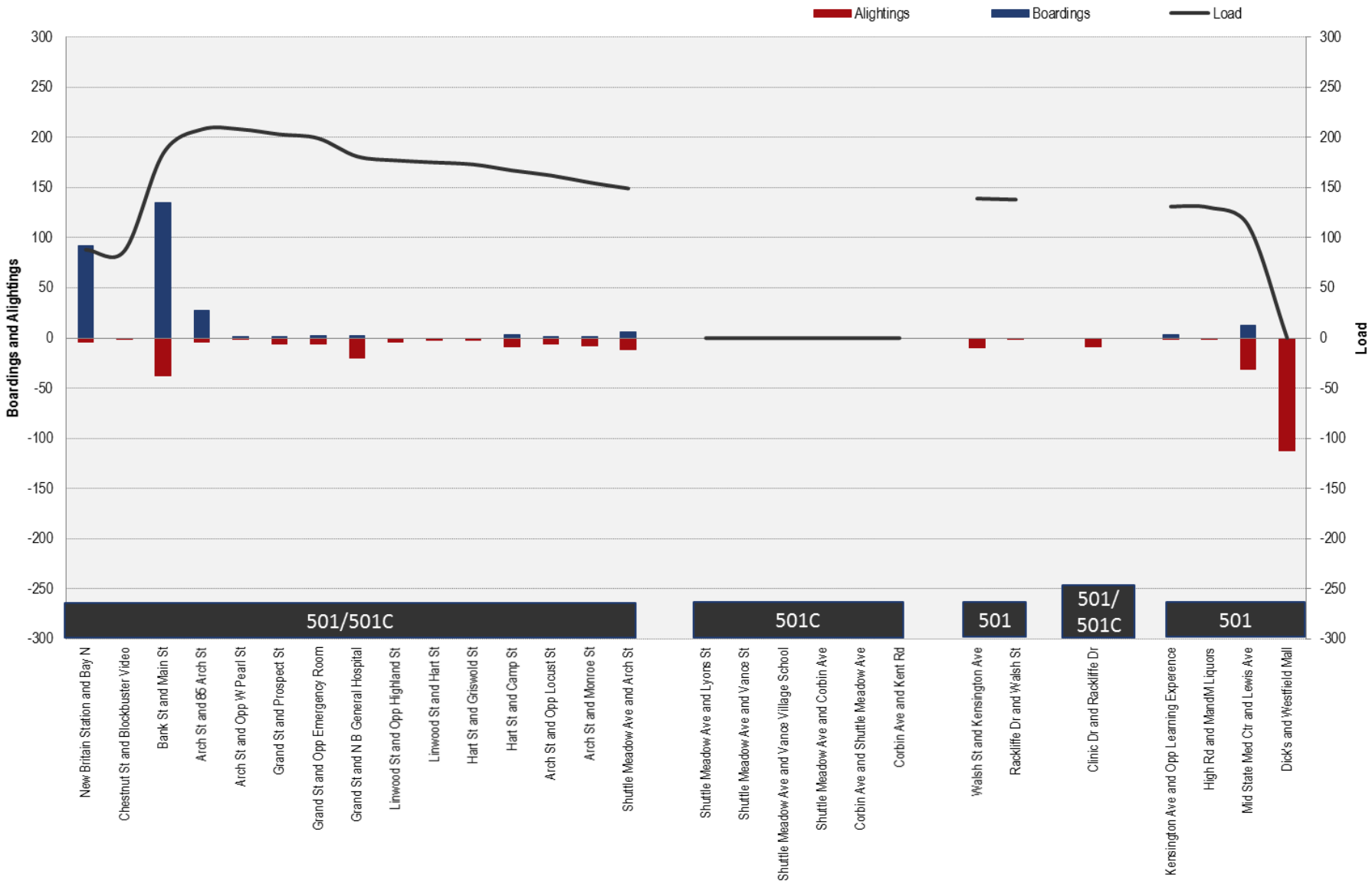


FIGURE 7 | WEEKDAY OUTBOUND RIDERSHIP BY STOP MAP

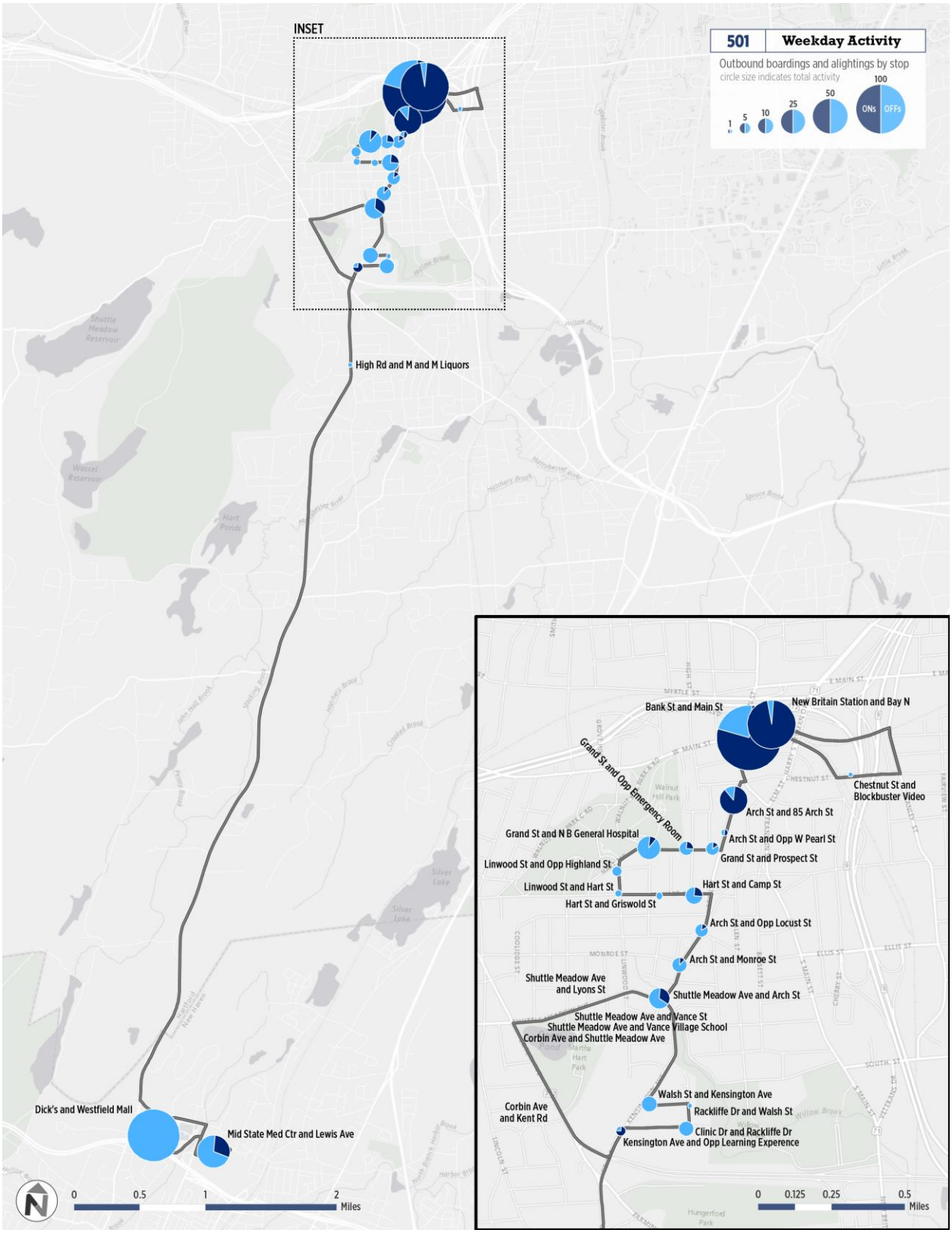


FIGURE 8 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

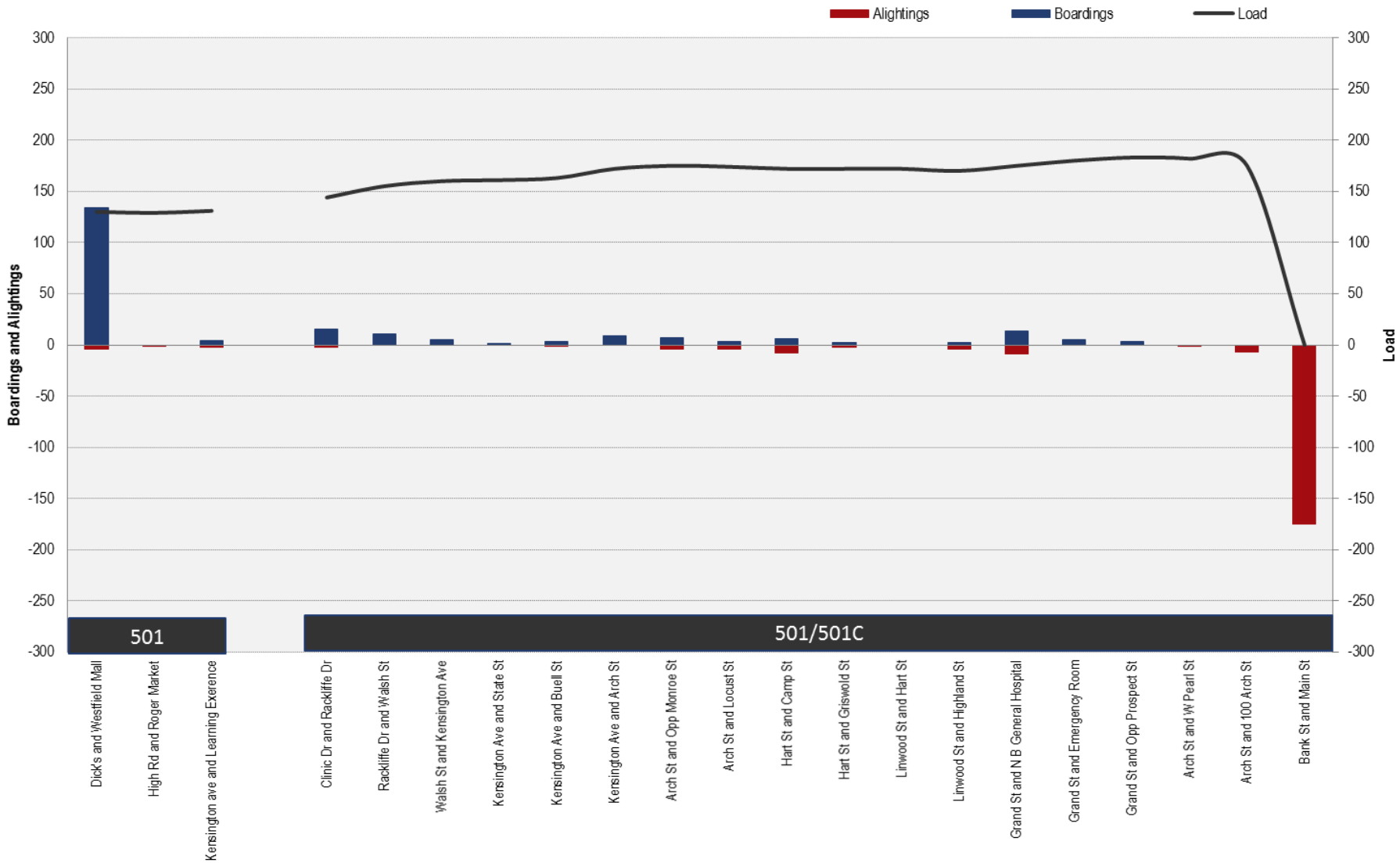


FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

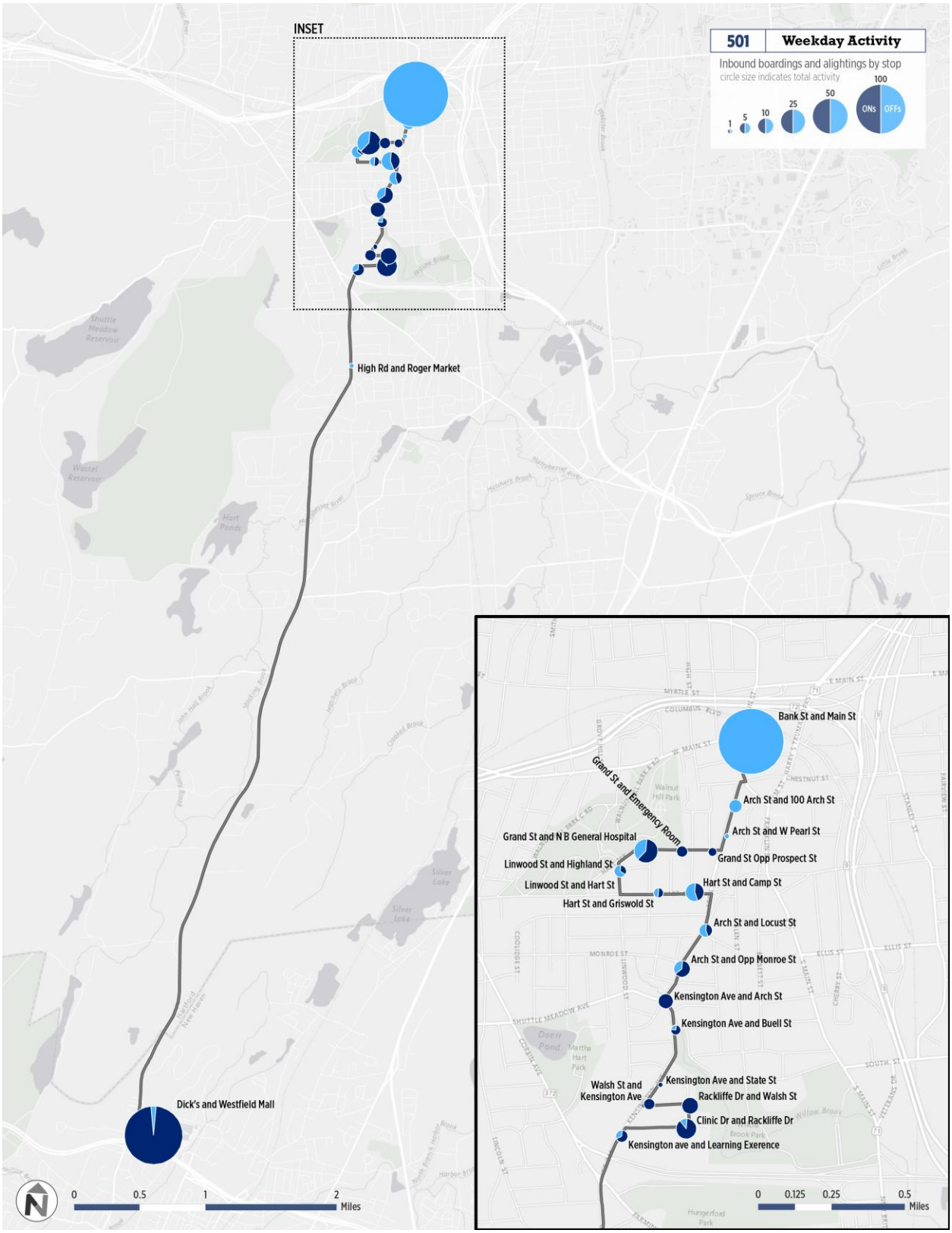


FIGURE 10 | SATURDAY OUTBOUND RIDERSHIP BY STOP GRAPH

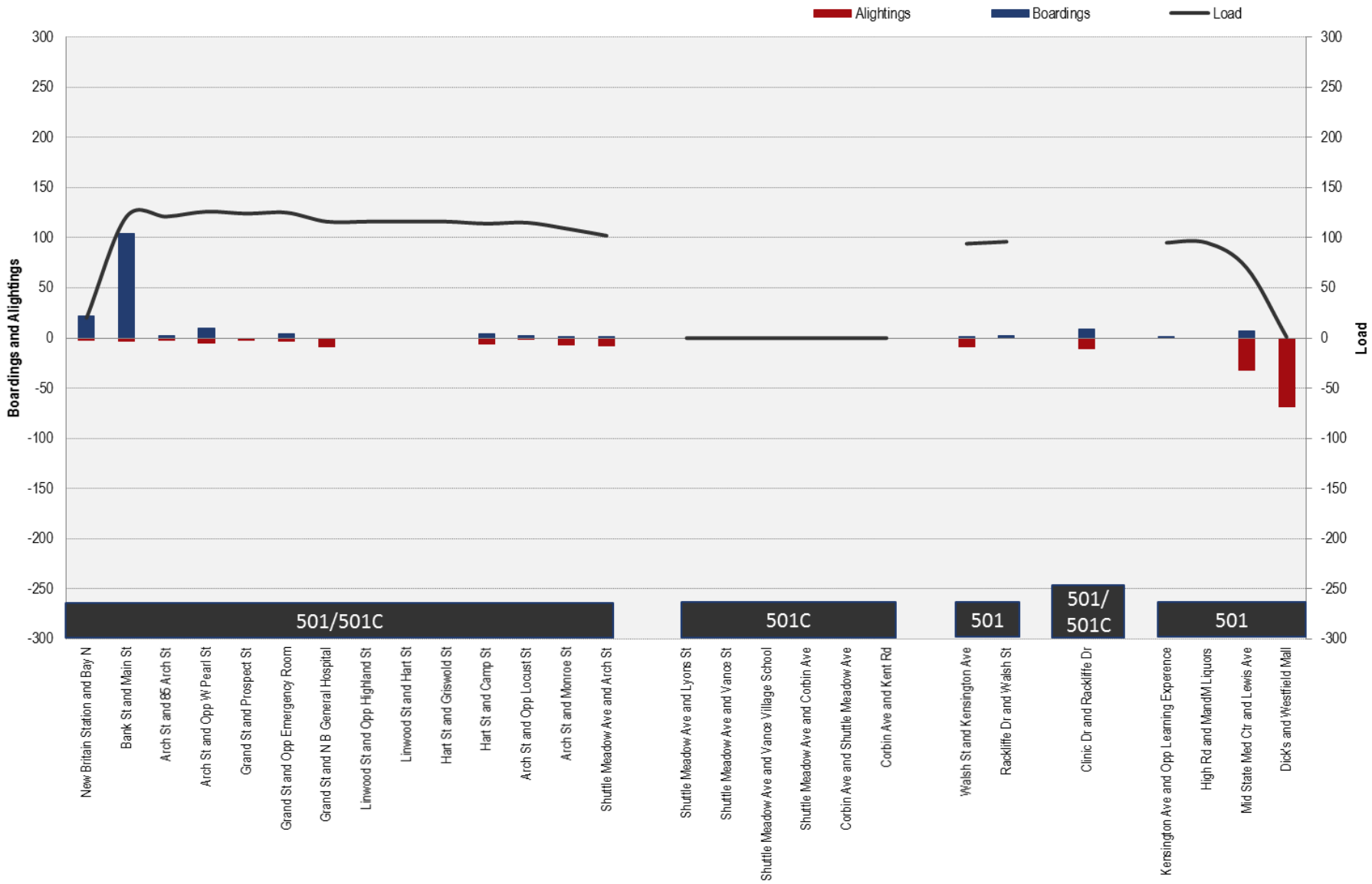


FIGURE 11 | SATURDAY OUTBOUND RIDERSHIP BY STOP MAP

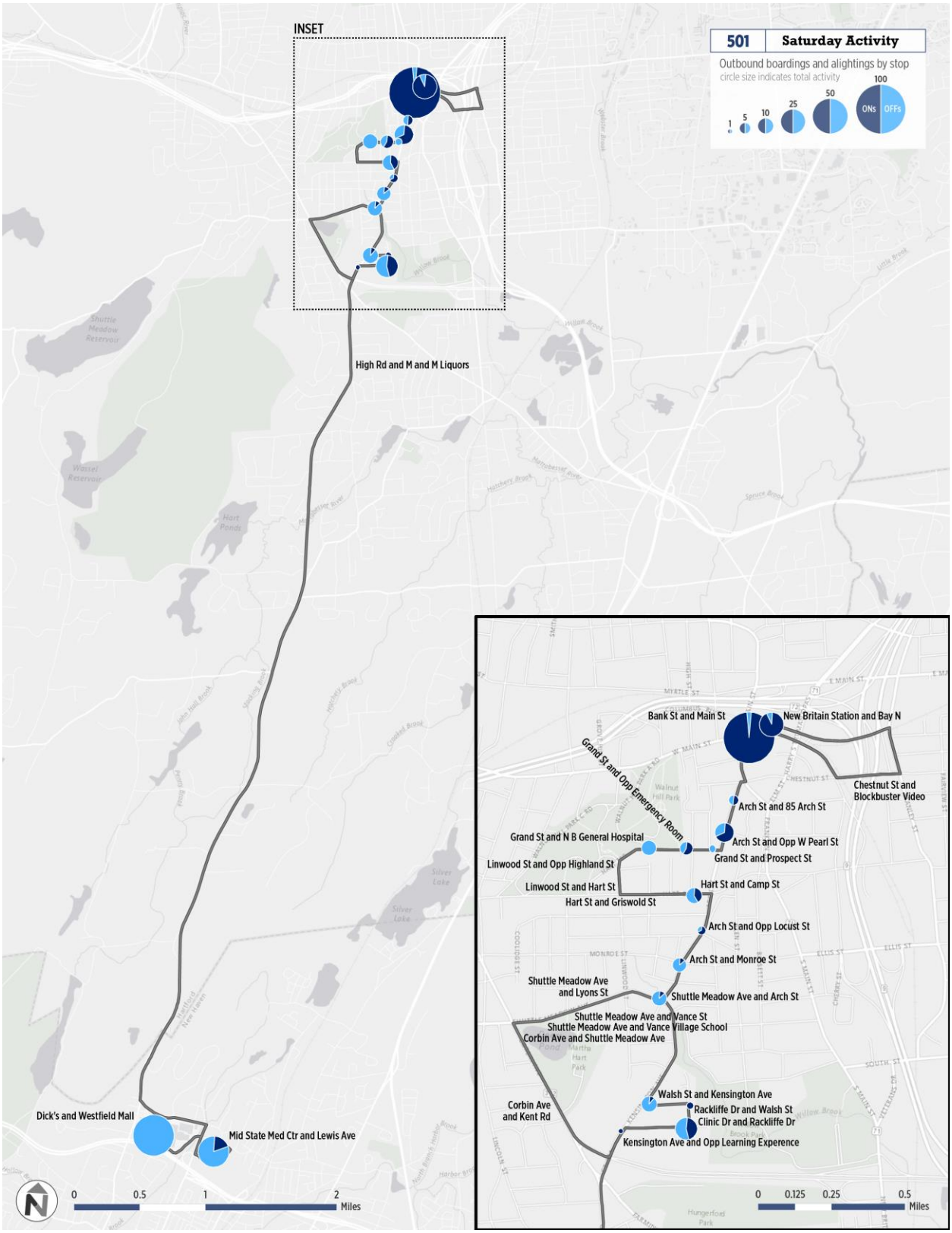


FIGURE 12 | SATURDAY INBOUND RIDERSHIP BY STOP GRAPH

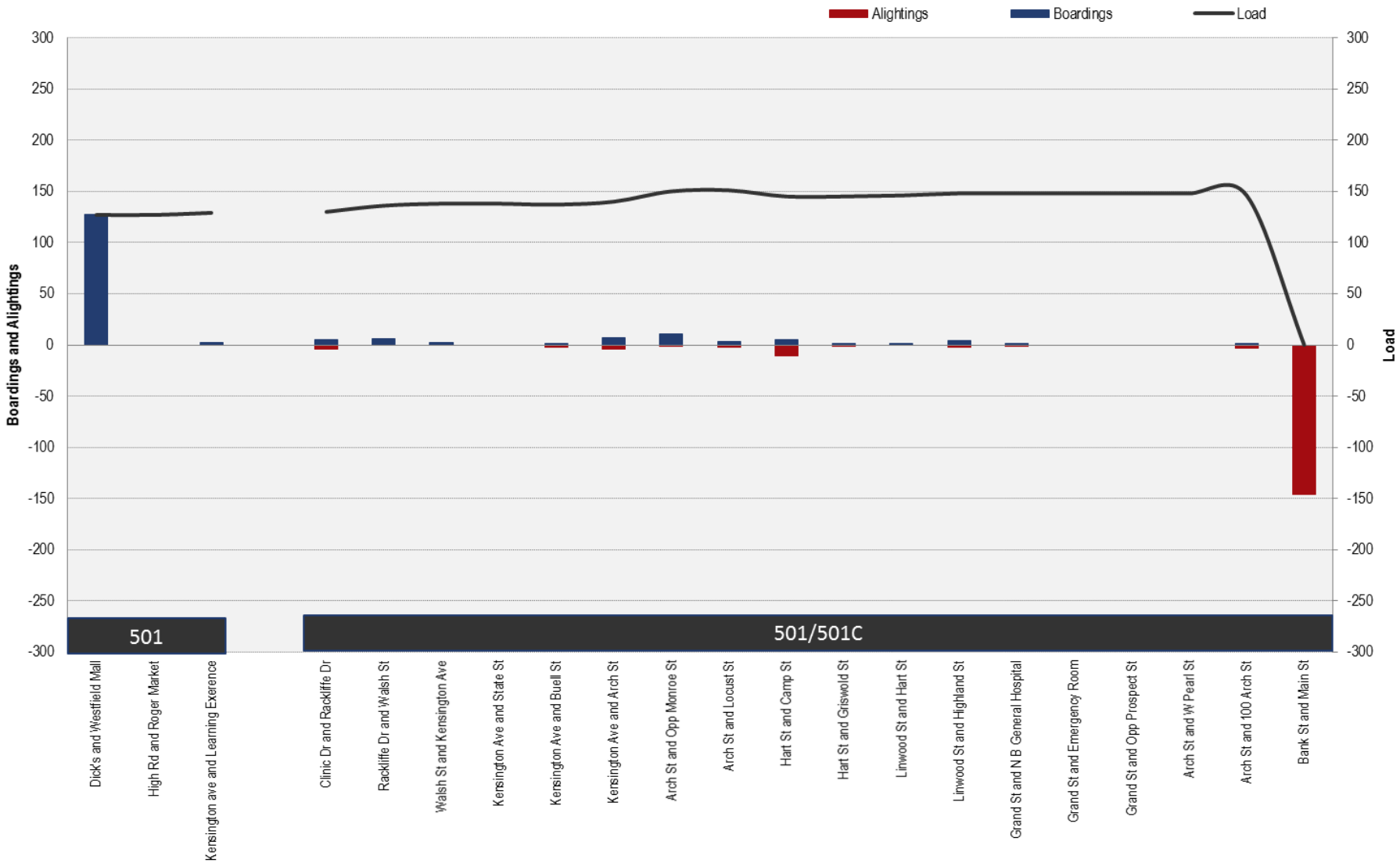


FIGURE 13 | SATURDAY INBOUND RIDERSHIP BY STOP MAP

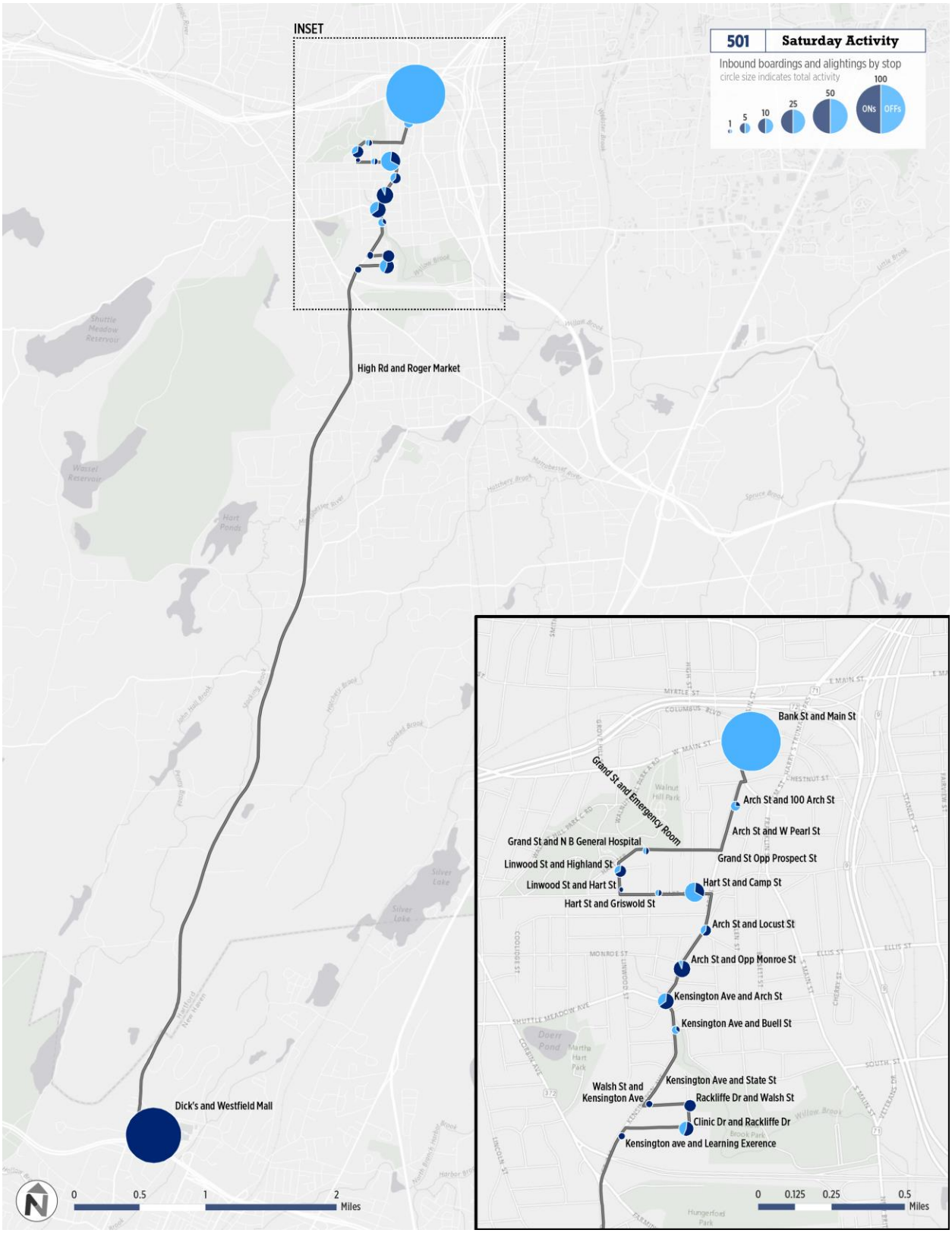


FIGURE 14 | SUNDAY OUTBOUND RIDERSHIP BY STOP GRAPH

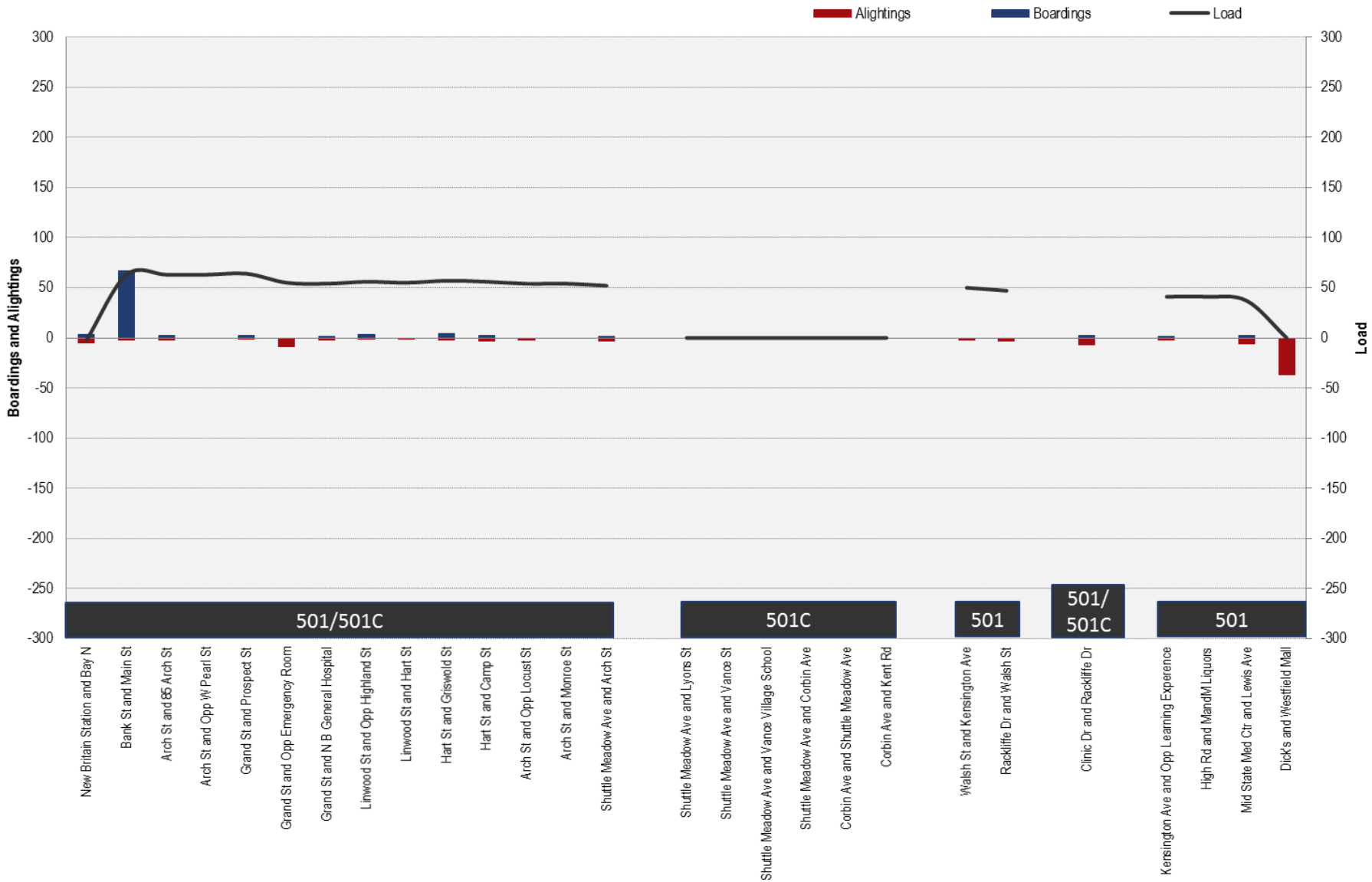


FIGURE 15 | SUNDAY OUTBOUND RIDERSHIP BY STOP MAP

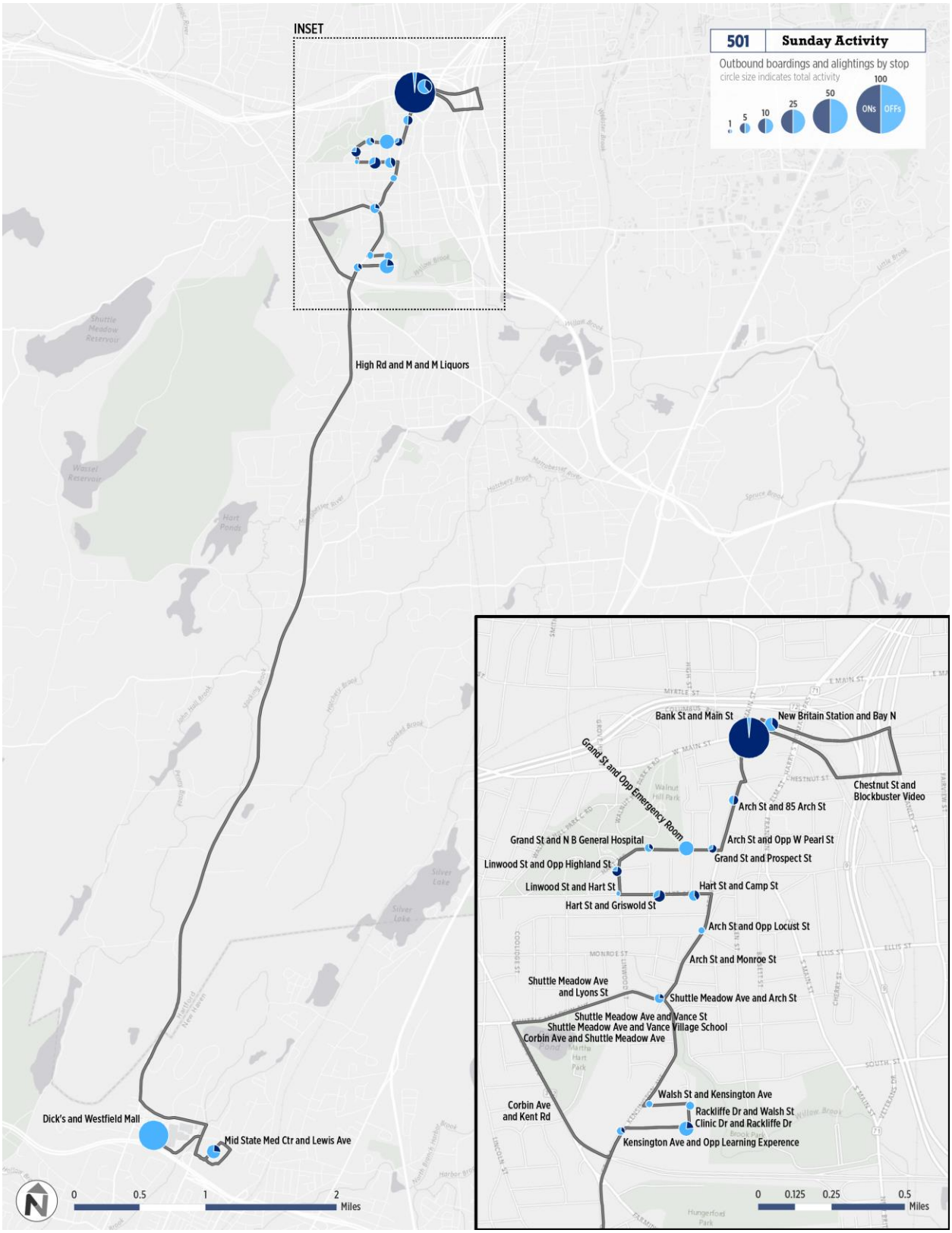


FIGURE 16 | SUNDAY INBOUND RIDERSHIP BY STOP GRAPH

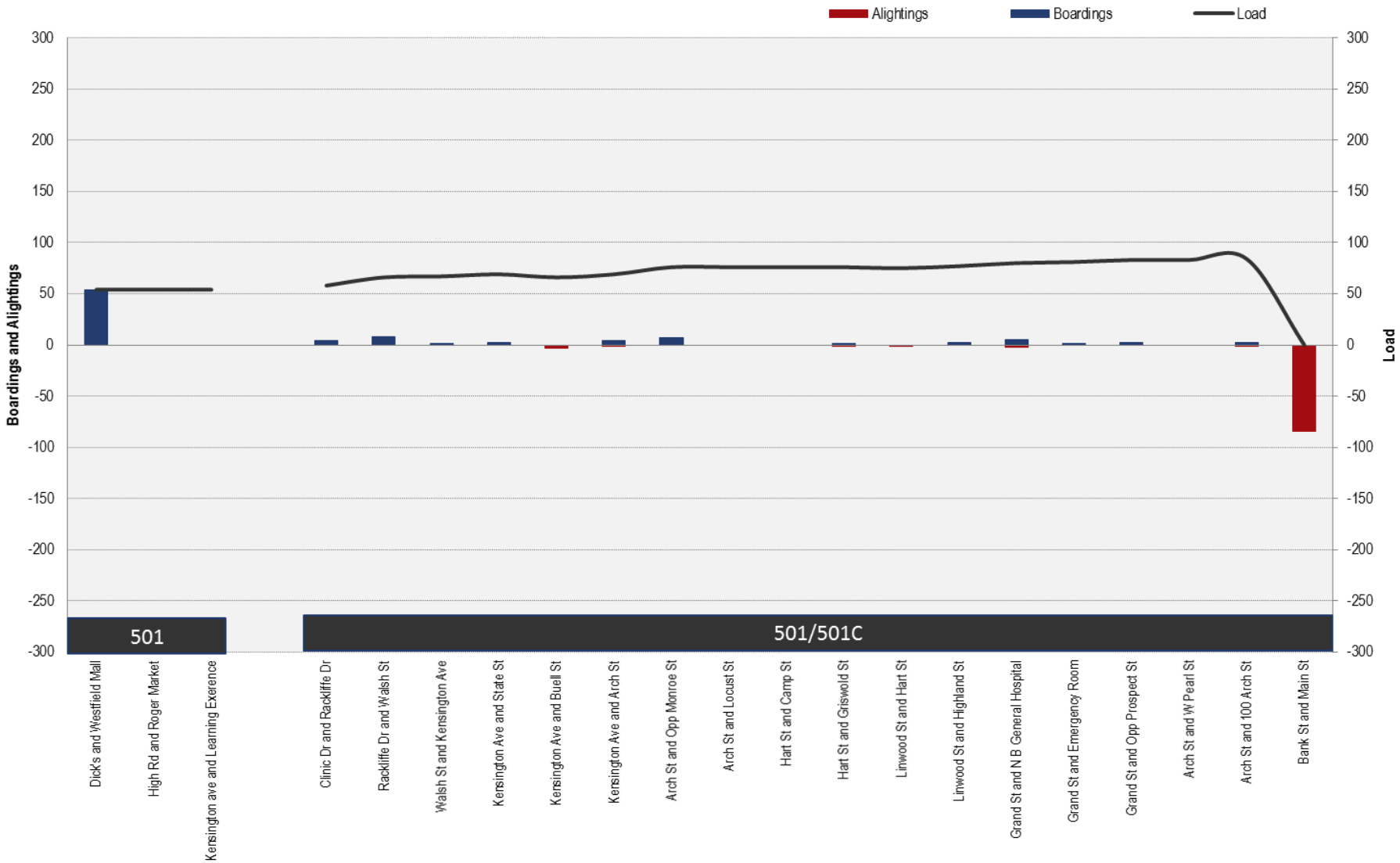
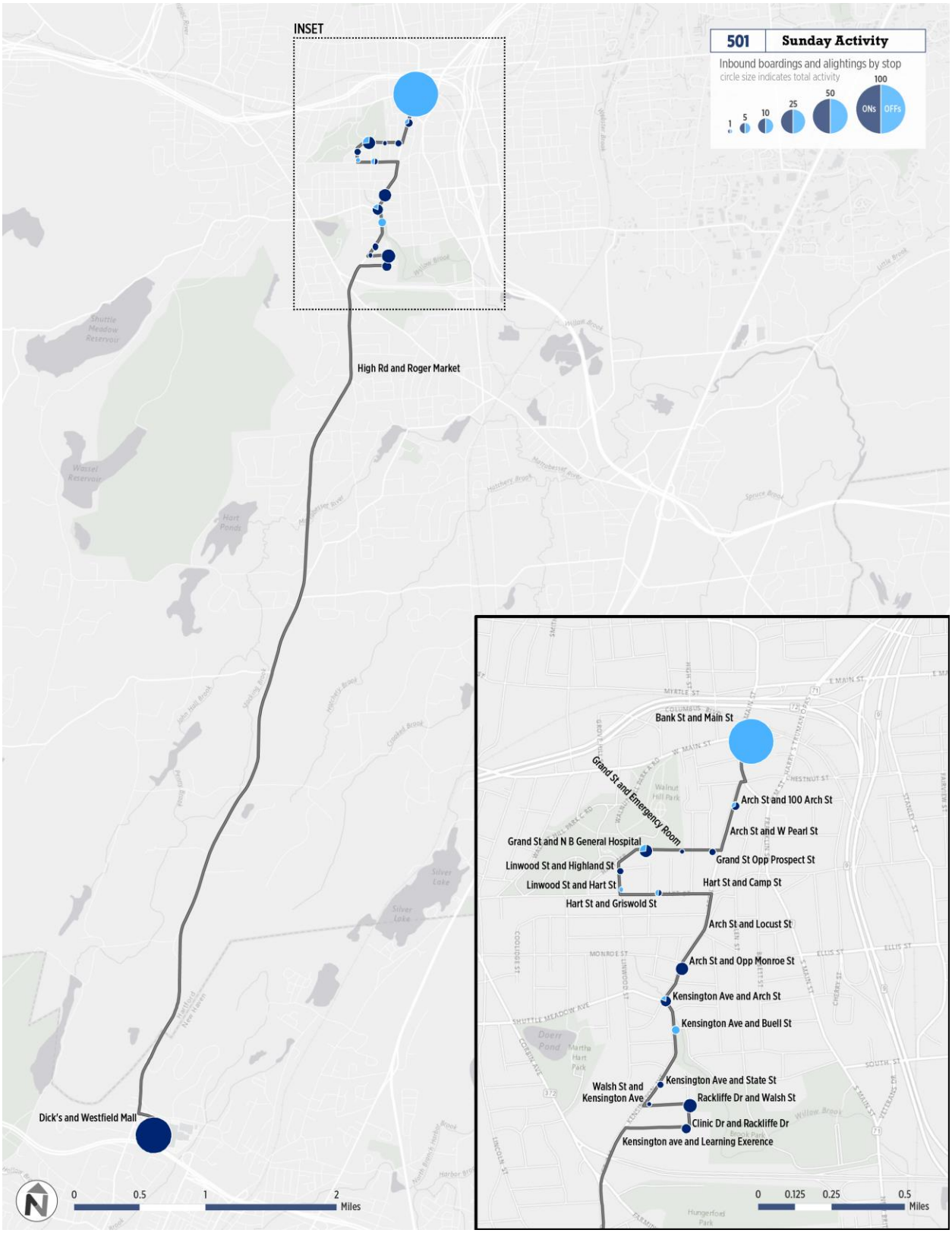


FIGURE 17 | SUNDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Route 501 carries an average of 14.2 passengers per trip on weekdays. Outbound ridership typically is higher through much of the day, particularly before 4:00 PM (see Figures 8 and 9). Ridership is moderate throughout the day, except for early morning and late night trips. Constant activity throughout the day suggests Route 501 serves multiple trips types and users. While inbound peaks near the typical PM peak, outbound has its ridership peak slightly before 11:00 AM.

Throughout the day, maximum loads never exceed 40 passengers, which is the typical seating capacity of a 40-foot transit bus.

FIGURE 18 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

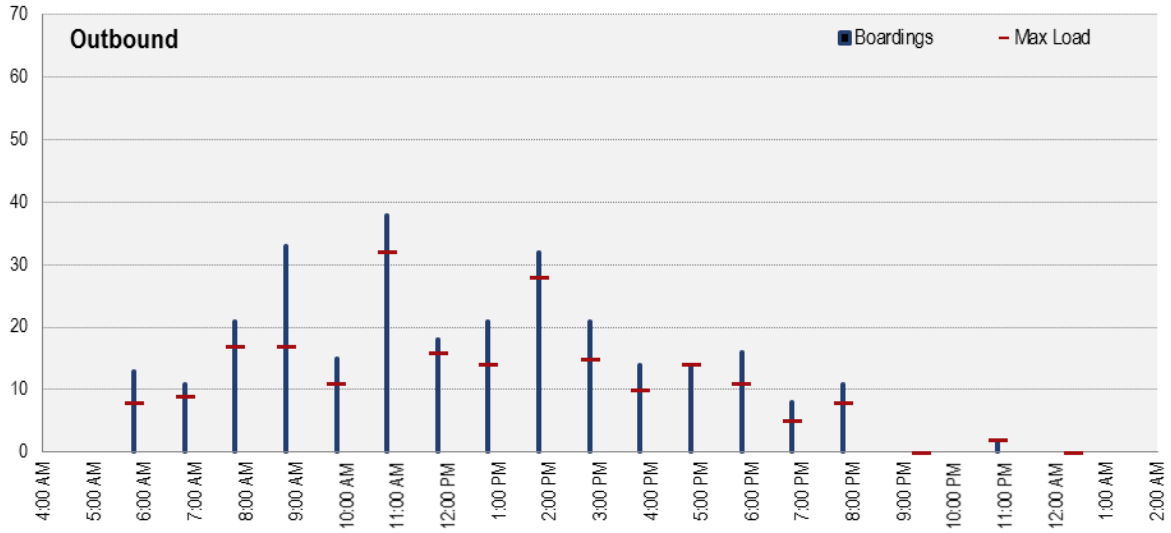
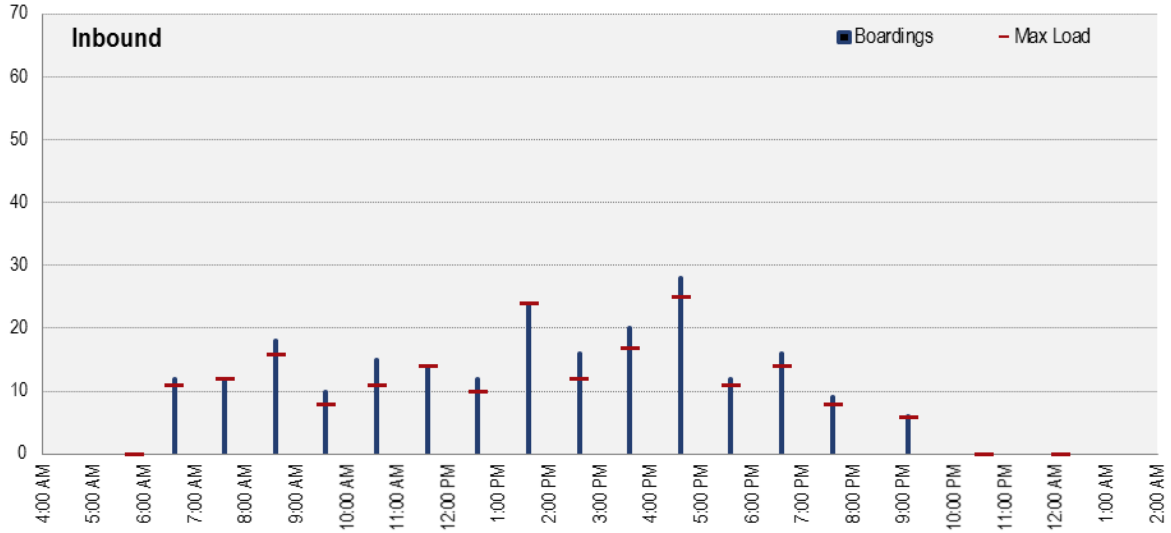


FIGURE 19 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Saturday service is not particularly strong, with nearly all trips carrying fewer than 20 riders. Demand does not vary widely in the outbound direction, though the mid-afternoon inbound peak stands out in comparison to the rest of the ridership pattern. Data for the inbound trips show that ridership is heaviest at the middle of the day. Outbound trips are more consistent, with approximately half of all trips serving between 10 and 20 riders, and the other half serving fewer than 10 riders. Ridership is low on the last inbound trip of the day, and for the last few outbound trips. Low morning ridership suggests that there is not a need for additional service in the earlier hours.

FIGURE 20 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

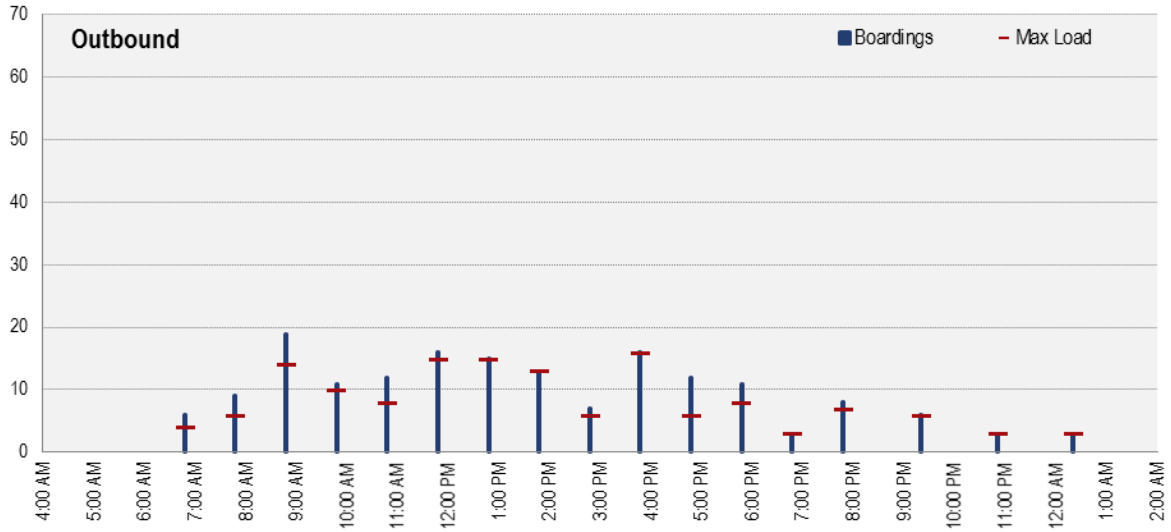
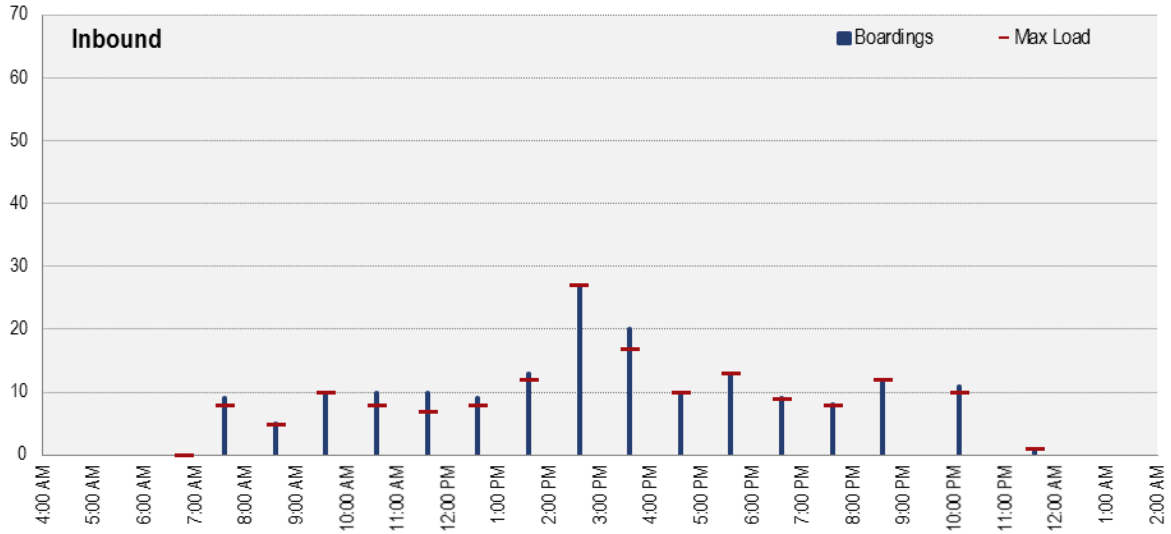


FIGURE 21 | SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

Sunday ridership is fairly low, with only two trips serving 15 riders. Whether inbound or outbound, most trips are serving fewer than 10 riders, and the first and last trips of the day carry fewer than five riders.

FIGURE 22 | SUNDAY OUTBOUND RIDERSHIP BY TRIP

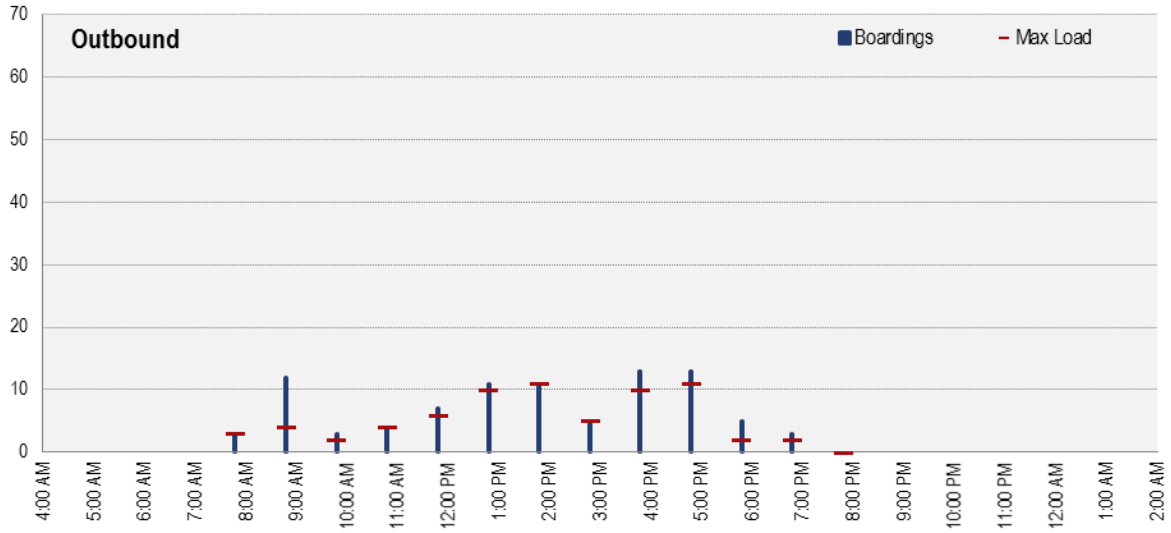
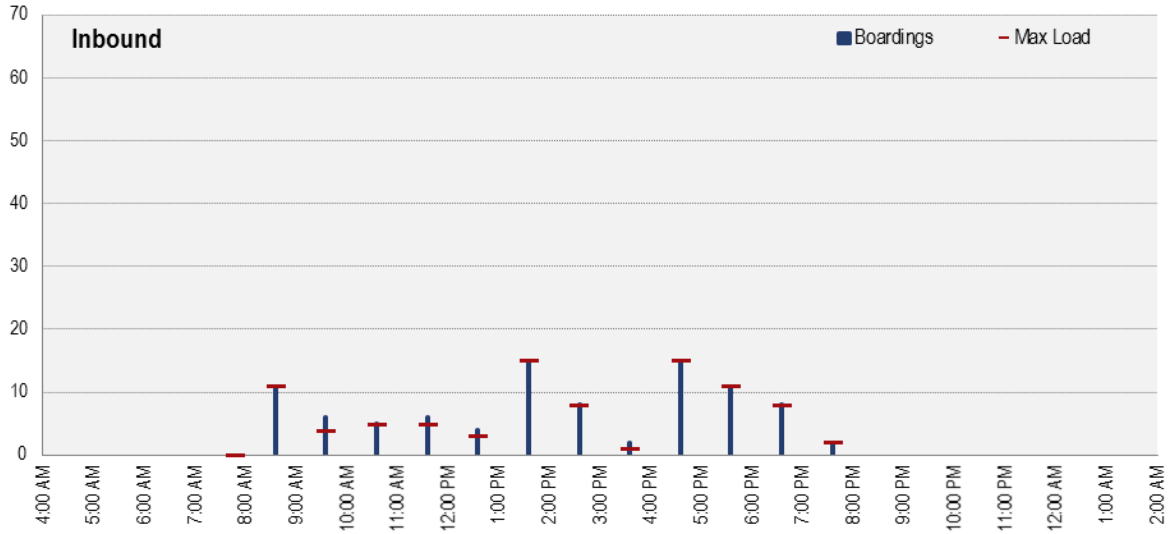


FIGURE 23 | SUNDAY INBOUND RIDERSHIP BY TRIP



Productivity

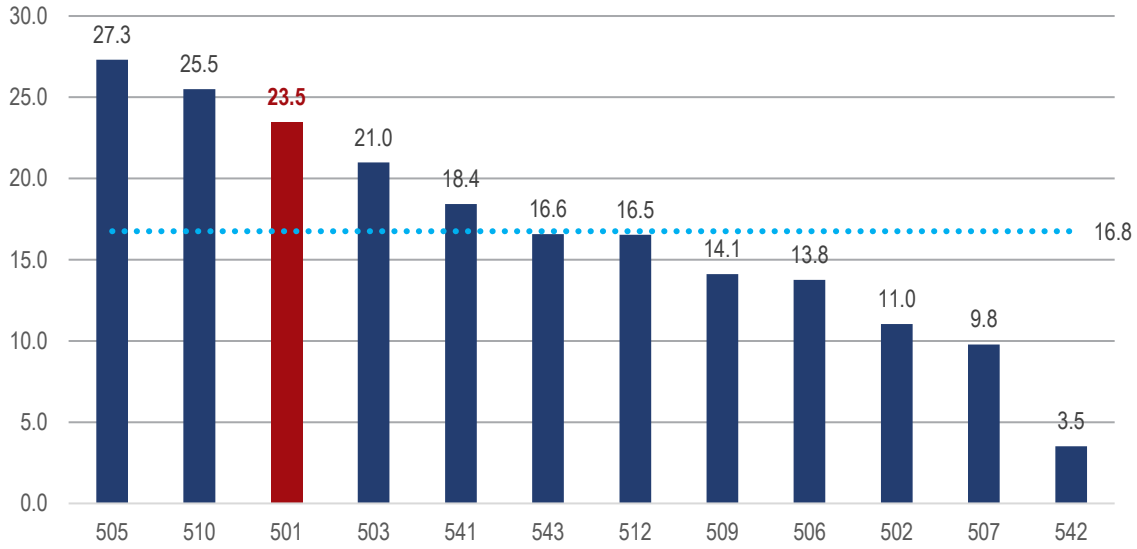
Route 501 exceeds the New Britain/Bristol Division average for both passengers per revenue hour on all service days (see Figure 14). While Route 501 has the third highest productivity for weekday ridership, it only has the 6th highest productivity for Saturdays and Sundays, suggesting that a comparatively high percentage of riders on the route are weekday commuters.

FIGURE 24 | PERFORMANCE MEASURES

PRODUCTIVITY MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 501	DIVISION AVG	ROUTE 501	DIVISION AVG	ROUTE 501	DIVISION AVG
Passengers per Revenue Vehicle Hour	23.5	16.8	15.0	13.1	11.1	10.4

Source: CTtransit performance data

FIGURE 25 | PASSENGERS PER REVENUE VEHICLE HOUR



ON-TIME PERFORMANCE

On weekdays, approximately 56% of Route 501 time points were served "on-time" during the survey period (Figure). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Weekday on-time performance was affected by early departures, which occurred 30% of the time. On Saturdays, approximately 46% of Route 501 time points were served "on-time" during the survey period, with 42% of time points served earlier than scheduled. On Sundays, approximately 47% of time points were served "on-time," and 44% of time points are served early.

FIGURE 26 | ON-TIME PERFORMANCE

PERFORMANCE	WEEKDAY	SATURDAY	SUNDAY
Early	30%	42%	44%
Late	14%	12%	9%
On-Time	56%	46%	47%

*Source: CT**transit** performance data*

SERVICE IMPROVEMENT

Route 501 is a radial route that serves New Britain south of downtown and provides direct service between New Britain and destinations in Meriden, including the Westfield Mall and Midstate Medical and Neuroscience Centers. It is the highest ridership route in the New Britain-Bristol Division, and is one of the most productive. Ridership per trip is among the highest of all routes on all days, and ridership per hour of service is well above average on weekdays. The route's alignment is direct and operates bidirectional service, and both downtown New Britain and the destinations in Meriden provide strong anchors that generate ridership.

Service Improvement Options

Opportunities to strengthen the route further include the following:

- **Consider additional trips during high-ridership times.** Ridership is generally highest during the late morning and midday periods on weekdays. Some additional trips that operate on the half-hour may be necessary to meet this demand.
- **Shift some or all trips to more high-density corridors or rebrand as Express Route**. Route 501 offers fast and direct service between New Britain and Meriden, but the route operates mostly closed-door along Chamberlain Highway. Other alignments, while slower, would offer substantially more ridership potential at interim stops. For example, an alignment including Farmington Avenue, Lower Lane, and Colony Road would serve Berlin High School and many residential neighborhoods. Shifting some trips to this corridor could preserve limited stop or express service along Chamberlain Highway, while also providing service to corridors with higher transit potential. In addition, trips operating along the Chamberlain Highway corridor could be rebranded as Commuter Express service to more accurately reflect the type of service being provided.
- **Revisit timepoints and running speed to address early trips.** Like many other routes in the division, Route 501's on-time performance has a high percentage of trips that are early. Evaluating current travel time and average speeds can inform any necessary adjustments to the schedule to make service more consistent for riders.

Route Evaluation

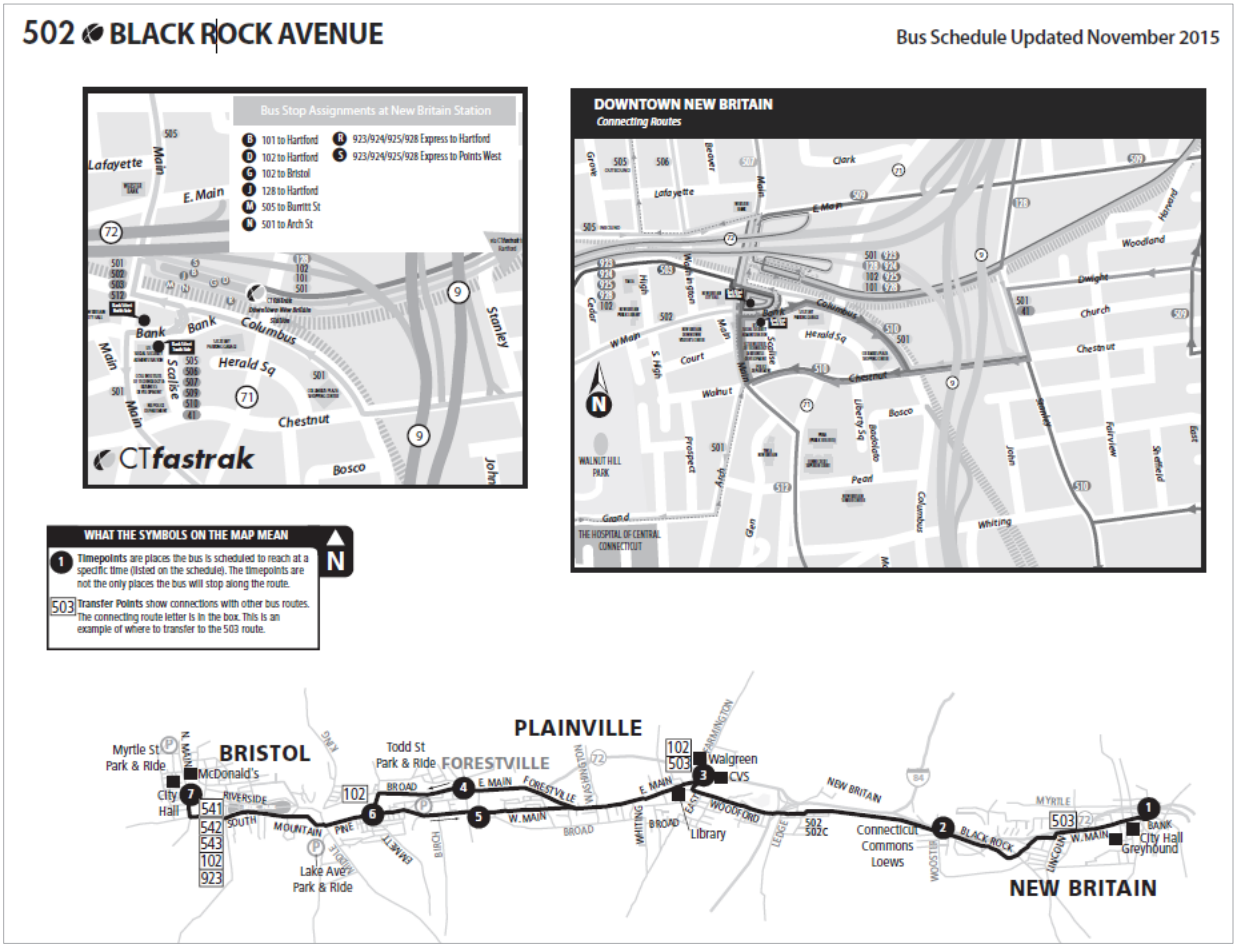
BLACK ROCK AVENUE

502 | Black Rock Avenue

Service Design

Route 502 is a radial route, providing service between the Downtown New Britain CT***fastrak*** station and Bristol City Hall with stops in Plainville. The route operates primarily on West Main Street, Black Rock Avenue, and South Street.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 502 begins/ends in downtown New Britain, where riders can transfer to nearly all other CT***transit*** New Britain/Bristol Division routes, as well as CT***fastrak*** for service onward to Hartford. Route 502 also offers several transfer opportunities at Bristol City Hall for local service within Bristol, including Forestville. In addition, there are several lines providing service along similar or parallel corridors. CT***fastrak*** Route 102 provides parallel limited stop service on a significant part of Route 502's corridor. Express Route 923 serves similar markets with express service between Bristol, Downtown New Britain, and Hartford.

During peak hours, Route 502 is interlined with local Route 542, providing local circulation to several social services and shopping centers within Bristol.

Outside of Downtown New Britain, transfer opportunities are available to numerous routes (see Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 102	Hartford, New Britain, Bristol via *CTfastrak* Limited stops between Bristol and New Britain
Route 503	New Britain via Corbin Avenue
Route 541	Bristol Local
Route 542	Bristol Hospital
Route 543	Gaylord Towers
Route 923	Hartford via CT***fastrak*** (express)

Alignments and Service Patterns

Route 502 operates from Downtown New Britain on West Main Street, jogs left on Lincoln Street and then right on Black Rock Avenue. Black Rock Avenue continues as White Oak Avenue and Woodford Avenue. The service turns right on East Street in Plainville and left on East Main Street. In Forestville, service continues on Broad Street. The route turns left on Forest Avenue and then right on Pine Street, which continues as Mountain Road and South Street. In central Bristol, the route turns right on Main Street, left on Riverside Avenue, and right on North Main Street to access Bristol City Hall.

Inbound service operates on the same alignment, except for in Forestville, where inbound service operates on Pine Street instead of East Main Street.

Service Schedule

Route 502 operates seven days per week. There are 16 outbound trips per weekday and 16 inbound trips. Service operates every 60 minutes during the peak periods, which are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM. During the off-peak, frequency drops to every 90 minutes.

On Saturdays, there are 13 outbound and 13 inbound trips. Service operates every 90 minutes throughout the day. On Sundays, there are nine inbound and nine outbound trips, starting later and ending earlier, with service operating every 90 minutes.

FIGURE 3 | SCHEDULE OVERVIEW (ROUTE 502)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:00 AM – 1:03 AM	60 / 90	16/16
Saturday	6:00 AM – 1:03 AM	90	13/13
Sunday	7:00 AM – 8:50 PM	90	9/9

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

Ridership on Route 502 is highest on weekdays, when the route carries 221 daily passengers or 6.9 passengers per trip. Route 502's weekday average is 8% lower than the New Britain/Bristol Division average of 7.5 weekday passengers per trip.

Saturday and Sunday ridership are lower, relative to the division average (see Figure 4).

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 502	ROUTE 502	DIVISION AVG
Weekday	221	6.9	7.5
Saturday	105	4.0	5.8
Sunday	64	3.6	4.2

*Source: CT**transit** performance data*

Ridership by Stop

The most heavily used stops on Route 502 are the origin stop at North Main Street and Laurel Street in Bristol and the downtown terminus at Bank Street and Main Street in New Britain. Outside of the origin and terminus stops, only three stops exceed 10 combined inbound boardings and alightings (Figure 5).

FIGURE 5 | ROUTE 502 HIGHEST WEEKDAY RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
N Main Street / Laurel Street	53/0	Bristol City Hall
Main Street/ South Street	8/0	Associated Spring
Mountain Road / Mitchell Street	3/6	Local retailers
E Main Street / Plainville Central Library	4/7	Plainville Government Office; Plainville Central Library; Local retailers
Black Rock Avenue / Oldfield Street	10/1	Residential housing
W Main Street / Washington Street	0/11	New Britain Mayor's Office; New Britain Public Library; Local retailers
Bank Street / Main Street	0/ 46	Central Park; US Social Security Administration; CCSU Institute of Technology and Business Development; Local retailers

Load profile data (Figure 6) combines passenger activity by stop and shows the cumulative passenger load as the bus travels along its route. Ridership by stop without the cumulative load is mapped in Figure 7. The data for Route 502 show that weekeday inbound passenger loads peak just west of downtown New Britain, which indicates that many passengers are riding from their destination and disembarking in downtown New Britain, instead of alighting at an interim stop. In the outbound direction weekday passenger loads are highest at the route's onset in New Britain, steadily decline as the route travels west, and rise slightly once the route enters Bristol.

FIGURE 6 | WEEKDAY OUTBOUND RIDERSHIP BY STOP GRAPH

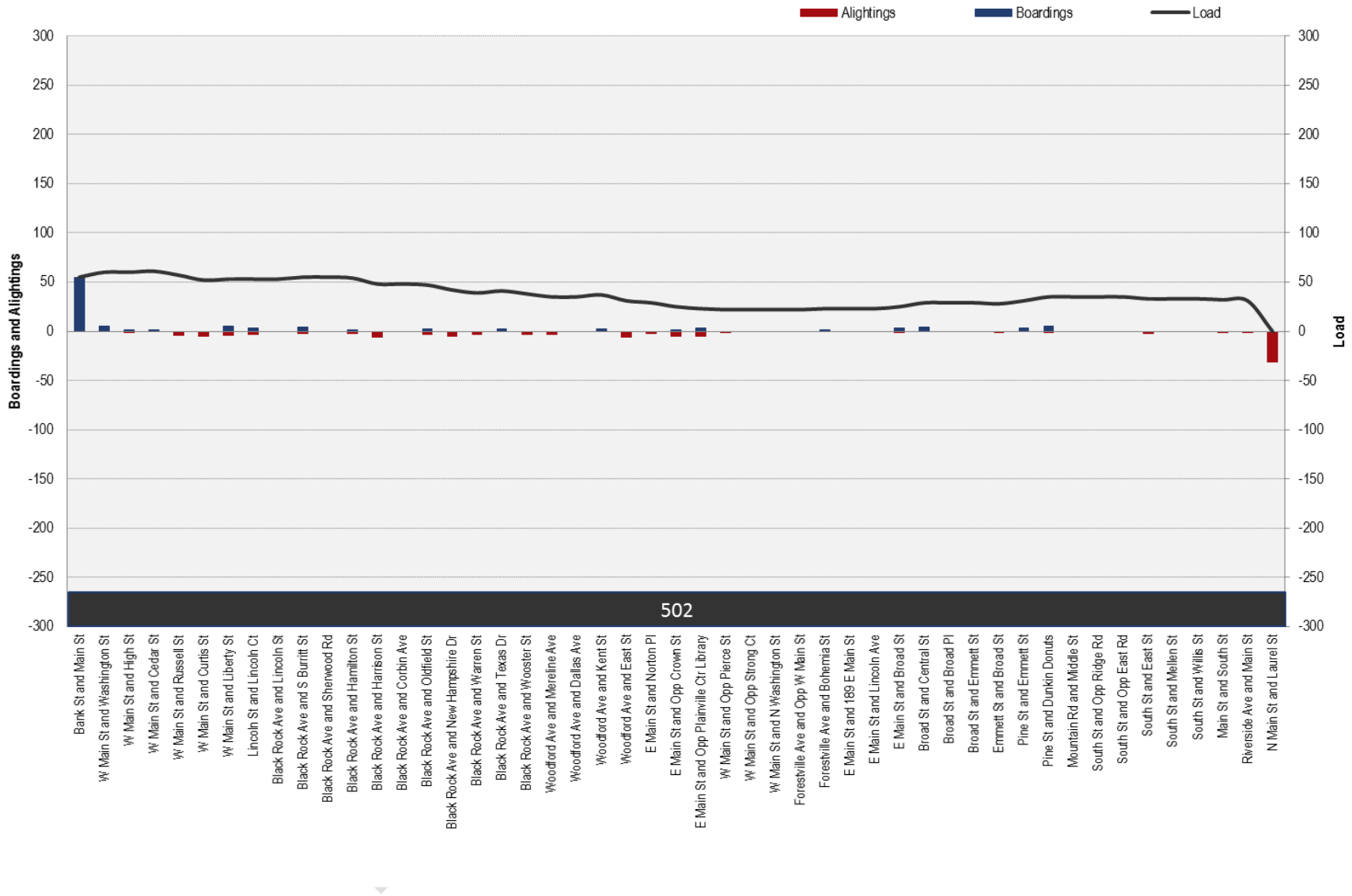


FIGURE 7 | WEEKDAY OUTBOUND RIDERSHIP BY STOP MAP

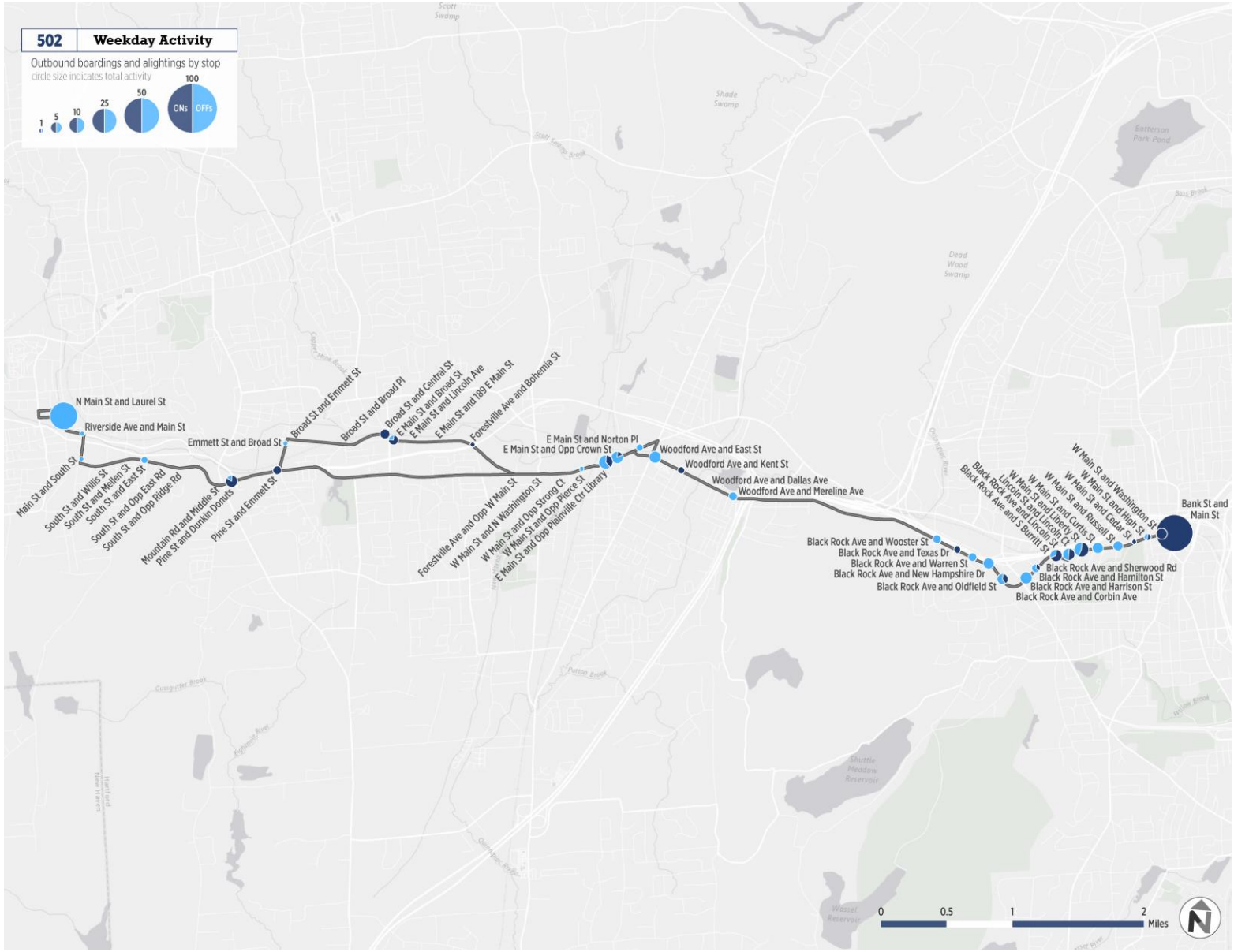


FIGURE 8 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

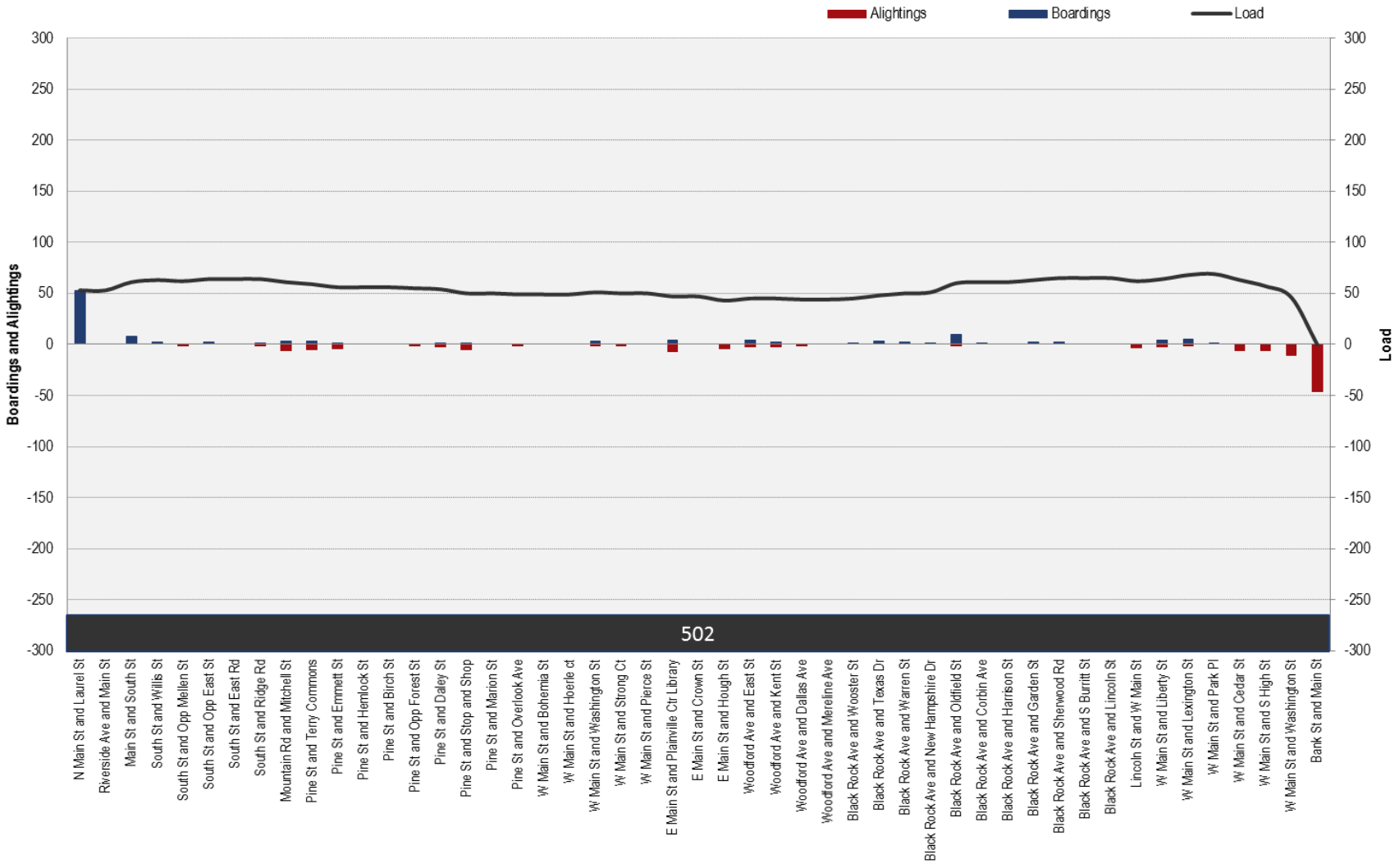


FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

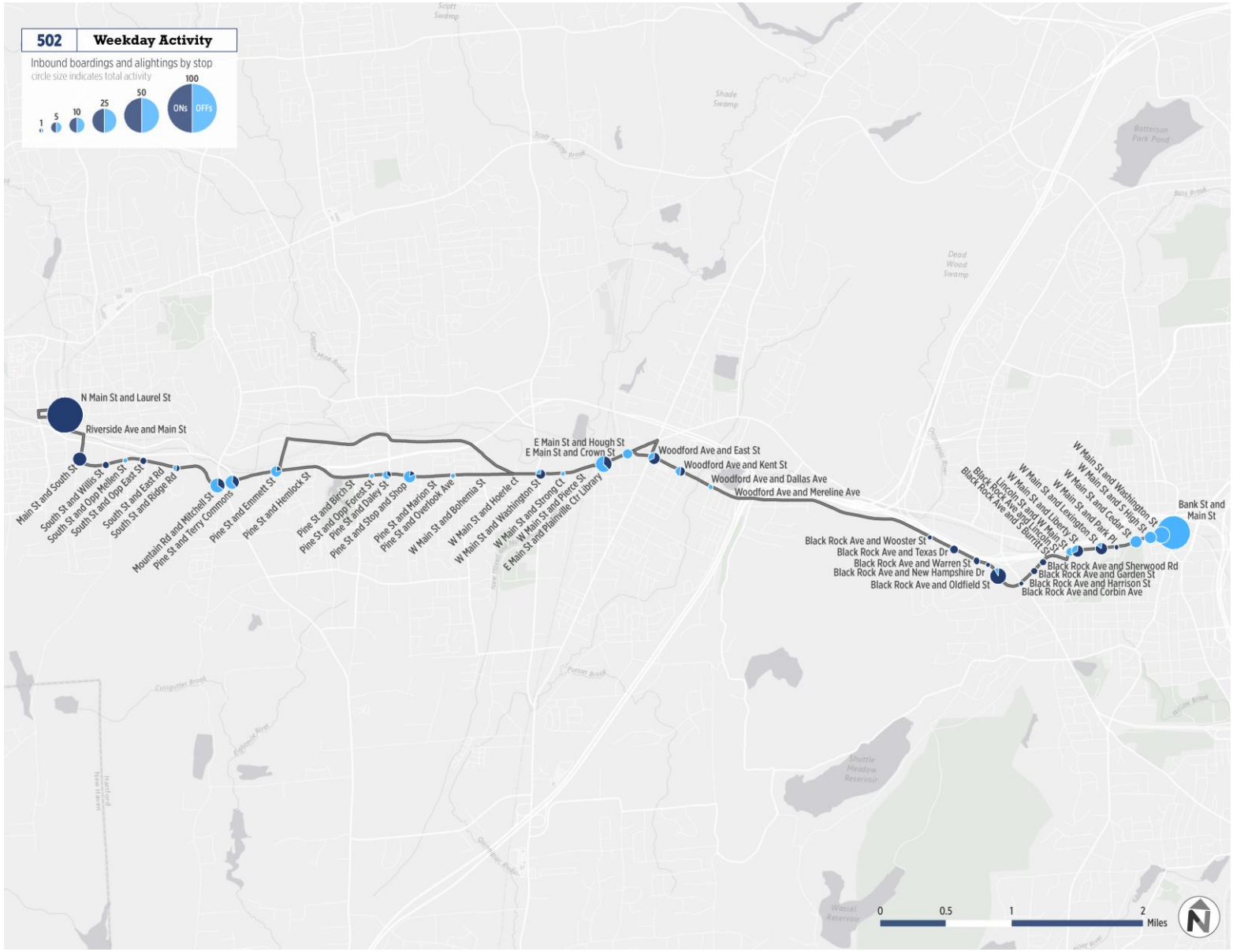


FIGURE 10| SATURDAY OUTBOUND RIDERSHIP BY STOP GRAPH

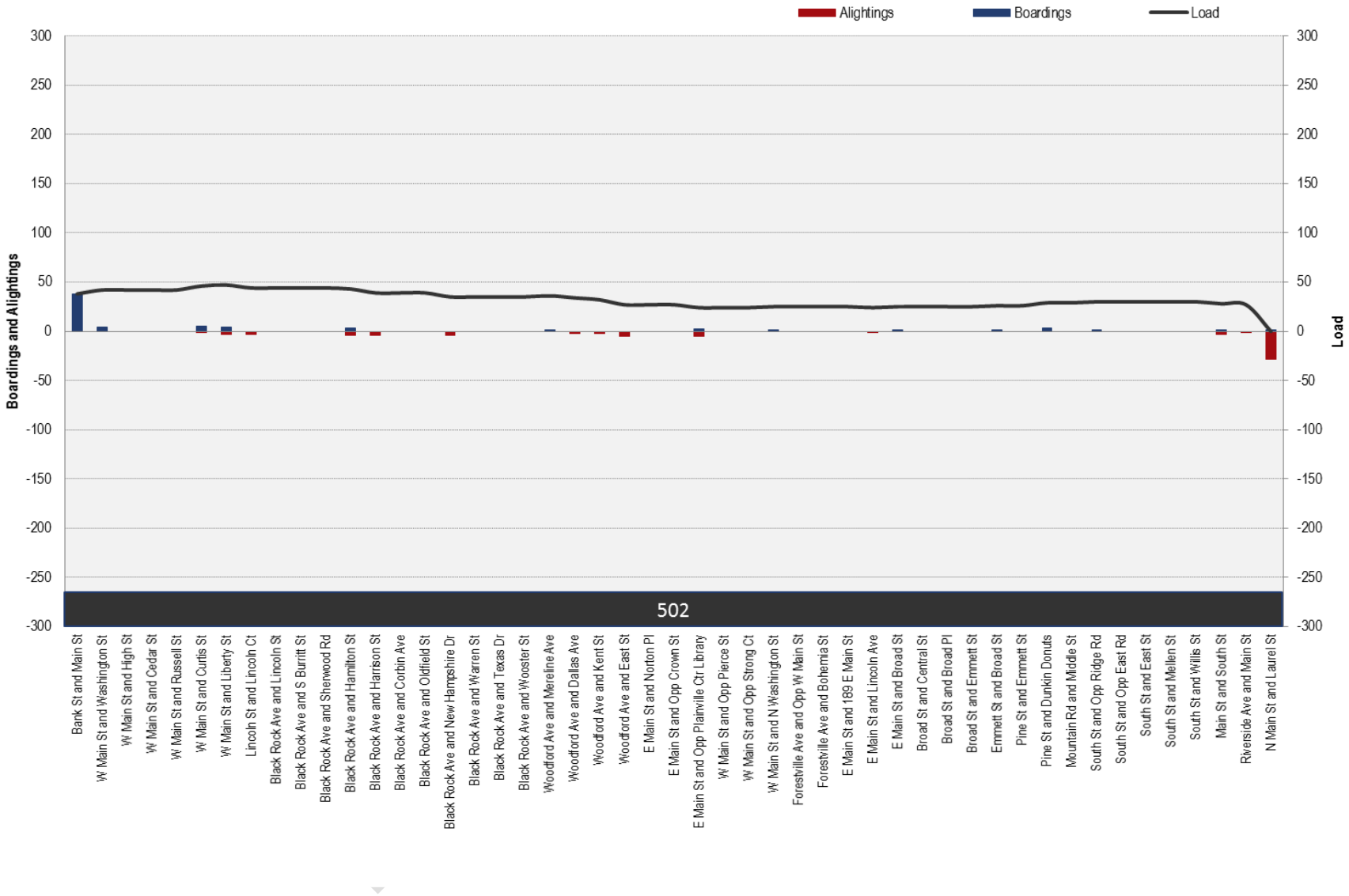


FIGURE 11 | SATURDAY OUTBOUND RIDERSHIP BY STOP MAP

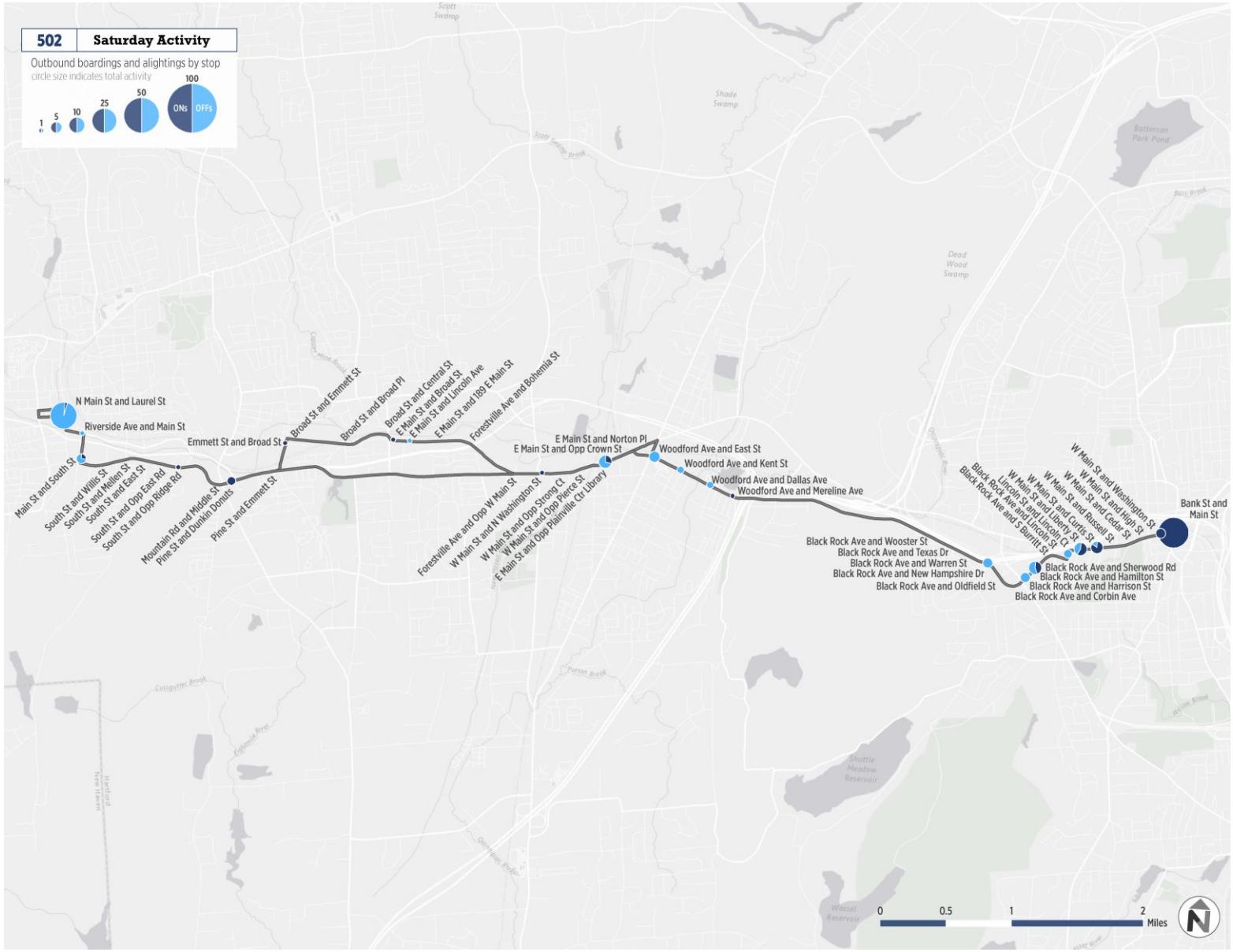


FIGURE 12 | SATURDAY INBOUND RIDERSHIP BY STOP GRAPH

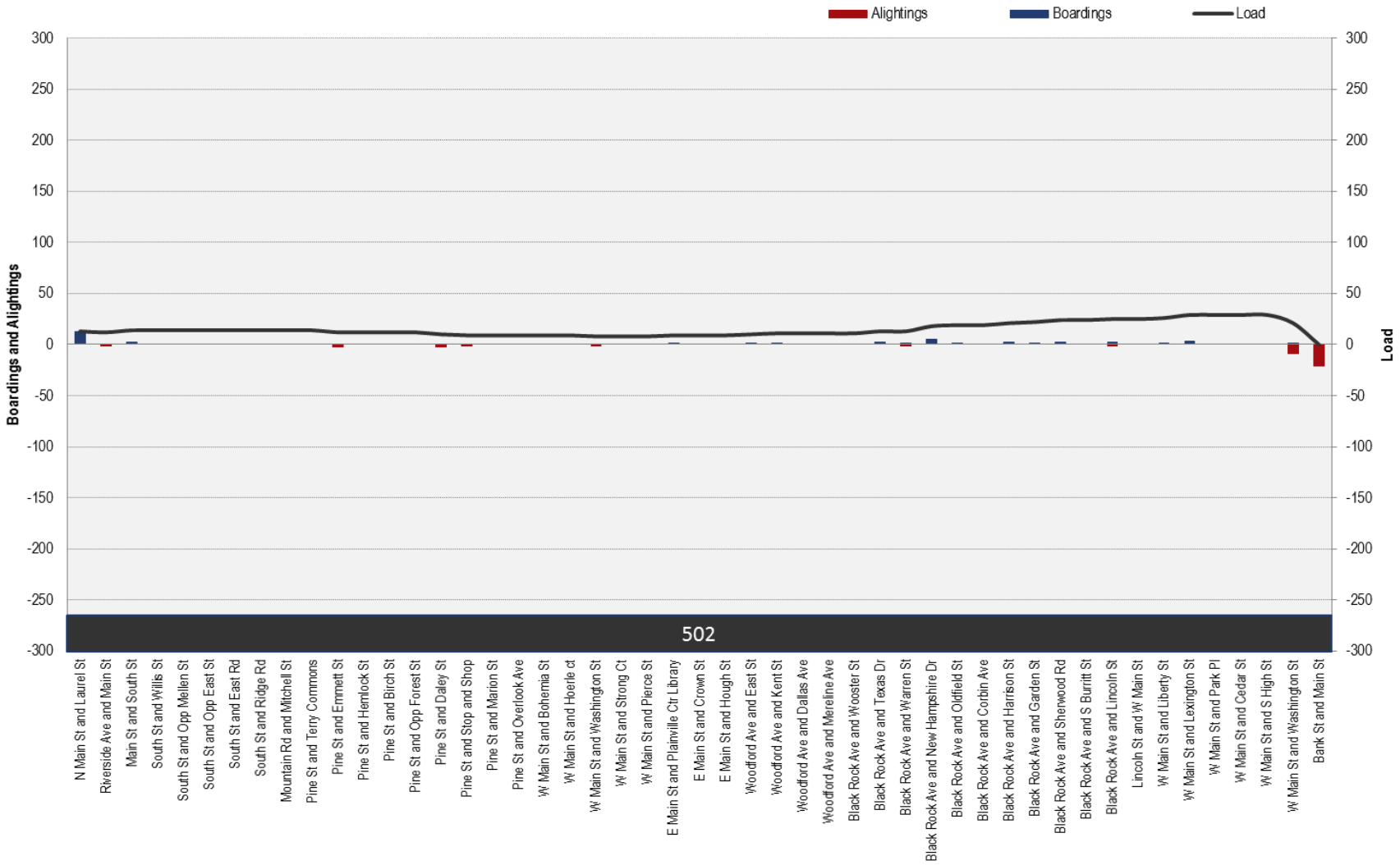


FIGURE 13 | SATURDAY INBOUND RIDERSHIP BY STOP MAP

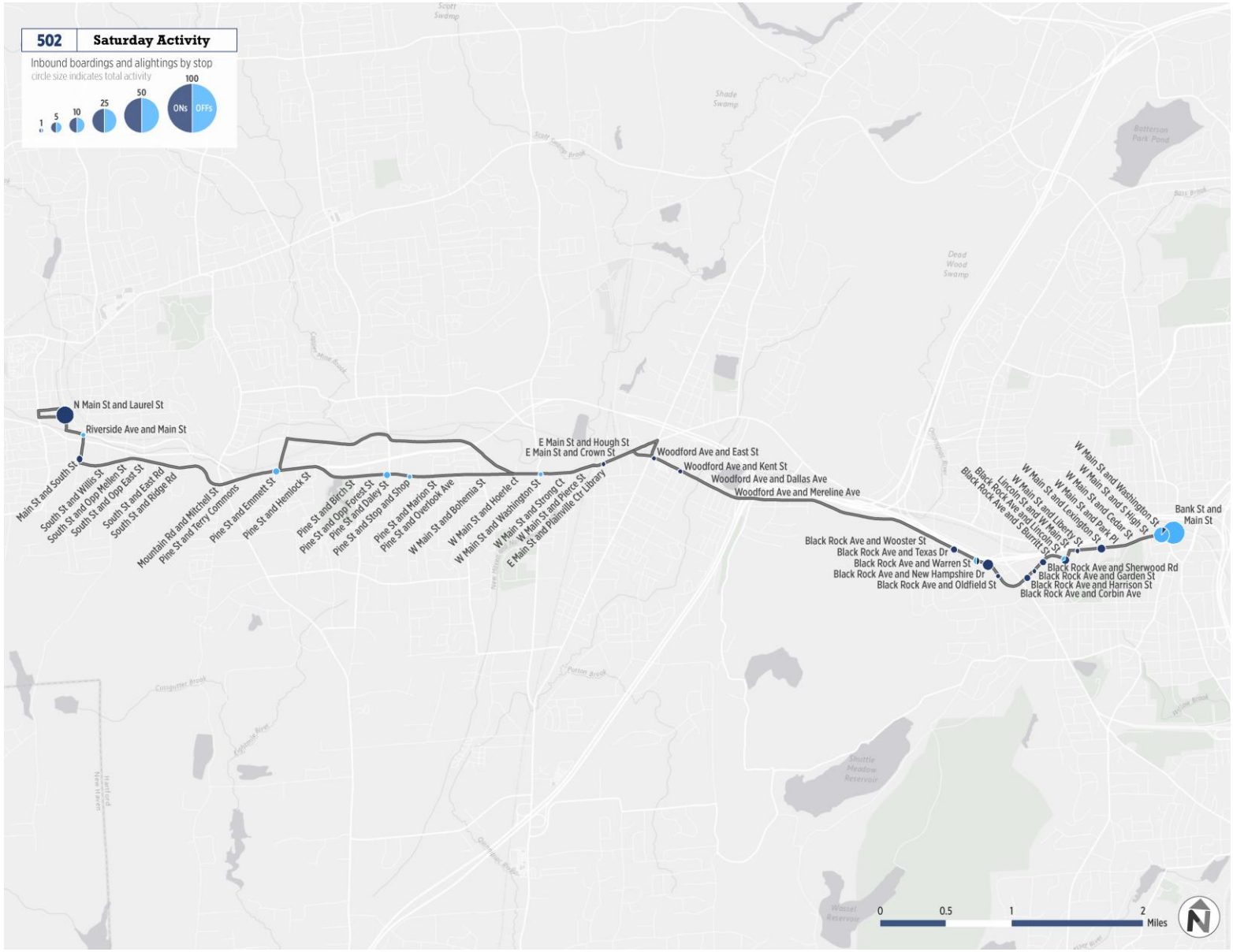


FIGURE 14 | SUNDAY OUTBOUND RIDERSHIP BY STOP GRAPH

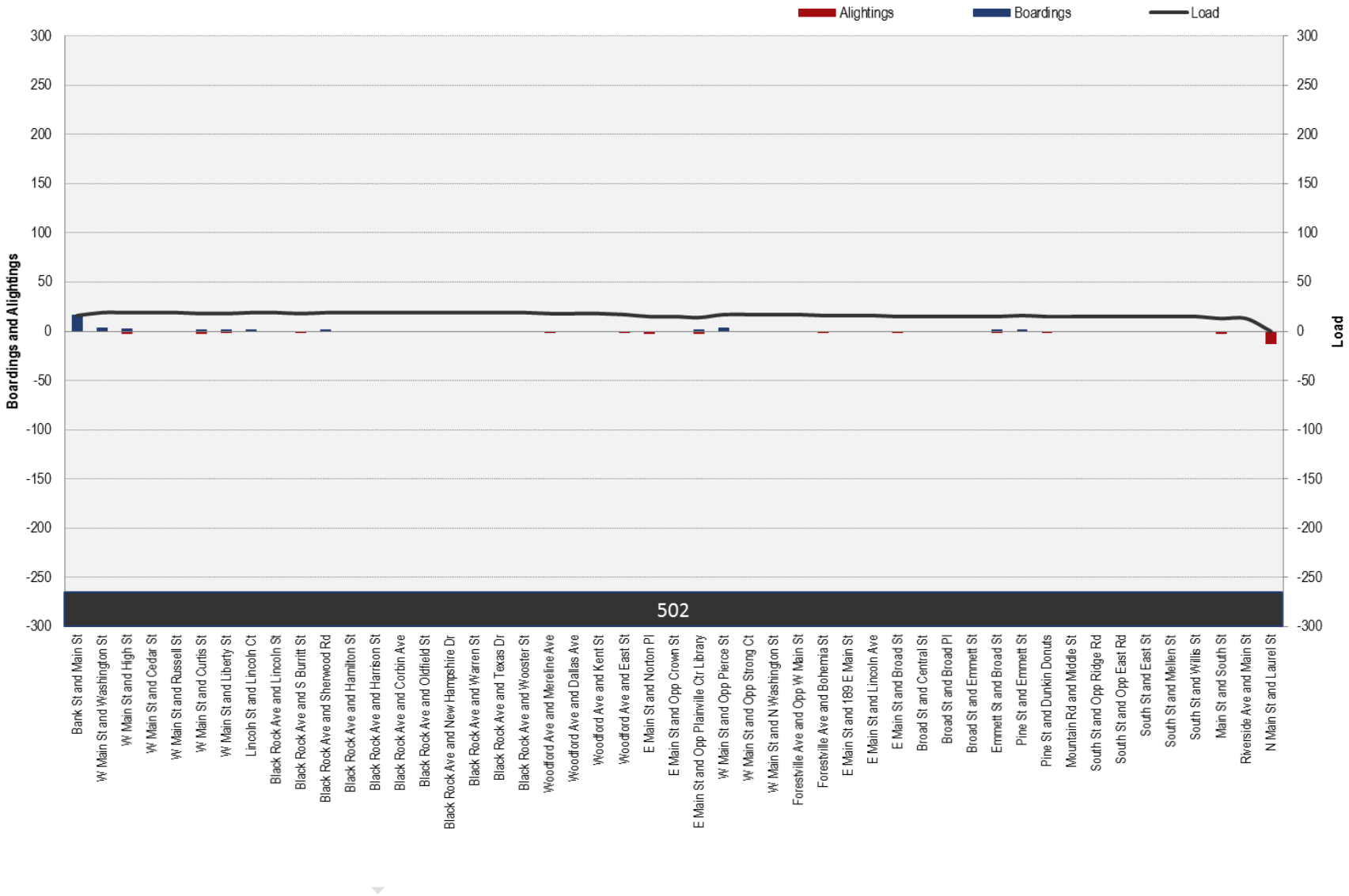


FIGURE 15 | SUNDAY OUTBOUND RIDERSHIP BY STOP MAP

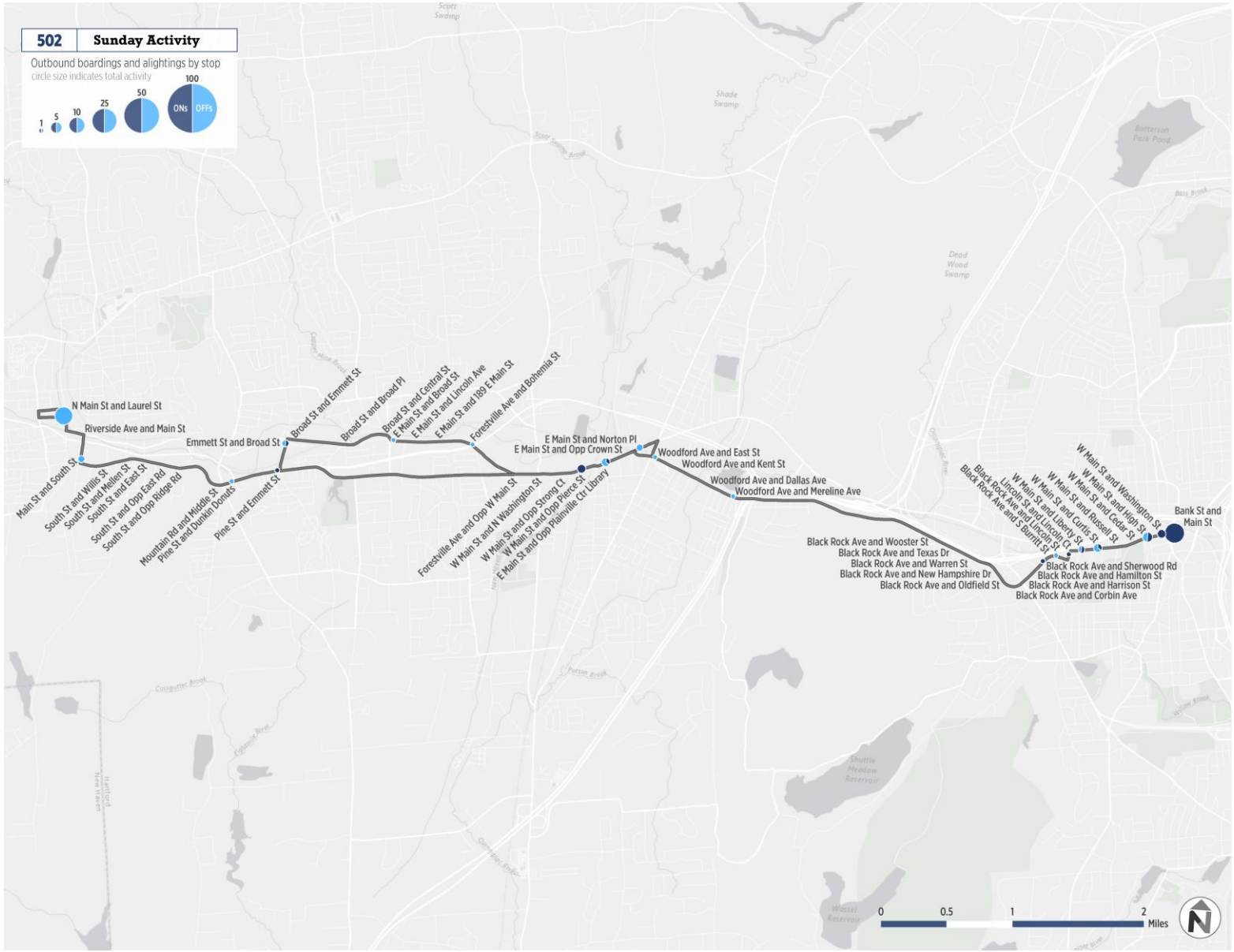


FIGURE 16 | SUNDAY INBOUND RIDERSHIP BY STOP GRAPH

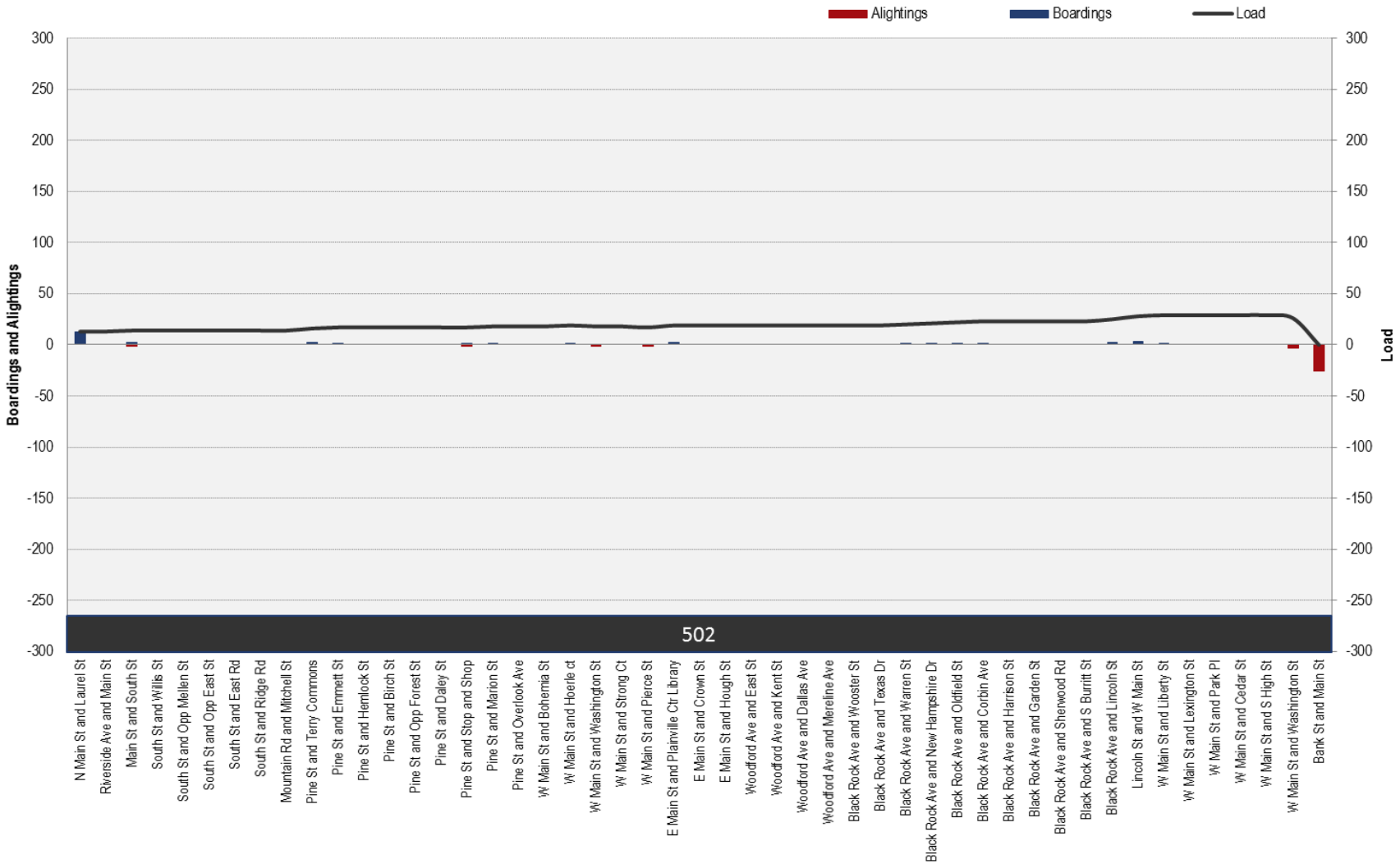
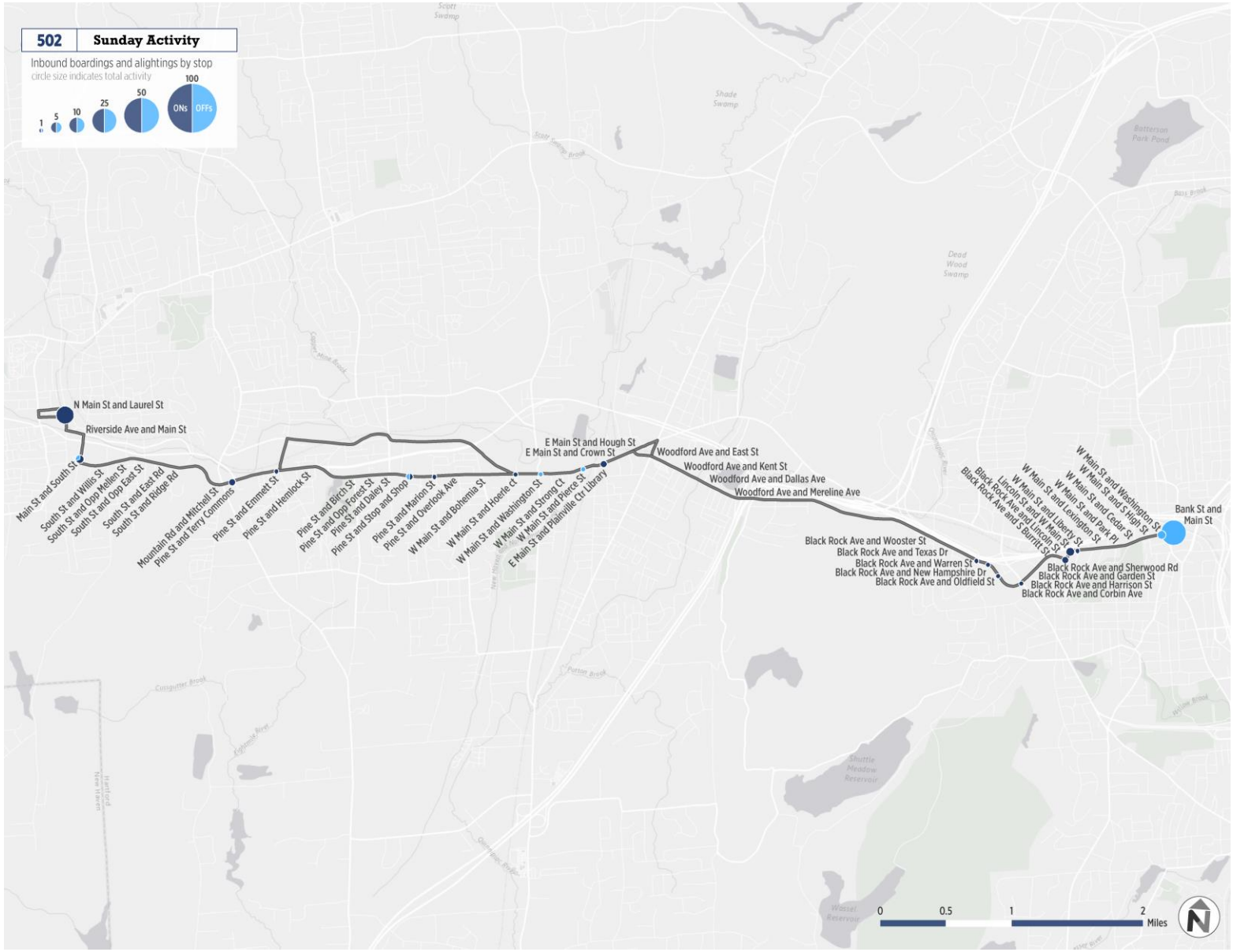


FIGURE 17 | SUNDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Route 502 carries an average of 6.9 passengers per trip on weekdays. For both inbound and outbound trips demand is highest in the morning and midday periods and drops off sharply after 6:00 PM (Figure 18 and Figure 19). This activity throughout the day potentially suggests that while Route 502 serves workers traveling between New Britain, Plainville, and Bristol, passengers are also using the route for recreational and retail shopping purposes during midday periods.

No trips exceed 20 passengers, and the highest max load is 13 passengers, which is well below the typical seating capacity of a 40-foot transit bus.

FIGURE 18 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

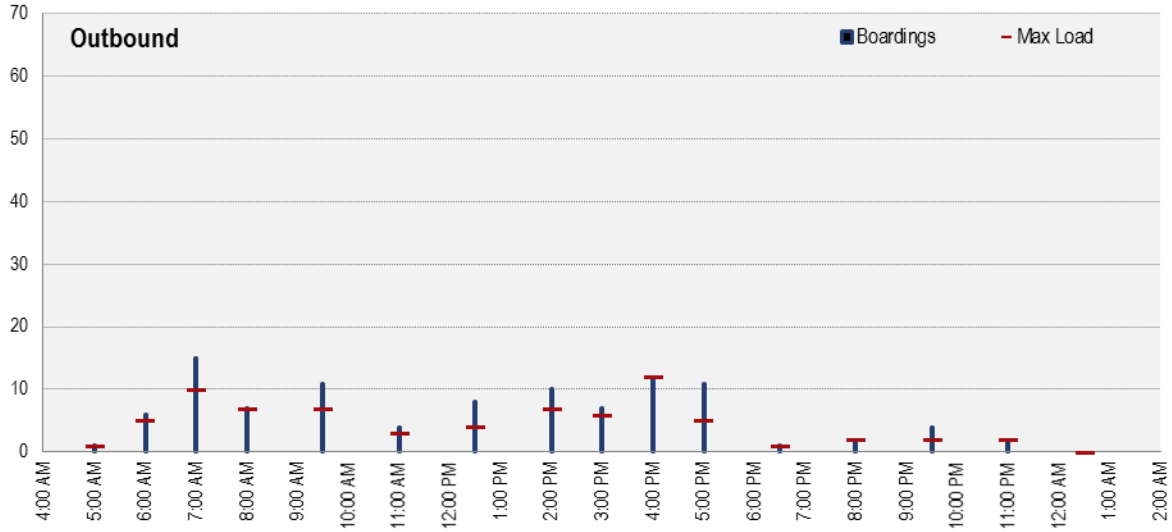
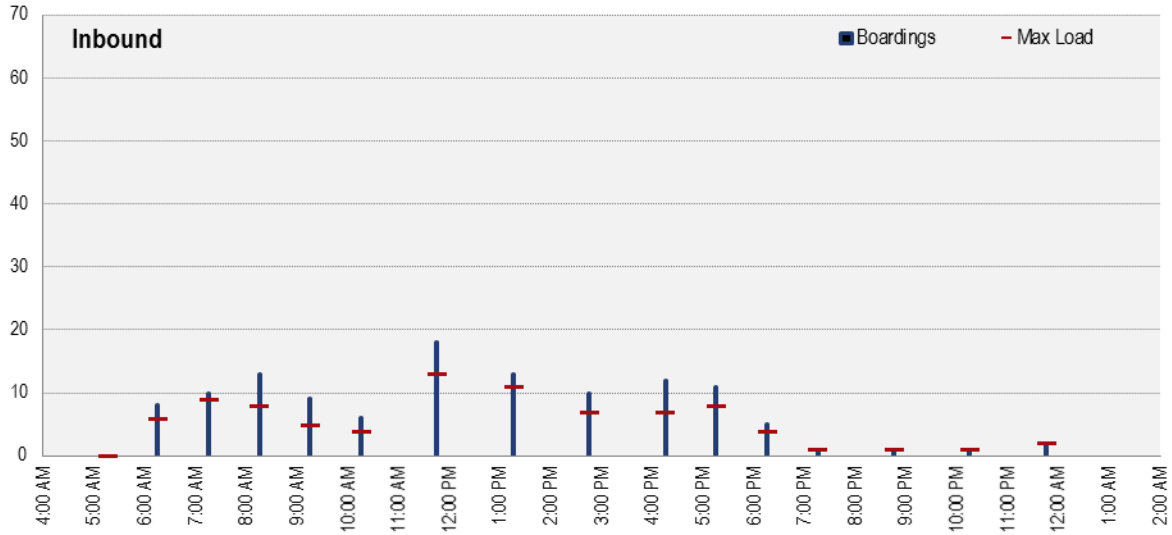


FIGURE 19 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Saturday ridership is minimal in both the inbound and outbound direction, with most trips carrying between five and 15 riders. Traveling outbound, ridership is highest from 11:00 AM to 5:00 PM. In the inbound direction no trips carry more than six passengers. Saturday trips average four passengers per trip.

FIGURE 20 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

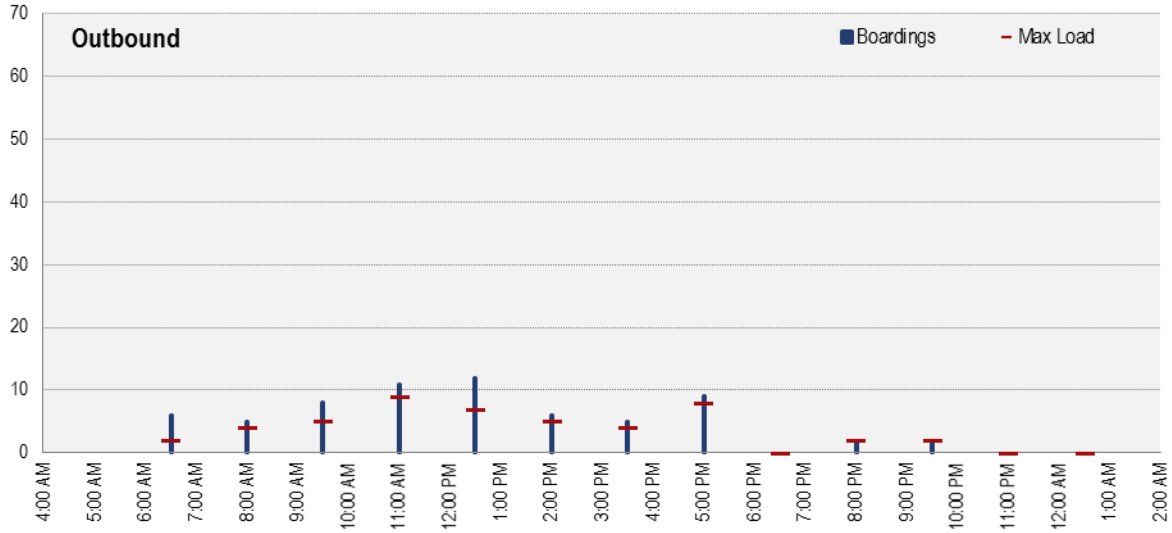
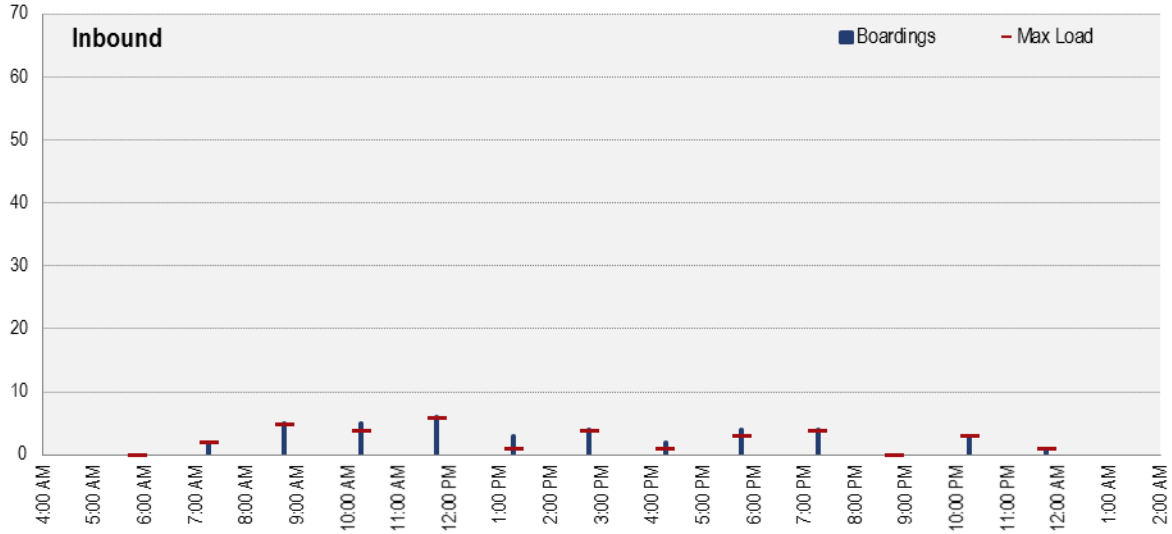


FIGURE 21 | SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

Sunday ridership follows a similar pattern to Saturday, with lower ridership; outbound ridership peaks at 2:00 PM, and inbound ridership peaks at 1:00 PM. Sunday trips average 3.5 passengers per trip.

FIGURE 22 | SUNDAY OUTBOUND RIDERSHIP BY TRIP

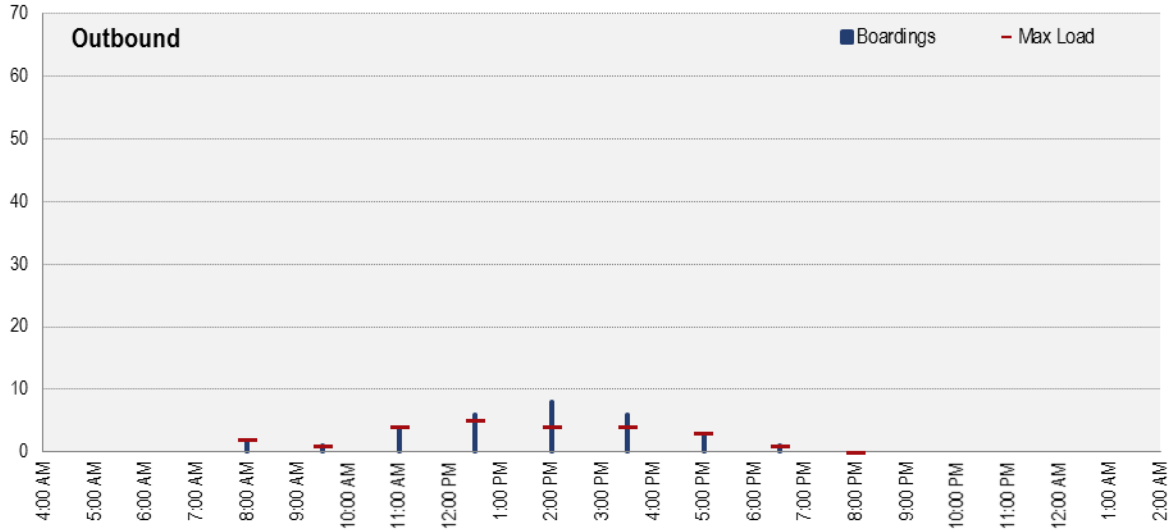
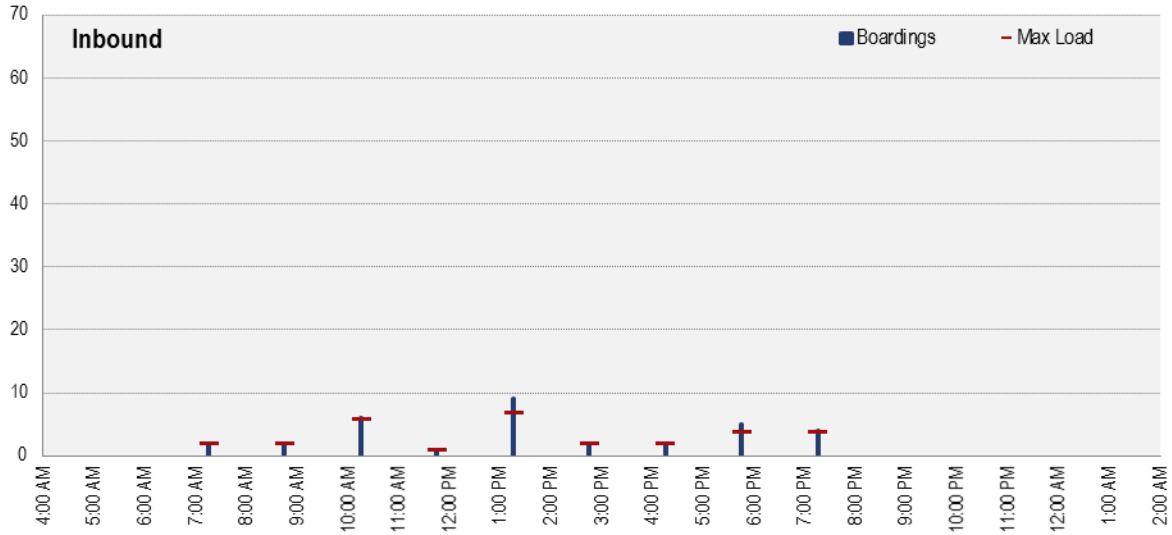


FIGURE 23 | SUNDAY INBOUND RIDERSHIP BY TRIP



Performance

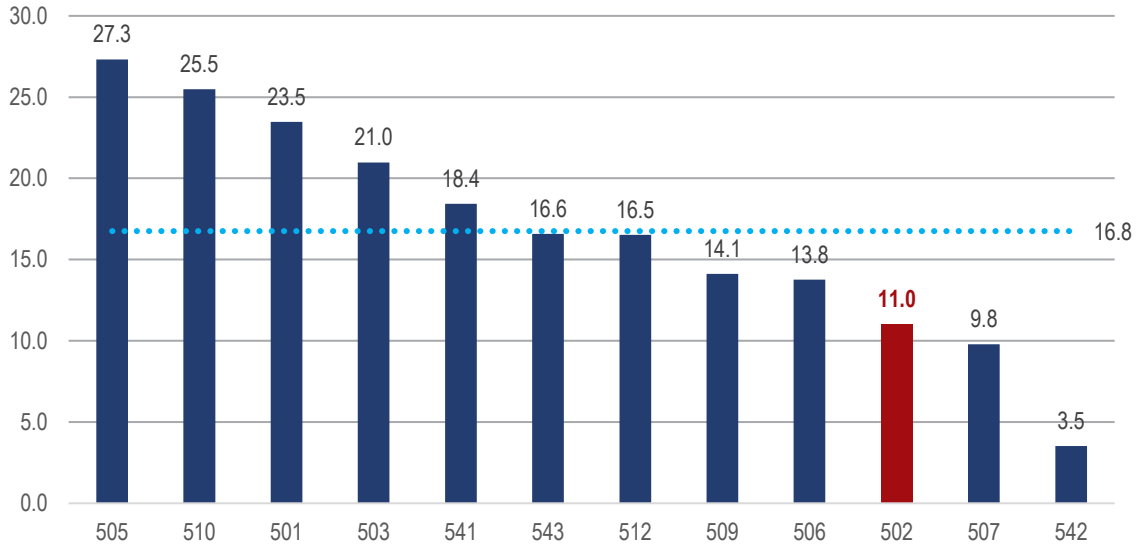
Route 502 carries 11.0 riders per hour on weekdays, ranking 10th out of 12 routes on this measure of productivity (**Error! Reference source not found.**). Weekend productivity is similar as weekday service with Route 502 ranked 10th on Saturdays and 11th on Sundays.

FIGURE 24 | PERFORMANCE MEASURES

PRODUCTIVITY MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 503	DIVISION AVG	ROUTE 503	DIVISION AVG	ROUTE 503	DIVISION AVG
Passengers per Vehicle Revenue Hour	11.0	16.8	6.5	13.1	5.7	10.4

Source: Ridecheck data, CTtransit maps and schedules

FIGURE 25 | WEEKDAY PASSENGERS PER REVENUE HOUR



ON-TIME PERFORMANCE

On weekdays, approximately 71% of Route 502 time points were served "on-time" during the survey period (Figure 26). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Weekday on-time performance was affected by early departures, which occurred 22% of the time. On Saturdays, approximately 44% of Route 502 time points were served "on-time" during the survey period, with 49% of time points served earlier than scheduled. On Sundays, approximately 42% of time points were served "on-time," and 56% of time points are served early.

FIGURE 26 | ON-TIME PERFORMANCE

PERFORMANCE	WEEKDAY	SATURDAY	SUNDAY
Early	17%	34%	40%
Late	8%	7%	3%
On-Time	75%	59%	57%

*Source: CT**transit** performance data*

SERVICE IMPROVEMENT

Route 502 provides bidirectional service between New Britain and Bristol. The route is fairly direct and easy to understand. The vast majority of riders board and alight at either end, with limited activity along the middle portion of the route. However, the route has relatively low ridership compared to other New Britain/Bristol Division routes and is one of the least productive routes in the system. Route 502 is also somewhat redundant with CT***fastrak*** Route 102, which runs more frequently and also operates direct service between New Britain and Bristol, albeit with limited-stop service.

Service Improvement Options

Potential opportunities to improve the route include the following:

- **Operate on the same alignment in both directions.** Along most of Route 502, service operates on the same alignment in both directions (Black Rock Avenue, Woodford Avenue, and West Main Street). However, a two-mile stretch of the route operates along East Main Street and Broad Street going outbound and along Pine Street going inbound. In this configuration, the walking distance between reciprocal stops is a third of a mile or more. Bidirectional service is more intuitive for riders to use, since they know how to get back to where they came from, making it more convenient to use.
- **Coordinate schedule with CT*fastrak* Route 102.** Route 502 operates along nearly the same alignment as Route 102, albeit providing local service and serving some parallel streets. For many trips, however, Route 502 departs soon before or after Route 102, creating additional redundancy along the same corridor. Adjusting Route 502's schedule to be coordinated with Route 102 could provide a higher level of service along the corridor. For example, both routes may operate every hour, but alternating the schedules would provide the common alignment with 30-minute service.
- **Eliminate weekday service after 11:00 PM.** Ridership figures show that later service is lightly used. Eliminating these trips could improve the overall productivity of the route.

Route Evaluation

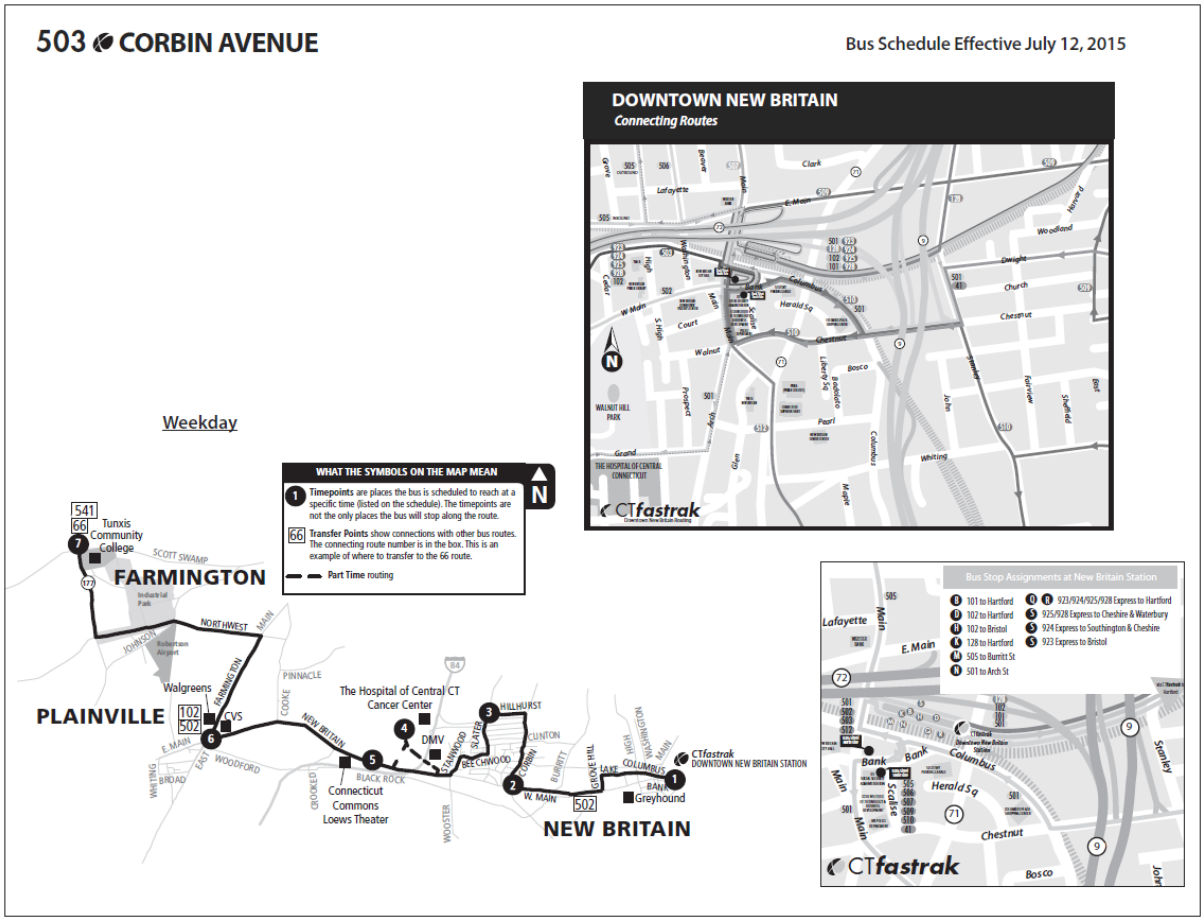
CORBIN AVENUE

503 | Arch Street

Service Design

Route 503 is a radial route, providing service between downtown New Britain and Tunxis Community College in Farmington. The route operates primarily on West Main Street, Corbin Avenue, New Britain Avenue, Farmington Avenue, Northwest Drive, and Plainville Avenue.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 503 begins and ends in downtown New Britain, where riders can transfer to nearly all other CT***transit*** routes serving New Britain as well as CT***fastrak*** for service to Hartford. Route 503 also has other transfer opportunities, including at Olde Canal Square Shopping Center in Plainville and at Tunxis Community College in Farmington. Route 503 is also interlined with Route 541 Bristol Local, which provides local circulation through Bristol.

Transfer opportunities are available outside of downtown New Britain to the following routes (see Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 66	Hartford via Farmington Avenue
Route 102	Bristol via Black Rock Ave, South Pine, Connecticut Commons
Route 502	Bristol via Black Rock Ave, South Pine
Route 541	Bristol Local

Alignments and Service Patterns

The primary alignment of Route 503 travels outbound from Bank Street and Main Street in Downtown New Britain via Columbus Boulevard. The route turns left on Lake Street, which continues as Grove Hill Street. The route then turns right on West Main Street, and right again on Corbin Avenue. The route turns left on Hillhurst Avenue, and left on Slater Road, right on Beechwood Drive, and right again on Stanwood Drive to return to West Main Street. The service then continues on West Main Street before deviating right on Mountain Road to serve the Hartford Healthcare Cancer Institute, returning back to West Main Street on Journey Road. West Main Street continues as New Britain Avenue. In Plainville, Route 503 turns right on Farmington Avenue. The route turns left at Northwest Drive, and then right onto Unionville Avenue to access Tunxis Community College.

Service in the inbound direction back to New Britain operates on the same alignment.

Service does not deviate to serve the Hartford Healthcare Cancer Institute during the early morning and late evenings on weekdays, the afternoons on Saturday, or anytime on Sunday.

Service Schedule

Route 503 operates seven days per week. There are 19 outbound trips per weekday and 18 inbound trips. Service operates every 60 minutes during the peak periods (defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM) and the midday. During the late evening, frequency drops to every 90 minutes.

On Saturdays, there are 18 outbound and 17 inbound trips. Service operates every 60 minutes throughout the day except for in the very late evening when service decreases to every 90 minutes. On Sundays, there are 13 inbound and 13 outbound trips, starting later and ending earlier, with service operating every 60 minutes.

FIGURE 3 | SCHEDULE OVERVIEW (ROUTE 503)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:00 AM – 1:03 AM	60 / 60	19/18
Saturday	6:00 AM – 1:03 AM	60 / 60	18/17
Sunday	7:00 AM – 8:50 PM	60 / 60	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

Route 503 carries 478 daily passengers or 12.9 passengers per trip on an average weekday, which is more than 72% higher than the New Britain/Bristol Division average of 7.5 weekday passengers per trip. Overall Route 503 carries the third highest average number of passengers in the division.

Saturday and Sunday ridership per trip are also high relative to the division average (see Figure 4). The average ridership per trip is the third highest in the division, and over 40% higher than the division average for both Saturday and Sunday.

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 503	ROUTE 503	DIVISION AVG
Weekday	398	12.9	7.5
Saturday	288	8.2	5.8
Sunday	174	6.2	4.2

Source: CTtransit performance data

Ridership by Stop

The most heavily used stops on Route 503 are downtown at Bank Street and Main Street, and the route's terminus at Tunxis Community College. Outside of downtown, there is only one stop that generates 30 or more boardings or alightings per day (see Figure 5 and Figure 6).

FIGURE 5 | ROUTE 503 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (WEEKDAY INBOUND)

BUS STOP	RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Tunxis Community college / Plainville Avenue	84 / 0	Tunxis Community College
W Main Street / Wakefield Court	28 / 4	CorWest Plaza (Super Stop and Shop and other retail)
Bank Street / Main Street	0 / 147	Downtown New Britain, with town offices and retail

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 503 shows high weekday outbound passenger loads as the route begins in downtown New Britain that decline steadily after leaving the downtown area. An inverse pattern is apparent for weekday inbound routes with the passenger load steadily increasing as it moves towards the downtown before most passengers alight downtown at Bank Street and Main Street. Ridership by stop without the cumulative load is mapped in Figure 7.

The load profiles shown below are not continuous because some stops are served by all variants, while others are served by individual variants or a combination of route variants. Each variant is labeled accordingly in Figure 6 and similar charts below.

FIGURE 6 | WEEKDAY OUTBOUND RIDERSHIP BY STOP GRAPH

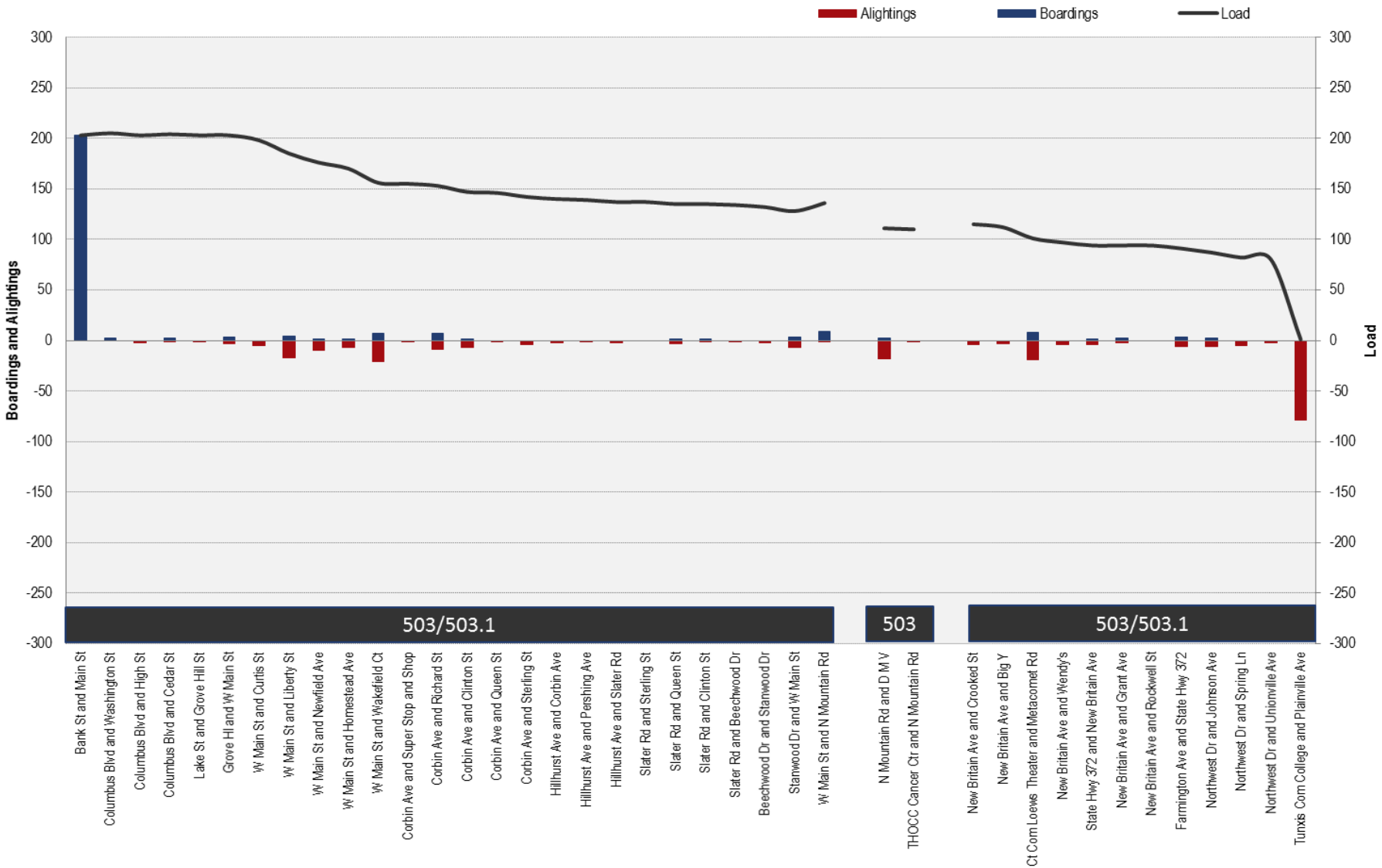


FIGURE 7 | WEEKDAY OUTBOUND RIDERSHIP BY STOP MAP

FIGURE 8 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

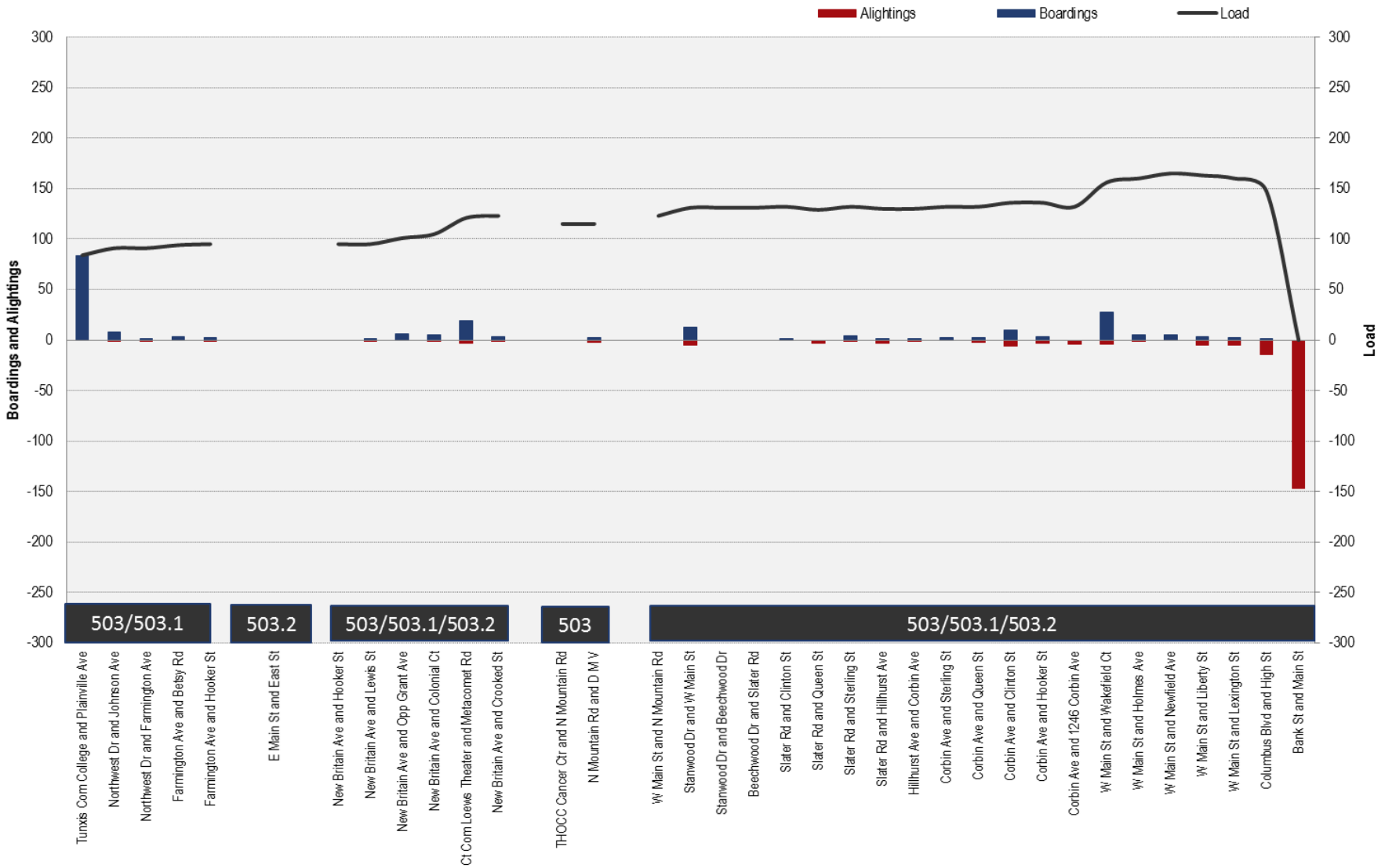


FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

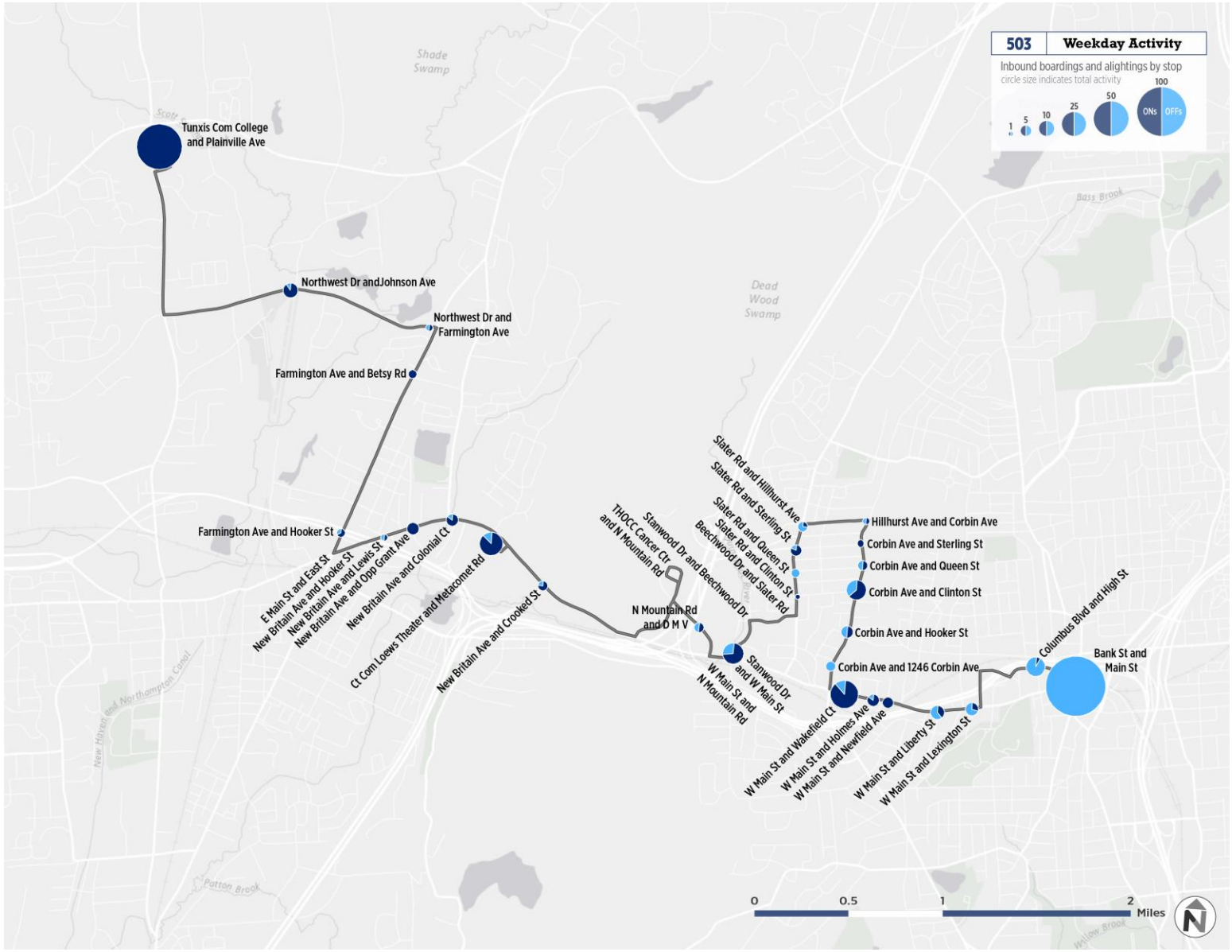


FIGURE 10 | SATURDAY OUTBOUND RIDERSHIP BY STOP GRAPH

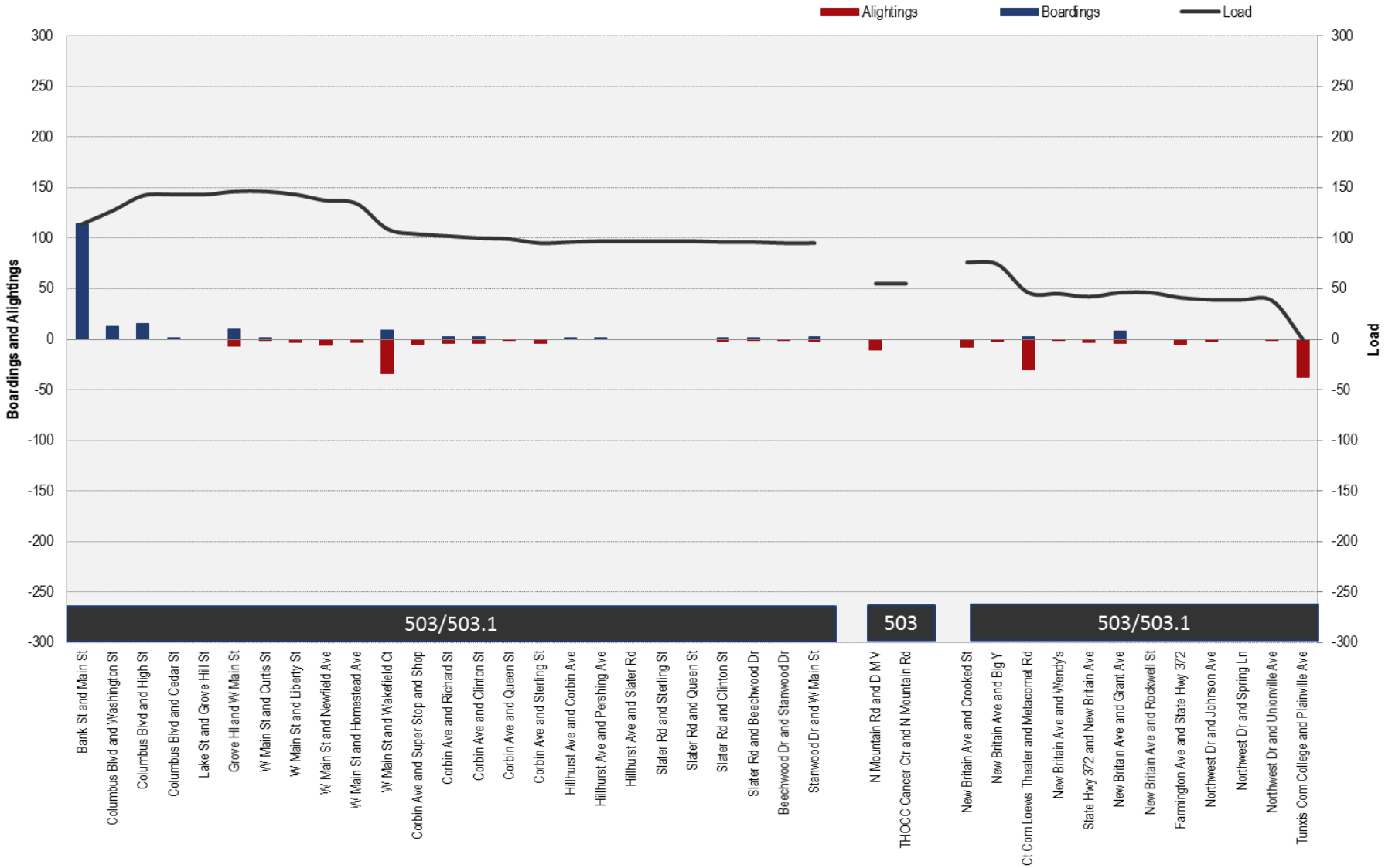


FIGURE 11 | SATURDAY OUTBOUND RIDERSHIP BY STOP MAP

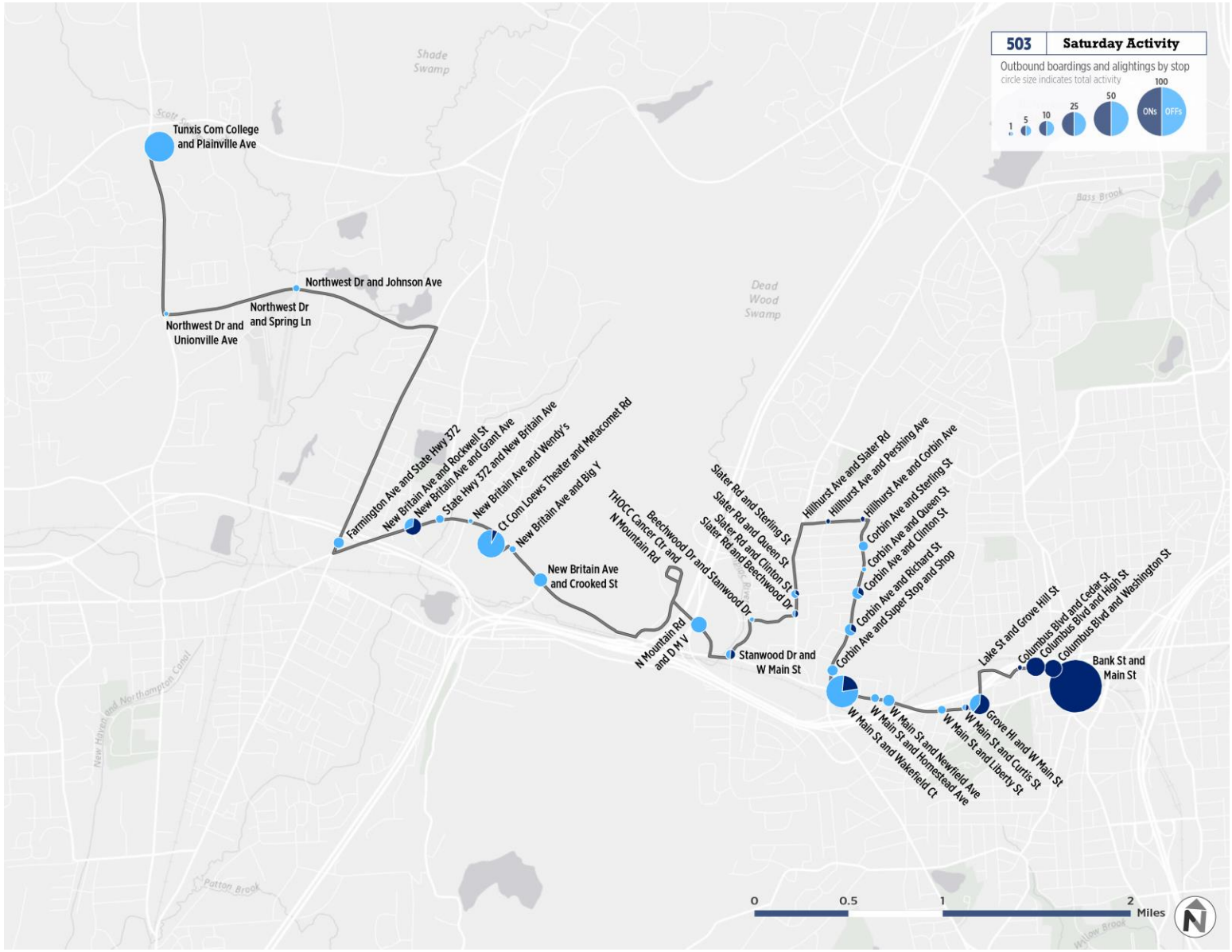


FIGURE 12 | SATURDAY INBOUND RIDERSHIP BY STOP GRAPH

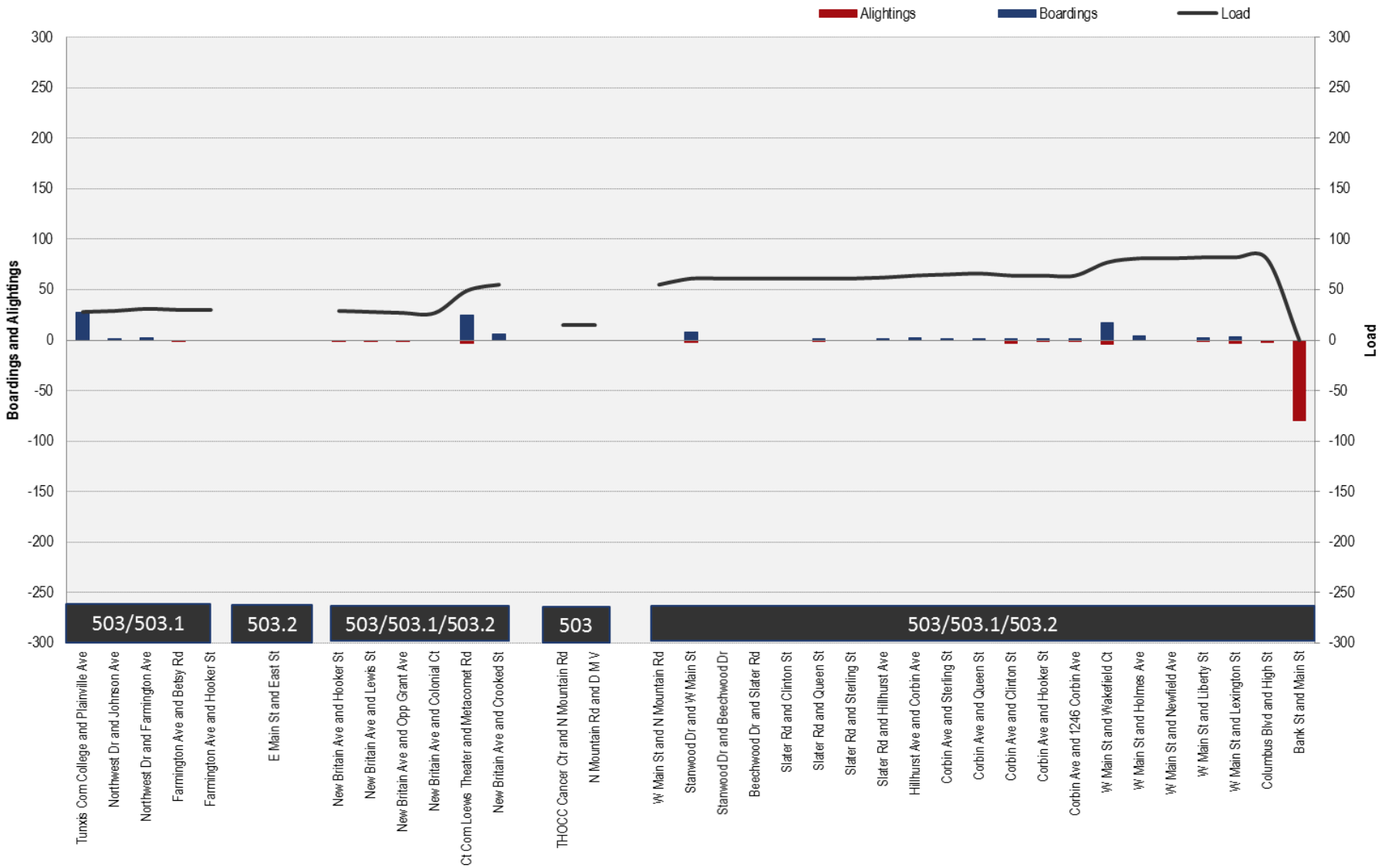


FIGURE 13 | SATURDAY INBOUND RIDERSHIP BY STOP MAP

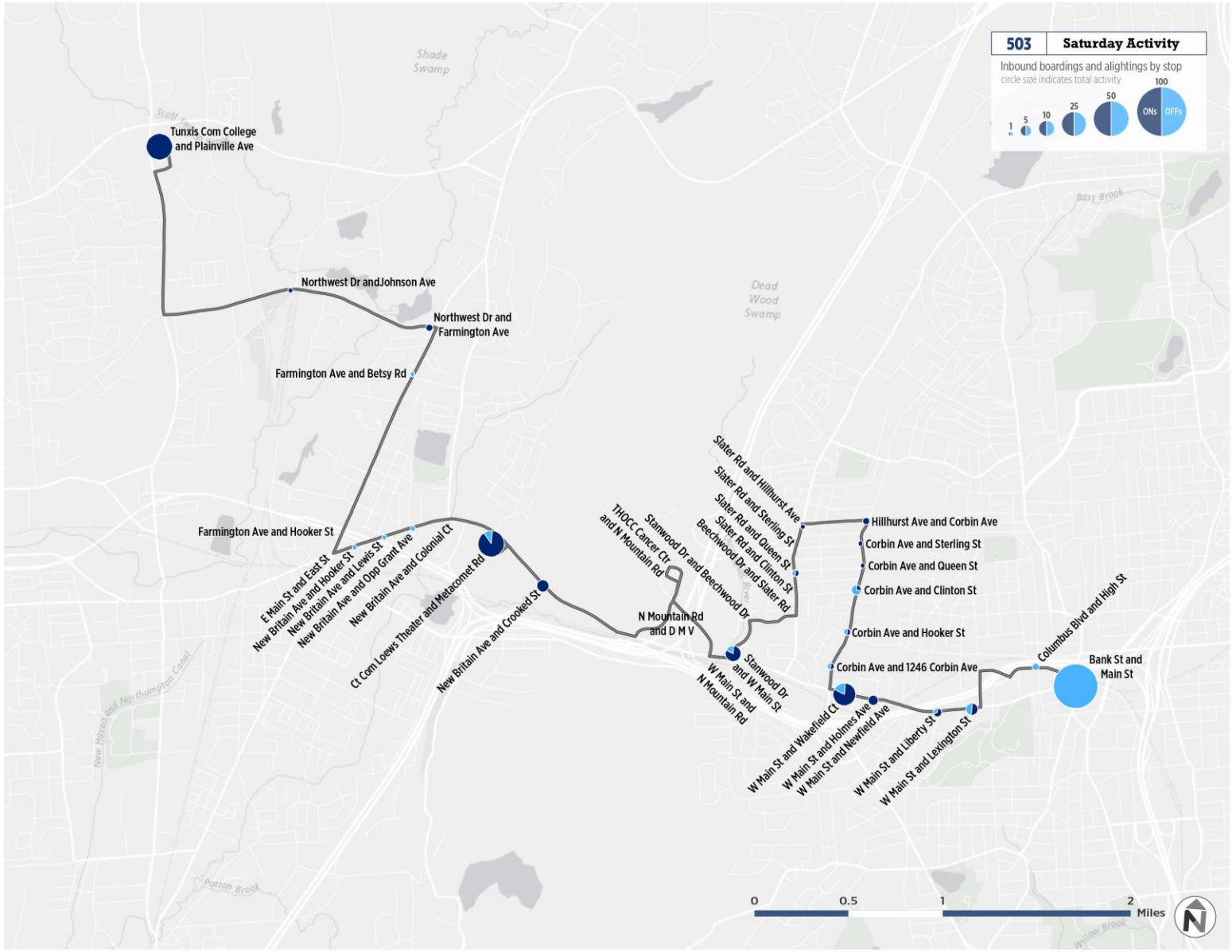


FIGURE 14 | SUNDAY OUTBOUND RIDERSHIP BY STOP GRAPH

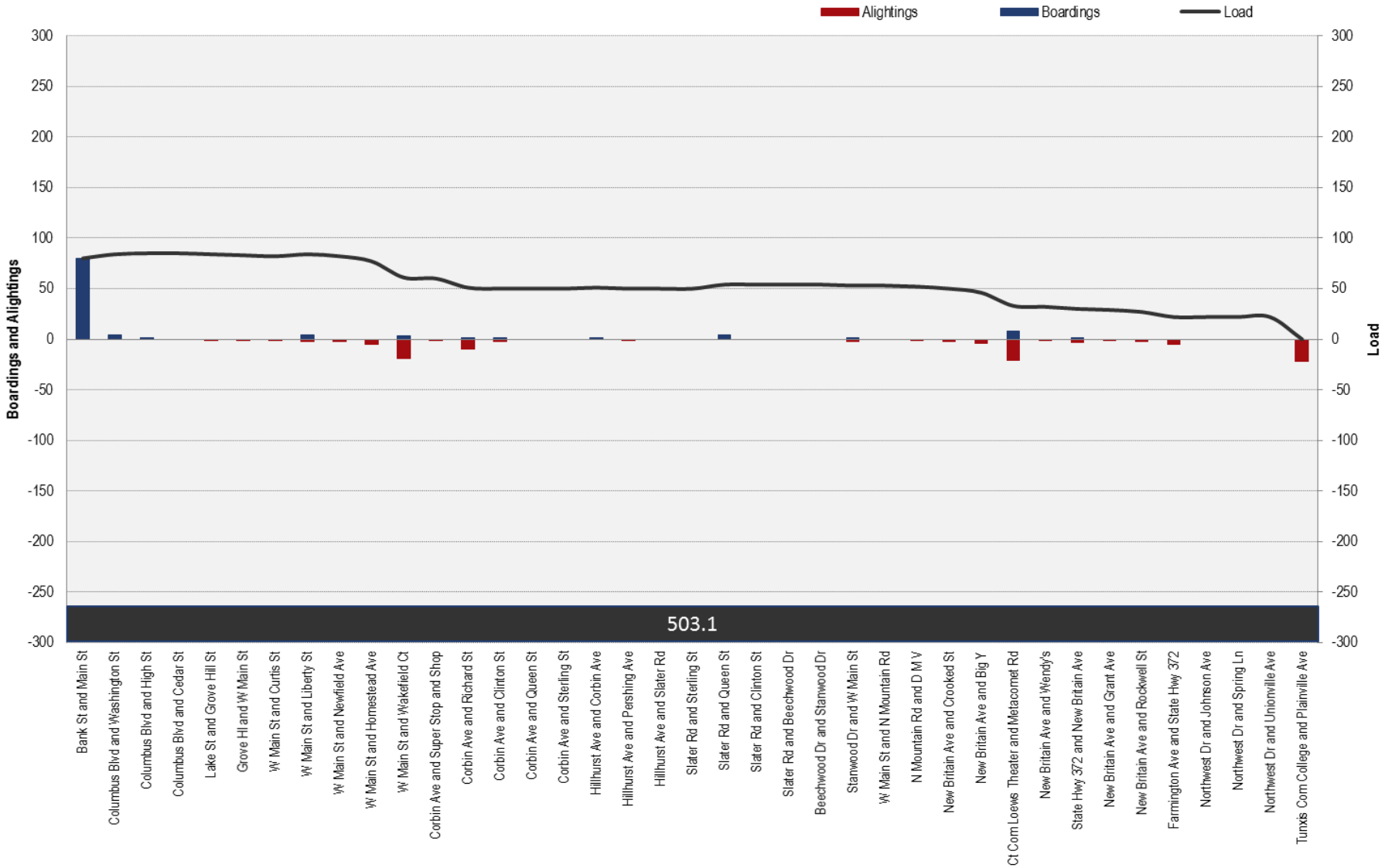


FIGURE 15 | SUNDAY OUTBOUND RIDERSHIP BY STOP MAP

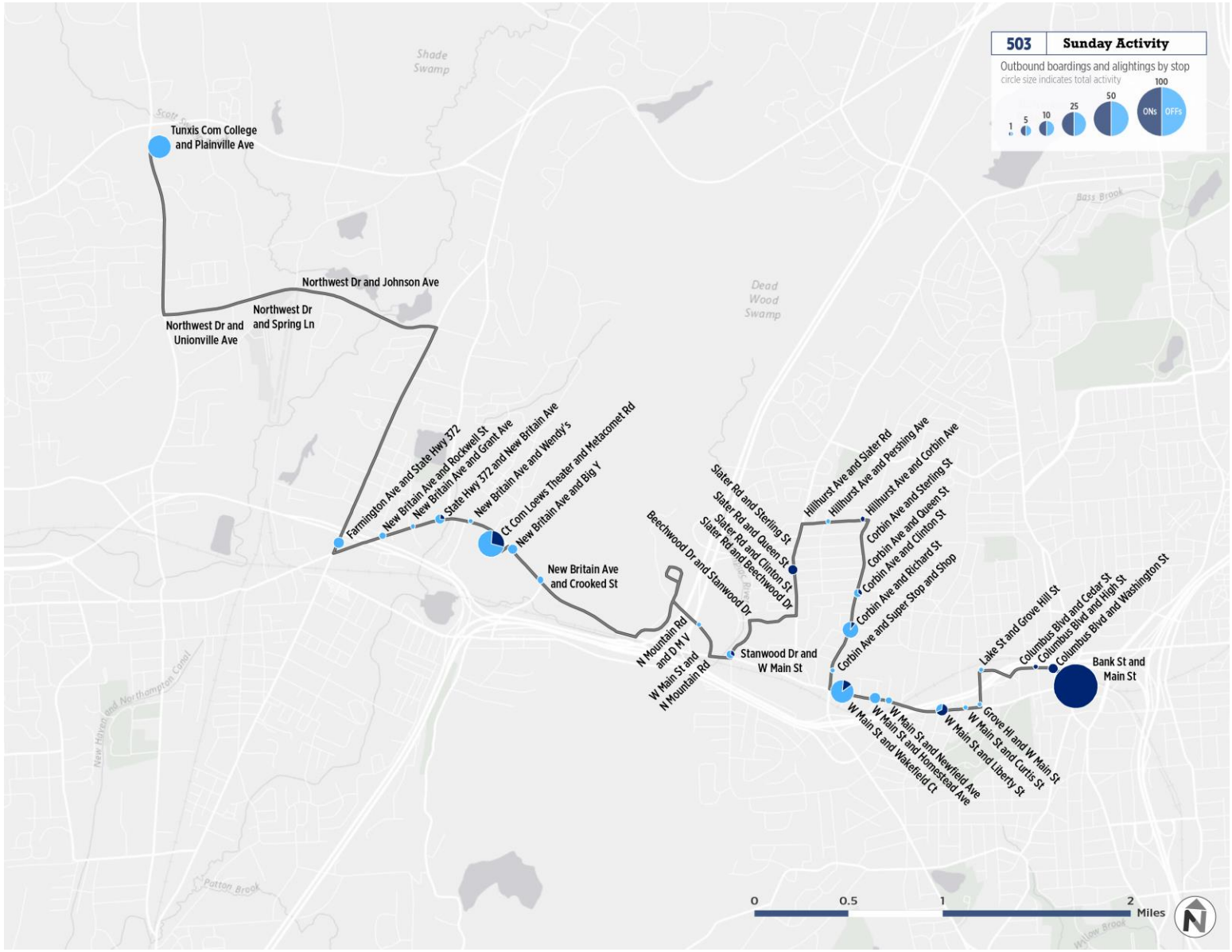


FIGURE 16 | SUNDAY INBOUND RIDERSHIP BY STOP GRAPH

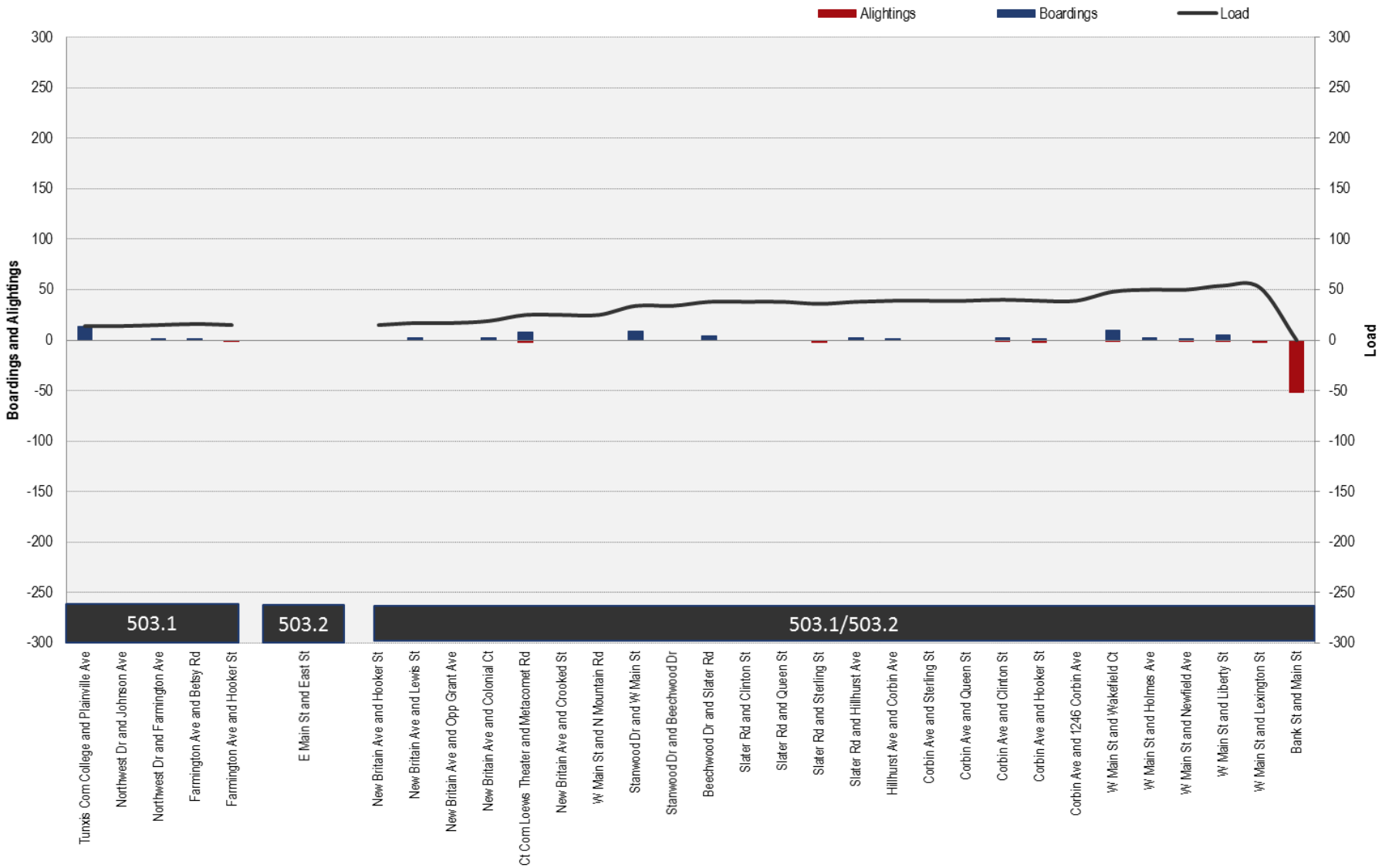
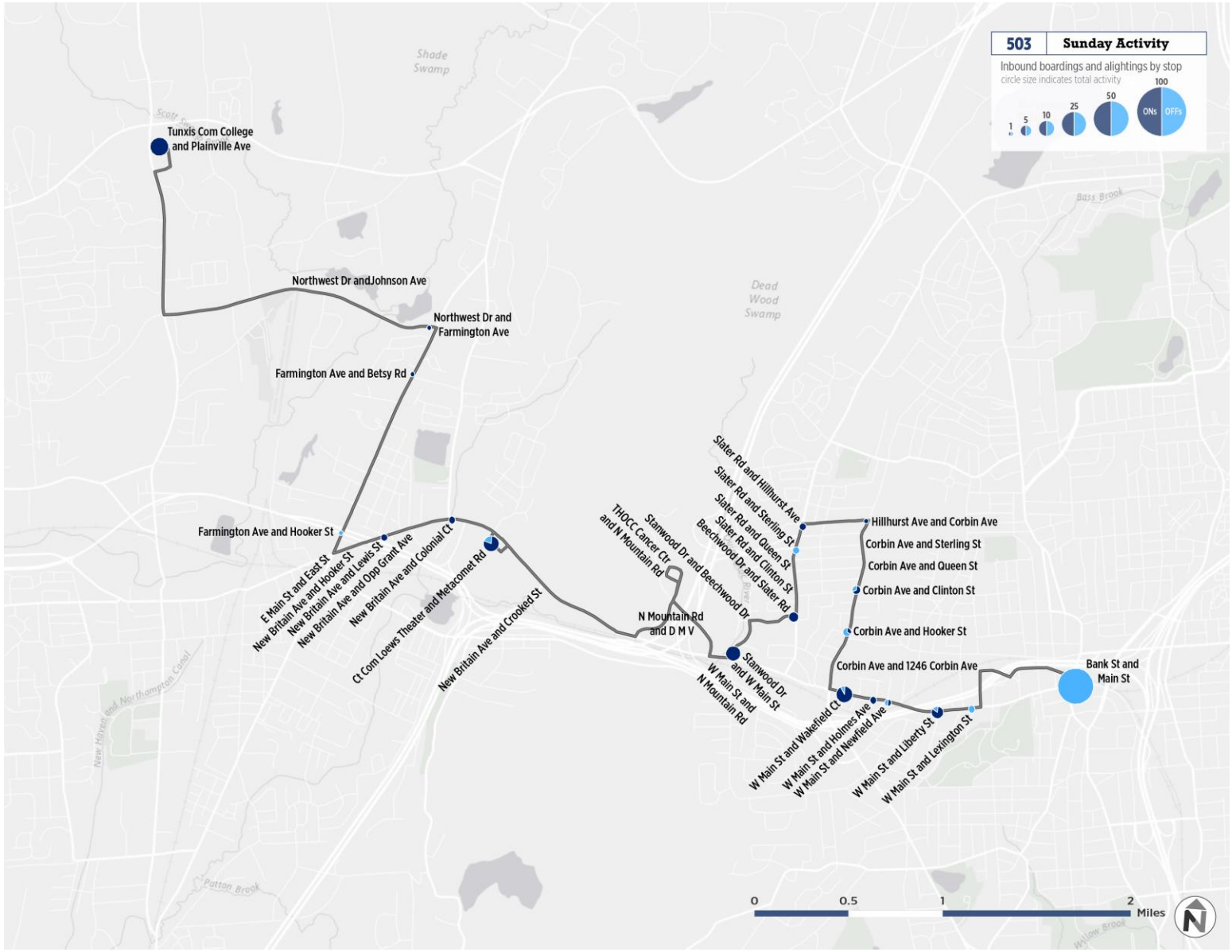


FIGURE 17 | SUNDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Route 503 carries an average of 10.8 passengers per trip on weekdays. Demand is higher in the outbound direction, with five trips exceeding 20 passengers and two trips with 30 or more passengers (Figure 18). While outbound trips peak in the morning (9 AM) and afternoon (2 PM), inbound trips peak only in the afternoon (see Figure 19). Constant activity throughout the day suggests Route 503 serves multiple trip types and users.

Total boardings or maximum loads never exceed 40 passengers, which is the typical seating capacity of a 40-foot transit bus.

FIGURE 18 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

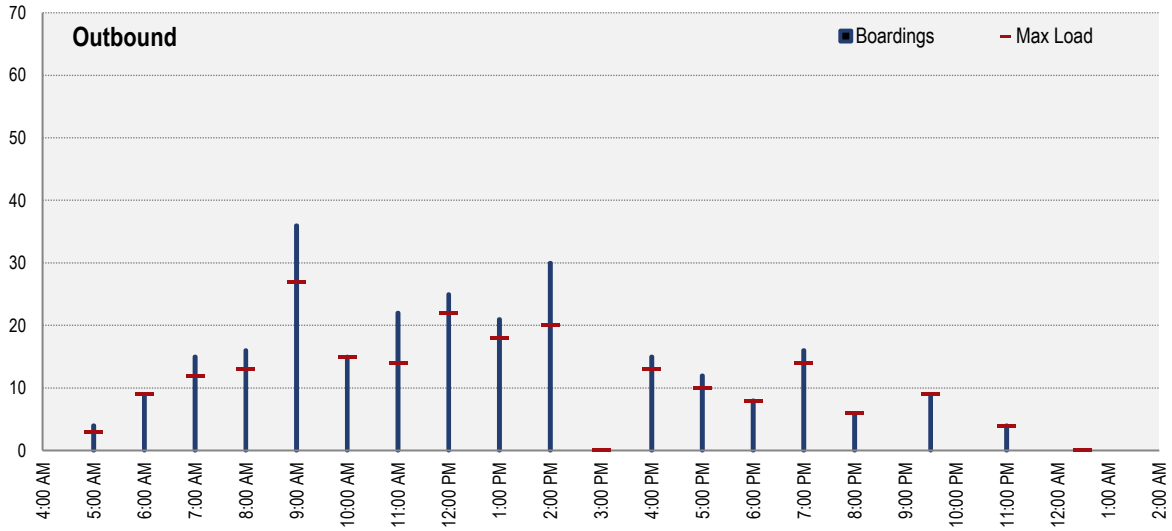
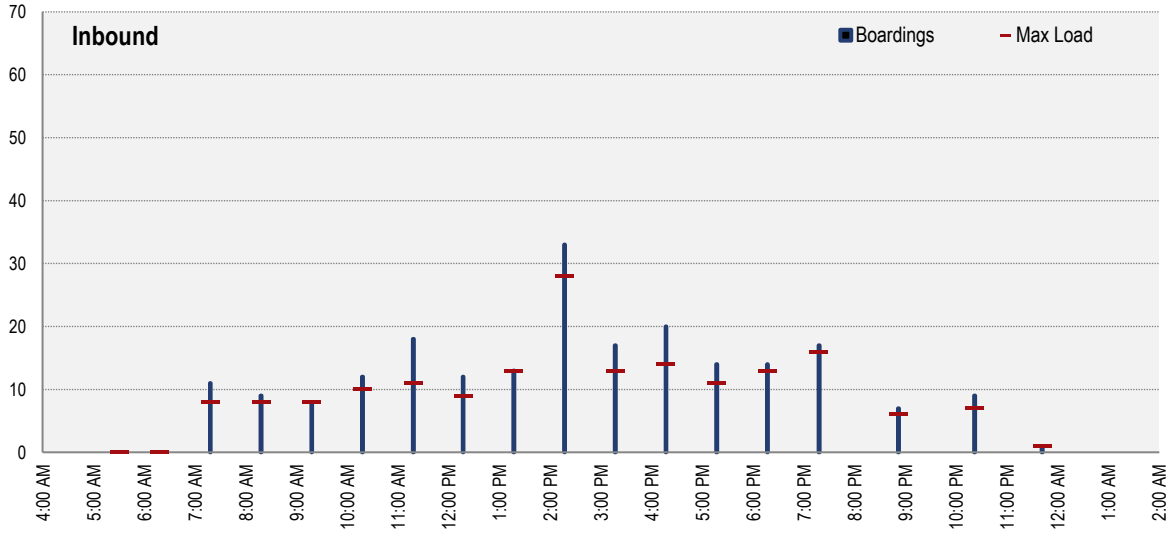


FIGURE 19 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Route 503 carries an average of 8.2 passengers per trip on Saturdays. Most outbound trips on Saturday carry 10 or more passengers per trip, while inbound ridership is not as high (Figure 20 and Figure 21). Demand is relatively higher in the morning and afternoon for outbound trips than the evening, while inbound demand is fairly higher and more consistent in the afternoon and evening. Fewer than 10 total passengers board Route 503 for either the inbound or outbound direction after 9:00 PM.

FIGURE 20 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

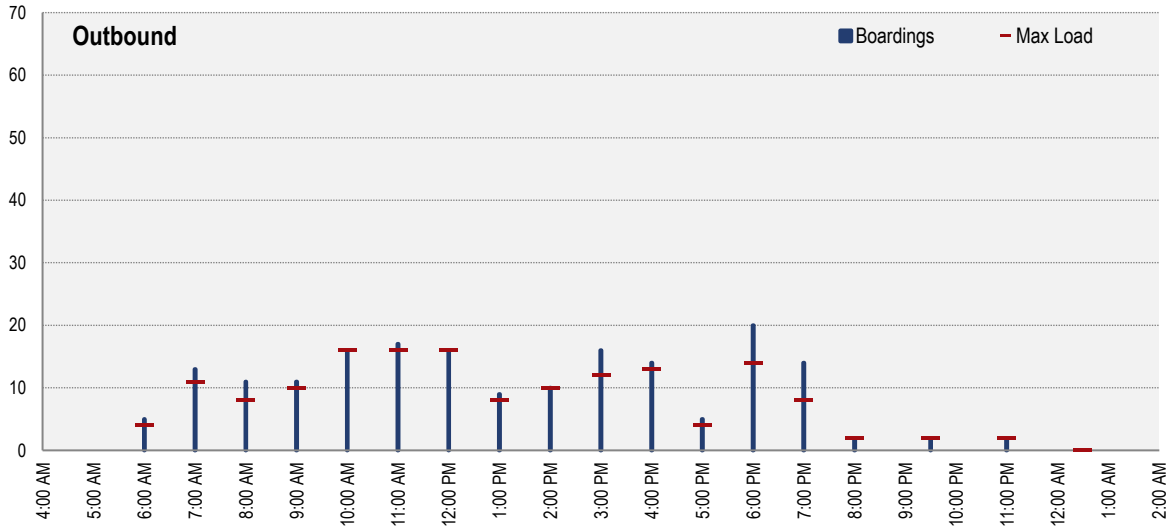
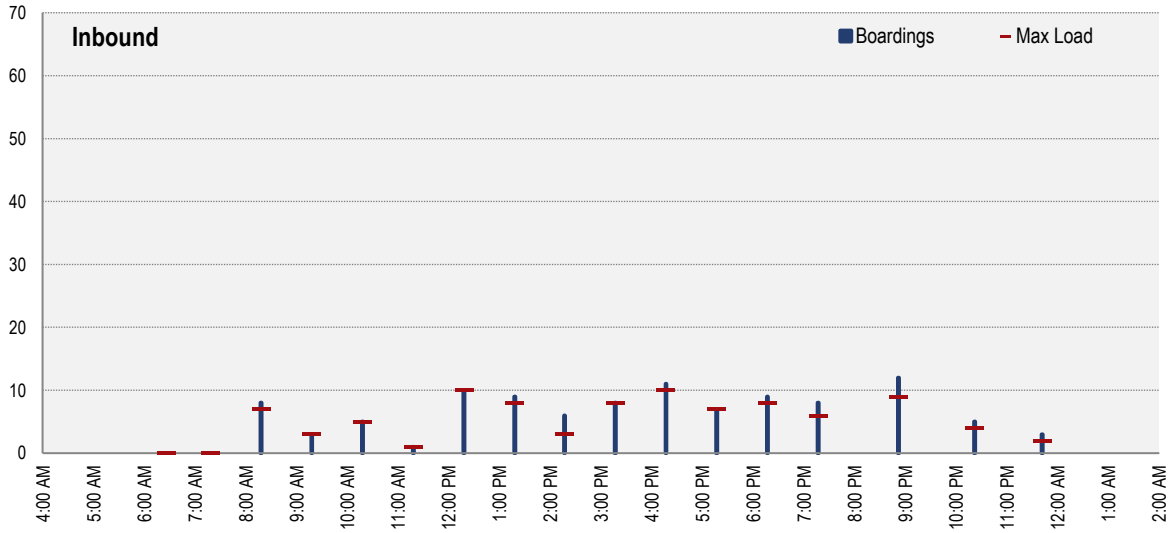


FIGURE 21 | SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

Outbound ridership peaks in the late morning (11:00 AM) and the late afternoon (4:00), with more than 10 passengers on each of these trips. As shown in Figure 22, all other outbound trips have fewer than 10 passengers. Similar to Saturday patterns, inbound trips have fewer riders overall than outbound trips. As shown in Figure 23, only one trip exceeds 10 riders.

FIGURE 22 | SUNDAY OUTBOUND RIDERSHIP BY TRIP

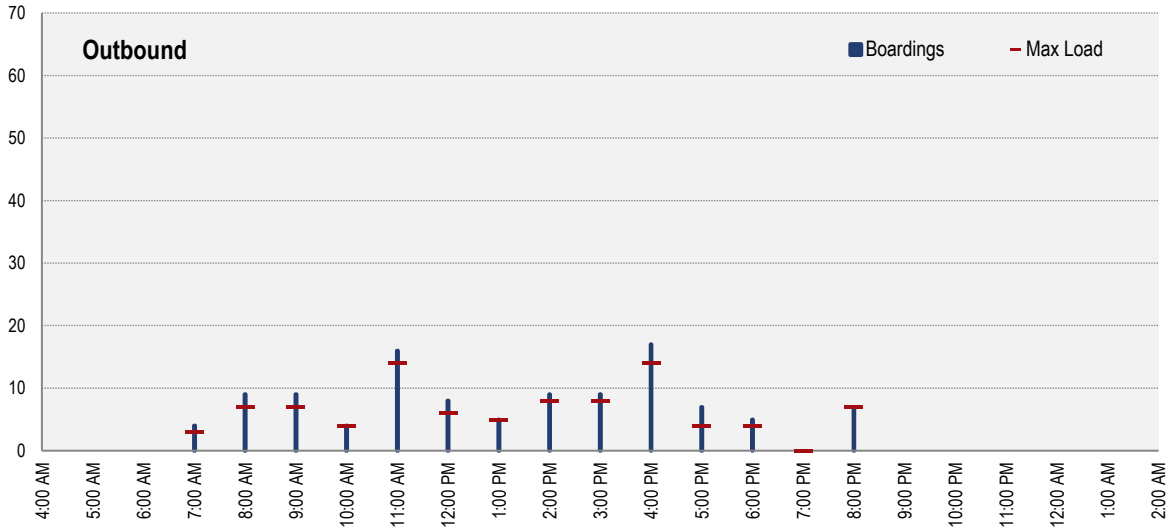
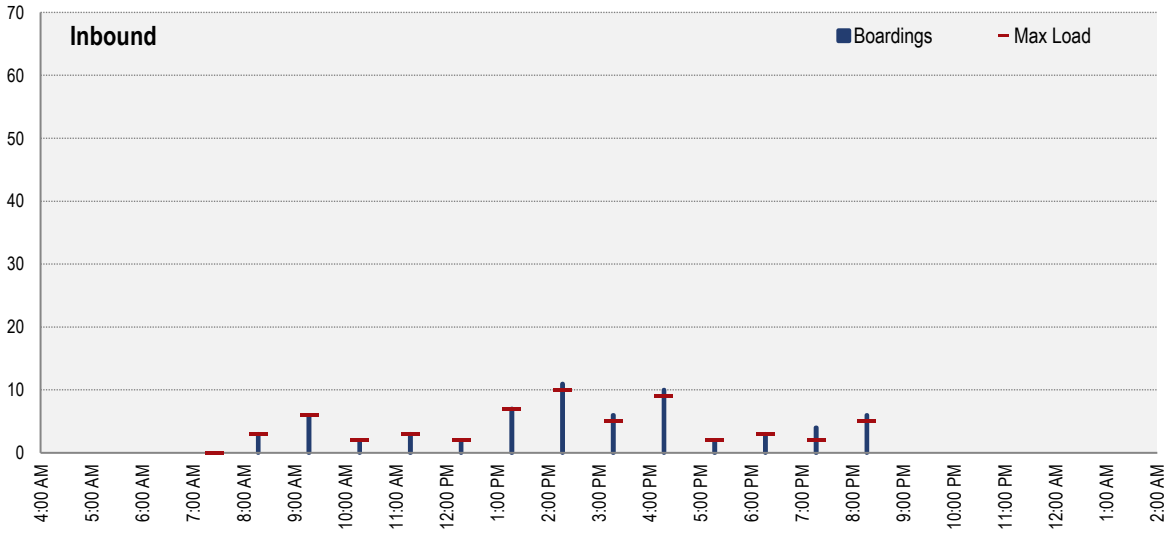


FIGURE 23 | SUNDAY INBOUND RIDERSHIP BY TRIP



Productivity

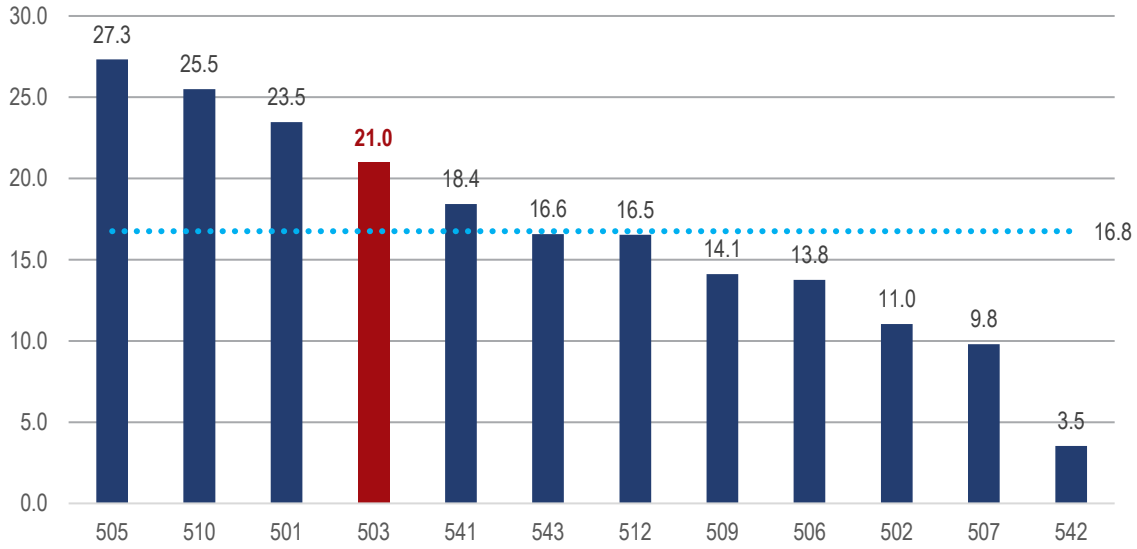
Route 503 performs higher than the New Britain/Bristol Division average for passengers per revenue hour on all service days (see Figure 24). The route carries an average of 21.0 riders per hour on weekdays, ranking fourth among New Britain/Bristol Division routes. Route 503 also ranks seventh in riders per hour on Saturdays, and ranks fifth in riders per hour on Sundays.

FIGURE 24 | PRODUCTIVITY

PRODUCTIVITY MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 503	DIVISION AVG	ROUTE 503	DIVISION AVG	ROUTE 503	DIVISION AVG
Passengers per Vehicle Revenue Hour	17.5	16.8	13.3	13.1	11.4	10.4

Source: CTtransit performance data

FIGURE 25 | PASSENGERS PER VEHICLE REVENUE HOUR



ON-TIME PERFORMANCE

On weekdays, approximately 71% of Route 503 time points were served "on-time" during the survey period (Figure 26). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Weekday on-time performance was effected by early departures, which occurred 16% of the time while the remaining 13% of time points were late. On Saturdays, approximately 74% of Route 503 time points were served "on-time" during the survey period, with 20% of time points served earlier than scheduled and the remaining 6% of time points were late. On Sundays, approximately 76% of time points were served "on-time," and 17% of time points are served early and the remaining 7% of time points were served late.

FIGURE 26 | ON-TIME PERFORMANCE

PERFORMANCE	WEEKDAY	SATURDAY	SUNDAY
Early	16%	20%	17%
Late	13%	6%	7%
On-Time	71%	74%	76%

Source: CTtransit performance data

SERVICE IMPROVEMENT

Route 503 is a fairly productive route, carrying above average ridership per trip and ridership per hour compared to the rest of the New Britain/Bristol Division. The route has strong anchors at either end, originating in downtown New Britain and terminating at Tunxis Community College, where riders can continue on to Bristol (Route 503 interlines with Route 541 Bristol Local) or transfer to Route 66 with service to Hartford via Farmington Avenue. In addition to the ends of the route, high-ridership stops include the CorWest Plaza shopping center, which includes a Super Stop and Shop, and Connecticut Commons, a regional retail center.

The route operates along the same alignment in both directions, providing consistent service for riders, and travels primarily along Main Street/New Britain and other major roads to connect local and regional destinations. The exception to this is when the route deviates off of Main Street in New Britain for more than two miles, serving predominantly residential areas along Corbin Avenue, Hillhurst Avenue, Slater Road, Beechwood Drive, and Stanwood Drive. Stops along Corbin Avenue produce a small number of riders, while stops along the rest of the deviation produce very few or no riders.

Service Improvement Options

Opportunities to strengthen Route 503 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Reconfigure Route 503 and Route 505 and create a third route to provide more direct service that maintains coverage.** Operate all Route 503 service along West Main Street instead of deviating along Corbin Avenue, Hillhurst Avenue, and Slater Road. Operate Route 505 between downtown New Britain and Malikowski Circle, with bidirectional service along the existing alignment. Create a third route to connect downtown New Britain and Marwood Drive and serve remaining areas; a potential alignment is via Broad Street, Clinton Street, Corbin Avenue, Osgood Avenue, and Summit Road.
- **Eliminate weekday and Saturday service after 11:00 PM.** Ridership figures show that trips departing after 11:00 PM on weekdays are lightly used. Eliminating these trips can improve the overall productivity of the route.

Route Evaluation

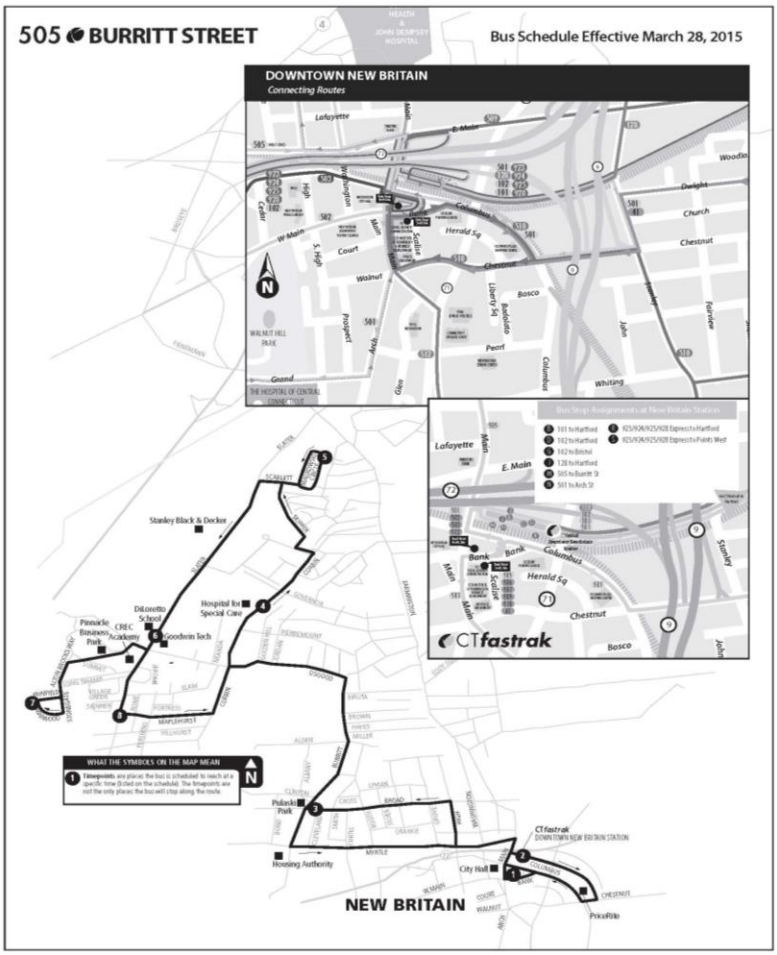
BURRITT STREET

505 | Burritt Street

Service Design

Route 505 is a radial route, providing service between Downtown New Britain and Winfield & Marwood, serving several social services, business parks, and multi-family housing developments. The route is coverage-focused, featuring several one-way segments and loops. The route operates primarily on Burritt Street, Osgood Street, Corbin Avenue, and Slater Road.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 505 begins and ends in downtown New Britain, where riders can transfer to nearly all other CT***transit*** routes serving New Britain as well as CT***fastrak*** for service to Hartford. Outside of downtown New Britain, there are few transfer opportunities. However, there are two routes that are accessible within a one to two block walk from Route 505's alignment (Figure 2). Route 503 operates in close proximity to the Maplehurst Street segment of Route 505. Route 506 is a two-block walk from Route 505's service to Malikowski Circle.

Nearly all Route 505 inbound trips are interlined with Route 501 Arch Street, which offers service to Meriden.

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 503	New Britain and Tunxis Community College via Corbin Avenue, New Britain Avenue
Route 506	New Britain and UConn Health Center via Farmington Avenue

Alignments and Service Patterns

Outbound service on Route 505 begins at Bank Street, just outside the CT***fastrak*** station in downtown New Britain. It operates on Main Street, deviating to pull into the CT***fastrak*** station, before returning back onto Main Street and then left on Myrtle Street, right on High Street, and left onto Broad Street. Route 505 turns right on Burritt Street, then left on Osgood Avenue. At Corbin Avenue, service operates along a modified one-way loop. Service turns right on Corbin Avenue, then jogs left on Horse Plain followed by a right on Ronald Road, then left again on Skipper Street. At Scarlett Street, the route turns right, looping around Malikowski Circle to return back onto Scarlett Street. Service turns left on Slater Road, then right on Summit Road, which continues as Stonegate Road. A terminal clockwise loop operates via Stonegate Road, Marwood Drive, and Winfield Drive.

Inbound service differs from outbound service as it continues along the modified one-way loop. From the terminal at Winfield Drive and Marwood Drive, the service operates back on Stonegate Street and Summit Road, and turns right on Slater Road. Service turns left on Maplehurst Avenue and left again on Corbin Avenue. Service rejoins the outbound alignment on Osgood Avenue, and right on Burritt Avenue. However, instead of operating on Broad Street as the outbound direction does, inbound service turns right on Myrtle Street instead. The service then turns left on Main Street to access the *CT****fastrak*** station before returning to Bank Street via the CT***fastrak*** guideway, Stanley Street, Chestnut Street, and Columbus Avenue.

During the late evening on weekdays and Saturdays, there are several trips that only operate on the short loop between Main Street and Chestnut Street in Downtown New Britain.

Service Schedule

Route 505 operates seven days per week. There are 18 outbound trips per weekday and 18 inbound trips. Service operates every 60 minutes during the peak periods (defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM) and the midday. During the late evening, frequency drops to every 90 minutes on the main section of the route. There are three additional trips in the late evening that only operate within Downtown New Britain and do not serve the rest of the route.

On Saturdays, there are 18 outbound and 18 inbound trips. Service operates every 60 minutes throughout the day except for in the late evening when service decreases to every 90 minutes. On Sundays, there are 13 inbound and 13 outbound trips, with service operating every 60 minutes.

FIGURE 3 | SCHEDULE OVERVIEW (ROUTE 505)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:00 AM – 1:22 AM	60 / 60	19 / 19*
Saturday	6:00 AM – 1:22 AM	60 / 60	18 / 18*
Sunday	7:00 AM – 8:52 PM	60 / 60	14 / 14

** Three additional trips operate in a short loop in Downtown New Britain during the late evening.*

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

Route 505 carries 484 daily passengers on an average weekday, which is the second highest ridership of all New Britain/Bristol Division routes. The route carries 11.8 passengers per trip, which is 57% higher than the division average of 7.5 weekday passengers per trip. Saturday and Sunday average ridership per trip figures are also significantly higher than the division averages (Figure 4).

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 506	ROUTE 506	DIVISION AVG
Weekday	484	11.8	7.5
Saturday	312	8.0	5.8
Sunday	170	6.1	4.2

*Source: CT**transit** performance data*

Ridership by Stop

The most heavily used stops on Route 505 are at the CT***fastrak*** Downtown Station (New Britain Station, Bay N), Marwood Drive, and the downtown terminus of Bank Street and Main Street. Outside of downtown, there are only two stops that generate 30 or more boardings or alightings per week day (Figure 5). The Marwood stop is the inbound origin stop, and is located in a dense residential neighborhood that includes Stonegate Apartments.

FIGURE 5 | ROUTE 505 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (WEEKDAY INBOUND)

BUS STOP	RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Burritt Street / Broad Street	37 / 3	Residential neighborhood
Marwood Drive / 17 Marwood Drive	91 / 0	Residential neighborhood; Stonegate Apartments
New Britain Station / Bay N	0 / 117	CT***fastrak*** Downtown Station, Mayor's Office, Town & City Clerk, CCSU Institute of Technology and Business Development, Downtown New Britain

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 505 shows weekday inbound passenger loads peak on Burritt and Myrtle Streets, near Stanley Black & Decker, and remain high until reaching New Britain Station.

The load profile in Figure 6 is not continuous because some stops are served by all variants, while others are served by Route 505 or 505.1 only. Each variant is labeled accordingly in Figure 6.

On Saturdays, three outbound stops and four inbound stops generate more than 30 boardings or alightings. No stops on Sunday exceed 30 combined boardings and alightings.

FIGURE 6 | WEEKDAY OUTBOUND RIDERSHIP BY STOP GRAPH

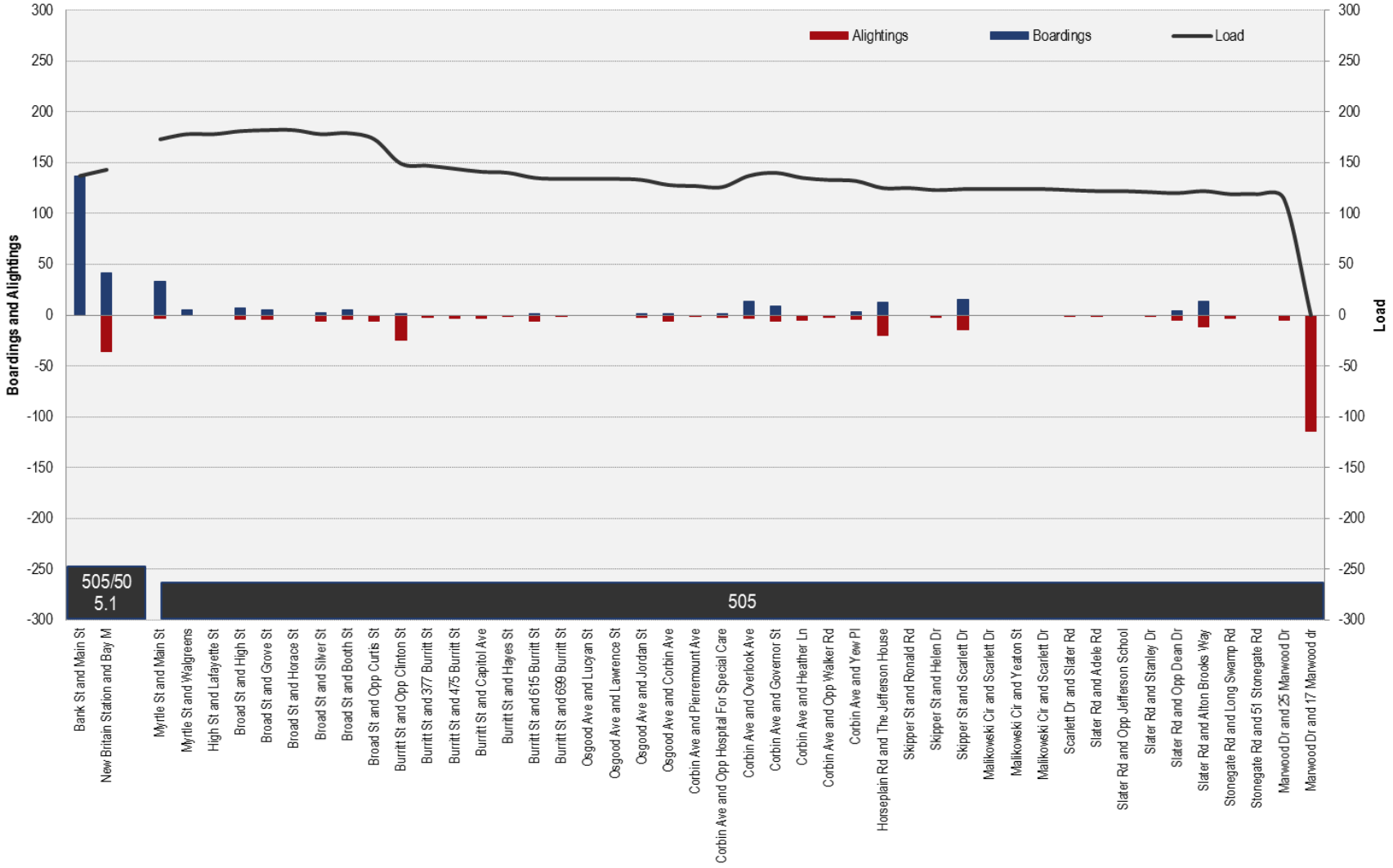


FIGURE 7 | WEEKDAY OUTBOUND RIDERSHIP BY STOP MAP

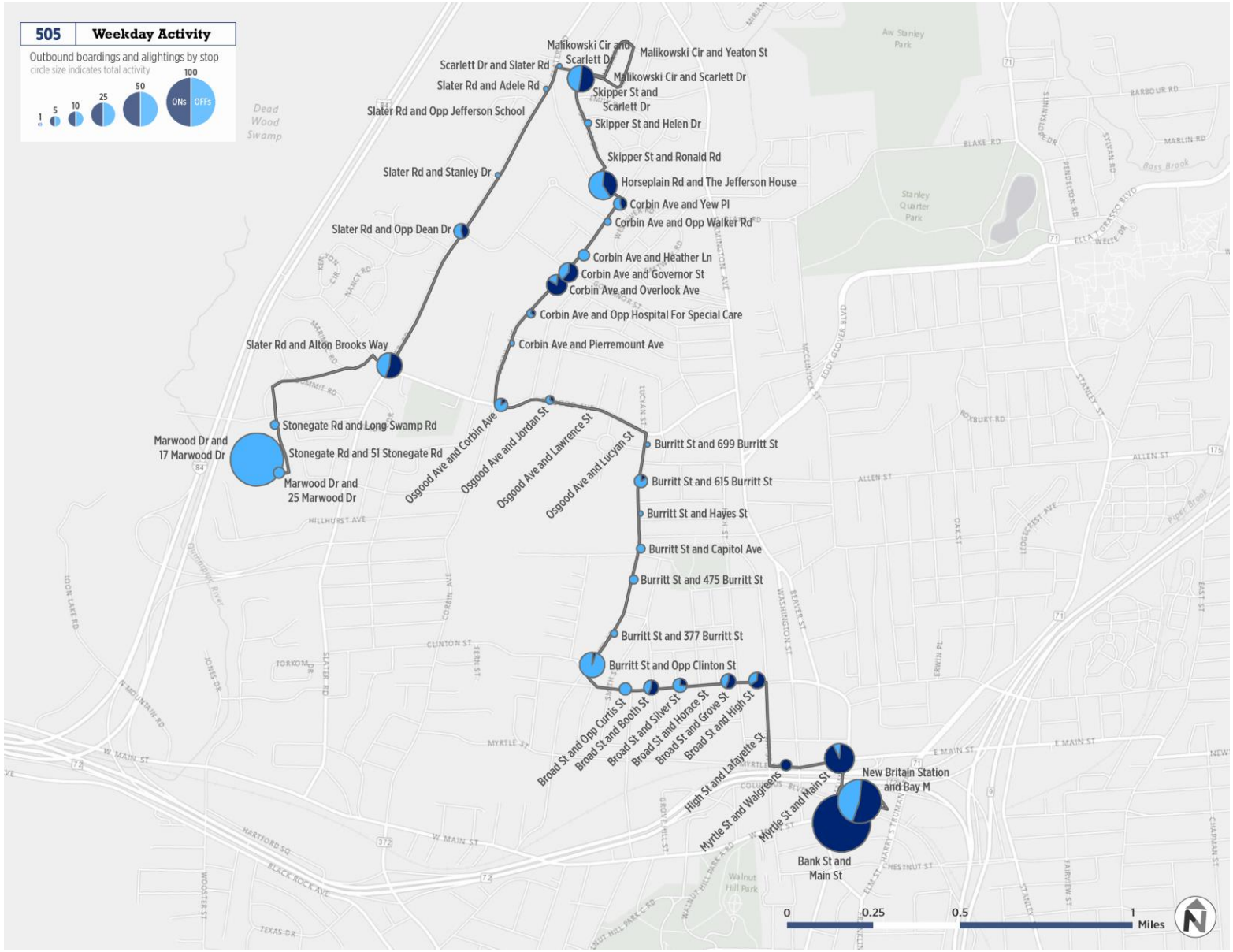


FIGURE 8 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

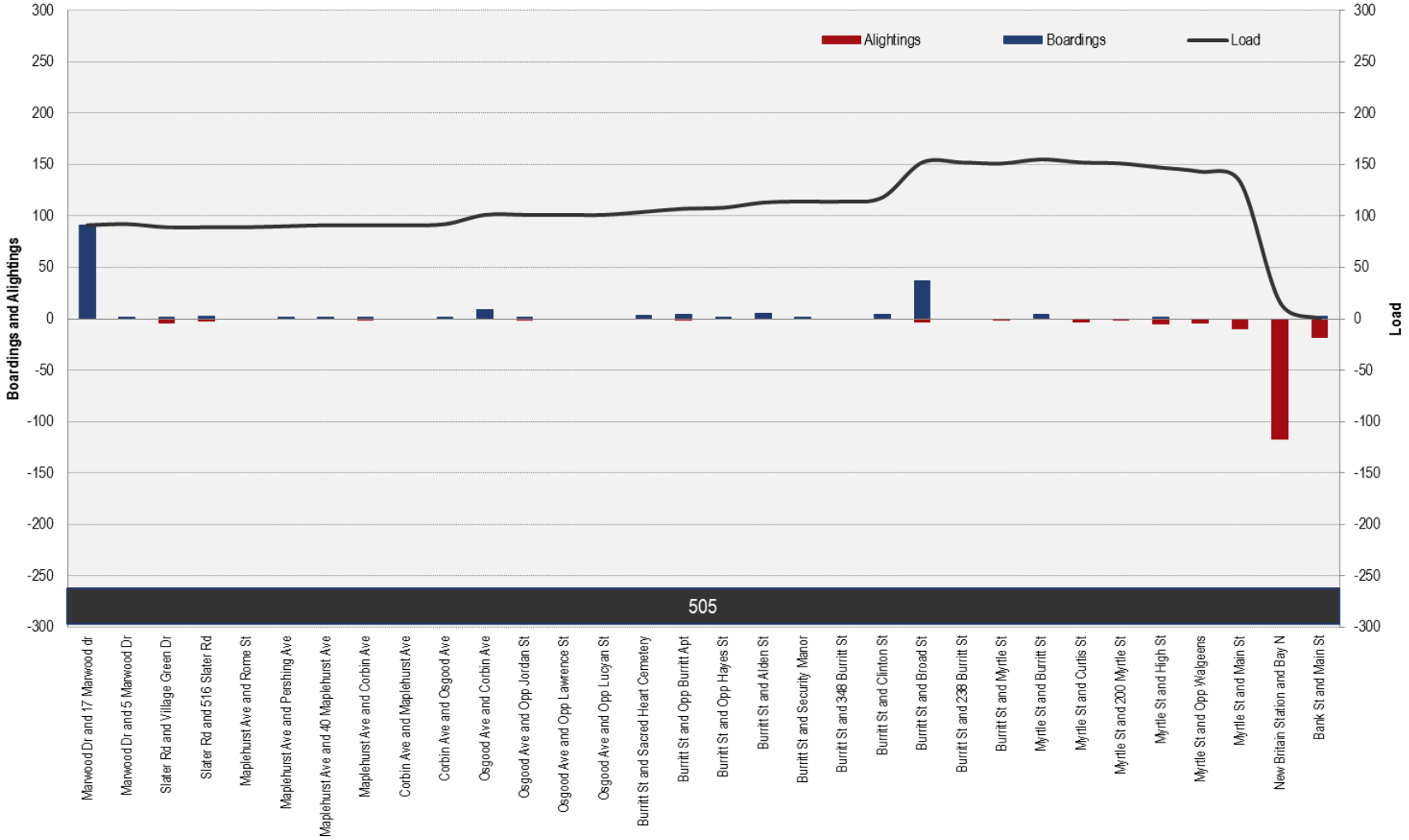


FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

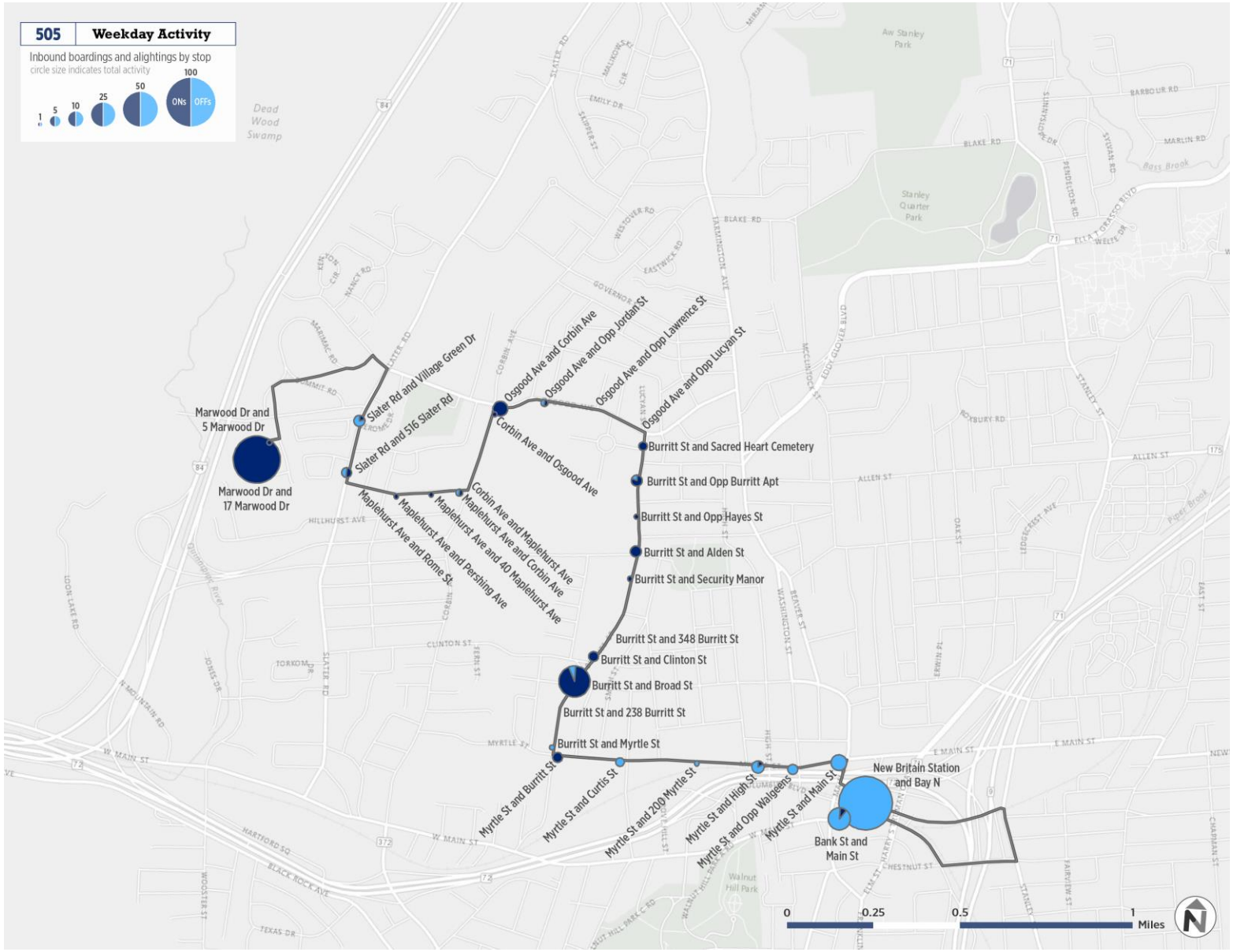


FIGURE 10 | SATURDAY OUBTOUND RIDERSHIP BY STOP GRAPH

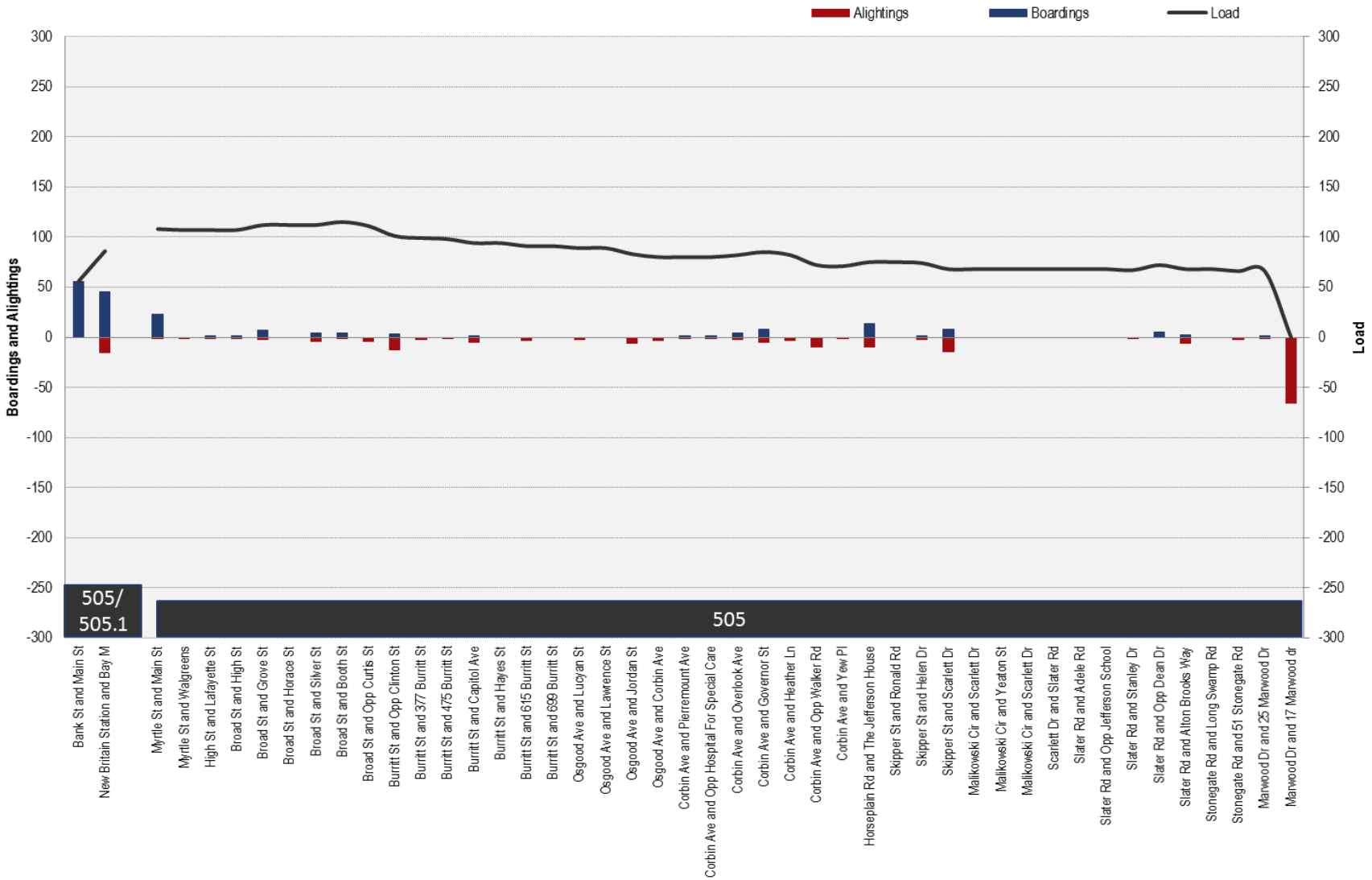


FIGURE 11 | SATURDAY OUTBOUND RIDERSHIP BY STOP MAP

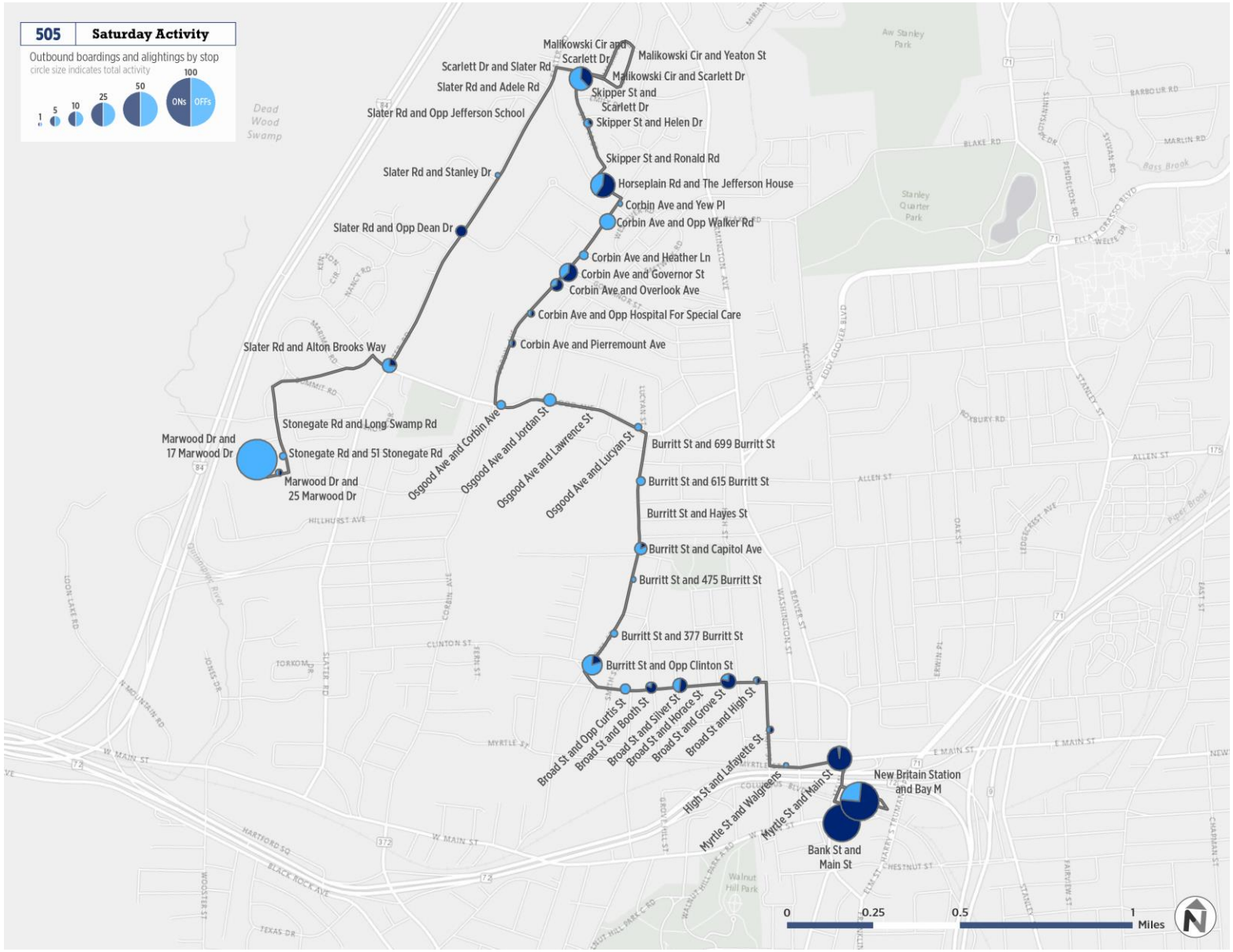


FIGURE 12 | SATURDAY INBOUND RIDERSHIP BY STOP GRAPH

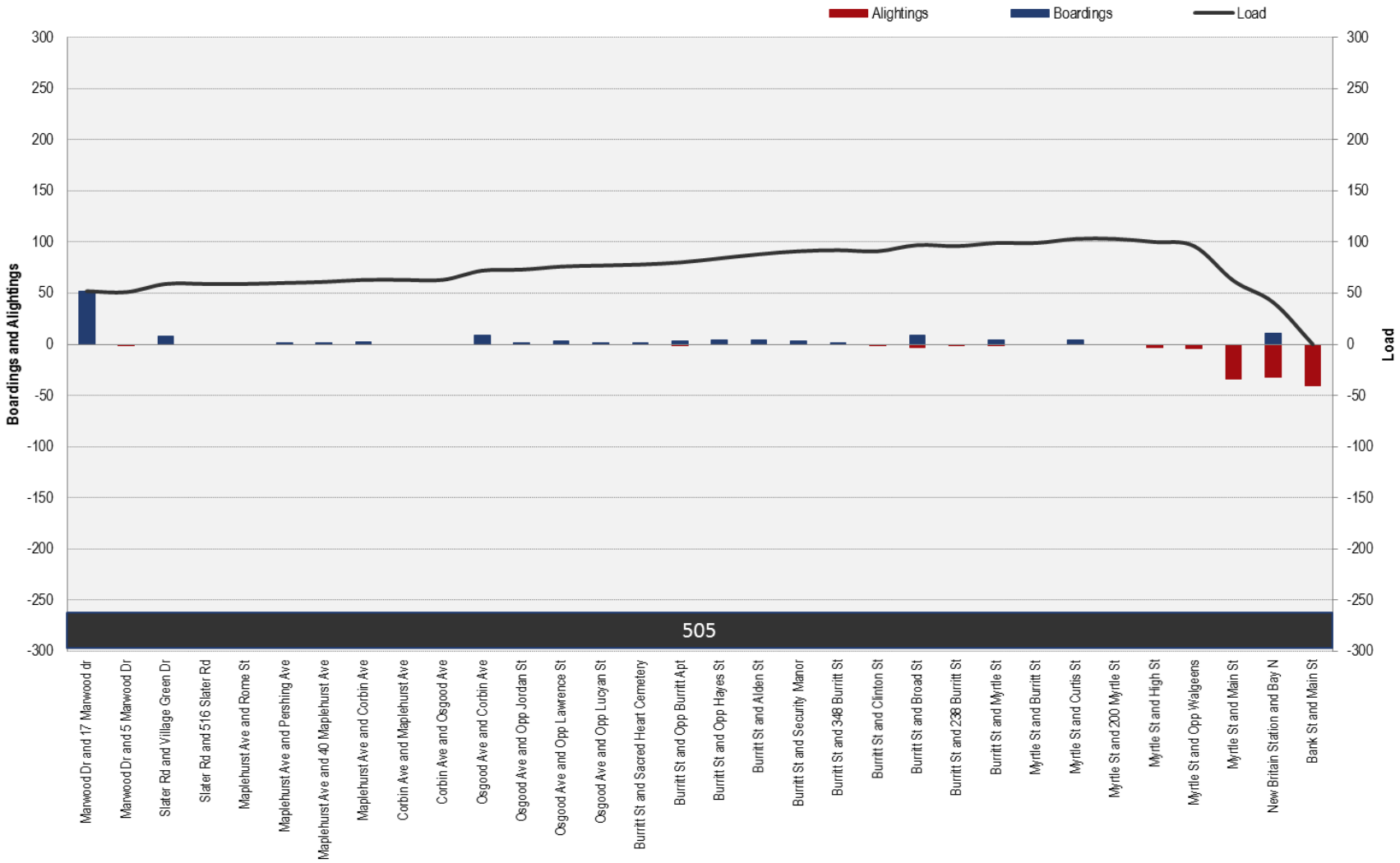


FIGURE 13 | SATURDAY INBOUND RIDERSHIP BY STOP MAP

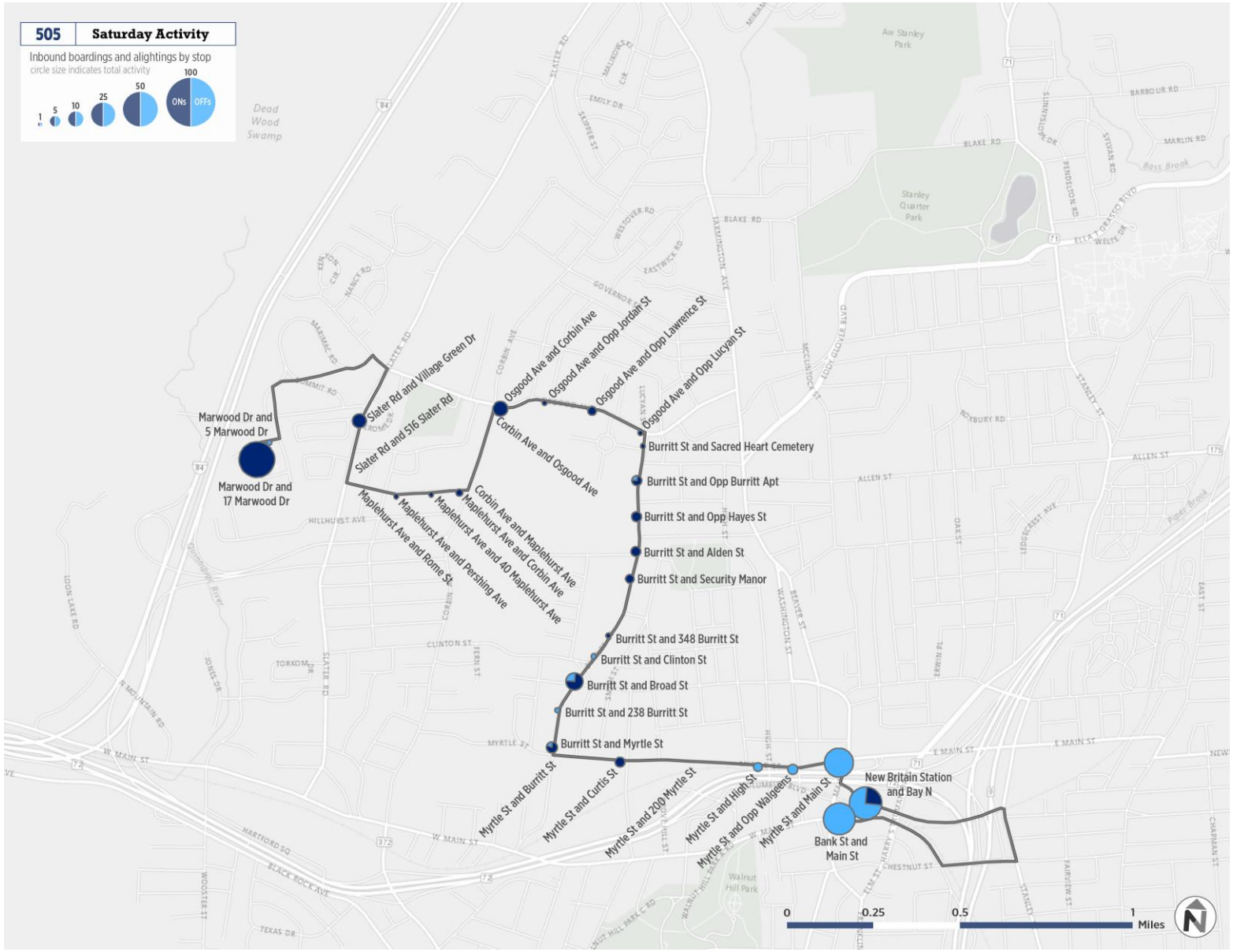


FIGURE 14 | SUNDAY OUTBOUND RIDERSHIP BY STOP GRAPH

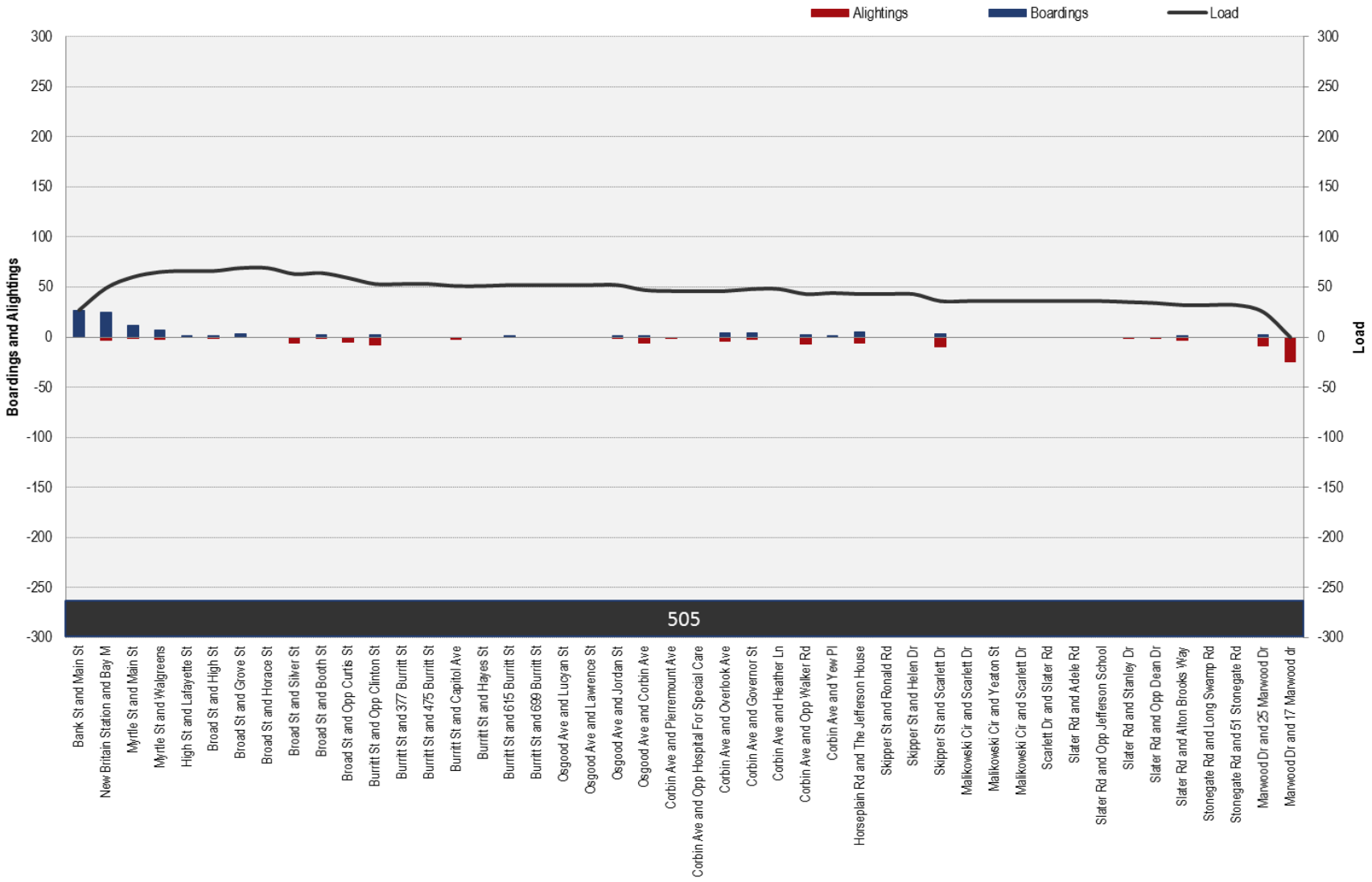


FIGURE 15 | SUNDAY OUTBOUND RIDERSHIP BY STOP MAP

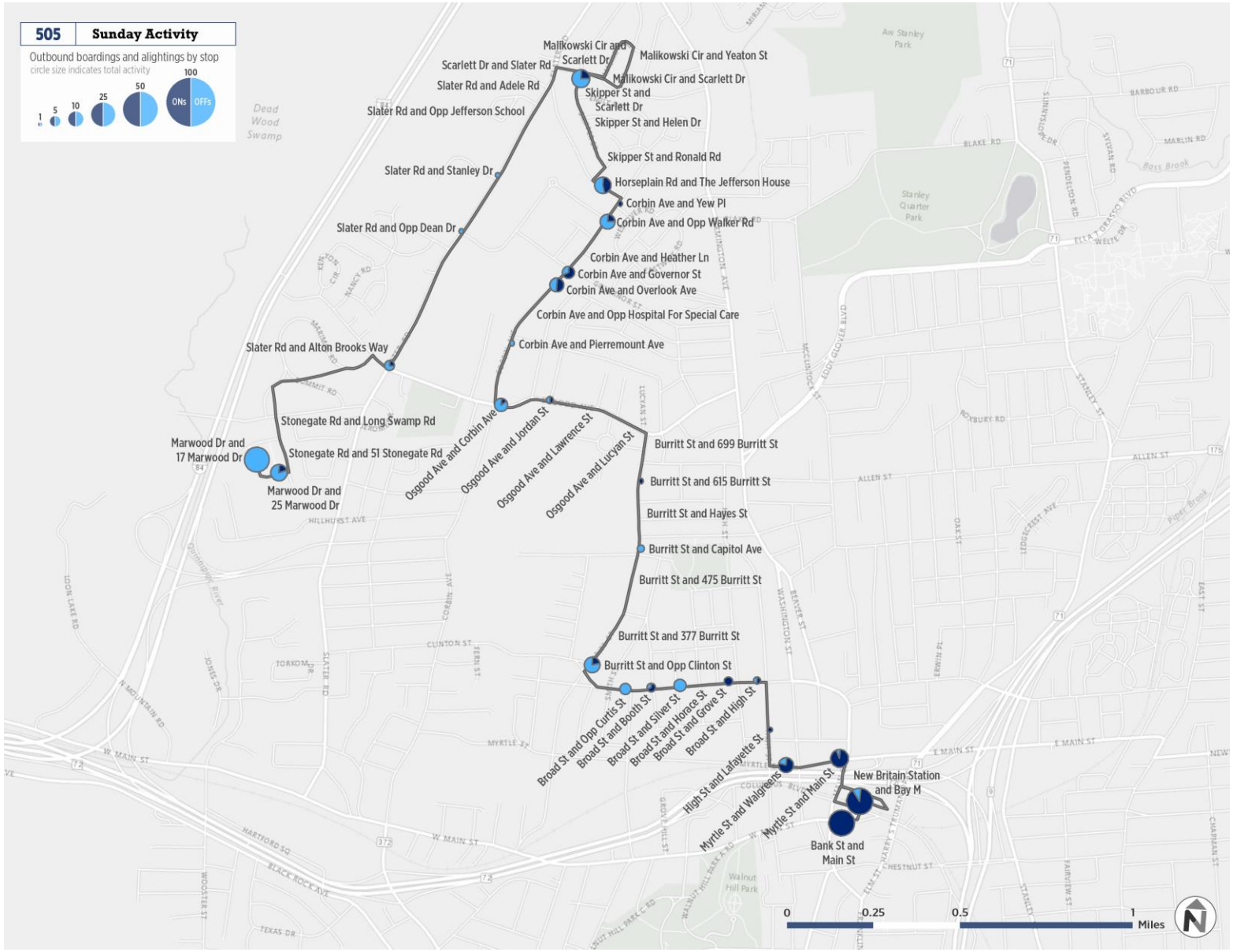


FIGURE 16 | SUNDAY INBOUND RIDERSHIP BY STOP GRAPH

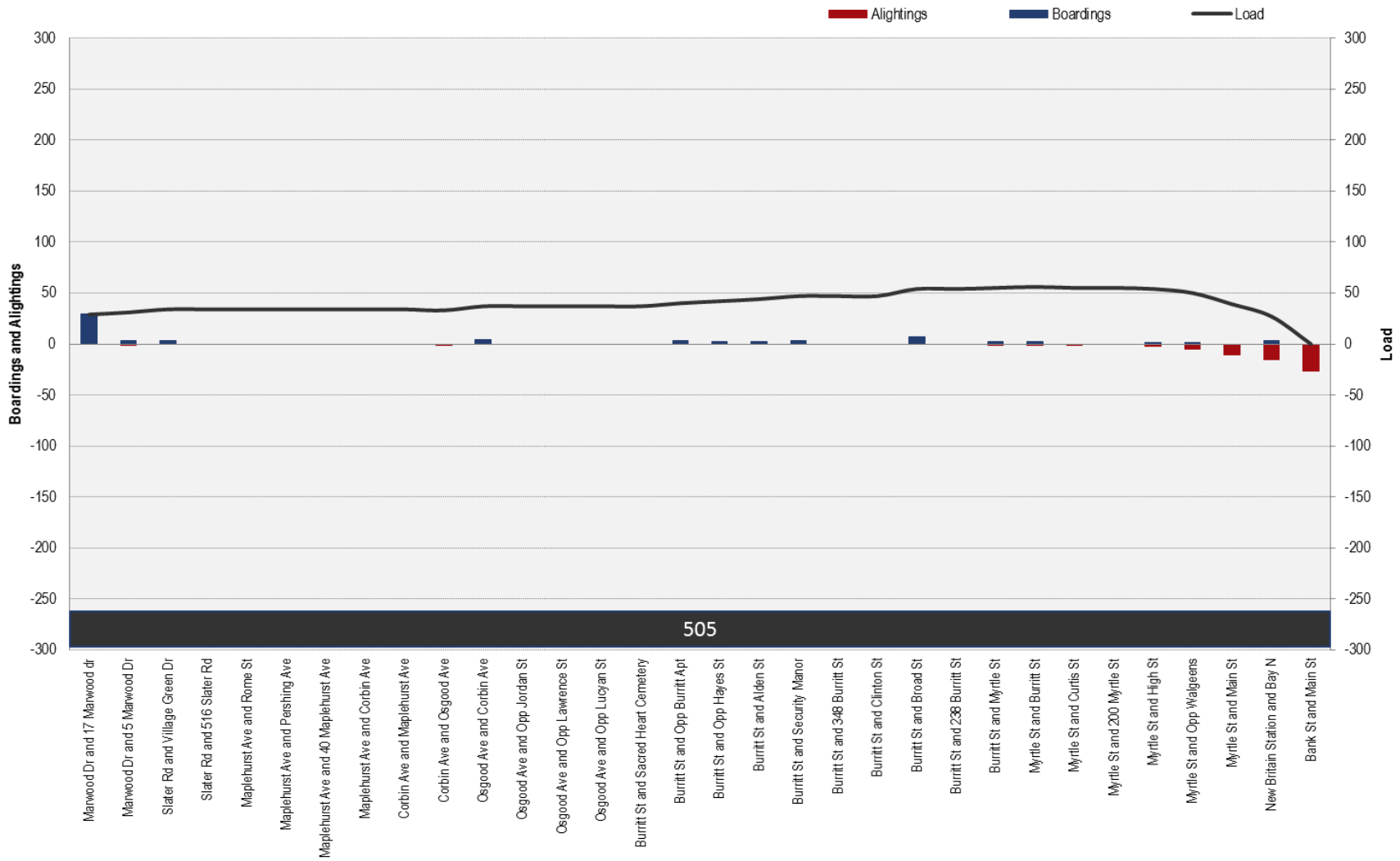
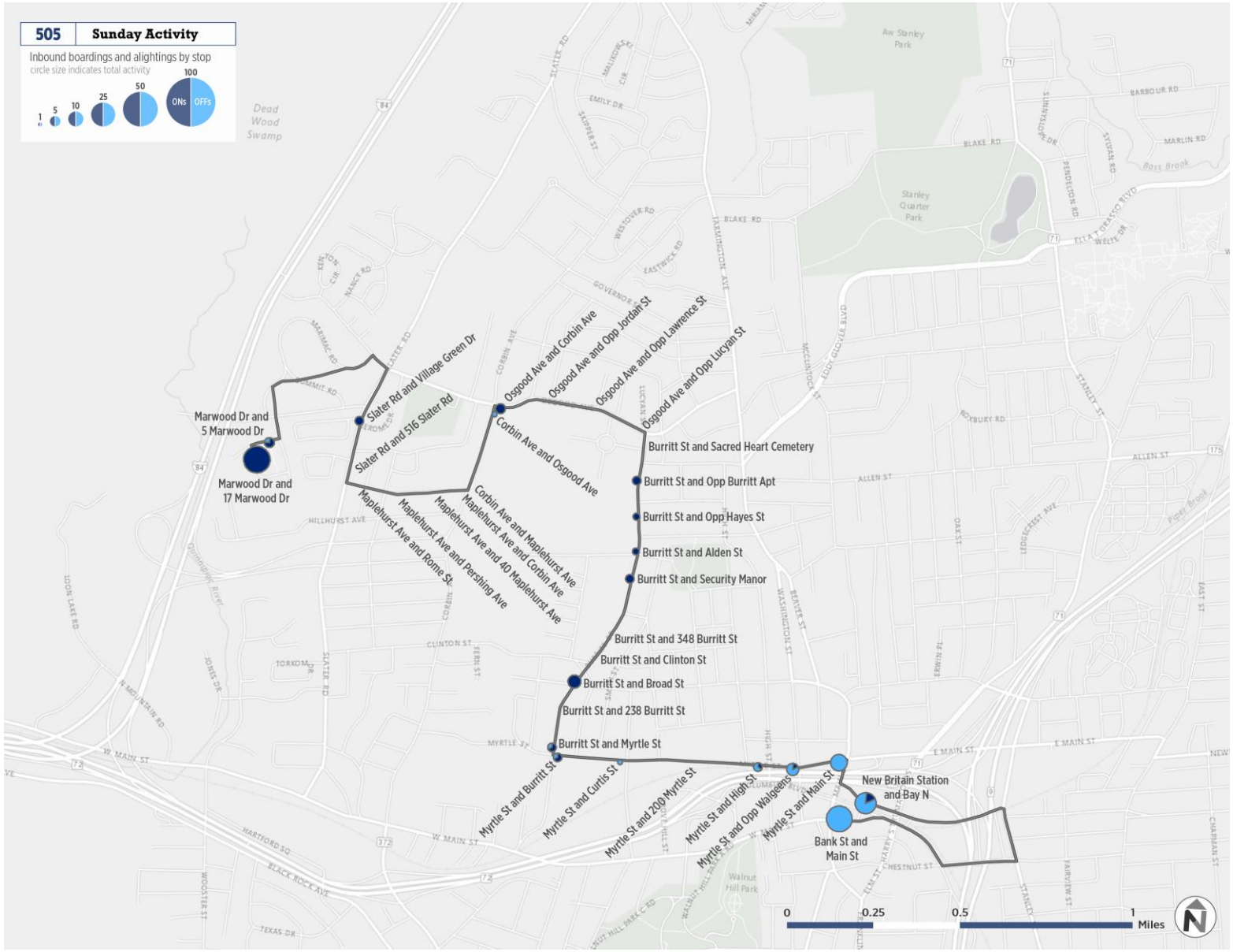


FIGURE 17 | SUNDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Route 505 carries an average of 12.7 passengers per trip on weekdays. Ridership is higher in the outbound direction, with eight trips exceeding 20 passengers (Figure 18). Inbound ridership peaks in the morning (8:30 AM) and evening (5:30 PM) (Figure 19). Constant activity throughout the day suggests Route 505 serves multiple trips types and users.

Total passengers or maximum loads do not exceed 40 passengers on any trips, which is the typical seating capacity of a 40-foot transit bus.

FIGURE 18 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

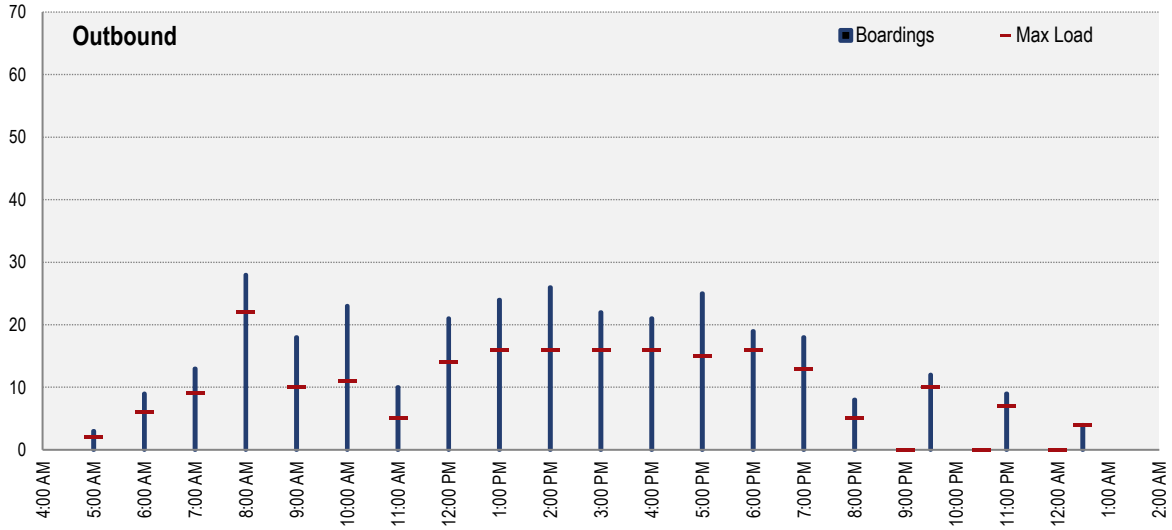
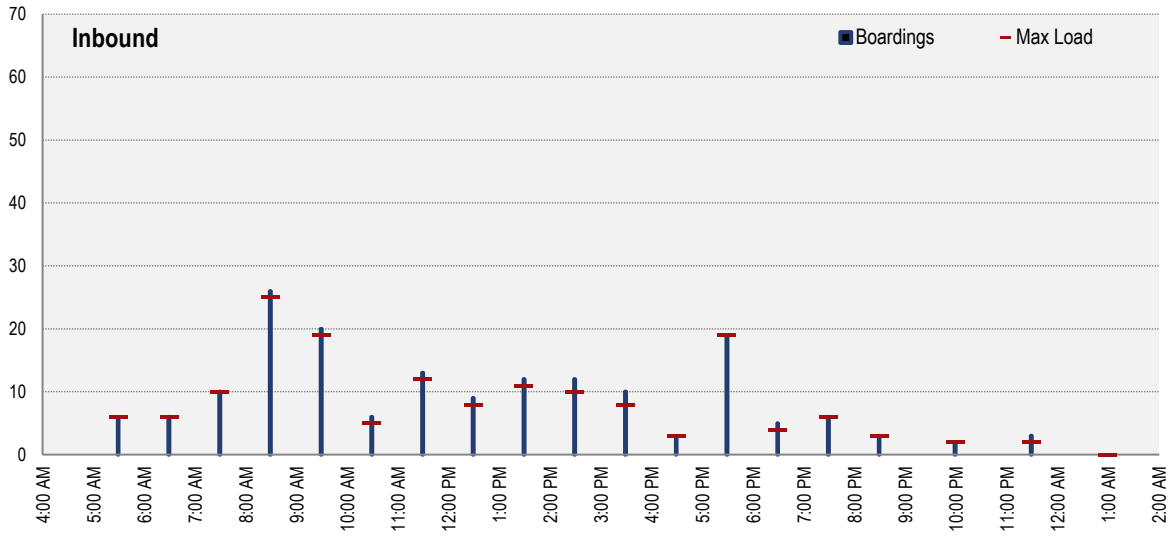


FIGURE 19 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Route 505 carries an average of 8.6 passengers per trip on Saturdays. Saturday service is strong, with approximately 50% of trips carrying 10 passengers or more (Figure 20). Demand is relatively constant throughout the day in the outbound direction. Data for the inbound trips show that ridership is heavier during the mid-morning period (9:30 – 11:30 AM) (Figure 21). Combined, fewer than 10 passengers board Route 505 in the outbound or inbound directions after 10:00 PM.

FIGURE 20 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

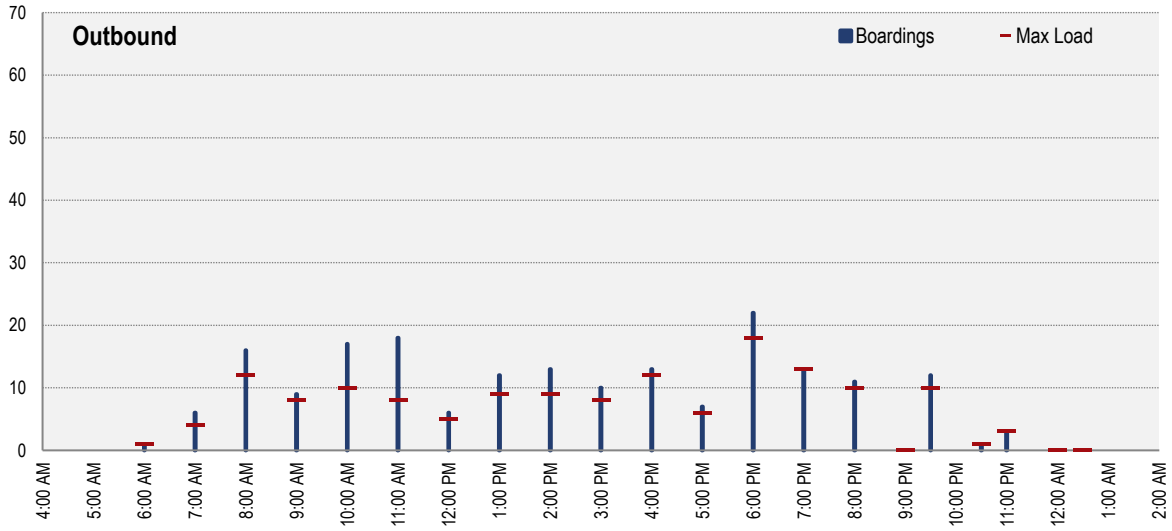
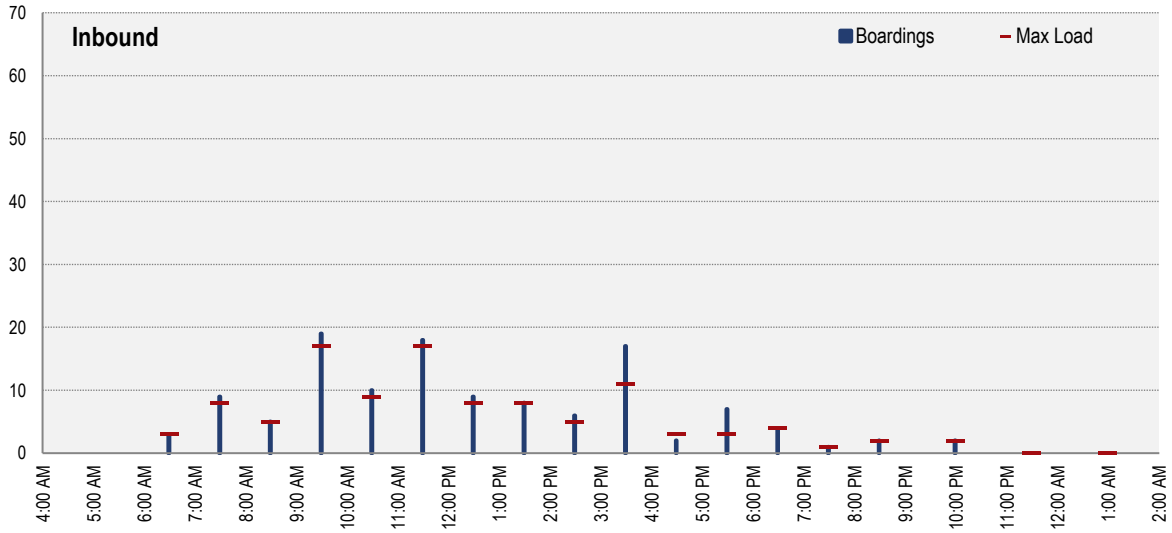


FIGURE 21 | SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

Route 505 carries an average of six passengers per trip on Sunday. Sunday ridership follows a similar pattern with the Saturday service; outbound ridership peaks between 10:00 AM and 4:00 PM and inbound ridership peaks in the morning.

FIGURE 22 | SUNDAY OUTBOUND RIDERSHIP BY TRIP

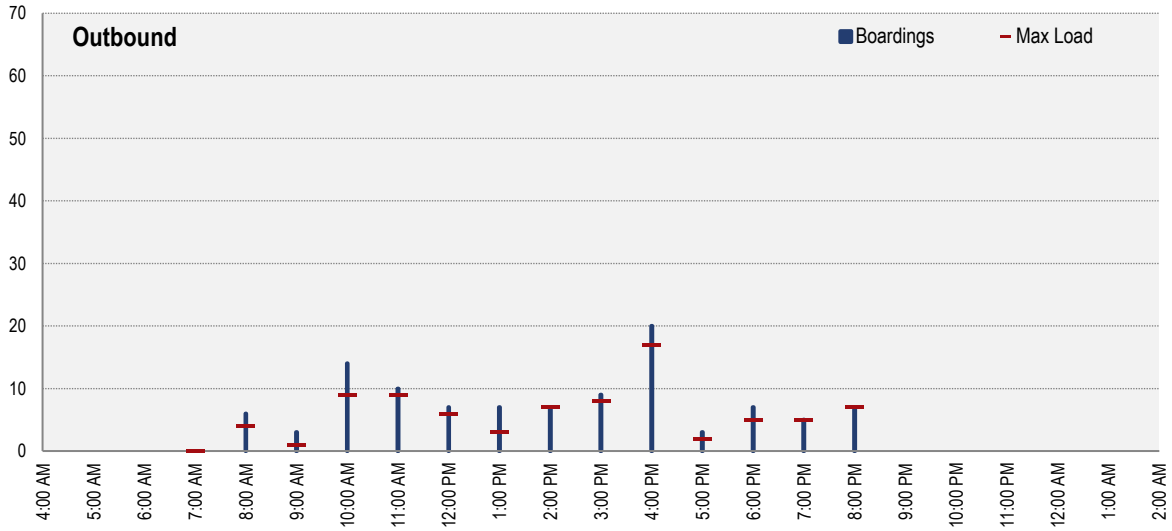
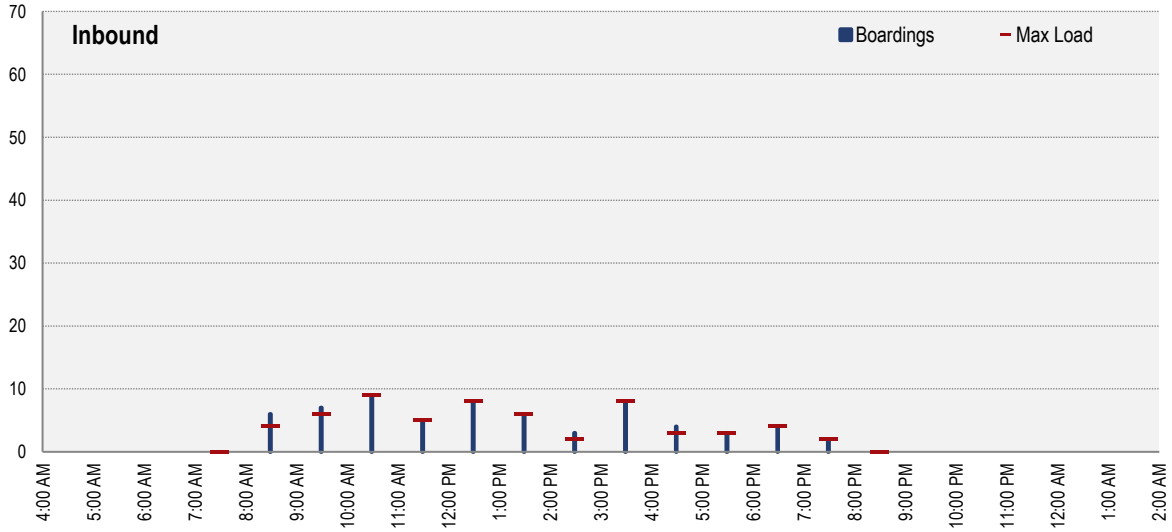


FIGURE 23 | SUNDAY INBOUND RIDERSHIP BY TRIP



Productivity

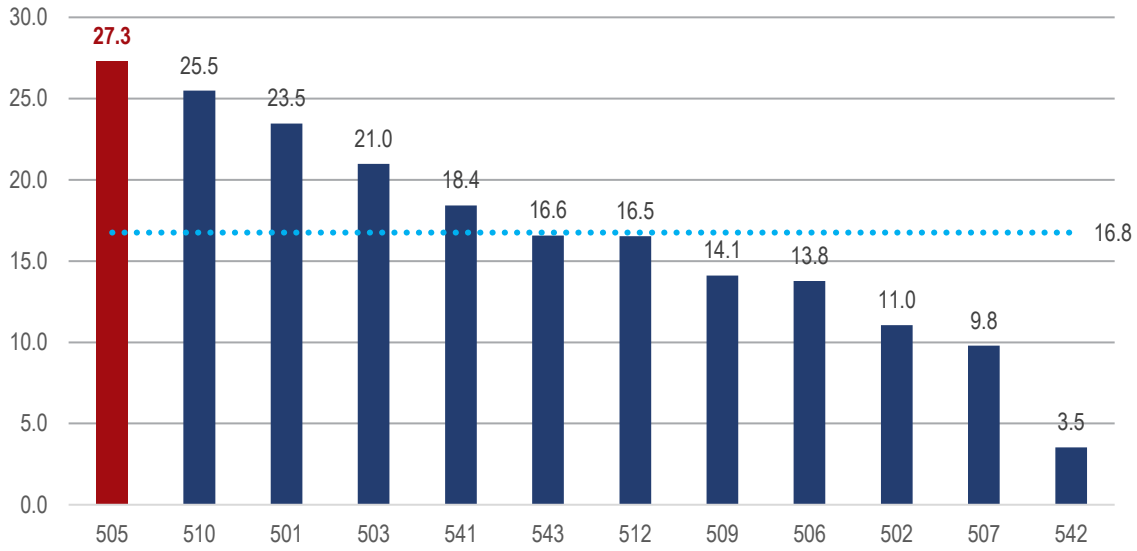
Route 505 carries 27.3 riders per hour on weekdays, the highest of any route in the division and over 63% greater than the division average of 16.8. Productivity is above average on weekends as well, with 18.5 riders per hour on Saturdays and 14.0 riders per hour on Sundays.

FIGURE 24 | PRODUCTIVITY

PRODUCTIVITY MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 505	DIVISION AVG	ROUTE 505	DIVISION AVG	ROUTE 505	DIVISION AVG
Passengers per Revenue Vehicle Hour	27.3	16.8	18.5	13.1	14.0	10.4

*Source: CT**transit** performance data*

FIGURE 25 | PASSENGERS PER REVENUE VEHICLE HOUR



ON-TIME PERFORMANCE

On weekdays, approximately 54% of Route 505 time points were served "on-time" during the survey period (Figure 26). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Weekday on-time performance was affected by early departures, which occurred 22% of the time. On Saturdays, approximately 61% of Route 505 time points were served "on-time" during the survey period, with 33% of time points served earlier than scheduled. On Sundays, approximately 53% of time points were served "on-time," and 38% of time points are served early.

FIGURE 26 | ON-TIME PERFORMANCE

PERFORMANCE	WEEKDAY	SATURDAY	SUNDAY
Early	22%	33%	38%
Late	24%	6%	9%
On-Time	54%	61%	53%

*Source: CT**transit** performance data*

SERVICE IMPROVEMENT

Route 505 is a productive route that provides coverage-based service in New Britain. It is one of the top performing routes in the New Britain/Bristol Division, carrying above-average ridership per trip and ridership per hour. Most ridership activity occurs at the beginning of the route in downtown New Britain, and at the end of the route adjacent to several multifamily housing developments.

The route provides significant coverage in New Britain, but consists mostly of one-way segments and large loops. In downtown New Britain, Route 505 travels along Broad Street going outbound and Myrtle Street going inbound, despite the fact that both of these are two-way streets. Northwest of downtown, the route travels in a large one-way loop. This forces many riders to travel out of direction to complete a round trip, making service less convenient for riders and difficult to understand for potential users.

Service Improvement Options

Opportunities to strengthen Route 505 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Make service more direct by eliminating one-way segments and operating bidirectional service.** Two opportunities for this include:
  - Operate service along Broad Street in both directions: Eliminate service on Myrtle Street and provide bidirectional service on Broad Street to make service more convenient and more intuitive to use.
  - Operate all service in both directions along the Corbin-Skipper-Slater alignment and eliminate service on Maplehurst: The outbound (northern) segment of the loop that travels along Corbin Avenue, Skipper Street, and Slater Road generates much higher ridership activity than the inbound (southern) segment of the loop, and has higher population and employment densities as well. Bidirectional service along this segment would provide more convenient service to existing riders and may attract new riders as well.
- **Reconfigure Route 505 and Route 503 and create a third route to provide more direct service that maintains coverage.** Operate Route 505 between downtown New Britain and Malikowski Circle, with bidirectional service along the existing alignment. Operate all Route 503 service along West Main Street instead of deviating along Corbin Avenue, Hillhurst Avenue, and Slater Road. Create a third route to connect downtown New Britain and Marwood Drive and serve remaining areas; a potential alignment is via Broad Street, Clinton Street, Corbin Avenue, Osgood Avenue, and Summit Road.
- **Eliminate weekday service after 11:00 PM.** Ridership figures show that trips departing after 11:00 PM on weekdays are lightly used. Eliminating these trips can improve the overall productivity of the route.
- **Eliminate early Sunday morning service.** Trips beginning before 8:00 AM on Sunday mornings carry no riders, and could be eliminated to improve the productivity of the route.

Route Evaluation

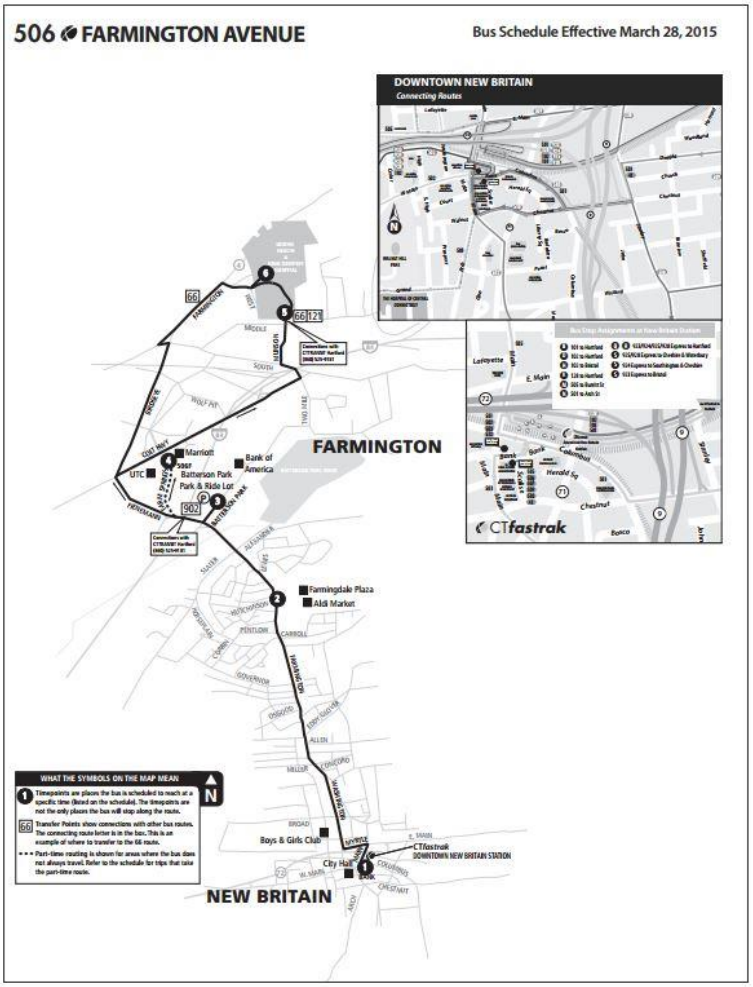
FARMINGTON AVENUE

506 | Downtown New Britain

Service Design

Route 506 is a radial route, providing service between Downtown New Britain and UConn Health/John Dempsey Hospital in Farmington. The route operates primarily on Washington Street, Farmington Avenue, Fienemann Road, Colt Highway, and Birdseye Road.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 506 originates in downtown New Britain, near the intersection of Bank Street and Main Street and the Downtown New Britain CT***fastrak*** station, and terminates at the UConn Health Center Outpatient Pavilion. From downtown New Britain riders can transfer to nearly all other CT***transit*** routes serving New Britain, as well as CT***fastrak*** routes for service to Hartford. In addition, Route 506 also has transfer opportunities with Route 66 and Route 121 at multiple locations on the campus of the UConn Health Center in Farmington and with Route 902 on Farm Springs Road (Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 66	Hartford and Unionville
Route 121	Farmington, Newington, Hartford, East Hartford
Route 902	Downtown Hartford, New Britain, Farmington

Alignments and Service Patterns

The primary alignment of Route 506 travels outbound from downtown New Britain via Main Street and Washington Street. The route follows Washington Street for three blocks, turns right on Lasalle Street, and makes an immediate left turn on to Farmington Avenue. The route travels northwest on Farmington Avenue and continues as the road transitions to Fienemann Road. At Batterson Park Road the route turns right to serve the Batterson Park Road Park and Ride, and then returns to Fienemann Road, traveling west. The route's alignment continues on Fienemann Road and turns right on Colt Highway. At the intersection with South Road, the route turns left, travels two blocks, and turns right on Munson Road to enter the campus of UConn's Health Center. The route travels circuitously through the campus, serving the UConn Medical Center off East Road, turns right on Main Road, then right on Dowling Way to serve the UConn Health Center and New Outpatient Pavilion, follows Circle Road back to Main Road, turns left on Main Road, and serves the Jackson Laboratory before turning right and exiting the health campus on Discovery Drive.

Traveling inbound, the route turns left on Farmington Road, left at the intersection with South Road, right on Birdseye Road, and right on Fienemann Road. From Fienemann Road the route travels south toward downtown New Britain, again deviating to serve the Batterson Park Road Park and Ride. In addition to the route's primary alignment, four outbound weekday morning trips and four inbound weekday afternoon and evening trips operate service to the Marriott hotel on Farm Springs Road.

Service Schedule

Route 506 operates seven days per week. There are 19 outbound trips per weekday and 19 inbound trips. Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM. Service operates every 60 minutes during the peak periods and the midday.

On Saturdays, there are 18 outbound and 18 inbound trips. Service operates every 60 minutes throughout the day except for in the late evening when service decreases to every 90 minutes. On Sundays, there are 14 inbound and 14 outbound trips, with service operating every 60 minutes.

FIGURE 3 | SCHEDULE OVERVIEW (ROUTE 506)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:00 AM – 12:57 AM	60 / 60	19/19
Saturday	6:30 AM – 1:20 AM	60	18/18
Sunday	7:30 AM – 8:50 PM	60	14/14

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

Route 506 carries 268 daily passengers or 7.1 passengers per trip on an average weekday, which is close to the division average of 7.5 weekday passengers per trip. Saturday and Sunday ridership per trip are also lower relative to the division average (see Figure 4).

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 506	ROUTE 506	DIVISION AVG
Weekday	268	7.1	7.5
Saturday	144	4.0	5.8
Sunday	99	3.5	4.2

*Source: CT**transit** performance data*

Ridership by Stop

The most heavily used stop on Route 506 is its downtown terminus of Bank Street and Main Street. Outside of the downtown, the inbound origin stop at UConn Health also generates more than 20 average passengers per trip (see Figure 5).

FIGURE 5 | ROUTE 506 HIGHEST RIDERSHIP AND KEY TRIP GENERATORS (WEEKDAY INBOUND)

BUS STOP	RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
UConn Medical Center / Main Road	21 / 0	UConn Health
Bank Street / Main Street	0 / 66	CT***fastrak*** Downtown Station, Mayor Office, Town & City Clerk, CCSU Institute of Technology and Business Development, Downtown New Britain

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 506 shows inbound passenger loads peak near the end of the route, near the intersection of Washington and Broad Streets. However, the majority of riders travel the entire length of the route, alighting at Bank Street and Main Street.

The load profile in Figure 6 is not continuous because some stops are served by all variants. Each variant is labeled accordingly in Figure 6.

FIGURE 6 | WEEKDAY OUTBOUND RIDERSHIP BY STOP GRAPH

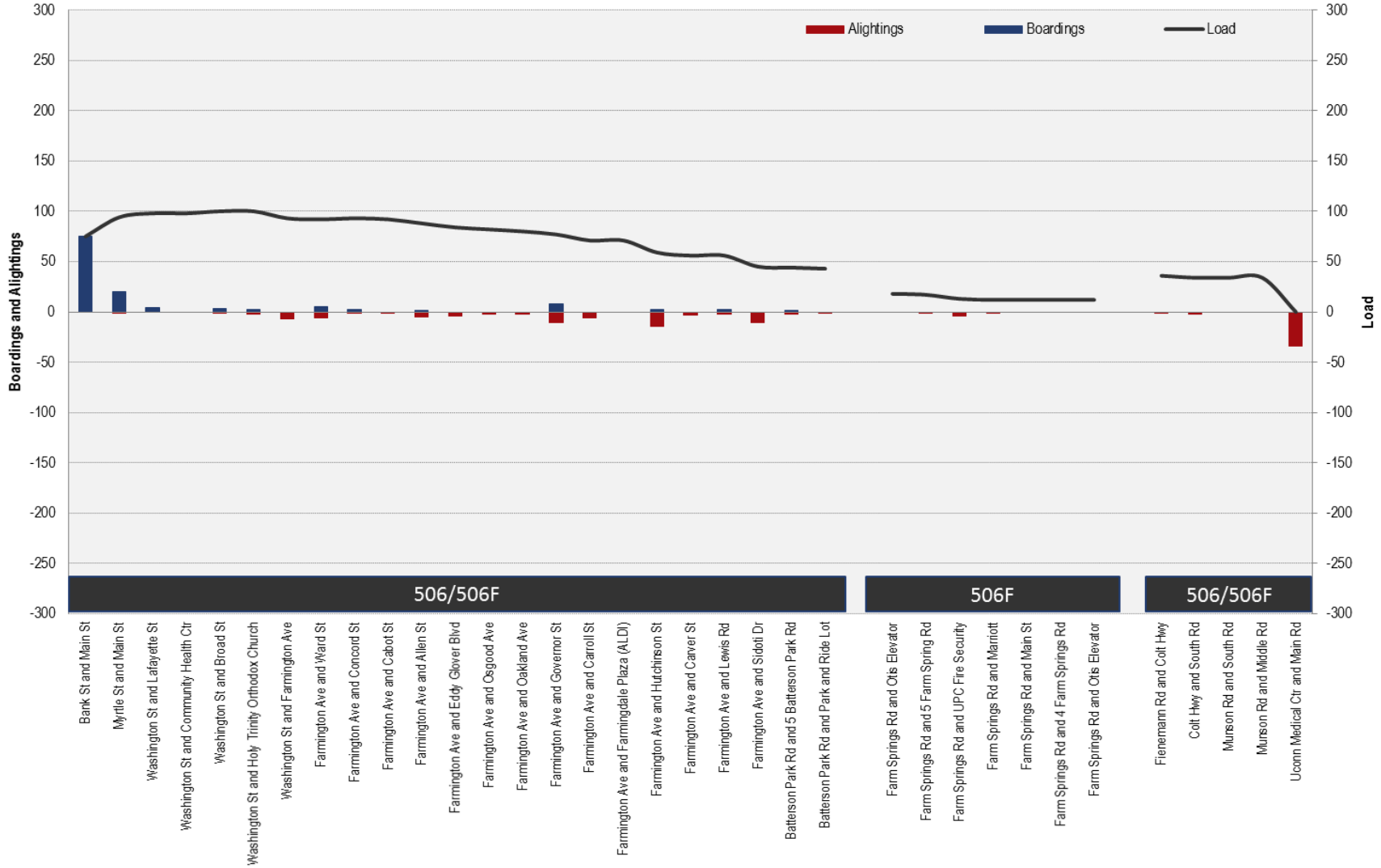


FIGURE 7 | WEEKDAY OUTBOUND RIDERSHIP BY STOP MAP

FIGURE 8 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

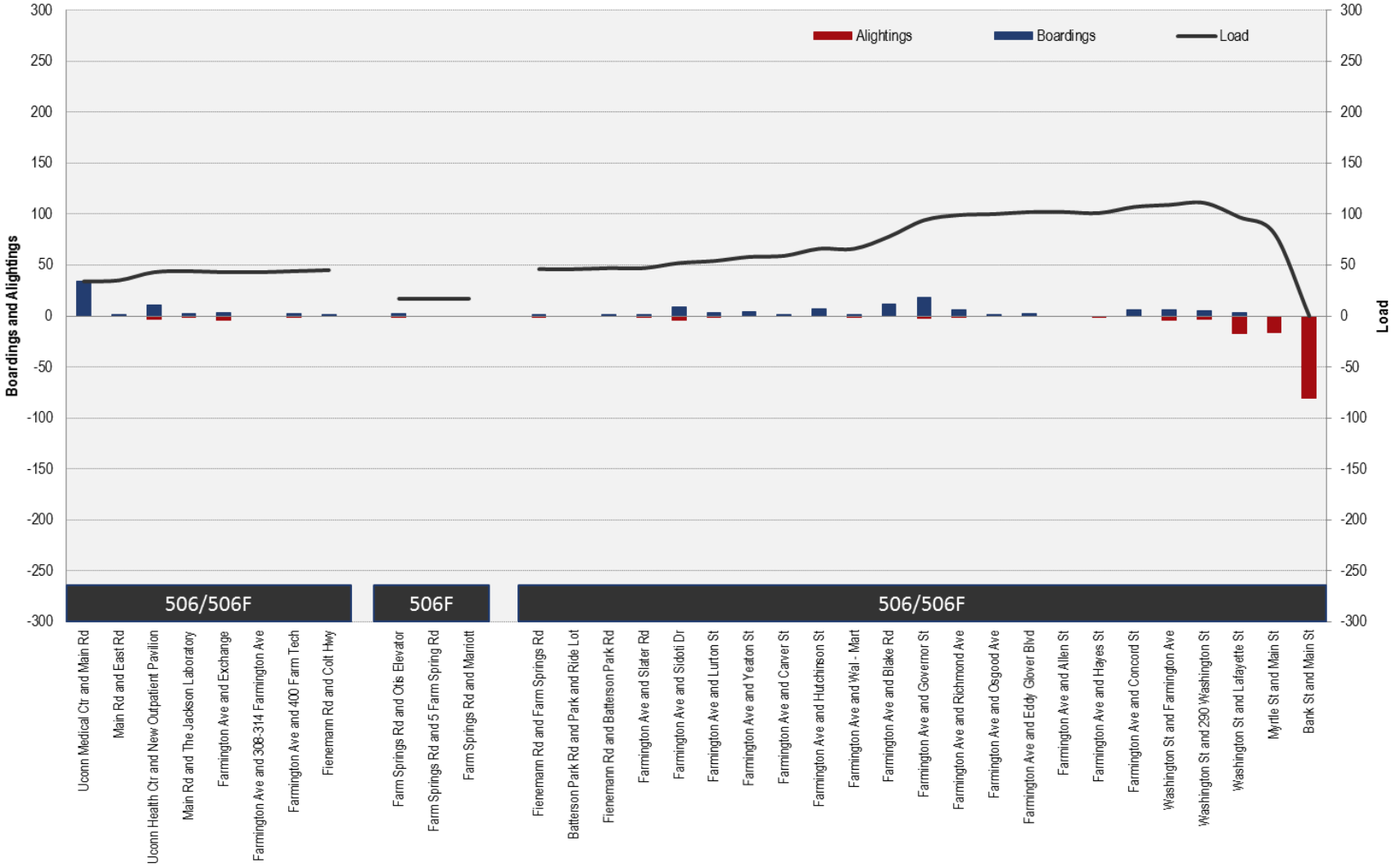


FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

FIGURE 10 | SATURDAY OUTBOUND RIDERSHIP BY STOP GRAPH

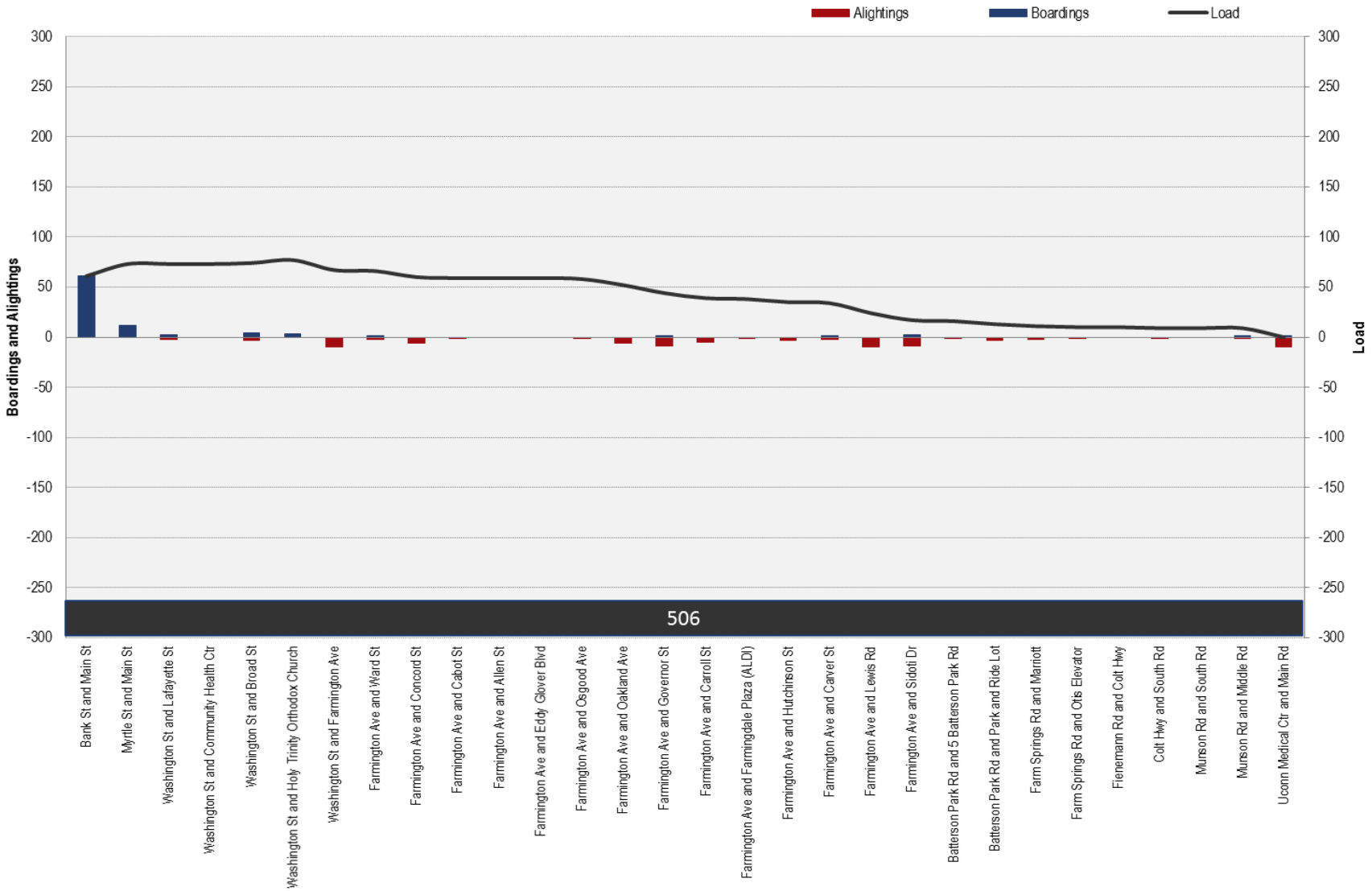


FIGURE 11 | SATURDAY OUTBOUND RIDERSHIP BY STOP MAP

FIGURE 12 | SATURDAY INBOUND RIDERSHIP BY STOP GRAPH

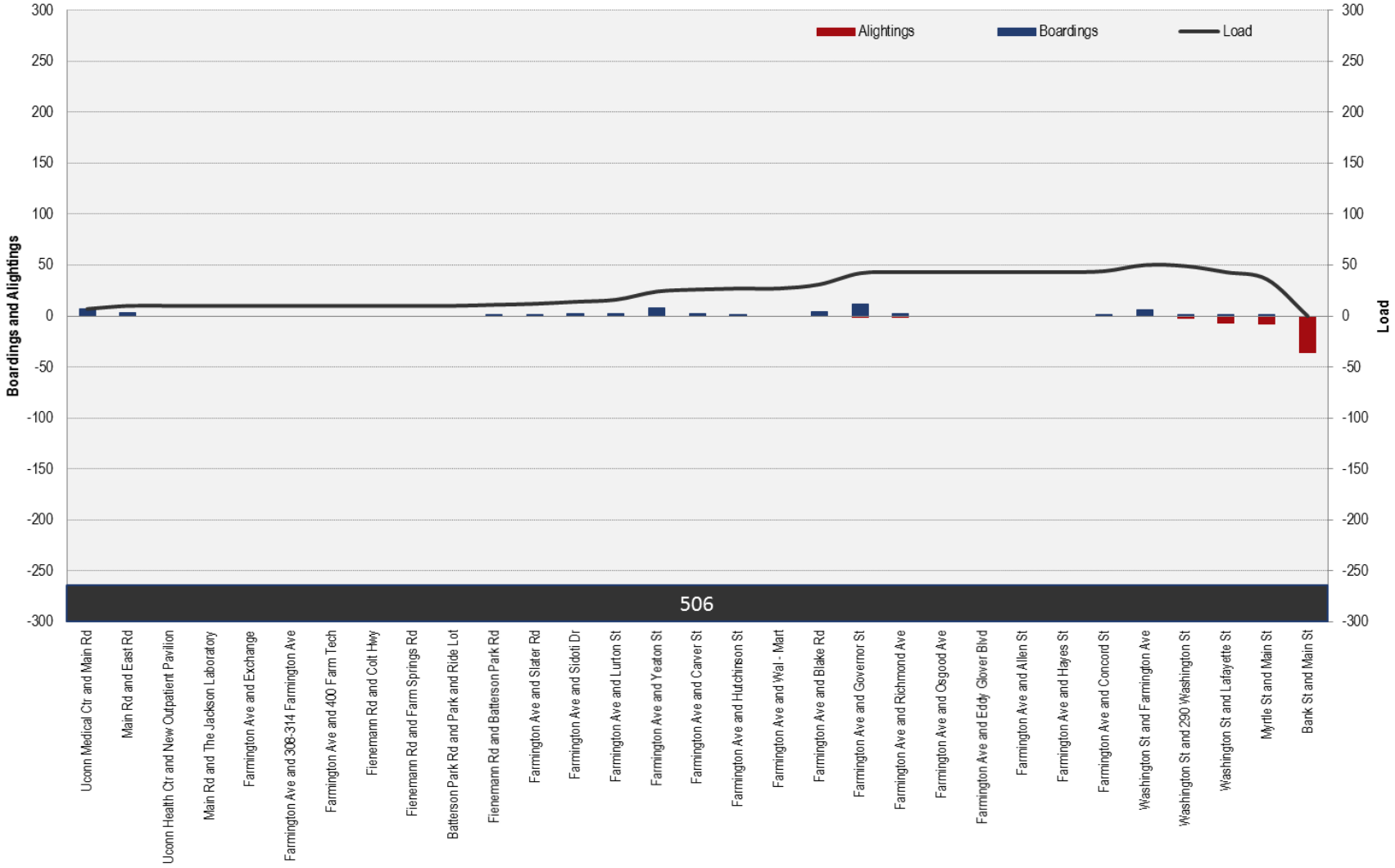


FIGURE 13 | SATURDAY INBOUND RIDERSHIP BY STOP MAP

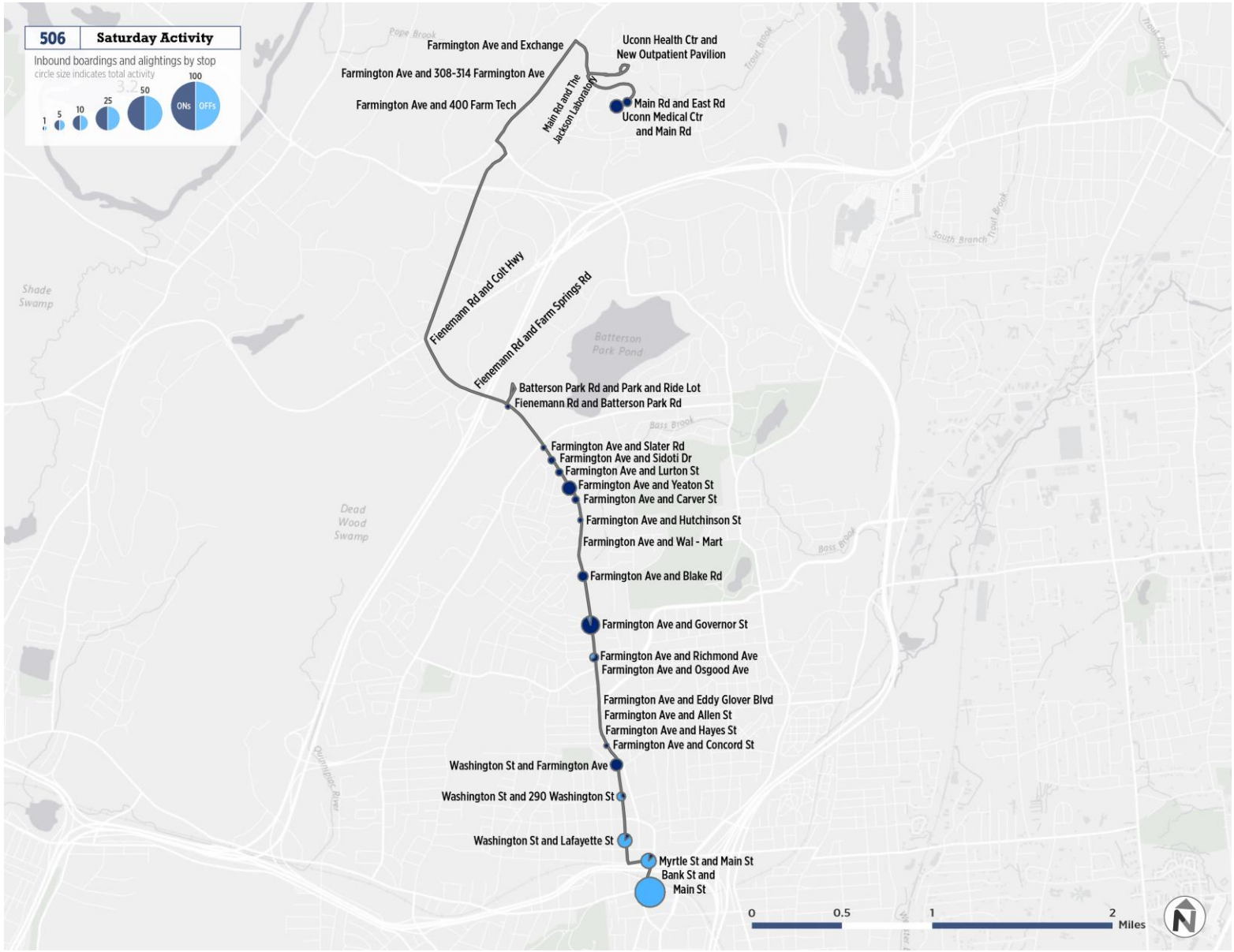


FIGURE 14 | SUNDAY OUTBOUND RIDERSHIP BY STOP GRAPH

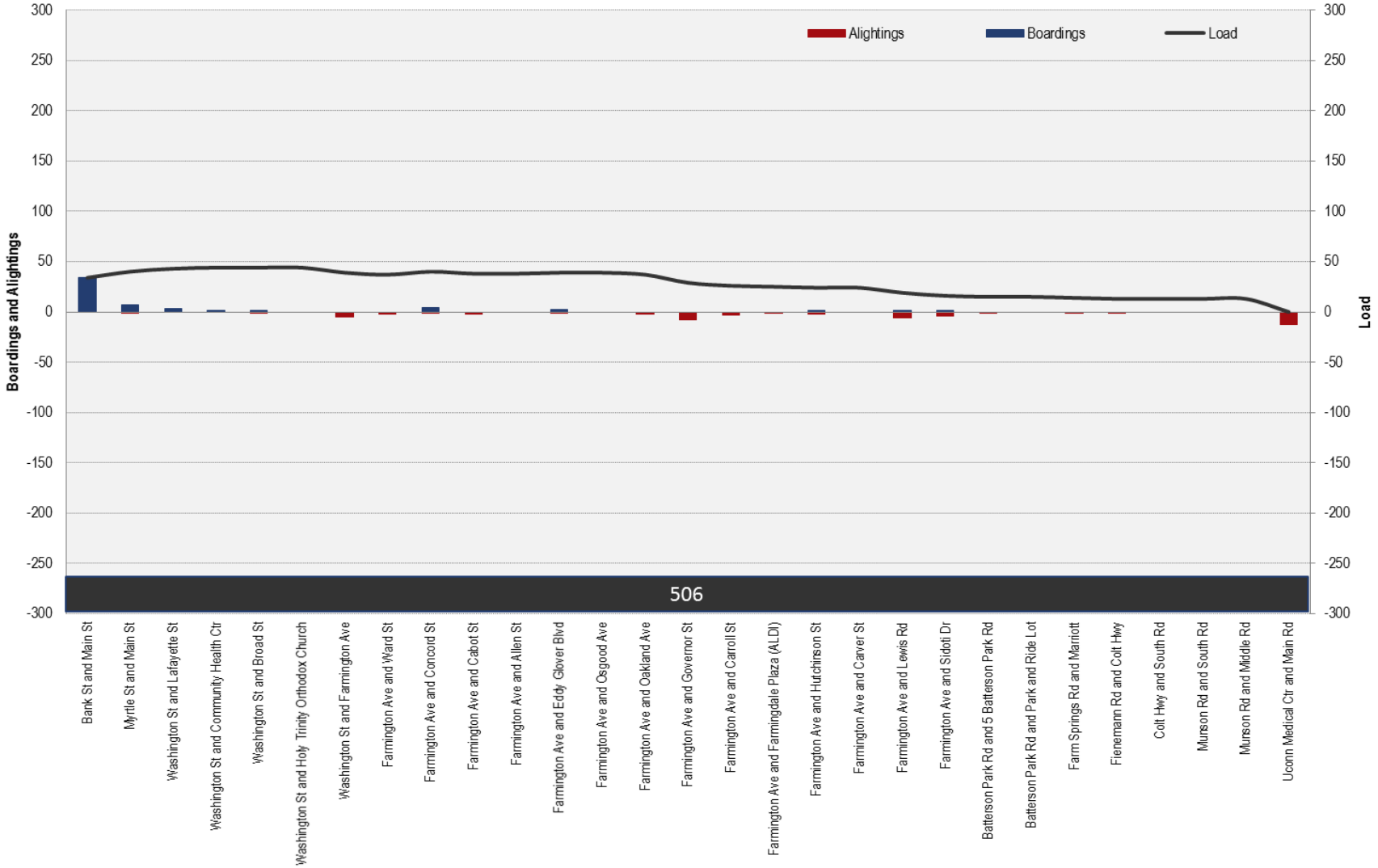


FIGURE 15 | SUNDAY OUTBOUND RIDERSHIP BY STOP MAP

FIGURE 16 | SUNDAY INBOUND RIDERSHIP BY STOP GRAPH

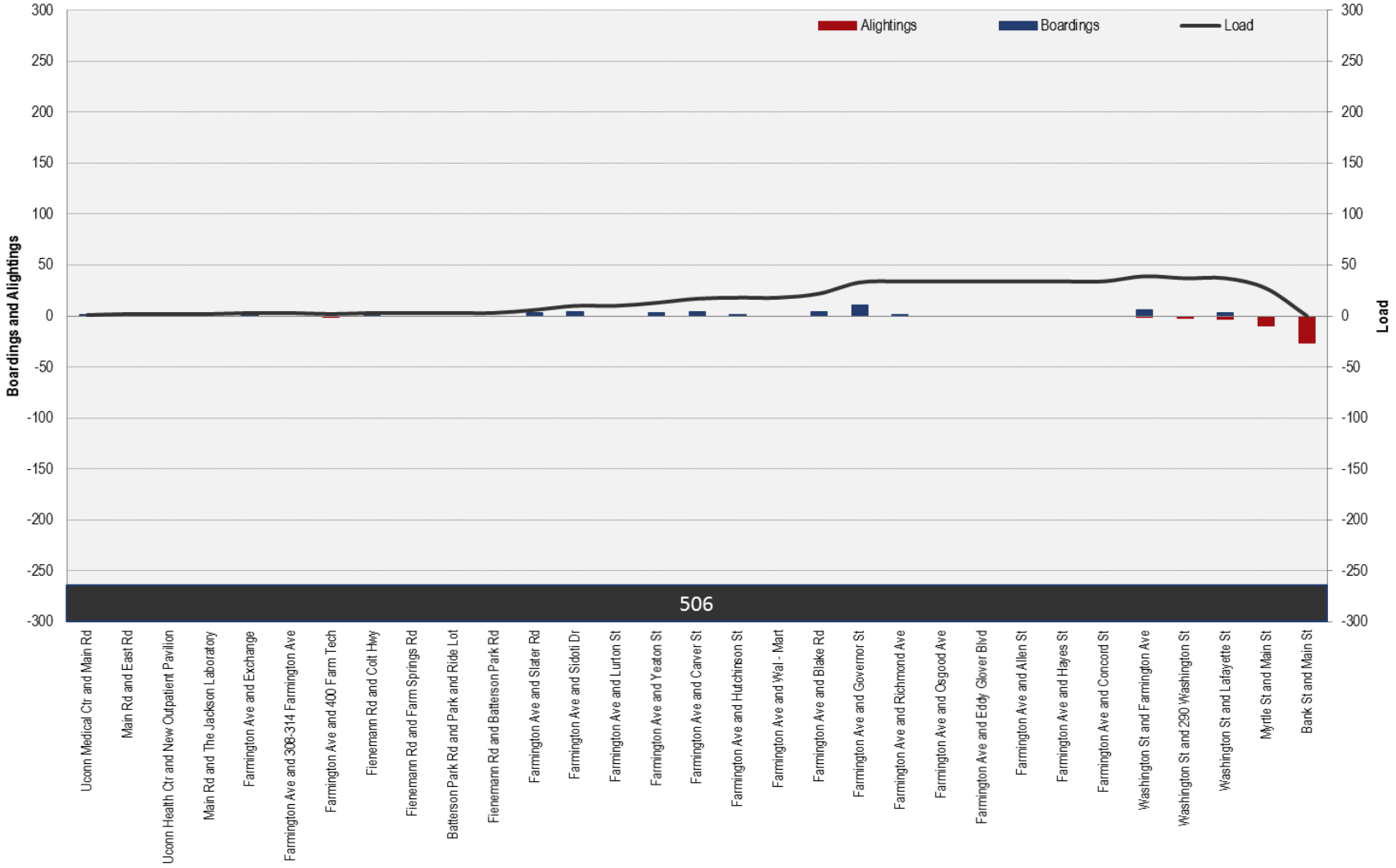


FIGURE 17 | SUNDAY INBOUND RIDERSHIP BY STOP MAP

Ridership by Trip

Weekday

Route 506 carries an average of seven passengers per trip on weekdays. Demand is well balanced between the inbound and outbound direction for most of the day, with ridership peaking outbound at 8:00 AM (see Figure 18 and Figure 19). Ridership on Route 506 is fairly light, with only 12 trips carrying 10 passengers or more. Constant activity throughout the day suggests Route 506 serves multiple trip types and users. Ridership demand drops precipitously after 8:00 PM, with no trips carrying more than four passengers.

Passenger totals and maximum loads do not exceed 40 passengers on any trip, which is the typical seating capacity of a 40-foot transit bus.

FIGURE 18 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

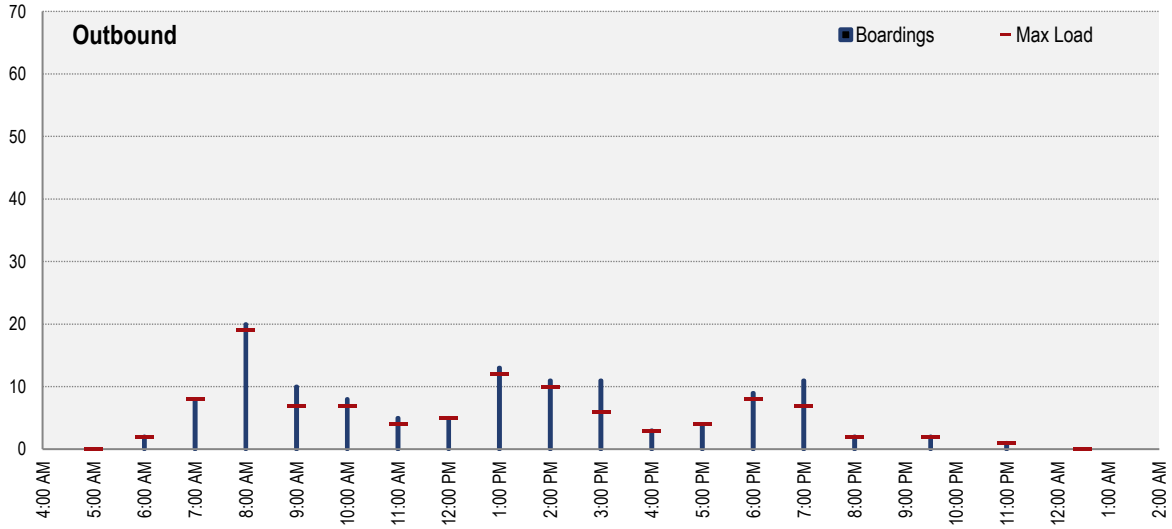
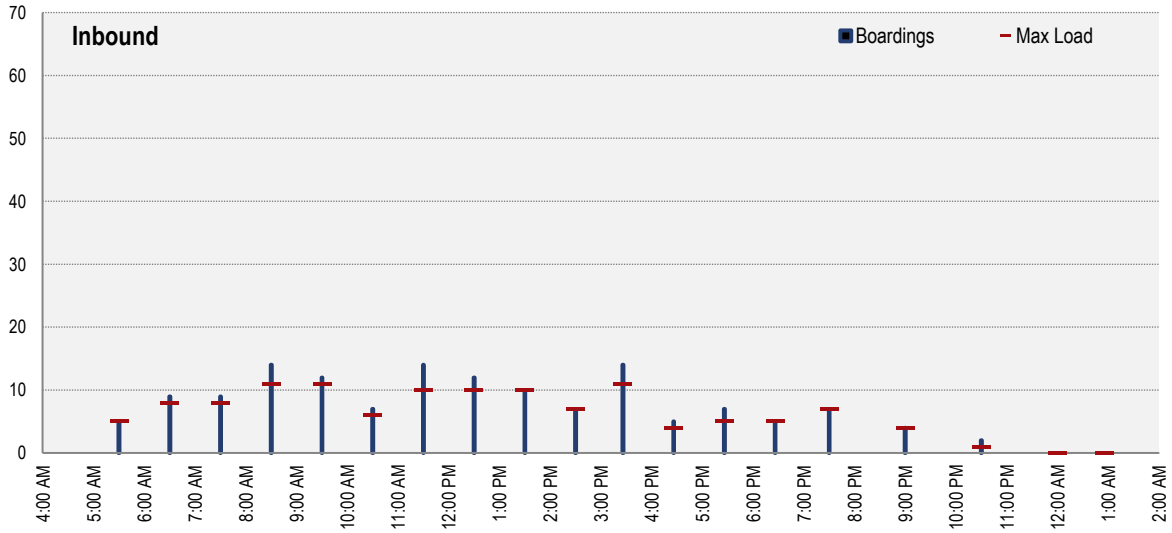


FIGURE 19 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Route 506 carries an average of four passengers per trip on Saturdays. Saturday ridership is generally low, with only four trips carrying 10 passengers or more. Ridership on outbound trips is highest between 2:00 PM and 7:00 PM; no inbound trips carry more than eight passengers (Figure 20 and Figure 21).

FIGURE 20 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

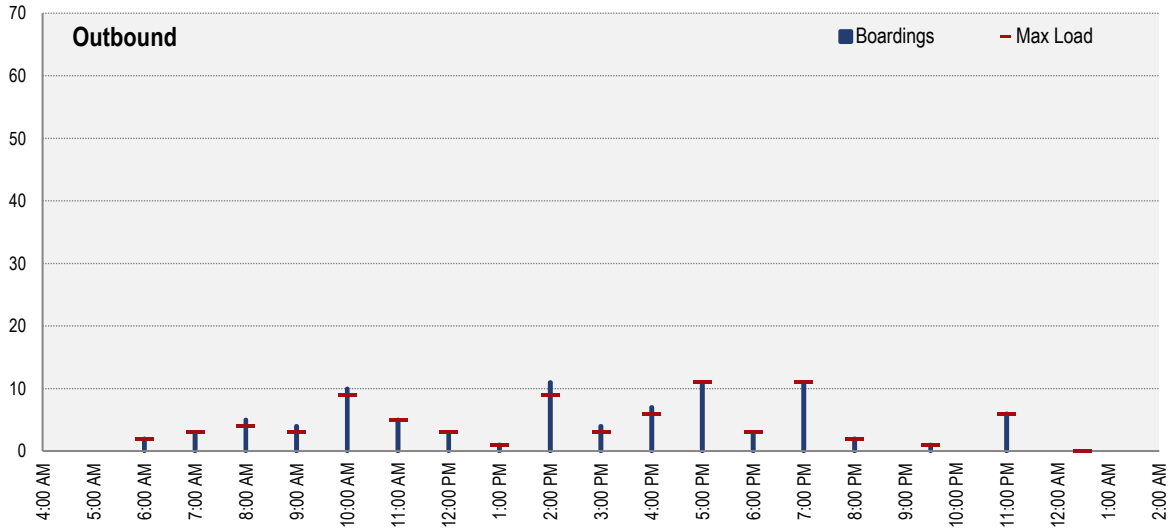
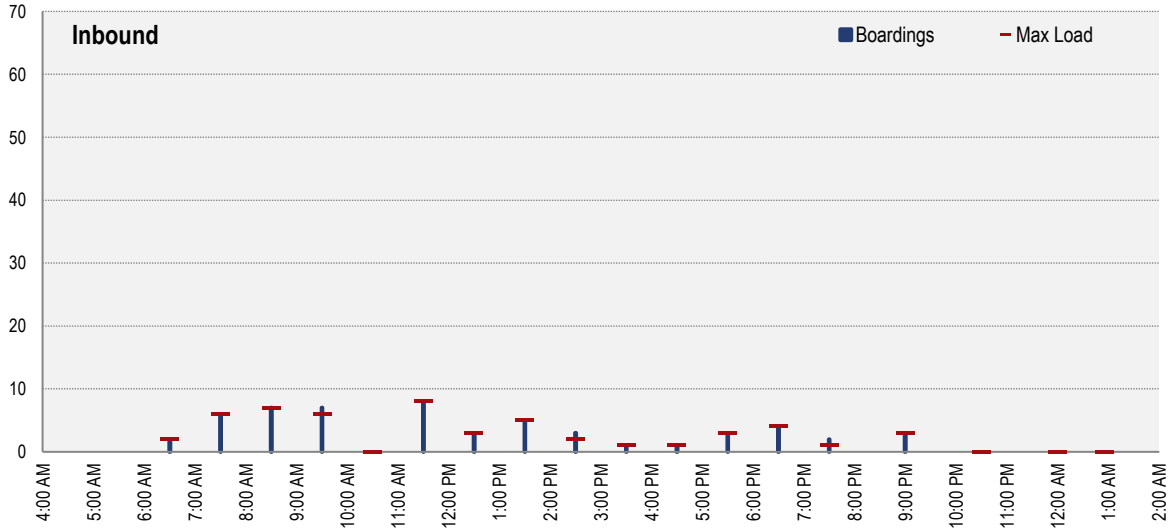


FIGURE 21 | SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

Route 506 carries an average of 3.5 passengers per trip on Sundays. Sunday ridership is minimal, with no trips carrying more than nine passengers. Outbound ridership is well balanced from 12:00 PM to 4:00 PM; inbound ridership peaks at 8:30 AM (Figure 22 and Figure 23).

FIGURE 22 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

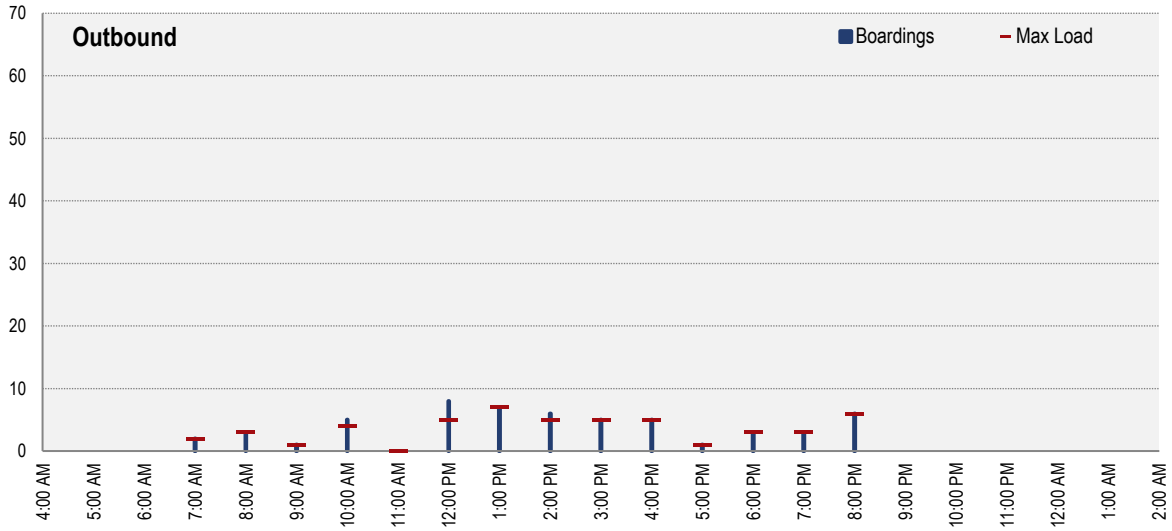
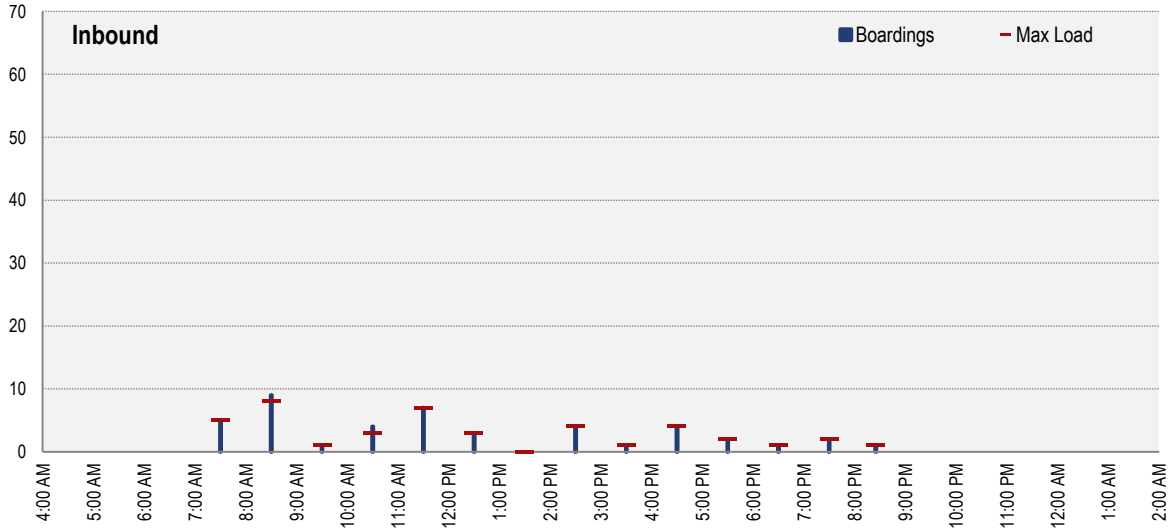


FIGURE 23 | SUNDAY INBOUND RIDERSHIP BY TRIP



Productivity

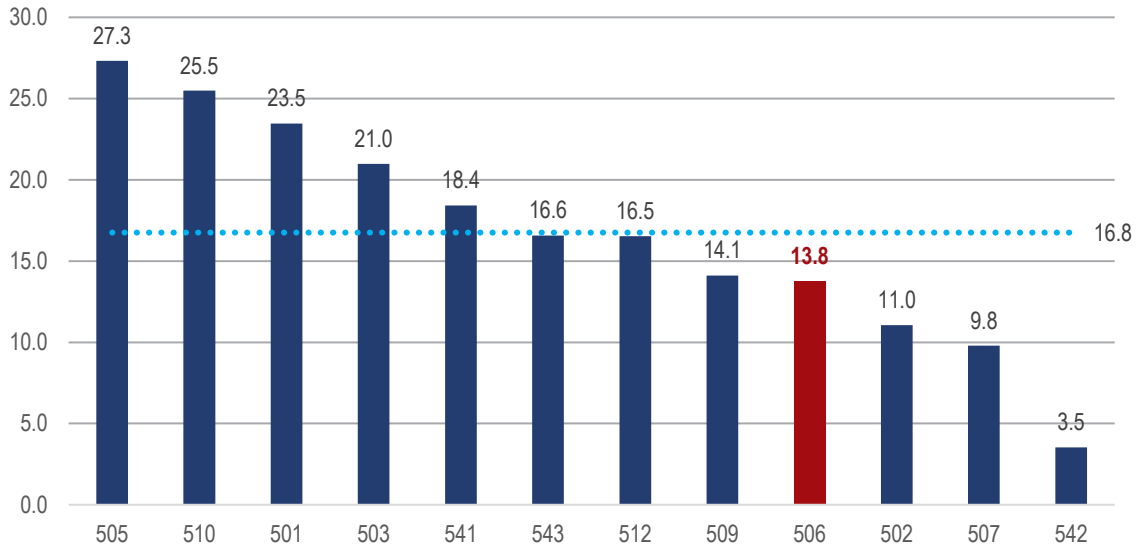
Route 506 carries 13.8 riders per hour on weekdays, somewhat below the division average of 16.8 riders per hour and ranking 9th out of 12 routes on this performance measure. Ridership per hour is also well below average on Saturdays and Sundays (Figure 24).

FIGURE 24 | PRODUCTIVITY

PRODUCTIVITY MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 506	DIVISION AVG	ROUTE 506	DIVISION AVG	ROUTE 506	DIVISION AVG
Passengers per Revenue Vehicle Hour	13.8	16.8	7.8	13.1	7.3	10.4

*Source: CT**transit** performance data*

FIGURE 25 | WEEKDAY PASSENGERS PER REVENUE HOUR



On-Time Performance

On weekdays, approximately 49% of Route 506 time points were served "on-time" during the survey period (Figure 26). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule. Weekday on-time performance was affected by early departures, which occurred 28% of the time.

On Saturdays, approximately 49% of Route 506 time points were served "on-time" during the survey period, with 43% of time points served earlier than scheduled. On Sundays, approximately 60% of time points were served "on-time," and 40% of time points are served early.

FIGURE 26 | ON-TIME PERFORMANCE

PERFORMANCE	WEEKDAY	SATURDAY	SUNDAY
Early	28%	43%	40%
Late	23%	8%	0%
On-Time	49%	49%	60%

*Source: CT**transit** performance data*

SERVICE IMPROVEMENT

Route 506 is a radial route that serves Farmington Avenue to the northwest of downtown New Britain and connects to the UConn Health/John Dempsey Hospital campus. Ridership is relatively low compared to other New Britain/Bristol Division routes, with below-average service productivity. Most ridership activity is focused along Farmington Avenue between downtown New Britain and Batterson Park Road, east of I-84. Service along this portion of the route is direct and serves the same alignment in both directions. Route 506 deviates briefly to serve the Batterson Park Road Park-and-Ride lot, although this stop generates only two riders on weekdays. The route also deviates onto Farm Springs Road during some weekday trips and all weekend trips, serving United Technologies and the Marriott hotel, although ridership at these stops is fairly low. With the exception of the UConn Health campus, few riders travel to or from stops along the one-way loop at the outer end of the route, and there is little underlying transit demand in this low-density area.

Service Improvement Options

Opportunities to strengthen Route 506 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Operate bidirectional service between Fienemann Road and UConn Health.** Route 506 travels along a large one-way loop via Colt Highway, UConn Health/John Dempsey Hospital, Farmington Avenue, and Birdseye Road. As a result, riders traveling to and from destinations along this loop must travel out of direction to complete a round trip. Operating bidirectional service along one alignment between Fienemann Road at Colt Highway and UConn Health/John Dempsey Hospital would make service more consistent and convenient for riders, while still providing access to the medical campuses in Farmington.
- **Eliminate service to Batterson Park and Ride.** Route 506 ridership is very low at Batterson Park and Ride. Passengers traveling to the park and ride are likely transferring to Express Route 902. Since all 902 buses access the park and ride via Fienemann Road, transfers between Route 506 and 902 can be facilitated at the intersection of Fienemann and Batterson Park Road. The elimination of the deviation to the park and ride will help streamline service on Route 506.
- **Eliminate weekday and Saturday service after 11:00 pm.** Ridership figures show that later trips carry very few riders, with some trips carrying zero riders. Eliminating these trips can improve the overall productivity of the route.
- **Address early departures.** Route 506 has relatively poor on-time performance with more early departures than late arrivals. Early departures are a bigger problem for passengers than late arrivals because if a bus leaves just before a passenger arrives at a stop, they have a much longer

wait for the next arrival than if a bus is a few minutes late. Early arrivals can be addressed through driver training or through service redesign that incorporates a more realistic schedule.

Route Evaluation

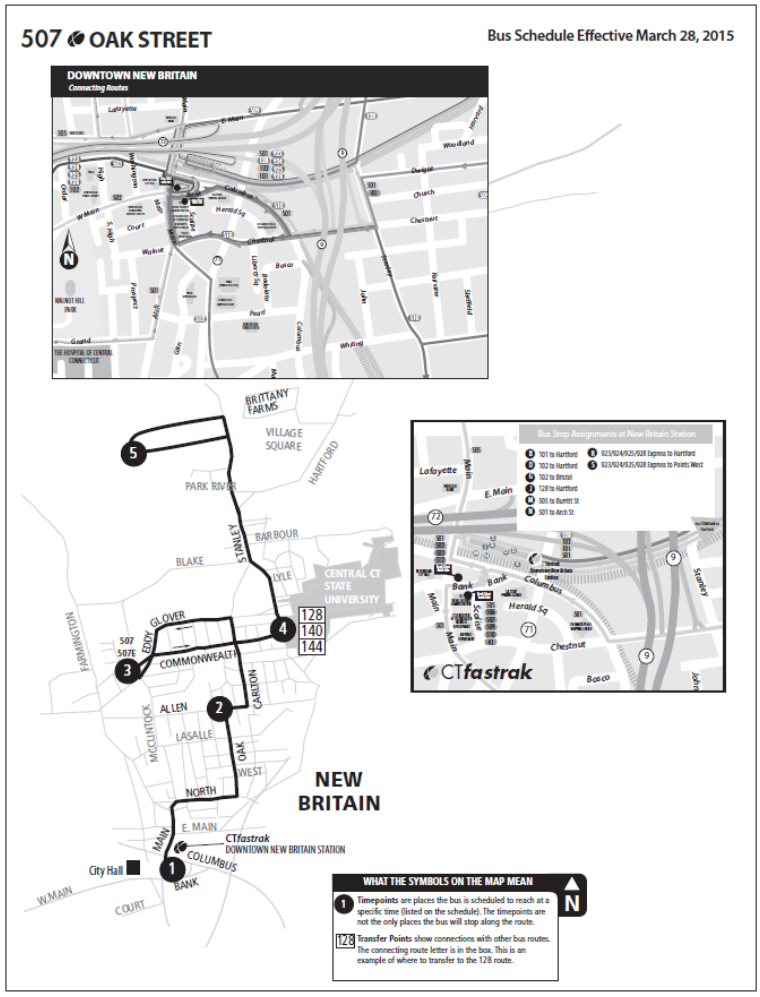
OAK STREET

507 | Oak Street

Service Design

Route 507 is a radial route, providing service between the Downtown New Britain CT*fastrak* station and A.W. Stanley Park via Central Connecticut State University (CCSU). The route operates primarily on Oak Street, Carlton Street, and Stanley Street.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 507 begins/ends in downtown New Britain, where riders can transfer to nearly all other CT***transit*** routes serving New Britain as well as CT***fastrak*** for service onward to Hartford. Route 507 offers connections to other routes at Central Connecticut State University with service to Newington, West Hartford, and Hartford.

Transfer opportunities are available outside of downtown New Britain to the following routes (see Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 128	Hartford via CT***fastrak***, New Britain via Stanley St
Route 140	CCSU Shuttle to Cedar Street CT***fastrak*** or Newington Junction CT***fastrak***
Route 144	Wethersfield, Westfarms Mall, Newington Center, Brittany Farms

Alignments and Service Patterns

Route 507 travels outbound via Main Street from Bank Street and Main Street, just outside the Downtown New Britain CT***fastrak*** station. It turns right on North Street and left on Oak Street. The route turns left on Allen Street followed by a left on Carlton Street. The route then deviates with a counter-clockwise loop: left on Eddy Glover Boulevard and left on Commonwealth Avenue, continuing east towards Stanley Street. At Stanley Street, the route turns left, serving Central Connecticut State University, and then continues to operate on Stanley Street until Country Club Road. A counter-clockwise terminal loop operates the full length of Country Club Road before turning left on Alexander Road and returning to Carlton Street.

Service in the inbound direction is generally the same as the outbound direction. However, the inbound direction serves the Commonwealth Avenue/Eddy Boulevard/Francis Street loop in the same direction as the outbound. Therefore, stops on these segments serve both directions.

Service Schedule

Route 507 operates seven days per week. There are 18 outbound and 18 inbound trips. Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM. Service operates every 60 minutes during the peak periods and the midday. During the late evening, frequency drops to every 90 minutes.

On Saturdays, there are 17 outbound and 17 inbound trips. Service operates every 60 minutes throughout the day except for in the late evening when service decreases to every 90 minutes. On Sundays, there are 13 outbound and 14 inbound trips, starting later and ending earlier, with service operating every 60 minutes.

FIGURE 3 | SCHEDULE OVERVIEW (ROUTE 507)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:27 AM – 12:50 AM	60 / 60	18 / 18
Saturday	6:27 AM – 12:50 AM	60	17 / 17
Sunday	7:27 AM – 8:55 PM	60	13 / 14

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

Route 507 carries 279 daily passengers, or 7.8 passengers per trip on an average weekday, which is just above the division average of 7.5 weekday passengers per trip.

Saturday and Sunday ridership per day and per trip on Route 507 is slightly lower than the division averages (Figure 4).

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 507	ROUTE 507	DIVISION AVG
Weekday	279	7.8	7.5
Saturday	145	4.3	5.8
Sunday	89	3.3	4.2

*Source: CT**transit** performance data*

Ridership by Stop

The most heavily used stop on Route 507 is its downtown terminus at Bank Street and Main Street. Outside of downtown, ridership is clustered along Oak Street, and only seven stops generate 10 or more boardings or alightings per day (Figure 5 and Figure 6).

FIGURE 5 | ROUTE 507 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Bank Street / Main Street	0 / 94	Mayor's Office, Town & City Clerk, CCSU Institute of Technology and Business Development, Downtown New Britain
Oak Street / LaSalle Street	22 / 0	Residential neighborhood
Oak Street / Allen Street	14 / 2	Four Star Plaza, local and national retailers, residential neighborhood
Oak Street / Putnam Street	15 / 0	Residential neighborhood
Main Street / Lafayette Street	2 / 11	New Brite Plaza, CT***fastrak*** Downtown Station, local retailers
Alexander Road / Country Club Road	13 / 0	Residential neighborhood
North Street / Tremont Street	10 / 1	Local retailers, residential neighborhood
Oak Street / Daly Avenue	7 / 3	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 507 shows inbound passenger loads peak at the stop at Sexton Street and North Street, one block north of New Brite Plaza (Figure 8).

FIGURE 6 | WEEKDAY OUTBOUND RIDERSHIP BY STOP GRAPH

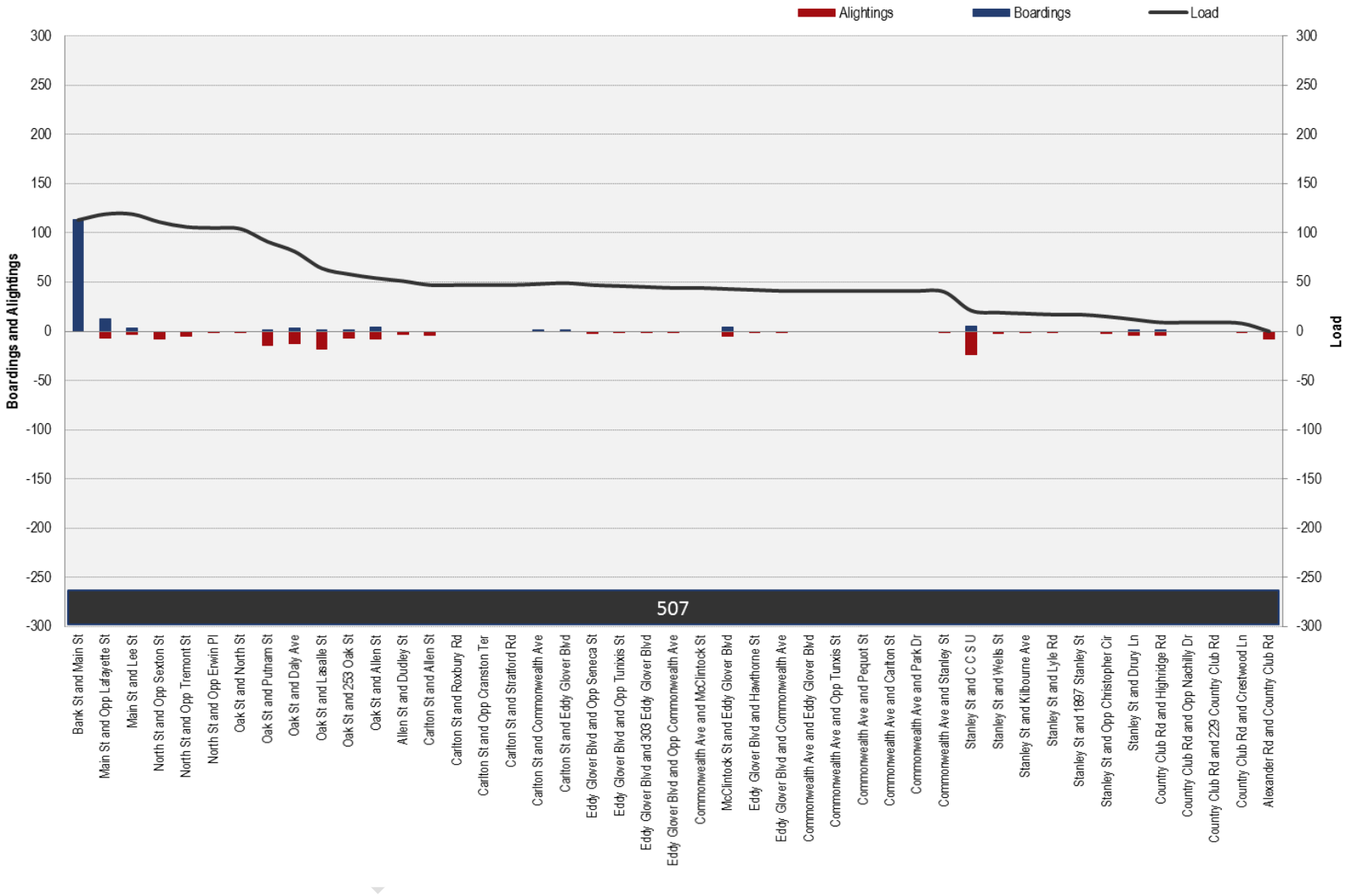


FIGURE 7 | WEEKDAY OUTBOUND RIDERSHIP BY STOP MAP

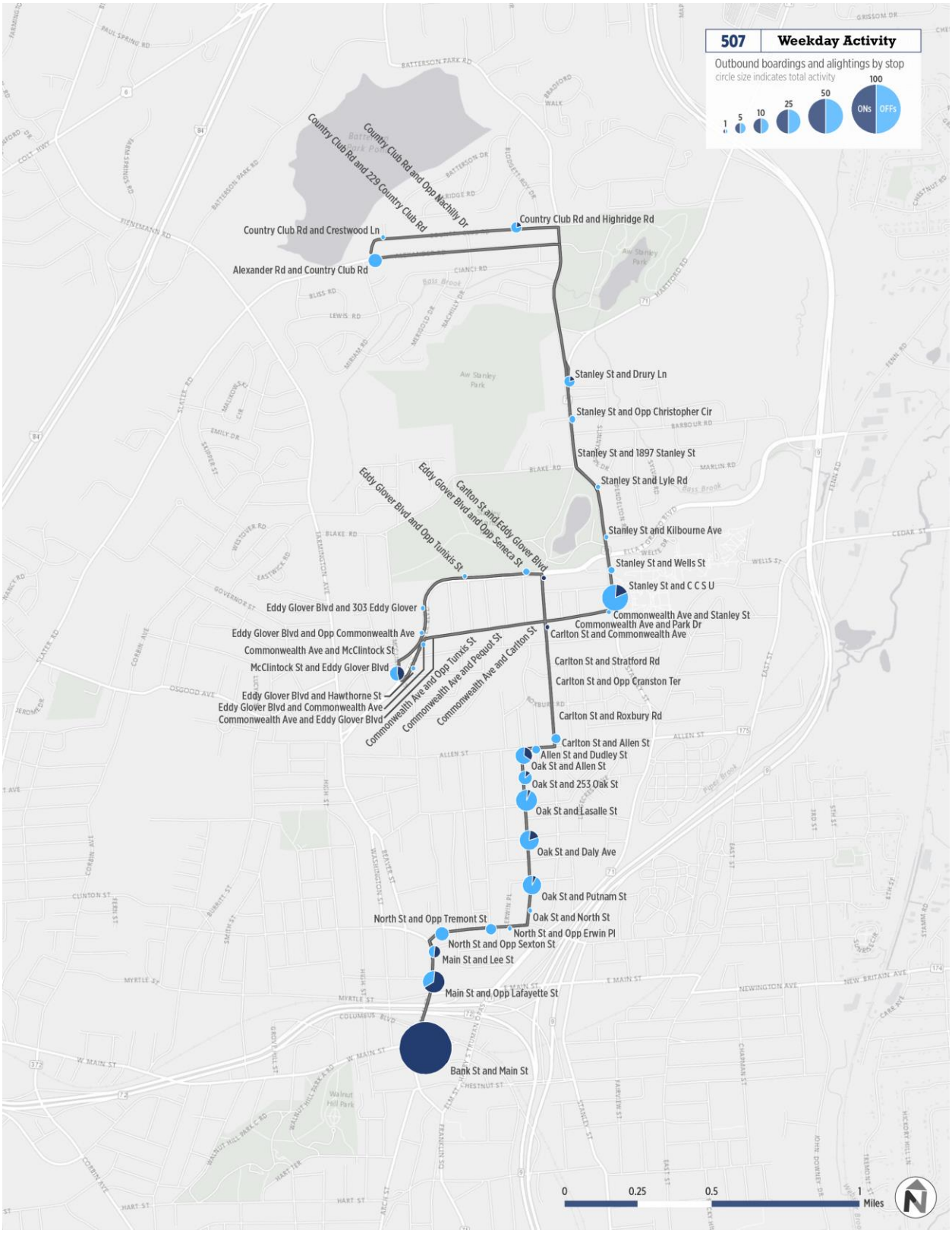


FIGURE 8 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

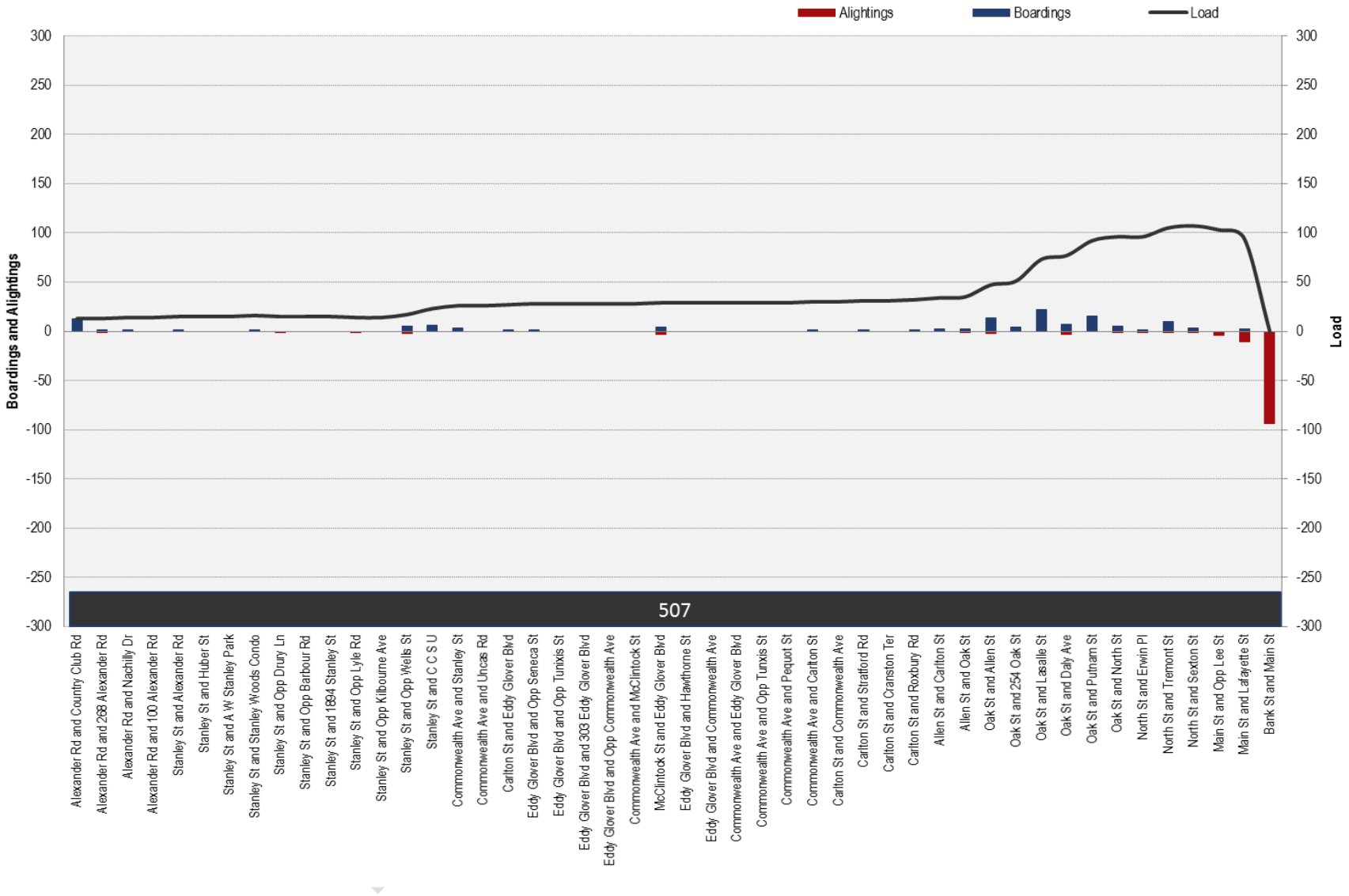


FIGURE 9| WEEKDAY INBOUND RIDERSHIP BY STOP MAP

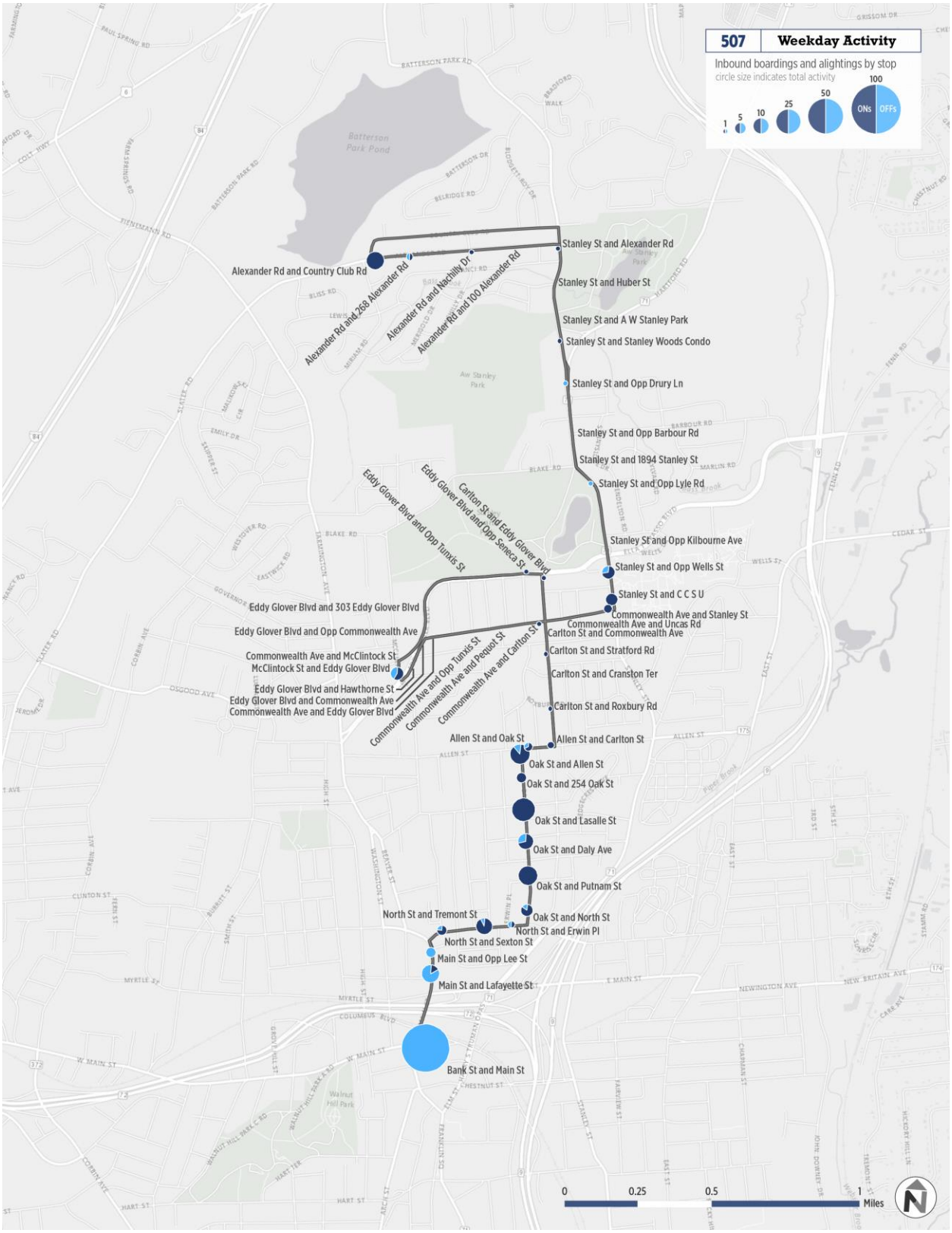


FIGURE 10| SATURDAY OUTBOUND RIDERSHIP BY STOP GRAPH

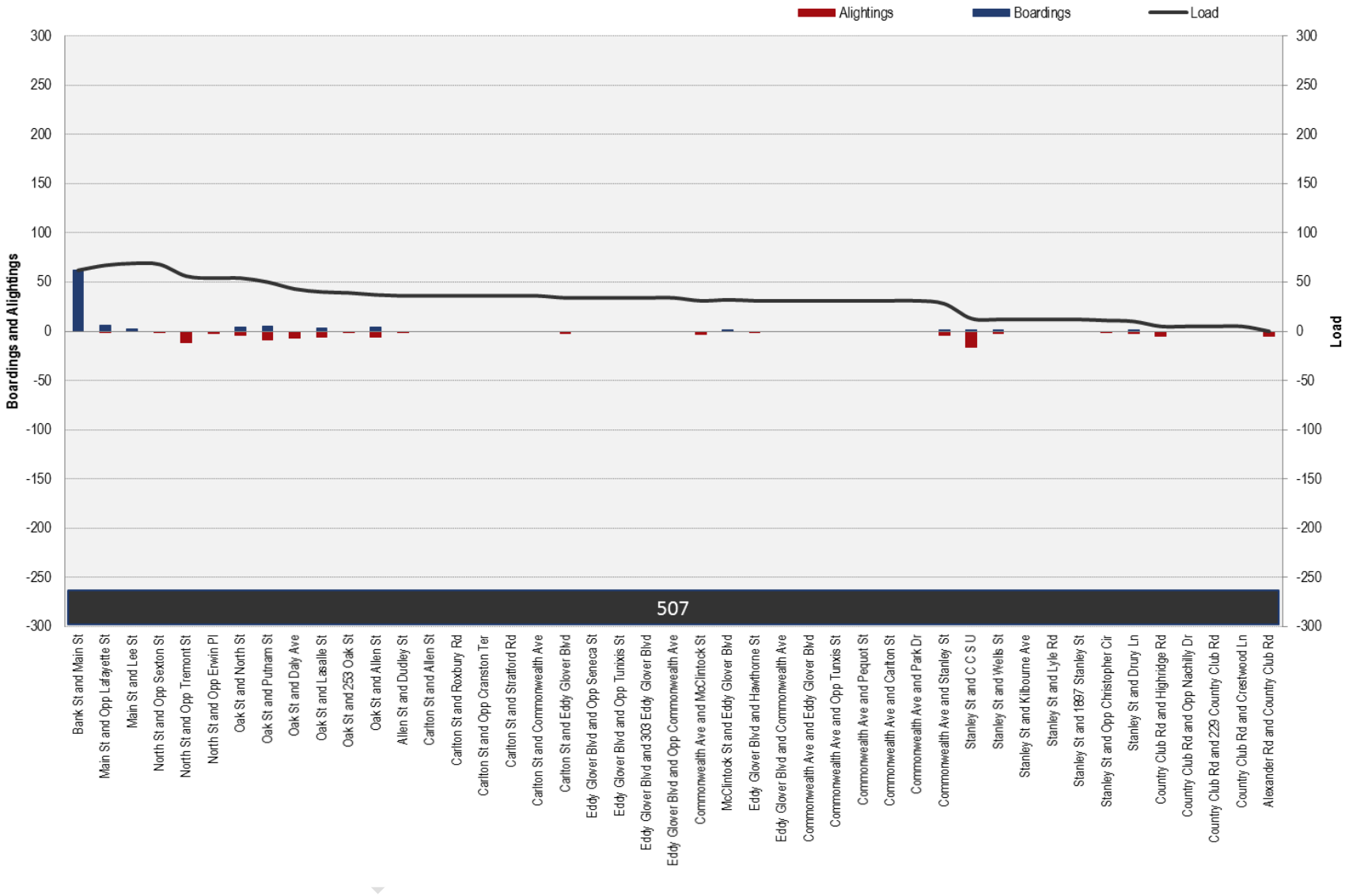


FIGURE 11 | SATURDAY OUTBOUND RIDERSHIP BY STOP MAP

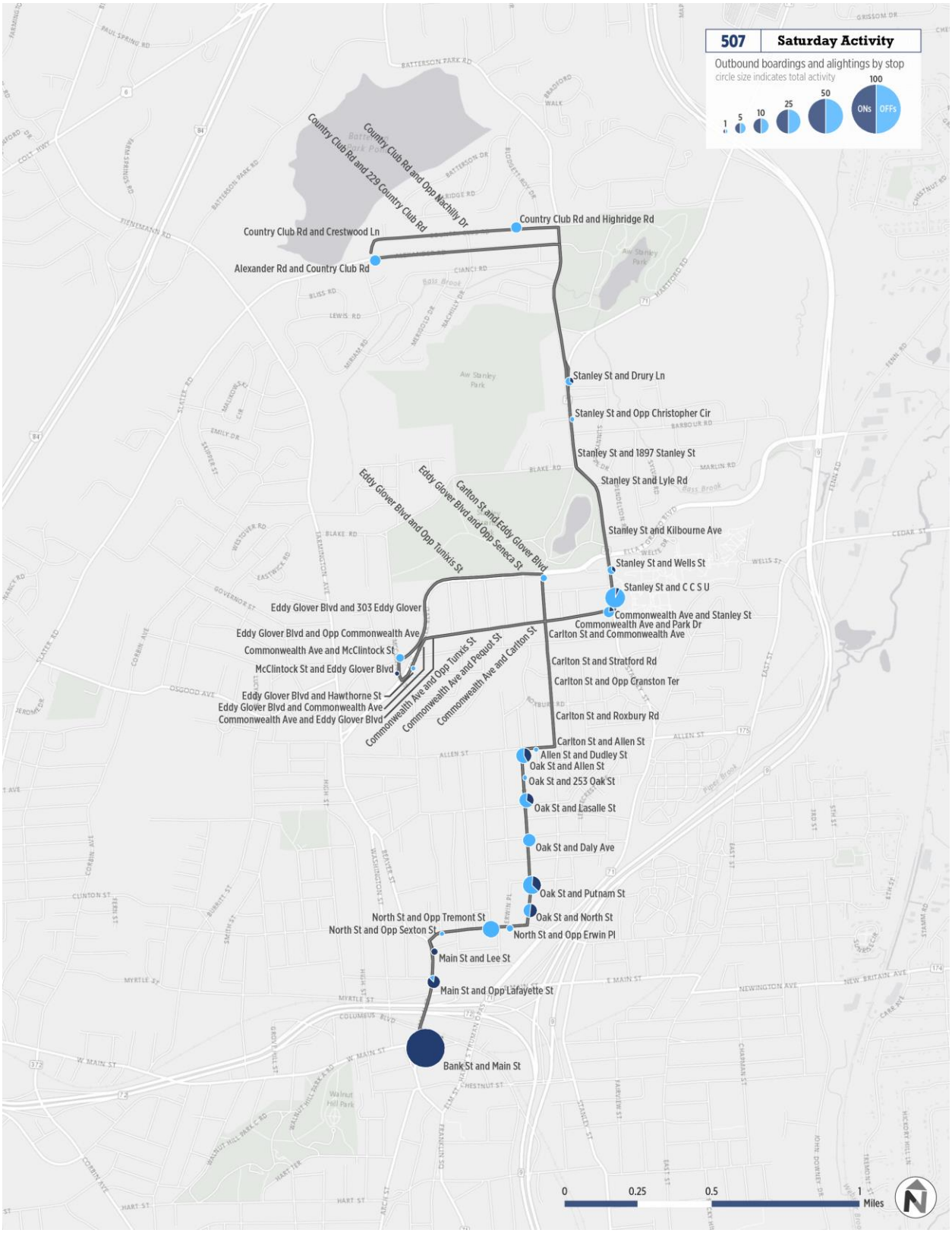


FIGURE 12| SATURDAY INBOUND RIDERSHIP BY STOP GRAPH

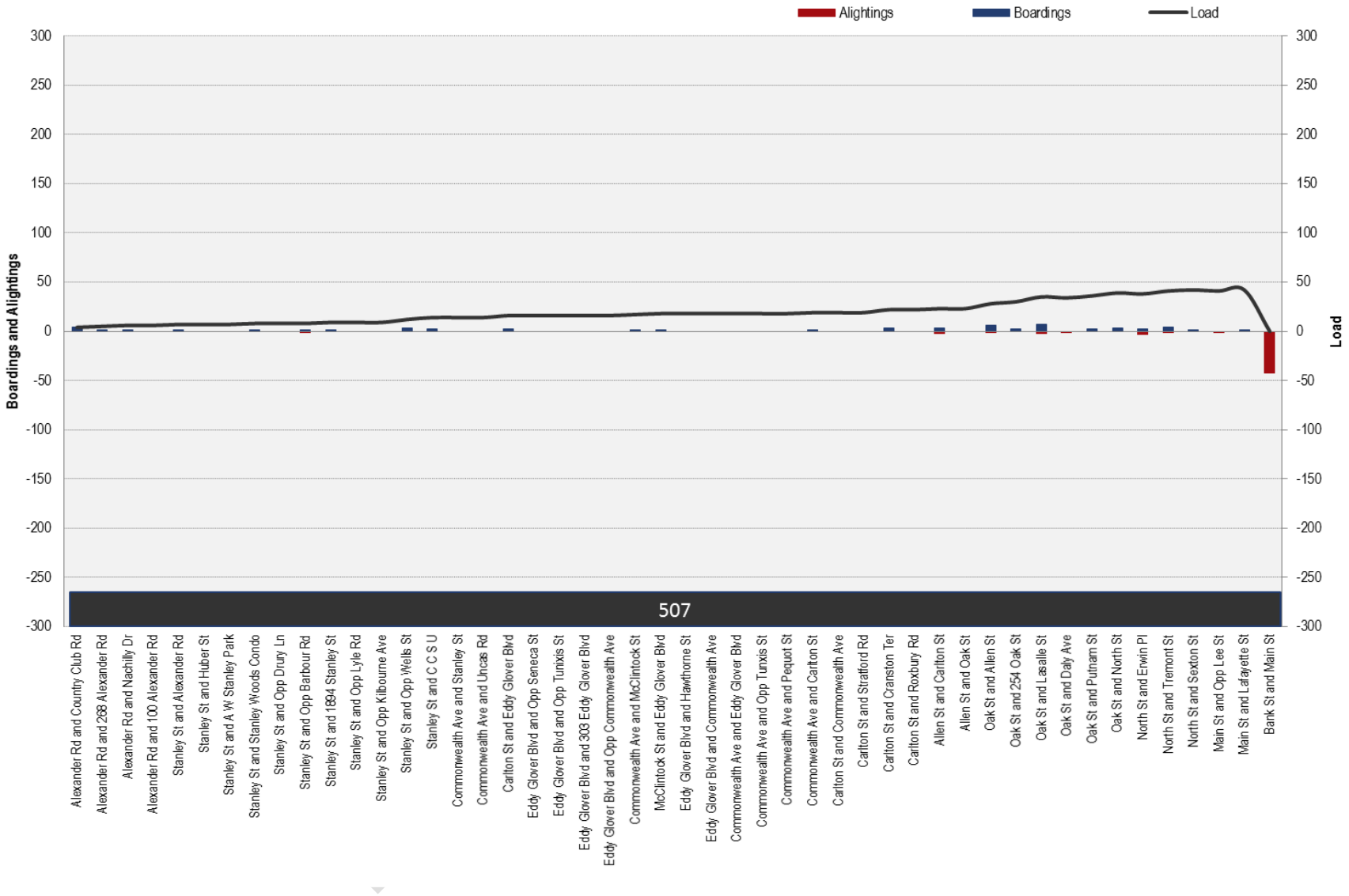


FIGURE 13| SATURDAY INBOUND RIDERSHIP BY STOP MAP

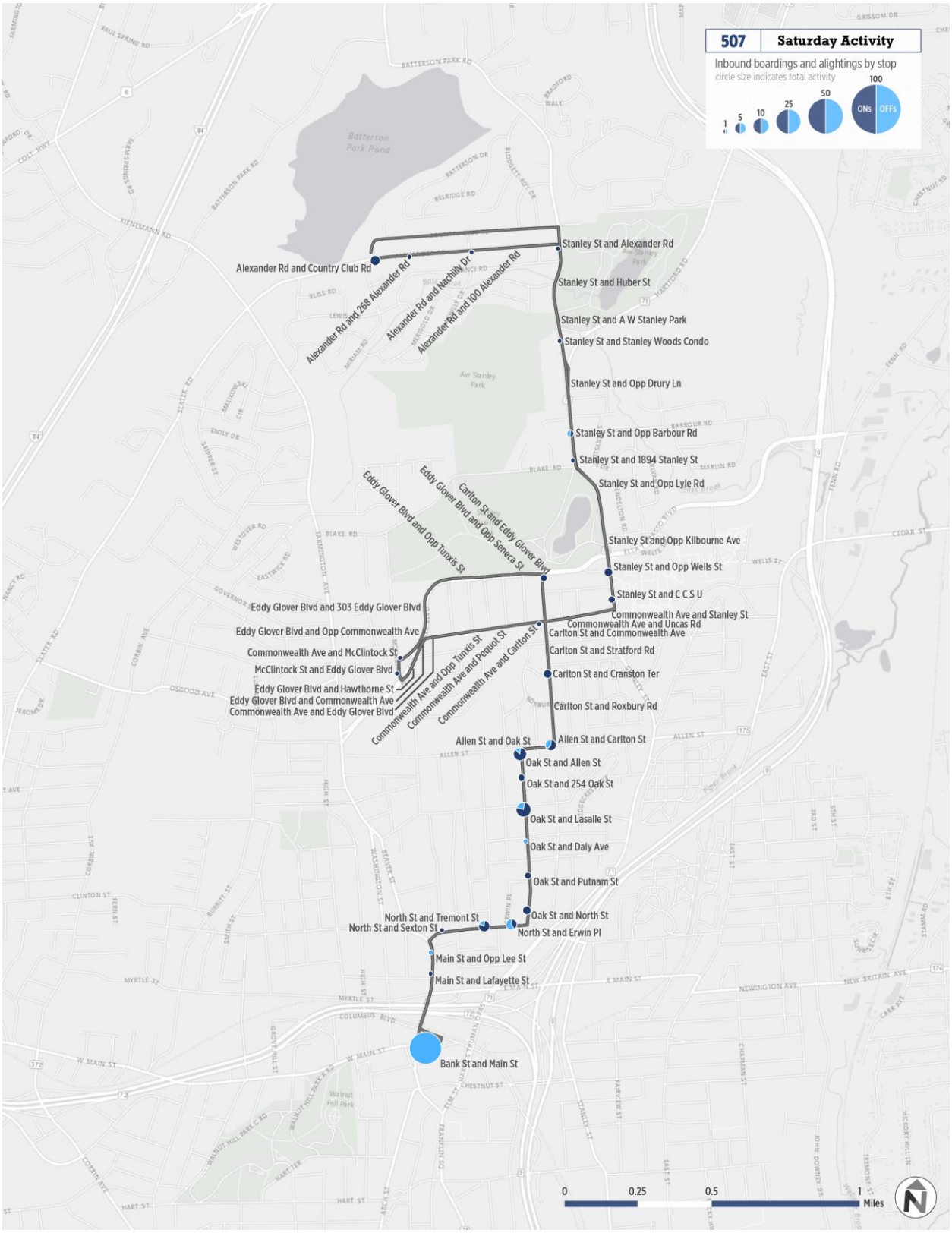


FIGURE 14| SATURDAY INBOUND RIDERSHIP BY STOP MAP

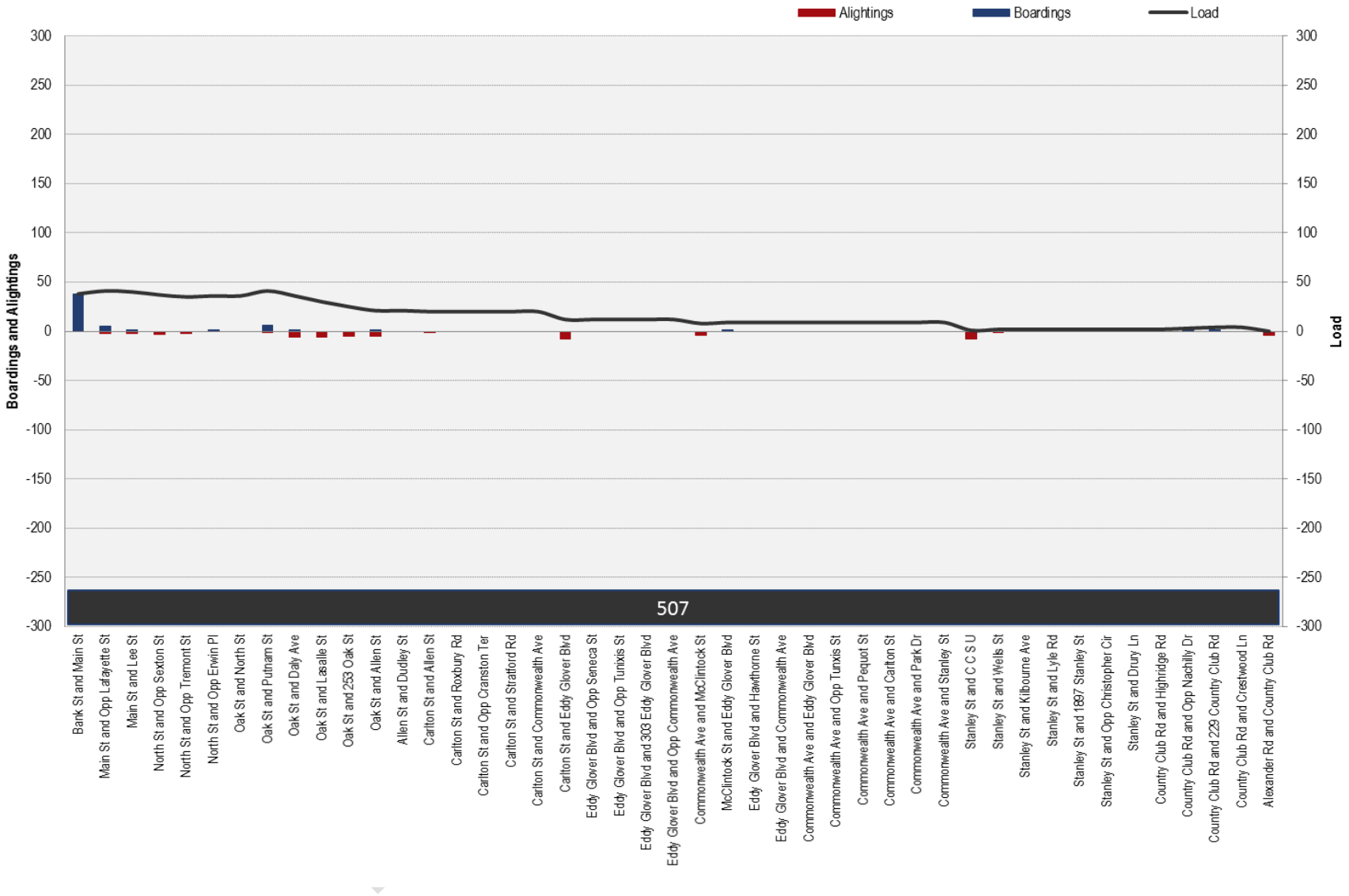


FIGURE 15| SUNDAY OUTBOUND RIDERSHIP BY STOP MAP

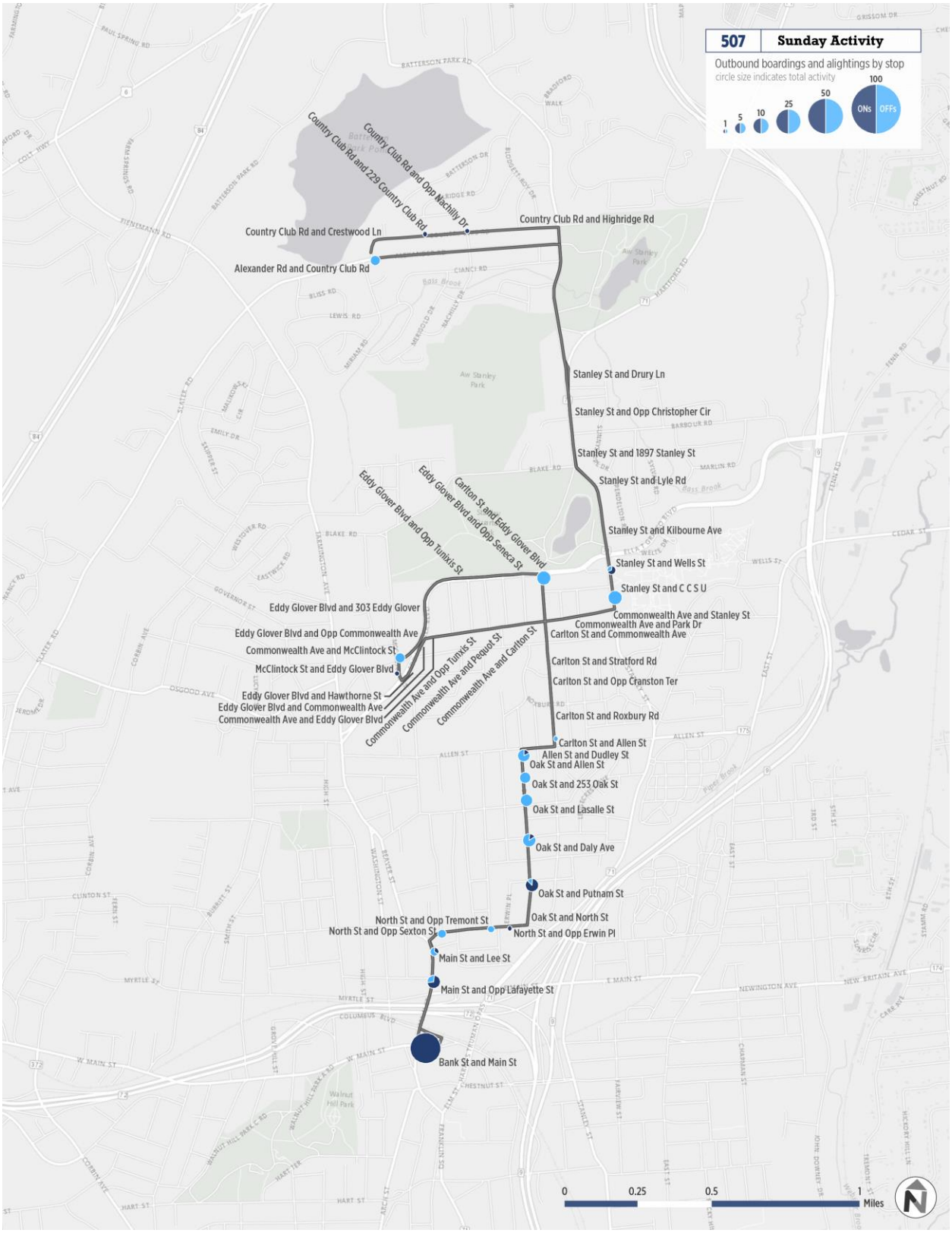


FIGURE 16| SUNDAY INBOUND RIDERSHIP BY STOP GRAPH

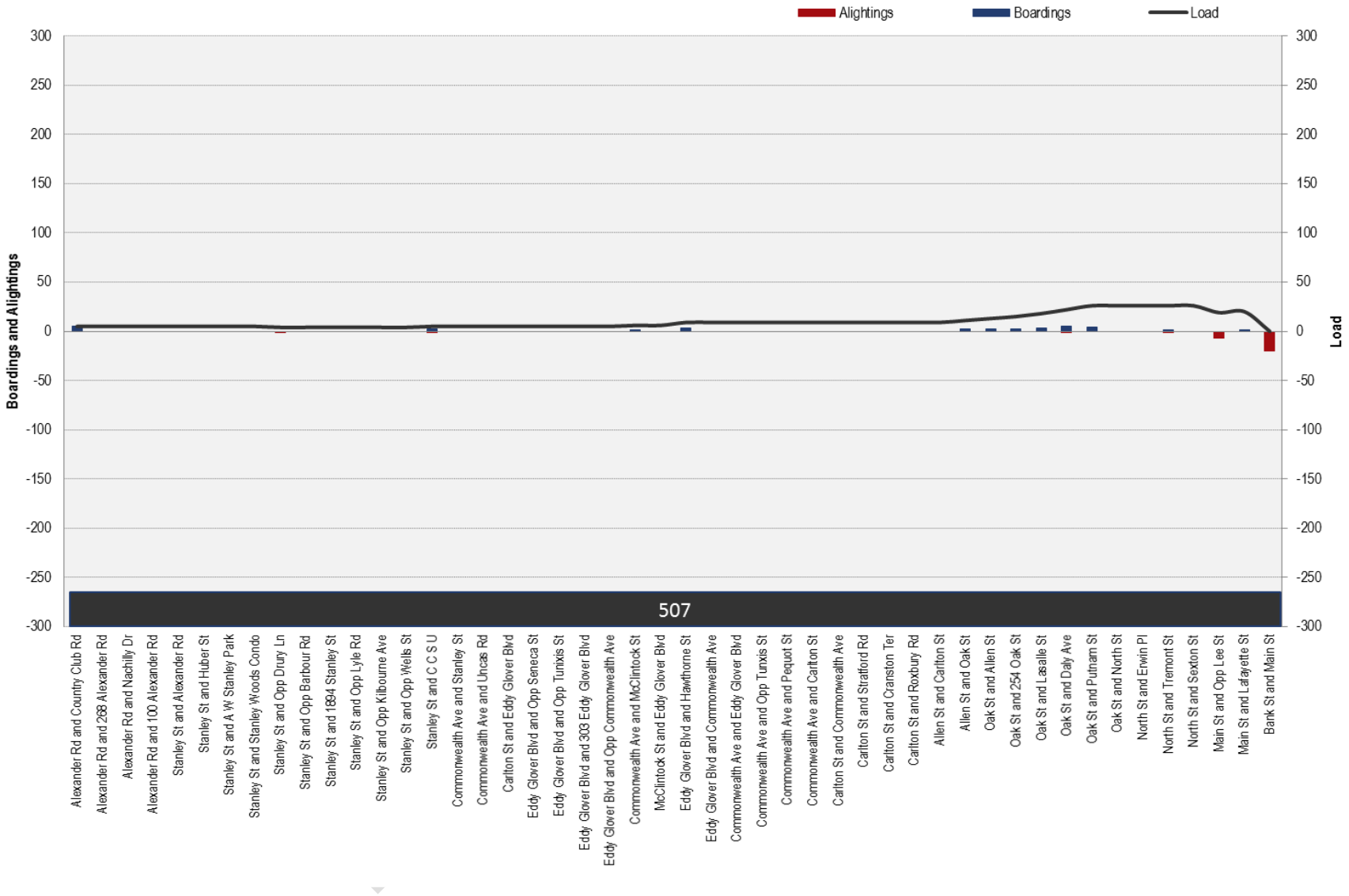
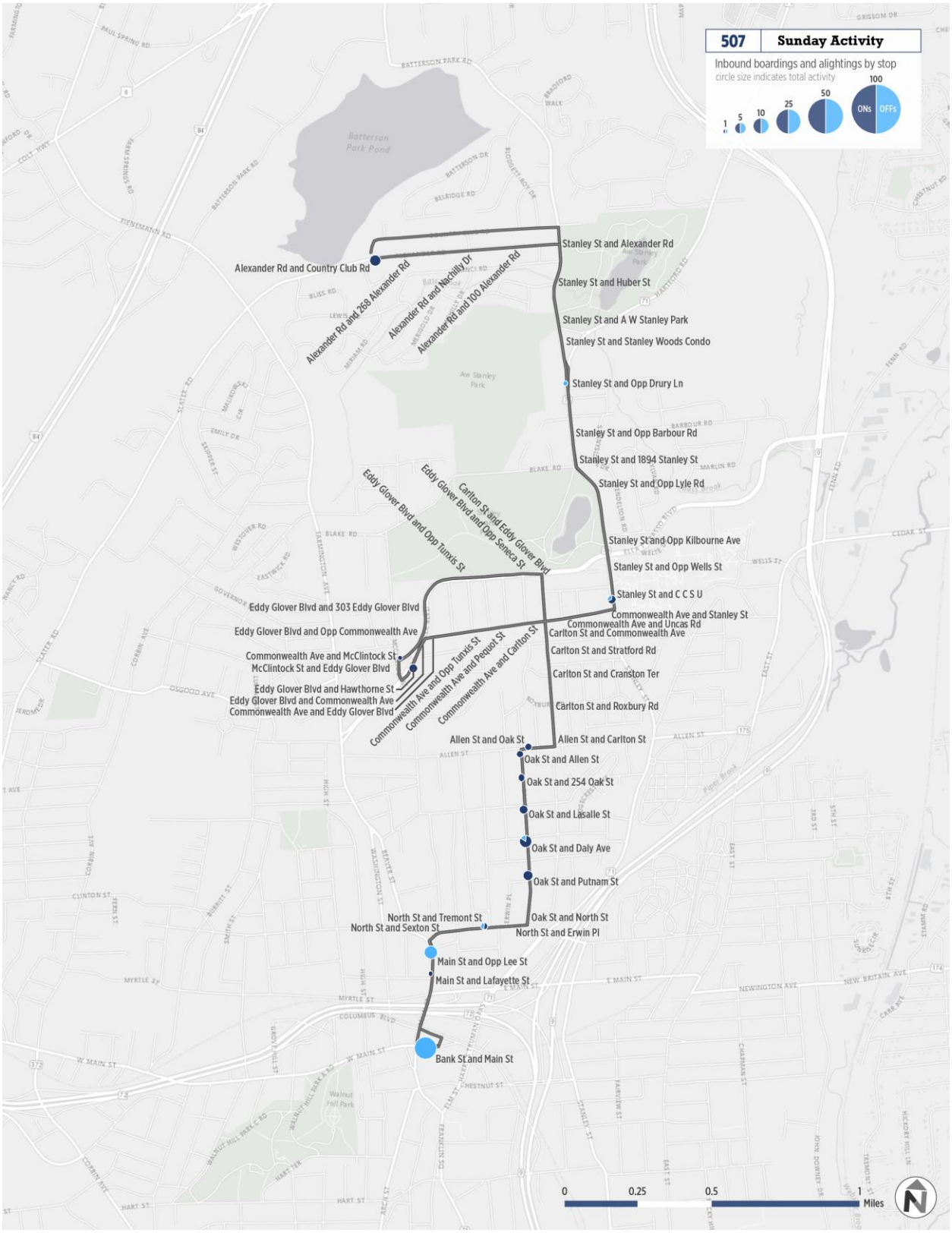


FIGURE 17| SUNDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Route 507 carries an average of 7.8 passengers per trip on weekdays (see Figure 18 and Figure 19). Ridership on outbound trips is concentrated during the midday period (12:00 to 4:00 PM), with all five trips during this period carrying more than 10 passengers; outbound ridership peaks at 1:00 PM, with 21 passengers. Traveling inbound, the highest ridership demand occurs from 7:00 AM to 12:00 PM. Ridership activity is lower traveling inbound, peaking at 19 passengers at 8:27 AM; after 12:00 PM only one inbound trip carries 10 or more passengers.

FIGURE 18| WEEKDAY OUTBOUND RIDERSHIP BY TRIP

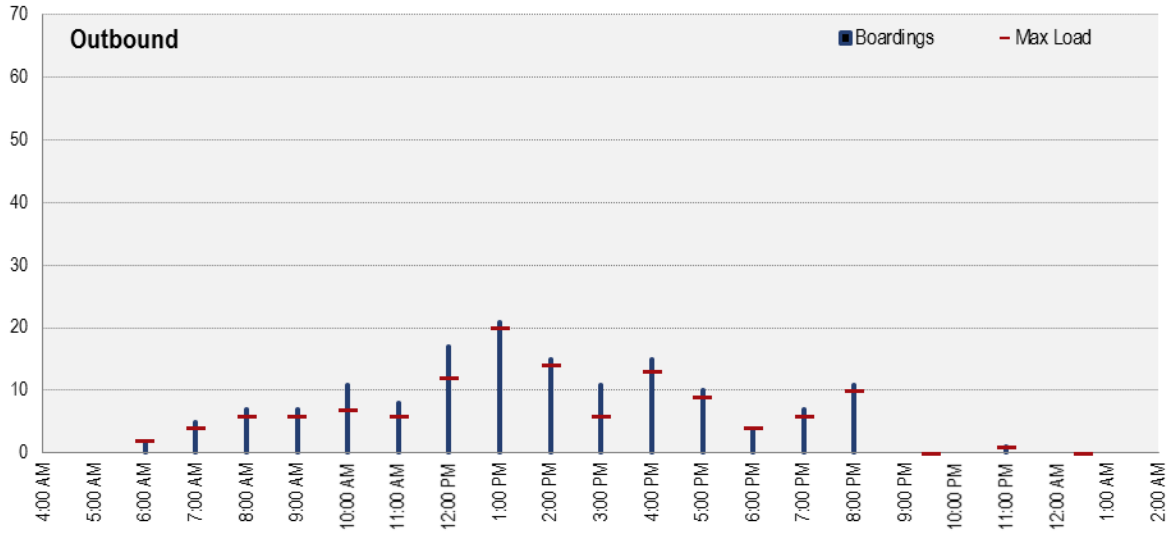
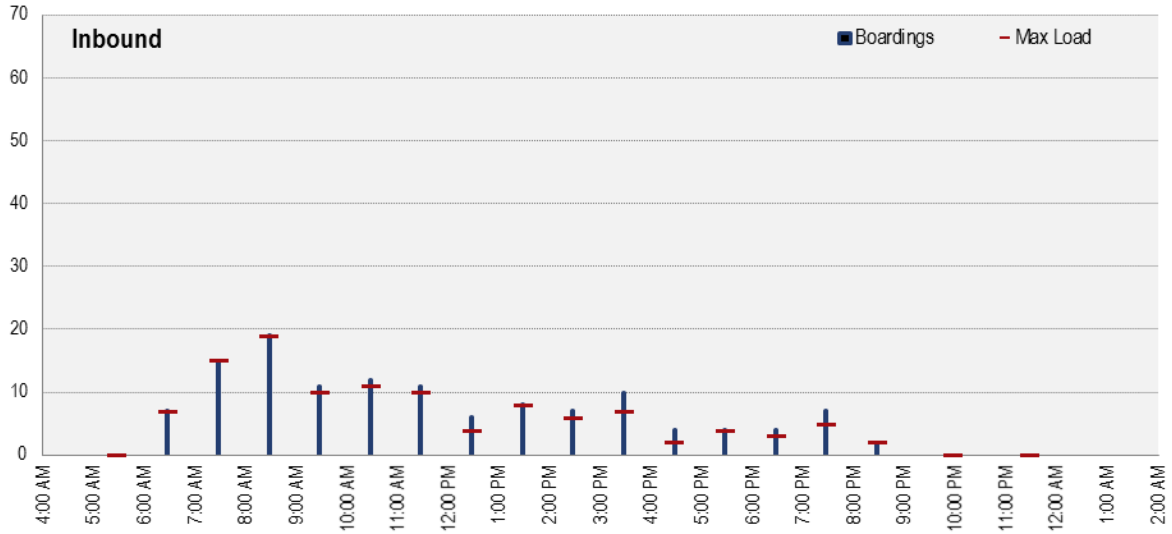


FIGURE 19| WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Saturday ridership is minimal, averaging 4.3 passengers per trip. In the outbound direction, ridership peaks at 6:00 PM (16 passengers) and only two trips carry 10 passengers or more (Figure 20). Inbound ridership is lower than outbound, with no trips carrying more than eight passengers. Inbound ridership is nearly non-existent after 3:00 PM, with eight trips carrying five combined passengers (Figure 21).

FIGURE 20| SATURDAY OUTBOUND RIDERSHIP BY TRIP

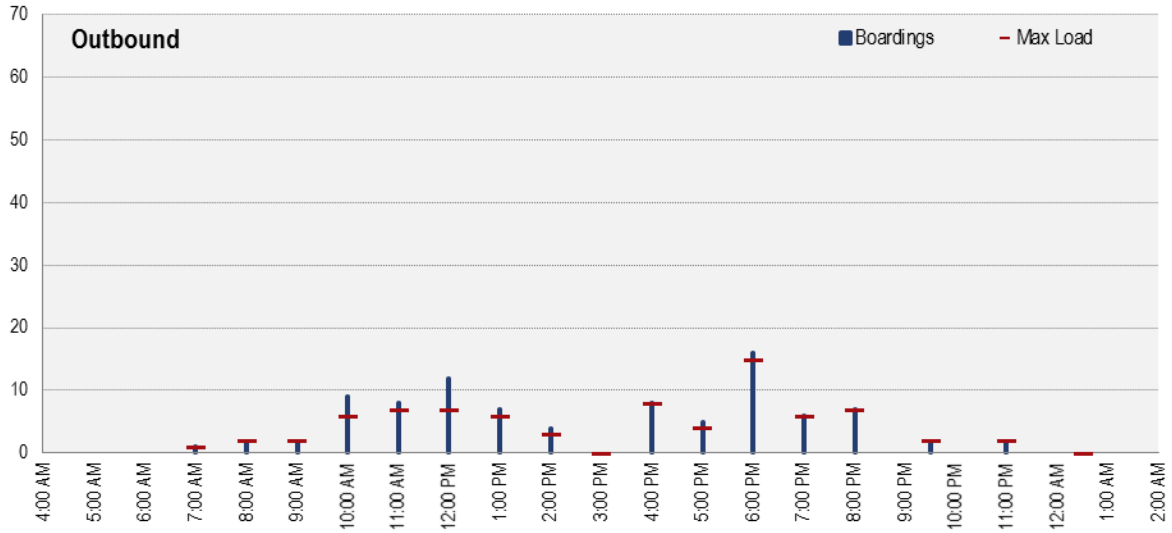
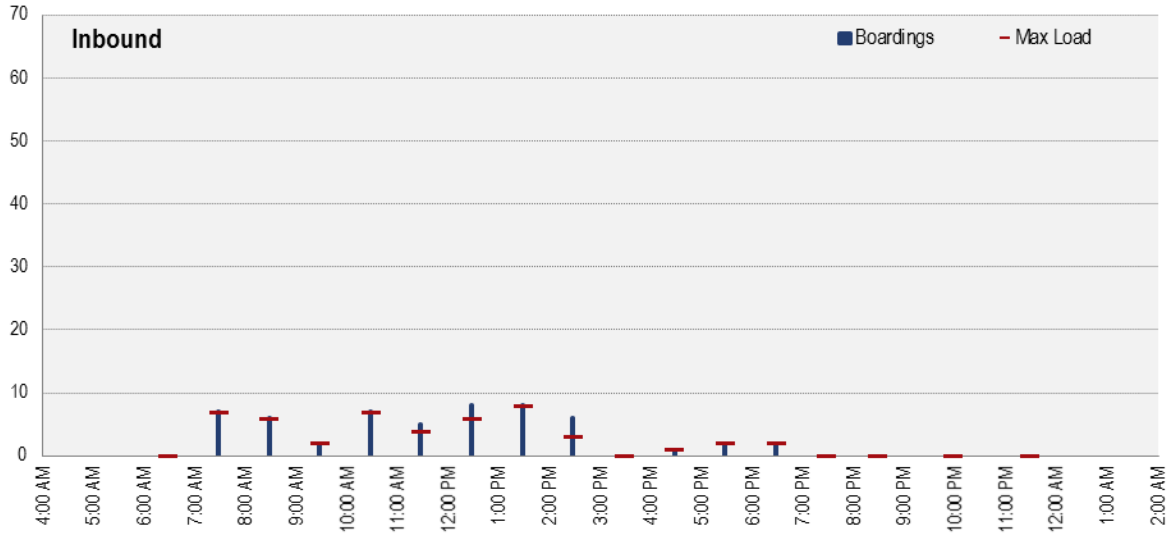


FIGURE 21| SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

Sunday ridership follows a similar pattern with the Saturday service, but averages only 3.3 passengers per trip. Outbound ridership peaks at 5:00 PM and inbound ridership peaks between 9:00 and 11:00 AM (Figure 22 and Figure 23). Only one trip (outbound or inbound) carries 10 passengers or more.

FIGURE 22| SUNDAY OUTBOUND RIDERSHIP BY TRIP

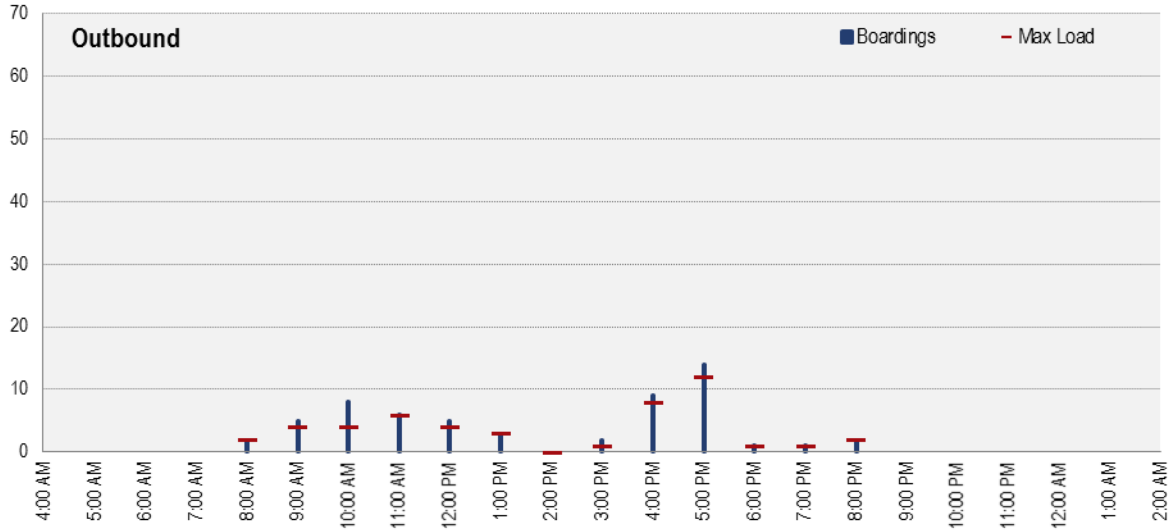
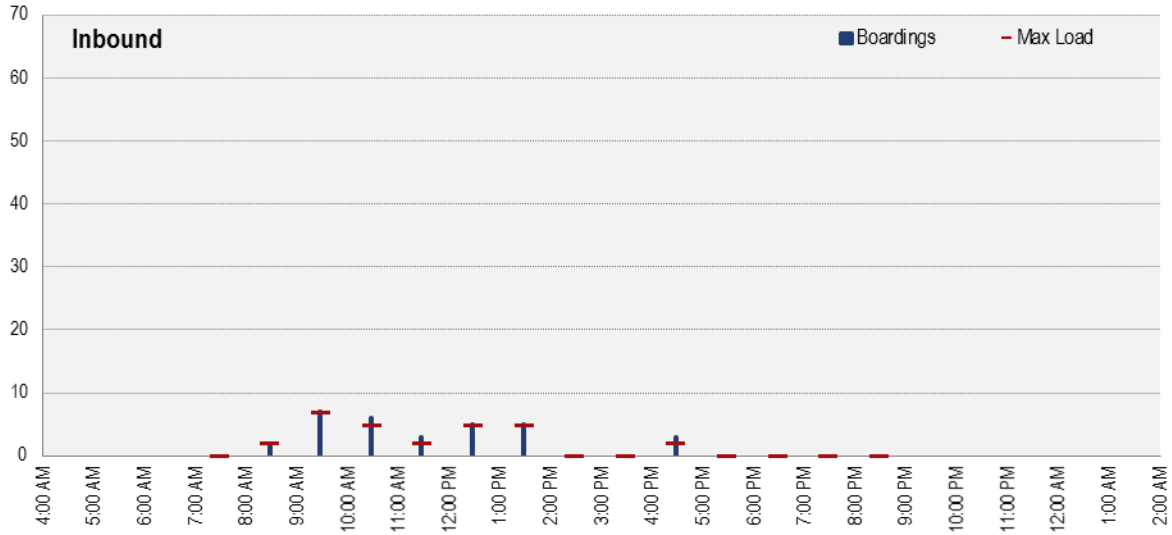


FIGURE 23| SUNDAY INBOUND RIDERSHIP BY TRIP



Productivity

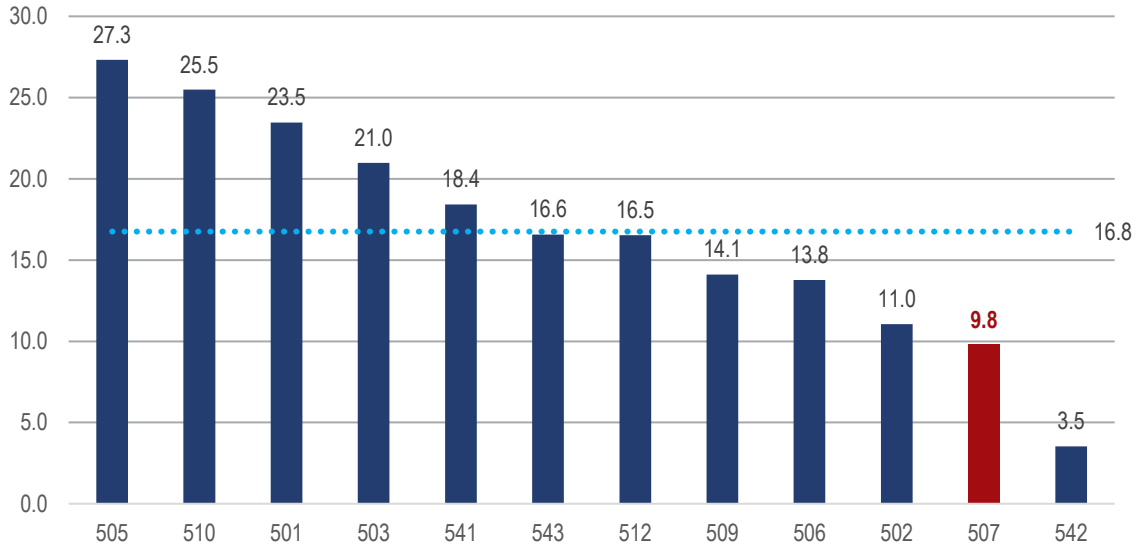
Route 507 carries 9.8 riders per hour on weekdays, 42% lower than the New Britain/Bristol Division average of 16.8, and is the second-least productive route in the division (Figure 24 and Figure 25). The route also underperforms on the weekends, averaging 5.3 riders per revenue vehicle hour on Saturday (60% below the division average), and 7.2 riders per hour on Sunday (30% below the division average).

FIGURE 24| PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 507	DIVISION AVG	ROUTE 507	DIVISION AVG	ROUTE 507	DIVISION AVG
Passengers per Revenue Vehicle Hour	9.8	16.8	5.3	13.1	7.2	10.4

*Source: CT**transit** performance data*

FIGURE 25 | PASSENGER PER REVENUE VEHICLE HOUR



ON-TIME PERFORMANCE

On weekdays, approximately 59% of Route 507 time points were served "on-time" during the survey period (Figure 26). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Weekday on-time performance was affected by early departures, which occurred at nearly one-third of time points. On Saturdays, approximately 60% of Route 507 time points were served "on-time" during the survey period, with 38% of time points served earlier than scheduled. On Sundays, approximately 63% of time points were served "on-time," and 30% of time points are served early.

FIGURE 26 | ON-TIME PERFORMANCE

PERFORMANCE	WEEKDAY	SATURDAY	SUNDAY
Early	30%	38%	30%
Late	11%	3%	7%
On-Time	59%	60%	63%

*Source: CT**transit** performance data*

SERVICE IMPROVEMENT

Route 507 is a radial route that provides coverage to neighborhoods in east New Britain and serves CCSU. The route mostly operates bidirectional with fairly direct service, although it does operate in a large one-way loop in the middle of its alignment that generates very little ridership. Limited street connectivity and few through streets pose a challenge in the area served by Route 507, and limit the options for routing service.

Ridership in the outbound direction is consistently highest along Oak Street and at CCSU. Ridership per trip is around or just below the division average. In terms of ridership per hour of service, Route 507 is the second-least productive route in the division, carrying just above half the division average in passengers per service hour.

Service Improvement Options

Opportunities to strengthen the route further include the following:

- **Eliminate the loop along Eddy Glover Boulevard and Commonwealth Avenue.** This 1.5-mile loop generates few riders and forces other passengers to travel out of direction. Eliminating the loop and having buses travel directly from Carlton Street onto Commonwealth Avenue towards CCSU would make service faster for most riders, and make service easier to understand for potential riders. Passengers who currently use the stops near McClintock Street and Hawthorne Street can access service on Route 506 along Farmington Avenue.
- **Establish a stronger anchor at the northern end of the route.** Route 507 currently ends in a terminal loop along Country Club Road and Alexander Road. Stops along this loop have few or no riders. The route could instead provide service to a higher-density residential area such as the apartment complexes along Brittany Farms Road, which do not currently have direct transit service to downtown New Britain, or to a commercial establishment such as the Target or Costco on Hartford Road. The latter option may also produce a more even distribution of ridership throughout the day.
- **Eliminate weekday and Saturday service after 11:00 pm.** Ridership figures show that these later trips carry very few or no riders. Eliminating these trips can improve the overall productivity of the route.

Route Evaluation

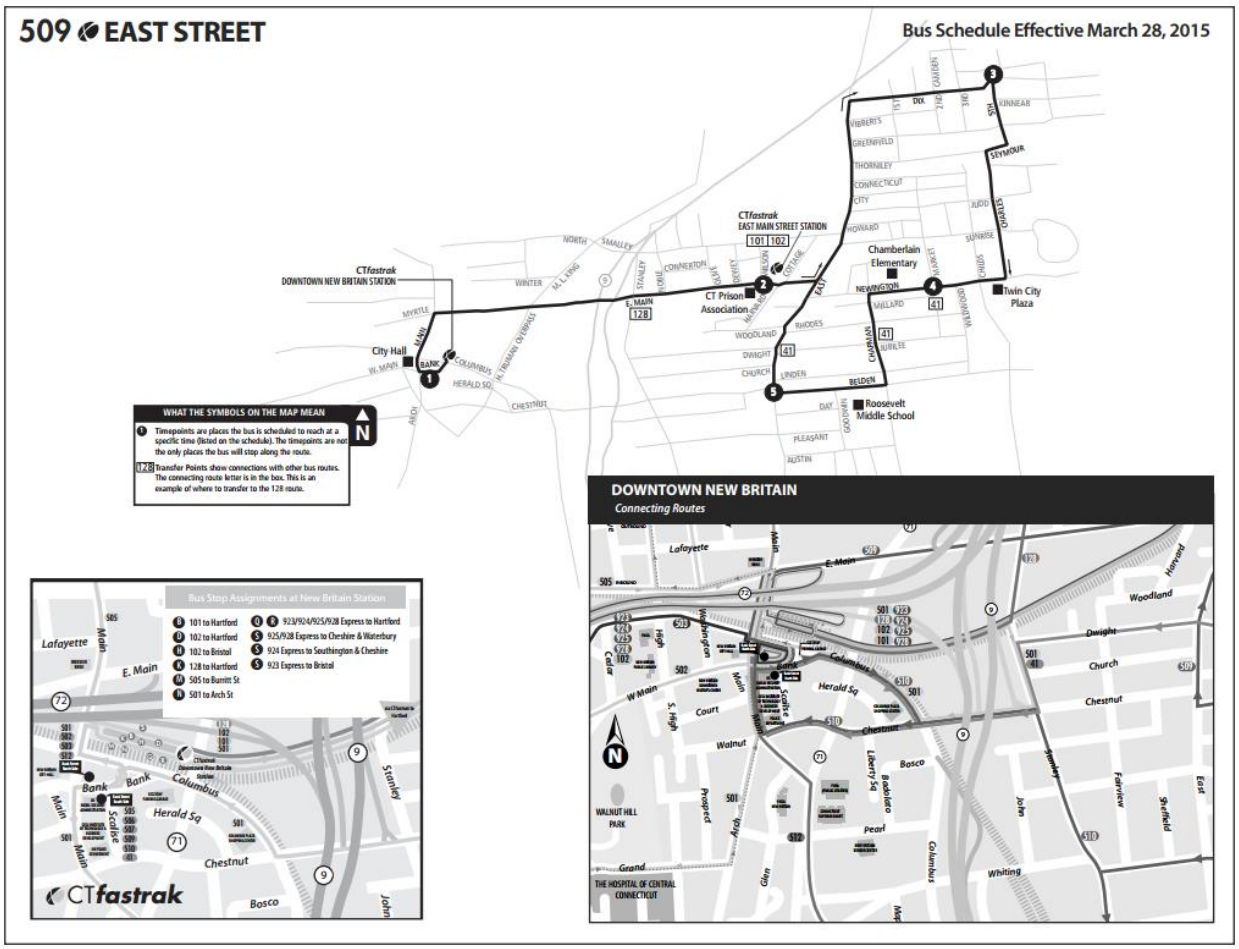
EAST STREET

509 | East Street

Service Design

Route 509 is a cross-town loop route, providing service between the Downtown New Britain CT*fastrak* station, the city's eastern neighborhoods, and the Twin City Plaza. The route operates primarily on East Main Street, East Street, Dix Avenue, Newington Avenue, and Belden Street.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 509 originates and terminates in downtown New Britain near the intersection of Bank Street and Main Street, where riders can transfer to nearly all other CT***transit*** serving New Britain, as well as CT***fastrak*** for service onward to Hartford. In addition, outside of downtown New Britain Route 509 also has transfer opportunities with Route 41 at the Twin City Plaza and at the intersection of Chapman and Jubilee Streets and with CT***fastrak*** Routes 101 and 102 at the East Main Street Station. Route 509 is also interlined with Route 510 South Street, which provides local circulation through southeast New Britain (Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 41	Hartford and New Britain
Route 101	Hartford, New Britain
Route 102	Hartford, New Britain, Bristol

Alignments and Service Patterns

Route 509 travels outbound from downtown New Britain via Main Street. The route turns right on E. Main Street and travels for one mile before turning left on East Street, right on Dix Avenue, and right on 5th Street until the route reaches Seymour Park. At Seymour Park, the route turns right on Seymour Avenue for one block and turns left on 4th Street, continuing as the road transitions to Charles Street. At the intersection with Newington Avenue the route turns right, travels four blocks, and turns south on Chapman Street. From Chapman Street the route turns right on Belden Street, right on East Street, left on E. Main Street, and then returns to downtown New Britain.

Service Schedule

Route 509 operates seven days per week, with 26 weekday trips. Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM. Service operates every 30 minutes during the peak periods and every 60 minutes during the remainder of the daily schedule.

On Saturdays, there are 19 trips. Service operates every 60 minutes throughout the day. On Sundays, there are 13 trips, with service operating every 60 minutes.

FIGURE 3 | SCHEDULE OVERVIEW (ROUTE 509)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:30 AM – 12:56 AM	30/60	26
Saturday	6:30 AM – 12:56 AM	60	19
Sunday	7:30 AM – 7:56 PM	60	13

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

Route 509 carries 159 daily passengers or 6.1 passengers per trip on an average weekday, which is just below the New Britain-Bristol Division average of 7.5 weekday passengers per trip.

Saturday ridership per trip is also just below the division average, while Sunday ridership per trip is slightly higher (see Figure 4).

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 509	ROUTE 509	DIVISION AVG
Weekday	159	6.1	7.5
Saturday	95	5.0	5.8
Sunday	60	4.6	4.2

*Source: CT**transit** performance data*

Ridership by Stop

The most heavily used stop on Route 509 outside of downtown New Britain appears to be the stop at Dix Avenue and 5th Street. However, this stop is considered the end of the "outbound" segment of the route, so all riders who ride through this point are considered to "board" the inbound trip, even if they never leave the vehicle. Beyond the route's origin and destination, only four stops generate 10 or more boardings or alightings per day (Figure 5).

FIGURE 5 | ROUTE 509 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (INBOUND)

BUS STOP	INBOUND RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Bank Street / Main Street	0 / 50	Mayor's Office, Town & City Clerk, CCSU Institute of Technology and Business Development, Downtown New Britain
Dix Avenue / 5th Street	42 / 0	Residential neighborhood
Belden Street / Goodwin Street	12 / 6	Residential neighborhood, HALS Academy
Chapman Street / Belden Street	12 / 2	Residential neighborhood, HALS Academy
E. Main Street / Cottage Place	6 / 7	CT***fastrak*** East Main Street Station, residential neighborhood, New Britain City Yard/Garage
E. Main Street / New Brite Plaza	1 / 10	New Brite Plaza

Load profile data (Figure 6) combines passenger activity by stop and shows the cumulative passenger load as the bus travels outbound along its route. Outbound ridership peaks along Dix Avenue, near the route's terminus. Ridership by stop without the cumulative load is mapped in Figure 7. The data for Route 509 shows inbound passenger loads peak at the E. Main Street and Stanley Street stop and declines as buses approach downtown New Britain (Figure 8 and Figure 9).

FIGURE 6 | WEEKDAY OUTBOUND RIDERSHIP BY STOP GRAPH

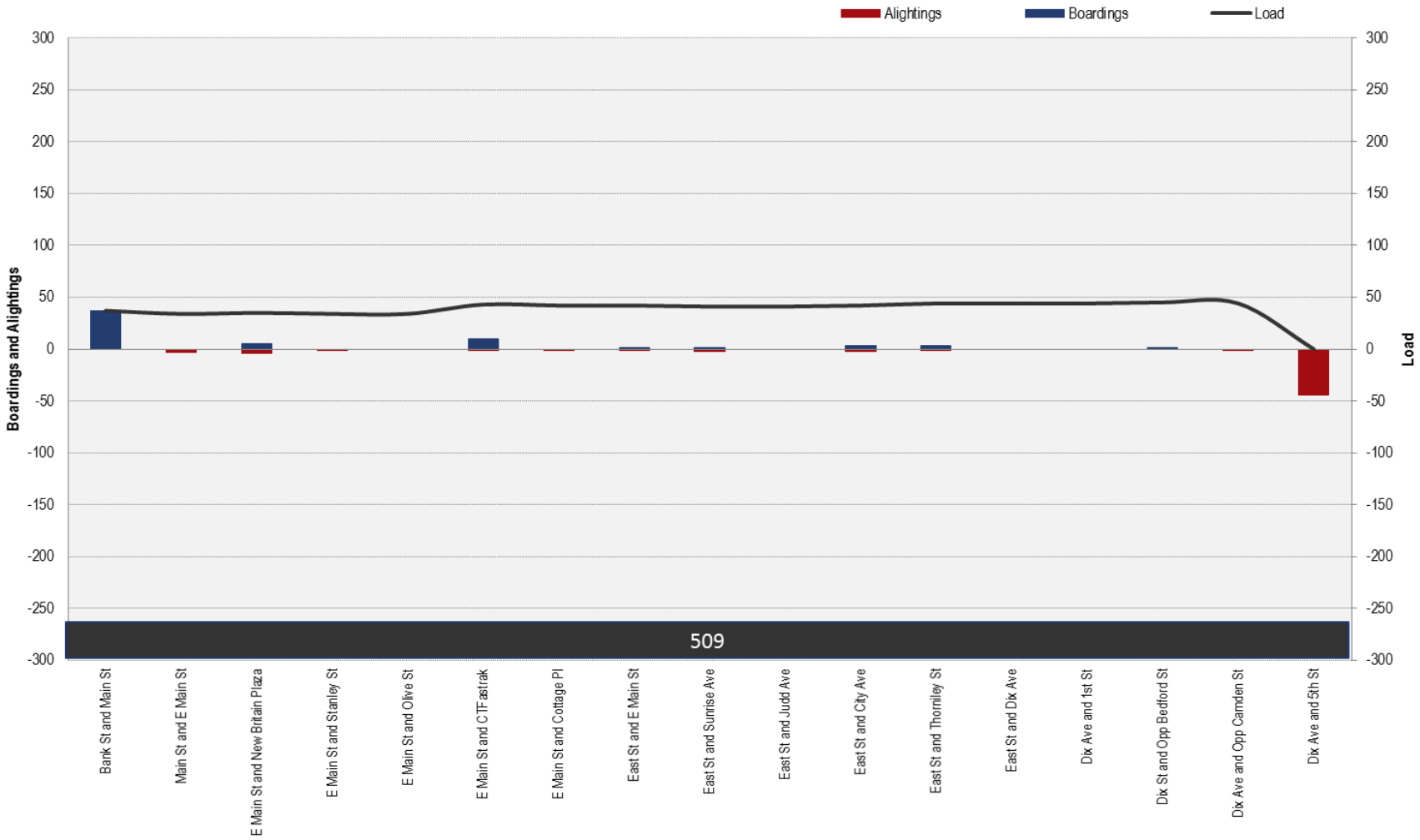


FIGURE 7 | WEEKDAY OUTBOUND RIDERSHIP BY STOP MAP

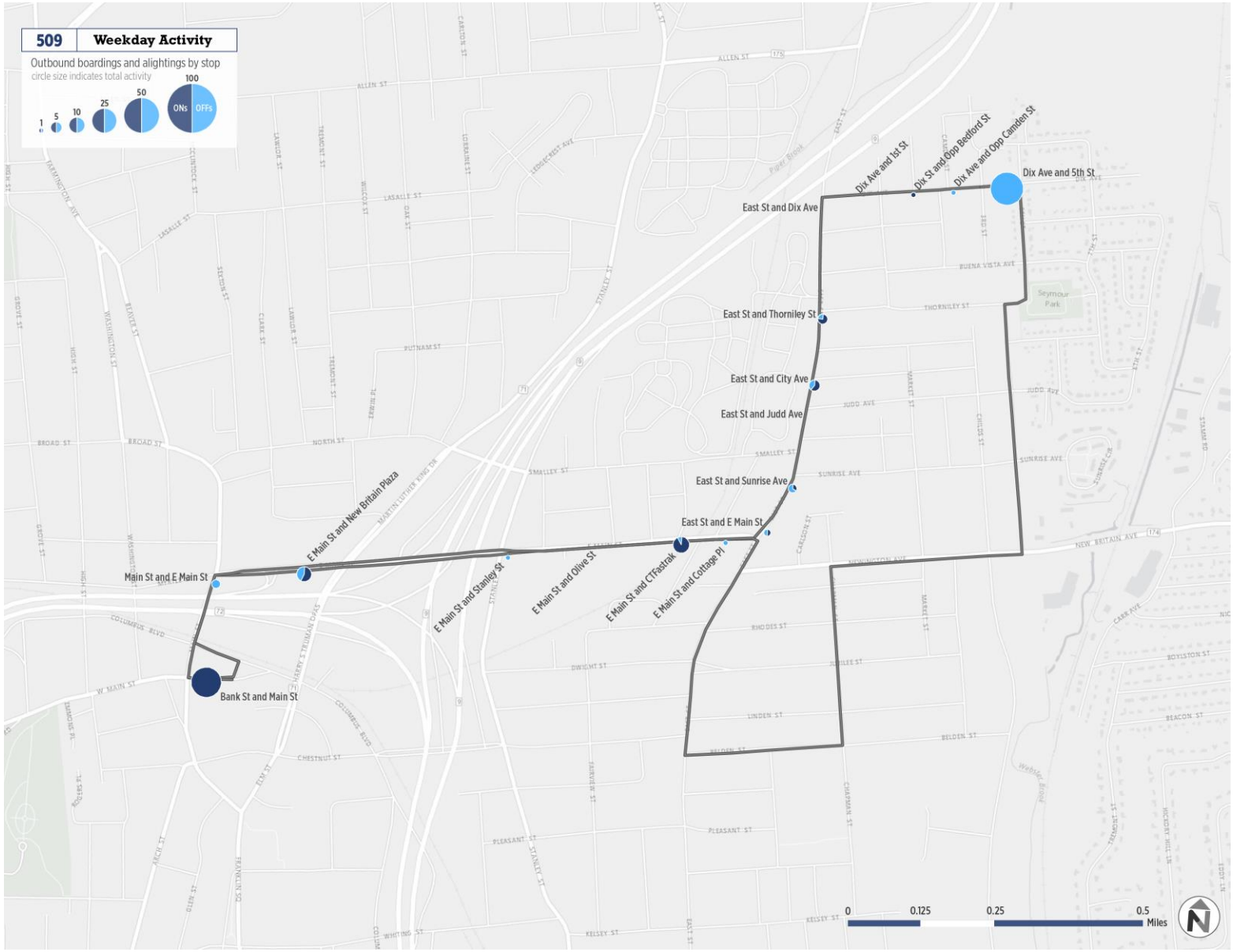


FIGURE 8 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

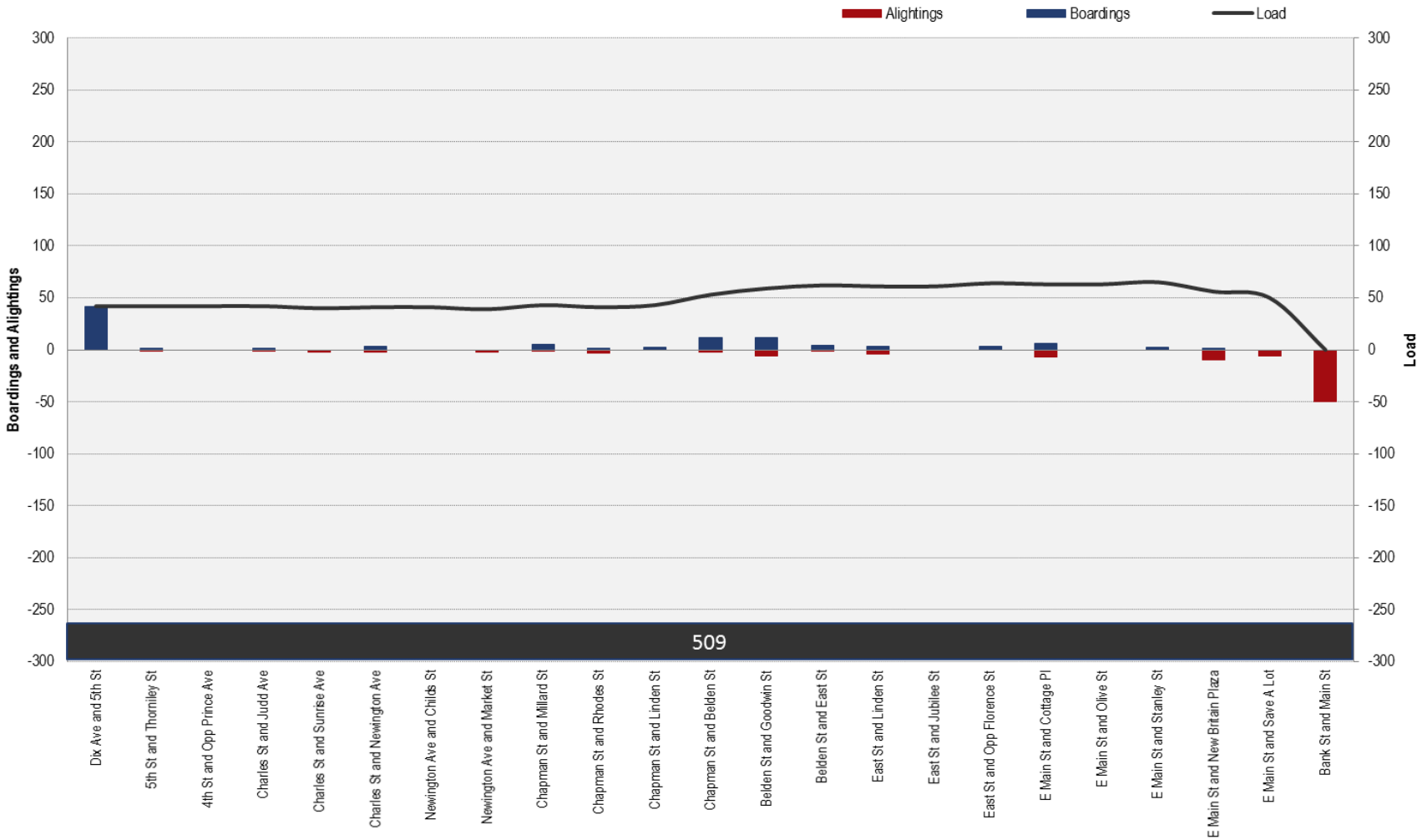


FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

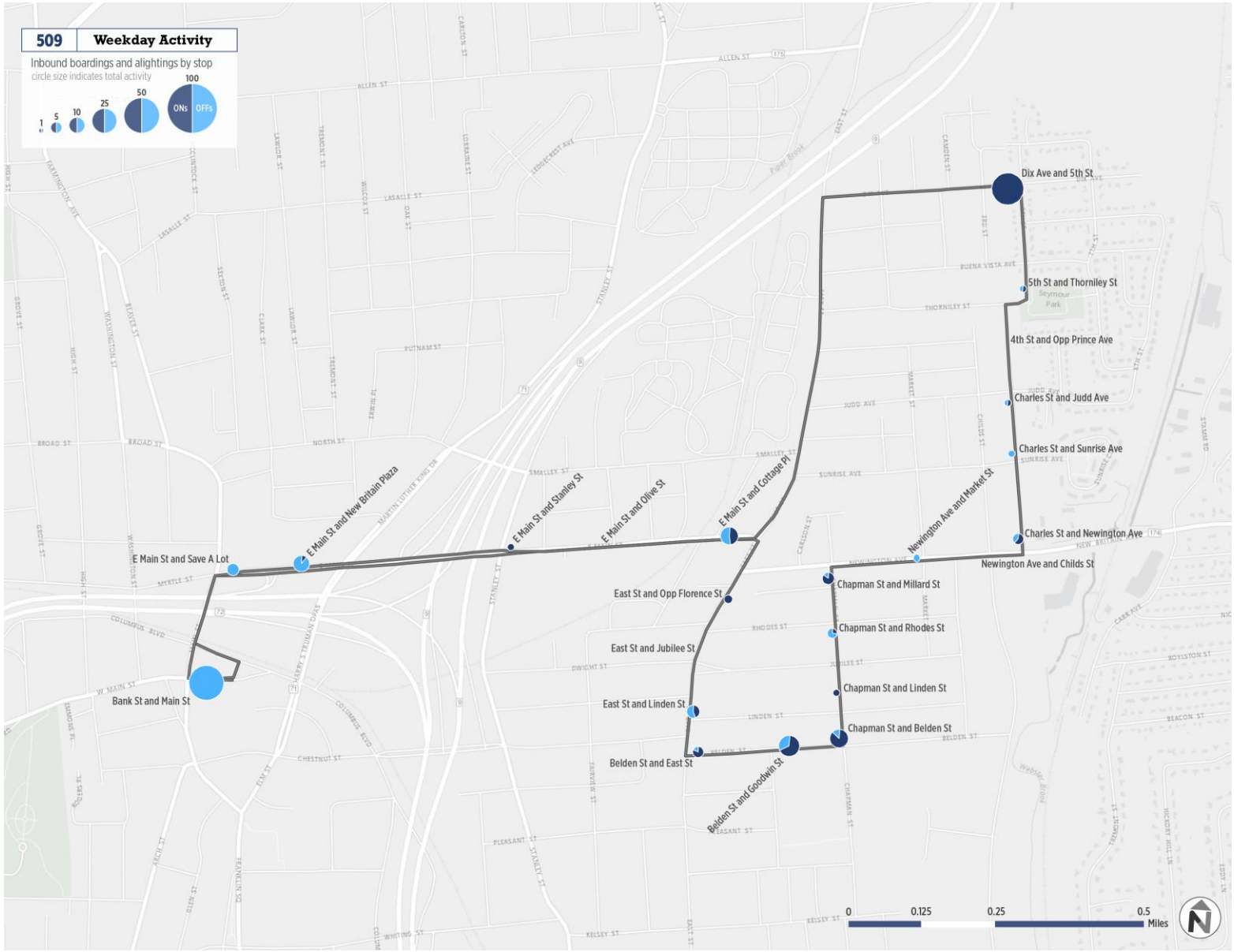


FIGURE 10 | SATURDAY OUTBOUND RIDERSHIP BY STOP GRAPH

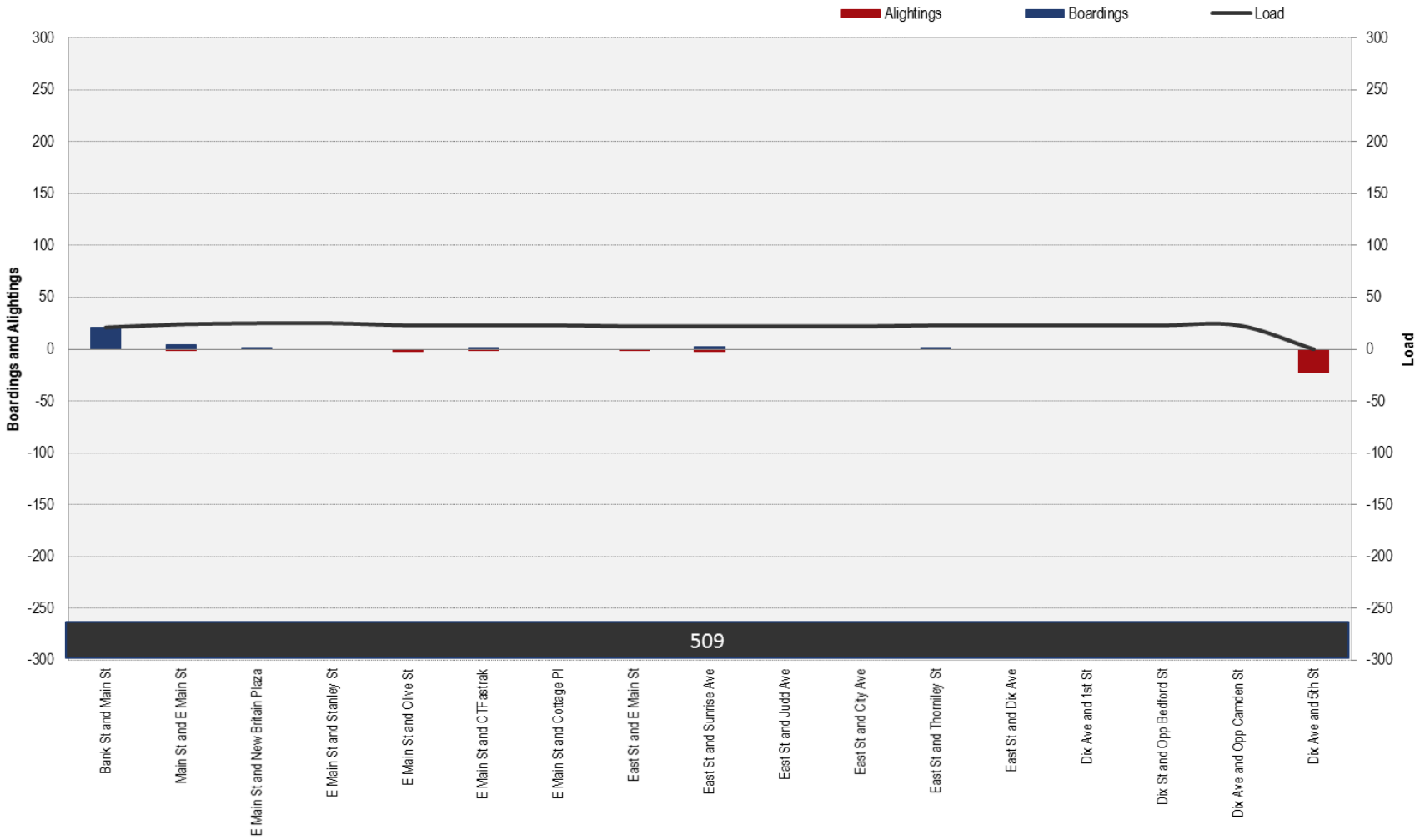


FIGURE 11 | SATURDAY OUTBOUND RIDERSHIP BY STOP MAP

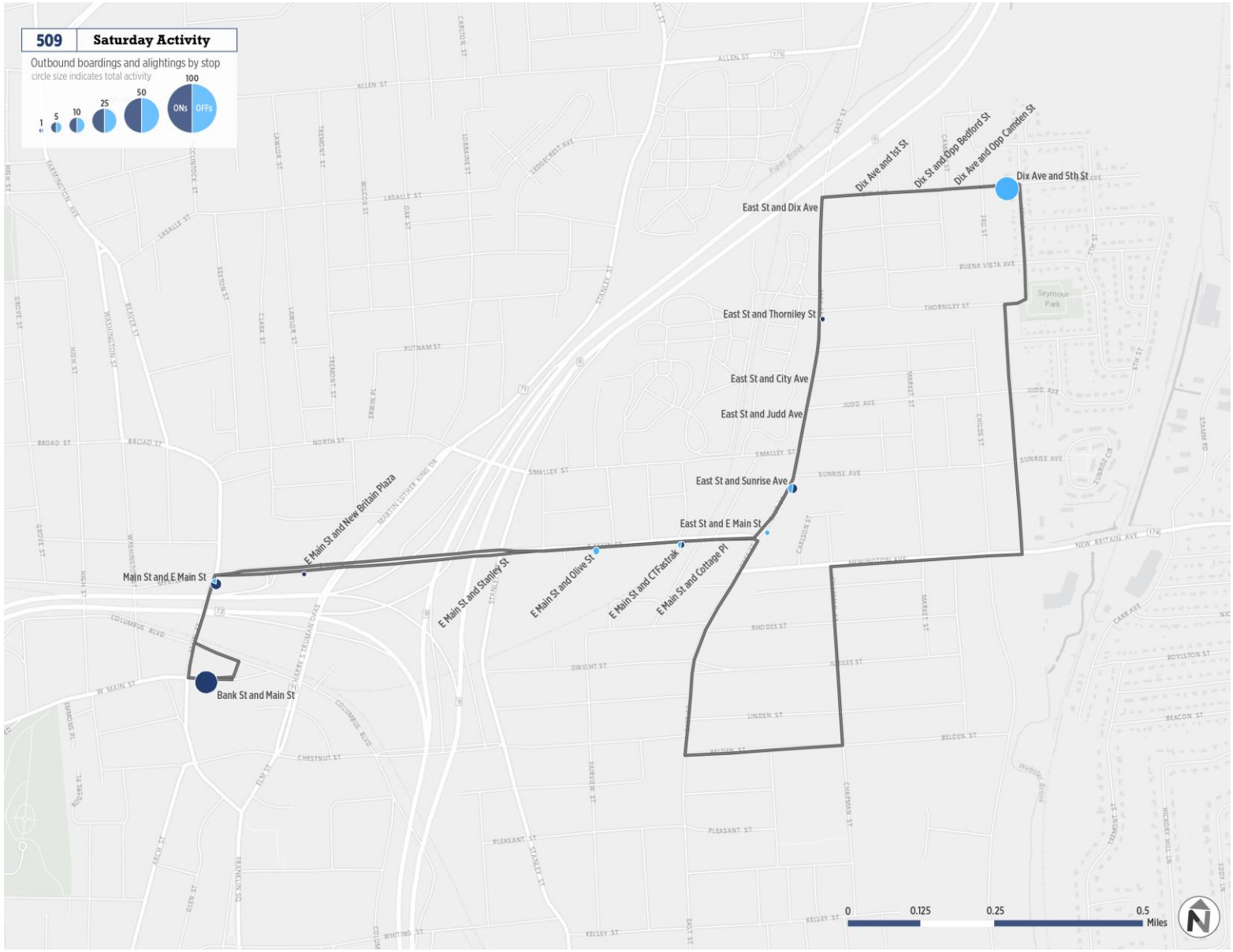


FIGURE 12 | SATURDAY INBOUND RIDERSHIP BY STOP GRAPH

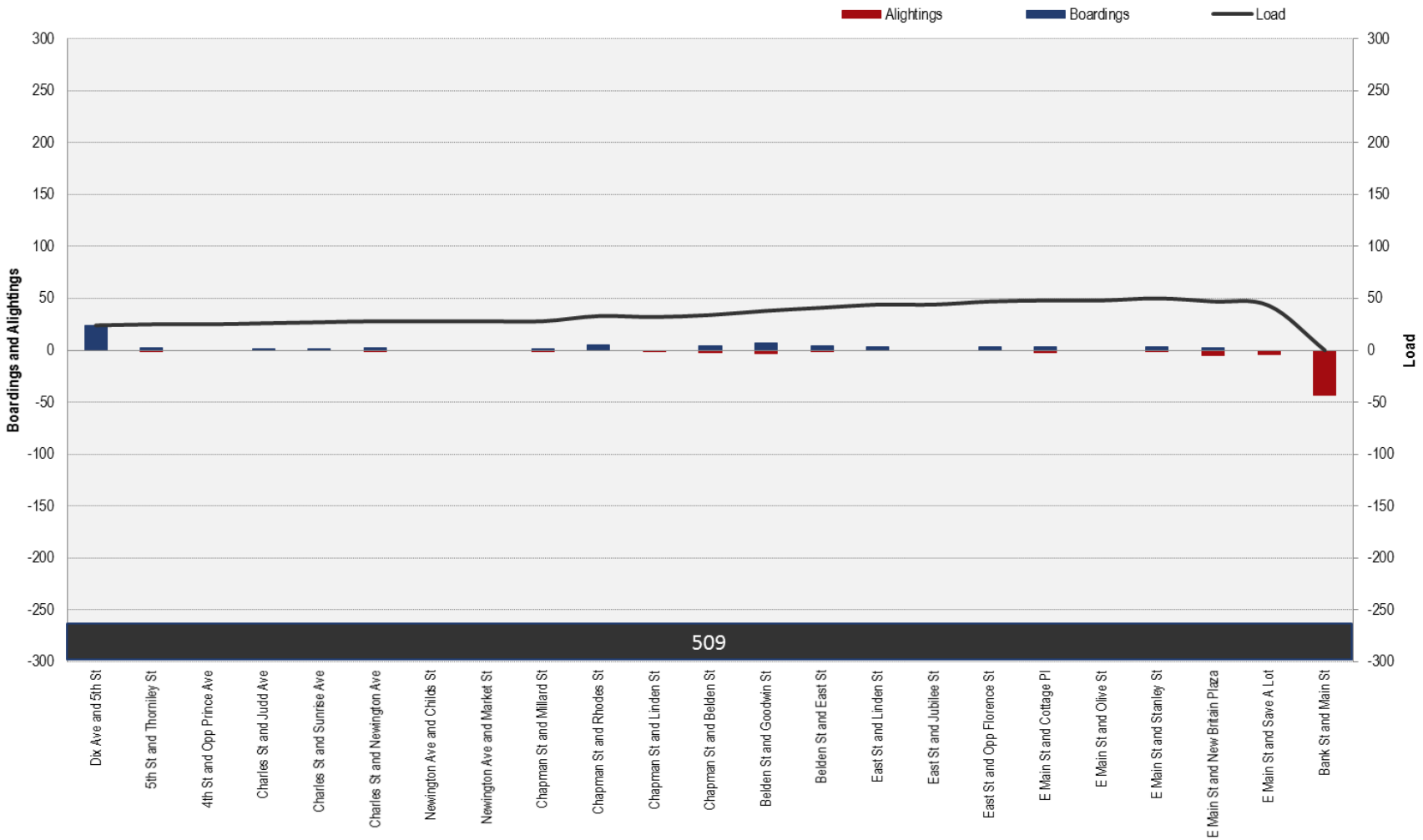


FIGURE 13 | SATURDAY INBOUND RIDERSHIP BY STOP MAP

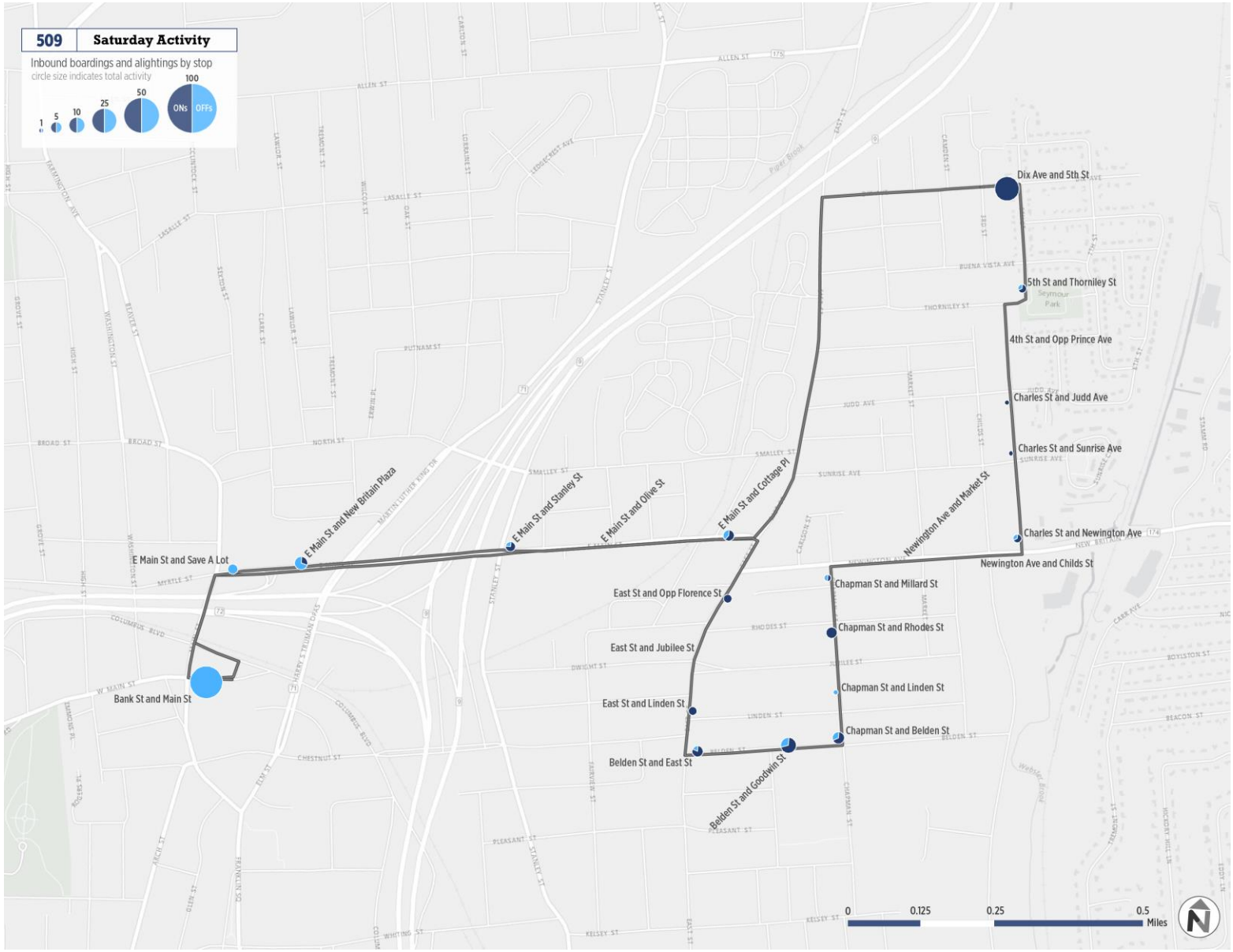


FIGURE 14 | SUNDAY OUTBOUND RIDERSHIP BY STOP GRAPH

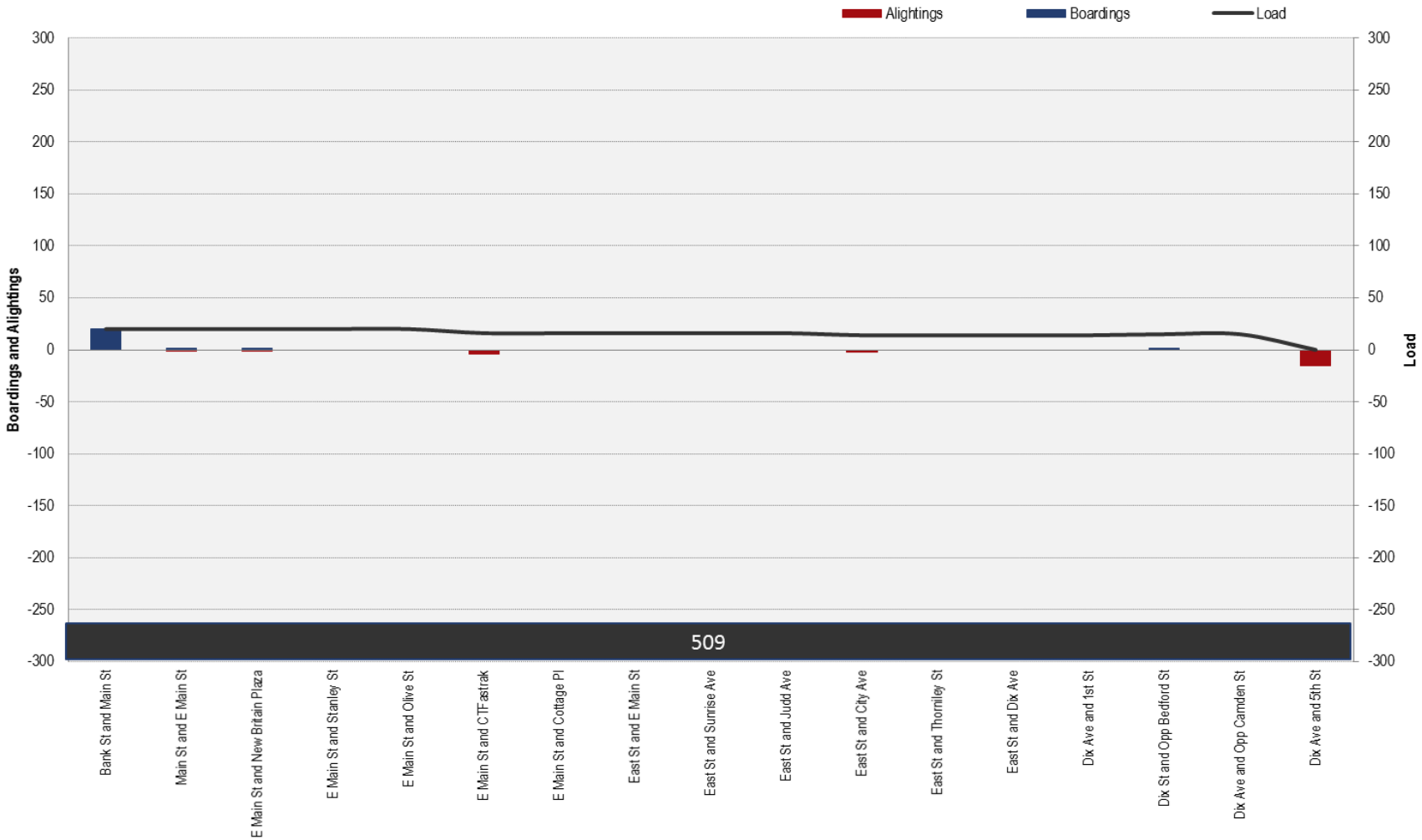


FIGURE 15 | SUNDAY OUTBOUND RIDERSHIP BY STOP MAP

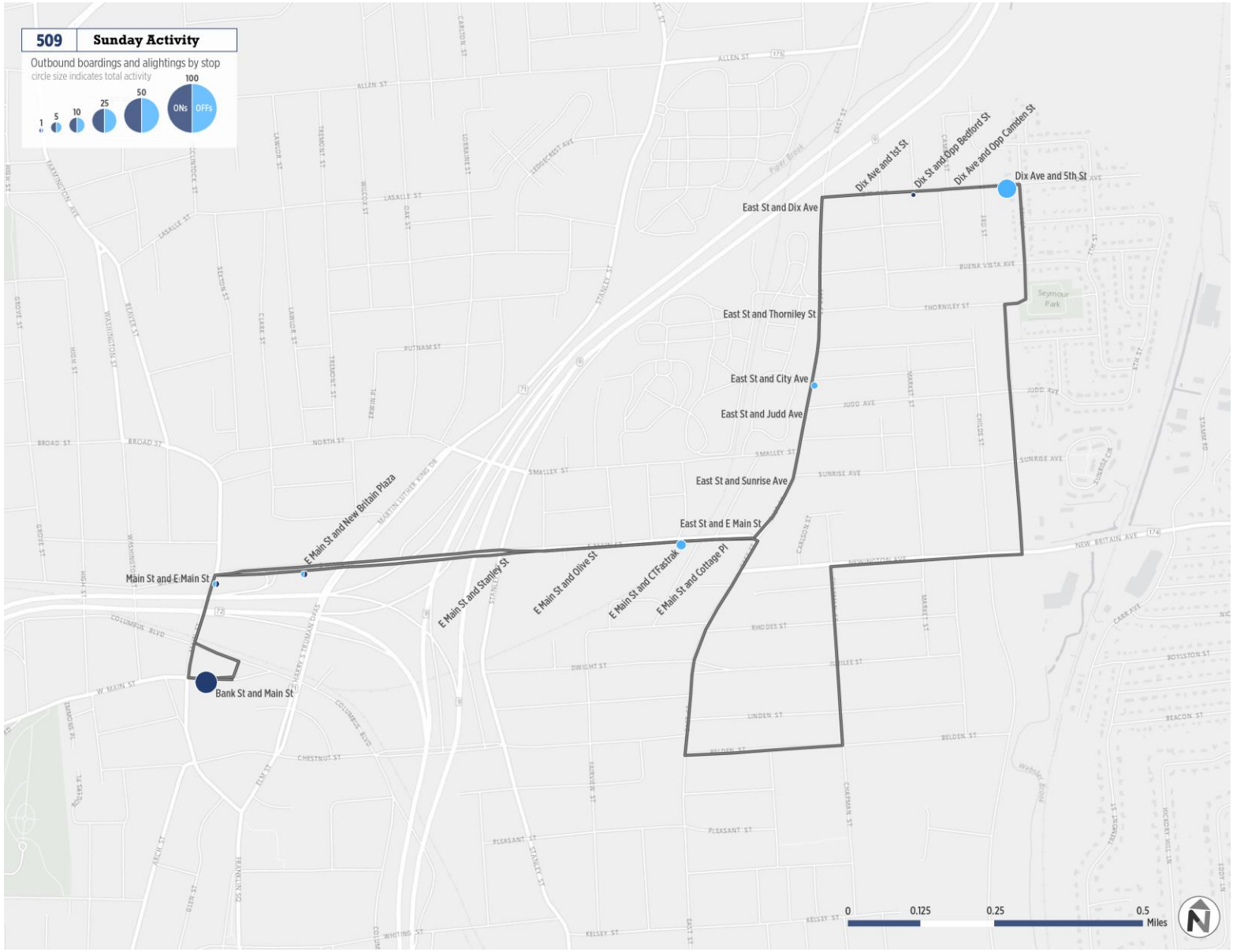


FIGURE 16 | SUNDAY INBOUND RIDERSHIP BY STOP GRAPH

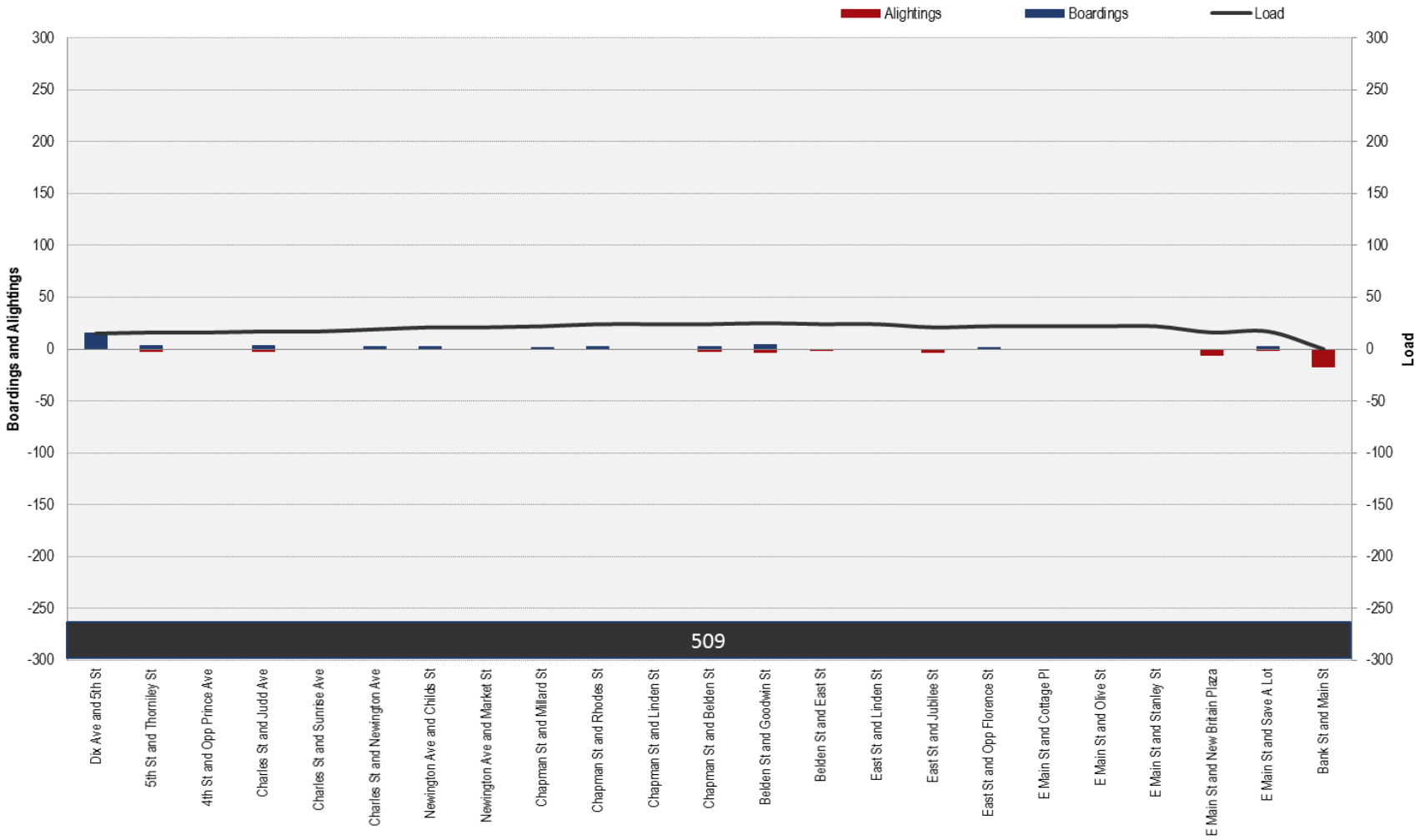
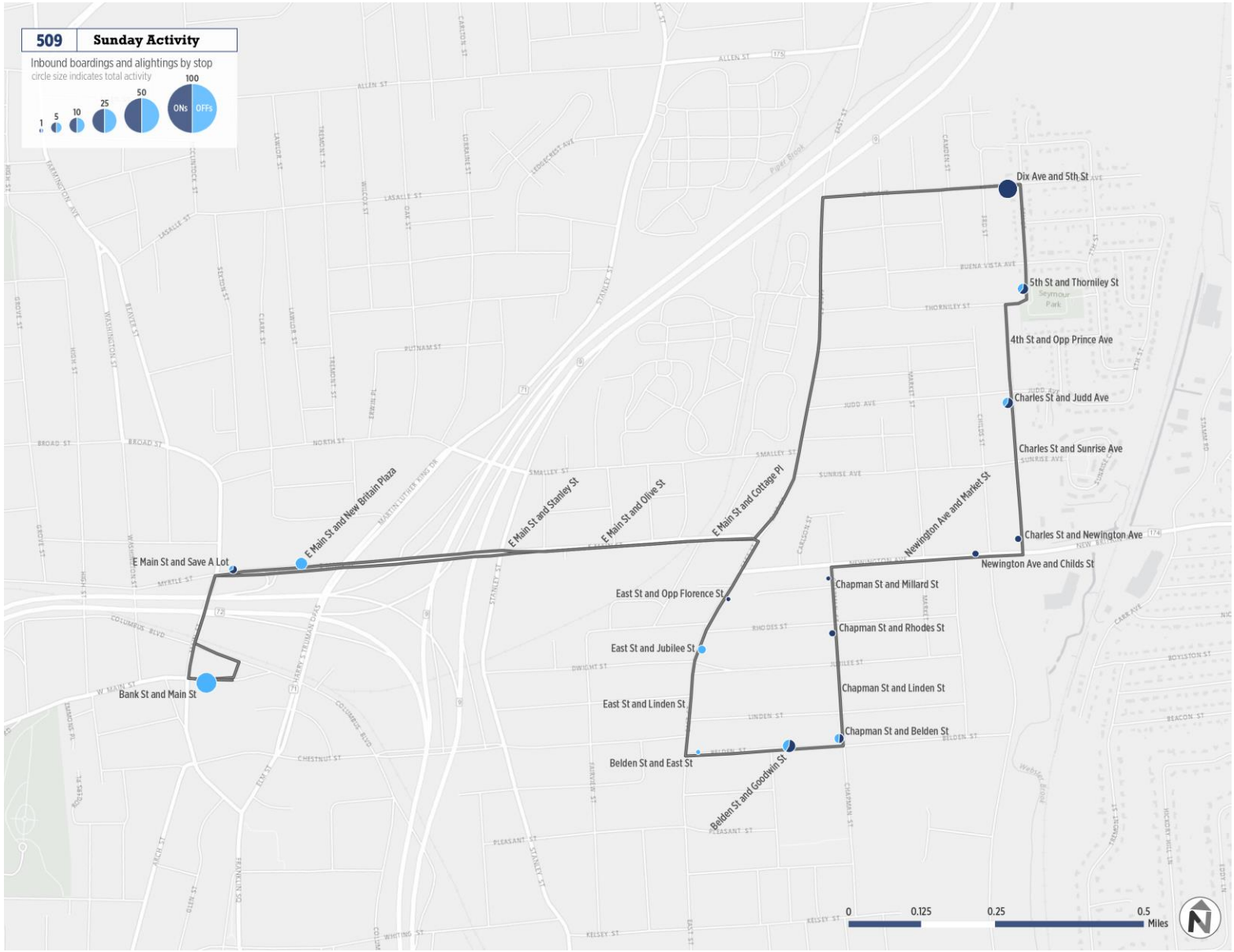


FIGURE 17 | SUNDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Route 509 carries an average of 6.1 passengers per trip on weekdays. Demand on outbound trips is well balanced for most of the day (Figure 18). Traveling inbound, ridership is concentrated in the morning period, from 6:00 to 10:00 AM (Figure 19). Ridership in both directions is minimal after 8:00 PM. Only one weekday trip carries 10 or more passengers.

FIGURE 18 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

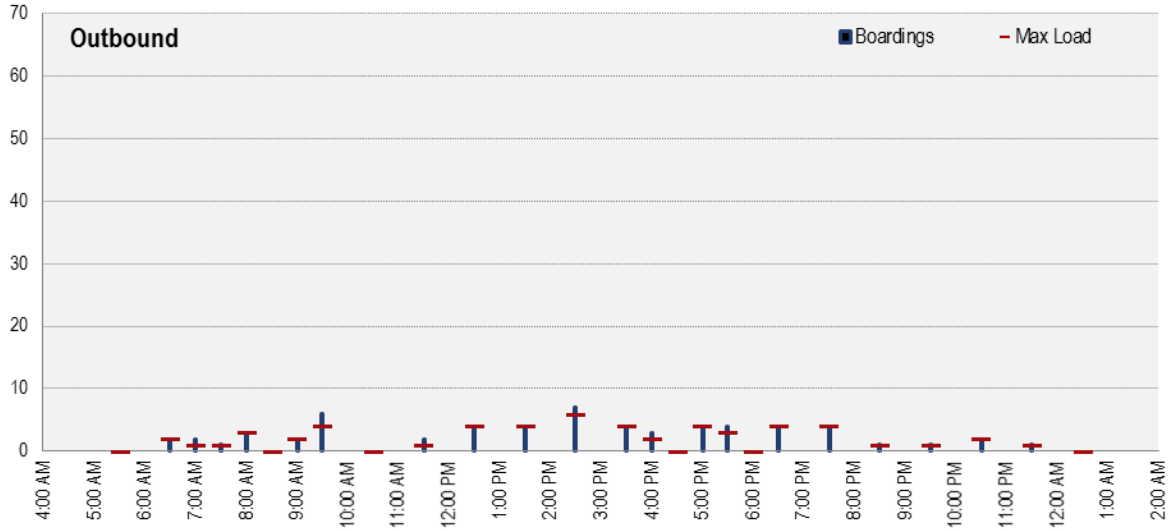
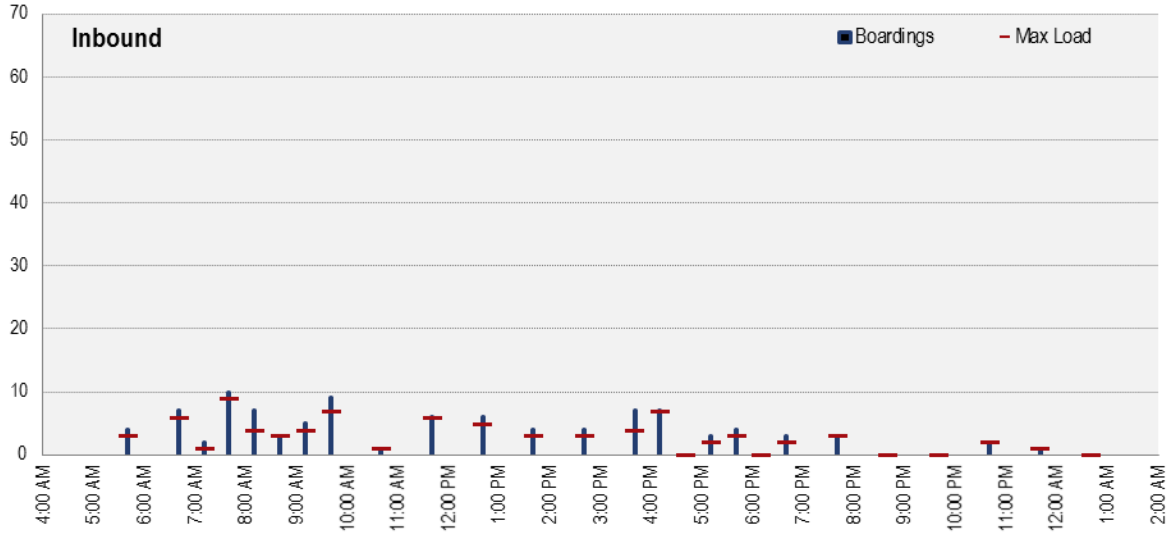


FIGURE 19 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Saturday ridership on Route 509 is lower than weekday ridership, averaging 5 passengers per trip. Demand on outbound trips is spread throughout the day, and no outbound trips carry more than five passengers. Inbound ridership peaks at 10:40 AM and 1:40 PM, with each trip carrying 10 passengers.

FIGURE 20 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

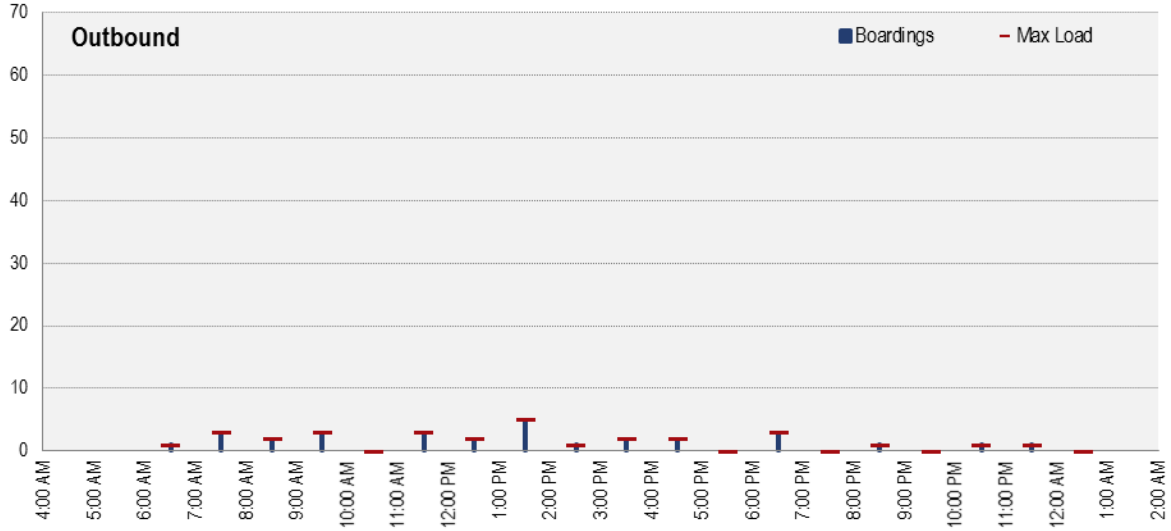
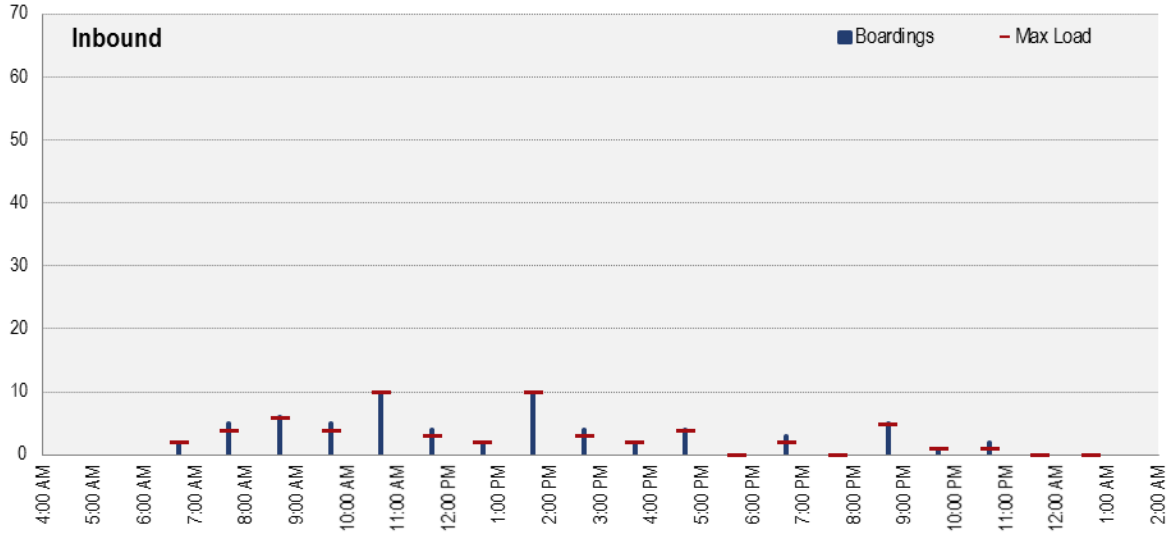


FIGURE 21 | SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

Sunday ridership is also low, averaging 4.6 passengers per trip. Outbound ridership demonstrates low demand, with no discernable peak. Traveling inbound, ridership peaks at 1:40 PM, with nine passenger boardings.

FIGURE 22 | SUNDAY OUTBOUND RIDERSHIP BY TRIP

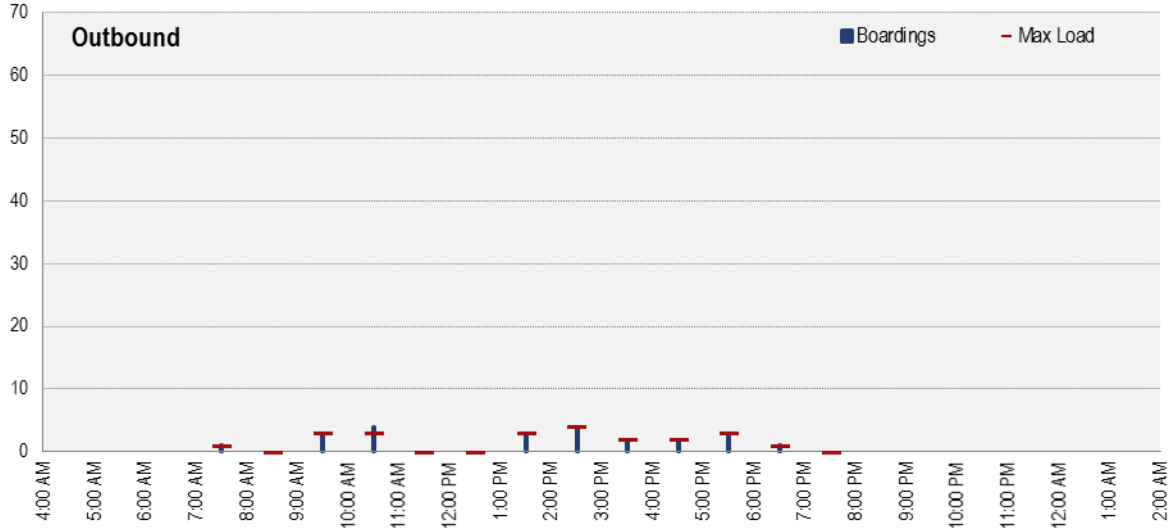
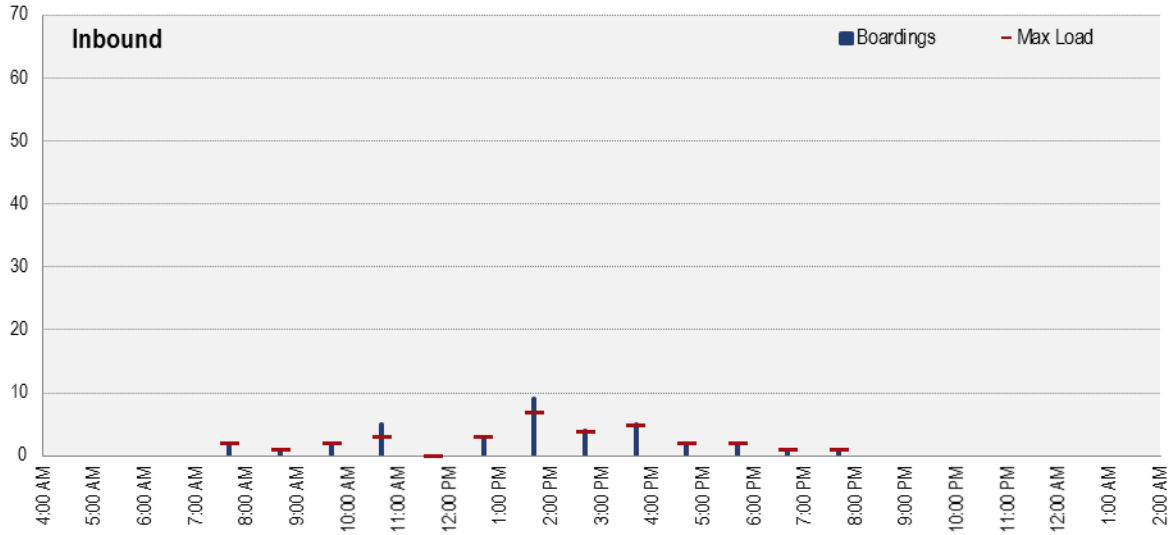


FIGURE 23 | SUNDAY INBOUND RIDERSHIP BY TRIP



Productivity

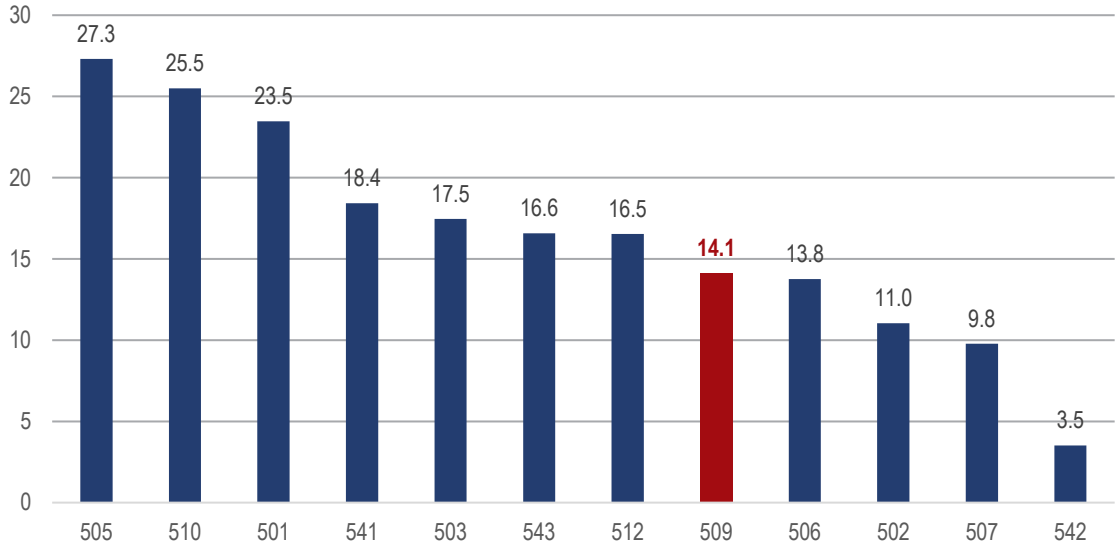
Route 509 carries 14.1 riders per hour on weekdays, the fifth lowest of any route in the division and 15% lower than the division average of 16.5 (Figure 24). Productivity on Saturdays is below average, carrying 8.8 riders per hour, while productivity on Sunday is slightly better than the division average, carrying 10.7 riders per hour.

FIGURE 24 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 509	DIVISION AVG	ROUTE 509	DIVISION AVG	ROUTE 509	DIVISION AVG
Passengers per Revenue Vehicle Hour	14.1	16.5	8.8	13.1	10.7	10.4

*Source: CT**transit** performance data*

FIGURE 25 | PASSENGERS PER REVENUE VEHICLE HOUR



ON-TIME PERFORMANCE

On weekdays, approximately 59% of Route 509 time points were served "on-time" during the survey period (Figure 26). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Weekday on-time performance was affected equally by early and late departures. On Saturdays, approximately 60% of Route 509 time points were served "on-time" during the survey period, with 40% of time points served earlier than scheduled. On-time performance is highest on Sundays, with 78% of time points were served "on-time," 11% of time points served early, and 11% of time points served late.

FIGURE 26 | ROUTE 509 ON-TIME PERFORMANCE

PERFORMANCE	WEEKDAY	SATURDAY	SUNDAY
Early	20%	40%	11%
Late	21%	0%	11%
On-Time	59%	60%	78%

*Source: CT**transit** performance data*

SERVICE IMPROVEMENT

Route 509 is a coverage-focused route that serves east New Britain. It operates direct east-west service along East Main Street, but most of its alignment is a three-mile one-way loop past East Street. This loop forces many passengers to travel the entire length of the route to complete a round trip. The route is one of the least productive in the New Britain-Bristol Division, and the lowest-ridership route serving New Britain. Average ridership per trip is less than half of the division average, and ridership per service hour is also below average.

Service Improvement Options

Opportunities to strengthen the route further include the following:

- **Eliminate or reduce one-way service.** The majority of Route 509 runs in a large one-way loop, which forces riders to travel the entire length of the route to complete a round trip. Providing more direct, bidirectional service makes service more convenient for riders, reduces travel time, and makes the route easier to understand for potential riders. More direct service on Route 509 may require splitting the route into two separate routes. One route could operate as a smaller one-way loop north of Newington Avenue, while another route could be combined with part of Route 510 to serve Belden Street and the John Downey Corridor.
- **Operate hourly service all day.** Route 509 operates every 30 minutes during the AM and PM peak periods on weekdays. These trips carry very few passengers, and load per trip never exceeds 10 passengers. Operating hourly service during these peak periods could improve the route's productivity and these resources could be allocated towards serving routes with higher demand.
- **Eliminate trips after 11:00 PM on weekdays and Saturdays.** Ridership figures show that these later trips carry very few or no riders. Eliminating these trips can improve the overall productivity of the route.

Route Evaluation

SOUTH STREET

510 | South Street

510C | South Street and Corbin-Russwin

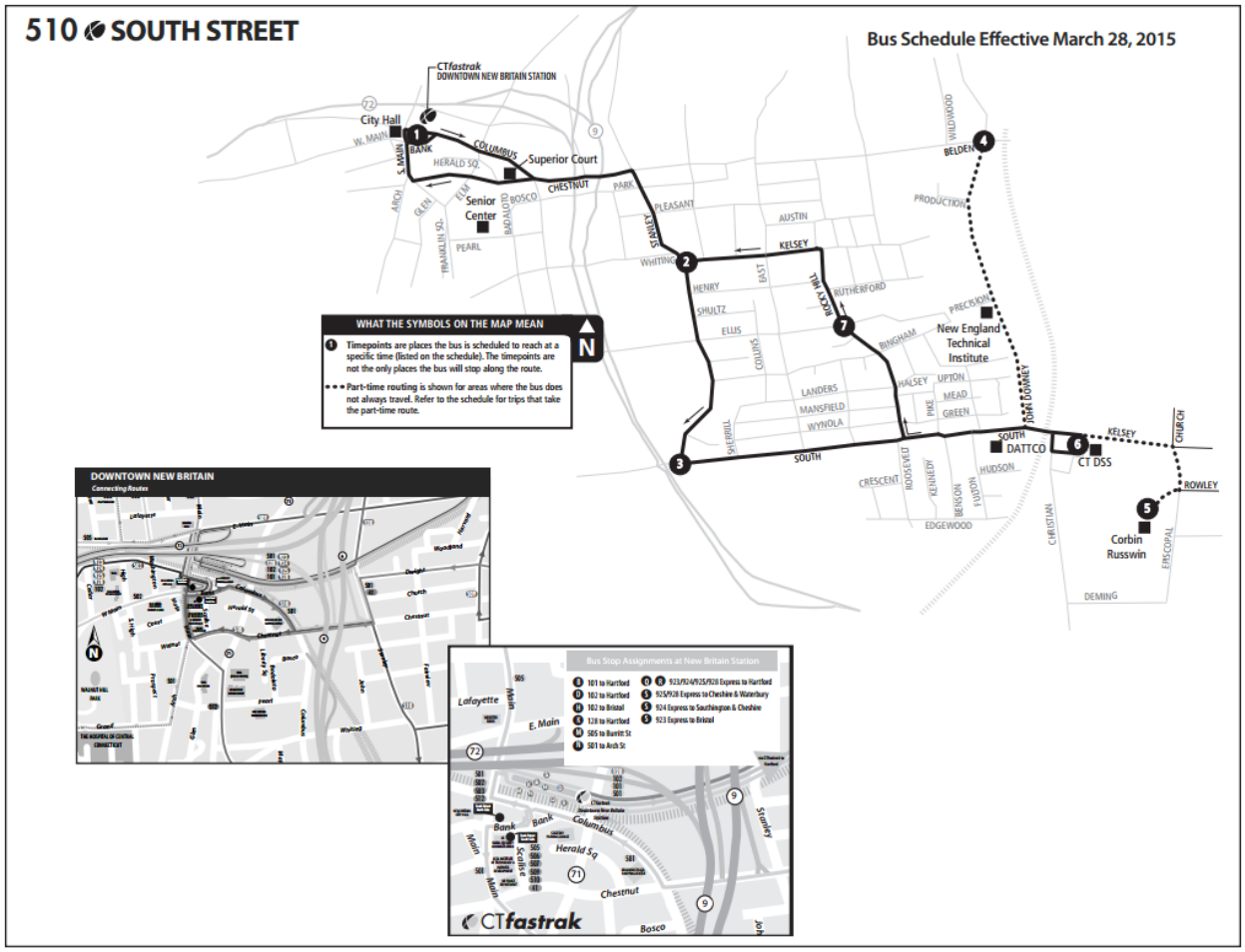
510D | South Street and John Downey Drive

510S | South & Fulton

Service Design

Route 510 is a radial loop route, providing service between the Downtown New Britain CT***fastrak*** station, the city's southeastern neighborhoods, and the Lincoln Technical Institute. The route operates primarily on Columbus Boulevard, Chestnut Street, Stanley Street, South Street, Rocky Hill Avenue, Kelsey Street, and John Downey Drive.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 510 originates and terminates in downtown New Britain near the intersection of Bank Street and Main Street, where riders can transfer to nearly all other CT***transit*** routes serving New Britain, as well as CT***fastrak*** for service onward to Hartford. In addition, outside of downtown New Britain Route 510 also has transfer opportunities with Route 41 on Chestnut Avenue between Columbus Boulevard and Stanley Street. Route 510 is also interlined with Route 509 East Street, which provides local circulation through northeast New Britain (Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 41	Hartford and New Britain

Alignments and Service Patterns

Route 510 features four different service alignments: 510, 510C, 510D, 510S. The primary alignment, 510, accounts for 68% of the total weekday trips. Traveling outbound from downtown New Britain, Route 510 turns right on Columbus Boulevard, turns left on Chestnut Street, turns right on Stanley Street, and

travels south on Stanley Street until reaching the intersection with South Street. At South Street, the route turns left, travels one-mile, turns right on Christian Lane, and turns around in the parking lot of the Connecticut Department of Social Services (CT DSS). The route then turns left back onto South Street, turns right on Rocky Hill Avenue, and follows Rocky Hill Avenue to the intersection with Kelsey Street. Route 510 turns left and travels on Kelsey Street for two blocks, right on Staley Street, left on Chestnut Boulevard, and right on Main Street, back to Bank Street.

There are three other service patterns that operate on the route:

- The 510C follows the primary alignment, but continues past the CT DSS on Kelsey Street, turns right on Church Street, and turns right on Rowley Street, serving the Corbin Russwin plant, before returning to South Street and following the primary alignment inbound; two weekday trips (at 6:40 a.m. and 3:40 p.m.) operate on this alignment. This variant operates only twice on weekdays and does not operate on weekends.
- 510D follows the primary alignment, but following the stop at CT DSS turns right on John Downey Drive from South Street, serving Lincoln Technical Institute and Belden Street; the route then returns to South Street and follows the primary alignment inbound; six weekday trips operate on this alignment. It operates periodically throughout the weekday, but does not operate on weekends.
- 510S is a short run service, starting and ending at the South Street and Fulton Street stop.

Service Schedule

Route 510 operates seven days per week, with 31 weekday trips. Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM. Service operates every 30 minutes during the peak periods and every 60 minutes during the remainder of the daily schedule.

On Saturdays, there are 20 trips. Service operates every 60 minutes throughout the day. On Sundays, there are 14 trips, with service operating every 60 minutes.

FIGURE 3 | SCHEDULE OVERVIEW (ROUTE 506)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday*	5:16 AM – 1:08 AM	30/60	31
Saturday^	6:16 AM – 1:08 AM	60	20
Sunday^	7:16 AM – 8:08 PM	60	14
**Four weekday trips start/end at South and Fulton, with service at 5:16 a.m., 5:45 a.m., 6:38 p.m., and 1:08 a.m.* *^Two Saturday and Sunday trips start/end at South and Fulton, with service at 7:16 a.m. and 8:00 p.m.*			

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

Route 510 carries 311 daily passengers on an average weekday, or 5.4 passengers per trip, which is 28% lower than the New Britain/Bristol Division average of 7.5 weekday passengers per trip.

Saturday and Sunday ridership per trip are closer to the division average (see Figure 1). The average ridership per trip is slightly below the division average for Saturday and equivalent to the division average for Sunday.

FIGURE 1 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 510	ROUTE 510	DIVISION AVG
Weekday	311	5.4	7.5
Saturday	190	5.0	5.8
Sunday	108	4.2	4.2

*Source: CT**transit** performance data*

Ridership by Stop

The most heavily used stops on Route 510 are downtown at Bank Street and Main Street, and the route's first two stops when traveling inbound. Outside of downtown, seven stops generate 10 or more boardings or alightings per day (see Figure 2 and Figure 3).

FIGURE 2 | ROUTE 510 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (WEEKDAY INBOUND)

BUS STOP	RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Corbin Russwin / Episcopal Road	34 / 0	Corbin Russwin, McKinney Products
Christian Lane / DDS	61 / 0	Department of Social Services
Rocky Hill Avenue / Halsey Road	12 / 9	Residential neighborhood
Rocky Hill Avenue / Ellis Street	7 / 5	Residential neighborhood
Rocky Hill Avenue / Kelsey Street	10 / 9	Residential neighborhood
Chestnut Street / Blockbuster Video	1 / 14	Retail shopping
Chestnut Street / Elm Street	0 / 10	Downtown New Britain, with town offices and retail
Bank Street / Main Street	0 / 95	Downtown New Britain, with town offices and retail

Load profile data (Figure 3) 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 4. The ridership data for Route 510 shows that when traveling outbound the passenger load peaks early in the route, at the stop at Columbus Boulevard and Chesnut Street. Weekday inbound passenger loads increase as the route progresses, peaking at the stop at Stanley Street and Park Street, just east of downtown New Britain.

The load profiles shown below are not continuous because some stops are served by all variants, while others are served by individual variants or a combination of route variants. Each variant is labeled accordingly in Figure 6 and similar charts below.

FIGURE 3 | WEEKDAY OUTBOUND RIDERSHIP BY STOP GRAPH

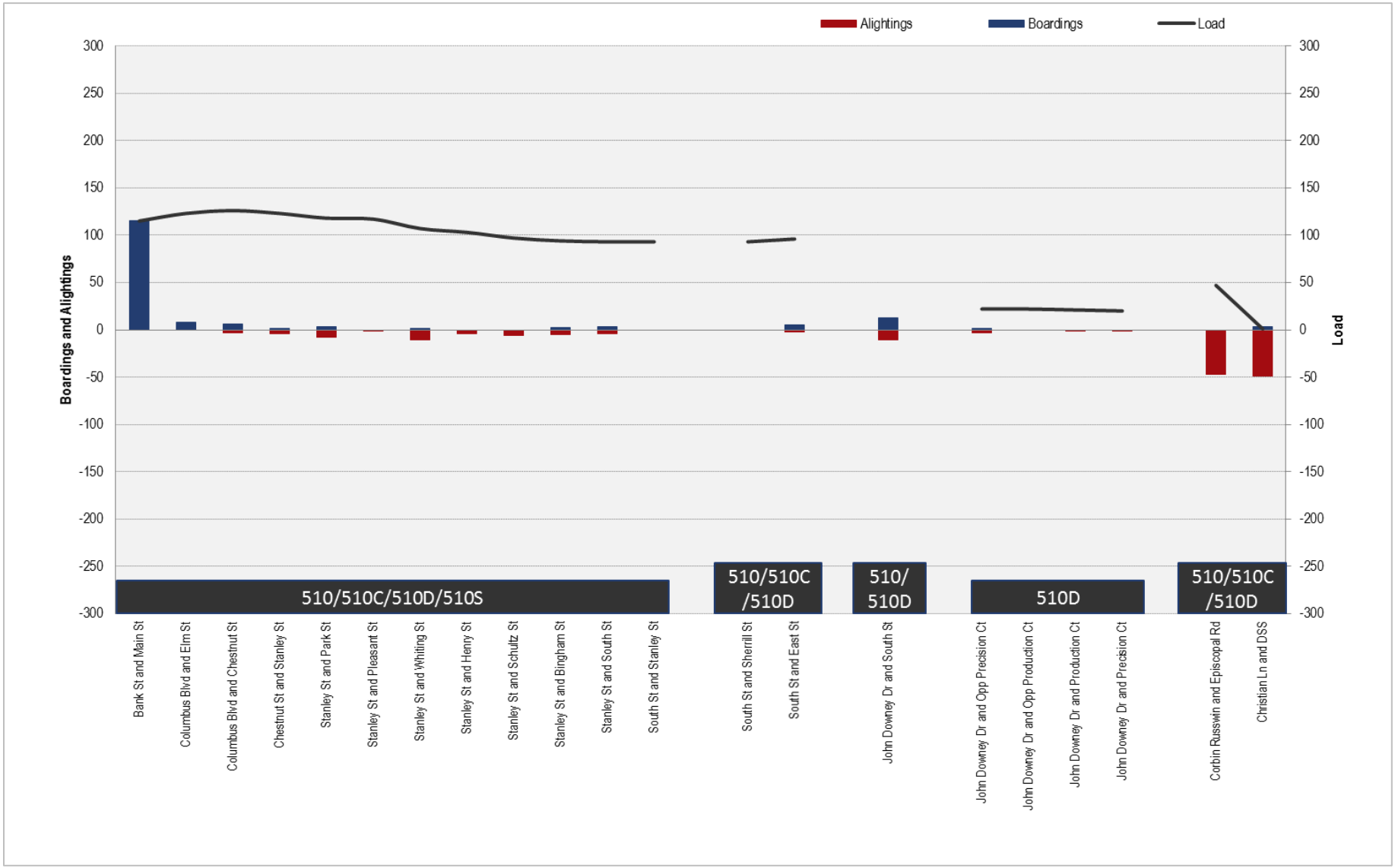


FIGURE 4 | WEEKDAY OUTBOUND RIDERSHIP BY STOP MAP

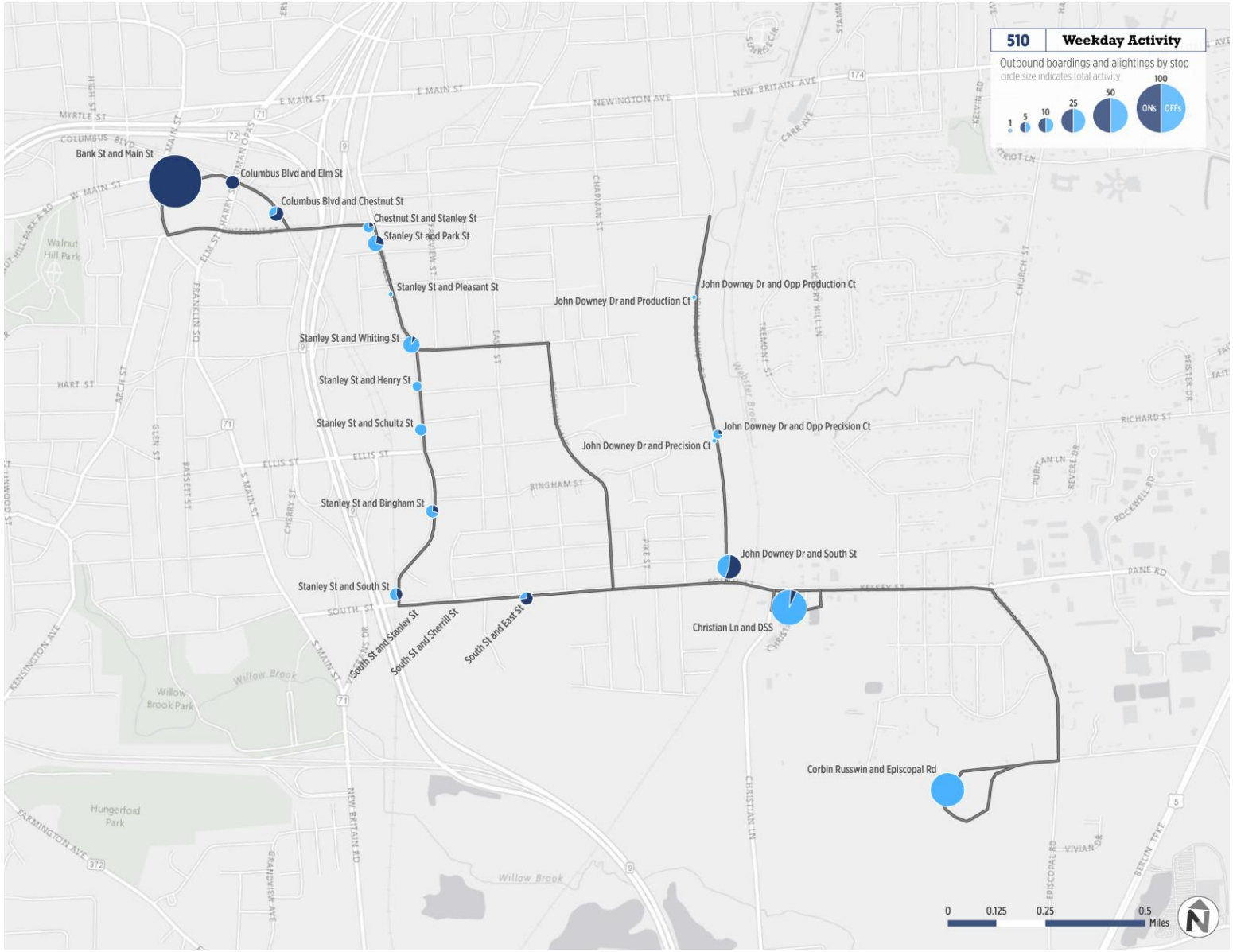


FIGURE 5 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

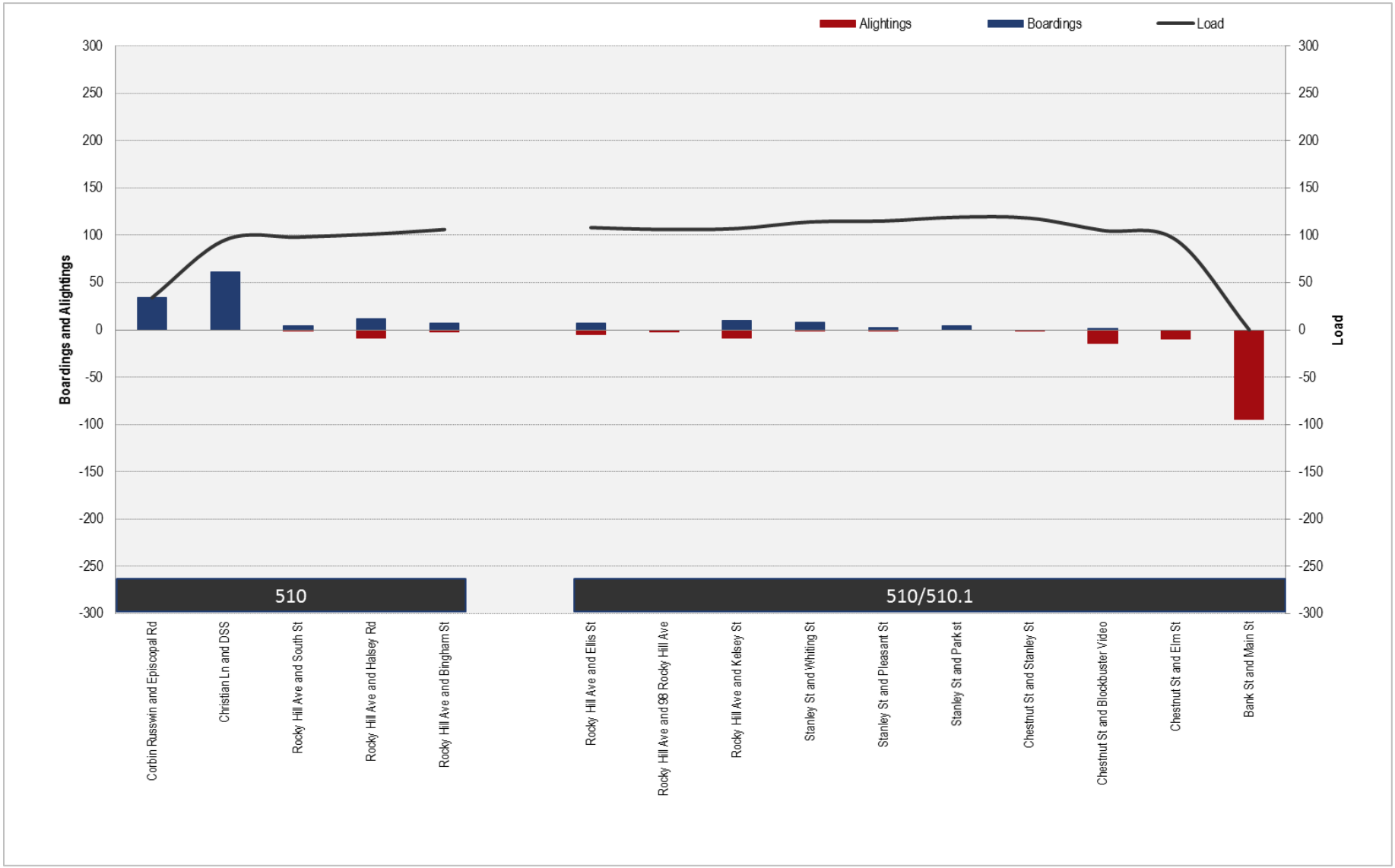


FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

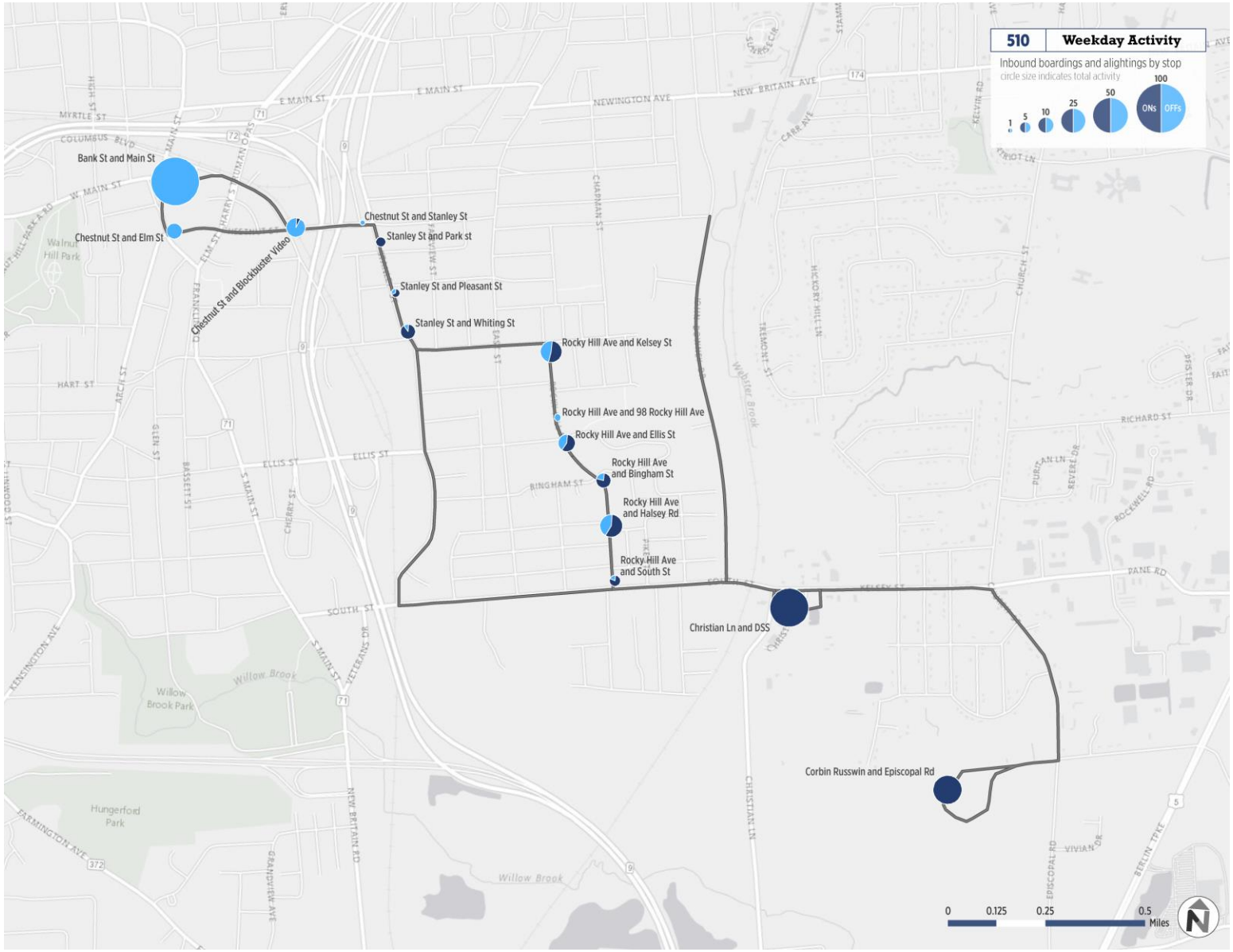


FIGURE 7 | SATURDAY OUTBOUND RIDERSHIP BY STOP GRAPH

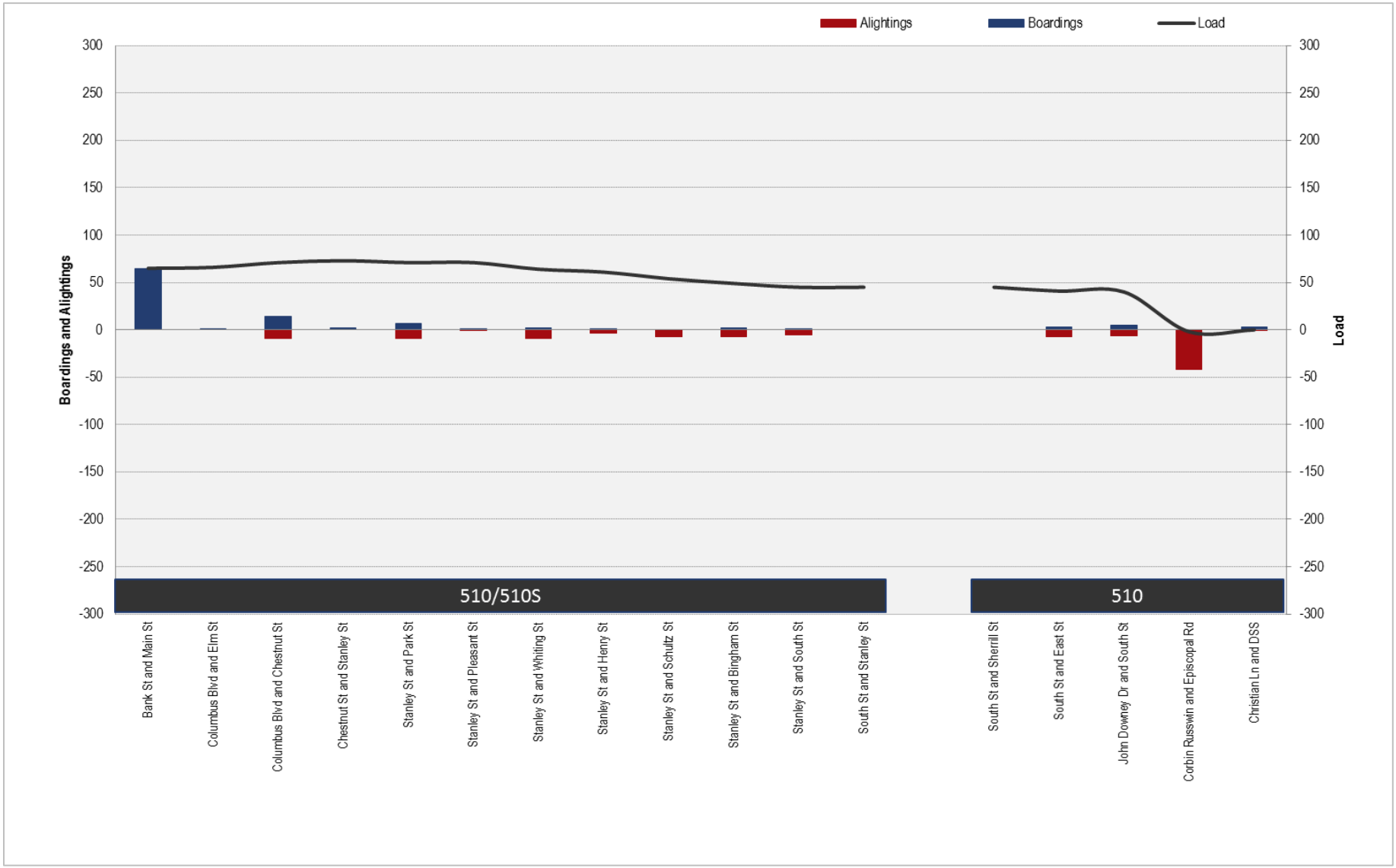


FIGURE 8 | SATURDAY OUTBOUND RIDERSHIP BY STOP MAP

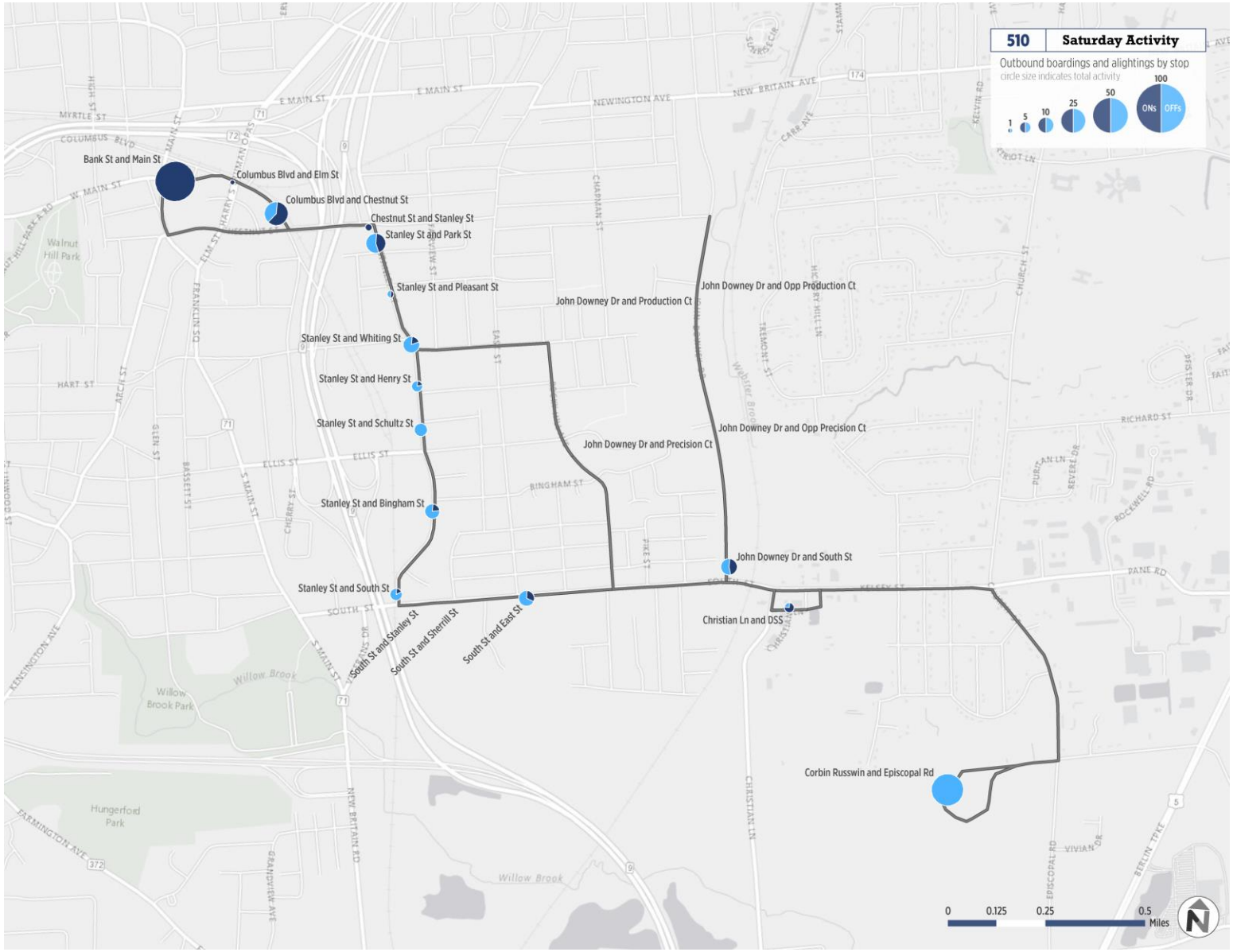


FIGURE 9 | SATURDAY INBOUND RIDERSHIP BY STOP GRAPH

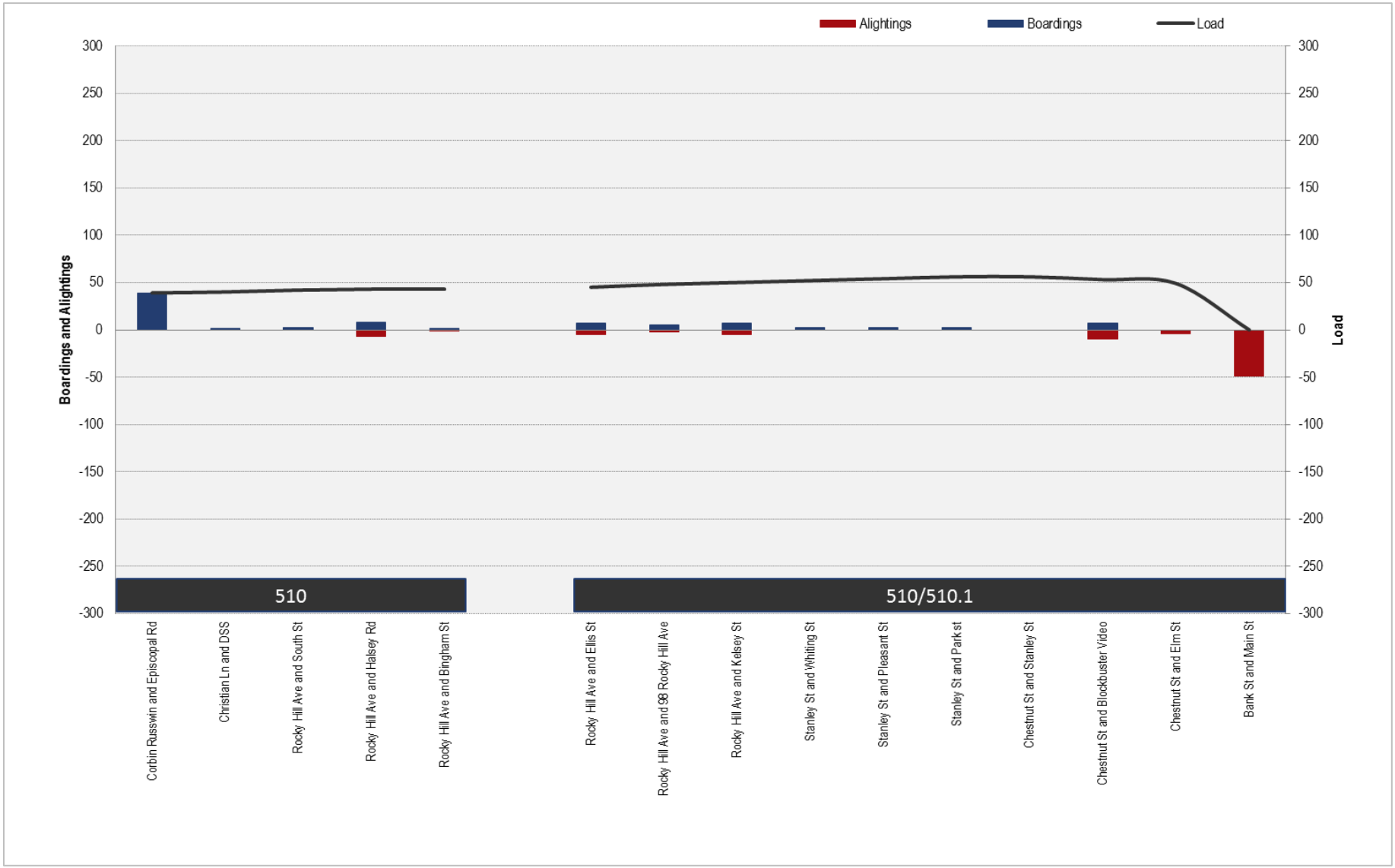


FIGURE 10 | SATURDAY INBOUND RIDERSHIP BY STOP MAP

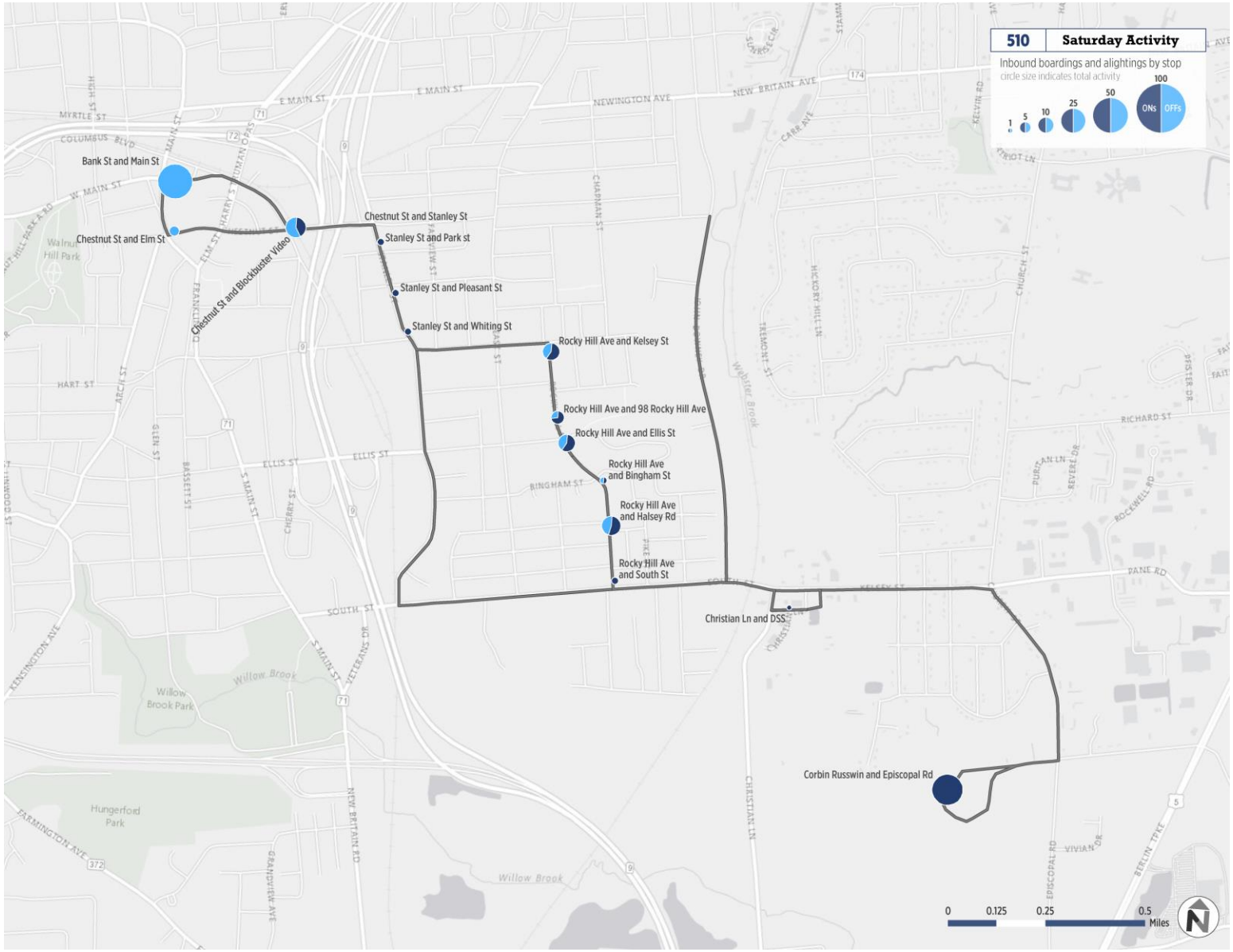
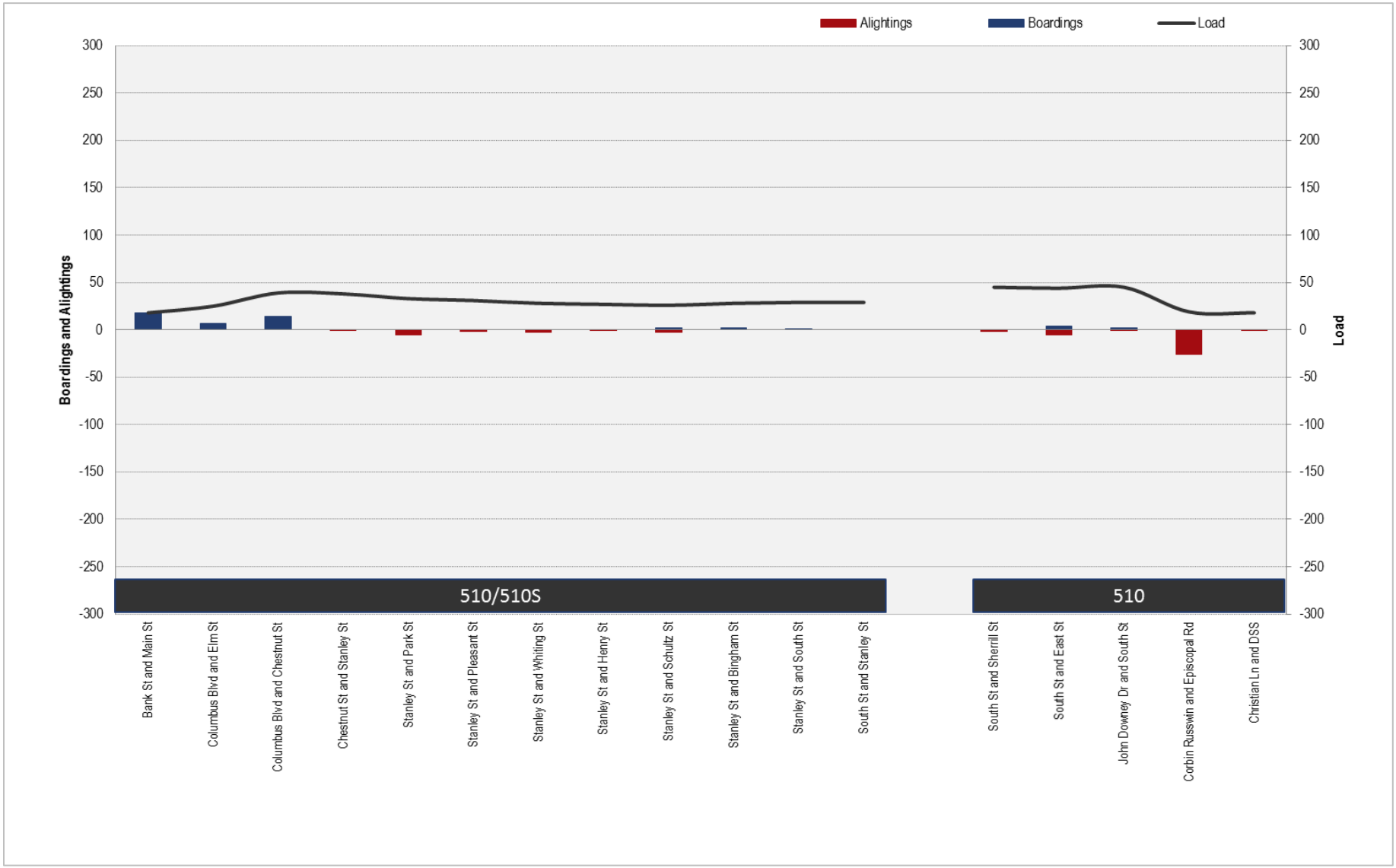


FIGURE 11 | SUNDAY OUTBOUND RIDERSHIP BY STOP GRAPH



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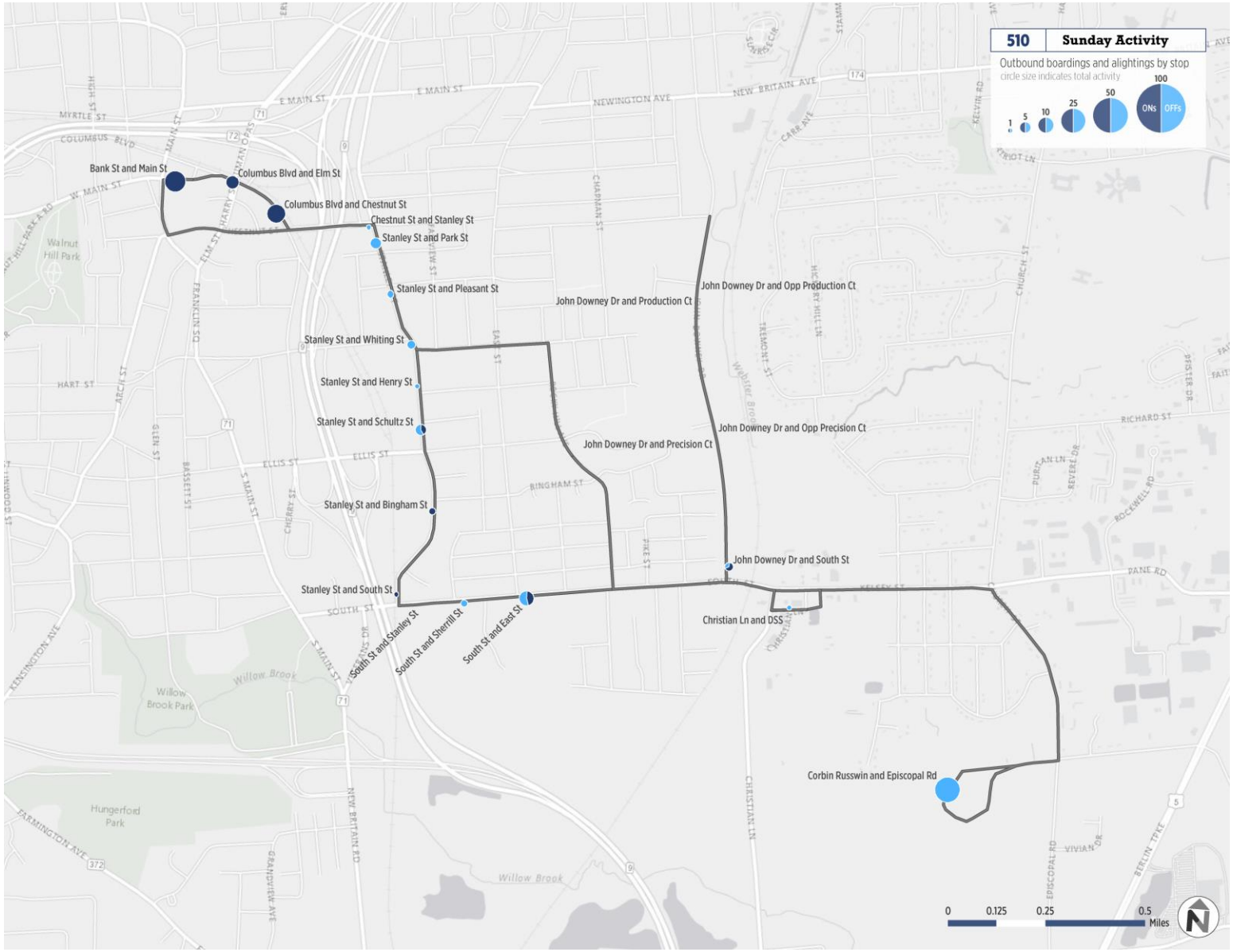


FIGURE 13 | SUNDAY INBOUND RIDERSHIP BY STOP GRAPH

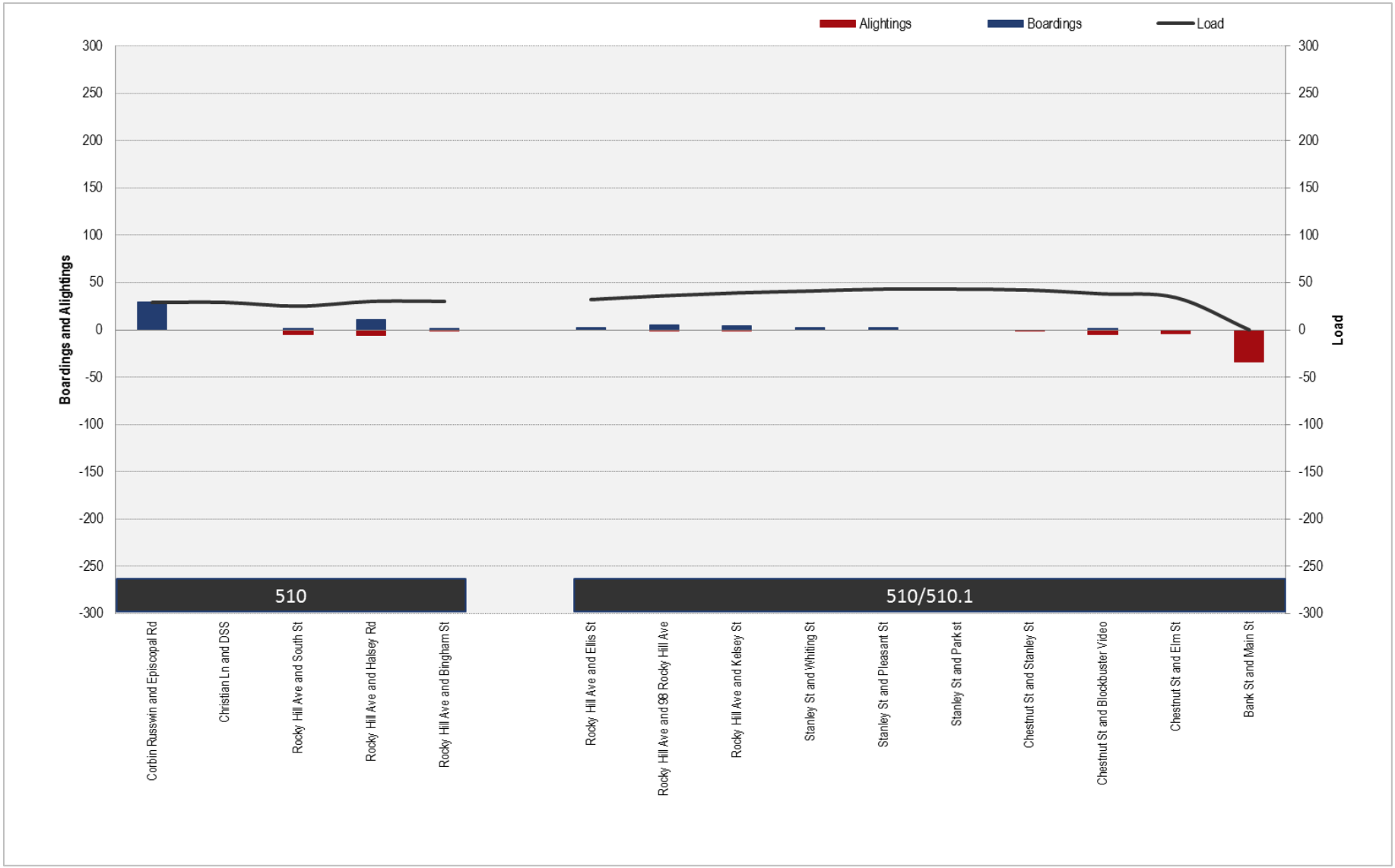
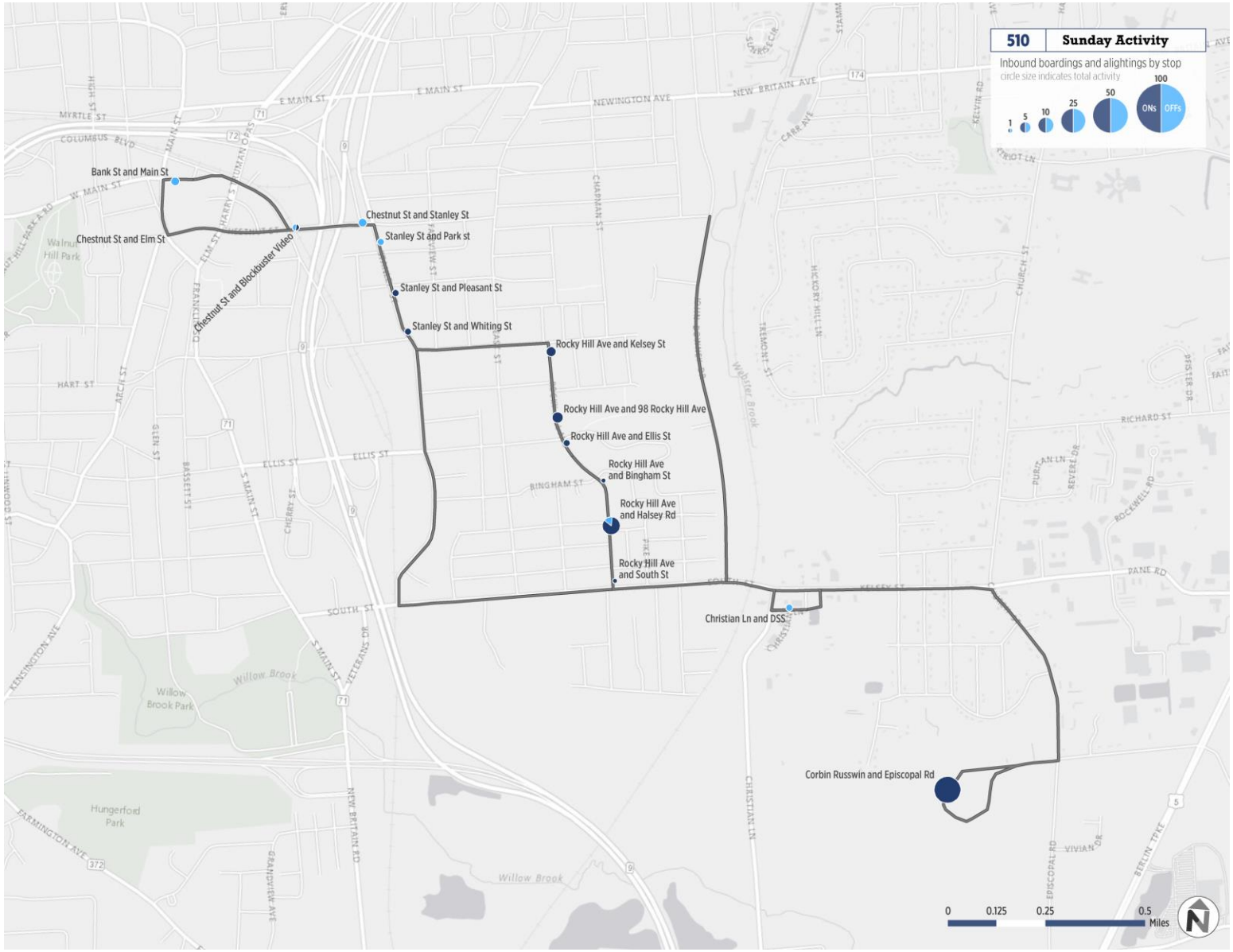


FIGURE 14 | SUNDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Route 510 carries an average of 5.4 passengers per trip on weekdays. Weekday demand is evenly distributed between the outbound and inbound direction: seven outbound and seven inbound trips carry 10 passengers or more (Figure 15 and Figure 16). Outbound trips peak in the afternoon (3:00 PM) at 20 passengers, while ridership is highest inbound at 11:00 AM (20 passengers). Consistent activity throughout the mid-morning and afternoon periods suggests that Route 510 serves multiple trip types and users.

Total boardings or maximum loads never exceed 40 passengers, which is the typical seating capacity of a 40-foot transit bus.

FIGURE 15 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

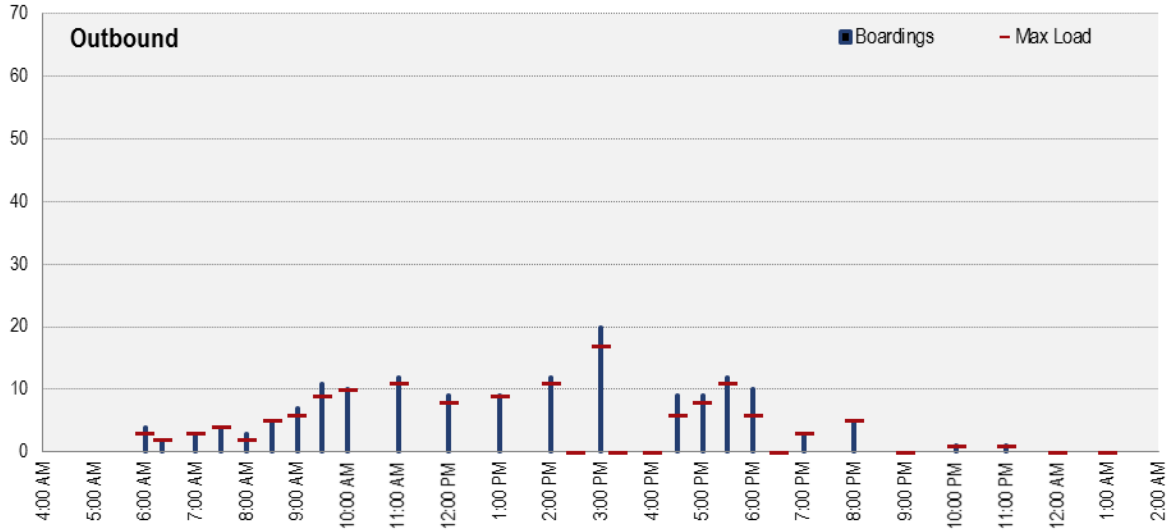
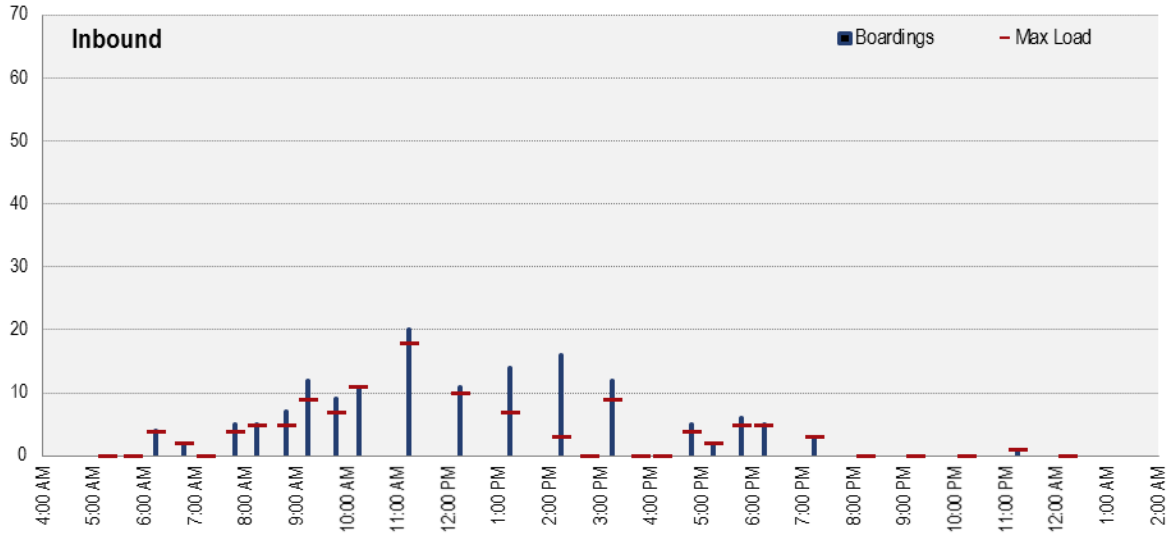


FIGURE 16 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Route 510 carries an average of 5.0 passengers per trip on Saturdays. Traveling outbound, four trips carry 10 passengers or more per trip (Figure 17). Inbound ridership is lower, with only two trips carrying more than 10 passengers (Figure 18). Demand on outbound trips is highest in the afternoon (3:00 – 5:00 PM), while demand on inbound trips peaks at 11:00 AM with 14 passengers. After 9:00 PM no trips in either direction carry more than two passengers.

FIGURE 17 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

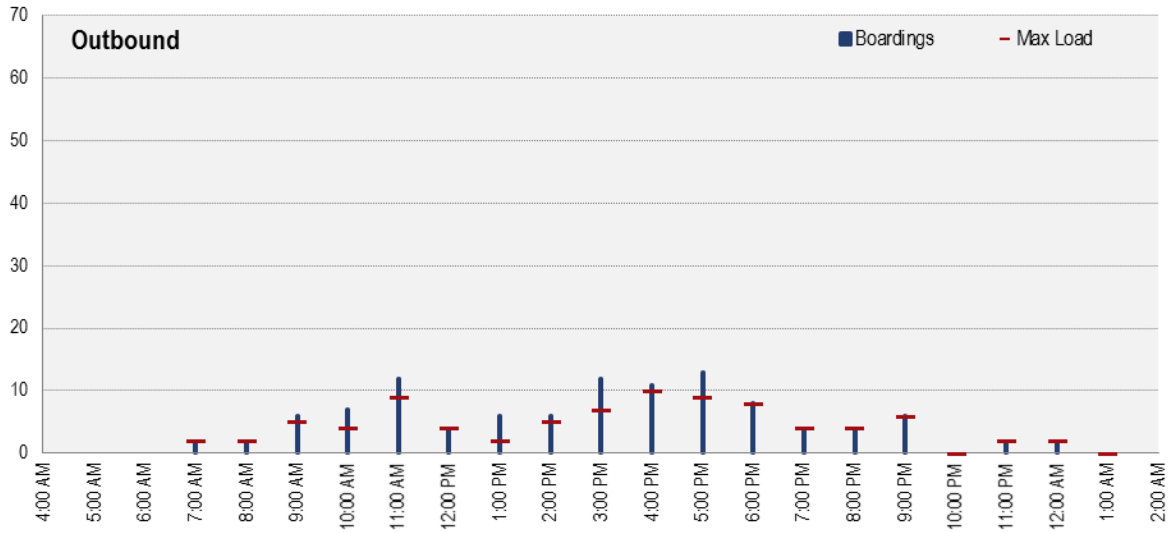
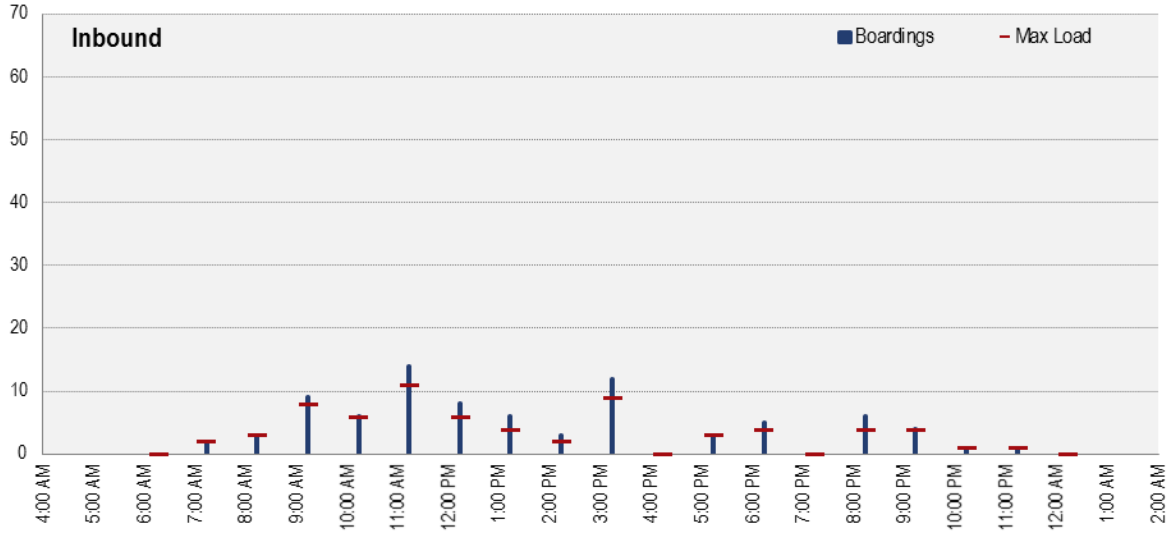


FIGURE 18 | SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

Route 510 carries an average of 4.2 passengers per trip on Sundays. Outbound and inbound ridership peaks at 2:00 PM (Figure 19 and Figure 20). Outside the peak, inbound ridership is concentrated between 8:00 – 10:00 AM. All other outbound and inbound trips carry fewer than 10 passengers. Ridership drops significantly after 5:00 PM, with no trips carrying more than three passengers.

FIGURE 19 | SUNDAY OUTBOUND RIDERSHIP BY TRIP

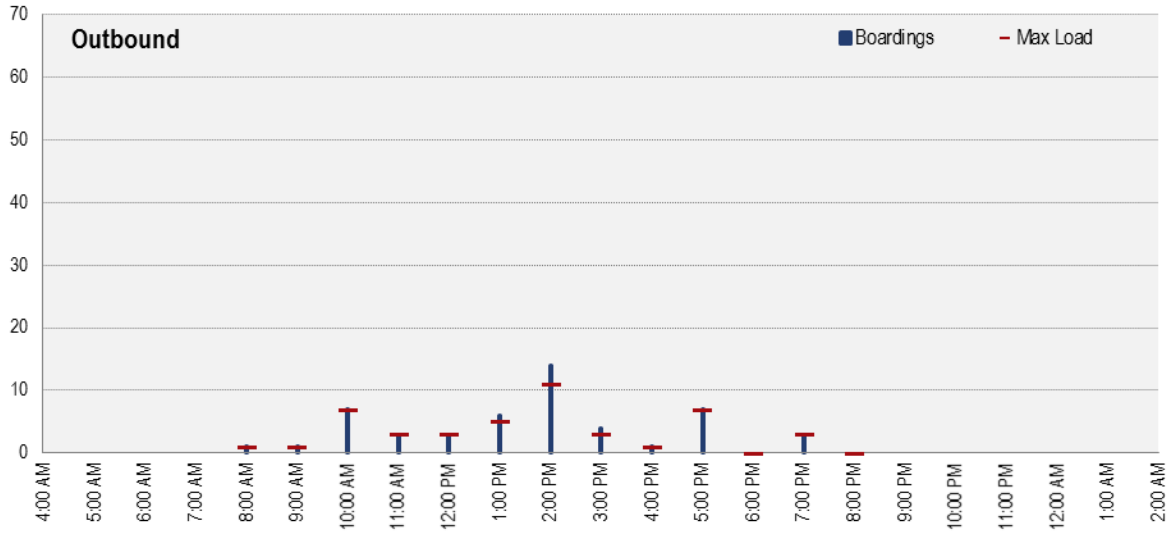
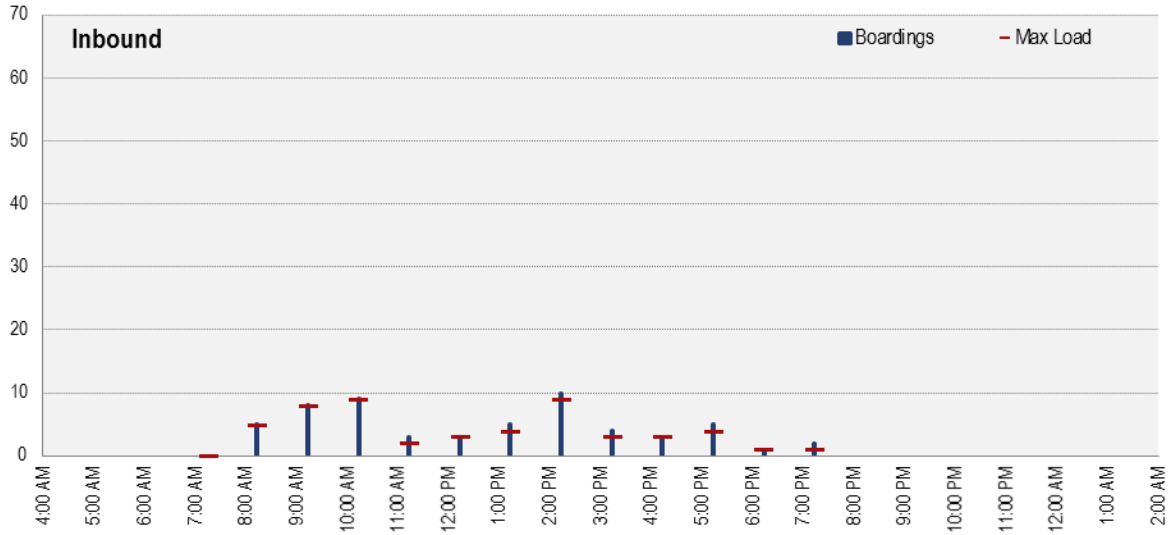


FIGURE 20 | SUNDAY INBOUND RIDERSHIP BY TRIP



Productivity

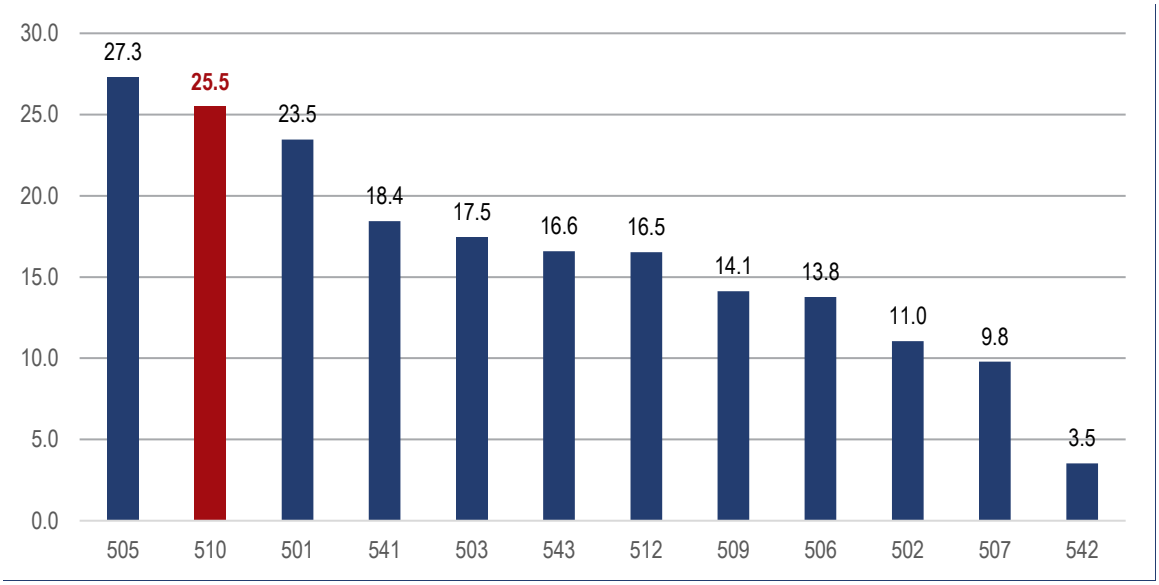
Route 510 is one of the highest performing routes in the New Britain/Bristol Division (Figure 21). On weekdays Route 510 carries an average of 25.5 passengers, 54% higher than the New Britain/Bristol Division average for passengers per revenue hour. Route 510 is the division's most productive route on Saturday and Sunday, carrying 25.4 and 21.3 passengers per vehicle revenue hour, respectively.

FIGURE 21 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 510	DIVISION AVG	ROUTE 510	DIVISION AVG	ROUTE 510	DIVISION AVG
Passengers per Vehicle Revenue Hour	25.5	16.5	25.4	13.1	21.3	10.4

Source: CTtransit performance data

FIGURE 22 | PASSENGERS PER VEHICLE REVENUE HOUR



ON-TIME PERFORMANCE

On weekdays, approximately 62% of Route 510 time points were served "on-time" during the survey period (Figure 23). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Weekday on-time performance was affected by late departures, which occurred 26% of the time while the remaining 12% of time points were early. On Saturdays, approximately 68% of Route 510 time points were served "on-time" during the survey period, with 26% of time points served earlier than scheduled and the remaining 6% of time points were late. On Sundays, approximately 79% of time points were served "on-time," and 15% of time points are served early and the remaining 6% of time points were served late.

FIGURE 23 | ON-TIME PERFORMANCE

PERFORMANCE	WEEKDAY	SATURDAY	SUNDAY
Early	12%	26%	15%
Late	26%	6%	6%
On-Time	62%	68%	79%

*Source: CT**transit** performance data*

SERVICE IMPROVEMENT

Route 510 is a coverage-focused route that serves neighborhoods east and south of downtown New Britain. The route follows a different alignment traveling inbound and outbound, operating as a one-way loop for most of the route, which means many riders must either travel to a different stop or travel the entire length of the route to complete a round trip. The route is productive in terms of ridership per service hour, ranking second in the New Britain/Bristol Division, but it has very low ridership per trip. This is true on weekends as well: Route 510 carries the highest ridership per hour in the division, but ranks in the middle in terms of riders per trip.

Service Improvement Options

Opportunities to strengthen Route 510 are listed below.

- **Eliminate or reduce one-way service.** Route 510 operates along different alignments traveling inbound and outbound, essentially operating in a large one-way loop that forces riders to travel out of direction to complete a round trip. More direct and bidirectional service is convenient for riders, reduces travel time, and makes the route easier to understand for potential riders. A more direct alignment could travel east along Chestnut Street, then turn right on East Street and left on South Street before terminating at CT DSS on Christian Lane. The route would travel inbound by following this alignment in reverse. This alignment would operate bidirectional service that is equidistant to Stanley Street and Rocky Hill Avenue, providing more convenient service while continuing to reach customers who are served today. It also provides service to East Street and Belden, which is currently served by Route 509; if Route 509 is made more direct and this deviation eliminated, the new Route 510 alignment could fill this gap in service.
- **Eliminate service to John Downey Drive.** Six outbound trips per day (three in the AM peak and three in the PM peak) include a deviation to serve John Downey Drive, where several industrial and technical companies are located. This deviation produces very few riders. The stop that generates the most riders on this deviation is John Downey Drive and South Street, which would still be served if Route 510 continued along South Street without turning onto John Downey Drive. Other than John Downey Drive and South Street, the stop with the second highest weekday ridership generates one boarding and three alightings. Route 510D trips should instead operate as regular Route 510 trips.
- **Eliminate Route 510S trips.** These trips serve only a short part of the alignment, and are served by vehicles going out of service. Both trips, at 6:30pm and 1:00am, generate no ridership and may create confusion for riders.
- **Eliminate weekday and Saturday service after 11:00 PM.** Ridership figures show that trips departing after 11:00 PM on weekdays are lightly used. Eliminating these trips can improve the overall productivity of the route.

Route Evaluation

BERLIN TURNPIKE

512C | South Main Street – Walmart Cromwell – Berlin Turnpike

512N | Norpaco Foods

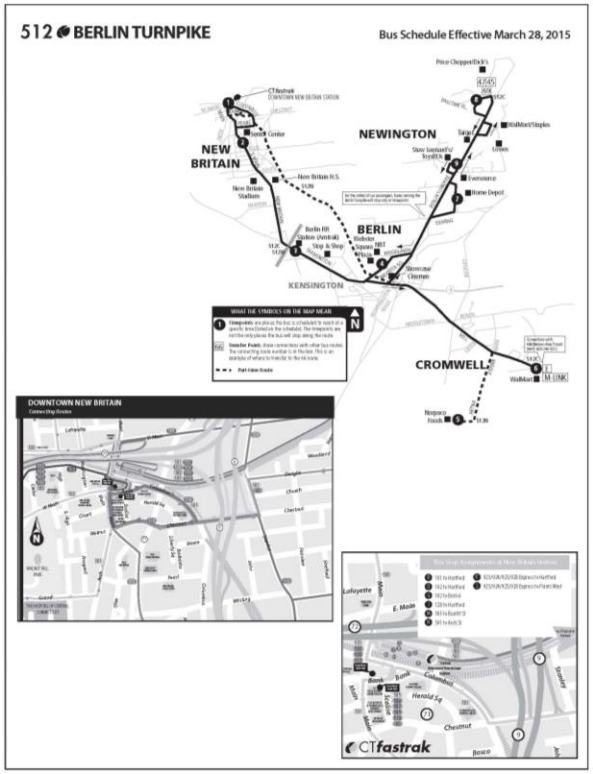
512W | South Main Street – Webster Square

512 | South Main Street – Downtown New Britain (short)

Service Design

Route 512 is a radial route, providing service from Downtown New Britain to Berlin, Newington, and Cromwell. The route operates primarily on South Main Street, New Britain Road, and Farmington Avenue on the core segment.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 512 begins/ends in downtown New Britain, where riders can transfer to nearly all other CT***transit*** routes serving New Britain as well as CT***fastrak*** service onward to Hartford. In addition, Route 512 has several transfer opportunities at Pascone Place Price Chopper in Newington to both local and express services to Hartford. Route 512 offers connections to Middletown Area Transit at the Walmart in Cromwell.

Transfer opportunities are available outside of downtown New Britain to the following routes (see Figure 2).

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 45	Hartford via Berlin Turnpike (Express)
Route 47	Hartford via Franklin Avenue
Route 69	Hartford via Capitol Avenue
MAT Route E	Middletown via Westlake Drive
MAT Route M	Meriden, Middletown

Alignments and Service Patterns

The primary variant of Route 512 is 512C, which begins at Bank Street near the Downtown New Britain CT***fastrak*** station, operates south on South Main Street, which continues as New Britain Road. The route turns left on Farmington Avenue. The route deviates to serve the Webster Square Shopping Center with a left turn on Webster Square Road, circling through the Webster Square Shopping Center, and then exiting onto Frontage Road. Frontage Road becomes Mill Street in East Berlin, and then Berlin Road. Just after the Cromwell border, the route pulls into the Walmart Supercenter.

The return trip to New Britain differs substantially from outbound service, operating along a seven-mile deviation to serve the shopping centers on Berlin Turnpike. The deviation operates on Berlin Turnpike, serving the Home Depot, Walmart, and Price Chopper. The service then returns along Berlin Turnpike, serving the Target and the Stew Leonard's/Toys-R-Us. The deviation rejoins the main alignment at Webster Square Plaza Shopping Center, returning back to New Britain the same as the outbound.

There are several other variants and branches as follows.

- **Short Run to Webster Square (512W/512)**. This variant begins or ends at Webster Square Shopping Center. This service operates generally as the first and last trips of the day. This variant also supplements service during the weekday in the morning peak and in the evening.
- **Express service to Norpaco in Middletown (512N).** This service operates from New Britain to Norpaco in the morning, and one return trip in the afternoon. There are no intermediate stops. Service is only available during the weekdays.

Service Schedule

Route 512 operates seven days per week. There are 20 outbound and 19 inbound trips per weekday across all variants. Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM. Service operates every 30 minutes during the peak periods and the midday. During the late evening, frequency drops to every 90 minutes.

On Saturdays, there are 13 outbound and 13 inbound trips. Service operates every 90 minutes throughout the service day. On Sundays, there are 9 inbound and 9 outbound trips, with service operating every 90 minutes.

FIGURE 3 | SCHEDULE OVERVIEW (ROUTE 512)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:25 AM – 12:49 AM	30 / 60	20 / 19
Saturday	6:04 AM – 12:49 AM	90	13 / 13
Sunday	7:34 AM – 8:19 PM	90	9 / 9

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

Route 512 carries 378 daily passengers or 9.7 passengers per trip on an average weekday, which is more than 30% higher than the New Britain/Bristol Division average of 7.5 weekday passengers per trip. Overall Route 512 carries the fourth highest average number of passengers in the division on weekdays.

The average ridership on Saturday is nearly equivalent to the average weekday ridership, and Saturday trips carry more passengers per trip (13.1) than weekday trips. Additionally, Route 512 carries the highest average number of passengers in the division on Saturday. Sunday ridership per trip is more than double the division average (see Figure 1).

FIGURE 1 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 512	ROUTE 512	DIVISION AVG
Weekday	378	9.7	7.5
Saturday	341	13.1	5.8
Sunday	162	9.0	4.2

*Source: CT**transit** performance data*

Ridership by Stop

The most heavily used stops on Route 512 are the origin stop at Pascone Place/Price Chopper, and the route's terminus at Bank Street and Main Street. Outside of these two stops, five stops generate 10 or more boardings or alightings per day (see Figure 2 and Figure 3).

FIGURE 2 | ROUTE 512 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (WEEKDAY INBOUND)

BUS STOP	RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Pascone Place / Price Chopper	79 / 0	National and local retail stores and restaurants
Maselli Road / Stew Leonard's	4 / 10	National and local retail stores and restaurants
Farmington Avenue / Baxter Avenue	9 / 1	National and local retail stores and restaurants
New Britain Road / 293 New Britain Road	8 / 2	Local retail outlets; Residential neighborhood
S Main Street / Ellis Street	7 / 5	Local retail outlets; Residential neighborhood
Main Street / Glen Street	1 / 12	Retail district; Connecticut Superior Court
Bank Street / Main Street	2 / 100	Downtown New Britain, with town offices and retail

Load profile data (see Figure 3) 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 4. The data for Route 512 shows high weekday outbound passenger loads as the route begins in downtown New Britain that decline steadily after leaving the downtown area.

Traveling inbound, an inverse pattern is apparent, with the passenger load steadily increasing as it moves towards downtown before most passengers alight downtown at Bank Street and Main Street. Ridership by stop without the cumulative load is mapped in Figure 6.

The load profiles shown below are not continuous because some stops are served by all variants, while others are served by individual variants or a combination of route variants. Each variant is labeled accordingly in Figure 6 and similar charts below.

FIGURE 3 | WEEKDAY OUTBOUND RIDERSHIP BY STOP GRAPH

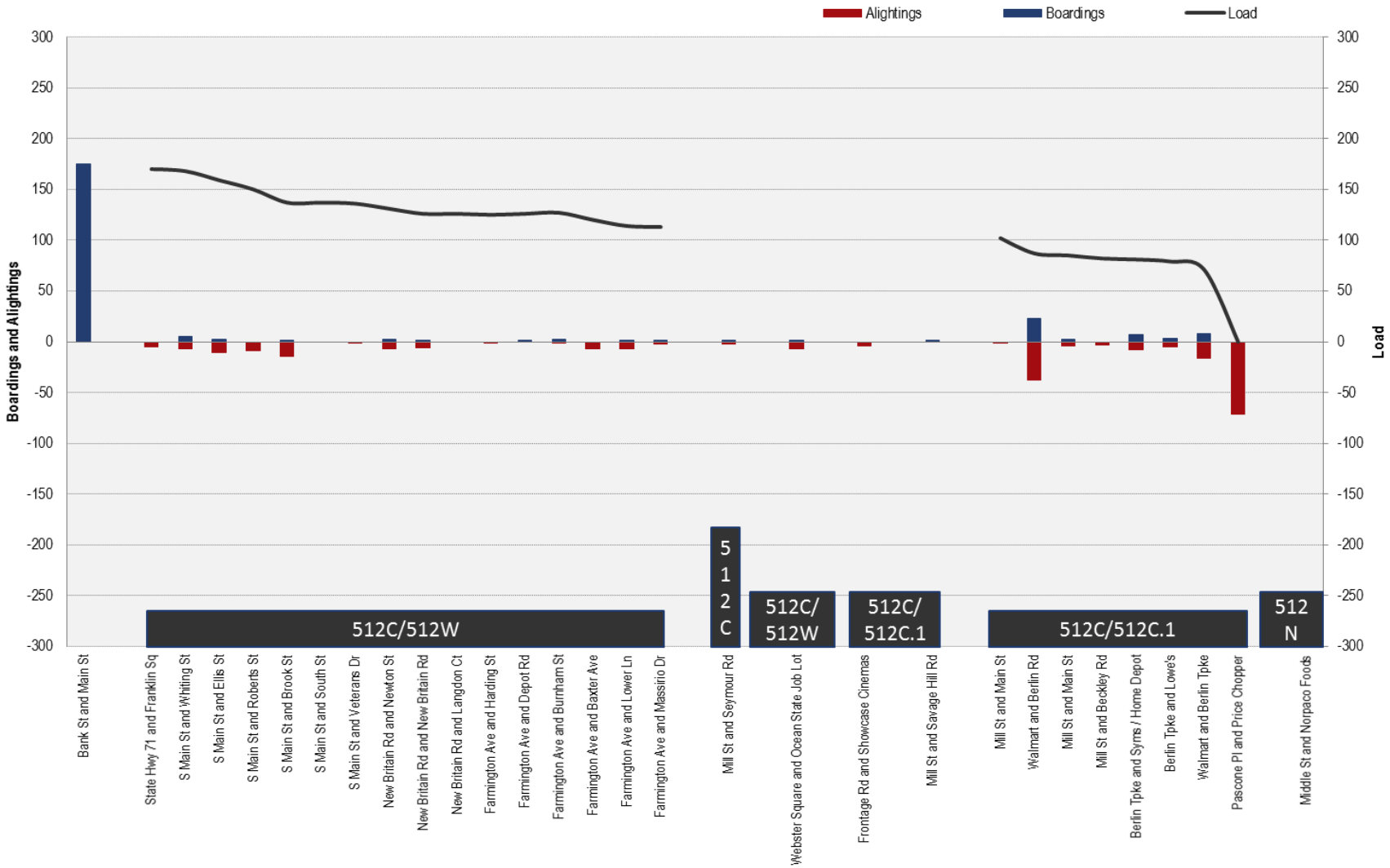


FIGURE 4 | WEEKDAY OUTBOUND RIDERSHIP BY STOP MAP

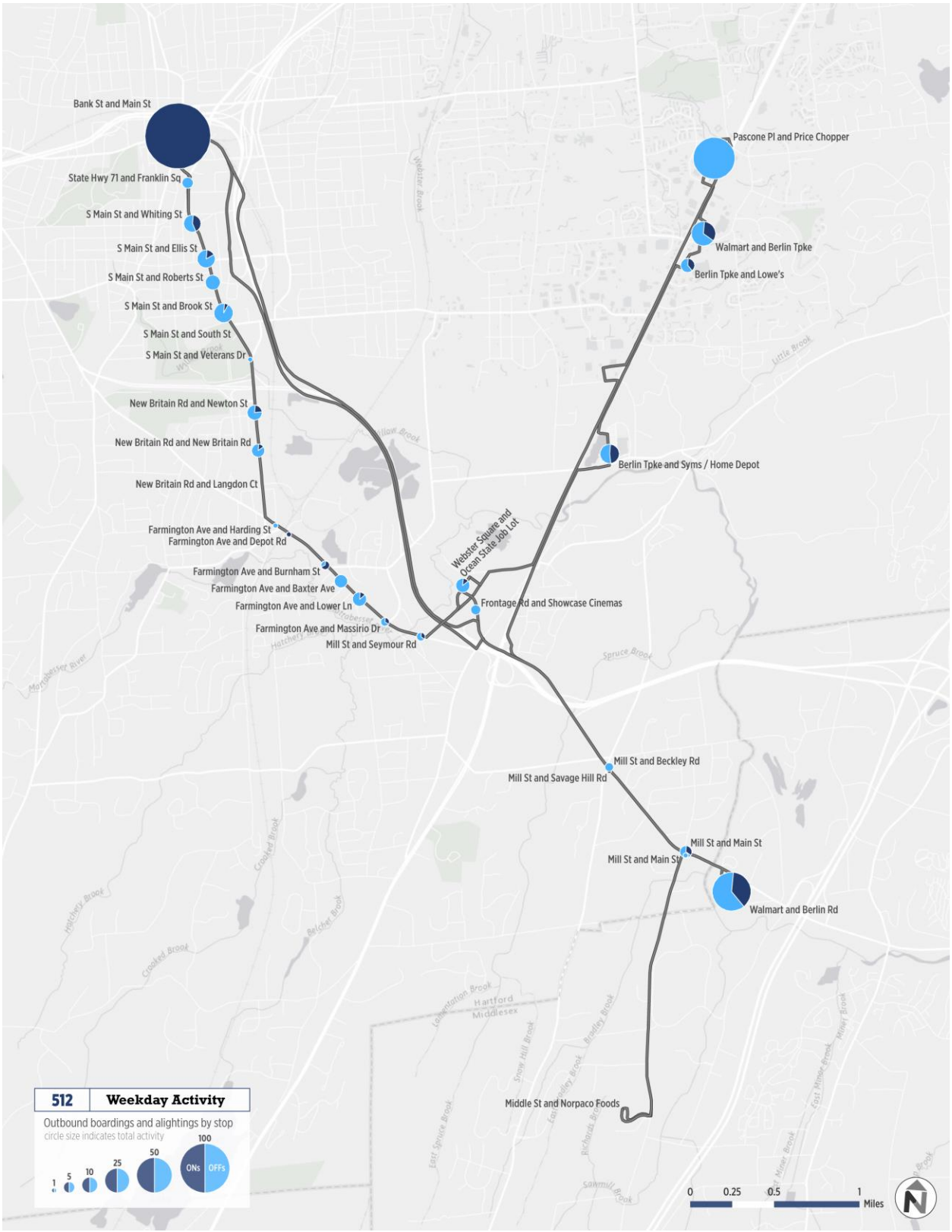


FIGURE 5 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

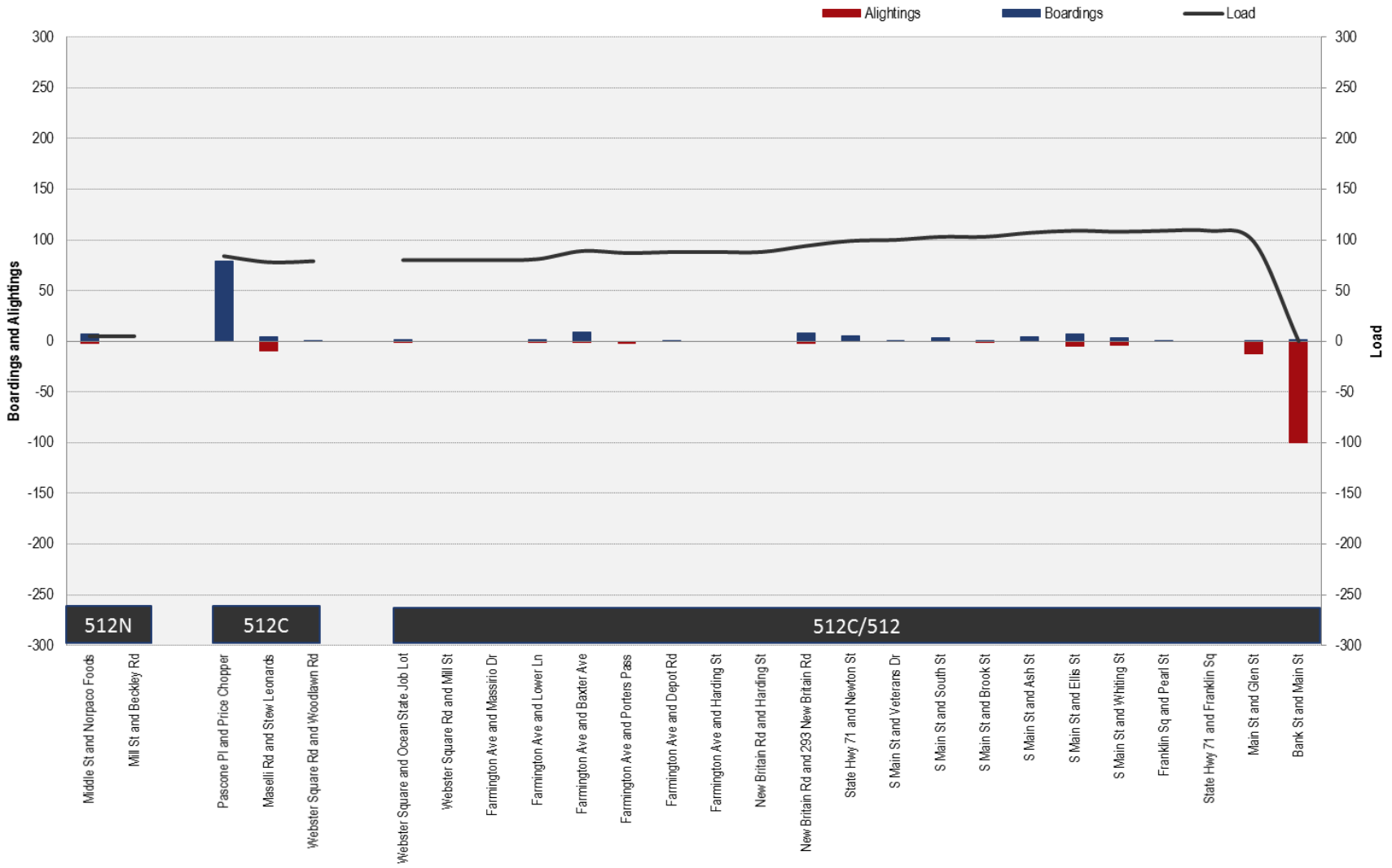


FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

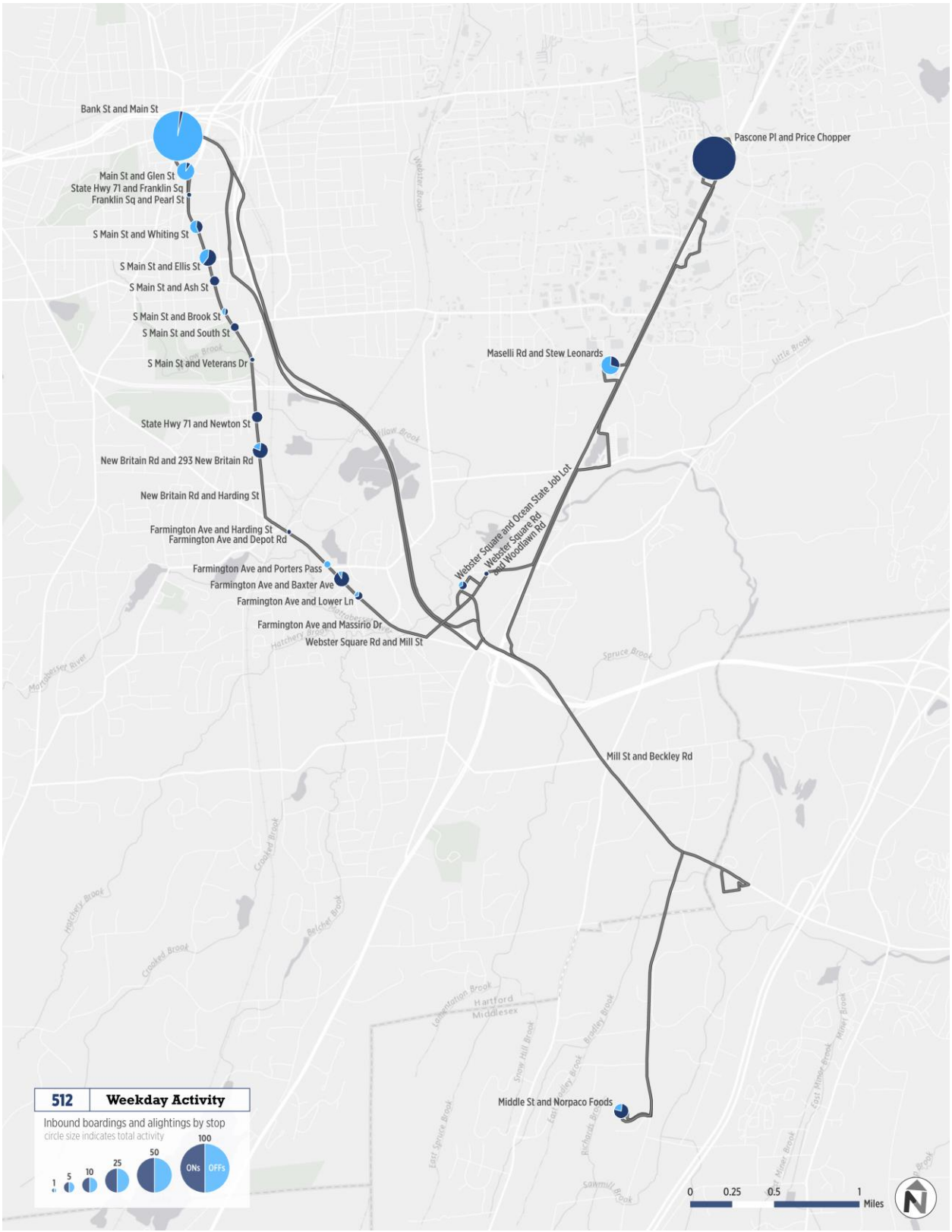


FIGURE 7 | SATURDAY OUTBOUND RIDERSHIP BY STOP GRAPH

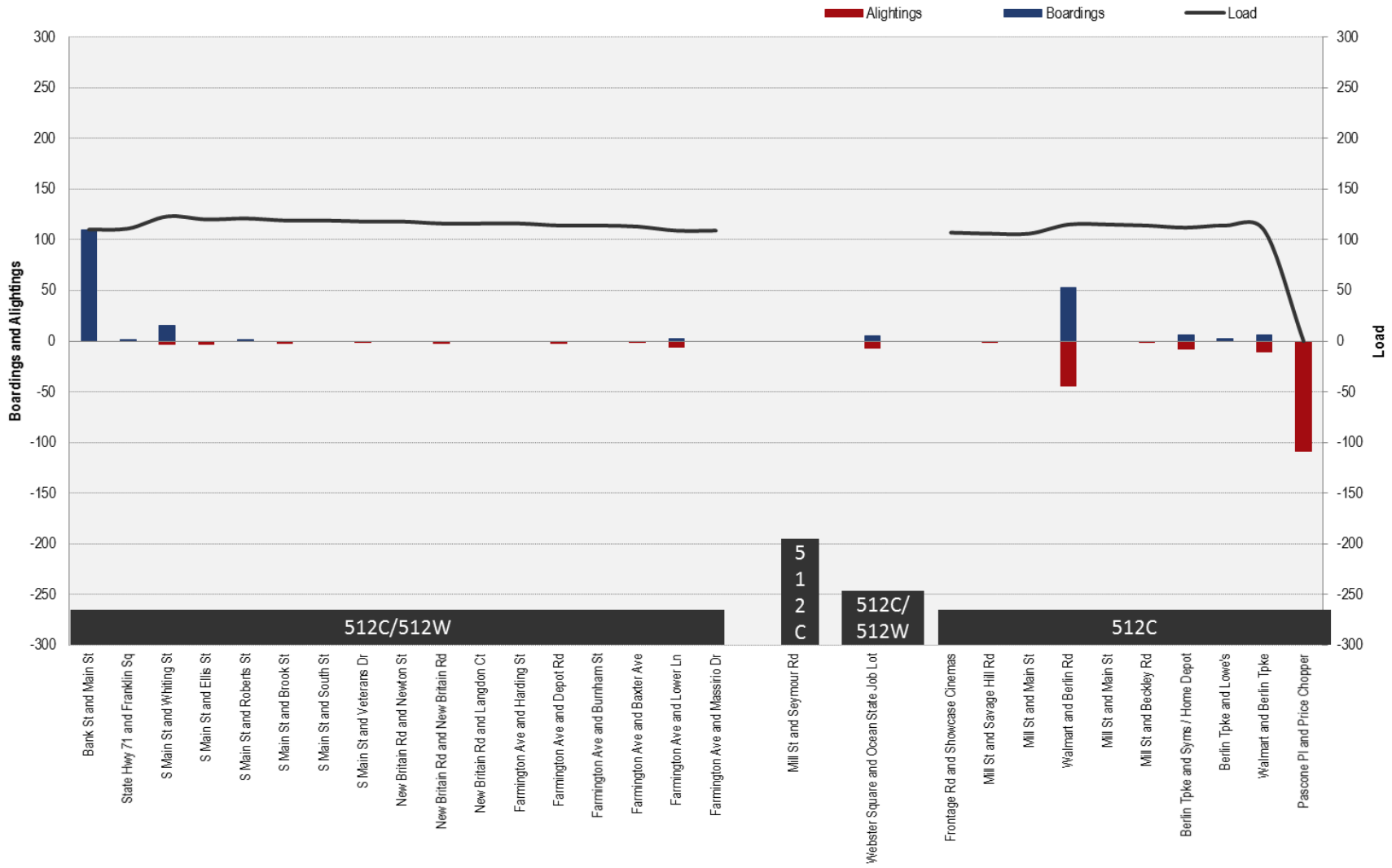


FIGURE 8 | SATURDAY OUTBOUND RIDERSHIP BY STOP MAP

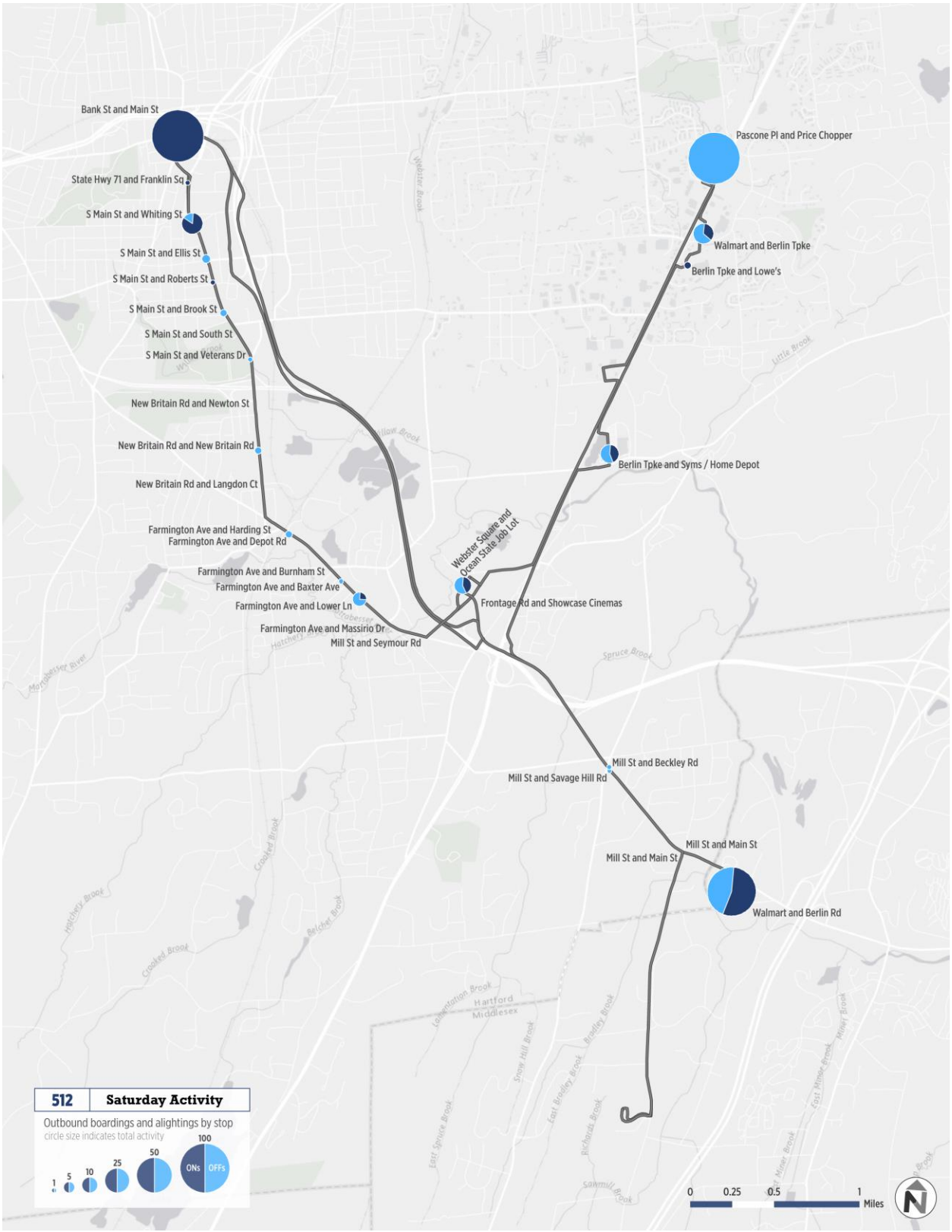


FIGURE 9 | SATURDAY INBOUND RIDERSHIP BY STOP GRAPH

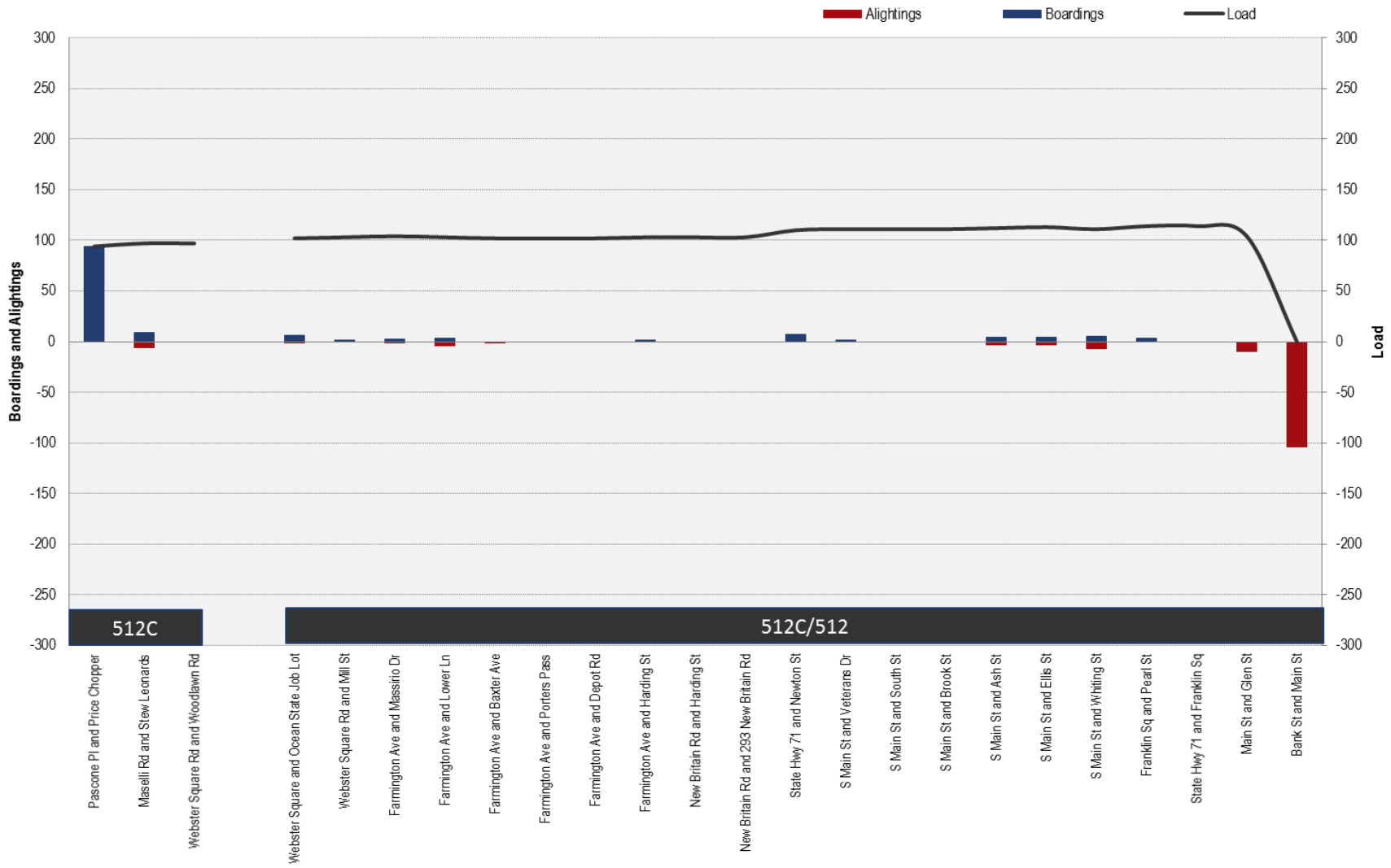


FIGURE 10 | SATURDAY INBOUND RIDERSHIP BY STOP MAP

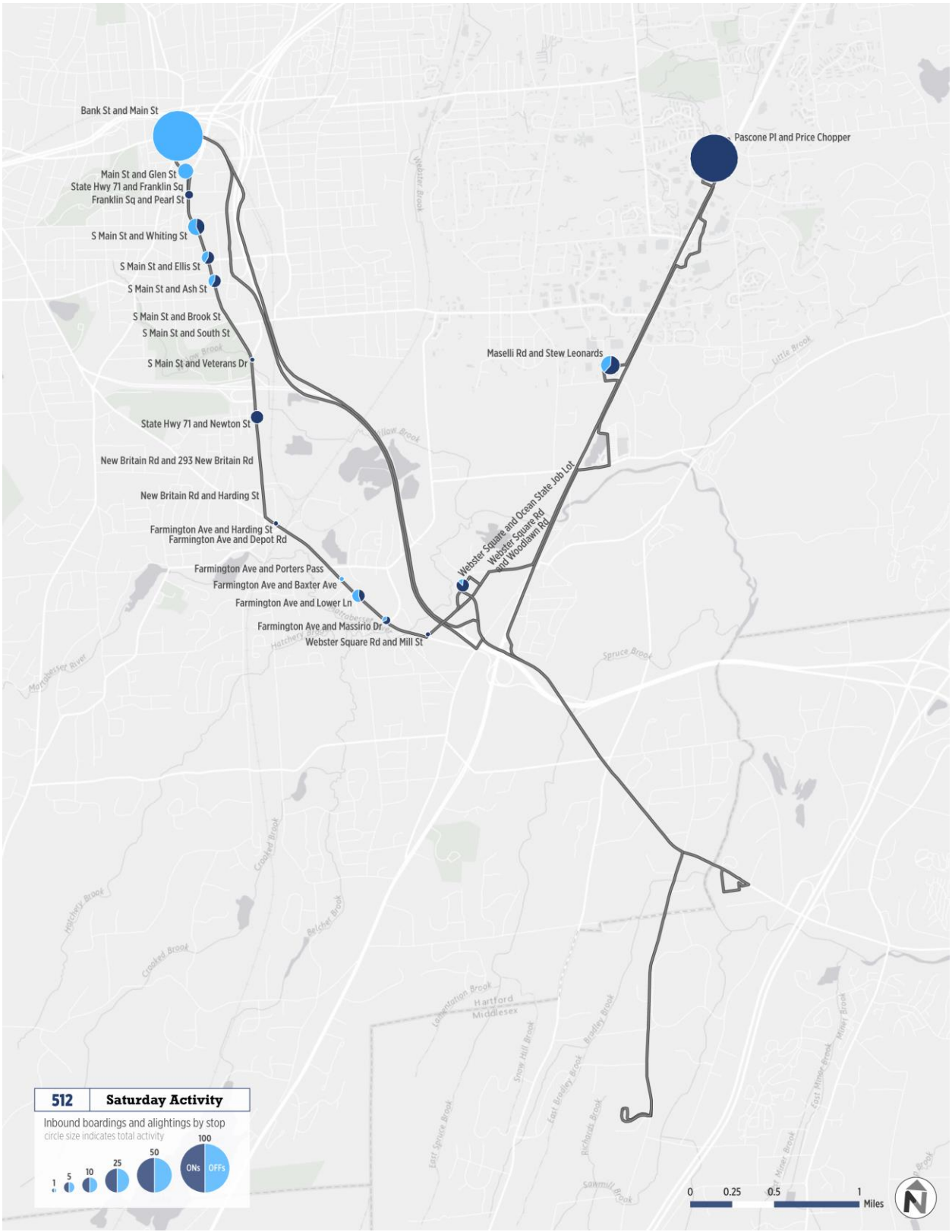


FIGURE 11 | SUNDAY OUTBOUND RIDERSHIP BY STOP GRAPH

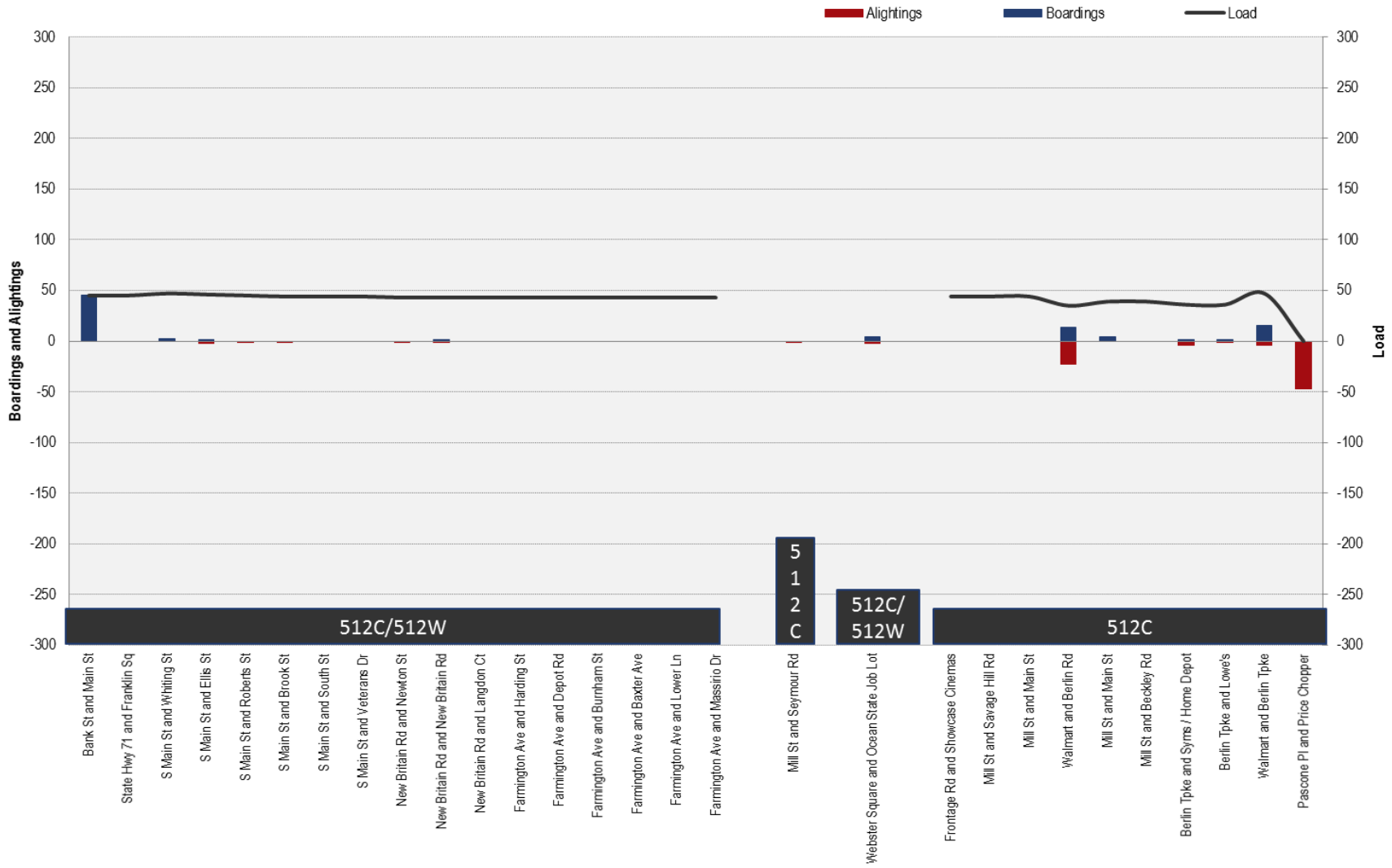


FIGURE 12 | SUNDAY OUTBOUND RIDERSHIP BY STOP MAP

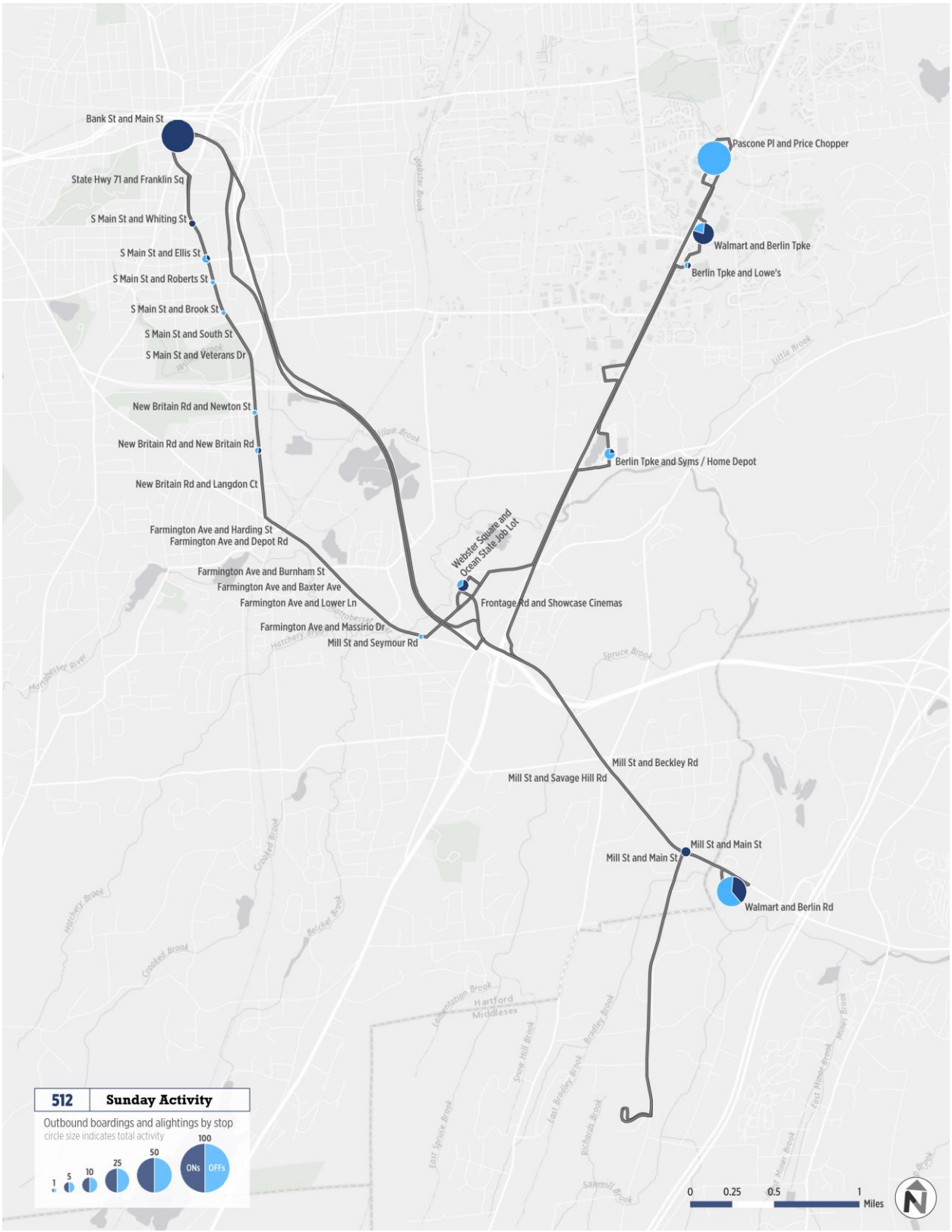


FIGURE 13 | SUNDAY INBOUND RIDERSHIP BY STOP GRAPH

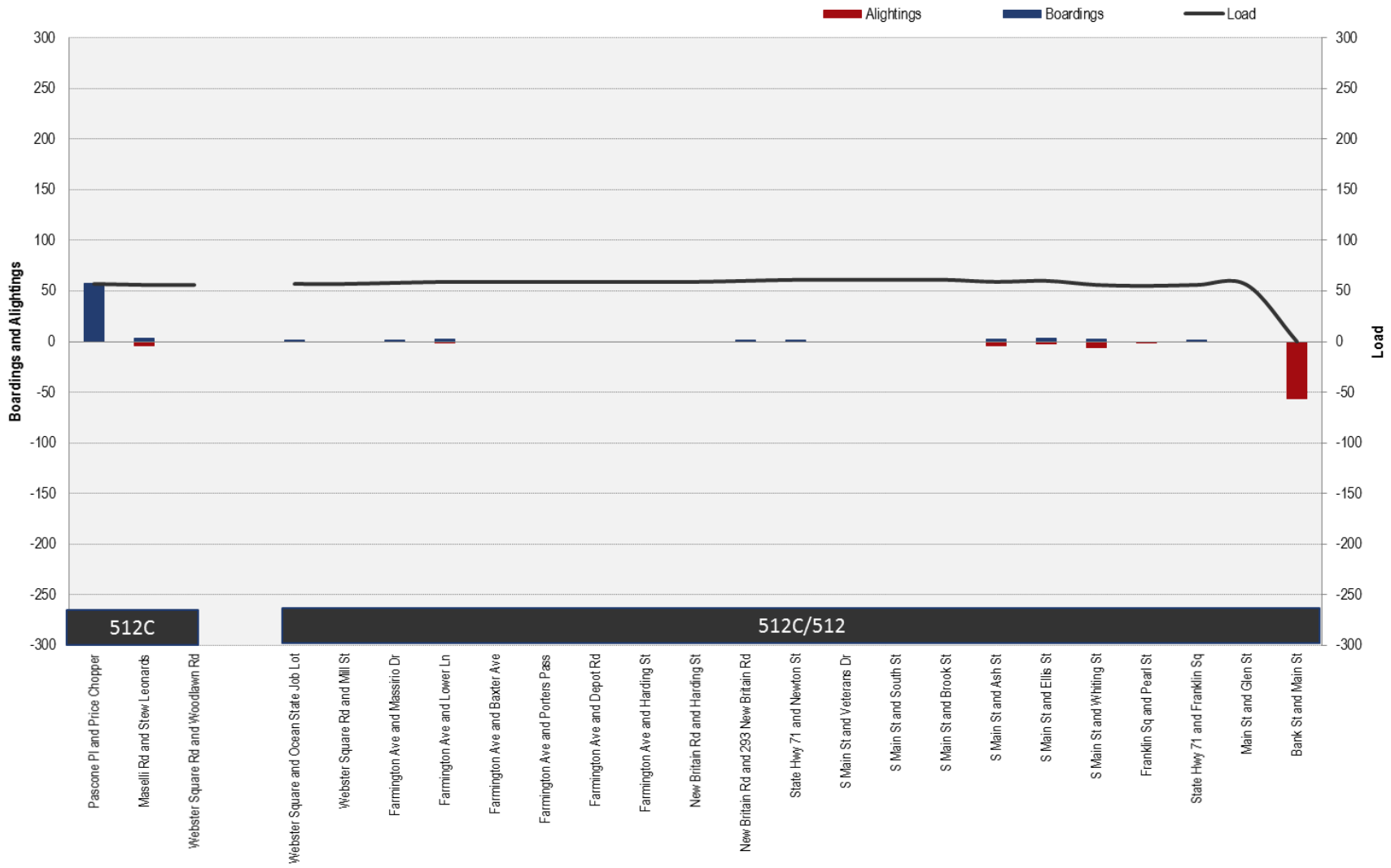
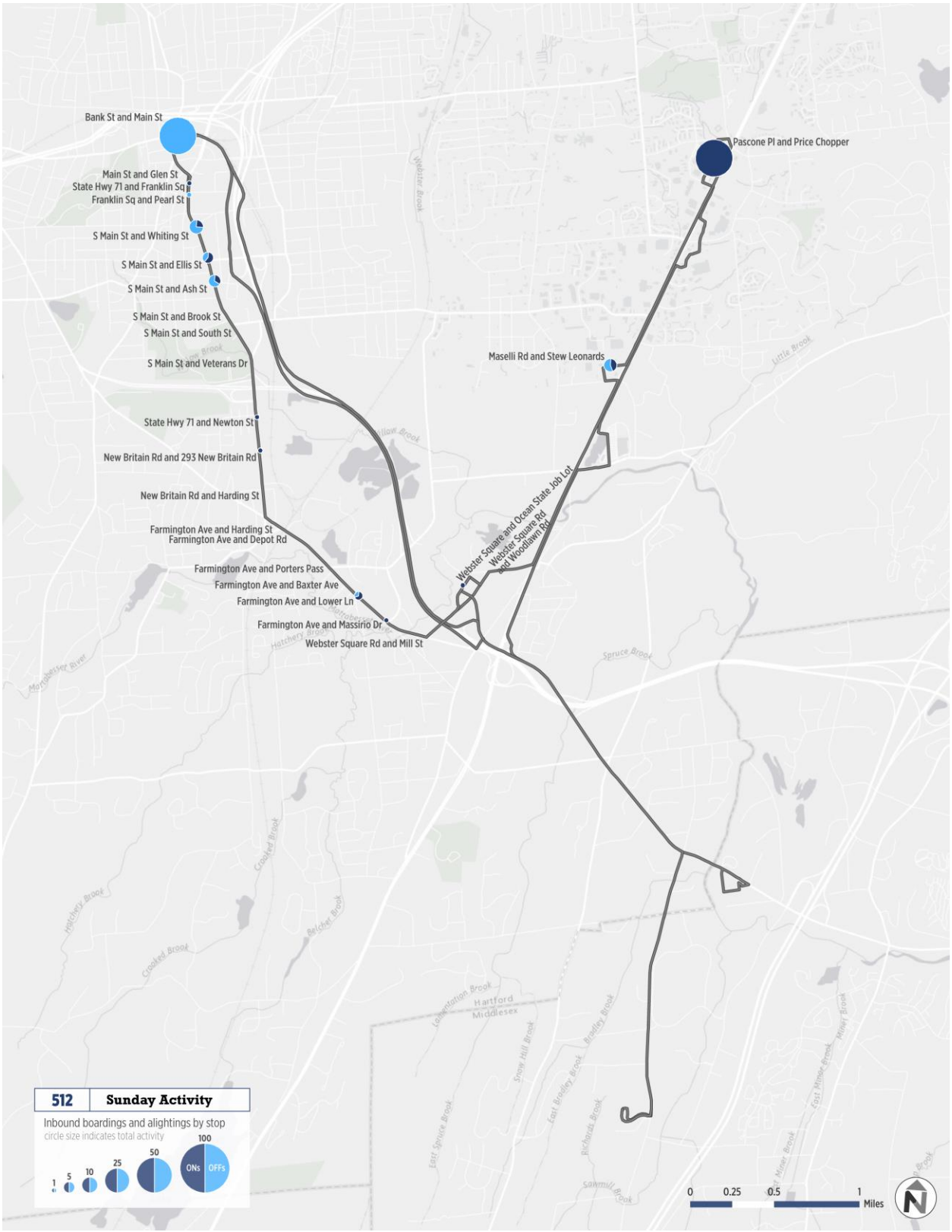


FIGURE 14 | SUNDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Route 512 carries an average of 9.7 passengers per trip on weekdays. Demand is higher in the outbound direction, with four trips carrying more than 20 passengers (Figure 15). Ridership on outbound trips peaks at 12:30 PM, at 25 passengers. Traveling inbound, five trips carry 10 or more passengers, and ridership peaks at 4:00 PM, carrying 19 passengers (Figure 16). In general, ridership demand decreases after 5:00 PM in both directions, with only one outbound trip carrying more than 10 passengers.

Total boardings or maximum loads never exceed 40 passengers, which is the typical seating capacity of a 40-foot transit bus.

FIGURE 15 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

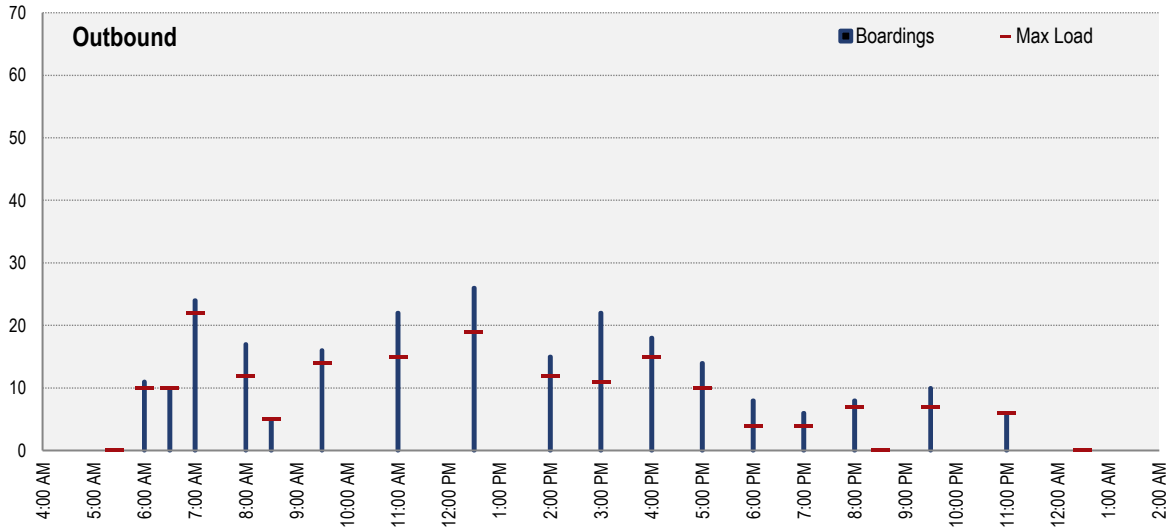
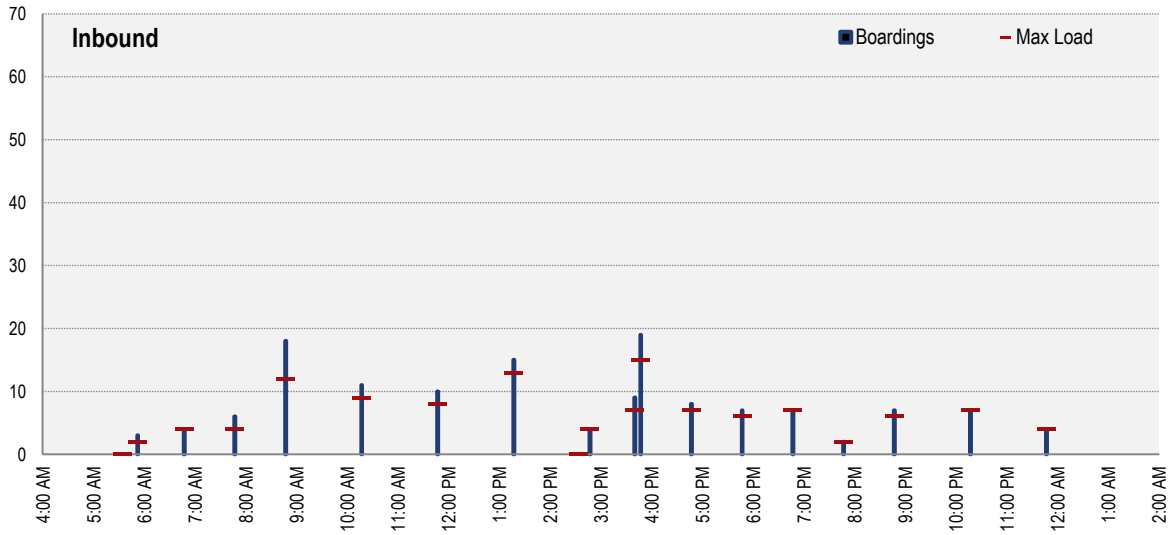


FIGURE 16 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Route 512 carries an average of 13.1 passengers per trip on Saturdays. Similar to weekday ridership patterns, demand is higher in the outbound direction, with six trips carrying 20 passengers or more (Figure 17). Over half of inbound trips on Saturday carry 10 or more passengers per trip, although only two trips carry 20 passengers or more (Figure 18). Evening and nighttime ridership in both the outbound and inbound directions is higher than on weekdays, with multiple trips carrying double-digit passenger loads. Outbound ridership peaks between noon and 2:00 PM; inbound ridership is highest just before 6:00 PM.

FIGURE 17 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

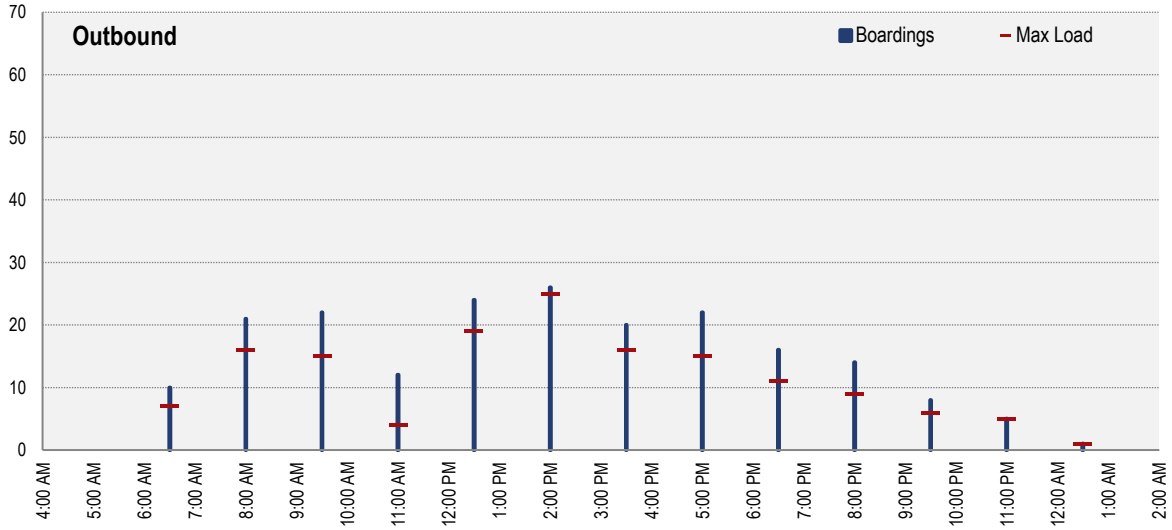
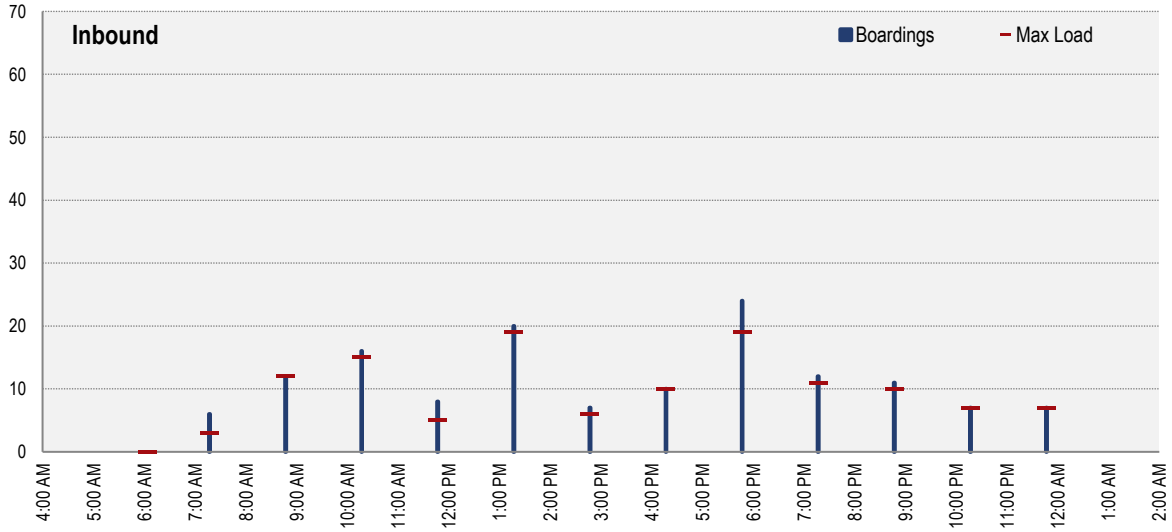


FIGURE 18 | SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

Route 512 carries an average of 9.0 passengers per trip on Sundays. Overall, ridership is higher traveling outbound, with two trips carrying more than 20 passengers; inbound, three trips carry 10 passengers or more (Figure 19 and Figure 20). Ridership is highest on both directions between 2:00 and 4:30 PM: outbound ridership peaks at 2:00 PM, carrying 29 passengers, and inbound trips peak at 21 passengers around 4:15 PM. However, service on Route 512 is irregular on Sundays; high midday passenger volumes could indicate the need for additional trips.

FIGURE 19 | SUNDAY OUTBOUND RIDERSHIP BY TRIP

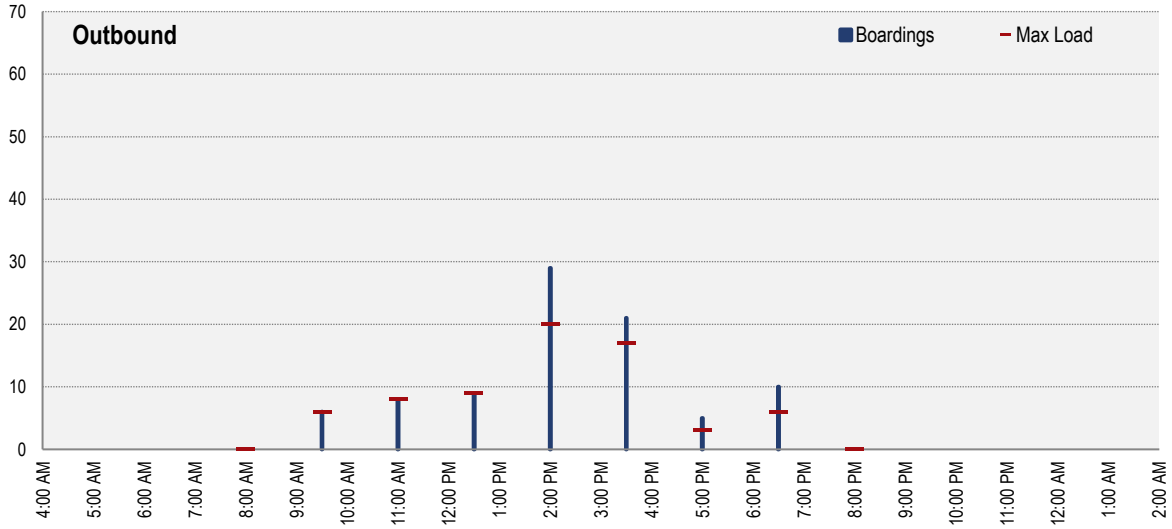
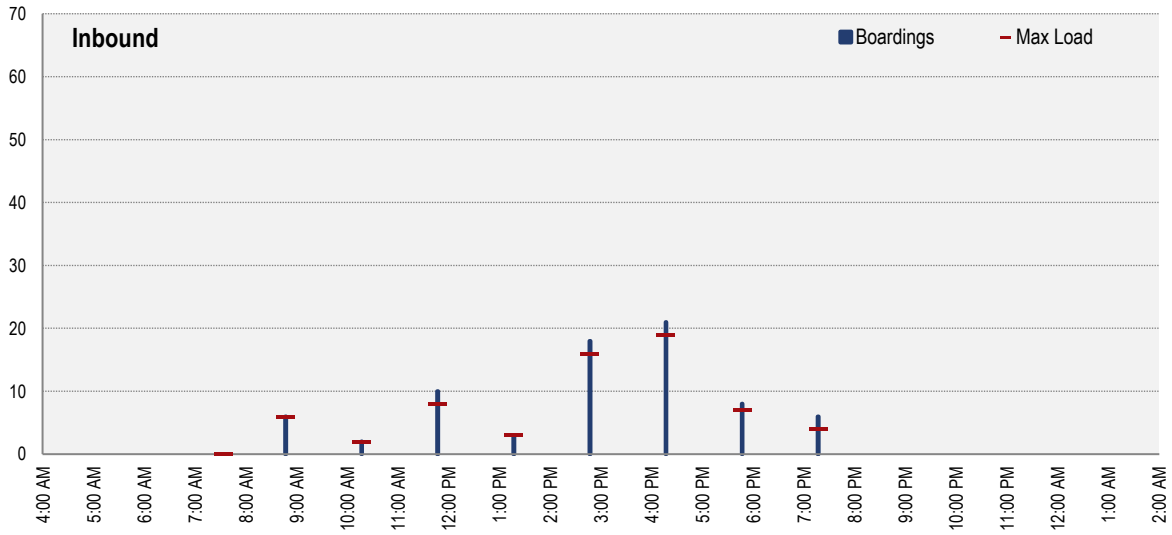


FIGURE 20 | SUNDAY INBOUND RIDERSHIP BY TRIP



Productivity

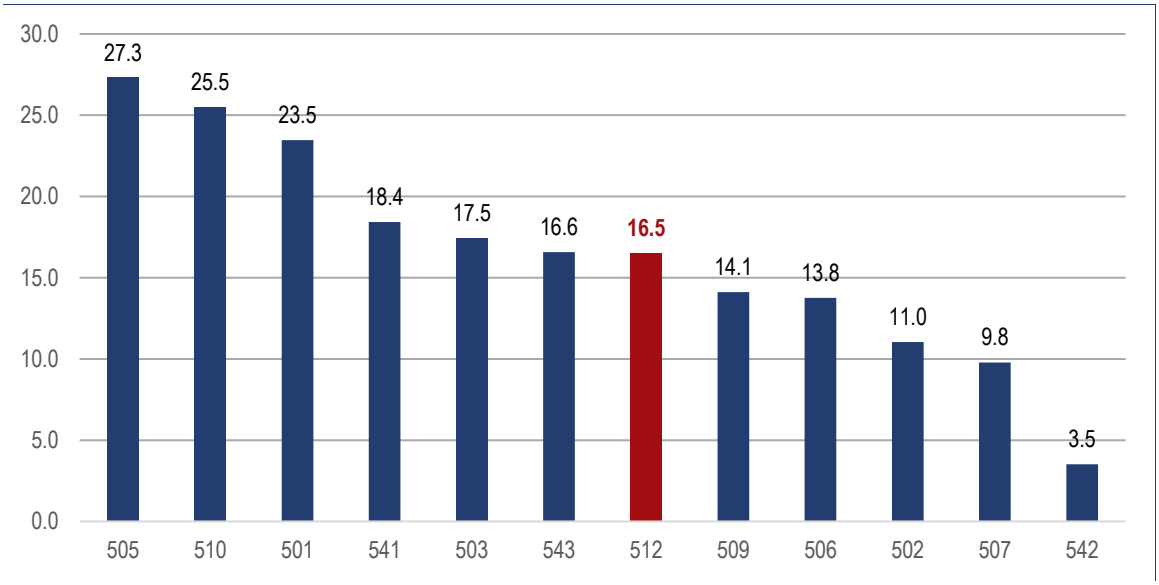
Route 512 performs similarly to the New Britain/Bristol Division average for passengers per revenue hour on weekdays, and is significantly more productive than average on Saturday and Sunday (Figure 21). The route carries an average of 16.5 riders per hour on weekdays, ranking seventh among New Britain/Bristol Division routes. Route 512 ranks second in riders per hour on Saturdays, and second in riders per hour on Sundays.

FIGURE 21 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 512	DIVISION AVG	ROUTE 512	DIVISION AVG	ROUTE 512	DIVISION AVG
Passengers per Vehicle Revenue Hour	16.5	16.5	20.7	13.1	14.5	10.4

*Source: CT**transit** performance data*

FIGURE 22 | PASSENGERS PER VEHICLE REVENUE HOUR



ON-TIME PERFORMANCE

On weekdays, approximately 58% of Route 512 time points were served "on-time" during the survey period (Figure 23). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Weekday on-time performance was effected by early departures, which occurred 26% of the time while the remaining 16% of time points were late. On Saturdays, approximately 63% of Route 512 time points were served "on-time" during the survey period, with 29% of time points served earlier than scheduled and the remaining 8% of time points were late. On Sundays, approximately 58% of time points were served "on-time," and 26% of time points are served early and the remaining 16% of time points were served late.

FIGURE 23 | ON-TIME PERFORMANCE

PERFORMANCE	WEEKDAY	SATURDAY	SUNDAY
Early	26%	29%	26%
Late	16%	8%	16%
On-Time	58%	63%	58%

Source: CTtransit performance data

SERVICE IMPROVEMENT

Route 512 is a radial route that serves Main Street in New Britain and connects to Berlin, Newington, and Cromwell. It carries the fourth-highest weekday ridership in the Division, and performs fairly well in terms of ridership per trip. Route productivity in terms of ridership per hour is just below average, however, likely due to the route's long alignment. Although the route operates in both directions along each corridor it serves, the alignment functions as a large one-way loop, which forces passengers to travel the entire length of the route to complete a round trip if they begin or end their trip past Main Street in New Britain. Despite this service design, the "terminal" points at the end of the two branches provide strong anchors with shopping and retail employment.

Service Improvement Options

Opportunities to strengthen Route 512 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Reconfigure Route 512 to eliminate one-way travel and make service more direct.** The route currently operates similarly to a large one-way loop. Riders must travel the entire length of the route to complete a round trip, which is particularly burdensome given the long distance that the route covers. With the high ridership at the "terminal" points (Walmart Supercenter in Cromwell and Price Chopper/Dick's in Newington), service along both of these branches should be maintained. Strategies to provide more direct and convenient service include:
  - **Operate two separate branches with direct service.** One strategy for providing more direct service to both of these destinations is to operate 512 as one route with two branches that are served on alternate trips. Both variants would serve Main Street in New Britain and Webster Square, and then would provide direct service to and from either the Walmart Supercenter in Cromwell or the Price Chopper in Newington.
  - **Combine the Berlin Turnpike branch with another route.** The branch that terminates at Price Chopper may be combined with another route or developed into a new route. Route 512 would still operate along Main Street, Farmington Avenue, and Mill Street to the Walmart Supercenter. The other route would continue to serve Price Chopper, a strong anchor, without operating redundant service on Main Street. One option to implement this is to combine some or all of the Berlin Turnpike branch with a reconfigured Route 510, providing riders on this route with a more direct connection to shopping and employment to the east.
- **Operate and brand trips to Norpaco Foods as a different kind of service.** Route 512 runs two trips per day to Norpaco Foods (one outbound in the morning, one inbound in the afternoon). These trips run directly from downtown New Britain to Norpaco Foods along Route 9 with no stops in between. By operating limited trips to a single employer along a unique alignment, this variant provides a fundamentally different service from the rest of Route 512, and

may lead to confusion among riders about where Route 512 can take them and when. These trips should be operated and presented as a different route or type of service.

Route Evaluation

BRISTOL LOCAL

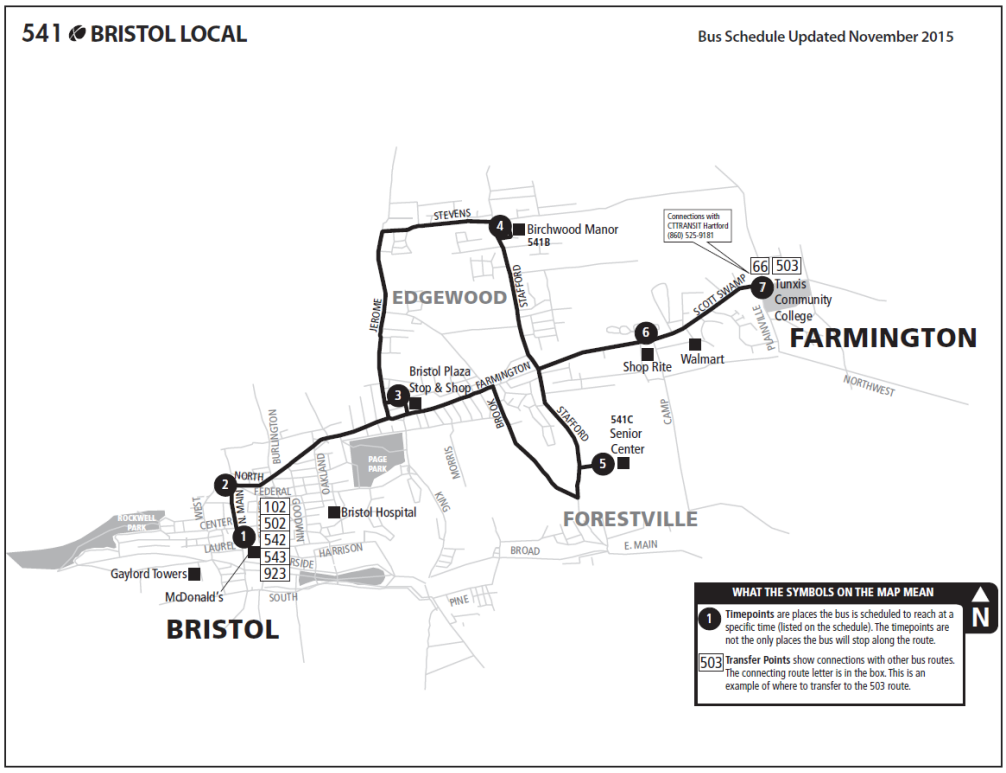
541B | Bristol Local via Birchwood Manor

541C | Bristol Local via Senior Center

Service Design

Route 541 provides service between the Bristol City Hall and Tunxis Community College in Farmington, serving several shopping areas and social services. The route operates primarily on North Main Street, North Street, and Farmington Avenue. Service alternates between two variants, one to serve Edgewood and Birchwood Manor (541B), and the other to serve Forestville and the Bristol Senior Center (541C). Both variants rejoin on Farmington Avenue at Stafford Street, operating on Scott Swamp Avenue until Tunxis Community College.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 541 begins/ends in central Bristol, where riders can transfer to several other CT***transit*** services, including express service to Hartford and New Britain. Tunxis Community College also offers transfer opportunities to New Britain and Farmington (see Figure 2). All trips are interlined with Route 503 at Tunxis Community College, providing a one-seat ride to downtown New Britain.

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 66	Hartford via Farmington Avenue
Route 102	Hartford, New Britain via *CT**fastrak***
Route 502	New Britain via Black Rock Avenue
Route 503	New Britain via Corbin Avenue (interlined)
Route 542	Bristol Hospital
Route 543	Gaylord Towers
Route 923	Hartford via *CT**fastrak*** (express)

Alignments and Service Patterns

Route 541 travels outbound from Bristol City Hall, located at Laurel Street and North Main. Service operates on North Main, turns right on North Street, and pulls into the Bristol Plaza Shopping Center, serving the Stop & Shop. Service then alternates between two variants. The 541B variant operates on Jerome Avenue, and right on Stevens Street, right on Birchwood Drive to serve Birchwood Manor, and then left on Stafford Avenue to connect back to Farmington Road. The 541C variant continues from Bristol Plaza Shopping Center on Farmington Street, turning right on Brook Street, and then left on Stafford Avenue to return north. This variant also deviates via Charles Street to serve the Bristol Senior Center. Both variants rejoin a common alignment at Farmington Avenue and Stafford Avenue, operating on Scott Swamp Avenue until the terminus at Tunxis Community College.

Inbound service back to Bristol follows the same alignment. Service also alternates between the two variants, providing bidirectional service on both 541B and 541C.

Service Schedule

Route 541 operates seven days per week. There are 17 outbound trips per weekday and 18 inbound trips. Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM. Along the common segments, service operates every 60 minutes during the peak periods and the midday. During the late evening, frequency drops to every 90 minutes. As Route 541 alternates between two variants, each variant has service every 120 minutes.

During the weekends, there are 16 outbound and 17 inbound trips. Service operates every 60 minutes throughout the day except for in the late evening when service decreases to every 90 minutes. Like during weekdays, service alternates between the two variants, and thus each variant has service every 120 minutes.

FIGURE 3 | SCHEDULE OVERVIEW (ROUTE 541)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (OUTBOUND/INBOUND)
Weekday	5:40 AM – 12:13 AM	60 / 60	17/18
Saturday	6:40 AM – 12:08 AM	60	16/17
Sunday	6:40 AM – 12:08 AM	60	16/17

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

Route 541 carries 310 daily passengers or 8.9 passengers per trip on an average weekday, which is slightly higher than the New Britain/Bristol Division average of 7.5 weekday passengers per trip.

Saturday ridership per trip is also relatively high compared to the division average, and Sunday ridership falls exactly on the division average (see Figure 4).

FIGURE 4 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 541	ROUTE 541	DIVISION AVG
Weekday	310	8.9	7.5
Saturday	249	7.5	5.8
Sunday	108	4.2	4.2

*Source: CT**transit** performance data*

Ridership by Stop

The most heavily used stops on Route 541 are at North Main Street at Bristol City Hall and Main Street and Laurel Street in Bristol, and the route's terminus at Tunxis Community College. Other than the ends of the line, there is only one stop that generates 30 or more boardings or alightings per day (see Figure 5 and Figure 6).

FIGURE 5 | ROUTE 541 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (WEEKDAY INBOUND)

BUS STOP	RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Tunxis Community College / Plainville Avenue	54 / 0	Tunxis Community College
Stop and Shop / Columbus Ave	39 / 9	Bristol Plaza (Super Stop and Shop and other retail)
N Main St / Laurel Street	0 / 74	Downtown Bristol, Bristol City Hall

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 541 shows high weekday outbound passenger loads as the route begins in

downtown Bristol with little activity inbetween until the line terminates at Tunxis Community College. A similar pattern is seen for weekday inbound, with most activity at the ends except for at Bristol Plaza. Ridership by stop without the cumulative load is mapped in Figure 7.

The load profiles shown below are not continuous because some stops are served by all variants, while others are served by individual variants or a combination of route variants. Each variant is labeled accordingly in Figure 6 and similar charts below.

FIGURE 6 | WEEKDAY OUTBOUND RIDERSHIP BY STOP GRAPH

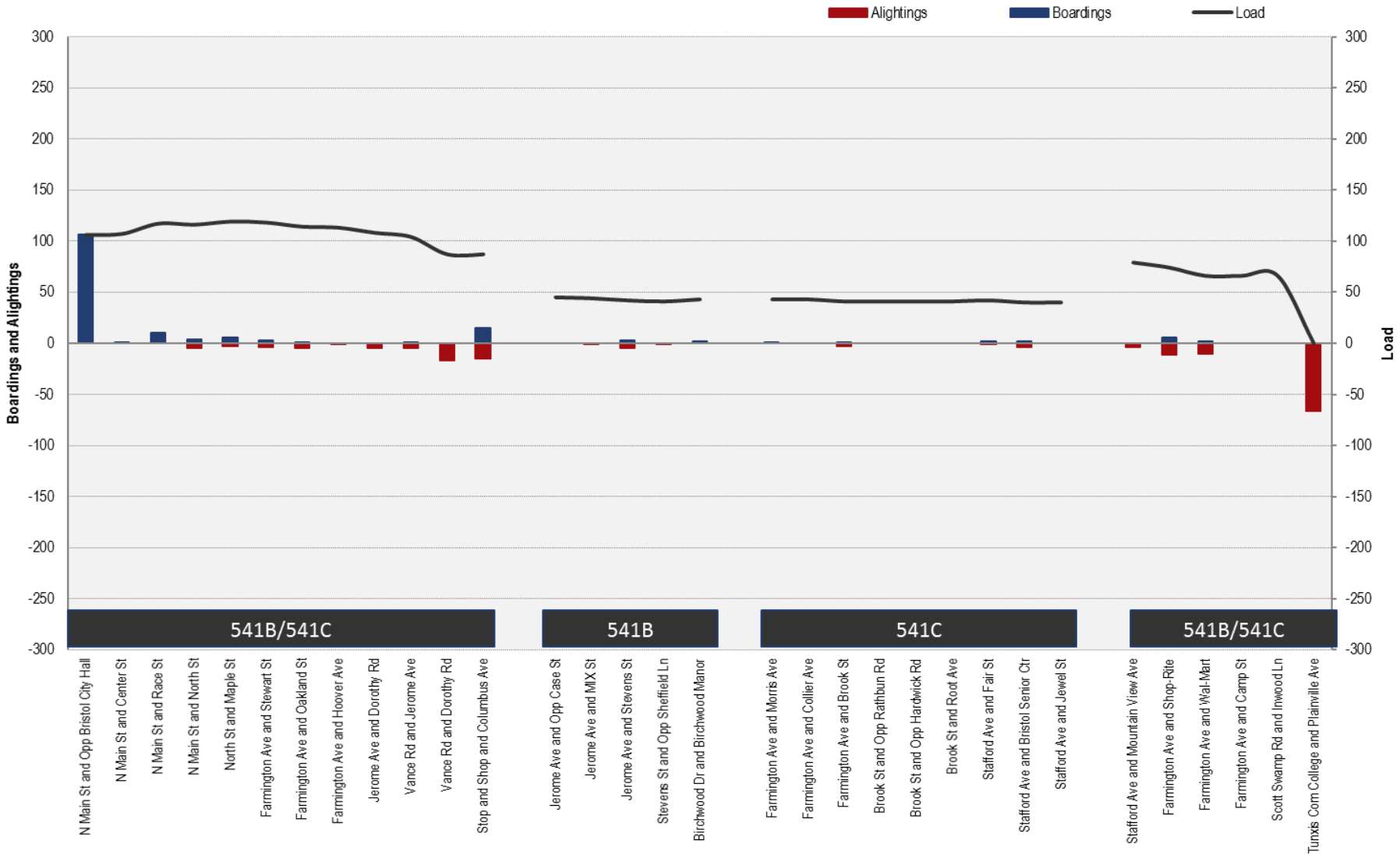


FIGURE 7 | WEEKDAY OUTBOUND RIDERSHIP BY STOP MAP

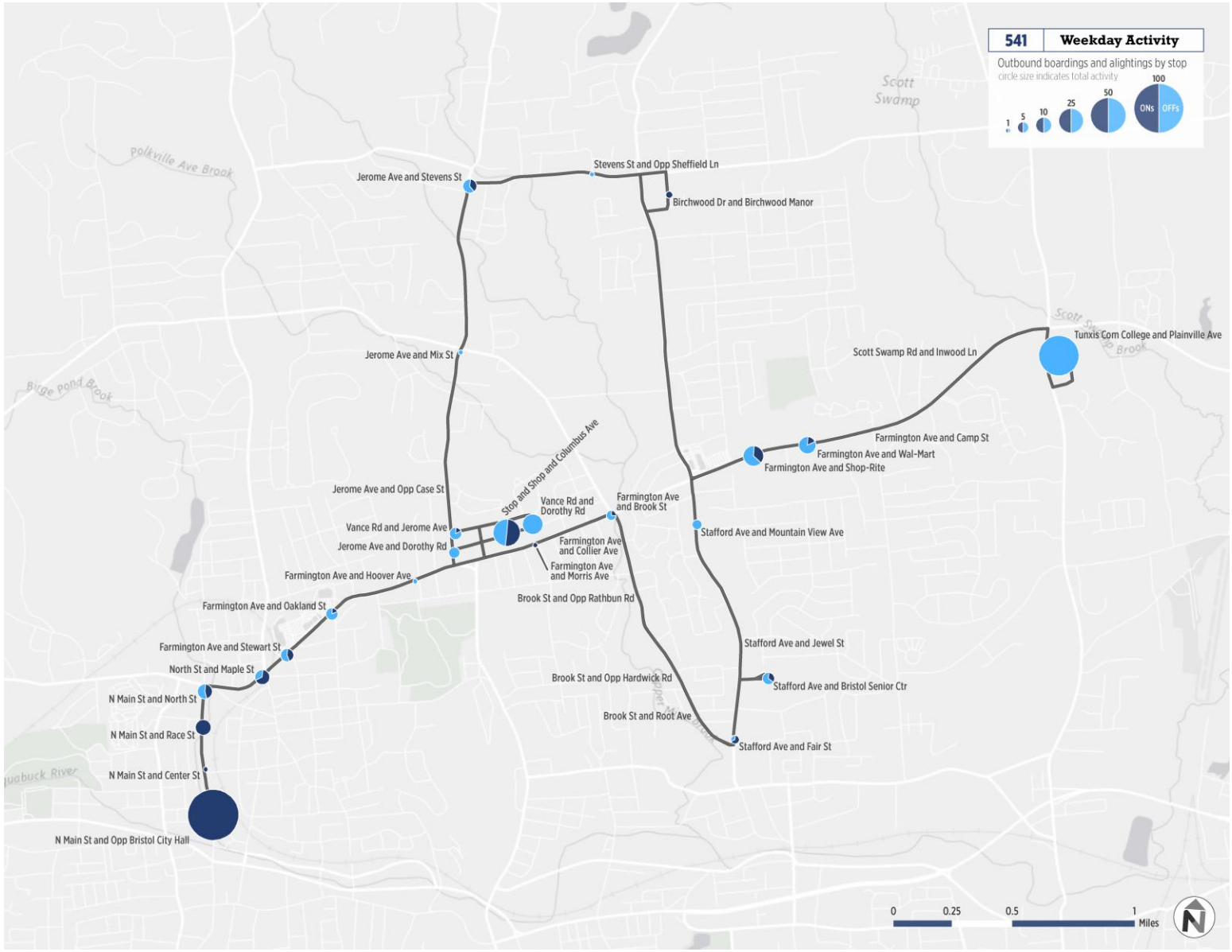


FIGURE 8 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

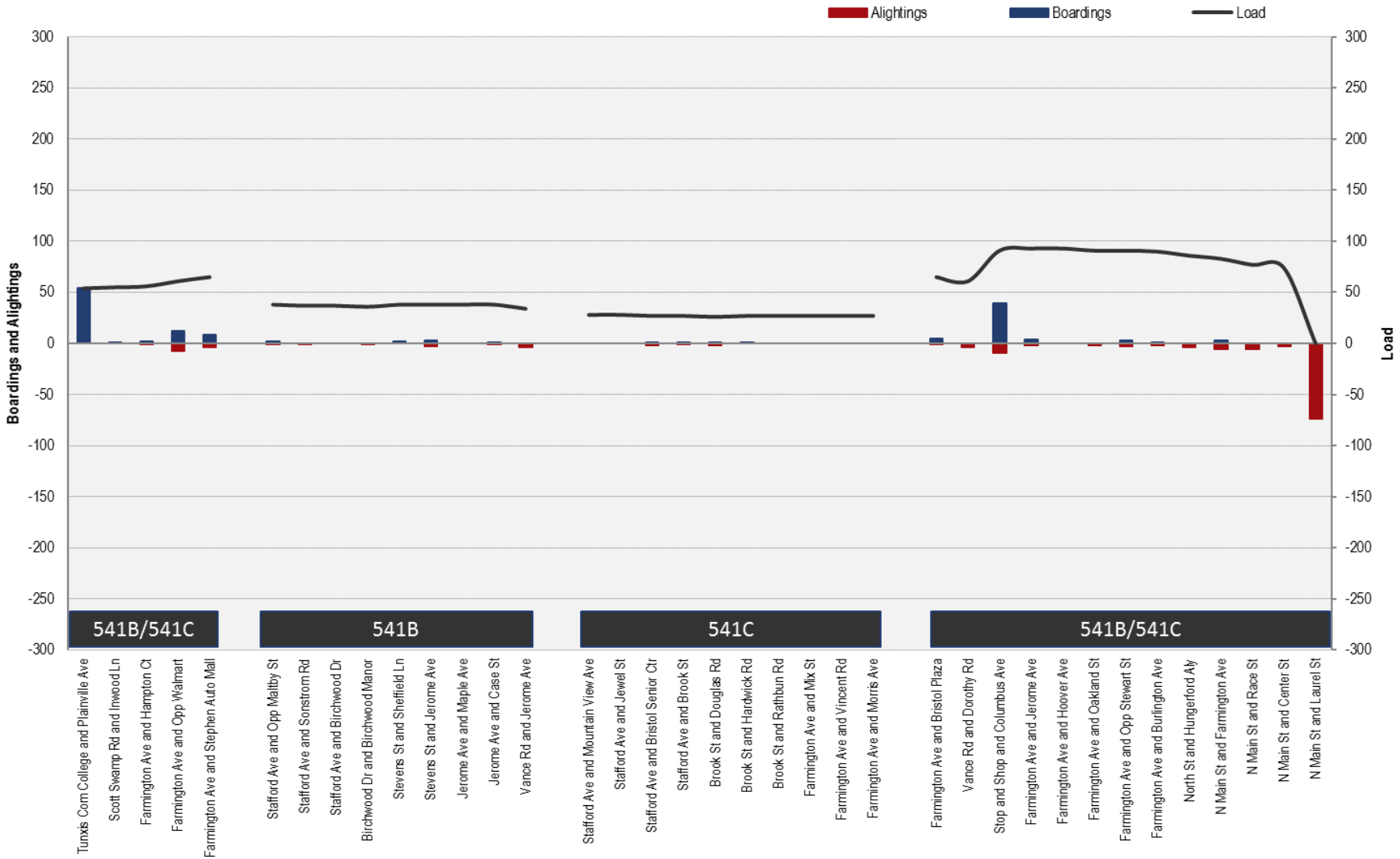


FIGURE 9 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

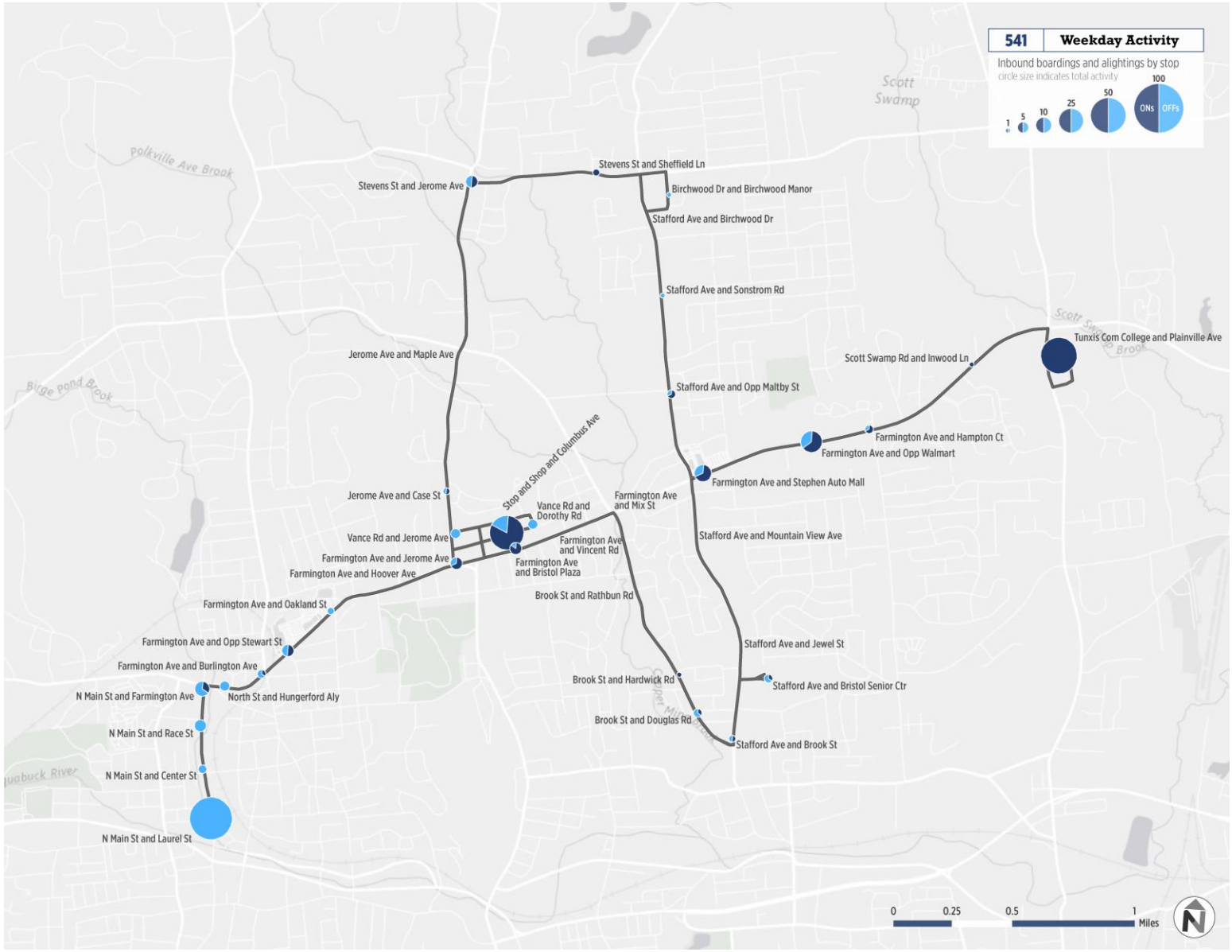


FIGURE 10 | SATURDAY OUTBOUND RIDERSHIP BY STOP GRAPH

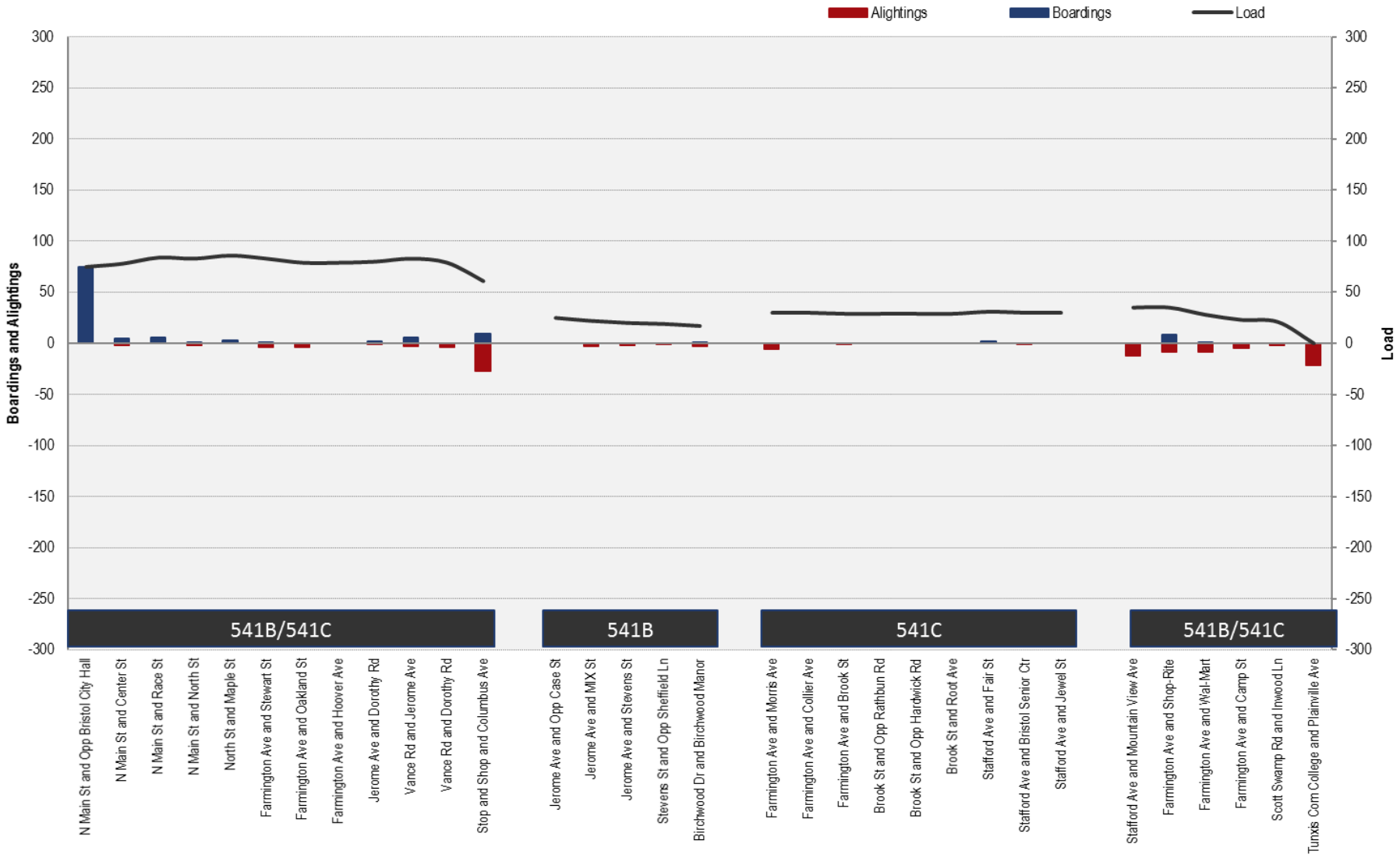


FIGURE 11 | SATURDAY OUTBOUND RIDERSHIP BY STOP MAP

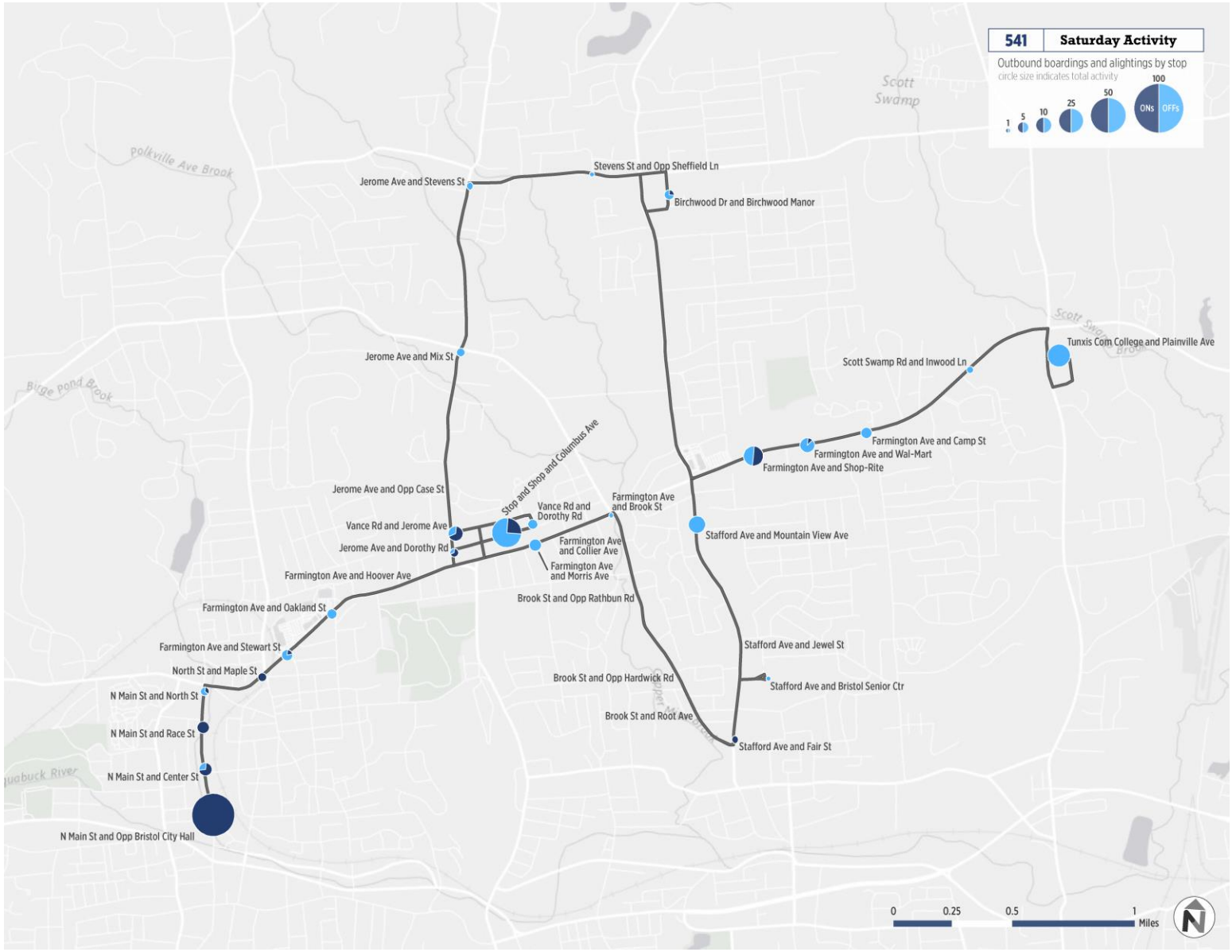


FIGURE 12 | SATURDAY INBOUND RIDERSHIP BY STOP GRAPH

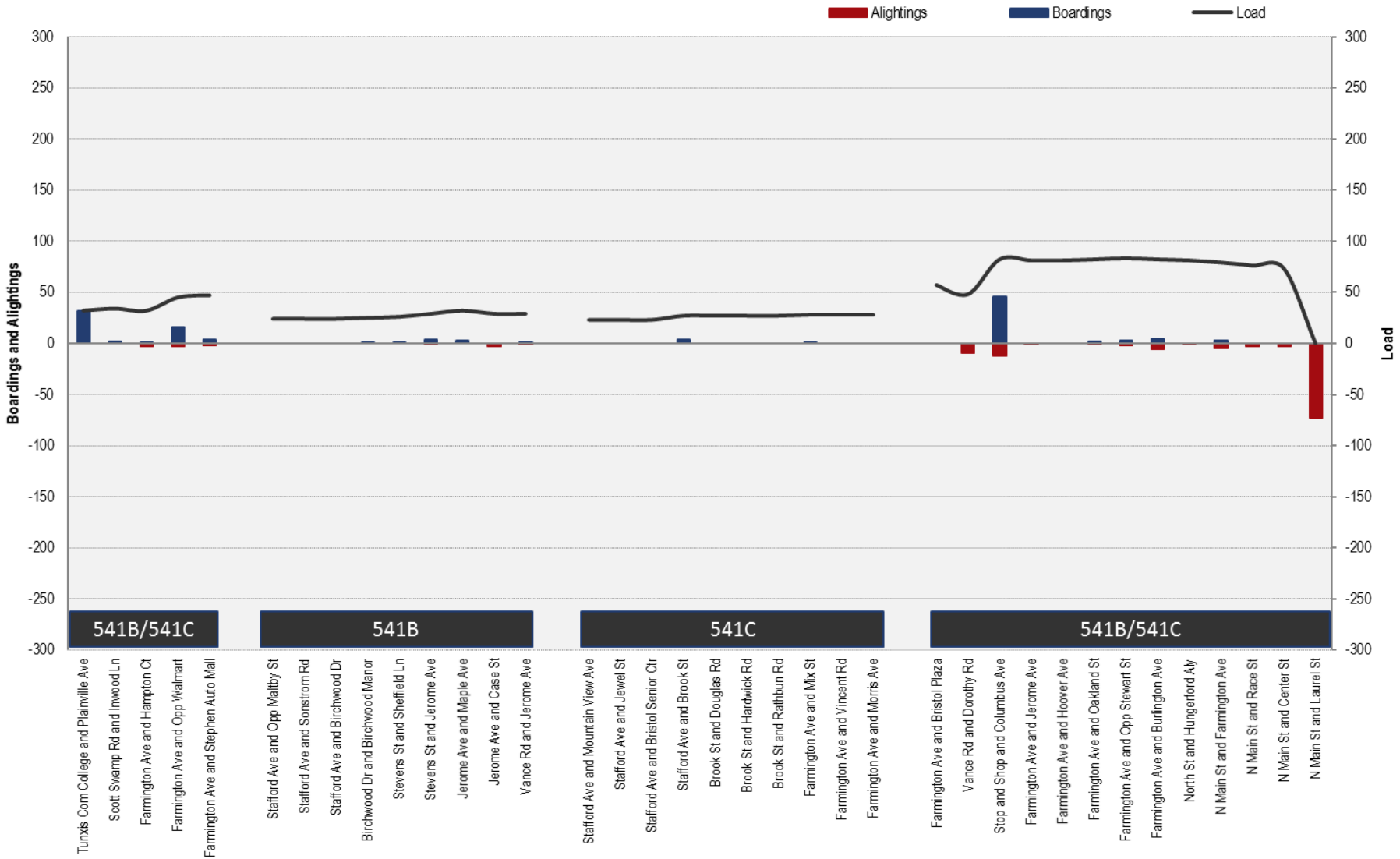


FIGURE 13 | SATURDAY INBOUND RIDERSHIP BY STOP MAP

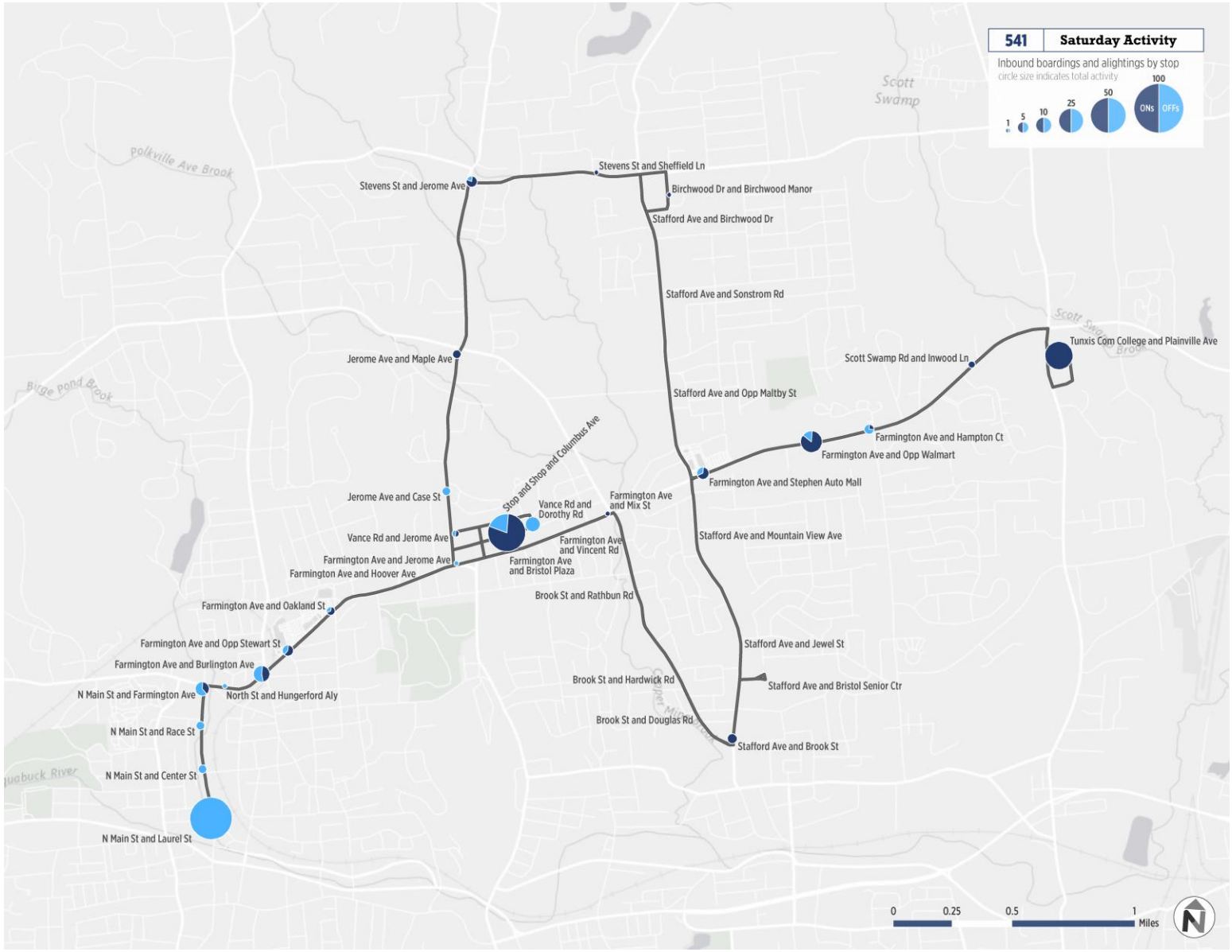


FIGURE 14 | SUNDAY OUTBOUND RIDERSHIP BY STOP GRAPH

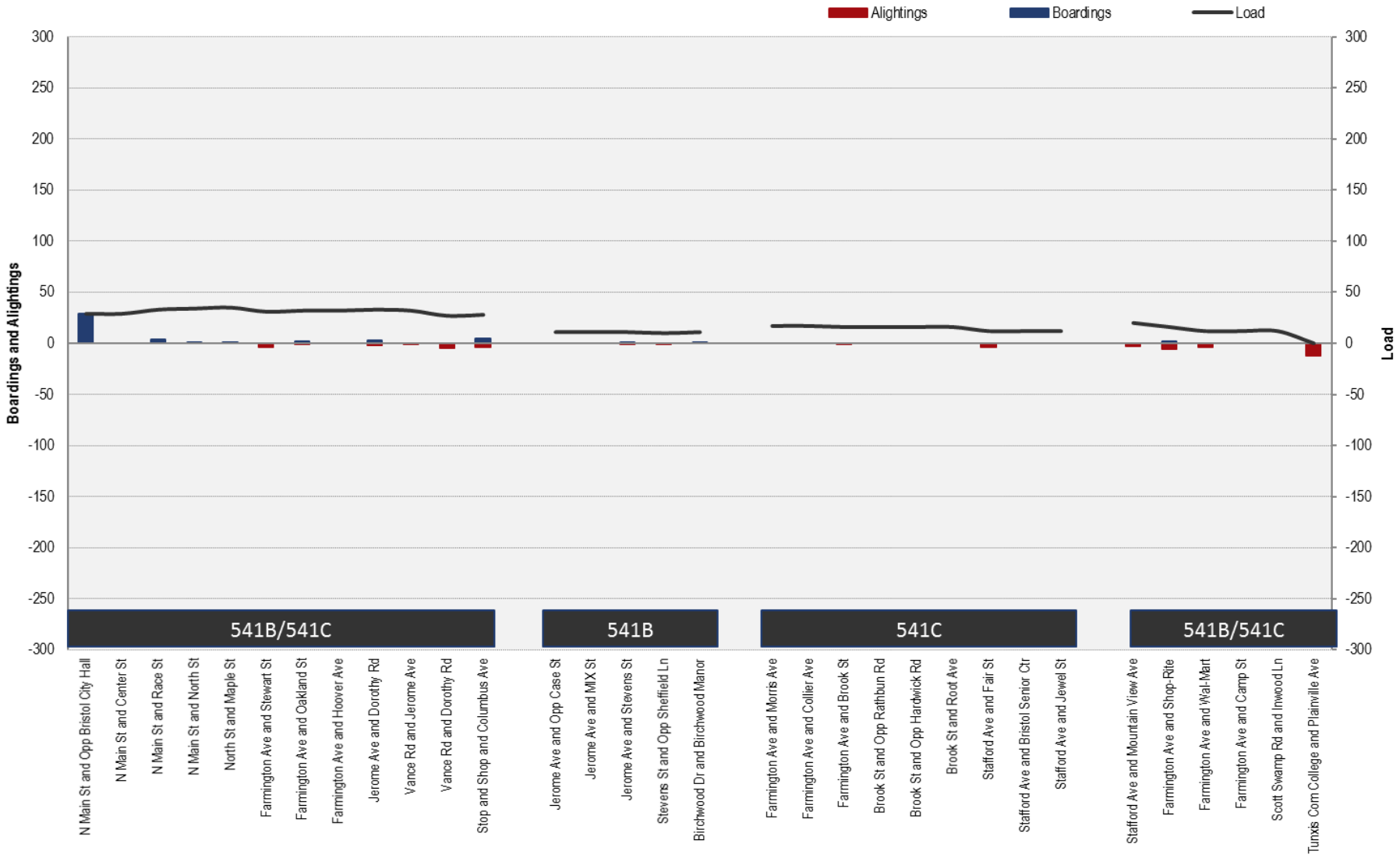


FIGURE 15 | SUNDAY OUTBOUND RIDERSHIP BY STOP MAP

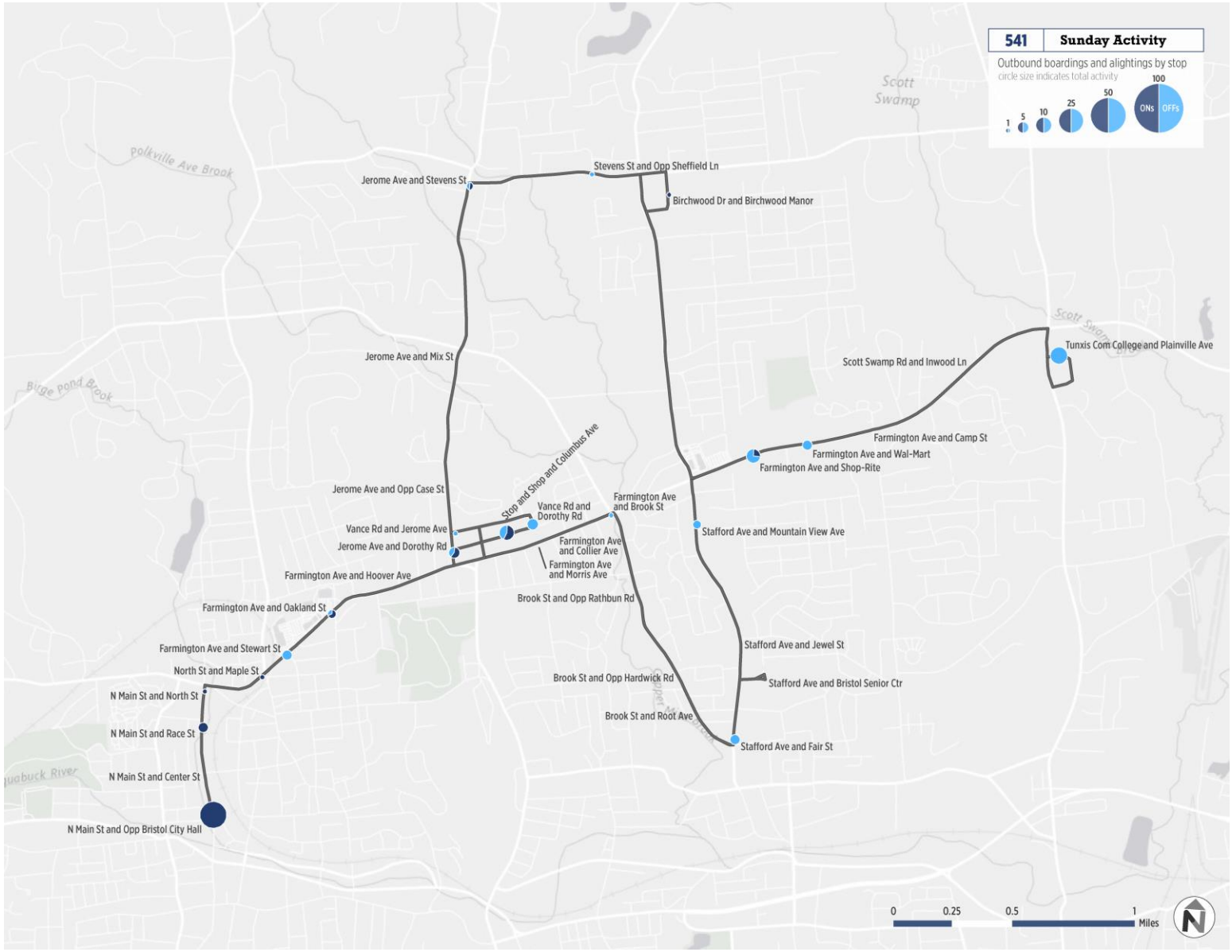


FIGURE 16 | SUNDAY INBOUND RIDERSHIP BY STOP GRAPH

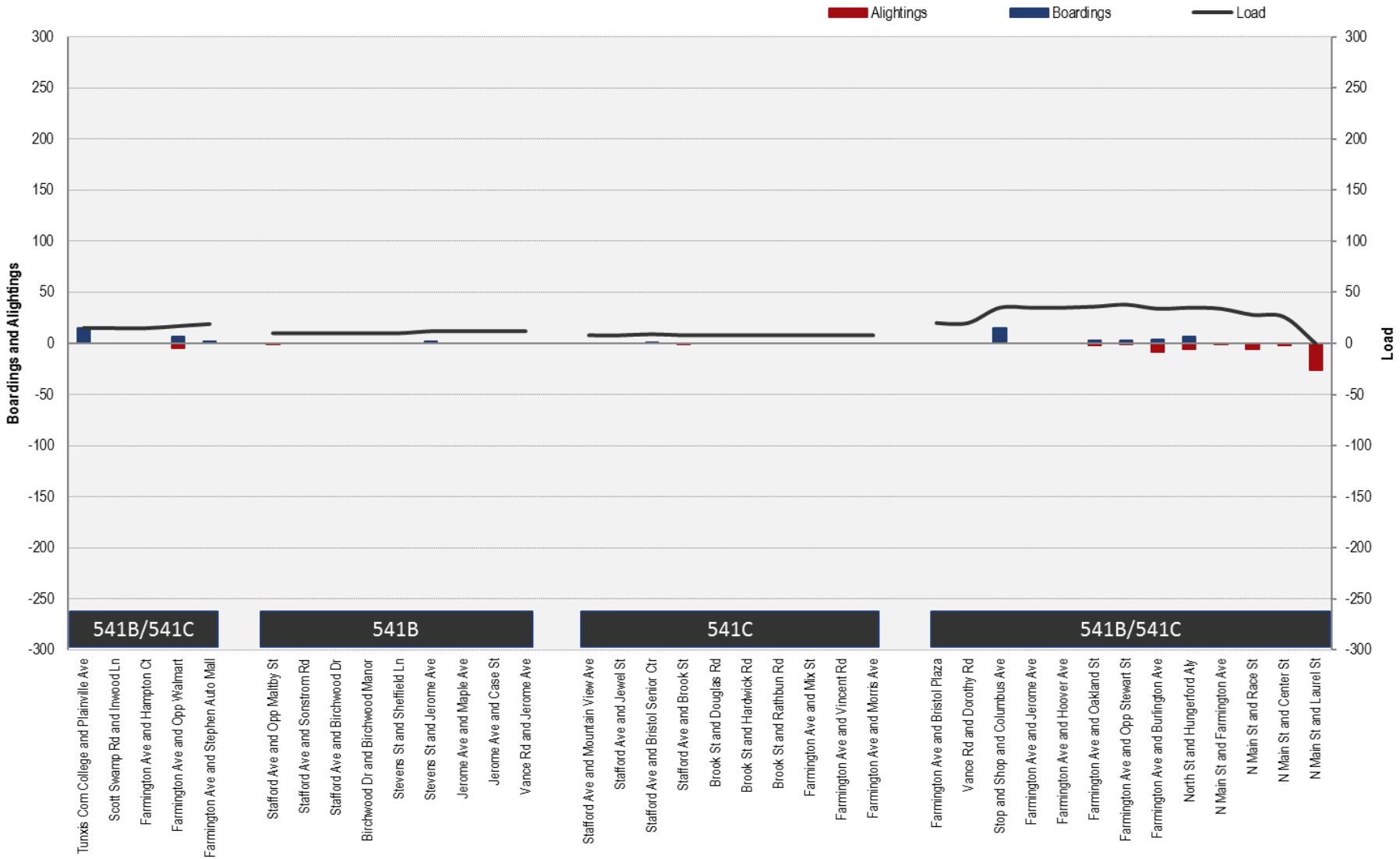
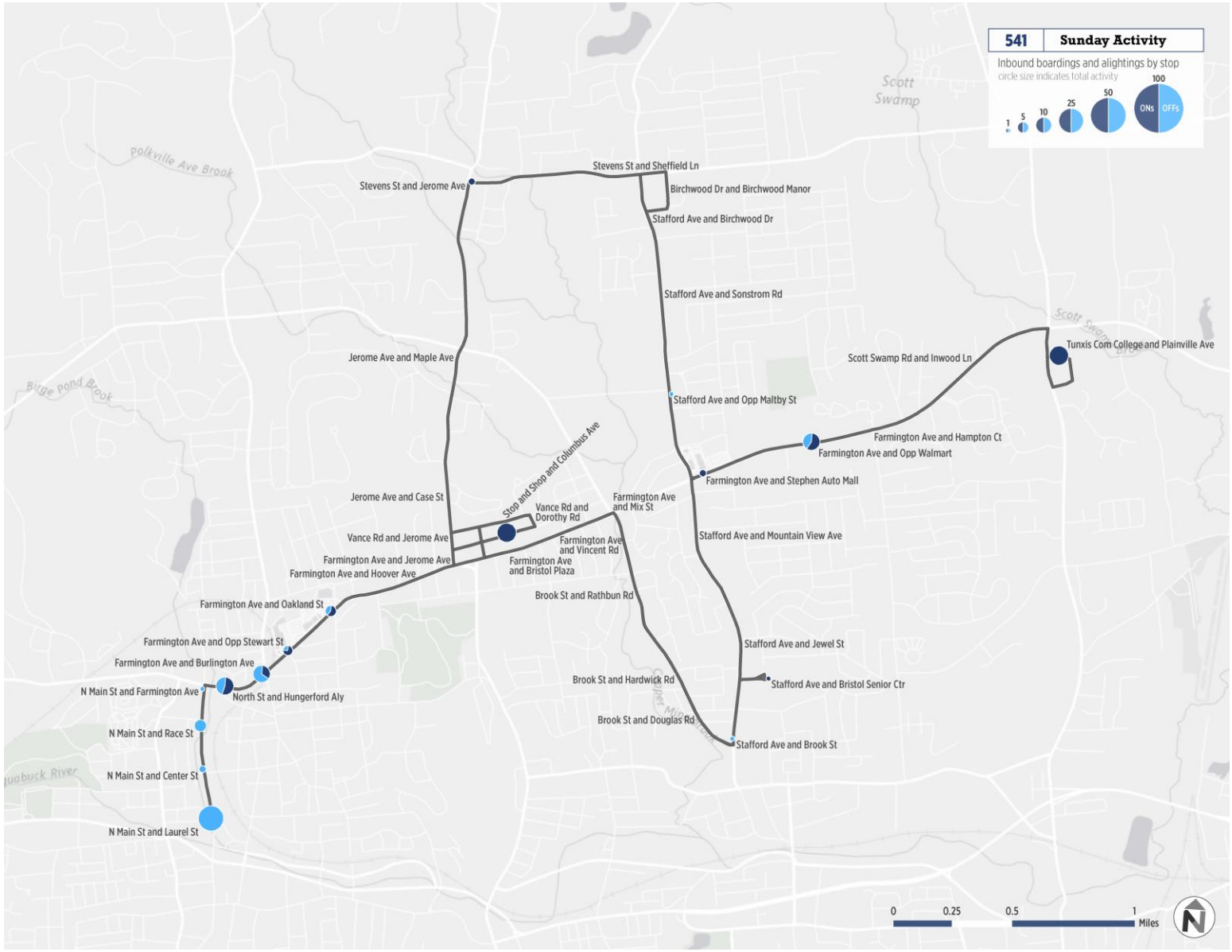


FIGURE 17 | SUNDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Route 541 carries an average of 8.9 passengers per trip on weekdays. Demand is slightly higher in the outbound direction, however only one trip for both inbound and outbound exceeds 20 passengers (Figure 18 and Figure 19). Outbound ridership has a small peak before 8:00 AM, and both outbound and inbound trips peak during midday, with the outbound peak prolonged until approximately 5:00 PM. Constant activity throughout the day suggests Route 541 serves multiple trip types and users.

Total boardings or maximum loads never exceed 40 passengers, which is the typical seating capacity of a 40-foot transit bus.

FIGURE 18 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

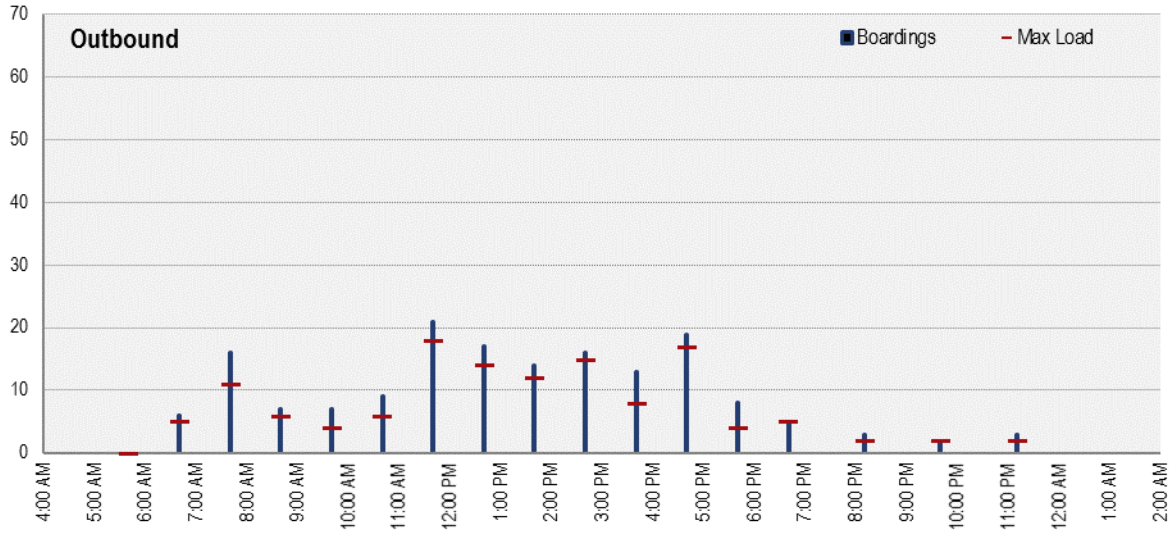
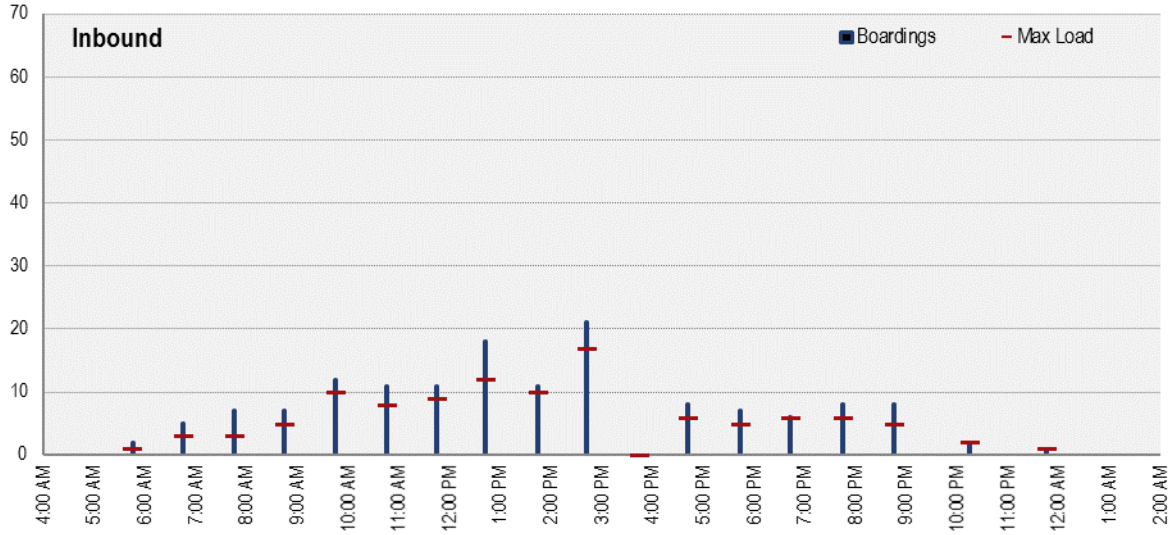


FIGURE 19 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Route 541 carries an average of 7.5 passengers per trip on Saturdays. Outbound and inbound ridership is approximately equivalent, with inbound trips more frequently exceeding 10 passengers (Figure 20 and Figure 21). Demand is relatively higher in the morning and afternoon for outbound trips than the evening, while inbound demand is fairly higher in the afternoon and evening.

FIGURE 20 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

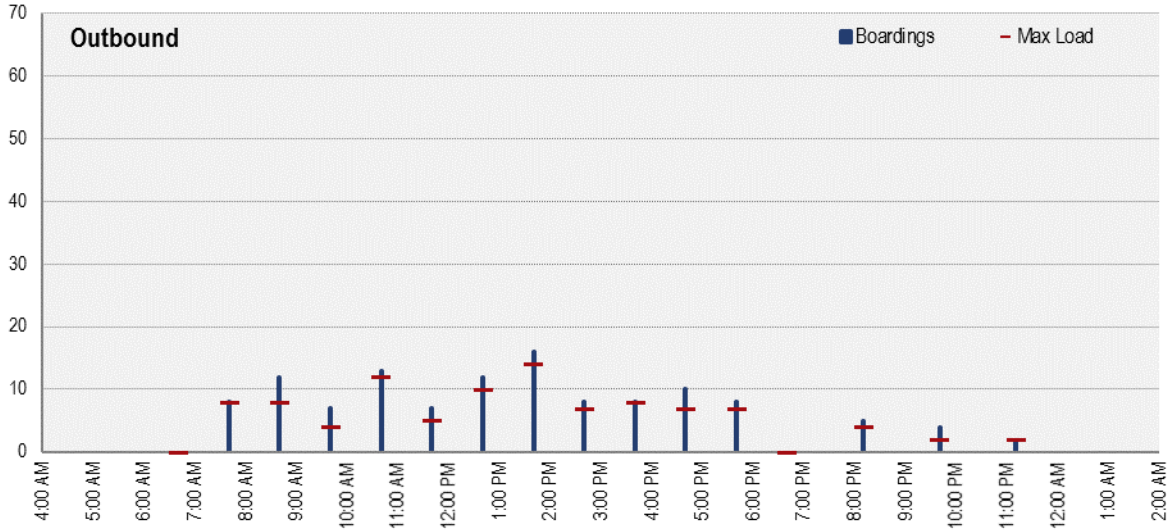
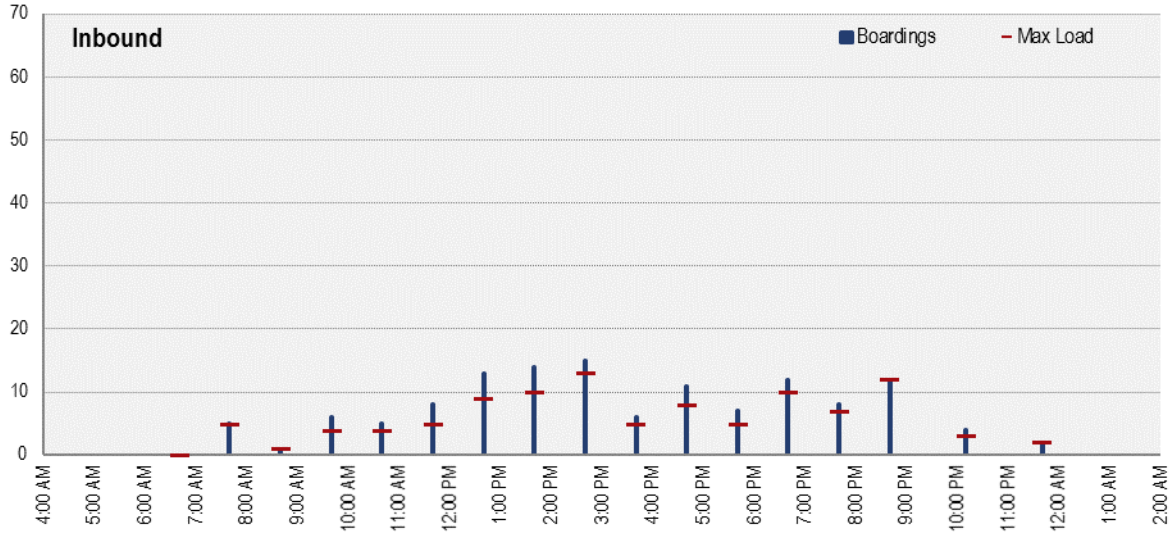


FIGURE 21 | SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

Route 541 carries an average of 4.2 passengers per trip on Sundays. Although there is a slight peak in the late afternoon for inbound trips, both outbound and inbound trips never exceed 10 passengers (See Figure 19 and Figure 20). There are no passengers after 8:00 PM for either direction.

FIGURE 22 | SUNDAY OUTBOUND RIDERSHIP BY TRIP

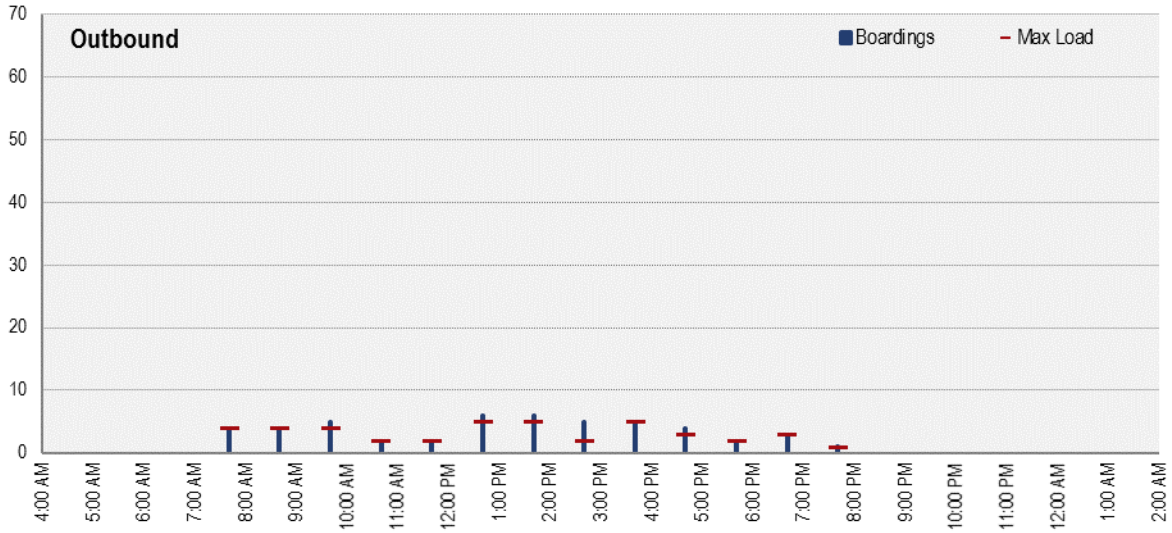
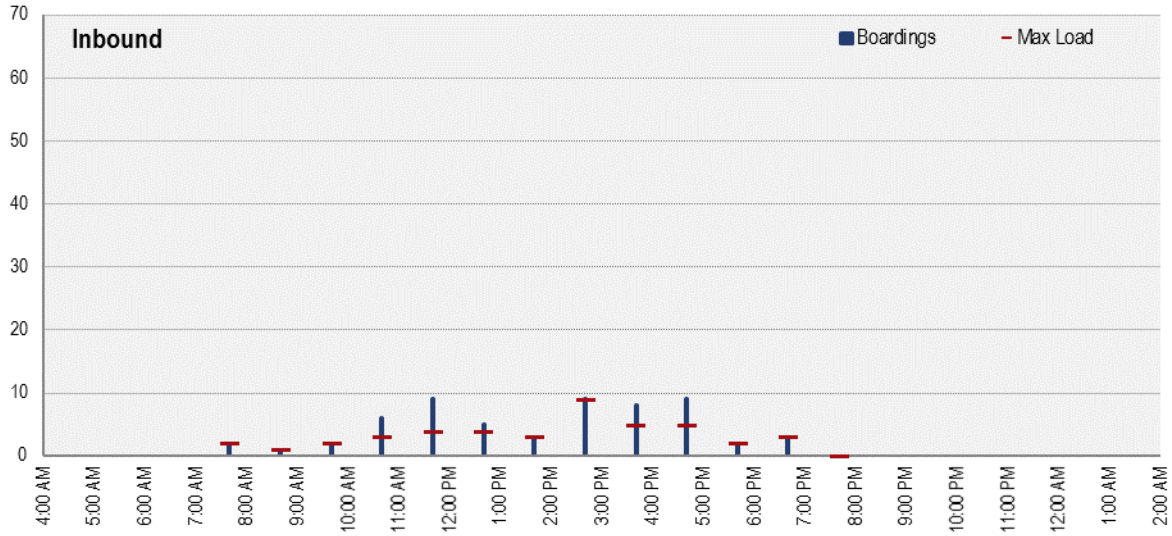


FIGURE 23 | SUNDAY INBOUND RIDERSHIP BY TRIP



Productivity

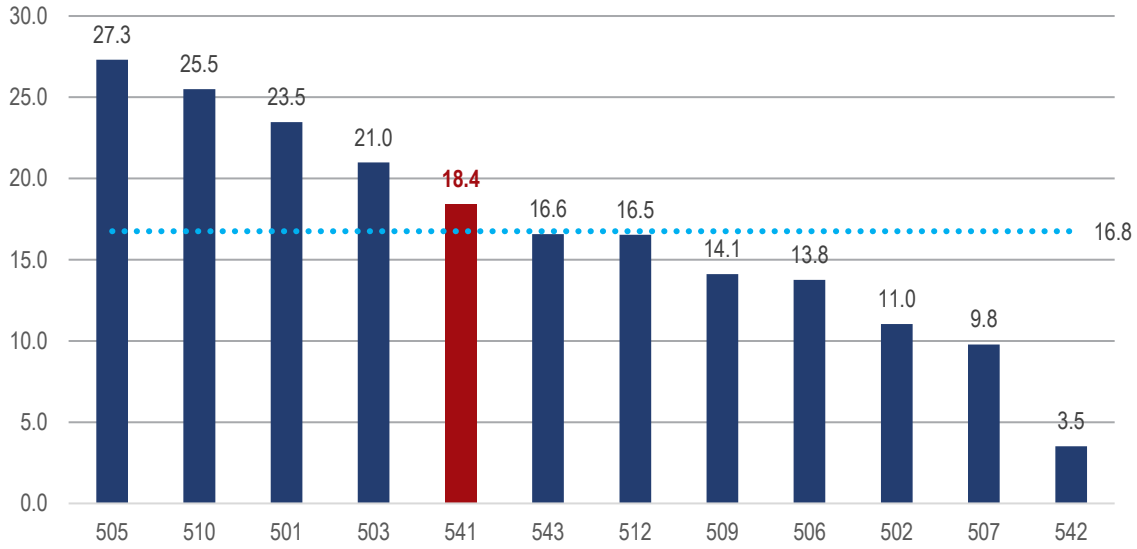
Route 541 performs slightly higher than the New Britain/Bristol Division average for passengers per revenue hour on all service days (see Figure 24). The route carries an average of 18.4 riders per hour on weekdays, ranking fourth among New Britain/Bristol Division routes. Route 541 also ranks fifth in riders per hour on Saturdays, and ranks eighth in riders per hour on Sundays.

FIGURE 24 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 541	DIVISION AVG	ROUTE 541	DIVISION AVG	ROUTE 541	DIVISION AVG
Passengers per Vehicle Revenue Hour	18.4	16.8	16.0	13.1	8.8	10.4

Source: CTtransit performance data

FIGURE 25 | PASSENGERS PER VEHICLE REVENUE HOUR



ON-TIME PERFORMANCE

On weekdays, approximately 52% of Route 541 time points were served "on-time" during the survey period (Figure 26). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Weekday on-time performance was effected by late departures, which occurred 29% of the time while the remaining 19% of time points were early. On Saturdays, approximately 67% of Route 541 time points were served "on-time" during the survey period, with 19% of time points served earlier than scheduled and the remaining 14% of time points were late. On Sundays, approximately 63% of time points were served "on-time," and 16% of time points are served early and the remaining 21% of time points were served late.

FIGURE 26 | ON-TIME PERFORMANCE

PERFORMANCE	WEEKDAY	SATURDAY	SUNDAY
Early	19%	19%	16%
Late	29%	14%	21%
On-Time	52%	67%	63%

Source: CTtransit performance data

SERVICE IMPROVEMENT

Route 541 is a fairly productive route, carrying just above average ridership per trip and ridership per hour compared to the rest of the New Britain/Bristol Division. Total daily ridership is fairly high, with the route carrying the sixth highest daily ridership in the division on weekdays and the fifth highest on Saturdays and Sundays. The route has strong anchors at either end, originating in downtown Bristol and terminating at Tunxis Community College, where riders can continue on to New Britain (Route 541 interlines with Route 503 Corbin Avenue) or transfer to Route 66 with service to Hartford via Farmington Avenue. In addition to the ends of the route, several retail locations generate higher ridership, including Bristol Plaza shopping center and Shop Rite.

Route 541 serves several shopping centers and other retail along the Farmington Avenue corridor, which generate most of the riders along the route. The route operates with two variants, each operating primarily along Farmington Avenue with deviations to serve either Edgewood and Birchwood Manor (541B) or Forestville and the Bristol Senior Center (541C). These variants operate on alternating trips in both directions. As a result, stops along these deviations receive bidirectional service that operates every two hours (half of Route 541's frequency along Farmington Avenue). Both deviations off of Farmington Avenue generate very few riders, yet each deviation adds at least two miles of travel to a one-way trip. However, given the street network and development pattern in the area, there are few alternative routing options that would provide more direct service and better connections while maintaining the coverage that exists today, posing a significant challenge to improving service.

Service Improvement Options

Opportunities to strengthen Route 541 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Make service simpler and more direct by eliminating deviations to Birchwood Manor and the Bristol Senior Center.** The shopping centers and other retail along the Farmington Avenue corridor generate most of the ridership along Route 541, while the deviations off of Farmington Avenue on both 541B and 541C generate very few riders, despite adding at least two miles of travel to each one-way trip. This forces the majority of riders to travel out-of-direction for a large portion of their trip, making service less convenient. In addition, having two different variants that travel so far from the route's primary corridor makes service more confusing and difficult to understand, particularly for new riders.
- **Split Route 541 into two routes.** Rather than operating in a large loop, Route 541 provides bidirectional service on each of two variants. Although this provides indirect transit service for riders, the alignment maximizes service to local areas of Bristol (particularly the Forestville area that has higher transit potential) and provides connections to retail destinations along Farmington and to both downtown Bristol and Tunxis Community College, despite the disconnected street network that limits bus routing options in the community. Presenting each

variant as a separate route would make the service more comprehensible to riders. Additionally, higher frequency could be considered for each route so that each of the current branches of Route 541 are served hourly, and the common alignment is served every half hour.

- **Eliminate weekday and Saturday service after 11:00 PM.** Ridership figures show that trips departing after 11:00 PM on weekdays are lightly used. Eliminating these trips can improve the overall productivity of the route.

Route Evaluation

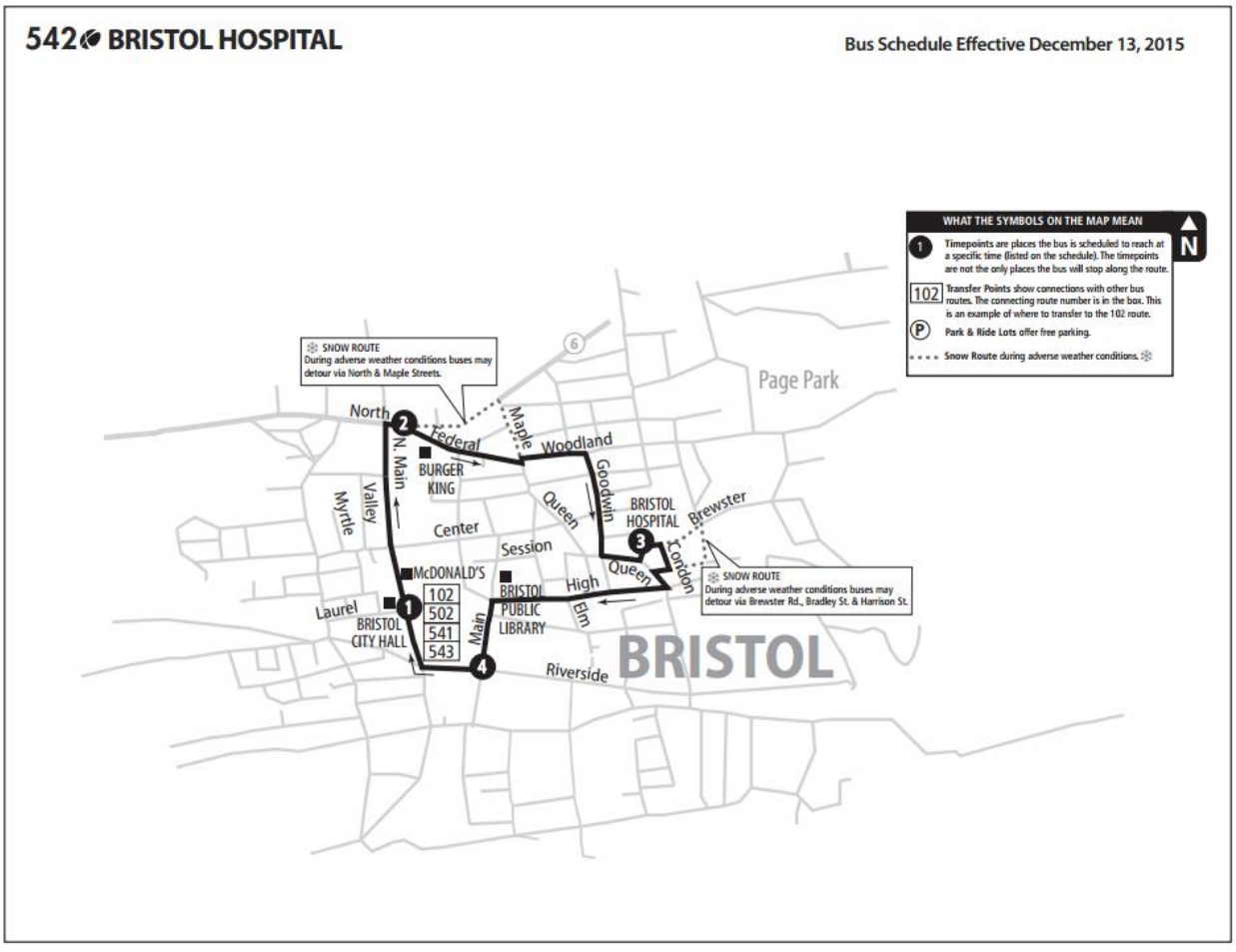
BRISTOL HOSPITAL

542 | Bristol Hospital

Service Design

Route 542 provides local circulation within Bristol, serving Bristol City Hall, Bristol Hospital, and the Bristol Public Library, as well as several low density retail areas. The route operates in a one-way clockwise loop, primarily on North Main Street, Federal Street, Goodwin Street, and High Street.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 542 begins/ends in central Bristol, where riders can transfer to several other CT***transit*** services, including express service to Hartford and New Britain (see Figure 2).

During peak periods, Route 542 is interlined with Route 502, which provides local service to New Britain via Black Rock Avenue. At other times, Route 542 is interlined with Route 102, which provides limited stop service to New Britain and CT***fastrak*** service to Hartford. On weekends, all trips are interlined with Route 102.

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 102	New Britain, Hartford via *CT**fastrak***
Route 502	New Britain via Black Rock Avenue
Route 503	New Britain via Corbin Avenue (interlined)
Route 541	Bristol Local
Route 543	Gaylord Towers
Route 923	Hartford via *CT**fastrak*** (express)

Alignments and Service Patterns

Route 542 operates along a one-way clockwise loop. Service begins at Bristol City Hall, operates north on North Main Street, right on Federal Street, which continues as Woodland Street, right on Goodwin Street. At Bristol Hospital, the route turns right on Queen Street, and right again on Brewster Road to serve the hospital's front entrance, then right on Condon Road, and right on Harrison Street. The route then turns left on Queens Street, and left on High Street. At Main Street, the route turns left, then turns right on Riverside Avenue, and one final right on North Main Street, returning to Bristol City Hall. The loop takes 19 minutes to complete.

Because the route interlines at Bristol City Hall, the loop is broken at this point. Thus, if a passenger wants to ride through the terminus, it would require disembarking at Bristol City Hall, and waiting at least 40 minutes for the next vehicle.

Service Schedule

Route 542 operates seven days per week. There are 19 trips on weekdays, and service operates every 60 minutes throughout the entire service period.

On Saturday, there are 18 trips with service operating every 60 minutes. On Sundays, there are 13 trips with service also operating every 60 minutes.

FIGURE 3 | SCHEDULE OVERVIEW (ROUTE 542)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS (LOOP)
Weekday	5:45 AM – 12:04 AM	60 / 60	19
Saturday	6:45 AM – 12:04 AM	60	18
Sunday	7:45 AM – 8:01 PM	60	13

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*

Note: Route 542 includes trips that are performed by vehicles interlined with Route 502 and Route 102. However, information provided by New Britain Transit prior to data collection only indicated interlines between Route 542 and Route 502. Therefore, this analysis is based on only partial ridership data.

Ridership by Service Day

Route 542 carries 20 daily passengers or 0.5 passengers per trip on an average weekday, which is the lowest average number of passengers in the division.

FIGURE 1 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 542	ROUTE 542	DIVISION AVG
Weekday	20	0.5	7.5
Saturday	—	—	5.8
Sunday	—	—	4.2

*Source: CT**transit** performance data*

Ridership by Stop

The most heavily used stops on Route 542 are to the east of downtown at Bristol Hospital, and in the Downtown at the Bristol City Hall. Along the entirety of the route, there are no stops that generate 20 or more boardings and alightings per day (see Figure 2). When totaling boardings and alightings, only the two stops listed in Figure 5 have more than one passenger boarding or alighting.

FIGURE 2 | ROUTE 542 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (WEEKDAY INBOUND)

BUS STOP	RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Brewster Road / Bristol Hospital	13 / 0	Bristol Hospital
N Main Street / Laurel Street	0 / 13	Bristol City Hall

Load profile data (see Figure 3) 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 4. The data for this route show that few people use the middle of the route, and instead use it to move almost exclusively between downtown Bristol and Bristol Hospital. The data for Route 542 shows low, but consistent weekday outbound passenger loads as the route moves through downtown Bristol and on to the hospital. A similar pattern is apparent for weekday inbound routes with the passenger load steadily increasing as it moves towards downtown before most passengers alight downtown at Bristol City Hall. Ridership by stop without the cumulative load is mapped in Figure 4.

FIGURE 3 | WEEKDAY OUTBOUND RIDERSHIP BY STOP GRAPH

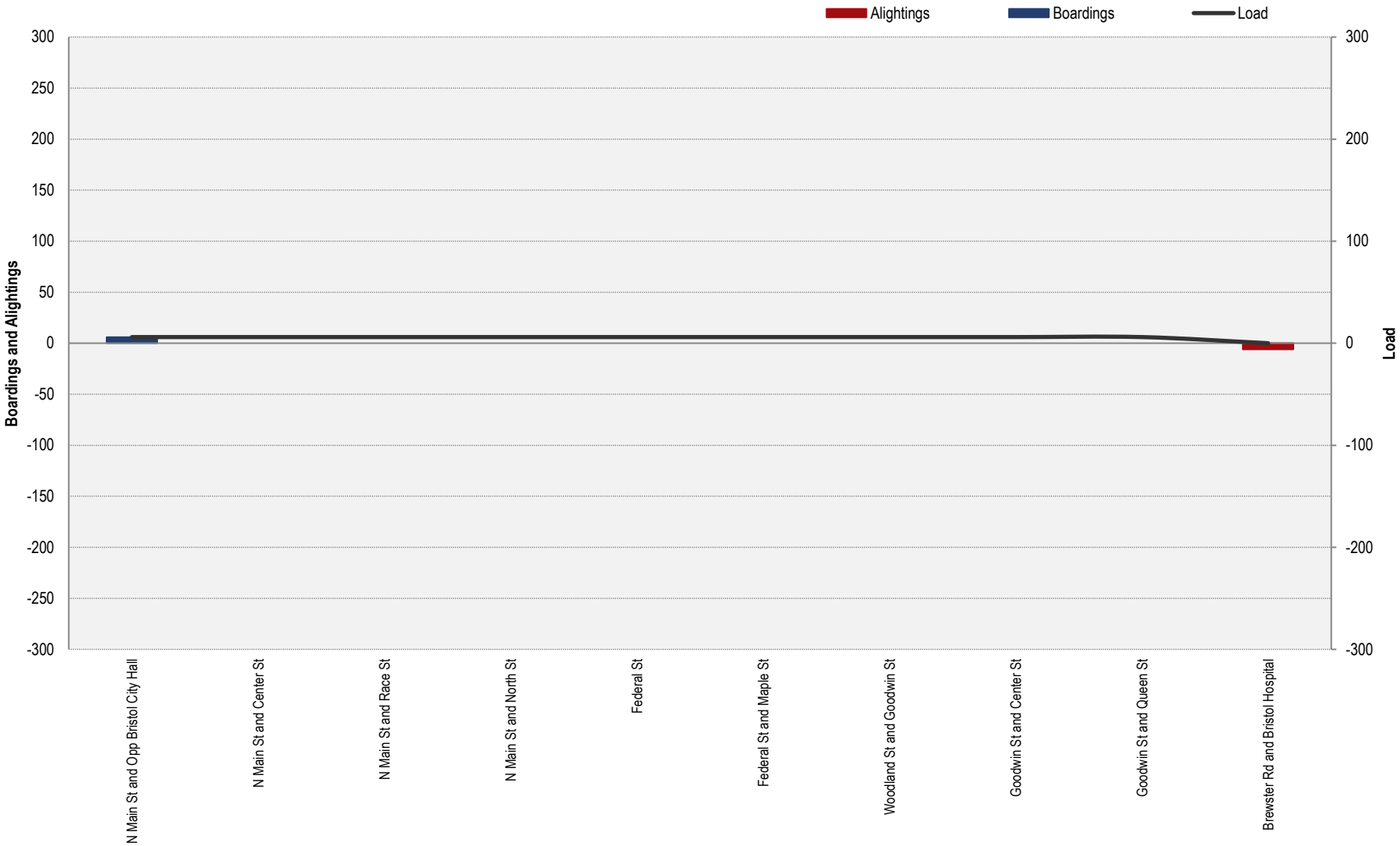


FIGURE 4 | WEEKDAY OUTBOUND RIDERSHIP BY STOP MAP

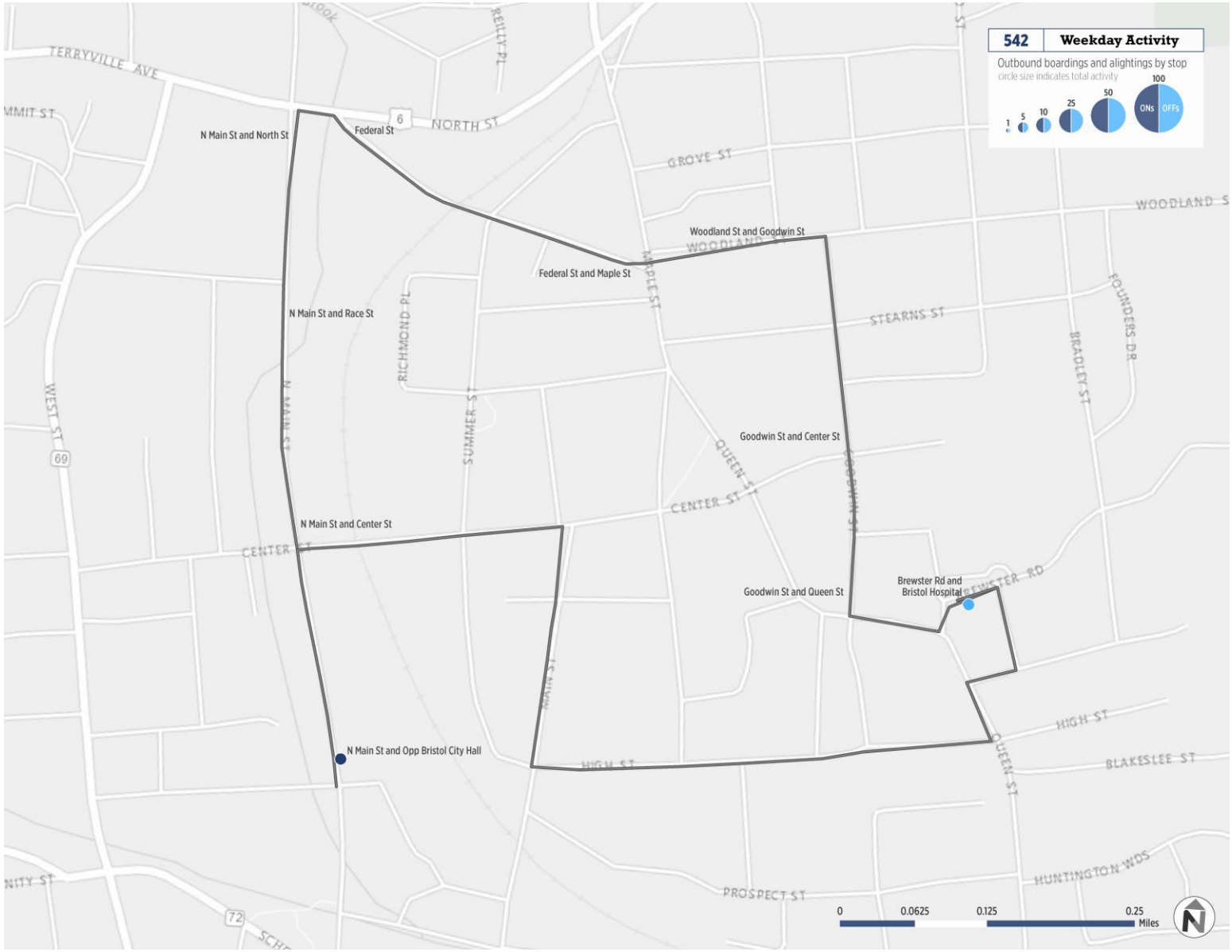


FIGURE 5 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

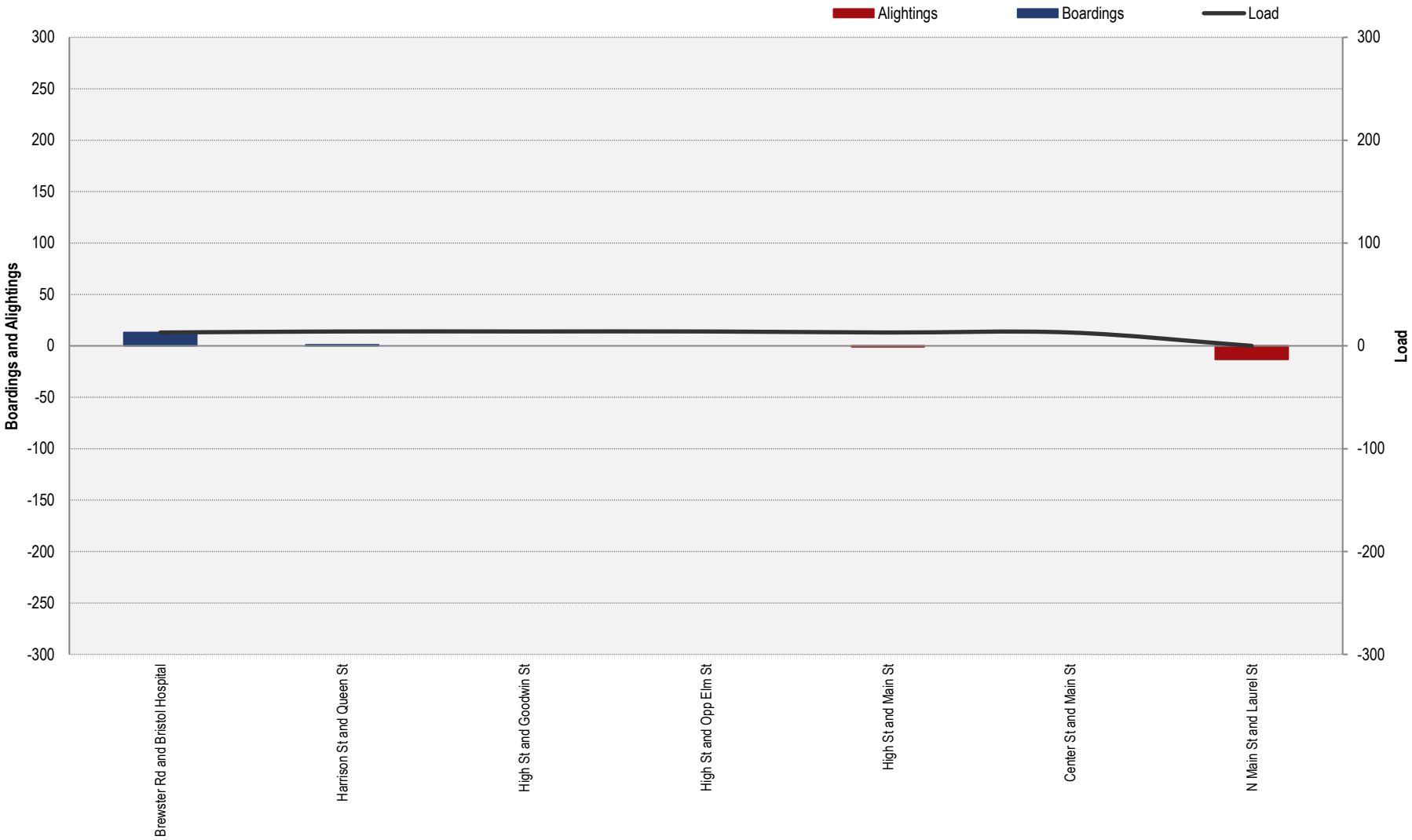
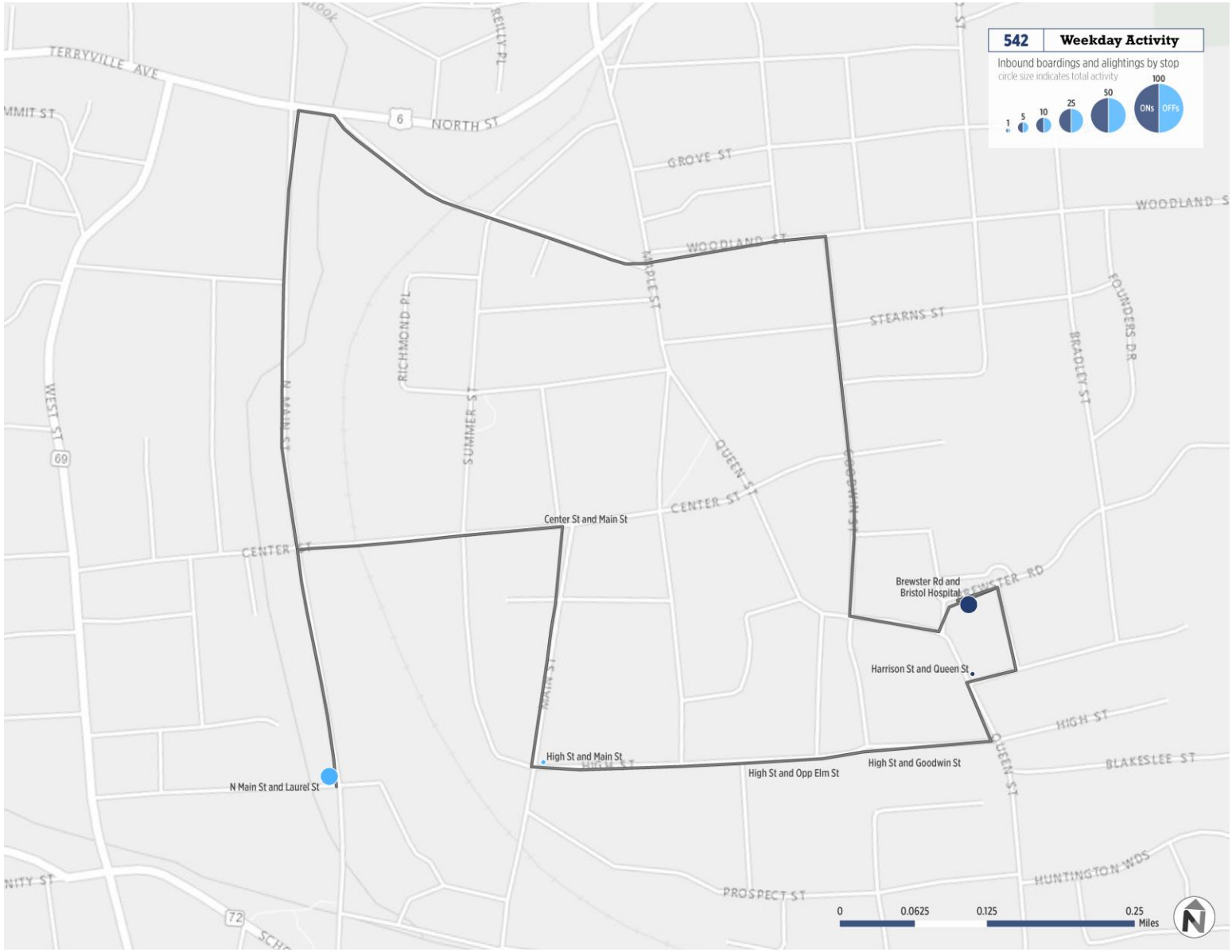


FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

During the survey period, Route 542 carried an average of 0.5 weekday passengers per trip (again, only partial data was collected for this route). At no point did ridership exceed 3 passengers per trip for outbound or inbound trips during peak hours (Figure 7). Total boardings or maximum loads on these trips never exceeded 40 passengers, which is the typical seating capacity of a 40-foot transit bus.

FIGURE 7 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

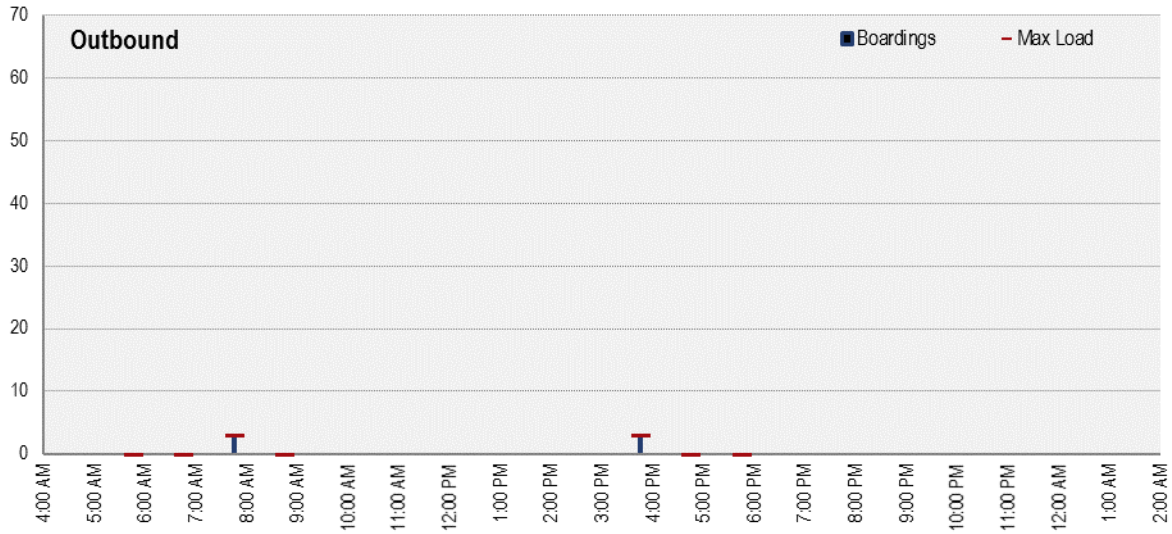
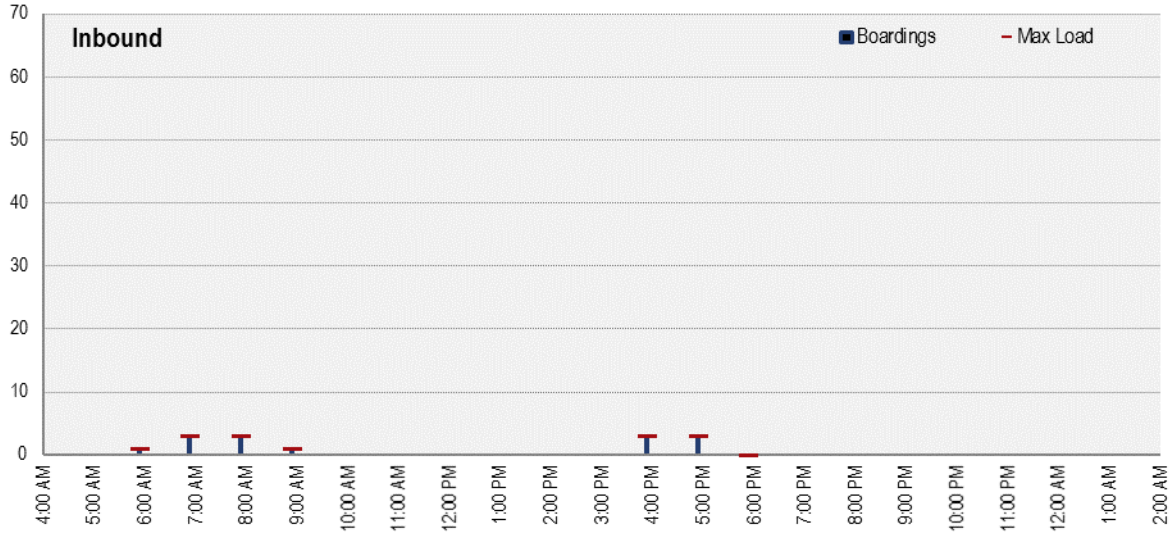


FIGURE 8 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Productivity

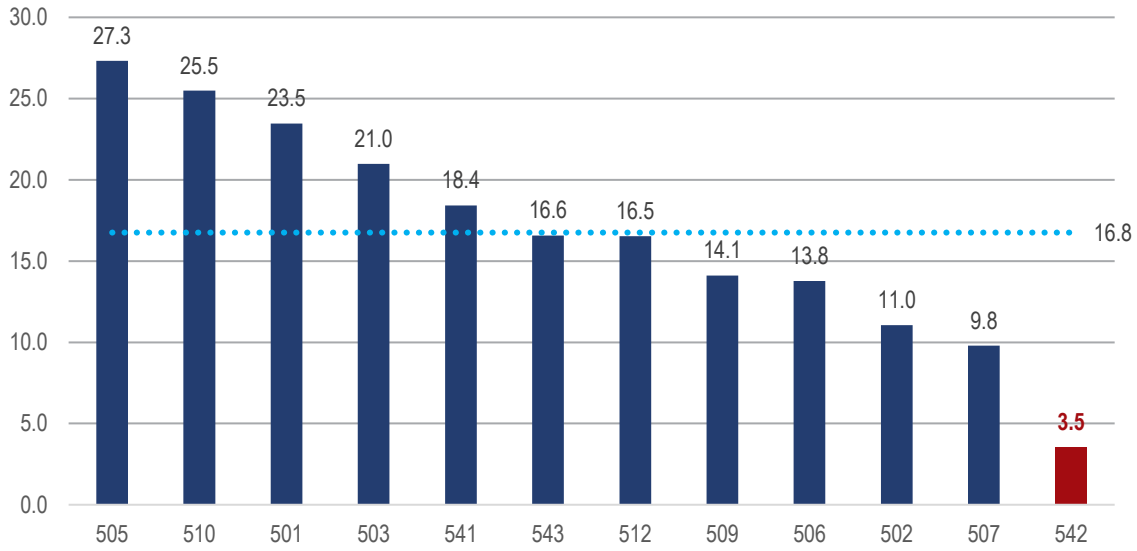
Route 542 performs the poorest of all New Britain/Bristol Division routes for passengers per revenue hour on all service days (see Figure 9). The route carries an average of 3.5 riders per hour on weekdays, ranking last among New Britain/Bristol Division routes.

FIGURE 9 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 542	DIVISION AVG	ROUTE 542	DIVISION AVG	ROUTE 542	DIVISION AVG
Passengers per Vehicle Revenue Hour	3.5	16.8	—	13.1	—	10.4

*Source: CT**transit** performance data*

FIGURE 10 | PASSENGERS PER VEHICLE REVENUE HOUR



ON-TIME PERFORMANCE

On weekdays, approximately 65% of Route 542 time points were served "on-time" during the survey period (Figure 11). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Weekday on-time performance was effected by early departures, which occurred 28% of the time while the remaining 7% of time points were late. For weekends, on-time performance is not available due to the interlining of Route 542 and Route 102.

FIGURE 11 | ON-TIME PERFORMANCE

PERFORMANCE	WEEKDAY	SATURDAY	SUNDAY
Early	28%	—%	—%
Late	7%	—%	—%
On-Time	65%	—%	—%

*Source: CT**transit** performance data*

SERVICE IMPROVEMENT

Route 542 is a highly unproductive route, carrying well below average ridership per trip and ridership per hour compared to the rest of the New Britain/Bristol Division. The route has anchors at either end, originating in downtown Bristol where riders can continue on to New Britain (Route 542 interlines with Route 502) or transfer to Route 102 with service to Hartford via New Britain, and terminating at Bristol Hospital. These two anchors are located less than one mile apart via local streets. The route operates in a loop, serving different alignments in each direction, which provides inconsistent service for riders. The alignment travels mainly along local streets that do not connect easily to local destinations aside from Bristol City Hall.

During peak weekday hours for which ridership data is available, ridership at the two terminuses is very low: neither stop generates more than 13 riders per day. There is almost no ridership at stops between the two terminuses in either direction.

Service Improvement Options

Opportunities to strengthen Route 542 are listed below.

- **Reconfigure Route 542 to move directly between Bristol City Hall and Bristol Hospital.** This route would be better served by changing the route alignment to remove the loop pattern. Of the 19 daily trips on this route, only one boarding and one alighting occur along the route between the route terminals. Each of these trips occurs on the inbound alignment originating at the hospital and ending at City Hall, thus the other half of the alignment could be removed without eliminating service for existing riders.
- **Interline all trips with Route 502.** In addition to improving the availability of ridership data, interlining all Route 542 trips with Route 502 would make service more predictable for riders and make connections more consistent, without needing to determine whether they would continue on either Route 502 or CT***fastrak*** Route 102. Increasing Route 502 to hourly frequency all day would make this change feasible. Further, interlining some Route 542 trips with CT***fastrak*** Route 102 dilutes the CT***fastrak*** brand by using premium vehicles on a short, low-ridership route.
- **Gather ridership data on trips that interline with CT*fastrak* Route 102.** Without ridership information for midday and evening hours on weekdays and for weekends, information about Route 542's performance is incomplete. There may be times or days when ridership performs more strongly than during traditional peak hours, which is not captured in this analysis. More complete data from Route 102 may provide additional insight into Route 542's performance and lead to different recommendations for improving the route.
- **Discontinue Route 542.** Route 542 generates very little ridership except at its two anchors - downtown Bristol and Bristol Hospital. Service to these key destinations can be provided by

modifications to other routes, including Route 502, which themselves have unproductive segments and would likely benefit from the addition of service to a key destination such as Bristol Hospital. In addition, the current alignment of Route 542 fails to serve areas with high ridership potential, such as Prospect Street. This could be addressed with the realignment of other routes to pick up for the elimination of Route 542.

Route Evaluation

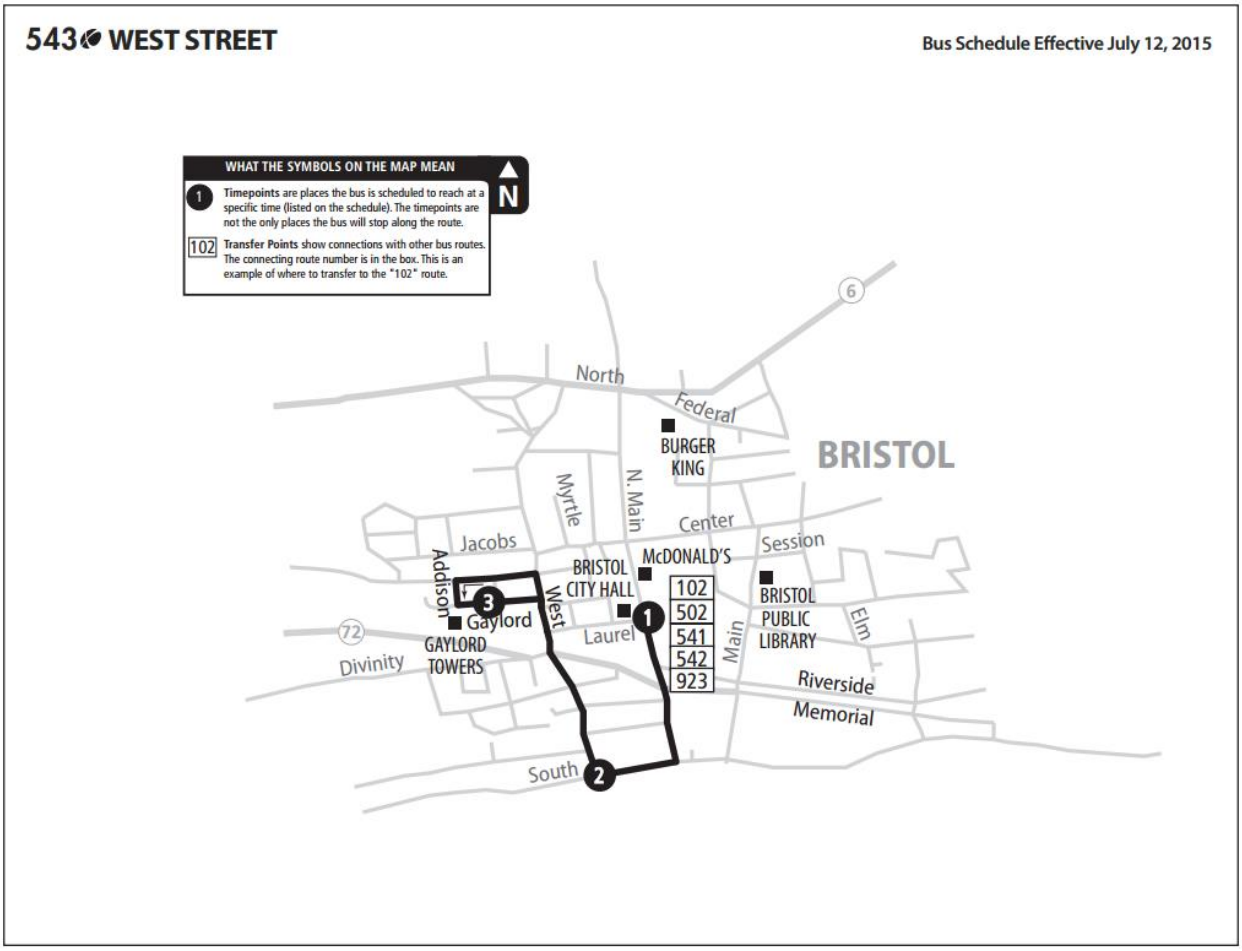
WEST STREET

543 | West Street

Service Design

Route 543 provides local service within Bristol, serving Bristol City Hall and Gaylord Towers, a subsidized senior housing development in Bristol's West End. The route operates primarily on North Main Street, South Street, and West Street.

FIGURE 1 | ROUTE MAP



System Interaction and Transfer Opportunities

Route 543 begins/ends in central Bristol, where riders can transfer to several other CT***transit*** services, including express service to Hartford and New Britain (see Figure 2).

Trips on Route 543 are interlined with Route 541 Bristol Local, which offers a one-seat ride to further destinations in Bristol, including shopping and social services.

FIGURE 2 | TRANSFER OPPORTUNITIES

TRANSFER TO	SERVING
Route 102	Hartford, New Britain via CT***fastrak***
Route 502	New Britain via Black Rock Avenue
Route 541	Bristol Local (interlined)
Route 542	Bristol Hospital
Route 923	Hartford via CT***fastrak*** (express)

Alignments and Service Patterns

Route 543 operates in a U-shaped alignment. While the terminals are only 0.4 miles apart, the entire route is 1.1 miles. Service begins from Bristol City Hall, operates south on North Main Street, which continues as Church Street. The route turns right on South Street, operates for one block before turning right on West Street to head back north. The route terminates with a terminal loop with a left turn on Jacobs Street, left on Adison Street, and left on Gaylord Street.

The route returns to Bristol City Hall on the same alignment. All trips are interlined with Route 541 Bristol Local.

Service Schedule

Route 543 operates seven days per week with 19 trips per weekday. Peak periods are defined as 6:30 AM to 9:00 AM and 4:00 PM to 6:30 PM. Service operates every 60 minutes throughout the entire service period.

On Saturday, there are 18 trips with service operating every 60 minutes. On Sundays, there are 13 trips with service also operating every 60 minutes.

FIGURE 3 | SCHEDULE OVERVIEW (ROUTE 541)

SERVICE DAY	SPAN OF SERVICE	TYPICAL FREQUENCY (PEAK/OFF-PEAK)	ONE-WAY TRIPS OUTBOUND/INBOUND
Weekday	6:15 AM – 11:02 PM	60 / 60	17/ 17
Saturday	7:15 AM – 11:02 PM	60	16/16
Sunday	8:15 AM – 7:32 PM	60	12/12

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

Route 543 carries 63 daily passengers or 1.9 passengers per trip on an average weekday, which is more than 75% lower than the New Britain/Bristol Division average of 7.5 weekday passengers per trip. Overall Route 543 carries the second lowest average number of passengers in the division.

Saturday and Sunday ridership per trip are also low relative to the division average (see Figure 1). The average ridership per trip is the second lowest in the division, and over 62% lower than the division average for both Saturday and Sunday.

FIGURE 1 | RIDERSHIP STATISTICS

SERVICE DAY	AVERAGE RIDERSHIP PER DAY	AVERAGE RIDERSHIP PER TRIP	
	ROUTE 543	ROUTE 543	DIVISION AVG
Weekday	63	1.9	7.5
Saturday	69	2.2	5.8
Sunday	32	1.3	4.2

*Source: CT**transit** performance data*

Ridership by Stop

The most heavily used stops on Route 543 are for the origin at Gaylord St and Gaylord Towers, and the route's terminus downtown at Bristol City Hall. Outside of downtown, there is only one stop that generates a boarding each day for inbound service (see Figure 2).

FIGURE 2 | ROUTE 543 HIGHEST RIDERSHIP STOPS AND KEY TRIP GENERATORS (WEEKDAY INBOUND)

BUS STOP	RIDERSHIP (ON/OFF)	KEY LOCAL TRIP GENERATORS
Gaylord Street / Gaylord Towers	23 / 0	Gaylord Towers and Kennedy Apartments
North Main Street / Bristol City Hall	0 / 24	Bristol City Hall

Load profile data (see Figure 3) 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 The data for Route 543 shows the highest weekday outbound passenger loads as the route begins in downtown Bristol and declines steadily after leaving the downtown area, with some additional boardings as the route moves towards the Gaylord Towers. Inbound routes similarly have most boardings at the beginning of the route, with some passenger loadings in the middle of the route, before all alightings at the route terminus in downtown Bristol. Ridership by stop without the cumulative load is mapped in Figure 4.

FIGURE 3 | WEEKDAY OUTBOUND RIDERSHIP BY STOP GRAPH

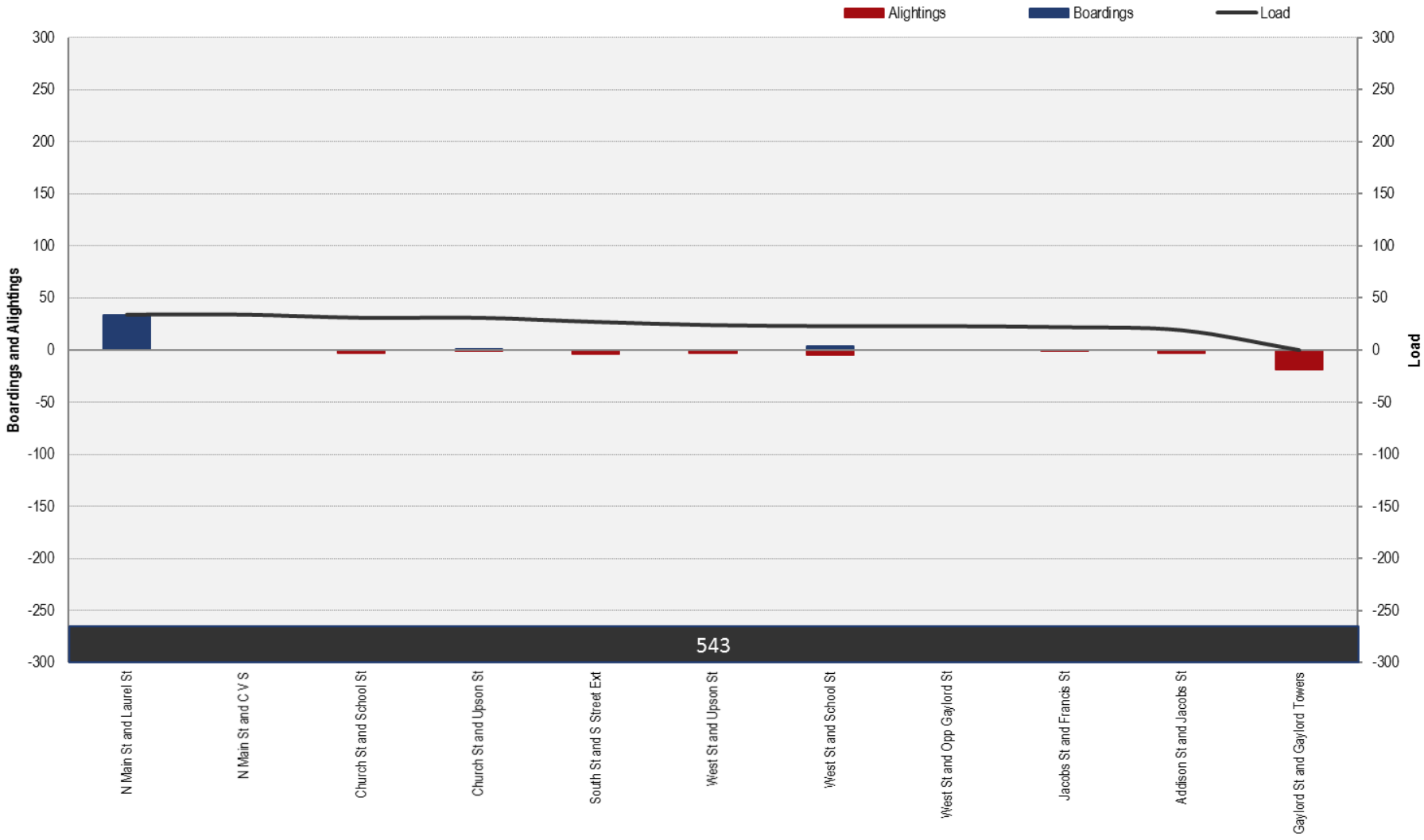


FIGURE 4 | WEEKDAY OUTBOUND RIDERSHIP BY STOP MAP

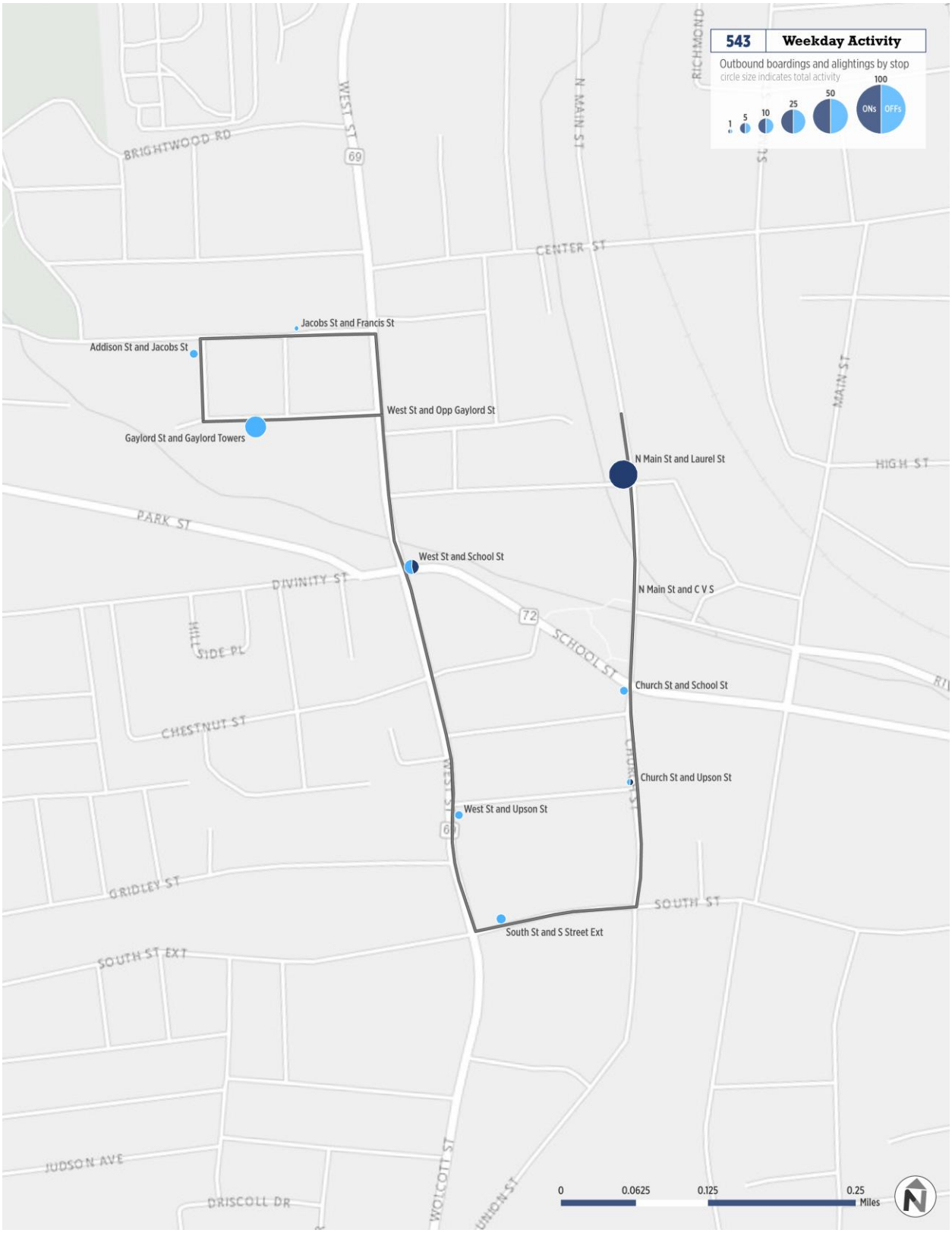


FIGURE 5 | WEEKDAY INBOUND RIDERSHIP BY STOP GRAPH

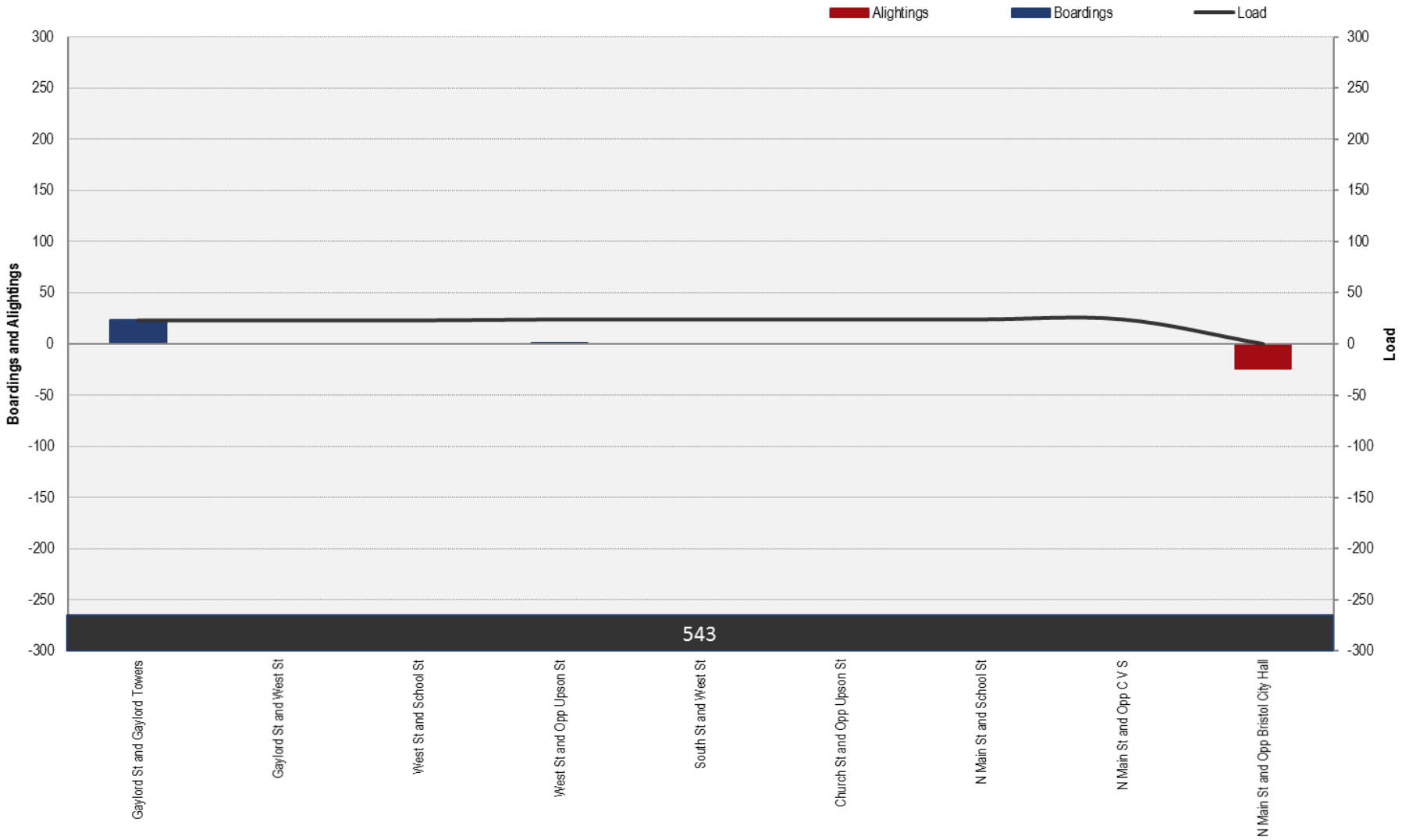


FIGURE 6 | WEEKDAY INBOUND RIDERSHIP BY STOP MAP

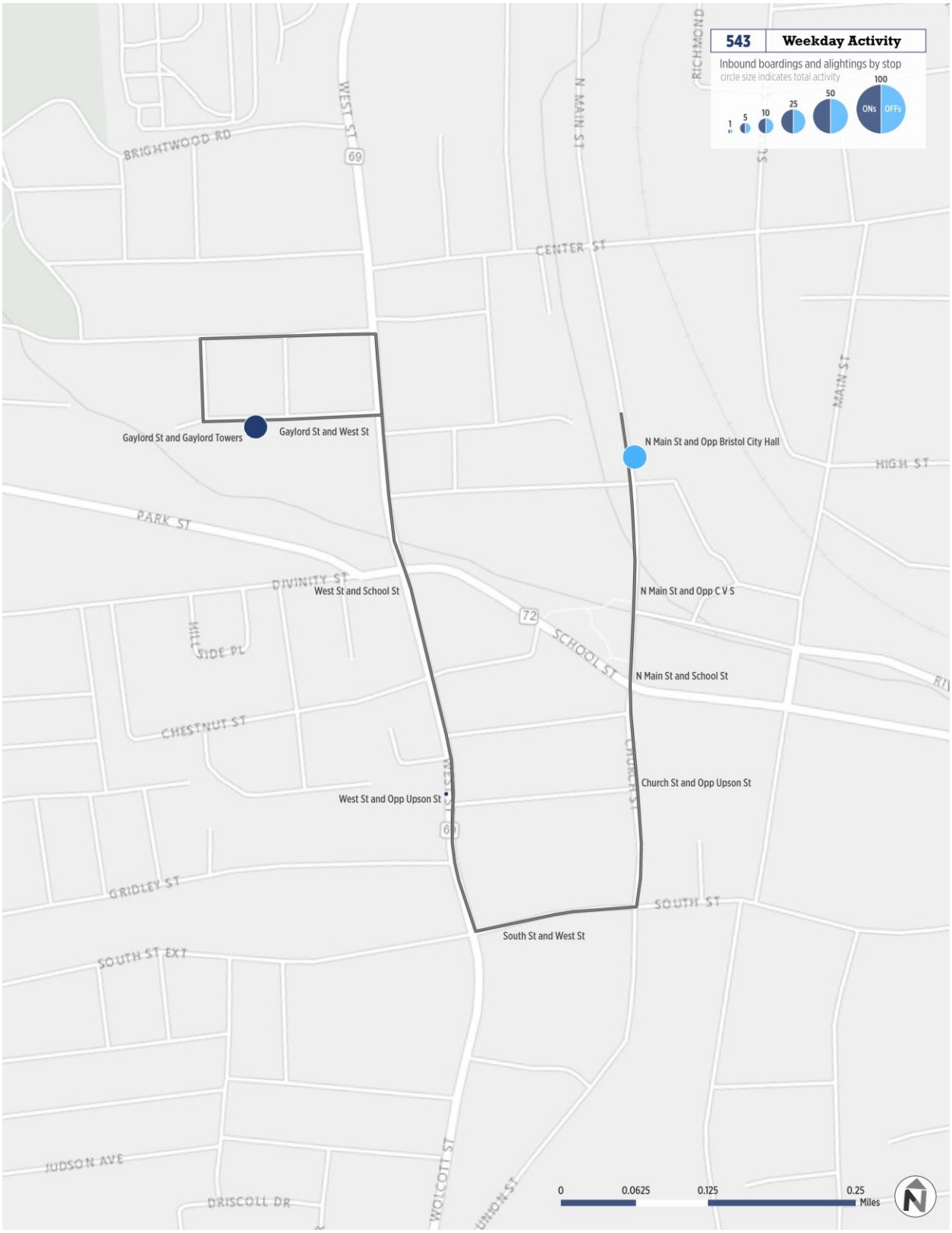


FIGURE 7 | SATURDAY OUTBOUND RIDERSHIP BY STOP GRAPH

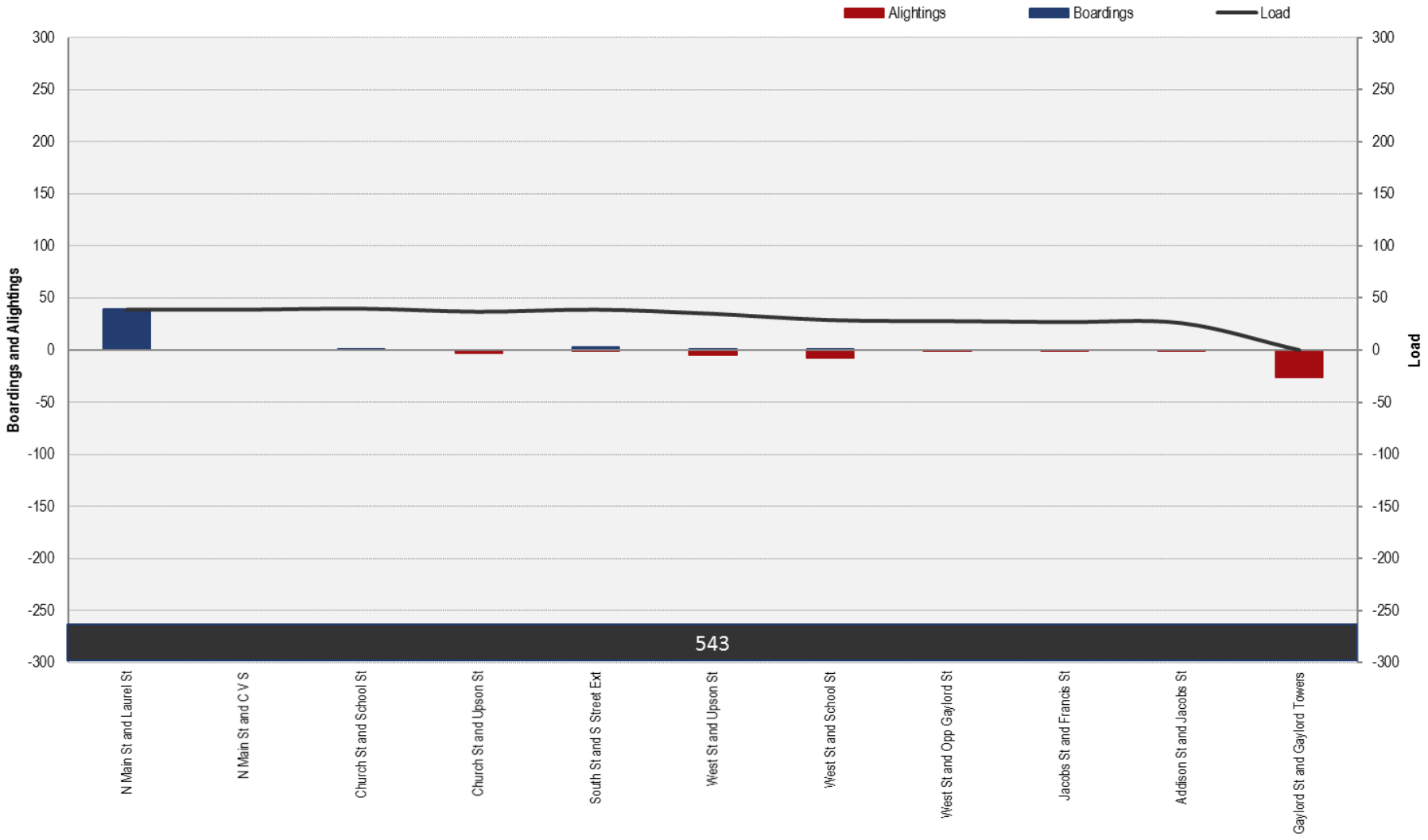


FIGURE 8 | SATURDAY OUTBOUND RIDERSHIP BY STOP MAP

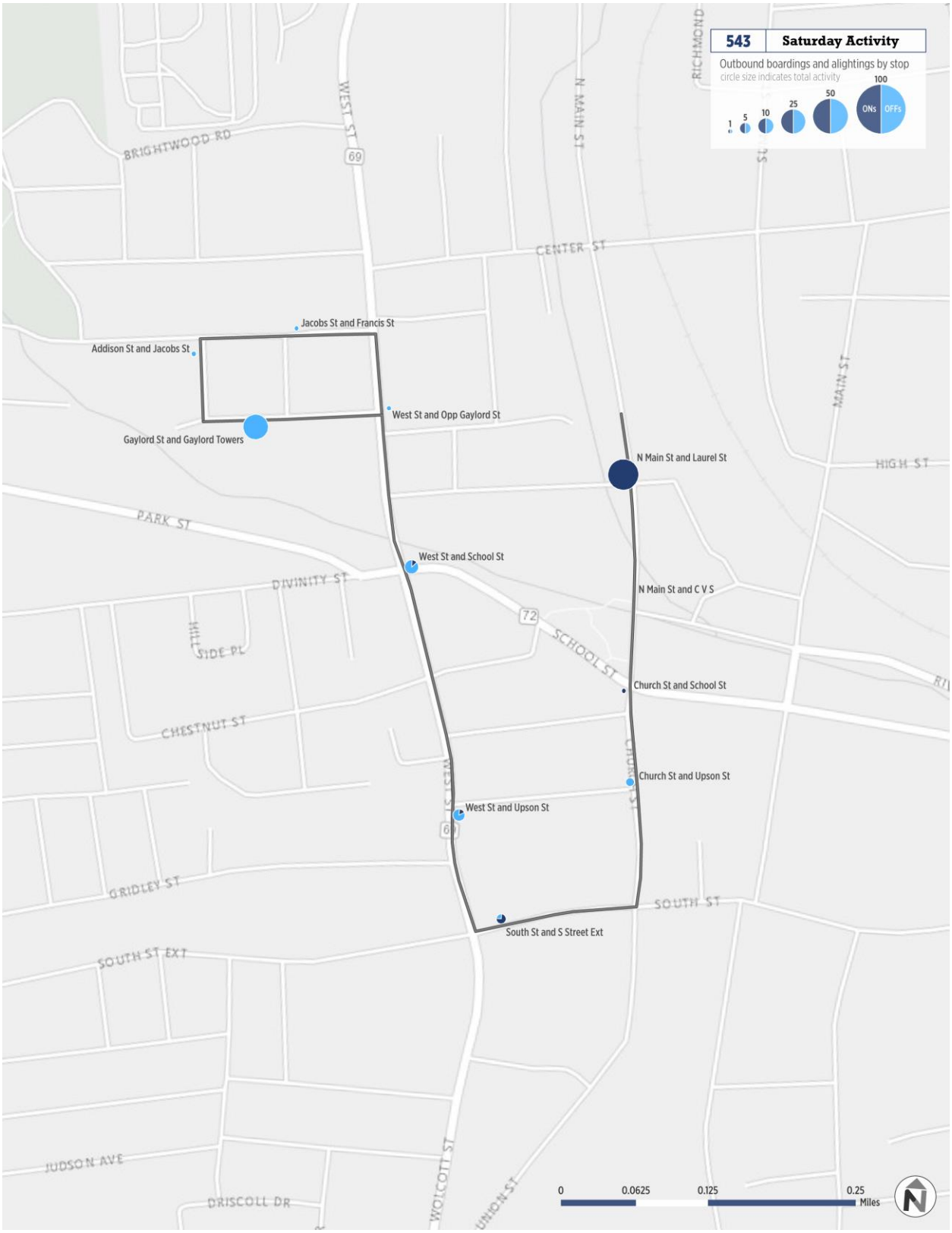


FIGURE 9 | SATURDAY INBOUND RIDERSHIP BY STOP GRAPH

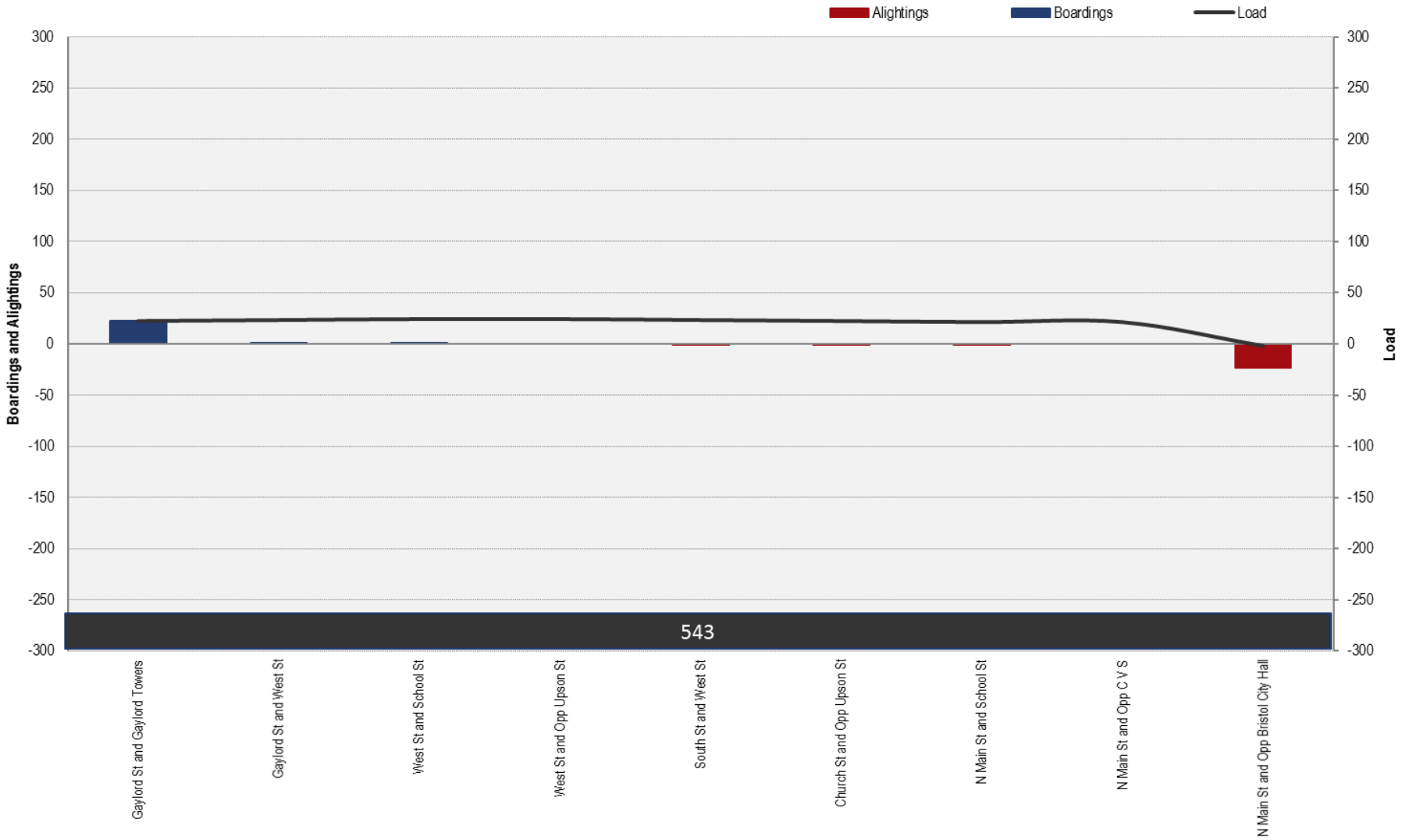


FIGURE 10 | SATURDAY INBOUND RIDERSHIP BY STOP MAP

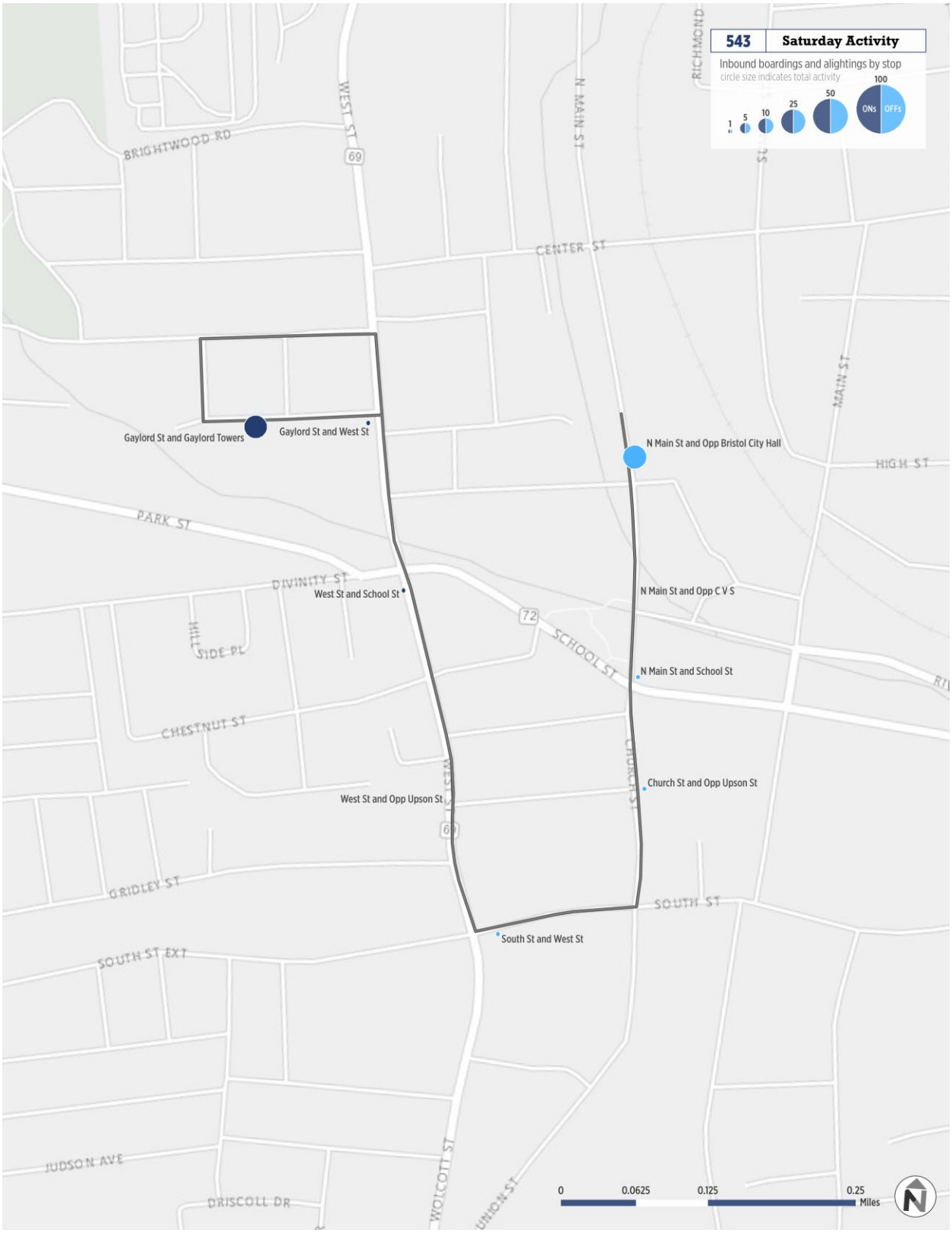


FIGURE 11 | SUNDAY OUTBOUND RIDERSHIP BY STOP GRAPH

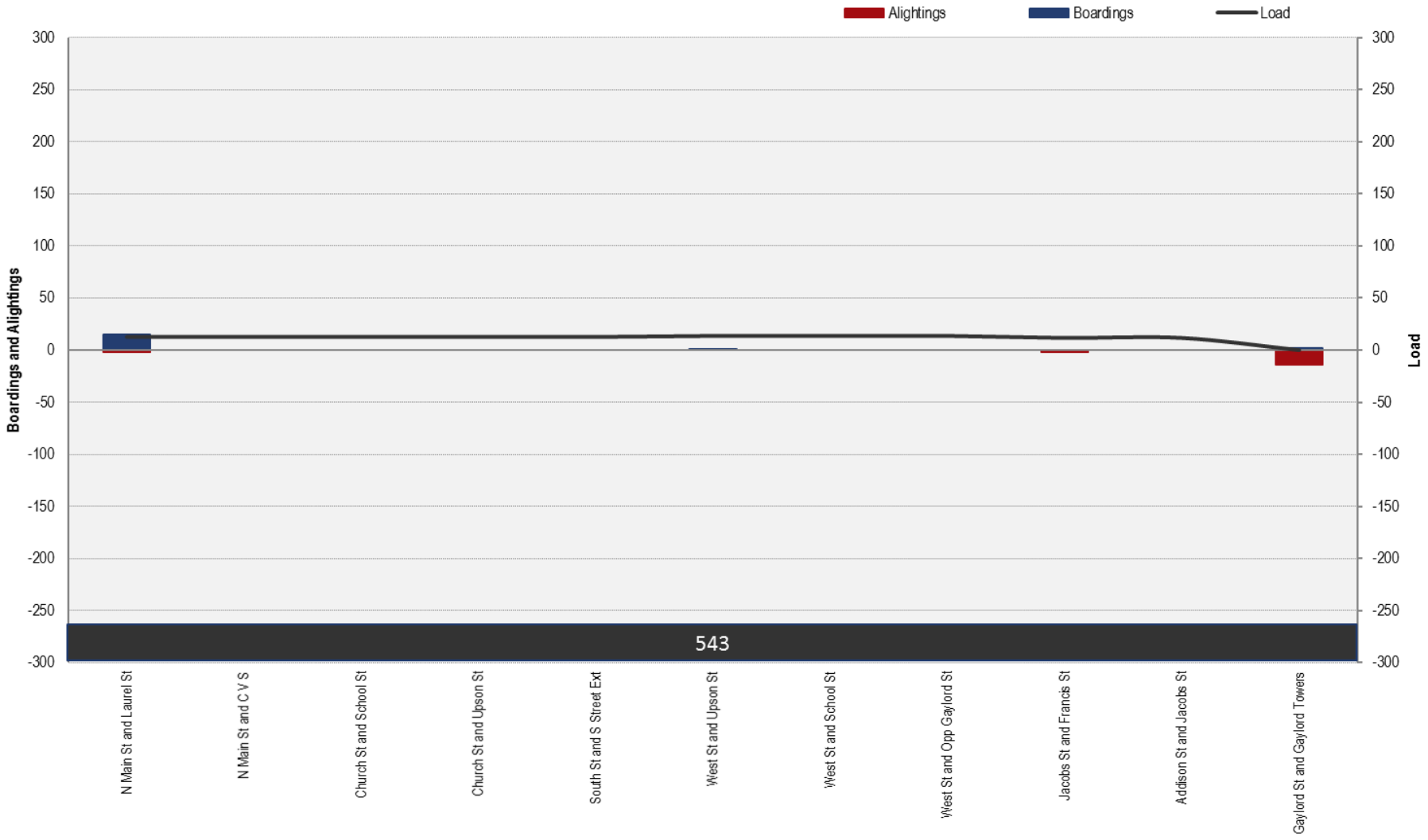


FIGURE 12 | SUNDAY OUTBOUND RIDERSHIP BY STOP MAP

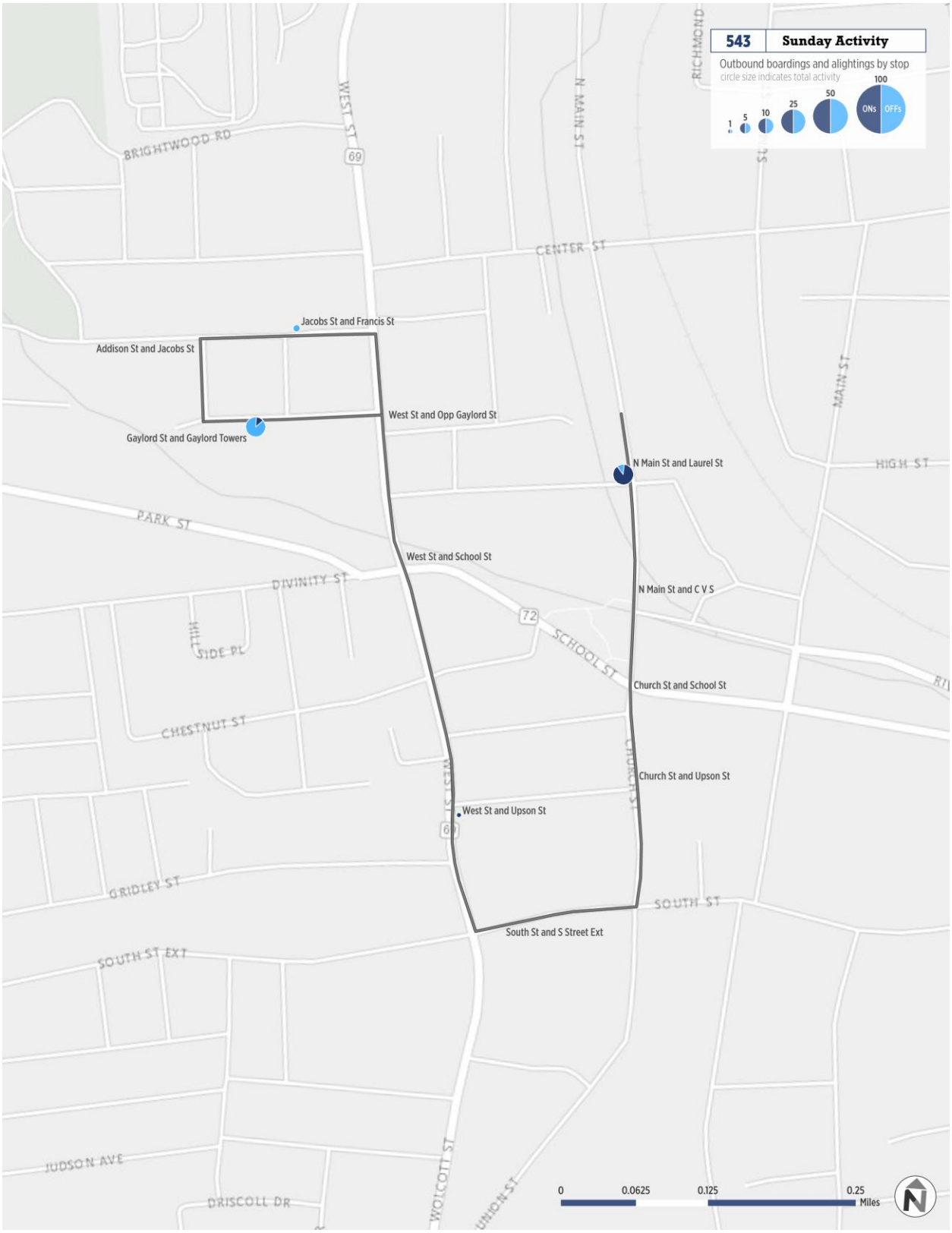


FIGURE 13 | SUNDAY INBOUND RIDERSHIP BY STOP GRAPH

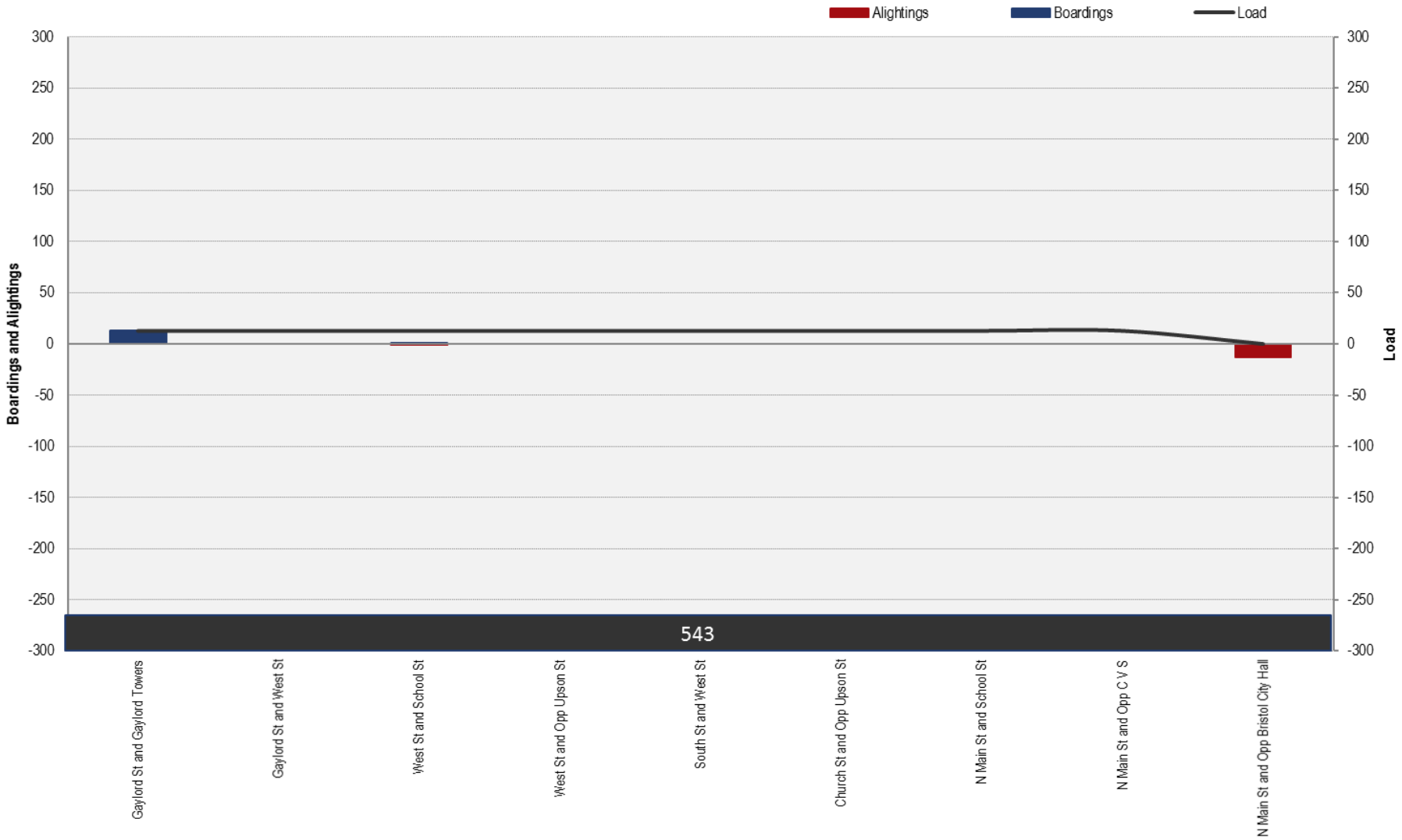
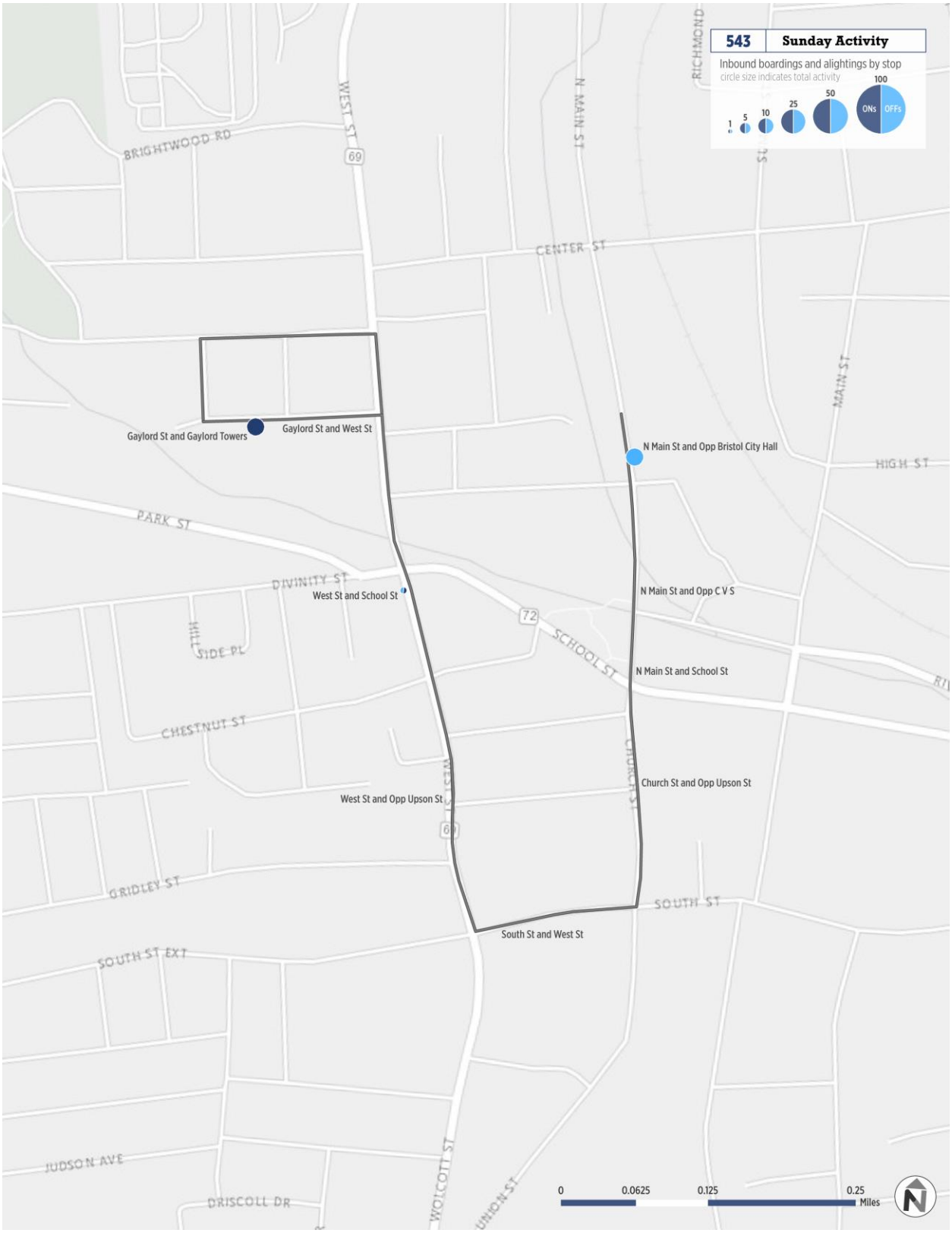


FIGURE 14 | SUNDAY INBOUND RIDERSHIP BY STOP MAP



Ridership by Trip

Weekday

Route 543 carries an average of 1.9 passengers per trip on weekdays. Demand is slightly higher in the outbound direction, though no trip exceeds 6 passengers (Figure 15). Outbound trips peak in the afternoon (3 PM), while inbound trips peak in the midday (see Figure 16). Although Route 543 shows activity throughout the day, there is insufficient variation in the ridership patterns to draw notable distinctions in the temporal ridership patterns, other than to say there is scant ridership in either direction after 4 PM.

Total boardings or maximum loads never exceed 40 passengers, which is the typical seating capacity of a 40-foot transit bus.

FIGURE 15 | WEEKDAY OUTBOUND RIDERSHIP BY TRIP

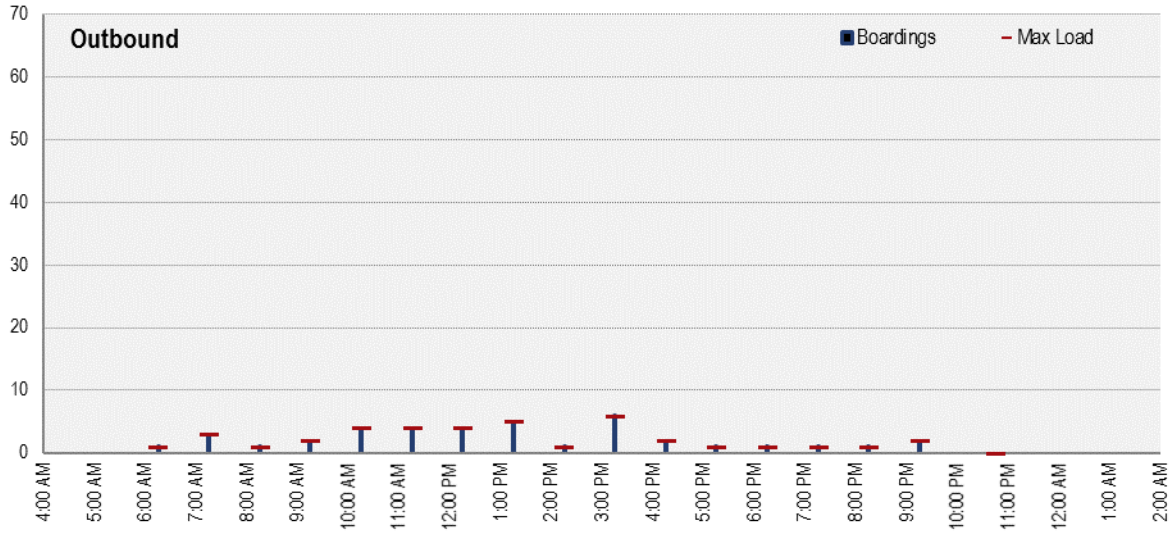
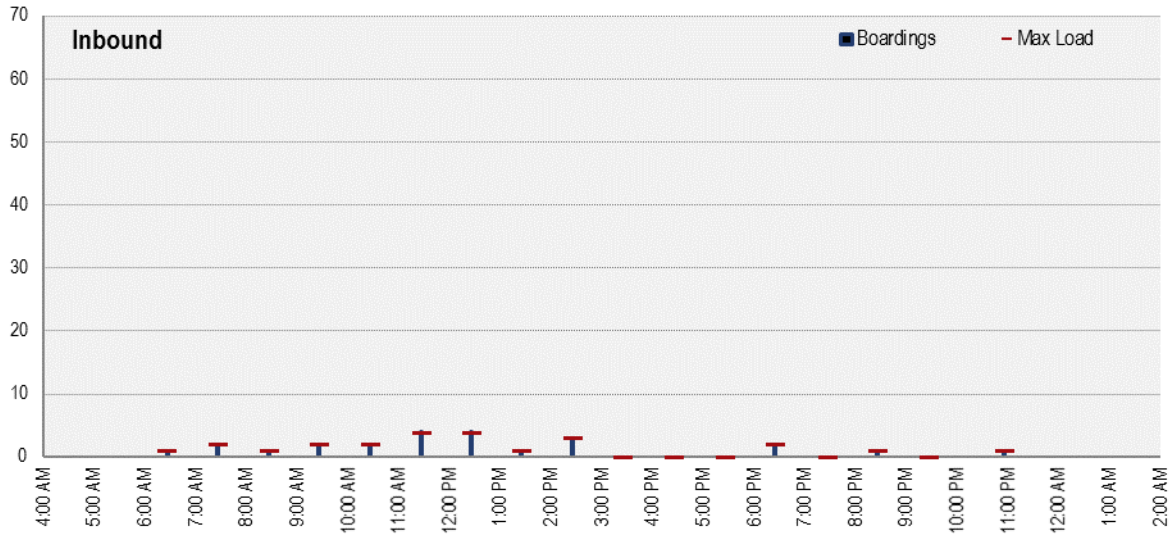


FIGURE 16 | WEEKDAY INBOUND RIDERSHIP BY TRIP



Saturday

Route 543 carries an average of 2.2 passengers per trip on Saturdays. All outbound and inbound trips on Saturday carry fewer than 10 passengers per trip, though inbound ridership is lower than outbound (Figure 17 and Figure 18). Demand is varied throughout the day for both directions, though outbound trips show the greatest ridership demand in the afternoon.

FIGURE 17 | SATURDAY OUTBOUND RIDERSHIP BY TRIP

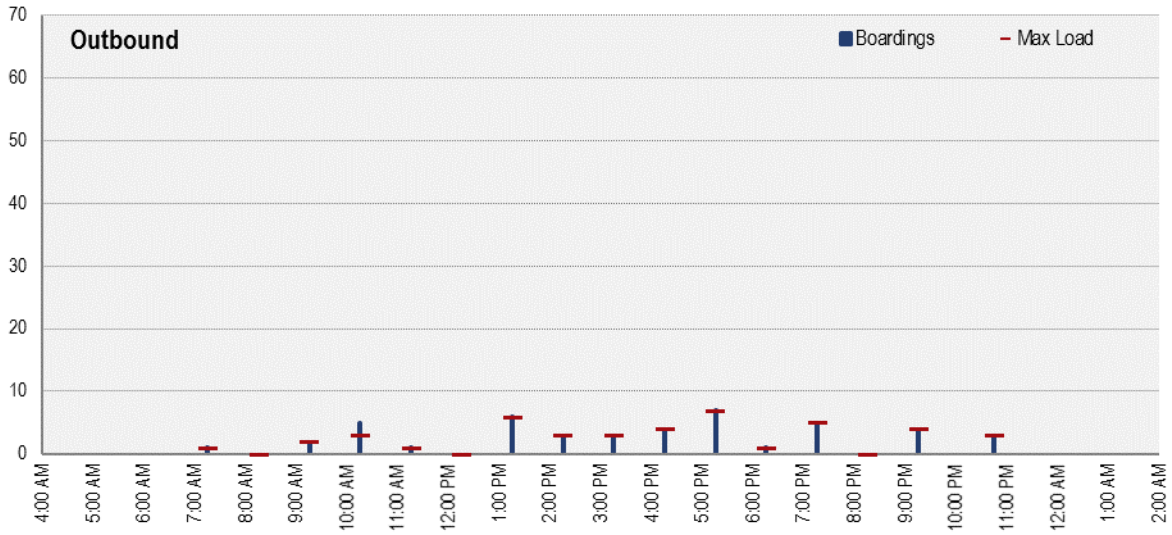
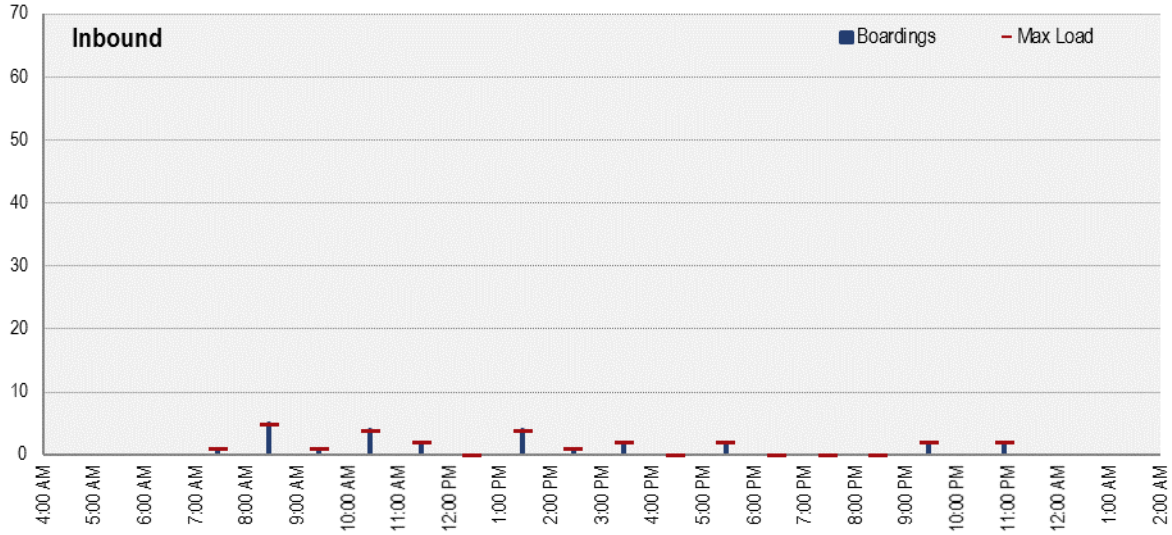


FIGURE 18 | SATURDAY INBOUND RIDERSHIP BY TRIP



Sunday

Route 543 carries 1.3 passengers per drip on Sundays, and never with more than 5 passengers on any given trip. As shown in Figure 19 and Figure 20, all other outbound trips have fewer than 10 passengers. Similar to Saturday patterns, inbound trips have fewer riders overall than outbound trips.

FIGURE 19 | SUNDAY OUTBOUND RIDERSHIP BY TRIP

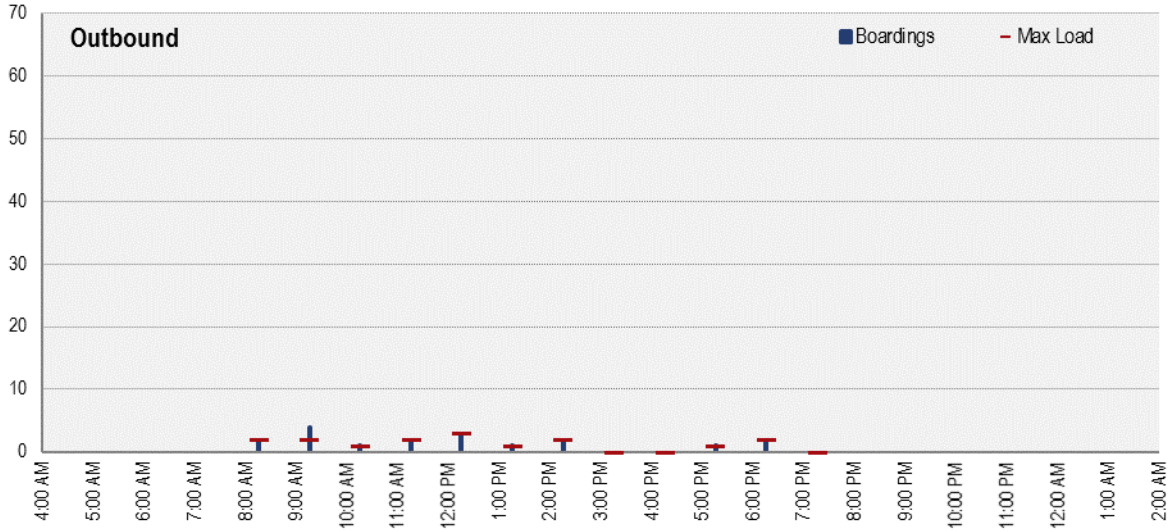
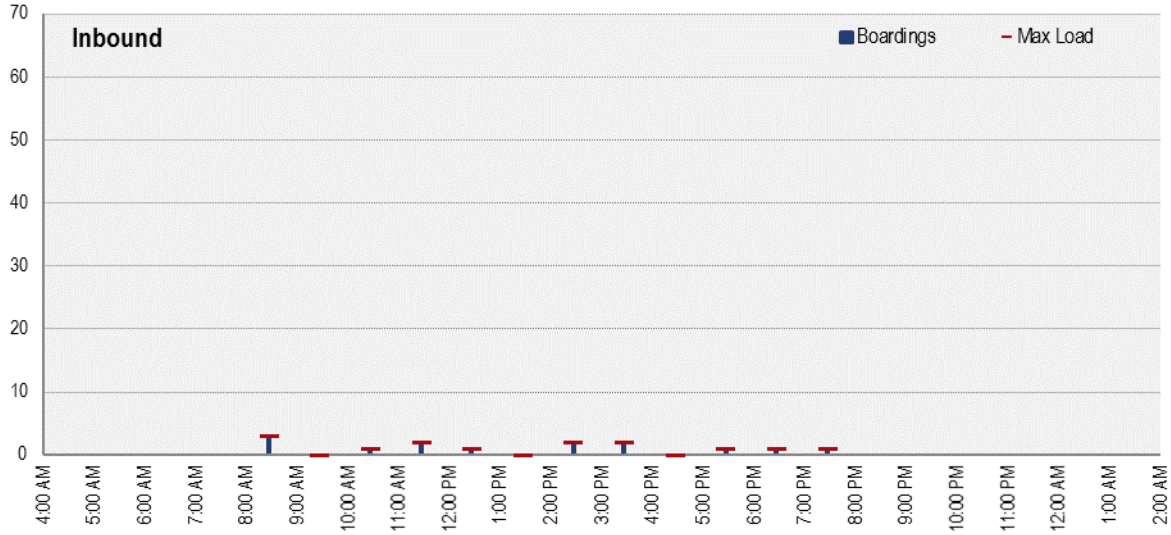


FIGURE 20 | SUNDAY INBOUND RIDERSHIP BY TRIP



Productivity

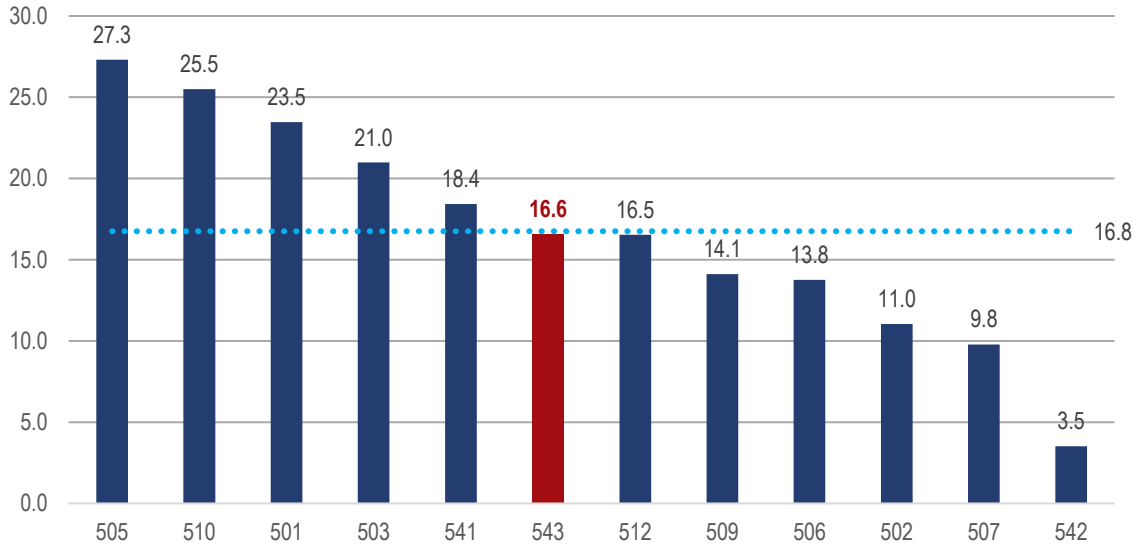
Route 543 performs slightly lower than the New Britain/Bristol Division average for passengers per revenue hour on all service days (see Figure 21). The route carries an average of 16.6 riders per hour on weekdays, ranking sixth among New Britain/Bristol Division routes. Route 543 ranks higher on weekends, ranking third in riders per hour on Saturdays and ranks fourth in riders per hour on Sundays.

FIGURE 21 | PERFORMANCE MEASURES

PERFORMANCE MEASURE	WEEKDAY		SATURDAY		SUNDAY	
	ROUTE 543	DIVISION AVG	ROUTE 543	DIVISION AVG	ROUTE 543	DIVISION AVG
Passengers per Vehicle Revenue Hour	16.6	16.8	19.9	13.1	12.3	10.4

*Source: CT**transit** performance data*

FIGURE 22 | PASSENGERS PER VEHICLE REVENUE HOUR



ON-TIME PERFORMANCE

On weekdays, approximately 46% of Route 543 time points were served "on-time" during the survey period (Figure 23). Buses are considered early when they depart a time point before their scheduled departure time. Buses are considered late when they depart a time point more than five minutes behind schedule.

Weekday on-time performance was effected by late departures, which occurred 34% of the time while the remaining 20% of time points were early. On Saturdays, approximately 60% of Route 543 time points were served "on-time" during the survey period, with 35% of time points served earlier than scheduled and the remaining 5% of time points were late. On Sundays, approximately 67% of time points were served "on-time," and 23% of time points were served early and the remaining 10% of time points were served late.

FIGURE 23 | ON-TIME PERFORMANCE

PERFORMANCE	WEEKDAY	SATURDAY	SUNDAY
Early	20%	35%	23%
Late	34%	5%	10%
On-Time	46%	60%	67%

*Source: CT**transit** performance data*

SERVICE IMPROVEMENT

Route 543 is a moderately productive route, carrying close to average ridership per hour, but very low ridership per trip compared to the rest of the New Britain/Bristol Division. The route has anchors at either end, originating in downtown Bristol and terminating at Gaylord Towers, and riders can connect to additional routes in the downtown area. In addition to the ends of the route, there is only one stop (at West Street and School Street) that has total activity of more than five riders a day, and that is only for outbound service.

The route operates along the same alignment in both directions, providing consistent service for riders, and travels primarily along Main Street and West Street. All stops that are not at the end of the route generate few or no riders.

Service Improvement Options

Opportunities to strengthen Route 543 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Reconfigure Route 543 to serve a larger area and operate more direct service.** Route 543 currently operates in a very short, U-shaped alignment connecting two destinations that are less than one-half mile apart. The route could be reconfigured to provide more direct service between downtown Bristol and Gaylord Towers, and also extended to serve additional areas of Bristol such as Dollar General on Divinity Street and/or Bristol Central High School. Both destinations would be relatively strong ridership generators on their own, but would also allow for increased accessibility to transit for residents in adjacent neighborhoods.
- **Eliminate Route 543 and serve it using another route.** Given that nearly all ridership activity is occurring at the ends of the route, which are less than a half mile apart, most of Route 543's riders could be served by another route that could be reconfigured to serve both stops. One option would be to extend Route 542 to include service to Gaylord Towers, providing more direct service to downtown Bristol and a one-seat connection to New Britain via Route 502 (which interlines with Route 542).