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To: CRCOG Transportation Committee

From: Dagmar Noll, Principal Transit Planner

Date: January 10, 2025

Subject: CTDOT Bus Stop Enhancement Program

Under the first phase of their Bus Stop Enhancement Program (BSEP) which seeks to upgrade bus stops across the state of Connecticut, the Connecticut Department of Transportation (CTDOT) is prioritizing the installation of 400-500 bus shelters at the most highly utilized bus stops over four program years. This initial phase will cover about 10% of the state's bus stops and positively impact 50% of the state's bus users.

As a prerequisite for receiving bus stop enhancements under the BSEP, CTDOT is requesting that each municipality, service provider, or COG submit a Stop Enhancement Application (SEA) for stops listed in the attached excel table. Within the CRCOG region, there are eligible Phase 1 stops in the following fourteen (14) municipalities: Bloomfield, East Hartford, Farmington, Hartford, Manchester, New Britain, Newington, Plainville, Rocky Hill, South Windsor, Vernon, West Hartford, Wethersfield, and Windsor.

SEA submissions will be reviewed on a rolling basis, and it will most likely take **at least six (6) months** from submission for shelter installations to occur. CTDOT is hoping SEAs can be submitted as early as February 1, 2025 but understands this is a complex process and larger municipalities may need more time.

Accessing the SEA
The SEA is available via the following link:
https://survey123.arcgis.com/share/65adadbadfdd46bfb935c3b5471367b5?portalUrl=https://CTDOT.maps.arcgis.com
To fill out the SEA, you must enter the passcode **CTDOTBSEP**

Please see attached documentation:

- A BSEP Phase 1 Primer PDF
- An updated SEA Quick-Start Guide PDF
- An updated SEA User Guide PDF
- An Excel table of eligible Phase 1 Bus Stops in the CRCOG region (where average daily boarding data is currently available)
    - The "Phase 1 Eligible Stops" tab has been pre-sorted by Municipality, then Average Daily Boardings, then by Bus Route Count (number of bus routes serving the stop).

CRCOG is here to assist. CRCOG's staff point of contact is Dagmar Noll, Principal Transit Planner (dnoll@crcog.org, 860-724-4321).

FAQs:

Q: Why does my town need to do this?
A: CTDOT does not know what customization options each municipality desires for its bus shelters. Similarly, CTDOT does not know which existing bus shelters are in a state of good repair and which are not. Your SEA submissions will help CTDOT compile this information and enable them to move forward with ordering bus shelters in line with the specifications desired.

Q: Why can my town no longer choose which stops will be enhanced for BSEP?
A: In response to feedback from the pilot run of the SEA, CTDOT has removed as much complexity from the application as possible. Part of these efforts entailed transitioning from a model where the municipality selects which bus stops are desired for enhancement to a model where CTDOT preemptively determines which stops are eligible for bus shelter provision in principle. Agency at the municipal level has been intentionally retained by providing towns with the ability to select customization options for shelters, the ability to identify which existing bus shelters need replacement due to poor condition, and the ability to justify non-enhancement of a bus stop which CTDOT has identified.

For future BSEP phases where greater variety of amenities will be available, CTDOT anticipates returning to a bottom-up model of enhancement selection.

Q: What resources are available for me to help me with this?
A: The attached documents provide plenty of information which will assist and answer any questions you may have. Additionally, CTDOT has set up a dedicated email inbox for BSEP: dot.busstops@ct.gov Please message this inbox with any questions that are not answered by the included reference materials.

Q: What happens after I submit the SEA for all the eligible stops in my town?
A: CTDOT will review the submissions and request your final confirmation of the details as part of their purchase order preparations. CTDOT will also require your municipality to sign a Maintenance Responsibilities Agreement between your town and CTDOT as a precondition for shelter provision. This agreement will be sent out once finalized.

Bus Stop Enhancement Program

Phase 1 Primer

Bureau of Public Transportation
Office of Transit & Ridesharing

Connecticut Department of Transportation
2800 Berlin Turnpike, Newington, CT 06111

Published November 2024

Approach

This primer is intended to explain how CTDOT is implementing the first phase of a phased approach to the Bus Stop Enhancement Program (BSEP). CTDOT envisions the BSEP to be a rolling program which will consist of multiple phases that will eventually operate concurrently.

Methodology

A bus stop must have at least 5 or more average daily boardings (ADBs) for it to be eligible for enhancement through the BSEP. About 24% of the state's ~14,000 bus stops are eligible for enhancement.

The extent of enhancements is based on bus stop types corresponding to ADB quartiles that were identified for each transit service area. The 25% of bus stops within each service area with the highest ridership were defined as Type 4 bus stops, while the 25% of bus stops with the lowest ridership were defined as Type 1 Bus Stops. Type 2 and Type 3 bus stops were defined similarly.

CTDOT will deprioritize bus stops which might be affected by upcoming streetscape and/or other construction projects to ensure that the bus stop enhancements align with the priorities of those projects. CTfastrak stations were removed from the pool of eligible stops due to the existing level of custom designed amenities.

CTDOT has opted to prioritize the addition and enhancement of bus shelters at Type 4 bus stops as part of Phase 1 deployment. Other bus stop types will receive enhancement in future program phases. Similarly, other amenities may become available to accommodate future changes to the program's direction or scope.

Pilot

CTDOT has ordered 55 bus shelters as part of the BSEP pilot, which is intended to stress test our ordering and installation processes. As the pilot prioritized testing processes, bus stop sites selected for the pilot were not selected based on the defined methodology above.

Phase 1

For Phase 1, CTDOT is prioritizing the installation of bus shelters at the most highly utilized bus stops in the state, Type 4 bus stops, based primarily on average daily boarding counts. The objective of Phase 1 is to double the number of sheltered bus stops in CT. Phase 1 will benefit stops that comprise 50% of the state's bus ridership and increase shelter coverage to 10% of all bus stops Statewide. 44 towns will receive enhancements through Phase 1.

CTDOT is expecting to install between 500-700 bus shelters over the course of four (4) years as a part of Phase 1. The variance in the expected number of installs is due to a mix of

uncertainty resulting from our limited knowledge of existing conditions - both the condition of the shelter and any space or engineering constraints identified during site inspection that may make shelter installation infeasible i.e. insufficient space to meet ADA requirements or lack of existing pedestrian connections that would push the design past the scope of the BSEP.

The first few years of Phase 1 will focus on sheltering unsheltered stops while the final years will focus on replacing existing shelters beyond a state of good repair as many existing shelters have been typed as Types 1-3 based on current ADBs. CTDOT does not possess information on the existing state of these shelters and will be relying on municipalities and transit agencies to indicate the need for replacement of these shelters via the Stop Enhancement Application (SEA).

Installation Priorities

CTDOT wishes to emphasize that based on available funding, **every bus stop eligible for BSEP Phase 1 will receive a bus shelter unless justification to the contrary is provided by a municipality or transit service provider via the Stop Enhancement Application.**

While CTDOT has created a preliminary installation timeline to assist program planning, Phase 1 delivery is ultimately reliant on the successful submission of the SEA. Without knowledge of what type of shelter/amenities are desired, CTDOT cannot submit purchase orders for the enhancements in question. While we anticipate robust engagement with the SEA, it is possible that CTDOT will prioritize the installation of bus stops identified by SEA submissions as they are submitted to ensure the timely ordering, delivery and installation of enhancements.

To install BSEP enhancements cost effectively and in a logistically prudent fashion, BSEP installations will likely be prioritized based on proximity to other BSEP installations, which will reduce installer costs. This may result in some BSEP installations not occurring until the program's second or third years.

Methodological Exceptions

A note to municipalities served by Housatonic Area Regional Transit (HARTransit)

At the time of this writing, CTDOT does not possess stop-level ADB data for bus stops serviced by HARTransit due to a lack of automatic passenger counter (APC) technology. Consequentially, CTDOT has allocated several bus shelter installations to the HARTransit service area at-large in proportion to HART's contribution to the state's 2024 ridership—1.51%. This means that HART is eligible for 13 shelter enhancements under Phase 1. CTDOT will collaborate with HART to identify where these enhancements should be located.

A note to municipalities served by Windham Region Transit District (WRTD)

Due to a mismatch in bus stop IDs between WRTD's recent General Transit Feed Specification (GTFS) and their previously submitted ADB list, CTDOT cannot accurately type bus stops for prioritization. CTDOT will identify eligible stops upon receipt of the cleaned data.

A note to municipalities served by Southeast Area Transit District (SEAT)

SEAT is in the process of transitioning from a flag-down service to a signed-stop service. As these types of service can theoretically pick up riders from any point along a bus route, SEAT's ADB data is attributed 'virtual bus stops', or general areas along the route where the ridership data is logged. This data is too imprecise to assist CTDOT in typing stops by ADB without projecting ADBs at proposed signed-stop locations.

CTDOT intends to reach out to SEAT in order to confirm which stops will become signed stops and if any existing stop level ridership data can be attributed to these pending stops.

CTDOT possesses SEAT's bus shelter inventory. However, the existing condition of these shelters is unknown. CTDOT intends to contact SEAT to ascertain the condition of the agency's existing bus shelters.

A note to municipalities served by Milford Transit District (MTD)

At the time of this writing, CTDOT does not possess stop-level average daily boarding data for bus stops serviced by MTD due to the absence of APC technology. Consequentially, CTDOT has allocated several bus shelter installations to MTD's service area at-large in proportion to MTD's contribution to the state's 2024 ridership—.69%. This means that MTD's ridership justifies the provision of 5 shelter enhancements.

The stops where these 5 shelters will be installed will be determined in partnership with MTD.

A note to municipalities served by CTtransit - Bristol Division

While CTDOT possess ADB data for the CTtransit operated routes serving Bristol, CTDOT does not possess ADB data for the New Britain Transit. The NBT route has been allocated bus shelters in proportion to its contributions to the state's 2024 ridership—.11%. This means that NBT Bristol's ridership justifies 1 shelter as part of Phase 1.

Stop Enhancement Application

Quick Start Guide

Bureau of Public Transportation
Office of Transit & Ridesharing

Connecticut Department of Transportation
2800 Berlin Turnpike, Newington, CT 06111

Published November 2024

What is the Bus Stop Enhancement Program (BSEP)?

Connecticut has just under 14,000 bus stops statewide. These stops are served by 17 different service providers—some have bus service that is owned and operated directly by the state as part of CTtransit, while other agencies operate independently with funding from the state. The independence of the other transit agencies which has historically made the provision, placement, and maintenance of bus stop infrastructure throughout the state more complex.

The Connecticut Department of Transportation's Bus Stop Enhancement Program (BSEP) aims to improve ADA compliance and place additional amenities at select bus stops across the state throughout a rolling 4-year program. The program will be implemented in a phased approach using State funds and leveraging Federal funds when necessary.

What is Phase 1?

Phase 1 will prioritize the installation of bus shelters at stops across the state with the highest ridership—Type 4 bus stops. So far, 44 municipalities have been identified as possessing Type 4 bus stops, and more Type 4 stops in municipalities served by SEAT, MTD, WRTD, NECTD, and HART will be identified once higher quality data is made available to CTDOT. At present, CTDOT anticipates enhancing between 500 and 700 bus stops as part of Phase 1, which will provide positive benefits to 50% of Connecticut's bus riders.

What is the Stop Enhancement Application?

The main purpose of the Stop Enhancement Application (SEA) is to collect data on existing bus stop conditions and desired customization preferences that CTDOT can then use to map and place purchase orders. It is a repeatable form that enables a municipality or transit agency to submit an existing bus stop as a candidate for enhancement under BSEP. By doing so, CTDOT receives location-linked data relating to the nature of the existing stop and the desired enhancements. submission of the SEA will allow CTDOT record customization preferences and local circumstances on a stop-by-stop basis. The information will also enable:

- Creation of a publicly accessible webapp that maps BSEP's progress, providing transparency and accountability to the project.
- Collection of additional relevant data that will inform how we implement future enhancements as part of future BSEP phases.

- The SEA will serve as an authoritative source on the present state of Connecticut's bus stops and on the enhancements desired for each bus stop.

What should I expect?

CTDOT's GIS and planning teams have worked to make the SEA as user-friendly as possible, which results in much of the application's data collection occurring behind the scenes. Based on the bus stop locations you select, the application will actively pull data from CTDOT's geospatial database to answer some questions automatically, which in turn limits the questions you must answer. The SEA is also dynamic, meaning that the number of questions required for you to answer differs based on the how you respond to other questions within the survey.

Each SEA submission is tied to a stop or multiple bus stops that share the same characteristics. For example, The SEA may be submitted once on behalf of 1 or 10 bus stops, so long as all the bus stops share the same customization option selections.

An excel template for bulk submissions may be available upon request. For more information on this template or to receive access, please email DOT.busStops@ct.gov.

How do I fill out the Application?

Your municipality will receive a link to the Stop Enhancement Application, this brief quick-start guide, a detailed user guide, an application passcode, and a primer on Phase 1 of BSEP from your regional Council of Government. The passcode enables CTDOT to ensure select access to the application. Before completing the SEA, review of the full User Guide is strongly recommended.

CTDOT recommends that you fully read and engage with the complete SEA User Guide before attempting to complete the SEA to avoid errors and ensure your applications don't fall behind in the processing que and are processed in a timely manner.

If I have a question, who do I contact for more information?

For all BSEP-related inquiries, please email DOT.BusStops@ct.gov.

List of Procurable Amenities under BSEP

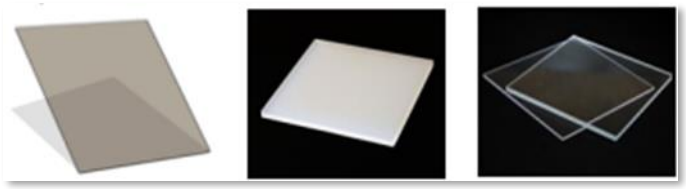
All enhancements available in the phase 1 of BSEP will be procured via Brasco International, Inc. More information about this vendor and their offerings may be found on their website. A list of the specific amenities and customizations available through BSEP are detailed on the next few pages.

Bus Shelters Options

The following customizations are also listed in the more detailed SEA User Guide but are listed here for quick reference.

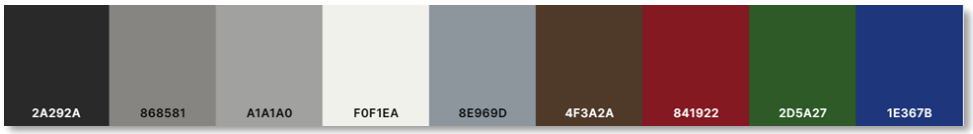
- Shelter Dimensions: 8’ X 4’, 12’ X 6’, 10’ X 5’, 10’ X 5’ (cantilevered)
- Shelter Roof styles: Barrel, Reverse Barrel, Hip, Gable, Arch
- Shelter Roof Materials: Aluminum or Acrylic (reverse barrel only)

  - Aluminum Roof Colors:
  - Acrylic Roof Colors (reverse barrel roof only)



- Shelter Finishes: Anodized or Powder Coat
    - Anodized colors:

    - Powder Coat Colors:



- Seating: Wall-mounted.
- Required ADA improvements to bus stop under this phase of BSEP:
    - ADA-compliant boarding and alighting area (5x8 Min, Firm & Stable, 2% Max Cross Slope), ADA Compliant path to/from stop to street, sidewalk, or pedestrian path, curb ramp at crossing, tactile warning strips at curb, signalized or high-visibility crosswalk over main road at nearby intersection, addition of crosswalk and/or pedestrian crossing phase at nearby intersection, ADA compliant signage (legibility)
- Other amenities procurable under BSEP:
    - Solar, windscreens, grillwork, map case, art panel, advertisement panel, trash receptacle.

Stop Enhancement Application

User Guide

Bureau of Public Transportation
Office of Transit & Ridesharing

Connecticut Department of Transportation
2800 Berlin Turnpike, Newington, CT 06111

Published November 2024

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Preface: About BSEP

Program Background

In 2022, the Connecticut Department of Transportation (CTDOT) released its Customer Experience Action Plan. One of the plan's findings revealed that only 43% of Connecticut's bus riders are satisfied with the present state of bus stops in Connecticut and identified the need for improved bus stops across the state. The State of Connecticut has almost 14,000 bus stops statewide. These stops are served by 17 different service providers. Some bus services are owned by the State and operated through contracts between CTDOT and private companies under the CTtransit brand name. Other bus services are operated by independent transit districts governed by Board of Directors representing their member towns with financial assistance provided by CTDOT through transit operating contracts. CTDOT as major funding source of transit services statewide has the major impact on transit services throughout the State but does not directly govern the provision, placement, and maintenance of bus stop infrastructure in the transit districts service areas.

Historically, the procurement, installation and management of bus stop improvements and amenities have been the responsibility of the municipalities. This approach has resulted in the emergence of regional bus stop improvement programs which, while having been successful in improving user experience, have in turn led to inconsistent bus stop amenity designs across the state and an inability for CTDOT to affirm the compliance of these bus stops with federal standards.

It has become clear that bus users in Connecticut deserve better bus stops. CTDOT's Bus Stop Enhancement Program (BSEP) has been developed as vendor-in-place system for delivering standardized bus stop enhancements across the state.

Program Objectives

BSEP intends to improve customer experience and satisfaction at the bus stop level. BSEP aims to standardize bus stop amenity designs statewide while bringing the stops that the program enhances into compliance with the Americans with Disabilities Act (ADA) via the installation of sidewalk, concrete boarding pads, and curb cuts where necessary for a complete streets approach to providing pedestrian access.

For CTDOT, BSEP will establish a streamlined procurement and installation process of standardized bus stops and amenities and will implement new maintenance agreements that clearly identify the requirements and roles of responsible parties. New bus stop amenities will be furnished at no cost to either transit agencies or municipalities. The

maintenance of these amenities and stop enhancements will be reaffirmed through new maintenance agreements that define responsibilities in line with current CTDOT policy. Through successful pursuit of a legislative change, CTDOT has lifted the prohibition on bus shelter advertising along state owned rights of way. This change will allow program participants to enter into revenue sharing agreements with advertising companies to generate the additional income necessary to offset costs of maintenance.

CTDOT is positioning BSEP as a long-term program which will complement CTDOT's ADA transition plan.

Legislative Basis & Requirements

CTDOT's Office of Transit and Ridesharing has been developing BSEP since Summer 2021. On 27 June 2023, the Connecticut General Assembly passed HB05001 into law as Public Act No. 137: An Act Concerning Resources and Support Services for Persons with an Intellectual or Developmental Disability (PA 23-137). This act mandates CTDOT and each transit provider jointly develop a plan to modernize and maintain bus stops and shelters throughout the state (PA 23-137-22). CTDOT is satisfying this requirement via the development of the BSEP in coordination with a committee of transit service providers.

Section 22 of this act imposes the following upon the BSEP:

1) That the BSEP ensures all bus stops and shelters be constructed and maintained in compliance with accessibility guidelines under the federal Americans with Disabilities Act (42 USC 12101).
2) That bus stops inclusively serve all via the inclusion of sidewalks, appropriate curb cuts and ramps, shelter from weather conditions, lighting and signage that provides real-time information concerning transportation services.
3) That the installation of solar PV systems at bus stops for the operation of lights and electronic device charging be considered [see discussion in program guide]
4) That maintenance and safety of bus stops and shelters be ensured following construction.

Program Scope

To target enhancements toward the bus stops where they will provide the most benefit to customers, only bus stops with 5 or more Average Daily Boardings (ADBs) are eligible to participate in BSEP. As a program, BSEP has been planned to occur via a phased approach. These phases are likely to overlap as the program matures.

Pilot

CTDOT has ordered 55 bus shelters as part of the BSEP pilot, which is intended to stress test our ordering and installation processes. As the pilot prioritized testing processes, bus stop sites selected for the pilot were not selected based on BSEP's established methodology. The distribution of pilot sites across municipalities is as follows:

Municipality	Number of Pilot Shelters
Bethel	1
Bridgeport	7
Cromwell	3
Danbury	6
Hamden	5
Mansfield	1
Middletown	7
New Milford	1
Portland	1
Stamford	13
Stratford	3
Trumbull	1
Windham	6

Phase 1

For Phase 1, CTDOT is prioritizing the installation of bus shelters at the most highly utilized bus stops in the state (Type 4 bus stops) based primarily on average daily boarding counts. The objective of Phase 1 is to double the number of sheltered bus stops in CT. Phase 1 will benefit stops that comprise 50% of the state's bus ridership and increase shelter coverage to 10% of all bus stops Statewide. Under Phase 1, 44 towns will receive enhancements.

Phase 1 of BSEP will prioritize provision of bus shelters at the most heavily utilized bus stops in the state that do not presently have bus shelters in a state of good repair. CTDOT expects to shelter between **500 and 700** bus shelters under phase 1, with 150 bus shelters expected to be delivered in the first year of phase 1. All stops improved by BSEP will be brought into ADA compliance.

Phase 2

Phase 2 will deliver less intense enhancements at bus stops with lower levels of ridership Examples include transit pole systems, single pole shaded seating. As with phase 1, phase 2 will also deliver ADA compliant upgrades to all enhanced stops.

CTDOT expects to be able to enhance a greater quantity of bus stops under phase 2 than under phase 1 due to less intense design requirements and less overall cost than a formal

bus shelter. While roughly 2,500 bus stops are estimated to be eligible for phase 2, planning for this phase has yet to be completed.

Phase 3

Phase 3 will entail the piloting and installation of what can be considered as the 'bells and whistles' of a bus stop. Real Time Information (RTI) signage, bike racks, community stewardship programs and art programs have been identified as enhancements which CTDOT's planning team would like to incorporate into BSEP in the future. Phase 3 will add new enhancements to bus stops which have previously been enhanced by BSEP.

Section I: About the Stop Enhancement Application & FAQ's

The Stop Enhancement Application (SEA) is a repeatable form that enables a municipality or transit provider to submit an existing bus stop or list of candidate stops for enhancement under the BSEP. By doing so, CTDOT receives location-linked data detailing to the nature of the existing stop and the specific customizations desired by the municipality/transit service provider.

Why an application?

While CTDOT possesses ridership data, knowledge of which stops are eligible for BSEP and knowledge of which stops are eligible to participate in Phase 1, CTDOT relies on municipalities to provide information regarding the specifics around bus stop customization—some municipalities will desire one particular bus stop shelter roof style, while others will desire a particular color in line with a town's branding, and so on. The SEA enables the efficient collection and review of this data by CTDOT while also allowing for municipalities/transit providers to note additional local or regional design preferences or requirements for bus stop enhancements.

Each submission of the SEA will also provide data to a publicly accessible GIS web application depicting which stops have been selected for enhancement, the status of each stop's enhancement, and other stop related attributes which will provide transparency and accountability to the project.

It is CTDOT's intent that the SEA, through your responses, will serve as an authoritative source on the enhancements desired at each bus stop.

How do I access the application?

The application is accessible through a link sent to your municipality via email from your Council of Governments (COG). The email containing this link will accompany a spreadsheet containing ridership data for all the Phase 1 eligible bus stops separated by COG and a passcode.

Frequently Asked Questions:

Whose responsibility is it to fill out this application?

The SEA should be filled out by a representative of either the transit service provider which serves a bus stop or the municipality within which the bus stop in question is located.

I represent a municipality and want to leave BSEP-related decisions to the transit service provider that serves my municipality. What do I do?

1) Open the SEA.
2) When filling out the SEA, you will reach a question that asks if you are (in your capacity as the applicant) representing a municipality or a transit service provider.
3) Select 'municipality,' which will cause an additional question to appear. This additional question asks if you wish to waive responsibility for BSEP option selection and customization.
4) Select the option "I defer my BSEP option-related choice making to my municipality's transit service provider."
5) Continue filling out the SEA and submit the application. Submission allows for CTDOT to record your municipality's decision to opt-out.

After submitting this opt-out once, no further action by you is required.

Can Native American Tribes participate in BSEP?

Yes, so long as fixed-route transit service is present on tribal land or tribal owned private property. A maintenance agreement between the State of Connecticut and the tribal authority will still need to be signed and might require Governor's Office approval.

What information does the application require?

The application requests the following information:

- Stop IDs as they appear in the embedded map within the survey application (instructions below)
- Whether lighting is present at each candidate bus stop
- The condition of any existing bus shelters
- Open-ended input around additional concerns (presence of proximate trip generators, site nuances, spatial constraints, etc.).
- Desired customization options for bus stop

It is recommended that the above information be collected before submissions of the application begin for the applicant's convenience. Some information may require field inspection or digital inspection using satellite or photolog imagery of the stops in question, analysis of a transit service provider's ridership, and knowledge of municipal or transit service

provider design/branding guidelines with relation to the customization of bus stop enhancement options.

How many times must I fill out this application?

Ideally, the application should be filled out once per each unique request of desired enhancements. An option for bulk submission is available where a single application may be submitted on behalf of multiple selected bus stops if they share the same set of desired enhancements. In other words, if 4 stops all have the same shelter size and customization selections, the application can be submitted once on behalf of all 4 stops. However, if each of the 4 stops had different shelter dimensions and customization selections, the application would have to be submitted once for each of the 4 stops, or 4 times total.

Excel-based submission

A spreadsheet template may be available for bulk bus stop submission. To check if your application qualifies, please email dot.busstops@ct.gov for further information.

What happens if I do not fill out this application?

Bus stops will not be considered for enhancement under BSEP unless submitted into the SEA.

Is CTDOT's new Complete Streets Directive relevant to the BSEP?

Yes. The Complete Streets Directive (CSD) and its requirements have been incorporated into BSEP's planning. Street improvement projects undertaken by CTDOT are using BSEP's methodology to gauge the extent to which any present bus stops should be improved, though these improvements are not occurring as part of BSEP.

For more information on the Complete Streets Directive, refer to the Directive issued by CTDOT's Bureau of Engineering and Construction.

What are the levels of enhancement and the amenities available under the BSEP?

For the purposes of the BSEP, CTDOT has developed a method for categorizing bus stops into one of four types:[1]

ADA Compliant Boarding Areas			
	Type 1		Signed stop typical of low ridership/very low frequency
	Type 2		Seated, signed stop typical of moderate ridership/low frequency
	Type 3		Sheltered, seated, & signed stop typical of high ridership/high frequency
	Type 4		Sheltered, seated, signed, & outfitted stop typical of exceptional ridership/very high frequency

** Full list of amenities offered by stop type available in BSEP Design Guide*
*** Images adapted from Metro Hartford Rapid Routes*
**** All stops types include ADA compliance-related enhancements & either direct or indirect lighting. Stop types 2, 3, & 4 include either seating or shelter.*
***** Stops that will be impacted by other projects (Ex: New Haven BRT) or that have an existing shelter in a State of Good Repair (SOGR) will not be eligible for enhancement under BSEP.*

Figure 1: An illustration of BSEP's Typology using images from Hartford Rapid Routes (illustrations are indicative and are not fully representative of what each bus stop type will entail).

Each bus stop type entails sequentially progressive enhancements, also called amenities or assets, that build upon the enhancements of the preceding bus stop type (ex: Type 3

Typology Level	Description	Defining Traits
Type 1	Basic Coverage Stop	*(Limited-space contexts, ADA boarding pad, sign and post, passive lighting)*
Type 2	Regular Coverage Stop	*(Seating where requested, rider info, site-specific lighting, waste bins)*
Type 3	Enhanced Coverage Stop	*(Shelter, high ridership and/or transfer between routes)*
Type 4	Transportation Hub	*(High ridership, clusters of bus stops, "the works")*

[1] *a Type 5 bus stop was designed for categorizing high traffic facilities and signature BRT system stops (i.e., CTFastrak and the upcoming MOVE-New Haven service), though enhancing bus stops to this standard and level of design is outside the scope of the BSEP.*

enhancement also includes Type 1 and Type 2 enhancements) and the recharacterization of some amenities in terms of their optionality (ex: an optional enhancement at Type 1 may become required at Type 3).

Terminology

Each of the amenities researched for the BSEP were further characterized in terms of their necessity from CTDOT's perspective as Required, Preferred, or Optional:

Required	Amenities which are nonnegotiably included as part of enhancement to the bus stop type in question
Preferred	Amenities that CTDOT prefers the inclusion of in accordance with bus stop enhancement best practices which are at the discretion of the municipality/transit service provider
Optional	Amenities whose inclusion is at the discretion of the municipality/transit service provider

Table 1: Explanation of terms related to Amenity Necessity color coded for colorblindness.

The Bus Stop Typology developed by CTDOT and the amenities available at each level of enhancement conform with national and international universal design best practices related to the enhancement of bus stops. The table on the following page identifies amenity necessity by bus stop type for every item currently procurable through the BSEP.

Table 2: Procurable Amenities by Bus Stop Type and Necessity

Bus Stop Amenities	Bus Stop Type 1	Bus Stop Type 2	Bus Stop Type 3	Bus Stop Type 4
Context	**Basic Coverage Stop** (Limited-space contexts, ADA boarding pad, sign and post, passive lighting)	**Regular Coverage Stop** (Seating where needed, rider info, site-specific lighting, waste bins)	**Enhanced Coverage Stop** (Shelter, high ridership and/or transfer between routes)	**Transportation Hub** (High ridership, clusters of bus stops, site-specific design)
Signage				
ADA compliant signage (Legibility)	**Required**	**Required**	**Required**	**Required**
Digital Signage/Next Bus Arrival	-	**Optional**	**Preferred**	**Preferred**
Accessibility				
ADA-compliant boarding and alighting area (5x8 Min, Firm & Stable, 2% Max Cross Slope)	**Required**	**Required**	**Required**	**Required**
ADA compliant path to/from stop to street, sidewalk, or pedestrian path	**Required**	**Required**	**Required**	**Required**
Curb ramp at crossing	**Required**	**Required**	**Required**	**Required**
Accessibility				
Tactile warning strips at curb (Boarding area flush with road or curb greater than 6")	**Required**	**Required**	**Required**	**Required**
Signalized or high-visibility crosswalk over main road at nearby intersection	**Optional**	**Optional**	**Preferred**	**Preferred**
Add crosswalk and/or ped. phase at nearby intersection	-	**Preferred**	**Preferred**	**Preferred**
Safety and Security				
Lighting (includes passive lighting from streetlights)	**Required**	**Required**	**Required**	**Required**
Passenger Comfort/Convenience				
Seating [awaiting clarification for types 1 & 2]	-	**Preferred**	**Required**	**Required**
ADA compliant Bus Shelter	-	-	**Required**	**Required**
Bike Rack(s)	-	**Optional**	**Optional**	**Optional**
Trash and Recycling receptacles	-	**Optional**	**Preferred**	**Preferred**
Operational Enhancements				
Concrete bus pad (in-street)	-	**Optional**	**Optional**	**Optional**
Solar Panels/electrical hardwire connection (for lighting [if not already present])	-	**Optional**	**Optional**	**Optional**

Required: Amenities which are nonnegotiably included as part of enhancement to the bus stop type in question.	**Preferred:** Amenities that CTDOT prefers the inclusion of in accordance with bus stop enhancement best practices which are at the discretion of the municipality/transit service provider.	**Optional**: Amenities whose inclusion is at the discretion of the municipality/transit service provider.

How is the 'Type' of an applicant bus stop determined?

Table 3: Factors for Determining Bus Stop Type

Factors	Type 1 Basic Coverage Stop	Type 2 Regular Coverage Stop	Type 3 Enhanced Coverage Stop	Type 4 Transportation Hub (High ridership, clusters of bus stops, site-specific design)
Ridership	**Typical of**	**Typical of**	**Typical of**	**Typical of**
Customer Utilization (boardings)	Low Ridership	Moderate Ridership	High Ridership	Very High Ridership
Service Levels	**Typical of**	**Typical of**	**Typical of**	**Typical of**
Frequency of service/Headway	Low Frequency/Highest Wait Times	Moderate Frequency/Low Wait Times	High Frequency/Low Wait Times	Very High Frequency/Lowest Wait Times
Context/Setting	**Typically, Near/Better For**	**Typically, Near/Better For**	**Typically, Near/Better For**	**Typically, Near/Better For**
Activity Centers/Adjacent Land Use	Low Activity Areas/Residential Land Use	Moderate Activity Areas/Mixed Land Use	High Activity Areas/Mixed Land Use	Major Activity Centers/Commercial Land Use
Bus Stop Environment	Limited space with use of very basic amenities and requirements (ADA accessible improvements, Signage, Lighting etc.)	Stops with more space to accommodate additional basic amenities and options (seating, waste bins, bike racks)	Stops with more space to accommodate higher level of amenities (shelters, information displays, solar panels etc.)	Stops with more space to accommodate full buildouts of all possible amenities (shelters, information displays, solar panels etc.)

During Phase 1, only Type 4 bus stops–the bus stops with the highest ridership in Connecticut—are eligible for BSEP.

As future BSEP phases are brought online, other bus stop types will become selectable in the SEA.

CTDOT correlates BSEP bus stop type with quartiles[2] of average daily boardings per year per stop within transit districts to determine if the stop is indicative of low, moderate, high, or very high ridership. Collectively, these factors create a statewide framework for determining levels of ridership.

Why quartiles?

The SEA requires an easy & quantifiable method for determining which type of enhancement said applicant bus stop is eligible for. Using quartiles allows this characterization to occur quickly, which in turn allows for the SEA to adjust what questions are presented to the applicant based on how prior questions are answered. This method also allows for transit systems with differencing characteristics (rural or urban, big, or small) to all retain eligibility for participation in BSEP.

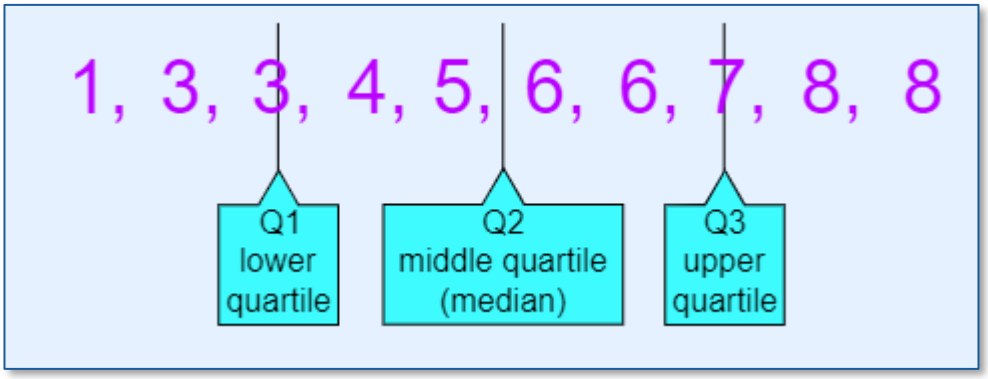

Figure 2: A visualization of quartiles within a dataset

Other Considerations

Quartiles alone are insufficient for definitively determining an applicant bus stop's type, which is why other information is requested by the SEA and considered as part of CTDOT's deliberation.

Applicant Rationale

In addition to the quartile system outlined above, CTDOT's determination of a stop's type with respect to the BSEP typology considers applicant input. The survey has questions that allow for the applicant to explain their reasoning for requesting amenities in an open format.

[2] *A statistical method which divides the number of data points within a dataset into four parts, or quarters, of more-or-less equal size.*

Information provided in response to these more open-ended questions will be considered by CTDOT and may lead to adjustment of the stop's type under the BSEP Typology on a case-by-case basis.

What happens after the application is submitted?

Following submission of the SEA, the applicant stop's eligibility for enhancement will be considered by the CTDOT's Office of Transit and Ridesharing with respect to the below criteria.

Feasibility Criteria

The feasibility criteria will aid CTDOT, local authorities, and other stakeholders in identifying whether stops can be upgraded through the BSEP based on current program and site constraints. The impact of the feasibility criteria upon an applicant bus stop's enhancement prioritization is circumstantial—These factors do not entail reasons why a bus stop should not be enhanced but note the factors which CTDOT must consider in determining if the prioritized stops should be enhanced through this program.

Table 4: Feasibility Criteria

Factors	Criteria/Considerations
Context/Setting	
Bus Stop Environment & Adjacent Land Use	Environ characteristics may influence bus stop amenity design/construction feasibility (i.e., distance from existing structures, zoning requirements [if any], connections to electric utilities or storm water runoff).
Other Considerations	
Classification of street/roadway	Nature of roadway/street adjacent to bus stop site (Local or State-owned collector or arterial roadway) will inform which permits are needed for bus stop enhancement/construction; may determine design requirements.
Intersection or midblock	Bus stop siting may necessitate changes to the site's built environment, such as the need and/or design of ADA accessibility features (curb cuts, ramps, concrete boarding pads etc.).
Traffic control	The presence of traffic signals, stop signs or uncontrolled intersection shall influence design recommendations from a complete street/ADA accessibility perspective.
Sidewalk or shoulder width	The availability of the amounts of space necessary at a site for either a new or enhanced bus stop at an existing sidewalk or shoulder. • The necessary amounts of space are outlined by the technical drawings included in section 7 of this design guide.
Existing curb cuts or ramps	• Preexistence of these curb elements VS. need for their construction • Difficulty/cost/time for bus stop construction/modification
Electrical/Stormwater considerations	Site conditions informing whether electrical connections/stormwater drainage considerations will take place as part of the bus stop design process. Standards and designs to be considered if necessary and on a case-by-case basis.
Other safety considerations	As they situationally arise.

For Phase 1:

Following review of each bus stop's feasibility by CTDOT's engineers, CTDOT will compile SEA submissions into a Purchase Order format. These submissions will likely be organized by location to reduce installation costs, though this has not yet been finalized. Once compiled, these submissions will be sent to the municipality/transit provider for final verification. Once approved, these submissions will be sent as part of a formal purchase order to the appropriate BSEP supplier.

A Note on Equity

Equity is a core principle of the BSEP, and it is the intent of this program to prioritize the provision of bus stop enhancements within communities and locations that have historically been underserved by or particularly dependent on public transportation. Therefore, it is the policy of CTDOT to implement bus stop enhancements in an equitable fashion.

Under Title VI of the Civil Rights Act of 1964 (Title VI), 42 U.S.C. § 2000d et seq., and DOT Title VI regulations at 49 C.F.R. Part 21, The U.S. Department of Transportation enforces CTDOT's provision of equal opportunity and access in all programs receiving Federal Financial Assistance from USDOT by ensuring nondiscrimination on the basis of race, color, or national origin (including limited English proficiency). One such manner of USDOT's enforcement is via CTDOT's creation and submission of maps which show public transportation service areas and the census tracts which are and are not served by public transit. Census tracts which contain statistically significant levels of racial, linguistic, or national minorities are identified as part of this map making.

Bus stops put forward for enhancement under the BSEP will have their locations logged into a GIS database as part of the BSEP SEA. Each applicant bus stop will be reviewed with regards to whether the stop is located within one of the statistically significant census tracts identified as part of CTDOT's Title VI reporting requirements. Should an applicant bus stop indeed be present within such a census tract, it will be prioritized for enhancement to a greater extent than a stop that is not within such a census tract.

CTDOT recognizes that use of a census tract as the unit for analysis may be imprecise. The use of other measures of equity — primarily applicant-submitted exposition— in tandem with census tracts is intended to alleviate this imprecision.

Section II: About the Enhancements

Accessibility

ADA-compliant boarding and alighting area

Type 1	Type 2	Type 3	Type 4
Required	**Required**	**Required**	**Required**

Per USDOT's ADA Standards for Transportation Facilities, bus stop boarding and alighting areas must:

- Possess a firm, stable surface (810.2.1)
- Possess dimensions of 96 inches (perpendicular to curb) by 60 inches (parallel to roadway) at minimum (810.2.2)
- Not possess a slope steeper than 1:48 (Perpendicular to curb) (810.2.4)
- Possess a slope the same as the roadway to the maximum practical extent (parallel to roadway) (810.2.4)

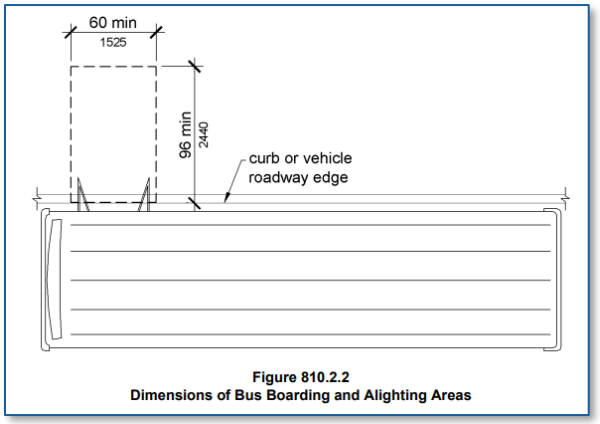

Figure 3: Dimensions of BUs Boarding and Alighting Areas required by ADA.

CTDOT intends to bring the boarding and alighting areas of all bus stops enhanced through the program into ADA compliance. Precise technical drawings of what BSEP-enhanced boarding and alighting areas entail are available for reference in the BSEP Bus Stop Design Standards and Guidelines.

ADA compliant path to/from stop to street, sidewalk or pedestrian path

Type 1	Type 2	Type 3	Type 4
Required	**Required**	**Required**	**Required**

Per the USDOT's ADA Standards for Transportation Facilities, bus stops must be connected to streets, sidewalks, or pedestrian paths by an accessible route (810.2.3). An accessible route is defined as a continuous unobstructed path connecting all accessible elements and spaces of a building or facility. For a path to be considered ADA compliant, it must be:

- Not steeper than 1:20 (402.2)
- Of a stable, firm, and slip-resistant surface (302).
- Of a minimum width (clear width) of 36 inches, which may be exceptionally reduced to 32 inches in width for a length of 24 inches so long as this segment is separated by segments that are at least 36 inches wide over a length of 48 inches (402.5.1).

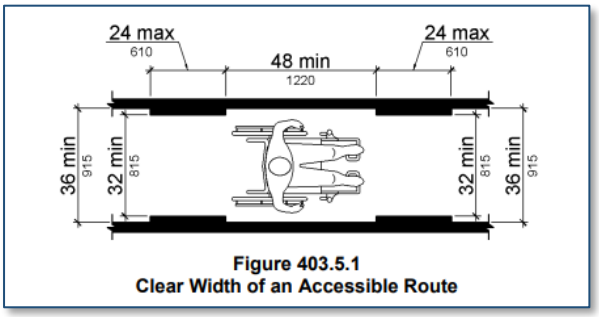

Figure 4: Clear width of an accessible route required by ADA.

- If of a width between 36 and 60 inches, possess passing spaces at intervals of 200 feet maximum which are either 60 inches by 60 inches minimum or compliant with Figure 304.3.2 (T-shaped turning space) (403.5).

CTDOT intends to implement ADA compliant accessible routes between enhanced bus stops and streets, sidewalks, pedestrian, and bicycle paths where appropriate. If no such path is present, it will be implemented as part of BSEP and in accordance with CTDOT's Complete Streets Directive.

Curb ramp at Crossing

Type 1	Type 2	Type 3	Type 4
Required	**Required**	**Required**	**Required**

A curb ramp is a ramp which connects a sidewalk or footpath to the street. Per the USDOT's ADA Standards for Transportation Facilities, a curb ramp:

Figure 5: An example of an ADA-Compliant curb ramp at a crossing point.

- May not be steeper than 1:12 (405.2)
- May not have a cross slope stepper than 1:48 (405.3)
- Must be stable, firm, and slip-resistant (405.4)
- Must possess a clear width of 36 inches minimum (405.5)
- Must not adjoin to surface with a slope steeper than 1:20 (406.2)
- Must not possess curb ramp flares steeper than 1:10 (406.3)
- Must provide a Landing at the top of the curb ramp 36 inches long at minimum and at least as wide as the curb ramp itself (406.4)
- Must not be located so as to protect into vehicular traffic lanes, parking spaces, or parking access aisles, and if present at marked crossings, must be wholly contained within the markings (406.5)
- Must contain a detectable warning which extends for the curb ramp's full width and either the curb ramp's full depth or 24 inches deep (406.8).

CTDOT intends to implement curb ramps at any street to sidewalk/footpath connection that contributes to an accessible route toward the enhanced bus stop. If no curb ramp is present at a street crossing which serves bus riders, curb ramps will be implemented as part of the BSEP and in accordance with CTDOT's Complete Streets Directive. Precise technical drawings of what curb ramps provided through the BSEP entail are available for reference in the BSEP Bus Stop Design Standards and Guidelines.

Tactile warning strips at curb

Type 1	Type 2	Type 3	Type 4
Required	**Required**	**Required**	**Required**

Figure 6: CTfastrak station with curbside tactile warning strips.

Per the US Access Board's Public Right-of-Way Accessibility Guidelines, detectable warnings/tactile warning strips are required to be present along the boarding edge of any boarding platform for transit vehicles (R305.2.6). Within the context of bus stops, detectable warnings are only required at the edge of boarding platforms which are more than 6 inches higher than the base roadway. As part of the BSEP, CTDOT intends to implement tactile warning strips/detectable warnings where necessary under the guidelines and the ADA.

Signalized or high-visibility crosswalk over main road at nearby intersection

Type 1	Type 2	Type 3	Type 4
Optional	**Optional**	**Preferred**	**Preferred**

A signalized crosswalk works in conjunction with the traffic signals of a nearby intersection to provide pedestrians with the opportunity to safely cross a roadway while vehicular traffic is halted. This is typically done through display of a positive crossing signal in tandem with the display of red-light signals at an intersection, which halt oncoming vehicular traffic. Signalized crosswalks provide safe pedestrian crossing either as part of the traffic signal rotation or at the request of a pedestrian via push-button.

Figure 7: a crosswalk in Spartanburg, SC made highly visible through implementation of a crosswalk mural.

In contrast, a high visibility crosswalk is not tied to a signal that halts vehicular traffic. Instead, it relies on vehicular traffic yielding to a crossing pedestrian in response to a pedestrian's presence amidst a highly visible, contrasting crosswalk that makes the prioritization of the pedestrian over a vehicle apparent to a motorist.

Under CTDOT's Complete Streets Design Directive, accessible pedestrian access is to be provided between both sides of a roadway within 400 feet of existing or proposed transit stops. Such access is also required by the ADA for the purpose of creating accessible routes which connect to existing or planned pedestrian facilities.

Presently, implementation of these crossings is at the request of the municipality/transit provider, as noted by the use of Optional and Preferred necessity under the BSEP Typology. While the level of necessity is subject to change following further discussion between the Complete Streets Committee and CTDOT's transit planning unit, the implementation of signalized/high-visibility crosswalks will remain within the scope of the BSEP—even if the crosswalks are furnished through other CTDOT programs.

Add crosswalk and/or ped. phase at nearby intersection

Type 1	Type 2	Type 3	Type 4
-	**Optional**	**Optional**	**Optional**

Due to automotive centric design standards that may have been in force at the time of an intersection's planning and construction, not every intersection possesses crosswalks or a pedestrian signaling phase that enables safe pedestrian crossing.

Figure 8: A crosswalk countdown signal showing the time left in a pedestrian crossing phase.

It is within the scope of the BSEP to, where necessary and where requested, implement formal crosswalks and pedestrian signal phases at existing intersections in the interest of creating a connected and usable network of pedestrian facilities that in turn connect to bus stops being enhanced by CTDOT. The level of necessity is subject to change following further discussion between the Complete Streets Committee and CTDOT's transit planning unit, and will likely occur in partnership with existing CTDOT programs.

Safety and Security

Lighting (includes passive lighting from streetlights)

Type 1	Type 2	Type 3	Type 4
Required	**Required**	**Required**	**Required**

Adequate lighting at bus stops enables bus operators to see if riders are waiting to board. Just as importantly, lighting provides waiting riders with a safer environment, greater visibility of the surrounding environs, and a greater sense of safety. It also formalizes the presence of bus stops within the built environment and makes the choice of bus travel more visible within the conscious of the general public.

Figure 9: A rider under a stand-alone light waiting for their bus to arrive.

Under the Complete Streets Directive Design Criteria, illumination is required to be provided at all transit stops.

For the purposes of the BSEP, acceptable means of illumination include streetlights, streetlamps, and bus stop-specific lighting. Ambient light from buildings or illuminated signage is not acceptable.

Through the BSEP, illumination via in-shelter lighting, standalone Sol-Stop-style lighting, and typical streetlight-lighting is procurable. The lighting may be powered by either locally mounted photovoltaic [solar] panels (should conditions allow) or by direct hardwire connection to an adjacent utility power conduit. The method of electrification will be determined as part of the review of each BSEP stop application by CTDOT in accordance with local conditions.

Figure 10: An internally illuminated bus shelter powered by solar.

Seating

Type 1	Type 2	Type 3	Type 4
Required	**Required**	**Required**	**Required**

Seating refers to a piece of street furniture which a waiting passenger can sit down on while waiting for their bus to arrive. Under CTDOT's Complete Streets Directive Design Criteria, a shelter or bench is to be provided at any transit stop with high levels of boarding per day or low levels of frequency of service, which effectively means that every enhanced bus stop must possess seating or a bus shelter (which includes seating.)

The scope of the BSEP allows for a high degree of customization in terms of seating styles, materials, and coloration, which are outlined below.

Wall-mounted bench

Wall-mounted benches accompany bus stops which are to be enhanced with bus shelters. As the name suggests, these benches are mounted on the inside wall of the bus shelter. They comprise of a seating surface made of two slats, which are themselves made of either aluminum or HDPE. These benches vary in length depending on the size of the corresponding bus shelter, and feature backrests. It will match the color of the bus shelter's finish, unless otherwise specified.

Figure 11: Wall-mounted bench

Is the wall-mounted bench ADA compliant?

Yes. Per the U.S. Access Board, the ADA Standard [for bench depth] only scopes benches located in dressing, fitting, and locker rooms (ADA Standards 803, 903).

The most recently adopted version of the Department of Transportation's Public Right of Way Guidelines in 2024 states that "benches in the public right-of-way should have armrests and back support for maximum accessibility…However, as the US. Access Board did not propose specific technical requirements, such as specifications for armrest loads and dimensions and back height, the Board declines to add those now at the final rule stage" (R209.6). Consequentially, the wall-mounted benches available through BSEP remain ADA compliant so long as the rest of the bus shelter satisfies the ADA.

ADA compliant Bus Shelter

Type 1	Type 2	Type 3	Type 4
-	-	**Required**	**Required**

A bus shelter is a covered space which provides a waiting bus passenger with shelter from inclement weather. Under the BSEP typology, Type 3 and Type 4 bus stops are required to possess an ADA compliant bus shelter. These shelters are provided with a high degree of customization with respect to roof styles, roof materials, window materials, and color.

Under CTDOT's Complete Streets Directive Design Criteria, a shelter or seating is to be provided at any transit stop with high levels of boarding per day or low levels of frequency of service, which effectively means that every enhanced bus stop must possess seating or a bus shelter (which is likely to include a form of seating.) The required implementation of bus shelters at Type 3 and Type 4 stops conforms with this directive criteria.

Possible Shelter Dimensions

Four possible bus stop dimensions are selectable through BSEP:

- 12′ x 6′ Shelter
- 8′ x 4′ shelter
- 10′ x 5′ shelter
- 10′ x 5′ shelter (cantilevered)

Bus Shelter Roof Styles

5 possible roof styles are anticipated to be selectable under the BSEP:

Figure 12: The palette of bus shelter roof styles selectable through the Bus Stop Enhancement Program

If selection becomes too difficult, CTDOT recommends either the gable or hip roof styles. These roof styles best honor New England's architectural patterns, which widely use gables and hipped roofs.

Bus Shelter Roof Materials

2 roof material options are anticipated to be selectable through the BSEP:

Aluminum

Aluminum offers ultimate strength and coverage for shelter roof applications. Depending on the shelter model and roof type, either aluminum sheet or prefinished standing seam aluminum will be offered. An Aluminum roof is ideal for locations with high sun, high wind loads, or high snow loads. It is available in a wide selection of powder coat paint and prefinished colors and is the preferred roofing material by CTDOT.

Figure 13: The palette of aluminum bus shelter roof colors selectable through the Bus Stop Enhancement Program.

Acrylic

Acrylic glazing offers 92% light transmission with UV protection and has a higher impact strength than glass. Acrylic's clarity, light weight, impact resistance, and weather resistance make it a popular choice for shelter roof applications. Acrylic glazing is available in **clear**, **white**, and **bronze**. It is important to note that the acrylic's thickness will vary based on the shelter model and its location.

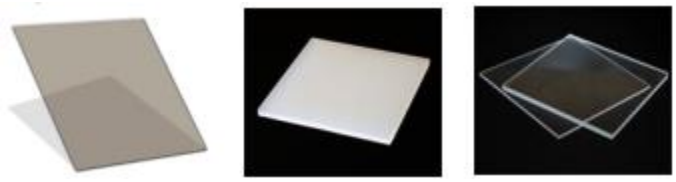

Figure 14: The palette acrylic roof colors selectable through the Bus Stop Enhancement Program.

Due to its large curve, the reverse barrel roof style imposes a premium cost if aluminum is used (due to the need to use standing seams to connect the multiple pieces of aluminum that make up the roof). Consequentially, it is the only roof type to offer acrylic as a selectable material. Acrylic is far less customizable than the aluminum roofs used by other bus shelter roof styles. Keep this in mind when planning the overall design uniformity of your service area's bus stops!

Bus Shelter Wall Materials

Tempered Safety Glass

Tempered safety glass is a universally popular wall glazing choice due to its strength and the ease with which it can be replaced if damaged. Tempered safety glass offers superior rigidity for high wind locations. Tempered safety glass is heat resistant, breaks into granular pieces if broken, which reduces harm risk, and is more scratch resistant than acrylic and polycarbonate.

All shelter walls delivered through the BSEP will use ¼" tempered safety glass as the standard option. Options to replace some of these panels with either an advertising panel at the time of installation or with an art panel in the future will be offered. These options are discussed further on in this guide.

Bus Shelter Frame and Accessory Finishes

Bus shelter frames and accessories can be given two different types of finishes: powder coat paint coloring or anodized aluminum finishing. Given the lower maintenance burden imposed by an anodized finish, CTDOT recommends the selection of an anodized finish. However, the option to choose from a powder coating remains.

Anodization protects the aluminum material of the bus shelter to a greater extent than a powder coat paint finish and is easily maintainable and cleanable. Anodized finishes do not deteriorate in UV light to the same extent as a powder coating finish. However, they possess a lower degree of customization in terms of color variation due to the translucence of the coating. Under the BSEP, two anodization finishes are selectable: Clear & Dark Bronze (pictured above).

Figure 15: The palette of selected anodized finishes selectable through the Bus Stop Enhancement

Powder coating is more resilient than a typical paint coating and provides a bus stop's aluminum material with a resistance to corrosion, protection against wear and tear, and improved reflectivity and hardiness. It is also cost-effective for large scale coverage, though it is prone to chipping and vulnerable to prolonged UV exposure.

In an effort to provide all stops upgraded under the BSEP with some degree of uniformity, CTDOT's BSEP Working Group has curated the selectable powder coating colors to the below 9 options:

Figure 16: The palette of selectable powder coatings available through the Bus Stop Enhancement Program.

Additional colors may be available upon request and on a case-by-case basis.

Optional Bus Shelter Accessories

Art panel

An art panel entails a specialized safety glass panel that artwork is applied onto. The art can be applied by either the manufacturer (for an additional cost, of course) or directly by the community/transit service provider/municipality.

A variety of designs are available as art panels by the manufacturer. CTDOT is exploring a build out of an Art-in-Transit program as part of a later phase of BSEP. The program would enable artists and communities to submit designs for placement at bus shelters as art panels.

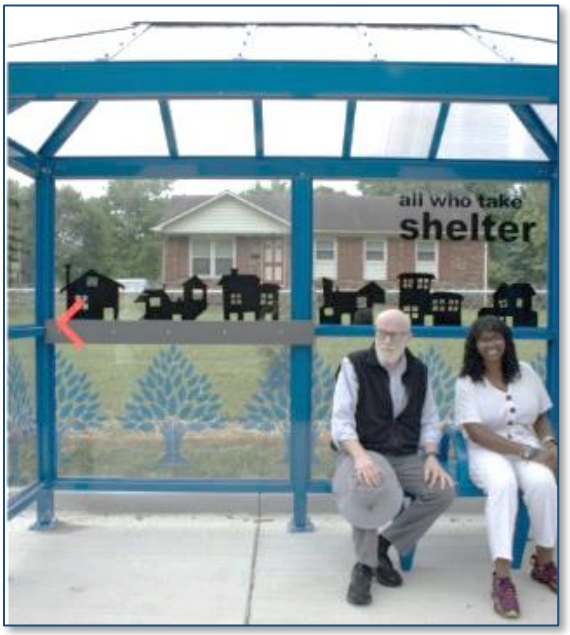

Figure 17: An example of community-applied art panels in a bus stop.

Map case holder

A map case holder is precisely what it sounds like—a small panel on the side of the shelter that holds a map of the transit service provider's system. It is procurable in multiple sizes based on the actual dimensions of the map that it is intended to hold.

While the map case will be procured under BSEP, maps will remain the responsibility of the transit providers.

Figure 18: an example of a map case holder in a gable-roofed bus shelter.

Advertising panel

An advertising panel replaces a safety glass panel with a secure, resilient space where advertisements can be hosted. This provides a revenue stream which can be used to cover the maintenance costs of the bus stop.

Figure 19: an example of an advertising panel in an arch roofed bus shelter.

Shelter Windscreens

Windscreens refer to a partial 4th side of the shelter which faces the roadway. This 4th side provides additional protection from the elements to the shelter user while leaving an ADA-compliant entryway in and out of the shelter.

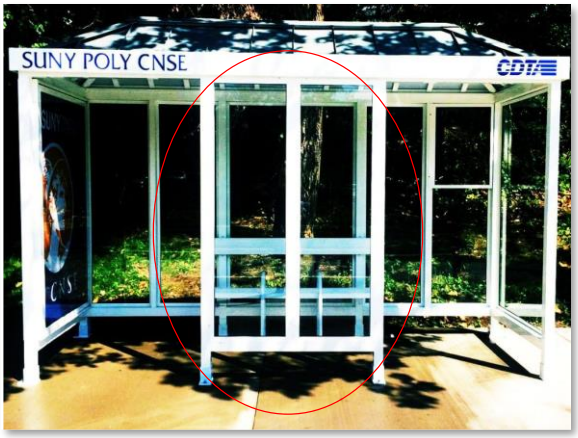

Figure 20: an example of a bus stop shelter windscreen in a hip-roofed bus shelter.

Decorative Grillwork

Additional decorative grillwork per panel is procurable as a shelter add-on only if required by existing transit service provider branding needs. If a transit service provider's existing shelters all have grillwork, then the provision of grillwork on new shelters through the BSEP would be considered. If that is not the case, decorative grillwork will not be considered due to cost considerations.

Figure 21: An example of decorative grillwork in a barrel roofed bus shelter.

Trash and Recycling Receptacles

Type 1	Type 2	Type 3	Type 4
-	**Optional**	**Preferred**	**Preferred**

Trash and recycling receptacles are places where waiting bus stop riders can place their trash and recycling. This allows for the disposal of unwanted material without littering and prevents the rider from having to bring empty wrappers/cans with them onto a bus, which in turn keeps the bus clean.

Figure 22: trash and recycling receptacles featuring a deposit ring add-on.

The provision of trash or recycling bins at bus stops imposes a routine maintenance burden, as the trash/recycling must be emptied routinely in the interest of rider comfort and hygiene. However, they also lessen the rate at which a bus stop becomes unclean by providing a concentrated point for where trash/recycling should be directed, which in turn lessens the frequency with which the entire bus stop must be cleaned and maintained.

Conversely, trash/recycling bins can act as a focal point for anti-social behavior, particularly with relation to so-called bottle collectors, or those who dig through the trash to acquire items such as soda cans and bottles that are returnable for a small monetary deposit. In Germany, implementation of a deposit ring, or *pfandring*, around trash and recycling receptacles alleviates this behavior by providing a low-cost place for the public to place empty containers, which allows for bottle collectors to obtain deposit-eligible goods without digging through trash. This in turn provides hygienic and health benefits for the bottle collector, societal benefit by preventing trash rummaging, and ecological benefit: the placement of deposit rings at trash cans enables greater separation of trash and recyclable material. More info on bottle deposit rings can be found here: *https://bundespreis-ecodesign.de/en/winners/pfandring*

CTDOT has identified the trash and recycling receptacles as components of bus stop enhancement best practice. Given the increased level of maintenance they necessitate, the implementation of these receptacles as part of the BSEP would be the prerogative of transit agencies or municipalities. Given that the BSEP entails the absolution of maintenance responsibilities by CTDOT as a condition of bus stop

enhancement provision, the provision of trash and recycling receptacles will likely not occur as part of the first phase of the BSEP.

At this point in time (November 2024), a single model of trash can is available. Other models may be introduced further into BSEP's lifespan.

Operational Enhancements

Concrete bus pad (in-street)

Type 1	Type 2	Type 3	Type 4
-	**Optional**	**Optional**	**Optional**

Bus pads are highly durable areas of the roadway surface at bus stops. Typically made of colored concrete, bus pads eliminate asphalt pavement deterioration caused by the stopping and acceleration of a heavy bus, which in turn increases the overall roadway's longevity while reducing roadway maintenance costs in the long run. The contrast between the bus pad and the rest of the roadway also demarcates and formalizes the bus stop.

Figure 23: A high volume bus pad in Seattle, WA

CTDOT has identified the provision of bus pads as an important element of bus stop enhancement best practice. Unlike other enhancements under the BSEP, however, bus pad installation requires disruptive roadworks and traffic management during the installation period. For this reason, bus pads are planned to be implemented as part of a bus stop's enhancement upon request by a municipality or transit service provider, and in line with local roadway and transit conditions.

Solar Panels

Type 1	Type 2	Type 3	Type 4
-	**Optional**	**Optional**	**Optional**

Solar panels provide an environmentally and ecologically friendly alternative to how power-consuming bus stop amenities may be powered. By virtue of being

disconnected from the larger electrical grid, solar power provides power regardless of disruptions that the grid may be experiencing, though it is reliant on continuous sunlight as its power source.

CTDOT has identified the use of solar panels as a best practice element of bus stop enhancement and prefers their use over hardwired connection to power infrastructure due to solar's cheaper cost in the long run and the elimination of any need to involve power utilities or power metering. However, not every bus stop is suited for solar power and solar panel provision due to varying site conditions. While the implementation of solar panels is broadly encouraged as part of Connecticut's climate change adaptation and decarbonization efforts under law, the implementation of solar panels as part of the BSEP will occur on a case-by-case basis that is primarily influenced by local conditions and with input from the transit service provider/municipality.

Section III: Application instructions

The following section provides additional detail and instruction to aid in the completion of the SEA on a question-by-question basis.

What comprises the SEA?

The application contains a variable number of questions. The total number of questions the applicant must answer will vary between each submission of the application, as some questions only appear based on how other questions are answered. For this reason, the questions below are not numbered.

How do I access the SEA?

A link to the SEA is included in the email that also contained this user guide which was sent to you via your COG. A passcode was also included in the email, which is necessary for accessing the SEA and ensuring that only municipalities and transit agencies have the ability to fill out the Stop Enhancement Application.

Application Questions

Please enter your first and last name.

An easy question to start the application off.

Please enter the best email address for CTDOT communications related to BSEP.

CTDOT will use this email address for contact in relation to this survey and will follow up as needed.

Please enter your phone number.

If we need to give you a call about something bus stop enhancement program-related, expect us to use this number (we do prefer email though).

Are you filling this survey out on behalf of a municipality or a transit agency?

Select based on the nature of your employer.

Please Identify the municipality you are filling out this survey on behalf of.

Simply begin typing the name of your municipality into the provided field, and it should appear as a selected option.

Please identify the transit agency you are filling out this survey on behalf of.

Simply begin typing the name of your transit agency/transit service provider into the provided field, and it should appear as a selected option.

As a municipality, do you waive responsibility for BSEP option selection and customization?

A municipality may defer their selection of BSEP options and customizations to their transit service provider but must record their choice to do so via this application. After selecting this option and submitting the application, no further action is required.

This question only appears if you select that you are filling out this survey on behalf of a municipality.

Please identify the municipality that this stop is located in.

Select the relevant municipality from the drop-down list. Due to the nature of Survey123, it is necessary to ask this question again.

What stop ID(s) from the map above are you applying for the enhancement of?

Please list which stop(s) you are applying for the enhancement of via the unique Stop IDs associated with each bus stop in the embedded web map above.

Per the dataset you received from CTDOT via your COG, does this bus stop already possess a shelter?

Please answer yes or no. Supplying this answer to the SEA helps CTDOT in centralizing bus stop-related data into one place.

On a scale of 1 to 5, with 1 being poor and 5 being excellent, what is the condition of this stop's shelter?

Answering this question will help us determine if the shelter needs replacement or not. If the shelter is past its useful life (20 years), please answer 1 regardless of its condition.

Is there anything else that you think CTDOT should know about this bus stop/set of bus stops?

Other relevant information could include (but is not limited to) the presence of an extreme slope at the site, known issues with nearby property boundaries and private property, the dimensions of an existing bus shelter, whether this bus stop will be impacted by a future program (Hartford's Albany Avenue Corridor Study, Move New Haven BRT, local street works,), if there are any strong recommendations for/against a bus stop at this location exists at the local level, if the bus stop location is prone to flooding, etc.. In other words, this is the place to advocate for or against the enhancement of a bus stop open ended!

For Phase 1 of BSEP, only the highest ridership bus stops in Connecticut are being considered for enhancement. Enhancements for stops with moderate and low ridership will become available in future phases of the program.

This is a placeholder question. It will be altered once future phases of BSEP are brought online. Please refer to *the table on page 8* *for more information on the Bus Stop Types and their qualifying criteria.*

Which size shelter is desired?

Please refer to this guide's section on available shelter sizes for further information. Through the BSEP, four shelter sizes are procurable:

8' x 4' three-sided shelter w/ integrated bench
12' x 6' three-sided shelter w/ integrated bench
10' x 5' three-sided shelter w/ integrated bench
10' x 5' narrow cantilever shelter w/ integrated bench

Please select the appropriate size of shelter based on the site conditions of the applicant bus stop.

Which roof style is desired?

Refer to the section of this guide discussing the available roof styles for further information. Through the BSEP, five bus shelter roof styles are available for selection:

Reverse Barrel
Barrel
Arch
Hip
Gable

Please select the style of roof desired.

What color acrylic is desired for the bus stop shelter's roof?

Refer to the section discussing acrylic color options on page 21 for further information. This option only appears if the 'Reverse Barrel' roof style option is selected. Due to its large curve, the reverse barrel roof style imposes a premium cost if aluminum is used (due to the need to use standing seams). Consequentially, it is the only roof type to use acrylic as a material and is far less customizable than the aluminum roofs used by other bus shelter roof styles. Keep this in mind when planning the overall design uniformity of your service area's bus stops!

Refer to the below color chart. What color roof is desired?

Please refer to this guide's section on the selectable aluminum roof colors for further information.

CTDOT strongly prefers that every shelter use an anodized finish. Which color finish is desired?

Please refer to this guide's section on anodization as a finish option for further information.

In lieu of an anodized finish, which powdered coat finish is desired?

Please refer to this guide's section on powder coating as a finish option for further information.

This question only appears if "other" is selected as an answer to the above question. While CTDOT strongly prefers that every shelter use an anodized finish as it significantly reduces maintenance burden and cost, we recognize that additional colors may be necessary due to existing branding standards and community desires. Should an excluded color be required, please contact CTDOT via the contact information outlined at the end of this User Guide.

Which size windscreen is desired?

For the bus shelter to remain ADA compliant, the windscreen must leave an opening of 32 inches or more for entry and exit. The pool of selectable windscreen sizes is determined by the desired bus shelter dimensions selected earlier on in this survey.

Do existing design or branding standards make grillwork necessary at this/these shelter(s)?

Please refer to the section on decorative grillwork for further information.

Which pattern of grillwork is used for the upper portion of each shelter panel?

This option enables you to select the pattern of grillwork desired.

Which pattern of grillwork is used for the lower portion of each shelter panel?

This option enables you to select the pattern of grillwork desired.

Do you desire a map case holder?

Please refer to the section on map case holders for further information.

Do you desire for one or more of the shelter's(s') safety glass panels to be substituted with an advertising panel?

Please refer to the section on Ad Panels for further information.

Do you desire for one or more of the shelter's(s') safety glass panels to be substituted with an art panel in the future?

Please refer to the section on Art Panels for further information.

Does your municipality/transit district have a standard trash barrel design that is used?

CTDOT seeks to understand if a common model of trash barrel is used by municipalities and to log information around which town prefers what model of trash barrel. Your response is appreciated!

Do you desire the below trash can at this/these bus stops?

At present, CTDOT only has 1 model of trash barrel available through the vendor on contract, Brasco. Future models of trash barrels may be added to BSEP as the program's growth expands.

Does adequate lighting (including ambient lighting from street lights) pre-exist at this bus stop site?

CTDOT does not possess data about lighting conditions on an individual bus stop level. Communicating whether adequate lighting already exists at bus stops will assist us in determining whether additional lighting should be included as part of said bus stop's enhancement.

Would you prefer for this/these applicant bus stop(s) to be solar powered?

CTDOT wishes to gauge whether solar powered is preferred over hardwire connections by municipalities and collect preferences at the level of each individual bus stop.

CTDOT has become aware of the bottle deposit ring's widespread usage abroad in Germany, The Netherlands and Ireland, and is exploring its addition as a potential bus stop amenity under BSEP. Would you be open to the idea of a bottle deposit ring at this/these bus stops as part of a future phase of BSEP?

Bottle deposit rings mount to a trash bin's exterior and provide a place for recyclable containers to be deposited. This provides ecological benefit through greater separation of recyclable material from trash and public health benefit by preempting "trash-sifting" for deposit-eligible recyclables. For more information: https://bundespreis-ecodesign.de/en/winners/pfandring. CTDOT is experimenting with implementing this amenity and is measuring preference at the level of each individual bus stop.

Point of Contact

For all questions related to the BSEP, please send us an email at our bus stop enhancement program-specific inbox: DOT.BusStops@ct.gov. Thank you!