

Downtown Hartford Transit Circulation and Through Routing Study

Final Report

Capitol Region Council of Governments

February 2013

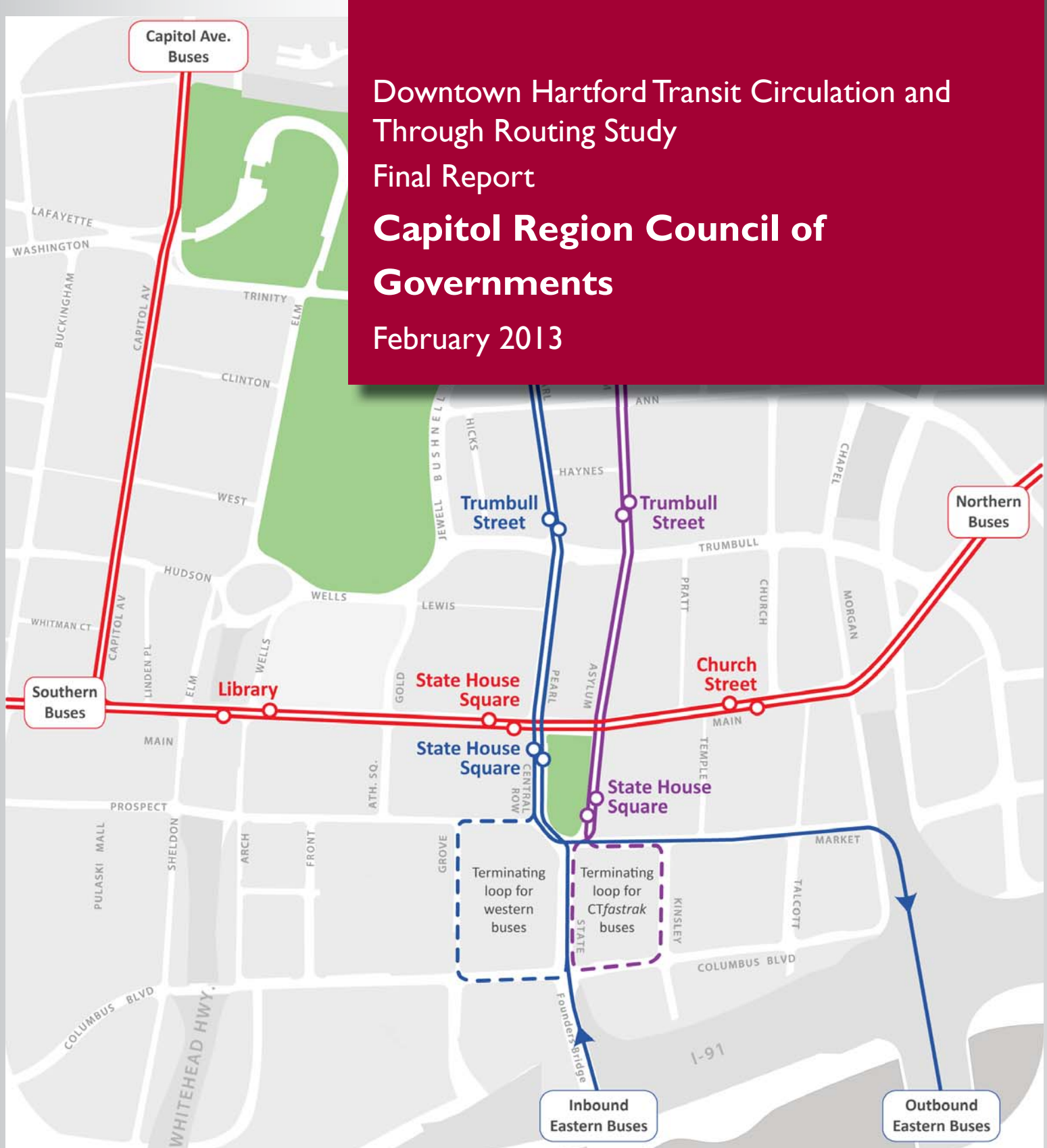


Table of Contents

1. Study Overview	1-1
1.1 Introduction.....	1-1
1.2 Study Process	1-1
1.3 Report Organization.....	1-1
2. Transit Circulation Concept.....	2-1
2.1 Concept Overview.....	2-1
2.2 North-South Local Routes.....	2-1
2.3 East-West Local Routes.....	2-3
2.4 CTfastrak	2-3
2.5 Commuter Routes	2-3
2.6 Night and Sunday Pulse Operation	2-4
3. Bus Stop and Roadway Requirements	3-1
3.1 Bus Stop Sizing	3-1
3.2 State House Square.....	3-3
3.3 Asylum Street – Main to Trumbull.....	3-4
3.4 Asylum Street – Trumbull to Ann.....	3-5
3.5 Asylum Street – Ann to High/Ford	3-7
3.6 Asylum Street – High/Ford to Union Place.....	3-9
3.7 Union Station Loop.....	3-11
3.8 Ford Street.....	3-12
3.9 Pearl Street – Ford to Ann	3-12
3.10 Pearl Street – Ann to Trumbull	3-13
3.11 Pearl Street – Trumbull to Main	3-15
3.12 Central Row/American Row	3-16
3.13 State Street	3-19
3.14 Market Street	3-19
3.15 Kinsley Street Loop	3-20
3.16 Grove Street Loop.....	3-20
3.17 Main Street.....	3-21
4. Bus and Passenger Volumes	4-1
4.1 Peak Hour Bus Volumes.....	4-1
4.2 Peak Hour Bus Stop Volumes	4-2
4.3 PM Peak Period Bus Stop Boardings.....	4-3

I. Study Overview

I.1 Introduction

The City of Hartford's TIGER-funded Intermodal Triangle Project is intended to strengthen the region's economic and employment core by facilitating the flow of bus traffic across downtown, redirecting bus and general traffic away from Bushnell Park, enhancing Main Street as a more pedestrian-friendly street, and providing better transit access to Union Station. The City's initial planning efforts developed a new downtown bus circulation concept that included a pair of new downtown transit spines along Asylum and Pearl that would facilitate east-west bus flow, enhance access to parts of downtown that are east and west of Main Street, and remove west of downtown bus routes from Bushnell Park and Main Street.

The initial concept lacked specifics as to the exact routing for east-west routes, which routes would use each of the two east-west streets, whether east and west routes could be through-routed, where buses that were not through-routed could turnaround, and where bus stops would be located. To develop a more specific plan, the City of Hartford developed a working group that included the Capitol Region Council of Governments (CRCOG), the Connecticut Department of Transportation (CTDOT), CTTRANSIT and the Greater Hartford Transit District (GHTD). The City and CRCOG then hired TranSystems to complete the Downtown Hartford Transit Circulation and Through-Routing Study.

I.2 Study Process

TranSystems met with the working group on four occasions between October 2012 and January 2013. The first meeting on October 15th consisted of a discussion of the Intermodal Triangle Project elements, assumptions and guidelines. The concept called for local buses on Asylum, *CTfastrak* buses on Pearl and commuter bus routes to be determined.

At the second meeting on November 5th, the consultant team presented information on current downtown bus and passenger volumes and how they might be impacted by the proposed concept. The discussion then moved to an identification of which elements of the concept might need to be reconsidered and a discussion of several unresolved elements in the concept.

At the third meeting on December 5th, the consultant team presented a refinement of the concept based on the November meeting and identified specific bus stop locations. The group then discussed options for commuter bus routing and several alternative configurations for State House Square.

At the fourth meeting on January 3rd, the consultant team reviewed the latest concept resulting from the December meeting. A City proposal to switch local and commuter buses to Pearl Street and *CTfastrak* buses to Asylum was adopted as well as a proposal from the City's traffic consultant create a more workable bus stop on Central Row.

The consultant and working group then met with the project design team on January 8th to present the final concept.

I.3 Report Organization

Section 2 of this report presents the final bus circulation concept. Section 3 presents the specific details regarding bus facility and service needs for each block in the project area with bus service. Section 4 presents peak hour bus volumes and estimated passenger boardings for the final concept.



2. Transit Circulation Concept

2.1 Concept Overview

The transit circulation concept implements the vision of the TIGER project to develop an east-west spine of transit service along Asylum and Pearl streets creating two east-west transit priority streets, one for local and express bus service and one for the new *CTfastrak* busway service. The improved east-west flow of buses removes many of the buses from Jewell, Gold and northbound Main Street that are now using those streets simply as a turnaround loop and layover location. Having fewer buses on Main Street supports the creation of a more pedestrian-friendly Main Street, especially in the vicinity of the Old State House and Wadsworth Atheneum, enhancing downtown Hartford as a destination. Moving buses from Jewell and Gold Street to Pearl Street reinforces Pearl Street as a transit street and allows Jewell and Gold to be better integrated with Bushnell Park.

The concept improves transit service by creating a better downtown distribution network for bus riders from east and west of downtown. The focus of local bus service around the intersection of Main and Pearl/Central Row is maintained and enhanced reducing the distance transit patrons must walk to make transfer connections. Commuter buses are moved away from that location to allow better local bus connections. The accompanying streetscape improvements will include new bus shelters that will improve the visibility and comfort of bus stops for transit patrons.

The concept also allows for future creation of additional east-west bus routes, possibly including new *CTfastrak* services, that will better connect neighborhoods east and west of downtown in a way similar to the way in which north and south neighborhoods are connected today.

The concept for local and *CTfastrak* routes is shown in the figure on the following page. Commuter buses will follow a routing similar to the local buses. The routes and stop locations for each set of routes are outlined in the following sections. In the last section, stop locations for the evening and Sunday pulse operation are discussed.

2.2 North-South Local Routes

All current North-South routes (shown in red in the figure) will continue to operate on Main Street. Downtown stops will be at the Library, State House Square (between Gold and Pearl/Central Row) and at Church Street. The current northbound stops at the Atheneum and Old State House will be consolidated into a single stop on the block between Gold and Central Row.

Most north-south buses will continue to be interlined or through-routed so that they will not need to turn around in the downtown. They will, however, need to be able to have some recovery time at the Main Street stops between Pearl and Gold in order to stay on schedule and provide reliable transfer connections at the central transfer point. Northbound routes include Routes 32, 34, 36, 38, 40, 42, 44, 46, 50, 52, 54, 56, and 58. Southbound route include Routes 31, 33, 37, 39, 41, 43, 47, 53, 55, 59, 61, 63, and 69.

The routes that do need to turn around downtown (Routes 41 and 59) both come from the south. These routes will need to turn around in the downtown and then begin their return trip at the southbound stop on Main Street between Pearl and Gold. A final routing will need to be identified by CTTTransit, but these buses will need to enter downtown from the south using either Trumbull, Prospect or Columbus, instead of Main, and then turn onto Pearl (from Trumbull) or Central Row (from Prospect or Columbus) before turning south on Main Street to reach the southbound stop.

The map illustrates the bus network in downtown Hartford, Connecticut. Key features include:

- Capitol Ave. Buses (Red Line):** Runs along Capitol Avenue, with stops at Southern Buses, Library, State House Square, and Church Street.
- CTfastrak New Britain (Blue Line):** Connects the city to New Britain, with stops at Trumbull Street, State House Square, and Union Station.
- Western Buses (Purple Line):** Connects the city to western areas, with stops at Trumbull Street, State House Square, and Union Station.
- Northern Buses (Orange Line):** Connects the city to northern areas, with stops at Church Street and Union Station.
- Union Station:** A central hub for multiple routes, featuring a turnaround loop for terminating eastern buses.
- State House Square:** A major transit point with multiple bus stops.
- Trumbull Street:** A key intersection with several bus stops.
- Church Street:** A major thoroughfare with multiple bus stops.
- Turnaround Loops:** Dashed lines indicate specific loops for terminating western buses and CTfastrak buses.

2.3 East-West Local Routes

Currently, routes from the east and from the west have separate downtown loops that do not meet. One of the key features of the revised circulation concept is that east and west routes will be re-routed along a common east-west spine on Pearl Street and Central Row (shown in blue in the figure) allowing through-routing of east and west routes. It will also allow routes that are not through-routed to overlap in order to provide service from both corridors to points east and west of Main Street.

From the west buses will enter downtown along Asylum Street. They will turn right onto Ford and left onto Pearl to cross downtown to Central Row. After Central Row they can use either Market to Morgan to I-84, or State Street to the Founders Bridge to leave downtown to the east. From the east, buses will enter downtown over the Founders Bridge and use State Street and American Row to Central Row and Pearl, leaving downtown to the west via Ford and Asylum.

Downtown east-west stops will be at Union Station (on Asylum), at Trumbull Street, and at State House Square (on Central Row).

Buses that are through-routed will not need to turn around in the downtown. They will, however, need to be able to have some recovery time on Central Row in order to stay on schedule and provide reliable transfer connections at the central transfer point.

Those that do need to turn around will have designated turnaround loops at Union Station (from the east) and using Prospect, Grove, Columbus and State Street (from the west). (These are shown as dotted lines in the figure.)

Because many routes from the east and west are quite long, only the shortest routes from each direction are recommended for through-routing. It is recommended that Routes 74 and 76 from the west be through-routed with trips on shorter routes from the east, such as Routes 86, 87, 94, 95 and 96. Longer routes from the east, such as routes 30, 83, 82/84, 88, would terminate at Union Station. The Farmington Avenue routes (Routes 60, 62, 64, and 66) from the west would terminate using the Grove Street loop.

2.4 CTfastrak

CTfastrak buses will also cross downtown along an east-west spine (shown in purple in the figure). They will use Asylum Street, which will be modified to include an eastbound bus-only lane. The principal stop will be located on a re-opened block of State Street between Main and Market streets, to be known as State House Square.

All *CTfastrak* buses will be coming from the west and will turn around using a loop along Market, Kinsley, Columbus and State Street. Future *CTfastrak* services from the east may be through-routed with the west route, leaving downtown along Market Street to Morgan Street and I-84 and entering downtown from the Founders Bridge and State Street.

Downtown *CTfastrak* stops will be located at Union Station (on Asylum east of High Street), Trumbull Street, and at State House Square (in the re-opened portion of State Street).

2.5 Commuter Routes

Commuter bus routes will be consolidated along Pearl and Central Row, although most commuter routes already operate along Pearl and Central Row. Those that now leave downtown to the north via

Pearl, Trumbull, Gold and Main will instead use Pearl to Central Row to Market Street. Those that travel to and from the west will use Pearl Street instead of the current routing that has privately-operated routes on Pearl and CTTRANSIT operated routes outbound on Asylum and inbound on Pearl.

All AM peak north, east and south route commuter routes will have drop-off stops located on Central Row near American Row (possibly extending onto American Row) and on Pearl Street (in the local stop at Haynes Street). Commuter Shuttle trips will originate at Pearl and Ann Street and stop at Union Station (on Asylum Street) on their way to Asylum Hill. West routes will drop off at Union Station (on Asylum Street), Pearl Street (in the local stop at Trumbull Street) and on Central Row (at Prospect Street).

In the PM peak, north, east and south routes will each have one boarding stop on Pearl Street and one east of Main Street. In each location, three separate loading areas have been identified, each serving approximately one-third of the buses. On Pearl Street, these are existing commuter bus stops. The routes proposed for each stop are slightly modified from current service to limit each route to one stop in this area and leave room for a local bus stop. The stops and proposed routes are:

- Pearl Street east of Ann Street (Routes 3,4,14,18)
- Pearl Street mid-block between Ann and Trumbull (Routes 6,7,10,20,21,23)
- Pearl Street east of Trumbull (Routes 5, 15, 17, 19)

To the east of Main Street, the stops are:

- Central Row west of Prospect Street (Routes 3,4,14)
- State Street between Market and Columbus (Routes 6,7,10,17,18,19,20,21)
- Market Street between State Street and Kinsley (Routes 5,15,23)

Commuter Shuttle trips will also pick up at Union Station (on Asylum Street) and meet other routes on Pearl Street. West routes (Routes 1, 9, 11, 26, 27) will pick up on Central Row (at American Row), Pearl Street (in the local stop at Haynes Street) and at Union Station (on Asylum Street).

One guideline followed in development of the details of the service concept was that locating local bus stops in their optimal location should take precedence over locating commuter bus stops. As a result, commuter bus stops currently located on Main Street at the Traveler's Building and on Central Row are moved east to State Street and to Market Street to make room for local northbound and eastbound bus stops. The number of pick-up locations on each commuter route is also limited to two (excluding Commuter Shuttle stops) rather than the two to four currently.

It should also be noted that planning for *CTfastrak* assumes that commuter Routes 2 and 24 are subsumed into the *CTfastrak* operating plan and will operate as *CTfastrak* routes using Asylum Street and State House Square.

2.6 Night and Sunday Pulse Operation

During the day on weekdays and Saturdays service on most routes is scheduled fairly frequently. Buses arrive and leave downtown on a continual basis without much clustering of trips at particular times. In the evening and on Sundays, however, service is less frequent and most routes are scheduled to arrive and leave downtown at the same time in order to make transferring more convenient for riders. This creates a pulse of as many as 18 buses at a time in the center of downtown. The proposed service concept is able to accommodate that many buses at the principal downtown bus stops on Main Street and Central Row.

The maximum number of buses scheduled to leave downtown at any one time in each direction occurs at several times on Sunday. The routes in each direction are shown below:

Direction	Number of Routes	Routes
Northbound	6	32, 38, 40, 46, 50, 58
Southbound	6	31, 35, 37, 45, 47, 63
Eastbound	4	30, 82, 83, 88
Westbound	2	60, 76

The number of buses leaving at each pulse time on Sunday is shown in the following table:

Pulse Time	Northbound	Southbound	Eastbound	Westbound
7:00 AM	2	2	2	1
8:00 AM	4	5	4	2
9:10 AM	5	5	3	2
10:20 AM	5	5	4	2
11:30 AM	5	6	4	2
12:40 PM	5	5	4	2
1:50 PM	5	5	4	2
3:00 PM	5	6	3	2
4:10 PM	5	5	4	2
5:20 PM	5	6	3	2
6:30 PM	4	6	3	2
7:40 PM	1	3	1	2
8:50 PM	1	3	0	2

At pulse times, northbound and southbound trips will start on Main Street between Pearl and Gold, as they do at all other times. Similarly, westbound trips will start on Central Row at pulse times. Eastbound trips will need to start at Union Station a few minutes before pulse time and move to Central Row arriving just before the pulse time.

The Main Street and Central Row bus stops described in subsequent sections are sufficient to accommodate the numbers of buses shown in the above table. At Union Station, there may not be enough room at the proposed transit center to hold four buses. One route may need to lay over elsewhere on Union Place on Sundays.



3. Bus Stop and Roadway Requirements

This section provides the specific details regarding bus facility and service needs for each block in the project area with bus service. Bus facility needs, such as bus lanes and bus stop locations are identified and bus operations at the adjoining intersections are also explained. One of the most important design questions will be the size of the bus stops at each location. Therefore, the methodology for determining appropriate bus stop lengths is presented first.

3.1 Bus Stop Sizing

One of the critical design elements for the TIGER project is allocating the appropriate amount of curb space for each bus stop. The amount of space needed depends on the peak hour number of buses using the stop, the size of the buses (conventional or articulated), and the location of the stop (near-side, far-side, or mid-block).

The number of peak hour buses determines the number of bus loading areas that should be provided. As stops serve more and more buses, the likelihood that two buses need to occupy the stop at the same time increases. This likelihood can be reduced somewhat through scheduling strategies that stagger buses on the different routes serving the stop, but this often works against a desire to have buses reach a common stop or intersection at the same time to facilitate transfers. Thus there is a tradeoff between space needs and rider convenience.

Most local bus stops in downtown Hartford will need to accommodate between 27 and 41 buses per hour in peak periods. With the exception of the stops closest to Main Street and Central Row, buses will unload and load passengers and quickly move on. For this number of buses, a stop capacity of two buses is sufficient to avoid congestion most of the time.¹ *CTfastrak* stops will need to accommodate 24 buses per hour in peak periods, and a stop capacity of two buses should be sufficient there, as well. AM westbound commuter bus unloading stops are proposed to accommodate around 30 buses in the peak hour, so two spaces should be provided. PM eastbound commuter bus loadings stops are most dispersed and are proposed to accommodate between 13 and 19 buses in the peak hour. Still two spaces are needed for each of these given the longer loading times and concurrent scheduling of many of the routes.

Most of the buses used on *CTfastrak* will be sixty-foot articulated buses, so *CTfastrak* stops will need to be designed for articulated buses. Most buses used in local bus service are conventional forty-foot transit buses. However, there are several articulated buses in service and CTTRANSIT plans to convert to more articulated buses in the future to accommodate ridership increases, rather than add more buses to existing routes. Therefore, for local bus routes, stops should also be designed to accommodate articulated buses. Commuter routes generally use over-the-road coaches which are 40-45 feet in length. Articulated buses are not anticipated on these routes so 45-foot buses should be the design standard for commuter stops.

Stops may be located on the near-side of intersections, on the far-side of intersections, or mid-block. Mid-block stops require the most space since buses must pull to and from the curb to leave and enter the traffic stream. At near-side stops, buses can use the width of the intersection to pull into traffic. At

¹ Based on Equation 4-7 on p. 4-15 of the Transit Capacity and Quality of Service Manual, second edition, and assuming a dwell time averaging 1 minute (with a coefficient of variation of 0.6), a green time ratio of 0.5, a fixed clearance time of 10 seconds, and a re-entry delay of no more than 15 seconds.

far-side stops, buses can use the width of the intersection to pull to the curb. Because pulling to the curb requires somewhat more space than pulling away from the curb, near-side stops require somewhat more space than far-side stops. The guidelines in the following table were adapted for use in this project from draft guidelines developed for the MBTA in Boston. Note that the stop lengths here assume that buses are in a travel lane and must pull to/from the curb. A bus traveling along the curb would only need a space as long as the bus itself.

Bus Stop Length Guidelines

Placement	40' bus		60' bus	
	Preferred	Minimum	Preferred	Minimum
Far-side	80 ft.	60 ft.	100 ft.	80 ft.
Near-side	100 ft.	80 ft.	120 ft.	100 ft.
Far-side, after bus left turn	130 ft.	100 ft.	150 ft.	120 ft.
Mid-block	130 ft.	100 ft.	150 ft.	120 ft.

For multiple berths, add 40/60 feet per bus

For local and *CTfastrak* bus stops with a capacity of two articulated buses, and commuter bus stops with a capacity of two 45' buses, the following stop lengths are needed.

Recommended Bus Stop Lengths

Placement	Two Artic. Buses		Two 45' Buses *	
	Preferred	Minimum	Preferred	Minimum
Far-side	160 ft.	140 ft.	130 ft.	110 ft.
Near-side	180 ft.	160 ft.	150 ft.	130 ft.
Far-side, after bus left turn	210 ft.	180 ft.	180 ft.	150 ft.
Mid-block	210 ft.	180 ft.	180 ft.	150 ft.

* Five feet added per bus for 45' versus 40' buses

3.2 State House Square

Bus-Only Roadway

State House Square will consist of a re-opened section of State Street between Market Street and Main Street. The roadway should be two lanes wide to accommodate a single lane of bus traffic in each direction. This segment will be bus-only at all times. *CTfastrak* will be the only service using State House Square. Eastbound buses will enter directly from Asylum Street and exit by turning left onto Market Street. Westbound buses will enter from State Street and exit to Asylum Street.

Eastbound Bus Stop

A bus stop should be provided in the eastbound direction in the travel lane. The stop should be close to the middle of the block so that buses stopped at the stop do not back up into Main Street and so that buses stopped at the exit onto Market Street do not block the bus stop. This stop will primarily be used by *CTfastrak* buses to drop off passengers traveling into Hartford. Few if any boardings will occur here, therefore no shelter is needed. The stop could serve boarding riders in the future if *CTfastrak* services are ever extended to points east of the river.

Westbound Bus Stop

A bus stop should be provided in the westbound direction in the travel lane. The stop should be close to the middle of the block so that buses stopped at the stop do not back up into Market Street and so that buses stopped at the exit onto Main Street do not block the bus stop. This stop will likely be the most highly used boarding stop for *CTfastrak* buses. PM Peak period boardings (3:30-6:00 p.m.) are estimated at 850. Shelters, benches, and other passenger amenities are needed.

Market Street Intersection

At the Market Street end buses will be entering primarily from State Street. Most buses will exit by making a left onto Market Street. If possible, a right turn onto American Row should be permitted.

Main Street Intersection

At the Main Street end all buses are expected to be entering and exiting straight from and to Asylum Street. Turns to and from Main Street are not anticipated.

3.3 Asylum Street – Main to Trumbull



Eastbound Buses in Bus-Only Lane

The existing parking lane and curb bump-outs will be eliminated to create an eastbound bus-only lane to be used only by *CTfastrak* services. Buses will continue from the bus lane on the previous block and will flow straight across Main Street into State House Square.

Westbound Bus Flow

Westbound *CTfastrak* bus service will use the regular mixed traffic lane(s), crossing Main Street from State House Square and continuing straight across Trumbull Street.

No Bus Stops

There will be no bus stops in this block.

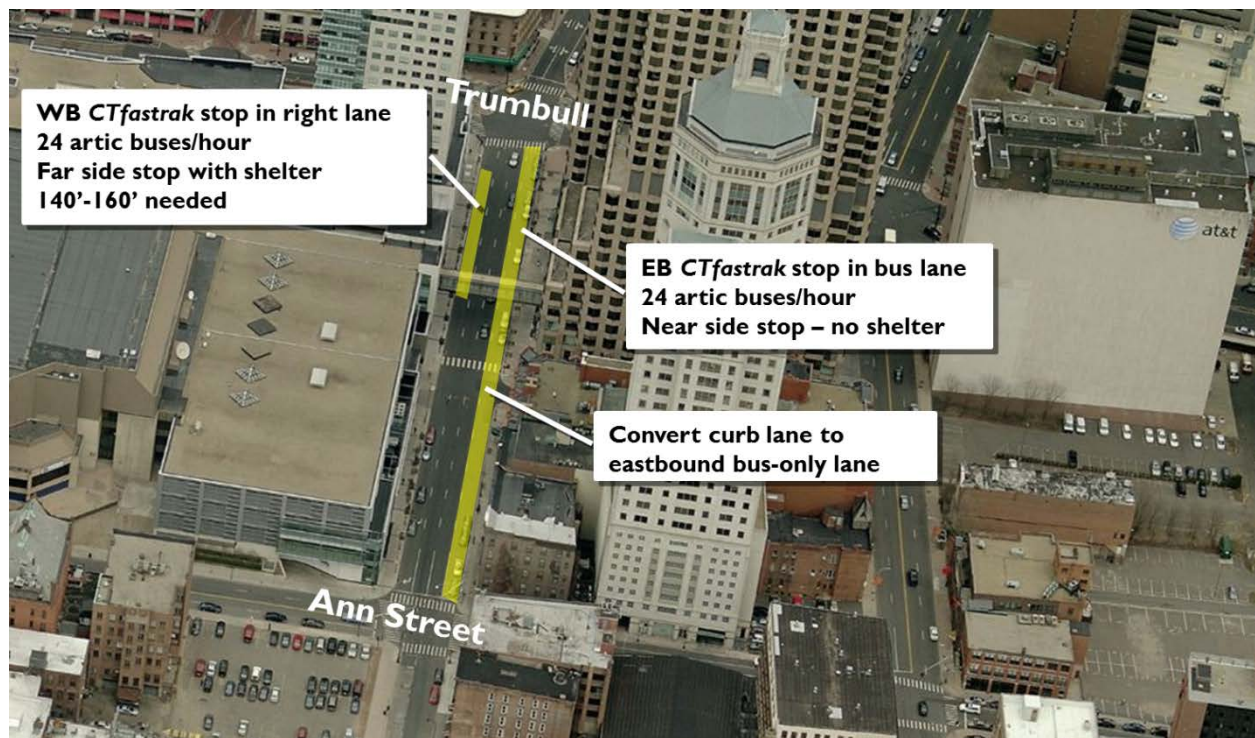
Main Street Intersection

All buses are expected to be entering and exiting straight from and to State House Square

Trumbull Street Intersection

All buses are expected to be continuing through on Asylum Street in both directions.

3.4 Asylum Street – Trumbull to Ann



Eastbound Buses in Bus-Only Lane

The existing westbound left side curb lane will be converted into an eastbound bus-only lane to be used only by CTfastrak services.

Westbound Bus Flow

Westbound CTfastrak bus service will use the regular mixed traffic lane(s). After crossing Trumbull Street, buses will pull into the far-side stop. After stopping, buses will need to move into the left lane to continue on Asylum Street and avoid the right-turn-only lane onto Ann Street.

Eastbound Bus Stop

An eastbound near-side bus stop should be provided in the bus-only lane at the corner of Trumbull Street. The stop will be in the bus-only lane so no specific stop length is required. This will primarily be a drop-off stop so no shelter is needed.

Westbound Bus Stop

A westbound far-side bus stop should be provided at the corner of Trumbull Street. A far side stop will require about 140'-160' of curb space. The width of the street will permit the stop to be out of the mixed traffic lane. This will primarily be a boarding stop. A shelter should be provided.

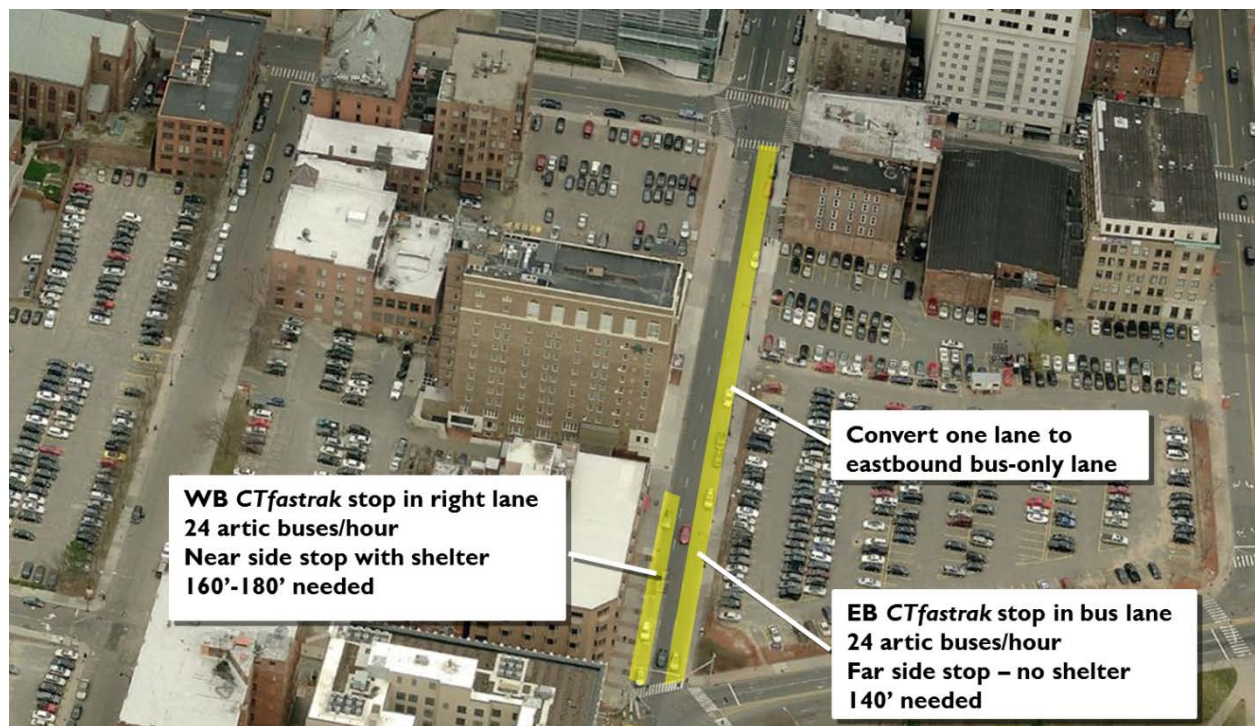
Trumbull Street Intersection

Eastbound buses will continue through on the bus-only lane. Westbound buses will pull into the right lane to access the stop.

Ann Street Intersection

Eastbound buses will be continuing through on the bus-only lane. Westbound buses will use the left lane to continue on Asylum Street.

3.5 Asylum Street – Ann to High/Ford



Eastbound Buses in Bus-Only Lane

The existing westbound left side curb lane will be converted into an eastbound bus-only lane. This will be used only by *CTfastrak* services.

Westbound Bus Flow

Westbound *CTfastrak* bus service will use the regular mixed traffic lane(s). Approaching High Street, buses will pull into the near-side stop. After stopping, buses should be able to cross the intersection in the right lane without having to merge back into traffic.

Eastbound Bus Stop

An eastbound far-side bus stop should be provided in the bus-only lane at the corner of Ford Street. The front of the stop should be at least 140' from Ford Street to prevent buses from backing up into the Ford Street intersection if two buses arrive at once. This will primarily be a drop-off stop so no shelter is needed.

Westbound Bus Stop

A westbound near-side bus stop should be provided at the corner of High Street for *CTfastrak* (this is an existing bus stop location). A near-side stop will require about 160'-180' of curb space. This stop should be separate from the mixed traffic lane to avoid blocking the intersection. This will primarily be a boarding stop with an estimated 297 PM peak period *CTfastrak* boardings. A shelter should be provided.

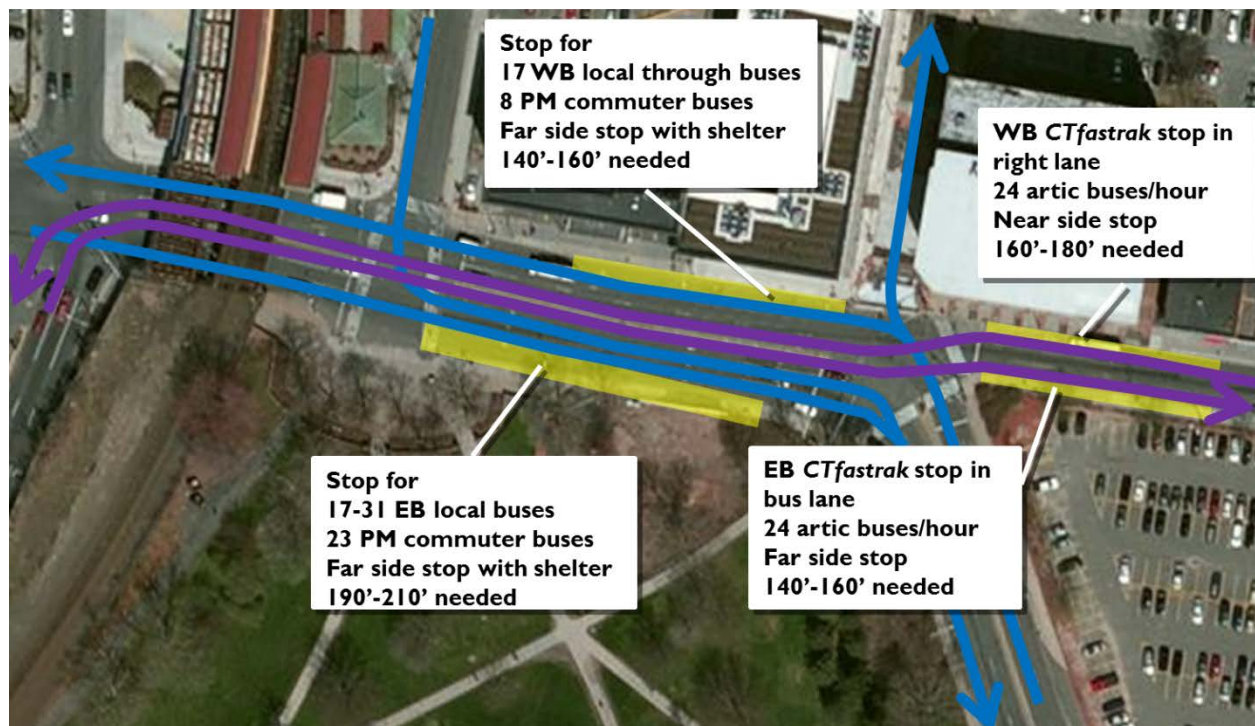
Ann Street Intersection

Eastbound buses will be continuing through on the bus-only lane. Westbound buses will be in what will most likely be a single through mixed traffic lane.

High/Ford Intersection

The eastbound bus-only lane will need to be fed by a bus-only “left-turn” lane on the next block of Asylum Street. Westbound buses using the westbound bus stop should be allowed to proceed into the right lane on the next block of Asylum with mixed traffic proceeding into the left lane. If mixed traffic is permitted to turn right onto the newly two-way High Street, this could create a conflict. Right-turning traffic may need to be allowed to use the bus stop for the right turn.

3.6 Asylum Street – High/Ford to Union Place



Eastbound Bus Flow

Eastbound *CTfastrak* buses will not stop in this block but will need an exclusive “left-turn” lane to access the bus-only lane on the next block of Asylum Street. Most eastbound local and commuter buses will be in the right lane and will use the eastbound bus stop before turning right onto Ford Street. Some eastbound buses may be entering from Union Place and may or may not stop.

Westbound Bus Flow

Westbound *CTfastrak* buses will enter this block in the right lane from the bus stop on the near side of High Street. They will need to move from the right lane to the left lane before the Spruce Street/Busway entrance intersection in order to access the busway. Most westbound local and commuter buses will stay in the right lane and use the westbound stop in this block.

Eastbound Bus Stop

An eastbound mid-block stop should be provided just after Union Place. A mid-block stop will require about 180'-210' of curb space. A mid-block design is needed so that the width of Asylum Street at Union Place can be kept to a minimum to allow pedestrian access to Bushnell Park. If buses coming from Union Place are to use this stop, it may be advisable to add 40'-60' to accommodate more buses. A shelter should be provided.

Westbound Bus Stop

A westbound far-side stop should be provided at the corner of High Street for local and commuter buses. A far-side stop will require about 140'-160' of curb space. Alternatively, this could be a near side stop at Union Place, requiring about 160'-180' of curb space. A shelter should be provided.

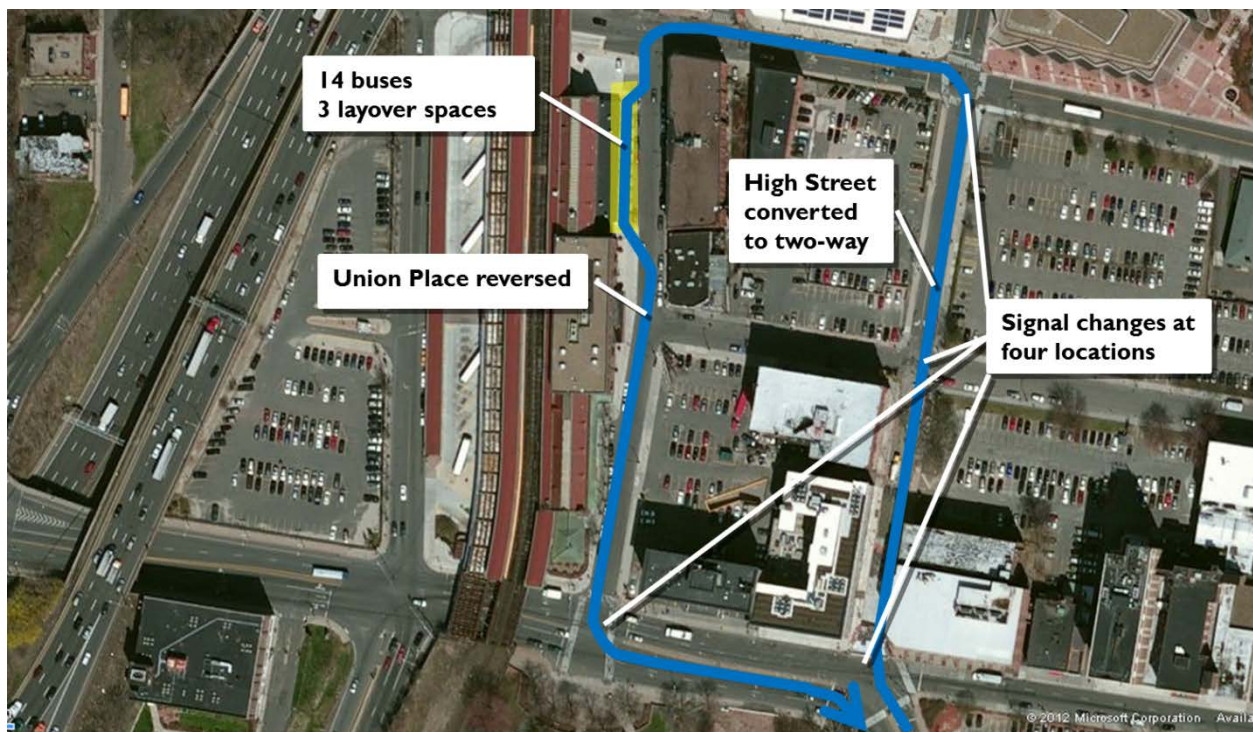
High/Ford Intersection

An eastbound bus-only lane “left-turn” lane will be needed for *CTfastrak* buses to move into the bus-only lane on the next block of Asylum Street. Changes to the signalization will also be needed to allow this movement. Eastbound local and commuter buses will stay in the right lane and turn right onto Ford Street. Westbound *CTfastrak* buses should be allowed to proceed into the right lane from the near-side bus stop with mixed traffic proceeding into the left lane (although *CTfastrak* buses will need to move into the left lane by the time they reach Spruce Street.) Westbound local and commuter buses will be in the right lane of Ford Street. Most will turn left onto Asylum but some will continue straight onto High Street, which will become two-way

Union Place Intersection

All buses on Asylum will be continuing straight through this intersection. Local and commuter buses will be in the right lane, while *CTfastrak* buses in both directions will be moving into the left lane. Some local buses will be turning left onto Asylum Street from Union Place. Signalization changes will be needed to accommodate the reversal of Union Place.

3.7 Union Station Loop



High Street

In order to permit buses to use High Street in the northbound direction, the City has agreed that High Street will be converted to two-way operation between Asylum Street and Church Street. This will require modifications to the signals at Asylum Street and at Church Street. The design process will need to consider whether left and right turns from Asylum Street can be accommodated or should be prohibited. Buses using High Street will come from Ford Street and turn left onto Church Street.

Union Place

In order to permit buses to use Union Place in the southbound direction, the City has agreed to reverse the direction of Union Place. (This project assumed that Union Place would be reversed. The option of operating Union Place as a two-way street was not evaluated and would require further traffic study.) This will require modifications to the signals at Asylum Street. Turns from Asylum Street will no longer be permitted, while a signal phase allowing traffic to exit Union Place will be required. Buses using Union Place will turn left from Church Street and will turn left onto Asylum Street.

Union Station Bus Stop

An end-of-route bus layover location is envisioned for northern end of Union Place. Space for a minimum of three buses will be needed. A fourth space is desirable for the Sunday pulse if there is room. Otherwise, additional curb space on Union Place will need to be designated as a bus stop on Sundays.

3.8 Ford Street

Eastbound and Westbound Bus Flow

Most local and commuter bus services will flow from Asylum Street to and from Pearl Street via Ford Street staying in the right lane in both directions. Some westbound local buses will proceed straight from Ford to High Street.

No Bus Stops

There will be no bus stops on this block.

Asylum Street Intersection

While some westbound local buses will need to flow straight from Ford Street to High Street, most westbound local and commuter buses will need to turn left from Ford Street onto Asylum Street. Allowing buses (and other traffic) to make this turn from the right lane on Ford Street will simplify the flow of bus traffic and prevent the need for buses to change lanes.

Pearl Street Intersection

Eastbound local and commuter buses will continue from Ford Street onto Pearl Street. Allowing buses (and other traffic) to make this turn from the right lane on Ford Street will simplify the flow of bus traffic and prevent the need for buses to change lanes.

3.9 Pearl Street – Ford to Ann

Eastbound and Westbound Bus Flow

Local bus services will flow from Ford Street to and from Pearl Street staying in the right lane. Commuter buses providing Commuter Shuttle service to (in the AM) and from (in the PM) Asylum Hill will also flow from Ford Street to and from Pearl Street staying in the right lane. Other commuter buses may depart (AM) or arrive (PM) to or from other directions. In particular, some PM peak commuter buses may come into service from staging locations near the Capitol via Trinity Street.

No Bus Stops

There will be no bus stops on this block.

Commuter Bus Staging

Currently, in the PM peak, commuter buses often stage on the south side of Pearl Street in this block. The buses arrive downtown from their midday storage location and wait here until it is time to begin their trip. This operation is expected to continue.

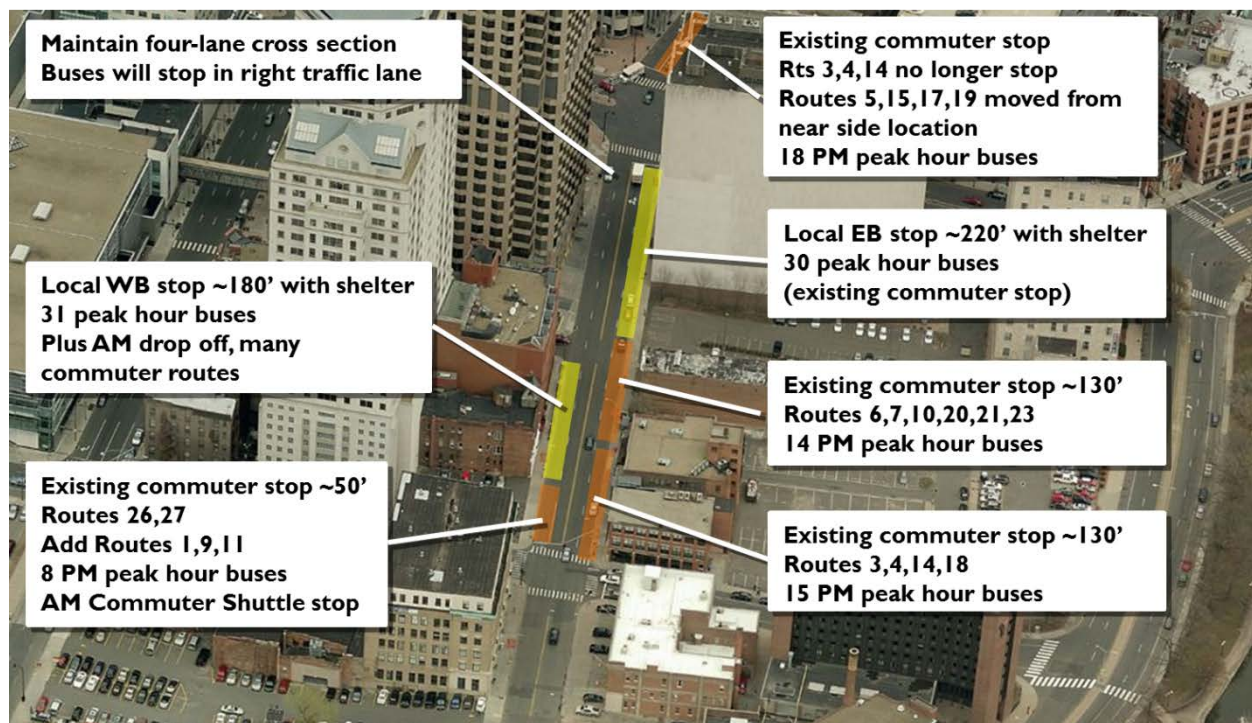
Pearl Street Intersection

Eastbound local and commuter buses will continue from Ford Street onto Pearl Street. Allowing buses (and other traffic) to make this turn from the right lane on Ford Street will simplify the flow of bus traffic and prevent the need for buses to change lanes.

Ann Street Intersection

All buses are expected to be continuing through on Pearl Street in both directions.

3.10 Pearl Street – Ann to Trumbull



Eastbound Bus Flow

Local bus services will flow along Pearl Street staying to the right. In peak periods, commuter buses may block the right lane while loading or unloading so other buses may move to the left lane to pass. In off-peak periods, parking may be permitted in the commuter bus stops, so local buses will initially stay to the left and move into the right lane to serve the local bus stop. In the PM peak many commuter buses will begin their outbound trip at the commuter bus stops, and then move into the left lane.

Westbound Bus Flow

Local and commuter bus services will flow along Pearl Street staying in the right lane, except to pass other buses at the stops. In the AM peak, those commuter buses continuing as the “Commuter Shuttle” will hold and load in the westbound commuter bus stop. Transfers to the commuter shuttle will take place here instead of on Central Row where they do now.

Eastbound Bus Stops

This entire block is currently a commuter bus stop during the PM peak period with three distinct loading areas. It will continue to be a bus stop with three areas but one of the three areas will be devoted to local buses. (Some of the commuter buses will be moved to the next block east.) The block is about 500’ feet long and the entire right lane will need to be available for buses in the PM peak. There should be no physical separation between the three bus stops, and no curb extensions at the corners. The space should be allocated approximately as follows:

- Far-side of Ann Street – 130’ for commuter buses (Routes 3,4,14,18)
- Mid-block – 130’ for commuter buses (Routes 6,7,10,20,21,23)
- Near-side of Trumbull – 220’ for local buses

Each of the three stop areas should have a shelter. Parking may be permitted in the commuter bus stops, except during the PM peak. During the AM peak, commuter routes from the west (Routes 1, 9, 11, 26, 27) will use the local bus stop to drop off passengers.

Westbound Bus Stops

Westbound stops will be limited to the entire half-block between Haynes Street and Ann Street due to the presence of loading docks east of Haynes Street. Two distinct loading areas should be provided. The half-block is only about 230' feet long so the entire curb lane will need to be available for buses (without any restrictions, such as curb extensions at the corners). There should be no physical separation between the two bus stops, but the space should be allocated approximately as follows:

- Far-side of Haynes Street – 180' for local buses and AM commuter bus drop off
- Near-side of Ann – 50' for AM Commuter Shuttle & PM commuter (Routes 1, 9, 11, 26, 27)

Both areas should have shelters. In the PM peak, the commuter bus stop will serve as a boarding area for the commuter routes to the west (Routes 1, 9, 11, 26, 27). In the AM peak, the commuter stop will serve as the boarding area for the Commuter Shuttle to Asylum Hill. With the limited space available on this block, the commuter stop can only hold one bus, so AM peak commuter buses that are dropping off passengers will use the local stop. Most commuter bus passengers will have gotten off the bus at Central Row, so these buses are not expected to dwell very long at this stop and should not interfere with local bus operations.

There will be no parking on this side of the street for the entire block.

Ann Street Intersection

All buses are expected to be continuing through on Pearl Street in both directions.

Trumbull Street Intersection

All buses are expected to be continuing through on Pearl Street in both directions.

3.1.1 Pearl Street – Trumbull to Main

Eastbound Bus Flow

Eastbound local buses will flow along Pearl Street staying in the right lane. The eastbound right lane will need to be kept open (no parking) so that local buses can flow freely from Pearl Street to the bus stop on Central Row. One local bus route (Route 72) will use the right lane to turn right from Pearl Street to Main Street southbound. In peak periods, loading commuter buses may block the right lane between Trumbull and Lewis so local buses may move to the left lane to pass.

Eastbound commuter buses that load on the previous block (Routes 3,4,6,7,10,14,18,20,21,23) will stay in the left lane. Commuter Routes that stop on this block (Routes 5, 15, 17, 19) will move into the left lane after the stop. Commuter buses will approach Main Street in the left lane so that they can pass the local bus stop on Central Row.

Westbound Bus Flow

All westbound buses (except Route 72) will be received in the right lane of Pearl Street from the right-turn lane of Central Row. The westbound right lane will need to be kept open (no parking) so that buses can flow freely from Central Row and continue west to the next block on Pearl Street.

Eastbound Bus Stop

An eastbound far-side stop will be provided between Trumbull Street and Lewis Street for commuter buses (Routes 5, 15, 17, 19). The half-block is about 180' feet long so the entire curb lane will need to be available for buses (without any restrictions at the corners). A shelter should be provided.

No Westbound Bus Stop

There will be no westbound bus stop on this block.

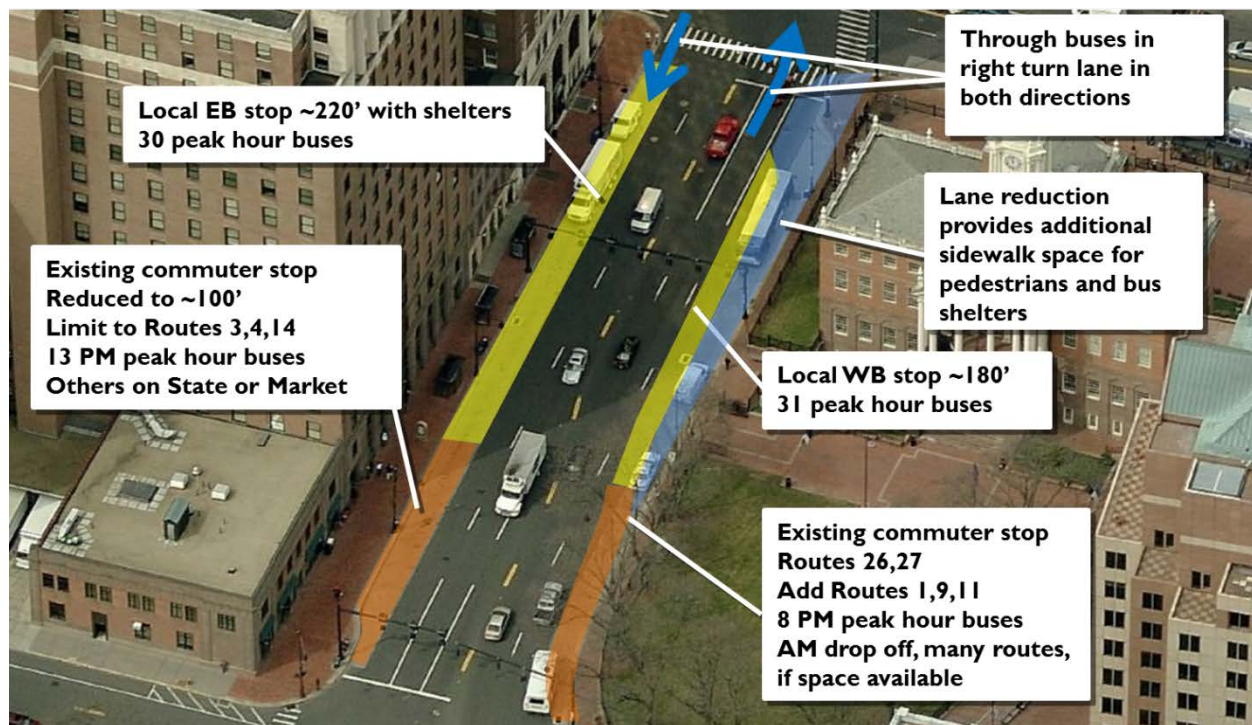
Trumbull Street Intersection

All buses are expected to be continuing through on Pearl Street in both directions.

Main Street Intersection

The right approach lane will be designated “right-turn-only except buses”. Local buses will use this right lane to move directly into the bus stop on Central Row without interference from the traffic in the left lane. Commuter buses will use the left (through) lane. Buses from Central Row will cross into the right lane of Pearl Street while all other traffic crosses into the left lane.

3.12 Central Row/American Row



Lane Reduction

Central Row proved to be one of the most challenging areas in which to design the service concept. Heavy traffic, limited sidewalk space and the need to add local bus service to the existing commuter bus operation pose a significant challenge. The City of Hartford's traffic consultant has devised a plan that calls for a one-lane reduction in width at the Main Street end of the block from five lanes (plus bus stops) to four while keeping the full five lane width at the Prospect/American Row end.

At the Main Street end, the plan calls for two eastbound receiving lanes, one of which is purely a bus stop. (There should not be a curb extension on the eastbound side of the street at Main Street.) There would be three westbound lanes: a left-turn-only lane, a through-only lane, and a right-turn-only-except-buses lane. What is now the rightmost westbound lane will become a bus stop that will end before the intersection so that buses can move into the right-turn-only-except-buses lane, and so that a curb extension can be installed between the end of the bus stop and the corner. The current bus stop lane will be replaced by an expanded sidewalk and shelters adjacent to the Old State House.

The expansion of the sidewalk will be tapered back and end before the Prospect/American Row Intersection so that the existing five-lane (plus bus stops) cross-section is retained at that end.

Eastbound Bus Flow

Eastbound local buses will come from the right-turn-only-except-buses lane on Pearl Street and flow straight into the bus stop on Central Row. Local buses that terminate (Routes 60-66) will then turn right onto Prospect. All others will proceed onto American Row to points east of the river either by turning left to Market Street or going through on State Street. During the AM peak, the movement through onto State Street is prohibited, so all eastbound buses will need to turn left onto Market Street.

PM eastbound commuter buses will come from the through lane on Pearl Street into the single through receiving lane on Central Row. Some (Routes 3,4,14) will stop at the commuter stop on this block before proceeding to State Street to cross the river; others (Routes 6,7,10,17,18,19,20,21) will stay to the right and proceed to State Street and stop there; and a third group (Routes 5,15,23) will stay to the left and turn onto Market Street to stop there.

Westbound Bus Flow

Westbound local buses will approach from State Street and pull into the local bus stop on this block. They will then pull into the right-turn-only-except-buses lane and proceed straight into the right lane on Pearl Street.

In the AM peak, commuter buses will arrive from the north, east and south via State Street and pull into the commuter bus stop on this block to drop off passengers. They will then pull into the right-turn-only-except-buses lane and proceed straight into the right lane on Pearl Street. Commuter Shuttle buses will no longer hold here; instead they will hold on Pearl Street at Ann Street.

In the PM peak, commuter buses on a few routes (Routes 1, 9, 11, 26, 27) will begin their outbound trip at the commuter bus stop, and then pull into the right-turn-only-except-buses lane and proceed straight into the right lane on Pearl Street.

Eastbound Bus Stops

This entire block on Central Row is currently a commuter bus stop during the PM peak period and it is used as a local bus stop by three routes at all times. It will continue to be a bus stop but will be split into two areas, one for local buses and one for commuter buses. (Most of the current commuter buses will be moved to the east or north.) The block is about 320' feet long and the entire right lane will be a bus stop. There should be no physical separation between the two bus stop areas, and no restrictions at the Main Street corner. The existing curb extension at Prospect Street can probably remain as long as buses using that end of the stop do not need to turn right. The space should be allocated approximately as follows:

- Far-side of Main Street – 220' for local routes
- Near-side of Prospect – 100' for commuter bus (Routes 3,4,14)

This will be a high boarding stop so both stop areas will need a substantial shelter. The length of the local bus stop is sufficient for the four evening and Sunday pulse buses to arrive and leave simultaneously.

Currently the commuter bus stop is used as an informal loading zone at some times of the day. By becoming a largely local bus stop, this stop will be used by buses almost constantly all day long. Parking restrictions will need to be rigorously enforced. It may be possible to allow the commuter portion of the stop to be used as a loading zone at certain times.

Westbound Bus Stops

In the AM peak period this entire block is currently a commuter bus unloading stop and Commuter Shuttle loading stop. It will continue to be a bus stop but will also be split into two areas, one for local buses and one for commuter buses. The block is about 320' feet long from Main Street to the crosswalk opposite Prospect Street. As noted above, the curb will be moved out to allow the expansion of the sidewalk and installation of shelters. The bus stop will be out of the traffic lanes and will end some distance (to be determined) short of Main Street to give buses some distance to move into the right lane and to allow a curb extension at Main Street.

There should be no physical separation between the local and commuter bus stop areas. The local bus stop will be set back some distance from the intersection and should extend for at least 180'. This will be a high boarding stop so substantial shelters are needed in the expanded sidewalk area. This stop will have ample room for the two buses using this stop for the evening and Sunday pulse.

The commuter stop (most routes in the AM, Routes 1, 9, 11, 26, and 27 loading in the PM) will begin at the end of the local bus stop and extend as far as possible onto American Row along the Old State House grounds. A shelter at the commuter bus stop would be desirable if there is room. This stop will be the location where the most AM commuter bus riders alight, but buses will unload and depart as soon as possible.

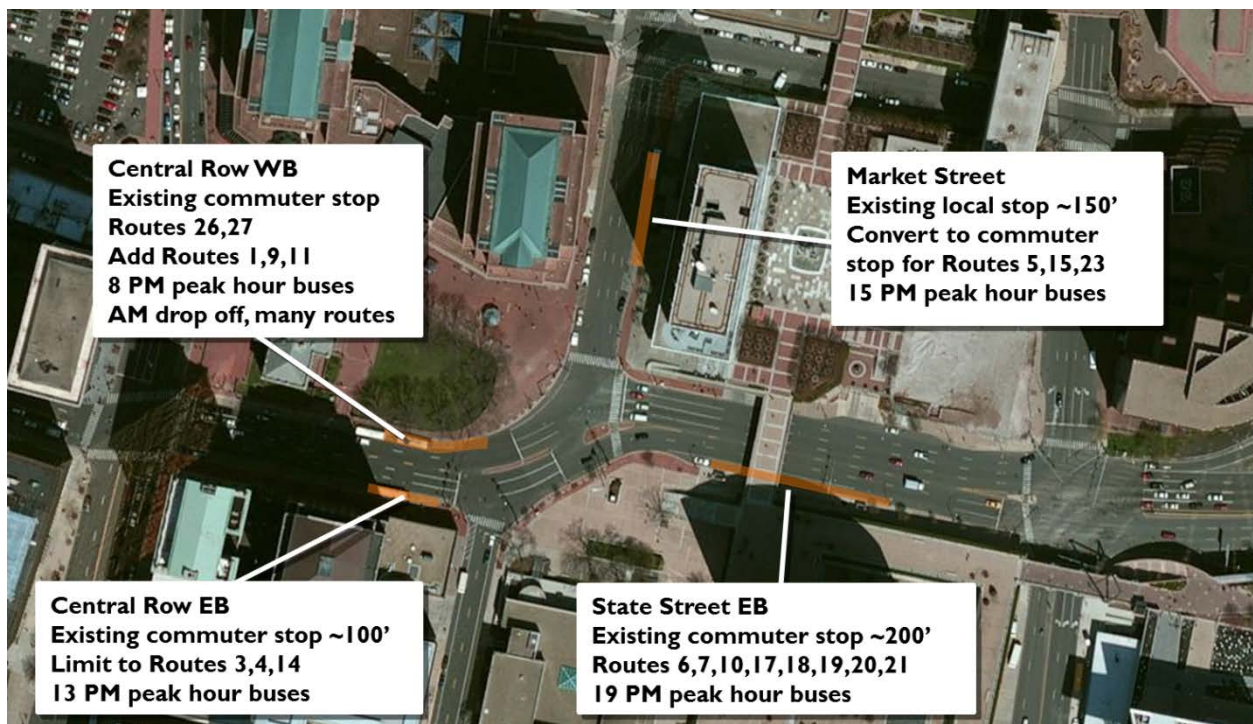
The current commuter bus stop in this location is often used for illegal parking. By becoming a largely local bus stop, this area will be used by buses almost constantly all day long. Parking restrictions will need to be rigorously enforced.

Main Street Intersection

As noted above, all buses are expected to be continuing to and from Pearl Street in both directions. In both directions, buses will approach in a right-turn-only-except-buses lane and will be received in a lane that is either bus-only (the eastbound bus stop) or primarily buses (on Pearl Street westbound).

Prospect/American Row Intersection

At Prospect Street/American Row, eastbound buses will need to be able to turn right onto Prospect, go straight onto State Street, or turn left onto Market. During the AM peak, the movement through onto State Street is prohibited, so all eastbound buses that are not turning around using Prospect will need to turn left onto Market Street. PM commuter buses stopping at the stop along the curb near this intersection are expected to be going straight onto State Street rather than turning left or right.



3.13 State Street

Eastbound Bus Flow

Eastbound local buses that may use Founders Bridge will flow along State Street to the bridge without stopping. A few PM commuter routes (Routes 3, 4, 14) will also flow along State Street to the bridge without stopping. Several other PM commuter routes (Routes 6, 7, 10, 17, 18, 19, 20, 21) will stop on this block before continuing to the bridge or I-91 southbound.

Westbound Bus Flow

Local and AM commuter buses from east of the river will arrive via the Founders Bridge. AM Commuter buses from the north and south will turn onto State Street from Columbus Boulevard in both directions. All of these buses will proceed onto American Row/Central Row to bus stops there. In the PM, a few commuter routes (1, 9, 11, 26, 27) will arrive from various directions to begin their trip at central Row. Throughout the day, *CTfastrak* buses will turn right from Columbus Boulevard onto State Street westbound and proceed directly into the new State House Square *CTfastrak* bus-only street.

Eastbound Bus Stop

Many commuter bus routes (Routes 6, 7, 10, 17, 18, 19, 20, 21) will use the existing commuter bus stop. This is an increase in the number of routes so an additional shelter may be needed.

No Westbound Bus Stop

There will be no bus stop in the westbound direction.

3.14 Market Street

Northbound Bus Flow

Eastbound local buses will follow Market Street from American Row and turn right onto Morgan Street to I-84. Northbound commuter buses (Routes 5, 15, 23) will follow Market Street from American Row to points north. *CTfastrak* buses will follow Market Street from the exit from the State House Square bus-only street and turn right onto Kinsley Street.

Northbound Bus Stops

Local buses may use the existing stop on Market Street between Kinsley and Talcott. Commuter buses (Routes 5, 15, 23) will use the existing stop on Market Street between State and Kinsley. These stops already have shelters.

Southbound

Buses will not use Market Street in the southbound direction.

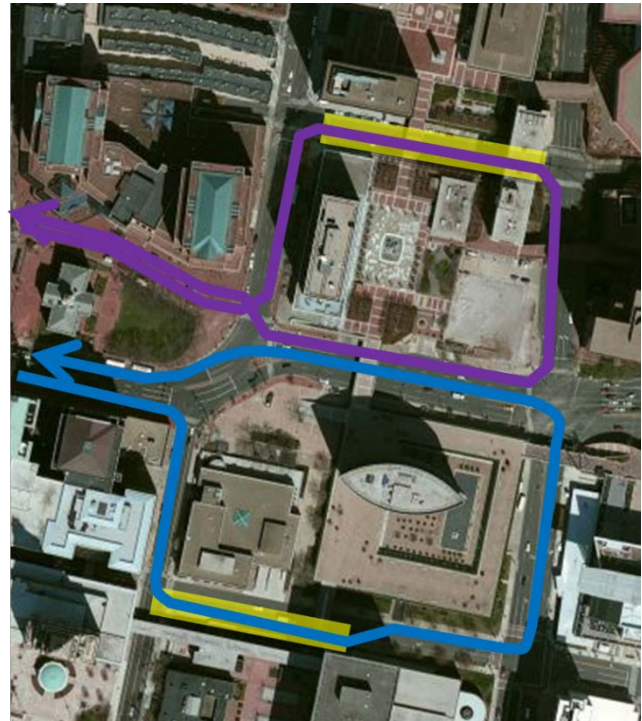
3.15 Kinsley Street Loop

Kinsley Street

CTfastrak buses will turn right from Market Street to Kinsley Street. While many *CTfastrak* buses will use the loop to immediately begin their outbound trip, curb space will need to be allocated on Kinsley Street for *CTfastrak* buses to hold before beginning their outbound trip. A near-side stop at Columbus would require 160'-180' while a far-side stop at Market would require only 140'-160'.

Columbus Boulevard

CTfastrak buses will turn right from Kinsley and then right onto State Street to begin their outbound trip. AM peak commuter buses from the north will continue to enter downtown on Columbus and turn right onto State Street. There will be no stops on Columbus Boulevard



3.16 Grove Street Loop

Prospect Street

Local buses from the west that terminate downtown (Route 60-66) will turn right from Central Row onto Prospect Street and then left onto Grove Street. There will be no stops on Prospect Street.

Grove Street

Local buses from the west that terminate downtown will turn left from Prospect Street to Grove Street and then left onto Columbus. Curb space will be allocated on Grove Street for buses to hold before beginning their outbound trip. A far-side stop at Prospect Street that displaces some existing parking appears most feasible. This will require 190'-220' for two buses (longer than other far-side stops due to the left turn from Prospect).

Columbus Boulevard

Local buses from the west that terminate downtown will turn left from Grove and then left onto State Street to begin their outbound trip. AM peak commuter buses from the south will continue to enter downtown on Columbus and turn left onto State Street. There will be no stops on Columbus Boulevard

3.17 Main Street

Northbound and Southbound Bus Flow

All Main Street routes to and from the north and south will continue to operate along Main Street. Route 72/63, which currently uses Asylum and Pearl to and from the west and Main Street to and from the south, will use Pearl Street and Main Street in both directions. Other west routes and commuter routes will no longer use any part of Main Street as they will all be using Pearl and Central Row.

Southbound Stop Pearl to Gold

The block between Pearl and Gold southbound will continue to be used by all southbound routes. The entire block will continue to be needed since this is the central transfer point in the system and buses must continue to be able to dwell there for a few minutes in order to stay on schedule and provide reliable service.

The block is approximately 540' long. If curb extensions are built at the corners and mid-block as proposed, it will be possible to create two 220' mid-block bus stops. This length will accommodate independent movement of three buses (including one articulated bus) at each stop. This will accommodate the 11 routes and 41 PM peak hour buses using this stop. It will also be able to hold the six buses using this stop during the evening and Sunday pulse times. This will be a high boarding stop so substantial shelters should be provided.

No Northbound Stop at Wadsworth Atheneum

The existing northbound stop in front of the Wadsworth Atheneum will be eliminated. Buses will instead stop between Gold and Central Row.

No Northbound Stop at Old State House

The existing northbound stop in front of the Old State House will be eliminated. Buses will instead stop between Gold and Central Row.

Northbound Stop Gold to Central Row

The northbound block between Gold and Central Row is currently used by west local routes and north commuter routes. These routes will be relocated to Pearl Street and Central Row/Market Street. This block will instead be used by northbound local routes instead of the Atheneum and Old State House stops. The entire block will continue to be needed since this is the central transfer point in the system and buses must be able to dwell there for a few minutes in order to stay on schedule and provide reliable service.

The block is approximately 550' long. If curb extensions are built at the corners and mid-block as proposed, it will be possible to create two 220' mid-block bus stops. This length will accommodate independent movement of three buses (including one articulated bus) at each stop. This will accommodate the 13 routes and 35 PM peak hour buses using this stop. It will also be able to hold the six buses using this stop during the evening and Sunday pulse times. This will be a high boarding stop so substantial shelters should be provided.

Library Stops

South of the center of downtown existing stops near the Library will be retained. These are located southbound on the near side of Wells Street (in front of the MDC) and northbound on the near side of Arch Street (in front of the Library). Shelters should be provided.

Church/Pratt Stops

North of the center of downtown stops will be provided near Church Street. These could be at the existing stops southbound on the near side of Pratt Street and northbound on the near side of Church Street, or at slightly relocated locations. Shelters could be provided although the existing overhang at the old G. Fox building serves as an excellent shelter.

4. Bus and Passenger Volumes

4.1 Peak Hour Bus Volumes

PM peak hour downtown bus volumes under the service concept are shown in the figure below. Main Street will serve between 32 and 42 buses in the PM peak hour with slightly higher volumes south of Pearl Street due to the one route that travels between the south and the west. All of the buses on Main Street will be local buses.

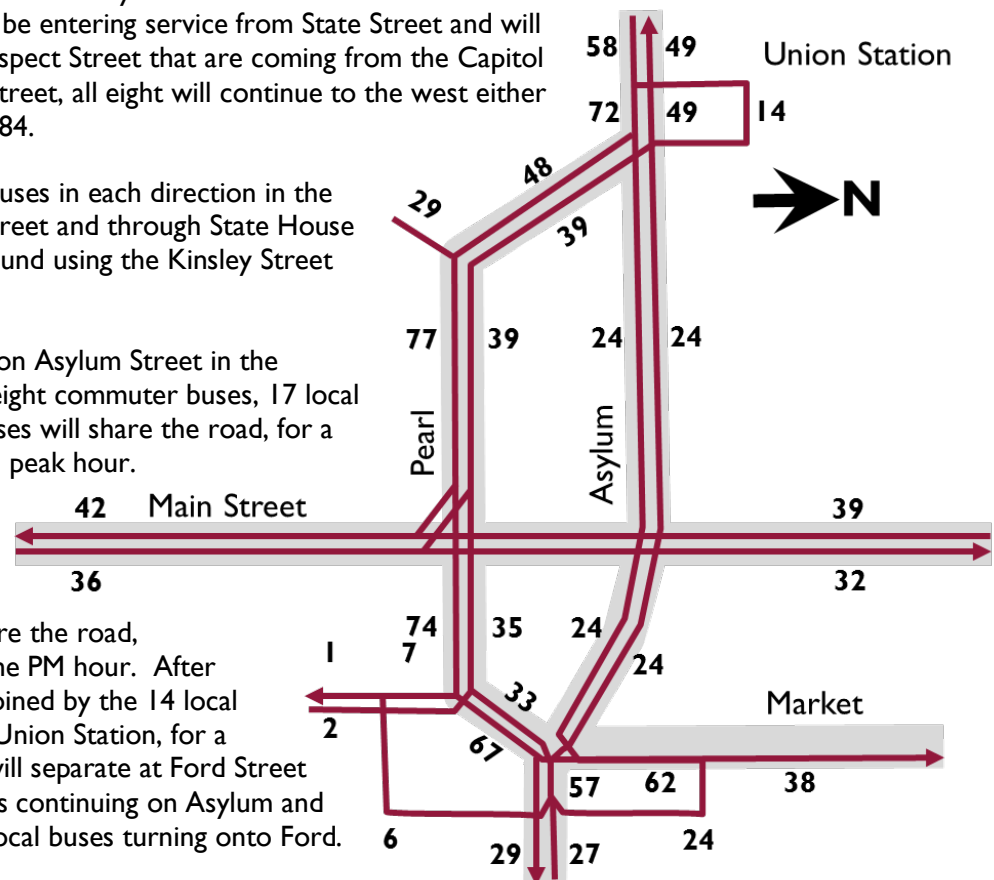
Pearl Street between High and Main will serve the most buses - 77 buses eastbound and 39 westbound in the PM peak hour. The peak flow of 77 buses will consist of 47 commuter buses and 30 local buses. Of the commuter buses, 18 will arrive from Asylum Hill via Asylum and Ford, while the remaining 29 will be entering service from their midday layover locations, mostly via Trinity Street. Of the local buses, 16 will arrive from the west via Asylum and Ford, while the remaining 14 will be coming from the Union Station turnaround loop. The eastbound peak volume on Pearl Street will dissipate east of Main Street with three local buses turning south on Main, six local buses turning onto Prospect to turn around, 21 local and 17 commuter buses turning north on Market Street, and 29 commuter buses continuing east either to I-91 or across the river.

In the westbound direction on Pearl Street, 31 of the 39 buses will be local buses. Twenty-one local buses will be coming from across the river on the Founders Bridge. Six will join them from the turnaround loop at Columbus, and four will join from Main Street from the south. After serving Pearl Street, 14 of the 31 will travel straight from Ford to High Street to turn around at Union Station, while the remaining 17 will continue on Asylum Avenue to the west. Six of the eight commuter buses will be entering service from State Street and will be joined by two from Prospect Street that are coming from the Capitol area. After serving Pearl Street, all eight will continue to the west either along Asylum Avenue or I-84.

CTfastrak will operate 24 buses in each direction in the peak hour along Asylum Street and through State House Square. They will turn around using the Kinsley Street loop.

In the Union Station area, on Asylum Street in the westbound direction, the eight commuter buses, 17 local buses, and 24 CTfastrak buses will share the road, for a total of 49 buses in the PM peak hour.

Eastbound on Asylum Street, passing under I-84, the 18 commuter buses, 16 local buses, and 24 CTfastrak buses will share the road, for a total of 58 buses in the PM hour. After Union Place, they will be joined by the 14 local buses that turn around at Union Station, for a total of 72 buses. These will separate at Ford Street with the 24 CTfastrak buses continuing on Asylum and the 18 commuter and 30 local buses turning onto Ford.



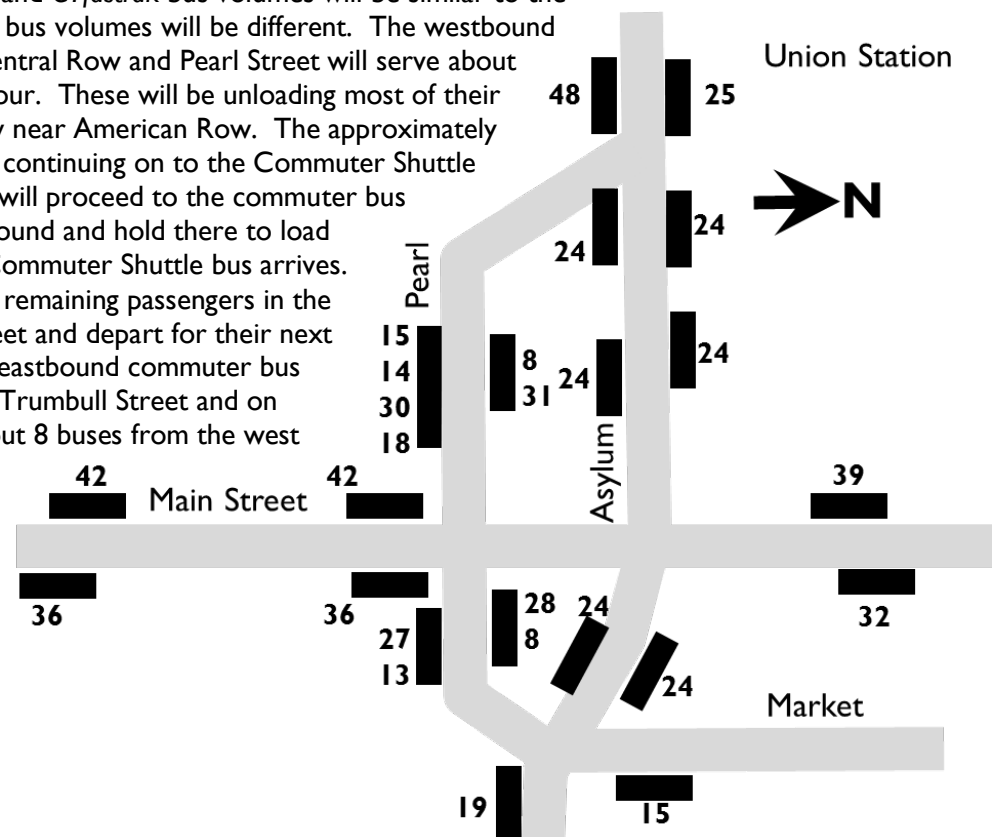
In the AM peak hour, local and *CTfastrak* bus volumes will be similar to the PM peak hour. Commuter bus volumes will be different. About 30 westbound commuter buses will use Central Row and Pearl Street as far as High Street in the AM peak hour. Approximately 16 of these will continue on as Commuter Shuttles through Asylum Hill proceeding along Pearl Street westbound to Ford and Asylum. About eight eastbound commuter buses from the west will travel east on Pearl Street from Asylum to Central Row before exiting to the east.

4.2 Peak Hour Bus Stop Volumes

PM peak hour volumes at downtown bus stops under the service concept are shown in the figure below. Local bus stops on Main Street will serve between 32 and 42 buses in the PM peak hour. Local bus stops on Pearl Street and Central Row will serve between 27 and 31 buses in the PM peak hour. *CTfastrak* stops will serve 24 buses per hour. Westbound commuter bus stops on Central Row and Pearl Street will serve eight buses in the PM peak hour. The three eastbound commuter bus stops on Pearl Street, and the three on Central Row, State and Market, will serve between 13 and 19 buses in the PM peak hour.

In the Union Station area, on Asylum Street, the westbound stop on Asylum Street will serve the eight westbound commuter buses plus the 17 local buses that are continuing through to the west, for a total of 25 buses in the PM peak hour. The remaining 14 local buses traveling westbound across downtown will turn around on the Union Station loop will use the transit center stop at Union Station instead. The eastbound stop on Asylum Street will serve the 18 commuter buses that are either Commuter Shuttle buses or that are routes that now begin at Union Station, plus the 16 local buses that are arriving from the west. This stop may also serve the 14 eastbound local buses that are originating at the Union Station transit center, for a total of 48 buses in the PM peak hour as shown in the figure.

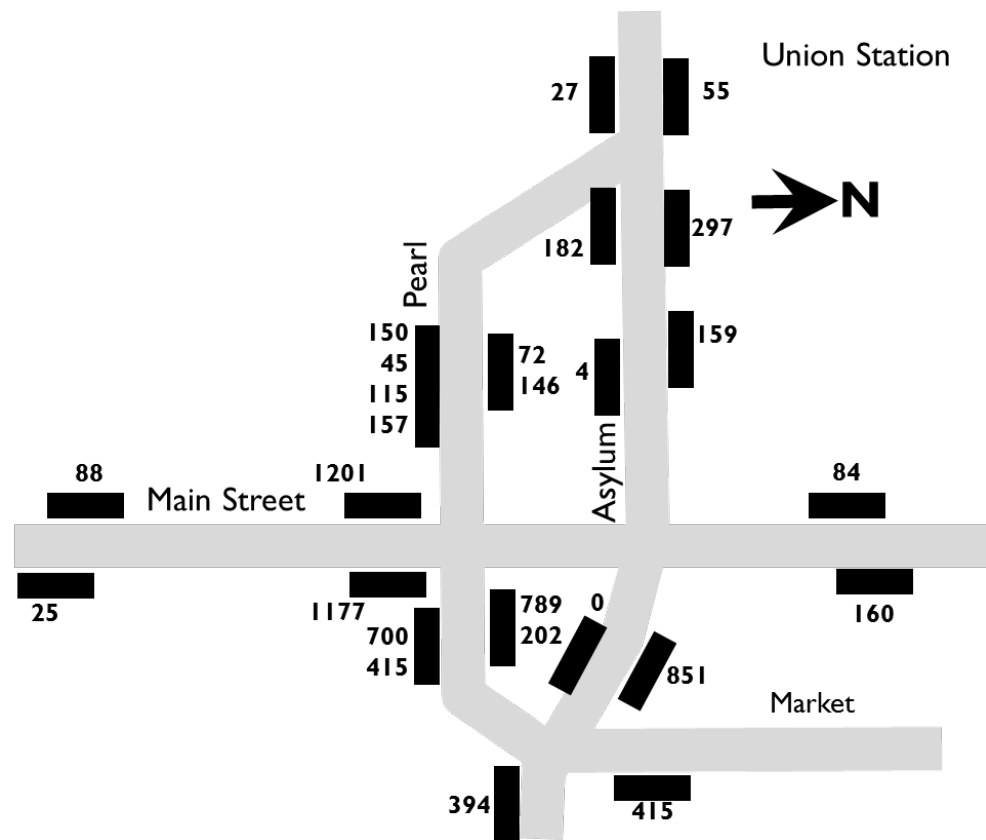
In the AM peak hour, local and *CTfastrak* bus volumes will be similar to the PM peak hour. Commuter bus volumes will be different. The westbound commuter bus stops on Central Row and Pearl Street will serve about 30 buses in the AM peak hour. These will be unloading most of their passengers on Central Row near American Row. The approximately 16 buses per hour that are continuing on to the Commuter Shuttle route through Asylum Hill will proceed to the commuter bus stop on Pearl Street westbound and hold there to load passengers until the next Commuter Shuttle bus arrives. All others will unload their remaining passengers in the local bus stop on Pearl Street and depart for their next trip or to the garage. The eastbound commuter bus stops on Pearl Street after Trumbull Street and on Central Row will serve about 8 buses from the west unloading passengers in the AM peak hour.



4.3 PM Peak Period Bus Stop Boardings

PM peak hour data on bus ridership by stop was not available. This data was only available for the PM peak period (3:30-6:00 p.m.). It was also not available from the operators of commuter routes 16 through 27 so ridership on these routes was estimated using per trip ridership on commuter routes 1 through 15. Local and commuter bus ridership data from 2012 was used and adjusted to 2015 assuming 1.7% annual ridership growth. *CTfastrak* ridership daily estimates for 2015 were used and converted to a PM peak period estimate assuming 25% of daily ridership in the PM peak period.

Estimated PM Peak period boardings by downtown stop are shown in the following figure. The figure shows that the vast majority of downtown boardings will occur around the intersection of Main Street and Central Row. The four stops at that location are each expected to serve between 900 and 1,200 PM peak hour boardings. The nearby *CTfastrak* stop at State House Square is expected to serve over 800.





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