Long-Range

TRANSPORTATION PLAN

for Central Connecticut, through 2040

2015 Minor update

ADOPTED APRIL 21, 2015

CENTRAL CONNECTICUT METROPOLITAN PLANNING ORGANIZATION
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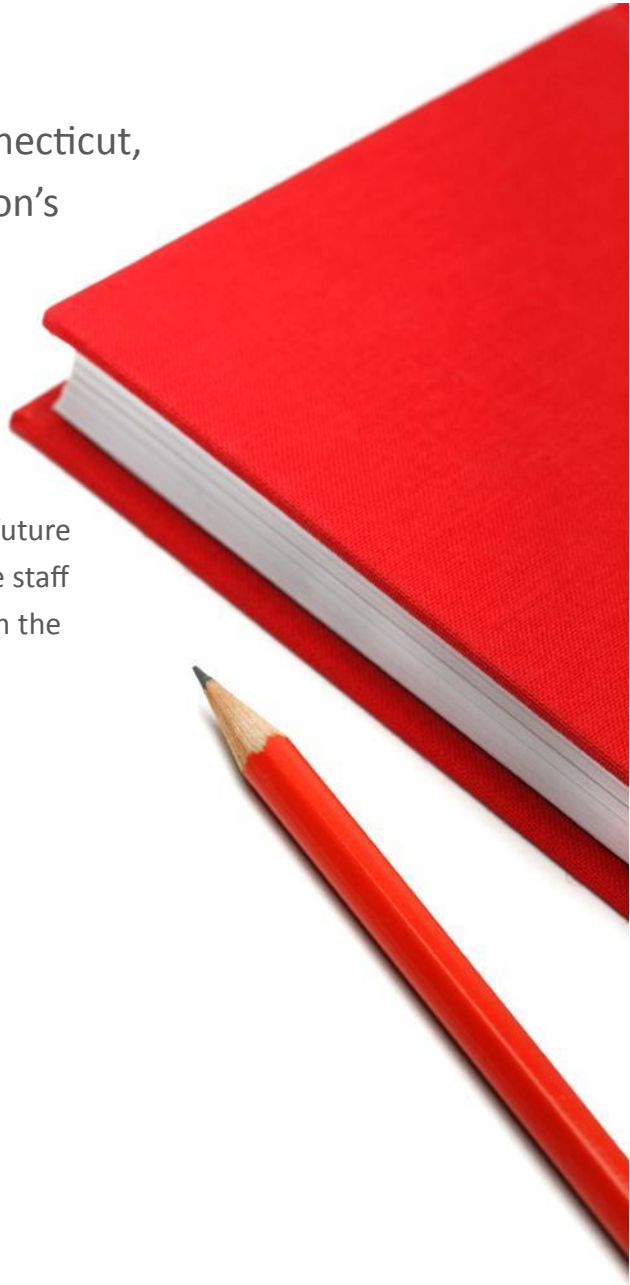
Disclaimer

Contents

Foreword

This document, the Long Range Transportation Plan (LRTP) for Central Connecticut, through 2040, lays out a broad vision of the form and functions of the region's transportation system now and as it will be for several years to come. However, this vision is not static. The Plan is flexible and may be revised to adapt to changes in regional needs. Reevaluation and revisions of the Plan over time reflect the purpose of the framers to keep the Plan relevant.

The Plan gives a snapshot of transportation in the region with a view toward the future. Projecting future need and determining how to meet that need is a collaborative process. Thanks are extended to the staff who authored the Plan and to the Connecticut Department of Transportation for its help. Input from the Agency Board, staff of member municipalities, and the public is much appreciated.



2015 Minor Update

PURPOSE OF THIS MINOR UPDATE

The primary purpose of this update is to comply with new requirements that were part of the Moving Ahead for Program in the 21st Century (MAP-21) legislation. MAP-21 introduced new elements that must be considered by MPOs when preparing their transportation plans.

CCMPO is doing a minor update, instead of a full update, for a number of reasons. The first reason is that MAP-21 requires MPOs to coordinate with their state's department of transportation to develop performance metrics to be used in planning efforts. CCMPO's long-range transportation plan (as well as the LRTPs of other MPOs in Connecticut) was due for an update before those metrics were ready.

A second reason for doing a minor update instead of a full update is that MPO boundaries in Connecticut are changing. In 2013, the State of Connecticut initiated a process to reorganize its regional planning organizations (RPOs, who have traditionally been the hosts of the state's MPOs). This process resulted in the Central Connecticut Regional Planning Agency being dissolved. Four of the municipalities joined the Capitol Region Council of Governments (CRCOG), two joined the Naugatuck Valley Council of Governments (NVCOG), and one joined the Northwest Hills Council of Governments (NHCOG). Subsequent to this reorganization, the towns clearly indicated their desire to change the MPO boundaries to match RPO boundaries.

While the RPO re-designation process was complete in January 2015, the MPO process is taking longer. The MPO re-designation process requires that municipalities and the governor approve of the boundary change. As of this writing, the municipalities belonging to CCMPO, CRCOG, NVCOG, and NHCOG have all officially endorsed the change. In February 2015 the CRCOG and CNVCOG, supported by all the requisite municipal and MPO resolutions, sent a letter to the Governor's office requesting approval of the boundary change. That approval is still pending. CCMPO anticipates that this process will not be complete until June 2015.

NEXT STEPS

Once the boundaries are officially changed, CCMPO will cease to exist and the enlarged MPOs will revise their plans to incorporate the new municipalities. Current CCMPO municipalities cannot be incorporated during this minor update as they are not officially members of their presumed new MPOs.

In July, 2015, Connecticut' MPOs will complete a full update of their LRTPs. At this time, if the MPO redesignation process is complete, each of the MPOs receiving municipalities from the Central Connecticut MPO will include these municipalities in

their respective updates. Each region's revised plans will include a full update that will incorporate the needs, priorities, and projects from the all of the MPO's member municipalities. In the meantime, this document will serve as the long-range transportation plan for the seven municipalities of the Central Connecticut Region.

WHAT'S NEW

While not comprehensive in nature, this update includes a number of changes. They include:

- An explanation of the MPO restructuring process that is ongoing in Connecticut (see above)
- References to the ongoing process of establishing performance metrics for MPOs in Connecticut (see the *National performance goals* section on page 9)
- An expanded discussion of freight planning efforts (see the *Freight* section on page 56)
- The inclusion of new or updated long-term projects to optimize municipal vehicle routes (see page 21), develop a regional bike path network (see page 24), undertake a comprehensive review of transit routes (see page 40), a study of the Route 9/571 corridor in New Britain and Berlin (see page 58), and a study of Memorial Boulevard in Bristol (see page 58)
- Updates to projects that are underway (see the *Major improvements* section on page 11)
- Updated financial data (see the *Finances* section on page 65)
- Updated Ozone Air Quality Conformity Report (see *Clean Air Act and amendments* section on page 185)

Throughout this plan, sections that are new or that include significant revisions, are displayed in orange.

As noted above, after the MPO boundaries are redrawn these changes will be integrated into the plans of the newly enlarged Capitol Region Council of Governments and Naugatuck Valley Council of Governments.

Vision

The Central Connecticut Metropolitan Planning Organization will work together with its members Berlin, Bristol, Burlington, New Britain, Plainville, Plymouth and Southington to ensure that transportation investments in the region embody the vision, achieve the goals, and complete the projects endorsed by this plan.

Four core principles inform this Plan. Taken in concert, these principles create a vision for the future of transportation in the region. It is the intent of this Plan and the policy of CCMPO, that investment in the region, whether on new projects or upgrades of existing facilities, reflects these principles. The principles are as follows on the next page.

PRINCIPLES

1. **Safety**. Investment should prevent accidents and save lives. Given the high economic and human cost of disability and death, maintaining and improving safety in the transportation system is essential.

2. **Nature**. Investment should protect and, where possible, enhance the environment. An intact environment is key to all human activity. To maintain the region's wellbeing, the transportation system must respect the environment.

3. **Access.** Investment should help people get where they need to be. Residents, workers, and visitors to the region live, work, learn, and play in diverse places. To help them get there, the transportation system must provide them with a high level of proximity and, where that fails, mobility.

4. **Place.** Investment should make vibrant places. Lively downtowns and village centers are integral to the social, economic, and environmental health of the region. Many of these areas have fallen on hard times, in part due to poor investments. To redress this, the transportation system must contribute to making these places unique, vibrant places.

National performance goals

Moving Ahead for Progress in the 21st Century (MAP-21) is the current surface transportation funding law, introduced a new performance- and outcome-based program requirement for MPOs and states. MAP-21 set forth a national policy in support of performance management that stated:

"Performance management will transform the Federal-aid highway program and provide a means to the most efficient investment of Federal transportation funds by refocusing on national transportation goals, increasing the accountability and transparency of the Federal-aid highway program, and improving project decision-making through" -§1203; 23 USC 150(a)

National performance goals are established in seven areas. Those goals are listed in Table 1.

Table 1. National performance goals

Goal area	National goal
Safety	To achieve a significant reduction in traffic fatalities and serious injuries on all public roads
Infrastructure condition	To maintain the highway infrastructure asset system in a state of good repair
Congestion reduction	To achieve a significant reduction in congestion on the National Highway System
System reliability	To improve the efficiency of the surface transportation system
Freight movement and economic vitality	To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development
Environmental sustainability	To enhance the performance of the transportation system while protecting and enhancing the natural environment
Reduced project delivery delays	To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices

PERFORMANCE MEASURES

Along with these performance goals, MAP-21 directs the Secretary of Transportation to establish a series of *performance measures* to help states and MPOs measure their progress toward meeting the goals. The performance measures must be established by the states and MPOs in the following areas:

- Pavement condition on the Interstate System and on remainder of the National Highway System (NHS)
- Performance of the Interstate System and the remainder of the NHS
- Bridge condition on the NHS
- Fatalities and serious injuries—both number and rate per vehicle mile traveled--on all public roads
- Traffic congestion
- On-road mobile source emissions
- Freight movement on the Interstate System

STATE AND MPO TARGETS

Within one year of the U.S. Department of Transportation's establishment of performance measures, each state will develop a series of performance targets. These targets will be developed in consultation with the MPOs in that state.

The Connecticut Department of Transportation is currently working with Connecticut MPOs, including CCMPO, to develop these performance targets. Once these targets are established, CCMPO will update this plan to include them.

Major improvements

The following section lists and describes all of the major improvements and upgrades to be made to the region's transportation system over the next 25 years.

These projects were identified during the LRTP process as commensurate with and necessary for the attainment of the vision spelled out on the foregoing page. Projects are grouped by mode; they are not listed in order of importance.

- National performance goals

GENERAL

	Addressees
Give priority to maintenance over expansion. Do not construct new facilities at the expense of critical, existing infrastructure. Instead, seek to wring more efficiency from what is already built.	DOT, towns, CCMPO
Review all projects for environmental impact. Do not pursue projects that impair the environment.	DOT, towns, CCMPO
Design roads and streets to enhance the built environment. Use transportation to make safe, livable communities, in particular in areas with density or potential for redevelopment at density.	DOT, towns, CCMPO
Improve data collection. Collect region-wide traffic data. Work with police to routinely geocode accident reports and traffic violations and submit them electronically to a statewide database for system-wide analysis.	State police, towns, DOT
Develop high-speed communication networks. Connect workers and employers in the region to the information superhighway to give alternatives to physical travel (e.g., telecommuting).	Federal govt., State, towns, telecoms

Preserve scenic and historic corridors. Enhance scenic views and historic sites through transportation investments that preserve these assets and promote compatible land-use patterns.	State, towns

PEDESTRIANS AND CYCLISTS

Implement the State's 'complete streets' law. All projects must provide for pedestrians and cyclists.	DOT, towns
Adopt a network of on- and off-road pedestrian and cyclist routes. Routes should connect to the Farmington Canal Heritage Trail and CRCOG's multi-use network.	CCMPO, towns
Complete the Farmington Canal Heritage Trail. Plug the gaps between Red Oak Hill Road in Farmington and Hart Street in Southington.	Towns, DOT, DEP
Add connecting side trails to the New Britain-Hartford Busway trail. Link the busway trail to CCSU and Westfarms Mall with spurs.	Towns, CCMPO, DOT, DEP
Protect and extend hiking trails. Preserve, maintain, and, where possible, expand the region's trail system, including the New England Trail.	Towns, DEP

PUBLIC TRANSIT

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

PRIVATE VEHICLES

Add electronic highway signs to indicate alternate routes to avoid congestion or incidents. Supplement existing notification systems with signs that direct drivers onto alternate routes.	DOT
Explore connecting local streets to serve as alternate routes for congested corridors. Relieve traffic on arterials by knitting together and dispersing traffic onto the street grid.	CCMPO, towns
Replace intersections with roundabouts where appropriate. Eliminate unnecessary stops to improve safety and traffic flow.	Towns
Implement access management and/or signal coordination where appropriate. Better time traffic lights and consolidate driveways on congested roads, especially on busy through routes, to improve safety and traffic flow.	Towns, DOT
Add red light and/or speed cameras at dangerous locations.	DOT, towns
Construct a charging network to support electric vehicles.	Federal govt., State, towns

	FREIGHT	
	Maintain and upgrade the region's rail system to handle freight traffic. Shift as much freight as feasible from busy highways and roads to rail.	Pan Am, DOT

General

IMPROVE DATA COLLECTION

Comprehensive data should be collected on traffic conditions and incidents region-wide.

DESCRIPTION

To ensure that transportation funds are spent in the most efficient, cost-effective manner, good data are essential. In the past, resource constraints have by and large limited data collection to spot probes, such as traffic counts, taken at a certain place at a specific time. The lack of comprehensive data often forces planners to rely on generalizations and anecdotal evidence and makes project development, evaluation, and prioritization a challenge.

The proliferation of GPS presents a solution to this problem. Many GPS units, such as the millions of smartphones in circulation, report back on traffic conditions. Servers integrate these reports not into snapshots of momentary conditions but also into comprehensive historical databases with around-the-clock, nationwide coverage. As of writing, Google, for instance, not only gives live traffic maps on all roads from expressways down to collectors; it also makes quarter-hourly maps of typical traffic available. The spatiotemporal comprehensiveness of these sources, which can also include other information such as dwell times and travel routes, dwarfs the data collection capacity of even the largest MPOs and DOTs. Access to this information could revolutionize transportation planning. For that reason, this Plan calls on all relevant parties to make good-faith efforts to acquire this information.

There are also opportunities for gathering data firsthand. Accident reports, for instance, include the location of the accident. These locations are not entered in any standardized form, let alone geocoded and tabulated into a statewide database. This makes working with these data very difficult and impairs the efficiency of safety improvement programs. To redress this, this Plan recommends outfitting all State *and* local police that respond to traffic incidents with GPS units that record location and submit the data to a central incident registry.

COST

Project cost depends on the source and type of data. Third-party licenses run from free to exorbitant. The cost of primary data collection if properly executed (with appropriate equipment and retraining), should be relatively low.

STATUS AND NEXT STEPS

At present, access to such information is minimal. In theory, procurement and collection of these data could occur relatively swiftly. However, impediments do exist. These include the availability, licensing, and cost of third-party data (while some entities, such as Google, have professed an interest in making these data available to transportation planners, no commitments have been made) as well as the need to develop a primary data collection system that is robust, reliable, and workable (i.e., yields good data and does not impose any burden on incident responders). Next steps to follow are:

- DOT, DEMHS, and/or CCMPO gains access to third-party traffic data. *Starts post-adoption of this Plan and concludes within two years.*
- DOT, DEMHS, State police develop and implement a plan including hardware, registry software, and staff training components to collect and submit geocoded incident data. *Starts post-adoption of this Plan and concludes within five years.*
- Local police adopt the State policy system. *Starts post-implementation of the aforementioned State plan and completed within five years.*

HIGH-SPEED COMMUNICATION NETWORKS

High-speed networks should link homes and businesses to give an alternative to physical travel.

DESCRIPTION

The spilling of homes, workplaces, schools, and retail and entertainment establishments out of dense, walkable downtowns and into sprawling suburban and exurban areas over the last several decades has led to average people having to take more and longer trips by car in order to meet their life needs. This growth in automobile travel produces numerous social, economic, and environmental costs, the most visible of which is worsening congestion. (See *Traffic and congestion*, p. 159.)

Telecommuting offers a solution to this problem. At present, few people in the region work at home. This suggests there is potential for more to do so. Given the non-linear nature of traffic flow, raising the telecommuting rate even modestly could have a salutary effect on congestion (as well as on a host of other measures, such as household finances and air and water quality.)

The region's low levels of telecommuting may stem from the novelty of the practice, some employers' unfamiliarity or discomfort with working from home and the simple fact that some jobs require one's bodily presence. However, they also likely reflect technical limitations. Telecommuting is demanding, and many workers and workplaces do not have access to network facilities and infrastructure suitable to support efficient telecommuting. In other words, the region's information superhighway is running up against the same problem its highways are: a

lack of capacity. In light of the relatively low cost of network as compared to transportation infrastructure, and the large benefits of telecommuting, this Plan advocates the targeted rollout of true high-speed wired and/or wireless networks in the region.

COST

The cost of deploying a high-speed communications network depends on a multitude of factors. These include the technology and area chosen, the level of service desired, as well as funding options and regulatory tools available. Until further study has been conducted, detail cannot be given.

STATUS AND NEXT STEPS

Fiber-to-the-curb has been rolled out in some areas. Yet this represents an incremental improvement over traditional copper-wire broadband services and, when compared to overseas offerings (particularly Northern Europe and East Asia), still falls short of true high speed.

AT&T (now Frontier Communications) provides fiber to the home service in some parts of the region. High speed mobile data (4G LTE) is also available in portions of the region. The State of Connecticut's Office of Policy Management launched a grant-funded program to extend the state's "Nutmeg Network", a high-speed fiber optic network, to municipal buildings. The Capitol Region Council of Governments is in the process of launching a pilot program in 2015.

Next steps to follow are:

- CCMPO studies impediments to the adoption of telecommuting in the region and proposes strategies to overcome these. *Starts within five years of the adoption of this Plan and concludes within one year.*
- The state and the Capitol Region Council of Governments continue their pilot project to expand access to the "Nutmeg Network". *Starts in 2015.*

HISTORIC AND SCENIC PRESERVATION

Transportation investments should complement scenic and historic corridors, preserving views and sites of value, and promoting compatible land use.

DESCRIPTION

Transportation has played a key role in shaping the built and natural environments. In many cases, the results have been good, creating places of historic and cultural value, as well as making natural resources accessible. In others, however, they have been less benign, degrading human communities and disfiguring landscapes.

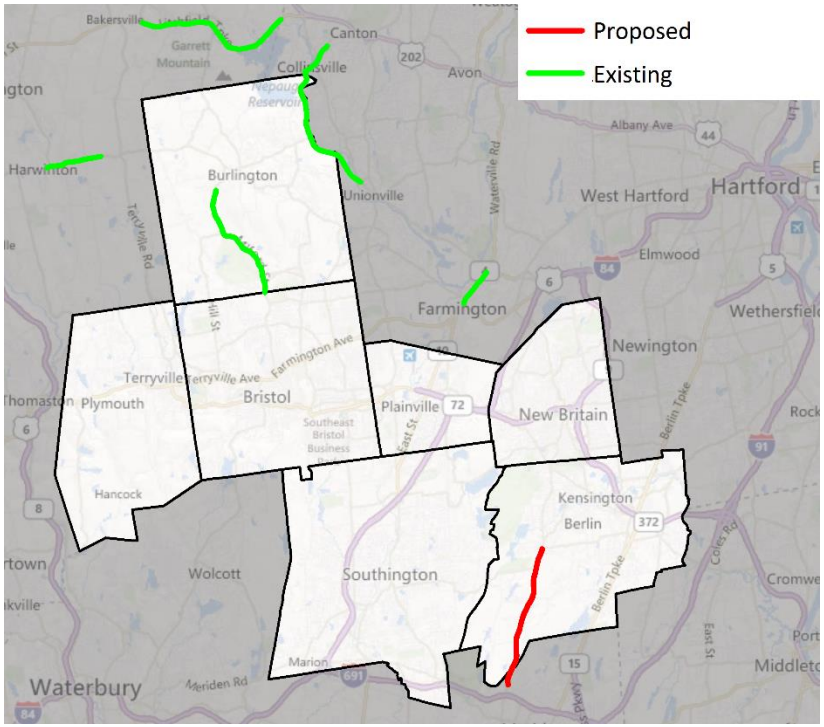
While transportation investments over the last century have enhanced mobility (at least for drivers), they come at a cost. Highway improvements, in particular construction of expressways, have, in many cases, severely damaged city and village centers as well as resulted in the loss of millions of acres of farms, fields, and forests.

To redress the damage that some transportation projects have caused in the past, as well as the potential for future projects to yield further degradation and loss, this Plan calls for transportation investments to be selected, structured, and implemented insofar as feasible to avoid and address human and environmental costs.

Avoidance of these costs can come with a price. Where needs exceed means, prioritization is necessary. This Plan therefore urges that avoidance and addressing of damage focus on areas of especial human or environmental value. These include:

1. Historic sites and districts listed in the National or State Registers of Historic Places or otherwise recognized.
2. Critical habitat identified by the Connecticut Department of Environmental Protection or otherwise recognized.
3. Scenic corridors identified by the region's municipalities, CCMPO, and/or the DOT.

Figure 1. Scenic roads in and around the region



Areas falling under categories 1 and 2 have been omitted from this Plan for the sake of brevity but can be found at the respective Agency's web site. To date, no municipalities in the region have designated local scenic roads. This Plan identifies the following corridors (*Figure 1*, p. 20) as of regional import and worthy of preservation for their high scenic value:

1. Canton Road, Burlington
   (State Route 4/179 along the Farmington River)

2. Milford Road, Burlington (State Route 69)
3. Chamberlain Highway, Berlin (State Route 71)

These routes are the only State routes in the region that this Plan has identified as of high scenic value. Due to the scarcity of scenic routes in the region, as well as threats to their scenic value, this Plan supports investments that maintain these routes' historic and scenic character. These investments include scenic highway designation and permanent protection through land and easement acquisition.

COST

Project cost depends on the specific project. Where changes in land use are involved, projects may entail considerable upfront costs but can pay for themselves over the long run by preventing development- and degradation-related costs.

STATUS AND NEXT STEPS

Various parties, including the State, municipalities, and land trusts, have acquired land along the corridors listed above to preserve their scenic and historic value.

Canton Road (Route 4/179) and Milford Road (Route 69) in Burlington have both been granted scenic road status by ConnDOT.

Next steps to follow are:

- CCMPO screens roads for local scenic road designation and makes recommendations to municipalities. *Starts within two years of the adoption of this Plan and concludes within two years.*
- CCMPO, municipalities, and land trusts pursue opportunities (land/easement acquisition and/or zoning changes) to preserve views along corridors identified as scenic, especially those listed above. *Starts immediately and continues indefinitely.*
- CCMPO develops a map of historic sites and districts and critical habitats for use in project development and review. *Starts within one year of the adoption of this Plan and concludes within three months.*

MUNICIPAL VEHICLE ROUTE OPTIMIZATION

Municipal vehicles, such as school buses, snow plows, garbage/recycling trucks, should use routes that are optimized using the latest available techniques.

DESCRIPTION

Traditionally, routes employed by municipal departments have been created by hand using knowledge obtained by staff. While this knowledge is valuable and provides many insights into the most efficient methods of serving a municipality, advanced software can supplement this knowledge to provide greater efficiency. Municipalities across the country are employing this technology and have seen decreases in fuel consumption and employee costs of up to 30%. Not only does this technology

promise to save taxpayer dollars, but it can lead to significant environmental benefits through reduced emissions.

COST

Software to perform these optimizations costs about $75,000 up-front. Annual maintenance agreements cost $6,000 to $8,000. Employees must also be trained to use the software and must spend time gathering necessary information and running the simulations. A better estimate of these costs will require more details from the municipalities that wish to participate. CCMPO recommends running a pilot project with one municipality to determine what sort of time/resource commitment is necessary, and what sort of benefits may be expected.

STATUS AND NEXT STEPS

CCMPO works with one municipality to develop a pilot optimization project. The City of Bristol is currently preparing an application for grant funding to purchase the necessary software.

Next steps to follow are:

- A municipality (potentially Bristol) decides to start a pilot project. *Starts within a year of this plan's passage.*
- The municipality determines which routes are most in need of optimization. *Starts within a year of this plan's passage.*
- The municipality and CCMPO acquire the software necessary and train staff to run it. *Starts within three years of this plan's passage.*
- CCMPO and the municipality gather the necessary data and setup the software model. *Starts within three years of this plan's passage.*
- The municipality implements the new routes and collects data to determine the level of improvement. *Ongoing after implementation.*
- CCMPO works with other municipalities to expand the pilot program. *Ongoing after implementation.*

Pedestrians and cyclists

COMPLETE STREETS IMPLEMENTATION

Transportation investments must integrate and genuinely accommodate all users.

DESCRIPTION

In 2009, the State passed Public Act No. 09-154. This law (now section *13a-153f* of the Connecticut General Statutes, p. 206), mandates "completing the streets," or the integration of all users of the transportation system, including cyclists, pedestrians, and transit riders into the planning, design, construction, and operation of roadways in the State. The law enjoins DOT and municipalities to expend a "reasonable amount" of funds received for the "construction, restoration, rehabilitation or relocation of highways, roads or streets … [on] facilities for all users, including…bikeways and sidewalks." From fiscal year 2010 on, DOT and municipalities must devote at least 1% of these funds for such projects.

Although DOT and municipalities in the region must now incorporate non-motorized users into their transportation system, this Plan strongly encourages them to go above and beyond the 1% minimum.[1]

COST

Project cost depends on the specifics of each proposed improvement or upgrade.

STATUS AND NEXT STEPS

The 'complete streets' bill is law. It is now up to the DOT and municipalities to adhere to it. Next steps to follow are:

- DOT and municipalities integrate all users into transportation projects. *Starts immediately and continues indefinitely.*
- To facilitate implementation of the law, CCMPO reviews all proposed transportation projects in the region for compliance with the law. *Starts immediately and continues indefinitely.*

[1] *This Plan recommends that the greater of 1% of transportation funds received for a given municipality, or a share of all such funding expended in a given municipality equivalent to the percentage of all workers commuting by foot or bicycle to work in that municipality, should be spent on Complete Streets implementation. According to latest 5-year 2009 American Community Survey estimates (2005-2009), the percentage of workers in each municipality who walk or bike to work is as follows: Berlin, 0.5%; Bristol, 1.8%; Burlington, 0.2%; New Britain, 3.3%; Plainville, 1.9%; Plymouth, 1.0%; Southington, 0.9%.*

- DOT and municipalities expend at least 1% of received funds on non-motorized users. *Starts fiscal year 2010 and continues indefinitely.*
- CCMPO to give added weight to projects that 'complete the streets' in its evaluations. *Already started and continues indefinitely.*

PEDESTRIAN AND CYCLIST ROUTE NETWORK

Investments in dedicated facilities should focus on a regional network of designated routes.

DESCRIPTION

The 'complete streets' approach underscores the role that pedestrians and cyclists play in the transportation system and accordingly calls for them to be accommodated, so that all people, not just drivers and their passengers, may pass with safety and efficiency. This Plan espouses these goals in its principles of *Safety* and *Access*. Yet the Plan also recognizes that resources are limited. If funds are not to be spread so thin as to be invisible but to yield tangible benefits for walkers and bikers, their application must be concentrated. In other words, investment should focus on improving transportation facilities that have been targeted, or *designated*, for pedestrian and cyclist use.[2]

To ensure that investments in pedestrian and cyclist facilities make for a coherent, usable, and ultimately successful system, a comprehensive, well-connected network of multi-use routes was developed for this Plan. *Figure 2* (p. 26) depicts these routes, which result from extensive public consultation. The routes are intended to connect population centers and popular destinations with current and future pedestrian and cyclist infrastructure within and without the region. (The latter include the Farmington Canal Heritage Trail, discussed below as a distinct upgrade due to its especial significance, the New Britain-Hartford Busway multi-use trail, and CRCOG's multi-use network.)

COST

Adoption of a designated network has no cost. The cost of implementation depends on the changes proposed and runs from low (e.g., signage and lane striping) to relatively high (bridges and tunnels for pedestrian and cyclist use).

STATUS AND NEXT STEPS

A draft network is included in this Plan, based upon comments received through the public involvement process. Adoption of the Plan will signify adoption of this network.

[2] *However, the Plan also emphasizes that all transportation facilities, except where so declared, such as in the case of limited-access expressways, should be designed to serve all users with safety.*

Next steps to follow are:

- CCMPO develops and adopts a regional on- and off-street route network. *Completed with the adoption of this Plan.*
- CCMPO works with CRCOG to refine and integrate route networks. *Starts in 2015 and continues for one year.*
- DOT and municipalities integrate the network into their planning and public works routines. *Starts post-adoption of this Plan and concludes within one year.*
- Municipalities integrate the network into their Plans of Conservation and Development. *Starts post-adoption of this Plan and concludes within ten years.*
- DOT and municipalities design new projects to provide appropriate, adequate facilities on designated roads. *Occurs on a project basis, starting post-adoption of this Plan.*

FARMINGTON CANAL HERITAGE TRAIL

Gaps in a multi-use trail of regional significance should be plugged.

DESCRIPTION

The Farmington Canal Heritage Trail is a planned, continuous 84-mile trail along a former railroad right-of-way between New Haven and Northampton, Massachusetts. In recent years, large sections of the trail have been paved and opened to the public for walking and biking. These sections have quickly become a major recreational facility and tourist attraction, with congestion frequent on clement days. Spot counts[3] of cyclists and pedestrians bear these impressions out. Estimates[4] indicate that many points along the trail enjoy over 100,000 unique visits, with some areas up to 500,000 or more. As the remaining sections of the trail are completed, and links to more densely-populated suburban and urban areas are established, it is anticipated that the trail will also increasingly serve commuters and utility bikers and walkers.[5]

The trail passes through two towns in the region, Southington and Plainville. These towns also make up the lion's share of the remaining uncompleted mileage of the trail in the state. As of this Plan, the only stretches remaining to be completed in the state run between:

1. Cornwall Avenue in Cheshire and West Main Street in Plantsville (Southington)
2. Hart Street in Southington and Red Oak Hill Road in Farmington

[3] *Data collected by CRCOG.*

[4] *Estimates by CCMPO.*

[5] *"Utility" biking and walking include all other purposes besides commuting to work and recreation, such as shopping, running errands, visiting friends or family members, or traveling to a park or entertainment venue.*

Figure 2. Designated route network and trail map

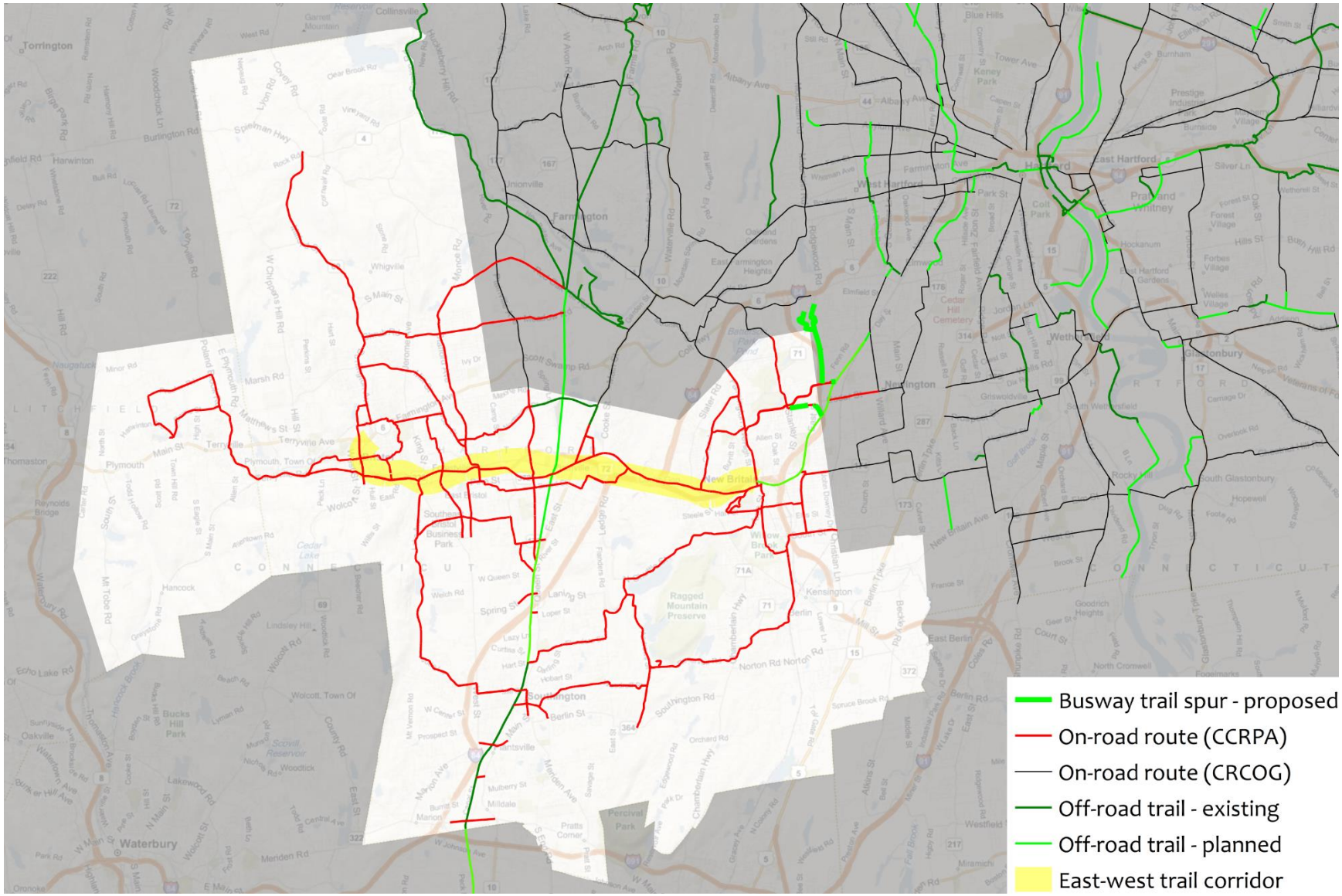


Table 2. Trail spot counts

Location	Date/time	Pedestrians	Cyclists	Total users
Red Oak Hill Rd., Farmington	Thursday, 9/10/2009 4-6 PM	22	59	81
Sand Hill Rd. /SR10/202, Simsbury	Thursday, 9/10/2009 4-6 PM	17	30	47
Salmon Brook Bridge, East Granby	Thursday, 9/10/2009 4-6 PM	9	30	39
SR 177, Unionville	Thursday, 9/10/2009 4-6 PM	19	38	57
Sperry Park, Avon	Thursday, 9/10/2009 4-6 PM	20	12	32
South of SR10, Simsbury	Sunday, 9/13/2009 12-2 PM	24	110	134

As *Figure 2* (p. 26) illustrates, these gaps sever the trail at its center, a critical point.[6] As such, they constitute a primary impediment to use of the trail. This Plan therefore recommends that Plainville and Southington, together with their neighbors Farmington and Cheshire, work to fill the gaps.

COST

Communities have found that engineering and design for the Farmington Canal Heritage Trail in general runs $75,000 to $100,000 per mile. Construction ranges between roughly $750,000 and $1,250,000 per mile. (Bridges and other design challenges can raise the cost substantially.) This yields an estimated total cost between $14 and $23 million to engineer, design, and build the 16.9 miles of the trail that have yet to be completed (see *Status and next steps*, p. 27).

STATUS AND NEXT STEPS

Most of the trail within Connecticut has been completed. The remaining unbuilt sections lie in, or next to, the region. As of this Plan, the status of the trail in these communities is as in *Table 3*.[7]

Next steps for the trail include:

[6] *The gaps are depicted as narrow, green lines on the north-south route that roughly bisects the map.*

[7] *Sections that are under construction are not considered "unbuilt." Mileage is approximate.*

- CCMPO and ConnDOT agree on a scope for the proposed Plainville Gap study and CCMPO hires a consultant to perform the study. *Within one year of adoption of this plan.*
- The four towns named above complete engineering, design, and construction of the remaining unfinished parts of the trail. *Completed within five years of the adoption of this Plan.*

Table 3. Trail mileage and status by town

Municipality	Unbuilt mileage	Status
Cheshire	4.6	A one-half mile link between Cornwall Avenue and West Main Street is finishing design and will be ready to enter construction. Between West Main Street and the Southington town line, work has yet to commence.
Southington	0.5	CCMPO is in the process of initiating a study to determine a preferred route for the trail north of West Queen Street. It is currently being evaluated by ConnDOT for their participation. CCMPO expects to initiate the study in FY15 and complete it in FY16.
Plainville	4.3	The Plainville Greenway Alliance drew on a $45,000 grant to complete a routing study on the trail in 2010. Discussions are underway; however, due to the difficulty of securing access to the railroad right-of-way, the project remains in the concept phase. CCMPO is in the process of initiating a study to determine a preferred route through Plainville. It is currently being evaluated by ConnDOT. CCMPO expects to initiate the study in FY15 and complete it in FY16.
Farmington	3.0	CCRPA applied in 2010 to the State Office of Policy and Management for $175,000 to complete planning, engineering, and design for the incomplete section of the trail between Red Oak Hill Road in Farmington and Northwest Drive in Plainville.

BUSWAY SIDE TRAILS

Spurs should connect the busway multi-use trail to major destinations such as CCSU and Westfarms.

DESCRIPTION

The design for the New Britain-Hartford Busway, a planned 9.4-mile bus-only highway that will connect the two cities, calls for a five-mile trail for pedestrian and cyclist use between the transit center at the busway's western terminus in downtown New Britain and Route 173 at Newington Junction in the east.[8] This trail constitutes a welcome expansion of the region's virtually nonexistent dedicated route network; however, the trail is destined to fall short of its potential: by dumping trail users out at the relative desert of Route 173 instead of Hartford (or West Hartford[9]), it is unlikely to spur many travelers along the corridor to switch to bikes. Moreover, while the trail passes within a mile or two of Central Connecticut State University and Westfarms Mall, it connects to neither. The landscape that surrounds these destinations (busy roads, vast parking lots, and thick woods) renders even these short distances unattractive for pedestrians and cyclists and makes it improbable that many will forgo their cars when traveling to (or from) these destinations.

This Plan cannot remedy the lack of connectivity between Route 173 and Hartford[10], but it can fix the gaps between downtown New Britain, the busway trail, CCSU, and Westfarms Mall. While the vast majority of traffic to these sites currently arrives by private automobile, the latter two facilities could be natural hotspots for walking and biking *with the proper infrastructure*. Given that the trail is set to pass within a short distance of CCSU and Westfarms, this Plan recommends building from the trail to both of these large trip generators and attractors. In order to maximize use of the trail (and minimize automobile traffic), these side trails should take the form of dedicated, off-road trails where possible. *Figure 3* (p. 32) maps potential routes for these spurs.

COST

The cost for these side trails is expected to be similar to that for other trails in the region (on the order of $1 million per mile).

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[8] *The narrow right-of-way precludes farther extension of the multi-use trail east of Route 173.*

[9] *Southward extension of and improvements to West Hartford's Trout Brook Trail would create a desirable and useful connection between downtown New Britain and West Hartford Center.*

[10] *That lies within the purview of CCMPO's sister agency, CRCOG.*

In some cases, the cost may be higher due to the absence of a rail bed.

STATUS AND NEXT STEPS

To make these trails, which are concepts at present, a reality, the following will need to be completed. Next steps to follow are:

- Together with CRCOG, DOT, and affected municipalities, CCMPO studies and selects routes. *Starts post-adoption of this Plan and concludes within two years.*
- DOT and/or affected municipalities complete engineering, design, and construction of chosen side trails. *Completed within five years of the adoption of this Plan.*

PROTECTION AND EXPANSION OF HIKING TRAILS

The region's system of hiking trails should be preserved, maintained, and, where possible, extended.

DESCRIPTION

Hiking trails bring many benefits to a community. Trails can enhance quality of life, increase property values, attract visitors and tourists, and stimulate economic development, as well as improve public health and preserve the environment. Despite the importance of these benefits, relatively scant attention is paid to trails, and, if not actively protected, they can be lost.

The region has a diverse trail system that runs from solitary to busy, from stubs to the 220-mile New England Trail, the newest of eleven National Scenic Trails (*Hiking trails*, p. 106). While the growth of the system offers enormous potential value to the region, the system, much of which traverses unpreserved land is under pressure. If the region values and wishes to retain the benefits its hiking trails impart, their protection and, when possible, expansion is necessary. Due to the trails' regional and environmental significance, this Plan recommends that special attention be given to:

- Preservation and promotion of the New England Trail
- Acquisition of the Plymouth Reservoir and establishment of trails thence to the Thomaston Dam and up Leadmine Brook to Roraback Wildlife Management Area (the 'Leadmine Trail') or along the Naugatuck River, possibly to the Mattatuck Trail
- Bridging of gaps in the Tunxis Trail in Burlington

COST

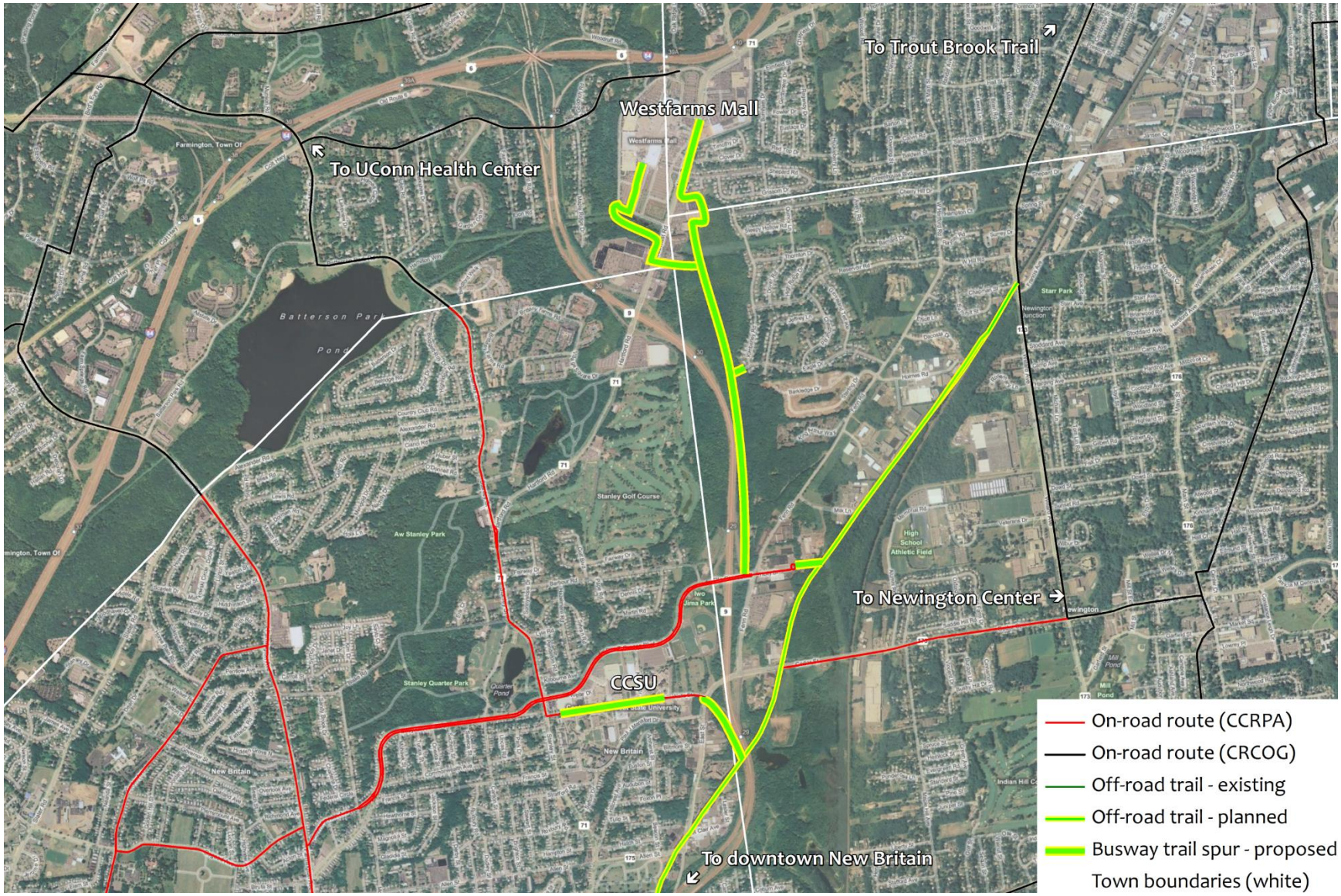
Trail maintenance often falls to volunteers, so the cost can be zero. Preservation ranges from cheap (land bequests, establishing covenants with landowners, zoning changes) to potentially costly (buying property). Grants and cooperation with organizations such as land trusts can offset costs.

STATUS AND NEXT STEPS

Next steps include:

- The Connecticut Forest and Park Association, land trusts, DEP, and CCMPO work with municipalities and landowners to protect existing trails and develop new ones, especially those listed above. *Starts immediately and continues indefinitely.*

Figure 3. Close-up of potential side trails



Public Transit

INTEGRATION WITH NEW YORK

Public transit should connect the region with the New York metropolitan area.

DESCRIPTION

Globalization has brought change. The falling cost of moving goods, people, and information has given producers and consumers unprecedented locational flexibility. That is, people—whether manufacturers, workers, or vacationers—have gained the ability to 'up and leave.' The results for central Connecticut have been sobering: since the 1970s, economic growth in the region has been lackluster, as businesses and their employees have moved away.

As traditional industries have declined, so, too, has the concept of central Connecticut as an autonomous region. New Britain and Bristol, the region's historical core, no longer function unchallenged as growth centers. To some extent, metro Hartford has grown in importance. (Census 2000's annexation of the region into the Hartford Urbanized Area reflects this.) However, the story of the last few decades has not been the growth of cities like Hartford, but the development of economies around internationally-prominent metropolitan regions, such as the New York City metropolitan area pictured *Figure 4* (p. 34). These regions comprise dozens and hundreds of distinct jurisdictions. The success of these constituent parts is influenced by the well-being of the region as a whole, much as a rising tide lifts all boats.

As regions go, the massive, diverse New York metro region has proven itself more dynamic than metro Hartford. *Figure 4*[11] illustrates the boundaries of both regions. Given the differing fortunes of these regions (see *Figure 5*, p. 35)[12], the extent to which central Connecticut is integrated into them is of critical importance to its future.

Although central Connecticut borders the New York metro area, obstacles have thwarted deeper integration between the regions. One of these obstacles is transportation. At present, there is minimal bus or rail service between the region and the

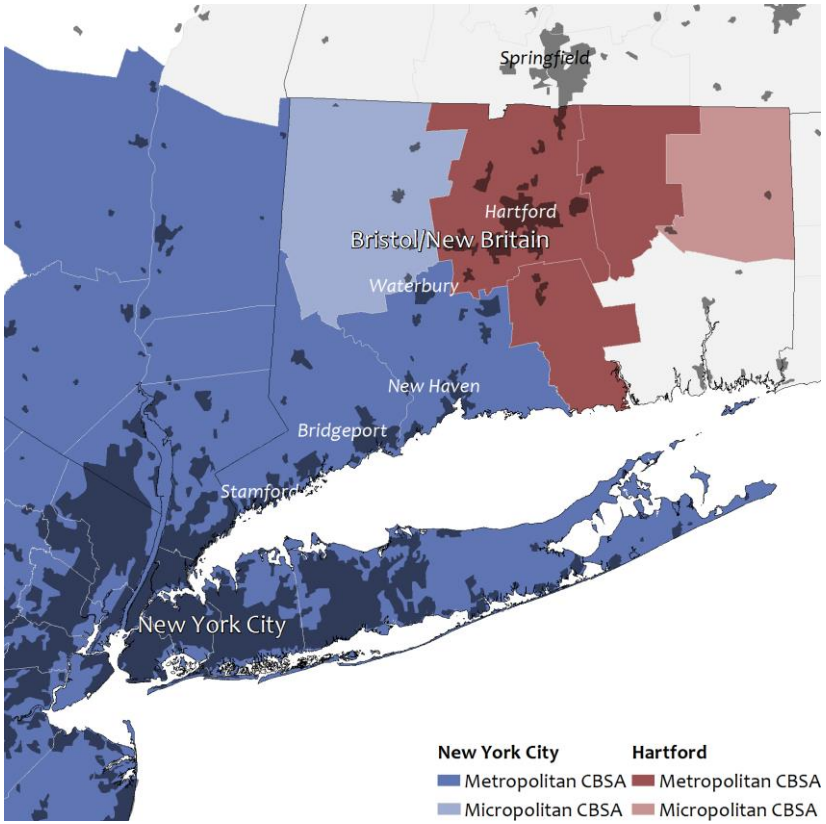
[11] *Core-based statistical areas (CBSAs) are defined by the U.S. Census Bureau.*

[12] *Population and GDP data are for 2008 and are sourced from the U.S. Census Bureau and BEA, respectively. GDP figures do not include micropolitan areas.*

New York metro area (including Stamford, Bridgeport, New Haven, and Waterbury.)[13] This isolates the region socially and economically. This Plan therefore recommends that a frequent, speedy, and usable transit connection be established between the region and the New York metro area. To yield the greatest benefit, this connection should include the following components:

1. The connection should integrate with and build on existing transit facilities and services. Metro-North's successful transit corridors (the New Haven[14] and Waterbury branches) could and should be extended through the region to Hartford.
2. Stations should be added or maintained at significant population centers or destinations. In the region, these include downtown Bristol, Plainville center, downtown New Britain, CCSU, as well as Berlin-Kensington.
3. Local bus routes should be reconfigured to meet the service and facilitate transfers.

Figure 4. Regions (Core-based statistical areas)



[13] Connections are possible but so time-intensive as to be infeasible. (The trip from the region to New Haven via local bus can take four hours; from the region to Waterbury, six hours.)

[14] The next section discusses extension of the New Haven Branch into the region (via Berlin-Kensington) in greater detail.

Figure 5. Human and economic wherewithal of New York City and Hartford metro areas/markets

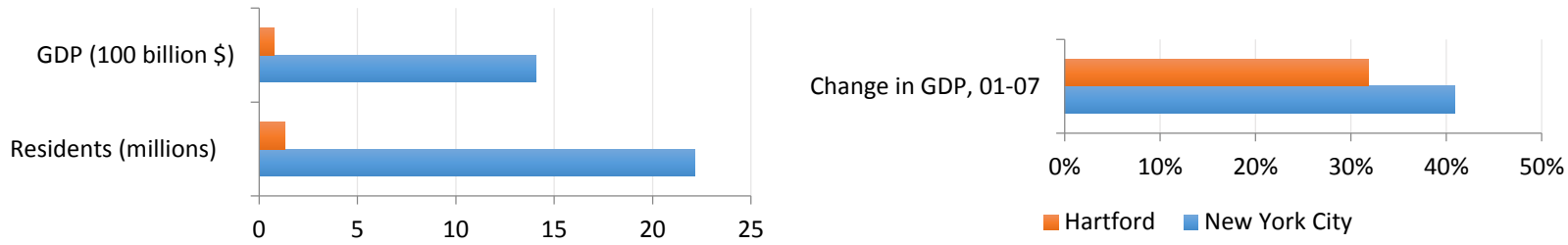


Figure 6 (p. 38) lays out how such integration could be achieved through the implementation of items 1 and 2 in the list above (i.e., the strategic provision of transit lines and stations).[15]

COST

The cost establishing of a transit connection between Waterbury, Bristol, New Britain, and Hartford depends on a multitude of factors. These include the mode and alignment chosen, the level of service desired, as well as the State's condition and funding options available. Until further study has been conducted, and a preferred alternative selected, additional detail cannot be given.

STATUS AND NEXT STEPS

Historically, passenger trains stopped in central Connecticut on their way from Hartford to New York. Although these ceased in the 1950s, calls for their reinstatement were soon raised. Since the 1970s, local, regional, and state actors have discussed reconnecting the region to the west and south. As a part of this discourse, studies were conducted. All have come to the conclusion that renewed service is feasible. However, no action has been taken. Given this poor record, and the repeated calls for better connections to the south and west, as well as the fact that much of the infrastructure for such a connection remains

[15] *For the sake of illustration, such integration is depicted along the existing freight line. Locations are approximate and should not be interpreted to foreclose the possibility of other alignments or modes.*

on ground, this Plan cannot endorse further study *unless it produces action.* This Plan therefore foresees the following next steps:

- DOT undertakes a feasibility study, alternatives analysis, and scoping study for the corridor that lays the groundwork for entry into the Project Development phase of FTA's Very Small Starts or an equivalent program. *Funding has been secured and the study is underway. Concludes within two years of start.*
- CT Transit initiates demonstration bus service with no more than 60-minute headways between Hartford, New Britain, Bristol, and Waterbury. The buses are timed to meet Metro-North trains and are intended to build transit ridership along the corridor. *Starts as soon as funding is available but intended for the short- to mid-term.*
- DOT makes necessary repairs and upgrades to the Waterbury Branch. Improvements to the branch should, where feasible, support passenger rail service into the region. *Starts upon conclusion of the above study, contingent upon funding.*
- Pan Am brings the track up to a state of repair sufficient for commuter rail. *Starts as soon as funding is available. Concludes within two years of start.*
- Pan Am and/or DOT designs and builds appropriate stations. *Starts as soon as funding is available. Concludes within two years of start.*
- DOT begins operation and reconfigures local bus routes to fit service. *Starts once construction is complete but intended for the mid- to long-term.*

NEW HAVEN-HARTFORD-SPRINGFIELD RAIL

The rail corridor between New Haven, Hartford, Springfield, and northern New England should be upgraded.

DESCRIPTION

Unlike the east-west axis described in the preceding project, passenger trains still run between New Haven, Hartford, Springfield, and northern New England. Yet due to the constraints listed below, this line has yet to realize its full potential, both in terms of ridership and economic development:

1. Frequency. Trains do not run often enough or at convenient times.
2. Speed. Single track conditions and low operating speeds slow the train.
3. Layovers. Poor coordination with other transit services results in long transfer waits, especially in New Haven Union Station.
4. Price. Amtrak tickets are beyond the reach of many and are not competitive with long-distance bus service.
5. These factors make the train uncompetitive with private automobiles for much travel along the corridor. This is unfortunate. The concentrations of population and destinations

between New Haven and northern New England, as well as congestion on I-91 and Route 15 indicate potential for high ridership, low operating subsidies, and transit-oriented development.

Although enhanced rail service on this line would run tangential to the region, stopping only in Berlin, given the centrality of the corridor to the State, as well as the potential for an inland high-speed alternative to the coastal Northeast Corridor (connecting New York and Boston via Hartford, Springfield, and Worcester), this Plan supports the majority of the upgrades that have been proposed and that are under study for it.[16] These include the New Haven-Hartford-Springfield Commuter Rail project and Pioneer Valley's Knowledge Corridor project.[17] Amtrak and its State and rail authority partners in the Northeast Corridor Master Plan Working Group recently identified this line as one of four core network branch lines and described future improvements thereto in its Northeast Corridor Infrastructure Master Plan.

COST

DOT has estimated a full-build scenario that can accommodate high-speed trains with 30-minute headways and minimal freight disruption at $880 million.

STATUS AND NEXT STEPS

This project, which has been under study since at least 1994, is currently undergoing an Environmental Assessment to qualify for federal funding. In 2010, the State was awarded $40 million in stimulus funds to double-track a ten-mile stretch of the line between New Britain and Newington. It is expected that the State will apply in the near future for a further $400+ million to complete more substantial upgrades to the line that will enable intercity and, by extension, commuter rail, along the line. *Figure 7* (p. 39) depicts the route and stations of this line.[18] Next steps to follow are:

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[16] The Plan supports all elements of project implementation, except for the construction of parking lots at stations, which the Plan neither supports nor opposes. The Plan similarly has not taken a position on the proposed new stations at Newington Junction and Wharton Brook.

[17] The latter project, which costs and was awarded $70 million in stimulus funding, will rebuild 49.8 miles of line in Massachusetts, restore the Northampton station, and construct a new multimodal center in Greenfield, returning trains to their historic alignment west of the Connecticut River and shaving fifty minutes off the current detour trains make through Palmer and Amherst.

[18] Only stations that belong to the New Haven-Hartford-Springfield Rail project are labeled.

Figure 6. Interregional transit integration

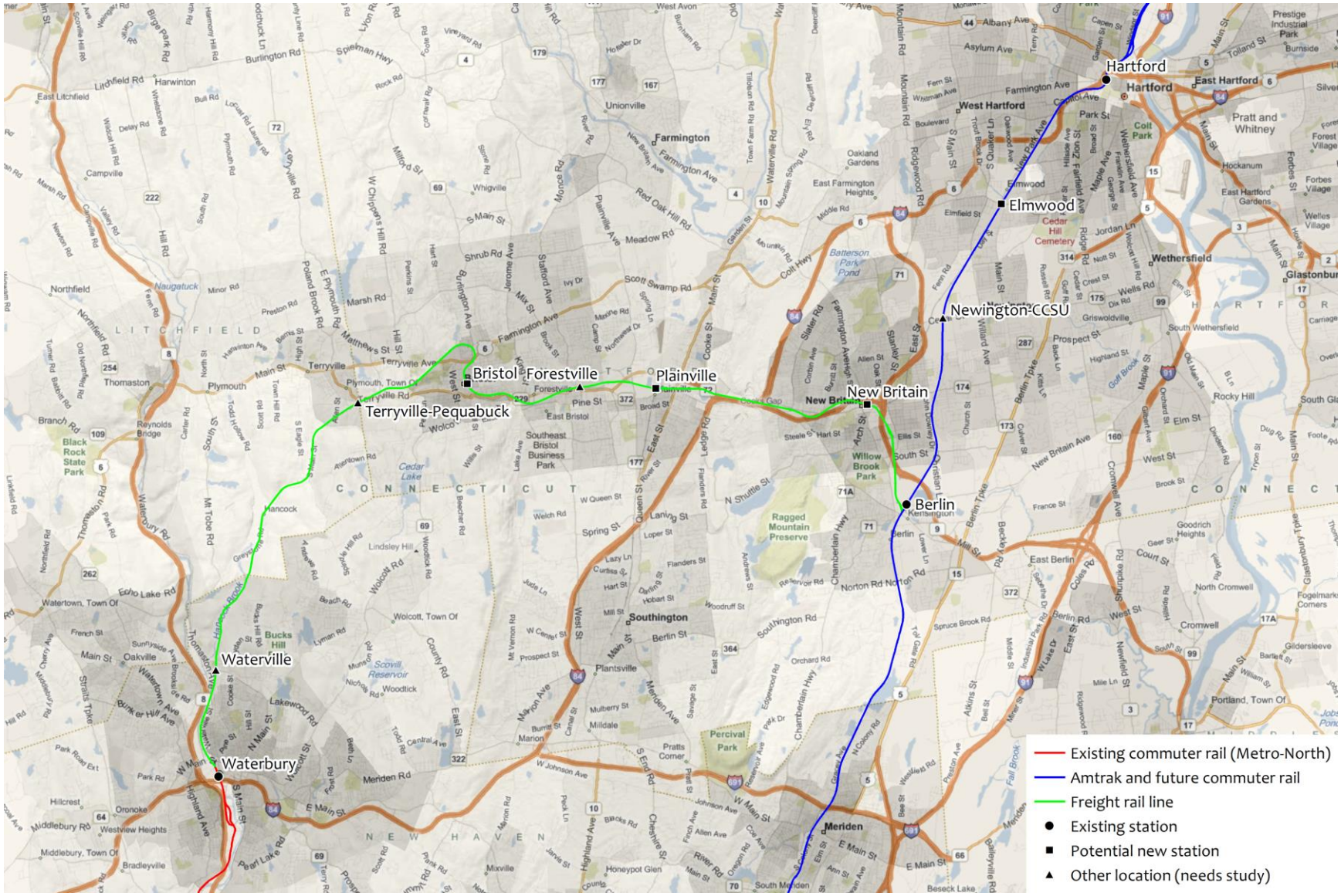
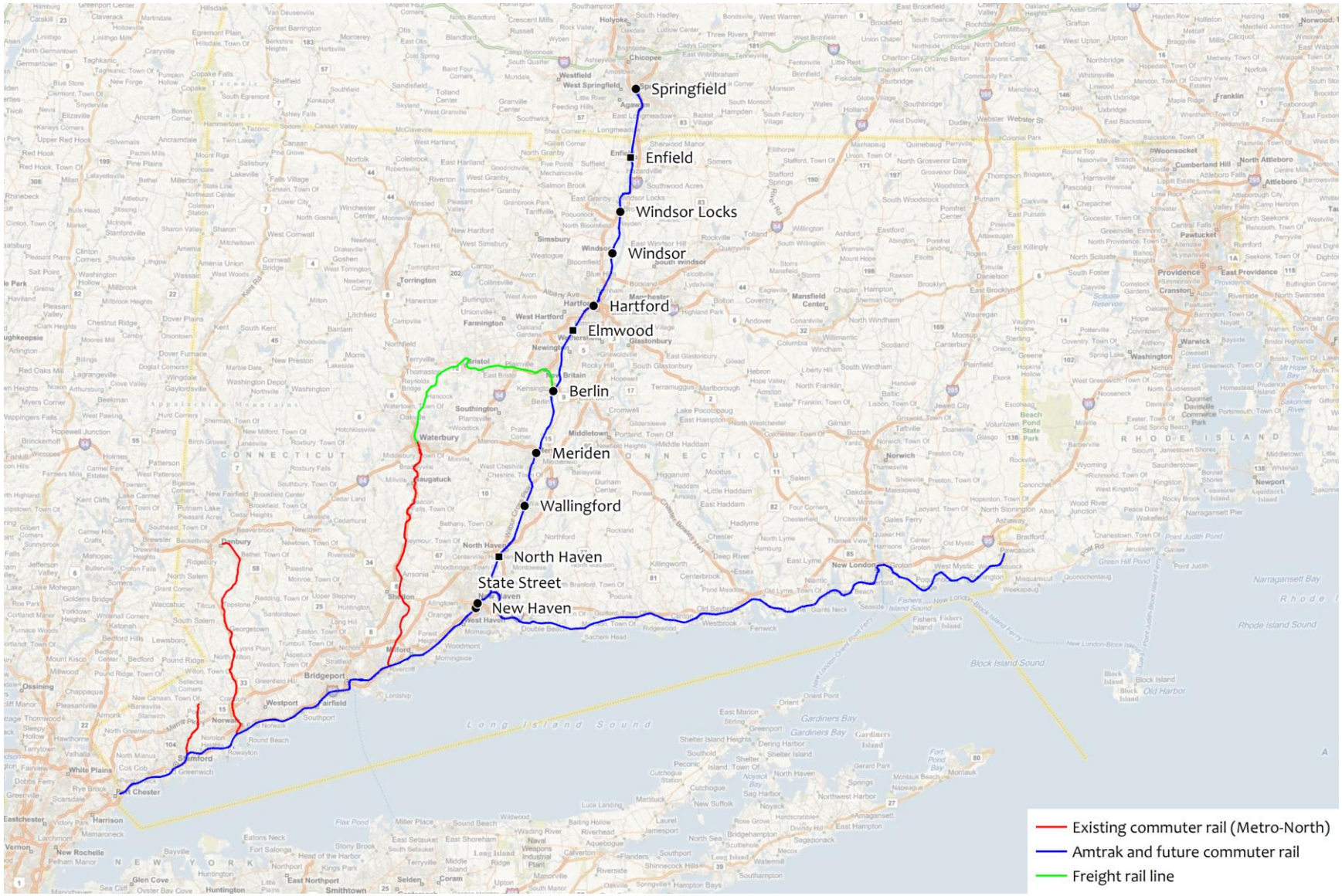


Figure 7. New Haven-Hartford-Springfield rail map



- DOT and associated consultants finish the Environmental Assessment and accelerate subsequent phases of the project (e.g., funding application, full design, construction). *Currently underway and nearing completion. Service is scheduled to start in 2016. Connecticut approved a bonding measure in 2015 to advance designs of the new train stations.*
- DOT begins operations, including through trains to New York City, Boston, and/or northern New England, and reconfigures local bus routes to fit service. *Starts once construction is complete.*
- Berlin, CCMPO, and/or DOT develop, study, and, pending feasibility and favorable evaluation, implement projects to improve the area around, access to, and patronage of Berlin-Kensington station. *Underway. Berlin is currently considering zoning changes to facilitate transit-oriented development. A mixed-use development is under construction across from the train station.*

BUS LINE RATIONALIZATION

Local bus routes should be rationalized to improve system performance.

DESCRIPTION

Despite changes in the economy and land development patterns of the region, the bus routes of CT TRANSIT's New Britain/Bristol divisions have only undergone minor changes. As a result, they may no longer represent the optimal paths for the service. To improve service, capture operational efficiencies, and boost ridership, this Plan therefore calls for a thorough review of all bus routes in the system. In particular, the Plan recommends that the potential for the elimination of transfers and detour loops should be investigated. Transfers and detour loops can greatly slow the effective speed of service, depressing ridership significantly.

In some cases, augmenting the system may help it reach the goals of better service, greater efficiency, and higher ridership. Increasing buses' frequency and lengthening their hours of operation, as well as expanding the geographic reach of the bus system, can make buses a viable option for people who, due to scheduling or location, found riding the bus inconvenient or impossible. This Plan therefore also recommends that the potential for service expansions be investigated.

Figure 8 (p. 44) depicts a preliminary stab at rationalization, the New Britain-Hartford Busway Service Plan. This figure eliminates certain transfers and detour loops; however, this Plan holds that additional changes should be considered. In particular, it holds the potential changes as of especial import:

Transfer eliminations

1. Bristol-New Britain-Hartford direct service. This is a critical need for the region, and the New Britain-Hartford Busway service plan as of writing foresees initiating direct, frequent bus service between downtown Bristol along the new Route 72 extension to New Britain and thence via the busway to Hartford. Additional, longer-distance or commuter service may be provided by the transit option described under *Integration with New York* (p. 31).
2. New Britain-Middletown direct service. Poor scheduling and transfers make travel via bus on the busy Route 9 corridor excessively arduous.[19] This need not be: analysis undertaken for the Busway service plan suggests that direct bus service between New Britain and Middletown is feasible.

Service expansions[20]

3. Waterbury-Bristol-New Britain-Hartford. Congestion on area roads between these points, including I-84 and Routes 6, 72, and 229 indicate high potential demand for transit service. The New Britain-Hartford Busway should address this problem on I-84 west of Hartford. For longer-haul travel, and all travel west of New Britain, its impact is likely to be modest at best. Further bus, rail, or other transit services will be necessary to meet these needs; (p. 31) discusses these.
4. Southington. Explosive growth in housing as well as commercial and industrial properties has transformed Southington into one of the larger population and employment centers in Greater Hartford. Without bus or rail—save commuter buses, Southington no longer has any transit—this

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[19] *While buses do provide seamless connections between Middletown and Hartford and Meriden, no such connections exist between the former and New Britain. Transferring on the existing bus service is not adequate for the following reasons:*

1. *Timing. CT TRANSIT's and Middletown Area Transit's schedules do not allow for transfers early or late enough to make commuting for individuals working a 9-5 schedule possible, let alone those working earlier or later shifts.*
2. *Unreliability. The most direct route between the two cities takes two transfers and lasts 45 minutes longer in one direction than in the other.*
3. *Speed. Routes with single transfers are extremely time-intensive, as they entail detours to Meriden or Hartford. Trips between New Britain and Middletown, which take no more than half an hour by car, can take over two hours by bus.*
4. *Frequency. Since not all trips meet for transfers, service is, in effect, less frequent. (For instance, the New Britain-Meriden-Middletown connection only occurs thrice daily.)*

For these reasons, this Plan holds that new service is needed. Given that CT TRANSIT and Middletown Area Transit already meet for transfers in multiple locations, it may be possible to cobble together existing bus routes into a longer through-route that does not increase overall operational hours and costs yet improves service and boosts ridership and farebox recovery.

[20] *These are concepts at the moment; further study (comprising identification of ideal routes) is necessary.*

development has been entirely dependent on private automobiles. The predictable result of this has been a dramatic worsening of traffic. To alleviate this, provide much-needed transportation options, and foster responsible land use practices (e.g. transit-oriented development), transit should be restored to Southington.

5. Plymouth. Terryville is a densely-populated village just across the city line from Bristol. The village has high levels of low income and mobility-challenged households, as well as strong economic ties to the east, which congestion on Route 6 bears out. Many parties have advocated the restoration of transit to Terryville over the years; however, no action has been taken. This Plan seconds these, recommending that bus and/or rail be extended to the village. This service could consist of an extension of the busway's Bristol shuttle, a stop on the *Integration with New York* (p. 31) project, or something else altogether.
6. East and north of Hartford. The New Britain-Hartford Busway is slated to terminate in Hartford. Yet much of the regions' traffic does not end in Hartford but continues to points beyond. The busway as conceived does not serve these travelers. To give these persons an alternative to driving, and to boost the speed, reach, interconnectedness, and overall utility of the transit system, some buses on the busway should continue to destinations farther afield. Towards the north, these may include Bradley International Airport and the corporate parks around it and in Bloomfield and Windsor; to the east, they may include East Hartford (riverfront area, downtown, Goodwin College), Manchester (downtown, Manchester Community College, and Buckland Hills), and Vernon/Rockville. Buses to and from many of these locations would have the advantage of being able to operate in the High-Occupancy Vehicle lanes along I-91 north and I-84 east of Hartford, in essence spreading the benefits of bus rapid transit far beyond the New Britain – Hartford corridor and building the skeleton of a genuine regional transit system.

COST

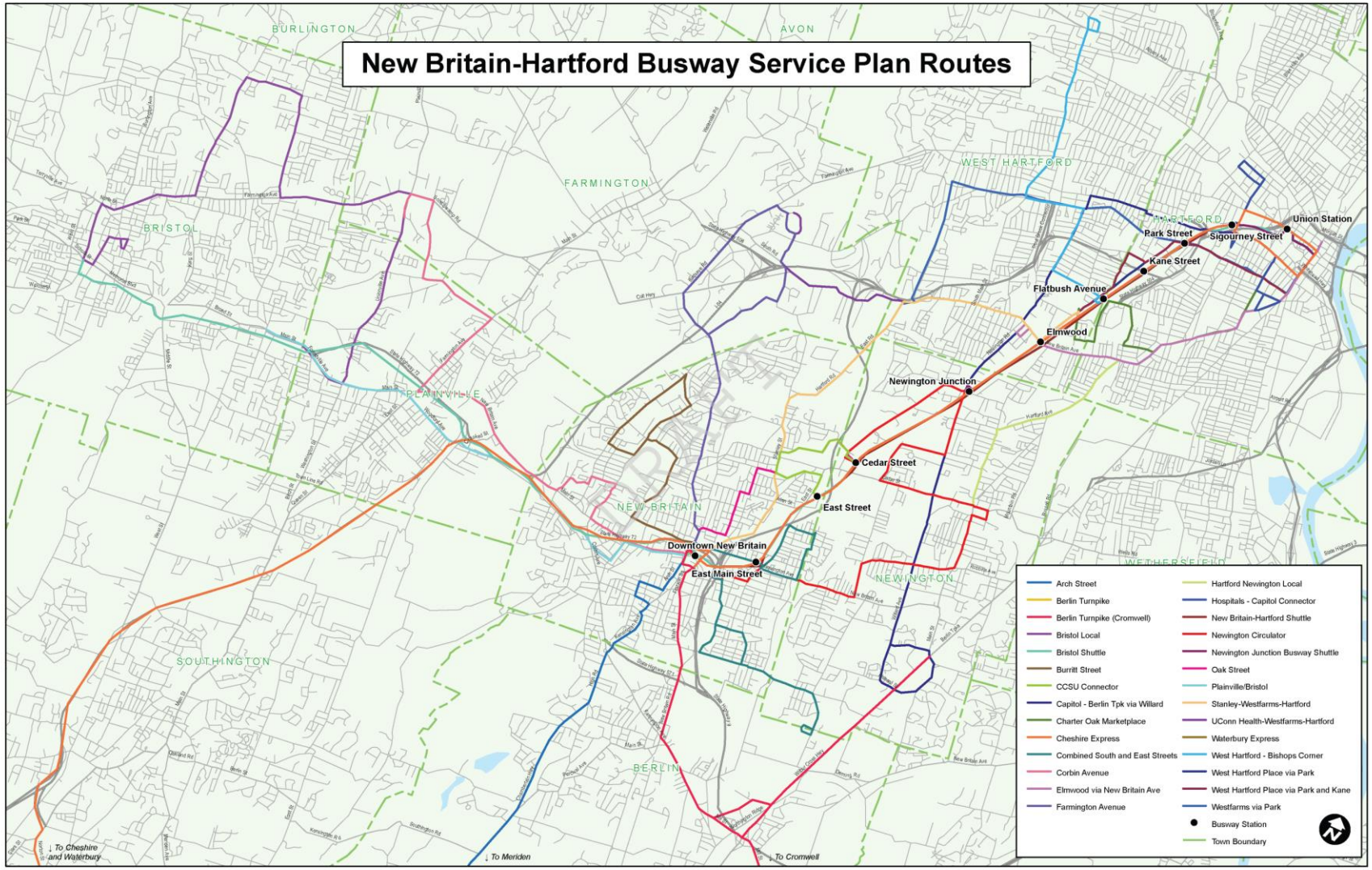
The cost of implementation depends on the level of service desired. Cost may range from minimal, zero, or even negative, for instance from the elimination of costly detours and the combination of the connecting services that currently meet for transfers, to moderate, e.g. for increased frequency on existing routes or the creation of new ones.

STATUS AND NEXT STEPS

- CCMPO submitted a grant application for TIGER funding to begin bus service between Waterbury and Bristol, stopping in Plymouth. The project was not selected by US DOT. CCMPO and NVCOG will continue to pursue funding opportunities. *Underway and continues until service begins.*

- CCMPO, together with CT TRANSIT, New Britain Transportation and DATTCO, studies existing routes and determines feasible operational improvements. *Starts within one year of the adoption of this Plan and concludes within two years. CRCOG initiated a study for the Hartford Region in which CCMPO will also participate.*
- Findings of aforementioned study are implemented. *Starts within three months after study ends and concludes within one year.*

Figure 8. Potential candidates for study



INTERNET TRIP PLANNING

All public bus routes in the State, including those in the region, should be on Google Transit.

DESCRIPTION

One of the barriers to a successful transit system is information. If people do not have ready, comprehensible, usable data on transit options—where and when they depart and arrive—they will not ride public transit. This is critical both to new customers, who may be lost as transit riders, as well as to existing customers, who may broaden their use of the system (e.g., if they do not understand possibilities for transfers beyond their regular routes, such as onto other lines or systems).

Efforts to distribute information have often run into obstacles. Advertising is costly and, in a diverse, fragmented market, often fails to reach large segments of the public. It is also static. While advertising can build awareness of a brand, such as a transit system, or product, such as a route, it does not give personalized trip information. It cannot tell riders where and when they should get on, transfer, and get off the bus.

Manned kiosks and telephone lines are one solution to the information problem. However, these tend be expensive and inefficient.[21] Because of this, their deployment has been limited to areas of high demand (e.g. busy train and subway stations). Automated systems, such as online trip planners and text messaging services, have eliminated the staff, but have run up against problems of their own, namely high installation and maintenance costs, poor usability, and a lack of awareness about the systems themselves.

Google's Transit program addresses all of these problems. The program makes getting transit directions as easy as getting driving directions online. All users need do is enter an origin and destination in Google Maps, select "By public transit," and finally click "Get Directions." Google does the rest, giving easy-to-read door-to-door directions, with text and maps illustrating routes, times, and stops. It even provides for seamless transfers between routes, modes, and even transit systems and states.

The system is visible, easy to use, accessible by smart phone (for on-the-spot directions), and free to both transit providers and users. However, it is an opt-in system. Only agencies that have signed up and supplied their data to Google participate. As of this Plan, approximately five-hundred agencies around the country and world have done so. These include the New York City MTA, Boston MBTA, New Jersey Transit, Rhode Island Public Transit Authority, and regional transit authorities in the Springfield and Framingham regions. Despite this, no transit providers

[21] *Such facilities suffer from underutilization—open lines—as well as overutilization—long waits.*

in Connecticut (with the exception of Metro-North) actively participate. As a result, transit directions are not available in the state, and Connecticut appears as a 'black hole,' obstructing transportation in the northeast between New York and Boston.

Given the low cost and high benefits of the system—an easy-to-find, easy-to-use trip planner that some have found boosts ridership 10-20%—this Plan holds that the top priority for transit in the region and, indeed, in the state, is to integrate *all* transit providers in Connecticut into Google Transit. Given the fragmentation of transit in the state, this is all the more important.[22] Google's effortless knitting-together of disparate transit system into a unified network will greatly enhance the simplicity, usability, and, ultimately, the use and viability of transit.

STATUS AND NEXT STEPS

- DOT completes digitization of bus routes and submits the data to Google for inclusion. *Completed for the Hartford, Bristol/New Britain, New Haven, and Stamford divisions of CT TRANSIT. Digitization of routes from other divisions and providers occurs within one year.*
- Google accepts and broadcasts submitted data. *Completed.*

BUS STOP IMPROVEMENTS

Signage should be added to heighten visibility of the bus system. Maps and schedules should be posted at time points or stops.

DESCRIPTION

No official bus stops exist in central Connecticut. Instead, all CT TRANSIT buses in the region stop on demand, either from a passenger in the vehicle or a fare on the side of the road (by flagging down the bus). The advantage of this system is that it allows the buses to pick up and drop off drivers closer to their origins or destinations, which is a major plus for a system with suburban components such as the region's. (Since suburban areas sprawl more, fixed bus stops would often necessitate more walking on the part of passengers, thus slowing overall travel times and the desirability of the system).

This flexibility has a downside. With no signs, shelters, or posted maps and schedules, the bus system is practically invisible: the public has no idea where and when buses stop. Indeed, the only way they would know that buses run along a certain road is to catch sight of one passing (and even then, they would not have any knowledge of its destination.) In short, the absence of in-

[22] *Connecticut has approximately 15 separate transit operators to New Jersey and Rhode Island's one or two each; this fragmentation makes riding more difficult, as transfers often mean juggling maps and timetables from different systems. This poses an unnecessarily high learning curve and information burden for users and depresses ridership.*

ground signage renders the bus system invisible, which likely depresses ridership.

To redress this, this Plan recommends bringing the central Connecticut bus system to be at least on par with other CT TRANSIT divisions in the state. This means, at a bare minimum, large, visible, standard bus signs with a route number. In order to further increase usability, however, displays should be located below these signs containing:

1. Timetables and linear maps for all routes that stop there
2. A system map (to show how the routes intersect and transfer)
3. The web site and telephone number of CT TRANSIT to allow contact
4. A reference to Google Transit

Signs should only be installed after bus routes have been rationalized (to avoid having to remove and reinstall them at new locations). The system may continue to run on a flag-down basis; however, all time points should be treated as stops for the purposes of signage. Doing so will not only boost visibility and usability of the system; it will also allow the bus operators to place signs at locations where they would like customers to wait (i.e., so that customers gather at safer, operationally more efficient locations rather than strew into less safe, operationally more problematic locations.)

STATUS AND NEXT STEPS

- CCMPO, in partnership with the Greater Hartford Transit District, has received funds to purchase and install bus signs. *Planning has been completed. CTTRANSIT is in the process of installing signs.*

INTELLIGENT TRANSIT SYSTEM

Use technology to improve the performance, efficiency, and ridership of transit and paratransit in the region.

DESCRIPTION

Most transit in the region does not run on dedicated rights-of-way but uses the public roads, which it shares with other modes of transportation, including personal transportation (cars) and freight (trucks). While such infrastructure-sharing is fiscally smart, forcing buses to mix with traffic often has an adverse impact on the speed, reliability, and use of a transit system: not only are buses and vans less able to cope with traffic—they accelerate and decelerate more slowly than passenger cars—but, unlike cars, whose drivers can change directions, timing, or plans in response to traffic, they must stick to a fixed route, even if it means hitting a traffic jam. This makes transit uncompetitive with driving, and, as a consequence, can depress ridership dramatically.

The region finds itself in this situation. Congestion (*Traffic and congestion*, p. 159), especially on the corridors served by the

region's transit system, has made for long, slow trips on its buses and vans. This Plan features projects that the region is pursuing to address this problem. These include *Integration with New York* (p. 33) *New Haven-Hartford-Springfield Rail* (p. 36) and the New Britain-Hartford Busway (p. 136). These projects will enable transit riders to bypass congestion by providing trains and buses separate rights-of-way.

However, neither the rail nor busway projects will address congestion on all of the region's bus routes. Transit riders not traveling on the rail or busway corridors (or traveling on those corridors but unable to use those services) are still expected to face congestion. Since it is not desirable or possible to construct separate rights-of-way on every bus route, solutions than expedite the passage of buses and vans *in mixed traffic* are needed. A diverse array of techniques has been developed to do this. These include:

- Transit signal priority
- Signal coordination/optimization
- Queue jumps
- Enhanced acceleration buses
- Prepaid boarding
- Multiple door entry
- Passenger information systems
- Telephone and online trip booking (e.g., One Call/One Click centers)
- Continuous optimization, real-time computer scheduling, and automatic dispatching for Dial-a-Ride and paratransit
- Automatic vehicle location

STATUS AND NEXT STEPS

- CCMPO studies needs and available technologies, and determines feasible operational improvements. *Starts within two years of the adoption of this Plan and concludes within five years.*
- CT*transit* and ConnDOT will be installing automatic vehicle location technology in all buses after the launch of CT*fastrak*. *Starts in 2015 with the launch of CTfatrak.*
- Selected operational improvements are implemented. *Contingent on funding, starts within three months after study ends and concludes within two year.*

Private vehicles

ELECTRONIC HIGHWAY SIGN IMPROVEMENTS

Add electronic highway signs to indicate alternate routes to avoid congestion or incidents. Supplement existing notification systems with signs that direct drivers onto alternate routes.

DESCRIPTION

Highways in the region have choke points that regularly congest. To minimize delay and make optimal use of the road network, electronic highway signs have been installed at some of these locations. These signs give drivers information in the case of congestion or incidents.

Unfortunately, the utility of these signs has been somewhat limited due to their sparseness. Messages often indicate simply that a delay exists, or to "plan alternate routes," without specifying which alternate routes should be taken. This is a particular problem for drivers who are not intimately familiar with the regional network; unsure where to go, they may drive headlong into the jam, or slow down alternate routes with unsure driving. If these drivers had better information, many of them likely would follow it.

To ensure the freest flow of traffic, this Plan therefore recommends the installation of additional electronic highway signs at strategic points. These signs should be installed much like town signs are on local roads, or exit signs on highways: that is, they are posted at every major intersection along the route, and they are posted at least twice in advance of every turn lest a driver miss or forget a direction.

Installation of these signs will require the identification of strategic alternate routes and appropriate sign locations. For instance, the existing signs in the region that warn of congestion on I-84 in West Hartford and advise alternate routes should be supplemented with two signs each at all junctions, in both directions, (turns) on the route that runs as follows: I-84E → 72E →9N → 175E → 15N → 84E. *Figure 9* (p. 51) maps this route (shaded in red) as well as other alternate routes. [23] The first sign should be located well ahead of junction and inform drivers of the turn they must make to enter or stay on the alternate route;

[23] *Signs will be needed in at least two directions for every junction or interchange. Due to the complex nature of several, including the confluence of I-91 and Route 15 in Hartford; I-91, I-691, and 15 in Meriden; I-84, 15, and 2 in East Hartford; and I-84 and 72 in Plainville and New Britain, multiple signs may be needed to indicate a particular movement. The location of the yellow dots is approximate. (Actual sign locations may differ noticeably.)*

the second sign should be located above the junction and essentially 'point an arrow' to the route. In some cases, it may be acceptable to omit signs, provided more information can be displayed on a screen; however, this Plan holds that some alternate routes, such as the above, are too complex for almost anybody but the drivers who already take them to remember.

STATUS AND NEXT STEPS

- DOT and DEMHS complete and update diversion plans. *Plans were last updated in 2008. Updates are pending.*
- CCMPO studies opportunities for additional or improved signage and makes recommendations to DOT. *Starts within five years of the adoption of this Plan and concludes within two years.*
- DOT installs signage at recommended locations. *Completed within ten years of the adoption of this Plan.*

LOCAL STREET RECONNECTION

Explore connecting local streets to serve as alternate routes for congested through-corridors. Relieve traffic on arterials by knitting together and dispersing traffic onto the street grid.

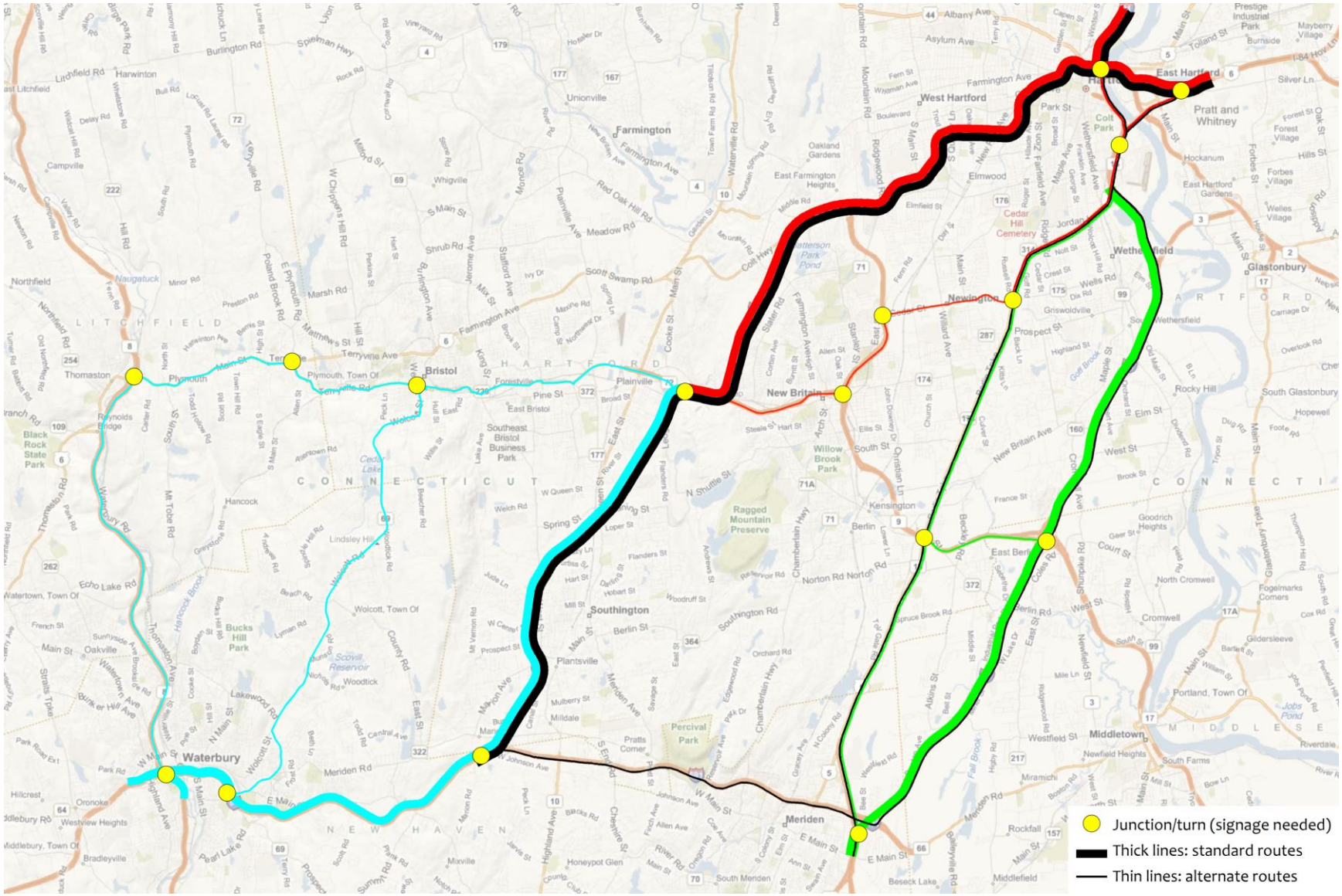
DESCRIPTION

Traffic in many parts of the region, above all along its east-west axis from Terryville through Bristol, Forestville, and Plainville to New Britain, is heavy (but also north-south from Bristol through Southington to Meriden). Most arterials and collectors are near, at, or above capacity. Congestion and long trip times result.

Much of this congestion owes to the relative paucity of continuous collectors and, especially, arterials along these corridors. While there are numerous local roads, few of them connect. This forces drivers to pour en masse onto the few collectors and arterials there are, thus overburdening them. If intersections are storm drains, the sewers that are the collectors and arterials overflow.

Given the prohibitive cost, environmental undesirability, and political infeasibility of constructing major new roads through the region, the region will have to make better use of the road network it has, especially as traffic volume grows. (Due to population growth and, especially, sprawl, traffic is expected to grow. Given that many roads are at or near capacity, the increases in congestion may not be linear but exponential.)

Figure 9. Potential alternate routes and sign locations



One option that has not been explored but should be is the use of local streets. These streets by and large are far below capacity. They represent a terrific opportunity to offload traffic from the collectors and arterials; however before they can do that they need connections. The reason these streets are so underutilized is that they do not join together well: the suburban pattern of development in the region has yielded not traditional city blocks, which can disperse and effectively dissipate large volumes of traffic, but, cul-de-sac-type streets that impede rather than promote mobility. Given the substantial maintenance costs such roads accrue to the local municipalities, it might be in their interest to look at them anew—can they also deliver benefits?

They may be able to. In many cases, only short segments of asphalt would be needed to form blocks out of currently discontinuous streets. This Plan therefore recommends that the possibilities for connecting these blocks, and the resultant decrease in congestion (and increase in attendant benefits) be seriously studied.

STATUS AND NEXT STEPS

- CCMPO studies opportunities and makes recommendations to municipalities. *Starts within five years of the adoption of this Plan and concludes within two years.*

ROUNDABOUT RETROFIT

Replace congested local intersections with roundabouts where appropriate.

DESCRIPTION

Many roads in the region are overtaxed. Due to the explosive growth of auto-dependent suburban development, traffic at many intersections is beyond their capacity. The long delays that result especially at major intersections with traffic lights have forced load-balancing, i.e. spillover, where drivers opt instead to take local roads. The result is unnecessary back-ups at many intersections, especially four-way stops (but also, to some degree, minor intersections with traffic lights). This congestion has a number of detrimental effects, including wasted time and fuel, and, especially, the encouragement of reckless, dangerous behavior by impatient drivers (rolling stops, accelerating through yellow lights, etc.)

A simple solution that addresses all of these problems—increases capacity while vastly decreasing the environmental (including air pollution, noise, and fuel consumption) and safety issues of signalized intersections is roundabouts. This Plan holds that many intersections in the region could greatly benefit from conversion to roundabouts and accordingly strongly recommends that roundabouts be considered seriously for all intersection projects. The Plan supports the installation of roundabouts wherever appropriate and feasible.

STATUS AND NEXT STEPS

CCMPO completed a study of potential roundabout locations in Bristol and Plainville in 2011.

- DOT and municipalities consider roundabouts for all intersection projects. *Starts immediately and continues indefinitely.*
- CCMPO modifies the project evaluation process to assign bonus points for innovative projects. *Occurs within three months of the adoption of this Plan.*
- CCMPO selects a roundabout project for the TIP as a demonstration for the region. *Occurs on an opportunity basis.*

ACCESS MANAGEMENT AND SIGNAL COORDINATION

Consolidate driveways and better time lights on congested roads to improve safety and traffic flow.

DESCRIPTION

While the region's major thoroughfares, such as Routes 6 and 10, once mainly carried through traffic, with the migration of retail into roadside plazas and strips, they now also transport large volumes of local traffic. This 'mall traffic', which moves at low speeds and makes frequent turns, conflicts with the purpose and functioning of these roads as regional through-routes; its admixture not only dramatically exacerbates congestion and delay but also results in significantly elevated accident rates. (See *Traffic and congestion* and *Safety and status*, p. 159 and 169, respectively, for examples.)

Stricter land use policies that redirect *future* commercial development to downtowns or the like would alleviate this problem, but in the short to mid-term they will not have much effect on traffic, as they do not address the *existing* development. To put it another way: as long as the store is there, the cars will keep coming. However, that does not mean that there is no room for improvement—on the contrary, insofar as speeds and turns can be controlled, the congestion and safety hazards posed by 'mall traffic' can be mitigated. Two proven ways to do this are access management and signal coordination.

Access management consolidates the innumerable (and often poorly sited) driveways and curb cuts that typify most strips. Culling the points of ingress and egress can thin the concentration of turns as well as deter unsafe maneuvers, reducing the potential for conflict and bettering the experience for all transportation users (including pedestrians, cyclists, and transit riders).

Rows of traffic lights also define many strips. Turning movements often cause frequent signal changes; congestion and frustration result. Signal coordination can eliminate many of these unnecessary stops and thus facilitate better flow by timing traffic lights so that more drivers do not 'hit every red', but rather see a 'green wave' as they continue down the road.

This Plan holds that certain roadways in the region stand to gain from these techniques; it therefore advises that the implementation of access management and signal coordination where appropriate.

STATUS AND NEXT STEPS

- CCMPO studies opportunities and makes recommendations to DOT and municipalities. *Starts within five years of the adoption of this Plan and concludes within two years.*
- DOT and municipalities consider access control and signal coordination where relevant. *Starts immediately and continues indefinitely.*
- CCMPO selects a project for the TIP as demonstration for the region. *Occurs on an opportunity basis.*

AUTOMATED TRAFFIC ENFORCEMENT

Add red light and/or speed cameras at dangerous locations.

DESCRIPTION

High traffic volumes and a culture of scofflaws have led to a situation where dangerous traffic violations have become routine. Due to resource constraints, municipalities and the State are unable to enforce every violation, or even all severe ones. The resultant anarchy not only impairs the transportation system (by causing delays and accidents) but also endangers and wastes valuable lives and property. This is a huge cost to society. Technology is now available to punish the worst offenders who violate traffic laws and put the lives of others in jeopardy. These include those who run red lights and drive at unsafe speeds. To ensure a safe transportation system, this Plan recommends that automated enforcement devices be installed wherever losses, accidents, violations, or risk are high.

STATUS AND NEXT STEPS

- CCMPO studies opportunities for automated traffic enforcement and makes recommendations to DOT and municipalities. *Starts within five years of the adoption of this Plan and concludes within two years.*

ELECTRIC VEHICLE SUPPORT NETWORK

Construct a network of charging stations to support the use of electric vehicles.

DESCRIPTION

The threat of climate change, together with rising fuel prices and geopolitical instability, are making clear that the petroleum-based transportation system constructed over the last fifty years is neither environmentally nor economically sustainable. As a result, other forms of mobility and accessibility are growing in prominence. These include the traditional forms of walking, biking, and transit, as well as newer approaches such as telecommuting and a renewed focus on denser, multi-use

communities. (Many of the projects listed above support these.)

While these approaches are valuable and, as numerous domestic and international examples attest, can dramatically shrink the dependency of a society on automobiles, it is unlikely that the need for cars will ever completely disappear. To address this need in a limited-petroleum, limited-emissions future, alternative fuel vehicles are being developed and, as of writing, starting to be marketed. Electric cars are the most promising of these technologies. While these cars perform like and can share the road with conventional vehicles, they have unique fueling needs that are incompatible with the existing fuel distribution network. The rise of electric vehicles necessitates the creation of new distribution system, not of roadside fuel tanks and pumps but of charging stations at trip origins and destinations.

The wholesale adoption of electric cars is likely to necessitate the installation of charging stations and supporting equipment (e.g., smart meters). While charging stations are not expensive, the breadth of the deployment—tens, if not hundreds, of thousands of installations across the region—is a logistical challenge unlikely to be achieved without government involvement. As and so that the electric vehicle fleet grows, this Plan calls for installing stations at all major destinations in the region (employers, schools, and shopping centers); it also recommends supporting the installation of charging stations at automobile owner's locations (i.e., where vehicles are kept overnight).

STATUS AND NEXT STEPS

Connecticut's Department of Energy and Environmental Protection began an EV charging station grant program in 2013. Two rounds of the program have been funded.

- CCMPO identifies priority locations for charging station installation. *Starts within one year of the adoption of this Plan.*
- DOT, municipalities, and third parties install charging stations at priority locations. *Starts as soon as funding is available. Concludes within two years of start. Central Connecticut State University (CCSU) has installed two charging stations on campus and is looking for opportunities to install more.*

Freight

STUDY OF FREIGHT SYSTEM

Coordinate with statewide and regional partners to study and plan for improvements to the region's freight infrastructure.

DESCRIPTION

CCMPO coordinates with the Capitol Region Council of Governments on freight planning efforts. In 2005 CRCOG, in partnership with the state and other MPOs, developed an initial inventory of freight-relevant infrastructure. That effort has morphed into a continuous freight planning process that includes a stakeholder outreach program as well as a focus on coordination of freight planning efforts with state agencies and neighboring planning agencies. Based on this continuous planning effort, weak spots in the freight transportation infrastructure for local, regional and inter-regional freight movements will be identified, and recommendations will be made to improve freight transportation conditions.

STATUS AND NEXT STEPS

- CCMPO contacts CRCOG to coordinate on freight planning efforts. *Complete.*
- CRCOG continues with ongoing freight planning process. *Ongoing.*
- CCMPO evaluates recommendations that result from freight planning efforts. *Already started and continues indefinitely.*

RAIL SYSTEM UPGRADES

Maintain and upgrade rail system to handle freight traffic. Shift as much freight as feasible from busy highways and roads to rail.

DESCRIPTION

Connecticut is overly dependent on trucks for freight. This has many ill effects, including environmental problems (air pollution and noise,) safety hazards (trucks pose collision dangers to other drivers), higher maintenance costs (they destroy roadways). Before there were trucks, however, most freight moved by ship or train. The region does not have any water shipping corridors; however, it does boast a rail corridor along which daily operations continue. This corridor connects the port in Bridgeport with intermodal yards near Springfield.

Unfortunately, the corridor has been allowed to deteriorate, limiting the speed, weight, and frequency of trains. As a result, capacity is severely constrained, and the line is no longer competitive with truck freight. To reverse this, this Plan recommends that the line be upgraded and maintained.

STATUS AND NEXT STEPS

- CCMPO seeks funding for rail line improvements. *Completed. CCMPO submitted a High-Priority Projects appropriations request for $24 million to repair the rail line in 2009. The request is held up in the reauthorization of the transportation bill.*
- Upgrades to the rail line, which would benefit freight access as well, are being considered as part of the Central Connecticut Rail Study. *The study is underway and should be completed in 2015.*
- CCMPO and ConnDOT seek funding to implement recommendations from the Central Connecticut Rail Study. *Begins once the study is complete.*
- Pan Am brings the track up to a state of repair sufficient for enhanced freight rail. *Starts as soon as funding is available. Concludes within two years of start.*

Preservation & upgrades

In addition to the *major* improvements listed in the preceding section, the tables below list specific projects (preservation and *minor* improvement projects) identified to date in each of the towns in central Connecticut. This list of projects informs the region's Transportation Improvement Program (TIP). The tables are not final and may evolve in response to changing needs, conditions, and funding. *Type* in the tables below may be *P* (preservation), *U* (upgrade), or *N* (new); *Time* may be *S*, *M* or *L* for short-, medium-, or long-term. (Most short- term projects, many of which have moved beyond the conceptual phase, can be found in the TIP.)

Note that bridge projects are not included below. For discussion of the region's bridges, see *Bridges*, p. 172. For more information regarding the TIP, federal funding programs, and the planning process, see *Background*, p. 180.

The following tables list current and future transportation projects identified by CCMPO and member municipalities. Projects and concepts of importance to the whole region are listed under the heading *Region-wide*; all other projects are given under the respective municipality's name. Projects are not listed in any particular order.

While projects must be included in this Plan to be potentially eligible for federal transportation funds, inclusion in this Plan does not guarantee that a project will receive federal funds or come to pass. This list is one source of projects for the region's Transportation Improvement Program (TIP). Many of the listed projects here are concepts and ideas, while projects listed in the TIP are scheduled to receive federal funding. As this Plan and the TIP are required to be fiscally-constrained, many of the listed projects are considered unfunded concepts until the necessary development and evaluation have been complete. These projects, which are denoted by a *C* under the *Phase* column, require further elaboration. Some of these merely lack cost estimates; others need extensive study. This Plan is subject to change—through amendments by the region—and this list may be updated to reflect changes in project feasibility, cost, and priority. For more information regarding the TIP, see *Background*, p. 180.

Abbreviations for project type (as indicated under the column *What*) stand for the following: *accCtl = access control; bikePed = pedestrian and cyclist improvements; Bridge = bridge rehabilitation or replacement; Hwy = highway; hikeTrail = hiking trail; intImp = intersection improvements; Recon = reconstruction; rndAbt = roundabout; stScape = streetscape enhancement/beautification; Rail = conventional railroad; Trail = dedicated multi-use trail; TBD = to be determined; TBD-s = to be determined (safety); Widen = widening*.

REGION-WIDE

Where	What	Type	Est. cost[24]	Phase	Time
Interregional transit from New York city metro (Bridgeport-Waterbury corridor) through Bristol and New Britain to Hartford	TBD	U	—	C	L
High-speed/intercity rail from New Haven to Springfield, via Berlin	Rail	U	—	C	M
New Britain-Hartford Busway	Hwy	N	$572.0m	PE	S

[24] *Depending on the project, not all of the cost may be borne by the region.*

Extension of Bristol shuttle to Plymouth	Bus	N	—	C	M
Bus system improvements	TBD	P	—	C	S
Protection of the New England Trail	hikeTrail	P	—	C	—
Program scoping	N/A				

BERLIN

Where	What	Type	Est. cost	Phase	Time
Farmington Avenue Bridge	Bridge	P	$5.300m	CON	S
Four Rod Rd., Burnham Rd. to Norton Rd.	Recon	P	—	C	M
Kensington Rd., Camel Back to Main St.	Recon	P	—	C	M
Orchard Rd., Chamberlain Hwy. to Tollgate Rd.	Recon	P	—	C	M
Railroad station access and area improvement (may include TOD, projects supportive thereof, and/or Rt. 9 ramp improvements)	TBD	U	—	C	M
Railroad station facility and site enhancement	Rail	P	$1.625m	PE	S
Reservoir Rd.	Recon	P	—	C	M
Rt. 372, New Britain Rd. to Webster Square Rd.	accCtl	U	—	C	L

BRISTOL

Where	What	Type	Est. cost	Phase	Time
Rt. 229, Lake Ave. to Southington Town Line	accCtl	U	—	C	L
Rt. 6, Rt. 229 to Farmington Town Line	accCtl	U	—	C	L
Rt. 6, Rt. 229, and Jerome Ave.	intImp	U	—	C	L

Rt. 6, Rt. 69 to Vanderbilt Rd.	accCtl	U	—	C	L
Rt. 72, Rt. 229 to Memorial Blvd.	intImp, Bridge	U	$3.2m	ROW	M
Rts. 69 and 72	TBD-s	U	—	C	L
Stafford Rd. and Maltby St.; Maltby St. and Mix St.; Mix St., Maple Ave., and Jerome Ave.; Maple Ave., Peacedale St., and Burlington Ave.	rndAbt	U	—	C	L
South St., Church St., and Union St.	intImp	U	$0.550m	C	S
South St.; Route 69 at South St. and South St. Ext.	intImp	U	—	C	M
Wolcott St.	Recon	P	—	C	M
Woodland St. at King St.	intImp	U	—	PE	M

BURLINGTON

Where	What	Type	Est. cost	Phase	Time
Bridging of gaps in the Tunxis Trail	hikeTrail	N	—	C	M
Burlington town center	bikePed, stScape	N	—	C	L
Farmington River Trail, Burlington Ave. to Rt. 4/179 parking lot	Recon	P	$1m	CON	M
Multi-use trail, Rt. 179 to Burlington Ave.	Trail	N	—	C	L
Rts. 4 and 179	TBD-s	U	—	C	L

NEW BRITAIN

Where	What	Type	Est. cost	Phase	Time
Broad St.	Recon	P	$6.550m	C	M
Design/construction of an on-road bicycle network	bikePed	U	—	CON	M
East St., East Main St., and Newington Ave.	intImp	U	—	C	M
Ellis St. and various (South Main St.; Stanley St.)	rndAbt	U	—	C	L
Glen St. pedestrian improvements	bikePed	U	$0.220m	C	S
Multi-use trail from busway trail to CCSU	Trail	U	—	C	M
Multi-use trail from busway trail to Westfarms	Trail	U	—	C	L
Rt. 174 and East St.	intImp	U	$7.500m	C	M
Hart St. reconstruction	Recon	P	$3.483m	PE	S
Rt. 372 and Corbin Ave.	accCtl, intImp	U	—	C	M
Rt. 372 and various (Steele St.; Black Rock Ave.; Lincoln St., Monroe St., and 10 Acre Rd.)	rndAbt	U	—	C	L
Rt. 372, Route 72 ramps to West Main St.	TBD-s	U	—	C	L
Rt. 71, North St., and Stanley St.	TBD-s	U	—	C	L
Rt. 71, Route 9 ramps to businesses	TBD-s	U	—	C	L
Rt. 71, Rt. 175, and Allen St.	TBD-s	U	—	C	L

PLAINVILLE

Where	What	Type	Est. cost	Phase	Time
Camp St. and various (Washington St.; Bradley St.)	rndAbt	U	—	C	L

Farmington Canal Heritage Trail, Farmington to Southington	Trail	N	$6.990m	C	M
Pedestrian improvements in Cooks Gap and land preservation on the New England Trail	bikePed	U	—	C	M
Rt. 372 and Rt. 10 (Cook St.)	Recon, bikePed	U	$1.300m	PE	M
Rt. 372, Cook St. to Hooker St.	Widen	U	$8.000m	C	M
Rts. 10, 177, and 372 bike improvements and sidewalk	bikePed	U	—	C	M

PLYMOUTH

Where	What	Type	Est. cost	Phase	Time
Acquisition of Plymouth Reservoir and Leadmine Brook properties, creation of Leadmine Trail	hikeTrail	N	$2.000m	CON	S
Allentown Rd., Fall Mountain Rd. to Wolcott Rd.	Recon	U	$3.000m	C	M
Beach Ave. (including culvert)	Recon	U	$1.250m	C	M
Bemis St., Rt. 72 to High St.	Recon	U	$2.200m	PE	S
Creation of downtown municipal parking	Parking	N	$0.600m	C	M
East Plymouth Rd. and Matthews St.	intImp	P	$3.000m	C	M
Greystone Rd.	Recon	P	—	C	M
Harwinton Ave., Rt. 6 to Armbruster Rd.	Recon	U	$3.500m	C	M
Lake Plymouth Blvd.	Recon	U	$1.000m	C	M
Main St.	stScape	P	$2.000m	C	M
Rt. 6 and Harwinton Ave.	intImp	U	$4.000m	C	L

Rts. 6 and 72	intImp	U	$8.950m	C	L
Scott Rd., Cross. Rd to Washington Rd.	Recon	U	$1.000m	C	M
S. Main St., N. Main St., and Agney Ave.	intImp	U	$2.500m	PE	M
Seymour Rd., Rt. 6 to Harwinton Ave.	Recon	U	$2.500m	C	M
South Main St., Rt. 6 to Beach Ave.	Recon	P	—	C	M
South Main St. (soften 90° curve)	Recon	U	$2.100m	C	S
Todd Hollow Rd., Rt. 6 to end	Recon	U	$4.000m	C	M
Terryville Center to Plymouth Center Sidewalk	bikePed	U	$0.430m	C	S
Wolcott Rd. Greystone Rd. to Wolcott Town Line	Recon	U	$2.000m	C	M

SOUTHINGTON

Where	What	Type	Est. cost	Phase	Time
East St., Meriden Ave. to Kensington Ave.	Recon	P	—	C	M
Farmington Canal Heritage Trail, Lazy Ln. to Plainville Town Line	Trail	N	$2.500m	CON	M
Mt. Vernon Rd., Marion Ave. to Prospect St.	Recon	P	$4.05m	F	M
Plantsville Business District beautification (Rt. 10)	stScape	U	$1.500m	C	M
Rt. 10 and various roads in town center, Center St. to Flanders St.	intImp	U	—	C	L
Rt. 10, Plainville Town Line to Lazy Ln.	accCtl	U	—	C	L
Rt. 229, I-84 ramps to Executive Blvd S.	TBD-s	U	—	C	L
South End Rd., Rt. 322 to Cheshire Town Line	Recon	P	$3.800m	C	M
Jude Ln. and West St.	intImp	U	$0.50m	C	M

Finances

Sound financial planning is pivotal to the success of any transportation project. This Plan is required by federal regulations to be financially constrained, which means the estimated total cost of all planned transportation expenditures, both for preservation and upgrades, may not exceed the expected revenue available.

Although projections should be taken with a grain of salt—they are essentially educated guesswork—this Plan strives to provide a most probable estimate of available funding and project costs over its twenty-five year time period. Funding for government-sponsored transportation projects comes from three levels of government: federal, state, and local. The following sections present these sources in current-year (2010) dollars.

Federal funding

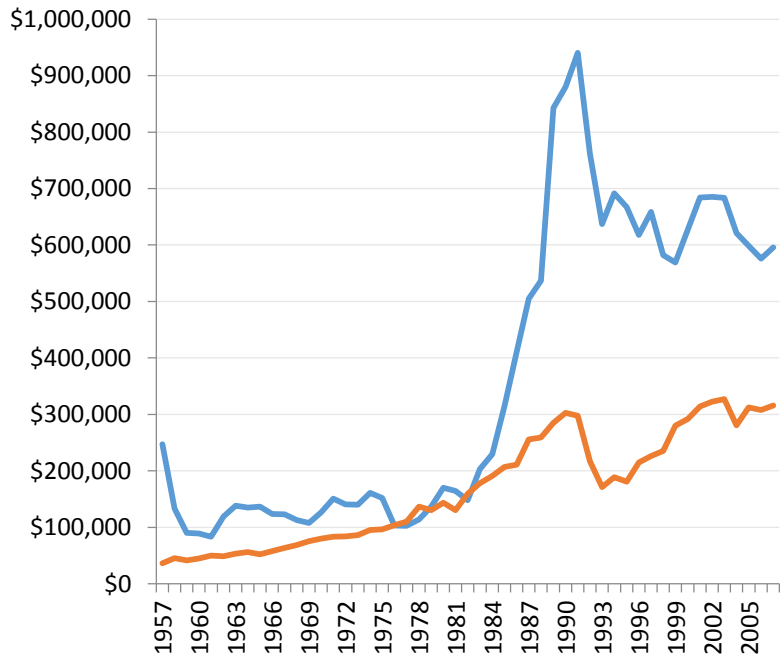
The largest source of funding in Connecticut is the federal government. (This is not always true in other states or countries, where state/provincial and local governments may contribute a larger share.) The principal body of law dictating the disbursement of federal funds for transportation is the *Moving Ahead for Progress in the 21st Century Act* (MAP-21). This act, passed in into law in 2011, succeeds the *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users* (SAFETEA-LU), and is was to expire in 2014. It has been extended through May of 2015.

MAP-21 is a complex law, authorizing a variety programs to fund transportation projects. The United States Department of Transportation has three major divisions, the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), and the Federal Railroad Administration (FRA). -FHWA, FTA, and FRA funding programs are described at:

- http://www.fhwa.dot.gov/federalaid/projects.cfm
- http://www.fta.dot.gov/grants/12853.html
- http://www.fra.dot.gov/Page/P0021.

Economic and political uncertainties cast the future of transportation funding into doubt. The long-term solvency of the transportation system is yet to be addressed. Figure 10 shows the fluctuation in federal highway spending over the past half century. In contrast, the American Recovery and Reinvestment Act (ARRA) of 2009, or 'stimulus package,' recently gave the nation's transportation system an extra infusion of capital. The Act enabled the expedition of many transportation projects. Despite

Figure 10. Federal highway spending over time



merit, some of these projects had languished or been repeatedly postponed due to shortfalls; in other cases, however, the Act's limitation to "shovel-ready" projects led to the plucking of low-hanging fruit (e.g., routine road maintenance and paving projects) rather than addressing more complex needs. (For the purposes of planning, the revenue from stimulus is considered a one-time occurrence whose chief effect was to reduce the backlog of existing infrastructure repair needs.) *Table 4* lists ARRA funded projects in the region. All projects began in 2010 and are now complete. In addition to these projects, the Act also funded the resurfacing of a park and ride lot in Southington and statewide initiatives, including the purchase of new transit buses for the region.

The distribution of federal transportation funds (from all programs) per capita are shown in Table 4 for the ten year period

Table 4. ARRA-funded projects in the region

Town	Description	Total $ (000)	Fed. $ (000)	State $ (000)	Local $ (000)
Berlin	Reconstruction and paving: Episcopal Rd.	738	499	0	239
Bristol	Reconstruction and normalization of Mix St. intersection with Maltby St.	1,500	1,500	0	0
Burlington	Linear park: Farmington River Trail	225	225	0	0
New Britain	Pavement preservation: Corbin Ave., East St., Stanley St., and Ellis St.	4,306	1,735	0	2,571
New Britain	Mill and overlay: Corbin Ave. (W. Main St. to Osgood Ave.), East St. (Newington Ave. to South St.), Stanley St. (Chestnut St. to South St.)	2,075	1,735	0	340
Plainville	Reconstruction and paving: Camp. St.	439	439	0	0
Plymouth	Mill and overlay: Harwinton Ave., Rt. 6 to Armbruster Rd.	307	307	0	0
Southington	Mill and overlay, South End Rd (4150 ft.) and Mount Vernon Rd. (3300 ft.)	1,100	1,039	0	61
Southington	Linear park: Plantsville to Cheshire town line	3,342	3,342	0	0

Table 5. Federal highway funding per capita by community, 2004-2014

Town	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Berlin	$0.00	$0.00	$0.00	$9.09	$0.00	$0.00	$44.64	$0.00	$0.00	$0.00	$87.79	$157.32
Bristol	$0.00	$7.96	$16.66	$204.68	$175.52	$188.51	$243.90	$7.28	$26.46	$77.85	$3.47	$1,056.64
Burlington	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$51.02	$0.00	$10.32	$0.00	$175.90	$263.75
New Britain	$0.00	$50.30	$47.03	$0.00	$5.07	$19.67	$28.81	$116.57	$0.00	$4.78	$96.70	$465.46
Plainville	$0.00	$142.68	$43.01	$10.23	$0.00	$0.00	$24.79	$0.00	$3.61	$164.94	$25.80	$1,485.16
Plymouth	$168.38	$125.20	$62.97	$9.95	$0.00	$39.40	$128.09	$4.49	$65.34	$11.27	$37.33	$833.13
Southington	$0.00	$95.31	$0.00	$36.70	$1.10	$95.96	$24.13	$51.42	$53.21	$57.40	$28.70	$565.33
Region	**$8.68**	**$52.14**	**$25.53**	**$61.65**	**$47.07**	**$74.10**	**$90.16**	**$47.67**	**$20.57**	**$44.90**	**$54.35**	**$699.08**

from 2004 to 2014. Note that this table does not include projects classified as "statewide." For example, Burlington may receive money for a statewide traffic signal project but will not be included in Table 4 if that project includes signals outside the region. Transit funding is also not part of Table 4 which leaves out the region's and State's largest projects – $572 million for CTfastrak (bus rapid transit project between New Britain and Hartford) and $366 million for the NHHS Rail Corridor (high speed rail between New Haven, Hartford, and Springfield). In addition, there are significant discrepancies in highway spending between the towns. Some of this variation may result from major state projects (e.g., the extension of Route 72 in Bristol from 2007 to 2010) or eligibility restrictions (e.g., much of Burlington not being considered part of the Hartford Urbanized Area which excludes it from several funding programs), but it nevertheless is worthy of attention, as it has distributional and equity implications.

Data for the tables in this section is sourced from ConnDOT's annual summary of federal obligations (the federal government's legal commitment for the federal share of projects).

The Surface Transportation Program (STP), parts of which are managed by CCMPO, is typically the largest funding source for transportation projects in the region. Eligible roads for funding

are restricted by ConnDOT to those classified by FHWA as collectors or arterials. (Local roads are ineligible.) STP encompasses several subprograms. Of these, the Surface Transportation Program – Urban (STP-U), which is based on urbanized area, is the most significant. CCMPO is part of the Hartford urbanized area and receives about 25% of STP-U-Hartford funds ($4 million out of $16 million annually, although the exact amount fluctuates). While ConnDOT administers most federal transportation funding programs, management of STP-U for the region rests with CCMPO.

Table 6 (p. 70) demonstrates the significance of STP-U in funding the region's transportation system. As the table makes clear, STP-U funding as a fraction of all TIP-listed funds has stayed relatively constant since 2002, with an exception in 2004, when only one project was funded in the region. An entry of *n/a* indicates there were no federally-funded transportation projects in the respective municipality that year.

As *Table 7* shows, STP-U funding varies year-to-year and over time among municipalities. New Britain received the largest share of STP-U funds in the region, over one-quarter, between 2002 and 2012. Bristol and Plymouth came in second, with Southington a close fourth.

Receipt of STP-U funds also varies on a per capita basis. As *Table 8* and *Table 9* show, a difference of more than twenty-fold separates the municipalities with the highest (Plymouth) and lowest (Berlin) per capita funding levels since 2002.

There are several reasons for this variation. These include:

1. Population. New Britain has eight times as many residents as Burlington.
2. Road networks. The total mileage of roads eligible for federal funding in Bristol is three times that of Burlington.
3. Merit. Per federal regulation, funds must be awarded on a competitive and not per capita basis. Municipalities that submit projects that correspond to the core principles of this Plan and benefit the entire region are more likely to be awarded funds than those that do not.
4. Resource constraints. Due to the high cost of projects, the region often can only fund one or two projects (and municipality) per year. As a result, the region's cities and towns may end up 'taking turns.'

Future STP-U projects (with estimated costs) not included in the above tables are shown in **Error! Reference source not found.**. hese projects will be added to the TIP once project development has concluded.

Table 6. STP-U as a percentage of all TIP-listed funds

Municipality	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Avg.
Berlin	n/a	n/a	n/a	0%	n/a	n/a	44%	n/a	n/a	n/a	1%	13.2%
Bristol	n/a	100%	0%	19%	9%	0%	6%	0%	0%	49%	0%	12.1%
Burlington	n/a	n/a	n/a	n/a	n/a	n/a	0%	n/a	0%	n/a	56%	38.0%
New Britain	n/a	3%	57%	n/a	0%	97%	0%	32%	n/a	86%	28%	25.0%
Plainville	n/a	0%	0%	0%	n/a	n/a	0%	n/a	0%	0%	0%	4.8%
Plymouth	100%	100%	0%	100%	n/a	100%	80%	0%	0%	0%	0%	53.6%
Southington	n/a	0%	n/a	9%	0%	12%	0%	0%	88%	88%	0%	30.9%
Region	**100%**	**17%**	**33%**	**18%**	**8%**	**14%**	**12%**	**24%**	**41%**	**45%**	**23%**	**14.6%**

Table 7. Percent of STP-U share received by town

Municipality	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Cum.
Berlin	0%	0%	0%	0%	0%	0%	15%	0%	0%	0%	1%	1.7%
Bristol	0%	23%	0%	90%	100%	0%	37%	0%	0%	48%	0%	32.4%
Burlington	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	31%	3.9%
New Britain	0%	6%	100%	0%	0%	58%	0%	100%	0%	6%	68%	35.7%
Plainville	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5.3%
Plymouth	100%	71%	0%	5%	0%	20%	49%	0%	0%	0%	0%	22.6%
Southington	0%	0%	0%	6%	0%	21%	0%	0%	100%	45%	0%	31.0%
Region	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100.0%**

Table 8. STP-U funding by municipality ($ 000)

Municipality	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Berlin	$0	$0	$0	$0	$0	$0	$388	$0	$0	$0	$20	$408
Bristol	$0	$480	$0	$2,348	$917	$0	$948	$0	$0	$2,323	$0	$7,016
Burlington	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$924	$924
New Britain	$0	$122	$1,961	$0	$0	$1,394	$0	$2,699	$0	$300	$2,000	$8,477
Plainville	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Plymouth	$2,000	$1,495	$0	$120	$0	$480	$1,261	$0	$0	$0	$0	$5,356
Southington	$0	$0	$0	$144	$0	$512	$0	$0	$2,013	$2,182	$0	$4,851
Region	**$2,000**	**$2,096**	**$1,961**	**$2,612**	**$917**	**$2,386**	**$2,597**	**$2,699**	**$2,013**	**$4,805**	**$2,944**	**$27,031**

Table 9. STP-U funding by municipality per capita

Municipality	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Berlin	$0	$0	$0	$0	$0	$0	$20	$0	$0	$0	$1	$21
Bristol	$0	$8	$0	$39	$15	$0	$16	$0	$0	$38	$0	$116
Burlington	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$99	$99
New Britain	$0	$2	$27	$0	$0	$19	$0	$37	$0	$4	$27	$116
Plainville	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Plymouth	$168	$125	$0	$10	$0	$39	$103	$0	$0	$0	$0	$446
Southington	$0	$0	$0	$3	$0	$12	$0	$0	$47	$51	$0	$113
Region	**$168**	**$135**	**$27**	**$52**	**$15**	**$70**	**$138**	**$37**	**$47**	**$93**	**$128**	**$911**

State and local funding

Connecticut relies heavily on federal funding for its transportation programs. Currently, nearly two thirds of the money for transportation capital projects in the State comes from the Federal government. Most states, particularly those outside of the Northeast, use a much greater portion of state and/or regional funds to pay for transportation projects. Most state transportation programs are funded from the Special Transportation Fund (STF), which collects revenues from transportation-related taxes, fees, and revenues as well as from the proceeds of Special Tax Obligation Bonds. Roughly two thirds of the STF comes from state motor fuel taxes and motor vehicle receipts. Although reliance on these sources is desirable from both economic *and* environmental perspectives (they function as a Pigovian tax), the revenues they bring in are beginning to fall short of the level needed to preserve the State's existing transportation system, let alone pay for upgrades. The widening gap between the State's means and its needs has various roots. These include:

1. **A decline in federal aid.** The federal gasoline tax has been frozen at 18.4 cents per gallon since 1993. The lack of an index to inflation means that federal revenues (and potential state aid) has fallen and continues to fall in real terms. As a consequence, a greater share of transportation costs must be borne by the states.
2. **A reduction in the state gasoline tax.** The State motor fuel tax was cut by 14 cents per gallon, or 35.9%, between 1997 and 1999. This dramatically reduced the capacity of the State to undertake projects on its own, or even to provide a State match for federally-funded projects. A lack of index to inflation is also hobbling these revenues (and the State's ability to take on transportation projects) over the long term.
3. **Growing maintenance needs.** Much of the State's transportation infrastructure was built at during the golden years of the 50s and 60s, often with a 50-year design life. As a result, a large portion of the State's roads, bridges, dams, and other structures are now up for replacement (or escalating maintenance costs). The need to tackle all these projects at one time presents a challenge: DOT has estimated the *unfunded* State maintenance burden in the near future to be on the order of $4-5 billion.
4. **Debt service**. A plurality of STF funds (39% in 2009) is used to pay the debt on transportation projects paid for with bonds. The need to pay for the past leaves less money available for the present and future.

Local governments also play a critical role in financing the transportation system. Nationally, thirty-six percent of surface transportation funding comes from local government. This proportion is expected to rise in the future as federal and State finances deteriorate. Town and cities also face challenges similar to those of the States both in revenues and expenditures: in many places, needs (particularly for maintenance and rehabilitation) are growing while property taxes, municipal bonds, and other sources of revenue are stagnant or shrinking.

LOTCIP

In 2013, the Connecticut General Assembly passed Public Act 13-239, which authorized the state to issue bonds to fund a program called the Local Transportation Capital Improvement Program (LOTCIP). This program is designed to take the place of STP-U, and comes with fewer strings attached. ConnDOT has agreed to provide this funding to the regions and in-turn asks the regions to use their share of STP-U funds on state-selected projects in their regions.

Table 10. Future STP-U Projects (2015 and onward)

Town	Project	Phase	Year	Federal funds
Berlin	Replace Bridge 4474 over Mattabesset River	CON	2015	$3,156,000
Bristol	Dam Removal	CON	2015 (est.)	$500,000
Bristol	Intersection Improvements	TBD	TBD	TBD
Bristol	Major Intersection Improvement	ROW	2016 (est.)	60
Bristol	Major Intersection Improvement	CON	2017 (est.)	3,000
New Britain	Reconstruction of Hart St	FD	2015	$240,000
		CON	2015	$2,546,000
Plymouth	Reconstruct a 780 foot section (plus Section 129 funds)	CON	2015	$160,000
Plymouth	Intersection Improvements on Route 6	CON	2016 (est.)	$2,500,000

One significant difference between LOTCIP and STP-U is that LOTCIP, as a state-funded program, is being administered by Councils of Governments (COGs), not MPOs. In most of the state, MPOs and COGs are housed in the same organization.

With the dissolution of CCRPA, the Central Connecticut MPO became a separate entity from any COG (though it is hosted by the Capitol Region COG). This arrangement is temporary as CCMPO is scheduled to be dissolved in June 2015.

The state made $44 million available statewide in FY14. Central Connecticut (through the now defunct Central Connecticut Regional Planning Agency) received $3.124 million. Projects selected by the region are shown in Table 11.

Administration of these projects has been transferred over to the respective municipality's new COG. CCMPO no longer has any control over this funding source. That said, it is a significant investment by the state.

Table 11. LOTCIP projects for 2015

Town	Route	Project
Bristol	Various	Replace loop detectors at 23 intersections
New Britain	Allen St	Reconstruction of Allen Street
Plainville	Cooke St.	Pavement rehabilitation of Cooke Street
Plymouth	Bemis St.	Reconstruction of Bemis Street
Southington	Jude ln.	Intersection improvement

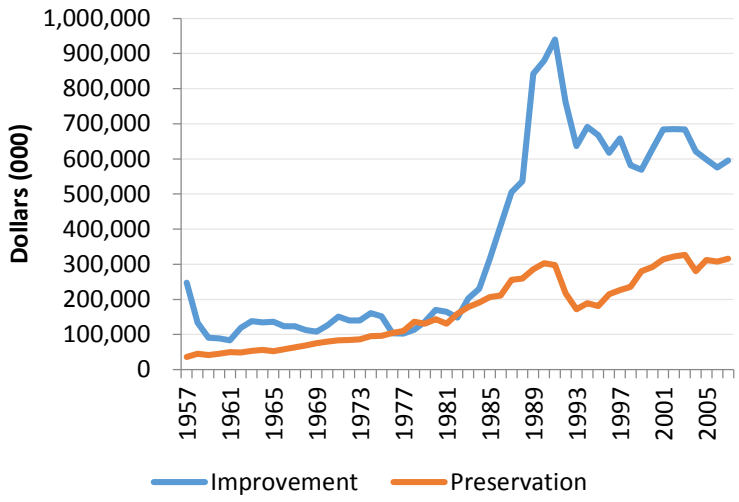
Revenue assumptions and estimates

The DOT has projected Federal Highway and State funds for project programming for all the RPOs in the State through the year 2040. Total expected funding for all 9 MPOs including CCMPO is shown in *Table 12* (p. 77). Central Connecticut is forecast to receive 2.9% of the total State funding, divided between 2.8% of the total made for system improvements and 4.3% of that for system preservation. The region is expected to receive only 0.2% of the funds that will be made available for major projects of statewide significance, all of which will be dedicated to the proposed New Britain-Hartford Busway. The region's disproportionately small, even minimal, allocations for projects of statewide significance is curious and begs explanation, given the region's sizeable population and economy, central location in the State, and function as a conduit among major cities and metro areas.

In future years the funding allotted to CCMPO will be split between the new COGs. Based on population, CRCOG will receive 65.2% of CCMPO's STP-U allocation, NVCOG will receive 30.8%, and NHCOG would receive 3.9%.

The ratio of funds for improvements to that for preservation varies dramatically across the regions. For instance, the Greater

Figure 11. Statewide transportation funding over time



Bridgeport region has nearly 70% of those funds allocated for improvements, while Litchfield Hills and Northwestern Connecticut each have 77% of their funds set for preservation. Project funding in central Connecticut favors preservation by roughly a two-to-one margin. This may be a judicious mix, given the region's maturity, the age of its infrastructure, and the State's historical underfunding of preservation in favor of improvements (*Figure 11*).

Table 13 (p. 78) breaks this funding out year-by-year over the thirty-year time horizon of the forecast. These projections assume a six percent annual increase in funding and a constant

distribution between improvements and preservation. (In reality, total funding and the apportionment ratio will vary from year to year, but this linear projection gives an idea of estimated funding available over the timeframe of the Plan.)

Table 12. Projected available transportation funds by region (through 2040)

Planning region	System improvements	System preservation	Major projects of statewide significance	Totals
Southwestern	1,454,422,869	672,891,462	1,555,260,000	3,682,574,331
Housatonic Valley	627,376,551	523,837,013	66,180,000	1,217,393,565
Northwest Hills	288,719,858	927,453,709	-	1,216,173,567
Central Naugatuck Valley	434,576,855	505,237,139	1,904,200,000	2,844,013,994
Valley	178,687,550	307,619,569	27,200,000	513,507,119
Greater Bridgeport	913,686,758	381,908,065	353,068,400	1,648,663,223
South Central	1,120,144,189	1,189,336,693	1,105,184,697	3,414,665,579
Central Connecticut	228,058,977	419,644,555	13,500,000	661,203,531
Capitol	1,086,094,343	2,012,984,655	419,415,000	3,518,493,999
Midstate	201,691,287	432,965,861	320,000,000	954,657,148
CT River Estuary	144,754,404	343,902,266	207,000,000	695,656,670
Southeastern	527,456,452	1,091,508,811	114,480,000	1,733,445,263
Northeastern	95,661,435	513,374,043	-	609,035,478
Undefined Towns	247,982,957	417,217,697	-	665,200,654
State total	**7,549,314,485**	**9,739,881,539**	**6,085,488,097**	**23,374,684,122**

Table 13. Project available transportation funds by year

Year	Central CT *improvement*	*preservation*	Total	**Statewide *improvement***	***preservation***	***Total***
2015	$3,855,188	$7,093,817	$10,949,005	$230,487,429	$164,646,334	$395,133,763
2016	$4,086,499	$7,519,446	$11,605,945	$244,316,675	$174,525,114	$418,841,789
2017	$4,331,689	$7,970,613	$12,302,302	$258,975,676	$184,996,621	$443,972,297
2018	$4,591,591	$8,448,850	$13,040,440	$274,514,216	$196,096,418	$470,610,634
2019	$4,867,086	$8,955,781	$13,822,867	$290,985,069	$207,862,203	$498,847,272
2020	$5,159,111	$9,493,127	$14,652,239	$308,444,173	$220,333,935	$528,778,109
2021	$5,468,658	$10,062,715	$15,531,373	$326,950,824	$233,553,972	$560,504,795
2022	$5,796,777	$10,666,478	$16,463,255	$346,567,873	$247,567,210	$594,135,083
2023	$6,144,584	$11,306,467	$17,451,051	$367,361,946	$262,421,242	$629,783,188
2024	$6,513,259	$11,984,855	$18,498,114	$389,403,662	$278,166,517	$667,570,179
2025	$6,904,055	$12,703,946	$19,608,001	$412,767,882	$294,856,508	$707,624,390
2026	$7,318,298	$13,466,183	$20,784,481	$437,533,955	$312,547,898	$750,081,854
2027	$7,757,396	$14,274,154	$22,031,549	$463,785,992	$331,300,772	$795,086,765
2028	$8,222,840	$15,130,603	$23,353,442	$491,613,152	$351,178,819	$842,791,971
2029	$8,716,210	$16,038,439	$24,754,649	$521,109,941	$372,249,548	$893,359,489
2030	$9,239,182	$17,000,745	$26,239,928	$552,376,538	$394,584,521	$946,961,058

Year	Central CT *improvement*	*preservation*	Total	**Statewide *improvement***	***preservation***	***Total***
2031	$9,793,533	$18,020,790	$27,814,323	$585,519,130	$418,259,592	$1,003,778,722
2032	$10,381,145	$19,102,037	$29,483,183	$620,650,278	$443,355,167	$1,064,005,445
2033	$11,004,014	$20,248,160	$31,252,174	$657,889,294	$469,956,477	$1,127,845,772
2034	$11,664,255	$21,463,049	$33,127,304	$697,362,652	$498,153,866	$1,195,516,518
2035	$12,364,110	$22,750,832	$35,114,943	$739,204,411	$528,043,098	$1,267,247,509
2036	$13,105,957	$24,115,882	$37,221,839	$783,556,676	$559,725,684	$1,343,282,360
2037	$13,892,314	$25,562,835	$39,455,149	$830,570,076	$593,309,225	$1,423,879,301
2038	$14,725,853	$27,096,605	$41,822,458	$880,404,281	$628,907,778	$1,509,312,059
2039	$15,609,404	$28,722,401	$44,331,806	$933,228,538	$666,642,245	$1,599,870,783
2040	$16,545,969	$30,445,746	$46,991,714	$989,222,250	$706,640,780	$1,695,863,030
Total	**$228,058,979**	**$419,644,555**	**$647,703,534**	**$13,634,802,590**	**$9,739,881,545**	**$23,374,684,135**

People

Plans like this tend to focus on projects and payments. There are grounds for that: if the devil is in the details, these two aspects are particularly satanic. But transportation systems consist of more than physics and finances. At its most fundamental, transportation is about people and places: who are the people, where do they need to be, and how do we get them there?

Because of this, any discussion of a transportation system without mention of people or places would be incomplete. (Understanding of both is essential if a transportation system is to perform well.) To this end, this chapter reviews the human part to this question; *Systems* (p. 101) covers the places side.

Population

According to the 2010 Census, 235,878 people live in central Connecticut. This compares to 227,676 as of the 1990 Census and 226,695 as of Census 2000. The region's population as a whole has stayed remarkably stable over the last twenty years.

On the intra-regional level, however, the situation is not as stable. As *Table 14* (p. 81) makes clear, despite a relatively stable total population, the region is experiencing a high degree of internal migration. In the last two decades, the population of the region's and older suburbs cities has steadied (in the case of Bristol and Plainville) or shrunken (New Britain). Rapid growth in outlying areas, such as the suburbs of Berlin and Southington, and especially the exurb of Burlington, has balanced this loss.

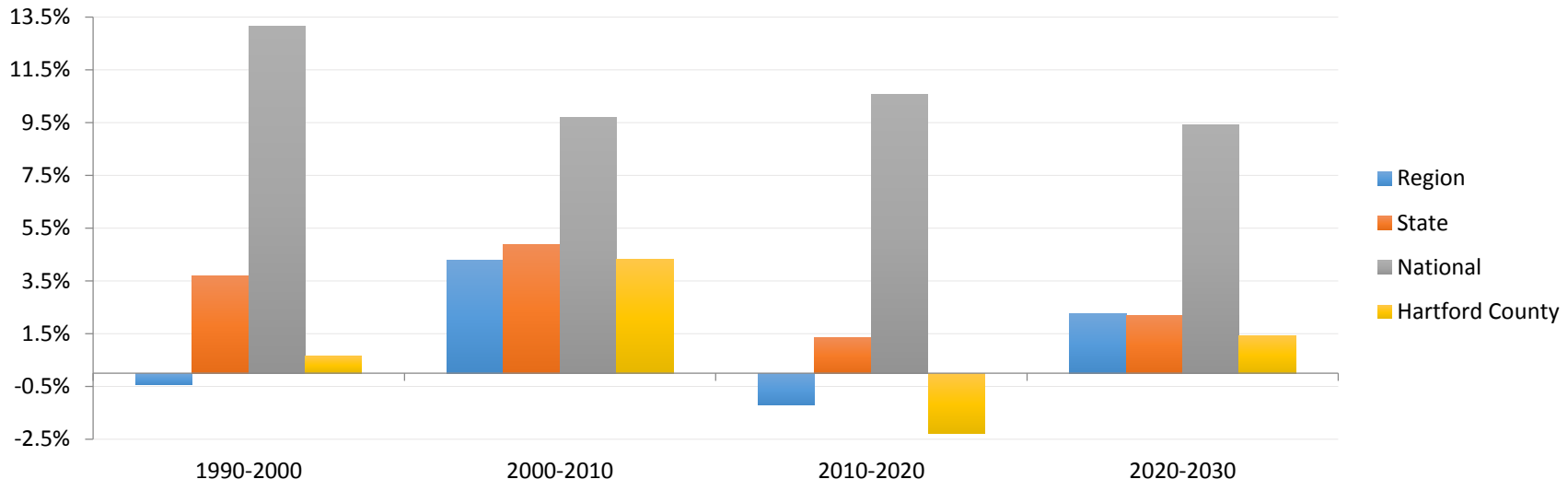
While the stability of the region's population may, at first glance, seem healthy and sustainable—the premise of stability after all underlies sustainability—these internal shifts reveal an environment that is anything but. These shifts run contrary to the principles of smart growth; they represent a massive population migration and bring a slew of problems, including a loss of forests, fields, wetlands, and the critical ecosystem services that these open spaces provide; disinvestment in and the decay of downtowns and older neighborhoods; declining social capital and public health; and, last but not least, major transportation challenges, such as automobile dependency, congestion, and high travel costs.

Population may be diffusing from the region's historic cores into suburbs and exurbs, but this process is not yet complete. Total

Table 14. Population by municipality

Year	Berlin	Bristol	Burlington	New Britain	Plainville	Plymouth	Southington	Total
1990	16,787	60,640	7,026	75,491	17,392	11,822	38,518	227,676
2000	18,215	60,062	8,190	71,538	17,328	11,634	39,728	226,695
2010	19,866	60,477	9,301	73,206	17,716	12,243	43,069	235,878
Change, 1990-2010	**18.3%**	**-0.3%**	**32.4%**	**-3.0%**	**1.9%**	**3.6%**	**11.8%**	**3.6%**

Figure 12. Population growth by decade



population and population density continues to vary considerably across the region's municipalities, as *Figure 13* (p. 83) shows. Despite considerable shrinkage in recent years, New Britain remains the region's largest and densest municipality, followed by Bristol. (If current trends continue, Bristol may wrest the first title from New Britain in the foreseeable future.)

Projections suggest (*Figure 12*[25], p. 82) the region will shrink over the next ten years, albeit at a slower rate than Hartford County, and then rebound with growth faster than the county over the succeeding decade. The Center forecasts that the regional growth rate will lag the nation but be exceed with the state by 2030. However, given that past projections for the region have often failed to come to pass, these too should be taken with a large grain of salt. It seems most likely that the population of the region will remain stable. Whether the trends of urban flight and suburban sprawl that have defined the region to this point will continue defies facile augury, as it depends on a complex of factors that includes the performance of

[25] 1990-2010 growth rates derive from Census population counts; 2010-2030 rates are 2007 projections from the Connecticut State Data Center.

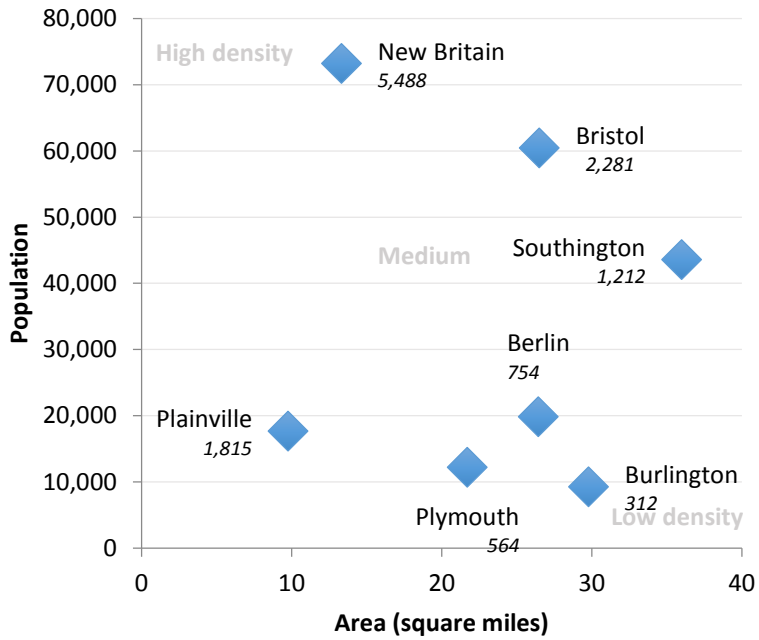
the regional, state, and national macro-economies, the size and character of the housing market and banking sector (including buyers' preferences and the availability of financing), federal and state policies, local land use regulations and building codes, redevelopment projects, and the cost and availability of transportation options.

RELEVANCE

The high variation in density and development patterns throughout the region has implications for its transportation system. Rural and suburban areas are notoriously challenging for transit. In most cases, concentration—of origins and destinations—is a necessary (but not sufficient) condition for successful bus or rail operations. Given their relatively high population density, Bristol and, especially, New Britain have the greatest potential of the region's municipalities for transit. (The confluence of CT TRANSIT's current bus lines in these cities reflects this. See *Local*, p. 125, for details.) That said, if the present trend of dispersal continues, with origins and destinations moving beyond transit's reach, the system may slip into a vicious cycle of dwindling ridership and service cuts. If steps are not taken to arrest this, the long-term viability of transit in the region may be called into question.

The sprawl trend also has implications for the roads. Where distances are great, people cannot walk or bike, and when there is no bus or train, people must drive. Replacing trips that would otherwise be taken by foot, bicycle, bus, or train intensifies congestion. Although some areas have sufficient capacity to absorb additional cars without deterioration in transportation system performance, many of the region's highways are at the breaking point: they are near, at, or above capacity. (See *Traffic and congestion*, p. 159.) Due to the nonlinearity of congestion, in these cases even slight additions can turn heavy traffic into gridlock.

Figure 13. Population density (persons per square mile)



Economics

In 1999, the median household income for the region was $64,095.[26] By 2008, it had risen to $70,637.[27] This figure would seem to indicate that the region is faring well economically, as it lies not only above the statewide median household income of $68,411 but is a full 35% higher than the national median household income of $52,175. However, this figure masks three important facts:

1. Inflation. Incomes have not kept pace with inflation, so real purchasing power is falling.
2. High cost of living. The region's cost of living is higher than the nation, so earnings do not go as far in central Connecticut as an equal amount would elsewhere.
3. Uneven distribution. Although incomes are high, there is wide variation within the region.
4. Out-of-date statistics. The infrequency of economic data collection means they no longer reflect actual conditions (the boom of the 1990s versus the 'Great Recession' today.)

INFLATION

Although earnings have risen in the region, the value of money has fallen at the same time. According to the Bureau of Labor Statistics, inflation over the last ten years has been so high as to more than nullify the above cited gains. To keep up with inflation from 1998 to 2008, a household earning $64,095 would have to earn $72,794 in 2008. [28] Given that the true inflation rate—that experienced by households[29]—tends to lead the official rate (the federal government tends to understate true inflation for political reasons), the loss in real earnings may be double the $2,157 difference between the actual income of households in the region and what they would have earned, had income merely kept up with inflation. Thus, in terms of real earning power, median household income did not stagnate over the last decade; it fell by a striking margin (likely on the order of $4,000.) The region is, in other words, getting poorer—and noticeably so.

[26] *According to Census 2000.*

[27] *CERC Town Profiles.*

[28] *Annual U.S. inflation from the Bureau of Labor Statistics, Consumer Price Index. http://www.bls.gov/data/inflation_calculator.htm.*

[29] *Many basic household expenses have undergone hyperinflation in the last ten years, doubling or more in price, e.g. housing,* fuel*, health care, and education.*

COST OF LIVING

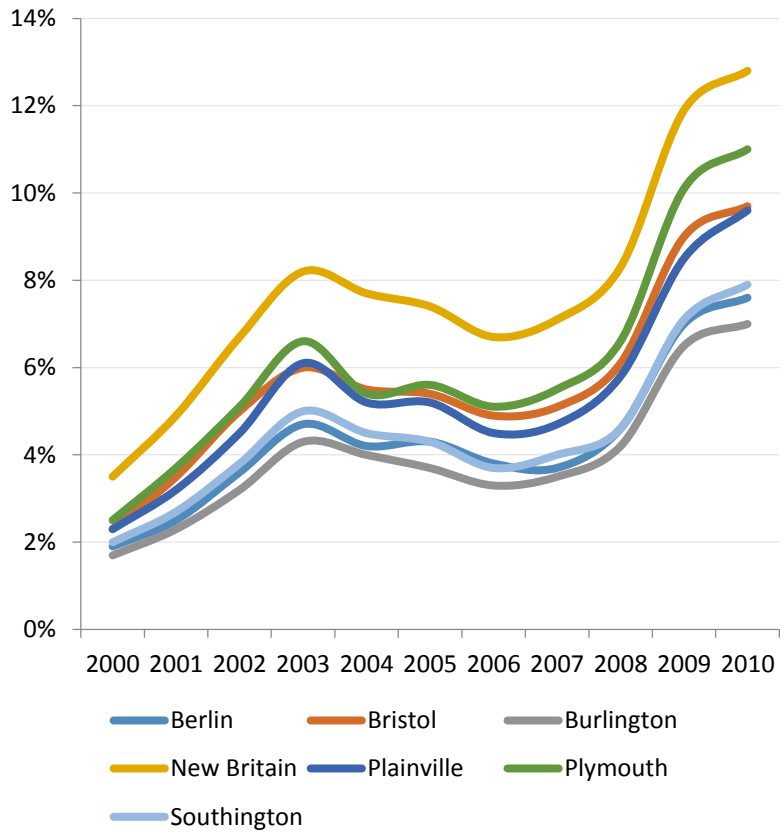
Households in the region may take in more money than their national counterparts do, but they must also give out more. Central Connecticut is no Gold Coast, but most of the region is a more expensive place to live than the nation as a whole.

Figure 16 (p. 89) maps the cost of living in the region relative to the nation. [30] Downtown New Britain, with a score of 91.3 is 8.7% cheaper than the national average; Burlington, at 129.9 is nearly 30% more expensive. The region's higher living expenses partially erode the advantage its higher pay gives. Households in the region are financially better off than the rest of the nation, but not a full 35% so.

UNEVEN DISTRIBUTION

Income is not evenly distributed across the region. *Figure 17* (p. 90) shows that census block groups[31] with the highest median incomes concentrate in the more suburban and rural parts of the region, Burlington, Berlin and Southington. Those with the lowest median incomes cluster in central New Britain.

Figure 14. Annual unemployment rates



[30] *Cost of living for the United States as a whole is 100. Data taken from Sperling's BestPlaces, Cost of Living Comparison. http://www.bestplaces.net/col/.*

[31] *As of 1999, per Census 2000.Census block groups represent an intermediate, submunicipal level of aggregation between Census blocks and tracts.*

Figure 18[32] (p. 91) maps the inverse of wealth, poverty. The figure reveals the highest concentration of low-income households (defined as below 150% of the poverty line[33]) in downtown Bristol and, above all, New Britain. Poor households exist in other parts of the region; however, unlike in these two areas, they are not visibly concentrated. Employment is the primary source of most households' income. Employment rates therefore have a large effect on the economic well-being of households throughout the region. *Figure 14* reveals that unemployment rates have climbed over over the last three years in all of the region's cities and towns. This corresponds to the onset of the 'Great Recession.' While rates have risen more or less in parallel across the region, New Britain and, to a lesser extent, Plymouth, Bristol, and Plainville began at a higher baseline. (Even in the best of times, unemployment was a problem for New Britain.) As a result, unemployment rates are substantially higher in these communities—as of this Plan, they top 10% in all four communities. This suggests that households in these four areas may be experiencing considerably greater financial duress.

OUT-OF-DATE STATISTICS

As the past few years have demonstrated, the economy can turn upside-down seemingly overnight. Yet with the exception of unemployment statistics, economic data often suffer from considerable lag. (The Census is held once every ten years, for instance.) As a consequence, the data get out-of-date. The last Census was conducted at the azimuth of the go-go '90s. As a consequence, the data portray what could be described as *best-case* scenario for the economy; they do not reflect the soberer reality that reigns as of this Plan's writing. Because of this, the conservative assumption should be that the situation on the ground is significantly worse than most of the statistics educed herein would otherwise lead one to believe.

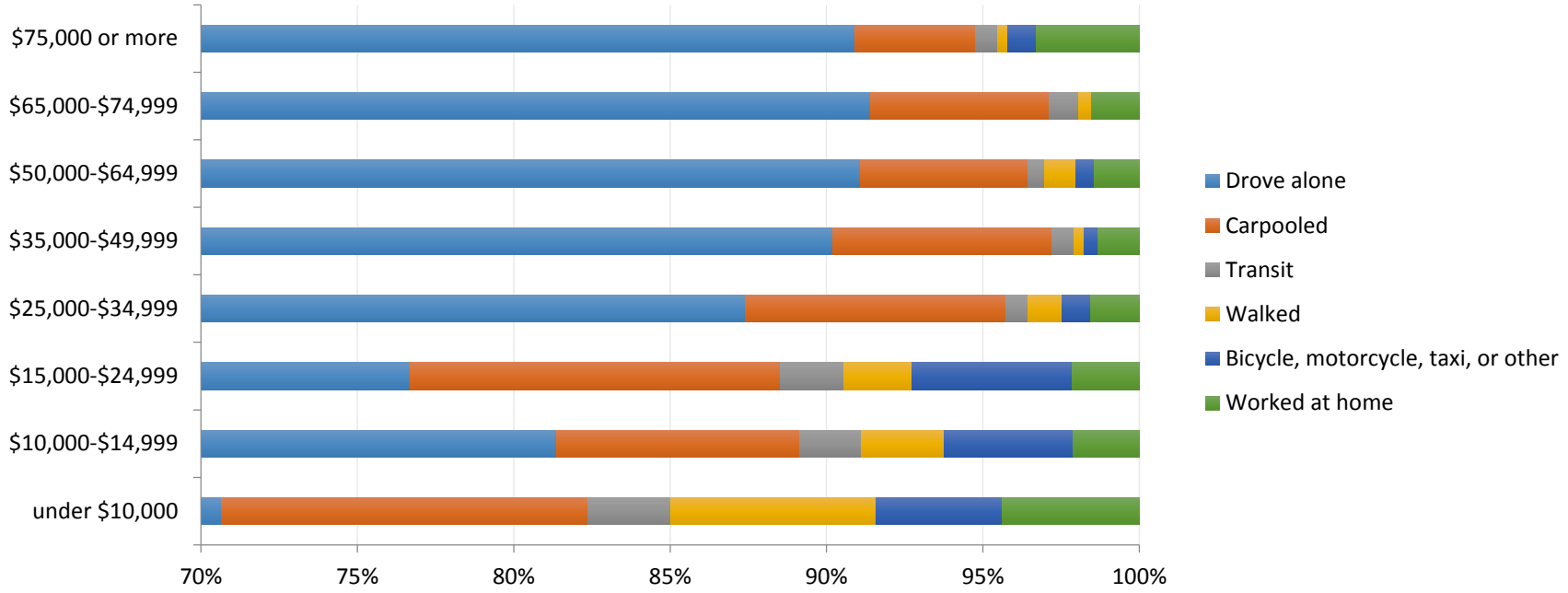
RELEVANCE

In recent years, the region has developed physically, with forests and farms giving way to subdivisions and strip malls. While this style of development yields some benefits, it also comes with steep costs, such as congestion, pollution, urban blight, and a loss of ecosystem services. Many of these problems are passed on as hidden costs: while they cost society as a whole, nobody in particular pays for them.

[32] *As of 1999, per Census 2000.*

[33] *In 1999. One-and-a-half times the federal poverty line is generally considered a more realistic measure of poverty than the poverty line itself, due to the latter being set artificially low.*

Figure 15. Travel mode by income group



However, not all costs are so hidden. New buildings cost money, as do cars and the fuel to drive the lengthening distances between them, and roads to link them. Yet as the region has grown physically, as the foregoing discussion reveals, it has failed to do so economically. Income has stagnated at the same time that the cost of living has exploded. (Housing roughly doubled in price in the last decade; health care and education have experienced even sharper hyperinflation.)

These trends affect, and are affected by, the transportation system. Stagnant or declining income has left households and communities with less to spend on preserving, maintaining, and improving the transportation system, from the private domain (automobiles, fuel, etc.) to the public (infrastructure, services, etc.) Unfortunately, like in housing, health care, and many other critical needs, costs have also risen in transportation. Fuel, insurance, and construction materials climbed in price. Alternatives to driving such as walking, biking, and transit have served as a release from this price pressure, especially for low-income

households. However, as *Figure 15* shows, even the poorest of the region's poor—those least able to afford a car—have become automobile-dependent.

Moreover, the region's continued sprawl is likely to exacerbate this problem, forcing households to travel longer distances, spend more time on the road (versus productively), and own more cars, as well as driving municipalities and the State to add capacity. In short, sprawl and a stagnant economy have given rise to a situation where needs have grown as means have shrunk.

Given the high cost of both private and public investment in transportation (owning a car in the state runs about $10,000 per year; highways can easily top $1 million per lane-mile), if the economic welfare of households and municipalities is to be maintained over the long-term, and transportation is not to crowd out all the other, essential slices of a shrinking pie, cost efficiency should be a primary concern. The public side of the transportation system—spanning all aspects from planning to operations, and reaching into related fields such as land use—should orient toward making better use of existing investments and to minimizing households' costs of and, where possible, need for transportation.

Figure 16. Cost of living by ZIP code area

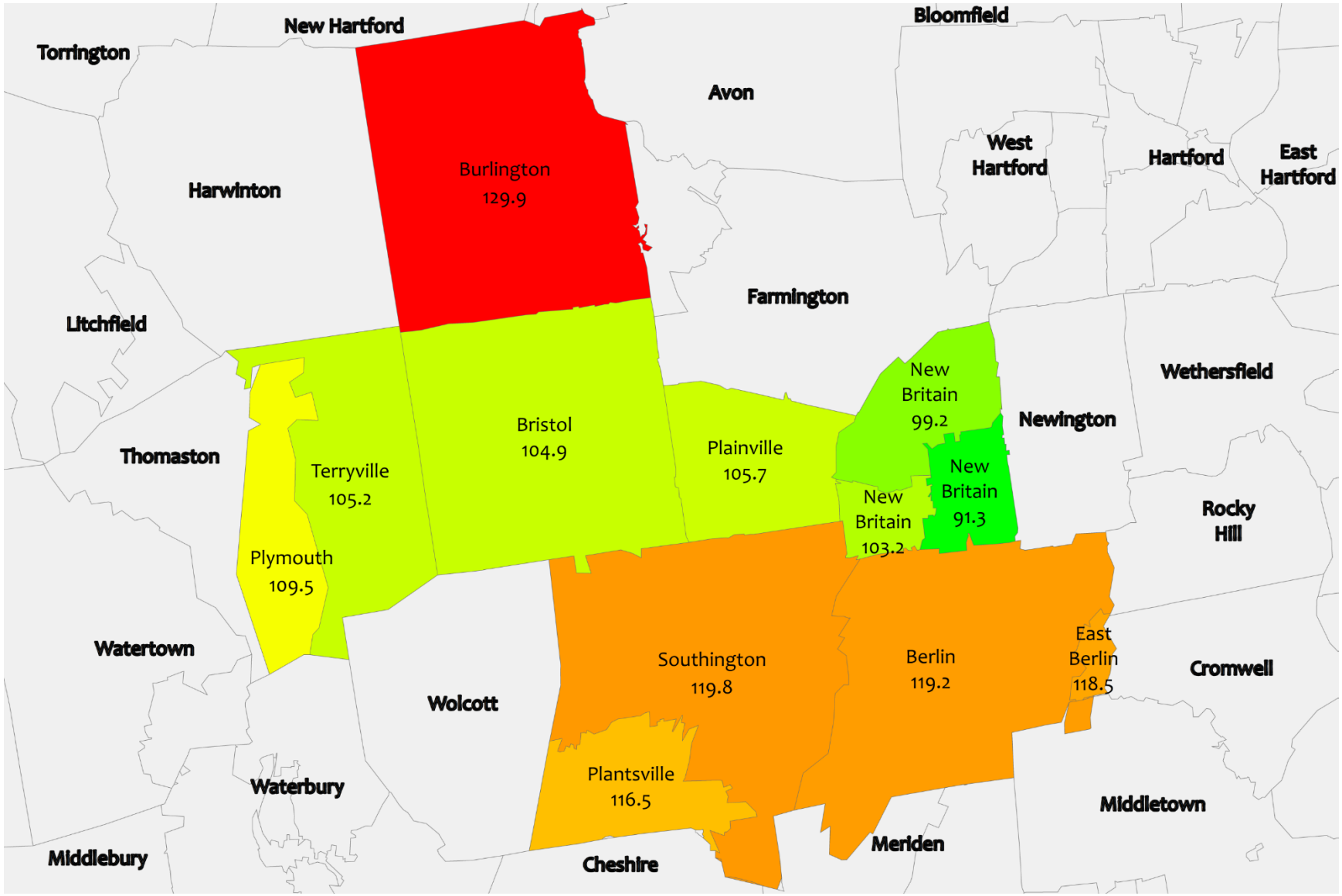


Figure 17. Median household income by Census block group

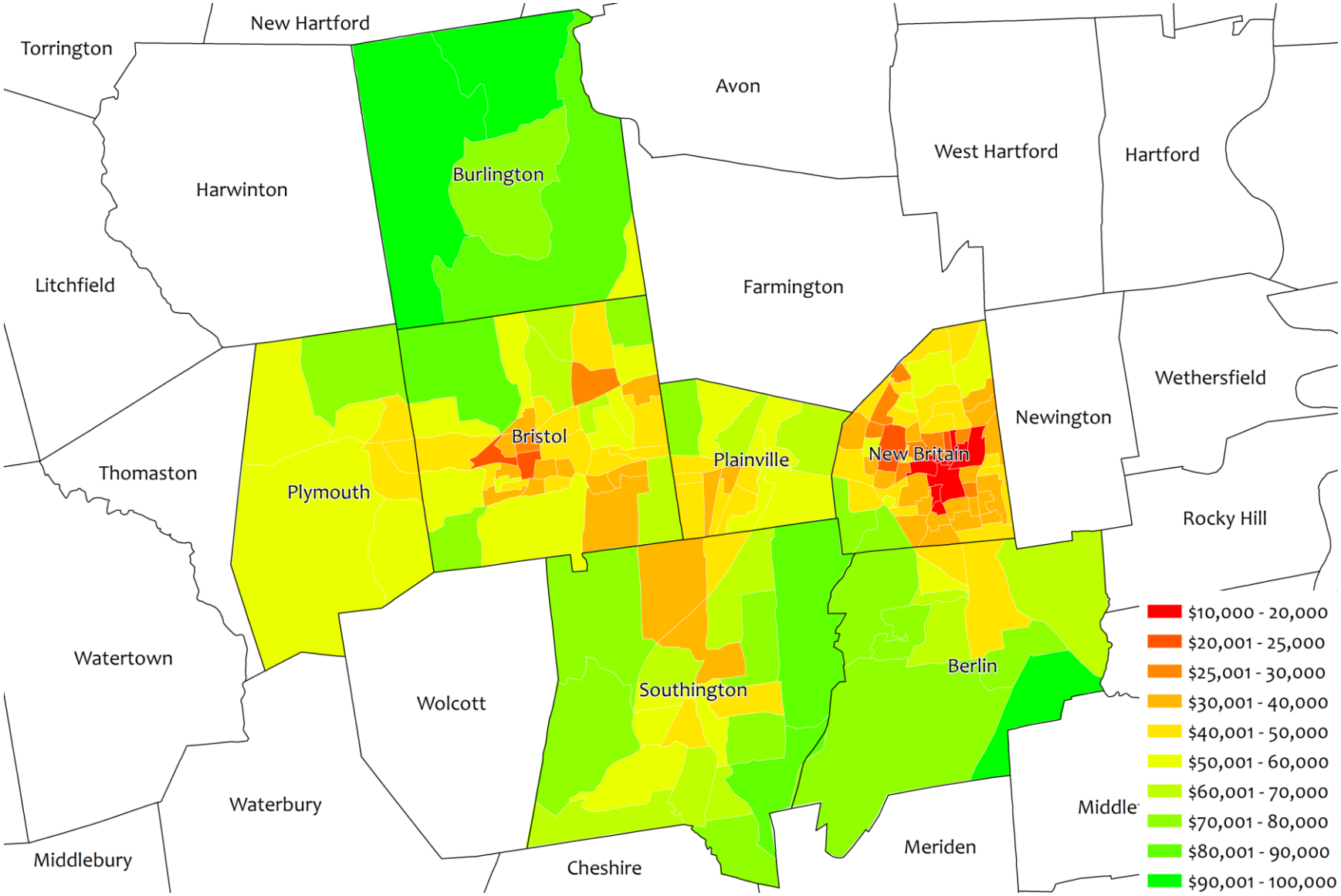
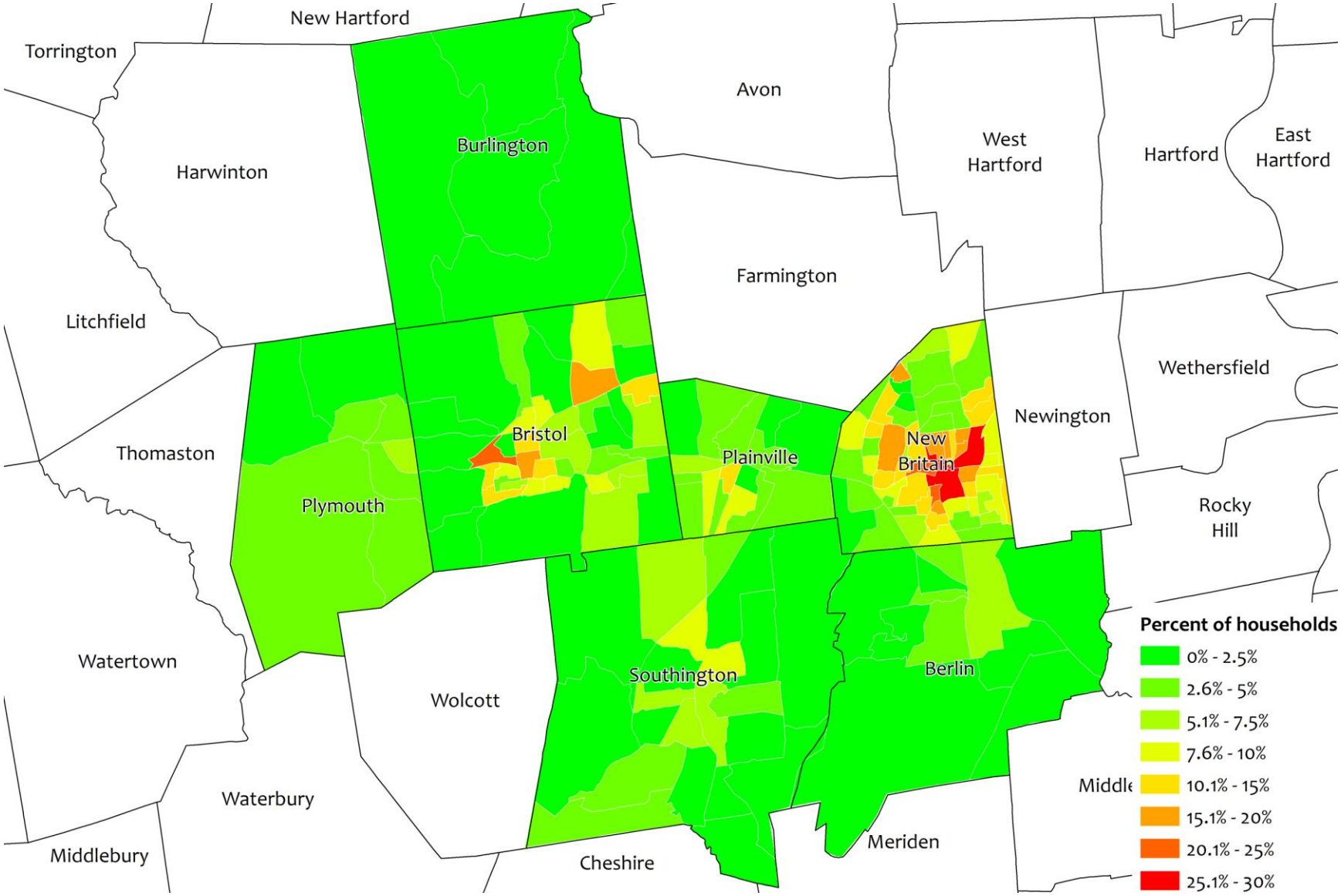


Figure 18. Households below 150% of the poverty level by Census block group



Age and disability

The age of a region's denizens is critical to its economic performance as well as its transportation needs. Children and the elderly tend to be more dependent, economically as well as in terms of mobility (many cannot drive); mid-and late-career employees tend to be more self-sufficient in both regards, though as late career employees transition into retirement, reliance on outside support increases. Young adults may be less self-sufficient than the middle-aged but offer good near-term prospects for income growth and reduced need for transportation options.

Table 15[34] shows that slightly over half the population of central Connecticut (53.2%) falls in 'workforce' age range, 25 to 64 years old. Two thirds of this group is aged 25 to 49. Together, Bristol and New Britain account for more than half of the persons between 25 and 64 in the region. The college age population (18-24 years old) is the smallest population segment. Its members are most prominently represented in New Britain, most likely due to the presence of Central Connecticut State University in the city. This segment of the population tends to make up a large share of transit ridership. They embody the characteristics of those with a high propensity to ride transit: high densities, low income and lack of automobile access.

Like income, age distribution is not consistent across the region. *Figure 19* (p. 94) graphs the deviations of cities and towns from the regional average for each age group. Aside from the crush of college-age persons in New Britain (and their relative absence elsewhere), perhaps the second striking trait is the overrepresentation of children and underrepresentation of old people in Burlington. The former may reflect the draw of the town's esteemed schools, while the latter may owe to the relative newness and automobile-dependent character of most development in town.

Much of the elderly (aged 65 and over) and disabled population cannot drive a personal automobile and are dependent on other means of transportation, such as public transportation. According to the Connecticut Economic Resource Center, just over one in seven persons in the region (15.6%) is age 65 or older. This is slightly higher than the 14.9% recorded in the 2000 Census for the region. As of 2000, one third (32.6%) of the mobility impaired population was age 65 and over. This makes over

[34] *Data from CERC.*

Table 15. Age distribution

Age	Berlin	Bristol	Burlington	New Britain	Plainville	Plymouth	Southington	% total
0-17	4,619	13,059	2,354	15,518	3,496	2,505	9,321	22.1%
18-24	1,364	5,296	580	10,009	1,425	1,141	3,102	10.0%
25-49	6,709	21,340	3,349	22,357	6,247	4,055	14,003	33.9%
50-64	4,189	11,469	2,025	11,157	3,636	2,414	9,538	19.3%
65+	3,208	8,884	765	10,819	2,632	1,543	6,067	14.7%
All	20,089	60,048	9,073	69,860	17,436	11,658	42,031	100.0%

one third of the region's entire population elderly and/or disabled. *Figure 20* (p. 96) plots the elderly and disabled[35] by Census block group, revealing high concentrations of both in Bristol and, in particular, New Britain.

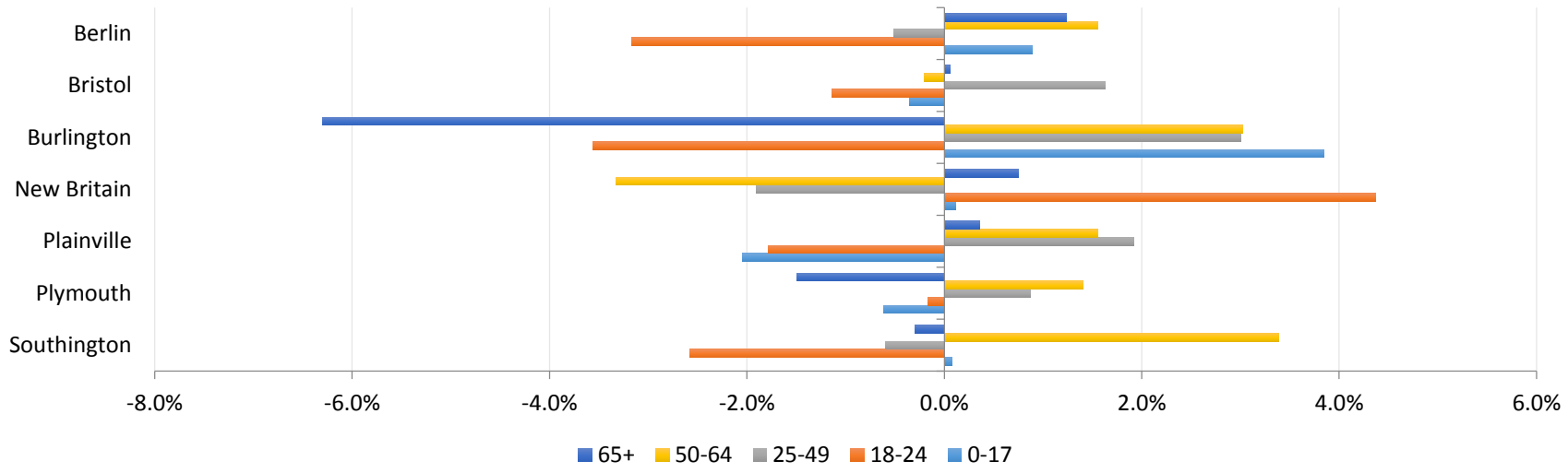
RELEVANCE

Although non-drivers exist in every age bracket, the young, old, and disabled face especial challenges when it comes to driving: whether from legal, physical, mental, and financial constraints or from choice, they drive at much lower rates than the general public. In central Connecticut alone, 85,000 people are less than 18 or at least 65 years old. Nearly two in five residents (36.8%) fall into either of these two groups. This figure indicates that, of all demographic factors, age has the greatest implications for the region's transportation system.

The abundance of minors, seniors, and disabled persons in the region—i.e., of non-drivers—suggests a demand and need for forms of transportation besides the private motorcar. Insofar as a transportation system responds to the demands and needs of its users and potential users, a correspondingly high level of investment in pedestrian and cyclist infrastructure as well as buses and trains is justified.

[35] 'Disabled' refers to the number of disabled persons in the civilian non-institutionalized population at least 5 years of age.

Figure 19. Age differences between the region and its municipalities



Investment in transportation infrastructure is not the only way to serve the roughly 40% of the public that does not drive. People demand or need transportation *per se*; the purpose of transportation is not to move people for mobility's sake, but to allow them access to the goods, services, and activities necessary to live a full life. While transportation can facilitate access, so, too, can community design. For instance, denser, mixed-use development can *eliminate* the need for transportation by providing for all of an individual's needs—homes, workplaces, schools, doctors' offices, shopping, entertainment venues, and parks—within a walking distance. Although community design has typically been treated separately from transportation infrastructure, in reality the two influence and are influenced by each other profoundly.

Because of this, one might expect those unable to drive to draw towards places where one can live without a car, such as downtowns and village centers. As the preceding maps show, this is the case in central Connecticut: the old, disabled, and poor cluster in downtown New Britain first and foremost, followed by downtown Bristol and, at some distance, Plainville, Terryville, and Southington centers. (See *Pedestrians and cyclists,* p. 102, for detail.) This suggests that, if one is to enhance the quality of life and socioeconomic participation of the most non-drivers at

the least cost, foot, bicycle, and transit investments as well as community design efforts should focus on these areas.

Figure 20. Disabled and elderly by Census block group

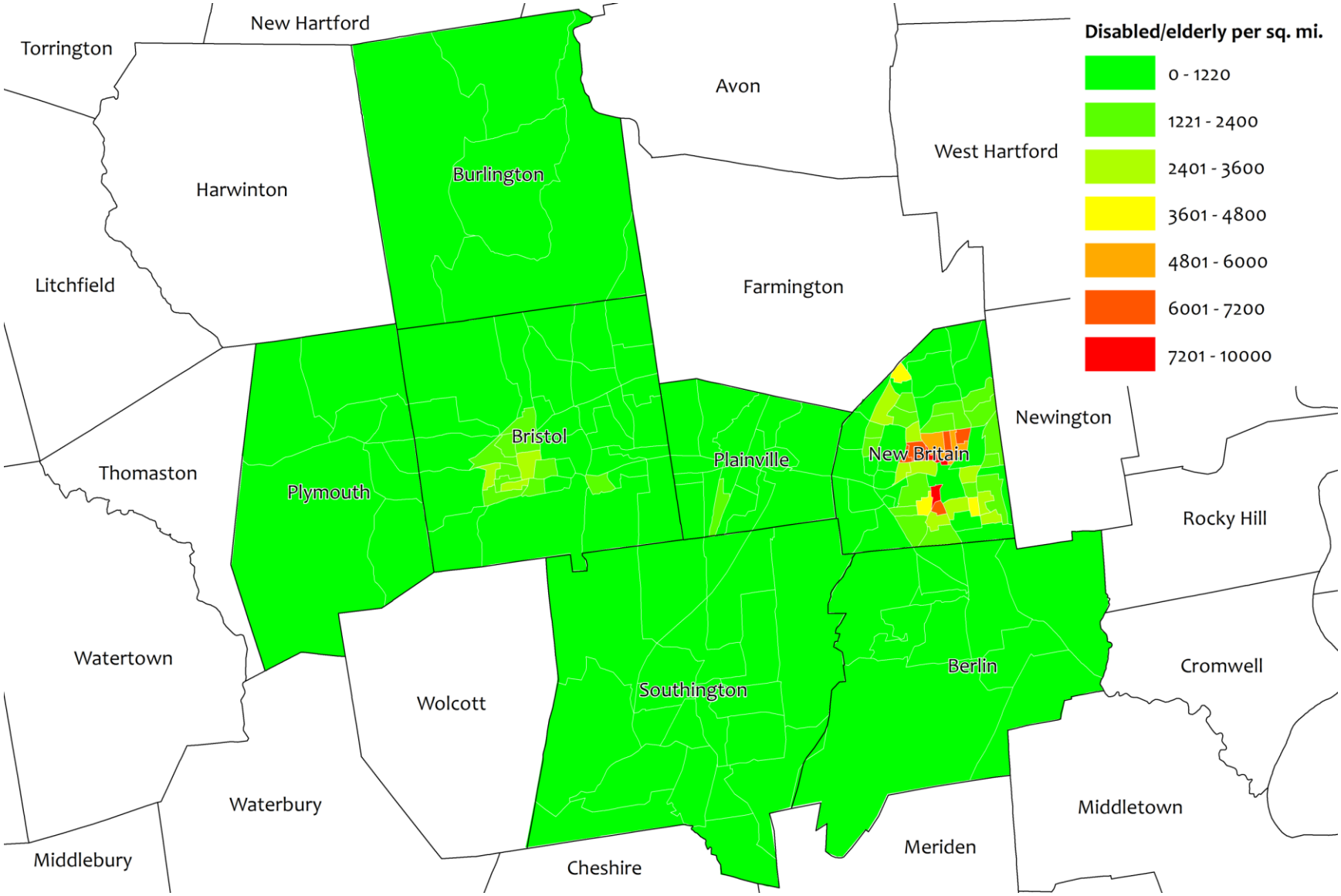
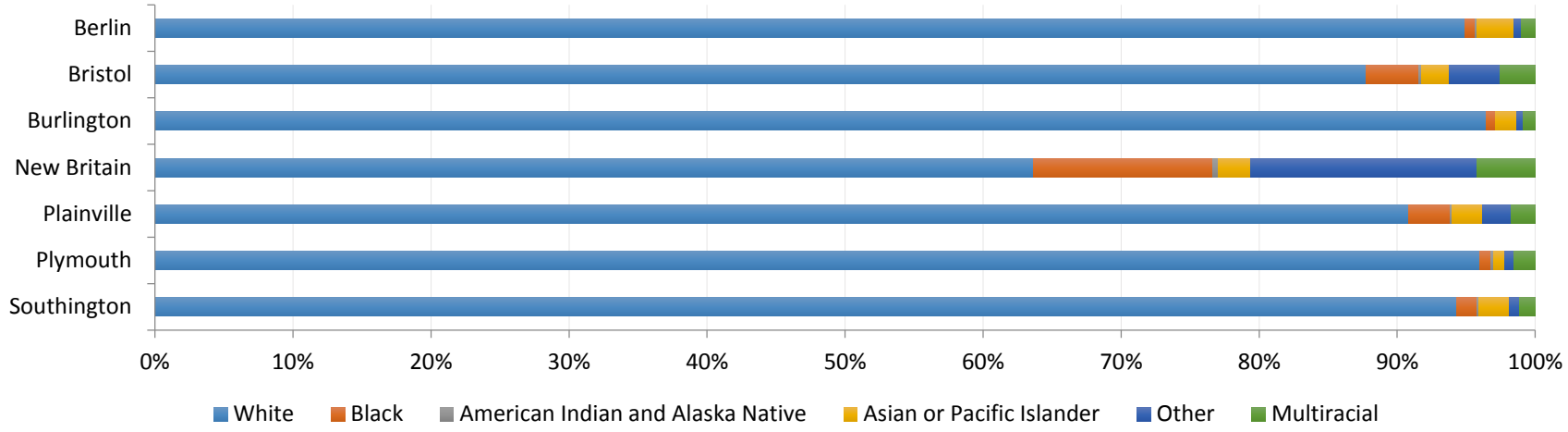


Table 16. Self-identified race



Race and ethnicity

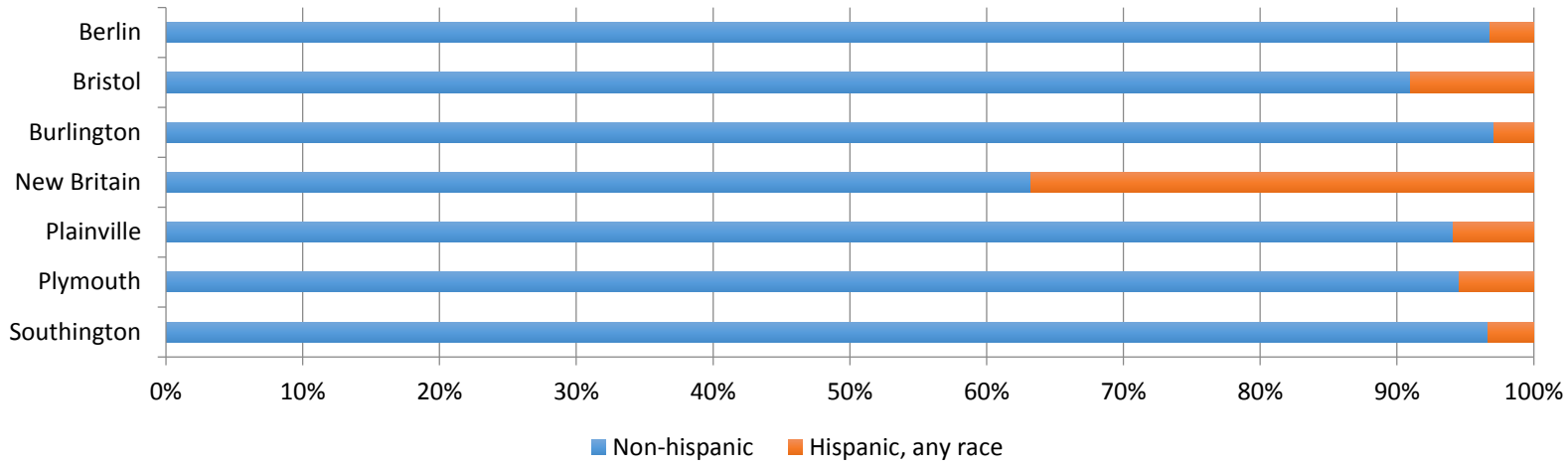
The region is diverse in terms of race. Roughly one in six of its residents (16.9%) asserts a racial identity of other than 'white alone.' The largest minority population in the region, 26,627 persons as of 2010, resides in New Britain. *Table 16*[36] shows that 36.4% of New Britons claim to be of non-white or multiracial ancestry. This is the highest rate in the region.

The distribution of Hispanics exhibits a similar pattern, with the largest absolute and relative populations also found in New Britain (26,934, or 36.8% of the city's total population). *Figure 21*[37] (p. 98) charts the incidence of Hispanic self-identification town-by-town in the region. Taken together, 15.5% of central Connecticut's residents of all races express a Hispanic ethnic identity.

[36] *Data from the U.S. Census Bureau, Census 2010.*

[37] *Data from the U.S. Census Bureau, Census 2010.*

Figure 21.Self-identified ethnicity (Non-Hispanic and Hispanic only)



Housing and household vehicles

Like many suburban areas, most of central Connecticut is zoned for single-family housing. That said, much of the region developed before the advent of the automobile; this legacy is visible as the dense, walkable neighborhoods of Bristol and New Britain. These neighborhoods often feature large numbers of multi-family structures such as duplexes and triple-deckers. More than two in five (41.5%) dwelling units in the region are part of multi-family structures. These units cluster in Bristol and New Britain. As *Table 17*[38] shows, New Britain is the sole municipality in which a majority (65.3%) of the units is not single-family.

Households in the region own an average of two cars. However, there is considerable variation in this statistic. Bristol and, in particular, New Britain have large numbers of carless households. Indeed, as *Figure 22* (p. 100) shows, a *majority* of households in parts of New Britain do not own a car.

[38] *Data from CERC. "Single family-detached" includes mobile homes.*

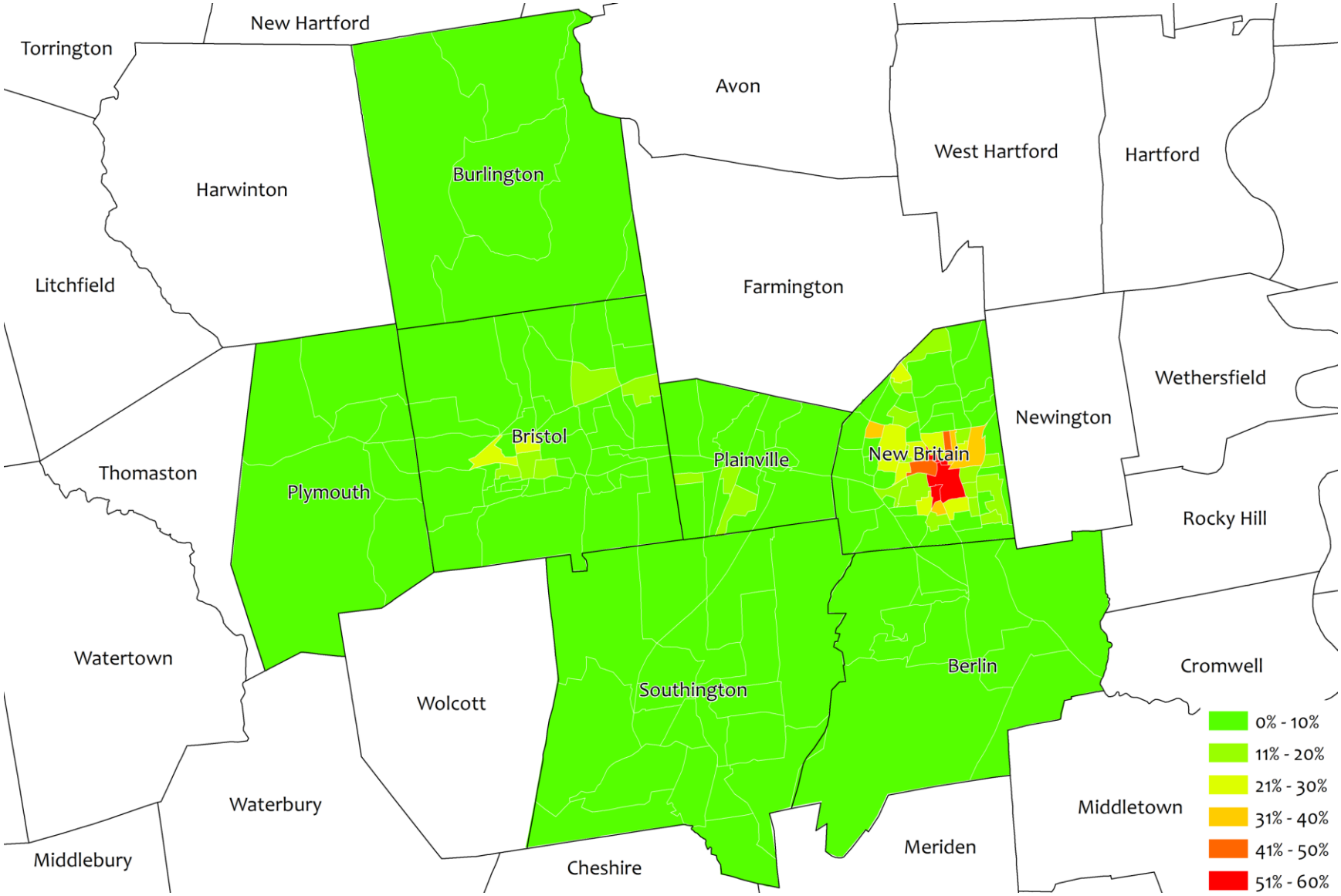
Table 17. Housing type

Municipality	Dwelling units	Single-family detached	Multi-family/attached
Berlin	7,918	6,675 (84.3%)	1,243 (15.7%)
Bristol	26,918	15,478 (57.5%)	11,440 (42.5%)
Burlington	3,246	3,080 (94.9%)	166 (5.1%)
New Britain	31,212	10,799 (34.7%)	20,413 (65.3%)
Plainville	7,898	5,126 (64.9%)	2,772 (30.1%)
Plymouth	4,859	3,669 (75.5%)	1,190 (24.5%)
Southington	16,704	12,979 (77.7%)	3,725 (23.3%)
Total	**98,755**	**57,806 (58.5%)**	**40,949 (41.5%)**

RELEVANCE

The use of automobiles is related to age, ability, and income. As discussed under *Age and disability* (p. 92), the young, the old, the disabled, and the poor are less able to own and drive a car. Because of this, what was said in that section applies here. However, the rates of household carlessness and single-car ownership by households in certain parts of the region, specifically downtown New Britain, is even higher than one might predict based on the demographic and socioeconomic data presented there. Residents of these areas are unable to profit from autocentric development; if they are to remain meaningfully integrated into the socioeconomic life of the region, they must either be provided cars (and chauffeurs) or have access to useful and usable pedestrian, cyclist, and transit infrastructure, as well as access to the full range of goods, services, and activities that others in the region enjoy (i.e., livable communities).

Figure 22. Percentage of households that is carless



Systems

This chapter lays out in brief the region's transportation system with an eye towards identifying and addressing the issues the system experiences today, tomorrow, and in the years to come.

Pedestrians and cyclists

FACILITIES

SIDEWALKS AND STREET CROSSINGS

As CCRPA found in its 2005 Plan for Transportation and Alternative Health (CCPATH), sidewalks are common in the denser parts of the region, the Bristol and New Britain downtowns. Sidewalks form relatively complete networks in these areas. Sidewalks are less frequent elsewhere in the region. In the village centers of Kensington, Plainville, Southington, and Terryville, as well as in the more suburban quarters of Bristol and New Britain, the sidewalk network is incomplete, with gaps and missing facilities, such as for safe crossing of streets (e.g. pedestrian signals, islands, chicanes, and crosswalks.) In the most rural parts of the region, which includes most of Berlin, Burlington, and Plymouth, provisions for pedestrians (and cyclists) are by and large missing. *Figure 23*[39] (p. 103) maps municipal sidewalk networks as of 2005.

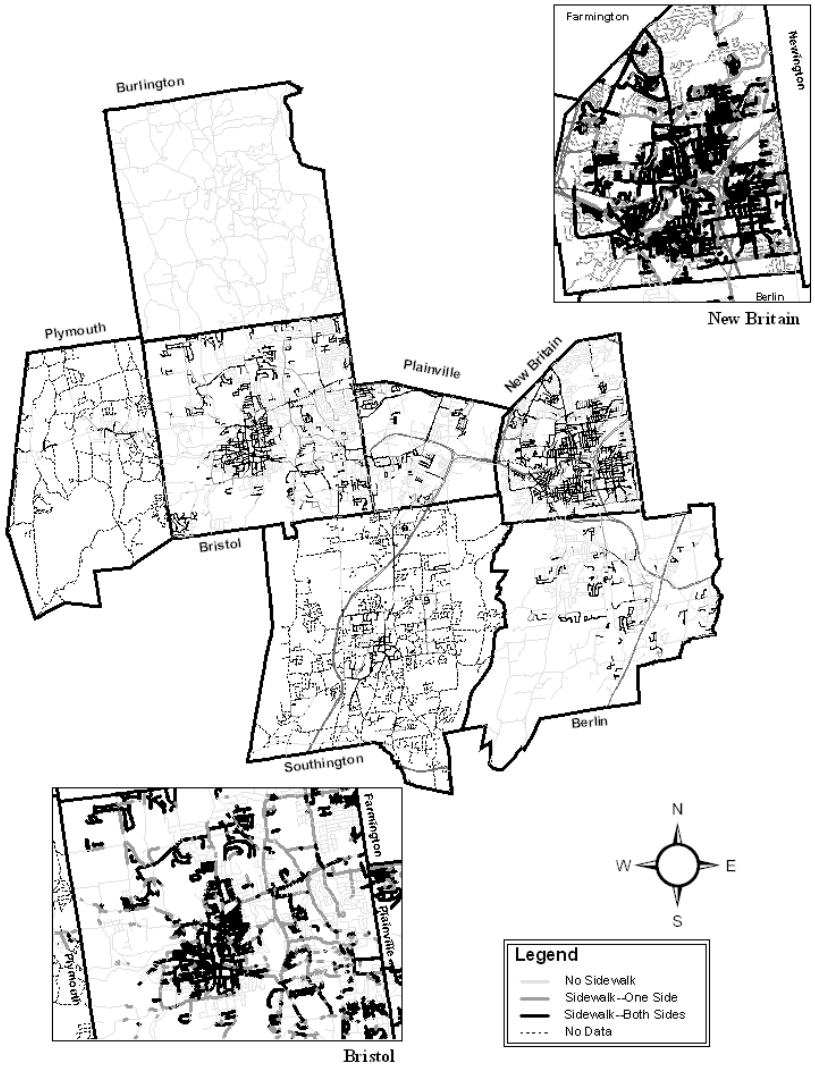
Although the completeness of a network is important to the functioning of a transportation system, it is not the only criterion by which a system should be judged. Efficiency is also a concern, as resources are invariably limited, and every investment in infrastructure has a price. A dollar spent in one place is a dollar not spent elsewhere, with, perhaps, a higher return. In addition, even when resources are available, investments should be sensitive to context, i.e. respond to local needs and respect the environment. Given the heterogeneity of the region, a 'one-size fits all' to transportation would be inappropriate. When it comes to sidewalks, the challenges the region faces differ by the pattern of development. They are roughly as follows:

1. Downtowns. Dense, mixed-use urban areas possess high concentrations of people and places, such as schools, workplaces, shopping centers, and entertainment venues. These dispose an area to high levels of non-vehicular transportation, provided that one can safely walk or bike. In downtowns with existing sidewalk networks, the emphasis should be on keeping them in a good state of repair (broken sidewalks and signals make for a hazardous environment that discourages walking), plugging gaps, and upgrading facilities to make for a more pleasant and inviting street experience.

[39] *This image is taken from CCPATH, the Central Connecticut Plan for Alternative Health and Transportation. It should be used for references purposes only, as the conditions depicted may no longer hold. (CCPATH has not been updated since publication in 2005.)*

2. Retail strips and office parks. Commercial developments tend to draw many visitors but often lack accommodations for non-vehicular users. Since most strips and office parks in the region perforce exclude a residential component—often due to single-use zones—these areas are constrained in the levels of walking and biking they can obtain. However, given the crowds which frequent these areas, they offer substantial potential to popularize walking and biking. This goal should guide investments in these areas. The emphasis in *existing* strips and office parks should be on retrofit, installing facilities where they are desirable but wanting (such as walkways between buildings and to nearby neighborhoods and transit stops), as well as infill, i.e. building homes around strips and office parks to create a market within walking distance of those businesses. *New* commercial development should designed on a human scale, so that they are easily accessible not just to automobiles but also to walkers and bikers from the ground up.
3. Suburban neighborhoods. Thanks to single-use zoning, many residential areas consist exclusively of single-family homes on relatively large parcels, on disjointed roads and dead ends. While this template insulates residents from the negative externalities of city living (e.g. through traffic and noise), it also means few, if any, destinations are within walking distance. As a consequence, sidewalks in these ar-

Figure 23. Municipal sidewalk networks

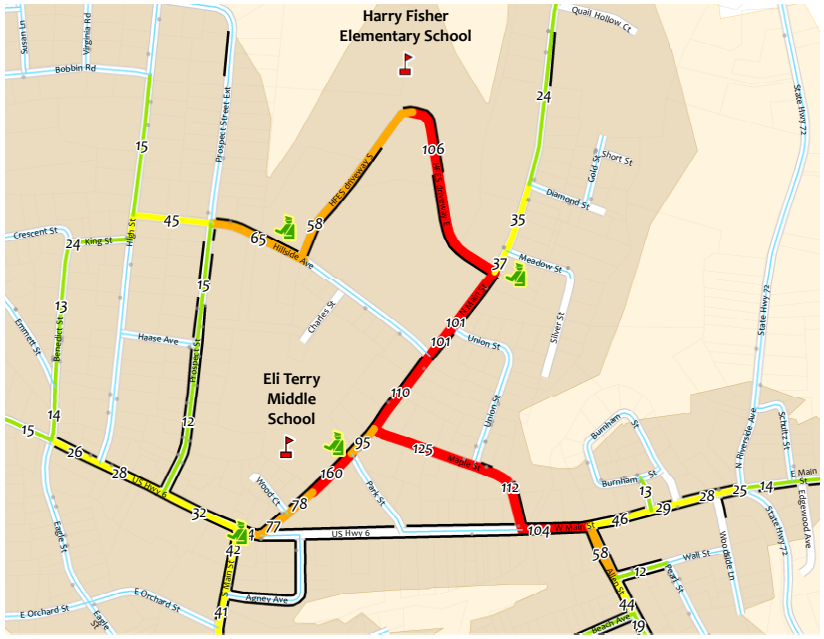


eas may not be prudent investments: not only are they unlikely to catalyze much non-motorized transportation, but the roads they would front carry such low volumes of traffic that they may serve as walking streets. In these areas, the emphasis should be on making streets work as *shared space* that welcomes vulnerable users such as pedestrians and cyclists. In other words, while sidewalks may not be necessary in most places,[40] *all* new residential streets should be built, and existing streets reconstructed, to calm traffic so that all users may pass without fear of harm.

4. Rural areas. The extremely low population densities and long distances of rural areas make it improbable that sidewalks and street crossings installed here will experience substantial use. Absent any overriding factor, these areas are poor candidates for cost-effective investment.

Despite the shortcomings identified by CCPATH, the region is making progress in certain places. Bristol, Plainville, and Southington have undertaken streetscape improvement projects that have calmed traffic and improved the pedestrian environment. All three communities as well as New Britain are in the process of planning further upgrades and enhancements (Main Street

Figure 24. Potential student walkers and new sidewalks by road segment



in Bristol, downtown in New Britain and Plainville, and Plantsville in Southington). In addition, Plainville, Plymouth, and Southington have undertaken a sidewalk construction projects with CCMPO under the umbrella of the Safe Routes to School program. *Figure 24*[41] (p. 104) presents a map of a pedestrian network analysis conducted for these projects.

[40] *Sidewalks and crossings will be merited in some places, such as on heavily-trafficked streets, streets that lead downtown or to commercial centers, or between proximate but disconnected streets, such as the ends of cul-de-sacs.*

[41] *Numbers reflect the total potential volume if all students in the neighborhood were to walk to school. Thick black lines indicate road segments lacking*

MULTI-USE TRAILS

The region is short on multi-use trails, which include bicycle paths and greenways. As of this Plan, trails exist in three locations in the region. These are the Farmington Canal Heritage Trail in Southington, which follows the former railroad right-of-way; the Farmington River Trail in Burlington, a spur of the Heritage Trail, and parts of Northwest Drive and Route 10 in Plainville. *Figure 2* (p. 26) depicts these. Although these facilities lie in close proximity to one another and could form the north-south spine of a regional pedestrian and bicycle network, they are disconnected at present. The project *Farmington Canal Heritage Trail* (p. 25) aims to remedy this by plugging the gaps.

When complete, the Farmington Canal Heritage Trail will give residents and visitors an invaluable alternative to the region's congested and often accident-prone roadways, including Routes 10 and 177. However, the trail's north-south axis is incongruent with the largest component of traffic in the region, which travels southwest-northeast, from Bristol through New Britain to Hartford. The trail altogether bypasses the region's two largest municipalities and those with the highest rates of walking and biking and lowest rates of vehicle ownership (Bristol and New Britain), failing to connect these cities with each other, Hartford, or with major trip generators in the region (such as CCSU and Westfarms Mall).

This suggests that, should the region desire walking and biking to become a real alternative to driving, at least one more multi-use trail will be necessary *in addition to* the Farmington Canal Heritage Trail. Happily, plans and concepts have been proposed to address these concerns. The New Britain-Hartford Busway is set to include a multi-use trail between its western terminus in downtown New Britain and Route 173 in Newington. This trail is slated to join on-road routes and West Hartford's Trout Brook trail; it should also pass within a mile or two of CCSU and Westfarms. To bolster safety and foster trail use, this Plan recommends building connectors between the trail and both destinations. *Figure 3* (p. 32) depicts these connections with dotted, green lines. To provide a link to Bristol and connect to the Farmington Canal Heritage Trail, this Plan also strongly urges the creation of an east-west trail between Bristol and the busway terminus in New Britain. Given topographic, infrastructural, and development constraints, the exact routing of this trail will like pose more of a challenge; however, its general course is shown in yellow in *Figure 2* (p. 26).[42]

but needing sidewalks; officer symbols show where traffic guards are recommended.

[42] The trail depicted follows the course of the existing trail line; a trail by rail may be possible; however, the diagram should is for illustration only and does not reflect a decision to collocate the facilities.

SHARED FACILITIES

None of the region's seven municipalities have designated pedestrian or bicycle route networks. The State's Bicycle and Pedestrian Advisory Board has identified at least two cross-state routes that pass through the region; however, they were selected without consultation of local stakeholders. What such identification will mean in terms of policy and facilities remains to be seen. These routes, which were conceived for recreational, long-distance cycling (e.g., 'century riding'), by and large wend their way along country roads; they tend to skirt downtowns, universities, commercial areas, and other potential hotbeds of commuter and utility cycling activity.

Neither the State nor the region's municipalities have made any physical or operational improvements to roadways besides the aforementioned streetscape improvement projects and multi-use trails: no bicycle lanes, shoulders, or sharrows exist in the region. This stands in contrast with cities and towns such as New Haven and Mansfield, which, through their expanding pedestrian and bicycle networks, have demonstrated that such facilities can and do work in Connecticut.

On the other hand, in areas with low pedestrian traffic but sidewalks, the latter often de facto serve as bicycle paths. Although some counsel against riding on the sidewalk, in places it can be appropriate and safer than riding on the road, provided that minimum conditions are met. (Sidewalks should be relatively empty of pedestrians or sufficiently wide to accommodate passing; curb cuts should be as level as possible and crossings, ramped; cyclists should travel at reasonable speeds, signal approach, and exercise caution when crossing roads.)

Sidewalks must be well-maintained and complete to ensure safe riding. Imperfections, such as cracks and bumps, can dash cyclists to the ground just as they trip pedestrians. In many cases, the injuries bikers sustain on a fall exceed those suffered by walkers in severity. (Cyclists' higher speeds, together with their foreshortened reaction times and the greater distance they have to fall, are to blame for the elevated risk.) In addition to surface conditions, sidewalk riders are particularly affected by contiguity. Sidewalks that turn to grass or mud, or that lack ramps at curbs, present hazards to riders. (These can cause bike riders to slide or come to an abrupt stop and fall.)

HIKING TRAILS

Parts of the region are rich in hiking and mountain biking trails. A map of long-distance woods trails in the region is printed *Figure 25* (p. 109) for reference. One of the country's eleven National Scenic Trails, which are trails that, on account of their especial natural beauty and preservation value, have been designated as a National Scenic Trail, passes through the region. This trail, the New England Trail, runs from Long Island Sound through Connecticut and Massachusetts to New Hampshire,

passing through Berlin, New Britain, Plainville, and Southington on the way.

Hiking trails, like all types of transportation infrastructure, constitute a network. Breaks in the network impair its utility and limit its use. While dead ends and cul-de-sacs can affect the efficient functioning of the transportation network, they never create impassable discontinuities. Such roads always connect to other streets that allow a way out or through. This is not the case for hiking trails. As *Figure 25* (p. 109) makes clear, many the trails in the region are discontinuous. These include the Tunxis Trail, whose northern and southern sections in Burlington and Southington Bristol interrupts, and the Mattatuck Trail, which nearly but not quite connects with the Tunxis in Wolcott. Given the proximity of these trail heads and the open space and undeveloped land that lie between them, it may be feasible to forge connections among them to make for a continuous and integrated trail network.

Opportunities also present themselves for the development of new trails, above all to the north and west of the region, where tracts of undeveloped land remain, but also to the region's east, whose ridges the New England Trail traces. Preservation and promotion of existing trails as well as new trail building in these areas could bring a host of benefits. These include enhancing residents' quality of life; drawing visitors and tourists; and promoting economic development; as well as assisting in the preservation of open space and in the maintenance of ecosystem services. *Protection and expansion of hiking trails* (p. 30) describes two projects that have been identified as of special significance to the region, preservation of the New England Trail and the creation of the 'Leadmine Trail' (see p. 30). *Figure 25* depicts both of these projects, in addition to all existing and potential long-distance trails and associated connectors in the region.

MAINTENANCE AND MANAGEMENT

Sidewalks, bike paths, and other forms of pedestrian and cyclist infrastructure, like roads and railways, require maintenance and management if they are to function safely and efficiently. For the most part, the facilities that exist in the region are in satisfactory condition. However, individual sites do exhibit the following problems:

1. Environment. Many roadways seem to have been designed with the automobile in mind, with pedestrian and cyclist facilities an afterthought. The result is streetscapes that are hostile or unsafe to these users. Many sidewalks, especially those along multi-lane commercial strips, lack functioning pedestrian crossing signals, are broken up by curb cuts (e.g. for drive-thrus), and are separated from the roadway by no more than the curb.

2. Connectivity. Many pedestrian and cyclist facilities have been installed piecemeal, often on a parcel basis. As a consequence, gaps interrupt the sidewalk network. Some of these occupy critical locations, including to and from popular destinations, such as schools, parks, and shopping and employment centers.
3. Repairs. Deferred maintenance on trails in certain areas has led to the appearance of cracks, humps, and other impediments. To some, these may be an annoyance, but to those with limited mobility, the frail, and persons traveling at higher speed (e.g. joggers and bikers), these can pose a real obstacle or hazard.
4. Snow removal. Municipalities do not plow most pedestrian and cyclist facilities in the region. That task is left up to property owners. While this saves money, it also treats pedestrians and cyclists as second-class citizens vis-à-vis car drivers, whose roads municipalities do clear: while some owners shovel straightaway, others tarry. The result is a dysfunctional network of unsalted slicks and snowdrifts that render sidewalks, crossings, and the like useless and force pedestrians to walk in the streets.

These problems, while isolated, bespeak a dearth of lasting attention to pedestrian and cyclist issues. No concerted efforts have been taken to better the pedestrian and cyclist experience in the region. Although CCRPA did identify and map some of the above facilities and deficiencies for CCPATH in 2005, the plan constitutes a one-time snapshot of non-motorized transportation and not an ongoing program of improvement. A systematic approach, as is practiced by the region's municipalities and the State with regard to facilities for *automobiles*, has been lacking. However as *Complete Streets implementation* (p. 23) lays out, this is set to change: with the enactment of the State's 'complete streets' law, pedestrians and cyclists are to be integrated into all stages of municipalities' and the State's road management. Further hope for improvement is given by the advent of technology like SeeClickFix[43], which dramatically simplifies the process of gathering feedback from transportation system users, including pedestrians and cyclists, tracking issues, and providing responses. Although such technology is not widely used in the region, given its popularity and deployment in nearby communities, there is reason to expect that it may be in the near future.

[43] *See http://seeclickfix.com*

Figure 25. Hiking trails in the region

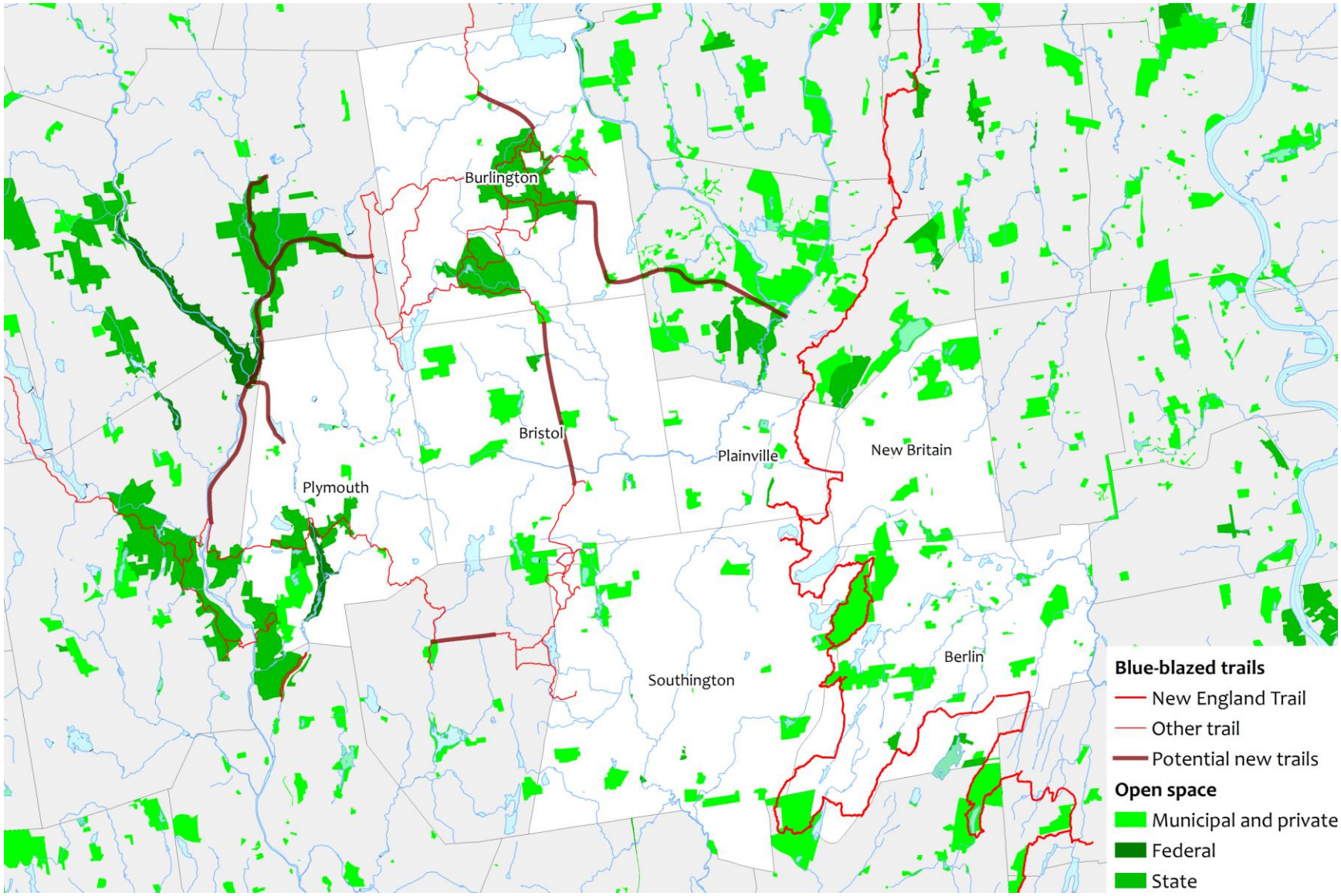
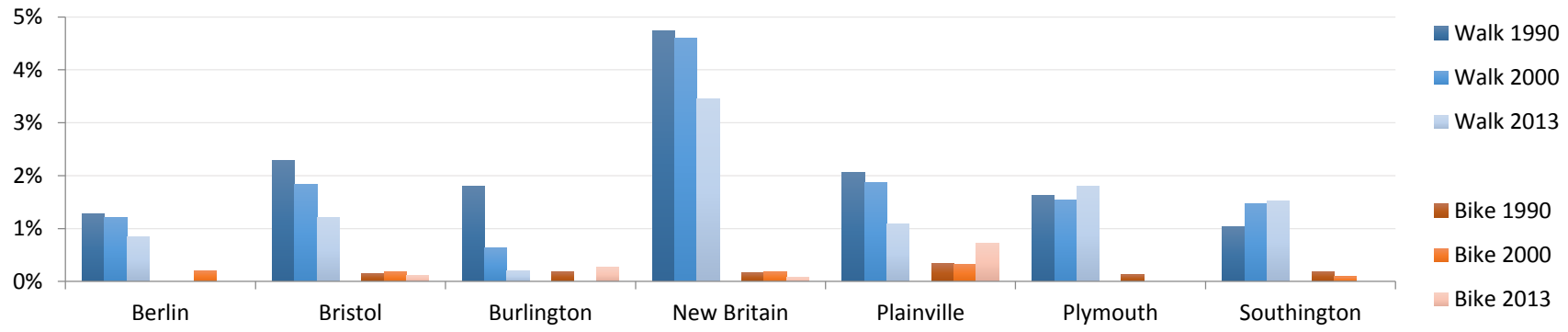


Figure 26. Walking and biking over time



WALKING AND BIKING

RATES

The prevalence of walking and biking is hard to quantify. In contrast with the traffic count programs run by DOT and CCMPO, nobody counts pedestrians and cyclists. Statistically, they are invisible. The only source of information on them in the region is Census' commute to work data. *Figure 26* shows the percentage of workers aged 16 and over who commute to work by foot or bicycle in the region's municipalities.[44] Private automobiles account for the lion's share of transportation in the region. Even in New Britain, the densest of the region's municipalities, and thus putatively the most ideal place for non-motorized transportation, 3.5% of commuters go by foot or bicycle. In Burlington, just 0.5% do. With figures this low, one *could* argue that the region is justified in not providing more comprehensive facilities to pedestrians and cyclists. On the other hand, safety is often cited as the first priority in highway funding. Given that pedestrians and cyclists account for approximately fifteen percent of all crash fatalities in the state and region, it could also be argued that facilities for these vulnerable users have been grossly underfunded.

Without such large-scale investment, trends in walking and biking over time are mixed: walking seems to have decreased,

[44] *Legend numbers refer to the years 1990, 2000, and 2013, respectively. Data from the U.S. Census Bureau, 1990 Census, Census 2000, and American Community Survey 2008-2013.*

while biking has increased as a share of all commutes. This may reflect the ongoing decentering of communities in the region through pedestrian-unfriendly suburban and exurban sprawl as well as the growing popularity of cycling.

The prevalence of these modes in the region has changed over the last two decades. As the *Figure 26* shows, there is no clear trend in walking—New Britain and Southington have lost sharply in that regard, while Bristol has gained slightly. Cycling has grown substantially and consistently in Bristol and New Britain. However, overall rates of walking and biking remain abysmal. Several reasons may be given for the low levels of walking and biking. These include:

1. Density and separation of uses. Most development in the region since the mid-20th century has taken a sprawling form that strews buildings over distances that are hard to walk or bike (as well as serve via transit) *and* intentionally separates origins from destinations. (Single-use zoning isolates homes far away from schools, workplaces, and shopping.)
2. Inadequate transit. The movement of residences and businesses to locations that are difficult to serve via transit creates a vicious circle, whereby a shrinking pool of riders begets service cuts, which in turn further depresses ridership, leading to additional cut. Since most transit riders use their own legs to get to the bus or the train, the loss of access to these modes also entails a corresponding diminution in walking and biking.
3. Unfriendly environments. The flipside of sprawl has been urban renewal. Under this banner, entire downtowns and transportation systems have been rebuilt. Until recently, most such 'renewal' has cloven to a modernist template, in which public spaces are reconstructed to prioritize speed, distance, and private automobiles. In the process, amenities or provisions for pedestrians and cyclists were sacrificed, and vast transit systems were dismantled, resulting in an urban environment inimical to any form of transportation but driving (and flying).

POTENTIAL

Although this list may daunt, it also implies that levels of walking and biking may be a cycle of sorts. The less people walk or bike, the fewer resources will be given to facilities for pedestrians and cyclists, and, as a consequence, the less people will walk or bike! This suggests that the opposite may be true, namely that 'if you build it, they will come.' A low baseline should not serve as a pretext for inaction. As projects from Singapore to Copenhagen, from Portland (Oregon) to New York City, and from Blueback Square to the Farmington Canal Heritage Trail demonstrate, investments in pedestrian and cyclist facilities, when coupled with well-planned land use, can make

walking and biking viable alternatives to driving. They can literally transform the face of transportation.

The potential for walking and biking in the region varies. Some communities, such as Burlington and Plymouth, may never have high levels of either activity due their lack of density. (Not only do relatively few people live there, but the destinations that those people frequent tend to lie beyond walking and biking distance.) Others, such as New Britain and Bristol, with their historic urban cores and higher, mixed concentrations of residences, workplaces, stores, schools, and active recreation are naturally more suited to and thus offer more potential for non-motorized use.

Historically, these areas seethed with non-motorized transport. Over the last several decades, these areas have grown increasingly hostile towards pedestrians and cyclists as transportation and planning have focused on the automobile. However, despite these setbacks, Bristol and New Britain (and, to a lesser extent, downtown Plainville, Terryville, and Southington) still may be fertile ground for pedestrians and cyclists. As *Figure 27*[45] (p. 113) shows, both Bristol and New Britain continue to boast a high concentration of amenities (libraries, shops, parks, schools, etc.) in their downtowns. With proper planning and investment, these areas may once again enjoy high foot and pedal traffic.

SAFETY

By themselves, walking and biking are relatively safe activities: the risks by and large consist of bruises, scrapes, and the occasional broken bone. However, few people have the opportunity to walk or bike in a vehicle-free vacuum. Most walking and biking occurs around and in a transportation system that has been designed to facilitate the efficient circulation of motor vehicles. The great discrepancy in mass and speed between motor vehicles and pedestrians and cyclists puts the latter at significant risk. As the chart *Figure 29* (p. 115) shows, collision speeds at which car drivers and passengers would survive often more likely than not result in death for vulnerable users such as pedestrians and cyclists.

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[45] *Walk Score "calculates the walkability of an address by locating nearby stores, restaurants, schools, parks, etc." According to walkscore.com, the technique works by "award[ing] points based on the distance to the closest amenity in each category. If the closest amenity in a category is within .25 miles… [it] assign[s] the maximum number of points. The number of points declines as the distance approaches 1 mile… no points are awarded for amenities further than 1 mile. Each category is weighted equally and the points are summed and normalized to yield a score.... The number of nearby amenities is the leading predictor of whether people walk." The categories in the legend in Figure 27 are defined as follows: Walkers' paradise, "Daily errands do not require a car"; Very walkable, "Most errands can be accomplished on foot"; Somewhat walkable, "Some amenities within walking distance"; Driving only, "You can walk from your house to your car."*

Figure 27. Walkscore map of Bristol and New Britain

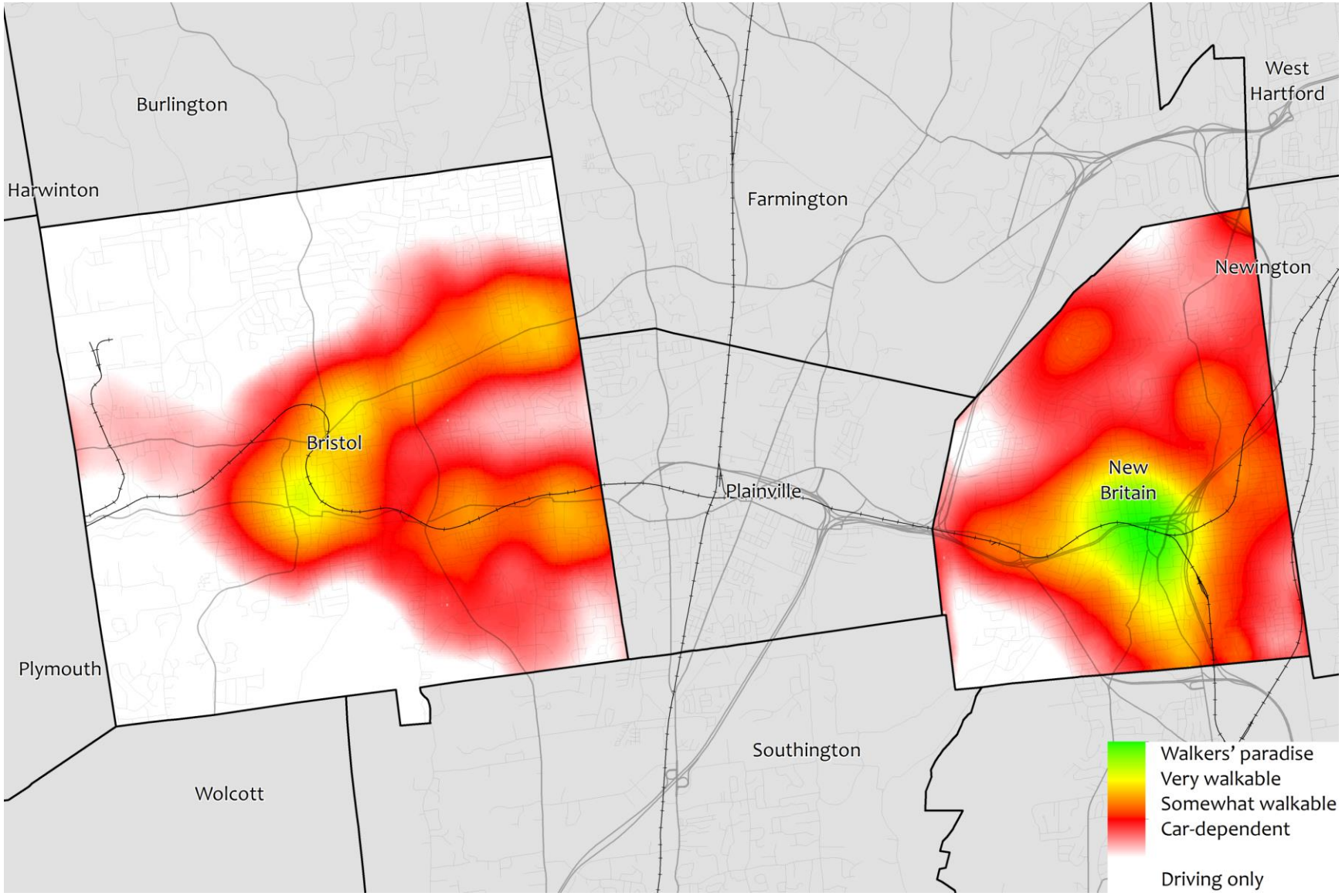


Table 18. Vulnerable user injuries and deaths

Municipality	Pedestrians hurt	killed	Cyclists hurt	killed
Berlin	4	2	8	0
Bristol	53	1	16	0
Burlington	2	0	2	0
New Britain	96	4	37	0
Plainville	15	0	15	0
Plymouth	3	0	3	0
Southington	14	1	14	0
Total	**187**	**8**	**95**	**0**

Every year, over one thousand pedestrians and cyclists are injured or killed in Connecticut. Some of these accidents occur in central Connecticut. *Table 18* (p. 114) tallies walkers and bikers injured or killed in the region by municipality over the three year period from 2011 to 2013. During this period, a total of 290 were reported injured or killed as a result of road accidents.[46] This is an increase from the 274 reported injuries and fatalities from the previous LRTP (using 2007-2009 data).

The two putatively most pedestrians and cyclist-friendly municipalities in the region, Bristol and New Britain, have the worst safety records for such users. Part of this may reflect a higher incidence of walking and biking in those cities (and thus potentially bespeak even lower per-mile walked or biked accident rates); however, evidence indicates that as the prevalence of walking and biking grows, relative *and* absolute accident rates tend to fall. Whatever the truth of the matter, this Plan holds

[46] *The actual number of casualties may be higher due to missing or incorrect reports.*

Figure 29. Probability of death versus impact speed

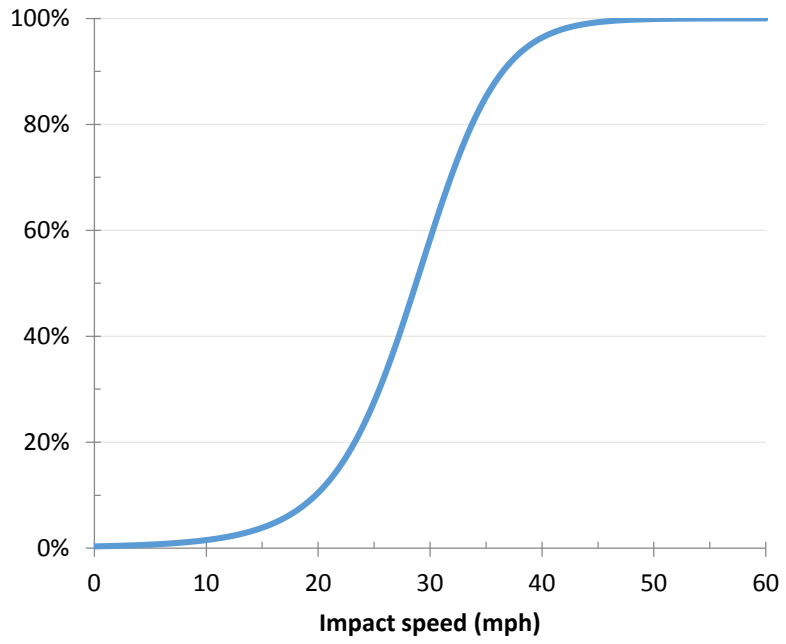
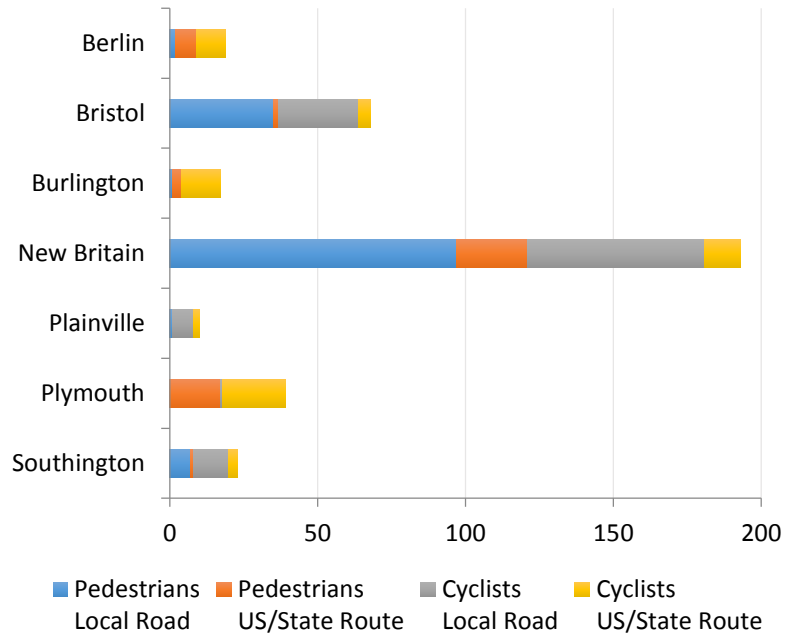


Figure 28. Collisions involving pedestrians/cyclists by road type



that every road casualty is needless, preventable, and grounds for action.

As the table suggests, such 'vulnerable user' casualties are not spread evenly across the region and its roads. As *Figure 28* (p. 115) shows, while pedestrians and cyclists tend to get hurt or killed most often on state and U.S. routes in Burlington and Plymouth, in Bristol and Southington, local roads are the problem. This suggests that different approaches to addressing these safety issues may be needed.

In addition, some areas appear to be hotspots, more prone to collisions and riskier to pedestrians and cyclists. *Figure 30*[47] (p.

[47] *Covers the five-year period from 2002 to 2006. Local roads are not included. Fatalities and injuries on limited-access expressways (e.g., Interstate 84) not depicted due to their prohibition on pedestrian use.*

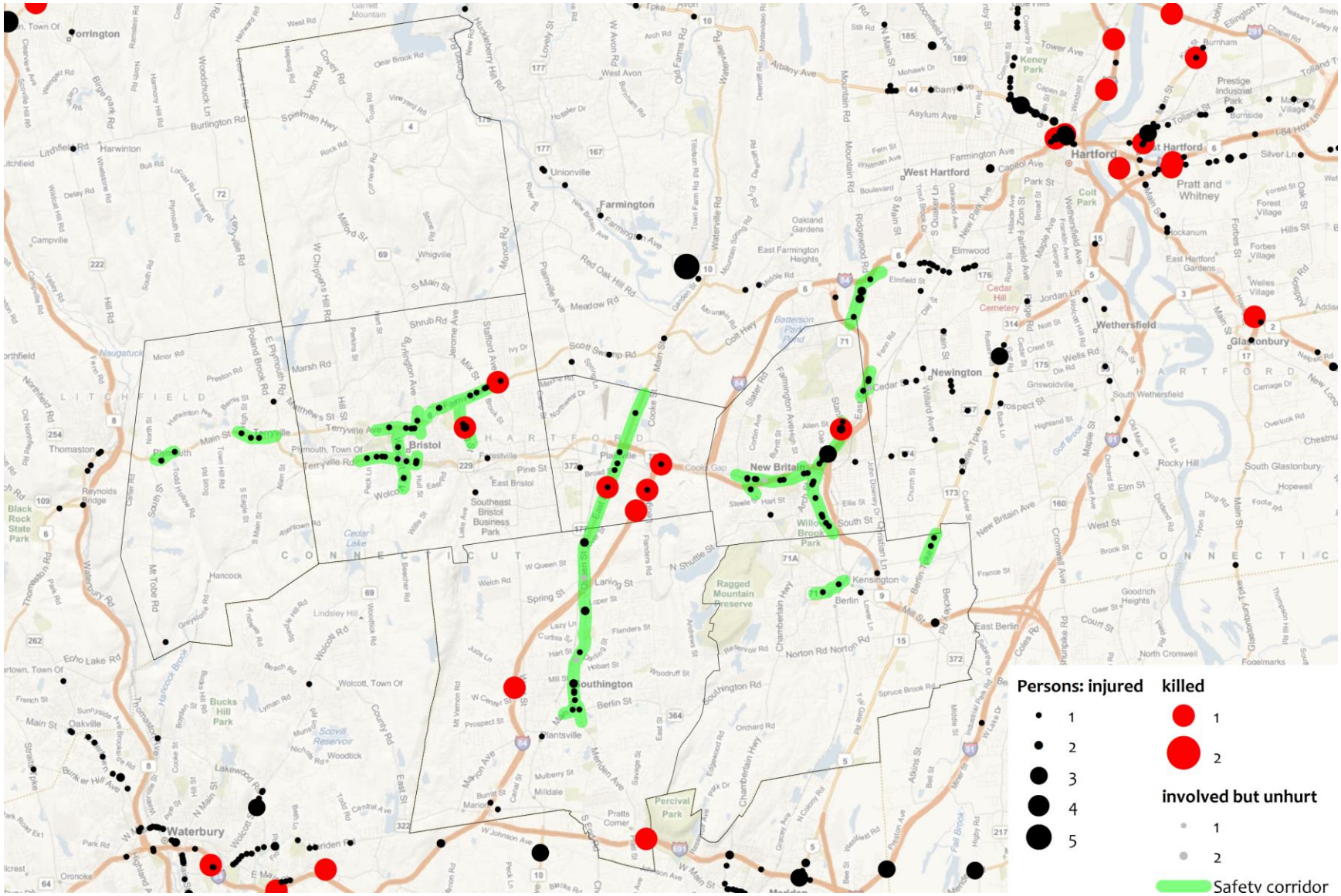
117) plots the locations of collisions involving such vulnerable users on State routes (including U.S. Routes but not Interstates) and highlights 'safety corridors' (concentrations of high accident activity) in the region, where improvements in the name of safety are especially justified.[48]

Due to data limitations, *Figure 30* does not differentiate by injury severity and only depicts collisions on State highways. This means it only tells part of the story. Most accidents involving vulnerable users occur on local roads. Between 2005 and 2007, 71.9% of collisions involving pedestrians took place on roads under municipal control; for cyclists, the same figure is 62.2%. The upshot of this is that, if the safety of walking and biking is to be improved, municipalities—especially Bristol and New Britain—in addition to the State must take an active role.

The safety corridors identified may be a good starting point. Since local roads are not included, it may be prudent to construe the corridors to encompass connecting local roads, as it may be presumed that pedestrians and cyclists access the State routes pictured via local roads and thus also are at risk there.

[48] *Safety improvements may also be justified outside the region; as these are beyond the purview of this Plan, the map does not denote these.*

Figure 30. Collisions on State highways with pedestrians by victim type and number



Public transit

Note: this Plan considers privately-owned or -operated services transit if their primary function is to carry unrelated members of the public between multiple origins and destinations. This comprises services such as ADA paratransit, Dial-a-Ride, and other vanpools as well as air and bus carriers such as Greyhound.

Despite high fuel prices and a national trend in favor of buses and trains, transit ridership in the region across all modes is low and stagnant, if not slipping. Bristol may have overtaken New Britain as the largest employment center in the region, but as *Figure 31*[49] demonstrates, the latter remains the municipality with the greatest number and proportion of transit commuters, at an estimated 1,120 transit riders out of 32,286 workers, for a rate of 3.5%.

From the standpoint of capturing a maximal or growing mode share (i.e., getting as many drivers out of their cars as possible), the transit system in the region comes up short. As *Figure 31* (p. 119) makes clear, even the municipality with the highest ridership in the region by far, New Britain, is disproportionately transit-averse. As *Figure 33*[50] (p. 120), which charts rates of transit ridership across various cities and regions in the state, shows, ridership among commuters from the *city* of New Britain is even lower than among commuters from the *full extent* of *any* of Connecticut's metropolitan regions, or New England city and town areas (NECTAs).[51] This is an important point, since these regions span not only transit-friendly cities but also large swaths of well-to-do suburbs and distant rural areas, communities which are challenging for transit service. Because of this, one might, on the face of it, expect ridership in cities to be visibly higher than in the regions that surround them, yet in the case of New Britain, the reverse is true. Transit's commute share in all of metro Hartford was 2.7%, versus 11.8% for the City of Hartford and 2.2% for the City of New Britain. This anomaly calls for investigation and suggests that the region's transit system may be underachieving.

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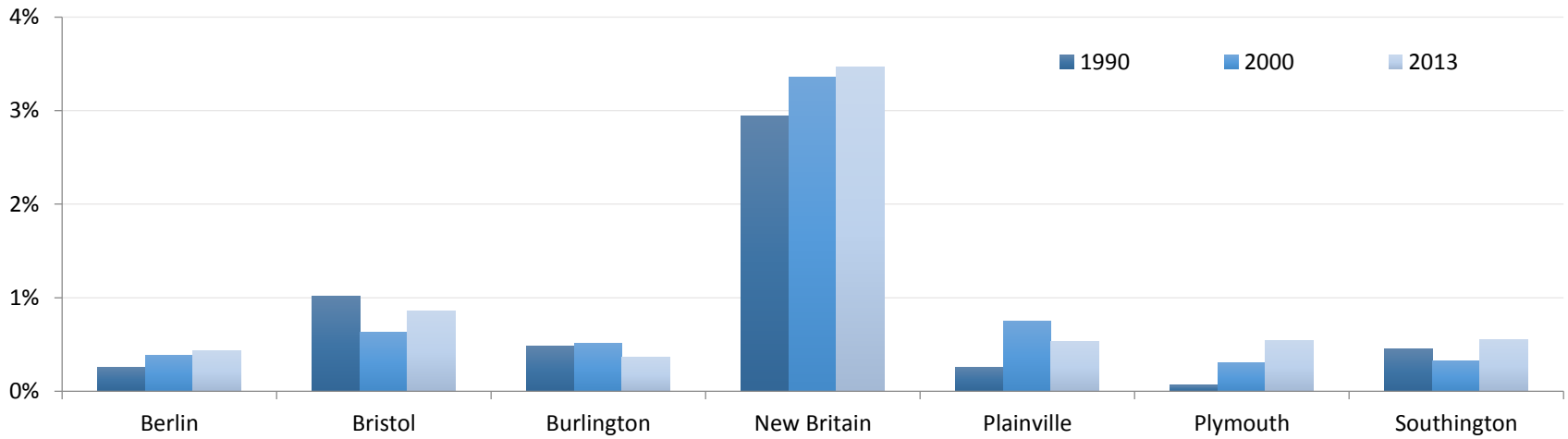
[49] *Legend numbers refer to the years 1990, 2000, and 2007, respectively. Data from the U.S. Census Bureau, 1990 Census, Census 2000, and American Community Survey 2009-2013.*

[50] *NECTA names abbreviated. Official names are: Bridgeport-Stamford-Norwalk; Danbury; Hartford-West Hartford-East Hartford; New Haven; and Waterbury, CT Metropolitan NECTA. All data from the U.S. Census Bureau, American Community Survey 2008, save Bristol and Southington, which draw on years 2006-2008 of the survey.*

[51] *New England city and town areas, as defined by the U.S. Census Bureau.*

Figure 31. Transit ridership as a percent of all workers by place of residence



Unfortunately, longitudinal metropolitan region data are not available, so no comparison of trends in transit popularity over time is possible. However, data on a municipal level are. *Figure 32* shows the change in mode share by urban commuters between 2000 and 20013. These data reveal that, while use of transit by New Britain commuters is markedly lower than by Hartford city and metropolitan region commuters, it has actually grown while Hartford's share has fallen. The result in Hartford is surprising because these years are generally recognized to be a period during which transit resurged nationwide, but also because use of transit by New Haven commuters burgeoned at the same time.

RAIL

From the middle of the 19th to the middle of the 20th century, central Connecticut connected to and was served by an extensive rail network, depicted in *Figure 34*[52] (p. 121). The network, which ran through every town and city of import in the state, included two lines in the region, one running east-west, and the other, north-south.

[52] *Map shows network from 1893.*

Figure 33. Percent of commuters using transit in selected regions and cities

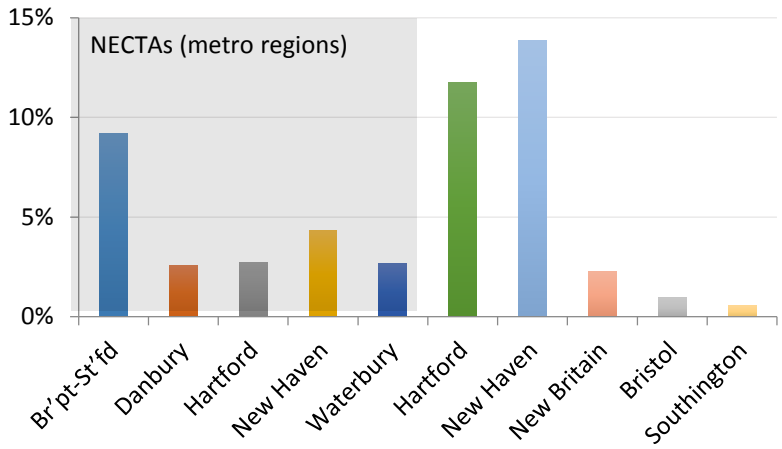
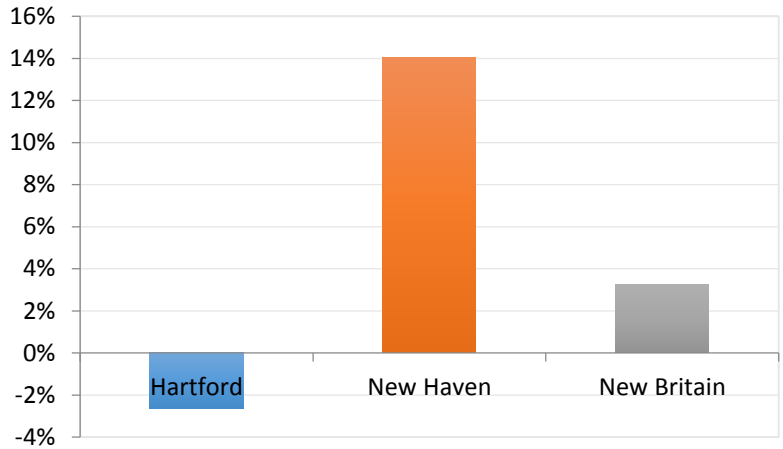


Figure 32. Change in transit mode share over time by urban commuters



The first line directly connected the region with Waterbury, Bridgeport, Norwalk, Stamford, and New York City to the southwest and Hartford, Manchester, Willimantic, and Boston to the northeast. Trains on this line served several stations in and around the region. These included East Waterville, Terryville, Bristol, Forestville, Plainville, New Britain, Newington, Elmwood, and Parkville. (Some trains also made stops in Greystone, Hancock, and Tolles.)

The Historical Time Tables (p. 195) give times for trips to and from these cities. Transfers were also possible to other nearby cities, including Middletown, New Haven, Essex, New London, Norwich, Providence, Springfield, Danbury, Torrington, and Winsted.

Although operations changed over time, riders enjoyed a high level of service until the abandonment of passenger service on this line. For instance, every Monday through Saturday in the mid-1920s, some 17 trains traveled from Waterbury to Hartford; 16 trains made the reverse trip.[53] (Thirteen trains ran Sundays.) Even as late as the mid-1950s, passengers could choose from six trains in each direction on weekdays (with four on Saturdays but none on Sundays). Although passenger operations

[53] *Holidays excluded.*

Figure 34. Historical train network

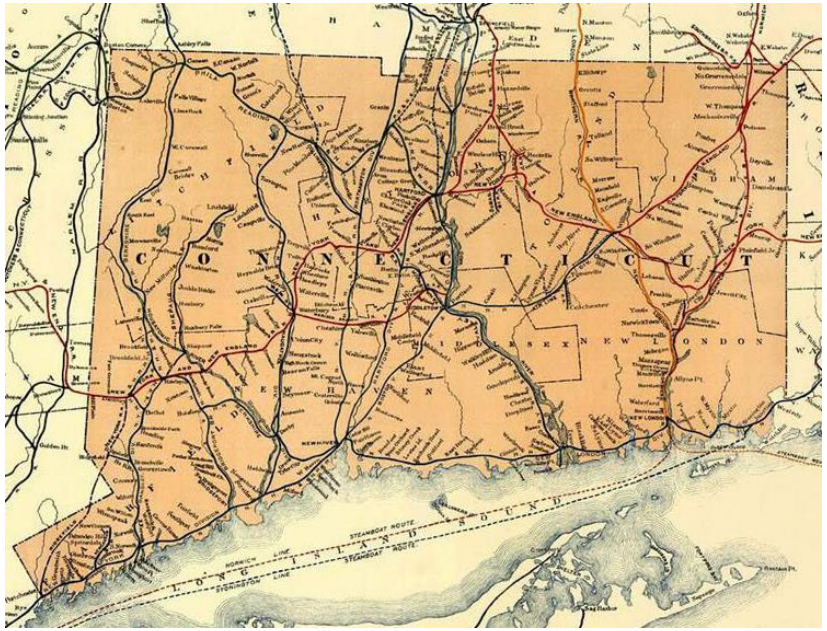
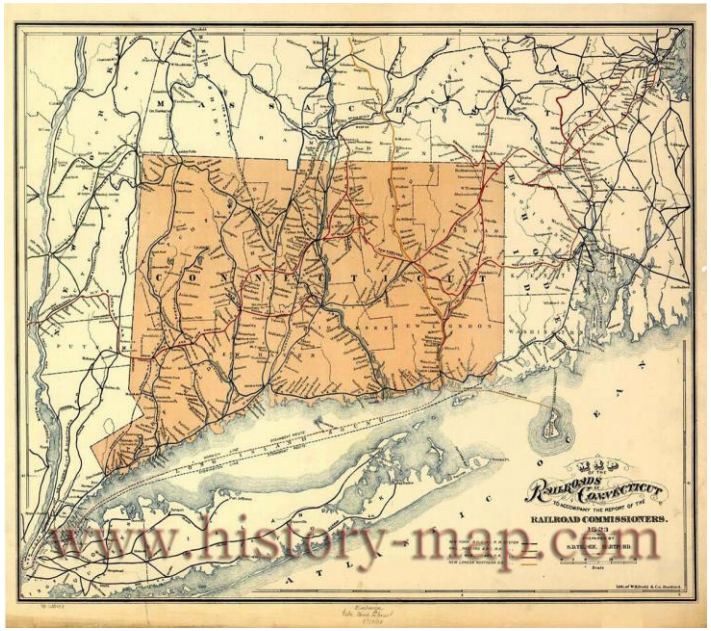


Figure 35. Historical tram network



between New York City and Waterbury have since resumed and intensified under the aegis of Metro-North, the last passenger trains in central Connecticut stopped running in 1960.[54] (Freight continues on this line, though at substantially diminished capacity due to track deterioration.) As a result, New Britain and Bristol now hold the distinction of being the largest cities by population in the tri-state area (New York, New Jersey, and Connecticut) without functioning train stations.

The second line linked the region with greater New Haven, the Farmington Valley, and Massachusetts' Pioneer Valley. Passengers could switch to the east-west line in Plainville; trains on this line also stopped at three additional stations in the region

[54]*Service to Boston ended after the floods of 1955; service between Waterbury and Hartford ended in 1960.*

(namely Milldale, Plantsville, and Southington), as well as New Haven, Mt. Carmel, and Cheshire to the south and Farmington, Avon, Simsbury, Granby, Congamond, Southwick, Westfield, Southampton, Easthampton (Massachusetts), Northampton, and Williamsburg to the north. (Flag stops were available at Brooksvale and Weatogue.) Trains on this line never attracted as high ridership as those between Waterbury and Hartford; as a consequence, passenger service ceased in 1925. Freight ran until the early 1980s, when floods damaged the tracks. Since then, much of the right-of-way has been converted into a greenway, the Farmington Canal Heritage Trail, with plans to convert the as-yet unimproved sections to rail trail. Freight operations persist only along a stub segment of the line between Robertson Airport in Plainville and the northern end of Southington.

In addition to the heavy rail network, a shorter-distance tram[55] system connected the communities of central Connecticut with each other and greater Hartford, shown in *Figure 35*. The trams enabled travel over shorter distances and transfers to the heavy rail system at major nodes, including downtown Berlin, Bristol, New Britain, and Plainville. With the rise of car culture, this system was dismantled in the 1930s. Nothing of it remains.

Although there have been repeated calls over the years for restoration of passenger rail to central Connecticut, including from this Plan (for details, see *Integration with New York,* p. 31), *no* commuter or express trains serve the region. The sole community with passenger rail is Berlin, at whose Kensington station Amtrak's Vermonter and some of its Northeast Regional trains stop. Due to the Vermonter's leisurely speed and awkward schedule, which partly result from track removal and deterioration, the service is unable to satisfy the commuter or high-speed rail market. (It essentially fills the same niche as long-distance bus service, only at higher cost.) The New Haven-Springfield Shuttle, which began after electrification of the Northeast Corridor, complements this service and provides an alternative to commuters from Hartford to New Haven.

(Current timetables do not facilitate a commute for most workers in the reverse, i.e., northbound, direction.) Amtrak also runs a limited number of through trains between Washington, D.C. and Hartford/Springfield. *Table 20* and *Table 21* (p. 124) reproduce the schedule as of writing for the Vermonter and Northeast Regional trains.

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[55] *Trams are also known as 'streetcars' or 'trolleys.' Map shows network from 1920. Lines to Terryville are depicted truncated. Rail lines, some of which followed the same corridors, are not shown. Image taken from Hartford County Trolleys, published by the Connecticut Trolley Museum (2005).*

Statistics on ridership and mileage for the Amtrak's and DOT's operations on the line are as follows. [56] As the numbers show, ridership is relatively low. The poor turnout reflects the condition of the line, which, since the removal of additional tracks, limits the speed of trains as well as their frequency and ability to make schedules that respond to a larger market (e.g., the New Haven *to* Hartford commuter and high-speed long-distance markets, which at present the Amtrak trains do not serve).

Projects are underway to return the line to a state of repair sufficient for more frequent and higher-speed service. *Table 19* quantifies the changes, a tripling to quadrupling in both service capacity and ridership, that are planned. (Also see *New Haven-Hartford-Springfield Rail*, p. 36, as well as *Excerpt from the Northeast Corridor Master Plan*, p. 192). This Plan supports those projects.

Table 19. Operating statistics for the New Haven-Springfield rail corridor

Operator	**Avg. weekday trains**		**Train miles (000)**		**Passenger mi. (000)**		**Ridership (000)**	
Year	Now	2030	Now	2030	Now	2030	Now	2030
DOT	0	36	0	571	0	43,129	0	617
Amtrak	12	28	245	571	54,598	152,698	1,215	3,399
Total			**245**	**1,142**	**54,598**	**195,827**	**1,215**	**4,016**

[56] *Figures taken from the Northeast Corridor Master Plan. Only selected stops are shown. Blue cells represent Amtrak shuttles. 'NER'-type trains are Northeast Regional; 'V' are Vermonter. Vermonter trains originate in or terminate at St. Alban's, Vermont.*

Table 20. Amtrak trains, northbound

Train	190/490	150/450	170/470	160/460	54	56	164/464	88/488	176/476	140	94/494	148	132/432	146	136
Type	NER	NER	NER	NER	V	V	NER	NER	NER	NER	NER	NER	NER	NER	NER
Days	Mo-Fr	SaSu	Mo-Fr	SaSu	SaSu	Mo-Fr	SaSu	SaSu	Mo-Fr	SaSu	Mo-Fr	Mo-Fr	Su	Sa	Fr
Wash.	3:15	3:15	5:02	5:25	7:30	8:10	9:25	11:25	12:05	12:25	14:05	15:02	15:25	16:25	17:05
Phil.	5:13	5:15	6:52	7:18	9:20	9:58	11:18	13:18	13:56	14:18	15:56	17:00	17:18	18:18	19:02
NYC	6:55	7:00	8:30	9:00	11:30	11:33	13:00	15:00	15:30	16:30	17:40	18:43	19:30	20:00	21:07
NHvn	8:38	8:37	10:15	10:43	13:20	13:22	14:50	16:50	17:15	18:21	19:25	20:30	21:20	21:50	23:00
Berlin	9:14	9:08	10:44	11:14	13:54	13:56	15:24	17:21	17:50	19:03	19:58	21:06	21:56	20:24	23:34
Hfd	9:27	9:20	10:57	11:27	14:08	14:10	15:41	17:36	18:05	19:19	20:12	21:20	20:10	20:38	23:48
Spfld	10:10	10:00	11:35	12:05	14:58	15:00	16:16	18:15	18:45	20:00	20:50	22:00	22:50	23:18	0:30

Table 21. Amtrak trains, southbound

Train	141	143	95/495	195/405	147	83/93/493	161/401	163/463	57	55	165/465	175/475	167/467	179/479	169/469
Type	NER	NER	NER	NER	NER	NER	NER	NER	V	V	NER	NER	NER	NER	NER
Days	Mo-Fr	SaSu	Mo-Fr	SaSu	Sa	Mo-Fr	SaSu	SaSu	SaSu	Mo-Fr	SaSu	Mo-Fr	Sa	Mo-Fr	SaSu
Spfld	6:00	6:30	7:10	7:30	8:00	10:40	10:40	12:40	14:50	14:50	16:10	16:05	17:25	19:20	19:40
Hfd	6:37	7:08	7:45	8:05	8:37	11:18	11:14	13:16	15:26	15:32	16:47	16:42	18:04	19:56	20:15
Berlin	6:51	7:21	7:58	8:16	8:50	11:30	11:25	13:28	15:40	15:45	16:59	16:54	18:14	20:09	20:26

NHvn	7:38	8:11	8:45	9:11	9:41	12:11	12:11	14:11	16:41	16:41	17:48	17:48	19:16	21:15	21:11
NYC	9:35	10:05	10:35	11:05	12:05	14:05	14:05	16:05	18:55	19:05	19:55	20:00	21:05	22:45	23:05
Phil.	11:08	11:33	12:00	12:31	13:33	15:35	15:33	17:33	20:25	20:25	21:23	21:28	22:33		0:30
Wash.	12:59	13:25	14:00	14:25	15:30	17:25	17:30	19:28	22:15	22:20	23:20	23:25	0:29		2:25

BUS

LOCAL

CT TRANSIT manages the region's local bus system, which serves parts of Berlin, Bristol, Hartford Farmington, Meriden, New Britain, Newington, and Plainville. Operations split three ways: CT TRANSIT (HNS) runs the Hartford division (one route in the region); the New Britain Transportation Company and DATTCO are under contract to operate the New Britain/Bristol division buses (two and ten routes, respectively.) Service is not offered in Burlington, Plymouth (including Terryville), or Southington. *Figure 36* (p. 127) depicts CT TRANSIT routes in and near the region. Buses run Monday through Friday from about 6 AM to 6 PM, with extended service to 9:30 PM in parts of Berlin, New Britain, and Plainville. There is no Sunday or holiday service.

Single transfers between CT TRANSIT routes, including to and from the New Britain/Bristol, Hartford, and Meriden/Wallingford divisions are possible at no cost. Multiple transfers and transfers to or from Middletown Area Transit buses are also possible but require the purchase of additional ticket(s). Passengers may also board or alight from Amtrak trains at the Berlin-Kensington station. Transfers can be time-intensive, as schedules are not always coordinated. The complexity and duration of making transfers may depress ridership; a solution to this, which this Plan recommends studying and implementing, is through-routing (see *Bus line rationalization*, p. *40*).

Due to service gaps, no direct transfers are possible to transit operations in and around Waterbury (including CT TRANSIT's Waterbury division and Metro-North's Waterbury branch line) and Torrington (namely the Northwestern Connecticut Transit District local buses).

The lack of through-routing and the predominantly local nature of the bus service make interregional trips lengthy to nigh impossible. *Table 22* (p. 128) lists common origins and destinations, the bus lines necessary to make the trip, and the respective one-way total travel time.

As the table suggests, buses are not competitive on travel time for any of the above routes: the bus takes a median of four times as long for a given route. (Travel times for specific routes range between twice and twelve times as long.) This leaves bus ridership to those who have no other choice and bus aficionados for whom time is a luxury. Together with infrequent service, limited hours, and minimal signage on many routes, this likely accounts for the low ridership on CT TRANSIT buses in the region.

Figure 36. Local bus routes

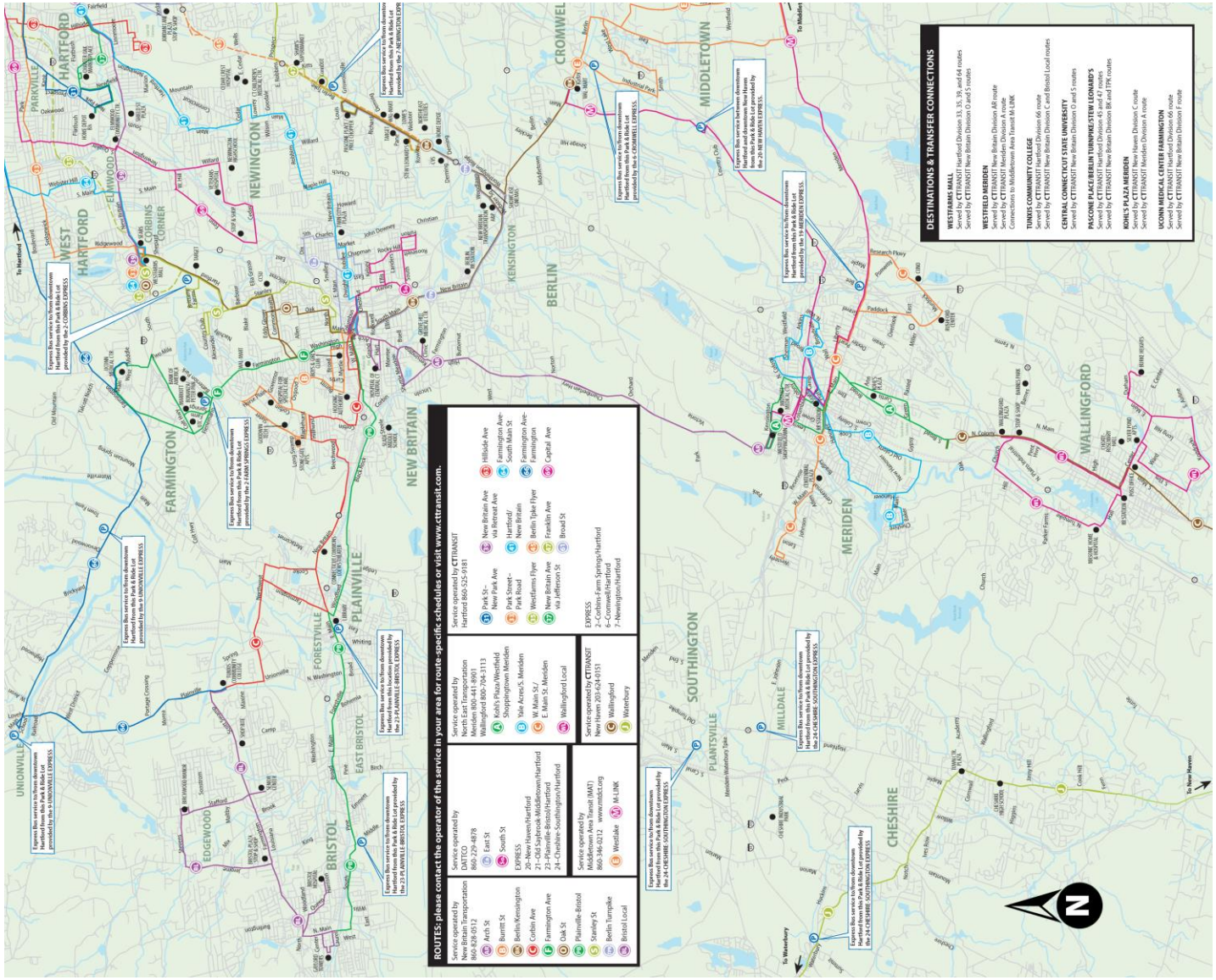


Table 22. Common routes and travel times (minutes) by mode

Destination		from Bristol	Bus	Car	from New Britain	Bus	Car
Bristol	Downtown	—	—	—	PB	30	18
Farmington	Mall	PB→41→S	90	21	S	30	11
Hartford	Train station	PB→41→60-66	103	28	41→60-66	49	16
Manchester	Downtown	PB→41→83	141	38	41→83	100	28
Meriden	Train station	PB→AR→A	120	29	AR→A	60	21
Middletown	Downtown	PB→41→55	148	35	41→55	98	18
New Britain	Downtown	PB	29	21	—	—	—
New Haven	Green	PB→AR→A→C	217	54	AR→A→C	157	44
	Train station	(above)→S	245	544	(above)→S	185	44
Southington	Green	Impossible	∞	19	Impossible	∞	14
Terryville	Green	Impossible	∞	8	Impossible	∞	24
Waterbury	Green	PB→AR→A→C→J	345	29	AR→A→C→J	285	26
	Train station	(above)→40	363	28	(above)→40	303	25
West Hartford	Center	PB→S→60-66	115	28	S→60-66	55	18
Windsor Locks	Airport	PB→41→30	131	45	41→30	117	35

All transit routes minimize on-bus time and depart as close to 9:00 AM as possible. Commuter buses (express routes) are not included. Driving directions and times given by Google and have been inflated by 25% to simulate more realistic traffic conditions. Other paths are possible for many of these routes but are often impractical due to scheduling or routing situations. For instance, the BK→E→C from New Britain to Middletown takes about the same time outbound but is drastically longer in the other direction; AR→ M-Link is faster at 60 minutes but only runs thrice daily. Southington and Terryville lack local bus service.

Figure 37. Passenger trips per operating hour

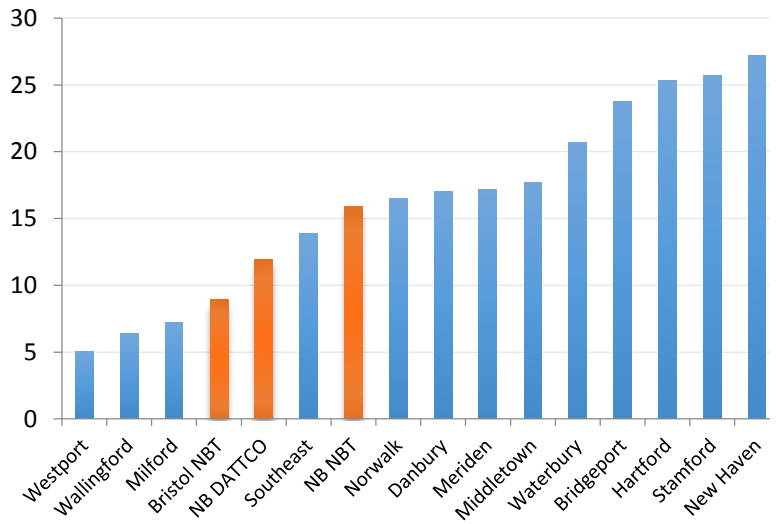
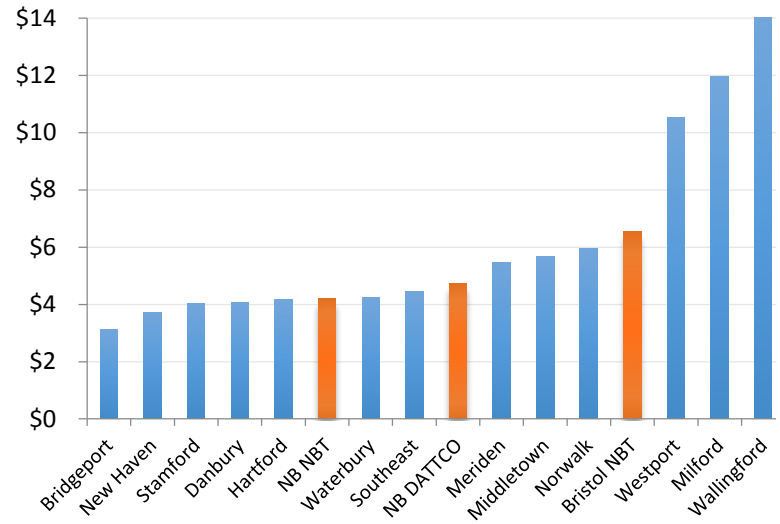


Figure 38. Cost per passenger trip



As *Table 23* (p. 131) shows, the extent of service differs substantially among the various fixed-route bus operators currently active in the state. (Statistics for rural, flexible route, commuter, and shuttle bus operators are not given.) As one might suspect given such diversity in operations, the operators also vary considerably in how efficiently they perform their services. *Figure 37* through *Figure 39* (p. 129) chart several common performance measures.

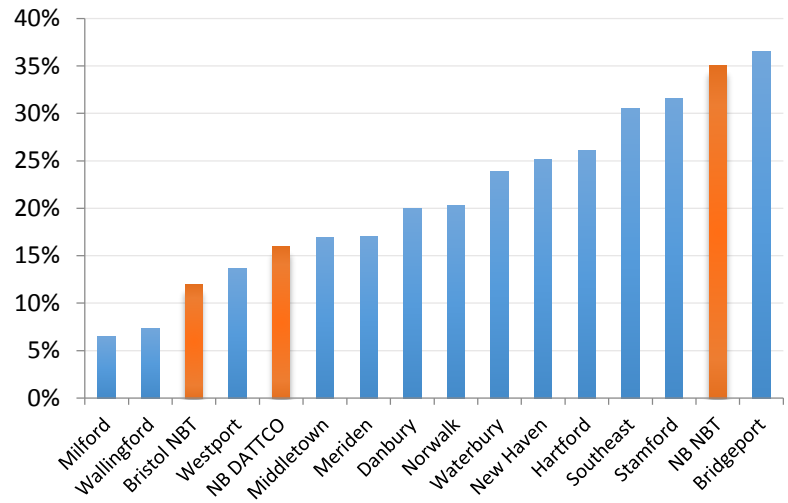
Empty buses do not garner revenue. In general, if an operator is to maximize earnings (and thus to minimize subsidies), it is in his interest to fill buses with as many paying fares as possible at all times. As *Figure 37* (p. 129) indicates, the New Haven division of CT TRANSIT carries the most passenger trips per hour of operation on average (27.2), followed by the Stamford, Hartford, Bridgeport, and Waterbury systems in that order. New Britain Transportation's New Britain buses fall in the middle of the pack, with 15.9 trips per hour, slightly below the Middletown, Meriden, Danbury, and Norwalk systems. DATTCO's New Britain and New Britain Transportation's Bristol routes perform substantially worse than most of the other systems, at 12.0 and 8.9 trips per hour. These figures imply that bus service is supplied with respect to demand or that the service does not fit the needs of potential customers. Given the accessibility challenges

the region faces, this Plan considers the latter more likely. In any event, *Figure 37* should give one pause. As examples from Hartford on down make clear, from the standpoint of filling buses, there is room for improvement in the region.

Buses' satiety is not the only performance measure worthy of consideration. Vacant buses may not be efficient on a per-mile basis, but in some cases they can be cost-effective. (If the costs of operation are low, then ticket sales need not be high.) From this point-of-view, the bus operators in the region fare somewhat better. *Figure 38* shows that bus operations in New Britain are roughly competitive with most other operations in the state when it comes to the actual cost to transport a single passenger. Per-passenger costs are markedly higher for the Bristol part of the system; as before, this implies that there may be opportunities to wring additional efficiency out of these routes.

Few, if any, transportation facilities and services cover their costs. This holds not only for all modes of transit but also for roads and airports. However, the degree to which transportation facilities and services require outside funding varies dramatically. In transit, the percentage of operating costs that tickets sales pay for is termed the "farebox recovery ratio." A ratio of 100% would indicate that fares cover the entire cost of providing that service; one of zero would imply the service is completely subsidized (i.e., gratis). *Figure 39* (p. 130) reveals

Figure 39. Farebox recovery ratio



great discrepancy among the ability of fixed-route bus operators to recover costs through fare revenue (or, put another way, their dependence on government subsidies.) As *Figure 39*, Bridgeport's GBTA leads in financial performance. New Britain Transportation Company's New Britain routes come in a close second, with a high ratio of 35.0%. DATTCO's routes in the city and New Britain Transportation's Bristol routes perform far worse, however, with ratios of 16.0% and 12.0%, respectively. These poor showings indicate that these routes may be overly dependent on subsidies and may be prime candidates for review.

Table 23. Fixed-route bus operations in Connecticut

Contractor	Region	Bus Hours	Passenger Trips	Miles
CT TRANSIT (HNS)	Hartford	501,119	12,697,727	6,203,945
CT TRANSIT (HNS)	New Haven	325,264	8,848,609	3,626,240
CT TRANSIT (HNS)	Stamford	124,467	3,195,477	1,381,958
DATTCO	New Britain	13,152	157,248	164,428
GBTA	Bridgeport	194,490	4,622,647	2,399,542
HART	Danbury	39,788	677,281	508,069
Middletown Transit District	Middletown	18,218	322,760	264,481
Milford Transit District	Milford	9,676	69,871	142,300
New Britain Transportation Co.	Bristol	5,504	49,038	73,322
New Britain Transportation Co.	New Britain	36,284	578,012	549,249
North-East Transportation Co.	Waterbury	68,171	1,411,312	897,844
North-East Transportation Co.	Meriden	9,697	166,845	159,125
North-East Transportation Co.	Wallingford	2,150	13,791	40,792
Norwalk Transit District	Norwalk	58,477	964,180	589,997
Norwalk Transit District	Westport	18,083	91,515	239,929
Southeast Area Transit	Southeast	63,368	878,627	1,024,276
DATTCO + NBT combined	**Bristol/New Britain**	**54,940**	**784,298**	**786,999**

These statistics paint a picture of a system that functions but could function better. Several problems have been identified as potential hampers to the utility of and depressors to ridership in the system. These include the following:

1. Convoluted routes. Many bus routes in the region do not follow linear paths but veer from the main axis of travel to sites such as big box retailers, office parks, and apartment complexes. Although these sites can generate trips in quantity, serving them necessitates taking detours that considerably increase the complexity of the route and decrease the speed of service. These factors reduce the effective level of service to such an extent that they may drive away more potential riders than they draw.
2. Lack of bus stops. In most of the region, buses run on a flag-down system without any defined bust stops. While this in theory can make travel more convenient by allowing pickups and drop-offs closer to origins and destinations, in reality it produces a system where stops are unreliable (the determination whether to stop is made at the discretion of the driver) and scheduling unpredictable (the ability of riders to embark and disembark at any point often yields a situation where buses have to stop every block or two, greatly slowing service).
3. Lack of signage. Where there are no bus stops, there also tend to be no signs. The absence of appropriate signage (including timetables and maps) in the region makes for a bus system that is practically invisible.
4. Poor connectivity. As discussed, although buses in the region do allow transfers, transfers are often complex and long in duration, as schedules are not always coordinated. In addition, the lack of through routing and exclusively local nature of the bus service makes interregional and intermodal trips lengthy and impractical.

All of these factors undermine the utility, efficiency, ridership, and solvency of the transit system. However, none of them are insoluble, and *Public Transit* (p. 33) proposes upgrades to help fix them.

EXPRESS

CT TRANSIT runs a series of express buses for commuters. Three of these serve the region. Hours of service and locations for the routes are extremely limited. Express buses primarily run during rush hour and travel between the stops listed and downtown Hartford only. With the exception of the Plainville Library, they do not stop at downtowns or town centers. At present, no express bus visits the cores of downtown Bristol, Southington Center, and Terryville. These gaps may depress transit ridership and certainly limit the utility of the express bus system for non-driving commuters.

Figure 40 maps the routes of these buses, save 41X. (CT TRANSIT treats local buses that make some express runs separately from those that only provide express service.) *Figure 42* through *Figure 43* (p. 134) illustrate the efficiency of the region's express buses relative to similar operations throughout the State. As the figures show, these routes vary widely in ridership and cost-efficiency. In general, express buses carry fewer passengers per hour and entail higher costs per passenger trip (up to $125.67!) than local buses. While ticket prices and, in many cases, farebox recovery are higher, express buses remain expensive to provide on a passenger-trip basis. If the efficiency of the worst-performing routes cannot be improved, it may be worth studying reallocating the subsidies behind them to other transportation services that deliver more bang for the buck.

Figure 40. Hartford-area express bus network

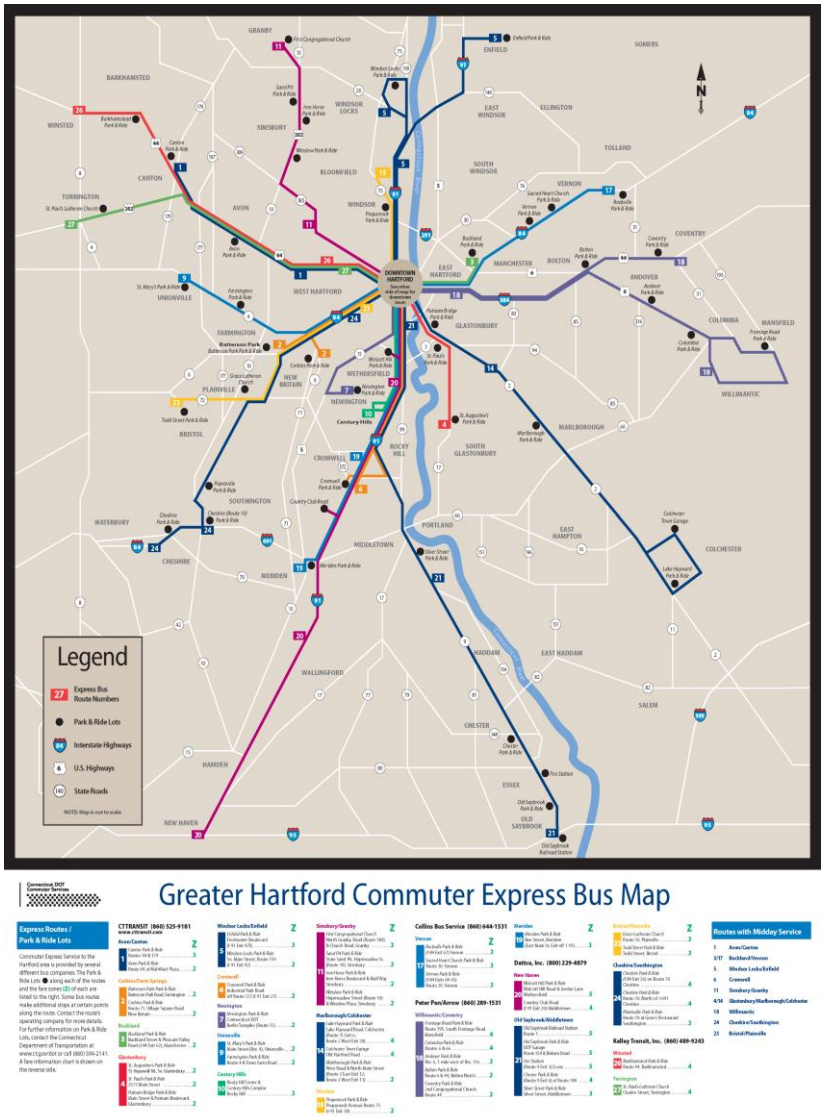


Figure 41. Cost per passenger trip

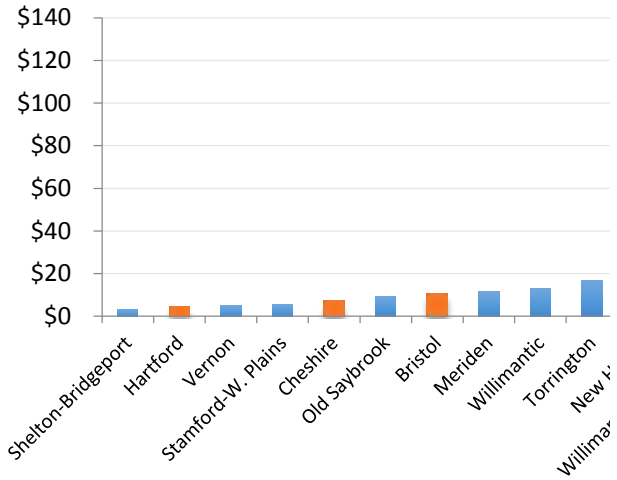


Figure 42. Farebox recovery ratio

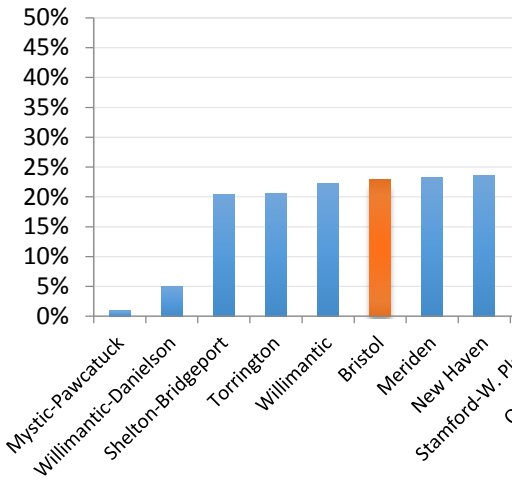


Figure 43. Passenger trips per operating hour

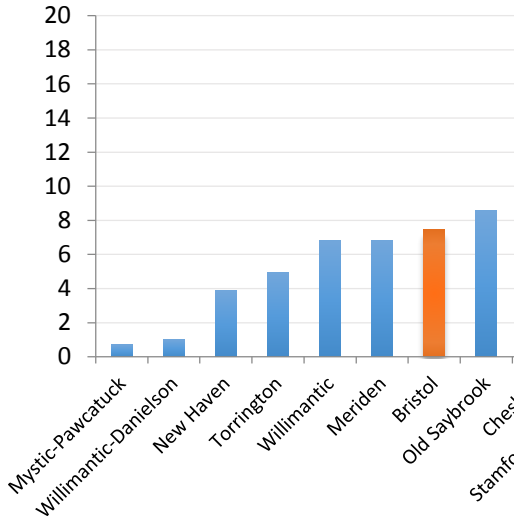


Table 24. Express bus routes

No.	Name	Stops	In-/outbound runs
9	Unionville	St. Mary's Park & Ride, Unionville	3/3
		Farmington Park & Ride, t. 4 and Town Farm Road	3/3
23	Plainville/Bristol	Lake Ave. & Rt. 229, Bristol	7/8
		Plainville Library, East Main St., Plainville	5/8
24	Cheshire/Southington	Park & Ride, Rt. 10 north of I-691, Cheshire	3/5
		Park & Ride, Rt. 10, Plantsville (Southington)	3/5
41X	Hartford/New Britain via Newington	Same as 41, but no pickups between New Britain/Newington Aves and Central Row	4/3

Table 25. Commuter bus operations in Connecticut

Contractor	Route (stars indicate Hartford destination)	Bus Hours	Passenger Trips	Miles
Arrow Bus Company	Willimantic*	7,586	51,567	142,578
Collins Bus Company	Vernon*	10,106	150,716	210,099
CT TRANSIT (HNS)	Hartford*	45,832	880,725	1,072,030
CT TRANSIT (HNS)	Stamford-White Plains	12,152	146,364	242,981
DATTCO	Cheshire*	3,805	41,354	91,456
DATTCO	Hartford-Old Saybrook	4,323	36,990	130,817
DATTCO	Bristol*	9,699	72,691	172,495
DATTCO	Hartford-New Haven	3,442	13,369	112,772
GBTA	Shelton Flyer	1,300	24,149	16,496
John Nason dba Kelley	Torrington*	5,362	26,466	106,164
Meriden TD	Meriden*	2,570	17,521	53,259
Southeast Area Transit	Mystic-Pawcatuck	630	459	11,172
Windham Region TD	Willimantic-Danielson	1,000	1,029	20,382

RAPID

Since 1997, CCMPO, together with CRCOG and the DOT, has been working on the development of a $573 million, 9.4-mile bus-only highway between Hartford and New Britain, the New Britain-Hartford Busway. The project emerged from a study that examined ways to relieve traffic on Interstate 84 between Plainville and Hartford, which is the most heavily-congested expressway segment in the state. The busway will run along the New Britain Secondary, a historic railroad right-of-way that until about 1960 carried trains between Hartford, New Britain, and beyond. Using the Secondary will enable the busway to bypass

traffic on this segment, giving persons riding between Hartford and New Britain a faster transit alternative than CT TRANSIT's local buses, and giving commuters to the Hartford suburbs and through-drivers a better experience by shifting traffic from the highway.

Figure 44 (p. 139) depicts the path the busway will follow. The physical busway will run from Union Station in Hartford to the Main Street and Columbus Boulevard in New Britain. Nine stations are planned for between these terminuses; two of these (East Street and Cedar Street) are in or near to New Britain. The busway corridor passes by several large destinations. While unfortunately none of these—Central Connecticut State University, Westfarms Mall, the University of Connecticut Health Center, and West Hartford Center—lie directly on or within easy walking distance of the busway, the flexibility afforded by buses, which are not bound to a fixed guideway such as railroad tracks, means that buses on the busway will be able to serve these locations. Preliminary service plans developed by DOT and CT TRANSIT provide for shuttles to meet and local routes that enter and exit the busway in order to serve these and other attractions.

Since the last Central Connecticut LRTP was adopted, funding was secure for the busway (now called CTfastrak) and construction is complete. If all goes as planned, service will begin before this document is officially adopted. DOT has estimated that busway, in tandem with modifications to local bus routes, will attract 13,400 passenger trips per day at its opening and an additional 4,900 daily passenger trips by 2030.

LONG DISTANCE

Though often neglected by transportation planners, long-distance bus services play a critical role in the transit-poor environment of central Connecticut. They provide much-needed mobility to people—including the young, the old, the disabled, and the poor—who would otherwise be trapped.

Greyhound Lines and Peter Pan Bus serve central Connecticut. Both services stop at two terminals in or near the region. Hours and locations for the terminals are as follows. The Farmington terminal gives convenient access from Interstate 84 and Route 9 for car-bus intermodal transfers; the downtown New Britain one allows connections to and from local CT TRANSIT buses (described on p. 125).[57]

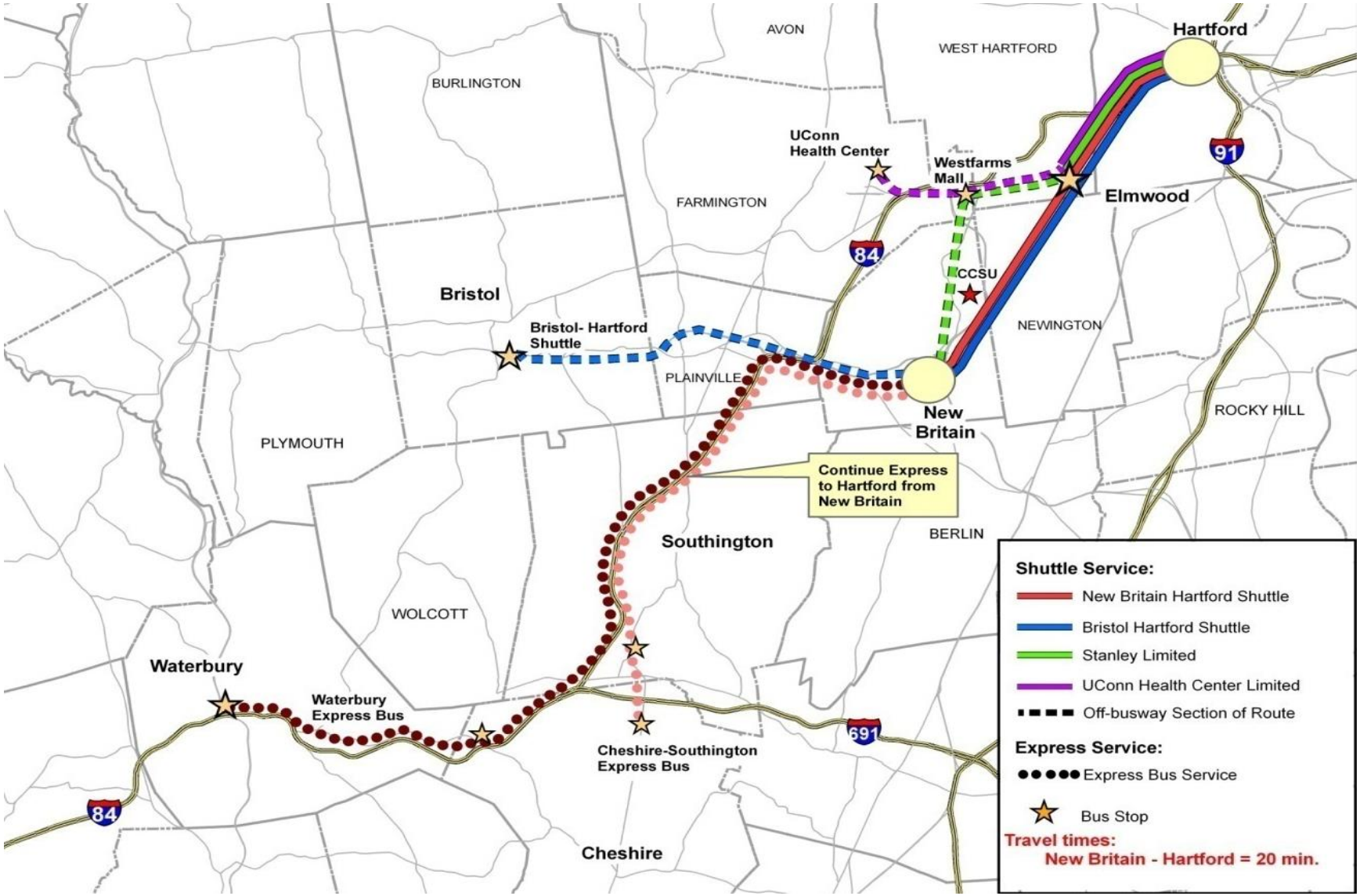
[57] *The convenience of and potential for transfers to and from long-distance and local bus services has not been studied.*

Table 26. Long-distance bus terminals

Terminal	New Britain	Farmington
Address	Jimmy's Smoke Shop 64 W Main St. New Britain, CT 06051	Bonanza Bus Terminal 12 Batterson Park Rd. Farmington, CT 06032
Hours of operation	5:45 AM – 10 PM daily	5:00 AM – 5:30 PM Mon-Fri 6:30 AM – 6:30 PM Sat-Sun

Greyhound and Peter Pan run direct and transfer buses to locations throughout North America, including New York City and Boston as wells as Providence, Springfield, and Worcester and to the municipalities and sites in Connecticut given in *Table 27* (p. 140).

Figure 44. CTfastrak route



OTHER PROVIDERS

PARATRANSIT

Under the Americans with Disabilities Act, where public transit is provided but is deemed not to be accessible to persons with disabilities, equivalent, disabled-accessible service must be made available ('paratransit'). Paratransit often takes the form of demand-responsive vans. These vehicles, which are designed to be more accessible to persons with limited mobility or other handicaps, carry riders within a fixed service area, generally three-quarters of a mile from an existing transit line. (Service expansions sometimes go beyond this.) Due to the extremely high cost and logistical complexity of providing the service, paratransit is only open to those who have been certified as eligible[58] under the Act's guidelines and booked trips in advance.

The Greater Hartford Transit District now manages paratransit for central Connecticut (the Central Connecticut Regional Planning Agency formerly managed the service). First Transit is under contract to operate the service, including trip booking, scheduling, and bus operation. The service covers all of Bristol, Plainville, and New Britain, as well as the parts of Berlin, Bur-

Table 27. Locations with long-distance bus service

Greyhound Lines	Peter Pan Bus
Bridgeport	Branford
Brooklyn	Bridgeport
Canaan	Brooklyn
Danbury	Canaan
Danielson	Danbury
Enfield	East Hartford
Farmington	Enfield
Foxwoods Casino	Fairfield
Hartford	Farmington
Manchester	Glastonbury
Mohegan Sun Casino	Hartford
Mystic	Manchester
New Britain	Milford
New Haven	Mystic
New London	New Britain
Southbury	New Haven
Stamford	Southbury
Storrs	Stamford
Torrington	Storrs
Waterbury	Stratford
Willimantic	Torrington
Winsted	Waterbury
	Willimantic
	Winsted

[58] *Certification may be performed by CCMPO or another transit district in the State.*

lington, Cromwell, Farmington, Meriden, Middletown, Newington, and West Hartford that fall within three-quarter miles of CT TRANSIT Bristol/New Britain division bus routes. Areas served by Central Connecticut's paratransit are tinted green and yellow in *Figure 45* (p. 142). Like the public buses, paratransit runs from 6 AM to 9:30 PM, Monday through Saturday, except in yellow and purple areas on the map, where service runs from 6 AM to 6 PM and 9 AM to 6 PM, respectively. There is no service on Sundays or holidays. (Paratransit mirrors the hours of regular transit service; as New Britain local routes run later, so, too, does paratransit there.)

Historically, trips that cross regional boundaries (e.g., from New Britain to Hartford) have enjoined passenger transfers. Given the physical and mental challenges that many riders face, as well as the frequently low marginal cost of transporting a rider all the way to his final destination in one vehicle, the Greater Hartford Transit District (GHTD) has begun offering single-seat rides to some locations. In the coming years, the Hartford paratransit district and the Central Connecticut paratransit district will be merged, negating the need for this service. Areas where single-seat rides are provided, which encompass parts of Farmington and West Hartford, as well as all of Hartford, Newington, Wethersfield, Rocky Hill, Cromwell, and Meriden, are tinted red in *Figure 45*. The Central Connecticut region will offer transfer-free rides to or from these 'expanded' areas *provided the origin or destination lies within the green or yellow area*. Trips that originate and terminate exclusively within the red area lie outside the Central Connecticut region and continue to be handled by GHTD's Hartford service. (Likewise, the Central Connecticut region service of GHTD will continue to serve those that remain solely in the green and yellow areas.)

Between 250 and 300 persons make use of Central Connecticut region's paratransit service in a given three-month period, though this figure is rising quickly.[59] The number of local clients enrolling in the service in 2009-2010 is up 163.6% over the preceding fiscal year.[60] The tally of passenger trips made by the service is up 74.7% over the same period. These increases likely owe to growing awareness of the service, better operational efficiency, and demographic shifts in the region (namely aging). With continued improvements to the service and graying of the population, demand is expected to surge further.

[59] *The average client makes .73 trips per weekday and .86 per weekend.*

[60] *This figure does not include Hartford region customers transported by the Central Connecticut region paratransit service to or from the region.*

Figure 45. Paratransit service area

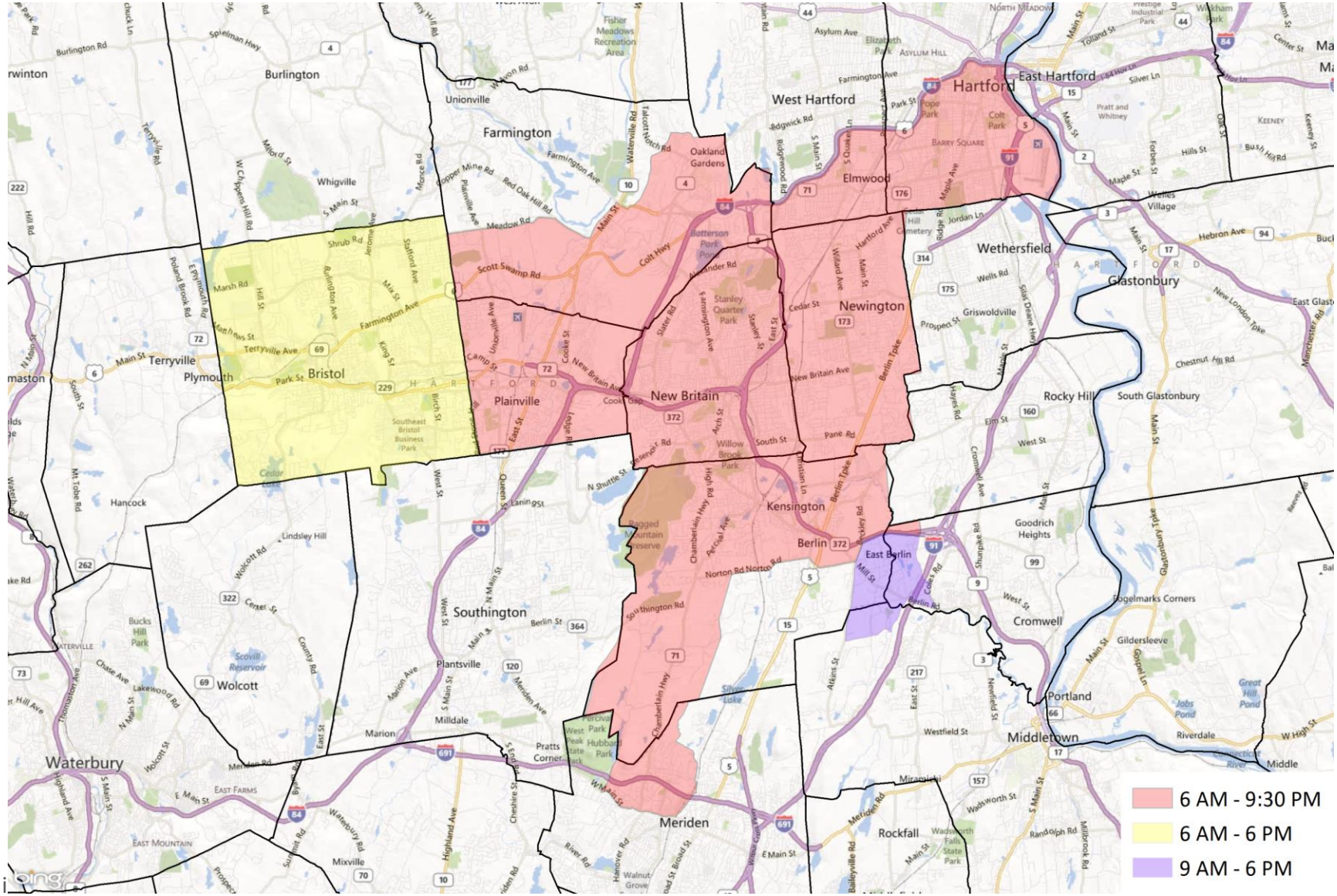


Table 28. ADA paratransit operations in Connecticut

Contractor	Region	Expenses	Bus Hours	Passenger Trips	Miles
CCRPA	New Britain-Bristol	$1,128,485	18,546	43,841	264,528
Greater Bridgeport Transit Authority	Bridgeport	$2,466,548	28,084	77,268	505,292
Greater Hartford TD	Hartford	$9,082,985	185,569	342,813	2,178,537
Greater New Haven TD	New Haven	$5,099,846	81,915	114,095	1,306,906
HART	Danbury	$253,493	4,491	13,145	55,680
Middletown TD	Middletown	$249,934	6,932	12,348	67,138
Milford TD	Milford	$652,541	15,545	43,714	220,081
North-East Transportation Co.	Waterbury	$1,954,622	40,401	64,684	546,522
North-East Transportation Co.	Meriden-Wallingford	$582,022	8,993	13,225	162,658
Norwalk TD	Stamford	$2,459,188	44,190	68,576	412,930
Norwalk TD	Norwalk	$969,193	20,176	27,545	192,145
Norwalk TD	Westport	$264,771	4,030	5,673	30,562
SEAT	New London	$150,655	2,727	3,013	42,654
Valley TD	Derby-Seymour	$249,286	4,983	16,807	61,421
Windham Region TD	Windham	$43,732	1,099	1,858	5,937

Paratransit is not as efficient as other forms of transit. Paratransit vans are considerably smaller than other transit vehicles and must provide space for bulky wheelchairs and scooters. This limits their passenger capacity to a fraction of what public buses and train cars can carry. In addition, paratransit vehicles do not follow concise, prescribed routes that have been developed to maximize ridership on a per-mile or per-dollar cost basis. Instead, they provide on-demand, curb-to-curb service

Figure 47. Passenger trips per operating hour

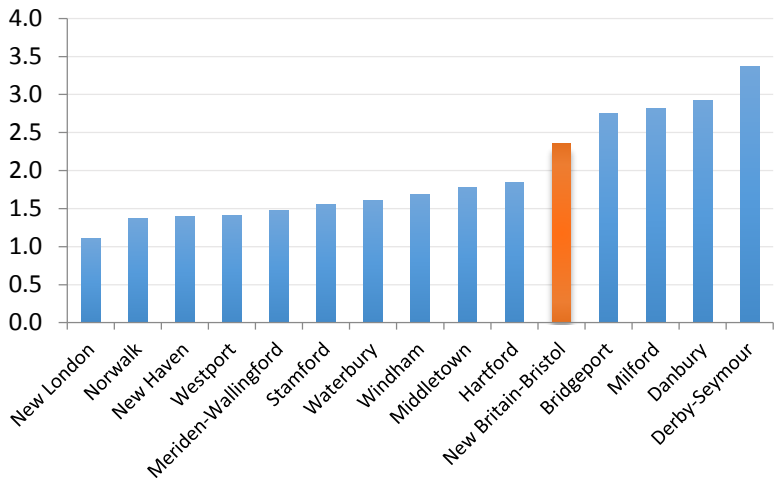
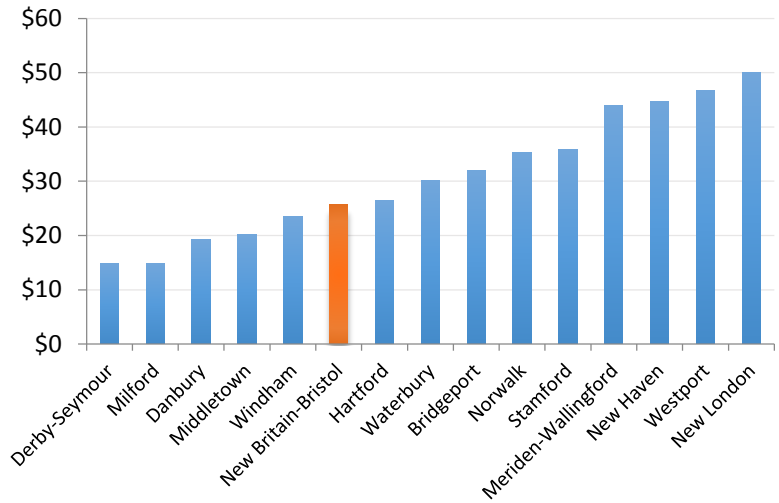


Figure 46. Cost per passenger trip



much like a shared cab. This means that paratransit vehicles must often travel long distances to pick up and drop off riders. As the *Figure 47* (p. 144) shows, paratransit in consequence transports far fewer passengers per hour than—between one half and one tenth as many as—buses. The region's paratransit makes an average of 2.36 passenger trips per hour of operation, which lands well above the middle state's paratransit services but still below the leaders.

These factors conspire to make paratransit is expensive. The total cost of running the paratransit service in the region for the 2009-2010 fiscal year was $1.2 million; for the 2014-2015 fiscal year it was $1.8 million. One-way tickets cost $2.50, which is double the corresponding bus fare. Even at this price, they only cover about one-tenth of the cost of providing each trip. *Figure 46* evinces that the region's paratransit service has lower than average costs per passenger trip ($25.74) but still lags the leaders in the state by a large margin. (Valley and Milford Transit Districts are able to offer trips for under $15 each.[61])

In Connecticut, the passenger fare for paratransit has been set at double that for an equivalent local bus trip. Given that local buses generally charge between one and two dollars for a ride,

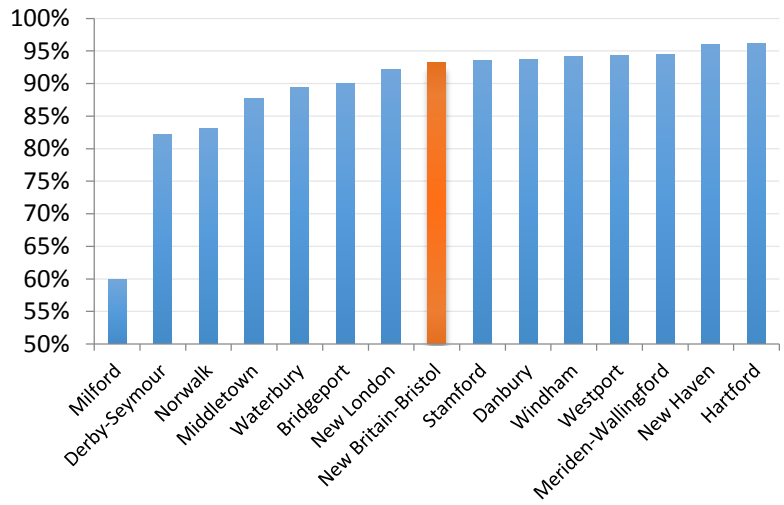
[61] *This likely owes, at least in part, to their tightly-circumscribed service area.*

this leaves a huge gap between income and expenses for all paratransit operators. Subsidies from the state make up the difference. *Figure 48* indicates that the state bears majority of costs for all paratransit service in Connecticut. Once again, Milford and Valley Transit Districts lead the pack; the region's paratransit service falls squarely in the middle with a subsidy of 93%, for a per-ride subsidy of $23.25.

The actual cost—and thus subsidy per individual trip—depends on manifold factors, including the quantity, spacing, and location of pickups and drop-offs; cancelations and no-shows; traffic conditions; the weather; and the clients' disabilities. One in five (18.5%) paratransit trips involves a client in a wheelchair or scooter. The remaining 81.5% are ambulatory. The latter (as well as wheelchair users who are unencumbered by additional handicaps) represent an opportunity: if they can be successfully helped to take advantage of existing bus service, paratransit expenditures may be saved accordingly.

Growth in ridership has stretched the paratransit system. As *Figure 49* (p. 146) reveals, at rush hour, the paratransit fleet is essentially maxed out, with nil capacity for extra trips at certain times (7:45 to 8:45 AM and 2:15 to 3:15 PM).[62] The result is low to no tolerance for incidents, such as tardy customers, traffic

Figure 48. Subsidy as a share of total cost of operations



congestion, or breakdowns. When such a contingency does arise, the results are often considerable delays that cascade through the fleet for the remainder of the day. Enlarging the size of the fleet could remedy this problem, but it would also come at a large cost. It may also be unnecessary, for the fleet enjoys considerable overcapacity during all other hours of the day. A more cost-effective approach to better the responsive-

[62] *Each interval includes a window of one quarter hour before and after the printed time. In other words, the column labeled '7:30' comprises all trips booked for pickup between 7:15 and 7:45. Weekend trips are Saturdays only.*

Figure 49. Average weekday trips per half-hour

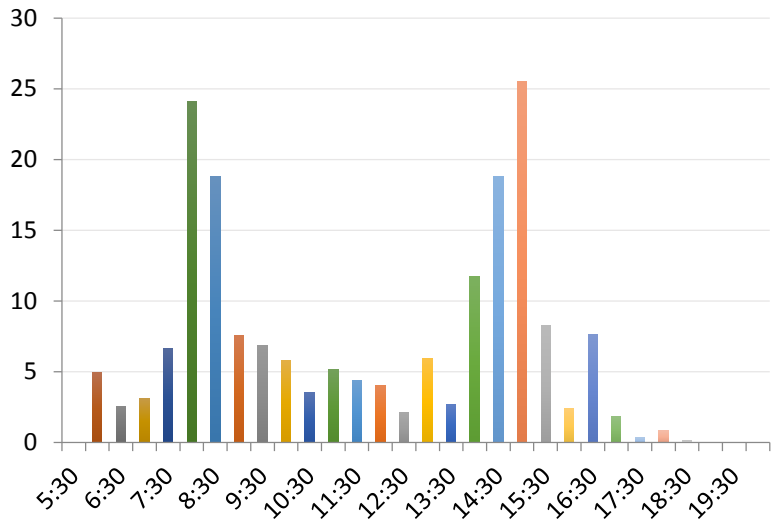
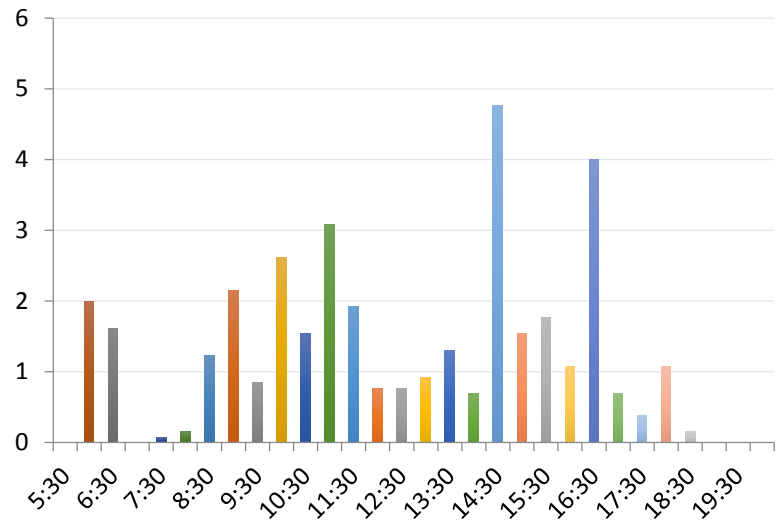


Figure 50. Average weekend trips per half-hour



ness of service would be to practice transit-demand management, where clients are encouraged to book their trips for the troughs rather than the peaks charted in *Figure 49*.

As *Figure 50* reveals, ridership patterns differ on Saturday. Any demand- management strategy adopted will have to take this into account.

DIAL-A-RIDE

All seven municipalities in the region and the Red Cross operate Dial-a-Ride services for senior citizens and, in some cases, the disabled. These services, which are state-subsidized, in part overlap with the region's paratransit (they operate in the same area with similar operating hours) but are not integrated with that service. Integration between these services may offer significant opportunities for improved customer service, better access to origins and destinations, and cost savings through economies of scale.

Table 29. Municipal Dial-a-Ride service clientele, area, and times

Municipality	Eligible riders[63]	Area covered	Hours of operation	Fare[64]
Berlin	Residents 60+	Berlin	Mo-Fr 8:30 AM – 4 PM	None
Bristol	Residents 60+	Bristol	Mo-Fr 8:30 – 5 PM	None
Burlington	Residents 60+	Burlington	MoTuTh 8:30 – 4 PM We 8:30 – 6:30 PM Fr 8:30 AM – 1:30 PM	None
New Britain	Residents 60+	New Britain	Mo-Fr 8:30 AM – 4 PM	None[65]
Plainville	Residents 60+ and caregivers	Bristol, Farmington, New Britain, Southington, Newington V.A.	Mo 9 AM – 6 PM TuWeTh 9 AM – 5 PM Fr 9 AM – 1 PM Su (for services)	None/ $1.00[66]
Plymouth	Residents 60+ and disabled residents	Bristol, Torrington, Waterbury Newington V.A.	Mo-Th 11:30 AM – 4:00 PM Fr 9:00 AM – 1:00 PM Su 8:30 AM – 11:30 AM	None
Southington	Residents 55+	Southington	Mo-Fr 8:30 AM – 4:30 PM	None
Red Cross	Residents 60+ of Berlin, New Britain, and Plainville	Farmington, Berlin, Bristol, New Britain, Newington, Plainville	Mo-Fr 9:-30 AM – 4:30 PM	$2.00/ $5.00[67]

[63] *All services allow disabled riders if they can be carried; however, only Plymouth also allows non-senior disabled persons to ride.*

[64] *Cost to riders for a single, one-way trip.*

[65] *Suggested donation of $1.50.*

[66] *No fee except $1.00 charge for Sunday rides.*

EASY STREET

The Connecticut DOT also sponsors a system of vans for commuters named 'easy street.' These vans, which are operated by The Rideshare Company, and whose survival depends on the desires of paying ride sharers and the availability of willing drivers, currently serve the following routes in the region. (These are subject to change at any time.) Each route makes one run daily.

Table 30. Easy street routes

No.	Origin	Stops	Destination
000597	New Britain	Hartford	Enfield
000135	New Britain	Newington	West Haven
088029	Southington		Hartford
066036	Southington	Plainville	Windsor
099630	Southington	Wallingford	New Haven
066005	Terryville	Bristol, Farmington	Hartford

SCHOOL BUSES

All seven municipalities in the region directly operate or contract with private providers to operate school bus fleets. These services, which are state-subsidized, in great part overlap with the region's public bus services. Integration among these services may offer significant opportunities for improved customer service, access to origins and destinations, and cost savings through economies of scale.

[67] *Trips within the local area, which comprises Berlin (including East Berlin and Kensington), New Britain, and Plainville cost $2.00. Rides to or from Bristol, Farmington, or Newington cost $5.00. To use the service, a $30.00 annual membership fee is also to be paid.*

Private vehicles

Transportation in the region skews heavily towards the automobile. As *Figure 51*[68] (p. 150) demonstrates, cars account for the overwhelming majority of transportation used in the region. Most of the time, these vehicles are parked; however when they are in use, by a huge margin they more often than not contain a single driver and no passengers. More persons carpool than ride transit to work in the region, but both are relatively rare phenomena.

The proportion of workers who commute to their jobs by automobile has changed over time. However, comparison of *Figure 51* with rates of walking, biking, and transit riding (*Figure 26* and *Figure 31*, p. 110 and 119) does not reveal an overarching trend toward one particular form of transportation. While the rate of driving increased in 2000, it seems to be on the retreat in 2013. Small increases over the 2000 rate are also shown for walking, biking, and transit (in some municipalities). Overall, the trend from 1990 to 2000 was an increase in single occupancy vehicle use at the expense of walking, biking, and transit; from 2000 to 2013, that trend has reversed to some extent.

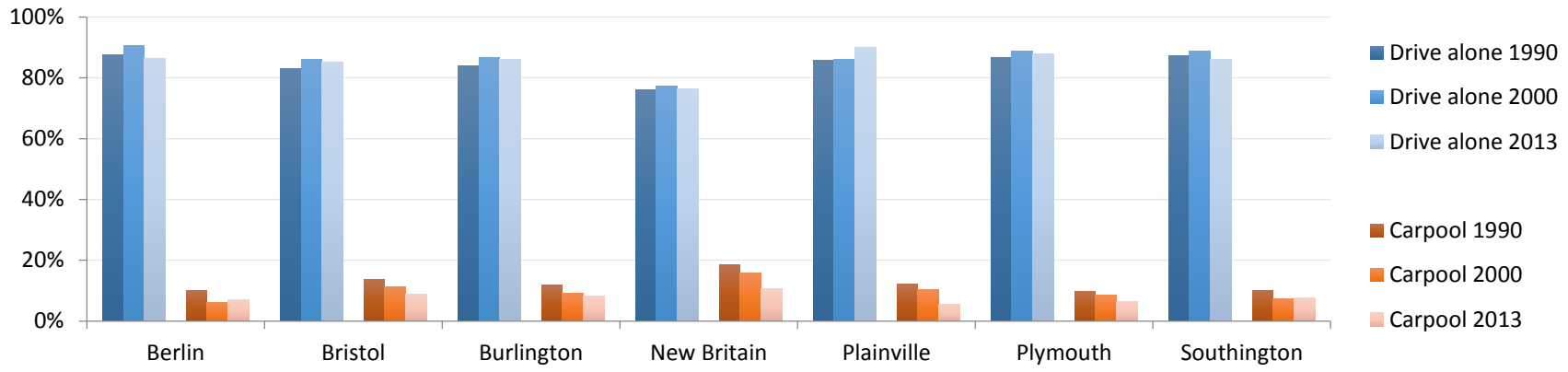
Overall, rates of driving, especially of single-occupancy vehicles (driving alone), remain very high. The roots of the poor showing for carpools, which plunged 35% across the region between 1990 and 2013 (*Figure 53*[69], p. 151) and walking, biking, and transit are manifold but likely include, as discussed above, a relative underinvestment in alternatives to driving, as well as the development of a decentered suburban landscape that does not lend itself to carpools or transit, migration of jobs out of the region, and the expansion of labor and residential markets. That is, not only have businesses moved to pedestrian-, cyclist-, and transit-unfriendly office and industrial parks outside of historic downtowns, but they also draw their employees from a larger geographical area, or 'workshed.'

Figure 57 (p. 155) illuminates the extent to which work and life have diverged. While the majority of a town's denizens once

[68] *Legend numbers refer to the years 1990, 2000, and 2007, respectively. Data from the U.S. Census Bureau, 1990 Census, Census 2000, and American Community Survey 2005-2009.*

[69] *Data from the U.S. Census Bureau, 1990 Census and American Community Survey 2005-2009.*

Figure 51. Percent of workers commuting by automobile



lived *and* worked within its boundaries, today[70] that is the case in only ten of the state's 169 towns and cities. As *Figure 57* shows, only thirty of these provide enough employment to satisfy the resident labor force (i.e., at least one job per worker who lives in town). In other words, a fraction of the State's residents live within a short drive of their work; even fewer live within a walk.

Part of this massive, quotidian to and fro, reflects individuals' lifestyle choices. Some prefer not to live close to work. However, part of it may result from a spatial disequilibrium between employment, the labor market, and housing. For various reasons, including exclusionary zoning, transportation systems, among other policies and subsidies, housing and businesses are often separated by great distances.

Whatever the cause, most of Connecticut's municipalities—all those towns and cities shaded in red in *Figure 57*—have become bedroom suburbs to a small number of regional employment centers: the I-91 corridor between New Haven and Massachusetts (especially Hartford, Farmington, and the suburbs

[70] *Data from the U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (Beginning of quarter employment, 2nd Quarter, 2009).*

Figure 53. Change in percent of workers commuting by carpool, 1990-2007

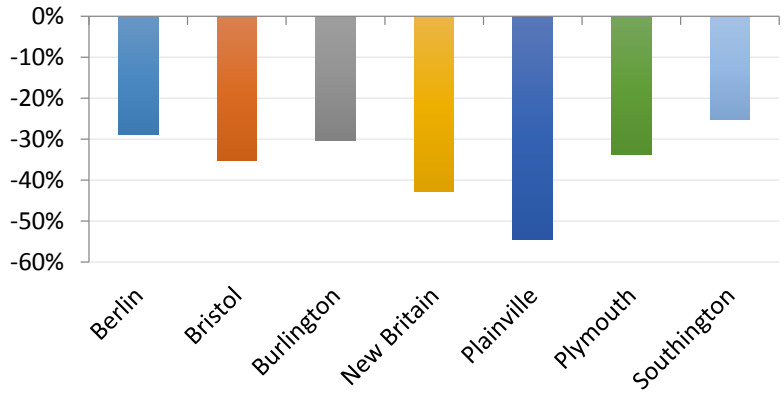
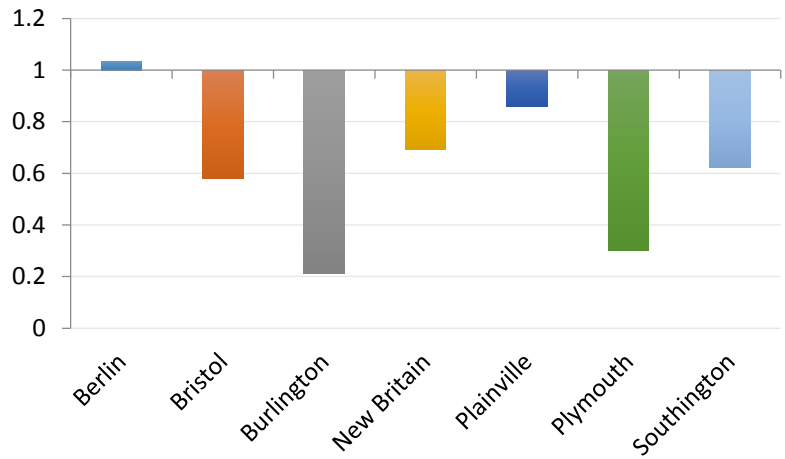


Figure 52. Jobs in town per resident worker



north of Hartford to Bradley International Airport), the corporate and financial centers of southwest Fairfield County, and the maritime, gambling, and pharmaceutical centers of southeastern Connecticut.

Central Connecticut is no exception to this pattern. *Figure 52*[70] visualizes how unbalanced the picture is. Farmington supports 2.38 jobs for each member of the labor force who resides in town; in contrast, Bristol has 0.58, and Burlington, a mere 0.21. As the inverted columns indicate, with none of the region's municipalities but for Berlin provides jobs sufficient fully to employ its resident workforce. With such a regional shortage and overall statewide imbalance of jobs, high rates of commuting, levels of congestion, and transportation expenses are to be expected.

As *Figure 54* (p. 152) shows, nowhere in the region do even one in four of any town's employed residents work in that same town. Bristol has the highest daytime retention, with 23.8% of its employed residents working in town. Burlington (as would be expected, given its exurban development pattern) has the lowest, with 6.3%. New Britain trails Bristol by a substantial margin, at 19.6%. This is surprising, given the city's dense, walkable urban form; other cities in the state exhibit markedly higher rates. (The loss of much of New Britain's economic base and its proximity and excellent highway connections to employment centers may explain this.) Overall, these percentages represent a decline from earlier periods. From 2002 to 2009, the region lost jobs for residents faster than it gained residents. *Fig-*

Figure 54. Percentage of working residents who work in the same town

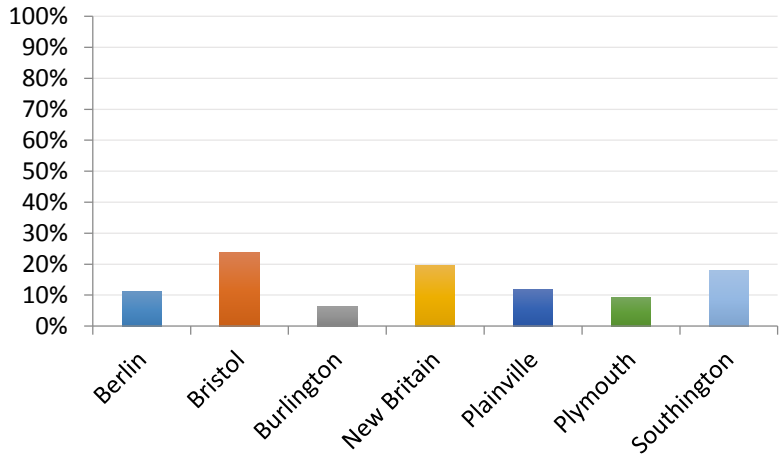
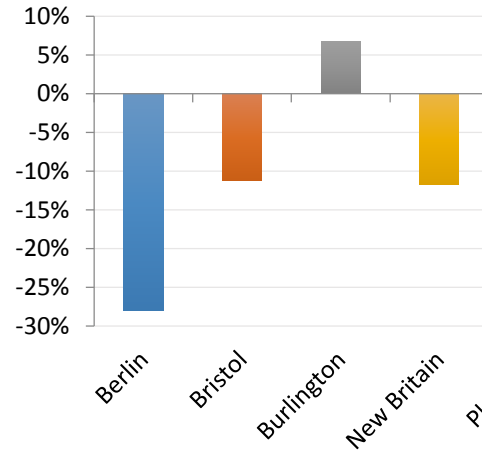


Figure 55. Change in percentage of w work in the same town, 2002-2009



ure 55 (p. 152) charts the percent change in the fraction of employed residents who work in each municipality. Figures range from 6.3% in Burlington (the only increase) to -27.9% in Berlin (the greatest decrease). In other words, growing numbers are, either by need or choice, having to go outside the region for work.

While this separation can deliver individual households some benefits, such as access to higher-ranked schools, the vast amount of travel it necessitates can overburden the transportation system and incurs significant costs for the economy, society, and the environment.

Figure 56[71] (p. 154) connects the dots between workers' origins and destinations. As the figure makes clear, Greater Hartford, including central Connecticut, is one of the commute-heaviest parts of the state. Only the I-95/New Haven Line corridor between the New York state line and the Havens rivals it for commute volume. (Line thickness symbolizes the number of people traveling between any two municipalities.) The figure also

[71] *Only flows of at least two hundred commuters are depicted. Data from the U.S. Census Bureau, Census 2000.*

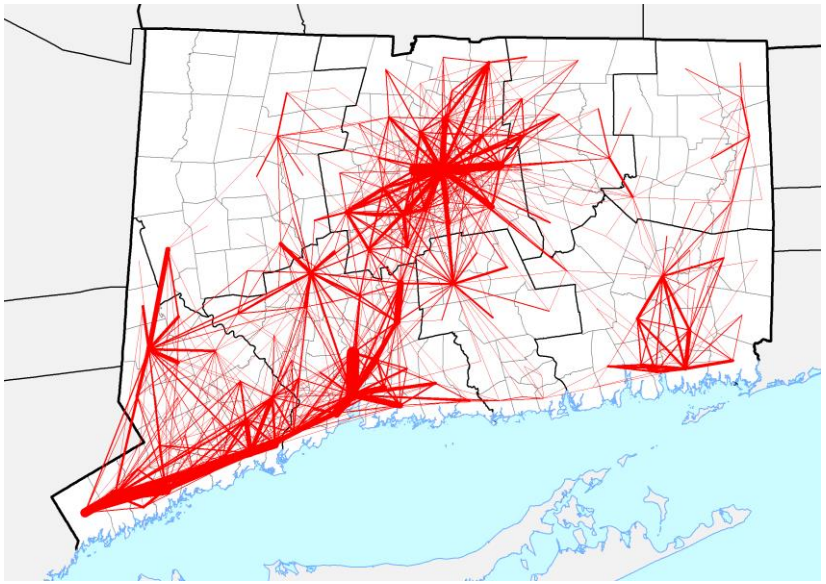
shows the degree of interconnection in Greater Hartford and their relative disconnection to the New York metropolitan area: while Hartford and its surrounding communities are tied together by thick lines, only wispy ones run from any part of it to New Haven and Waterbury.

Figure 58[72] (p. 156) enlarges the flows to show detail at the regional level. The map indicates that the communities of central Connecticut are tied to each other as well as surrounding municipalities by commute flows. (Again, line width is proportional to flow volume, with the thinnest line representing a flow of two-hundred persons.) The heaviest commute flows in the region orient southwest-northeast. This bias accounts for the heavy levels of traffic and congestion on the highways that ply this corridor, notably Routes 6 and 72, Interstate 84, and parallel arterials.

Although the heaviest flows orient northeast, not everybody commutes in that direction. Many people also work to the south. The most popular workplace destinations (i.e., those denoted by thick lines) are Waterbury, Meriden, and Middletown, as well as—to a slightly lesser extent—Cheshire and Wallingford. Given the size of these communities, their proximity to the region, and the highway infrastructure linking them with the region, these patterns are to be expected. *Figure 58* (p. 156) also reveals sizeable commute flows running from towns in the region farther south than this first tier of destinations. The thickest of these runs to New Haven, but flows to Hamden and North Haven, as well as Bridgeport, Danbury, Norwalk, Stamford, and Westport are also visible.

Most of these cities and towns, together with Hartford, have become more important as commute destinations for the region in recent years. *Table 31*[72] shows that these many of these areas have attracted workers from the region. Some of these may be new to the workforce, but given the employment losses evident in the table (all of the regions' municipalities, bar Burlington shed jobs), it is more likely that the region's workers *are having to go farther to find work*. The failure of the region to produce jobs for its existing labor force, let alone for new workers, has serious implications for State's already-burdened transportation system, as well as for society and the environment, especially given that virtually all the added travel must, by necessity, have taken the form of automobiles. (Walking and biking are not feasible over such great distances; and, as *Integration with New York* and *Public transit,* p. 31 and 117, respectively, discuss, transit connections to these locations are lacking.)

Figure 56. Commute flows within Connecticut



[72] *Only flows of at least two hundred workers are shown. Data from the U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (Beginning of quarter employment, 2nd Quarter, 2009).*

Figure 57. Jobs in town per resident worker (statewide)

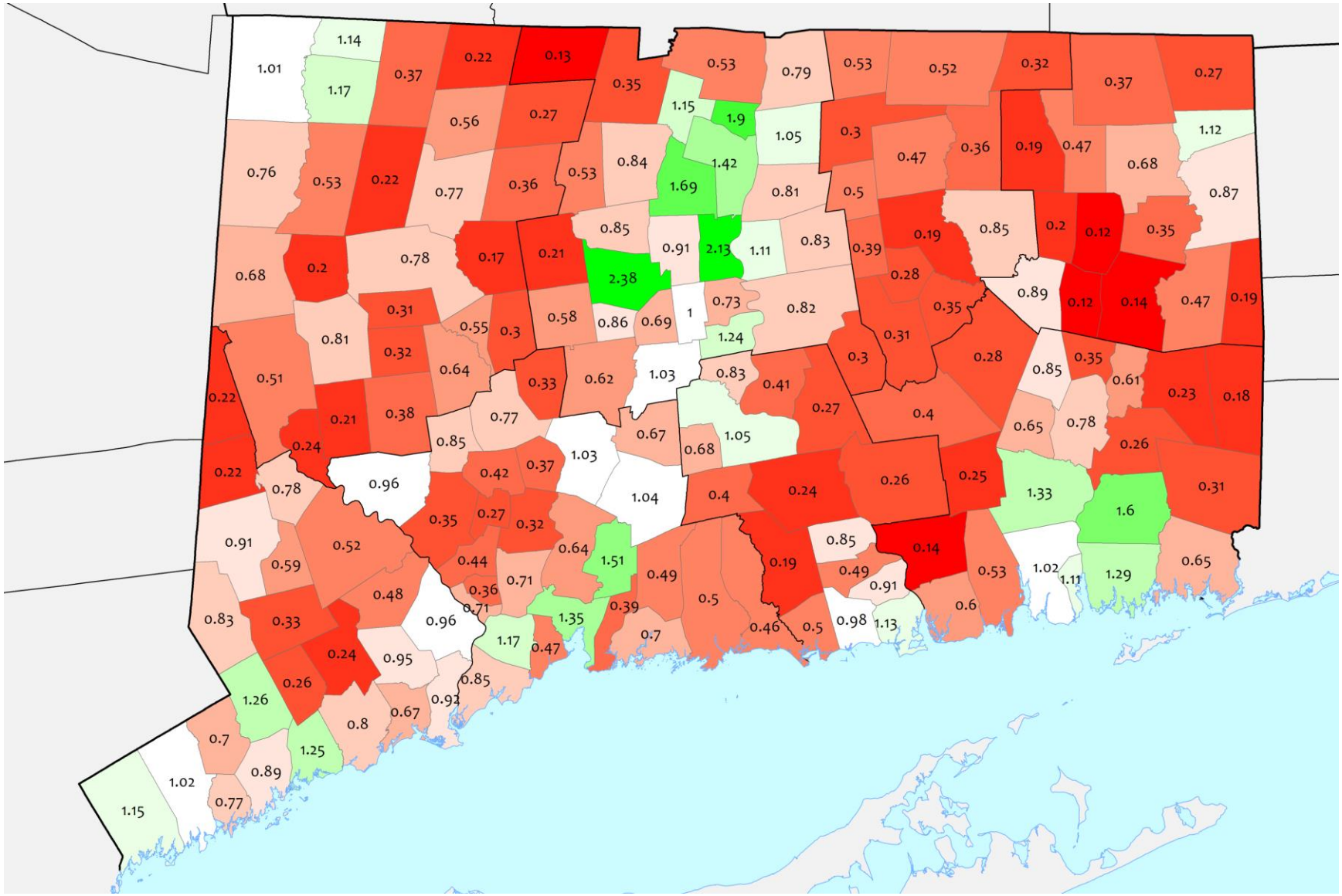


Figure 58. Commute flows to/from the region

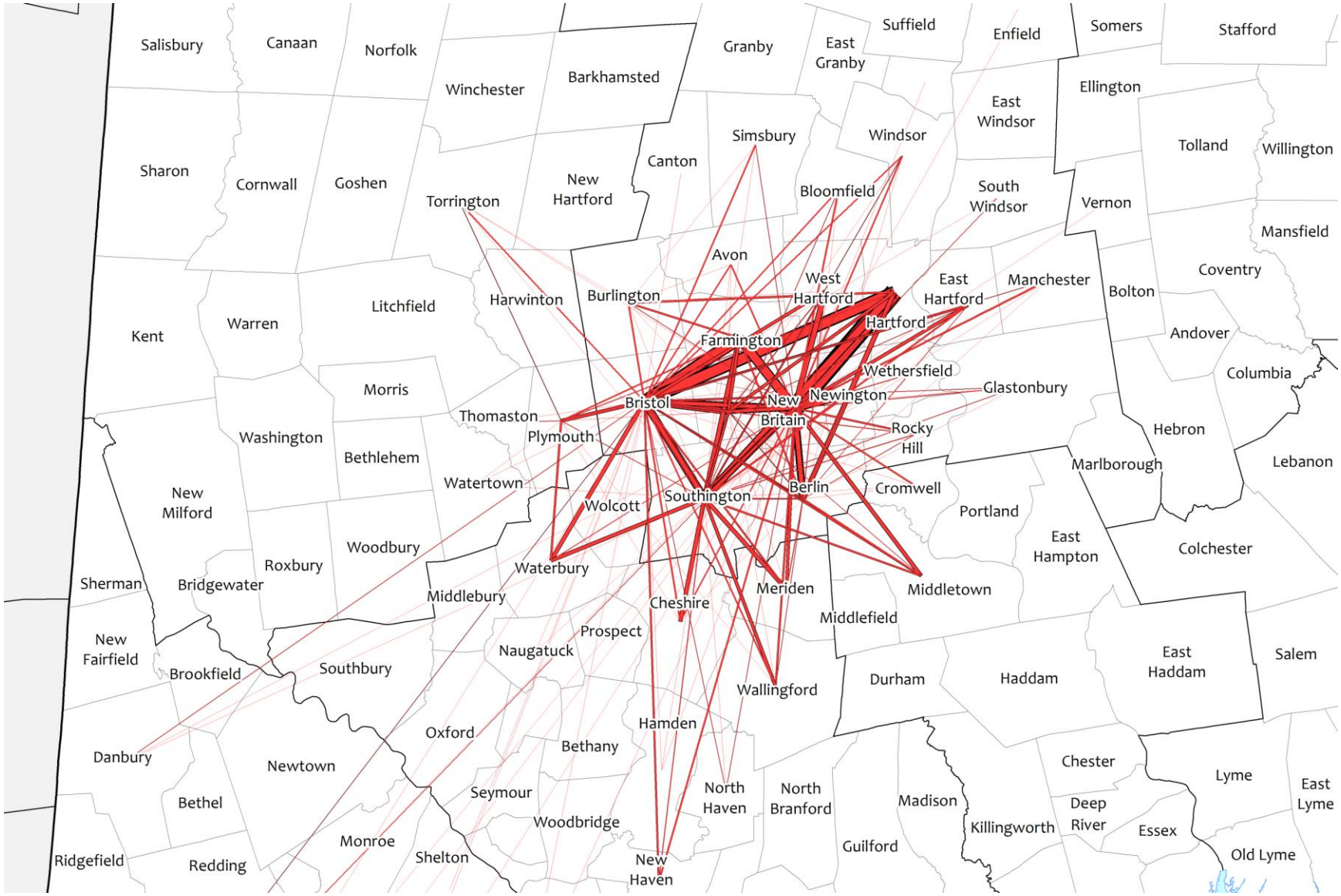


Table 31. Top commute destinations for workers from the region

Municipality	Workers from region	change, 2002-2009	% of all workers from region	% change, 2002-2009
Bristol	10786	-1056	10.1%	-8.9%
New Britain	10590	-662	9.9%	-5.9%
Hartford	10206	1088	9.6%	11.9%
Farmington	7469	71	7.0%	1.0%
Southington	6595	-818	6.2%	-11.0%
Plainville	4152	-597	3.9%	-12.6%
Berlin	3540	-641	3.3%	-15.3%
Newington	3367	180	3.2%	5.6%
West Hartford	2971	142	2.8%	5.0%
Waterbury	2908	374	2.7%	14.8%
Middletown	2751	97	2.6%	3.7%
Meriden	2344	-7	2.2%	-0.3%
East Hartford	2334	-91	2.2%	-3.8%
Cheshire	2085	239	2.0%	12.9%
Wallingford	2048	382	1.9%	22.9%
Rocky Hill	1600	-117	1.5%	-6.8%
Bloomfield	1480	-48	1.4%	-3.1%
Windsor	1473	62	1.4%	4.4%
New Haven	1273	204	1.2%	19.1%
Manchester	1250	112	1.2%	9.8%
Avon	1200	-13	1.1%	-1.1%
Simsbury	1024	-89	1.0%	-8.0%
Plymouth	1009	-100	0.9%	-9.0%
Glastonbury	965	161	0.9%	20.0%
Cromwell	914	14	0.9%	1.6%
Torrington	880	-113	0.8%	-11.4%
Wethersfield	806	-5	0.8%	-0.6%
North Haven	757	114	0.7%	17.7%
Stamford	714	26	0.7%	3.8%
Hamden	595	125	0.6%	26.6%
South Windsor	577	67	0.5%	13.1%
Danbury	576	-7	0.5%	-1.2%
Watertown	536	-31	0.5%	-5.5%
Burlington	457	50	0.4%	12.3%
Milford	440	17	0.4%	4.0%
Norwalk	412	128	0.4%	45.1%
Bridgeport	407	18	0.4%	4.6%
Thomaston	404	24	0.4%	6.3%
Canton	370	171	0.3%	85.9%
Manhattan, NY	370	167	0.3%	82.3%
Naugatuck	367	7	0.3%	1.9%
Shelton	359	29	0.3%	8.8%

Municipality	Workers from region	change, 2002-2009	% of all workers from region	% change, 2002-2009
Enfield	352	-15	0.3%	-4.1%
Stratford	350	57	0.3%	19.5%
Wolcott	343	55	0.3%	19.1%
Westport	334	225	0.3%	206.4%
Vernon	326	125	0.3%	62.2%
Norwich	310	79	0.3%	34.2%
Windsor Locks	270	-71	0.3%	-20.8%
Trumbull	257	40	0.2%	18.4%
Orange	249	59	0.2%	31.1%
Southbury	240	-57	0.2%	-19.2%
Fairfield	232	38	0.2%	19.6%
Branford	215	-10	0.2%	-4.4%

ROADS

The street network in the region is approximately 1,575 miles in length and comprises everything from dirt roads to limited-access expressways. Many roads in the region fall under the federal aid system (approximately 20.8% by mileage).[73] *Table 32* (p. 160) lists the total mileage of roads in the system by town, functional classification, and rural/urban split.

As the figures below imply, mileage is not allotted evenly on a per capita basis throughout the region. This is to be expected, given the differences in levels of development among the towns, which range from a dense, urban environment (New Britain) to a sparsely-populated exurban one (Burlington). *Figure 59* (p. 159) shows the extent to which the number of linear road feet per capita (both total and on the federal system, i.e. functionally-classified segments) varies between the region's municipalities.[74] Cities such as New Britain and Bristol, by virtue of their density, fit more people into per unit of space and, as the figures show, per unit of road. This explains the low ratios graphed in *Figure 59*. In themselves, such low numbers are not a bad thing; indeed, sharing the same resources among more people is to be lauded on grounds of fiscal efficiency and smart growth. However, more intense utilization may also subject infrastructure to greater stresses and wear it out faster.

Population, together with the differences in eligible mileage by town, may in part explain the substantial inter-municipal variation in federal aid received by the region's cities and towns over time. (See *Federal funding*, p. 66, for details.)

[73] *Total mileage for all roads and functionally-classified roads may be calculated differently.*

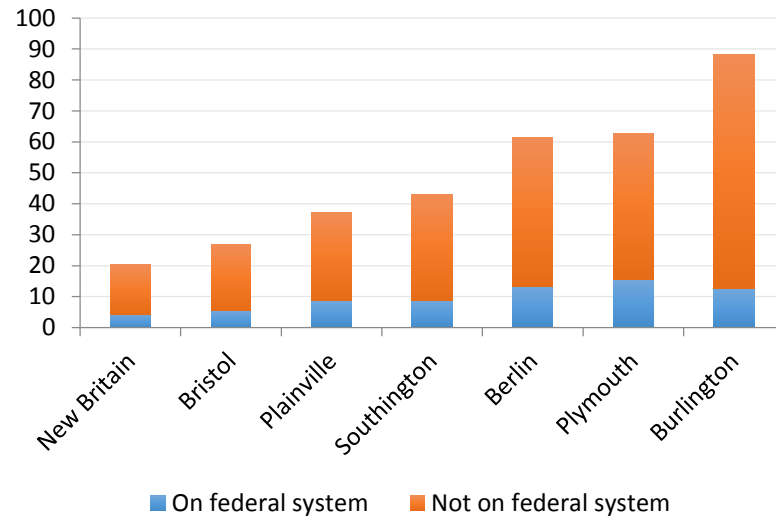
[74] *These figures reflect segment length only; not lane-miles or other multidimensional measures of roadway capacity.*

TRAFFIC AND CONGESTION

Although traffic jams do back up the region's limited-access expressways from time to time, congestion is not a recurring problem for them. (The nearest choke points in the State's expressway system center on cities beyond the region's boundaries, e.g. I-84 through Waterbury and Cheshire as well as between West Hartford and East Hartford, I-91 between Windsor and Wethersfield, and Route 9 in Middletown.) *Figure 60* and *Figure 61* (p. 163 and 164, respectively) , respectively) show traffic conditions for the region during Monday morning and Friday evening rush hours. As the maps show, with the exception of the western terminus of the expressway section of Route 72 in Plainville, which functions as a ramp, speeds are at least 50 miles per hour throughout the region's expressway system.

When the extent of study is broadened to span all state routes, not just limited-access expressways, the picture changes markedly. Some roads are wide open; while others are often choked with traffic. *Figure 62* (p. 165) illustrates this with volume-to-capacity ratios. (These convey the average daily traffic on a road as a percentage of the design capacity of the road; the higher the ratio, the more heavily trafficked and potentially congested

Figure 59. Road feet per capita by town



the road is.) As *Figure 63* (p. 166) shows, while volume-to-capacity ratios are acceptable in much of the region, by 2008 volume already neared or surpassed capacity on several of the region's key transportation corridors.

According to DOT projections, the picture will deteriorate by 2030. Major thoroughfares in the region will reach critical levels, with volume at or above capacity. The result will likely be

[75] *As estimates, these figures should not be used to justify construction projects: volume-to-capacity ratios do not necessarily relate to levels of congestion experienced. Some routes that exhibit high ratios may offer a superior driving experience than ones whose rations are lower.*

recurring congestion at peak hours, if not during the entire day. Barring any large-scale capacity expansion, implementation of transportation demand management strategies (TDM) or strict land-use controls, or provision of alternatives to driving, it is expected the roadway system of the region will 'seize up.' This is neither unique nor surprising: traffic is the predictable result of the unsustainable auto-centric patterns of development that the region and, indeed, most of the nation has pursued over the last several decades. Given the infeasibility of capacity expansion in a region as developed as central Connecticut, if TDM and transportation options are not rolled out, it is anticipated that—assuming that DOT's counts and projections are accurate[75]—worsening traffic will seriously impair the quality-of-life and economic wellbeing of the region. As the preceding maps make clear, ratios do not only vary by roadway and segment; they also change over time. By 2030, however, *all* state routes in the region but 69, 71, 72, 179, 364, and 571 will be near, at, or above capacity. This includes much of the region's expressway mileage

Table 32. Functional classification of roads

Town	Functional class	Rural mi.	Urban mi.	Total mi.
Berlin	Other Freeway or Expressway		5.36	5.36
	Other Principal Arterial		10.17	10.17
	Minor Arterial	2.20	14.99	17.19
	Collector		16.51	16.51
	Major Collector	0.54		0.54
	Minor Collector	0.30		0.30
Berlin Total		3.04	47.03	50.07
Bristol	Other Principal Arterial		17.79	17.79
	Minor Arterial		30.72	30.72
	Collector		13.60	13.60
Bristol Total			62.11	62.11

Town	Functional class	Rural mi.	Urban mi.	Total mi.
Burlington	Other Principal Arterial		3.46	3.46
	Minor Arterial	2.64	3.62	6.26
	Collector		5.27	5.27
	Major Collector	3.82		3.82
	Minor Collector	2.55		2.55
	Unclassified (Local Usage)		0.17	0.17
Burlington Total		9.01	12.52	21.53
New Britain	Interstate		1.54	1.54
	Other Freeway or Expressway		6.27	6.27
	Other Principal Arterial		2.85	2.85
	Minor Arterial		22.94	22.94
	Collector		23.89	23.89
	Major Collector		0.73	0.73
New Britain Total			58.22	58.22
Plainville	Interstate		2.35	2.35
	Other Freeway or Expressway		2.94	2.94
	Other Principal Arterial		5.28	5.28
	Minor Arterial		13.23	13.23
	Collector		4.72	4.72
	Unclassified (Local Usage)		0.38	0.38

Town	Functional class	Rural mi.	Urban mi.	Total mi.
Plainville Total			28.90	28.90
Plymouth	Other Principal Arterial		4.74	4.74
	Minor Arterial		7.60	7.60
	Collector		15.14	15.14
	Major Collector	6.53		6.53
Plymouth Total		6.53	27.48	34.01
Southington	Interstate		9.38	9.38
	Other Freeway or Expressway		0.58	0.58
	Other Principal Arterial		9.18	9.18
	Minor Arterial		20.06	20.06
	Collector		32.87	32.87
	Minor Collector	1.39		1.39
Southington Total		1.39	72.07	73.46
Grand Total		**19.97**	**308.33**	**328.30**

Figure 60. Expressway traffic, Monday, 8:30 AM

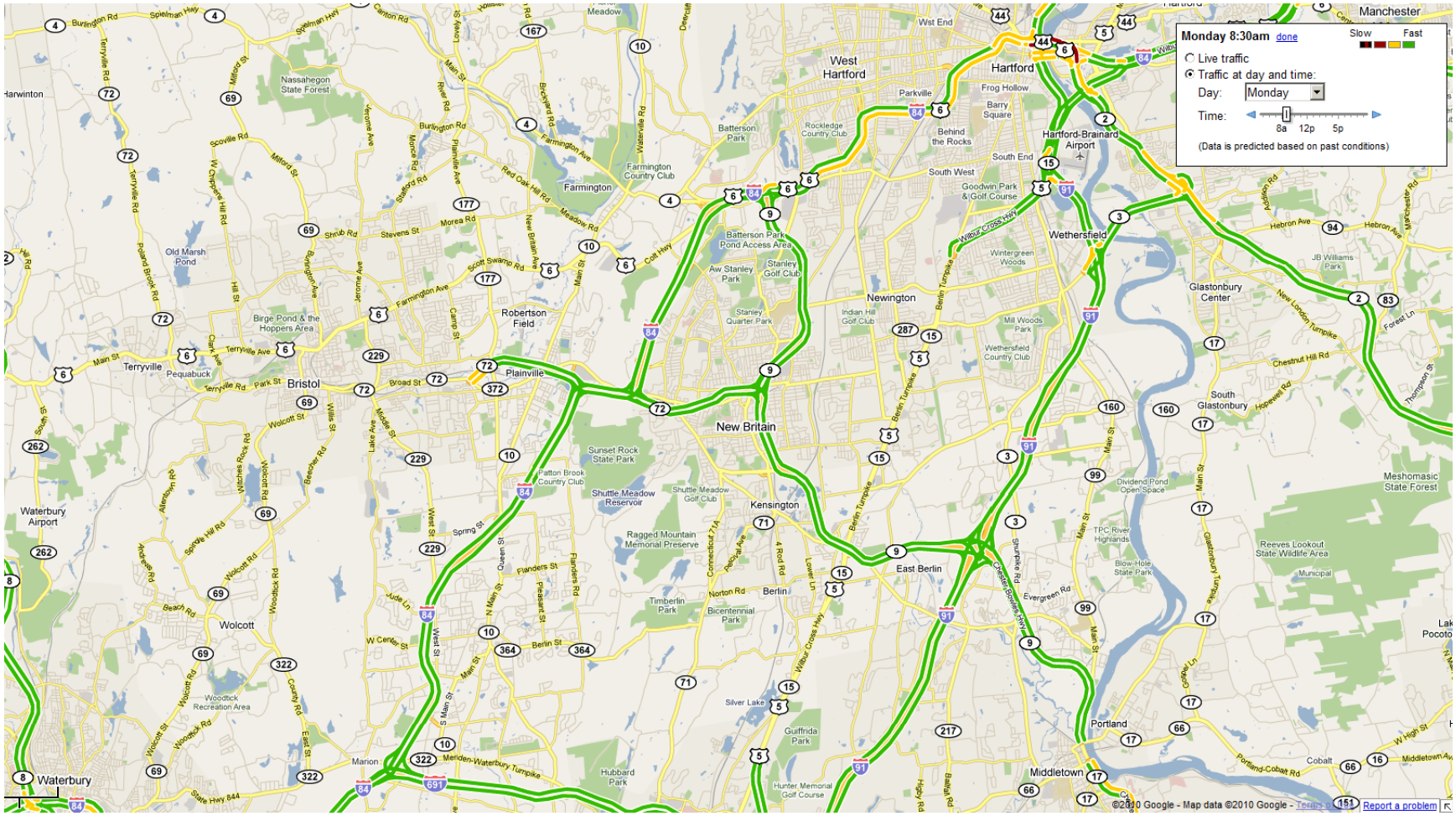


Figure 61. Expressway traffic, Friday, 5:30 PM

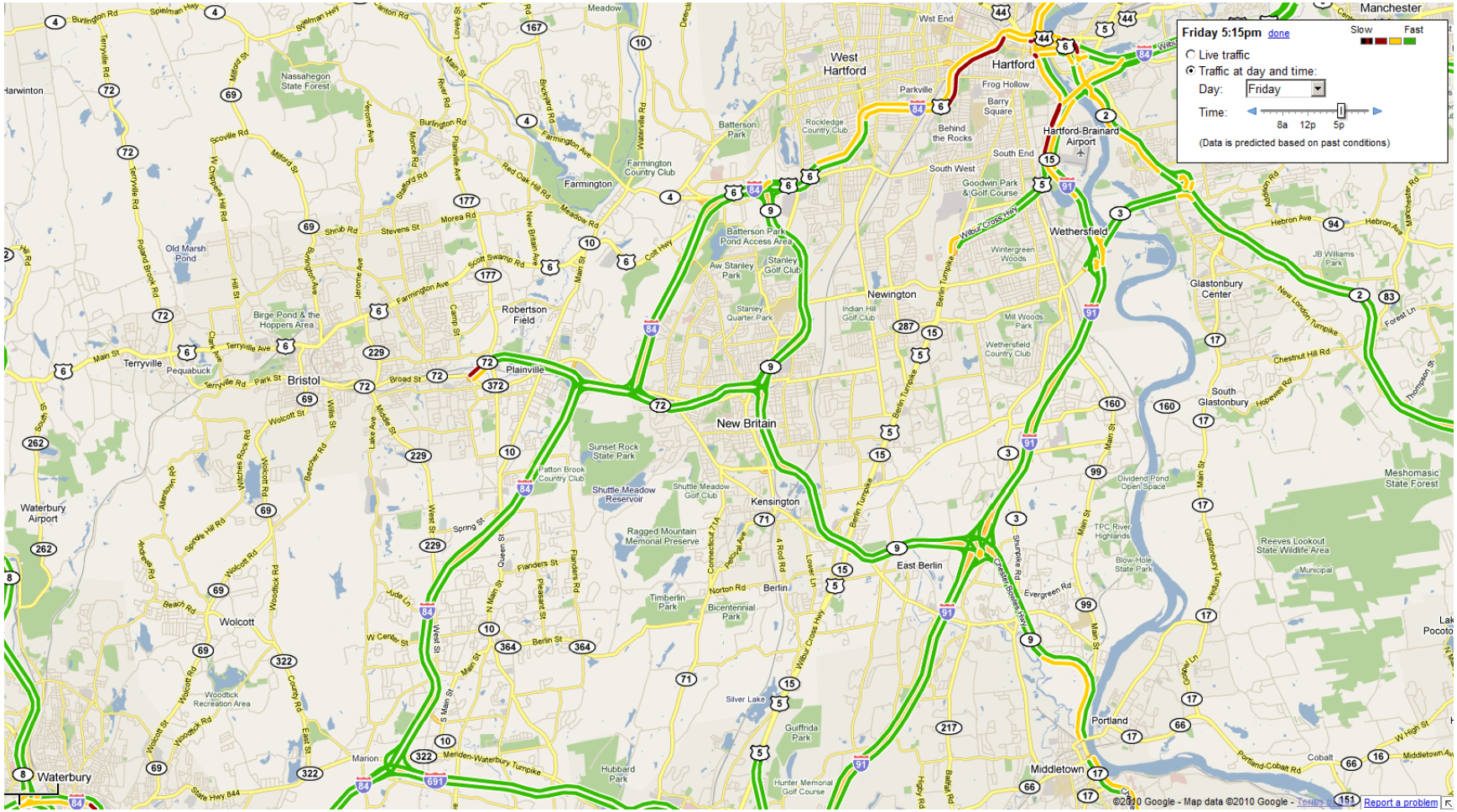


Figure 62. Volume to capacity ratios, 2008

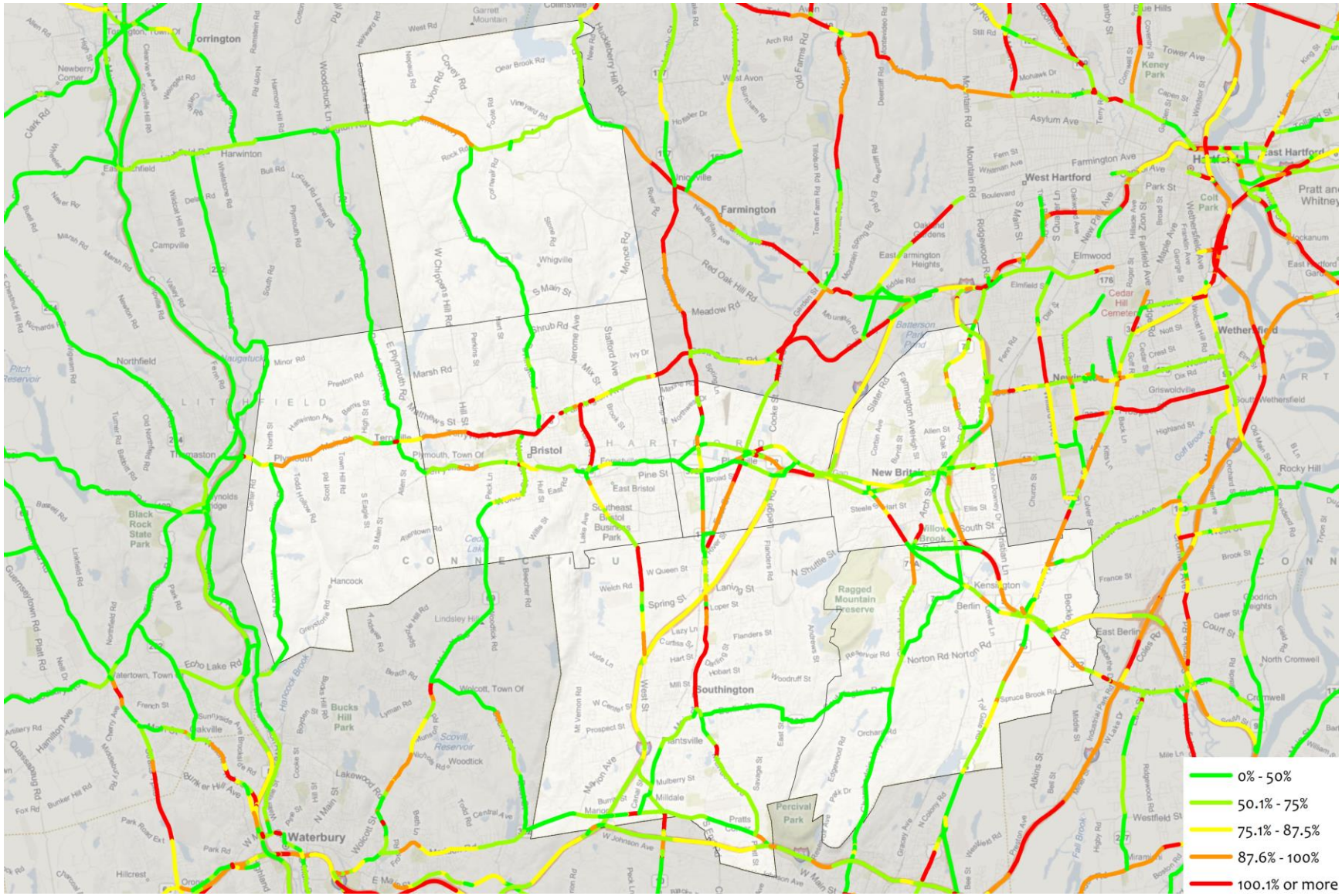
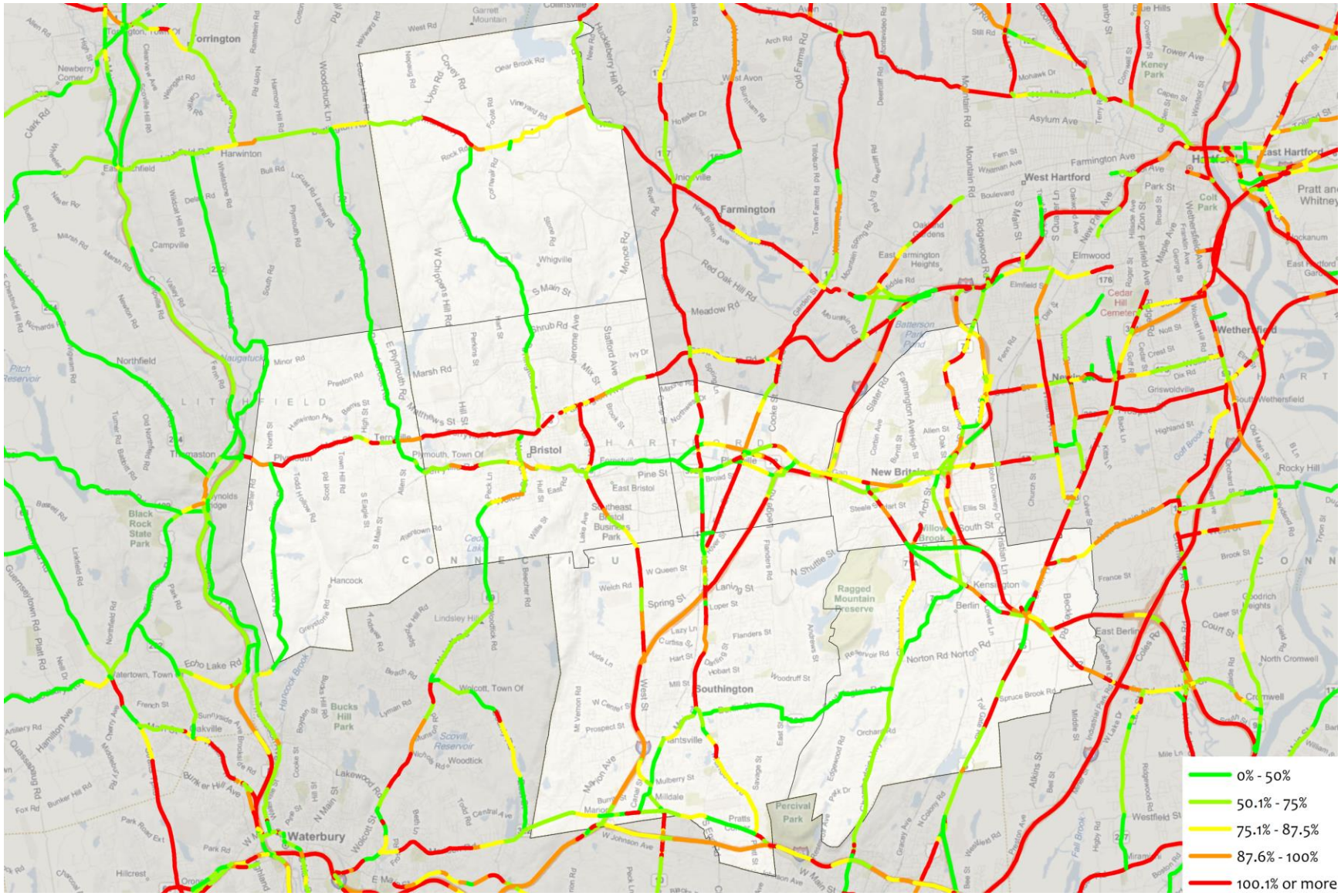


Figure 63. Volume to capacity ratios, 2030 (projected)



PARKING

No inventory of parking supply and demand has been undertaken in the region, so conclusions are difficult to reach. Based upon anecdotal evidence, it appears that, with few exceptions, there is no parking shortage in the region. If anything, in many areas, parking facilities may have been overbuilt. Overprovision of any resource is often counterproductive, as capital, maintenance, and opportunity costs are involved. An artificial surfeit of parking, which municipal ordinances often force developers to build, often has negative consequences, decreasing the cost of car use while increasing other costs. This results in artificially-elevated levels of driving, with its attendant ills (traffic congestion, air, water, and noise pollution; traffic congestion; asthma, stress, obesity, and cardiovascular disease; loss of open space) as well as communities that are unfriendly to pedestrians and cyclists.

Two parking studies have been conducted in Central Connecticut in the past few years. The first was at the Central Connecticut State University in New Britain. That study showed that at least 11% of the parking spaces, and often over 20%, were available at any given time. Throughout most of the day, at least 1,000 spots are empty. The second study was in the Plantsville section of Southington. That study had similar results, showing that parking utilization rates for study area did not exceed 33%. In some cases individual areas experienced higher rates (up to 80%).

PARK AND RIDE LOTS

Though free parking tends to raise the driving rate, park and ride lots can lower vehicle miles traveled. DOT maintains several park and ride lots in and around the region. These lots allow commuters to meet for carpools and to board local and express buses. They also serve important off-peak customers, too, such as persons rendezvousing for shared interstate segments on mid- to long-distance trips.

Table 33 lists the park and ride lots of the greatest probably use to commuters to and from central Connecticut; observed utilization is also given. As the table reveals, park and ride lots with the highest utilization are located at expressway ramps (chiefly I-84, but also Route 8). Several of these lots exceed their capacity on a frequent basis, denying commuters the ability to park and therefore ride, either by carpool or transit. Where possible, this Plan holds that expansion of lots at capacity and/or the creation of new lots to address the same need (e.g. up or down the highway by an exit or two) should be considered.

Table 33. Park and ride lots of use to the region

Municipality	Location	Attributes[76]	Capacity	Count[77]				Average
				1	2	3	4	utilization[78]
Berlin	Kensington Train Station		No data	30	27	21	—	—
Bristol	Mix St., Barnes Field Lot	P	57	3	15	13	3	15%
Bristol	Route 229 (Middle St.) @ Lake Ave.	PLE	58	U/C	U/C	U/C	U/C	—[79]
Bristol	Todd St.		U/C[80]	76	99	154	U/C	—
Cheshire	I-84 @ Route 70 (Exit 26)	PLTE	146	21	66	65	58	36%
Cheshire	Route 10, ¼ mi. north of I-691 (Exit 3)	PLTE	118	41	39	51	54	39%
Farmington	I-84, Fienemann Rd. (Exit 37)	PLT	70	48	44	35	—	60%
Farmington	Routes I-84 & 4 (Exit 39)	TB	15	14	6	16	16	87%
Farmington	Route 4 @ St. Mary's Church	PLE	40	12	13	24	2	32%
Farmington	Route 4 @ Town Farm Rd.	LSEB	72	16	15	15	11	20%
New Britain	Route 71 south of West Farms Mall	PLSEB	227	71	75	86	—	34%
Plainville	Grace Lutheran Church		No data	0	6	5	5	—
Southington	I-84 @ Route 10 (Exit 29)	PLTE	102	47	50	61	56	52%

[76] *P: paved; L: lit; T: telephone; S: shelter; E: express bus service; B: local bus service; R: rail service; RRS: railroad service.*

[77] *Single-time point vehicle counts from the following sources: 1, Bird's Eye, Bing Maps; 2, Aerial, Bing Maps; 3, Satellite, Google Maps; 4, Street View, Google Maps.*

[78] *As observed from counts 1-4.*

[79] *This lot was relocated, so use may have been artificially depressed.*

[80] *Under construction.*

Southington	Route 322 @ Waterbury Turnpike	PL	105	44	24	43	36	35%
Thomaston	Route 8 @ Route 6 (Exit 39)	PLT	46	10	25	44	25	57%

SAFETY AND STATUS

ACCIDENTS

DOT tabulates accidents on State highways. Accident rates are calculated on a per vehicle-mile basis and compared to a critical accident rate for a given location.[81] Should the actual accident rate exceed the critical accident rate, and at least fifteen accidents have occurred, at a given location, the high rate of accidents is deemed to be statistically significant (i.e., probably not a fluke), and the location is added to DOT's Suggested List of Surveillance Sites (SLOSS). *Figure 64* (p. 171) plots all road segments and intersections in the State highway system that are on the SLOSS. Lines and points are proportional to the ratio of the actual to the critical accident rate, so the thicker the line or point, the more extraordinary the rate is.

As the map shows, [82] sites with abnormally high accident rates fall into three types, in order of descending prevalence:

1. Commercial strips. Land-use decisions by municipalities have led to massive development on major thoroughfares. This development has predominantly taken the form of strip retail. While such development can support a municipality's grand list, it also impairs the utility of the State's numbered routes as a transportation network. Strip retail not only generates large motor vehicle traffic volumes. It also tends to produce a proliferation numerous turning movements and lanes, curb cuts, signals, and stopping, which impede the safe and efficient flow of vehicular through-traffic and non-motorized transportation such as walking and biking. A high incidence of accidents is a consequence. Examples of dangerous strips in the region include Route 372 in New Britain between Corbin Avenue and Russwin Avenue, Route 6 in Bristol, Route 372 in Plainville, and Routes 10 and 322 in Southington.
2. Ramps, interchanges, and environs. Due to high traffic volumes, frequent turning movements, and large disparities in speed, busy expressway ramps, interchanges, and the roads they feed into, especially when they are commercial strips and multilane highways, also tend to be the site of abnormally high accident rates. The ramps between Routes 9 and

[81] *The latter is computed by the rate-number quality control method.*

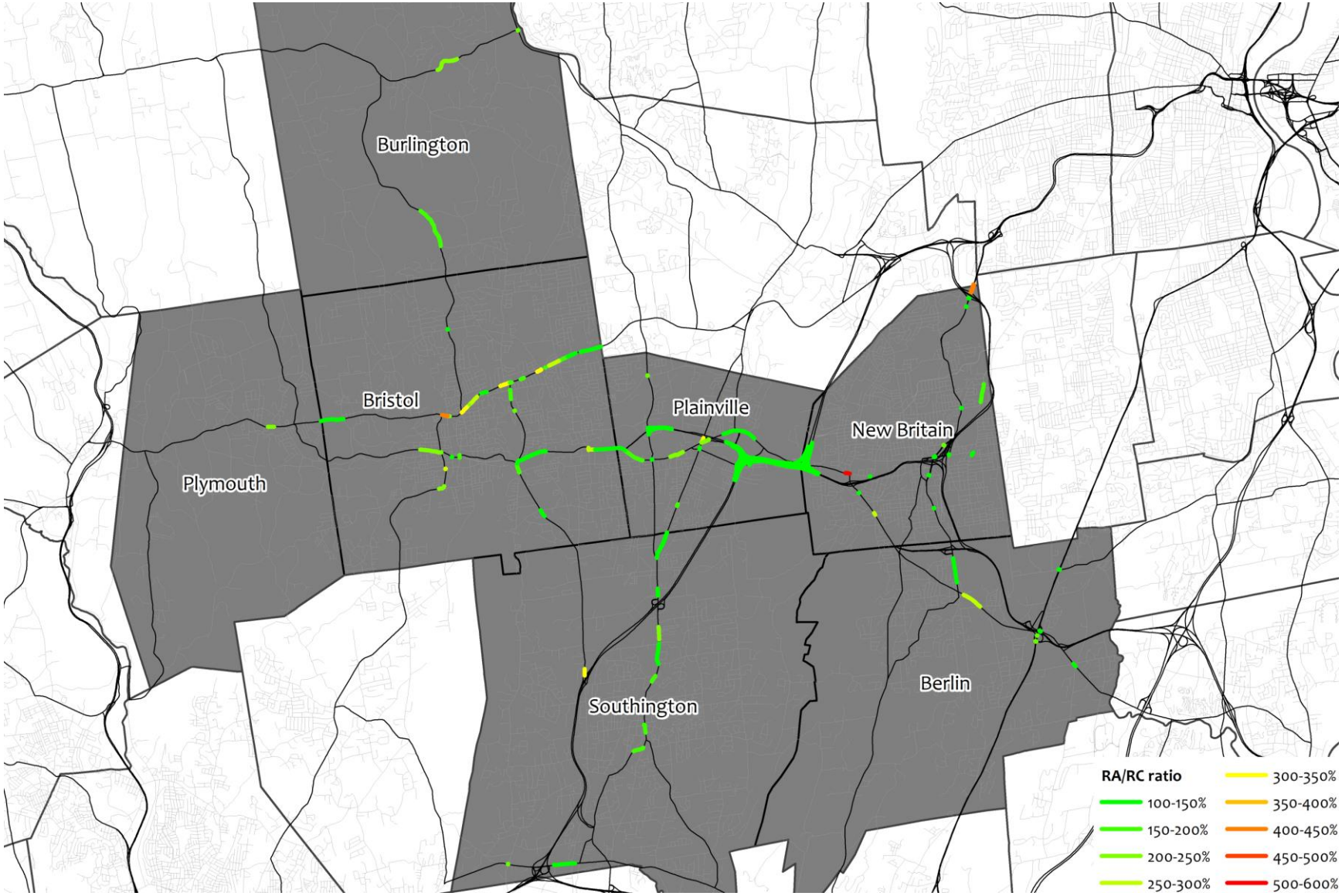
[82] *Data from DOT's Traffic Accident Surveillance Report, 2005-2007, for the Central Connecticut Region.*

71 south of Westfarms Mall in New Britain, the Route 72/177 ramps and 72 expressway terminus in Plainville, the I-84/72 interchange in Plainville, the I-84/229 ramps in Southington, and the Route 15/372 interchange in Berlin exemplify this.

3. Rural and lower-traffic roads with design problems. Although infrequent, certain roads in the region suffer from design issues that, while they do not render the road unsafe per se, may disconcert or induce drivers to operate their vehicles in an unsafe manner. These include the curved sections of Routes 69 and 4 in Burlington, as well as Route 6 approaching the Plymouth town line, and several intersections in the region (e.g. the Routes 4 and 179 in Burlington, Route 177 and Northwest Drive in Plainville, Route 69 and East Road in Bristol, Routes 229 and Woodland Street in Bristol, Route 174 and East Street in New Britain, and the Route 372 six-way intersection in Berlin.)

Unfortunately, comparable accident data for local roads is not available. As a consequence, while the SLOSS may be used to justify safety improvements, it should not serve as the sole criterion. (To provide a better basis for project evaluation and selection, this Plan proposes to *Improve data collection*, p. 17)

Figure 64. Sites with abnormally high accident rates



PAVEMENT CONDITION

The region's transportation network may resemble a circulatory system, but unlike arteries and veins, it does not heal itself. If it is to continue functioning in a safe, efficient manner, it must be maintained. Roads make up the largest part of the transportation network and, as such, require the most attention (and funding) in order to maintain them in acceptable condition.

Road maintenance schedules are determined based on pavement condition. The two primary metrics DOT uses to assess pavement condition are the Pavement Condition Index (PCI) and International Roughness Index (IRI).[83] DOT measures and records pavement data for 142 miles of road segments in the region. *Table 34* gives weighted averages of the pavement condition metrics of the road segments in each town and the region as a whole. The figures indicate that the roads in the region are generally fair to good, although there is variation among the towns. Burlington roads are in the best condition, while Bristol roads rank the poorest. (These data are derived from only a sample of road segments and should be interpreted accordingly.) No road segments have a PCI lower than 4, but 39 segments are reported to have an IRI higher than 170, which makes them 'unacceptable.' The table also gives the average pavement year, which represents the mean date of last paving for all measured segments in each town. On average the pavement on the roadways in the region is about ten years old.

Table 34. Measured pavement condition by town

Municipality	Average PCI	Average. IRI (in./mi.)	Avg. Pavement Year
Berlin	6.03	128.07	1998.8
Bristol	5.76	175.05	1998.2
Burlington	6.76	122.13	2003.9
New Britain	6.64	133.08	2002.0
Plainville	6.30	141.27	1999.0
Plymouth	5.99	160.66	1999.8
Southington	6.39	144.81	1999.5
Region	**5.97**	**140.07**	**1999.9**

BRIDGES

Bridges are an integral part of any transportation system, both to cross land features and to provide grade separation over

[83] *The PCI is a numerical index between 0 and 9 that measures the structural operational condition of the pavement. It is a statistical measure and requires a manual survey of the pavement. The relationship between PCI and the overall rating of the pavement is shown in the table below.*

The IRI is used to define a characteristic of the longitudinal profile of a traveled wheeltrack and constitutes a standardized roughness measurement. The index is measured in inches per mile. The FHWA declares an IRI acceptable if it is less than 170 and good if it is under 95.

other transportation infrastructure. There are 234 bridges total in the region. Ninety-seven of these have a span of at least twenty feet, which is the minimum necessary in order to qualify for federal funding. High material and labor inputs make bridges costly to build and repair; however, the risks aging bridges pose also means they require safety monitoring and, when called for, rehabilitation or replacement. DOT inspects and issues sufficiency ratings for all bridges in the region. *Table 35* (p. 173) gives an overview of the region's bridge stock by municipality. (*Bridges*, p. 201, lists all bridges in the region of at least twenty feet.)

Within the region are three historic bridges:

1. New Britain: 1925—A concrete arch bridge on Stanley Quarter Park Road.
2. New Britain: 1936—A concrete arch bridge on Stanly Park Road "C".
3. Plymouth: 1910—A concrete arch Bridge on Tunnel Road, Allen Street and South Main Street.[84]

The primary reasons bridges deteriorate are weather, loads, volume of traffic, and deicing operations. As a bridge deteriorates, its condition ratings gradually decline to poor. Preventive maintenance can extend the useful life of a structure substantially. However, a major rehabilitation or replacement will ultimately be required. When a structure receives a poor sufficiency rating, the bridge is identified as a candidate for rehabilitation or replacement.[85] *Table 36* (p. 174) lists all such bridges in the region as of writing.

Table 35. Bridges by municipality

	Bridge length	Berlin	Bristol	Burlington	New Britain	Plainville	Plymouth	Southington	Region
Number of bridges	<20 ft.	21	40	12	23	4	17	20	137
	≥20 ft.	16	25	7	11	4	15	19	97

[84] *Connecticut Historic Bridge Inventory, Final Report: Inventory Phase. State of CT, Department of Transportation. December, 1990.*

[85] *A bridge with a sufficiency rating of less than 80 percent is eligible for rehabilitation. One with a rating of less than 50 is eligible for replacement. Should the bridge be deemed useful, the bridge is programmed for rehabilitation or replacement. (Some bridges may no longer be necessary.) This can take several years due to social and environmental issues as well as legal and engineering concerns that must be addressed prior to construction. Initiating this process when the first poor rating is identified generally allows sufficient time for design and construction.*

	All	37	65	19	34	8	32	39	234
Average sufficiency rating	<20 ft.	67.6%	62.4%	84.7%	55.6%	60.2%	57.3%	28.7%	62.0%
	≥20 ft.	76.2%	80.5%	72.9%	74.5%	76.2%	80.3%	77.2%	77.7%
	All	72.8%	74.4%	74.6%	66.4%	73.0%	77.0%	74.7%	73.4%
Average ADT	<20 ft.	502.4	501.4	87.5	206.5	187.5	212.5	228.4	326.1
	≥20 ft.	2,459.7	4,936.3	341.1	3,751.6	2,138.8	753.3	3,815.8	3,066.0
	All	1,348.8	2,349.3	180.9	1,203.6	1,163.1	474.2	2,022.1	1,482.9
Average year built	<20 ft.	1957.0	1949.5	1962.2	1955.1	1964.3	1946.2	1961.1	1954.4
	≥20 ft.	1961.9	1946.7	1966.0	1968.4	1971.8	1971.2	1958.9	1960.2
	All	1959.1	1948.4	1963.6	1959.4	1968.0	1957.5	1960.0	1956.8

Table 36. Bridges with poor sufficiency ratings

No.	Town	Feature carried	Feature crossed	Location	Year built	Year recon.	Inspect. date	Rating
4473	Berlin	Burnham St.	Sebethe River	600 ft. west of Rt. 372	1960	1989	1/4/2007	59.73%
4474	Berlin	Farmington Ave.	Sebethe River	500 ft. from jct. w/ Rt. 372	1928		5/14/2008	38.10%
4091	Bristol	Jerome Ave.	Negro Hill Brook	200 ft. south of Coolidge St.	1964		12/5/2006	58.87%
2972	Bristol	Route 72 (Main St.)	Pequabuck River	Btwn. Riverside Ave. & School St.	1972		6/7/2004	58.35%
3634	Bristol	Maple Ave.	Polkville Brook	.20 mi. east of Rt. 69	1956		7/17/2007	57.29%
4105	Bristol	Memorial Blvd.	Pequabuck River	Over Pequabuck River	1921	1987	3/30/2006	48.58%
5916	Burlington	Vineyard Rd.	Burlington Brook	300 ft. west of Rt. 4	1954		1/24/2005	52.84%

No.	Town	Feature carried	Feature crossed	Location	Year built	Year recon.	Inspect. date	Rating
6077	New Britain	Paul Manafort Dr.	Stream	0.1 mi west of jct. w/ Rt. 175	1970	1994	7/14/2008	58.45%
6542	New Britain	Kensington St. & Arch St.	Willow Brook Culvert		1996		8/4/2004	58.45%
6078	New Britain	Oakwood Dr. No. 1	Stream		1970		7/12/2006	57.73%
4561	Southington	South End Rd.	Misery Brook	300 ft. from jct. w/ Maxwell Noble Dr.	1900	1931	10/31/2008	59.16%
4564	Southington	West Queen St.	Quinnipiac River	400 ft. from jct. w/ Redstone St.	1969		11/26/2008	46.37%

Freight

Over 200 million tons of freight pass through the Hartford metro area annually. Nearly all of this (98%) in the region travels by truck. This figure is higher than the 79% national average. Only 2% of freight in the region travels by rail, which is one tenth of the national average. The results of this bias towards road freight are congestion, high maintenance costs, and safety hazards on the region's highways, as well as air pollution, an over-dependence on fossil fuels, and an economically limiting dearth of transportation options for local shippers and receivers. *Figure 67* and *Figure 66* (p. 177) depict the volumes of freight that move from and to the Hartford metro area and surroundings (shaded gray), respectively.

Both figures show that the primary route in the region along which locally-sourced or -destined freight travels is I-84. This corridor leads by a large margin and skews slightly towards inbound freight i.e., deliveries). The Route 6/72 corridor between Route 8 and I-84 comes second, but carries more pickups than deliveries. (This likely reflects the continued presence of manufacturers in the region.) Route 9 south of its interchange with

Figure 65. Annual tons of truck freight traffic from the Hartford metro area

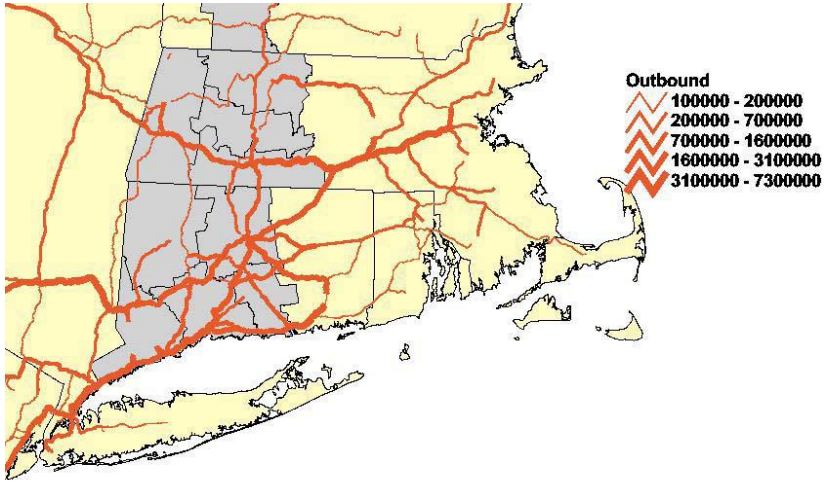
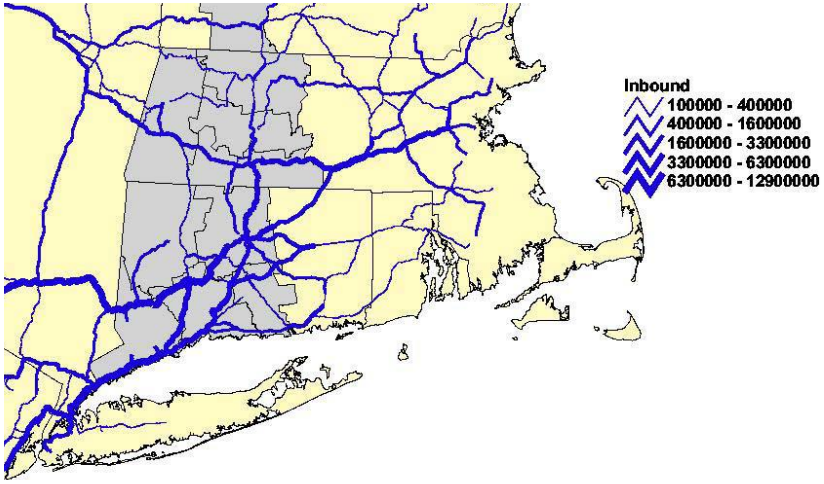


Figure 66. Annual tons of truck freight traffic to the Hartford metro area



72 and I-691 round out the rest, both with relatively low volumes (although 9 does skew towards pickups). Both of these highways serve as alternates for I-84, which suffers from high levels of congestion in and around Hartford.

Figure 65 reveals a different picture. The only road of consequence to freight through-traffic in the region is I-84. This route constitutes the most direct path between New York and Boston; it is not surprising that it is as popular with truckers as with car drivers. However, as the figure also shows, considerable volumes of freight continue southwest through the densely-populated eastern seaboard and to the Gulf Coast ports, northeast of Boston toward Maine and Canada, and west toward the Great Lakes, Midwest, and Pacific Coast ports. (Admittedly, some outbound and, in particular, inbound freight also serves these locations.) This indicates that the region's other highways, even expressways such as 9, 72, and I-691, are of limited utility to the mass of through freight.

Figure 68 (p. 179) shows state routes by the percentage of vehicles that are trucks. Interstates 84 and 691 exhibit vehicle mixes with the greatest proportion of trucks. Route 6 between 10 and 229 and Route 229 also possess above-average high truck shares, as does Route 15 south of Kensington. Although other roadways in the region may not carry a large amount of freight in absolute terms, trucks do account for a significant proportion of the vehicles that travel on them.

Figure 67. Annual tons of truck freight through the Hartford metro area

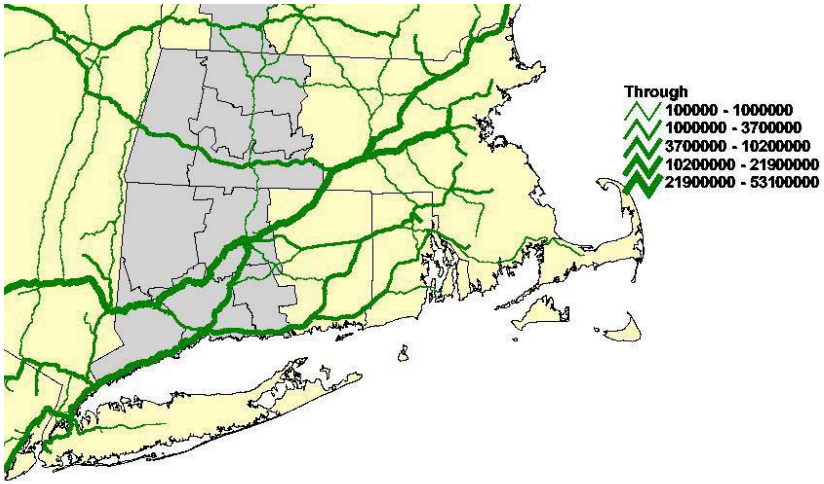


Figure 68 also depicts the historic rail network in the region. The railroads that ferried passengers as described under *Rail* (*p*. 119) also carried freight. Railroads traversed three interconnected routes through the region:

1. Bridgeport through Waterbury and both Newington and Kensington
   (via Waterville, Hancock/Greystone, Pequabuck, Bristol, Forestville, Plainville, and New Britain)
2. New Haven to Springfield
   (via Meriden, Kensington, and Newington)
3. New Haven to Northampton along the path Farmington Canal/Route 10 corridor

(via Cheshire, Southington, Plainville, Farmington, Simsbury, and Westfield; as well as northwest to Unionville, Collinsville, Winsted and into Massachusetts and New York state)

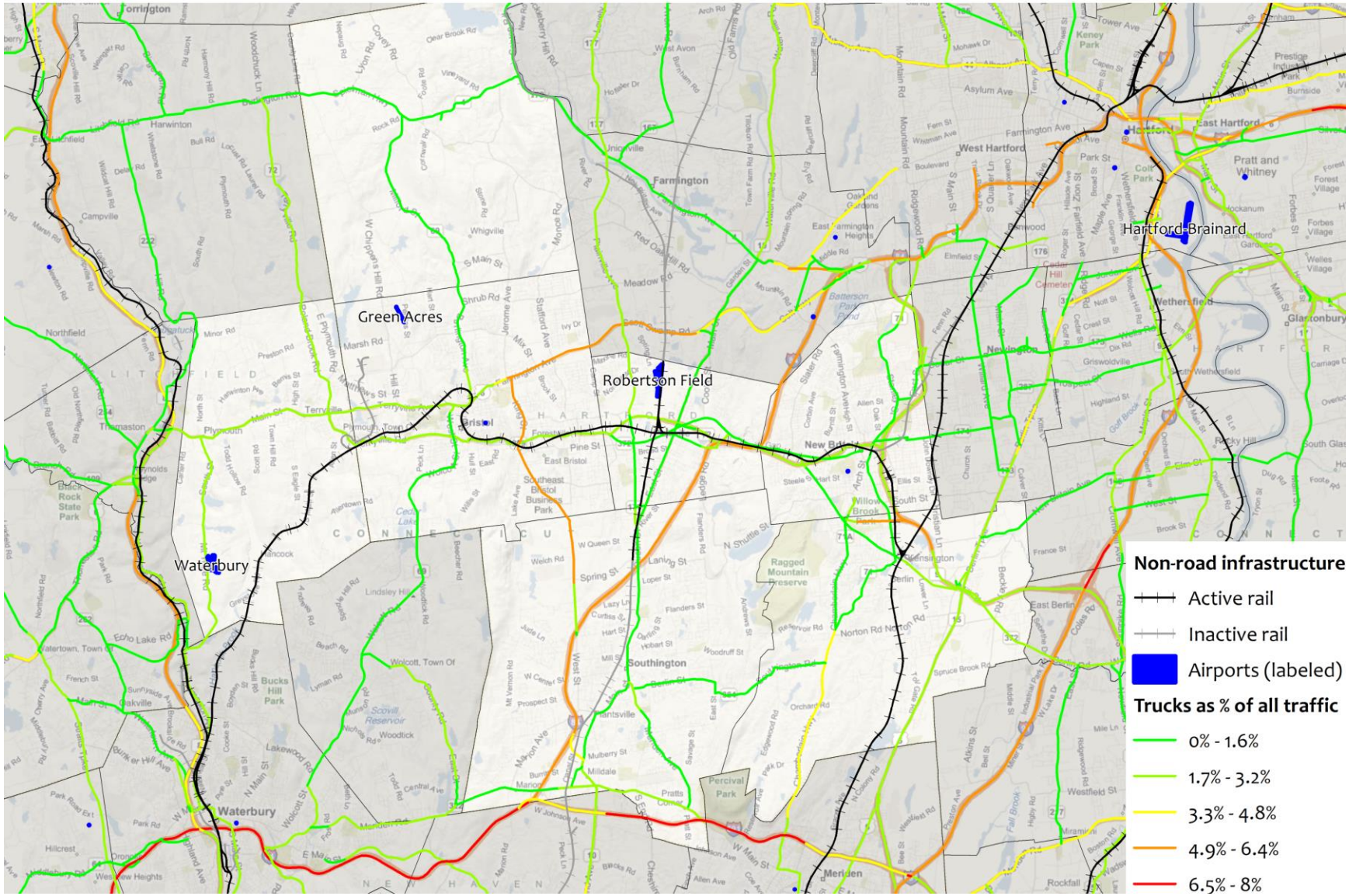
These routes are indicated in *Rail* (p. 119). Together, these routes knitted the region into the northeastern and national rail networks, from New York to Boston and beyond.

CCMPO, together with CRCOG and MRPA, contracted with a consultant to study freight movement in the Hartford metropolitan area. According to this report, "[t]raffic in the [regional] freight rail system… is shaped by the position [of the region] in the eastern and national rail network, and by the structure of the network itself. Ownership, connection, and distance combine to influence the pattern and character of current and prospective freight volume. While [the region] is a crossroads for highway traffic, it is poorly accessible from a freight rail standpoint. As such, the ability of rail to relieve the highway, and to act as a mitigant to deficient air quality and growing congestion, is constrained by network position, vertical clearances, facility capacity, and institutional factors."

"[T]here is an opportunity for regional rail intermodal expansion. These are found in lanes with annual truck densities of 100,000 to 400,000 annual tons and lengths of haul in excess of 1500 miles, and in lanes of greater than 400,000 annual tons and lengths of haul of greater than 750 miles."

Air freight is not a major player in the region. None of the region's airports possess sufficient capacity to support volume freight operations; even Windsor Locks' Bradley International Airport, which is the second-largest airport in New England can only offer limited potential to heavy cargo (due to the narrow-body planes and regional jets that serve the market). It is expected that most air freight will continue to be trucked in from larger airports in New York, Newark, and Boston, though certain lighter air freight activities may seek out Bradley as a more economical alternative to those airports.

Figure 68. Freight rail lines and truck share on State roads



Background

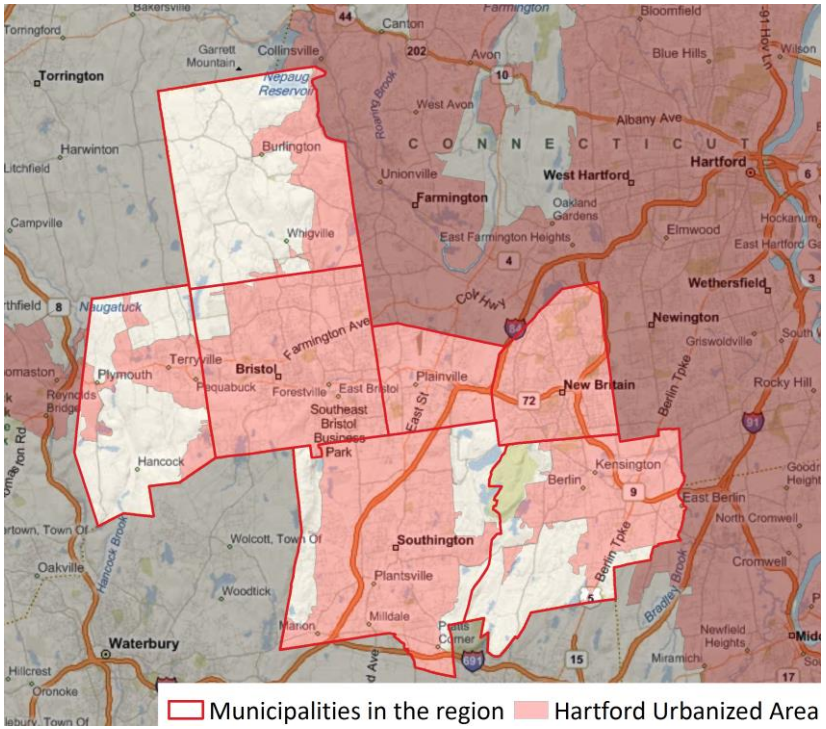
Structure and process

In every urbanized area with a population of at least 50,000 in the United States, at least one metropolitan planning organization (MPO) is designated. MPOs are responsible for regional transportation planning, including the creation and maintenance of a Long-Range Transportation Plan (LRTP) such as this document, as well as the approval and, in some cases, selection of transportation projects for funding by the federal government. MPO involvement is integral to transportation project development and funding. Projects must be endorsed by the MPO and included in its LRTP in to be eligible for federal funding. The particulars of the federal transportation planning and funding system are laid out in the Moving Ahead for Progress in the 21st Century (MAP-21) legislation.

THE CENTRAL CONNECTICUT REGION

Due to the 2000 Census findings, the former New Britain-Bristol Urbanized Area is now a part of the Hartford Urbanized Area. The Central Connecticut Metropolitan Planning Organization (CCMPO) is the designated MPO for a portion of the Hartford Urbanized Area and is responsible for transportation planning in the municipalities of Berlin, Bristol, Burlington, New Britain, Plainville, Plymouth, and Southington. *Figure 69* (p. 180) shows the location of the region within the Hartford Urbanized Area.

Figure 69. Central Connecticut region



Along with CCMPO, the Capitol Region Council of Governments, the Lower Connecticut River Valley Council of Governments, and the Naugatuck Valley Council of Governments represent

the Hartford Urbanized Area. Since the expansion of the urbanized area, these MPOs convene to discuss such items as funding coordination, joint planning initiatives, and issues of common concern. Issues these agencies have discussed include interregional rail service (reinstatement of commuter rail service between Bridgeport and Hartford via Waterbury, as well as between New Haven, Hartford, and Springfield); bus rapid transit; highway congestion, Jobs Access and Reverse Commute programs; and coordination in the areas of freight planning and the congestion management process.

PLANNING TRANSPORTATION

The MPO transportation planning process includes several related phases that produce various planning documents, one of which is this Plan, the LRTP. The LRTP is intended to focus discussions in the region by identifying current and future needs in terms of general and specific changes to the transportation system. The LRTP covers a 24-year period (2015-2040 for this document) and must be updated and adopted every four years. The last LRTP was adopted in May 2011.

The LRTP serves as the basis for many other MPO efforts, including the Transportation Improvement Program (TIP). The TIP is the schedule for the spending of federal funds on transportation in the region over a five-year period. The TIP derives from this Plan, in the form of actual projects with assigned funding.

PRODUCTION AND IMPLEMENTATION

The Plan is the product of collaboration between CCMPO, its members, and the public. (CCMPO's *Public Participation Plan* details the public involvement process the MPO follows in the development of this Plan.) This Plan has been informed by research and analysis as well as consultation with stakeholders throughout the region. (CCMPO gathered input from the diverse groups that make up the region via a variety of means; accounts of this consultation can be found in the document *Public input on the Long-Range Transportation Plan for Central Connecticut, 2015-2040*.) Preparation of the Plan is step one in the comprehensive, continuing, and coordinated transportation planning program practiced by CCMPO.

To ensure that the Plan remains an apt, living document, CCMPO monitors the region on an ongoing basis. The Agency's activities to this end include:

1. Identifying, quantifying, and prioritizing transportation needs in the region
2. Developing proposals and scrutinizing projects
3. Working towards the next Plan update
4. Coordinating with DOT and other State and regional agencies, the Federal Highway Administration, the Federal Transit Administration, the region's members, and its transportation providers

OTHER PLANNING

In addition to the LRTP and TIP, CCMPO undertakes a variety of other planning tasks. These tasks are spelled out in detail in the Agency's Unified Planning Work Program (UPWP). The UPWP lays out the transportation planning activities the Agency expects to undertake over a two-year period. The current UPWP, which covers the 2014-2015 fiscal year, spans ongoing and one-time activities, or 'special projects'. Many of the latter correspond to projects identified in this Plan. These include:

Recurring activities

1. Pedestrian, cyclist, and vehicular traffic counts
2. Congestion monitoring
3. Transportation studies
4. Statistical and quantitative analyses

One-time activities

1. *Regional bicycle plan: development of region-wide bicycle routes, including a master map and recommended treatments, for implementation. The routes will connect downtowns, town centers, and major destinations (e.g. commercial and employment hubs), as well as link up with existing trails and neighboring regions.*
2. *Central Connecticut State University Transportation Plan: continued implementation of a comprehensive evaluation of the university's transportation system and plan for making higher education more accessible and affordable, reducing congestion, and enhancing efficiency and sustainability.*
3. *Tunxis Community College Transportation Plan: comprehensive evaluation of the college's transportation system and a plan for making higher education more accessible and affordable, reducing congestion, and enhancing efficiency and sustainability.*
4. *Burlington Town Center study: a study of improvements to Routes 4 and 69 as well as adjacent roads and intersections to facilitate access to the planned town center and improve safety. To create a vibrant, pedestrian-friendly atmosphere and curb congestion, form and internal circulation will be considered as part of the project.*
5. *Farmington Canal Heritage Trail gap closure: plan to plug the gap in Plainville and Southington. The plan is intended to culminate in the release of final design so that the project can advance to the construction stage.*
6. *Plymouth Reservoir trail connection: plan for and selection of a final route to link the reservoir property with the Thomaston Dam and the Naugatuck River Greenway, connecting the town to a major multi-use trail. This project will be completed by the Naugatuck Valley Council of Governments in partnership with the Town of Plymouth.*

Environmental and social concerns

While transportation can be an end in itself—to wit boulevard cruisers; runners, joggers, walkers; and recreational pilots, sailors, and cyclists[86]—by and large it serves as a *means* to an end. Indeed, through American history, economic development has stood as the primary end of transportation. This past is reflected in shape of the places we live, work, and play, from ports at the mouths of rivers, to cities at major railroad junctions, to commercial strips and clusters on arterials and at expressway ramps.

While not all transportation projects have yielded economic development—poor investments seldom pay off—they all have consequences. Some of these are pecuniary. Resources are limited, making trade-offs inevitable. A dollar spent on transportation is dollar that could have been spent elsewhere, potentially with a higher rate of return. Transportation can be a good investment, improving our lot, but it can also be a ruinous one, depriving other needs and shortchanging the future. Every investment in one project represents a decision *not* to invest in other possibly as, if not more, meritorious ones. That is, transportation has an *opportunity cost*.

If transportation investment were cheap, the opportunity cost would not be worth writing about. However, that is rarely the case. Transportation investments, especially major capital projects, have escalated in price to the extent that covering all transportation needs could very well break the bank. While accounting practices may obscure the big picture, funds expended on one transportation project do not just subtract from another transportation project; in the end, they take away from all spending on all the other services we expect and demand of our government. While it may be impractical definitively to quantify the opportunity costs of any investment (opportunities are limitless), these costs should be borne in mind when reviewing transportation investments. This Plan attempts to do so by proposing only projects that it determines feasible, i.e. fit within the region's financial constraints and do not represent a disproportionate or inequitable drain on its resources. (For more information, see *Finances*, p. 65.)

However, these are not the only costs that investment in transportation. Transportation projects, like all actions, have real consequences beyond the 'what-if' speculation about whether

[86] *Even in these cases, transportation is not always the sole end. Other common ends include pleasure, fitness, and income.*

state funds would be better spent on something else. Some of these consequences are intended, such as a reduction in congestion (for instance as a result of capacity expansion), but others are not, such as a subsequent rebound in congestion (e.g., due to the demand that expansion can induce). Nor are they necessarily confined to the transportation sector and system alone. Transportation projects can and have had consequences for the economy, society, and the environment. Such consequences, which redound to an otherwise uninvolved third party, are called *externalities*. Externalities may be positive (benefits) or negative (costs). Both crop up regularly in transportation. External benefits (for example, property appreciation and development) have often figured, overtly or covertly, in the push for one or more transportation projects (e.g., a highway ramp); conversely, external costs historically have been glossed over or ignored. While external benefits, the undue profiting of certain parties may at times rankle on equity grounds, they do not entail an absolute loss on anybody's behalf. External costs, in contrast, do: they leave people or places worse off. The extent and intensiveness of the transportation system makes for an especially high potential for such loss; indeed, the growth and operation of the transportation system arguably have imposed the greatest external costs of any human action over the course of the last century.

This section addresses these concerns. While it may not be able to give solutions, it seeks to begin a discussion of the problems that transportation can produce. The intent is to draw attention to these negative externalities so that future investment may be conceived of and pursued in such a way that internalizes (i.e., pay the real costs) or, even better, prevents them.

ENVIRONMENTAL CONCERNS

Transportation can have adverse impacts on air, land, and water. These may arise in all stages of system development and use, from construction to operations and maintenance. Adverse impacts can include, but are not limited to:

- Air pollution
- Acid rain
- Climate change
- Decreased aquifer recharge
- Disruption of wildlife corridors and migration
- Endangerment of indigenous species
- Flooding
- Habitat fragmentation
- Heat islands
- Landscape change
- Light pollution
- Loss of biomes
- Loss of open space
- Noise pollution
- Oil spills
- Resource exhaustion

- Soil erosion
- Spread of invasive species
- Sprawl
- Surface and groundwater pollution
- Wildlife mortality

It is CCMPO's policy to review investment in the transportation system for adverse impacts such as those listed above and to, the greatest extent feasible, avoid them. (Mitigation may be considered where impacts are unavoidable.)

CLEAN AIR ACT AND AMENDMENTS

A high percentage of the nation's air quality problems relate directly to pollutants emitted by transportation sources. Concern over this problem gave rise to the federal Clean Air Act of 1970, which established national ambient air quality standards for the carbon monoxide (CO), oxides of nitrogen (NO_X) and others. NO_X, along with various hydrocarbons (HC), is a cause for concern due to its reaction in the presence of sunlight to form noxious photochemical oxidants, otherwise known as 'smog.'

The Clean Air Act, as amended over the years, established a process of designation and classification for areas around the country with regard to the attainment of national ambient air quality standards for ozone, carbon monoxide, and particulate matter. There are five levels of non-attainment: marginal, moderate, serious, severe and extreme. The Hartford Urbanized Area, of which central Connecticut is a part, is classified as a moderate non-attainment area for ozone and a Limited Maintenance Plan status area for carbon monoxide.

Regional transportation plans and programs, including this Plan, must be consistent with federal and State laws, regulations, and plans relating to air quality. All Long-Range Transportation Plans and Transportation Improvement Programs issued to date since the inception of this program have been found in conformity with these requirements. DOT has reviewed the major projects enumerated in this Plan and determined them to be in conformity with the budgets in the current State Implementation Plan for air quality. A copy of the pertinent analysis can be found in the document *Ozone Air Quality Determination of the 2015 Regional Transportation Plans and the FY 2015-2018 Transportation Improvement Programs Amendments for the Connecticut portion of the New York-Northern New Jersey-Long Island, NY-NJ-CT Ozone Nonattainment Area and the Greater Connecticut Ozone Nonattainment Area.*

SOCIAL CONCERNS

Transportation may also have negative effects on society, culture, and the economy. As with the environment, effects may arise at any point in system development and use. Potential negative effects include:

- Automobile dependence
- Death, injury, and property damage

- Decreased physical activity
- Dependence on foreign resources
- Disinvestment in existing areas
- Erosion of property values
- Exclusion of disadvantaged groups from participation in society and the economy (e.g., non-drivers, drivers)
- Health complications (e.g., respiratory diseases)
- Higher household expenses
- Higher public service costs
- Lifestyle-related illnesses (e.g. obesity, diabetes)
- Loss of a sense of place
- Loss of livelihoods
- Loss of recreational amenities
- Loss of social capital
- Loss of scenic value
- Loss of property and taxable assets
- Loss of time
- Public and private debt
- Socioeconomic and cultural segregation
- Sprawl
- Stress

It is CCMPO's policy to review investment in the transportation system for adverse impacts such as those listed above and to, the greatest extent feasible, avoid them. (Mitigation may be considered where impacts are unavoidable.)

Executive Order 12898, Title VI of the 1964 Civil Rights Act, and related federal and State guidance have informed this Plan, including project selection and development. These are briefly described below. Further detail on CCMPO's Title VI and environmental justice activities may be found in its *Public Participation Plan for the Central Connecticut Region* and *Unified Planning Work Program*.

TITLE VI OF THE 1964 CIVIL RIGHTS ACT

Title VI of the 1964 Civil Rights Act prohibits discrimination on the basis of race, color, and national origin in programs and activities receiving federal financial assistance.[87] This indicates that it is important to make sure that federally-sponsored projects do not serve certain groups and ignore or negatively affect others. Transportation projects are meant to increase mobility and safety for the traveling public. If funding only helps (or disproportionately hurts) people of a particular group or groups, Title VI has been violated.

[87] *U.S. Department of Justice,* *http://www.usdoj.gov/crt/cor/coord/titlevi.htm*.

ENVIRONMENTAL JUSTICE

Executive Order 12898 directed every federal agency to make environmental justice part of its mission by identifying and addressing the effects of all programs, policies and activities on minority and low-income populations. Effective transportation decision making depends upon understanding and properly addressing the unique needs of different socioeconomic groups. There are three principles of environmental justice that must be addressed:[88]

1. Avoid, minimize or mitigate disproportionately high and adverse human health and environmental effects on minority and low-income populations. In transportation planning this means evaluating the amount of disturbance caused by various transportation projects to determine whether a disproportionate share of this disturbance is occurring in minority and/or low-income population clusters.
2. Prevent the denial of, reduction in or significant delay in the receipt of benefits by minority and low-income populations. Here the existence of public transportation in minority and low-income population clusters can be evaluated.
3. Ensure the full and fair participation by all potentially affected communities in the transportation decision-making process. The intent is to enhance the public-involvement process, strengthen community-based partnerships and provide minority and low-income populations with opportunities to learn about and improve the quality and usefulness of transportation in their lives.

[88] *U.S. DOT Environmental Justice,* *http://www.fhwa.dot.gov/environment/ej2000.htm*

SAFETEA-LU Planning factors

The previous highway funding bill, SAFETEA-LU, contained eight planning factors which are designed to guide the direction of MPOs in terms of components of transportation that should be considered in every planning activity. While SAFETEA-LU has been superseded by MAP-21, the planning factors remain in place. Plans should:

1. Support the economic vitality of the United States, the States, nonmetropolitan areas and metropolitan areas, especially by enabling global competitiveness, productivity, and efficiency. A sound transportation system is vital for the region's economic health. Roads, public transportation, rail, alternative transportation and air transportation all work to increase efficiency in bringing goods and workers into and out of the region.
2. Increase the safety of the transportation system for motorized and non-motorized users. Every year, many deaths and injuries occur on the transportation network. It is important that transportation funding and project prioritization include measures to reduce injuries and fatalities, which may occur on routes that do not have the highest accident numbers. It is equally important to examine and plan for the safety of non-motorized transportation users as they coexist with the automobile.
3. Increase the security of the transportation system for motorized and non-motorized users. In the light of the events of 9/11 and subsequent transit-based terrorism in London and Madrid, the transportation system needs to secure from domestic and international terrorism. The disabling of transportation systems is a well-worn tactic in any war. Increased vigilance by providers and users of all modes of transportation is essential to a secure system.
4. Increase the accessibility and mobility options available to people and freight. It is important to increase mobility in order to improve personal mobility. As human mobility increases, so does access to jobs, shopping and recreation. As freight mobility increases, so does economic viability. It is important to recognize that many residents do not have automobile access and that public transportation, bicycle and pedestrian projects can increase mobility.
5. Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns. While transportation systems get people to where they want to go and provide for economic development, it is important to remember that they also can cause pollu-

tion, over-consumption of energy and other negative externalities. Transportation systems can be planned in a way that minimizes environmental damage and the negative effects on quality of life.

6. Enhance the integration and connectivity of the transportation system, across and between modes throughout the State, for people and freight. Many trips involve more than one transportation mode. It is important to connect all modes safely and efficiently. Examples include: improved automobile access to an airport, improved truck access to a railroad and the inclusion of bicycle racks on public transportation vehicles.
7. Promote efficient system management and operation. Efficient system management and operation increases the system's overall safety and efficiency.
8. Emphasize the preservation of the existing transportation system. In the name of achieving enhanced mobility, it is natural to want to expand upon the current transportation system. However, limited resources can cause the need to weigh system expansion against maintenance of the current system. Without maintenance of the existing system, the system cannot perform optimally.

Project selection

Certain federal transportation programs allow for MPOs to select projects directly for funding. To ensure that funds are directed to the most deserving and feasible projects, CCMPO has developed evaluation criteria for candidate projects.[89] The selection process is designed to satisfy federal requirements for the respective funding program, as well as meet State and federal regulations for public involvement.[90]

As of writing, STP-Urban and its Transportation Alternatives (TA) subcategory represent the only federal funds over which CCMPO has direct authority. CCMPO is generally allotted between three and four million dollars in STP-U and -TA funds per year. A wide variety of projects may be funded under STP-U and TA. Details STP-U and TAP project eligibility may be found at http://www.fhwa.dot.gov/map21/guidance/guidestp.cfm and http://www.fhwa.dot.gov/map21/guidance/guidetap.cfm.

[89] *The document* Project Evaluation Criteria *details the evaluation process.*

[90] *The document* Public Participation Plan *details CCMPO's public involvement activities.*

Appendixes

Acronyms

The following acronyms are used in this Plan.

ADA	Americans with Disabilities Act
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CMAQ	Congestion Mitigation and Air Quality Program
DEMHS	Connecticut Department of Emergency Management and Homeland Security
DOT	Connecticut Department of Transportation
EJ	Environmental Justice
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
GIS	Geographic Information Systems
GPS	Global Positioning Systems
LRTP	Long Range Transportation Plan
MPO	Metropolitan Planning Organization
NHS	National Highway System
RPO	Regional Planning Organization
RR	Railroad
SIP	State Implementation Plan
STIP	State Transportation Improvement Program
STP	Surface Transportation Program
TD	Transit District
TDM	Transportation Demand Management
TIP	Transportation Improvement Program
TMA	Transportation Management Area
TOD	Transit-Oriented Development
UPWP	Unified Planning Work Program
USDOT	United States Department of Transportation
VMT	Vehicle Miles Traveled

Excerpt from the Northeast Corridor Master Plan

The following is taken from *Part II: Current and Future Service and Infrastructure by Segment* (*p*. 59-63) of *The Northeast Corridor Infrastructure Master Plan*:

PHYSICAL ASSETS

This 60-mile branch of the NEC is owned and operated by Amtrak and runs parallel to Interstate 91 through Hartford. The Springfield Line connects to the NEC Main Line at Mill River Junction near New Haven and CSXT's Boston Subdivision at Springfield. The branch line is two tracks between Mill River and Cedar interlockings and single-track with sidings between Cedar Interlocking and Springfield Union Station.

Springfield Union Station, at the northern terminus of the branch, is served by two Amtrak intercity routes including the Lakeshore Limited operating between Chicago and Boston and Vermonter between Washington and St. Albans, Vermont. Union Station New Haven at is the branch's southern terminus and shared by Amtrak Acela Express, Regional, the Vermonter and intercity services, as well as SLE and MNR commuter rail services. The segment is part of the larger, federally-designated multi-route Northern New England High-Speed Rail Corridor which runs through the states of Vermont, New Hampshire, Maine, Massachusetts, Connecticut, and New York.

CURRENT OPERATIONS

Amtrak (passenger) and CSXT, Connecticut Southern, and Pan Am Southern (freight) operate in the segment. Amtrak operates 12 trains (six round trips) daily between Springfield and New Haven including round trips for Vermonter and Regional services, providing service to New York and points south. The remaining eight trains (four round trips) are Shuttle routes which operate each weekday between New Haven and Springfield connecting to NEC Regional trains at New Haven. There is no commuter rail service currently operating on the segment. Current and future passenger rail operating statistics are provided in Table 11 [omitted] above.

Future Plans Connecticut is developing plans for New Haven-Hartford-Springfield (NHHS) commuter rail service along this segment. Initial plans call for 36 trains (18 round trips) each day, providing half-hourly service during the peak hours and approximately hourly service throughout the day. This service would

be supported by an electrified, double-track infrastructure. Initially, service would operate along the Springfield Line, with additional service possible to Stamford, CT. The Springfield Line is part of the federally-designated Northern New England High-Speed Rail Corridor.

Daily Amtrak service between Springfield and New Haven will increase from 12 trains (6 round trips) to 28 (14 round trips) providing near hourly service throughout the day. Alternate trains will terminate at New Haven, or continue to Penn Station New York or Washington D.C. Service on the line would be further integrated with emerging corridors such as the Inland Route via Boston and Worcester and the Knowledge Corridor to Greenfield, MA. Other improvements include rerouting Vermonter service to the Connecticut River Line as part of the overall Knowledge Corridor service plan. This will improve trip times while serving the Holyoke, Northampton, and Greenfield communities and eliminating the required direction reversal in Palmer, MA.

MAJOR ISSUES

Electrification, double tracking and potential third-track sidings are needed to support new commuter and increased intercity rail services in the segment. Fixed bridges and the Hartford viaduct require rehabilitation or replacement to accommodate increased traffic along the segment. Existing and new interlockings need to be designed to accommodate the electrification and double-track program, affording increased speed and operating flexibility. Capital Investment Programs Connecticut and Amtrak are jointly developing corridor improvements between New Haven and Springfield which will accommodate the introduction of commuter service and expanded intercity corridor service. Vermont, Massachusetts, Connecticut and Amtrak are developing plans for the Knowledge Corridor service, which extends services from the Springfield Line northward, paralleling I-91 through Massachusetts and Vermont. Massachusetts is advancing planning for the development of the Inland Route service between Boston, Worcester and Springfield which would permit the extension of Springfield Line corridor services to Boston. These three distinct but interrelated programs will be subject to capacity analysis leading to the identification of recommended improvements and programs.

The Master Plan uses work already completed in these areas as the basis for the capital costs shown. Capital projects are grouped into programs described below. Programs are a set of similar projects designed to deliver a defined set of benefits and performance goals. Individual project information, including scope and costs are identified in the Appendices.

SEGMENT PROGRAMS

Springfield Line Track and Interlocking Upgrades: $834m. Electrification, double tracking and the addition of third track sid-

ings are included to support new commuter and increased intercity rail services in the segment. Fixed bridges and the Hartford viaduct will be rehabilitated or replaced, and when complete will permit operation of 286,000-pound freight car service. Existing and new interlockings will be designed to support electrification, the double track program and increased speeds. Additionally, new or increased train servicing and layover requirements will be defined at Greenfield, Springfield and New Haven terminals.

Positive Train Control: $8m. The Springfield Line includes installation of ACSES wayside transponders incorporating positive stop and civil speed control in areas of the corridor where ACSES is not currently installed (operating speeds greater than110 mph) as mandated by The Rail Safety Improvement Act of 2008. PTC design for the Knowledge Corridor and Inland Route will be determined by Pan Am Southern and CSXT for their respective routes.

Station Improvements**:** $105m. Station improvements are designed to meet ADA and SGR requirements, facilitate ease of travel, encourage intermodalism, and integrate stations into the economic fabric of the communities they serve. There are seven projects in this program, six of which are related to ADA and SGR improvements. The City of Springfield and its metropolitan planning organization are currently evaluating alternatives for the potential restoration of historic Springfield Union Station. If a decision is made to rehab the historic station, platform and track modifications will be included to effectively serve trains operating via the Knowledge Corridor, Springfield Line and Inland Route to Boston.

All existing intercity stations including Hartford will require expansion and modification to accommodate double tracking of the line. Modifications will include additional platforms, ADA compliance and facilities to accommodate excess dimension freight traffic shipments. In addition, three new commuter stations are proposed along with expansion of State Street Station in New Haven.

Historical railroad timetables

Only direct connections are depicted. (Passengers who could tolerate a short to moderate layover were able to avail themselves of several more daily trips between the region and the New York and Boston metro areas besides those shown.) For the sake of presentation, the timetables below have been abridged.[91]

Table 37. Trains from New York City to the region, 1953

Station/train	**444**	**448**	**446**	**8/350**	**54/156**	**136**	**460**
Days	Mo-Fr	Sa	Mo-Fr	Mo-Sa	Mo-Sa	Mo-Sa	Mo-Fr
Time of day	AM	AM	AM	AM	PM	PM	PM
NY Grand Central				8:00	12:30		
Stamford				8:47	12:24		
Norwalk					12:42		
Bridgeport				9:13/9:21	1:37/1:48		
Waterbury	6:40	7:54	7:58	10:19/10:30	2:35/2:36	4:00	
Terryville		8:08	8:11			4:14	
Bristol	7:06	8:17	8:18	10:50	2:56	4:23	4:50
Forestville	7:10	8:21	8:22	10:54	3:00	4:27	
Plainville	7:14	8:25	8:26	10:58	3:04	4:32	

[91] *The following information has been omitted: stops between Waterbury and New York City Grand Central other than Bridgeport, Norwalk, and Stamford; stops between Willimantic and Boston; notation of flag stops and train changes; special holiday schedules; baggage carriage instructions; car types; and times for trains to/from Thomaston, Torrington, and Winsted and Providence.*

New Britain	7:25	8:36	8:34	11:06	3:12	4:41	5:05
Newington	7:31	8:43	8:40			4:47	
Parkville	7:36		8:45				
Hartford	7:40	8:50	8:49	11:21	3:27	4:55	5:18

Table 38. Trains from the region to New York City, 1953

Station/train	**447**	**131**	**157/397**	**461**	**463**	**467**
Days	Mo-Sa	Mo-Sa	Mo-Sa	Mo-Fr	Mo-Sa	Mo-Fr
Time of day	AM	AM	PM	PM	PM	PM
Hartford	9:00	11:30	3:50	4:15	5:30	6:40
Parkville				4:18	5:33	
Newington		11:43		4:23	5:38	6:48
New Britain	9:15	11:49	4:05	4:29	5:45	6:55
Plainville	9:23	12:01	4:15	4:37	5:53	7:10
Forestville	9:28	12:08	4:19	4:41	5:58	7:14
Bristol	9:32	12:10	4:23	4:46	6:02	7:18
Terryville		12:20			6:09	
Waterbury	9:51	12:32	4:45/5:05		6:21	7:43
Bridgeport			6:03/6:32			
Norwalk			6:57			
Stamford			7:10			

NY Grand Central	8:00

Table 39. Trains from the region to Boston, 1953

Station/train	444/128	446/130	446/130	136
Days	Mo-Fr	Sa	Mo-Fr	Mo-Sa
Time of day	AM	AM	AM	PM
Waterbury	6:40	7:54	7:58	4:00
Bristol	7:06	8:17	8:18	4:23
Forestville	7:10	8:21	8:22	4:27
Plainville	7:14	8:25	8:26	4:32
New Britain	7:25	8:36	8:34	4:41
Hartford	7:40/7:45	8:50/9:18	8:45/9:18	4:55/5:00
Manchester	8:00	9:33	9:33	5:15
Willimantic	8:33	10:08	10:08	5:51
Boston South St.	10:23	12:12	12:12	7:54

Table 40. Trains from Boston to the region, 1953

Station/train	131	129/467	135
Days	Mo-Sa	Mo-Fr	Mo-Su
Time of day	AM	PM	PM
Boston South St.	8:35	3:55	6:45

Willimantic	10:42	5:45	8:57
Manchester	11:15	6:17	9:30
Hartford	11:30/11:35	6:32/6:40	9:45/10:00
New Britain	11:49	6:55	
Plainville	12:01	7:10	
Forestville	12:05	7:14	
Bristol	12:10	7:18	10:40
Waterbury	12:32	7:43	11:10

Table 41. Trains from New Haven to Williamsburg, Massachusetts, 1921

Station/train	**1104**	**1112**
Days	Mo-Sa	Mo-Sa
Time of day	AM	PM
New Haven	6:44	3:29
Mt. Carmel	7:03	3:51
Brooksvale	7:09	3:57
Cheshire	7:16	4:04
Milldale	7:24	4:11
Plantsville	7:28	4;15
Southington	7:35	4:19
Plainville	7:47	4:26/4:32

Farmington	7:58	4:42
Avon	8:09	4:55
Weatogue	8:15	5:00
Simsbury	8:28	5:10
Granby	8:36	5:19
Congamond	8:46	5:28
Southwick	8:51	5:33
Westfield	9:02	5:43/5:50
Southampton		6:05
Easthampton		6:17
Northampton		6:34
Williamsburgh Junction		6:40

Table 42. Trains from Williamsburg, Massachusetts to New Haven, 1921

Station/train	**1103**	**1111**
Days	Mo-Sa	Mo-Sa
Time of day	AM	PM
Williamsburgh Junction	6:05	
Northampton	6:15	
Easthampton	6:25	
Southampton	6:35	

Westfield	6:50	2:10
Southwick	7:00	2:20
Congamond	7:06	2:26
Granby	7:17	2:37
Simsbury	7:28	2:51
Weatogue	7:34	2:56
Avon	7:42	3:03
Farmington	7:58	3:18
Plainville	8:12	3:30
Southington	8:25	3:43
Plantsville	8:30	3:47
Milldale	8:36	3:53
Cheshire	8:46	4:04
Brooksvale	8:51	4:09
Mt. Carmel	8:58	4:16
New Haven	9:20	4:40

Bridges

The following table lists all bridges with a span of at least twenty feet in the region.

Bridge no.	Town	Feature carried	Feature crossed	Location	Year built	Year recon.	ADT	Structure length	Curb-curb width	Inspection date	Sufficiency rating
4341	Berlin	Norton Rd.	Amtrak	300' E of Kensington Rd.	1979	0	2,700	102	30	2/8/2007	91.60%
4062	Berlin	Lower Lane Rd.	Sebethe River	.25 mi. S of jct. Farmington Ave.	1970	0	2,100	55	30	12/10/2004	90.91%
4476	Berlin	Worthington Rd. No. 1	Sebethe River	.3 mi N of Wethersfield Rd.	1915	1996	250	54	27.2	2/21/2007	90.12%
4082	Berlin	Camels Back Rd.	Amtrak	.10 mi. E of Kensington Rd.	1891	1992	600	39	26	2/8/2007	88.95%
6124	Berlin	Middletown Rd.	Spruce Brook	0.45 mi. E of jct. w/ SR 15	1999	0	400	32	28.5	11/22/2006	86.42%
4477	Berlin	Wethersfield Rd.	Sebethe River	Jct. of Beckley Mills Rd.	1970	0	2,000	71	31.6	2/21/2007	86.36%
4109	Berlin	Orchard Rd.	Amtrak	2500' W jct. Old Turnpike Rd.	2000	0	600	60	26	2/2/2005	85.78%
4472	Berlin	Orchard Rd.	brook	.5 mi. W of Berlin Tpke.	1974	0	1,100	27	0	1/18/2007	81.96%
5224	Berlin	Berlin St.	Sebethe River	250' E Mattabassett St.	1981	0	900	92	28	11/27/2006	81.78%
6122	Berlin	Wildermere Rd.	Belcher Brook	0.3 mi. E of jct. w/ 4 Rod Rd.	1980	0	200	21	0	1/4/2007	69.54%
3657	Berlin	Kensington Rd.	Sebethe River	800' S of Rt. 71	1958	1990	5,900	65	28.2	3/12/2007	68.25%
6123	Berlin	Heritage Dr.	Stocking Brook	0.1 mi. E of jct. w/ SR 71	1985	0	205	21	30	1/14/2009	62.19%
5814	Berlin	Deming Rd.	Willow Brook	.2 mi. E of Christian Ln.	1970	0	12,500	37	0	1/24/2007	61.96%
4473	Berlin	Burnham St.	Sebethe River	600' W of Rt. 372	1960	1989	5,500	57	27.3	1/4/2007	59.73%
4474	Berlin	Farmington Ave.	Sebethe River	500' from jct. w/ Rt. 372	1928	0	3,400	52	28	5/14/2008	38.10%
7007	Berlin	Norton Rd.	Belcher Brook	1.9 mi. E of jct. w/ SR 71	1930	1950	1,000	20	27.9	6/26/1991	
4486	Bristol	Artisan St.	Copper Mine Brook	500' from jct. w/ Root Ave.	2003	0	1,614	52	33.5	4/6/2004	98.76%

4484	Bristol	Jacobs St.	Pequabuck River	0.29 mi. W of Rt. 69	1920	1956	2,700	48	36	11/21/2006	96.80%
4488	Bristol	Mellen St.	Pequabuck River	300' S of Rt. 72 jct.	1956	0	2,400	77	34	3/23/2006	95.82%
4480	Bristol	Louisiana Ave.	Copper Mine Brook	200' from jct. w/ Brook St.	1900	1952	3,600	46	36	4/19/2004	95.73%
3988	Bristol	Blakeslee St.	Boston & Maine Rail-road	.1 mi. W of Rt. 72	1937	1992	2,100	62	34	11/17/2006	94.83%
4294	Bristol	Maltby St.	Copper Mine Brook	.2 mi. W of Stafford Ave.	1979	0	8,000	117	34	12/28/2006	94.77%
6125	Bristol	Curtiss St.	Boston & Maine Rail-road	.1 mi. W of Rt. 69	1992	0	2,500	65	34	11/7/2008	93.80%
4481	Bristol	Frederick St.	Copper Mine Brook	50' from jct. w/ Curtiss Ave.	1900	1934	2,000	37	30	12/27/2006	92.09%
4123	Bristol	Central St. #2	Pequabuck River	Jct. Rt. 72 & Central St. 2	1956	0	12,426	80	36.2	12/4/2006	92.07%
4092	Bristol	Stevens St.	Copper Mine Brook	.2 M E of Jerome Ave.	1975	0	4,500	46	34	5/21/2004	90.07%
4487	Bristol	East St.	Pequabuck River	Near jct. Memorial Blvd.	1900	1929	2,200	63	34	4/6/2006	84.81%
4104	Bristol	Downs St.	Pequabuck River	Near jct. Memorial Blvd.	1938	1970	1,800	78	30.7	3/23/2006	82.40%
4483	Bristol	Jerome Ave.	Copper Mine Brook	50' from jct. w/ Shrub Rd.	1956	0	3,800	77	30	5/25/2004	79.64%
4086	Bristol	North Pond St.	Boston & Maine Rail-road	Near Curtis St.	1924	1992	3,200	104	30	11/7/2008	77.68%
4122	Bristol	North Main St. & River-side Ave.	Pequabuck River	Jct. North Main St.& Riverside Ave.	1972	0	12,600	33	0	11/27/2006	75.14%
4482	Bristol	Andrews St.	Pequabuck River	50' from jct. w/ Frederick St.	1900	1966	9,200	77	40	11/29/2006	71.48%
5741	Bristol	Lake Ave.	Entrance Lake Compounce	Bristol-Southington Town Line	1988	0	5,700	38	30.5	12/6/2006	67.49%
4103	Bristol	West Washington St.	Copper Mine Brook	.7 mi. E of Rt. 229	1938	0	6,000	38	36.8	5/27/2004	63.56%
4091	Bristol	Jerome Ave.	Negro Hill Brook	200' S of Coolidge St.	1964	0	4,400	39	28.6	12/5/2006	58.87%
2972	Bristol	Route 72 (Main St.)	Pequabuck River	Btwn. Riverside Ave. & School St.	1972	0	8,000	33	0	6/7/2004	58.35%
3634	Bristol	Maple Ave.	Polkville Brook	.2 mi. E of Rt. 69	1956	0	8,468	21	46.4	7/17/2007	57.29%
4105	Bristol	Memorial Blvd.	Pequabuck River	Over Pequabuck River	1921	1987	14,200	57	43.2	3/30/2006	48.58%
17031	Bristol	Perkins St.	Birge Pond Brook	.1 mi. S of jct. w/ Chapel St.	1945		200	23	28.1	6/6/1991	
17004	Bristol	East Rd.	South Mountain Brook	0.1 mi. E of jct. w/ Rt. 69	1930		800	20	34.3	5/14/1991	

17018	Bristol	Mix St.	Polkville Brook	0.3 mi. N of jct. w/ Rt. 6	1945		1,000	20	34.8	5/28/1991	
5049	Burlington	Reservoir Hill Rd.	Whigville Brook	Jct. Stony Hill Road	2005	0	406	32	26	10/23/2006	87.35%
5050	Burlington	Belden Rd. #2	Burlington Brook	Approx. 4500' N of Rt. 4	1956	2005	232	38	23.5	10/23/2006	85.11%
5047	Burlington	Foote Rd.	Burlington Brook	3500' N of Rt. 4	1975	0	200	26	26.5	1/31/2005	76.39%
5048	Burlington	Barnes Hill Rd.	Burlington Brook	100' N of Rt. 4 jct.	1956	0	200	58	22	1/20/2005	75.43%
5051	Burlington	South Main St.	Copper Mine Brook	5000' E of Rt. 69	1956	0	250	30	30.8	1/30/2005	60.35%
5916	Burlington	Vineyard Rd.	Burlington Brook	300' W of Rt. 4	1954	0	1,000	58	22.1	1/24/2005	52.84%
20006	Burlington	Main St.	Whigville Brook	0.2 mi. S. of jct. w/ Stone Rd.	1960		100	21	20.5	8/1/1991	
4337	New Britain	South St.	Amtrak		1979	0	13,800	132	36	3/20/2008	93.82%
6551	New Britain	Lincoln St. No. 2	Willow Brook	500' S of Rt. 372	1996	0	1,400	24	30	12/12/2007	92.25%
5216	New Britain	Biltmore St.	Sandy Brook		1956	1992	500	27	29	7/20/2006	87.41%
5884	New Britain	Ellis St.	Boston & Maine Railroad	At end of ext. 25 Rt. 9 NB	1989	0	10,878	56	37	8/20/2008	74.88%
5218	New Britain	Stanley Park Rd.	Bass Brook Spillway	800' E. of Stanley. St.	1936	0	100	31	18	7/11/2006	73.37%
6077	New Britain	Paul Manafort Dr.	stream	0.1 mi. W of jct. w/ Rt. 175	1970	1994	236	49	36	7/14/2008	58.45%
6542	New Britain	Kensington St. & Arch St.	Willow Brook Culvert		1996	0	5,800	22	0	8/4/2004	58.45%
6078	New Britain	Oakwood Dr. No. 1	stream		1970	0	50	22	29.8	7/12/2006	57.73%
88006	New Britain	Barbour Rd.	unnamed Stream	0.2 mi. E of jct. w/ Rt. 71	1920	1937	1,000	24	34.5	8/20/1991	
5433	Plainville	Northwest Dr.	Pequabuck River	0.5 mi. W of Rt. 10	1983	0	2,200	60	34	8/9/2004	97.49%
4544	Plainville	Shuttlemeadow Rd.	Quinnipiac River	100' from jct. w/ Carol Dr.	1968	0	2,200	42	33.6	12/20/2004	74.99%
4546	Plainville	Tomlinson Ave.	Quinnipiac River	600' from Cyrenus St.	1968	0	2,400	25	0	8/18/2008	71.46%
4545	Plainville	Stillwell Dr.	Quinnipiac River	700' from jct. w/ Pinecrest Dr.	1968	0	1,755	32	33.4	8/18/2008	61.00%
5044	Plymouth	Wilton Rd.	Wilton Pond	Over Wilton Pond at dam	1999	0	150	43		10/9/2003	99.22%
4428	Plymouth	Greystone Rd. Ext.	Todd Hollow & Hancock Brook	Over Todd Hollow & Hancock Brook	1998	0	10	76	22.6	8/16/2005	93.92%

5046	Plymouth	Greystone Rd. #1	Greystone Pond	700' E of Hancock Ct.	1964	0	1,000	57	28.1	9/28/2005	91.02%
4050	Plymouth	Greystone Rd. #1	Boston & Maine Railroad	0.5 mi. E of Rt. 262	1960	0	1,200	161	28	9/27/2005	90.60%
5993	Plymouth	South Eagle Rd.	Boston & Maine Railroad	200' No.-South Main St.	1991	0	570	44	26	11/1/2007	88.90%
5899	Plymouth	Marsh Rd.	Bristol Reservoir Spillway	200' W of Bristol T.L.	1990	0	400	28	21.5	9/16/2005	82.92%
5490	Plymouth	Canal St.	Pequabuck River	.2 mi. W of Rt. 72	1919	1987	1,500	46	25	9/15/2007	81.46%
3714	Plymouth	Bemis St.	Pequabuck River	1 mi. W of Rt. 72	2004	0	969	27	26	8/24/2007	77.00%
3715	Plymouth	Judd Rd.	Poland River	100' E of Rt. 72	1955	0	500	27	22.2	8/25/2005	70.29%
1670	Plymouth	North Main St.	Poland River	100' W of Rt. 72	1931	0	2,373	39	30	10/23/2007	63.38%
6129	Plymouth	Napco Dr.	Pequabuck River	.5 mi. E of Harwinton Ave.	1950	0	400	22	0	2/10/2006	63.33%
6543	Plymouth	Preston Rd.	Poland River	500' W of Rt. 72	1996	0	428	32	30	10/23/2007	61.33%
110008	Plymouth	South Main St.	unnamed brook	.1m S of Rt. 6	1945	0	1,000	22	33.3	4/16/1991	
3708	Southington	Old Turnpike Rd.	Quinnipiac River	Over Quinnipiac River	1957	1992	2,000	82	32	10/17/2008	96.85%
4563	Southington	West Center St.	Quinnipiac River	100' from jct. w/ Sumner St.	1900	2000	7,000	55	34	12/20/2006	94.46%
4562	Southington	Spring St.	Quinnipiac River	.6 mi. W of Rt. 10	1960	0	3,500	42	40	12/4/2008	94.46%
4338	Southington	West Main St.	Quinnipiac River	400' W of Rt. 10	1979	0	10,000	34	35	11/20/2008	94.46%
5535	Southington	West Center St. Ext.	Eight Mile River	Adjacent To I-84	1961	0	1,700	55	40	1/21/2009	93.87%
4336	Southington	Marion Ave.	Eight Mile River	Intersection of West St.	1979	2004	12,400	33	52.7	11/21/2008	93.10%
5268	Southington	Center St.	Quinnipiac River	200' W of Water St	1983	0	2,600	33	36	12/15/2008	87.23%
4558	Southington	Lazy Lane Rd.	Quinnipiac River	350' W of jct. w/ Rt. 10	1950	0	1,500	46	30	10/20/2008	83.30%
4560	Southington	Newell St.	Quinnipiac River	0.2 mi. N of West Queen St	1964	0	1,800	39	30.3	1/8/2009	82.65%
4559	Southington	Mill St.	Quinnipiac River	.2 Miles W of Rt. 10	1955	0	2,400	25	30	12/2/2006	82.48%
4557	Southington	Curtiss St.	Quinnipiac River	.2 mi. W of Rt. 10	1955	0	2,800	40	30.2	12/15/2008	72.66%
5404	Southington	Hart St.	Quinnipiac River	.25 mi. W of Rt. 10	1987	0	2,500	44	34	10/17/2008	68.71%
3707	Southington	Old Turnpike Rd.	Ten Mile River	500' N of Rt. 322	1954	1992	5,400	45	36	9/25/2008	68.37%

5392	Southington	Prospect St.	Eight Mile River	495' E of I-84	1961	2006	2,000	83	34.8	1/15/2009	63.12%
5523	Southington	West Center St. Ext.	Dayton Brook	.1 mi. W of Jubilee St.	1965	0	1,700	21	0	10/23/2008	62.93%
4157	Southington	Atwater St.	Quinnipiac River	Off Rt. 10 at I-84 Exit 29	1961	2005	700	58	30	11/24/2006	61.36%
6165	Southington	Jude Lane	Eight Mile River	.1 Mile W of jct. I-84	1980	0	2,100	27	0	10/23/2008	60.59%
4561	Southington	South End Rd.	Misery Brook	300' from jct. w/ Maxwell Noble Dr.	1900	1931	4,900	25	28	10/31/2008	59.16%
4564	Southington	West Queen St.	Quinnipiac River	400' from jct. w/ Redstone St.	1969	0	5,500	39	39.9	11/26/2008	46.37%

Complete Streets law (CGS 13a-153f)

(a) For the purposes of this section

(1) "Department" means the Department of Transportation;

(2) "Funds" means any funds from the Special Transportation Fund, bond allocations and any other source that is available for the construction, maintenance and repair of roads in this state;

(3) “User" means a motorist, transit user, pedestrian or bicyclist;

(4) "Bikeway" means any road, street, path or way which in some manner is specifically designated for bicycle travel, including the provision of a bicycle lane, regardless of whether such facility is designated for the exclusive use of bicycles or is to be shared with other modes of transportation; and

(5) "Total project cost" means the cost of the entire corridor plan project.

(b) Accommodations for all users shall be a routine part of the planning, design, construction and operating activities of all highways, as defined in section 14-1, in this state.

(c) From funds received by the department or any municipality for the construction, restoration, rehabilitation or relocation of highways, roads or streets, a reasonable amount shall be expended to provide facilities for all users, including, but not limited to, bikeways and sidewalks with appropriate curb cuts and ramps. On and after October 1, 2010, not less than one per cent of the total amount of any such funds received in any fiscal year shall be so expended. The department or municipality shall take future transit expansion plans into account where appropriate. Notwithstanding the provisions of this subsection, such provisions shall not apply in the event of a state or municipal transportation emergency.

(d) Accomodations [sic] pursuant to subsection (b) of this section and the provision of facilities pursuant to subsection (c) of this section shall not be required if the Commissioner of Transportation or a municipal legislative body determines, with respect to a highway, road or street that: (1) Nonmotorized usage is prohibited; (2) there is a demonstrated absence of need; (3) the accommodation of all users would be an excessively expensive component of the total project cost; or (4) the accommodation of all users is not consistent with the state's or such municipality's, respectively, program of construction, maintenance and repair.

Policy Board and Contact Information

MUNICIPAL REPRESENTATIVES

Municipality	Lead contact and title	TIC members
Berlin	Denise McNair, *Town Manager*	Art Simonian
Bristol	Ken Cockayne, *Mayor*	Walter Veselka
Burlington	Ted Shafer, *First Selectman*	Scott Tharau
New Britain	Erin Stewart, *Mayor*	Mark Moriarty
Plainville	Robert E. Lee, *Town Manager*	John Bossi
Plymouth	David Merchant, *Mayor*	Charles Weigert
Southington	Garry Brumback, *Town Manager*	Jim Grappone

CONTACT INFORMATION

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