MEETING NOTICE AND AGENDA

MANSFIELD PLANNING AND ZONING COMMISSION

Monday, January 4, 2016 ▪ 6:35 PM

Or upon completion of the Inland Wetlands Agency Meeting

Audrey P. Beck Municipal Building ▪ 4 South Eagleville Road ▪ Council Chamber

1. **Call to Order**
2. **Roll Call**
3. **Approval of Minutes**
   a. December 7, 2015 – Regular Meeting
4. **Zoning Agent's Report**
5. **Old Business**
   a. **The Villages at Freedom Green – Phase IVC, Beaudoin Brothers, LLC. PZC File #636**
      Request to release remaining bond; Memos from Assistant Planner/Zoning Agent and Assistant Town Engineer
   b. **Draft Zoning Regulations**
      Memo from Director of Planning and Development
   c. **Other**
6. **New Business**
   a. **Colonial Town House Apartments, Foster Drive, PZC File #1327**
      Memo from Director of Planning and Development
   b. **Other**
7. **Reports from Officers and Committees**
   a. Chairman's Report
   b. Regional Planning Commission
   c. Regulatory Review Committee
   d. Planning and Development Director's Report
   e. Other
8. **Communications and Bills**
   a. UConn Green Infastructure Journal
   b. Connecticut Water Notification of Construction
9. **Adjournment**

MINUTES
MANSFIELD PLANNING AND ZONING COMMISSION
Regular Meeting
Monday, December 7, 2015
Council Chamber, Audrey P. Beck Municipal Building

Members present:	J. Goodwin, C. Ausburger, B. Chandy, R. Hall, G. Lewis, K. Rawn, B. Ryan, V. Ward, S. Westa
Members absent:	
Alternates present:	P. Aho, K. Holt
Staff present:	L. Painter, Director of Planning and Development; C.Hirsch, Zoning Agent

Chairman Goodwin called the meeting to order at 7:14 p.m. A Proclamation in Honor of Curt B. Hirsch was read and approved by consensus of the Commission.

Approval of Minutes:

A. 11-16-2015 Regular Meeting: Hall MOVED and Chandy seconded to accept the minutes as written. MOTION PASSED UNANIMOUSLY.
B. 12-02-2015 Field Trip: Ward MOVED and Chandy seconded to accept the minutes as written. Goodwin, Ryan, Ward, Ausburger, Lewis, Chandy, and Aho voted in favor. All others disqualified themselves.

Zoning Agent's Report:

Hirsch informed the Commission that the Resident Trooper has reported issues with the theft of Christmas tree farms' directional signs and inquired if any member had any thoughts on a solution. By consensus, the Commission agreed that it had no regulatory authority over this issue but hoped such inappropriate behavior would not continue.

New Business:

A. **8-24 referral, acquisition of Puddin Lane (Parcel ID 33.97.3-39)**
Rawn MOVED and Ward seconded to have the PZC notify the Town Council that the proposed acquisition of the Meadowbrook Lane, LLC Property would promote Mansfield's Plan of Conservation and Development by expanding an existing preserved open space area, protecting the Nipmuck Trail, which is an existing state-designated greenway, protecting 61 acres located within a large contiguous interior forest area, protecting significant conservation and wildlife resource in the form of the Kidder-Sawmill Brook streambelt, and protecting a portion of Sawmill Brook, a significant water resource. MOTION PASSED UNANIMOUSLY.

B. **Modification Request, Amphitheater and Exhibit Project, 28 Dog Lane; Paideia, PZC file #1049-7**

Ilias Tomazos and Stephan Nousiopoulos, the applicant's architect, presented the applicant's modification request. Inasmuch as the modifications requested were substantially reduced in amount and scope from the prior request recently denied, Westa MOVED, Chandy seconded to approve the modifications to the Greek Amphitheater/Exhibit area project at 28 Dog Lane as described in the 12/7/2015 communication from I. Tomazos and as depicted on revised plans dated 12/5/2015. The Commission also hereby approves the architectural elevations of the Paideia Greek Theater Exhibit Hall in accordance with the requirements of the March 3, 2008 approval as depicted on the revised plans dated 12/5/2015. This approval is subject to the following conditions:

1. The applicant shall obtain all necessary permits for the revised plans prior to starting construction on the Exhibit Hall building.
2. Except for the modification revisions and the specific work requested and authorized by this approval, the plans and conditions of approval cited in the PZC's 9/3/02 Special Permit Approval and subsequent 7/21/03 action shall remain in effect.
3. All applicable Building and Fire Code requirements shall be met.
4. This approval extends the completion date for the project to September 30, 2017.
5. The following changes to the plans shall be made prior to issuance of zoning approval for the Exhibit Hall building:
    a. Handicap Parking in the northern and southern lot shall be revised to comply with both the Mansfield Zoning Regulations by locating the hatched areas to the right side of the space; per CT Building Code requirements, hatched areas cannot be shared between spaces.
    b. The fieldstone wall along Dog Lane shall be extended to the western edge of the Exhibit Building, consistent with the original approval.
    c. The design of the cedar gate along Dog Lane shall be revised to be consistent with the original approval.
    d. The landscape plan shall be updated to include additional street tree plantings consistent with prior approvals.
    e. A note requiring approval from the University of Connecticut and/or Connecticut Water Company for the proposed sewer and water service connections for the Exhibit Building prior to issuance of a permit for the Exhibit Building shall be added to the plans.
    f. The construction schedule shall be amended to include the revised completion date of September 30, 2017.
    g. A note shall be added requiring light fixtures to have full cut-off shields and use white lamps (metal halide, fluorescent, incandescent or LED).
6. The applicant shall work with the Director of Planning and Development to prioritize cosmetic improvements that are not impacted by construction.

Hall opposed the motion. All others voted in favor. MOTION PASSED.

C. **Cumberland Farms, 1660 Storrs Road, PZC file #1303-2**
Carolyn A. Parker, representing Cumberland Farms, made a brief presentation regarding the use of LED pump toppers for the Commission's determination as to whether such devices are considered "signs" within the meaning of the zoning regulations. Hirsch stated that if these devices were considered a sign, they would be prohibited under the regulations. After further explanation from Parker and Commission discussion, Lewis MOVED and Rawn seconded that the proposed LED pump toppers, as described in an 11/9/15 letter from Carolyn Parker, are not 'signs' per the zoning regulations, and may be used as described in the submittals. MOTION PASSED UNANIMOUSLY.

D. **Appointment of Zoning Enforcement Officer**
Ward MOVED and Ryan seconded to appoint Janell Mullen as Zoning Agent for the purpose of enforcing the Mansfield Zoning and Subdivision Regulations. MOTION PASSED UNANIMOUSLY.

E. **Draft Zoning Regulations**
Painter distributed draft regulations for Amplified and Live Music; Domestic Animal Uses; Stormwater Management and Water Service Connections. The Commission discussed the draft regulations for Amplified and Live Music in detail. Some members opined that the proposed draft regulation over regulated live music venues, duplicated regulation between this regulation and ordinary noise and nuisance ordinances and established inconsistent standards for businesses with and without music, holding venues with music to a higher behavioral standard than similar establishments without music. The item was referred back to the Regulatory Review Committee for rewrite. Members discussed the animal regulation, questioning the overall need for portions of the regulations, specifically with regard to limiting the number of pets in residential uses. These regulations were also referred back to the Committee for review consistent with the discussion. Painter briefly reviewed the stormwater management and water service connection regulations and asked for feedback at a future meeting.

F. **The Villages at Freedom Green – Phase IVC, Beaudoin Brothers, LLC. PZC file #636**
Hirsch noted that a request for release of the remaining bond was received from the builder and is being reviewed by staff. No action was taken.

Reports from Officers and Committees:

Chairman's Report: Ward MOVED and Westa seconded to add cancellation of 12-21-15 meeting to the agenda. MOTION PASSED UNANIMOUSLY. Westa MOVED and Chandy seconded to cancel the 12-21-15 meeting. MOTION PASSED UNANIMOUSLY. The next PZC meeting will be January 4, 2016, commencing at the new time, 6:30 p.m.

Regional Planning Commission: Westa reported that at the recent Regional Planning Commission meeting, a presentation was made on housing trends and that housing profile reports are available for each town.

Director's Report*:* In addition to her written report, Painter reported that two of the deputy zoning agents started conducting inspections of rental housing occupancy on November 30th. The joint Town Council/PZC Ad Hoc Committee on Rental Housing Regulations and Enforcement is expected to hold its first meeting in January.

Communications and Bills:
Noted

Adjournment:
Chairman Goodwin adjourned the meeting at 9:19 p.m.

Respectfully submitted,

Vera S. Ward, Secretary

Town of Mansfield

Department of Planning and Development

Date:	December 31, 2015
To:	Planning and Zoning Commission
From:	Janell Mullen, Assistant Planner/Zoning Enforcement Officer
Subject:	Freedom Green Release of Escrow Funds File #636

Background

Now that the final building phase of the Villages of Freedom Green is complete, the developer, Jean Beaudoin has requested a release of escrow funds in the amount of $100,000.00. This escrow account was established by the Construction Agreement between the town and the developer.

After the December 7th PZC meeting, staff notified the homeowners association of the request to release the final monies in the escrow account. In response, the Board of the Villages of Freedom Green submitted the attached letter.

Staff has reviewed the construction for conformance with the requirements of the Construction Agreement and other conditions of approval. Based on that review, we have identified several items that need to be addressed prior to release of the entirety of the remaining escrow funds. These items include:

- **Deficiencies in the as-built drawings submitted pursuant to the construction agreement.** These deficiencies are addressed in more detail in the December 30, 2015 memo from the Assistant Town Engineer.
- **Health and durability of landscape materials.** The developer recently planted several trees to comply with landscaping requirements; however, as these trees were installed outside of the recommended planting window there is significant concern as to whether they will survive the winter. Responsibility for ensuring the survival, and if necessary, replacement of these plantings lies with the developer.
- **Construction Debris.** While construction has been completed, construction debris remains on the site. Specific examples include remains of erosion and sedimentation controls in various locations and concrete debris discarded along the emergency access road. All of the construction debris needs to be picked up and properly discarded.

The Assistant Town Engineer has estimated that successful completion of the remaining elements will cost approximately $39,500. As such, staff recommends that the Commission authorize a partial release of the remaining escrow funds in the amount of $60,500 at this time and authorize the Chair to release the remaining funds ($39,500) when the outstanding elements are completed to the satisfaction of staff.

Recommendation

If the Commission concurs with the above recommendation, the following motion would be in order:

_____ MOVES, _____ SECONDS to authorize the release $60,500 of the remaining escrow funds to Beaudoin Brothers, LLC at this time. Furthermore, the Chair is authorized to release the remaining escrow funds once the landscaping has been stabilized, all construction materials have been removed from the site and all deficiencies related to the Construction Agreement have been addressed to the satisfaction of the Assistant Town Engineer and Zoning Agent.

Attachments

1) Letter from the Board of the Villages of Freedom Green
2) December 30, 2015 Memo from Assistant Town Engineer

TOWN OF MANSFIELD
DEPARTMENT OF PUBLIC WORKS

Engineering Division

AUDREY P. BECK BUILDING
FOUR SOUTH EAGLEVILLE ROAD
MANSFIELD, CT 06268-2599

From:	Derek M. Dilaj, P.E., Assistant Town Engineer
To:	Janell M. Mullen, Assistant Town Planner/Zoning Agent
Copy:	John Carrington, P.E., Town Engineer
Date:	December 30, 2015
Re:	Escrow Reduction for Freedom Green
Reports:	Agreement made between the Town of Mansfield and JRJ Associates dated April 30, 1991

Per your request, the Town of Mansfield Engineering Division has reviewed the as-built plans prepared by the Design and Development Group and provided by the Developer for Freedom Green in Mansfield, CT. In my previous letter provided to Curt Hirsch the following elements are required per the agreement between the Town of Mansfield and JRJ Associates the developer (JRJ Associates).

a. All main sewer lines constructed with each Phase and with all sewer connections and lines necessary for use of the system.
b. A storm drainage system to the outfall locations.
c. A water supply system with all water lines and secondary service lines to drives and buildings
d. The electrical, telephone, and cable TV service lines within the right-of-way of either Independence or Liberty Drive.

The provided as-builts are deficient as it relates to the 1991 Agreement in the following elements:

1) All sewer connections are not shown nor the location of service wyes located.
2) The electrical, telephone, and cable TV service lines within the right-of-way on Liberty Drive are not shown.

Description	Estimated Quantity	Units	Unit Cost ($)	Total ($)
Landscaping Trees	30	EA	$ 700.00	$ 21,000.00
Remove and Dispose of Construction Debris	1	LS	$ 500.00	$ 500.00
Removal of Sedimentation and Erosion Control	1	LS	$ 500.00	$ 500.00
Closed Circuit Television Inspection to locate Sewer Wyes	3	Days	$ 2,500.00	$ 7,500.00
Utility Location Service for Electrical, Telephone, and Cable	5	Days	$ 1,600.00	$ 8,000.00
Survey Locate Markings	2	Days	$ 1,000.00	$ 2,000.00
			Total	**$ 39,500.00**

To: Mansfield Planning and Zoning Commission

Fr: Thomas Weinland and the Board of the Villages of Freedom Green

Re: Release of Escrow Funds to Jean Beaudoin

We understand that with the completion of the final building phase of the Villages of Freedom Green, Mr. Beaudoin would wish to have escrow funds returned to him as with previous sections of the community. **We are writing to urge that you retain all or most of the remaining funds in this final phase.** Our reasons are as follows:

• During the building of the last phase of construction we raised objections to the appearance of several of the units – particularly their excessive height. Unfortunately, the chairman of the Commission had signed off on a map that appeared to permit what most agreed was an inappropriate design for the area and we were forced to accept a "compromise". Mr. Beaudoin agreed to make special provisions for landscaping to obviate or at least minimize the appearance of this portion of the construction. This past few weeks we have seen a a last minute paultry effort to plant undersized trees and bushes with no apparent intent to meet any commmon sense understanding of that compromise agreement. Indeed, the plantings reflect the same pattern as the rest of the condominium complex both as to size and number. Sadly, the effort represents one more example of Mr. Beaudoin making an agreement and then cutting corners and leaving the town, the commission and the Freedom Green community to "make do".

• The plantings themselves are likely at risk; trees have been planted late in the season with no leaves to indicate their health. Had Mr. Beaudoin met the spirit of the agreement with the PZC, much of this landscaping would have been done more than a year ago to allow us to determine the health and general appearance of the effort. What we have is a form of "plant and run" - last minute efforts to meet a minimum expectation and then cut out before the full effects are known. Indeed, some trees are replacements for those that have died; we would hope to have a chance to test this latest effort against this year's winter - should it ever arrive! Return of the escrow funds will provide no recourse should these plantings not survive the winter.









•We continue to have problems with the detritus left behind by the builder. Attached pictures reveal tree stumps, concrete, sheet metal and other pieces of construction strewn along the side of "fire road". The litter includes at least two large "mystery mounds" - no telling what is buried underneath. The recent Beaudoin "clean-up" may have reduced the situation on the fire road from "disgraceful" to "messy", but it leaves us with the costs of additional cleanup once he departs. Moreover, the scrap represents a safty hazard to those adults and children who may wish to walk in the woods adjacent to their units. At a minimum, labor costs for such cleanup will run into the hundreds of dollars.

Will the Past Be Prologue?

• The Commission should note that several units in this last phase have been purchased only recently. As such they should be allowed the requisite time for unit owners to determine that the structure, appliances and other components of their unit are working appropriately. We are particularly concerned that the back yards on the east side of Liberty lack sufficient swale away from the dwellings to guarantee that snow melt, perhaps combined with heavy rain water, will not invade the basements of these units. We have had such difficulties with units in other sections of the community where unit owners

or the community have been forced to bear the costs of repair.

• Beyond the landscaping issues we have other broader concerns. As units in other sections of the community have aged we have been forced to provide appropriate maintenance. In doing so, we have uncovered problems that go well beyond normal structural aging. We are enclosing additional information, including photos, that show the extent to which shoddy construction has contributed to breakdowns in a number of units. While we cannot wind the clock back to previous construction phases, we would simply note the likelihood, if not certainty, that "past will be prologue" with the construction in this final phase. Thus, beyond the likely costs noted above, we ask that the escrow funds be retained to cover the costs of repairing breakdowns that will likely originate from poor workmanship in this last phase.

To summerize: with the long record of difficulty with Mr. Beaudoin's performance over the years, his current failure to meet the agreement for which at least a portion of the escrow monies were set aside should come as no surprise. Given the circumstances described in this letter we believe it essential that the Commission hold Mr. Beaudoin accountable for insuring full and effective completion of this final phase. We strongly urge that the escrow funds be held back for a period of five years.

Thank you for your attention and, we hope, your support.

Town of Mansfield

Department of Planning and Development

Date:	December 3, 2015
To:	Planning and Zoning Commission
From:	Linda M. Painter, AICP, Director of Planning and Development
Subject:	Zoning Regulations

The Regulatory Review Committee met on December 23, 2015 to discuss several potential changes to the Zoning Regulations based on Commission discussion, including feedback received at the December 7th PZC meeting on Amplified Music and Animal Regulations. Based on that feedback, staff recommends the following approach based on priorities previously identified by the Commission and Regulatory Review Committee members.

First Package of Amendments

Attached to this memo are drafts of proposed amendments related to the following topics:

- **Water Service Connections.** The proposed amendments include the creation of a new Water Pipeline Overlay District with accompanying restrictions on water service connections. The proposed text amendments would establish the parameters for the new district; a map amendment would be needed to apply the district to specific locations. Initial locations identified though discussion with the Regulatory Review Committee include Route 195 between the Coventry Town Line and the Four Corners commercial area; Depot Road between Route 32 and Route 44; and Birch Road between Hunting Lodge Road and Bone Mill Road.

  The proposed amendments also include regulations for connections to the Connecticut Water Company system to address DEEP diversion permit conditions.

- **Stormwater Management**. This new section establishes minimum stormwater management requirements for projects that exceed certain thresholds based on state guidelines. The December 3, 2015 draft has been updated to include requirements for small scale projects.

- **Live Music.** Based on the feedback received at the December Commission meeting, the proposal for this package has been revised to simply eliminate renewal requirements for live music permits. Amplified music would be addressed as part of the overall code rewrite.

- **Brewpubs and Breweries.** The proposed amendments allow brewpubs, brewpubs/restaurants and breweries in the PB-1, PB-2, and PB-3 zones with special permit approval and allow brewpubs/restaurants in the SC-SDD as a permitted use. Additionally, references to specific liquor permits allowed in Mansfield are replaced with a reference to the Code of Ordinances, which is where liquor permits are specifically authorized.

- **Architectural and Design Standards**. Updates to Article 10, Section are proposed to reflect sustainability principles identified in the POCD, including new guidance related to site selection, site layout and landscape design. This section applies to all development within designated Design Development Districts.

- **Sustainability Requirements.** This new section identifies minimum sustainability requirements for projects that exceed a certain threshold. A menu of options is provided through which developers can achieve the minimum points required for their project.

If the Commission concurs, staff recommends referring the draft regulations to the following advisory committees and requesting that any comments be provided to the Commission by February 1, 2016:

- Agriculture Committee
- Conservation Commission
- Economic Development Commission
- Four Corners Sewer and Water Advisory Committee
- Open Space Preservation Committee
- Sustainability Committee
- Zoning Focus Group for Mansfield Tomorrow

Once comments have been received, the Commission would have the ability to make any needed changes to the regulations prior to scheduling a public hearing. If no major changes are needed, a hearing could be scheduled for March 8, 2016.

<u>Second Package of Amendments</u>
Due to the complex nature of the amendments related to multi-family development and affordable housing, additional time is needed to finalize a draft of these amendments with the Regulatory Review Committee and Commission. The following concepts were discussed by the Regulatory Review Committee at the December 23, 2015 meeting; it would be helpful to get feedback from the entire commission prior to finalizing draft regulations. Additional information will be distributed at the January 4th meeting for discussion.

- **Eliminate the Age Restricted Housing (ARH) and Planned Residence District (PRD) zones**. Neither of these zones have ever been applied to property in Mansfield. These districts appear to have been designed to facilitate senior housing and student housing projects, respectively. Special provisions related to density and parking for senior and student housing could be incorporated into the DMR district and modified as deemed appropriate by the Commission. For example, alternative parking requirements could be provided based on accessibility of transit service, proximity to the campus or downtown, and provision of supplemental alternative transportation such as shuttle service.

- **Amend the Definition of Family.** As recommended in the POCD, this amendment would allow for the Commission to authorize more than 3 unrelated individuals to live in one dwelling unit if approved as part of a special permit for a managed apartment complex in a DMR zone.

- **Establish Minimum Affordability Standards.** This amendment would require that a certain percentage of new units in the DMR zone be designated as affordable to meet state requirements. Current affordability standards based on unit size do not count toward the 10% town-wide goal established by the State of Connecticut (C.G.S. Sec. 8-30g, attached). Based on Regulatory Review Committee discussions, these units could either be provided on-site or through provision of a fee-in-lieu. To offset the cost of these units, density bonuses would be provided, with a larger bonus for on-site units to encourage use of that option.

- **Update Design Standards and Requirements for Multi-Family Districts.** Updates would address several topics, including to site layout; provision of open space; parking requirements, including bicycle parking; setbacks;

<u>Overall Rewrite</u>
Based on the feedback received at the December PZC meeting, changes to animal/kennel regulations and amplified music would be addressed as part of the overall rewrite of the regulations as those issues do not have the same urgency as the topics noted above.

DRAFT REGULATIONS RELATED TO WATER SERVICE CONNECTIONS

MANSFIELD DEPARTMENT OF PLANNING AND DEVELOPMENT ▪ DECEMBER 30, 2015

OVERVIEW

The proposed changes:

- Establish a new water pipeline overlay zoning district to regulate water service connections in that zone
- Provide criteria for regulating uses served by the Connecticut Water Company pipeline pursuant to the diversion permit issued by DEEP

AMENDMENTS TO ARTICLE TWO

AMEND SECTION 2.A

Add "W – Water Pipeline Overlay Zone" to end of list of Zoning Districts

AMENDMENTS TO ARTICLE SIX

AMENDMENTS TO ARTICLE SIX, SECTION B.4 – PERFORMANCE STANDARDS

Add new section B.4.u as follows:

u. Special Requirements for Properties Served by Connecticut Water Company. Pursuant to the terms of the water diversion permit issued by CT DEEP in May 2015 for the interconnection of the CWC and UConn water systems, future development served by that pipeline, whether directly or indirectly, shall meet the following requirements in addition to the requirements of Article 10, Section V, where applicable.

1. No connections shall be authorized for new or expanded uses unless one or more of the following conditions is met:
   - The type and intensity of use is consistent with the Planned Development designation identified in the 2006 POCD; or
   - For properties where a change in use from the 2006 POCD is proposed, the developer must demonstrate that: (1) the proposed use is consistent with the current POCD; and (2) that the water demands of the proposed use are equivalent to or less than the water demands of uses allowed pursuant to the 2006 POCD or that the proposed uses could be supported by an on-site water system. The Commission may require verification of on-site capacity through hydrologic engineering studies and/or issuance of a permit for a water system in accordance with the Public Health Code.
2. Uses developed after the effective date of this section using on-site water systems may connect to the public water system with a connection sized only to serve that use if their on-site well fails or is contaminated. Any new uses or expansions of use on the site shall comply with the provisions of subsection a, above.

3. Any projects requiring a water main extension and/ or Site Plan, Special Permit or Subdivision approval shall be referred to the Connecticut Water Company Water System Advisory Committee for review and comment.

AMENDMENTS TO ARTICLE TEN: SPECIAL REGULATIONS

ADD NEW SECTION V – WATER PIPELINE OVERLAY ZONE

1. Purpose. The purpose of this section is to protect rural areas of the community (designated as Rural Character Conservation Areas in the POCD) from inappropriate development that could be spurred by new water transmission mains traversing these areas prior to reaching areas designated as Smart Growth Development Areas in the POCD. To that end, the presence of water mains in Rural Character Conservation Areas shall not be used to justify the intensification of land uses in a manner that would conflict with the overall character of that specific area as described in the POCD.

   To implement this objective, this section establishes standards for connecting to new water mains in Water Pipeline Overlay Zones and identifies limitations specific to properties that will be served by the interconnection between the Connecticut Water Company and University of Connecticut water systems.

2. Applicability. The standards set forth herein are applicable to all properties located within the Water Pipeline Overlay Zone as depicted on the Official Zoning Map.

3. Establishment of New Water Pipeline Overlay Zones. This district may be applied to any area where a water pipeline exists or an extension is proposed that meets one or more of the following requirements:
   a. The property is designated on the current POCD Future Land Use map as:
      - Conservation/Recreation/Managed Resource Area
      - Rural/Residential/Agriculture/Forestry;
      - Rural Residential Village;
      - Village Center; or
      - Rural Commercial.
   b. The property was designated in the 2006 POCD as:
      - Low Density Residential; or
      - Planned Office/Mixed Use; or
      - Neighborhood Business/Mixed Use.

4. Development Requirements. Any owner of property located within a Water Pipeline Overlay Zone that desires to connect to the water main shall meet the following requirements.
   a. Any use that exists as of the effective date of this Regulation may connect to the water main with a single connection properly sized to serve only that use.
   b. New uses that are permitted as of right in the underlying zone may connect to the water main upon receipt of a Zoning Permit.
   c. New residential developments requiring subdivision approval shall be limited to the number of units allowed in the underlying zone either through conventional design or cluster design pursuant to the Mansfield Subdivision Regulations. While the overall number of units shall be limited to what could have been developed without access to a public water system, the developer may reduce the minimum lot sizes required to preserve a greater amount of open space.

d. The Commission may approve a Special Permit to allow higher density development to occur on a portion of a property while preserving the remainder of the property as open space provided the overall density of development on the entire property is not greater than what can be achieved in the underlying zone. The Commission may require a density analysis that gives consideration to such features as wetlands and water courses, steep slopes, soil conditions, and access to determine the development potential of the property in the underlying zone.

DRAFT STORMWATER MANAGEMENT REGULATIONS

MANSFIELD DEPARTMENT OF PLANNING AND DEVELOPMENT ▪ DECEMBER 30, 2015

OVERVIEW

The proposed changes:

- Establish thresholds for when stormwater management plans are required;
- Identify the minimum information required as part of a stormwater management plan;
- Promote the use of Low Impact Development practices to improve groundwater recharge;
- Require the use of more recent rainfall data (NOAA Atlas 14) to estimate stormwater volumes; and
- Establish minimum stormwater management requirements for small scale projects.

AMENDMENTS TO ARTICLE SIX OF THE ZONING REGULATIONS

AMENDMENTS TO SECTION B.4 – PERFORMANCE STANDARDS

Add new Section B.4.t:

t. Stormwater Management

1. Definitions. For the purpose of this section, the following definitions shall be used:
   a. *Low Impact Development (LID).* A stormwater management strategy designed to maintain or replicating the predevelopment hydrologic regime. Hydrologic functions of storage, infiltration and groundwater recharge, as well as the volume and frequency of discharges are maintained through the use of integrated and distributed micro-scale stormwater retention and detention areas; reduction of impervious surfaces, and the lengthening of run-off flow paths and flow time. Other strategies include the preservation/protection of environmentally sensitive site features such as riparian buffers, wetlands, steep slopes, valuable (mature) trees, floodplains, woodlands and highly permeable soils.
   b. *Impervious Surface.* The area of a building site or lot that is covered by materials that prevent the infiltration of surface water into the ground beneath. Such materials may include, but are not limited to, roofs, paved driveways, concrete slabs, sealed-joint paving blocks or stones, and pools. Impervious surface shall be expressed in terms of square footage or acreage, and percentage of total site or lot area.
   c. *Predevelopment site hydrology.* The water balance between runoff, infiltration, storage, groundwater recharge, and evapotranspiration prior to the development of a site.

2. Purpose. The purpose of these stormwater management regulations is to:
   a. Promote the goals and objectives for the conservation of the town's water resources as identified in the Plan of Conservation and Development;

b. Preserve the predevelopment site hydrology to the extent practical in order to maintain stream base flow conditions; maintain groundwater recharge; and minimize flooding, erosion, and the effects from runoff on downstream properties;
c. Minimize the sources and amounts of pollution transported by stormwater runoff to wetlands, watercourses, groundwater, and other natural resources, and minimize impacts to downstream properties; and
d. Promote the use of Low Impact Development (LID) practices in the planning, design, and execution of land development activities.

3. Applicability. These regulations are applicable to any new development and modifications to existing land uses that meet the following criteria:
   - Any development resulting in the disturbance of one or more acres of land;
   - Residential development of five or more dwellings;
   - Residential development involving the construction of a new road or common driveway serving more than two dwellings;
   - Any development where stormwater will have a point discharge to a wetland or watercourse;
   - Nonresidential development having greater than 10,000 square feet of impervious surface;
   - Other activities as described in the CTDEEP 2004 Connecticut Stormwater Manual (the Manual) as may be amended; or
   - Other developments determined by the Commission to have the potential for stormwater management issues.

4. Stormwater Management Plan. A Stormwater Management Plan (SWM) shall be included in any application that requires the submission and approval of a Site Plan or Subdivision Plan and shall be consistent with the purpose set forth in subsection 2 above, the Mansfield Standards and Specifications, and the principles set forth in the Manual.

   a. The SWM shall be consistent with sound engineering and site planning practices, and shall include best management practices and Low Impact Development practices where feasible. The plan shall include a summary report describing the nature of the improvement; a SWM improvement plan; supporting computations where appropriate; a description of construction sequence; and a program for operation, maintenance, and monitoring. The professional engineer shall sign and seal all documents which they prepared.

   b. The design report shall include:

      - Description of existing site and relevant off-site conditions that may be affected by the selection of water quality measures;
      - Rainfall data for the design storms as identified by the NOAA Atlas 14;
      - An evaluation of existing on-site and off-site hydrology including estimates of preconstruction and post-construction development from the 1-, 2-, 10-, 25-, and 100-year, 24-hour storm events;
      - A discussion of the function for the stormwater management system during typical operation and during a possible failure of a component; and
      - A discussion of the proposed treatment and control measures and their estimated effect on improving the quality of stormwater runoff, specifically for the removal of 80 percent of total suspended solids.

   c. The improvement plan shall be designed to:

- Maintain the predevelopment site hydrology to the maximum extent feasible;
- Provide zero net increase in peak runoff from the 2-, 10-, 25-, and 100-year storm events unless the applicant demonstrates that this would be a detriment to downstream properties;
- Provide treatment of stormwater runoff in accordance with the Manual;
- Reduce peak runoff from 2-year, 24-hour postdevelopment event to 50 percent of the predevelopment conditions for that storm event or to the equivalent of the 1-year, 24-hour storm event unless the Commission determines that such reduction is impractical;
- Have conveyance systems meeting the applicable provisions of the CTDOT Drainage Manual; and
- Incorporate vegetative measures where appropriate.

d. When the proposed development involves modification to an existing developed area, the applicant shall demonstrate that the stormwater quality treatment is being provided to the maximum extent practicable for all undisturbed impervious areas. New impervious areas shall meet the standards set forth in subsection (c), above.

5. Small Scale Projects. Any development that meets one or more of the thresholds set forth in subsection 3 but does not require Site Plan or Subdivision approval shall manage stormwater by implementing one or more of the following LID measures. Compliance with this requirement will be determined as part of the Zoning Permit process.

Reducing Hydraulic Connectivity of Impervious Surfaces

- Disconnecting roof drains and directing flows to vegetated areas or infiltration structures (swales, trenches, or drywells)
- Directing flows from paved areas such as driveways to stabilized vegetated areas
- Breaking up flow directions from large paved surfaces
- Encouraging sheet flow through vegetated areas
- Locating impervious areas so they drain to natural systems, vegetated buffers, natural resource areas, on-lot bioretention areas, or permeable soils

Modifying/Increasing Runoff Travel Time

- Maximizing overland sheet flow
- Increasing and lengthening drainage flow paths
- Lengthening and flattening site and lot slopes (although may conflict with goal of minimizing grading and disturbance).
- Maximizing use of vegetated swales

Increasing Groundwater Recharge

- Vegetated Swales, Buffers, and Filter Strips
- Bioretention/Rain Gardens
- Dry Wells/Leaching Trenches
- Rainwater Harvesting
- Vegetated Roof Covers (Green Roofs)

More detailed guidance for implementation of these measures can be located in the 2004 Connecticut Stormwater Quality Manual as may be amended.

DRAFT LIVE MUSIC REGULATIONS

MANSFIELD DEPARTMENT OF PLANNING AND DEVELOPMENT ▪ DECEMBER 29, 2015

OVERVIEW

The proposed changes:

- Eliminate the annual renewal requirement for Live Music Permits

AMENDMENTS TO ARTICLE SEVEN: PERMITTED USES

AMEND SECTION L.2. CATEGORY H

Section L.2.h authorizes Live Music in the PB-1 zone in association with certain uses provided Special Permit approval is obtained; this section and its standards is also referenced in other zones where the use of live music is allowed by Special Permit. As such, any changes to the standards of this zone apply to all other zones that reference this language.

Amend Section L.2.h to delete the requirement for annual renewal of the Special Permit and note that any special permit in effect as of the effective date shall not expire.

h. Category H

The use of live music associated with any hotel, motel, commercial recreation facility or restaurant, provided no outside speakers shall be used in conjunction with the use of such music and provided no music associated with the use is objectionable at the site's property lines. ~~Any special permit issued pursuant to this subsection shall expire on November 1 of each year and, upon application and Public Hearing, may be renewed.~~ Any Live Music Special Permit in effect on _____ [insert effective date of this amendment] shall remain in effect provided the conditions of approval continue to be met with the exception of conditions relating to permit expiration and renewal which shall no longer apply.

As an exception to this requirement for Special Permit approval, limited live music uses may be authorized with Zoning Permit approval provided the following standards are met:

1. The subject live music shall be limited to singing or the playing of musical instruments that, in the opinion of the Zoning Agent, are accessory to an authorized use (such as background music to enhance a dining experience) and not a primary use, (such as a separate concert event).
2. The subject live music shall be unamplified or amplified at volume levels that, in the opinion of the Zoning Agent, would have low potential for causing noise issues for neighboring property owners. If neighborhood noise problems occur, the subject live music authorization may be altered or revoked.
3. No live music use authorized under this Zoning Permit provision shall take place after 10 pm on weekdays and 11pm on weekends.
4. Zoning Permits issued for live music under this provision shall ~~be valid for an initial period ending on November 1 of an even numbered year and may, upon application of the holder of such permit, be renewed for additional periods of two (2) years each provided the requirement of this section are continually met. Such permit shall~~ not be transferable.

5. Any Zoning Permit in effect on [insert effective date of this amendment] shall remain in effect provided the requirements of this section are continually met.

Any questions regarding the appropriate permit process for authorizing live music uses, shall be resolved by the Planning and Zoning Commission.

DRAFT BREWPUB AND BREWERY REGULATIONS

MANSFIELD DEPARTMENT OF PLANNING AND DEVELOPMENT ▪ DECEMBER 29, 2015

OVERVIEW

The proposed changes:

- Allow brew pubs, brewpubs/restaurants and breweries in PB-1, PB-2, and PB-3 by Special Permit provided use is connected to public water and sanitary sewer systems.
- Allow brewpubs/restaurants in the SC-SDD as a permitted use
- Eliminate references to allowable state liquor permit types and replace with a reference to the section of the Mansfield Code of Ordinances that authorizes specific liquor permit types.
- Delete prohibition on nightclub permits as nightclub permits no longer exist in state statutes. Additionally, a prohibition statement is not needed as the only permits allowed are those identified in the Code of Ordinances. Any change to allow other types of liquor permit, such as a café permit which allows sales of alcohol with minimal food service, would require amendment to the Code of Ordinances.

AMENDMENTS TO ARTICLE SEVEN: PERMITTED USES

AMEND SECTION L.2. CATEGORY I

Section L.2.i authorizes the sale of alcoholic liquor with Special Permit approval in the Planned Business 1 zone (Route 195/Route 6 area) subject to the provisions of Article X, Section I. The proposed amendment would authorize brewpubs, brewpubs/restaurants and breweries provided they are connected to public water and sanitary sewer systems.

Amend Section L.2.i as follows:

i. Category I

1. The sale of alcoholic liquor subject to the provisions of Article X, Section I.

2. Brewpub/restaurant, Brewpub and Brewery uses as defined below subject to the provisions of Article X, Section I provided the is site is served by public water and sanitary sewer systems.
   Brewpub/restaurant – A restaurant where beer is manufactured, stored, bottled and sold to be consumed on premises. A limited amount of beer may be sold at retail in sealed containers for consumption off premises as accessory to the restaurant use.
   Brewpub – A facility where beer can be manufactured, stored, bottled, sold at wholesale or at retail in sealed bottles or other sealed containers for consumption off premises, or sold to be consumed on premises in a room that is ancillary to the production of beer, with or without the sale of food.
   Brewery – A facility where beer can be manufactured, stored, bottled and sold at wholesale or at retail in sealed containers for consumption off premises or offered for on-site tasting.

AMEND SECTION M.2, CATEGORY L

Section M.2.l authorizes the sale of alcoholic liquor with Special Permit approval in the Planned Business 2 zone (Route 195/Dog Lane Area) subject to the provisions of Article X, Section I. The proposed amendment would authorize brewpubs, brewpubs/restaurants and breweries provided they are connected to public water and sanitary sewer systems.

Amend Section M.2.l as follows:

l. Category L

1. The sale of alcoholic liquor subject to the provisions of Article X, Section I.
2. Brewpub/restaurant, Brewpub and Brewery uses as defined in Section L.2.i subject to the provisions of Article X, Section I provided the is site is served by public water and sanitary sewer systems.

AMEND SECTION N.3, CATEGORY J

Section N.3.j authorizes the sale of alcoholic liquor with Special Permit approval in the Planned Business 3 zone (Route 195/Route 44 Four Corners Area) subject to the provisions of Article X, Section I. The proposed amendment would authorize brewpubs, brewpubs/restaurants and breweries provided they are connected to public water and sanitary sewer systems.

Amend Section M.2.l as follows:

l. Category L

1. The sale of alcoholic liquor subject to the provisions of Article X, Section I.
2. Brewpub/restaurant, Brewpub and Brewery uses as defined in Section L.2.i subject to the provisions of Article X, Section I provided the is site is served by public water and sanitary sewer systems.

AMENDMENTS TO ARTICLE TEN: SALE OF ALCOHOLIC LIQUOR

AMEND SECTION I – SALE OF ALCOHOLIC LIQUOR

Article Ten, Section I contains specific standards related to the sale of alcoholic liquor, including a list of specific liquor permits authorized in Mansfield. The proposed amendments delete the specific list of permits and refer to the Code of Ordinances, where such list of allowable liquor permits is established. The proposed amendments also delete the prohibition on nightclub permits as such permit no longer exists in the state statutes.

Amend Section I as follows:

I. Manufacture and Sale Of Alcoholic Liquor

1. Definitions

All definitions of words used in this section which are not defined in this section or elsewhere in the Mansfield Zoning Regulations shall be the same as defined in the Liquor Control Act, Chapter 545 of the 1958 Revision of Connecticut Statutes, as revised, and the current regulations of the State Department of Liquor Control.

a. Permit Premises - That structure or building or that portion of a lot used for the manufacture, storage, or wholesale or retail sale of alcoholic liquor.

2. General

All proposed uses of land, buildings or structures involving the wholesale or retail sale of alcoholic liquor, whether for consumption upon the premises or otherwise, or involving the storage or manufacture of alcoholic liquor shall conform with the specific requirements contained in this section and shall conform with the permitted use provisions of Article VII or the non-conformity provisions of Article IX. The requirements contained in this Section I shall not apply to any permit premises located within an SC-SDD zone district.

The sale of alcoholic liquor is not considered an accessory use. In situations where the sale of alcoholic liquor was not specifically authorized by the Planning and Zoning Commission in association with the establishment of a land use, special permit approval in accordance with the provisions of Article V, Section B shall be required to initiate the sale of alcoholic liquor at the subject property.

~~Currently, the only liquor permits that may be authorized in Mansfield are: Club; Druggist; Grocery Beer; Hotel; Package Store; Package Store Beer; Restaurant; Restaurant Beer; Restaurant Wine and Beer, and Temporary Special Outing Facility.~~

3. Authorized Liquor Permit Types ~~Prohibition~~

~~Night Club (Extra Hour) Permits - Night Club Permits as defined in the Liquor Control Act shall not be allowed in the Town of Mansfield.~~
The only liquor permits that may be authorized in Mansfield are those identified in Section 101-1 of the Mansfield Code of Ordinances.

4. Separation Distance Requirements.

a. There shall be a minimum distance of 500 feet between all parts of permit premises and all parts of a building used for any of the following purposes except that described in subsection 1(b) below:
   1. (a)A public or private school conducted for the instruction of children primarily from 5 to 18 years of age and giving instruction at least three days a week for eight or more months a year;

      (b)The above limitation shall not apply to a permit premises in a Planned Business II zone which is a restaurant serving alcoholic beverages from a service bar in conjunction with the service of meals to customers seated at tables within a building and which premises does not contain a cocktail lounge or area where alcoholic beverages are served to patrons standing or seated at a bar.
   2. A hospital
   3. A training school for mentally retarded persons of any age
   4. A convalescent home or nursing home
   5. A library
b. There shall be a minimum of 250 feet between all parts of permit premises and all parts of a building used for the following purposes:
   1. A church or other building used for worship
   2. A public or private school conducted for the instruction of children primarily under 5 years of age and giving instruction at least three days a week for eight or more months a year.

In subsections (a) and (b) above, the distance referred to shall be measured in line without regard to intervening terrain or the actual means or ways of foot or vehicle travel between the two points.

c. There shall be a minimum distance of 1,000 feet between the permit premises of all package store permits. This 1,000-foot separation distance shall be measured in a straight line between the respective customer entrances of the subject permit premises which are closest together without regard to intervening terrain or the actual means or ways of foot or vehicle travel between the two points.

5. Temporary Special Outing Facility Permits

Temporary Special Outing Facility Permits may be authorized by the Planning and Zoning Commission, provided site plan approval is obtained as per the provisions of Article V, Section A and provided the following requirements are met:

a. Written approval from the Mansfield Police Department is submitted with the site plan application. Said approval shall specifically address the proposed plans for parking, traffic control, crowd control, hours or operation and protection of minors;
b. Written approval from the Mansfield Health Officer is submitted with the site plan application. Said approval shall specifically address the proposed plans for providing sanitary facilities for the subject event.

AMEND SECTION S.4 – USES PERMITTED IN THE STORRS CENTER SPECIAL DESIGN DISTRICT

Amend Section S.4.a to add the following use:

(xxvii) Brewpub/restaurant as defined in Article VII, Section L.2.i

DRAFT ARCHITECTURAL, DESIGN AND SUSTAINABILITY REGULATIONS

MANSFIELD DEPARTMENT OF PLANNING AND DEVELOPMENT ▪ DECEMBER 30, 2015

OVERVIEW

The proposed changes update current architectural and design standards to:

- Provide more guidance on overall site selection;
- Enhance standards related to site layout and landscape design; and
- Establish minimum sustainable design requirements.

AMENDMENTS TO ARTICLE TEN

SECTION R – ARCHITECTURAL AND DESIGN STANDARDS

Delete all text in Section R and replace with the following:

1. Purpose. The Plan of Conservation and Development identifies numerous goals and objectives related to protecting and enhancing the town's natural resources; preserving rural character; creating a sense of place; improving opportunities for walking and biking; and promoting resource and energy conservation. The purpose of this Section is to establish a framework for selecting building sites, laying out site improvements and designing buildings in accordance with the seven sustainability principles outlined in the POCD. Subject to compliance with more specific provisions of these Regulations, these standards shall be used as design determinants to organize a site layout and to develop the composition and character of new buildings and site improvements. Specifically, these standards are intended to:

    a. Protect and enhance the Town's natural systems and resources, including wildlife habitat, forests, and water resources such as wetlands, water bodies, stratified drift aquifers, rivers and streams;
    b. Respect and value the community context by protecting and enhancing historic, cultural and scenic resources and other attributes of community character that contribute to the value of properties in the neighborhood of a subject site and encouraging the most appropriate use of land;
    c. Promote the efficient use of land, energy and other natural and manmade resources to minimize waste;
    d. Assist the community in adapting to changing climate conditions by locating new development to minimize land disturbance and impacts to natural hazard areas and increasing natural storm water infiltration;
    e. Promote connectivity of natural systems and neighborhoods by protecting natural resource corridors and designing sites and buildings to support efficient, multi-modal circulation and appropriate transitions between the public and private realms;
    f. Direct development to appropriate areas in compact and efficient patterns to promote the creation of connected, livable neighborhoods and preserve the rural character in the majority of town;

g. Promote high-quality architectural design that encourages pedestrian activity and creates a sense of place; and
h. Encourage sustainable design practices at all scales of development.

2. Applicability. These guidelines shall apply to all development for which Site Plan, Special Permit or Subdivision approval is required.

3. Site Selection Principles. The following principles are intended to assist developers in selecting appropriate sites for new development to minimize impacts on Mansfield's natural systems, improve connectivity, promote compact development patterns in areas designated as Smart Growth Development Areas in the POCD and preserve rural character in areas designated as Rural Character Conservation Areas in the POCD. Proposed developments may not be denied solely for failure to meet these site selection principles.

   a. To the greatest extent possible, new development should be located:
      1. In areas designated in the POCD as Smart Growth Development Areas;
      2. On the following types of sites (listed in descending order of desirability) to increase the efficiency of land usage:
         - A previously developed site;
         - An infill site;
         - A site adjacent to existing development;
         - On sites that have access to existing infrastructure and do not require construction of or extensions to existing infrastructure;
         - On or within close proximity to existing transit routes, bicycle routes and walkways;
         - On sites that do not have prime agricultural soils;
         - On sites that are not located within a public drinking water supply watershed.
   b. If a site is located in an area designated as a Rural Character Conservation Area, the following site selection principles apply in addition to those identified above:
      1. To the greatest extent possible, new developments should be located:
         - On arterial or collector roadways with the exception of agricultural uses and single-family residential subdivisions;
         - Outside of large contiguous forest tracts; and
         - At least 500 feet way from areas of stratified drift aquifer.

4. Site Layout Standards. The following standards provide general guidance on items that should be considered and addressed as part of the overall site design process. Specific requirements for design of parking and loading areas, landscape areas and buildings are identified in other sections of these Regulations.

   Applicants are encouraged to consult with relevant Town advisory commissions and committees with regard to identification and protection of natural, historic, cultural and scenic resources of particular sites before they begin the site design process.

   a. Preserve open space, conserve natural habitats and protect and enhance fragile ecosystems by:
      - Incorporating natural features such as water bodies, wetlands, watercourses, prime agricultural soils, existing vegetation, hills, ridges, hedges, rock outcroppings, etc. into the project design;
      - Providing appropriate buffers to natural features;
      - Clustering new development to minimize land disturbance;

- Locating the majority of development on previously developed land where feasible; and
- Remediating any existing on-site contamination.

b. Protect and enhance site and neighborhood features that are of historic, cultural or scenic importance or otherwise provide or contribute significant character to the site and neighborhood such as historic structures, foundations, stone walls, fences, cemeteries, historic sites, and significant views and vistas on or adjacent to the subject site.
c. Create significant and proportional spatial relationships between site and neighborhood features and the mass (the size or bulk of the building) and scale (the size relationship of the building to the site and also to the persons who use it) of proposed structures and site improvements. Where appropriate, use large open space or natural buffers to separate incompatible uses and provide a transition between developments of different scales and density. In large developments with multiple buildings, consider open space breaks and preserving existing vegetation to create identifiable places within the development.
d. Use natural features and manmade features such as stormwater ponds, streets and sidewalks to create a sense of community and place.
e. Where appropriate, respect prevailing building setbacks and continue existing visual patterns (e.g. density, location of sidewalks, parking areas, etc.).
f. Site new buildings to promote energy conservation where feasible.
g. Address vehicular and pedestrian safety and accessibility in a comprehensive and multi-modal manner. Design site entrances, and where appropriate, building entrances to be clearly visible and identifiable from public access ways or any other primary vantage points. Provide safe and attractive walkways/bikeways and, where appropriate, public transit amenities and interconnected development that promote walking and cycling to, and within, the area and enhanced public transit opportunity.
h. Where feasible, locate major parking areas to the rear or side of proposed buildings.

5. Landscape Design Standards.
   a. Whenever possible:
      - Use natural, planted slopes rather than retaining walls;
      - Retain existing healthy, mature trees and provide protection during construction;
      - Use native plant species for at least 50% of the planted area that can survive on the natural rainfall cycle and require minimal or no fertilizers, herbicides or pesticides; and
      - Select plan species that thrive in spite of the native deer population;
   b. Incorporate stormwater management systems into the overall landscape plan for the site. Examples include rain gardens, depressed planting islands, permeable pavers, and ponds designed to be an organizing feature and site amenity.
   c. Use landscaping to accomplish multiple functions such as stormwater filtration and edible plants.

6. Building Layout and Design Standards.
   a. Balance the visual relationships of building mass and size with the site and adjacent sites, especially when viewed from a distance. Where applicable, preserve and reinforce historic scale, massing, and proportions between building height, length and width.
   b. Avoid long, box-like structures. Break large building volumes into smaller forms to lessen the total building mass and to provide continuity with nearby patterns. Consider projections (overhangs, awnings, etc.) or recesses (e.g., windows) on all buildings and stepping back upper levels on larger buildings.
   c. Strive for visual simplicity rather than complexity and create variety through compatibility rather than conformity. Coordinate color schemes and materials with neighboring buildings and coordinate all

exterior elevations of a building (color, materials, architectural form, detailing, etc.). Establish character by creating shadow patterns using architectural elements (overhangs, trellises, projections, and awnings, etc.).

d. Form a consistent composition between the roof mass and building façade. Where appropriate, consider rooflines of adjacent properties and adjacent building roof details (e.g., dormers, fascias, roof pitches, etc.).
e. To encourage pedestrian use, build elements (e.g. protective canopies, stairs, columns, wall or roof projections and recesses, etc.) to human scale at sidewalk level and incorporate weather protection convenience and safety features.
f. Conceal view of all roof-mounted equipment (HVAC, plumbing, exhaust fans, etc.), particularly from the public right-of-way, using detailing incorporated into the architectural design. Avoid false detailing (mansard roofs, partial HVAC screens, truncated roof structures, etc.) where possible.
g. Natural materials, or modern materials with the same visual characteristics, in their traditional applications (e.g., wood, stone, brick, glass, metal, etc.) should be used as primary building materials. The number of different materials on the exterior building elevation should be limited, and attention shall be given to detail at corners, trim, openings, and wherever there are abutting materials. Long-term maintenance shall be an important consideration in the selection of building materials.
h. National franchise uses shall use building designs and building materials that reflect the context of the area in which they are located in their form, materials, and details.
i. Secondary rear or side building facades that are visible from public spaces or adjacent properties shall be designed to complement the architectural treatment of primary facades.
j. The design of signage, lighting fixtures, accessory structures, fences, storage enclosures, bicycle racks, benches, trash baskets, and other site improvements shall be coordinated with primary buildings in form, materials, and details.
k. Buildings shall be sited and designed to promote energy conservation. Consideration should be given to solar orientation, insulation, lighting, plumbing, landscaping and other energy efficient design elements.

ADD NEW SECTION B: SUSTAINABILITY REQUIREMENTS

Replace Current Section B. RESERVED with the following:

B. Sustainability Requirements

1. Purpose. The standards of this section are intended to further the sustainability goals outlined in the Plan of Conservation and Development.
2. Applicability. These standards apply to all new construction (including additions to existing buildings) for which Site Plan or Special Permit approval is required with the exception of agricultural uses.
3. Minimum Requirements. Developments shall achieve no fewer than the number of points identified below from any combination of the sustainable development measures identified in Section 4. Projects where the level of improvement is less than the threshold required for achieving two (2) sustainability points shall be exempt from the requirements of this section.
   a. A minimum of **2 points** shall be earned for any development project that either:
      - Increases an existing building footprint by 30% or more of gross building area; or
      - Includes the replacement, renovation or reconfiguration of 60% or more of the total site parking area (inclusive of required parking lot landscaping areas).
   b. A minimum of **5 points** shall be earned for any development project that increases an existing building footprint by 60% or more of gross building area.

c. A minimum of **7 points** shall be earned for any development project that involves either:
   - The construction of a new building; or
   - The complete renovation or replacement of an existing building.

4. Calculation and Evaluation. Points shall be calculated in accordance with the following standards:
   a. All point values shall be awarded based on meeting the minimum requirements of each sustainability measure as identified in the following table. No partial points shall be awarded.
   b. The sum of all assigned values for achieved sustainability measures shall meet the minimum point requirement per project.
   c. Documentation of which measures the applicant will achieve and the total number of points requested shall be included in the application.
   d. Supporting documentation shall be submitted as required for each applicable measure.

Sustainability Measure	Minimum Requirements	Required Documentation	Point Value
Certified Green Building	Certify a new construction building or building undergoing major renovations through a green building rating system requiring review by an independent, third-party certifying body and approved by the Commission. The score shall be mid- to high-level, reflecting multiple measures included in this Table, such as silver, gold, or platinum by a USGBC green building product.	▪ Registration of the project with the system; ▪ Payment of all applicable fees for the rating system; and ▪ Draft scorecard showing the achieved credits or points.	7 points
Building Energy Efficiency	▪ **New Construction.** Newly constructed buildings must demonstrate an average 10 percent improvement over the energy code currently in effect. ▪ **Major Renovation.** Building must demonstrate an average 5 percent improvement over the energy code currently in effect in the Town.	Energy model demonstrating that the building(s) will achieve the proposed improvements.	3 points
Building Water Efficiency	Indoor water use in new buildings and major renovations must be an average 20 percent less than in baseline buildings. Baseline water usage shall be determined based on fixtures per the Energy Policy Act of 1992 and subsequent rulings by the United States Department of Energy or a similar method approved by the Commission.	Cut sheets for all water fixtures.	2 points
Water Efficient Landscaping	Reduce potable water used for landscape irrigation by 50 percent from a calculated midsummer baseline case by using either one of the following methods: ▪ Utilizing all xeriscape plant materials and providing no permanent irrigation system ▪ Using only captured rainwater with an	A landscape and irrigation plan illustrating the system.	2 points

	irrigation system		
Renewable Energy Sources	Incorporate renewable energy generation on-site with production capacity of at least 5 percent of the building's annual electric or thermal energy, established through an accepted building energy performance simulation tool. The following renewable energy generation sources are applicable: ▪ Solar thermal or photovoltaics. ▪ Ground-sourced heating or cooling. ▪ Fuel cells and microturbines using nonfossil fuel ▪ Wind energy conversion. ▪ Other means of generating electricity without using a fuel, such as kinetic heat exchange, approved by the Commission.	Specifications and construction details for the installation of the system.	5 points
Green Roof	Install a vegetated roof for at least 50% of any building roof area or roof deck.	Roof construction plans with drainage and planting details.	4 points
Heat Island Reduction	Use any combination of the following strategies for 35 percent of all on-site, non-roof hardscape areas, including sidewalks, plazas, courtyards, parking lots, parking structures, and driveways. ▪ **Tree Canopy Cover.** Coverage of the surface at canopy tree maturity in 15 years. ▪ **SRI.** Solar reflective paving & roofing with a SRI (solar reflectance index) of at least 29.	Plans and specifications for installation of the strategy.	2 points
Pervious Pavement	Install an open grid or pervious pavement system that is at least 40 percent pervious on 80 percent of all hardscape surface areas, including sidewalks, plazas, courtyards, parking lots, and driveways. The water shall be directed into the groundwater or other acceptable stormwater accommodation approved by the Town Engineer.	Plans and specifications for installation of the strategy	2 points
Enhanced Bicycle Amenities	Inclusion of 2 of the following earns 1 point. Inclusion of 3 of the following earns 2 points. ▪ **Lockable enclosed bicycle storage.** Provide 1 secure, enclosed bicycle storage space for 10 percent of planned employee or resident occupancy. ▪ **Employee shower facilities.** Provide a minimum of one shower facility per 150 employees, minimum of one.	Site and/or building plan locating the measures	Up to 2 points

	▪ **Bicycle parking spaces.** Provide a minimum of 2 times the bicycle parking required by other sections of these regulations. Where no bicycle parking requirements have been specified, provide one bicycle parking space for every 5 required motor vehicle parking spaces. ▪ **Repair Center.** Provide a designated bicycle repair center open to the public and consisting of an air pump, water, and tools at a minimum.		
Alternative Measure	The applicant may submit an alternative sustainable development measure for review and approval by the Commission. The measure shall be unrelated to any of the other measures defined in this Section. The Commission shall determine the number of points to be awarded.	Documentation shall clearly illustrate that the project will achieve the measure and that the measure furthers a sustainability goal.	1 to 3 points

5. Maintenance. Failure to maintain all measures in good working condition shall constitute a Zoning Violation.

CHAPTER 126a

AFFORDABLE HOUSING LAND USE APPEALS

Table of Contents

Sec. 8-30g. Affordable housing land use appeals procedure. Definitions. Affordability plan; regulations. Conceptual site plan. Maximum monthly housing cost. Percentage-of-income requirement. Appeals. Modification of application. Commission powers and remedies. Exempt municipalities. Moratorium. Model deed restrictions. (a) As used in this section:

(1) "Affordable housing development" means a proposed housing development which is (A) assisted housing, or (B) a set-aside development;

(2) "Affordable housing application" means any application made to a commission in connection with an affordable housing development by a person who proposes to develop such affordable housing;

(3) "Assisted housing" means housing which is receiving, or will receive, financial assistance under any governmental program for the construction or substantial rehabilitation of low and moderate income housing, and any housing occupied by persons receiving rental assistance under chapter 319uu or Section 1437f of Title 42 of the United States Code;

(4) "Commission" means a zoning commission, planning commission, planning and zoning commission, zoning board of appeals or municipal agency exercising zoning or planning authority;

(5) "Municipality" means any town, city or borough, whether consolidated or unconsolidated;

(6) "Set-aside development" means a development in which not less than thirty per cent of the dwelling units will be conveyed by deeds containing covenants or restrictions which shall require that, for at least forty years after the initial occupation of the proposed development, such dwelling units shall be sold or rented at, or below, prices which will preserve the units as housing for which persons and families pay thirty per cent or less of their annual income, where such income is less than or equal to eighty per cent of the median income. In a set-aside development, of the dwelling units conveyed by deeds containing covenants or restrictions, a number of dwelling units equal to not less than fifteen per cent of all dwelling units in the development shall be sold or rented to persons and families whose income is less than or equal to sixty per cent of the median income and the remainder of the dwelling

units conveyed by deeds containing covenants or restrictions shall be sold or rented to persons and families whose income is less than or equal to eighty per cent of the median income;

(7) "Median income" means, after adjustments for family size, the lesser of the state median income or the area median income for the area in which the municipality containing the affordable housing development is located, as determined by the United States Department of Housing and Urban Development; and

(8) "Commissioner" means the Commissioner of Housing.

(b) (1) Any person filing an affordable housing application with a commission shall submit, as part of the application, an affordability plan which shall include at least the following: (A) Designation of the person, entity or agency that will be responsible for the duration of any affordability restrictions, for the administration of the affordability plan and its compliance with the income limits and sale price or rental restrictions of this chapter; (B) an affirmative fair housing marketing plan governing the sale or rental of all dwelling units; (C) a sample calculation of the maximum sales prices or rents of the intended affordable dwelling units; (D) a description of the projected sequence in which, within a set-aside development, the affordable dwelling units will be built and offered for occupancy and the general location of such units within the proposed development; and (E) draft zoning regulations, conditions of approvals, deeds, restrictive covenants or lease provisions that will govern the affordable dwelling units.

(2) The commissioner shall, within available appropriations, adopt regulations pursuant to chapter 54 regarding the affordability plan. Such regulations may include additional criteria for preparing an affordability plan and shall include: (A) A formula for determining rent levels and sale prices, including establishing maximum allowable down payments to be used in the calculation of maximum allowable sales prices; (B) a clarification of the costs that are to be included when calculating maximum allowed rents and sale prices; (C) a clarification as to how family size and bedroom counts are to be equated in establishing maximum rental and sale prices for the affordable units; and (D) a listing of the considerations to be included in the computation of income under this section.

(c) Any commission, by regulation, may require that an affordable housing application seeking a change of zone shall include the submission of a conceptual site plan describing the proposed development's total number of residential units and their arrangement on the property and the proposed development's roads and traffic circulation, sewage disposal and water supply.

(d) For any affordable dwelling unit that is rented as part of a set-aside development, if the maximum monthly housing cost, as calculated in accordance with subdivision (6) of subsection (a) of this section, would exceed one hundred per cent of the Section 8 fair market rent as determined by the United States Department of Housing and Urban Development, in the case of units set aside for persons and families whose income is less than or equal to sixty per cent of median income, then such maximum monthly housing cost shall not exceed one hundred per cent of said Section 8 fair market rent. If the maximum monthly housing cost, as calculated in accordance with subdivision (6) of subsection (a) of this section, would exceed one hundred twenty per cent of the Section 8 fair market rent, as determined by the United States Department of Housing and Urban Development, in the case of units set aside for persons and families whose income is less than or equal to eighty per cent of median income, then such maximum monthly housing cost shall not exceed one hundred twenty per cent of such Section 8 fair market rent.

(e) For any affordable dwelling unit that is rented in order to comply with the requirements of a set-aside development, no person shall impose on a prospective tenant who is receiving governmental rental assistance a maximum percentage-of-income-for-housing requirement that is more restrictive than the requirement, if any, imposed by such governmental assistance program.

(f) Any person whose affordable housing application is denied, or is approved with restrictions which have a substantial adverse impact on the viability of the affordable housing development or the degree of affordability of the affordable dwelling units in a set-aside development, may appeal such decision pursuant to the procedures of this section. Such appeal shall be filed within the time period for filing appeals as set forth in section 8-8, 8-9, 8-28 or 8-30a, as applicable, and shall be made returnable to the superior court for the judicial district where the real property which is the subject of the application is located. Affordable housing appeals, including pretrial motions, shall be heard by a judge assigned by the Chief Court Administrator to hear such appeals. To the extent practicable, efforts shall be made to assign such cases to a small number of judges, sitting in geographically diverse parts of the state, so that a consistent body of expertise can be developed. Unless otherwise ordered by the Chief Court Administrator, such appeals, including pretrial motions, shall be heard by such assigned judges in the judicial district in which such judge is sitting. Appeals taken pursuant to this subsection shall be privileged cases to be heard by the court as soon after the return day as is practicable. Except as otherwise provided in this section, appeals involving an affordable housing application shall proceed in conformance with the provisions of said section 8-8, 8-9, 8-28 or 8-30a, as applicable.

(g) Upon an appeal taken under subsection (f) of this section, the burden shall be on the commission to prove, based upon the evidence in the record compiled before such commission, that the decision from which such appeal is taken and the reasons cited for such decision are supported by sufficient evidence in the record. The commission shall also have the burden to prove, based upon the evidence in the record compiled before such commission, that (1) (A) the decision is necessary to protect substantial public interests in health, safety or other matters which the commission may legally consider; (B) such public interests clearly outweigh the need for affordable housing; and (C) such public interests cannot be protected by reasonable changes to the affordable housing development, or (2) (A) the application which was the subject of the decision from which such appeal was taken would locate affordable housing in an area which is zoned for industrial use and which does not permit residential uses; and (B) the development is not assisted housing, as defined in subsection (a) of this section. If the commission does not satisfy its burden of proof under this subsection, the court shall wholly or partly revise, modify, remand or reverse the decision from which the appeal was taken in a manner consistent with the evidence in the record before it.

(h) Following a decision by a commission to reject an affordable housing application or to approve an application with restrictions which have a substantial adverse impact on the viability of the affordable housing development or the degree of affordability of the affordable dwelling units, the applicant may, within the period for filing an appeal of such decision, submit to the commission a proposed modification of its proposal responding to some or all of the objections or restrictions articulated by the commission, which shall be treated as an amendment to the original proposal. The day of receipt of such a modification shall be determined in the same manner as the day of receipt is determined for an original application. The filing of such a proposed modification shall stay the period for filing an appeal from the decision of the commission on the original application. The commission shall hold a public hearing on the proposed modification if it held a public hearing on the original application and may hold a public hearing on the proposed modification if it did not hold a public hearing on the original application. The commission shall render a decision on the proposed modification not later

than sixty-five days after the receipt of such proposed modification, provided, if, in connection with a modification submitted under this subsection, the applicant applies for a permit for an activity regulated pursuant to sections 22a-36 to 22a-45, inclusive, and the time for a decision by the commission on such modification under this subsection would lapse prior to the thirty-fifth day after a decision by an inland wetlands and watercourses agency, the time period for decision by the commission on the modification under this subsection shall be extended to thirty-five days after the decision of such agency. The commission shall issue notice of its decision as provided by law. Failure of the commission to render a decision within said sixty-five days or subsequent extension period permitted by this subsection shall constitute a rejection of the proposed modification. Within the time period for filing an appeal on the proposed modification as set forth in section 8-8, 8-9, 8-28 or 8-30a, as applicable, the applicant may appeal the commission's decision on the original application and the proposed modification in the manner set forth in this section. Nothing in this subsection shall be construed to limit the right of an applicant to appeal the original decision of the commission in the manner set forth in this section without submitting a proposed modification or to limit the issues which may be raised in any appeal under this section.

(i) Nothing in this section shall be deemed to preclude any right of appeal under the provisions of section 8-8, 8-9, 8-28 or 8-30a.

(j) A commission or its designated authority shall have, with respect to compliance of an affordable housing development with the provisions of this chapter, the same powers and remedies provided to commissions by section 8-12.

(k) Notwithstanding the provisions of subsections (a) to (j), inclusive, of this section, the affordable housing appeals procedure established under this section shall not be available if the real property which is the subject of the application is located in a municipality in which at least ten per cent of all dwelling units in the municipality are (1) assisted housing, or (2) currently financed by Connecticut Housing Finance Authority mortgages, or (3) subject to binding recorded deeds containing covenants or restrictions which require that such dwelling units be sold or rented at, or below, prices which will preserve the units as housing for which persons and families pay thirty per cent or less of income, where such income is less than or equal to eighty per cent of the median income, or (4) mobile manufactured homes located in mobile manufactured home parks or legally approved accessory apartments, which homes or apartments are subject to binding recorded deeds containing covenants or restrictions which require that such dwelling units be sold or rented at, or below, prices which will preserve the units as housing for which, for a period of not less than ten years, persons and families pay thirty per cent or less of income, where such income is less than or equal to eighty per cent of the median income. The municipalities meeting the criteria set forth in this subsection shall be listed in the report submitted under section 8-37qqq. As used in this subsection, "accessory apartment" means a separate living unit that (A) is attached to the main living unit of a house, which house has the external appearance of a single-family residence, (B) has a full kitchen, (C) has a square footage that is not more than thirty per cent of the total square footage of the house, (D) has an internal doorway connecting to the main living unit of the house, (E) is not billed separately from such main living unit for utilities, and (F) complies with the building code and health and safety regulations.

(l) (1) Notwithstanding the provisions of subsections (a) to (j), inclusive, of this section, the affordable housing appeals procedure established under this section shall not be applicable to an affordable housing application filed with a commission during a moratorium, which shall be the four-year period after (A) a certification of affordable housing project completion issued by the commissioner is published in the Connecticut Law Journal, or (B) after notice of a provisional approval is published

pursuant to subdivision (4) of this subsection. Any moratorium that is in effect on October 1, 2002, is extended by one year.

(2) Notwithstanding the provisions of this subsection, such moratorium shall not apply to (A) affordable housing applications for assisted housing in which ninety-five per cent of the dwelling units are restricted to persons and families whose income is less than or equal to sixty per cent of median income, (B) other affordable housing applications for assisted housing containing forty or fewer dwelling units, or (C) affordable housing applications which were filed with a commission pursuant to this section prior to the date upon which the moratorium takes effect.

(3) Eligible units completed after a moratorium has begun may be counted toward establishing eligibility for a subsequent moratorium.

(4) (A) The commissioner shall issue a certificate of affordable housing project completion for the purposes of this subsection upon finding that there has been completed within the municipality one or more affordable housing developments which create housing unit-equivalent points equal to the greater of two per cent of all dwelling units in the municipality, as reported in the most recent United States decennial census, or seventy-five housing unit-equivalent points.

(B) A municipality may apply for a certificate of affordable housing project completion pursuant to this subsection by applying in writing to the commissioner, and including documentation showing that the municipality has accumulated the required number of points within the applicable time period. Such documentation shall include the location of each dwelling unit being counted, the number of points each dwelling unit has been assigned, and the reason, pursuant to this subsection, for assigning such points to such dwelling unit. Upon receipt of such application, the commissioner shall promptly cause a notice of the filing of the application to be published in the Connecticut Law Journal, stating that public comment on such application shall be accepted by the commissioner for a period of thirty days after the publication of such notice. Not later than ninety days after the receipt of such application, the commissioner shall either approve or reject such application. Such approval or rejection shall be accompanied by a written statement of the reasons for approval or rejection, pursuant to the provisions of this subsection. If the application is approved, the commissioner shall promptly cause a certificate of affordable housing project completion to be published in the Connecticut Law Journal. If the commissioner fails to either approve or reject the application within such ninety-day period, such application shall be deemed provisionally approved, and the municipality may cause notice of such provisional approval to be published in a conspicuous manner in a daily newspaper having general circulation in the municipality, in which case, such moratorium shall take effect upon such publication. The municipality shall send a copy of such notice to the commissioner. Such provisional approval shall remain in effect unless the commissioner subsequently acts upon and rejects the application, in which case the moratorium shall terminate upon notice to the municipality by the commissioner.

(5) For purposes of this subsection, “elderly units” are dwelling units whose occupancy is restricted by age and “family units” are dwelling units whose occupancy is not restricted by age.

(6) For purposes of this subsection, housing unit-equivalent points shall be determined by the commissioner as follows: (A) No points shall be awarded for a unit unless its occupancy is restricted to persons and families whose income is equal to or less than eighty per cent of median income, except that unrestricted units in a set-aside development shall be awarded one-fourth point each. (B) Family units restricted to persons and families whose income is equal to or less than eighty per cent of median income shall be awarded one point if an ownership unit and one and one-half points if a rental

unit. (C) Family units restricted to persons and families whose income is equal to or less than sixty per cent of median income shall be awarded one and one-half points if an ownership unit and two points if a rental unit. (D) Family units restricted to persons and families whose income is equal to or less than forty per cent of median income shall be awarded two points if an ownership unit and two and one-half points if a rental unit. (E) Elderly units restricted to persons and families whose income is equal to or less than eighty per cent of median income shall be awarded one-half point. (F) A set-aside development containing family units which are rental units shall be awarded additional points equal to twenty-two per cent of the total points awarded to such development, provided the application for such development was filed with the commission prior to July 6, 1995.

(7) Points shall be awarded only for dwelling units which were (A) newly-constructed units in an affordable housing development, as that term was defined at the time of the affordable housing application, for which a certificate of occupancy was issued after July 1, 1990, or (B) newly subjected after July 1, 1990, to deeds containing covenants or restrictions which require that, for at least the duration required by subsection (a) of this section for set-aside developments on the date when such covenants or restrictions took effect, such dwelling units shall be sold or rented at, or below, prices which will preserve the units as affordable housing for persons or families whose income does not exceed eighty per cent of median income.

(8) Points shall be subtracted, applying the formula in subdivision (6) of this subsection, for any affordable dwelling unit which, on or after July 1, 1990, was affected by any action taken by a municipality which caused such dwelling unit to cease being counted as an affordable dwelling unit.

(9) A newly-constructed unit shall be counted toward a moratorium when it receives a certificate of occupancy. A newly-restricted unit shall be counted toward a moratorium when its deed restriction takes effect.

(10) The affordable housing appeals procedure shall be applicable to affordable housing applications filed with a commission after a three-year moratorium expires, except (A) as otherwise provided in subsection (k) of this section, or (B) when sufficient unit-equivalent points have been created within the municipality during one moratorium to qualify for a subsequent moratorium.

(11) The commissioner shall, within available appropriations, adopt regulations in accordance with chapter 54 to carry out the purposes of this subsection. Such regulations shall specify the procedure to be followed by a municipality to obtain a moratorium, and shall include the manner in which a municipality is to document the units to be counted toward a moratorium. A municipality may apply for a moratorium in accordance with the provisions of this subsection prior to, as well as after, such regulations are adopted.

(m) The commissioner shall, pursuant to regulations adopted in accordance with the provisions of chapter 54, promulgate model deed restrictions which satisfy the requirements of this section. A municipality may waive any fee which would otherwise be required for the filing of any long-term affordability deed restriction on the land records.

(P.A. 88-230, S. 1, 12; 89-311, S. 1, 4; P.A. 90-98, S. 1, 2; P.A. 93-142, S. 4, 7, 8; P.A. 95-250, S. 1; 95-280, S. 1, 3; P.A. 96-211, S. 1, 5, 6; June Sp. Sess. P.A. 98-1, S. 84; P.A. 99-261, S. 1–3; P.A. 00-206, S. 1; P.A. 02-87, S. 1, 3, 4; P.A. 05-191, S. 2; P.A. 10-32, S. 18; June 12 Sp. Sess. P.A. 12-2, S. 46; P.A. 13-234, S. 11, 150.)

History: P.A. 89-311 effective July 1, 1990 (Revisor's note: P.A. 88-230 authorized substitution of "judicial district of Hartford" for "judicial district of Hartford-New Britain" in all 1989 public and special acts, effective September 1, 1991); P.A. 90-98 changed the effective date of P.A. 88-230 from September 1, 1991, to September 1, 1993; P.A. 93-142 changed the effective date of P.A. 88-230 from September 1, 1993, to September 1, 1996, effective June 14, 1993; P.A. 95-250 and P.A. 96-211 replaced Commissioner and Department of Housing with Commissioner and Department of Economic and Community Development; P.A. 95-280 amended Subsec. (a) to revise the definition of "affordable housing development" to require 25% of units rather than 20% be affordable for 30 rather than 20 years and to add provision that income of eligible persons or families may be 80% of the state median income; amended Subsec. (b) to change appeal to the judicial district where the real property is located instead of the Hartford-New Britain district and amended Subsec. (c) to add provision placing burden of proof on the commission to show that the application would locate affordable housing in an industrial area not zoned for housing and that development is not assisted housing and made technical changes, effective July 6, 1995, and applicable to affordable housing applications pending on that date for which the commission has not rendered a decision; June Sp. Sess. P.A. 98-1 amended Subsec. (a) by making a technical change; P.A. 99-261 amended Subsec. (a) by adding that for at least 30 years after the initial occupation of the proposed development the dwelling units shall be sold or rented at, or below, prices which will preserve the units as affordable housing, and by adding the requirement that 10% of the deed-restricted units be set aside for families at or below 60% of the area median income, effective June 29, 1999, and amended Subsec. (b) by adding further specification as to where all appeals, including pretrial motions, shall be heard (Revisor's note: In codifying Subsec. (a) the Revisors editorially deleted the designator "(i)" from the phrase "... of the proposed development, (i) such dwellings ..." to reflect the deletion of "(ii)" by floor amendment to sHB 6834); P.A. 00-206 amended Subsec. (a) to redefine "affordable housing development" and to add definitions in Subdivs. (6) to (8), inserted new Subsecs. (b) to (e), inclusive, re affordability plan, conceptual site plan, maximum monthly housing cost and maximum percentage-of-income-for-housing requirement, respectively, relettered former Subsecs. (b) to (e) as Subsecs. (f) to (i), amended Subsec. (g) re commission's burden of proof, amended Subsec. (h) to add language re commission procedures to deal with modifications to applications and increase from 45 to 65 days the time period within which the commission must act, added new Subsec. (j) re powers and remedies of commission under this chapter, relettering former Subsec. (f) as (k) and adding requirement that commissioner use the most recent U.S. census, deleted former Subsec. (g) re certificate of affordable housing project completion and added Subsec. (l) re moratorium; P.A. 02-87 amended Subsec. (k) by adding "binding recorded" in Subdiv. (3), adding Subdiv. (4) re mobile manufactured homes and accessory apartments, defining "accessory apartment" and making technical changes, amended Subsec. (l)(1) to extend moratorium period from 3 years to 4 years and add provision re extension of moratorium in effect and added Subsec. (m) re model deed restrictions; P.A. 05-191 amended Subsec. (k) by requiring municipalities meeting criteria to be listed in report submitted under Sec. 32-1m instead of in regulations, and eliminating authority for regulations and requirement re denominator to be used in determining percentage required by subsection; P.A. 10-32 made technical changes in Subsecs. (f), (h) and (i), effective May 10, 2010; June 12 Sp. Sess. P.A. 12-2 made technical changes in Subsecs. (f) and (g); P.A. 13-234 amended Subsec. (a)(8) by redefining "commissioner" and amended Subsec. (k) by replacing reference to Sec. 32-1m with reference to Sec. 8-37qqq re report, effective July 1, 2013.

Court held that legislature intended statute's appeals procedure to apply to defendant's legislative decision to grant or deny a zone change in connection with an affordable housing proposal. 228 C. 498. Cited. 232 C. 122. Denial by planning commission of master plan for affordable housing development does not invalidate appeal of decision by zoning commission denying proposed changes

to zoning regulations and map because viability of such changes not dependent on viability of such master plan. 271 C. 1. Denial of sewer application by water pollution control authority is valid reason for denial of subdivision application for affordable housing development by the planning commission and commission has no authority to approve subdivision application on condition sewer application is approved. Id., 41.

The narrow rigorous standard of section dictates that commission cannot deny an application on broad grounds such as noncompliance with zoning. 37 CA 303. Cited. Id., 788. Court construed language of section to apply to every type of application filed with a commission in connection with an affordable housing project whether application is submitted to change zoning at a particular site or to build affordable housing on land previously zoned for that purpose. 42 CA 94. Burden of proof on commission to show by specific evidence that denial was necessary to protect substantial public interests in health and safety or that public interests clearly outweighed need for affordable housing. 59 CA 608. Statute requires applicant in an affordable housing appeal to prove that he or she is aggrieved pursuant to Sec. 8-8(b). 66 CA 631.

Subsec. (a):

Plaintiff's floating zone creation application and its accompanying single page conceptual site plan failed to satisfy definitional requirement to be considered an "affordable housing development" because it failed to demonstrate that it received or should be receiving financial assistance under any governmental program for its development and, in the alternative, the conceptual site plan also did not indicate an intention to restrict the deed language in accordance with the definitional language in section. 142 CA 300.

Subsec. (f) (former Subsec. (b)):

Statute provides no right of direct appeal to Appellate Court from a final judgment of Superior Court and, as in other zoning cases, such an appeal requires certification by Appellate Court as required in Sec. 8-8(o). 245 C. 257.

To have statutory standing to bring an affordable housing appeal under Subsec., plaintiff was required to establish that defendant's approval of plan with modifications created a substantial adverse impact either on the viability of the planned affordable housing development or on the degree of affordability of the planned units. 139 CA 256.

Subsec. (g) (former Subsec. (c)):

When a town renders a decision, it shall identify those specific public interests that it seeks to protect by the decision; Subparas. (B), (C) and (D) of Subdiv. (1) require the same defendant's burden as Subpara. (A), namely, to establish that decision and reasons cited therein are supported by sufficient evidence in the record; court's function in an appeal is to apply the scope of judicial review as expressed in Subparas. (A), (B), (C) and (D) to the pertinent determinations made by zoning commission; Subpara. (A) states the general scope of review, drawn from traditional zoning principles, that applies to Subparas. (B), (C) and (D); each of the Subparas. in Subdiv. (1) embodies the "sufficient evidence" standard; judicial review must be based on the zoning record returned to the court, not on the basis of a trial de novo; need for affordable housing is determined by the need for such housing in the local community, not by regional or statewide housing needs. 249 C. 566. Legislature intended that commission bear burden of proving that the public interest cannot be protected by reasonable changes to applicant's proposed development and such burden is not

inconsistent with Sec. 22a-19. 256 C. 674. Statute requires board to make a collective statement of its reasons on the record when it denies an affordable housing land use application, including a denial based on the industrial zone exemption. 259 C. 675. Application of legal standards set forth in Subsec. is mixed question of law and fact subject to plenary review by court and the court is not limited to review of commission decision to determine if supported by sufficient evidence. 271 C. 1. Trial court's remand order to defendant zoning commission was not an appealable final judgment in a matter where remand order required commission to conduct further evidentiary proceedings and thereafter commission retained discretion to grant or deny plaintiff's application. 284 C. 124.

The goals of affordable housing can be satisfied by conditional approvals; since a conditional approval can protect against the risk of harm to the public interests, it was proper for the trial court to order commission to grant plaintiff's amended application on condition that plaintiff obtain approval from the water pollution authority, even if there was no evidence that the other agency would act favorably. 124 CA 379. Court has power to correct application defects arising from noncompliance with statutory requirements, and is not limited to defects re municipal regulations. 125 CA 665. In reviewing affordable housing appeal, court must determine whether the record establishes that there is more than a mere theoretical possibility, but not necessarily a likelihood, of a specific harm to the public interest if the application is granted; reasons cited by zoning commission for denial of affordable housing application not supported by sufficient evidence of a quantifiable probability that a specific harm would result if application were granted. 130 CA 36.

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Sec. 8-30h. Annual certification of continuing compliance with affordability requirements. Noncompliance. On and after January 1, 1996, the developer, owner or manager of an affordable housing development, developed pursuant to subparagraph (B) of subdivision (1) of subsection (a) of section 8-30g, that includes rental units shall provide annual certification to the commission that the development continues to be in compliance with the covenants and deed restrictions required under said section. If the development does not comply with such covenants and deed restrictions, the developer, owner or manager shall rent the next available units to persons and families whose incomes satisfy the requirements of the covenants and deed restrictions until the development is in compliance. The commission may inspect the income statements of the tenants of the restricted units upon which the developer, owner or manager bases the certification. Such tenant statements shall be confidential and shall not be deemed public records for the purposes of the Freedom of Information Act, as defined in section 1-200.

(P.A. 95-280, S. 2, 3; P.A. 97-47, S. 16.)

History: P.A. 95-280 effective July 6, 1995; P.A. 97-47 substituted reference to the Freedom of Information Act for list of sections.

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Sec. 8-30i. Sales price of certain housing subject to affordable housing deed restriction or limitation of bylaws of condominium unit owners' association. Notwithstanding any provision of the general statutes or the bylaws of a condominium unit owners' association, adopted under section 47-80, or any affordable housing deed restriction limiting the sales price of housing subject to such provisions

or restrictions, an owner who purchased such housing on or after July 1, 2004, but before July 15, 2004, for an amount exceeding the amount specified in every such provision or restriction may sell such housing for an amount not exceeding the amount such owner paid to purchase the housing.

(P.A. 08-173, S. 2.)

History: P.A. 08-173 effective June 12, 2008.

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Town of Mansfield

Department of Planning and Development

Date:	December 30, 2015
To:	Planning and Zoning Commission
From:	Linda M. Painter, AICP, Director of Planning and Development
Subject:	Colonial Townhouse North Side of Foster Drive, West of Storrs Road Stormwater and Landscape Management Plans File #1327

On July 21, 2014, the Commission approved a special permit authorizing the addition of 31 dwelling units to Colonial Townhouse Apartments. Due to the location of the property within an area of stratified drift aquifer, the applicant was required to submit stormwater and landscape management plans for the Commission's review and approval pursuant to Article Six, Section B.4.m.5 and B.4.m.6 of the Mansfield Zoning Regulations.

Specifically, the regulations require the following:

5. All commercial, industrial or multi-family developments and other land uses with cumulatively more than ½ acre of impervious surface shall incorporate best management practices for storm water controls in accordance with State Department of Environmental Protection Best Management Guidelines, and shall prohibit or restrict the use of salts and chemicals for ice removal in order to minimize the risks of groundwater contamination. A storm water management plan detailing the proposed provisions shall be submitted for Commission approval.

6. All land uses involving the maintenance of lawns, fields and landscaped areas shall incorporate landscape management plans regarding the use of fertilizers, pesticides and other organic or chemical applications to minimize the risks of groundwater contamination. A landscape management plan detailing proposed provisions shall be submitted for Commission approval.

In response to the above requirements and the condition of approval of their Special Permit, the applicant has submitted the attached stormwater management (titled Best Management Practices) and landscape management plans for the Commission's approval.

If the Commission concurs that the plans fulfill the requirements as noted, the following motion would be in order:

_____ MOVES, _____ seconds to approve the stormwater and landscape management plans for the Colonial Townhouse project.

Best Management Practices

The following best management practices (BMP) will be the responsibility of the owner and will be implemented to protect the environmental surroundings of the site.

The catch basins will be inspected at least twice per year and cleaned as needed to remove trapped sediment and litter.

The paved areas will be swept at appropriate intervals to remove debris and road sand applied during the winter months.

Deicing practices and material storage will emphasize a minimum use of salt and stormwater runoff to sensitive receptors.

In order to protect the physical, chemical and biological characteristics of the wetlands and watercourses and water quality.

> Pesticides and herbicides shall only be applied utilizing best management practices for integrated pest management.

Installation of soil erosion and sedimentation control and stabilization measures shall be the owner's responsibility. It shall be the owner's responsibility to inspect these control measures during, and immediately following, substantial storm events and maintain and/or replace the control measures, when needed, on a regular basis until the site is vegetatively stabilized. Hay bales shall be replaced every 60 days. The town is hereby authorized to require additional soil erosion and sediment controls and stabilization measures to address situations that arise on the site.

Metal waste containers shall be provided at the site to facilitate the collection of refuse material generated from construction activities. Such material shall not be buried or burned at the site.

Landscape Management Plan

This landscape management plan was developed as required in Article VI, Section B.4m.6 of the Mansfield Zoning Regulations.

This landscape management plan was based on resources provided by the United States Environmental Protection Agency and the Connecticut Department of Environmental Protection.

Fertilizers will be used sparingly and only if absolutely needed. If fertilizers are required they will be natural organic and slow release products. These help to reduce nutrient runoff and leaching. To further prevent runoff, fertilizers will be placed only on soil and away from pavement.

The lawn will be maintained at a height between two and three inches. During periods of rapid growth the lawn will be mowed more frequently so that no more than one third of the height of the grass is cut. This will minimize the amount of grass clippings. To encourage a healthy lawn the grass clippings will be left during mowing. Organisms in the soil utilize the clippings, which then provides fertilization to the lawn.

The landscaped areas and lawn will be watered as required initially during establishment and then decreased to appropriate levels for maintenance. Watering will be done in the early mornings as this allows the most efficient use of water.

Integrated Pest Management techniques will be used to reduce the need for pesticides. These techniques involve methods to manage pests systematically through the use of non-chemical pest management methods and the judicious use of pesticides when there are unacceptable levels of pest population. In cases where pesticide application is necessary the least toxic pesticide possible is the first choice. The Connecticut Department of Environmental Protection has found that using Integrated Pest Management techniques can significantly reduce the volume and toxicity of necessary pesticides. Prevention is a fundamental principle of integrated pest management. Maintaining healthy soils, selecting pes-resistant plants and selecting their proper location, removing dead or diseased plants, pulling weeds and allowing taller grass all work together to prevent problems. If a problem arises, the specific disease, bug or weed will be identified so that the correction can be targeted specifically to the problem.

Trees and shrubs will be maintained based on their individual needs. At the time of planting the shrubs and trees will be pruned as needed to compensate for loss of roots. For long term maintenance pruning will be done during the appropriate season for the species.

Town of Mansfield

Department of Planning and Development

Date: December 30, 2015

To: Planning and Zoning Commission

From: Linda M. Painter, AICP, Director of Planning and Development

Subject: Director's Report

If there are any other items or questions, I will address them at the January 4th meeting.

Agricultural and Open Space Preservation

- *Open Space Acquisition* – The Town Council voted on December 14, 2015 to acquire the 61 acre parcel off of Puddin Lane.

Infrastructure and Transportation

- *Northeast Corridor Tier 1 Draft Environmental Impact Statement.* The Federal Rail Administration has issued a draft EIS for NEC FUTURE, a comprehensive plan for improvements to the Northeast Corridor (NEC) rail line from Washington D.C. to Boston, MA. According to the FRA, "The plan will define a long-term vision and incremental approach for improving passenger rail service." A copy of the plan and a list of public hearing dates and locations can be found on www.necfuture.com and a hard copy is available at the Mansfield Public Library.

  A copy of the highlights brochure and draft EIS summary are attached to this memo for your review and information as Alternatives 2 and 3 include a potential new rail segment connecting Hartford and Providence through Mansfield. I will prepare a more detailed memo for the January 19th meeting. Comments on the draft EIS are due by January 30, 2016. A public hearing, including a brief presentation on the project, is scheduled for January 13, 2016 from 4 pm to 7 pm at the Lyceum, 227 Lawrence Street in Hartford.

- *Comprehensive Transit Service Analysis.* CRCOG is hosting public meetings to obtain public input on potential transit service improvements as part of a Comprehensive Transit Service Analysis for the region. See attached press release for more information.

Economic Development

- *Windham Arts.* Mary Oliver, the Program Coordinator for Windham Arts, will be making a presentation to the Economic Development Commission at their January 28th meeting at 5:30 p.m.

A Rail Investment Plan for the Northeast Corridor

Our Future on Track

HIGHLIGHTS OF THE TIER 1 DRAFT ENVIRONMENTAL IMPACT STATEMENT

NEC FUTURE

NOVEMBER 2015

U.S. Department of Transportation
Federal Railroad Administration

457
MILES LONG

2,200
DAILY TRAINS

750,000
DAILY PASSENGERS

THE NEC IS THE BUSIEST RAIL CORRIDOR IN THE NATION, AND IS VITAL TO THE ECONOMY AND CITIES OF THE NORTHEAST.

Why NEC FUTURE?

The Northeast United States—stretching from Washington, D.C., to New England—is a dominant force in the national economy with its vast job base, highly educated and diverse workforce, strong and stable communities, vibrant cities, quality educational institutions, and rich history and culture. The continued economic competitiveness of the Northeast depends on a transportation system that supports the region's growing needs. And yet today, the region's transportation system—its highways, airports, maritime ports, and rail networks—is already operating at or above capacity. By 2040, the Northeast is expected to add seven million new residents, putting further pressure on all travel modes. Stronger, more reliable transportation options are essential to support mobility and the region's continued economic growth.

The Northeast Corridor (NEC) passenger rail line—a central transportation spine of the entire region—is critical to regional mobility. However, the NEC today operates on outdated infrastructure with capacity constraints that cannot accommodate future growth. Determining how these needs will be met, and defining the role that the NEC will play in the overall transportation system is the focus of NEC FUTURE.

NEC FUTURE: ADDRESSING CRITICAL NEEDS

The Federal Railroad Administration (FRA) is preparing a comprehensive plan for the NEC that will define a long-term vision and an incremental approach to achieving that vision. The plan considers the needs of all types of passengers on the NEC—commuters as well as intercity riders. The result of NEC FUTURE will be the FRA's adoption of an investment program to guide passenger rail improvement projects on the NEC through 2040.

The FRA is preparing a Tier 1 Environmental Impact Statement (Tier 1 EIS), in compliance with the National Environmental Policy Act and other regulations, to evaluate the effects of proposed investment program alternatives. This document provides highlights of the Tier 1 Draft EIS, which will be available for public comment through January 30, 2016. The full document, as well as the accompanying Draft Programmatic Agreement, prepared in compliance with the National Historic Preservation Act, are available at www.necfuture.com and at libraries along the NEC.

Study Partners

The FRA is the lead agency for NEC FUTURE, working closely with a number of key partners including:

- Federal Transit Administration
- NEC Infrastructure and Operations Advisory Commission
- Railroad operators (including Amtrak, eight commuter rail authorities, and freight railroads)
- State and federal agencies, as well as local jurisdictions along the NEC

The FRA coordinates regularly with environmental resource and regulatory agencies, and consults with federally recognized tribes.

Key Needs

- Aging Infrastructure
- Connectivity
- Capacity
- Performance
- Resiliency
- Sustainability
- Economic Growth

How will the FRA select a vision for the NEC?

The FRA will identify a preferred investment program (Preferred Alternative) based on the analysis presented in the Tier 1 Draft EIS, FRA policy guidance, and comments received from all stakeholders—agencies, railroad operators, interested organizations, and the public—by January 30, 2016. Your comments on the alternatives, and the analysis presented in the Tier 1 Draft EIS, are critical to the decision-making process. For information on how to participate in this historic decision, see the end of this brochure.

Choices for the NEC

The FRA has identified three distinct Action Alternatives for the NEC, each of which presents a different vision for the future role of passenger rail in the transportation system of the Northeast. In developing these Action Alternatives, the FRA considered a broad range of possibilities for the NEC to respond to future travel market trends, passenger service needs, and public input. The Tier 1 Draft EIS compares each Action Alternative to a baseline, the No Action Alternative.

Alternative 1 MAINTAINS the role of rail with sufficient additional service to keep pace with population and employment growth.

Alternative 2 GROWS the role of rail with service to new markets and accommodates a greater portion of the population.

Alternative 3 TRANSFORMS the role of rail by becoming a dominant mode choice for travel in the Northeast.

Enhanced Service Concepts

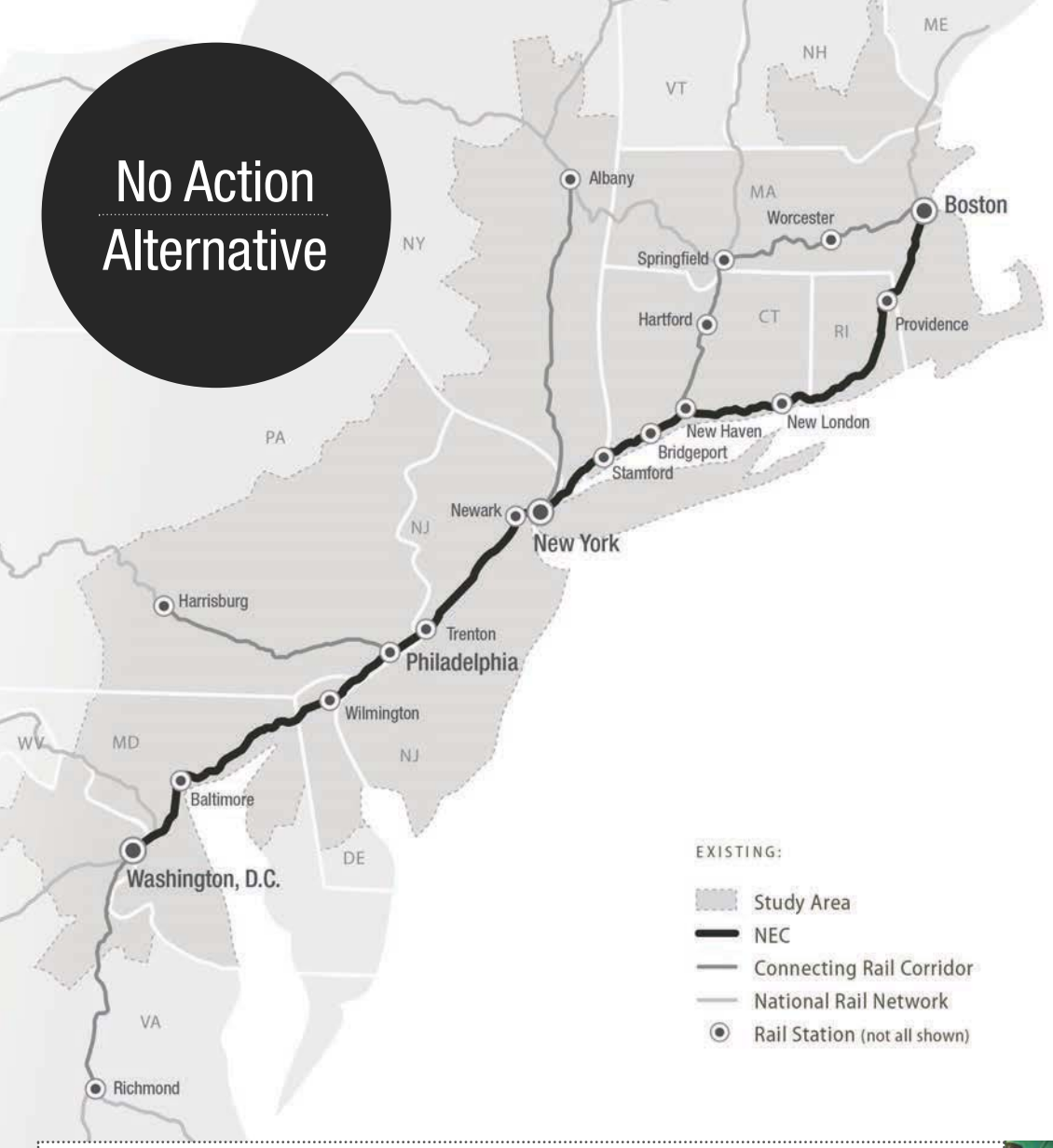
Each of the Action Alternatives includes enhanced service concepts to improve the passenger experience and increase efficiency. These concepts include a new type of Intercity service that stops at more stations, high-performance equipment, coordinated scheduling and ticketing, and easier transfers.

WHAT'S INCLUDED IN AN ACTION ALTERNATIVE?

The investment program for each Action Alternative consists of a set of geographic markets to be served by passenger rail; a Representative Route (or footprint) that connects these markets; assumptions about the level of passenger rail service that will be provided to these markets; and infrastructure improvements that support this level-of-service. In addition, each of the three Action Alternatives:

- ✓ Maintains and improves passenger rail service on the existing NEC
- ✓ Incorporates innovative approaches to improve the passenger experience and increase efficiency.
- ✓ Brings the NEC to a state of good repair
- ✓ Addresses the most pressing chokepoints that limit the railroad's capacity and undermine reliability
- ✓ Protects freight rail access and the opportunity for future expansion

No Action Alternative



No Action Alternative

WHAT DOES IT MEAN FOR THE FUTURE OF THE NEC?

The No Action Alternative is the baseline against which the FRA compared each of the Action Alternatives. It includes projects currently planned and programmed, and repairs to keep the railroad operating, but only at today's level-of-service.

Except for planned improvements, such as the Long Island Rail Road's East Side Access project, the No Action Alternative:

- Does not increase capacity to meet unmet demand or accommodate growth
- Does not improve reliability
- Does not address gaps in connectivity
- Does not expand service to new markets
- Does not bring the NEC into a state of good repair

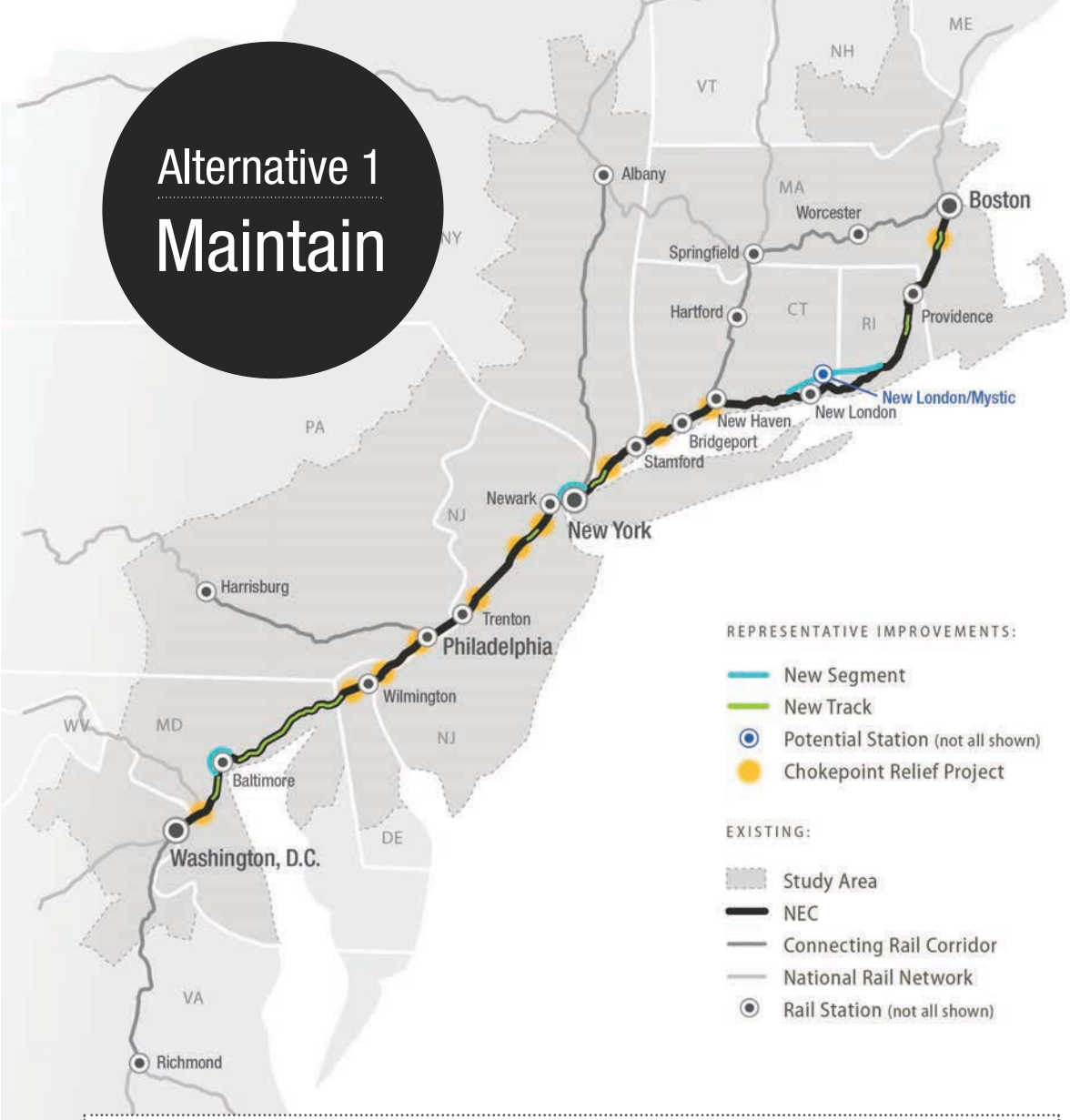
With its continued reliance on constrained and aging infrastructure, the No Action Alternative means a declining role for rail in the Northeast transportation system. Moreover, with minimal new investment in capacity or reliability, the No Action Alternative provides limited ability for the NEC to recover from major storms and other disruptive events, and hinders freight movement.

The No Action Alternative requires investment in the NEC by the federal government, states, and railroads that exceeds historical levels of funding. If sufficient funding to meet even the minimum requirements of the No Action Alternative is not available, the reliability and quality of service on the NEC would be further degraded, driven in large part by insufficient capacity and aging infrastructure.

The No Action Alternative cannot accommodate the full volume of passengers who will want to travel by rail. The tightest constraint is at the Hudson River, where demand will exceed capacity by over 6,000 passengers per hour in 2040.

Alternative 1

Maintain



Alternative 1 maintains the role of rail as it is today, with significant increases in the level of rail service as required to keep pace with the growth in population. It enables the NEC to continue to support the transportation needs of the growing region through 2040, but provides little additional capacity to support growth after 2040.

Alternative 1 Benefits

{ as compared to the No Action Alternative }

AGING INFRASTRUCTURE

- Brings the existing NEC to a state of good repair

CONNECTIVITY

- Improves connections between metropolitan areas with more frequent intercity service

CAPACITY

- Provides sufficient capacity to accommodate demand at all places along the corridor (except at the Hudson River) through 2040, but lacks sufficient additional capacity to support growth in demand after 2040
- Increases capacity for through-trips on connecting corridor services south of Washington, D.C., and along the Keystone, Empire, and New Haven-Hartford-Springfield Corridors

PERFORMANCE

- Increases Intercity and peak-hour Regional rail (commuter) service
- Top Intercity-Express operating speeds of 160 mph on portions of the corridor
- Travel time between Washington, D.C. and Boston reduced by up to 35 minutes
- New service types with a range of pricing to attract more passengers

RESILIENCY

- New segment between Old Saybrook, CT, and Kenyon, RI, provides resiliency, avoiding movable bridges and waterways along the Long Island Sound and providing an alternative to portions of the existing NEC adjacent to the Connecticut shoreline

SUSTAINABILITY

- Net decrease in emissions of pollutants and greenhouse gases and reduction in roadway vehicle miles traveled
- Shifts 69 million annual trips from other modes to passenger rail

ECONOMIC GROWTH

- Improves access to jobs within and between metropolitan areas for existing stations; generates some travel time savings for intercity travel

Alternative 2

Grow

Alternative 2 grows the role of rail, expanding rail service at a rate greater than the proportional growth in regional population and employment. It adds service to new markets in New England and provides modest capacity to support growth beyond 2040.

Alternative 2 Benefits

{ as compared to the No Action Alternative }

AGING INFRASTRUCTURE

- Brings the existing NEC to a state of good repair

CONNECTIVITY

- Connects new travel markets in the Connecticut River Valley
- Provides Intercity service to T.F. Green Airport in Providence, RI, and Philadelphia International Airport
- Improves interregional connections by introducing Intercity service at select rail stations

CAPACITY

- Provides sufficient capacity to accommodate demand at the Hudson River and provides room for growth at other locations post-2040
- Addresses capacity and speed constraints with a new route adjacent to the NEC between New Haven and Hartford, CT, and Providence, RI; this supplements existing service between New York City and Boston and connects new travel markets
- Increases capacity for through trips on connecting corridor services south of Washington, D.C., and along the Keystone, Empire, and New-Haven-Hartford-Springfield Corridors

PERFORMANCE

- Provides five times as much Intercity service and more than doubles peak-hour Regional rail service
- Top Intercity-Express operating speeds of 160 mph on the majority of the corridor
- Travel time between Washington, D.C. and Boston reduced by up to 1 hour 5 minutes

RESILIENCY

- New inland route through Connecticut and Rhode Island provides an alternate route if coastal inundation or other hazards affect services along the coastline

SUSTAINABILITY

- Net decrease in emissions of pollutants and greenhouse gases and reductions in roadway vehicle miles traveled
- Shifts 93 million annual trips from other modes to passenger rail

ECONOMIC GROWTH

- Improves access to jobs within and between metropolitan areas for existing and new stations with increased service frequency, service types, and improved travel times
- Provides improved access between metropolitan areas and commercial centers such as Wilmington, DE, and Hartford, CT
- Creates opportunities for economic and station area development

Alternative 3
Transform

Alternative 3 transforms the role of rail. Along with improvements to the existing NEC, a second spine from Washington, D.C., to Boston supports faster trips and serves markets not currently well connected by passenger rail. Rail becomes the dominant mode of travel in the Northeast, with the capacity to support the regional economy well into the future.

Alternative 3 Benefits

{ as compared to the No Action Alternative }

AGING INFRASTRUCTURE

- Brings the existing NEC to a state of good repair

CONNECTIVITY

- Connects new travel markets throughout the NEC with the addition of a second spine and new stations
- Provides Intercity service to T.F. Green Airport in Providence, RI, and Philadelphia International Airport
- Improves interregional connections by introducing Intercity service at select rail stations on the existing NEC

CAPACITY

- Provides excess capacity at all locations along the corridor to accommodate additional off-corridor trips and future growth post-2040

PERFORMANCE

- Provides six times as much Intercity service and up to three times the amount of peak-hour Regional rail service
- Top Intercity-Express operating speeds of 220 mph on the second spine
- Travel time between Washington, D.C. and Boston reduced by up to 2 hours 55 minutes

RESILIENCY

- Inland route options through either Long Island or Connecticut, and Massachusetts assist in reducing service disruptions should a coastal flooding event affect assets along coastal Connecticut and Rhode Island

SUSTAINABILITY

- Net decrease in emissions of pollutants and greenhouse gases and reductions in roadway vehicle miles traveled
- Shifts 141 million annual trips from other modes to passenger rail

ECONOMIC GROWTH

- Improves access to jobs within and between metropolitan areas for existing and new stations with increased service frequency, service types, and improved travel times
- Creates opportunities for economic and station area development with more connections within and between metropolitan areas both along the existing NEC and to markets served with a second spine
- Provides passenger rail network coverage and capacity to support population and employment growth beyond 2040

Evaluating the Alternatives

The Tier 1 Draft EIS presents a detailed evaluation of the No Action and Action Alternatives for NEC FUTURE, including their effects on transportation, the economy, the built and natural environment, as well as projected ridership, capital and operating costs, construction requirements, and phasing.

The range of benefits and effects varies by Action Alternative, based on the service and infrastructure proposed. Examples of the findings are shown on this page.

EFFECTS ON THE BUILT AND NATURAL ENVIRONMENT

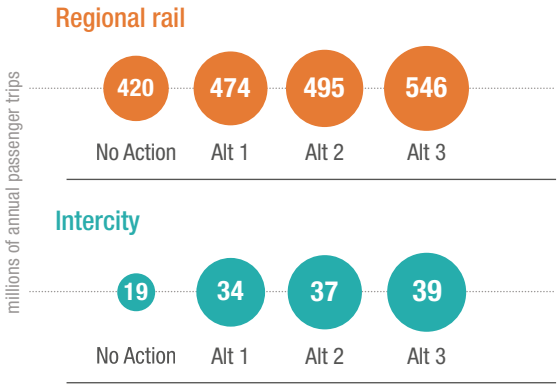
Alternative 1: Environmental impacts occur with the addition of two segments in Connecticut and Rhode Island outside of the existing NEC right-of-way, including impacts on land cover, water resources, ecological resources, prime farmlands, and prime timberlands.

Alternative 2: Environmental impacts primarily occur with the addition of a new segment between New Haven and Providence, via Hartford. Much of this area is less developed and key considerations are the effects of acquisitions and displacements in noted environmental justice communities, and impacts on prime timberlands and floodplains.

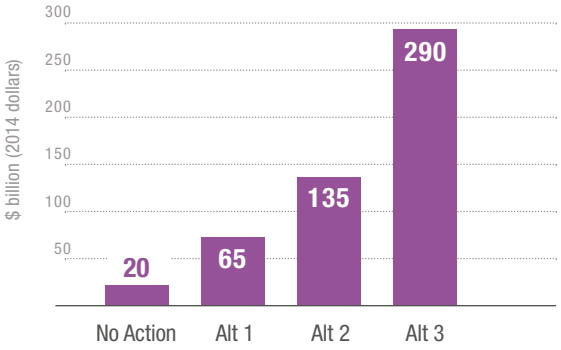
Alternative 3: Impacts to the built and natural environment occur along the entire length of the additional spine between Washington, D.C., and Boston, MA. A range of effects occur north of New York City, due to variations in routing; impacts include conversion of undeveloped land, acquisition of developed land, impacts on water and ecological resources, and conversion of prime farmland and timberlands.

More-detailed environmental reviews at the Tier 2 (project) level will be needed to identify specific community and resource impacts and benefits, seek public and agency input, and identify mitigation measures, if necessary.

RIDERSHIP



LEVEL OF INVESTMENT*



*Estimates are intended to be representative of the relative levels of investment that could be required and are for comparative purposes.

The Benefits of Action

For Passengers

+ More frequent, reliable service – often with shorter travel times – and far fewer delays
+ Ability to reach many more destinations conveniently by rail
+ Greater range of ticket price options, allowing more affordable travel
+ Easier travel arrangements across the NEC

For the Region

+ Easier travel and interaction among businesses
+ Economic development of station areas and cities along the NEC
+ Reduction in roadway vehicle miles traveled, energy use, and greenhouse gas emissions
+ World class transportation to power regional growth and mobility for future generations

What's at stake in this decision?

The selection of an investment program for the NEC will have far-reaching effects on transportation in the Northeast. It will help to define how and when the federal government, states, and railroads invest in upgrades to the NEC, with implications for the mix of rail services offered, service frequency, travel times, and stations served. The construction of new infrastructure and the operation of expanded services would create jobs and economic development opportunities, as well as result in impacts to properties and effects on the natural environment. The FRA has analyzed the No Action and Action Alternatives at a Tier 1 (broad) level of detail in order to understand and compare these effects. The analysis is presented in the Tier 1 Draft EIS.

WHAT HAPPENS NEXT?

After considering the analysis presented in the Tier 1 Draft EIS and comments received from the public, agencies, and railroad stakeholders, the FRA will identify a preferred investment program (Preferred Alternative) that provides a framework for future rail improvements on the NEC. The Tier 1 Final EIS will describe and evaluate this Preferred Alternative. The FRA will formally select an alternative (Selected Alternative) in a Record of Decision to complete the Tier 1 environmental review process, and develop a Service Development Plan that defines the process for implementing the Selected Alternative.

The Selected Alternative will be a road map for incremental improvement of the NEC necessary to achieve the selected vision for passenger rail in the NEC. A phasing plan will describe the priorities and proposed approach to implementing the improvements so that benefits throughout the NEC are maximized. As a framework for future rail improvements on the NEC, the Selected Alternative does not require any rail operator to fund or construct new infrastructure, but ensures that future investments by any entity are consistent with the long-term NEC vision and benefits all of its users. Improvements will be carried out as discrete projects that will undergo more detailed planning and environmental analysis.

The selection of an investment program for the NEC will have far-reaching effects on transportation in the Northeast.

Help us make the smartest choice!

NEC FUTURE is a historic opportunity to shape the future of the NEC and help ensure that the Northeast region continues to thrive. The Action Alternatives reflect public and stakeholder input, but the FRA's work is not done. We still need your help and feedback to identify a Preferred Alternative.

WHAT ROLE SHOULD THE NEC PLAY IN THE FUTURE OF THE NORTHEAST?

We hope you will help us make the best choice to keep our future on track. Please review the Tier 1 Draft EIS and submit your comments online, by email, or by letter until January 30, 2016, or attend a public hearing. Details are at the end of this brochure.

REVIEW THE TIER 1 DRAFT EIS

Visit www.necfuture.com; copies are also available at libraries along the NEC.

4 ways you can submit your comment

Comment in person by:
Attending a Public Hearing

Submit a comment online at:
www.necfuture.com

Comment via email:
comment@necfuture.com

Or send comments to:
NEC FUTURE
Rebecca Reyes-Alicea
U.S. DOT Federal Railroad Administration
One Bowling Green, Suite 429
New York, NY 10004

Para información en español, visite: necfuture.com/es

Let us hear from you by January 30, 2016!

PUBLIC HEARING SCHEDULE

Wednesday, December 9	Boston, MA
Monday, December 14	New Haven, CT
Tuesday, December 15	New York, NY
Wednesday, December 16	Washington, DC
Thursday, December 17	Providence, RI
Monday, January 11	Philadelphia, PA
Tuesday, January 12	Mineola, NY
Wednesday, January 13	Hartford, CT
Thursday, January 14	Baltimore, MD
Tuesday, January 19	Newark, NJ
Wednesday, January 20	Wilmington, DE

For locations, visit **www.necfuture.com**.

Each hearing will run from 4-7 p.m., with scheduled presentations at 4:30 p.m. and 6:00 p.m. There will be an opportunity to speak following each presentation; if you plan to speak, please sign up when you arrive. A stenographer will also be available for private testimony, if you prefer. Comment cards will be available at each hearing. In the event of inclement weather, hearings may be canceled or rescheduled; please check the website at **www.necfuture.com**. If you require assistance to attend, please contact the NEC FUTURE team at **comment@necfuture.com** at least five days prior to the hearing you wish to attend.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Thanks for your help in keeping

Our Future on Track

U.S. Department of Transportation
Federal Railroad Administration

necfuture.com

NEC FUTURE

S. Summary

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Figures

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Summary

NEC FUTURE is a comprehensive planning effort to define, evaluate, and prioritize future investments in the Northeast Corridor (NEC) from Washington, D.C., to Boston. The NEC is the rail transportation spine of the Northeast and a key component of the region's transportation system. The NEC supports the operation of eight Regional rail authorities and Amtrak—the Intercity rail service provider—as well as four freight railroads.

The Federal Railroad Administration (FRA) launched NEC FUTURE in 2012 to evaluate improvements to address passenger rail transportation needs within the Study Area shown in Figure S-1. NEC FUTURE will result in a Passenger Rail Corridor Investment Plan (PRCIP) for the NEC that will establish a framework for future investment in the corridor through 2040 and beyond. The PRCIP comprises a Tier 1 Environmental Impact Statement (Tier 1 EIS) and a Service Development Plan (SDP). Together, these documents will provide a long-term vision for the role of passenger rail on the NEC in the regional transportation system and a phased investment plan to accomplish that vision.

The term **"Intercity"** is defined as passenger rail service between metropolitan areas. The term "**interregional"** describes travel flows that start and end in a different metropolitan area. "**Interregional**" and "**Intercity**" may be used interchangeably when referring to markets, passengers, trips, and passenger rail service.

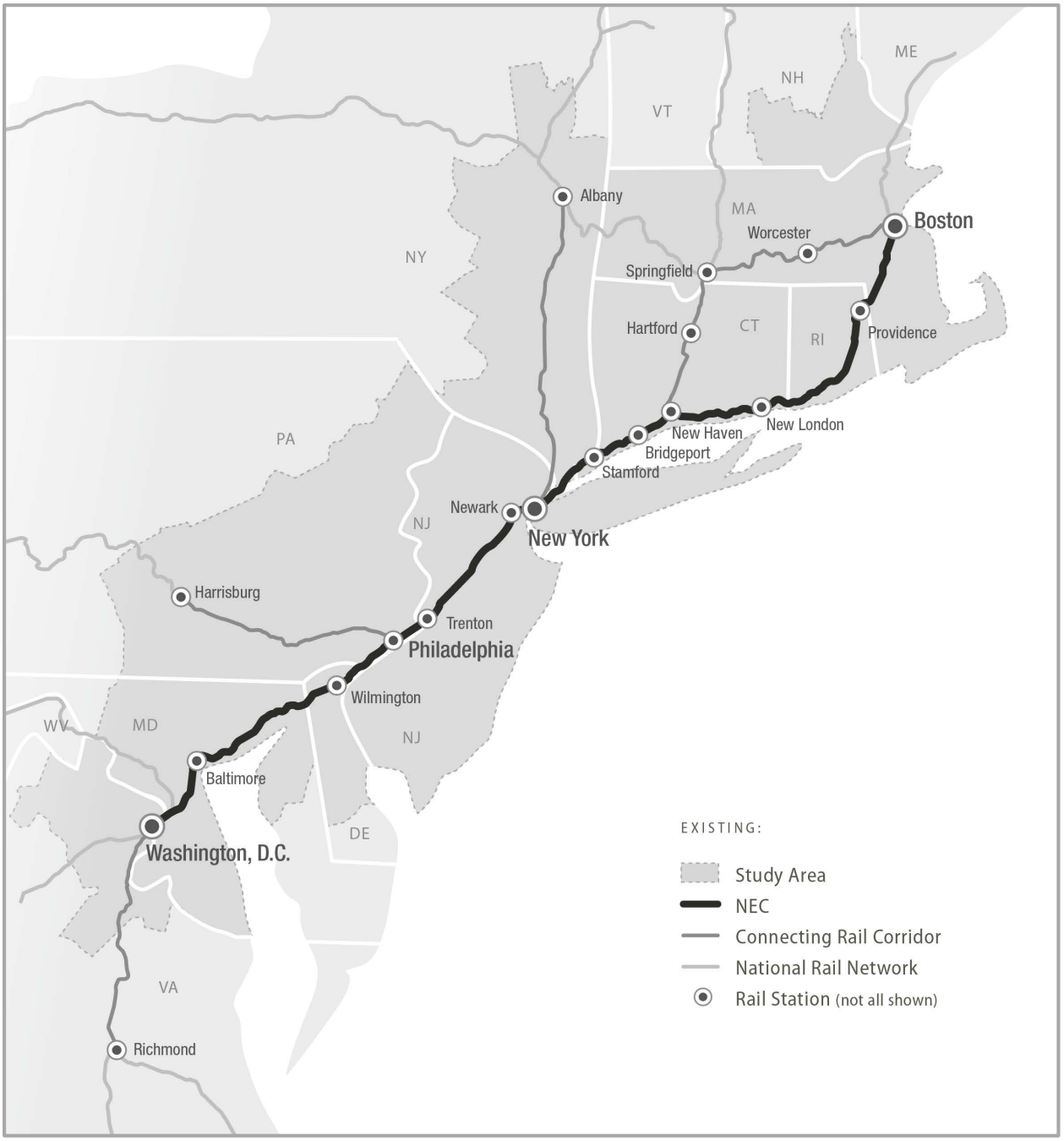
"Regional" describes travel within a metropolitan area. "**Regional rail**" is defined as passenger rail service within the travel shed of a metropolitan area. **"Regional rail**" provides local and commuter-focused service characterized by a high-percentage of regular travelers. Regional rail is a broad term that reflects the expanded role of commuter railroads to also serve metropolitan travel needs throughout the day and beyond the work week.

S.1 TIER 1 DRAFT ENVIRONMENTAL IMPACT STATEMENT

This document is the Tier 1 Draft Environmental Impact Statement (Tier 1 Draft EIS) for the NEC FUTURE program. This Tier 1 Draft EIS was prepared in compliance with the National Environmental Policy Act (42 USC §4332 et seq.) and implementing regulations (40 CFR Parts 1500–1508) (NEPA), and other applicable laws and regulations. It presents the analysis completed by the FRA to assess the potential effects of NEC FUTURE rail investment alternatives on the economy, transportation system, and the human and natural environment within the Study Area. It provides information to inform the public and stakeholders about the findings of the analysis, and to help inform the FRA's decision on a Preferred Alternative for NEC FUTURE. Concurrent with the Tier 1 Draft EIS, the FRA is conducting a review of potential effects on historic properties under Section 106 of the National Historic Preservation Act. (Appendix G presents a Draft Programmatic Agreement under Section 106.)

The term "Tier 1" in the title of this document refers to a "tiered" approach to environmental review. NEPA provides the flexibility to assess projects in a staged approach known as "tiering," which addresses broad programs and issues in an initial (Tier 1) analysis, and analyzes site-specific, project-level (Tier 2) proposals and impacts in subsequent studies. The FRA determined that a Tier 1 EIS was the appropriate level of NEPA documentation for NEC FUTURE.

Figure S-1: Study Area Map



Source: NEC FUTURE, 2015

Both a Tier 1 EIS and project-level (or Tier 2) EIS follow the same process. The major difference is the level of detail and analysis that are presented. For a Tier 1 EIS, since the federal action is broad or programmatic in nature, the information required by decision-makers includes "big picture" constraints and opportunities. In this case, the proposed federal action being evaluated in this Tier 1 Draft EIS is the **adoption of an investment program** to improve passenger rail service within the Study Area. The Action Alternatives that the FRA examined in this Tier 1 Draft EIS represent various levels of investment in passenger rail.

If the FRA adopts an investment program, the projects would be implemented incrementally over the next few decades; the FRA will prepare a phasing and implementation plan in the SDP to be published after the Tier 1 Final EIS and Record of Decision. An example of a Tier 2 project that might take place would be adding a new bridge at an existing river crossing. A Tier 1 EIS identifies the train service a bridge will need to carry, but the specifics of the operations, bridge design, and localized impacts of that bridge are not identified. A subsequent Tier 2 project and NEPA process would focus on the specific design and construction of the bridge crossing and local impacts of that structure.

S.2 CONSIDERATION OF OTHER TRANSPORTATION MODES AND FREIGHT RAIL SERVICE

While NEC FUTURE focuses on passenger rail, it is important to understand the connectivity and interface of rail with other modes in the Northeast transportation network. Travelers within the NEC have multiple transportation options to move through and along it, including air, rail, automobiles, and buses. To better understand the role of rail within this transportation network, the FRA began by examining the role that rail service plays today in the Northeast transportation network and considering what role it could play in the future. These questions are fundamental to how the FRA has developed the rail alternatives being evaluated in this Tier 1 Draft EIS.

While NEC FUTURE is focused on passenger rail services, the investment program will be defined in a way that preserves current and planned service levels for freight railroad operations. Opportunities are also being considered to accommodate improvement of freight rail service within the NEC FUTURE Study Area.

S.3 AGENCY AND PUBLIC INVOLVEMENT

Decisions about the future of the NEC affect a wide range of stakeholders, from today's rail passengers as well as the agencies and operators currently providing services on the NEC, to the residents, travelers, businesses, and communities potentially affected by the outcomes of NEC FUTURE. The FRA has conducted an extensive agency and public involvement process to engage these stakeholders and the public in the decision-making process for NEC FUTURE. This effort began with an agency and public scoping process in 2012 that elicited over 2,000 comments from 800 participants. These comments helped shape the alternatives that have been analyzed and the technical analyses conducted for this Tier 1 Draft EIS.

Rail transportation projects are typically sponsored by a locality, state, or railroad. However, the NEC covers a 457-mile corridor through eight states and Washington, D.C., and is used by multiple railroads that share the NEC's limited infrastructure. The FRA has sponsored NEC FUTURE to provide

a uniform look at the NEC as a whole in order to ensure an integrated and prioritized approach to investments in the NEC that benefits not only all users and operators of the NEC, but that also promotes economic activity and environmental sustainability of the entire Northeast region of the Unites States. The FRA is serving as the lead federal agency for the Tier 1 EIS, working in coordination with other federal and state agencies and stakeholders, including the Federal Transit Administration, which is a Cooperating Agency to the NEPA process, the Northeast Corridor Infrastructure and Advisory Commission (NEC Commission), and the metropolitan planning organizations in the corridor.

The FRA has conducted a variety of public involvement activities, including 18 public meetings, six regional workshops, multiple webinars, direct outreach at 18 rail stations, presentations to interested organizations, and outreach to organizations and local officials representing Environmental Justice populations. Communication tools were developed to support the public outreach and environmental review process, including a comprehensive website, contact database, newsletters, fact sheets, and media outreach, including press advisories and media briefings. The information gained through agency and public engagement was used by the FRA team to better understand stakeholder concerns and to integrate information and ideas provided by the public and stakeholders into the work process.

S.4 NEED FOR NEC FUTURE

Passenger rail services that operate along the NEC rail network are a critical component of the transportation system in the Study Area. By 2040, continued population and employment growth in the Study Area is expected to create increasing demand for travel options across the passenger transportation system—rail, air, auto, transit, and intercity bus. Yet the aging infrastructure and capacity limitations of the NEC already result in congestion and delays for daily commuters and for regional[1] and interregional[2] travelers. Forecast growth in population and employment in the Study Area will put increasing pressures on this already constrained NEC rail network.

The 457-mile NEC and its connecting rail corridors[3] form the most heavily utilized rail network in the United States. The NEC ranks among the busiest rail corridors in the world, moving more than 750,000 passengers every day[4] on 2,200 trains.[5] Freight operators share the NEC with passenger railroads and

[1] Interregional refers to the interregional travel market, and includes trips that start and end in different metropolitan areas (see Chapter 13, Glossary).
[2] Regional refers to the regional travel market, and includes trips that start and end within the same metropolitan area (see Chapter 13, Glossary).
[3] Connecting corridors are those rail corridors that connect directly to a station on the NEC. These include (1) corridor service south of Washington Union Station to markets in Virginia and North Carolina including Lynchburg, Richmond, Newport News, Norfolk, and Charlotte; (2) Keystone (connects Philadelphia 30th Street Station to Harrisburg Station); (3) Empire (connects Penn Station New York to Niagara Falls Station); and (4) New Haven-Hartford-Springfield (connects New Haven Union Station to Springfield Union Station) as described in Chapter 13: Glossary.
[4] Northeast Corridor Infrastructure and Operations Advisory Commission. (February 2014). *State of the Northeast Corridor Region Transportation System.* State of the Northeast Corridor Region Transportation System.
[5] Amtrak. (2014). *NEC Maps & Data: Growing Demand for Rail Services in the Northeast*. Retrieved January 2015, from Amtrak, The Northeast Corridor: http://nec.amtrak.com/content/growing-demand-rail-services-northeast

are responsible for the movement of over 350,000 car loads of freight per year on the NEC.[6] This volume of traffic and diversity of service today operates on an NEC with capacity constraints that require scheduled and real-time trade-offs in frequency, speed, and performance of passenger and freight services. The congestion caused by these capacity constraints limits operations and opportunities to improve or expand passenger rail services. The NEC's aging infrastructure further limits operations and constrains the ability to improve and expand services. This infrastructure, in many cases built over 100 years ago, does not provide the resiliency or redundancy necessary to respond to unanticipated natural disasters or other disruptive events.

Growth in population and employment in the region, combined with changes in travel preference, will increasingly require a level of service and connectivity that cannot be supported by the existing NEC infrastructure. Challenges to passenger rail travelers today include poorly coordinated transfers and unattractive service frequencies, which make other travel choices more appealing. A well-defined and coordinated investment program to support both preservation and enhancement of the NEC is essential to meet the needs of the NEC's passenger and freight markets in the coming decades. A rail transportation system that better connects residents and visitors with established and growing business centers in the Study Area is critical to the economic health of the region.

S.5 STATEMENT OF PURPOSE AND NEED (CHAPTER 3)

The following is the statement of Purpose and Need adopted for the NEC FUTURE Tier 1 EIS:

The ***purpose*** of the NEC FUTURE program is to upgrade aging infrastructure and to improve the reliability, capacity, connectivity, performance, and resiliency of future passenger rail service on the NEC for both Intercity and Regional trips, while promoting environmental sustainability and continued economic growth.

Overall ***needs*** addressed by NEC FUTURE include aging infrastructure, insufficient capacity, gaps in connectivity, compromised performance, and lack of resiliency. These needs are essential to support the reliability of the passenger rail system. In addition, there is a need to promote environmental sustainability and economic growth. These needs are summarized below:

- **Aging Infrastructure**: The quality of service on the NEC currently falls short due to the aging and obsolete infrastructure that has resulted from insufficient investment to maintain a state of good repair.[7] Aging infrastructure also increases the cost and complexity of continuing railroad operations. Achieving and maintaining a state of good repair is needed to improve service quality.
- **Insufficient Capacity**: Severe capacity constraints at critical infrastructure chokepoints limit service expansion and improvement as well as recovery from service disruptions, making it difficult to offer reliable service and accommodate growth in ridership. These constraints are

[6] Northeast Corridor Infrastructure and Operations Advisory Commission. (February 2014). *State of the Northeast Corridor Region Transportation System.* State of the Northeast Corridor Region Transportation System.
[7] State of good repair is a condition in which assets are fit for the purpose for which they were intended. American Public Transportation Association. (2013). *Defining a Transit Asset Management Framework to Achieve a State of Good Repair.* Washington, D.C.: American Public Transportation Association.

further exacerbated by individual railroad operating practices,[8] which are driven by their individual policies or customer needs.

- **Gaps in Connectivity**: The reach and effectiveness of the passenger rail network are limited by gaps in connectivity among transportation modes and between different rail services. In some cases, rail services between stations require lengthy layovers or difficult transfers, limiting mobility options for passengers on the NEC. The railroads operating on the NEC today share the infrastructure but in many cases operate different equipment with different performance capabilities. Both infrastructure (track configuration, power source) and equipment (diesel, electric) further limit the ability to provide passengers with direct service to some city-pairs along the NEC or via connecting corridors.
- **Compromised Performance**: In many markets, the trip times on passenger rail within the Study Area are not competitive with travel by air or highway. Improvements in train frequency, travel time, and ticket price are needed to make passenger rail competitive with other modes.
- **Lack of Resiliency**: The NEC is vulnerable to the effects of sea level rise, severe storms, extreme heat events, and other unanticipated weather-related events. It is similarly subject to delay and suspension of service as a result of routine or emergency maintenance, often in portions of the passenger rail network without the redundancy necessary to respond to or compensate for these disruptions. As a result, both natural and human-caused events can result in extensive service disruptions and delays. Without sufficient resilience and redundant capacity to work around these events, the NEC is vulnerable and reduces the reliability of the region's transportation system.

In addressing the overall needs of aging infrastructure, insufficient capacity, gaps in connectivity, compromised performance, and lack of resiliency, the FRA is committed to the NEC FUTURE Action Alternatives promoting environmental sustainability and continued economic growth:

- **Environmental Sustainability**: Throughout the Study Area, energy use and emissions associated with transportation diminish the environmental quality of the built and natural environments. Expanding the availability of more energy efficient transportation modes, including passenger rail, is needed to support desired improvements in air quality and growth patterns.
- **Continued Economic Growth**: A transportation system that provides options for reliable, efficient, and cost-effective movement of passengers and goods is needed to support continued economic growth, and retention and increase in jobs, in the Study Area.

S.6 ALTERNATIVES CONSIDERED (CHAPTER 4)

In developing the alternatives for evaluation in this Tier 1 Draft EIS, the FRA considered a broad spectrum of future possibilities to meet the Purpose and Need. The unique geographic, technical, and institutional complexity of NEC FUTURE led the FRA to an innovative approach to developing and evaluating alternatives, focused on analysis of markets and services. This process is described in greater detail in various alternatives documents, including the *Initial Alternatives Report*, *Preliminary*

[8] Operating practices include the specification of service levels, stopping patterns, dwell times, and equipment types.

Alternatives Report, *Preliminary Alternatives Evaluation Report*, and *Tier 1 EIS Alternatives Report* (see Appendix B).

The FRA began the evaluation of alternatives with an initial list of 98 rail market and service options, developed through extensive outreach with the NEC FUTURE stakeholders, the Northeast Corridor Infrastructure and Operations Advisory Commission (NEC Commission), and the general public. These Initial Alternatives were then organized into 15 Preliminary Alternatives representative of the broad spectrum of approaches that could be used to serve existing and new markets in the region. (See Appendix B, *Preliminary Alternatives Evaluation Report*, for additional information regarding the Preliminary Alternatives and their evaluation.) The FRA considered whether and how the Preliminary Alternative met the Purpose and Need, and analyzed their benefits in terms of ridership, travel time, service quality, and performance (for those that included second-spine route options). Based on this analysis, the FRA repackaged the Preliminary Alternatives to form the alternatives analyzed in this Tier 1 Draft EIS.

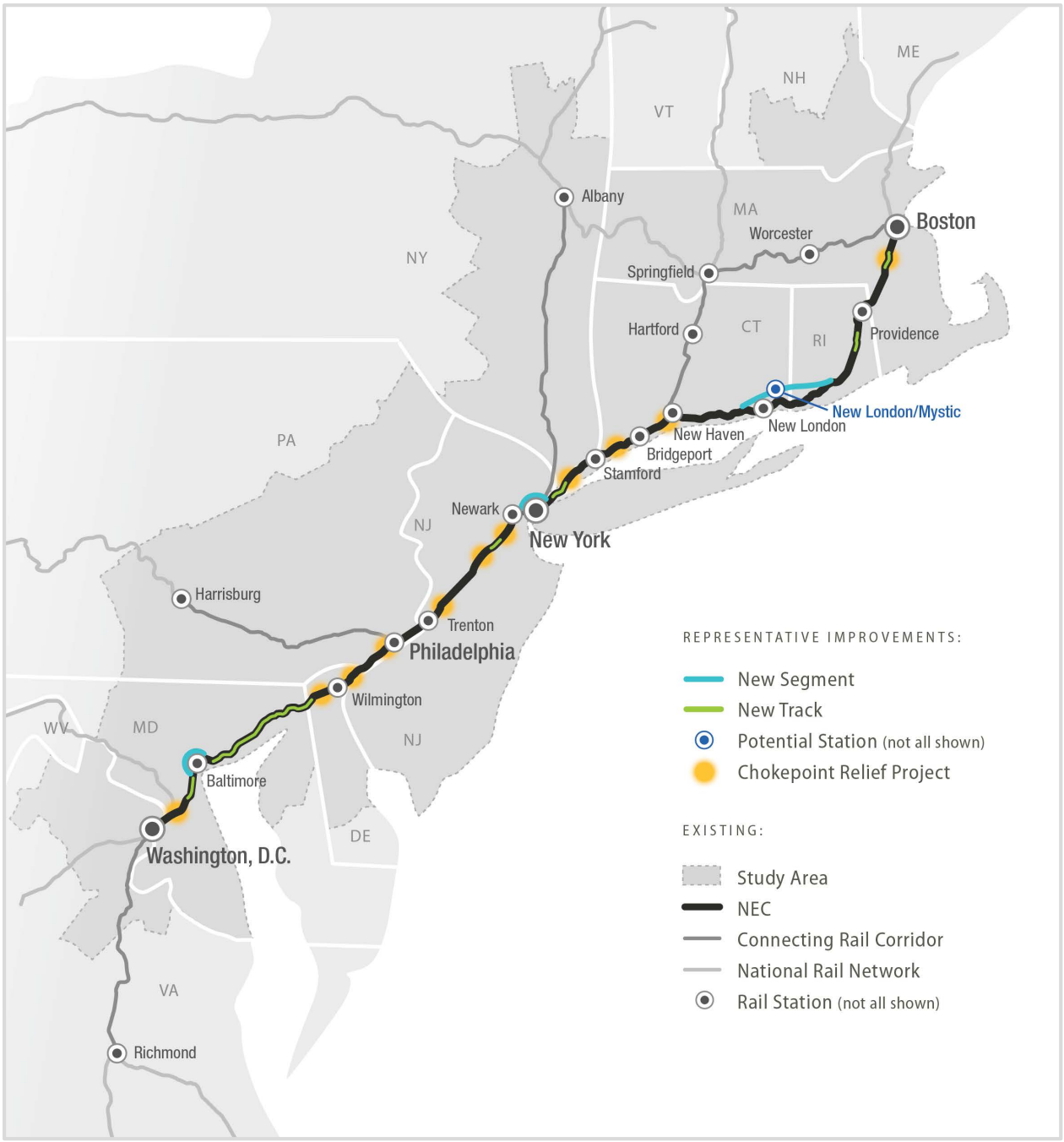
The FRA is considering three Action Alternatives that represent unique visions for the role of rail in the transportation system of the Northeast, and enable a broad analysis of benefits and impacts in the Tier 1 Draft EIS. The FRA compared the Action Alternatives to a No Action Alternative using ridership and service planning characteristics estimated with models customized for this effort. The transportation effects, economic effects, and environmental assessment of the Action Alternatives are presented in Chapters 5, 6, and 7, respectively.

The **No Action Alternative** represents an NEC in 2040 that would operate at today's service levels, which are defined as the number of trains per hour by operator[9] and type of service. The No Action Alternative is a normalized baseline used to understand the consequences of continuing to invest in and operate the NEC as it is today, particularly in comparison with Action Alternatives. The No Action Alternative does not allow for increased peak-hour rail service but does allow for some modest increases in off-peak service, where there may be some existing unused capacity. The No Action Alternative does not increase or significantly change capacity, speeds, or the markets served. Instead, it makes annual investments in programmed and funded major projects and in maintaining existing infrastructure sufficient to operate today's level of rail service, but falls short of achieving a corridor-wide state of good repair.

Alternative 1 maintains the role of rail as it is today, keeping pace with the level of rail service required to support growth in population and employment. Future service plans developed by the NEC service operators were also examined to assess projected increases in travel demand that were assumed by the service operators. To keep pace with the demand generated by the region's growing population and employment, Alternative 1 includes new rail services and commensurate investment in the NEC to expand capacity, add tracks, and relieve key chokepoints, particularly through northern New Jersey, New York, and Connecticut. Figure S-2 shows the principal infrastructure investments included in Alternative 1.

[9] Current operators on the NEC include Intercity services operated by Amtrak and Regional rail services operated by eight individual commuter railroads within the Study Area.

Figure S-2: Alternative 1 (Chokepoint, New Track, and New Segment Locations)



Source: NEC FUTURE team, 2015

Alternative 2 grows the role of rail, expanding rail service and passenger use at a faster pace than the growth in regional population and employment. The existing NEC generally expands to four tracks, with six tracks through portions of New Jersey and southwestern Connecticut. South of New Haven, CT, service and infrastructure improvements are focused generally within the existing NEC. However, as shown in Figure S-3, north of New Haven, Alternative 2 adds a new supplemental, two-track route between New Haven and Hartford, CT, and Providence, RI, to increase resiliency, serve new markets, reduce trip times, and address capacity constraints.

Figure S-3: Alternative 2 (Chokepoint, New Track, and New Segment Locations)

Source: NEC FUTURE team, 2015

Alternative 3 transforms the role of rail, positioning it as a dominant mode for Intercity travelers and commuters across the NEC. Service and infrastructure improvements include upgrades on the existing NEC and the addition of a two-track second spine within the Study Area. This new spine supports high-performance rail services between major markets and provides additional capacity for anticipated growth (Figure S-4).

Figure S-4: Alternative 3 (Chokepoint, New Track, and New Segment Locations)

Source: NEC FUTURE team, 2015

In Alternative 3, four route options are under consideration for the northern portion of the second spine, as shown in Figure S-4. These options include routings via Central Connecticut/Providence, Long Island/Providence, Long Island/Worcester, and Central Connecticut/ Worcester. In addition to comparing each Action Alternative against the No Action Alternative, the evaluation of alternatives in the Tier 1 Draft EIS includes comparisons of these route options as part of Alternative 3.

S.6.1 Service Types

The No Action and Action Alternatives incorporate assumptions about the mix of service types to be provided. For NEC FUTURE, the FRA categorized passenger rail service into two types: Intercity and Regional rail.

Intercity is passenger rail service between cities or metropolitan areas, operating at speeds and distances greater than that of Regional rail. Intercity serves large, mid-size, and selected smaller markets, with station stops typically every 10 to 25 miles. Intercity is further categorized into two service sub-types:

- **Intercity-Express** is premium Intercity service operating on the NEC, making limited stops and serving only the largest markets. Intercity-Express service offers the shortest travel times for Intercity trips, higher-quality on-board amenities, at a premium price, using high-performance trainsets.[10]
- **Intercity-Corridor** is Intercity service operating both on the NEC and on connecting corridors that reach markets beyond the NEC. This service provides connectivity and direct one-seat rides to large and mid-size markets on the NEC.

Regional rail is service within a single metropolitan area to local markets with station stops typically every 2 to 10 miles. Regional rail trains provide local and commuter-focused service characterized by relatively low fares and a high percentage of regular travelers.

Chapter 4, Alternatives Considered, provides additional detailed information about the mix of service types included in each Action Alternative, as well as stations served and assumptions about the level of service by station. A hierarchy of station types was defined for this effort, including Major Hub, Hub, and Local stations. Major Hubs serve the largest markets in the Study Area and have a full complement of rail service types; Hub stations offer some Intercity service, and Local stations only offer Regional rail service. Each Action Alternative includes new stations, station upgrades (e.g., Local to Hub, Local to Major Hub, and Hub to Major Hub), and physical improvements to stations.

While each Action Alternative has a distinct vision for the NEC, they all include common elements that address the following to varying degrees:

- Maintain and improve service on the existing NEC
- Bring the NEC to a state of good repair by replacing or renewing aging infrastructure on the existing NEC and eliminating the backlog of infrastructure requiring replacement

[10] New state-of-the-art train equipment consisting of electric multiple units cars with high rates of acceleration and deceleration and capable of operating at speeds of 150 mph or greater.

- Address the most pressing capacity and service chokepoints that constrain capacity on the existing NEC
- Protect freight rail access and the opportunity for future expansion
- Incorporate national and international best practices to address capacity constraints, broaden the mix of station pairs served, improve performance, and generate operating efficiencies

S.6.2 Technology

As documented in Chapter 11, Agency and Public Involvement, in defining a long-term vision for the role of passenger rail on the NEC, the FRA actively sought stakeholder and public input via an early and proactive outreach process. The overwhelming message received is that the users of the NEC are seeking reliable, integrated, and expanded train service to meet both Intercity and Regional rail travel needs. As such, the FRA focused on Action Alternatives that meet that Purpose and Need by improving steel-wheel passenger train technology that is used today by all the railroads sharing the NEC, including both Intercity and Regional rail operations, as well as freight service.

Given the accelerating pace of change in consumer technology, business practices and transportation patterns, application of future emerging and new technologies may help to support rail service on the NEC and meet other transportation needs across the region. These might include new information systems and services, new train propulsion and guideway systems, fare collection innovations, and safety enhancements. An advanced guideway system, such as magnetic levitation technology, could possibly be used to develop a second spine or portions thereof as envisioned in Alternative 3. Such technologies could be studied separately, and are not precluded as future transformative investments in the regional transportation system. Other potential applications of new technology transportation systems could support the NEC passenger rail network by connecting off-corridor markets to the NEC, or a major market to the NEC.

S.7 ANALYSIS AND EVALUATION OF ALTERNATIVES

The FRA has performed an extensive analysis of each Action Alternative and the No Action Alternative as a basis for an alternatives evaluation. As described in separate chapters of this Tier 1 Draft EIS, these analyses consider transportation effects, economic effects, environmental consequences, and construction effects, as well as capital and operations and maintenance costs. A variety of indicators and metrics are presented for each topic and used to compare each Action Alternative with the No Action Alternative. A cross-cutting evaluation links these findings to the needs defined in the Purpose and Need statement.

This summary briefly describes each of the analyses performed and highlights several key findings. However, the reader is referred to the appropriate chapters within this Tier 1 Draft EIS for additional context, details, and conclusions.

S.7.1 Transportation Effects (Chapter 5)

The No Action and Action Alternatives would result in both positive and negative effects to the multimodal transportation network within the Study Area. Chapter 5, Transportation Effects,

describes the transportation effects of the Action Alternatives. A summary of these findings is presented below.

Each of the Action Alternatives creates new connections and travel options within the Study Area. Alternatives 2 and 3 provide service to new off-corridor markets. By providing more travel options, the Action Alternatives generate significantly greater Intercity and Regional rail ridership compared to the No Action Alternative: the greater the improvement in frequency of service, types of services, travel times, and the number of metropolitan areas connected to the rail network, the higher the projected ridership.

The Action Alternatives also improve connectivity at Intercity stations by increasing the daily duration of rail service at many stations, making rail service available for longer periods of the day and hence more convenient to travelers. Alternatives 2 and 3 include service frequencies and daily durations of service that are more robust than the No Action Alternative, which expand mobility options for travelers and improve the attractiveness of passenger rail as a travel choice. The Action Alternatives result in more convenient passenger rail with increased service frequency at many Regional rail and Intercity stations. The greatest change in trip frequencies between stations is possible with the capacity and travel-time improvements included in Alternative 3.

As the frequency of service, types of services, and travel times improve with the Action Alternatives, passenger rail ridership increases. Table S-1 shows the number of trips for all passenger rail service types predicted for the No Action and Action Alternatives, and Table S-2: highlights the anticipated passenger rail trips by Alternative 3.

Table S-1: Number of Annual One-Way Trips (1,000s) by Service Type for the No Action and Action Alternatives (2040)

Mode	No Action Alternative	Alternative 1	Change vs. No Action (%)	Alternative 2	Change vs. No Action (%)	Alternative 3 (average)	Change vs. No Action (%)
Intercity	19,300	33,700	75%	37,100	92%	39,000	102%
Regional rail	419,800	474,500	13%	495,400	18%	545,500	30%

Source: NEC FUTURE Travel Demand Model, April 2015

Table S-2: Number of Annual One-Way Trips (1,000s) by Service Type for the Alternative 3 Route Options (2040)

Service Type	via Central CT/ Providence (3.1)	via Long Island/ Providence (3.2)	via Long Island/ Worcester (3.3)	via Central CT/ Worcester (3.4)
Intercity	38,900	38,700	39,800	38,600
Regional rail	545,500	545,500	545,500	545,500
TOTAL	584,500	584,200	585,300	584,100

Source: NEC FUTURE Travel Demand Model, April 2015

In the No Action Alternative, approximately 439 million passenger rail trips are predicted, while in Alternative 3, there are 579–580 million passenger rail trips predicted, an increase of 32 percent compared to the No Action Alternative. The greatest growth is predicted for Regional rail tripmaking, which is the dominant passenger rail travel type, even within the No Action Alternative. Regional rail ridership shows steady gains in all Action Alternatives compared to the No Action Alternative, as capacity grows to support more robust peak-hour and off-peak service.

S.7.2 Economic Effects (Chapter 6)

The construction and operation of the rail improvements and services in the No Action and Action Alternatives would result in changes to economic activity throughout the Study Area. Some changes would be immediate, while others would take place over a long period of time. These economic effects include Economic Development Response, Travel Market Effects, Construction and Rail Sector Employment Effects, and Indirect Effects associated with potential economic growth, as summarized below.

Economic Development Response

The Action Alternatives accommodate greater numbers of rail travelers and allow these travelers to make their trips faster and to a greater variety of destinations within and between the urban economies that line the corridor. The expansion of regional travel choices would allow households to access a greater range of employment and leisure options via rail from their home location—thereby improving quality of life. Businesses gain access to a larger, more diverse, and specialized pool of labor—thereby increasing productivity. The Action Alternatives would also accommodate a greater flow of people between major commercial centers and metropolitan areas.

- The largest potential economic impact of the Action Alternatives would be a greater flow of people within the major metropolitan economies through the increased volume of Regional rail relative to the No Action Alternative.
- The No Action Alternative is capacity constrained and insufficient for future demand. Potential rail travelers would be forced to take their second-best choice, imposing a cost on the economy. Alternative 1 offers an improvement over the No Action Alternative that would lessen this economic penalty. Alternatives 2 and 3 fully address the capacity constraints present in the No Action Alternative. Alternative 3 provides service levels and capacity to accommodate demand beyond that forecast for 2040.
- More-frequent service, faster travel times, and connections to new markets not currently served by rail would create opportunities for station area development. The support for station area development generally rises with the increase in travel-time savings, frequencies, and direct connections achieved across the Action Alternatives; gains are generally largest in the northern portion of the corridor.
- Discussions with experts from academic, development, business, and planning communities highlighted the importance of other local factors, such as quality schools, supportive infrastructure, or planning and zoning, in creating opportunities for station area development. (See Economic Development Workshop description in Chapter 6.)

- Improved passenger rail service to new markets has the potential to transform development patterns and in turn create greater demand for passenger rail. For the economics effects analysis, the FRA did not model local alternative economic growth or development scenarios, but did rely on insights from discussions with experts to understand the potential for economic growth with passenger rail improvements proposed in the Action Alternatives.

Travel Market Effects

Changes in mobility and connectivity proposed for each Action Alternative can be monetized to estimate the economic effects of transportation improvements as a function of travel time and cost savings as well as other factors such as safety and air quality impacts. The Action Alternatives offer faster travel times for many existing rail-served markets, expand service to markets not currently served, and offer a greater range of pricing.

- The volume of Intercity trips more than doubles under Alternative 3, over what is experienced in the No Action Alternative. All Action Alternatives would result in growth in intercity travel.
- Collectively, the changes in service frequencies, pricing, and markets in the Action Alternatives would allow travelers to make different travel choices than under the No Action Alternative. This change in travel behavior can influence economic outcomes.
- One of the key changes in travel behavior observed is that when offered a greater range of travel options, some travelers selected travel modes with longer travel times in order to save money. Thus, some existing rail and air travelers would shift from faster trains and planes to slower, less expensive rail options. When the value of the change in travel time was compared against the savings in travel cost, travelers realized a net savings. The travel cost savings, which are the smallest in Alternative 1 and greatest in Alternative 3, represent real gains in disposable income that support economic activity in the region.
- All of the Action Alternatives offer an increase in direct connections relative to the No Action Alternative. The magnitude of the gains varies by Action Alternative and by individual market, but the general pattern is that markets between the Greater Boston metropolitan area and the New York—North Jersey metropolitan area would experience the greatest gains in direct connectivity.
- All three Action Alternatives would help ease select chokepoints in the corridor, offering benefits for freight movements as well as passenger service compared to the No Action Alternative. The Action Alternatives do not differ measurably with regard to freight-related economic outcomes.

Construction and Rail Sector Employment Effects

- Potential construction effects occur primarily within the Affected Environment and represent a large, one-time stimulus to the economy. Construction jobs (measured as job-years) range from approximately 300,000 under the No Action Alternative to a high of 3.5 million for Alternative 3 (average of Alternative 3 route options), rising with the level of capital investment.
- Additional hiring would be required to operate and maintain the expanded rail service; the amount of employment supported rises incrementally across the No Action (lowest at 3,100 job-years) and Action Alternatives. Alternative 3 offers the greatest expansion and accordingly supports the greatest employment gain (24,200 job-years).

- The expansion of Intercity service proposed in the Action Alternatives would generate revenues in excess of projected operation and maintenance (O&M) costs. As such, no additional public subsidy would be required for the operation of the representative Intercity service included in the Action Alternatives.

Indirect Effects

- Induced growth can result in both positive and negative indirect effects. The potential for induced growth effects is higher under the Action Alternatives relative to the No Action Alternative and rises incrementally across Action Alternatives 1 through 3 with expansion of rail service offered.
- The north region would have the highest potential for indirect effects—the Greater Providence and Boston metropolitan areas under all Action Alternatives, and the greater Hartford metropolitan area under Alternatives 2 and 3. The New York-North Jersey metropolitan area also has the potential for indirect effects, largely attributed to improvements in travel time and capacity within the area to New York City.

Across the Action Alternatives, the Greater New York-North Jersey, Greater Philadelphia, and Greater Baltimore markets have the greatest gains in station connectivity. These markets have the greatest gains under Alternative 3 as compared to other Action Alternatives. Moreover, each Action Alternative gains one or more hub stations, which are focal points for development in the surrounding area. Hubs support greater development intensity than stations with just rail service. These stations have potential for indirect effects to occur as a result of induced growth.

S.7.3 Environmental Consequences (Chapter 7)

S.7.3.1 Approach to Analyzing Environmental Consequences

The FRA analyzed the effects of each Alternative on the resources shown in Table S-3. For each resource, an Affected Environment was studied to assess potential for impact and was defined generally as a "swath" of land centered on the Representative Route for each Action Alternative. Some potential environmental effects are due to changes in the physical footprint of the rail infrastructure, while others are due to changes in the type and volume of passenger rail service associated with each Action Alternative. The environmental effects assessment is based on readily available secondary source data, including geographic information system (GIS) data, published reports, and technical analyses. No field investigations occurred as part of this analysis.

Table S-3: Environmental Resources and Limits of Affected Environment

Resource	Description of Resource	Affected Environment
Land Cover	Land cover within the Affected Environment	½-mile-wide swath centered on the Representative Route for each Action Alternative
Agricultural Lands (Prime Farmlands and Timberlands)	Prime farmland and timberlands	2,000-foot-wide swath centered along Representative Route for each Action Alternative

Table S-3: Environmental Resources and Limits of Affected Environment (continued)

Resource	Description of Resource	Affected Environment
Parklands and Wild and Scenic Rivers	Publicly owned parklands; parklands receiving funding from the Land and Water Conservation Fund Act; Rivers identified as Wild and Scenic by the National Rivers Inventory within the Affected Environment	2,000-foot-wide swath centered along Representative Route for each Action Alternative
Hydrologic/Water Resources	Coastal zones and saltwater wetlands, freshwater resources (including wetlands), and floodplains	2,000-foot-wide swath centered on the Representative Route
Ecological Resources	Critical habitats and federally listed Threatened & Endangered Species	3,000-foot-wide swath centered along Representative Route for each Action Alternative
Geologic Resources	Soil, geological, groundwater and topographic resources	3,000-foot-wide swath centered along Representative Route for each Action Alternative
Hazardous Waste and Contaminated Material Sites	Known sources and potential suspected sources of contaminated and hazardous materials	2-mile-wide swath centered along Representative Route for each Action Alternative
Cultural Resources and Historic Properties	Resources listed in or eligible for listing in the National Register of Historic Places within the Affected Environment or identified as significant by Indian Tribes	1-mile-wide swath centered along Representative Route for each Action Alternative
Visual and Aesthetic Resources	Prominent visual resources and aesthetic qualities within the Affected Environment	1-mile-wide swath centered along Representative Route for each Action Alternative
Environmental Justice	Minority and low-income populations within the Affected Environment	1-mile-wide swath centered along Representative Route for each Action Alternative
Noise and Vibration	Ambient noise and vibration conditions, and noise-sensitive land cover categories	5,000-foot-wide swath centered along Representative Route for each Action Alternative
Air Quality *(including greenhouse gas emissions)*	Current attainment status for criteria pollutants established by the U.S. Environmental Protection Agency for air-sheds within the Study Area	Determined by metropolitan planning organization by state within the Study Area
Energy	Energy consumed, particularly by the transportation sector	Entire Study Area
Climate Change and Adaptation *(excluding greenhouse gas emissions)*	Identification of areas susceptible to the impacts of climate change (sea-level rise, storm surge and/or extreme heat and cold events)	For flood hazards: 2,000-foot-wide swath For extreme heat and cold events: Entire Study Area

Table S-3: Environmental Resources and Limits of Affected Environment (continued)

Resource	Description of Resource	Affected Environment
Section 4(f) and Section 6(f) Resources	Parklands converted to transportation use, including publicly owned public parks, recreation areas, and wildlife/waterfowl refuges	2,000-foot-wide swath centered along Representative Route for each Action Alternative
	Converted lands or facilities that were acquired with Land and Water Conservation Fund Act funds	
	Historic resources converted to transportation use, including historic sites of local, state or national significance (eligible or listed)	1-mile-wide swath centered along Representative Route for each Action Alternative
Electromagnetic Fields and Electromagnetic Interference	Electromagnetic Fields (EMF) associated with electric conventional or high-speed train operations and electromagnetic interference that occurs when EMFs are produced	2,000-foot-wide swath centered on Representative Route for each Action Alternatives
Safety	Operational, infrastructure and overall modal safety	Entire Study Area
Public Health	Potential public health-related effects for each of the relevant Tier 1 Draft EIS resource areas	As per the resource areas
Cumulative Effects	Combined result of the incremental direct and indirect effects of the Tier 1 Draft EIS Action Alternatives as well as the effects of other past, present, and reasonably foreseeable future actions, regardless of agency, on key resources	Study Area, expanded to include connecting corridors

[1.] Chapter 5 addresses transportation effects and Chapter 6 addresses economic effects and growth.

In general, impacts on environmental resources are greatest in areas where the Representative Route goes off-corridor, away from the existing NEC. These areas are often less developed than the current NEC. However, some impacts do exist to resources located along and within the existing NEC right-of-way. All Action Alternatives include improvements to the existing NEC; therefore, all effects-assessments consider potential effects that occur to both the existing NEC and any proposed off-corridor routing.

S.7.3.2 Key Resource Areas

While all environmental factors are important, some have greater potential to influence the identification of a Preferred Alternative as they are tied to Executive Orders, environmental laws, regulations and regulatory requirements, including but not limited to Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations), Section 404 of the Clean Water Act, Section 106 of the National Historic Preservation Act, Section 7 of the Endangered Species, and Section 4(f) of the U.S. Department of Transportation Act. Some of these laws require avoidance of impacts or selection of an alternative that has the least environmental impact. At a Tier 1 level of assessment, site-specific constructability or feasibility factors are unknown. The FRA is considering key effects on resources that could result from implementation of an Action Alternative and key findings from the NEC FUTURE analysis in deciding on a Preferred Alternative for the NEC FUTURE program, including:

- Land Cover (Chapter 7.2): Potential for land cover conversion to a transportation-related land use, or changes to existing land cover that could result in loss or fragmentation of ecological resources; loss of or changes to hydrologic resources; conversion of recreational resources; acquisitions and displacements; and conversion of prime farmlands or timberlands.
- Parklands (Chapter 7.4): Conversion of parkland resources to non-recreational uses informs the Section 4(f) analysis (Chapter 7.16).
- Hydrologic Resources (Chapter 7.5): Dredge or fill of wetlands; encroachment of floodplains; development within designated coastal zones; crossing Navigable Waterways.
- Ecological Resources (Chapter 7.6): Loss or fragmentation of habitat; changes to migratory patterns of transient species; effects on protected species.
- Cultural Resources and Historic Properties (Chapter 7.9): Loss of or damage to cultural resources and historic properties.
- Environmental Justice (Chapter 7.11): Concentrations of minority populations and low-income populations that could benefit or be affected by environmental impacts occurring in their communities.
- Climate Change and Adaptation (Chapter 7.15): Areas at highest risk from inundation from sea level rise, storm surge flooding, and riverine flooding.
- Section 4(f) (Chapter 7.16): Conversion of recreational properties, cultural resources and historic properties to a transportation use.

S.7.3.3 No Action Alternative

The No Action Alternative includes projects and transportation improvements that range in scope and complexity. Most of the projects and activities included as part of the No Action Alternative occur within the existing NEC right-of-way. Under the No Action Alternative, passenger rail service along the NEC operates and provides approximately the same level of service as provided today. As a result, "service-related" effects on noise and vibration would be unlikely. However, service-related effects on air quality could result due to increased congestion on the overall multimodal transportation network. "Footprint" effects on environmental resources under the No Action Alternative would vary, depending on the scope of the project being implemented. In a few cases, projects that are part of the No Action Alternative have footprints and effects that extend beyond the existing NEC right-of-way. Those types of projects, depending on the scope and complexity, have a greater potential to affect environmental resources than those activities occurring within the existing NEC right-of-way. However, the majority of passenger rail projects included in the No Action Alternative occur within the existing NEC right-of-way.

S.7.3.4 Action Alternatives

A range of benefits and impacts would occur with each of the Action Alternatives since each proposes varying degrees of both service and infrastructure improvements. As such, benefits and impacts associated with each Action Alternative would differ due to the level of service and infrastructure proposed. All Action Alternatives would result in the following:

- Travel options and improved mobility, and access to employment for all populations, including Environmental Justice populations.
- Decrease of greenhouse gas emissions for the year 2040 due to predicted shifts in mode choice (reduction in vehicle miles traveled (VMT) in personal automobiles) and changes in renewable energy usage.
- Decrease in energy usage from roadways from expected decrease in roadway VMT (autos) and an increase in energy use from power sources due to increase train service/frequencies.

Each Action Alternative provides for improvements that may affect environmental resources. Table S-4 identifies the key findings for the key resources by Action Alternative.

Table S-4: Summary of Key Resource Findings by Action Alternative

Resource	Alternative 1	Alternative 2	Alternative 3
Land Cover	< Greatest total conversions – MD, CT < Alternative with least total conversions	< Greatest total conversions – MD, CT < Alternative with the greatest undeveloped land conversions (CT)	< Greatest total conversions – MD, CT < Alternative with the greatest total conversions (via Long Island/Worcester)
Parklands	< State with greatest impacts to parklands – RI < 97 parks affected < Key parks affected – Greenway (RI), Great Swamp (RI)	< State with greatest impacts to parklands – RI < 111 parks affected < Key parks affected – Greenway (RI), Natchaug State Forest (CT)	< States with greatest impacts to parklands – NY, RI < 116–130 parks affected < Key parks affected – Greenway (RI), Natchaug State Forest (CT), Pelham Bay Park (NY), Eisenhower County Park (NY), Patuxent Research Refuge (MD), Gunpowder Falls State Park (MD), Saxon Woods County Park (NY), Norfolk County Canoe River Wilderness (MA), Natchaug State Forest (CT)
Hydrologic	< State with greatest effects: CT (particularly with water resources located in New Haven, Middlesex, and New London counties)	< State with greatest effects: CT (particularly water resources located in New Haven, Middlesex, Hartford and New London counties) < Only Alternative that bisects John Heinz Wildlife Refuge in Delaware and Philadelphia, PA	< State(s) with greatest effects NY and CT (resources associated with Long Island Sound) < Crosses 11 Navigable Waterways

Table S-4: Summary of Key Resource Findings by Action Alternative (continued)

Resource	Alternative 1	Alternative 2	Alternative 3
Ecological	Under all Action Alternatives: < New Haven, New London, and Fairfield Counties, CT, are, in general, the counties with highest overall potential ecological resource impacts (ESH[1], T&E[2], EFH[3]) < A number of large ESHs and wildlife refuges are clipped or bisected by the Action Alternatives: Patuxent Research Refuge, Anacostia and Gunpowder Falls (MD); John Heinz National Wildlife Refuge (PA), Laurel Ridge Setauket Woods Nature Preserve, Pelham Bay Park, and Saxon Woods County Park (NY); Great Swamp Management Area/Great Swamp (RI); and Paugussett State Forest and Rocky Neck State Park (CT). < Suffolk County, NY, has the greatest potential T&E species occurrence by county in the Affect Environment for all the Action Alternatives.		
Environmental Justice (Counties with EJ populations with highest number environmental impacts)	< Baltimore City, MD, < Fairfield County, CT	< Philadelphia County, PA < Middlesex County, NJ < Queens County, NY < Fairfield County, CT	< Baltimore City and Harford Counties, MD < Philadelphia County, PA < Bronx and Queens Counties, NY < Fairfield and Hartford Counties, CT < Providence County, RI < Worcester County, MA
Cultural/Historic Properties (total # of NRHP and NHL sites within Representative Route, and key cultural/historic property(ies) affected)	< NRHPs: 143 < NHLs: 2 (Fairmount Waterworks, Andalusia, PA)	< NRHPs: 171 < NHLs: 3 (Fairmount Waterworks, John Bartram House, Andalusia, PA)	< NRHPs: 132-150 < NHLs: 3-4 (Washington Square West Historic District, Reading Terminal and Trainshed, Andalusia, PA, John B. Smith Building, MA)
Climate Change (Counties that have or are proposed to have rail assets in areas at highest risk of inundation)	< New London, CT < Hudson, NJ < New York City, NY < New Haven, CT < Fairfield, CT < Provides resilience/redundancy with Old Saybrook-Kenyon Segment	< New London, CT < Hudson, NJ < Philadelphia, PA < New London, CT < New Haven, CT < Provides resilience/redundancy with New Haven-Hartford-Providence Segment	< Hudson, NJ < New Castle, DE < New York City, NY < New London, CT < Hudson, NJ < Provides resilience/redundancy with route options between New York City and Hartford and Hartford to Boston

Table S-4: Summary of Key Resource Findings by Action Alternative (continued)

Resource	Alternative 1	Alternative 2	Alternative 3
Section 4(f) (parks with the highest acreage potentially affected and NHLs within the Representative Routes)	Parklands: < The Greenway, RI < The Great Swamp Management Area, RI NHLs: < Fairmount Waterworks, PA < Andalusia, PA	Parklands: < Natchaug State Forest, CT < The Greenway, RI NHLs < Fairmount Waterworks, PA < John Bartram House, PA < Andalusia, PA	Parklands: < Patuxent Research Refuge, MD < Gunpowder State Falls, MD < Natchaug State Forest, CT < The Greenway, RI < Pelham Bay Park, NY < Eisenhower County Park, NY < Saxon Woods County Park, NY < Norfolk County Canoe River Wilderness, MA NHLs < Washington Square West Historic District, PA < Reading Terminal and Trainshed, PA < Andalusia, PA < John B. Smith Building, MA

Source: NEC FUTURE team, 2015

[1.] Ecologically Sensitive Habitat (ESH) is a term for those areas dedicated to conserving and maintaining biological diversity and natural resources, such as national wildlife refuges, parks, or forests. Other natural areas (such as wetlands, streams, and coastal areas) can also be considered ecologically sensitive. Federal or state agencies do not designate ESHs.

[2.] Federally listed Threatened and Endangered (T&E) species are vulnerable to endangerment in the near future or are in imminent danger of becoming extinct due to the loss of habitat or the decline in population numbers. For some T&E species, federal agencies designate and protect critical habitats.

[3.] Essential Fish Habitat (EFH) comprise all aquatic habitats where fish spawn, breed, feed, or grow to maturity. These habitats include wetlands, coral reefs, sea grasses, and rivers.

S.7.4 Construction Effects (Chapter 8)

The Action Alternatives involve construction of significant rail infrastructure—tunnels, bridges, embankments, stations, and ancillary roads and support facilities—across the Affected Environment over an extended time period. Since detailed project design and construction information is not available at the Tier 1 level of analysis, the FRA developed potential construction types based on available conceptual information for each Action Alternative.

Six construction types comprise the potential infrastructure associated with all of the Action Alternatives: tunnel, trench, at-grade, embankment, aerial structure (bridges and viaducts), and major bridge. The FRA considered existing NEC construction features, as well as land use, topographic and other environmental features, and cost in developing the construction types. Figure S-5 describes the percentage of construction types by route distance for the existing NEC and each Action Alternative.

As presented in Figure S-5, the route miles by construction type for Alternatives 1 and 2 are similar to the existing NEC, with the exception of additional tunnel route miles as part of Alternatives 1 and 2. For Alternative 3, the route miles by construction type increase for tunnel, aerial structure, and trench, along with a decrease in embankment and at-grade route miles.

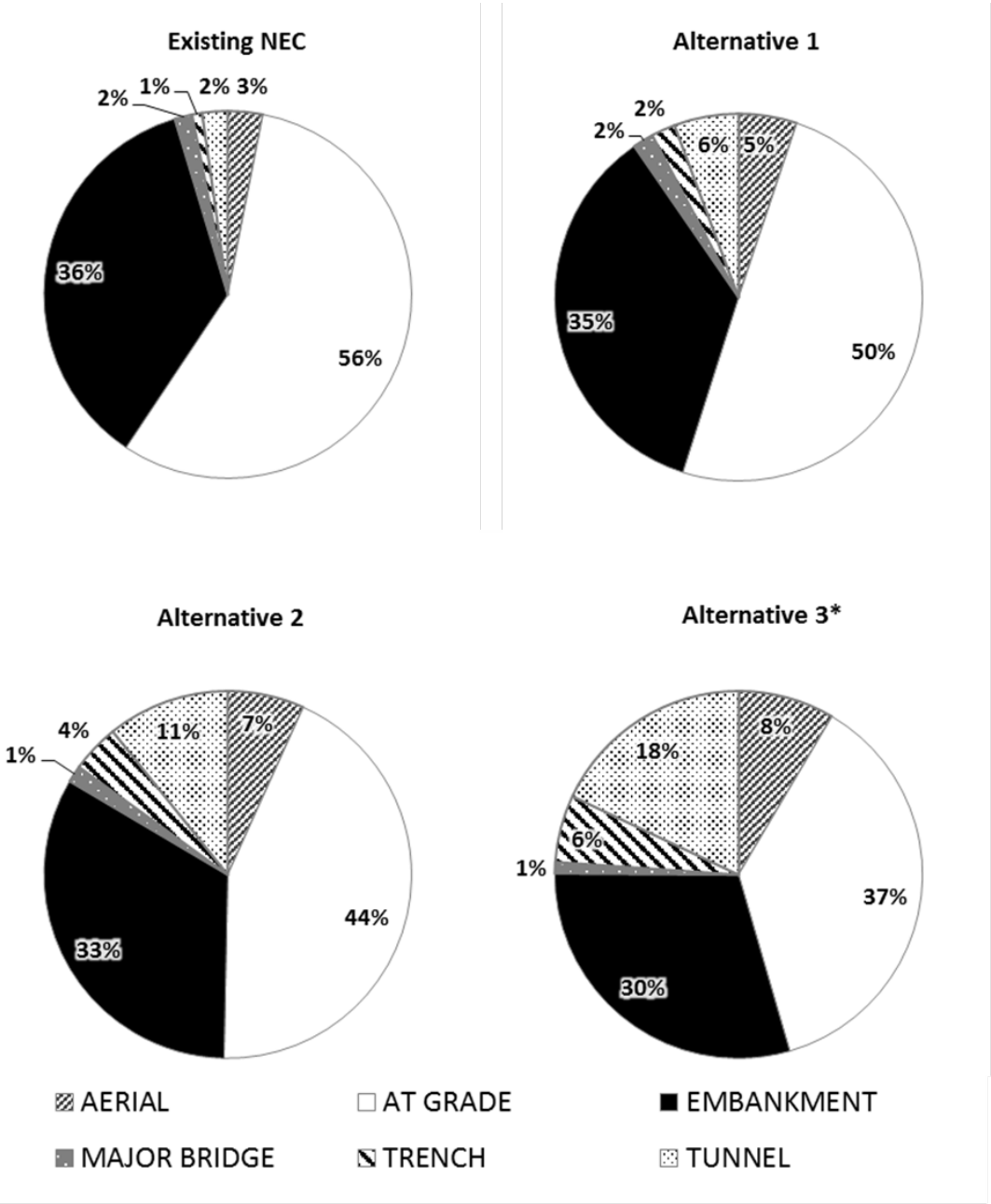
Regardless of the alternative selected, minimizing construction impacts on on-going rail operations can be best planned and achieved through the packaging of projects into multiple phases of the Selected Alternative. Through such phasing, individual projects can be timed to meet a number of important objectives. These include optimizing the benefits across the NEC of complementary capacity and travel-time projects, balancing the demand on resources, and spacing projects to take maximum advantage of construction outages and minimize adverse impacts on on-going train operations. The SDP will include a full phasing plan for the Selected Alternative that seeks to achieve these benefits.

S.7.5 Costs

Capital cost estimates were developed to understand the differences between the No Action Alternative and the Action Alternatives. An estimate of the capital cost of the No Action Alternative is $19.9 billion in 2014 dollars. This includes $8.35 billion in funded projects, $980 million in funded and unfunded mandates, and $10.53 billion in unfunded projects that are necessary to keep the railroad operating. The estimated $9 billion cost of the first two types of projects (funded or mandated projects) is also included in each of the Action Alternatives. The No Action Alternative may have additional costs from emergency or unplanned repairs since the corridor will remain at heightened risk of service disruption and unpredictable failures. These additional costs are not accounted for in the estimate.

Table S-5 provides estimates of the capital cost of each Action Alternative. The capital cost of Alternative 1 is estimated at between $64 billion and $66 billion in 2014 dollars; Alternative 2 is estimated at $131 billion to $136 billion, and Alternative 3 is estimated at $267 billion to $308 billion. The large range for Alternative 3 is due to the difference in cost associated with each route option, as shown in Table S-6.

Figure S-5: Percentage of Route Miles by Construction Type – Washington, D.C., to Boston, MA



* The percentage of route miles shown in Alternative 3 is the average route miles by construction type for all route options between Washington, D.C., and Boston, MA.

Table S-5: Capital Costs – Action Alternatives ($2014 billions)

Category	Alternative 1 (range)	Alternative 2 (range)	Alternative 3 (range)
Infrastructure	$52–54	$116–$121	$252–$293
Vehicles	$3	$5	$6
Subtotal	$54–$57	$122–$127	$257–$299
No Action Alternative Projects	$9	$9	$9
TOTAL	$64–$66	$131–$136	$267–$308

Source: NEC FUTURE team, 2015
Notes: Infrastructure costs include professional services. Cost does not include property acquisition costs for yards or stations. Each of the Action Alternatives includes the $9 billion cost associated with the No Action Alternative projects.

Table S-6: Capital Costs – Alternative 3 Route Options ($2014 billions) (end-to-end costs)

Category	Central Connecticut/ via Providence	Long Island/ via Providence	Long Island/ via Worcester	Central Connecticut/ via Worcester
Infrastructure	$267–$279	$252–$262	$265–$276	$281–$293
Vehicles	$6	$6	$6	$6
Subtotal	$273–$285	$257–$268	$271–$281	$286–$299
No Action Alternative Projects	$9	$9	$9	$9
TOTAL	$283–$294	$267–$277	$280–$291	$296–$308

Source: NEC FUTURE team, 2015
Notes: Infrastructure costs include professional services. Cost does not include property acquisition costs for yards or stations.

The FRA also estimated annual operating and maintenance costs for each alternative. In the No Action Alternative and in Alternative 1, annual Intercity operating revenue is estimated at approximately $2 billion and O&M costs at $1 billion. In Alternatives 2 and 3, annual operating revenue would be approximately $3 billion and O&M costs approximately $2 billion. Surplus net operating revenues from Intercity service would be realized in each alternative and would range from an estimated $500 million to $1 billion annually.

S.7.6 Comparison of Alternatives: Summary of Findings (Chapter 9)

Table S-7 summarizes the factors and metrics discussed in this Summary and in Chapter 9 of the Tier 1 DEIS the FRA used to evaluate the similarities and differences between the No Action and Action Alternatives. Metrics such as service frequency, capacity, and annual passenger trips increase as the level of investment and service improvements increase, demonstrating the range of possibilities for the role of rail in the Study Area. Table S-7 illustrates the overall potential for improved mobility and economic growth. Metrics that capture changes in service frequency and travel times demonstrate how each Action Alternative would change travel from a local perspective. Both the end-to-end and local (sub-region or city-pair) perspectives are important in considering the benefits and costs of the No Action and Action Alternatives.

S.7.7 Phasing and Implementation (Chapter 10)

The ability to implement expanded passenger rail service as envisioned in the Action Alternatives, and to construct the improvements necessary to support such service, will depend on many factors,

including funding, environmental approvals, market growth, regional cooperation, and practical constraints relating to construction on a very busy rail corridor. Therefore, project sponsors will implement improvements incrementally. Some work, such as state-of-good-repair projects, could advance on a continual basis through annual bridge, track, electric-traction, systems, and structures programs, while larger projects would be planned and implemented separately.

To ensure that incremental capital investment in the NEC will result in benefits for the entire corridor, the FRA anticipates that the alternative selected in the Record of Decision (Selected Alternative) will be implemented in phases consisting of integrated, complementary projects. Phasing ensures that an appropriate integrated package of improvements is planned and implemented in order to meet specific service and operational objectives and to lay the foundation for future phases of work. In this way, travelers will experience near- and mid-term service benefits over the extended period of time that it will take to implement the full service plan envisioned by each Action Alternative.

Each of the Action Alternatives assumes the implementation of a common set of projects, or "Universal First Phase," that would support important enhancements to service and serve as a foundation for advancing subsequent work. In addition to a core set of projects common to the three Action Alternatives, the Universal First Phase includes operational efficiencies and corridor-wide service enhancements that will require significant coordination between the NEC railroads, including potential changes to existing institutional arrangements.

The Universal First Phase consists of high priority projects currently in planning for replacing aging infrastructure and relieving major chokepoints; additional infrastructure needed to support construction activities and to minimize adverse impacts on passenger rail operations during construction; equipment, and operational and institutional changes required to maximize the benefit and cost-effectiveness of investment in the NEC and provide for an enhanced customer experience.

Chapter 10, Phasing Implementation, provides information on the projects included in the Universal First Phase. Implementation of these projects would support a modest increase in both Intercity and Regional rail service, greatly enhance the overall reliability of passenger rail on the NEC, and prepare the NEC for future phases of work.

Table S-7: Summary of Alternatives – Characteristics and Evaluation Factors

Project Needs Addressed	Metrics for Evaluating	No Action	Alternative 1	Alternative 2	Alternative 3 (average)
Aging Infrastructure	< NEC in a state of good repair	NO	YES	YES	YES
Capacity	< Peak Rail Capacity utilization (# of trains, peak hour, peak direction)	Washington: 6 Hudson River:24 Boston: 11	Washington: 12 Hudson River: 37 Boston: 17	Washington: 20 Hudson River: 52 Boston: 22	Washington: 24 Hudson River: 70 Boston: 24-32
	< Peak trains per hour (Intercity Trains at NYC)	—	2X the No Action	3X the No Action	5X the No Action
	< Peak passenger capacity utilization (# of passengers, peak hour, peak direction)	WAS: 6,610 Hudson: 30,374 Boston: 9,562	WAS: 9,615 Hudson: 44,993 Boston: 13,528	WAS: 11,173 Hudson: 61,280 Boston: 14,682	WAS: 12,403 Hudson: 71,111 Boston: 18,480
	< Annual Passenger Rail Trips (1,000s of Trips)	439,100	508,100	532,500	584,500
	o Intercity	19,300	33,600	37,100	39,000
	o Regional Rail	419,800	474,500	495,400	545,500
	< Annual Passenger Miles (in 1,000s)	13,957,565	17,640,308	19,142,079	20,710,292
	o Intercity	3,103,000	5,610,200	6,232,400	6,565,500
	o Regional Rail	11,264,400	12,547,100	13,455,800	14,713,900
	< Reduction in Annual VMT (in millions)	N/A	-2,000	-2,600	-3,100
	< % Intercity Trips Diverted to Rail (% of trips on the NEC diverted from other modes)	—	36%	44%	46%

Table S-7: Summary of Alternatives – Characteristics and Evaluation Factors (continued)

Project Needs Addressed	Metrics for Evaluating	No Action	Alternative 1	Alternative 2	Alternative 3 (average)
Connectivity	< Daily Trains Serving Airport Stations (total number of trains)	BWI: 141 PHL: 0 EWR: 152 T.F. Green: 25	BWI: 252 PHL: 0 EWR: 240 T.F. Green: 81	BWI: 386 PHL: 149 EWR: 364 T.F. Green: 74	BWI: 450 PHL: 88 EWR: 414 T.F. Green: 101
	< Air-to-rail diversions (annual trips in 1,000s)	—	WAS-NJ/NY: 83 NJ/NY-BOS: 216 PHL-BOS: 42	WAS-NJ/NY: 164 NJ/NY-BOS: 274 PHL-BOS: 47	WAS-NJ/NY: 225 NJ/NY-BOS: 248 PHL-BOS: 45
	< Daily service volumes – train volume for key city-pairs and key stations	WAS-NYC: 36 NYC-BOS: 19	WAS-NYC: 70 NYC-BOS: 47	WAS-NYC: 96 NYC-BOS: 88	WAS-NYC: 150 NYC-BOS: 143
	< Daily service volumes – train volume for connecting corridors	Richmond-NYC: 9 Harrisburg-NYC: 9 Albany-NYC: 12 Springfield-NYC: 2	Richmond-NYC: 13 Harrisburg-NYC: 13 Albany-NYC: 22 Springfield-NYC: 9	Richmond-NYC: 14 Harrisburg-NYC: 22 Albany-NYC: 22 Springfield-NYC: 27	Richmond-NYC: 14 Harrisburg-NYC: 21 Albany-NYC: 22 Springfield-NYC: 37
	< Number of Stops by Station (daily)				
	o Intercity Service	Odenton: 0 PHL Airport: 0 Secaucus: 0 Providence: 38	Odenton: 44 PHL Airport: 0 Secaucus: 0 Providence: 98	Odenton: 92 PHL Airport: 92 Secaucus: 108 Providence: 198	Odenton: 112 PHL Airport: 86 Secaucus: 174 Providence: 167
	o Regional rail Service	Odenton: 59 PHL Airport: 72 Secaucus: 367 Providence: 74	Odenton: 108 PHL Airport: 72 Secaucus: 522 Providence: 84	Odenton: 164 PHL Airport: 216 Secaucus: 722 Providence: 104	Odenton: 188 PHL Airport: 288 Secaucus: 970 Providence: 140
	o Total (Intercity Service + Regional rail Service)	Odenton: 59 PHL Airport: 72 Secaucus: 367 Providence: 74	Odenton: 152 PHL Airport: 72 Secaucus: 522 Providence: 182	Odenton: 256 PHL Airport: 308 Secaucus: 830 Providence: 302	Odenton: 300 PHL Airport: 374 Secaucus: 1144 Providence: 307

Table S-7: Summary of Alternatives – Characteristics and Evaluation Factors (continued)

Project Needs Addressed	Metrics for Evaluating	No Action	Alternative 1	Alternative 2	Alternative 3 (average)
Performance	< Travel-Time savings for key city-pairs (Intercity-Corridor times in min)	—	WAS-NYC: 15 NYC-BOS: 40	WAS-NYC: 22 NYC-BOS: 70	WAS-NYC: 32 NYC-BOS: 97
	< Station-to-station travel times (h:mm) – Intercity-Corridor	ODN-TRE: — WAS-HFD: 6:35 PHL-NHV: 3:23	ODN-TRE: 2:10 WAS-HFD: 5:14 PHL-NHV: 2:48	ODN-TRE: 2:03 WAS-HFD: 5:02 PHL-NHV: 2:35	ODN-TRE: 1:43 WAS-HFD: 4:19 PHL-NHV:2:36
	< Top speed by segment	WAS-NYC: 160 NYC-BOS: 150	WAS-NYC: 160 NYC-BOS: 160	WAS-NYC: 160 NYC-BOS: 160	WAS-NYC: 220 NYC-BOS: 220
Resiliency	< Redundancy for key network links (# of routes WAS-BOS)	WAS-NYC: 1 NYC-BOS: 1	WAS-NYC: 1 NYC-BOS: 1	WAS-NYC: 1 NYC-BOS: 2	WAS-NYC: 2 NYC-BOS: 2
	< Acres of the Representative Route vulnerable to flooding (At-grade and Construction)				
	o Alternative 1: Old Saybrook-Kenyon New Segment (Existing NEC/Alt 1)	—	SLR*:5/2 SSF*: 126/3 RF*:141/4	—	—
	o Alternative 2: New Haven-Hartford-Providence (Existing NEC/Alt 2)	—	—	SLR:7/1 SSF: 138/10 RF:353/139	—
	o Alternative 3: New York County, NY, to Suffolk County, MA (Existing NEC/Alt 3 range)				SLR:10/0-1 SSF: 193/5-16 RF:277/42-97
	< Number of Stations vulnerable to flooding – Current Climate Conditions, one or more flood hazards				
	o New Stations	—	7	10	15-16
	o Existing Stations	—	54	55	55

* Sea Level Rise (SLR); Storm Surge Flooding (SSF); Riverine Flooding (RF)

Table S-7: Summary of Alternatives – Characteristics and Evaluation Factors (continued)

Project Needs Addressed	Metrics for Evaluating	No Action	Alternative 1	Alternative 2	Alternative 3 (average)
Environmental Sustainability	< Change in Greenhouse Gas and Criteria Pollutants (tons/year)				
	o CO_2e	—	-274,650	-327,180	-252,461
	o CO	—	-2,480	-3,375	-3636
	o VOC	—	-30	-45	-44
	o NOx	—	-75	-80	8
	o PM10	—	-30	-35	-34
	o PM2.5	—	-10	-10	-5
	o SO2	—	170	340	516
	< Change in energy use (MMBtu)		-3,813,815	-4,899,110	-4,526,791
	o Roadways	—	-4,815,105	-6,516,805	-7,108,620
	o Diesel Trains	—	-1	-128,585	3
	o Electric Trains	—	1,001,290	1,746,280	2,581,826
Economic Growth	< Employment Impacts in the Study Area (# of job-years)	300,900	784,670	1,583,000	3,483,400
	o Construction Effects Employment	297,800	773,670	1,561,100	3,453,200
	o Rail Operations Effects Employment	3,100	11,000	21,900	30,200
	< Annual Travel Market Savings				
	o Total Intercity Travel-Time Savings (millions)	—	$1,973	$1,941	$2,106
	o Total Emissions Savings	—	$22	$20	$6
	< Number of New and Modified Stations	5 stations	24 stations	27 stations	42–47 stations
	< Jobs Accessible in a 30-Minute Train Travel Time (000s of jobs, net of No Action	—	WAS: 60 NYP: 840 BOS: 0	WAS: 440 NYP: 1,410 BOS: 330	WAS: 430 NYP: 1,850 BOS: 370

Table S-7: Summary of Alternatives – Characteristics and Evaluation Factors (continued)

Project Needs Addressed	Metrics for Evaluating	No Action	Alternative 1	Alternative 2	Alternative 3 (average)
Environmental Impacts	< Rating of magnitude of effects on environment:				
	o Population: Total population of census tracts intersecting the Affected Environment	4.4 million	4.5 million	4.9 million	5.9–6.5 million
	o EJ Census Tracts: Percentage of EJ census tracts among all census tracts within the Affected Environment	59% census tracts	59% census tracts	57% census tracts	54–56% census tracts
	o Land Cover Conversion: Percentage of Representative Route with potential conversion of Undeveloped Land	18% of the Representative Route	19% of the Representative Route	21% of the Representative Route	16-19% of the Representative Route
	o 6(f) Parks: Total Resources	20	21	23	23-27
	o 4(f) Parks: Total Resources	95	97	111	116-130
	o NRHP-Listed: Total Resources	30 resources	142 resources	171 resources	136-150 resources
Cost	< Total Capital Cost ($B 2014)	$19.9	$63.6–$66.2	$131.0–$136.1	$266.8–$308.0
	< Total O&M Net Revenue ($M 2014)	$970	$840	$680	$570

Source: NEC FUTURE team, 2014

S.8 NEXT STEPS

The FRA encourages public dialogue on the evaluation of the No Action and Action Alternatives presented in this Tier 1 Draft EIS. A public comment period will be held, beginning with a Notice of Availability in the *Federal Register* and extending through January 30, 2016. During the public comment period, the FRA will host public hearings on this Tier 1 Draft EIS in various locations within the Study Area. Information on the public hearings and other methods of submitting comments will be available online at *www.necfuture.com*. The Tier 1 Draft EIS will be available for download from the website and in hard copy form at major libraries throughout the Study Area, including in all counties through which the existing NEC and Action Alternative Representative Routes run.

Following the public comment period, the FRA will identify a Preferred Investment Program (Preferred Alternative) that achieves a vision for passenger rail in the NEC. The Tier 1 Final EIS will describe the Preferred Alternative, which could be one of the Alternatives considered in this Tier 1 Draft EIS or an Action Alternative that is made up of elements of the Action Alternatives considered in this Tier 1 Draft EIS.

Finally, the FRA will formally select an alternative in a Record of Decision (ROD) to complete the Tier 1 environmental review process. The FRA will then prepare an SDP for the Selected Alternative as defined in the ROD. Future decisions by the U.S. Department of Transportation, the NEC states and Washington, D.C., and rail operators will shape the manner in which NEC FUTURE will be incrementally implemented over several decades.

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

241 Main Street / Hartford / Connecticut / 06106
Phone (860) 522-2217 / Fax (860) 724-1274
www.crcog.org

Press Release

FOR IMMEDIATE RELEASE
Tuesday, December 29, 2015

Public Meetings Scheduled for Transit Riders Feedback on Comprehensive Transit Service Analysis

Capitol Region Council of Governments Will Be Hosting Public Meetings to Gather Feedback from Transit Riders on Potential CT***transit*** Service Improvements

Hartford, Connecticut – The Capitol Region Council of Governments (CRCOG) will be holding public meetings to gather input from transit riders and other community members on potential service improvements as part of the ongoing Comprehensive Transit Service Analysis. The meetings will be held at various times and locations throughout the Capitol Region to encourage participation. A table of events can be found at the end of this release.

The Comprehensive Transit Service Analysis is a collaboration between CRCOG, the Connecticut Department of Transportation, CT***transit***, and Nelson\Nygaard Consulting Associates. The purpose of this effort is to evaluate current CT***transit*** route effectiveness and to recommend bus system changes to increase ridership and convenience. Feedback from the upcoming meetings will be used to critique the presented service change recommendations and inform the creation of a preferred scenario to be presented later in the study.

Public meetings will be held in two formats. Open house meetings will be held during lunch and evening hours. Each open house will feature a short presentation about the study and potential improvement options. Study maps will be on display before and after the presentation, and study team members will be on hand to answer questions. Refreshments will be provided. Open house meetings in East Hartford and Manchester will also include a presentation on the CT***fastrak*** East study.

For people who cannot attend the open house meetings, smaller informational sessions will be hosted at several CT***transit*** and CT***fastrak*** stop locations. At these events, project staff will hand out information flyers and talk about possible changes with transit riders.

Interested individuals are encouraged to complete a short transit survey and learn more about the project at www.HartfordTransitStudy.com. Paper versions of this survey will also be available at all open house meetings and information sessions.

We do not discriminate on the basis of disability. Individuals who need auxiliary aids are invited to make their needs known by contacting us at 860-522-2217 x227, as soon as possible.

Un interprete estará disponible para esta reunión si usted lo solicita al 860-522-2217 x227, lo más pronto posible.

OPEN HOUSE MEETINGS	
Tuesday, January 19* These two meetings will also feature information about the CT***fastrak*** East study.	**11:00am to 1:00pm,** presentation starts at 11:30. Goodwin College Community Room 1 Riverside Dr. East Hartford, CT 06118
	5:00pm to 7:00pm, presentation starts at 5:30. Whiton Memorial Library Auditorium 100 N. Main St. Manchester, CT 06042
Wednesday, January 20*	**11:00am to 1:00pm,** presentation starts at 11:30. Hartford Public Library Center for Contemporary Culture 500 Main St, Hartford, CT 06103
	5:00pm to 7:00pm, presentation starts at 5:30. Elmwood Community Center Rm 29/211 1106 New Britain Ave. West Hartford, CT 06110
Thursday, January 21*	**5:00pm to 7:00pm,** presentation starts at 5:30. Windsor Town Hall Ludlow Room 275 Broad St. Windsor, CT 06095
RIDER INFORMATION SESSIONS	
Tuesday, January 19*	**2:00pm to 3:30pm** Buckland Hills Mall CT***transit*** Bus Stop
Wednesday, January 20*	**7:30am to 9am** CT***fastrak*** Parkville Station
	2:00pm to 3:30pm Copaco Center CT***transit*** Bus Stop
Thursday, January 21*	**11:00am to 1:00pm** CT***fastrak*** Flatbush Station
	2:00pm to 3:30pm Wethersfield Shopping Center CT***transit*** Bus Stop

**In the event of severe weather, meetings scheduled for January 19 will be held on January 26; meetings scheduled for January 20 will be held on January 27; and meetings scheduled for January 21 will be held on January 28.*

About the Capitol Region Council of Governments (CRCOG) – Working Together for a Better Region

CRCOG is established under the Connecticut General Statutes as a voluntary association of municipal governments serving the 38 Metro Hartford municipalities. Our members have collaborated for more than 30 years on a wide range of projects related to planning, transportation, service sharing, and cooperative procurement to benefit our towns individually and the region as a whole.

Kevin F. Filchak

From:	Linda M. Painter
Sent:	Friday, December 18, 2015 11:27 AM
To:	Janell M. Mullen; Kevin F. Filchak
Subject:	FW: Journal article on UConn green infrastructure
Attachments:	Dietz_et al_j_of_greenbldg.pdf

Kevin-please add as a communication for the next PZC and CC packets. Thanks!

From: Dietz, Michael [mailto:michael.dietz@uconn.edu]
Sent: Friday, December 18, 2015 11:25 AM
To: Linda M. Painter <PainterLM@mansfieldct.org>; John C. Carrington <CarringtonJC@mansfieldct.org>; Jennifer S. Kaufman <KaufmanJS@MANSFIELDCT.ORG>
Subject: Journal article on UConn green infrastructure

Hi folks,
Here is the article. Thanks again for your participation in the group.

-Mike (or Eric...)

****

Michael Dietz, Ph.D.
Water Resources Educator

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EXTENSION

THE CARE AND FEEDING OF A LONG-TERM INSTITUTIONAL COMMITMENT TO GREEN STORMWATER INFRASTRUCTURE: A CASE STUDY AT THE UNIVERSITY OF CONNECTICUT

Michael E. Dietz[1], Chester L. Arnold[2], Katie D. Milardo[3], Richard A. Miller[4]

INTRODUCTION

In 2007, the Connecticut Department of Energy and Environmental Protection issued the first Total Maximum Daily Load (TMDL) in the country based not on a specific pollutant or pollutants, but on impervious cover (IC) (Arnold et al., 2010). The water body in question was Eagleville Brook, a small tributary of the Willimantic River in eastern Connecticut that drains a majority of the University of Connecticut campus. The university is in effect a small city within a largely rural area. Partly as a result of this, there has been a history of "town-gown" tension and controversy with regard to the university's impact on the water resources of the area. This tension reached a climax in September 2005, when a quarter-mile stretch of the Fenton River, which drains the part of campus not in the Eagleville watershed, ran dry (Merritt, 2005). Water quantity concerns were frequently joined by water quality concerns, with area residents complaining about the pollution of their drinking water (Morse, 2002).

Although the Fenton incident precipitated increased efforts on the part of the university to conserve water, efforts to improve the way that campus addressed stormwater issues lagged behind until the advent of the impervious cover TMDL. In the intervening eight years since the issuance of the "IC-TMDL" - practically the wink of an eye in the deliberate world of land use decision making - the University of Connecticut campus has become a showcase for green stormwater infrastructure (GSI) practices, also known as low impact development (LID) practices.

While the IC-TMDL served as the catalyst, an environmental regulation, no matter how innovative, cannot in itself produce such dramatic change. For this to occur a number of interconnected efforts have to come together, including leadership, research, monitoring, coordination, and education both within and without the

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university community. This paper is an attempt to capture these key elements, consider why they worked (or didn't), and provide a status report on green stormwater infrastructure on the University of Connecticut campus.

KEYWORDS
green stormwater infrastructure, low impact development, university

HISTORY AND STATUS OF GSI ON CAMPUS

Early efforts

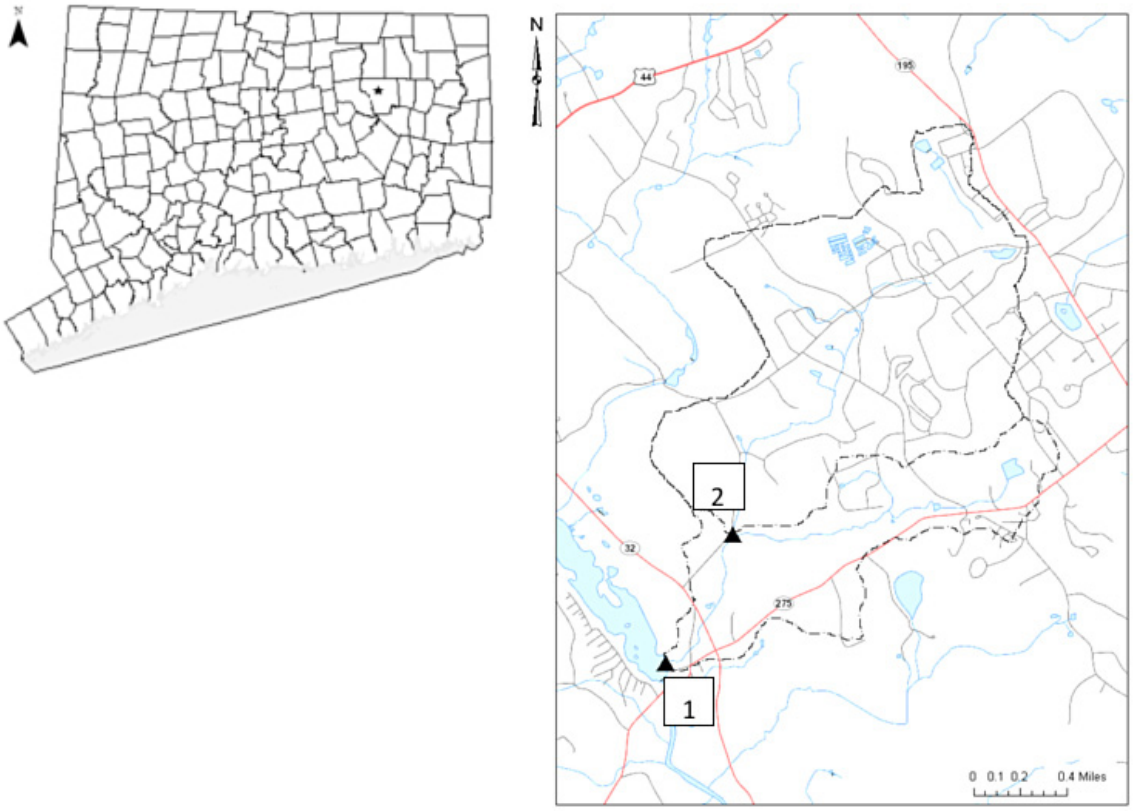
Substantial changes in infrastructure were implemented on the University of Connecticut campus over the last 20 years as part of the "UConn 2000" and "UConn 21st Century" programs. Although the new buildings and upgrades to existing buildings have been a benefit to members of the campus community, the impacts on Eagleville Brook have been less than positive. The addition of IC from new buildings and parking lots increased the discharge of stormwater to Eagleville Brook. As a result, the Brook has suffered from high sediment loading, scouring during large rainfall events, and decreased water quality. Many faculty members attempted to get the University administration to take action on reducing stormwater pollution on campus, due to the fact that research on GSI practices was beginning to show significant potential for bioretention, rain gardens, pervious pavements, and green roofs to reduce stormwater pollution from urban areas. However progress was slow at best.

The Connecticut Department of Energy and Environmental Protection routinely monitored Eagleville Brook as part of its responsibility to report to Congress on the quality of waters in the State (section 303d of the Clean Water Act). Two segments of the stream were found to be impaired for aquatic life (Figure 1), with the cause listed as "unknown", although siltation and copper loading were suspected (CT DEEP, 2004). Land development and urban runoff were cited as two potential sources of the problems. This is not surprising given the large amount of developed land that drains to Eagleville Brook (Figure 2).

Shortly after this in 2007, a Total Maximum Daily Load (TMDL) for Eagleville Brook was developed using impervious cover (IC) as a surrogate pollutant (CT DEEP, 2007). Although surrogate pollutants such as volume have been used before, no TMDL had ever been established using IC as the surrogate (Arnold et al., 2010). In 2005 and 2006, statewide research was conducted on the relationship between IC and stream health, as indicated by state aquatic life standards; these standards are based primarily on assessments of the benthic macroinvertebrate community. Of the 125 research sites, no stream with IC greater than 12% met the state standard for a healthy aquatic system (CT DEEP, 2005; Bellucci, 2007). Therefore, total IC was proposed by Connecticut Department of Energy and Environmental Protection, and eventually approved by the U.S. Environmental Protection Agency, as a surrogate pollutant for the Eagleville Brook TMDL, and the target was set at 11% IC in the watershed.

Prior to the establishment of this goal, the University of Connecticut had implemented several GSI practices on campus, with the goal of reducing stormwater runoff in general.

FIGURE 1: a) Location of project area in Connecticut, b) Watersheds of upper (location 1) and lower (location 2) impaired stream segments.



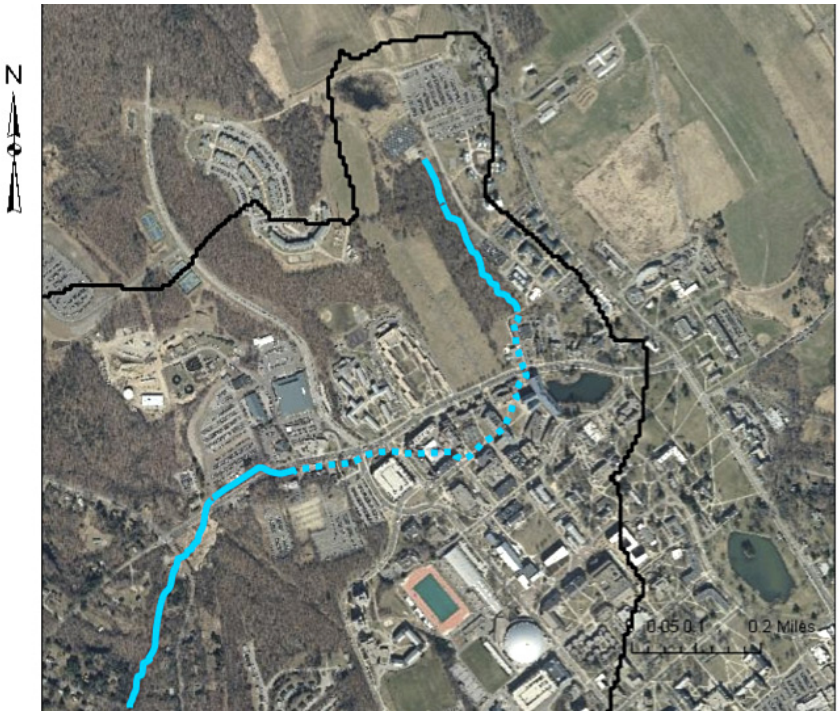


FIGURE 2: University of Connecticut campus in Storrs, with Eagleville Brook in blue (dashed blue line is where Eagleville Brook is in a concrete conduit beneath campus). Solid black line is watershed divide.

However, with the advent of the IC-TMDL, GSI implementation on campus has grown substantially since 2005 (Figure 3), with pervious pavements (Figure 4), bioretention (Figure 5), and green roofs (Figure 6) becoming commonplace on campus. More detailed information about these installations can be seen online through a virtual GSI tour at http://s.uconn.edu/virtualGSItour. The initial university response to the TMDL, in the form of a study, technical report and watershed plan, was led by the University of Connecticut's Center for Land Use Education and Research through its longstanding "NEMO" (Nonpoint Education for Municipal Officials, http://nemo.uconn.edu) stormwater effort. Documents and information related to the study can be found at http://clear.uconn.edu/projects/tmdl. Implementation has been primarily the responsibility of the University of Connecticut Office of Environmental Policy, with input from the Center for Land Use Education and Research, and other University faculty.

Around the same time, a Flood Management Certification analysis for the Brook recommended a 55 acre diversion from Eagleville Brook watershed to the Fenton River watershed, due to high peak flow rates noted for Eagleville Brook. This proposal generated strong local opposition, as the Fenton River drains to Mansfield Hollow reservoir, a drinking water supply system. Due to the opposition, the University of Connecticut held off on the diversion while exploring other alternatives to meet flood management requirements. Steady GSI implementation had been occurring on campus since 2005, and the potential for GSI practices to provide at least some mitigation for flooding was discussed. Design for flood control typically considers runoff from large events (i.e., the 100-year, 24-hour event) whereas water quality

FIGURE 3: Cumulative area treated with LID practices, University of Connecticut Storrs campus.

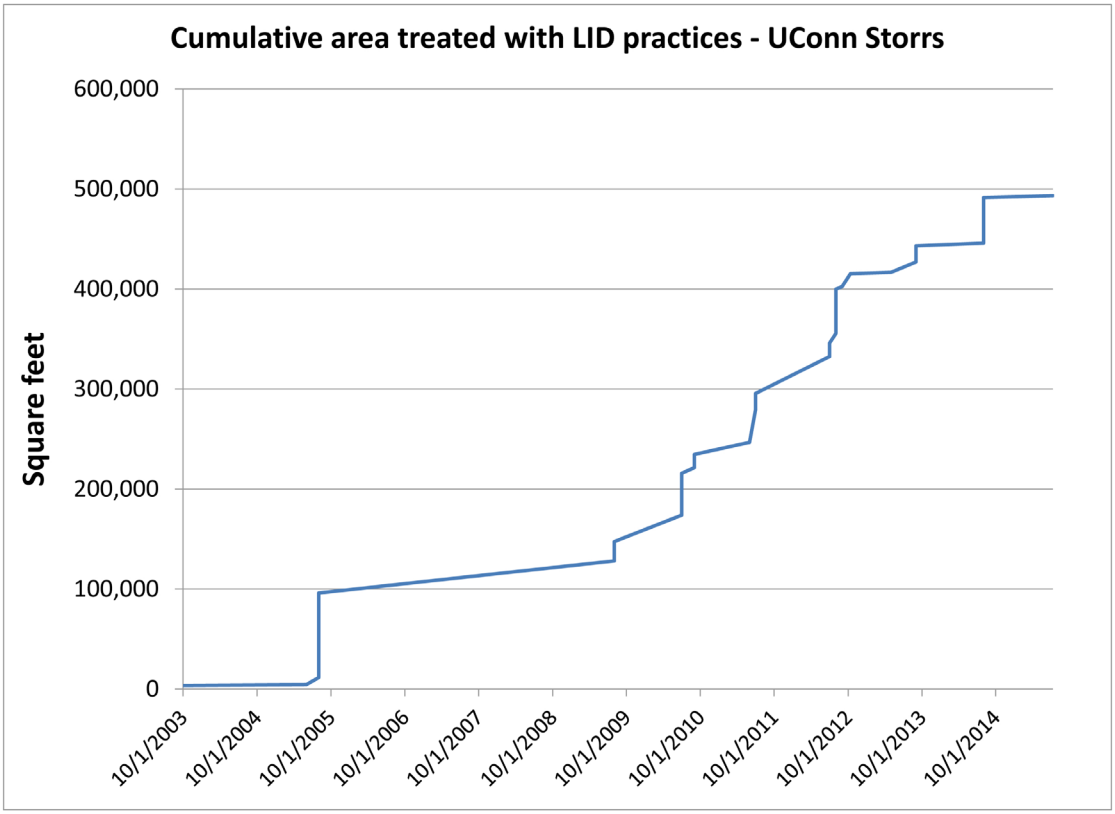


FIGURE 4: Pervious pavement in the "snow shelf" between the sidewalk and street, University of Connecticut, Storrs.

FIGURE 5: Bioretention area by Oak Hall, University of Connecticut, Storrs.

FIGURE 6: Green roof on Storrs Hall, University of Connecticut, Storrs.

considerations typically focus on runoff from a smaller event such as a one inch storm. There may be ways to achieve both of these goals by integrating these two designs. For example, one large bioretention on campus is designed to contain a 10-year 24-hour event. While this won't solve all flooding issues, this extra capacity will certainly help to reduce impacts downstream.

The University of Connecticut hired a consulting firm in 2012 (URS) to determine what effect, if any, the recently installed LID practices had on peak discharges in Eagleville Brook. The main goal was to determine whether these practices would have a large enough impact on the peak discharge in Eagleville Brook to negate the need for the 55 acre diversion that had been proposed in 2006. Key findings from the URS (2013) report were the following: modeled peak discharge for current conditions (2011) met flood management recommendations (this included projects that were constructed between 1993 and 2005) for a 2-year, 24-hour event. Peak discharges for the 10-year and 100-year events were lower than the "pre-1993" condition that was modeled, but they were not low enough to meet the flood management requirement for 10-year or 100-year events (Table 1). However, the analysis also included a hypothetical implementation of 10 "priority projects" identified in the pre-implementation IC-TMDL field survey of the Eagleville Brook watershed (CWP & HWG, 2010), along with water harvesting on a water reclamation plant that was installed in 2012. If these projects were implemented, hydrologic impacts would include maintenance of peak discharges below flood management levels for the 2- and 10-year events, but not for the 100-year event (Table 1),

TABLE 1. Peak flow rates (cfs) for 2-year, 10-year, and 100-yr events. Location 1 is immediately downstream of the University of Connecticut campus; location 2 is where Eagleville Brook drains into Eagleville Lake.

location	2-year				
	pre-1993	FMC goal	current (2011)	w/ water harvest	w/ top 10
1	**53**	**52**	**49**	**46**	**43**[1,2]
2	**161**	**157**	**154**	**149**	**143**[1,2]
	10-year				
	pre-1993	FMC goal	current (2011)	w/ water harvest	w/ top 10
1	**195**	**174**	**187**	**174**	**173**[1,2]
2	**519**	**501**	**506**	**493**	**488**[1,2]
	100-year				
	pre-1993	FMC goal	current (2011)	w/ water harvest	w/ top 10
1	**430**	**377**	**417**	**407**	**406**[2]
2	**1205**	**1137**	**1189**	**1185**	**1178**[2]

[1]Top Ten scenario reduces peak flow below FMC modeled criteria

[2]Top Ten scenario reduces peak flow below pre-1993 estimates

with an estimated annual stormwater volume reduction of roughly 5.9 million gallons (CWP & HWG, 2010).

Because of these findings and the existence of a reliable tracking system (next section), the Connecticut Department of Energy and Environmental Protection agreed in 2015 to create a new Memorandum of Understanding with the University of Connecticut, acknowledging the hydrologic benefits of the LID practices on campus. The 55 acre diversion was no longer required, but the University is now responsible for installing GSI practices that remove an amount of stormwater equivalent to that which would be removed by implementing the 10 priority projects proposed in the TMDL analysis. The terms of the agreement, signed in 2014, must be completed by 2021. The agreement further requires regular maintenance of all GSI practices, and continued monitoring/tracking of the impact of GSI features in the Eagleville Brook watershed.

Importance of keeping track: impact tracking system

As part of the reporting requirements for the IC TMDL, impervious cover additions and subtractions were recorded, to assess progress towards the goal (Table 2). Hydrologic monitoring has historically been used in other locations to obtain detailed performance data, such as the volume of water reduced by GSI installations. However, this type of monitoring is not practical on a large number of installations such as on the University of Connecticut campus, due to the high equipment and labor costs. Faculty from the Center for Land Use Education and

TABLE 2. Additions and subtractions of IC in the Eagleville Brook watershed from March 2010 to July 2014 (from Dietz, 2014).

Location	Practice	Date installed	IC added (ft^2)	IC disconnected (ft^2)
Northwoods apartments	Bioretention	7/1/2010		23,808
Northwoods apartments	Pervious asphalt	7/1/2010		42,000
Hillside Rd. snow shelf	PICP sw	6/1/2011	3,100	12,055
Laurel Hall	Bioretention	7/1/2011	27,125	27,125
Laurel Hall	PICP	7/1/2011	3,420	3,420
Laurel Hall	Green roof	7/1/2011		
Water reclamation facility	Bioretention	7/1/2012	36,975	36,975
Water reclamation facility	Water harvest	7/1/2012	13,600	13,600
Hillside Rd. snow shelf	PICP se	8/1/2012	6,280	9,355
Oak Hall	Bioretention n	8/1/2012		
Oak Hall	Bioretention s	8/1/2012		
Oak Hall	PICP	8/1/2012	3,150	3,150
Hillside Rd. snow shelf	PICP n	10/12/2012	6,550	12,750
Sundial	PICP	5/1/2013	1,450	1,450
D-Lot	Tree filter	6/9/2014		13,550
Hilltop apartments	Tree filter	6/16/2014		10,245
Basketball practice	PICP	8/1/2014	2,785	2,785
Basketball practice	Bioretention	8/1/2014	16,770	41,248
Klinck	Bioretention	7/10/2015		1,660
		Total	**121,205**	**255,176**
			Net change (ft^2)	**133,971**
			Net change (ac)	**3.1**

Research team decided to estimate runoff reductions for the University of Connecticut green infrastructure sites by using some basic parameters of each installation, and daily precipitation totals from a nearby National Oceanic and Atmospheric Administration (NOAA) station. For bioretention/rain gardens, the watershed area and capacity of the system were measured. For pervious pavements, the area of pavement plus the area of impervious surface that drained on the pervious area was measured. For green roofs, the area of the green roof was measured. For all installations, a performance rating between 0 and 1 was estimated. This value was used to

TABLE 3. Summary of stormwater volume reductions based on daily precipitation totals, University of Connecticut Storrs campus.

Location	Watershed	Type	Date Installed	Stormwater treated to date (ft3)	Stormwater treated to date (gal)
Towers dorms	Eagleville	Bioretention	Oct-03	119834	896479
Towers dorms	Eagleville	Pervious asphalt	Aug-09	613456	4589267
Lakeside apartments	Eagleville	PICP	Jun-05	36562	273519
Hilltop dorms	Eagleville	Bioretention	Aug-05	191417	1431989
Burton-Shenkman	Eagleville	Bioretention	Aug-05	2808079	21007240
Field House	Eagleville	Pervious concrete	Aug-09	91985	688140
MSB	Eagleville	Green roof	Sep-09	33198	248353
Northwoods apartments	Eagleville	Bioretention	Jul-10	208680	1561137
Northwoods apartments	Eagleville	Pervious asphalt	Jul-10	635959	4757607
Hillside snow shelf SW	Eagleville	PICP	Jun-11	170036	1272041
Hillside snow shelf SE	Eagleville	PICP	Aug-12	99582	744976
Hillside snow shelf N	Eagleville	PICP	Oct-12	112051	838251
Laurel Hall	Eagleville	Bioretention	Jul-11	417301	3121829
Laurel Hall	Eagleville	PICP	Jul-11	54814	410064
Laurel Hall	Eagleville	Green roof	Jul-11	1805	13505
Water reclamation facility	Eagleville	Bioretention	Jul-12	346648	2593275
Water reclamation facility	Eagleville	Water harvest	Jul-12	160525	1200890
Sundial	Eagleville	PICP	May-13	12724	95186
			Total	**6,114,657**	**45,743,750**
Mansfield apartments-E	Fenton	Bioretention	Sep-10	44957	336322
Mansfield apartments-W	Fenton	Bioretention	Sep-10	134316	1004817
Storrs Hall	Fenton	Pervious asphalt	Aug-12	88439	661612
Storrs Hall	Fenton	Green roof	Sep-12	15304	114487
Oak Hall N	Fenton	Bioretention	Aug-12	78872	590044
Oak Hall S	Fenton	Bioretention	Aug-12	66769	499500
Oak Hall	Fenton	PICP	Aug-12	35587	266227
Whetton W	Fenton	Bioretention	Sep-13	15625	116888
Whetton E	Fenton	Bioretention	Sep-13	69999	523662
Whetton	Fenton	Pervious asphalt	Sep-13	31523	235822
Basketball Practice	Fenton	Bioretention	Aug-14	143278	1071865
Basketball Practice	Fenton	PICP	Aug-14	8789	65754
			Grand Total	**6,696,047**	**51,230,748**

assess how well each unit was functioning, and account for installations that had known clogging or poor infiltration. For the green roofs, a value of 0.52 was used, since monitoring data for one of the green roofs on campus have indicated this was the annual precipitation retention (Gregoire & Clausen, 2011). The date of installation was also noted for each practice. Then, daily precipitation totals were used to calculate the amount of precipitation that was treated by each practice. This allows for an estimated cumulative total of gallons of stormwater treated to date by all of the practices on the University of Connecticut campus. As of July 2015, a total of 52,050,000 gallons of stormwater have been treated by LID practices on the University of Connecticut campus (Table 3).

Monitoring

In addition to the tracking system, actual water quantity and quality monitoring has also been performed on Eagleville Brook. In collaboration with the Department of Natural Resources and the Environment at the University of Connecticut, equipment to measure discharge in the Brook was installed in 2010, at an existing weir in the stream. Funding was obtained from the Connecticut Sea Grant program to add more sophisticated equipment to the site, and in 2012, real-time measurements of discharge, temperature, conductivity and precipitation were initiated. These measurements are updated every 30 seconds and posted to the Web (http://clear.uconn.edu/projects/eagleville) (Figure 7). These data are helping to build a long term record of discharge and other water quality parameters in Eagleville Brook (Figure 8),

FIGURE 7: Eagleville Brook real-time dashboard at http://clear.uconn.edu/projects/eagleville.

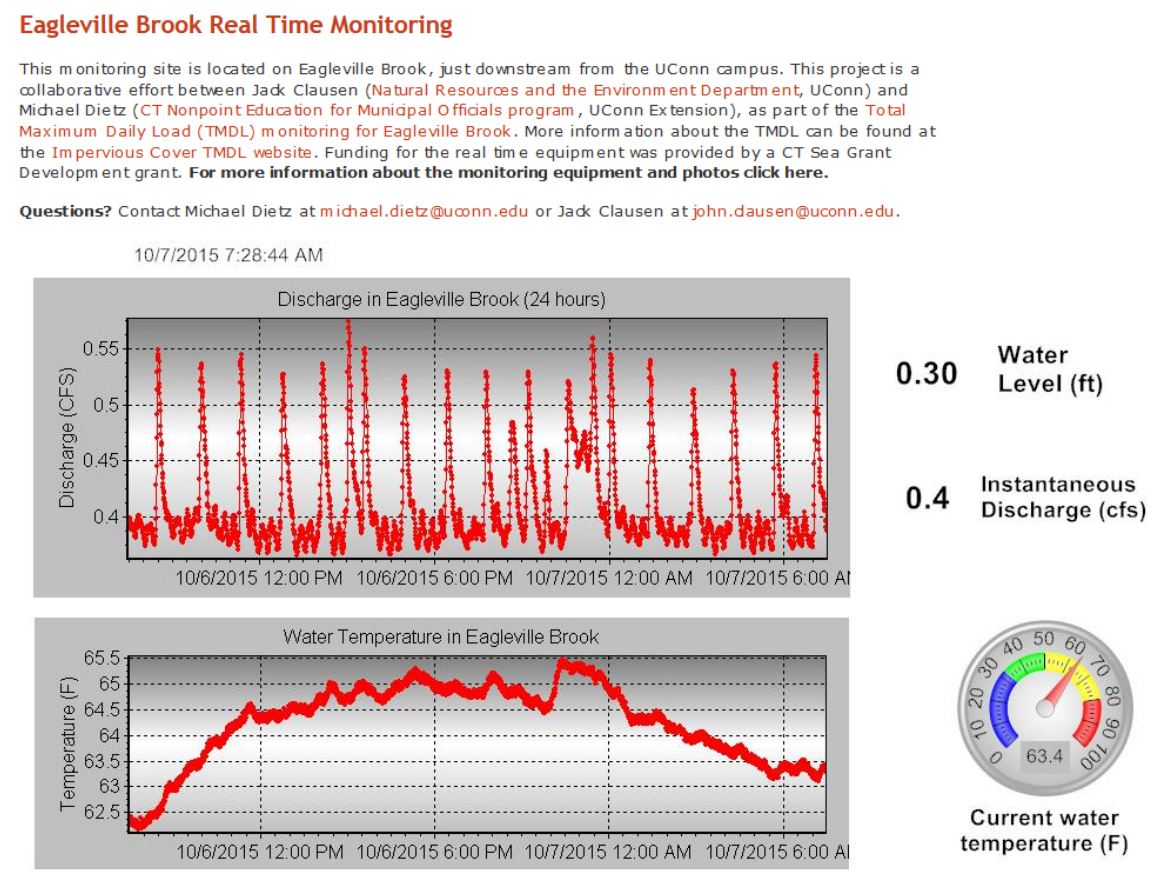
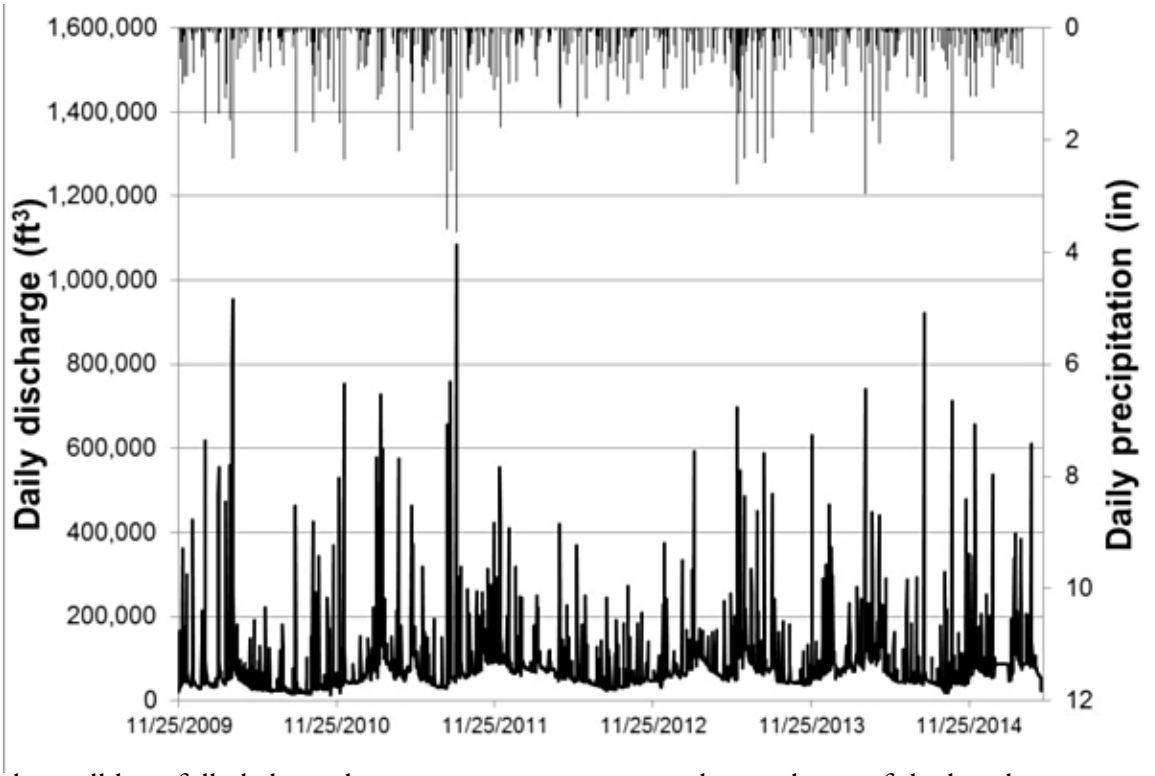


FIGURE 8: Daily discharge and precipitation totals, Eagleville Brook, Storrs CT.



that will hopefully help to document improvements in the condition of the brook over time. In addition, the results may uncover additional problems that are not strictly related to the stormwater volume focus of the IC-TMDL and the new agreement. For instance, a year of weekly water sampling indicated high levels of both chloride and copper in Eagleville Brook, with 80% of samples above chronic water quality criteria for chloride and copper. These findings are leading to additional studies, both on campus and in the lab, to learn more about the sources for both pollutants.

The tracking system and the water quantity/quality measurement site are helping to provide valuable information to support the implementation efforts that have been occurring on campus. These data provide hard evidence for regulators and administrators to prove that the investments that have taken place are providing tangible benefits.

COORDINATION AND MAINTENANCE

Advisory Committee

Funding for the initial IC-TMDL efforts on campus was provided by the University of Connecticut, the Connecticut Department of Energy and Environmental Protection, and the Town of Mansfield. Continued support from Clean Water Act Section 319 through the Connecticut Department of Energy and Environmental Protection has provided for part-time coordination and oversight of activities related to TMDL and implementation efforts. As was suggested in the Watershed Management Plan for Eagleville Brook (Dietz and Arnold, 2012), a Watershed Advisory Committee was formed. The Committee meets 2-3 times per year, and has representation from the University of Connecticut's Center for Land Use Education and

Research, the Office of Environmental Policy, Facilities, Architectural, Engineering and Building Services, and the Town of Mansfield. Although GSI has become part of the "fabric" of campus activities, the committee has helped to keep implementation and planning efforts coordinated and focused.

Maintenance Challenges

The maintenance of GSI practices is critical to ensuring their proper long-term function. Sedimentation, compaction, invasive plants, and over-mulching all have the potential to cause premature failure of GSI features. In an institutional setting such as the University of Connecticut, education (and ongoing retraining) of maintenance personnel is critical. To the untrained eye, a rain garden can appear to be a typical landscaped area. Without personnel trained to recognize the differences, rain gardens will be maintained like a regular landscaped area. They will have a good appearance, but flow paths can become blocked, they can end up getting filled up with mulch, and function becomes greatly reduced. For pervious pavements, clogging of the surface with fine organic material or sediment can lead to reduced infiltration. Again, to the untrained eye, the integrity of the lot surface can look fine, with no heaving and cracking. However, infiltration will be greatly reduced if surface clogging becomes extreme. The improved longevity of the pervious pavements on campus has stood out as an unintended benefit. Due to the highly pervious base, frost heaving does not occur, and the surface of the pavement remains in good condition. For example, there is a pervious asphalt lot on campus that was installed in 2009, and there are no cracks or heaves in the entire lot. The adjacent traditional pavement/base shows cracking and heaving in some areas.

At the University of Connecticut it has been difficult to integrate maintenance of GSI features into the regular work schedule of Facilities and Landscape operations. Overburdened and under-staffed, any request to add more (and different) tasks to their daily lists is understandably unpopular. As noted, however, the recent agreement between the University of Connecticut and the Connecticut Department of Energy and Environmental Protection requires that campus GSI features be properly maintained. The Watershed Advisory team is spearheading efforts to train facilities staff on how to maintain certain practices (rain gardens, bioretention, green roofs) or hire outside contractors (pervious pavements).

Ongoing work with Facilities Department

To ensure compliance with the agreement, the Watershed Advisory team meets frequently to provide support, guidance and status updates on our GSI features. It was critical for the University of Connecticut to get buy-in from the Facilities and Landscape departments because the maintenance of these GSI features relied heavily on their involvement, and some initial internal resistance was encountered. One of the major concerns was the additional maintenance costs for GSI features. To address these cost concerns (e.g., maintenance requirements, cost, equipment) a GSI summary document was created. The summary presented a maintenance comparison of GSI features (e.g., green roofs, bioretention, pervious lots) and conventional drainage structures, landscape beds, roofs, and impervious parking areas. Each GSI feature and/or conventional feature included recommended frequency and best management practices and/or maintenance items. Conventional maintenance costs were estimated from University of Connecticut records, while GSI costs were estimated from the literature. The summary also included the size of each feature, estimated hours it would take to complete the

maintenance item (based on the size) and a cost estimate. The cost estimate was based on the time and size of the GSI feature and it was further broken down to include costs expected to be incurred by University of Connecticut staff or contractors, if necessary.

The comparison showed that the costs for GSI features were similar and in many cases less expensive than the maintenance costs for conventional alternatives. The GSI summary helped gain the support of University of Connecticut staff and Administration, once all stakeholders had an understanding of the maintenance requirements and our obligation to the agreement between the University and the Connecticut Department of Energy and Environmental Protection.

An additional unforeseen hurdle was the turnover in Facilities and Project Management staff at the University of Connecticut. Just when it seemed that GSI had truly become part of the fabric of the University, staff turnover in these departments necessitated some re-education of new staff on GSI efforts on campus. Fortunately the Office of Environmental Policy and Center for Land Use Education and Research faculty are available to "carry the torch" for these efforts.

CONCLUSIONS

For the extended project team, the University of Connecticut experience has demonstrated the power of the old aphorism on the use of "the carrot and the stick". In this paper we have focused primarily on the "sticks" of the IC-TMDL and the flood management agreement, which continue to be the major motivating forces behind GSI implementation at the University of Connecticut. However, the "carrots" are gaining ground as the many benefits of GSI beyond regulatory compliance emerge. The large bioretention cells, many rain gardens, and green roofs are helping to transform the look of this "small city" into a greener place. In addition, many students now consider a university's environmental record as a factor in their decision on where to go to school; 60% of students and parents report that a college's commitment to environmental issues has an impact on their choice (The Princeton Review, 2015). The GSI features are a visible and in some cases dramatic demonstration of the University of Connecticut's commitment to environmental protection. The GSI focus has been a solid part of a greater environmental initiative at the University of Connecticut that has led to its being named by the Sierra Club in four consecutive years as one of the 10 "greenest" universities in the U.S. (Sierra Club, 2015). Faculty from the Center for Land Use Education and Research now field a steady stream of requests to lead tours of the campus GSI features for a wide variety of groups including municipal staff, nonprofit environmental organizations, researchers and regulatory staff.

As this paper has attempted to capture, there are many interconnected key factors that have combined to create this ongoing success story. Regulatory pressure was needed to get the ball rolling, and is needed to help keep up momentum and to provide a measuring stick with quantitative goals. A tracking system is needed to assess progress against these goals, and to survive the tracking effort has to be scientifically defensible yet affordable – a tough combination. Expertise, in this case both internal (faculty/staff) and external (consultants) is needed to establish priorities and guide implementation. And an internal champion, in this case the Office of Environmental Policy, needs to take ownership of the effort and continually insert the GSI agenda into the constant stream of day-to-day land use decisions made at the university. This agenda needs to be presented in the context of a realistic assessment of the cost/

benefits of GSI, particularly with regard to maintenance of these features. Finally, the positive, non-regulatory benefits of GSI need to be communicated to leadership (in this case university administration) in order to develop a loop that serves to continually reinforce the initiative. When these factors come together as they have at the University of Connecticut, the results can be dramatic.

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Customer Service: 800.286.5700

December 15, 2015

Dear Property Owner:

Connecticut Water will begin installing water main on Route 195 in Mansfield between the Railroad Bridge (near the Coventry town line) and St. Paul's. Town records show that you are a property owner along the construction route, and that is why we are sending this notice to you.

This work is being done as part of our project to bring water from our largest water system, which serves several communities in northern Connecticut, to the Mansfield area.

Construction is scheduled to begin this week and work hours will be 6 a.m. to 2:30 p.m., Monday through Friday. Most of this work in this area will done off the side of the road and will only occasionally require the use of a travel lane and alternating one-way traffic. Some of the work will disturb grassy areas and driveways at the edge of the road.

Our contractor will maintain access to driveways, but there may be a brief period as pipe is installed near a driveway apron that access to the driveway is blocked. This is the same contractor who has been working on the other portions of Route 195 for our project and who has worked diligently to minimize any inconveniences to other homeowners along the construction zone.

We anticipate working on this stretch of Route 195 for as long as weather permits. Work on portions of the project that are suspended due to winter weather conditions will resume in 2016.

We understand that Route 195 is heavily traveled in this area and we want to provide area residents and motorists with timely information on the water main project. Further, we will work closely with UConn and the Town of Mansfield to ensure that construction activities are suspended when there are major events planned.

Connecticut Water has launched a web page that provides detailed information and updates on the project and allows you to enroll for text and e-mail alerts for project updates and lane closures.

You can sign up directly for these alerts at www.ctwater.com/projects.

If you have any questions about our project please call Chris Wojciak, senior engineer, at (860) 292-2840.

Sincerely,

Craig J. Patla
Vice President of Engineering

ConnecticutWater

University of Connecticut and Town of Mansfield Water Main Project Construction Information

For more information, please visit the link on our website at ctwater.com/projects or contact Customer Service at 1-800-286-5700

Delivering Water Supply to University of Connecticut and Town of Mansfield

Connecticut Water is ready to deliver on our commitment to provide safe, reliable drinking water to meet the long-term water supply needs of the Town of Mansfield and the University of Connecticut.

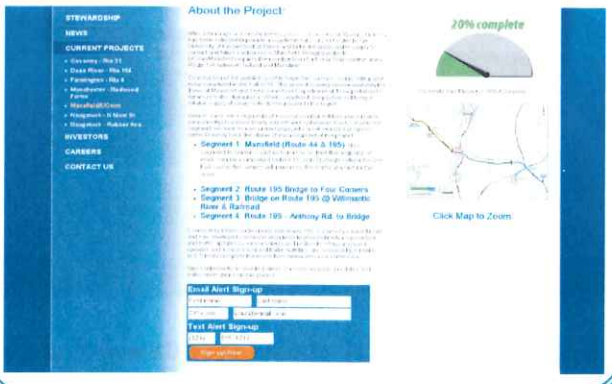
The project includes a five mile pipeline extension from Anthony Road in Tolland along Route 195 (Storrs Road) to the UConn "Delivery Point" at a meter vault located on Route 195 just south of Mansfield Supply.

Communications

A comprehensive digital communications tool has been developed to provide timely updates on construction status and potential impacts for property owners and drivers who may be affected by work on the project.

You are able to request direct email notifications and text alerts for project updates and traffic notifications on our Website.

Specific information on construction segments is available at www.ctwater.com/projects. Communications updates will also be provided through local communities and the University.



Project Overview

To provide for the most timely completion and delivery of the pipeline, the construction will be performed in 4 segments – with work on multiple segments being done concurrently with expected completion in 2016:

Segment 1: Mansfield (Route 44 & 195) – Crews have completed the installation of 7,000' of 16" pipe in Route195 from St. Paul's Church to the UConn "Delivery Point." Also Includes installation of 3,000' of 12" pipe in Route 44 working from the intersection of Route 195 west to Connecticut Water's system at Jensen's Rolling Hills. The final restoration work in the Four Corners area will be coordinated with the Town, consistent with other projects in the area.

Segment 2: Route 195 Railroad Bridge to St. Paul's Church – This is the Segment starting the week of December 14, 2015, and it involves installation of 8,900' of 16" pipe in Route 195 from Route 32 to St. Paul's Church.

Segment 3: Route 195 Between Willimantic River & Railroad Bridge – Stationary work site involving the crossing at Willimantic River and Railroad and some associated main in Route 195.

Segment 4: Route 195 - Anthony Road to Bridge – Installation of 9,700' of pipe in Route 195 from the Willimantic River Bridge West to Anthony Road in Tolland has been suspended and will resume in the spring of 2016.

- Hours of Work: Daytime construction, with adjustments as needed for special events or traffic flows.
- There will be multiple construction crews working concurrently within the project: Work may be done off road during winter as weather allows.

Serving Customers and Communities in Connecticut

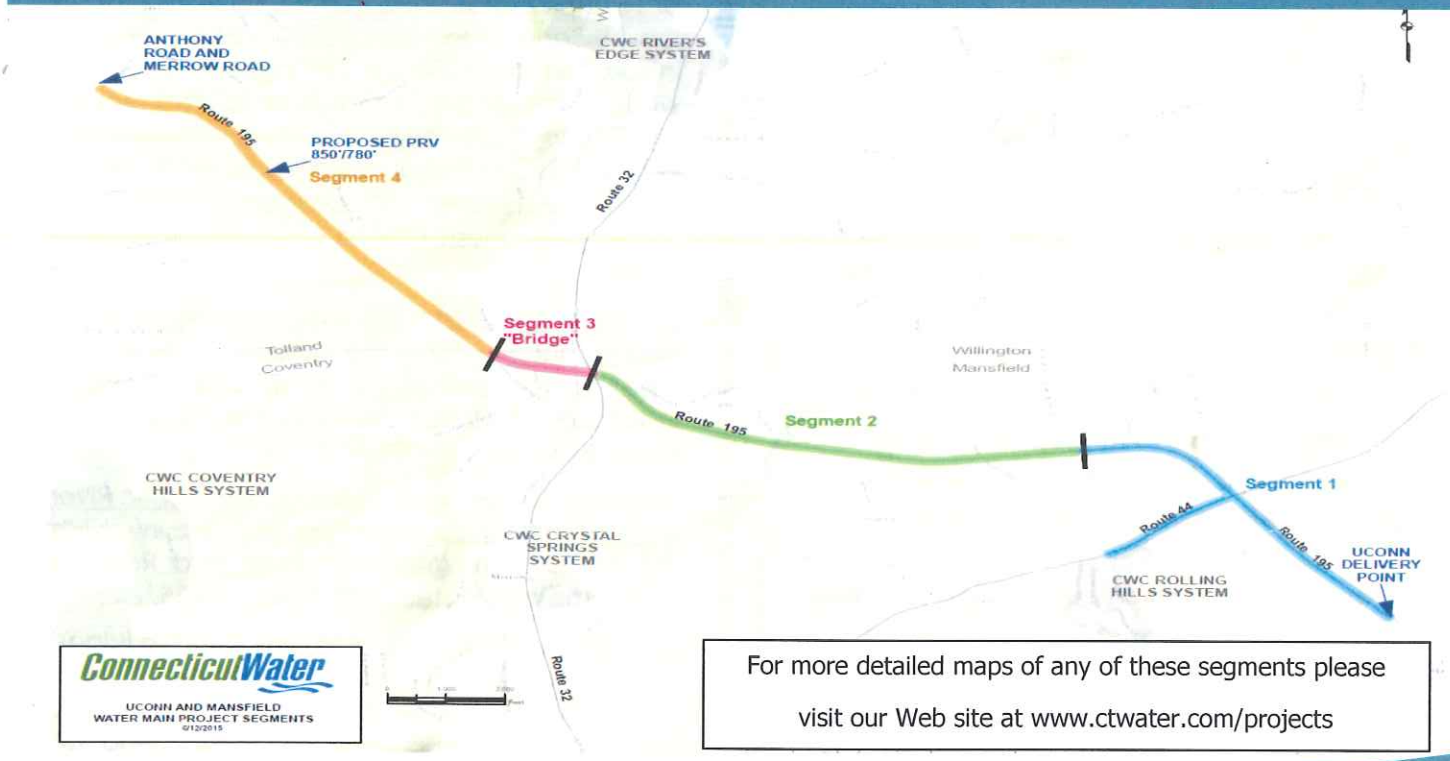
The construction project is broken into 4 segments, as shown below, with all work scheduled to be completed within 18 months.

- **Segment 1 – Has been completed. It started in July so that work in the area closest to the University and Four Corners could be performed when school was not in session to minimize the disruptions and traffic impacts.**
- **Segments 3 & 4 – Began in mid-August and is suspended until spring 2016.**
- **Segment 2 – Starts the week of December 14 and will continue as long as weather permits.**

VMS Construction has been hired to perform the work and Connecticut Water will have a designated representative on site if there are any questions during the project.

Anyone with questions on the project should contact Connecticut Water at 1-800-286-5700.

Sign up for timely construction updates at www.ctwater.com/projects



For more detailed maps of any of these segments please visit our Web site at www.ctwater.com/projects

Learn more at www.ctwater.com/projects

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Connecticut Water is proud to deliver quality water and service to 90,000 customers, or 300,000 people, in 56 Connecticut towns.

Safe, reliable water provides for public health, public safety and economic development for the customers and communities we serve.