

**THE ECONOMIC AND FISCAL IMPACTS OF
ALTERNATIVE BUILDOUTS ASSOCIATED WITH
THE INTERSTATE 84/ROUTE 8 INTERCHANGE
RECONFIGURATION**



**DEPARTMENT OF ECONOMIC AND COMMUNITY
DEVELOPMENT**

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EXECUTIVE SUMMARY

The Connecticut Department of Transportation (CONNDOT) requested that the Department of Economic and Community Development (DECD) perform an economic and fiscal impact analysis of future, hypothetical land development and buildout scenarios (hereinafter simply land buildout scenarios) for two conceptual Interstate 84/Route 8 (I-84/Rt. 8) interchange “Build” configurations defined in “Technical White Paper, Refinement of Alternatives, I-84/Route 8 Waterbury Interchange Needs Study,” (April 2007).¹ The purpose of this economic and fiscal analysis is to provide CONNDOT and the City of Waterbury with information to help select a preferred configuration concept for further consideration. We make the explicit assumptions that the interchange will have to be rebuilt at some future date, that the rebuild will improve the geometry of the interchange that will in turn improve safety and bring either configuration in conformance with national standards of highway design. In our analysis, we identify properties in the study area that are expected to be taken in whole or in part under each highway alternative “Build” concept and the property tax and employment consequences of the takings to the City of Waterbury.

The two configurations are combinations of three different road development plans. The first plan, known as Alternative 6, consists of improvements to existing local roads in the development area *excluding* reconstruction of the two highways. Under this plan, some local roads would be removed, and others added or modified. Some form of Alternative 6 is common to both interchange configurations.

The second and third plans consist of modifications to the two highways, I-84 and Route 8. The second plan, known as Alternative 7, would build new I-84 and Route 8 mainlines. Route 8 would follow the same right-of-way as the existing Route 8 configuration, but would change the geometry such that curves are straighter and entrances and exits are on the right-hand side. Under this alternative, the new I-84 eastbound and westbound mainlines would be located south of the current I-84 footprint. The third plan, known as Alternative 8, would also build new I-84 and Route 8 mainlines, but would move the entire interchange east of the Naugatuck River. The new I-84

¹ Prepared by Wilbur Smith Associates in association with Fitzgerald & Halliday, Inc., URS Corporation and AES, Keville Enterprises, Inc.

eastbound and westbound mainlines would run parallel to each other and would be located south of the current I-84 footprint. The new Route 8 northbound and southbound mainlines would run parallel to each other and would be located east of the Naugatuck River.

The first of the two configurations used for this economic analysis combines Alternatives 6 and 7, and is known as Alternative 6-7. The second configuration combines Alternative 6 and 8, and is known as Alternative 6-8.

We assume the first phase (Alternative 6) of road building begins in 2015 and takes three years to complete (Alternative 6). We assume the second road-building phase commences in 2025 and takes five years to complete for either highway reconfiguration (Alternatives 7 or 8). Therefore, given remediation, the hypothetical buildout scenarios under consideration would begin construction in 2030 and ramp up employment and sales in 2030. We assume as well that the proposed Greater Waterbury Intermodal Transportation Center (ITC) is built close to the existing Waterbury Metro North branch line train station and facilitates access to the proposed land development of the study area (defined below). Therefore, this exercise anticipates plausible futures that may not be realized as described herein. The information contained in this report provides a relative comparison of the alternatives considered. Costs and timelines are based solely on available information developed and gathered during the study process, and may change over time. The only certainty is that the multi-level I-84/Rt. 8 interchange must be rebuilt at some future date.

The study area contains several businesses, some of which have existed for decades. The study area also contains unused and vacant land. Most of the study area requires remediation if it is to be used for purposes other than industrial. A guiding principle in developing the buildout scenarios is to develop the land to its highest and best use (or at least to a higher and better use). This is a controversial ideal because defining such use is subject to political and ideological interpretation and is an emotional subject for some. Nevertheless, for purposes of this analysis, we propose a mixed-use development (consisting of office space, retail space, residential, and warehousing and distribution spaces) consistent with the area's character and location in Waterbury's central district.

Further, proximity to the ITC enhances the opportunity for mixed-use development (that is, transit-oriented development) as the case studies in Appendix A point out.

In each buildout scenario, we assume that the CL&P, MacDermid and Walgreen operations remain intact because their buildings are sound and consistent with our mixed use paradigm. We assume the businesses taken under either highway alternative would relocate within Waterbury. Some of these businesses (for example, the retail establishments) could relocate to the proposed mixed-use development. The existing commercial/industrial establishments in the affected area could conceivably relocate to a new industrial park further south and within the City of Waterbury.

For brevity, we report here the fiscal results of the four buildout scenarios under each highway alternative. Two buildout scenarios for each highway alternative develop the available land with the proposed ITC, and the other two scenarios develop the land but not the ITC. Tables E1 and E2 report the revenue and expenditure at the state and local levels and the net revenue that result under each highway alternative and each buildout scenario. Revenues consist of all taxes that arise from the direct and indirect economic activity generated in the construction and operation phases of the projects. Expenditure consists of all state and local spending arising from the direct and indirect economic activity generated in the construction and operation phases of the projects including debt service. State and local public expenditure changes are driven primarily by increased population that demands additional public services.

Tables E1 and E2 express the annual average change (impact) of key fiscal variables from the baseline or status quo forecast of the Connecticut economy over the study period (2015 through 2050) in 2006 dollars (that is, dollars adjusted for inflation). We include only fiscal results in these tables; economic impacts measured by annual average changes in gross state product, jobs, and personal income appear in the results section in the main report. We include fiscal results for the state as a whole and the City of Waterbury, reported here with and without the ITC for comparison. The fiscal results for the City and the state reflect the direct, indirect and induced effects (that is, the total effect) of demolition, remediation, road and building construction, and the subsequent increases in jobs, retail sales and all taxes thrown off by the new economic activity in each region, as well as debt service required to fund bond issue(s). In addition, the

results reflect the changes to the road network and in particular, safety improvements by virtue of changes in road geometry.

We note that for the land development no-buildout scenario under highway Alternative 6-7, the City and state fiscal results are the smallest (Table E1). These results include only road network changes (no land buildouts) and safety improvements with and without the ITC.

The fiscal results for the City and the state are greatest for Scenario 2 under highway Alternative 6-8 and appear in Table 8. These results obtain because the largest number of (high-paying) jobs occurs in this case (a mixture of warehouse/distribution, a medical arts building and commercial office and retail spaces). Fiscal results with the ITC are smaller because there is additional population attracted to metropolitan Waterbury without (necessarily any) job creation (the area is more attractive because it is more accessible with improved rail, bus, and shuttle services). The larger population demands increased public services driving public expenditure higher than without the ITC.

Except for the no land buildout scenario under highway Alternative 6-7, the City of Waterbury realizes \$7 million to \$10 million more annually in net tax revenue in each of the other scenarios. The City of Waterbury and the State of Connecticut maximize their net fiscal benefit under highway Alternative 6-8 (Scenario 2) in which there is a mixture of warehouse/distribution, a medical arts building and commercial office and retail spaces.

Table E1: Fiscal Impact of Alt. 6-7 Build-out Scenarios Average Annual Change, 2015-2050				
Variable	City of Waterbury		Connecticut	
	without ITC	with ITC	without ITC	with ITC
Alternative 6-7 Scenario 1 (No land buildout)				
Total Revenue (Millions 2006\$)	\$3.67	\$5.19	\$17.62	\$18.21
Total Expenditures (Millions 2006\$)	\$3.39	\$4.78	\$10.54	\$14.30
Net Revenue (Millions 2006\$)	\$0.29	\$0.41	\$7.08	\$3.91
Alternative 6-7 Scenario 2 (Mixed use + W/D)				
Total Revenue (Millions 2006\$)	\$24.89	\$26.08	\$74.51	\$74.70
Total Expenditures (Millions 2006\$)	\$17.89	\$18.98	\$51.74	\$54.69
Net Revenue (Millions 2006\$)	\$7.00	\$7.09	\$22.77	\$20.01

Source: REMI and DECD calculations.

Table E2: Fiscal Impact of Alt. 6-8 Build-out Scenarios Average Annual Change, 2015-2050				
Variable	City of Waterbury		Connecticut	
	without ITC	with ITC	without ITC	with ITC
Alternative 6-8 Scenario 1 (Residential)				
Total Revenue (Millions 2006\$)	\$30.93	\$32.92	\$83.38	\$86.36
Total Expenditures (Millions 2006\$)	\$21.28	\$23.11	\$61.08	\$66.22
Net Revenue (Millions 2006\$)	\$9.65	\$9.81	\$22.30	\$20.14
Alternative 6-8 Scenario 2 (Warehouse/Distribution)				
Total Revenue (Millions 2006\$)	\$33.14	\$35.20	\$92.96	\$97.29
Total Expenditures (Millions 2006\$)	\$23.34	\$25.24	\$67.15	\$72.62
Net Revenue (Millions 2006\$)	\$9.80	\$9.96	\$25.82	\$24.68

Source: REMI and DECD calculations.

INTRODUCTION AND OVERVIEW

The Connecticut Department of Transportation (CONNDOT) asked the Department of Economic and Community Development (DECD) to perform an economic and fiscal impact analysis of future, hypothetical land development (buildout) scenarios for two conceptual Interstate 84/Route 8 (I-84/Rt. 8) interchange “Build” configurations, as defined in “Technical White Paper, Refinement of Alternatives, I-84/Route 8 Waterbury Interchange Needs Study,” (April 2007). CONNDOT names these alternative highway configurations Alternative 6-7 and Alternative 6-8 for reasons explained below. The purpose of this economic and fiscal analysis is to provide CONNDOT and the City of Waterbury with information to help select a preferred configuration concept for further consideration. We make the explicit assumptions that the interchange will have to be rebuilt at some future date, and that the rebuild will improve the geometry of the interchange that will in turn improve safety and bring either configuration in conformance with national standards of highway design. Each alternative highway interchange configuration takes real properties on which businesses exist; there are no residential properties that are currently expected to be taken under either alternative. In our analysis, we identify properties that are currently expected to be taken in whole or in part (taking a sliver of a building implies the entire property is expected to be taken) under each highway alternative “Build” concept and the property tax and employment consequences of the takings to the City of Waterbury.

For purposes of this analysis, we assume there are no constraints to realizing the buildout scenarios we consider. That is, we assume that no zoning, flood plain or inland wetland restrictions impede the developments (buildouts) we describe below. We assume that the requisite level of brownfield remediation occurs so that buildouts may proceed. We make reasonable cost estimates and assume plausible sources of funding. If hard constraints emerge or evolve, the analysis herein can be modified.

We assume the first phase (Alternative 6) of road building begins in 2015 and takes three years to complete (Alternative 6). We assume the second phase of road building begins in 2025 and takes five years to complete (Alternatives 7 or 8). Therefore, the proposed land development (buildouts) in this analysis would begin construction in 2030 after remediation and subsequently ramp up employment and retail sales in 2032. We

assume as well that the proposed Intermodal Transportation Center (ITC) is built close to the existing Waterbury MetroNorth branch line train station and facilitates access to the proposed development of the study area (defined below). Therefore, this exercise anticipates plausible futures that may not be realized as described herein. The only certainty is that the multi-level I-84/Rt. 8 interchange must be rebuilt at some future date.

The study (affected) area is bounded on the north by West Main Street, is roughly bisected by Freight Street, is bounded on the west by the current Route 8 corridor, is bounded on the east by the MetroNorth tracks and on the south by the envelope (right-of-way) of the reconfigured I-84. Figures 1 through 5 below make the study area specific.

The study area contains several businesses, some of which have been there for decades. The study area also contains unused, vacant land. Most of the study area requires remediation if it is to be used for purposes other than industrial. A guiding principle in developing the buildout scenarios is to develop the land to its highest and best use (or at least to a higher and better use). This is a controversial ideal because defining such use is subject to political and ideological interpretation and is an emotional subject for some. Nevertheless, this analysis evaluates a proposed mixed-use development (consisting of office space, retail space, residential and warehousing and distribution space) consistent with the area's character and location in the City's central district. Further, proximity to the ITC enhances the opportunity for mixed-use development (that is, transit-oriented development) as the case studies in Appendix A illustrate.

In each buildout scenario, we assume that the CL&P, MacDermid and Walgreen operations remain intact because their buildings are sound, attractive and in keeping with our mixed use paradigm. Some of the CL&P land currently used for storage is currently expected to be taken under Alternative 6-8. We assume the businesses taken under either highway alternative would relocate within Waterbury. Some of these businesses (for example, the retail establishments) could relocate to the proposed development. The existing commercial/industrial establishments in the affected area could conceivably relocate to a new industrial park further south and within the City of Waterbury. Four retail establishments (Tools Plus, Petsmart, Sports Authority and

Jarjura's Market) are currently expected to be taken under either highway alternative because I-84 would be straightened and moved southward.

Highway Alternative 6

Highway Alternative 6 does not change the existing I-84/Rt. 8 mainline interchange. This alternative builds and reconfigures local roads on the ground under the elevated portions of the current highway beginning in 2015 depicted in Figure 1. Alternative 6 provides easier access to downtown Waterbury from the west side of the Naugatuck River without using the interstate for this purpose. Alternative 6 is slightly different for Alternatives 7 and 8 as shown in Figures 2 and 3. This alternative enhances the efficiency and effectiveness of the existing transportation system by improving transit, modifying signal timing and improving signage within the study area. The safety and operational enhancements achieved under this alternative would improve traffic operations as well as driver and pedestrian safety, particularly on local roads. Alternative 6 does not involve major structural modifications on the highway system.²

Figure 1 illustrates key features of Alternative 6 that include:

- New local connections from:
 - Sunnyside Avenue to Field Street;
 - West Main Street to Bank Street; and,
 - Bank Street to South Main Street
- A new bus circulator route to run between Brass Mill Mall and Waterbury Hospital to complement the existing bus system.
- The relocation of the existing bus travel terminal at the parking lot on Bank Street and the existing pulse point at the City Green to the existing train station. This would improve intermodal connections between bus and rail transit in the downtown area.
- Pedestrian and bicyclist facility improvements particularly near the existing rail station to enhance access to both rail and bus transit systems.

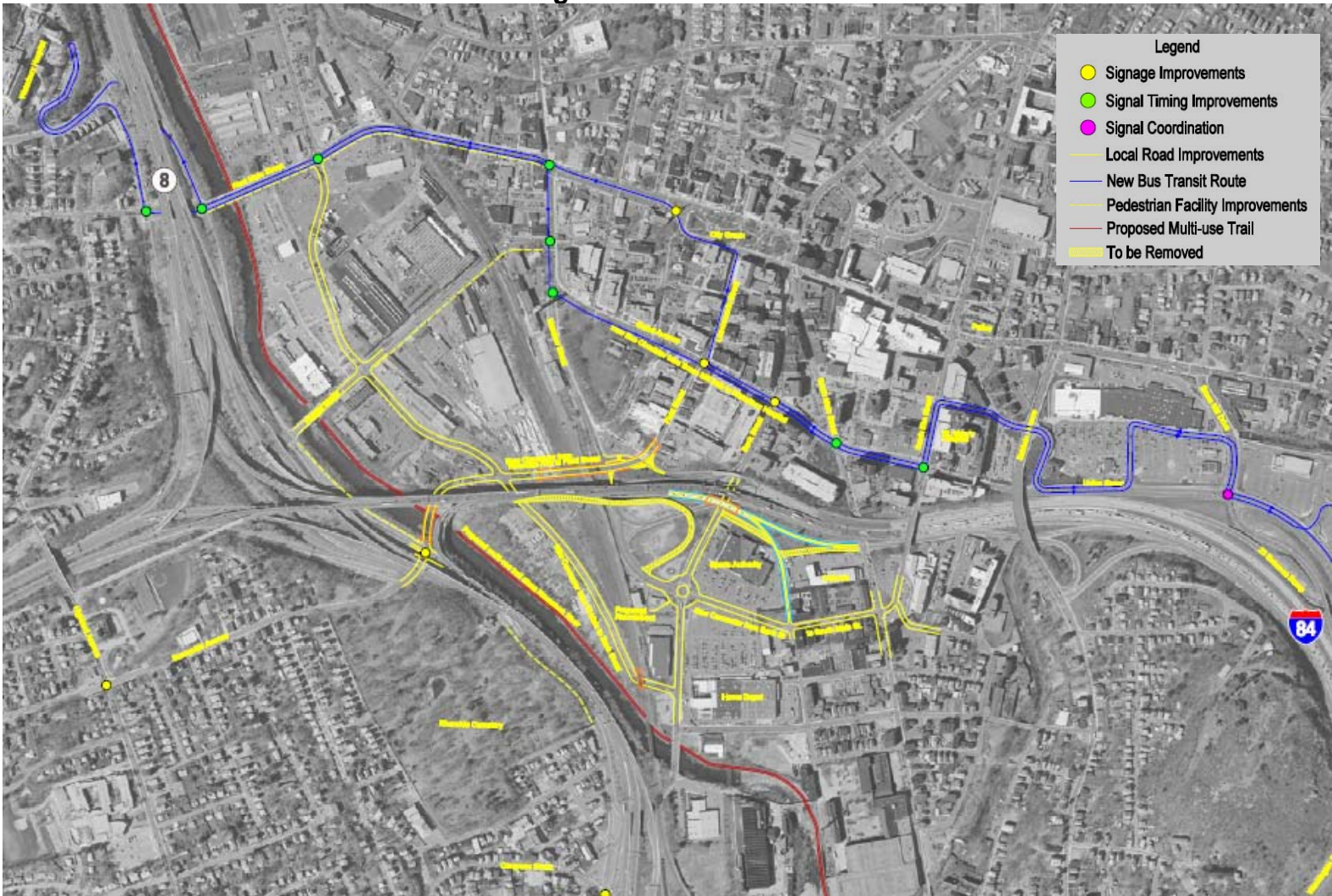
² This and the following paragraphs describing Alternatives 6, 7 and 8 have been adapted for accuracy and consistency from the "Technical White Paper, Refinement of Alternatives, I-84/Route 8 Waterbury Interchange Needs Study," State Project 151-301, Wilbur Smith Associates, April 2007.

- I-84 and Route 8 Signage/Way Finding improvements at the following locations to improve access to the highway system from downtown Waterbury:
 - City Green;
 - Intersection of Highland Avenue and Sunnyside Avenue;
 - Intersection of Mill Street and Baldwin Street; and,
 - Intersection of Bank Street and Meadow Street.
- Signal timing and coordination improvements at the Hamilton Avenue/Washington Street/Silver Lane intersection, Union Street/I-84 Entrance Ramp intersection, and Union Street/I-84 Exit Ramp/Brass Mill Mall Drive intersection to reduce congestion and delays on the Union Street corridor.
- Signal timing improvements on West Main Street/Thomaston Avenue intersection, West Main Street/Willow Street intersection and Freight Street/Willow Street intersection.
- The consolidation of the I-84 eastbound exit ramps to Meadow and South Main Streets.

Because Alternative 6 will likely be built in any case between 2015 and 2017, and will be slightly different depending on the highway configuration alternative chosen, we include Alternative 6 with Alternatives 7 and 8 and rename the two configurations as Alternative 6-7 and Alternative 6-8.

Note that the yellow lines on the map (Figure 1) are the Alternative 6 local roads, while the blue lines are bus routes.

Figure 1: Alternative 6



Source: Wilbur Smith & Associates, Inc.

Highway Alternative 7

Highway Alternative 7 follows the same right-of-way as the existing Route 8 configuration, but changes the geometry such that curves are straighter and entrances and exits are on the right-hand side eliminating crossing traffic (Figure 2). This brings the highway into conformance with national standards and improves safety. Conformance with national standards reduces confusion for travelers and trucks from outside Connecticut. This configuration requires substantial workarounds for existing traffic flows as it demolishes and rebuilds in place significant portions of the interchange. Thus, the construction period will create measurable slowdowns. The benefit however, is that it does not take property in the study area. Indeed, one buildout scenario under Alternative 7 is to leave the study area as it is.³

Alternative 7 expands mainline capacity and enhances roadway safety by reducing turbulent traffic flows resulting from the mix of local and high-speed through traffic. Under this alternative, frontage roads collect and distribute local traffic while the interstate mainline and associated high-speed ramps are dedicated to longer distance through trips. Under this alternative, new I-84 and Route 8 mainlines would be constructed. The new I-84 eastbound and westbound mainlines would run parallel to each other and would be located south of the current I-84 footprint. When complete, the new Route 8 mainline would, for the most part, remain within the existing footprint of Route 8.

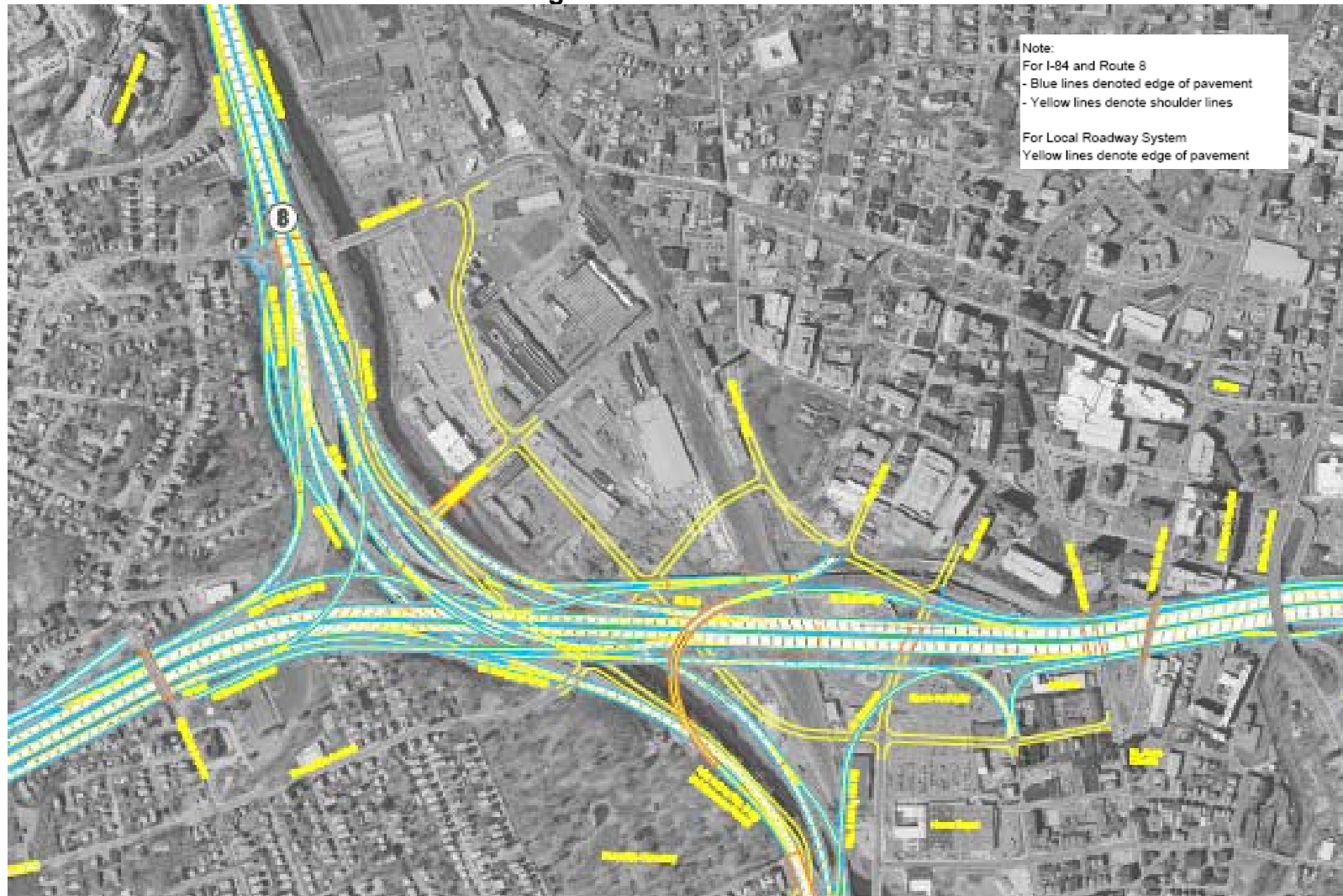
Figure 2 illustrates key features of Conceptual Alternative 7 and includes:

- New I-84 and Route 8 Mainlines;
- The introduction of a frontage road off the I-84 westbound exit ramp at Interchange 22 to reduce congestion on the I-84 mainline, west of Interchange 22;
- The consolidation and relocation of the existing I-84 ramps at interchange 18 to the area west of Country Club Road;
- The introduction of new entrance ramps from Field Street to I-84 westbound and Route 8;

³ The study area does not include the four retail establishments that are currently expected to be taken under either scenario: Tools Plus, Petsmart, Sports Authority and Jarjura's Market are located south of the study area and will be removed to make way for the straightened I-84 mainlines.

- The relocation of the Route 8 northbound exit ramp to I-84 eastbound at Interchange 30 further south to eliminate weaving on the Route 8 northbound mainline; and,
- New local connections from:
 - Sunnyside Avenue to Meadow Street; and,
 - West Main Street to South Main Street.

Figure 2: Alternative 6-7



Source: Wilbur Smith & Associates, Inc.

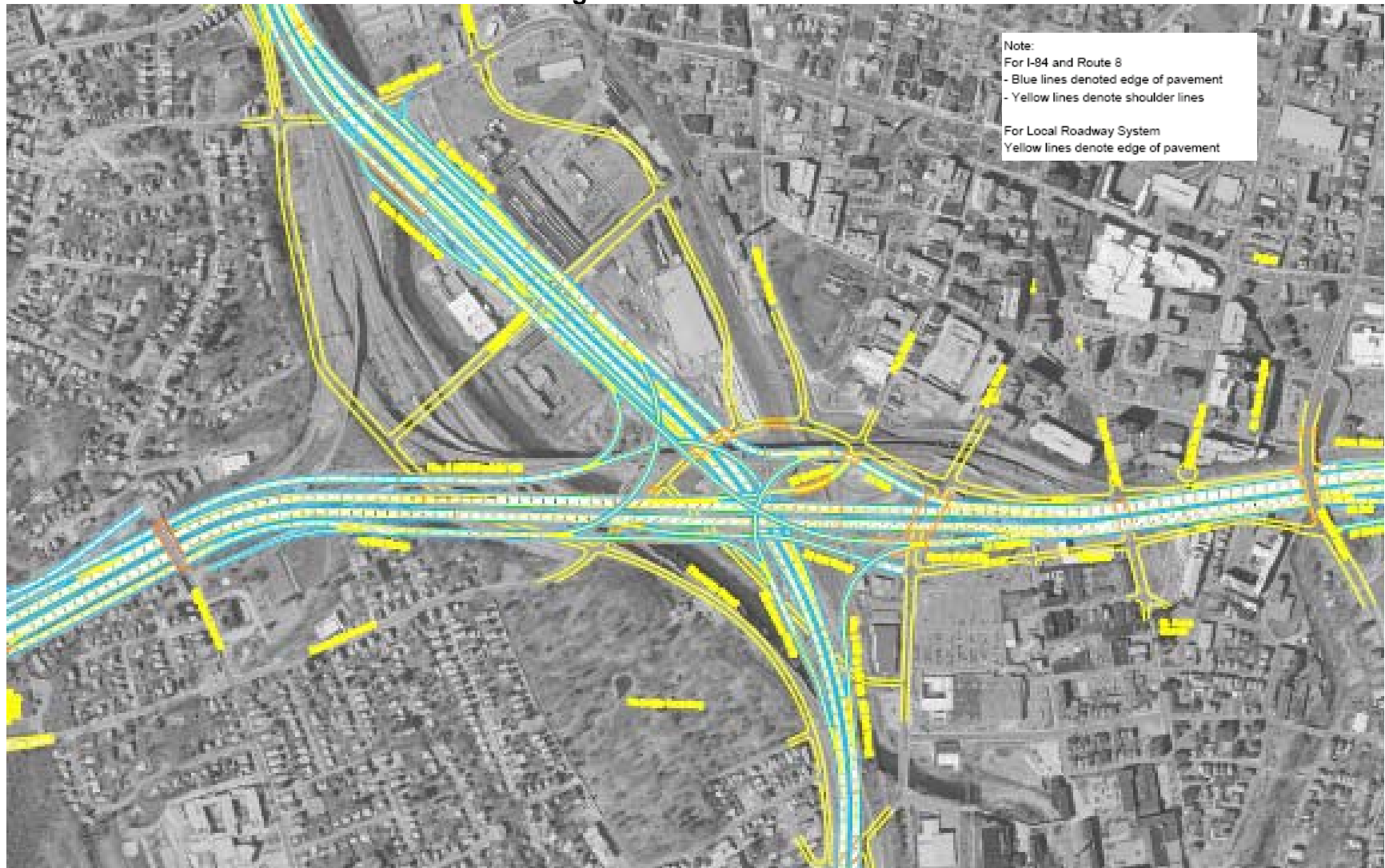
Highway Alternative 8

Highway Alternative 8 builds new I-84 and Route 8 mainlines. The new I-84 eastbound and westbound mainlines would run parallel to each other and would be located south of the current I-84 footprint. The new Route 8 northbound and southbound mainlines would run parallel to each other and would be located east of the Naugatuck River (Figure 3). This configuration takes several businesses in the area south of West Main Street and north of I-84. This configuration achieves straighter curves, creates entrances and exits on the right-hand side eliminating crossing traffic, brings the highway into conformance with national standards, and improves safety. In addition, relative to Alternative 7, this alternative minimizes construction staging, and maximizes local access using at-grade frontage roads.

Figure 3 illustrates key features of Alternative 8 and includes:

- New I-84 and Route 8 Mainlines;
- Two new interchanges at Freight and West Main Streets.
- The introduction of a frontage road off the I-84 westbound exit ramp at Interchange 22 to reduce congestion on the I-84 mainline, west of Interchange 22;
- The consolidation and relocation of the existing I-84 ramps at Interchange 18 to the area west of Country Club Road;
- The introduction of a new entrance ramp from Field Street to I-84 westbound.
- The relocation of Interchange 30 on Route 8 from the Washington Street area to Fifth Street;
- The relocation of the Route 8 northbound exit ramp to I-84 eastbound at Interchange 30 further south to eliminate weaving on the Route 8 northbound mainline;
- New local connections from:
 - Sunnyside Avenue to South Main Street;
 - West Main Street to Meadow Street area;
 - West Main Street to Washington Avenue; and,
 - Bank Street to Baldwin Street; and,
- The conversion of South Leonard Street to a two-way street, south of Washington Avenue.

Figure 3: Alternative 6-8



Source: Wilbur Smith & Associates, Inc.

BUILDOUT SCENARIOS

For each highway configuration, we imagine two buildout scenarios that incorporate the principle of higher and better use, mixed-use and high-density use (except for one scenario under Alternative 6-7 that preserves the status quo). Under Alternative 6-8, we envision residential space in one scenario and warehouse/distribution space in the other on the west side of the Naugatuck River because part of Route 8 will be razed and reconstructed on the east side. The land on which the to-be-razed section of Route 8 exists will be available for development when the unused part (the relocated portion; see Figure 3) of Route 8 is torn down. We assume this land will require little or no remediation and is thus suitable for residential use.⁴

We assume that the land east of the CL&P and MacDermid properties between West Main Street, I-84 and the MetroNorth tracks that several businesses currently occupy would be cleared, remediated and redeveloped under both highway alternatives; however, one scenario under highway Alternative 6-7 leaves this land as is. This land would be available for redevelopment after Alternative 6-7 (in one buildout scenario) or Alternative 6-8 is completed (in 2032 after demolition and cleanup of the unused portion of Route 8 under Alternative 6-7) and we assume existing structures are razed and the land is remediated to a level consistent with office, retail, parking garage and warehousing/distribution uses.

Under Alternative 6-7, the land on the west side of the Naugatuck River would not be available and more land on the east side of the Naugatuck River would be (because Alternative 6-7 does not require land east of the Naugatuck River in the study area; see Figure 2). As mentioned, one development scenario under Alternative 6-7 leaves this land untouched (no buildout). The second scenario we envision under Alternative 6-7 builds out a mixture of office, retail, parking and warehouse/distribution spaces east of the River after the land is cleared and remediated.

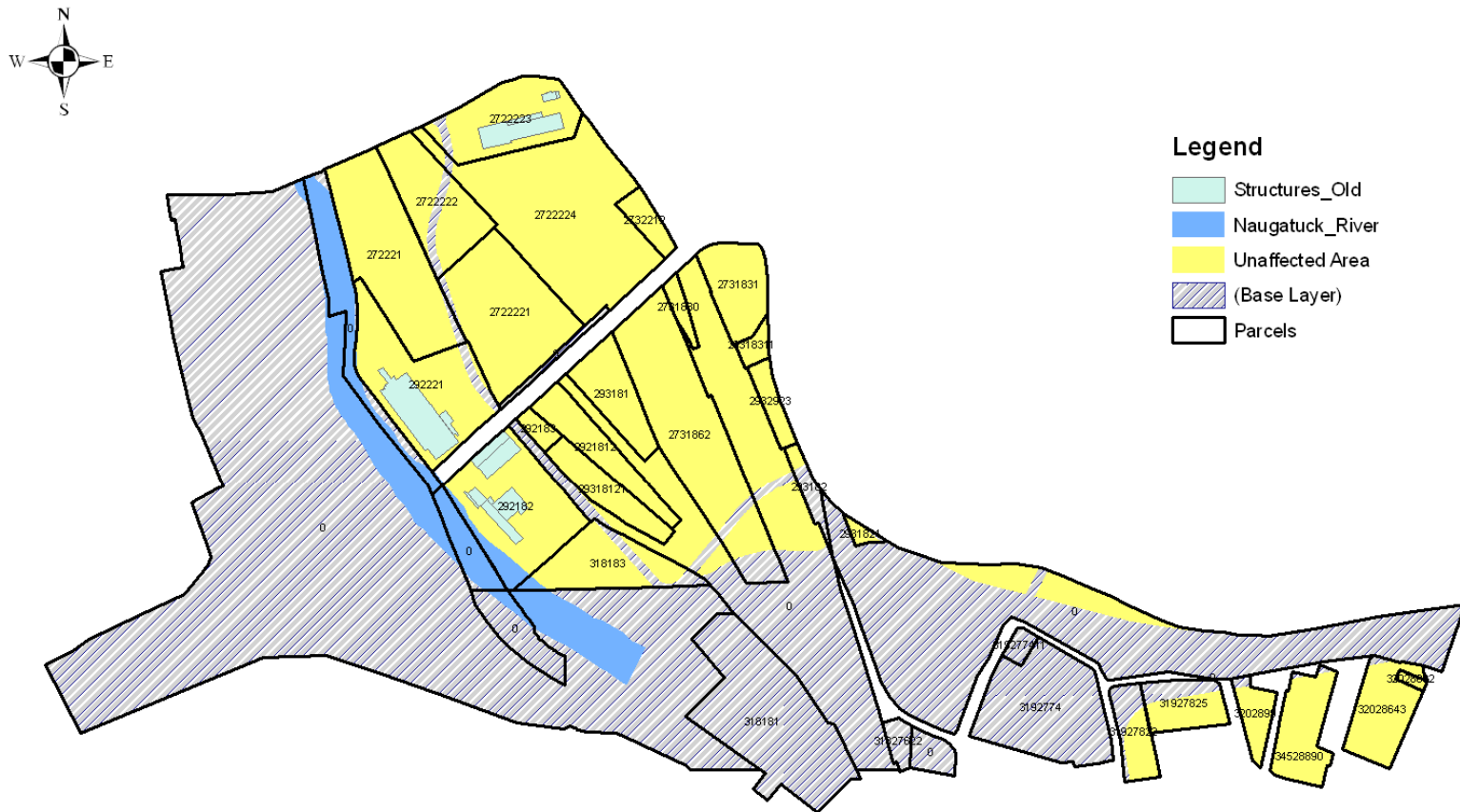
⁴ Gregory Dorosh of CONNDOT's Environmental Compliance Unit stated that no sample soil reports for this part of Route 8 are available, but he expects that the soil under the current Route 8 footprint in this area is not likely to be heavily contaminated. If there is any contamination, it would be mild and as the result of rain runoff from the highway (petroleum/oil from car accidents, lead/hydrocarbons from vehicle emissions, etc) and could be remedied with minor soil removal. Mr. Dorosh said that any major hazards that have occurred in this area since the highway was built would have been cleaned up by the DEP.

Our buildout analysis is parametric and scalable. That is, we assume structures occupy a decidable fraction of the available land under each buildout scenario. This provides for the remainder to contain infrastructure such as access roads, sidewalks, tree lawns and green spaces in plots too small for structures. We assume that a mixture of structures such as office buildings, a medical arts building (possibly a cooperative venture between St. Mary's and Waterbury Hospitals), a parking garage, residential (rental) units, and warehousing/distribution structure(s) occupy the remaining available land. The fraction of space (footprint) occupied by each type of structure (the mixture) is variable. Figures 4 and 5 show the footprints of Alternatives 6-7 and 6-8 and the CL&P, MacDermid and Walgreens (in the northeast corner of the study area) establishments. Figure 4 shows residential unit clusters as one development scenario under Alternative 6-8. In the second land buildout scenario under this highway alternative, warehouse/distribution establishments instead would occupy this land. As mentioned, under Alternative 6-7, we assume there is no residential development. This is because it would require an inordinate cost for remediation to residential standards for the land available east of the Naugatuck River. Figures 4 and 5 show the affected parcels under each highway alternative that correlates with Table 1 below. The blue strip in each figure is the photogrammetric footprint of the Naugatuck River, while the polygon approximately overlying it with parcel number '0' is the Assessor's rendition of the River. We digitized each parcel from the Waterbury Assessor's online maps⁵ and verified and modified them from deeds obtained from the Waterbury Town Clerk. For certain affected properties, we identified discrepancies between the Assessor's online property cards⁶ (specifically, the parcel's area) and our digitized and verified version of these parcels.

⁵ See <http://waterburyct.org/content/500/535/1850.aspx>

⁶ See <http://www.waterburyrealestate.org/propertymax/rover30.asp>

Figure 4: Alternative 6-7 Footprint and Buildout Prospect



Source: Waterbury land records and DECD GIS

[illegible]

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For simplicity, we assume that office buildings, residential structures, and parking garage(s) are three stories high (except the medical office building that is two stories high and the parking garage(s) that would have two levels below grade). These assumptions are easily changed as the land buildout analysis is parametric. Using estimates for per square foot construction costs of these building types from R.S. Means⁷, we estimate total construction costs. Using average sales per square foot for retail from the Urban Land Institute⁸, we obtain aggregate retail sales for the relevant development scenarios, and, using 387 square feet per office worker⁹, we obtain employment in the 'Professional, Scientific, and Technical Services' (NAICS 54) and 'Administrative and Support Services' (NAICS 561) [split 50/50] sectors. We use 1,700 square feet per worker in the warehousing/distribution establishments (see footnote 9).

We assume 'Professional, Scientific, and Technical Services' (NAICS 54) and 'Administrative and Support Services' (NAICS 561) contain the most likely type of establishment to locate in this area. Businesses in the 'Professional, Scientific, and Technical Services' industry include legal services, accounting, tax preparation, bookkeeping and payroll services, architectural, engineering and related services, specialized design services, computer systems design and related services, management, scientific and technical consulting services, scientific research and development services, advertising and related services, and other professional, scientific and technical services. Businesses in the 'Administrative and Support Services' industry include office administrative services, facilities support services, employment services, business support services, travel arrangement and reservation services, investigation and security services, services to buildings and dwellings, and other support services.

The following narrative and Table 1 below summarize the land buildout scenarios under each highway alternative. Of the total land available, we assume 75% contains structures (that is, 75% is buildable land); the remainder contains roads, walkways, greenery, emergency and handicapped parking and load zones. All utilities are underground.

⁷ See www.rsmeans.com

⁸ See *Dollars and Cents of Shopping Centers*, Urban Land Institute, 2004.

⁹ From eia.doe.gov

Alternative 6-7

Scenario 1: No new development; the area east of the River stays as is.

Scenario 2: Warehouse/distribution establishments, office space and parking east of the River area such that:

- ❑ Warehouse/distribution establishments occupy 26% of buildable land;
- ❑ The office space (footprint) occupies 65% of developable land such that:
 - There are several 3-story buildings;
 - A 1st floor consisting of 2/3 retail space, 1/3 restaurant, with gross sales obtained from sales per square foot estimates (see footnote 5); and
 - The 2nd and 3rd floors house office space.
- ❑ Parking occupies 9% of buildable land such that we have:
 - One or more 5-level parking garages; and,
 - Each parking space is 350 square feet including driveways and access lanes,¹⁰ yielding 1,500 spaces.

Alternative 6-8

Scenario 1: Residential structures occupy 50% of the west of River buildable area such that:

- The average residential unit size is 1,500 square feet;
- Residents increase by 20% each year for 5 years;
- The median household income of new tenants (that is, renters) in 2030 is \$95,000; this is equivalent to an annual household income of \$50,000 in 2008, with an annual inflation rate of 3%.
- We assume the rental rate is \$1.50 per square foot in 2006 dollars. This is based on Waterbury listings at www.condo.com, which range from \$0.93 per square foot to \$1.88 per square foot, with studios accounting for all of the higher per square foot rate listings. The average rate of these listings is \$1.27 per square foot. Our higher assumed rate reflects the more up-scale residential units we envision for this area in Waterbury. For comparison, the average rent per square foot in the new Trumbull-on-the-Park residential complex in Hartford is \$1.95 (based on 2007 Tenant Profile data provided by the Connecticut Housing Finance Authority, or CHFA).

¹⁰ *Parking Management: Strategies, Evaluation and Planning*, www.vtpi.org, August 2007.

- Consumers spend 65% of their income; expenditures in each consumer expenditure category follow the average consumption pattern predicted by REMI (See Appendix B) for the period 2006-2050.

Scenario 2: Warehouse/distribution structures occupy 70% of the west of River buildable area.

Each Scenario: Types of Buildings for east of River buildable area:

- Office space (footprint) occupies 69% of buildable land such that we have:
 - Several 3-story buildings;
 - A 1st floor consisting of 2/3 retail space, 1/3 restaurant, with sales obtained from sales per square foot estimates (see footnote 5); and,
 - The 2nd and 3rd floors house office space.
- A parking footprint occupying 20% of buildable land such that we have:
 - One or more 5-level parking garages; and,
 - 1,820 parking spaces of 350 square feet each including driveways and access lanes (see footnote 7), and
- A two-story medical office building occupying 11% of the buildable land.

Estimating Furniture, Fixtures and Equipment (FF&E) Costs

A general rule to estimate FF&E expenses when detailed cost data is not available is to estimate them as a fraction of total construction costs. A common range is 8%-15% of construction costs.¹¹ We assume FF&E expenses at 8% of total construction costs for the warehouse/distribution establishments; 10% for office, retail and restaurant; and 15% for the medical office building. We assume businesses purchase FF&E wholesale; therefore 40% of gross FF&E purchases affect Connecticut's economy as we assume such goods as machines, forklifts, computers, and office furniture are not manufactured in the state. FF&E purchases occur in 2031 the final year of construction.

Table 1 shows the land use scenarios for each highway alternative. Notably, more land is available for development under Alternative 6-8 than under Alternative 6-7. This results from the sizable parcel of land freed up when Route 8 is razed and reconstructed

¹¹ Source: Illinois Institute of Technology, College of Architecture (www.gl.iit.edu/grc/information/est.doc)

on the east side of the Naugatuck River. Table 1 also shows the direct employment and sales per square foot corresponding to each buildout. For retail and restaurant establishments we use sales per square foot rather than direct employment; therefore, the reported employment numbers (jobs) understate direct employment.

Table 1: Buildout Scenarios for Highway Alternatives 6-7 and 6-8

Development Alternative	Location	Land Available (sq ft)	Percent Used	Land Area Built (sq ft)	Build-Out Developments													
					Residential (3-story)		Office Buildings (3-story)					Medical Office (2-story)		Warehousing		Parking (5 levels)		
					Percent	Total Area	Percent	Land Area	Retail Space	Restaurant Space	Office Space	Percent	Total Area	Percent	Total Area	Percent	Total Area	Spaces
Alternative 6-7																		
Scenario 1 (No buildout)	East of River	1,659,786	0%	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scenario 2	East of River	1,659,786	75%	1,244,839	-	-	65%	809,146	542,128	267,018	1,618,291	-	-	26%	323,658	9%	560,178	1,600
Direct Employment Change					-	-	-	-	-	-	4,182	-	-	-	190	-	-	-
Total Sales Change (2006\$)					-	-	-	-	\$121,930,343	\$79,318,246	-	-	-	-	-	-	-	-
Alternative 6-8																		
Scenario 1	West of River	1,603,360	75%	1,202,520	50%	1,803,780	-	-	-	-	-	-	-	-	-	-	-	-
Scenario 2	West of River	1,603,360	75%	1,202,520	-	-	-	-	-	-	-	-	-	70%	841,764	-	-	-
Scenarios 1 & 2	East of River	1,525,401	75%	1,144,050	-	-	69%	789,395	528,895	260,500	1,578,790	11%	251,691	-	-	20%	1,144,050	3,268
Total		3,128,761	-	2,346,570	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Direct Employment Change					-	-	-	-	-	-	4,080	-	527	-	495	-	-	-
Total Sales Change (2006\$)					-	-	-	-	\$118,954,090	\$77,382,131	-	-	-	-	-	-	-	-

Source: Waterbury land records and DECD calculations

THE GREATER WATERBURY INTERMODAL TRANSPORTATION CENTER

The Greater Waterbury Intermodal Transportation Center (ITC), as proposed would consolidate public transportation providers in one location in downtown Waterbury. These providers include: Metro-North Railroad (commuter rail), Connecticut Limousine (airport service), Land/Jet Bus Lines (specialized service to Connecticut casinos), Bonanza Bus (intercity bus), Connecticut (CT) Transit operated by North East Transportation (local bus), and Yellow Cab (taxi). The ITC will accommodate auto, bicycle, and pedestrian traffic and afford easy access to the Waterbury Green central business area. The ITC thus created will facilitate development (if the City of Waterbury so chooses) of land roughly bordered on the north by West Main Street, on the west by the Naugatuck River, on the south by I-84 and on the east by the MetroNorth tracks. Several industrial businesses currently occupy this area. The proposed Transportation Center is consistent with the Governor's 'Responsible Growth' initiative and with principles of transit-oriented development described below. To the extent that this and subsequent developments reduce carbon emissions, Connecticut partially satisfies its commitment to the Regional Greenhouse Gas Initiative (RGGI).¹²

Current Situation

The downtown Waterbury terminal for the North East Transportation buses is currently located around the City's central downtown park, known as the "Green." Bus shelters are located around the Green, and local buses make stops at various boarding stops along the streets around the Green.

Bonanza Bus, Land/Jet Bus Lines, and Connecticut Limousine house administrative offices and operate out of the Travel Center in downtown Waterbury located at the corner of Bank and Grand Streets in the municipal parking garage. The owners of the Travel Center own and operate a travel agency on the premises, and operate the Land/Jet Bus Lines. They are agents for Bonanza Bus Lines and Connecticut Limousine as well.

The owners of the Travel Center prefer their current site to an alternative for several reasons. The first is easy and high-quality access to I-84 that the three transportation

¹² See <http://www.rggi.org/>.

providers use as their main access point to Waterbury. The second is the ample availability of parking spaces for patrons at the municipal parking garage. The third is the strong presence of offices and businesses along Bank and Grand Streets, which support the Travel Center's operations. The Center's owners cite a few concerns regarding a move to a new location. The first is the potential for increased costs at a new facility (the Travel Center estimates they would need 1,200 square feet, including space for the travel agency, and parking availability may be an issue). The second concerns the increased competition the providers are likely to face from Metro-North Railroad.

Proposed Waterbury Intermodal Transportation Center (ITC)

The proposed ITC location is adjacent to the existing train station, on Meadow Street, between Freight Street and I-84. The objectives of a new transportation center are to:

1. Ease automotive and pedestrian congestion in downtown Waterbury;
2. Restore the Waterbury Green to its original civic function;
3. Consolidate modes of transportation into one transportation center;
4. Increase safety and convenience of transit patrons and service providers;
5. Encourage transit ridership;
6. Support economic development; and,
7. Stimulate economic redevelopment.¹³

The economic development listed in objective (6) refers to downtown Waterbury economic development initiatives that some believe would greatly improve by the relocation of bus operations from the Green. Economic redevelopment in objective (7) is the redevelopment as described above of a 77-acre industrial and underutilized area located along Freight Street, west of downtown and east of the Naugatuck River. Some parcels in this area are vacant industrial sites that require extensive remediation. Some people expect the location of the Transportation Center at nearby Meadow Street to serve as a catalyst to the redevelopment of this area. Indeed, transit-oriented development principles and examples support this expectation.

¹³ *Greater Waterbury Transportation Center Needs and Feasibility Study*, DMJM Harris, June 2006 prepared for DECD.

Some private operators (Land/Jet Bus, Connecticut Limousine, and Bonanza Bus) currently operate out of the Travel Center on Bank Street. They are satisfied with their current location so it is not certain that they will move to the new ITC. Among their concerns regarding a move are the ability to conduct administrative functions in addition to their travel agents at the new facility, increased rents, and availability of adequate covered parking for their patrons.

Four transit-oriented development case studies that illustrate the potential for enhancing density, reducing automobile use, increasing the attractiveness of a region and adaptively reusing under-utilized and centrally-located land appear in Appendix A.

The Benefits of Transit-Oriented Development

Transit-oriented development (TOD) and intermodal transportation centers (ITCs) can provide several benefits, as the case studies in Appendix A demonstrate. They provide:

1. Infrastructure improvements – ITCs can turn key transfer stations into focal points of the surrounding communities with landscaping, pedestrian walkways, lighting, vibrant paint and tilework, and transformed neighborhoods. As a result, ITCs can increase transit ridership and infrastructure re-investment in the community. TOD supports workforce housing projects, and parking facilities within one quarter mile (1,300 feet) of transit stations (a ten-minute walk).
2. Spinoff development - Public transportation spurs economic development and revitalization. It is responsible for creating beautiful, walkable neighborhoods combining public transportation and mixed uses. Widening sidewalks and adding bikeways provide dramatic impact and value. The benefits of enhancing public transit through principles of TOD increase property values, tax revenues, and revitalization.¹⁴ Reduced automobile use reduces the region's carbon footprint and mitigates climate change.
3. Create a Sense of Place - Public transit centers and bus stops in the heart of the community reduces the need for parking spaces and creates a community landmark.

¹⁴“10 Ways to Enhance Your Community: Unleash the Power of Public Transportation,” APTA Public Transportation Partnership for Tomorrow.

Done correctly, a transit center can be a place centered around attractive features such as planters, benches, fountains and public art—creating a place where people want to spend time shopping, playing, living and working. A well-designed transportation infrastructure improvement can improve a place's image, and attract people and businesses.¹⁵

Modeling the ITC

The ITC increases access to labor and commodities (intermediate inputs) in the region (New Haven County). This in turn reduces costs to producers and workers in the region and enhances the attractiveness of the region as a place to work and as a place to do business. The ITC through its highway and rail connection through New Haven to New York City and points west and to Boston and points east, enhances Waterbury's competitiveness as regional producer of goods and services and as a place to live. We assume the ITC creates an additional 1,500 jobs in New Haven County because of improved access in the warehouse/distribution (NAICS 484 and 493), professional services (NAICS 54) and administrative and support services (NAICS 561) sectors. These jobs are in addition to the direct jobs created in each land buildout scenario. We model this effect as a percent change in the labor access index for each industry mentioned above in the Connecticut Economic Model (REMI).¹⁶

Changes in Commuter Patterns

The following maps provided by the Connecticut Economic Resource Council (CERC) show the change in commuter patterns in Connecticut from 1990 to 2000. Of particular interest to DECD is the change in commuter patterns to and from the New Haven area and Waterbury. A net increase in commuters between the two regions can further illustrate the attractiveness of an ITC for Waterbury and the need for improved public transport (e.g., rail) to facilitate movement among the region's cities.

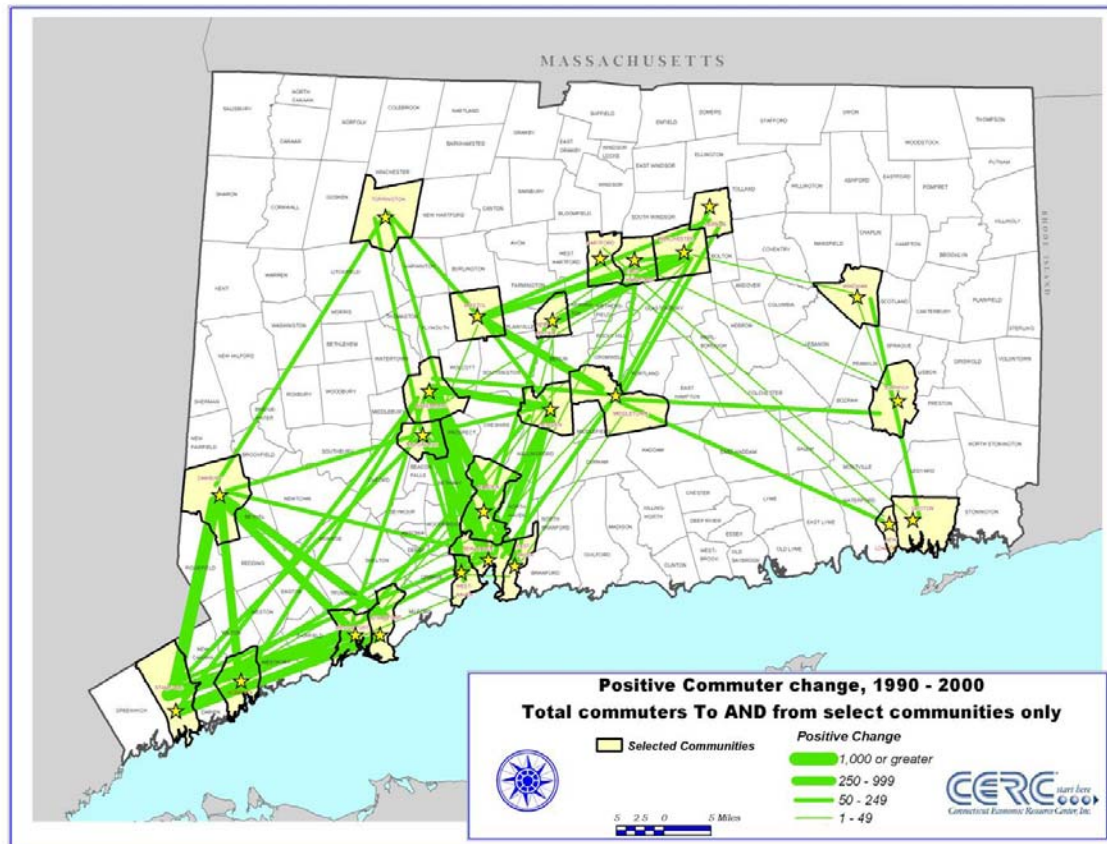
Map 1 shows the increase in commuting (number of commuters) between New Haven and Waterbury. The width of the connecting lines between Waterbury and New Haven

¹⁵Southeastern Regional Planning & Economic Development District (November 2005), Wareham Intermodal Transportation Center Site Analysis, p. 11. <http://www.srpedd.org/WarehamITC.pdf>.

¹⁶ REMI is available from Regional Economic Models, Inc. of Amherst, MA. We describe the model in Appendix B.

and Waterbury and Hamden suggest a significant increase in the number of commuters travelling between these cities over the ten-year period ending in 2000.

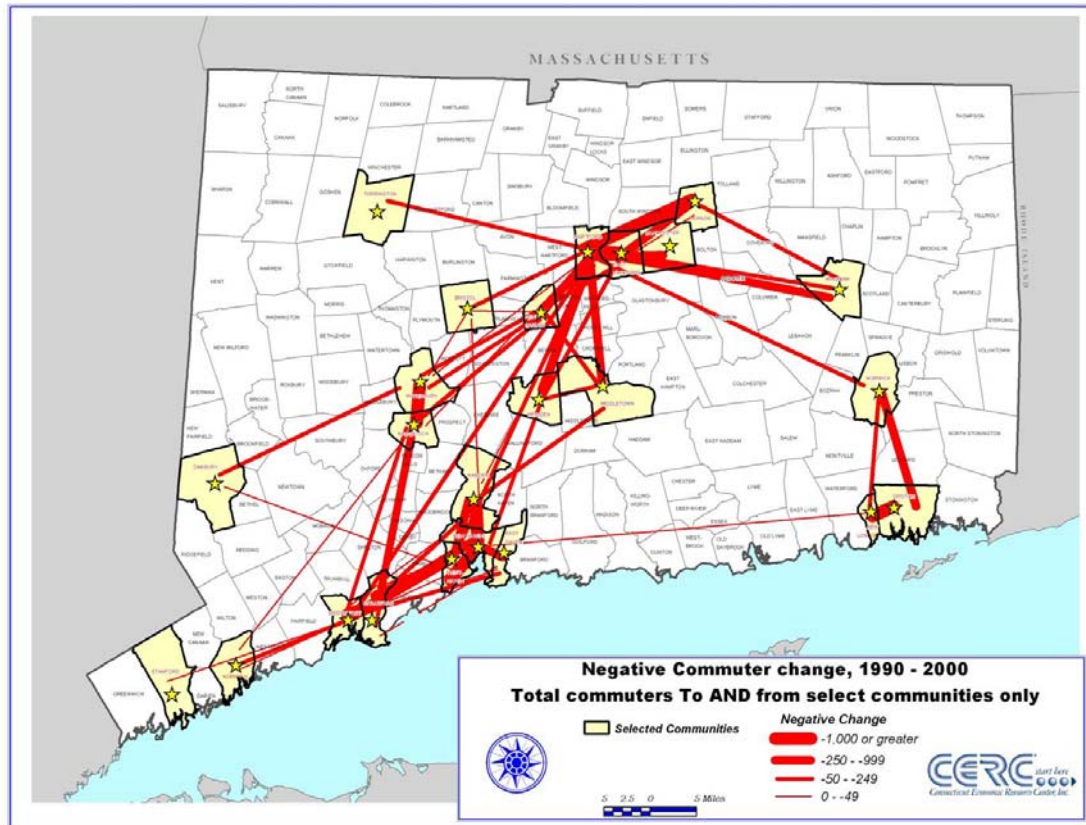
Map 1: Positive Commuter Change, 1990 - 2000



Source: CERC and Census data

Map 2 shows the decrease in commuting between New Haven and Waterbury. The lack of a connecting line between Waterbury and New Haven suggests that there was no decline in the number of commuters making the trip between these two cities from 1990 to 2000.

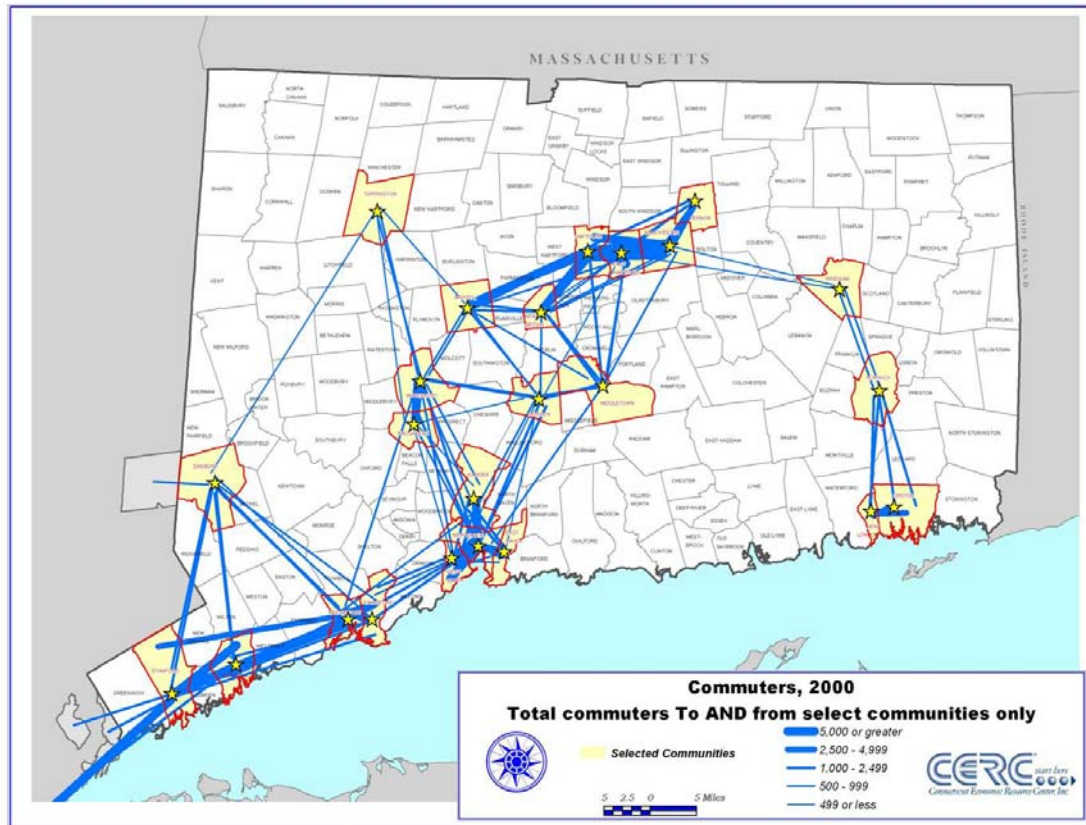
Map 2: Negative Commuter Change, 1900 - 2000



Source: CERC and Census data

These two maps suggest that there has been a net increase in commuters between New Haven and Waterbury. Map 3 shows the level of commuters between key Connecticut cities in 2000. Comparing the total number of commuters in 2000 with the change in commuters over the preceding ten years shows that the Waterbury-New Haven link is the fastest-growing commuter travel route originating or ending in Waterbury, among the selected cities illustrated in these maps.

Map 3: Total Commuters To and From Select Communities



Source: CERC and Census data

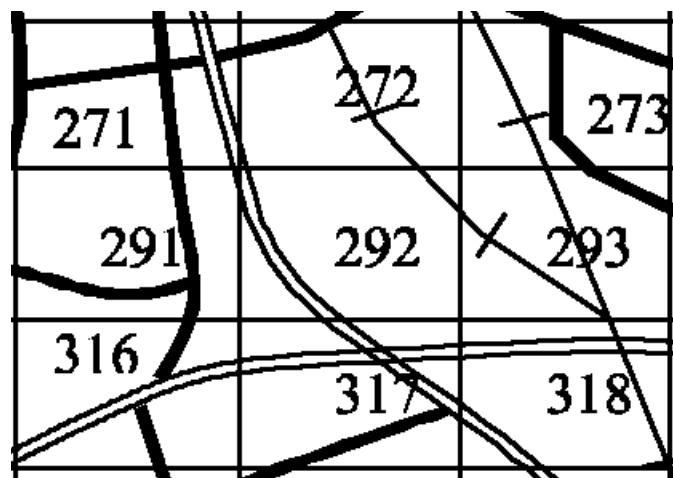
Whether these new commuters live in Waterbury or work elsewhere, or work in Waterbury and live elsewhere, the transportation improvements and buildouts as envisioned in this study will further enhance this commuter trend. The improved highway configuration and accompanying local road developments and improved transit systems will facilitate commuting, and an ITC will provide several transportation alternatives in one place, easing commuter costs significantly. Both workers and residents will be attracted to Waterbury as employment opportunities grow and new residential units become available. These commuter patterns show that Waterbury is already an attractive place to live or work, and infrastructure improvements and economic developments, such as those visualized in this study, will serve to increase the City's potential for economic development.

THE I-84/ROUTE 8 INTERCHANGE FISCAL AND EMPLOYMENT ANALYSIS

We identify the assessed value and associated taxes on property currently on the Waterbury Grand List and employment that would be lost or relocated because of highway reconstruction. The Waterbury Assessor's Office provides parcel maps and property card data online including specific data on assessed value, the assessment ratio, mill rate, and property sales prices. The data allow estimation of the assessed value for each parcel (land and buildings) in the study area. Parcel identification numbers consist of map, block, and lot numbers. Figure 6 indicates the array of Assessor's maps (by map number) we use to define the study area in detail. Each map contains the parcels we digitized to calculate the land area taken and that remaining for development.

Assessor's maps 319 and 320 do not appear to the south and east of Map 318 because no development (buildout) occurs there (the parcels in these maps are outside the study area; see Tables 2 and 3) and four properties are currently expected to be taken under either highway alternative (Petsmart, Sports Authority, Tools Plus, and Jarjura's Market). Note the intersection of the existing I-84 and Rt. 8 where the parallel lines cross in Map 317.

Figure 6: Assessor's Maps for Study Area



Source: Waterbury land records and DECD calculations

Table 2 (Alternative 6-7) and Table 3 (Alternative 6-8) below show each parcel affected by highway construction including those parcels in the study area defined above in which

buildouts occur. These Tables show the land area of each parcel affected and the fraction of each parcel where property would be partially taken by highway construction (100 percent if either wholly taken or a slice of a building taken and 0 percent if unaffected). In addition, properties are currently expected to be taken for each land buildout scenario. We calculate the "Assessed Value" using the Waterbury 2006 mill rate for each property that is currently expected to be taken either by highway construction or by redevelopment. The "Tax Bill" (liability of the taxpayer) is the mill rate (55.4938 mills) times the "Assessed Value." The "Tax Loss on Properties Taken" is the "Tax Bill" pro-rated by the Percent Affected if the property remains after buildout or the entire "Tax Bill" if the property is redeveloped under a buildout scenario. For example, one of the American Republican, Inc. properties in parcel 293-18-1 would disappear under our buildout assumptions, while the MacDermid, CL&P and Walgreen's properties would not. If a building would have a sliver removed, the entire property would have to be taken. The sum of the Tax Revenue Loss on the Percent Affected is \$643,331 under Alternative 6-7, and \$586,513 under Alternative 6-8. The job losses are incomplete because we were unable to gather the information from all employers in the study area. Note that the buildable area is less than the unaffected area because certain properties remain in each buildout scenario under either highway alternative.

Because we assume that many of the affected businesses relocate within Waterbury, there is minimal long-term job or tax consequence for the City. For the period during which these businesses relocate, Waterbury experiences a property tax loss reflected in the analysis.

Table 2: Land Available for Alternative 6-7												
MAP	BLOCK	LOT	Total Square Footage	Affected Sq Ft	Unaffected Sq ft	% Affected	In Study Area?	2006 Total Assessed Value	Tax Bill	Tax Loss on Properties Taken	Owner	Employment
272	22	1	285,218	7,144	278,074	2.50%	N/A	\$ 261,940	\$ 14,536	\$ 364	CONN LIGHT & POWER CO	0
272	22	21	271,581	5,727	265,854	2.11%	Yes	\$ 705,810	\$ 39,168	\$ 39,168	M R T REALTY	
272	22	22	164,231	19,661	144,570	11.97%	Yes	\$ 372,260	\$ 20,658	\$ 20,658	ENVIRONMENTAL WASTE REMOVAL INC	
272	22	23	181,379	8,301	173,078	4.58%	N/A	\$ 1,998,780	\$ 110,920	\$ 5,076	HAYDEN TIMOTHY 50% & AMY 50% (Walgreen's)	50
272	22	24	468,762	2,848	465,914	0.61%	Yes	\$ 1,074,850	\$ 59,648	\$ 59,648	DADDARIO ENTERPRISES INC	137
273	18	30	20,342	0	20,342	0.00%	Yes	\$ 117,740	\$ 6,534	\$ 6,534	CALLI REALTY LLC	
273	18	31	104,209	0	104,209	0.00%	No	\$ 1,295,000	\$ 71,864	\$ -	AMERICAN REPUBLICAN INC	250
273	18	62	366,094	36,305	329,789	9.92%	Yes	\$ 1,865,920	\$ 103,547	\$ 103,547	ADP REALTY LLC	
273	22	12	36,028	0	36,028	0.00%	Yes	\$ 60,830	\$ 3,376	\$ 3,376	J S D PARTNERS	
292	18	2	258,777	2,601	256,176	1.01%	N/A	\$ 3,827,950	\$ 212,427	\$ 2,135	MACDERMID INC	599
292	18	3	19,365	77	19,288	0.40%	Yes	\$ 128,030	\$ 7,105	\$ 7,105	185 FREIGHT ST INC	
292	18	12	99,139	0	99,139	0.00%	Yes	\$ 253,680	\$ 14,078	\$ 14,078	BRASS CITY LUMBER CO	4
292	22	1	262,550	13,850	248,700	5.28%	N/A	\$ 3,835,300	\$ 212,835	\$ 11,228	CONN LIGHT & POWER CO	144
293	18	1	99,196	0	99,196	0.00%	Yes	\$ 329,840	\$ 18,304	\$ 18,304	AMERICAN REPUBLICAN INC	
293	18	2	29,872	22,762	7,110	76.20%	No	\$ 140,420	\$ 7,792	\$ 5,938	WEBSTER BANK	0
293	18	21	11,560	1,337	10,223	11.57%	No	\$ 21,280	\$ 1,181	\$ 137	CITY OF WATERBURY	
293	18	311	20,178	0	20,178	0.00%	No	\$ 154,000	\$ 8,546	\$ -	AMERICAN REPUBLICAN INC	40
293	292	3	35,426	0	35,426	0.00%	No	\$ 1,347,010	\$ 74,751	\$ -	STATE OF CONNECTICUT	
293	18	121	81,219	0	81,219	0.00%	Yes	\$ 523,740	\$ 29,064	\$ 29,064	BOZZUTO RICHARD C TRUSTEE OF MARY	62
318	18	1	348,902	348,902	0	100.00%	No	\$ 292,110	\$ 16,210	\$ 16,210	YANKEE GAS SERVICES COMPANY	
318	18	3	147,477	49,030	98,447	33.25%	Yes	\$ 150,360	\$ 8,344	\$ 8,344	JDR PROPERTIES LLC	
318	276	22	21,813	21,813	0	100.00%	No	\$ 204,120	\$ 11,327	\$ 11,327	SAVELLE ERIC	
319	277	4	251,896	251,896	0	100.00%	No	\$ 4,252,640	\$ 235,995	\$ 235,995	PHOENIX WATERBURY LLC	20
319	277	411	15,396	15,396	0	100.00%	No	\$ 379,400	\$ 21,054	\$ 21,054	SAVINGS BANK OF DANBURY	10
319	278	22	64,672	28,062	36,610	43.39%	No	\$ 411,320	\$ 22,826	\$ 9,904	DUMOUCHEL ASSOCIATES LLC	21
319	278	25	79,237	27,722	51,515	34.99%	No	\$ 691,040	\$ 38,348	\$ 13,417	J P JARJURA & SONS	40
320	289	9	44,927	3,840	41,087	8.55%	No	Exempt	\$ -	\$ -	CITY OF WATERBURY	0
320	286	43	113,441	2,658	110,783	2.34%	No	\$ 553,700	\$ 30,727	\$ 720	MCHUGH JOHN M	
320	286	82	6,285	0	6,285	0.00%	No	\$ 38,500	\$ 2,137	\$ -	MCHUGH JOHN M	
345	288	90	107,953	3,036	104,917	2.81%	No	Exempt	\$ -	\$ -	CITY OF WATERBURY - MALONEY SCHOOL	
Totals			4,017,126	872,969	3,144,156		1,659,786			\$ 643,331		

Source: Waterbury land records and DECD calculations

Table 3: Land Available for Alternative 6-8

MAP	BLOCK	LOT	Total Square Footage	Affected Sq Ft	Unaffected Sq ft	% Affected	In Study Area?	2006 Total Assessed Value	Tax Bill	Tax Loss on Properties Taken	Owner	Employees
272	22	1	285,218	216,911	68,307	76.05%	Yes	\$ 261,940	\$ 14,536	\$ 14,536	CONN LIGHT & POWER CO	144
272	22	21	271,581	77,746	193,835	28.63%	Yes	\$ 705,810	\$ 39,168	\$ 39,168	M R T REALTY	
272	22	22	164,231	564	163,667	0.34%	Yes	\$ 372,260	\$ 20,658	\$ 20,658	ENVIRONMENTAL WASTE REMOVAL INC	
272	22	23	181,379	0	181,379	0.00%	N/A	\$ 1,998,780	\$ 110,920	\$ -	HAYDEN TIMOTHY 50% & AMY 50% (Walgreen's)	50
272	22	24	468,762	0	468,762	0.00%	Yes	\$ 1,074,850	\$ 59,648	\$ 59,648	DADDARIO ENTERPRISES INC	137
273	18	30	20,342	0	20,342	0.00%	Yes	\$ 117,740	\$ 6,534	\$ 6,534	CALLI REALTY LLC	
273	18	31	104,209	0	104,209	0.00%	No	\$ 1,295,000	\$ 71,864	\$ -	AMERICAN REPUBLICAN INC	250
273	18	62	366,094	10,233	355,861	2.80%	Yes	\$ 1,865,920	\$ 103,547	\$ 103,547	ADP REALTY LLC	
273	22	12	36,028	0	36,028	0.00%	Yes	\$ 60,830	\$ 3,376	\$ 3,376	J S D PARTNERS	
292	18	2	258,777	5,145	253,632	1.99%	N/A	\$ 3,827,950	\$ 212,427	\$ 4,224	MACDERMID INC	599
292	18	3	19,365	19,365	-	100.00%	Yes	\$ 128,030	\$ 7,105	\$ 7,105	185 FREIGHT ST INC	
292	18	12	99,139	89,356	9,783	90.13%	Yes	\$ 253,680	\$ 14,078	\$ 14,078	BRASS CITY LUMBER CO	4
292	22	1	262,550	77,907	184,643	29.67%	N/A	\$ 3,835,300	\$ 212,835	\$ 63,155	CONN LIGHT & POWER CO	
293	18	1	99,196	0	99,196	0.00%	Yes	\$ 329,840	\$ 18,304	\$ 18,304	AMERICAN REPUBLICAN INC	40
293	18	2	29,872	583	29,289	1.95%	No	\$ 140,420	\$ 7,792	\$ 152	WEBSTER BANK	0
293	18	21	11,560	0	11,560	0.00%	No	\$ 21,280	\$ 1,181	\$ -	CITY OF WATERBURY	
293	18	311	20,178	0	20,178	0.00%	No	\$ 154,000	\$ 8,546	\$ -	AMERICAN REPUBLICAN INC	0
293	292	3	35,426	0	35,426	0.00%	No	\$ 1,347,010	\$ -	\$ -	STATE OF CONNECTICUT	0
293	18	121	81,219	81,219	-	100.00%	Yes	\$ 523,740	\$ 29,064	\$ 29,064	BOZZUTO RICHARD C TRUSTEE OF MARY	62
318	18	1	348,902	246,323	102,579	70.60%	No	\$ 292,110	\$ 16,210	\$ 11,444	YANKEE GAS SERVICES COMPANY	
318	18	3	147,477	37,858	109,619	25.67%	Yes	\$ 150,360	\$ 8,344	\$ 8,344	JDR PROPERTIES LLC	
318	276	22	21,813	4,870	16,943	100.00%	No	\$ 204,120	\$ 11,327	\$ 11,327	SAVELLE ERIC	
319	277	4	251,896	131,068	120,828	52.03%	No	\$ 4,252,640	\$ 235,995	\$ 122,794	PHOENIX WATERBURY LLC	20
319	277	411	15,396	15,396	-	100.00%	No	\$ 379,400	\$ 21,054	\$ 21,054	SAVINGS BANK OF DANBURY	10
319	278	22	64,672	11,863	52,809	18.34%	No	\$ 411,320	\$ 22,826	\$ 4,187	DUMOUCHEL ASSOCIATES LLC	21
319	278	25	79,237	34,240	44,997	43.21%	No	\$ 691,040	\$ 38,348	\$ 16,571	J P JARJURA & SONS	40
320	289	9	44,927	9,762	35,165	21.73%	No	Exempt	\$ -	\$ -	CITY OF WATERBURY	0
320	286	43	113,441	18,851	94,590	16.62%	No	\$ 553,700	\$ 30,727	\$ 5,106	MCHUGH JOHN M	
320	286	82	6,285	6,285	-	100.00%	No	\$ 38,500	\$ 2,137	\$ 2,137	MCHUGH JOHN M	
345	288	90	107,953	15,663	92,290	14.51%	No	Exempt	\$ -	\$ -	CITY OF WATERBURY - MALONEY SCHOOL	
Totals			4,017,126	1,111,209	2,905,917		1,525,401			\$ 586,513		

Source: Waterbury land records and DECD calculations

Modeling Transportation Network Changes

In addition to the land buildouts and the ITC, the changes to the highway network produce intrinsic economic changes. The changes in highway geometry as well as the locations and types of access and egress theoretically improve network throughput as the changes may increase average speed and the number of trips the region originates and for which it serves as a destination. In addition, and perhaps more importantly, the geometry changes improve safety by straightening curves, eliminating left entrances and exits and reducing the number of entrances and exits per unit distance. Transportation engineers model the effects of the physical changes in terms of changes in average speed and the number of trips for cars and trucks in a transportation demand framework, usually a four-step process (see Appendix C). These changes relative to a baseline or no-build forecast form the basis for changes in commuter costs (cars), transportation costs (trucks) and an improvement in accessibility (increased trip counts from and to the region). These transportation network changes in turn increase the attractiveness of the region for economic development independent of explicit development. Changes in the road network reduce transportation costs and increase the chances for agglomeration effects to unfold as related firms collocate to improve productivity.¹⁷

Unfortunately, there are offsetting and confounding effects of highway improvements. 'Moral hazard' is the psychological response to safety improvements such as seat belts, air bags, and insurance among other things. Some people increase their recklessness because they think they have increased protection from injury or reduced risk of large liability. We cannot quantify this effect or the effect of the safety improvements precisely from either highway reconfiguration. Notwithstanding, for purposes of this analysis, we assume that the number of accidents in the categories of property damage only, bodily injury and fatalities in the I-84/Route 8 Interchange declines by net 25% due to the geometry improvements.¹⁸ The reduction in each accident type reduces New Haven County's total accidents slightly per million vehicle miles traveled.¹⁹

¹⁷ Fujita, Masahisa and Jaques-François Thisse (2002). Economics of Agglomeration: Cities, Industrial Location and Regional Growth, Cambridge University Press.

¹⁸ This assumption is easily changed. We could run a range of plausible safety improvement scenarios, but the array of results would multiply dramatically.

¹⁹ Vehicle miles traveled or VMT is the product of the number vehicles (traffic volume) and the length of the road network. In this case, the road network does not increase in length, but volume increases slightly due to the geometry improvements.

In addition to safety improvements, we assume that the cost of time (the opportunity cost of waiting in traffic) and the nominal cost of accidents rise at the 50-year historic rate of inflation (3%).²⁰ We assume that the nominal cost of fuel inflates at the 30-year historic rate of 5.7%.²¹ For each factor's rate in millions of VMT (that is, accident counts, accident costs, value of time, and fuel cost), the change in each factor's total cost results from the product of the change in vehicle miles traveled from the no-build highway alternative to Alternatives 6-7 and 6-8 and their corresponding rates. These changes in total factor costs translate to changes in fuel costs, consumption spending allocation and amenity or quality of life in the REMI model of the Connecticut economy.²²

Table 4 depicts a timeline of events and costs associated with each highway alternative and buildout scenario. CONNDOT provides highway construction costs; remediation costs arise from DECD and DEP estimates. The state assumes payment for 20% of the road construction cost and 100% of the remediation cost both of which we assume will be funded through bond issues. The City of Waterbury forgoes property tax revenue from the properties taken (see Tables 2 and 3) until the displaced businesses can reopen and contribute again to the Grand List. We assume private developers will bear the costs of developing the structures (and receive appropriate benefit) under each buildout scenario. Missing from these costs is the ITC construction because we have no information about its size or building type. In addition, we have not estimated the demolition costs required to make the land ready for remediation or infrastructure costs to make the land ready for structures. We assume these omissions are small relative to the overall economic and fiscal results in the long run (we assume the magnitude of these costs is in the neighborhood of a few tens of millions of dollars and their impact quickly dissipates).

Note that debt service for Alternative 6 begins in 2015 and ends in 2034 and that debt service continues to 2043 for the remediation bond cost and to 2045 for either highway alternative configuration bond cost.

²⁰ REMI assumes no change in nominal costs for these factors over its entire analysis time horizon (2006-2050).

²¹ Based on Energy Information Administration data for U.S. gas prices at the pump 1976-2006. See www.eia.doe.gov.

²² Appendix D references several state DOT transportation studies executed using REMI.

Table 4: Highway Alternative and Scenario Cost Table (in millions of current dollars)																															
Alternative 6 has an estimated cost of \$ 415.0 million based on an estimated construction time between 2012 - 2014.																															
Alternative 7 has an estimated cost of \$ 2.30 billion based on an estimated construction time between 2023 - 2027.																															
Alternative 8 has an estimated cost of \$ 2.15 billion based on an estimated construction time between 2023 - 2027.																															
Source: CONNDOT																															
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Alternative 6 Cost (\$ 415.0 million)	138.3	138.3	138.3																												
Alternative 6-7 Cost (\$ 2,300 million)											460.0	460.0	460.0	460.0	460.0																
Alternative 6-8 Cost (\$ 2,150 million)											430.0	430.0	430.0	430.0	430.0																
Intermodal Transit Center (ITC)																															
Renovation (Train Station) Cost	???																														
New Construction Cost		???	???																												
Industrial Bldgs (Current)																															
Demolition Cost					???	???																									
Remediation Cost							75.0	75.0																							
Infrastructure Costs																															
Roads & Utilities																???															
Greenway																	???														
Alt 6-7 Scenario 1																															
No Construction																															
Alt 6-7 Scenario 2 Construction Costs																															
Warehouse/Distribution																53.647															
Office space																115.731	115.731														
Parking Garage																15.107															
Alt 6-8 Scenario 1 Construction Costs																															
Warehouse/Distribution (West of River)																69.762	69.762														
Office space																112.906	112.906														
Parking Garage																30.854															
Medical Building																41.878															
Alt 6-8 Scenario 2 Construction Costs																															
Condomimiums (West of River)																76.085	76.085														
Office space																112.906	112.906														
Parking Garage																30.854															
Medical Building																41.878															
State Fiscal Cost (debt service based on 20% of total highway cost)																															
Alt. 6	(\$6.831)	(\$6.831)	(\$6.831)	(\$6.831)	(\$6.831)	(\$6.831)	(\$6.831)	(\$6.831)	(\$6.831)	(\$6.831)	(\$6.831)	(\$6.831)	(\$6.831)	(\$34.153)	(\$34.153)	(\$34.153)	(\$34.153)	(\$34.153)	(\$34.153)	(\$34.153)											
Alt. 6-7											(\$37.856)	(\$37.856)	(\$37.856)	(\$37.856)	(\$37.856)	(\$37.856)	(\$37.856)	(\$37.856)	(\$37.856)	(\$37.856)	(\$37.856)	(\$37.856)	(\$37.856)	(\$37.856)	(\$37.856)	(\$37.856)	(\$37.856)	(\$37.856)	(\$37.856)	(\$37.856)	
Alt. 6-8											(\$35.387)	(\$35.387)	(\$35.387)	(\$35.387)	(\$35.387)	(\$35.387)	(\$35.387)	(\$35.387)	(\$35.387)	(\$35.387)	(\$35.387)	(\$35.387)	(\$35.387)	(\$35.387)	(\$35.387)	(\$35.387)	(\$35.387)	(\$35.387)	(\$35.387)	(\$35.387)	
Remediation							(\$12.344)	(\$12.344)	(\$12.344)	(\$12.344)	(\$12.344)	(\$12.344)	(\$12.344)	(\$12.344)	(\$12.344)	(\$12.344)	(\$12.344)	(\$12.344)	(\$12.344)	(\$12.344)	(\$12.344)	(\$12.344)	(\$12.344)	(\$12.344)	(\$12.344)	(\$12.344)	(\$12.344)	(\$12.344)	(\$12.344)	(\$12.344)	
Local Fiscal Costs (Forgone Property Tax)																															
Alt. 6-7					(\$0.681)	(\$0.681)	(\$0.681)	(\$0.681)	(\$0.681)	(\$0.681)	(\$0.681)	(\$0.681)	(\$0.681)	(\$0.681)	(\$0.681)	(\$0.681)	(\$0.681)														
Alt. 6-8					(\$0.745)	(\$0.745)	(\$0.745)	(\$0.745)	(\$0.745)	(\$0.745)	(\$0.745)	(\$0.745)	(\$0.745)	(\$0.745)	(\$0.745)	(\$0.745)	(\$0.745)														
Project																															
Demolition																															
Remediation																															
Renovation																															
Construction																															

THE MODELING PROCESS: LINKING THE TRAVEL DEMAND MODEL AND REMI

Because the CONNDOT transportation demand model (TDM) and the economic analysis model (REMI) are not directly connected, DECD takes initial TDM results (that is, without land developments or buildouts) and produces a REMI forecast of the Connecticut economy for each buildout scenario (see Appendix C for a description of the CONNDOT TDM and Appendix B for a description of REMI). The results of this analysis produce employment and population forecasts based on the new economic activity. DECD maps these forecasts into 'traffic analysis zones' (TAZs) for subsequent TDM analysis. The next round of TDM results drives REMI to produce new employment and population forecasts for each TAZ and another round of TDM results that in turn produces the converged transportation and economic results we seek. Three rounds do in fact produce convergence between the TDM and the economic model.

This section of the report explains the modeling procedure and the steps involved in detail. In general, the TDM generates travel data, TranSight²³ accounts for safety improvements, fuel cost changes, and cost of time changes. Results from both models are entered into the REMI model along with other relevant data to obtain the economic and fiscal impacts of the transportation improvements and land buildouts. Appendix D lists several transportation/economic development studies across the country performed using REMI. Readers may wish to skip this detail and move to the results section.

CONNDOT's TDM provides estimates of Vehicle Miles Traveled (VMT), Vehicle Hours Traveled (VHT), and Vehicle Trips by cars and trucks for New Haven County (from and to). These estimates are for 2030, and are for three different networks: the existing network (the Base), Alternative 6-7 and Alternative 6-8. The demographic data underlying the TDM predictions are CONNDOT estimates for 2030. The changes in each variable (VMT, VHT and Trips) from the Base, build the REMI "Transportation Matrices" for Alternatives 6-7 and 6-8. The transportation matrices contain commuter costs, transportation costs and access indices represented as percent changes from a 'no-change' baseline. To account for the stages of road and highway improvements, we

²³ TranSight is a bridge between a TDM and the REMI economic analysis model.

assume 20% of the changes in VMT, VHT, and Trips occur beginning in 2018 (upon completion of Alternative 6), and 100% of the changes become effective in 2030 (upon completion of Alternative 7 or 8). That is, we ramp up the effects of the changes in the road network as construction phases occur.

TranSight translates safety improvements, changes in the cost of time and fuel costs due to the road and highway configuration improvements into REMI policy variables. The value of time is represented by the average wage per hour, and we adjust TranSight to reflect the average wage forecasted in REMI for Connecticut beginning in 2006 (TranSight has no realistic forecasts). The number of accidents per million VMT and the accident value represent safety costs (average cost per accident per million VMT). Accidents consist of fatalities, injuries and “property damage only” incidents. We updated TranSight’s accident numbers with 2006 accident data for New Haven County supplied by CONNDOT. We assume accidents will decrease by 10% in 2017, when Alternative 6 is completed and highway traffic declines as local traffic opts for the new local roads. We assume accidents decrease an additional 10% in 2030 when Alternative 7 or 8 is completed and the reconfigurations and an improved entry/exit system improves interchange safety. TranSight calculates accident values based on national averages, which we adjust for inflation (3% a year). We adjust operating costs in TranSight (fuel costs inflate at 5.7% per year and non-fuel costs inflate at 2% per year). The Travel Demand component underlying TranSight is updated with the new VMT, VHT and Trip data. When the TranSight simulation containing these parameter adjustments runs, TranSight provides changes in certain REMI input (policy) variables that result from the changes in the costs of time, fuel costs and safety improvements.

We then run the REMI model to obtain the economic impact of each configuration and the accompanying buildouts. We provided employment (retail and nonretail) and population results for 2040 from this initial REMI run to CONNDOT to update the demographic data underlying the Base in their TDM. This is necessary because the changes in population and employment that result from the interchange reconfiguration and consequent buildouts impact VMT, VHT and Trips to and from the region. A second iteration of the process is required to take this effect into account.

REMI provides employment and population results at the county level. The CONNDOT TDM requires the input (retail and nonretail employment, and population) by TAZ. We assigned the retail and nonretail employment and population changes to TAZs based on the locations and components of each buildout. Our assumptions for the assignment of employment and population by TAZ appear below:

Population

- 80% of the population increase is split evenly across TAZs 626, 629, 630, 631, and 661 (16% each);
- 20% of population increase is split evenly across TAZs 627, 628, 657, 658, 659, and 660 (3.33% each);
- Exception: In the two Alt. 6-8 scenarios with residential developments, 3,000 of the new residents will reside in TAZ 629 (which contains the site of the approximately 1,200 new residential units). Of the balance of the increase in population (*i.e.*, total increase in population *minus* 3,000);
 - 80% will reside in TAZs 626, 630, 631, and 661 (20% each);
 - 20% will reside in TAZs 627, 628, 657, 658, 659, and 660 (3.33% each).

Employment

- Non-retail employment includes office employees, medical office employees, warehouse employees and restaurant employees;
- Direct employment (retail plus non-retail) created by the buildouts is in TAZ 616. In the Alt. 6-8 warehousing scenario, all direct warehouse employment is in TAZ 629, and the remainder of the direct employment is in TAZ 616.
- The indirect employment (retail plus non-retail) derived from REMI is split evenly between TAZs 613, 614 and 615 (33.33% each).

CONNDOT updated the TDM's Base with the retail and nonretail employment and population estimates from REMI, then provided the second round of results for VMT, VHT and Trips for 2040. We used 2040 population and employment numbers instead of 2030 in this iteration because by 2040, the completed highway configuration and land buildouts would have been in existence for 10 years and we expect 100% of the change in VMT, VHT and Trips to be in effect by then. In 2032, the land buildouts would have just been completed, and it is reasonable to question whether the full effect of the

population and employment changes on travel demand would be felt so soon. Nevertheless, we can reason that the difference in travel demand between 2032 and 2040 is not substantial, given that all the envisioned construction would have been completed by 2032. This difference will therefore not have a significant impact on the final results.

The subsequent iterations of the modeling process follow the same procedure as above, incorporating the CONNDOT TDM, TranSight and the REMI models. We expect the increases in population and employment that result from each subsequent iteration to diminish as diminishing marginal returns set in, and the economic impact results converge. Examination of model output for each iteration confirms this expectation. Convergence occurs in our judgment after three iterations.

RESULTS OF BUILD-OUT ANALYSIS

The tables below summarize the economic and fiscal impacts of the four build-out scenarios discussed above for each highway alternative. We evaluated the impact of each scenario with and without the Intermodal Transportation Center (ITC), that is, with and without changing the labor access for the three industries described above. We present economic impact results for New Haven County and the entire state and fiscal results for the City of Waterbury and the state. The numbers in the tables represent the average annual increase in each economic variable above the REMI control forecast, which represents the status quo or no build prospect. The economic impact appears in terms of changes to total employment, Gross Regional Product (GRP)²⁴, personal income²⁵ and population. We report GRP and personal income in constant 2006 dollars (that is, adjusted for inflation). We report the fiscal impact in terms of changes to state revenue and state expenditure and the change in net state revenue as the difference between the former quantities in 2006 dollars. The study period is 2015-2050, which encompasses all construction phases of the highways and land buildouts, and 20 years of post-construction operations (2032-2052) including debt service repayment.

Table 5 presents REMI results for the total, that is, the sum of the direct, indirect and induced impacts of the construction and operation of the highway and mixed-use land buildouts under the two scenarios for Alternative 6-7 (one of which is no land buildout).

²⁴ Gross regional product is the value of goods and services produced in the region (county or state) within a year. At the state level, it is called state gross domestic product.

²⁵ Personal income is the broadest measure of income (income from all sources).

Table 5: Economic Impact of Alt. 6-7 Build-out Scenarios Average Annual Change, 2015-2050				
Variable	New Haven County		Connecticut	
	without ITC	with ITC	without ITC	with ITC
Alternative 6-7 Scenario 1 (No Buildout)				
Total Employment	1,589	1,632	1,688	1,666
Total GRP (Millions 2006\$)	\$212.7	\$1,215.8	\$232.9	\$1,259.4
Personal Income (Millions 2006\$)	\$106.2	\$541.9	\$138.4	\$672.6
Population	1,308	1,847	1,596	2,165
Alternative 6-7 Scenario 2 (Mixed use + W/D)				
Total Employment	7,382	7,385	7,612	7,546
Total GRP (Millions 2006\$)	\$891.8	\$1,071.0	\$930.8	\$1,107.0
Personal Income (Millions 2006\$)	\$467.1	\$467.5	\$587.8	\$581.0
Population	6,910	7,332	7,828	8,278

Source: REMI and DECD calculations.

If there is no land development accompanying Alternative 6-7 (Scenario 1), our results show there will be an increase of 1,589 jobs in New Haven County and 1,688 jobs in the state as a whole on average annually over the study period. These results reflect improvements in network throughput and safety exclusively. For the state as a whole, average annual employment changes are smaller with the ITC because in this case net new population is attracted to the region without necessarily increasing employment. New population demands increased public services.

The increase in GRP in New Haven County ranges from \$212.7 million without the ITC to \$1,215.8 million with the ITC on average annually over the study period. The state GRP increases from \$232.9 million without the ITC to \$1,259.4 million with the ITC. Population in the County increases by 1,308 without the ITC and the addition of the ITC increases this number by approximately 650. The state's population increase ranges from 1,596 new residents without the ITC to 2,165 new residents with the ITC on average annually over the study period.

These impacts improve considerably when development accompanies the highway improvements in Scenario 2. With the mixed-use build-out under Alternative 6-7 described above, and without the ITC, employment in New Haven County increases by 7,382 jobs above the baseline on average annually over the study period.

The increase in New Haven County GRP amounts to \$892 million without the ITC and \$1,071 with it on average annually over the study period. State employment increases by 7,612 above the baseline without the ITC and by 7,546 jobs with the ITC. For the state as a whole, average annual employment changes are smaller with the ITC because in this case net new population is attracted to the region without necessarily increasing employment. New population demands increased public services.

State gross domestic product increases range from \$930.8 million to \$1,107 million without and with the ITC. The population increase in the county ranges from 6,910 without the ITC to 7,332 with the ITC above the baseline forecast, and for the state, the average annual increase in population ranges from 7,828 above the baseline without the ITC to 8,278 with the ITC.

Table 6 presents REMI results for the total, that is, the sum of the direct, indirect and induced impacts of the construction and operation of the highway and mixed-use land build-outs under the two scenarios for highway Alternative 6-8.

Table 6: Economic Impact of Alt. 6-8 Build-out Scenarios Average Annual Change, 2015-2050				
Variable	New Haven County		Connecticut	
	without ITC	with ITC	without ITC	with ITC
Alternative 6-8 Scenario 1 (Residential)				
Total Employment	8,210	8,455	8,448	8,652
Total GRP (Millions 2006\$)	\$997.6	\$1,215.8	\$1,037.7	\$1,259.4
Personal Income (Millions 2006\$)	\$525.3	\$541.9	\$657.9	\$672.6
Population	8,219	8,926	9,241	10,024
Alternative 6-8 Scenario 2 (Warehouse/Distribution)				
Total Employment	9,068	9,426	9,346	9,679
Total GRP (Millions 2006\$)	\$1,124.4	\$1,354.7	\$1,172.5	\$1,408.8
Personal Income (Millions 2006\$)	\$584.0	\$607.7	\$732.7	\$758.2
Population	9,015	9,746	10,159	10,991

Source: REMI and DECD calculations.

Under Scenario 1, the land west of the river is developed as a residential area in our model, and the land east of the river will contain new office and retail spaces, a medical arts building and parking facilities. In New Haven County, this scenario generates approximately 8,210 jobs above the baseline without the ITC, and with the ITC, the jobs

impact increases to 8,455 jobs above the baseline on average annually over the study period.

New Haven County GRP increases from \$998 million above the baseline (without the ITC) to approximately \$1,215.8 above the baseline when the ITC is included on average annually over the study period. For the state as a whole, the employment increase ranges from 8,448 jobs above the baseline without the ITC, to 8,652 jobs above the baseline with the ITC on average annually over the study period. The increase in state gross domestic product under Scenario 1 ranges from \$1,038 million (without the ITC) to \$1,259.4 million (with the ITC) on average annually over the study period. The County's population increases by 8,219 people (without the ITC) to 8,926 people (with the ITC), and the state's population increases by 9,241 people (without the ITC) to 10,024 people (with the ITC), relative to the baseline forecast on average annually over the study period.

Under Scenario 2, warehousing and distribution facilities will be built on the land west of the river, and the land east of the river will contain new office space, a medical arts building and parking facilities as in Scenario 1. Employment in New Haven County will increase by 9,068 jobs above the baseline without the ITC, while the addition of the ITC will increase this number to 9,426 jobs on average annually over the study period. We expect higher employment numbers (compared to Scenario 1) as the warehousing and distribution facilities create more direct jobs than a residential development. In the state as a whole, the Scenario 2 land buildout creates approximately 9,346 jobs (without the ITC) and 9,679 jobs (with the ITC), relative to the baseline forecast.

GRP increases in New Haven County ranges from \$1,124.4 million without the ITC to \$1,355 million with the ITC on average annually over the study period. For the state as a whole, gross domestic product increases by \$1,172.5 million (without the ITC) to \$1,409 million (with the ITC) on average annually over the study period.

Population increases in the County range from 9,015 to 9,746 people (without and with the ITC, in that order), and in the state, the population increases range from 10,159 people to 10,991 people.

Fiscal Impact of Buildout Analyses

Tables 7 and 8 express the annual average change (impact) of key fiscal variables from the baseline or status quo forecast of the Connecticut economy over the study period (2015 through 2050) in 2006 dollars (that is, dollars adjusted for inflation). We include fiscal results for the state as a whole and the City of Waterbury, reported here with and without the ITC for comparison. The fiscal results for the City and the state reflect the direct, indirect and induced effects (that is, the total effect) of demolition, remediation, road and building construction, and the subsequent increases in jobs, retail sales and all taxes thrown off by the new economic activity in each region, as well as debt service required to fund bond issue(s). In addition, the results reflect the changes to the road network and in particular, safety improvements by virtue of changes in road geometry.

We note that for the land development no-buildout scenario under highway Alternative 6-7, the City and state fiscal results are the smallest (Table 7). These results include only road network changes (no land buildouts) and safety improvements with and without the ITC.

The fiscal results for the City and the state are greatest for Scenario 2 under highway Alternative 6-8 and appear in Table 8. These results obtain because the largest number of (high-paying) jobs occurs in this case (a mixture of warehouse/distribution, a medical arts building and commercial office and retail spaces). Fiscal results with the ITC are smaller because there is additional population attracted to metropolitan Waterbury without (necessarily any) job creation (the area is more attractive because it is more accessible with improved rail, bus, and shuttle services). The larger population demands increased public services driving public expenditure higher than without the ITC.

Except for the no land buildout scenario under highway Alternative 6-7, the City of Waterbury realizes \$7 million to \$10 million more annually in net tax revenue in each of the other scenarios. The City of Waterbury and the State of Connecticut maximize their net fiscal benefit under highway Alternative 6-8 (Scenario 2) in which there is a mixture of warehouse/distribution, a medical arts building and commercial office and retail spaces.

Table 7: Fiscal Impact of Alt. 6-7 Build-out Scenarios Average Annual Change, 2015-2050				
Variable	City of Waterbury		Connecticut	
	without ITC	with ITC	without ITC	with ITC
Alternative 6-7 Scenario 1 (No land buildout)				
Total Revenue (Millions 2006\$)	\$3.67	\$5.19	\$17.62	\$18.21
Total Expenditures (Millions 2006\$)	\$3.39	\$4.78	\$10.54	\$14.30
Net Revenue (Millions 2006\$)	\$0.29	\$0.41	\$7.08	\$3.91
Alternative 6-7 Scenario 2 (Mixed use + W/D)				
Total Revenue (Millions 2006\$)	\$24.89	\$26.08	\$74.51	\$74.70
Total Expenditures (Millions 2006\$)	\$17.89	\$18.98	\$51.74	\$54.69
Net Revenue (Millions 2006\$)	\$7.00	\$7.09	\$22.77	\$20.01

Source: REMI and DECD calculations.

Table 8: Fiscal Impact of Alt. 6-8 Build-out Scenarios Average Annual Change, 2015-2050				
Variable	City of Waterbury		Connecticut	
	without ITC	with ITC	without ITC	with ITC
Alternative 6-8 Scenario 1 (Residential)				
Total Revenue (Millions 2006\$)	\$30.93	\$32.92	\$83.38	\$86.36
Total Expenditures (Millions 2006\$)	\$21.28	\$23.11	\$61.08	\$66.22
Net Revenue (Millions 2006\$)	\$9.65	\$9.81	\$22.30	\$20.14
Alternative 6-8 Scenario 2 (Warehouse/Distribution)				
Total Revenue (Millions 2006\$)	\$33.14	\$35.20	\$92.96	\$97.29
Total Expenditures (Millions 2006\$)	\$23.34	\$25.24	\$67.15	\$72.62
Net Revenue (Millions 2006\$)	\$9.80	\$9.96	\$25.82	\$24.68

Source: REMI and DECD calculations.

Appendix A: Transit Oriented Development (TOD) Case Studies

1. ITC Brockton, MA: “Transit in the Old Colony Region”

Brockton, Massachusetts was an important industrial center from its founding. Famous for its shoe and boot industry, as the city’s manufacturing base eroded, the region suffered a decline in economic growth. Brockton Area Transit (BAT), established in 1974, is the largest provider of transit service in the region. In 2006, BAT completed an expansion of a five-acre ITC as a transit hub for Eastern Massachusetts and the South Shore. The ITC accommodates buses, trains, taxis, bicycles, pedestrians, private cars, and other ground transportation. It features parking, administrative services, close proximity to schools, medical facilities, shopping centers, and industrial parks, in addition to intermodal opportunities such as commuter rail stations in downtown Brockton and the Metropolitan Transit Authority’s (MBTA) “Red Line” to Boston. The new 4,500-sq.-ft. transit depot includes a waiting area, a dispatch and information center, retail spaces, a police substation, and commuter parking.

In cooperation with the local business community, BAT’s ITC is a key element in Brockton’s revitalization and a catalyst for a regional economic renaissance. A Bridgewater State College study in the mid 1990s, estimated BAT’s economic impact as \$73 million. The Metro South Chamber of Commerce and the Community Bank have officially recognized BAT for its economic impact. Former Massachusetts’ Governor Mitt Romney honored BAT’s ITC for its efforts to revitalize the downtown area using Transit-Oriented Development (TOD).²⁶

Brockton’s \$2.5 million ITC, like the other case studies in this report, is an example of an alternative to single driver automobile traffic that increasingly causes congestion. TOD helps manage limited space available for parking and ultimately enhances the quality of life. Transit has been a primary tool for economic development promoting spending in the region by various funding sources and visitors, and from improved access to jobs paying salaries to buy local goods and services. The availability of TOD and transit services provides a way to attract employees and for businesses to be broadly available

²⁶ Transit Cooperative Research Program (TCRP) in Washington DC, report R-34 C (1998) *Economic Impact Analysis of Transit Investment* pp. 174-176.

to customers in Brockton. Transit district studies have shown that each dollar invested in public transit provided a return on investment in excess of \$3.00.²⁷

TOD serves a broad spectrum of customers and needs from an economic and social perspective by providing riders choices and addressing the mobility needs of target populations including students, the elderly and low-income families. Providing mobility options ensures greater economic independence (i.e., employment), opportunities for economic advancement (i.e., education, job training) and neighborhood stability by allowing seniors to remain in their own homes.²⁸

In 2006, Brockton's population was 95,000 with 57 percent in owner occupied housing, and 43 percent in renter occupied housing. The number of households without a car or other private vehicle was 13%. Although 34% of households had two vehicles, users of public transportation increased notably from 3.0% in 2005 to 5.6% in 2006 with the ITC's completion.²⁹

Development spurred by the ITC is estimated to be \$90 million. New construction includes banks, a court house, distribution centers and warehouses, restaurants, grocery and other retail stores, schools, a hotel, a FedEx ground transportation center, recreation (golf), senior facilities, a conference center, and numerous other private businesses.³⁰ In addition, 2006 groundbreaking occurred for a new Brockton Neighborhood Health Center, and housing such as the SoCoLofts, SoCoLofts Complex, and Lincoln Lofts featured as "Smart Growth" projects that are auto-accessible, but also accommodate transit and pedestrian activity, preserve open space, and protect sensitive areas such as wetlands while recognizing a connection between development and quality of life.³¹

²⁷ See note 15.

²⁸ Urbitran Associates, Inc. in association with Mundle & Associates, Inc. and Abrams-Cherwony & Associates, Inc. (June 2005), Five-Year Transit Service and Capital Plan for the Massachusetts Regional Transit Authorities; Executive Summary, pp.3-4.

²⁹ American Community Survey (2006), Narrative Profile, Brockton city, Massachusetts.

³⁰ City of Brockton, Massachusetts (2007), Planning Department.

http://www.brockton.ma.us/Section_Departments/Planning_newconstruction.cfm.

³¹ Harrington, James E. (Mayor of the City of Brockton), State of the City Address, January 22, 2007. http://www.brockton.ma.us/deptdocs/State_of_the_City_Address_2007.pdf.

2. Collingswood, New Jersey

Before TOD



After TOD



The Borough of Collingswood, New Jersey, with a population of 15,000 and its industries are concentrated in administrative and professional, service, sales, and office occupations. Borough housing is 55% owner- and 45% renter-occupied. For a typical small New Jersey town, it is dominant in the education, health and social services, professional, scientific, management, and retail industries. The fact that it's on a Port Authority Transit Corporation (PATCO) rail line makes the Borough undistinguished. A South Jersey magazine described it this way:

"The Collingswood PATCO Speedline Station is a visual disappointment. A far cry from the Art Nouveau metro stations in Paris or even the brightly painted stops in Center City Philadelphia, Collingswood offers its railway riders nothing beyond a forgettable utilitarian space surrounded by an interchangeable array of commuters, scattered businesses sheltered in flat buildings, and parking lots. Lots of parking lots."³²

PATCO named the Borough as the site for one of the first TOD projects in South Jersey, a designation that places it among a few hundred transit stations in the country to serve as an officially-sanctioned anchor for a new pedestrian-geared, eco-friendly, neighborhood-sustaining livability that New Jersey and the rest of the nation so greatly lack.

³² Nurin, Tara (August 2007), "Catching the Train to Economic Development: Transit Oriented Development is the name; eco-friendly commuting is the game change," *South Jersey Magazine* (Volume 4, Issue 5), pp. 41-43.
<http://www.collingswood.com/files/3624/2007/08/Catching%20the%20Train%20to%20Economic%20Development.pdf>.

“Collingswood’s main commercial street that, despite being heralded as a successful renaissance story, is punctured by an astonishing number of vacant storefronts displaying “out of business” signs.”

The commercial district cited here underwent dramatic change over the last ten years:

“Collingswood is one of the turn-around success stories of the 90’s – from downtown on the brink to a hotspot – a main street with new specialty retail, and restaurants of all kinds that draw young professionals from Philadelphia.”³³

In April 2007, Collingswood, the Delaware River Port Authority and PATCO announced a partnership to examine new possibilities for TOD at the Collingswood PATCO Speedline station and surrounding area. Already new “Lumberyard Condos” are under construction within walking distance of the TOD zone -- the area’s first residential development in 40 years. Most buyers are young professionals or “empty nesters” who chose the Lumberyard units precisely for their proximity to transit. Collingswood’s Mayor welcomes the growth and considers TOD to be an integral part of it. The Borough favors more residential and commercial buildings and a parking garage.

Collingswood should benefit from a reduction in air pollution and energy consumption, and – according to a California DOT study – will experience



reduced greenhouse gas emissions by 2.5 to 3.7 tons per year for each household. TOD will increase household disposable income after reducing driving costs, a saving of \$3-4,000 per year for each household, and enhance regional conservation of land and open space. In addition, TOD will increase mobility choices for congested areas and for

³³Regional Plan Association (June 2004), “Mayors Create Healthy Communities: The 2003 New Jersey Mayors’ Institute on Community Design,” p. 20 available at <http://www.rpa.org/pdf/mayorsinstitute2003v3.pdf>.

people who prefer not to drive or who do not own cars (see footnote 30). Collingswood's share of commuters who drive alone to work is 75%.

3. Everett, Washington



Everett's Sound Transit (ST) networks and TOD planning provide a third case study that began in 1996. Major traffic congestion, long, frustrating commutes, and the threat of businesses leaving the area stimulated the region's "Sound Move" planning process. The plan intended to guide transit development and to be operational in ten years. In 2000, ST began "Sonder" a commuter rail service between Tacoma and Seattle. Since then it has expanded service. The Tacoma Link light rail line opened in summer 2003, introducing the state's first modern light rail system to Tacoma. In 2004, ST connected Everett -- about 25 miles to the north of Seattle. Comfortable, state-of-the-art cars and scenic views provide welcome escape from traffic. Strong ridership added a seventh car to one of the trains. Today, the Sonder averages 6,000 daily boardings, carrying passengers to destinations such as sports events at Qwest and Safeco fields and to concerts at the Tacoma Dome. Nearly all stations include new or expanded parking, feature public art reflective of their respective communities, and bring increased foot traffic into now thriving commercial areas.

Benefits include Tacoma's approval of over 2,000 housing permits since the Tacoma Link broke ground. In 2005, ST opened the Ash Way Transit Access Ramp, connecting buses to a park-and-ride lot. Subsequently, a new apartment complex, Newberry

Square, is also under construction within walking distance and touts its easy access to the transit hub, recognizing transit access as an attraction to potential residents. An airport link milestone occurred in 2007 with the start of construction on a SeaTac/Airport light rail station.³⁴

Everett Station is a multi-modal, multi-use building open seven days a week from 6 a.m. to 10 p.m. that serves as a transportation hub, a higher education and gathering place for community events. The 64,000 square foot structure cost \$44 million. It is home to Amtrak, Espresso Americano, Everett Transit, Greyhound, university centers, and the “WorkSource” career development center, and provides links to express buses, commuter rail, light rail, pedestrian traffic, and bicycle trails. The building houses an ATM, vending machines, Internet kiosks, rental car telephone, Amtrak ticket machine, ST ticket machine, pay phones, bike racks, 24-hour security and public restrooms. There are 748 parking spaces and more parking and a pedestrian overpass are being built.³⁵

4. Portland, Maine Transit Center (PTC)

Portland's Transportation webpage³⁶ displays intermodal transit links from the Portland Transit Center (PTC) to lodging and the Maine Mall, Portland International Jetport, two major interstate highways, Vermont Transit, parks and housing, Portland's restored 19th Century “Old Port District” waterfront, the downtown METRO station with connections to regular regional shuttle bus and faster “zoom” bus transit, rail including Amtrak to Boston, as well as ocean ferries and cruise lines. Marine transportation is available to Casco Bay Island, Bar Harbor, Prince Edward Island and Nova Scotia served by “The CAT”, a \$50.2 million, 98-meter, high-speed ferry, the largest and most modern marine vessel ever built by Incat of Tasmania. The CAT provides extended service to the Bahamas, Trinidad, and Tobago.

³⁴ Sound Transit (2007), <http://www.soundtransit.org/x2572.xml>.

³⁵ See Note 8.

³⁶ Partnership between the Greater Portland Council of Governments (GPCOG) and the City of Portland in cooperation with all area public and private transportation providers and services, http://www.transportme.org/html/General_Home.html

A ten-minute walk from the PTC brings pedestrians and bicyclists to trails, restaurants, theaters, microbreweries, art galleries, museums, and specialty shops – “all of Portland’s best attractions.”³⁷ Portland’s livability (e.g., named the number one place in the country to raise children and named in the top ten “perfect places to live in America”) is attributable in part, to its integrated, multi-modal transit system.³⁸

The PTC promotes new development:

“Until recently, the area [Thompson’s Point] could be accessed only through city streets. Now it’s connected to the Interstate by a new exit ramp. That ramp leads directly to the city’s transportation center for regional buses and Amtrak trains. The center has become so popular, there’s hardly room to park.

Immediately upriver, Mercy Hospital’s new campus is taking shape on 52 acres. Gone are piles of metal and glass destined for recycling. In their place is a scenic walking trail that winds two miles along the Fore River, under the Interstate and around Thompson’s Point.

... A concept plan prepared for buyers by Fishman Realty Group suggests how the site could accommodate luxury housing, a new transit center for buses and trains, offices, a marina and a parking garage. All this would be ringed by a tree-lined walking path along the water, part of the expanding Portland Trails network.”³⁹

Walking routes or “Trail Plan” expansion projects are already underway. A forthcoming study for the expansion of regional transit is underway in conjunction with a “Portland Peninsula Transit Plan” that would be broadened in scope to address parking needs of commuters who live outside downtown, and bicycle and pedestrian trails.⁴⁰

Among the benefits provided: in 2005, 30 units of single-room occupancy efficiency apartments were constructed on Frederic Street, 11 units of senior housing were completed on Peaks Island, and 16 units of family housing were built on Grant Street. An additional 20 units of family housing were under construction on Frederic Street, along with 31 efficiency apartments for persons with visual impairment (at the Iris

³⁷ CruiseMaine.com (2007), <http://www.portofportlandmaine.org/portland.pdf>.

³⁸ City of Portland (2007), <http://www.ci.portland.me.us/citytour.asp>.

³⁹ Turkel, Tux (June 26, 2007), “Thompson’s Point: A site to behold,” *Portland Press Herald*.
<http://pressherald.maine.com/story.php?id=116953&ac=PHbiz&pg=2>.

⁴⁰ City of Portland, Standing Committee on Transportation (January 25, 2007), Meeting Minutes City Hall, Council Chambers, Congress Street, Portland. <http://www.portlandmaine.gov/trans01-25-07.pdf>.

Network on Park Avenue), and 10 apartments for families on Cumberland Avenue and Anderson Street.⁴¹

An October 2006 Brookings study for the State of Maine found that: “Unlike the suburbs and rural areas, however, city officials consistently encourage new housing in the urban core, where construction consistently tops one hundred permits per city per year for a diverse array of multi-family and single family units.”⁴² The finding supported the projection of sufficient growth capacity six times greater than the current forecast in a build-out analysis of Portland, South Portland, and Westbrook’s urban core, and the Freeport and Scarborough adjacent suburbs. However the finding of sufficient urban capacity depended on continued urban development rather than the current trend toward suburban sprawl. Portland would then relieve some of the pressure on the suburbs by encouraging urban core development and TOD.⁴³

⁴¹ Portland, Maine Planning and Development Department, *2005 Annual Report*.

⁴² Brookings Institution Metropolitan Policy Program *et al.* (October 2006), “State of Maine Selected Service Center Development Capacity Analyses: A Background Paper for *Charting Maine’s Future: An Action Plan for Promoting Sustainable Prosperity and Quality Places*”, <http://www3.brookings.edu/metro/pubs/maine/capacity.pdf>.

⁴³ See Note 18.

Appendix B: THE REMI MODEL

The Connecticut REMI model is a dynamic, multi-sector, regional model developed and maintained for the Connecticut Center for Economic Analysis by Regional Economic Models, Inc. of Amherst, Massachusetts. This model provides detail on all eight counties in the State of Connecticut and any combination of these counties. The REMI model includes all of the major inter-industry linkages among 466 private industries, aggregated into 67 major industrial sectors. With the addition of farming and three public sectors (state and local government, civilian federal government, and military), there are 70 sectors represented in the model for the eight counties.

The REMI model is based on a national *input-output* (I/O) model that the U.S. Department of Commerce (DoC) developed and continues to maintain. Modern input-output models are largely the result of groundbreaking research by Nobel laureate Wassily Leontief. Such models focus on the inter-relationships between industries and provide information about how changes in specific variables—whether economic variable such as employment or prices in a certain industry or other variables like population affect factor markets, intermediate goods production, and final goods production and consumption.

The REMI Connecticut model takes the U.S. I/O “table” results and scales them according to traditional regional relationships and current conditions, allowing the relationships to adapt at reasonable rates to changing conditions. Listed below are some salient structural characteristics of the REMI model:

- REMI determines consumption on an industry-by-industry basis, and models real disposable income in Keynesian fashion, that is, with prices fixed in the short run and GDP (Gross Domestic Product) determined solely by aggregate demand.
- The demand for labor, capital, fuel, and intermediate inputs per unit of output depends on relative prices of inputs. Changes in relative prices cause producers to substitute cheaper inputs for relatively more expensive inputs.

- Supply of and demand for labor in a sector determine the wage level, and these characteristics are factored by regional differences. The supply of labor depends on the size of the population and the size of the workforce.
- Migration—that affects population size—depends on real after-tax wages as well as employment opportunities and amenity value in a region relative to other areas.
- Wages and other measures of prices and productivity determine the cost of doing business. Changes in the cost of doing business will affect profits and/or prices in a given industry. When the change in the cost of doing business is specific to a region, the share of the local and U.S. market supplied by local firms is also affected. Market shares and demand determine local output.
- “Imports” and “exports” between states are related to relative prices and relative production costs.
- Property income depends only on population and its distribution adjusted for traditional regional differences, *not* on market conditions or building rates relative to business activity.
- Estimates of transfer payments depend on unemployment details of the previous period, and total government expenditures are proportional to population size.
- Federal military and civilian employment is exogenous and maintained at a *fixed* share of the corresponding total U.S. values, unless specifically altered in the analysis.
- Because each variable in the REMI model is related, a change in one variable affects many others. For example, if wages in a certain sector rise, the relative prices of inputs change and may cause the producer to substitute capital for labor. This changes demand for inputs, which affects employment, wages, and other variables in those industries. Changes in employment and wages affect migration and the population level that in turn affect other employment variables. Such chain-reactions continue in time across all sectors in the model. Depending on the analysis performed, the nature of the chain of events cascading through the model economy can be as informative for the policymaker as the final aggregate results. Because REMI generates extensive sectoral detail, it is possible for experienced economists in this field to discern the dominant causal linkages involved in the results.

The REMI model is a structural model, meaning that it clearly includes cause-and-effect relationships. The model shares two key underlying assumptions with mainstream economic theory: *households maximize utility* and *producers maximize profits*. In the model, businesses produce goods to sell to other firms, consumers, investors, governments and purchasers outside the region. The output is produced using labor, capital, fuel and intermediate inputs. The demand for labor, capital and fuel per unit output depends on their relative costs, because an increase in the price of one of these inputs leads to substitution away from that input to other inputs. The supply of labor in the model depends on the number of people in the population and the proportion of those people who participate in the labor force. Economic migration affects population size and its growth rate. People move into an area if the real after-tax wage rates or the likelihood of being employed increases in a region.

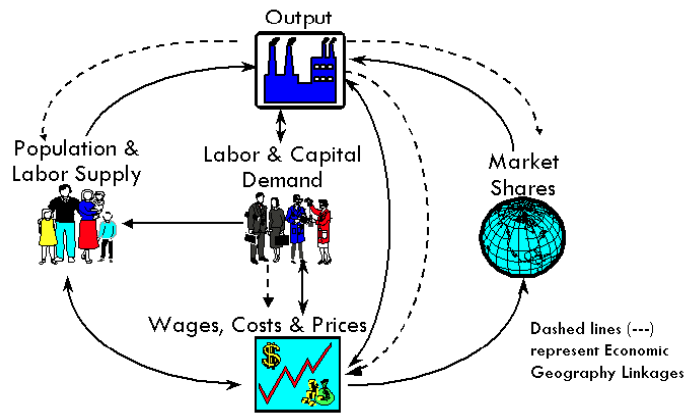
Supply of and demand for labor in the model determine the real wage rate. These wage rates, along with other prices and productivity, determine the cost of doing business for each industry in the model. An increase in the cost of doing business causes either an increase in price or a cut in profits, depending on the market supplied by local firms. This market share combined with the demand described above determines the amount of local output. The model has many other feedbacks. For example, changes in wages and employment impact income and consumption, while economic expansion changes investment and population growth impacts government spending.

Model Overview

Figure B-1.1 is a pictorial representation of the model. The Output block shows a factory that sells to all the sectors of final demand as well as to other industries. The Labor and Capital Demand block shows how labor and capital requirements depend on both output and their relative costs. Population and Labor Supply are shown as contributing to demand and to wage determination in the product and labor market. The feedback from this market shows that economic migrants respond to labor market conditions. Demand and supply interact in the Wage, Price and Profit block. Once prices and profits are established, they determine market shares, which along with components of demand, determine output.

Figure B-1.1

REMI Model Structure (2002 -)



The REMI model brings together the above elements to determine the value of each of the variables in the model for each year in the baseline forecasts. The model includes each inter-industry relationship that is in an input-output model in the Output block, but goes well beyond the input-output model by including the relationships in all of the other blocks shown in Figure B-1.1.

In order to broaden the model in this way, it is necessary to estimate key relationships econometrically. This is accomplished by using extensive data sets covering all areas of the country. These large data sets and two decades of research effort have enabled REMI to simultaneously maintain a theoretically sound model structure and build a model based on all the relevant data available. The model has strong dynamic properties, which means that it forecasts not only what will happen, but also when it will happen. This results in long-term predictions that have general equilibrium properties. This means that the long-term properties of general equilibrium models are preserved without sacrificing the accuracy of event timing predictions and without simply taking elasticity estimates from secondary sources.

Understanding the Model

In order to understand how the model works, it is critical to know how the key variables in the model interact with one another and how policy changes are introduced into the model. To introduce a policy change, one begins by formulating a policy question. Next, select a baseline forecast that uses the baseline assumptions about the external policy variables and then generate an alternative forecast using an external variable set that includes changes in the external values, which are effected by the policy issue.

Figure B-1.2

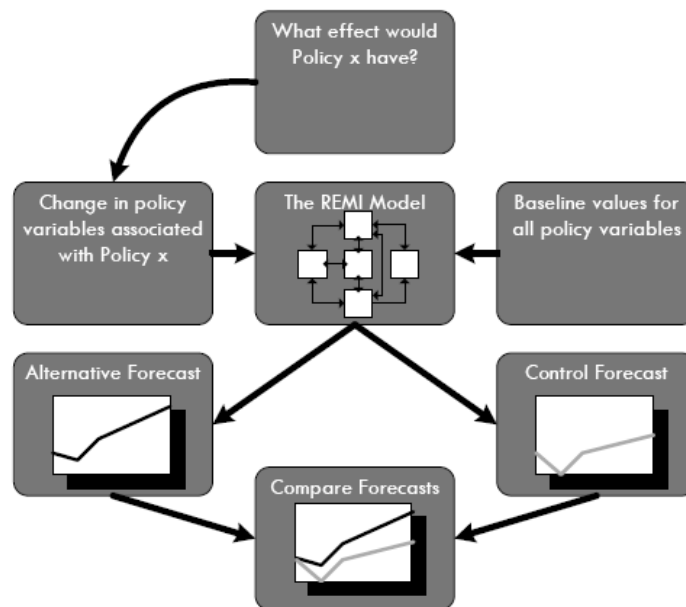


Figure B-1.2 shows how this process would work for a policy change called Policy X. In order to understand the major elements in the model and their interactions, subsequent sections examine the various blocks and their important variable types, along with their relationships to each other and to other variables in the other blocks. The only variables discussed are those that interact with each other in the model. Variables determined outside of the model include:

- Variables determined in the U.S. and world economy (e.g., demand for computers).

- Variables that may change and affect the local area, but over which the local area has no control (e.g., an increase in international migration).
- Variables that are under control of local policy (e.g., local tax rates).

For simplicity, the last two categories are called policy variables. Changes in these variables are automatically entered directly into the appropriate place in the model structure. Therefore, the diagram showing the model structure also serves as a guide to the organization of the policy variables (see Figure B-1.3).

Output Block

The Output Block variables are:

- State and Local Government Spending
- Investment
- Exports
- Consumption
- Real Disposable Income

These variables interact with each other to determine output and depend on variable values determined in other blocks as follows:

Variables in the Output Block

Variables Outside of the
Output Block that are
Included in its Determinants

State and Local Government Spending
Investment

Population
Optimal Capital Stock (also the
actual capital stock)

Output

Share of Local Market
(The proportion of local demand
supplied locally, called the Regional
Purchase Coefficient)

Exports

The Regional Share of Interregional
and International Trade

Real Disposable Income

Employment, Wage Rates and the
Consumer Expenditure Price Index

Labor and Capital Demand Block

The Labor and Capital Demand block has only three types of key variables:

- Employment - determined by the labor/output ratio and the output in each industry, determined in the Output block.
- Optimal Capital Stock - depends on relative labor, capital and fuel costs and the amount of employment.
- Labor/Output Ratio - depends on relative labor, capital and fuel costs.

Simply put, if the cost of labor increases relative to the cost of capital, the labor per unit of output falls and the capital per unit of labor increases.

Population and Labor Supply Block

The model predicts population for 600 cohorts segmented by age, ethnicity and gender. This block also calculates the demographic processes - births, deaths and aging. The models deal with different population sectors as follows:

- Retired Migrants are based on past patterns for each age cohort 65 and over.
- International migrants follow past regional distributions by country of origin.
- Military and college populations are treated as special populations that do not follow normal demographic processes.
- Economic migrants are those who are sensitive to changes in quality of life and relative economic conditions in the regional economies. The economic variables

that change economic migration are employment opportunity and real after-tax wage rates.

This block allows the determination of the size of the labor force by predicting the labor force participation rates for age, ethnicity and gender cohorts, which are then applied to their respective cohorts and summed. The key variables that change participation rates within the model are the ratio of employment to the relevant population (labor market tightness) and the real after-tax wage rates.

Wage, Price and Profit Block

Variables contained within the Wage, Price and Profit block are:

- Employment Opportunity
- Wage Rate
- Production Costs
- Housing Price
- Consumer Price Deflator
- Real Wage Rate
- Industry Sales Price
- Profitability

The wage rate is determined by employment opportunity and changes in employment demand by occupation for occupations that require lengthy training. The housing price increases when population density increases. The Consumer Expenditure Price Index is based on relative commodity prices, weighted by their share of U.S. nominal personal consumption expenditures. The model uses the price index to calculate the real after-tax wage rate for potential migrants that includes housing price directly, while the price index used to deflate local income uses the local sales price of construction. Wage rates affect production costs, as well as other costs, and they in turn determine profitability or sales prices, depending on whether the type of industry involved serves mainly local or external markets. For example, a cost increase for all local grocery stores results in an

increase in their prices, while an increase in costs for a motor vehicle factory reduces its profitability of production at that facility but may not increase their prices worldwide.

Market Shares Block

The Market Shares Block consists of:

- Share of Local Market
- Share of External Market

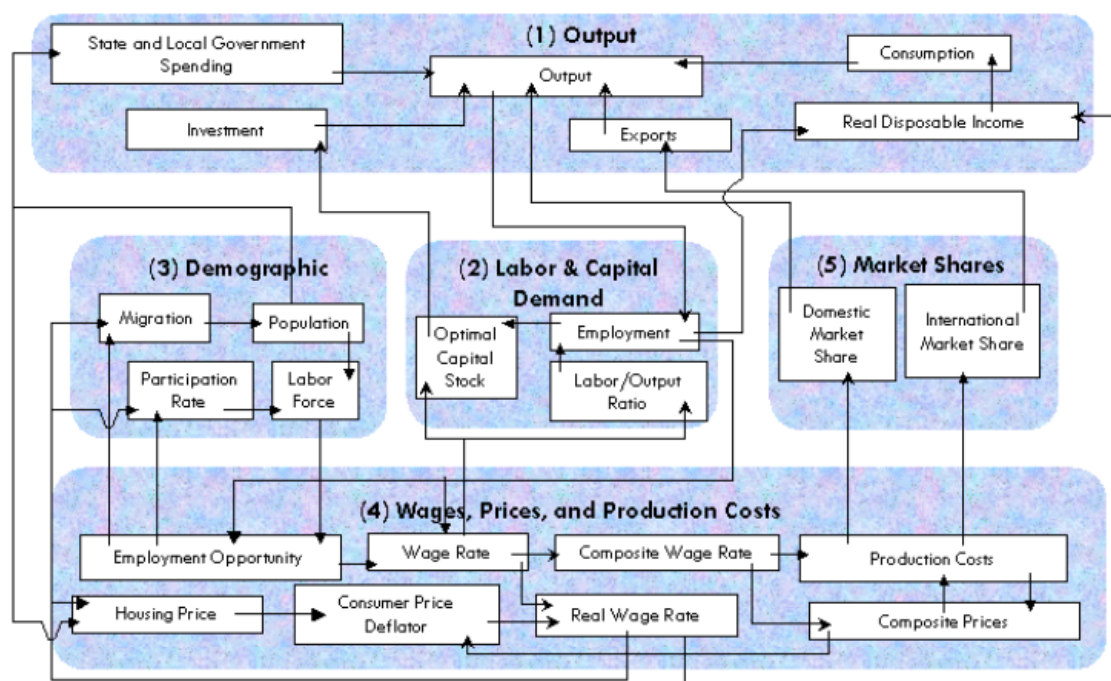
An increase in prices leads to some substitution away from local suppliers toward external suppliers. In addition, a reduction in profitability for local factories leads to less expansion of these factories relative to those located in areas where profits have not decreased. These responses occur because the U.S. is a relatively open economy where firms can move to the area that is most advantageous for their business.

The Complete Model

Figure B-1.3 illustrates the entire model and its components and linkages. This diagram is helpful in understanding the complex relationships shared by variables within the various blocks discussed above, as well as their relationships to variables in other blocks.

Figure B-1.3

REMI Model Linkages (Excluding Economic Geography Linkages)



Appendix C: TRAVEL DEMAND FORECASTING

Policymakers often face a choice among various transportation scenarios. One procedure available to help make this decision is Travel Demand Forecasting. Travel Demand Forecasting is the process used to predict travel behavior and resulting demand for a specific future period, based on assumptions dealing with land use, the number and character of tripmakers, and the nature of the transportation system.

Travel demand forecasting utilizes a travel-forecasting model and attempts to answer questions such as:

- How many trips will be made in the future?
- Which transportation systems will become over-congested in the future?
- How much ridership will a new transportation service attract?

Use of a tool such as the travel-forecasting model can help the policy-maker make an informed decision.

The Connecticut Department of Transportation (CONNDOT) model consists of four basic steps: trip generation, trip distribution, mode choice and travel assignment. Although much more complicated in actuality, CONNDOT's model, like most others in use throughout the US, has its roots in the four-step process.

Land use and Census

Land use data (population, employment, etc.) forms the basis for the amount and type of activity in a region. This demographic information is available from several sources. The Census is a nationwide survey conducted every ten years and provides a detailed population profile of Connecticut. Existing employment statistics are available from the Connecticut Labor Department. CONNDOT develops land use forecasts, in cooperation with the Office of Policy and Management and the regional planning agencies.

Trip Generation

Trip generation provides the connection between land use and travel. It uses known relationships between trip making and demographics to predict the number of person trips, or 'trip ends', starting and ending in particular geographic areas, called 'traffic analysis zones' (TAZs).

Trip Distribution

Trip distribution uses characteristics of the transportation network and regional demographics to distribute the trip ends from the generation model to specific origins and destinations amongst the states TAZs.

Mode Choice

The allocation of person and vehicle trips to a particular travel mode occurs in the mode choice model. Using 'Level of Service' characteristics of each available transportation system, the model 'chooses' a mode of travel for each trip based on the relative attractiveness of each competing mode.

Travel Assignment

Travel assignment or trip assignment is the process by which the transportation engineer estimates the volumes on the transportation system. These can be present-day volumes on an existing network or forecasted volumes on alternative future systems. Assignment volumes may be expressed as vehicles on a highway network or persons on a transit system.

The CONNDOT Statewide Travel Model is a network-based computer model utilizing TRANPLAN software. Highway and transit networks are an integral part of the model, allowing proposed service changes (highway or transit) to be incorporated into the model. Thus, the effect of adding a transit service, increased highway capacity or any other network-oriented change (which can be modeled in this manner) can be analyzed.

Products & Uses

The primary products and uses of the travel model are:

Highway Assignments: utilized to design and evaluate alternative highway proposals. These assignments are used by the Traffic Analysis unit to develop corridor and site-specific future traffic volumes.

Vehicle Miles of Travel (VMTs): a basic input to highway source emissions models for the Statewide Implementation Plan, environmental documents and Indirect Source applications. VMT is the product of highway distance and traffic volume. CONNDOT

uses VMTs and the Department of Environmental Protection for mobile emissions analysis.

Trip Tables: used to analyze area to area movements of person and vehicles.

Level of Service of Highway Sections: used to evaluate the quality of service on highway systems.

Transit Usage Forecasts: used to evaluate existing transit systems and proposed transit projects.

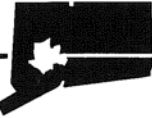
Appendix D: Transportation/Economic Development Studies: State DOT Examples using REMI

State	Purpose	Key Items of Note
California	US 101 Stabilization	<ul style="list-style-type: none"> - One year planned closure - Affecting Humboldt County - Focus on Increased Northbound I-5 Traffic
Louisiana	Statewide Planning	I-12 to Bush, LA Extension <ul style="list-style-type: none"> - Extensive use after Katrina
Michigan	2005-2030 State Long-Range plan “Moving Michigan Forward”	84 Region Model <ul style="list-style-type: none"> - Value of Truck Freight to the State - What if? Condensed Work Schedule
Mississippi	Vision 21 Plan Successor of 1987 Four-Lane Highway Program “A Needs-Based Highway Program”	36 Region Model <ul style="list-style-type: none"> - Gulf Coast Reconstruction - Schedule-lane rentals
Missouri	I-64 Investment	<ul style="list-style-type: none"> - Compared design build to design bid build development options - Focused around St. Louis Metro Area
New Jersey	ARC (Access to Regions Core) Study	<ul style="list-style-type: none"> - Trans Hudson Commuter Line - Access to New Jersey Labor Pool - Housing and Office Space Impacts
New Mexico	US-54 Investment	<ul style="list-style-type: none"> - Capacity Expansion (2 lanes → 4 lanes) - In-State versus out of State Benefits
North Dakota	Legislative Study	<ul style="list-style-type: none"> - Directive to Strengthen Infrastructure to Expand Sales. - Adjustments to Seasonal Highway Load Limits - Rail Infrastructure Analysis - Illustrative Constrained Funding Analysis
Oregon	Multimodal Investment in Southwest Oregon “Oregon Gateway”	<ul style="list-style-type: none"> - Port of Coos Bay Channel Dredging and Widening - Rail Speed and Weight Limits Improved, connection to Region Enhanced - Roadway Investments
Pennsylvania	Long Range Plan	10 Region Model <ul style="list-style-type: none"> - Assess Impact of Various Funding and Investment Scenarios - System Preservation vs. Penn Plan vs. Mobility Plan
Texas	Trans Texas Corridor LBJ Freeway (I-635)	16 Region Model <ul style="list-style-type: none"> - Multimodal Investments, Alternative Road Financing

Virginia	Demand Management	I-81 - Toll Road analysis
Washington	Comparative Roadway Analysis (Pilot Study)	2 Region Model - Compared Benefits and Costs of Two Alternative Roadway Projects

Appendix E: Public Comment and Response

COUNCIL OF GOVERNMENTS



CENTRAL NAUGATUCK VALLEY

60 NORTH MAIN STREET • 3RD FLOOR • WATERBURY, CT 06702-1403 (203) 757-0535
Web Site: www.cogcnv.org E-Mail: cogcnv@cogcnv.org

August 1, 2008

MEMORANDUM: 080108

TO: James Morrin, Connecticut Department of Transportation
FROM: Samuel Gold, AICP, Senior Planner
SUBJECT: **I-84 / Rte 8 Interchange Economic and Fiscal Impact Study**

The staff of the Council of Governments of the Central Naugatuck Valley has reviewed the draft economic and fiscal impact study for the I-84 / Rte 8 interchange project. Staff has a number of comments and concerns regarding the draft study.

1. The area considered in the study is significantly smaller than the area considered in the Technical White Paper. As a result, numerous takings identified in the White Paper are not considered in the economic and fiscal study. (Technical White Paper, Section 4.1.1, page 42)
2. The projected 10% reduction in accidents, upon the completion of alternative 6, seems high. Local traffic will continue to use the I-84 / Rte 8 interchange, and contribute to accidents, if it remains the quickest way across town.
3. The study shows both alternative 6-7 and 6-8 taking the same amount of time to complete. Alternative 6-7 is a technically more complicated project and may take longer to complete. Rebuilding Rte 8 in-place may require rerouting the expressway onto a temporary road and bridge built on the east bank of the Naugatuck River. It does not appear that these potential complications were considered in the study.
4. Appendix A should contain case studies of major highway interchange reconstruction projects, not intermodal transportation centers. Such case studies would be helpful in determining what impact a large highway project could have on Waterbury.
5. Much of the discussion presented in the study about the proposed Waterbury intermodal transportation center (ITC) is not relevant to the I-84 / Rte 8 interchange project. The interchange project is not conditional upon the outcome of the proposed ITC project. Nevertheless, there are a number of details about the ITC that were not considered in the study.
 - a. The study assumes that the proposed ITC will spur transit oriented development. The Economic Development Research Group's 2006 *Review of Thomaston Avenue – Jackson Street Connector Study* found that the proposed ITC probably would not “achieve a critical mass of vibrancy” (page 4).

- b. None of the preliminary designs for the intermodal transportation center include provisions for a direct pedestrian connection to the area west of the railroad tracks. Without a direct pedestrian connection, new development west of the railroad tracks cannot be transit oriented.
- c. The study identifies the Waterbury – New Haven corridor as the fastest growing commuter route and states that the ITC will improve rail access to New Haven from Waterbury. There is no rail line directly connecting Waterbury to New Haven. Traveling by rail to Waterbury takes over 90 minutes with a transfer in Bridgeport. A new ITC passenger terminal, on its own, will not improve access or generate rail ridership between Waterbury and New Haven.
- d. The study does not address the operational impacts of relocating the pulse point for Waterbury’s local bus system. Relocation may significantly increase the cost of bus operations or result in the curtailment of local bus service. Many bus trips may be longer if a transfer at the ITC is required. If service is curtailed and bus trips are lengthened, local bus ridership will decline. A decline in ridership will reduce the viability of any transit oriented development.
- e. If current bus headways and pulse are maintained at the ITC, Meadow Street will be effectively shut down on the hour and half hour. The resulting congestion may have financial impacts on businesses and on the desirability of surrounding properties.
- f. Many of the assumptions made on page 23, under the heading “Modeling the ITC,” are inaccurate:
 - i. The ITC will not be handling “commodities.” It is envisioned to be a passenger terminal.
 - ii. Since the ITC will not be a rail freight terminal, it is unlikely to create jobs in the warehouse/distribution sector.
 - iii. The ITC will not create any new rail connectivity. Enhancing Waterbury’s limited rail connections will require significant track improvements that are independent of the passenger terminal project.

DECD Response to COGCNV Comments and Concerns

1. Section 4.1.1 of the Wilbur Smith Technical White Paper (April 2007) on pages 42 through 44 identify in narrative a number of properties that would be wholly or partially taken by Alternatives 6-7 and 6-8. It is difficult to compare our analysis with the Technical White Paper concerning properties wholly or partially taken under each highway alternative because the properties are not identified by map, block or lot number as we did in our study. In addition, in reviewing the Assessor's maps, we found significant errors and redrew the maps from deeds obtained from the Town Clerk's Office. It is possible to reconcile the description of properties taken in the Technical White Paper with our Tables 2 and 3 on pages 29 and 30. The study area that Wilbur Smith uses in their study is a much larger area than the study area that DECD used. This is because the major differences between Alternatives 6-7 and 6-8 focus on a smaller part of the study area. The remainder of the Wilbur Smith study area (in terms of possible right-of-way changes) will be affected similarly under Alternatives 6-7 and 6-8. We have provided Wilbur Smith with our GIS work and would be willing to meet with stakeholders to understand the differences in the properties taken. The purpose of the analysis was in part to identify and quantify the effects of properties taken in terms of tax revenue forgone and lost jobs. This we attempted to do while the Wilbur Smith paper did not.
2. The 10% reduction in accidents relating to property damage only, fatalities and bodily injury is an assumption easily modified. As we state, the entire analysis is parameterized so that our modeling assumptions can be changed and new results obtained. Alternative 6 will be operational years before Alternatives 7 or 8 commence construction and should alleviate using Route 8 and I-84 for cross-town travel. CONNDOT and DECD are comfortable with the 10% assumption.
3. For the purposes of this study, this construction timeline was used only as an assumption to run the model. It was not intended as a prediction of an actual construction timeframe. It is likely that Alternative 6-7 will take longer than Alternative 6-8 to complete for the reasons you state, however the total cost will not change as we assume. Spreading the cost over additional years does not change the results. It is true we did not consider rerouting Route 8 and the potential complications that would entail. CONNDOT and Wilbur Smith are

looking at that scenario. If Alternative 7 is chosen, we can rerun our models with more accurate assumptions.

4. In laying out the land buildout scenarios under each highway alternative, we estimate the impact of the unique characteristics of the Waterbury project. Looking at other large highway construction projects would not necessarily help Waterbury understand the impact of this particular project. Appendix A examines TOD projects elsewhere as possible models that would enhance the I-84/Rt.8 Interchange Project.
5. We disagree and believe that the ITC is quite relevant to the I-84/Rt.8 Interchange Project. The study does not contend that the Interchange Project is conditional on the ITC or vice versa. The ITC and the Interchange Project are complementary and deserve to be considered as co-developments that enhance Waterbury's accessibility. Other Connecticut municipalities are considering ITCs as a means of fostering TOD and revitalizing their city centers and would be de facto in competition with Waterbury as a development site.
 - a. Our working assumption is that the ITC is complementary to the I-84/Rt.8 Interchange Project. EDRG did not study the I-84/Rt.8 Interchange Project as we did and the resulting improvements in access afforded by both projects.
 - b. DECD is not responsible for the design of the ITC. However, we agree that a pedestrian connection to the west side of the railroad tracks is essential to the success of the I-84/Rt.8 Interchange Project. There is no reason that with further design such a connector could not be incorporated.
 - c. The study does not state that there is direct access to New Haven. Current travel times can be altered with more frequent service. The study does not imply that ridership will increase because of the ITC exclusively. However, the ITC may offer more convenience for riders, which could affect ridership levels. If rail service improves and fuel costs continue to rise, demand will rise as we have seen for MetroNorth and Shore Line East.
 - d. It was not the study's purpose to address the operational impacts of relocating local or intercity bus service to the ITC. There are important issues to address, but developments in other U.S. cities show that transit

improvements are possible with appropriate planning. The conditionals mentioned may not materialize if all parties work together to improve Waterbury's local and intercity transportation system.

- e. It was not the study's purpose to address the operational impacts of adjusting local and intercity bus service. The conditionals mentioned may not materialize if all parties work together to improve Waterbury's local and intercity transportation system.
- f. Modeling the ITC:
 - i. There is no reason freight cannot be handled in the ITC. We have in mind a mail car that could deliver packages and off load to trucks. This could reduce truck traffic on the interstates and main state routes. Other heavier freight could be possible and coexist with passenger service as Amtrak realizes on the New Haven to Springfield line.
 - ii. The Waterbury Development Corp. has had inquiries about companies wanting to set up warehousing and distribution establishments. This is an assumption about the types of establishments that could populate the redeveloped area; it is one of several scenarios.
 - iii. The Waterbury and other MetroNorth Branch Lines need track and signal improvements. Such capital investment will encourage mode switching and enhance Connecticut's commitment to responsible growth.

#12

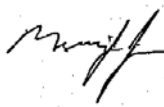
MICHAEL J. JARJURA
MAYOR



JOSEPH A. GEARY
DIRECTOR OF OPERATIONS

OFFICE OF THE MAYOR
THE CITY OF WATERBURY
CONNECTICUT

To: *The Honorable Board of Aldermen
c/o City Clerk's Office*

From: *Mayor Michael J. Jarjura* 

Date: *October 30, 2008*

.....
Dear Honorable Board Members:

*Enclosed for your information is the recommendation from the Mayor's
Economic Development Task Force relative to the proposed reconstruction of
Interstate 84 and Route 8.*

Thank you for your continued cooperation.

RECEIVED
WATERBURY CITY CLERK

236 GRAND STREET • WATERBURY, CONNECTICUT 06702 (203) 574-6712

2008 OCT 30 PM 12:31

DERMAN PAUL PERNERWSKI, JR.
MAJORITY LEADER



Home: (203) 755-2309
Cell: (203) 592-3810
E-mail: aldermanpernerewski@waterburyct.org

BOARD OF ALDERMEN
THE CITY OF WATERBURY
CONNECTICUT

October 22, 2008

Honorable Michael J. Jarjura
Mayor, City of Waterbury

Dear Mayor Jarjura,

Enclosed, please find the recommendation of your Economic Development Task Force for the I-84/Rt. 8 Interchange realignment project being developed by the Connecticut Department of Transportation (DOT). As you can see, the Task Force recommends Option 6-8, which we believe will have the most positive potential for the City in the long term. You will also note that our recommendation is contingent on the commitment by the DOT to address certain fundamental issues in the design process, most notably the Connecticut Light & Power and MacDermid Chemical properties.

Should you require anything further on this matter, please do not hesitate to contact us.

Very truly yours,

Paul K. Pernerecki, Jr.
Chairman
Mayor's Economic Development Task Force

TASK FORCE FOR ECONOMIC DEVELOPMENT

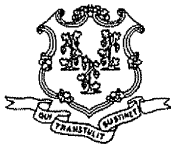
I-84/RT 8 PROJECT RECOMMENDATION (Dated 04 Oct 2008)

This Task Force is recommending that we support Alternate Option 6-8, which will relocate RT 8 from its current location west of the Naugatuck River to a new location east of the river. This option will allow for the greatest long-term opportunities for development and growth for the City of Waterbury. A significant amount of developable land will be reclaimed in downtown just south of Grand Street where I-84 is currently located, and along the west side of the Naugatuck River where RT 8 is currently located. The land that will be acquired for the construction of the new RT 8 on the east side of the river will not affect the current locations of either MacDermid or CL&P, which are two of the City of Waterbury's largest taxpayers. Another advantage of Option 6-8 is that it will be, by far, the least disruptive design for traffic flow throughout the City of Waterbury during the construction phases of the two new highways; as the new highways can be built alongside the current highways while they are still operational.

Alternate Option 6-8 also allows for the incorporation of several separate projects that are currently in-process, including the Transportation Center, and the Greenway Project. Several new local roads would be built and other local roads would also be modified in order to improve overall traffic safety and access to downtown, as well as access to properties in the Freight Street corridor. Overall, Alternate Option 6-8 is projected to cost \$112,000,000 less than Alternate Option 6-7 in 2025 dollars.

As part of our recommendation, the following items need to be addressed:

- The Right-of-Way for the new location of RT 8 east of the Naugatuck River needs to be defined as early as possible.
- Prepare and implement a comprehensive plan for the immediate commercial development of the Freight Street corridor.
- Prepare and implement a remediation plan for the property east of the Naugatuck River, next to the new RT 8 Right-of-Way, before construction begins.
- Finalize the approval of the Inter-Modal Transportation Center and complete its construction prior to the commencement of the highway construction project.
- Start construction of the modifications to the local roadways that are part of proposal Alternate 6 to improve traffic safety and access in and around downtown Waterbury.
- Develop, fund, and implement specific short and long-term plans for the construction of the riverfront Greenway.
- Eliminate the interference with parking at CL&P, possibly by elevating that portion of the roadway.

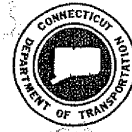


STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

2800 BERLIN TURNPIKE, P.O. BOX 317546
NEWINGTON, CONNECTICUT 06131-7546

Phone:

April 9, 2009



APR 17 2009

WATERBURY ASSOCIATES

Mr. Samuel Gold
Council of Governments Central Naugatuck Valley
60 North Main Street, 3rd Floor
Waterbury, Connecticut 06702-1403

Dear Mr. Gold:

This is in response to your February 19, 2009 comments (enclosed) concerning information presented at the Interstate 84 (I-84)/Route 8 Waterbury Interchange Needs Study (Study) Advisory Committee Meeting No. 4. The following are in response to your comments regarding Proposed I-84/Route 8 alignments:

1. Noted.
2. It is proposed that the Alternative 6 improvements be designed and implemented as a separate near-term project that would be compatible with Alternative 8. Funding and environmental documentation requirements would have to be determined in coordination with the Federal Highway Administration and Connecticut Office of Policy and Management.
3. Alternatives 7 and 8 would require approximately the same amount of time to construct. However, more of Alternative 8 would be constructed on new alignment (off-line), which would be beneficial towards maintaining traffic flow during construction.

The following are in response to your comments regarding the Department of Economic and Community Development (DECD) Draft Economic and Fiscal Impact Study:

1. The prospective land buildout scenarios under each highway alternative were developed by the study team as reasonably comparative analysis designed to aid and inform a decision regarding which highway configuration was preferred by the City of Waterbury (City) for further investigation. Meetings and discussions were held with the City and the Waterbury Development Corporation at various stages in the study process regarding methodology, assumptions and in reviewing draft documentation. At this time, the DECD has expended the funds allocated for the economic

impact study and cannot modify the report or complete further analysis, without additional time and resources (which is not available).

It is reasonable to assume that, because a portion of the existing businesses would be taken under Alternative 8, the economic and fiscal impact under a no-build scenario in this highway configuration would be smaller than the no-build scenario under Alternative 7. With the additional assumption that the displaced businesses would not relocate to another Waterbury location, there would be job and tax losses to the City (which would be small). If DECD assumed the displaced businesses would relocate in the City, the economic and fiscal impact would be quite small as it is in the no-build scenario under Alternative 7. DECD had modeled each scenario with and without the Intermodal Transportation Center (ITC) to be consistent with the other parts of the analysis.

2. The study anticipates Alternative 6 to be constructed in 2015. The DECD Economic and Fiscal impact report was revised accordingly. The implementation schedule is expected to be revised as the planning and project development process progresses.
3. The DECD study was not intended to evaluate possible incentives dislocated businesses might have available to them to mitigate displacement. This was not part of DECD's scope of work. Further, there are several possible incentives that exist and some that may be created to assist displaced businesses if a particular highway configuration and land buildout scenario is adopted.
4. The analysis in the residential scenario under Alternative 8 looks only at square footage of multi-unit residential (e.g., condos) structures because this example provides the construction costs and property tax revenue to the City necessary for economic modeling. Specifying the number of bedrooms and square footage for each unit would make no difference to the economic and fiscal impact to the City and the State.
5. The economic analysis model (REMI) calculates the demands for net new state services due to new population. Net new state services involve increases in some categories (e.g., public safety, public education, and public works) and reduction in certain expenditures as more people find work and put a smaller drain on transfer payments and social services. DECD calculates the local impact of increased population in a model outside REMI based on the historical revenues and expenditures per capita in Waterbury. DECD can share the details of these calculations and assumptions with you upon request.
6. The ITC is not the pivotal element in the decision regarding which highway configuration is recommended. When the ITC is built, it will have an added positive effect for any development scenario including the No-Build option. The land buildout scenarios under each highway configuration were

modeled separately to measure the effect of the developments independently. The ITC and the interchange configuration and land buildouts (if any) do have interactive effects and so they are co-developments from an economic development perspective.

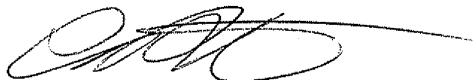
7. DECD did make assumptions about the Waterbury Branch Line service as you state. We will insert these implicit assumptions on page 23. Notwithstanding the current state budget and economic conditions in the state and nation, the ITC and other assumptions are helpful for comparing alternatives, which is their only purpose.

The economic assessment is intended to present a relative comparison for building either Alternative 7 or 8, based upon the information available at the time of analysis. Certain economic assumptions used in the report have been based on professional judgment. The economic impacts will be considered further as a component of additional environmental evaluations.

The Department appreciates your interest in this important initiative and looks forward to your continued input as this Study progresses into its final phase. Additional opportunity to participate in the decision process will be provided as part of subsequent planning and design processes. Your comments and this response letter will be included in the Final Report for the Study.

If you have any questions or need additional information, please contact Mr. James C. Morrin, Transportation Supervising Planner at (860) 594-2147 or by e-mail at james.morrin@ct.gov.

Very truly yours,



Carmine P. Trotta
Transportation Assistant Planning Director
Bureau of Policy and Planning

Enclosure

cc: Mr. David K. Stahnke
Mr. Stanley McMillen



February 19, 2009

MEMORANDUM: 021909

TO: James Morrin, Connecticut Department of Transportation
FROM: Samuel Gold, AICP, Senior Planner
SUBJECT: I-84 / Rte 8 WINS Advisory Committee Meeting #4 Comments

The staff of the Council of Governments of the Central Naugatuck Valley has some comments and concerns regarding the material covered at the Advisory Committee Meeting held on January 28, 2009.

Proposed I-84 / Rte 8 Alignments

1. Moving the interchange to the east of the river, alternative 8 may increase accessibility to downtown.
2. If alternative 6 is pursued as part of a larger alternative 7 or 8 project, it would be subject to the EIS for the entire project. The near-term improvements recommended under alternative 6 should be designed and implemented as a separate project so that the congestion and safety benefits can be realized as soon as possible. Such a project may only require an environmental assessment (EA), which would take less time than an EIS. The project should be eligible for Congestion Mitigation & Air Quality (CMAQ) funding.
3. If alternative 8 takes a significantly shorter amount of time to construct than alternative 7, an argument could be made that it would be less disruptive to the City of Waterbury and speed up new development of surrounding land. An estimate in the difference in construction time would be helpful for decision making.

DECD Draft Economic and Fiscal Impact Study

1. The economic impact of a "no land buildout" scenario is presented for alternative 7, but not for alternative 8. Staff appreciates that the land available for development in alternative 8 may be more attractive to developers than the land available in alternative 7. Considering the state of the economy and that future private development is not a certainty, a "no land buildout" economic impact scenario should be presented for alternative 8.
2. The Study shows projects from alternative 6 commencing in 2012. According to the time line presented at the advisory committee meeting, that date is unlikely. Staff would suggest that the 2012 date be revised in the study.

3. The Study should include recommendations of tax incentives or other techniques that the City and state might use to keep displaced businesses from relocating to other municipalities. The Study assumes that all displaced businesses will continue operating in Waterbury even though this may not be the case.
4. The Study should include a breakdown of new residential units (size, number of bedrooms) that were used in the model under alternative 8, Scenario 1.
5. On page 42, it states that "the fiscal results for the City and the state reflect the direct, indirect and induced effects (that is, the total effect) of demolition, remediation, road and building construction, and the subsequent increases in jobs, retail sales and all taxes thrown off by the new economic activity in each region, as well as debt service required to fund bond issue(s)."

What, if any, assumptions were used to forecast the fiscal impact of increased demand for municipal services (i.e. education) brought on by the new population in the residential units proposed in alternative 8?

6. The Study characterizes the proposed intermodal transportation center (ITC) and the I-84 / Rte 8 interchange project as "co-developments." The preliminary design for the ITC has been completed and, if built, the ITC could be completed decades before the interchange is rebuilt. The decision as to whether to build the ITC or some modification thereof will be made regardless of which interchange alternative is chosen. Therefore these two projects should not be considered "co-developments."
7. The Study makes the assumption that the ITC will generate 1,500 new jobs in New Haven County. Staff believes that this assumption is overly optimistic and cannot be realized by the ITC alone.

To realize a significant increase in employment related to ITC, other assumptions have to be made regarding the Waterbury Branch Line. Some of the assumptions include additional passenger rail service, improved access of rail freight, increased reverse commuting, and transit oriented development accessible to the ITC. It is important that these assumptions be stated in the report. Furthermore, given the current state of the economy and state budget, are these assumptions still valid?

REPORT OF MEETING

Project: I-84/Route 8 Waterbury Interchange Study
Date: Thursday, January 29, 2009
Time: 4:00 P.M.
Location: Waterbury Regional Chamber of Commerce, Waterbury

Subject: Advisory Committee Meeting #4

In Attendance:

Samuel Gold	- COGCNV
Carmine Trotta	- CTDOT-Planning
Judy Raymond	- CTDOT-Planning
Carl Rosa	- Main Street Waterbury
Jeffrey Rouleau	- Waterbury Regional Chamber of Commerce
Kathy McNamara	- Waterbury Development Corporation
Sgt. Brian Van Ness	- Connecticut State Police
Frederick Riese	- Department of Environmental Protection
Ron Sacchi	- URS Corporation
Katherine Zatkowski	- RIDEWORKS
James Morrin	- CTDOT-Planning
Edwin Rodriguez	- Loyola Development
Terry Caldarone	- Mayor's Office
Peter Dorpalen	- COGCNV
Ken Livingston	- Fitzgerald & Haddiday, Inc.
J. Paul Vance Jr.	- Board of Alderman
Jim Sequin	- City of Waterbury Planning
Stan McMillen	- DECD
Dave Stahnke	- Wilbur Smith Associates
Kwesi Brown	- Wilbur Smith Associates

Meeting/Presentation Summary:

Jim Morrin of the Connecticut Department of Transportation (CTDOT) opened the meeting by welcoming members of the Advisory Committee. He introduced Dave Stahnke from Wilbur Smith Associates and Stan McMillen from the Department of Economic and Community Development (DECD) as fellow presenters for the evening.

Mr. Morrin outlined the meeting agenda and detailed the background of the study as well as the work that has been done to date. He briefly described the five preliminary alternatives that were initially developed during the study screening process and used in developing the three conceptual improvement alternatives that remain.

Dave Stahnke then provided an overview of the three conceptual improvement alternatives (Alternatives 6, 7 and 8), highlighting their differences as well as their similarities. He explained the ranking exercise that had been undertaken during the refinement of conceptual alternatives stage of the study. He indicated that Alternative 8 obtained the highest score, based on the results of the ranking exercise. He stated that the preliminary recommendation from the refinement of alternatives stage of the study was to advance Alternative 6 as the near term improvement and Alternative 8 as the long term improvement. He highlighted the need to choose a preferred alternative to advance to the next phase of the study.

Stan McMillen from the DECD then gave an overview of the approach used in the economic development study. He discussed the REMI model that was used in the analysis and then presented the fiscal and economic results of the study. Dr. McMillen indicated that the results of the study showed that both the fiscal and economic benefits of Alternative 6/8 are expected to be better than Alternative 6/7.

Dave Stahnke then concluded the presentation by making the point that the DECD study supported WSA's preliminary recommendation to advance Alternative 6 as the near term improvement and Alternative 8 as the preferred long term improvement. He discussed the next steps for the study, as detailed in the presentation, and requested that comments be submitted by February 20, 2009. He then opened the floor for discussion.

Questions and Comments:

- 1) Question: If constructability was not included as a ranking criteria, would Alternative 8 still be the preferred alternative?

Response - Dave Stahnke: Yes, the other ranking criteria show that Alternative 8 is a better option.

- 2) Question: Alternative 8 is ranked higher than Alternative 7 but the cost of the two is about the same. Why is this so?

Response - Dave Stahnke: The cost estimates of the alternatives are very preliminary and have changed considerably since they were originally compiled. The relative difference between the two is not substantial.

- 3) Question: Will the alternatives be refined before a decision on a preferred alternative is made?

Response - Dave Stahnke: We are hoping that the committee and stakeholders can support a decision on an Alternative before refinement is undertaken.

Response - Jim Morrin: It may seem as if both Alternative 7 and 8 are comparable, but we feel from a constructability and traffic maintenance perspective, Alternative 8 is the better option.

- 4) Question: Why is the highway footprint illustrated in the DECD report for Alternative 8 smaller than Alternative 7?

Response - Stan McMillen: That was the footprint that was obtained from the CADD plans of the conceptual alternatives.

- 5) Question: Under Alternative 8, do you think that people will be reluctant to undertake any development in the area where the new Route 8 highway is proposed knowing that a highway will be coming through that area?

Response - Stan McMillen: People should not have to wait. Under Alternative 8, there are other parcels that will be available for development prior to highway construction.

- 6) Question: If we go with Alternative 8, how long will it take for the land where the Route 8 currently passes be available for development?

Response - Dave Stahnke: You will have to wait for the new Route 8 to be built and the old Route 8 removed, before that land becomes available.

Response - Stan McMillen: There are properties on the east side that can be developed during construction so developers do not have to wait.

- 7) Question: Is it for sure that the Maloney Magnet School will not be impacted?

Response - Stan McMillen: From the plans it seems that the Magnet School will not be touched.

Response - Jim Morrin: That is going to be part of the refinement process to make sure that the Magnet School is not impacted.

- 8) Question: Why does the Intermodal Transportation Center (ITC) have a positive impact on employment on New Haven County but a negative impact on the State?

Response - Stan McMillen: Providing more access attracts more people who may not be employed or fully employed (economic migrants), which leads to increased population and increased demand on public services. Therefore, for the State, the ITC will have a small but negative differential impact on public sector employment. In addition, the debt service that will be incurred by the state in bonding for the ITC accounts for the small but negative differential impact on public service.

- 9) Question: For Alternative 6-7 No Build (Scenario 1), you are gaining jobs from 1,589 jobs to 1,632 jobs. I take it that those gained jobs will be outside the developable land area?

Response - Stan McMillen: Yes, there is no buildout, so jobs will be gained in the surrounding towns in New Haven County but not the City of Waterbury.

10) Question: Will it make any difference if you run the model for other Connecticut Counties?

Response - Stan McMillen: We ran the model for 8 other counties, but the impact on those other counties was minimal.

11) Question: Is the difference in GRP with and without the ITC because of the capital improvements made?

Response - Stan McMillen: Yes, because you are providing increased access to the area.

12) Question: What level of service did you consider for the ITC?

Response - Stan McMillen: We assumed there would be three (3) to 4 trains during rush hour. Each train will have about 7 to 8 cars.

13) Comment: The fact that Alternative 8 provides increased access to the highway and downtown is in itself an economic benefit but this point is not emphasized enough in the report.

14) Question: Did you conduct a no-build economic analysis for Alternative 8 as in Alternative 7 so you can compare apples to apples?

Response - Stan McMillen: You will not be comparing apples to apples if you do that, since in Alternative 8, you will be losing land under a no-build scenario.

15) Question: Did you consider environmental remediation in the economic study?

Response - Stan McMillen: Yes, \$150 million was used as a placeholder.

16) Question: Will the EIS include an economic impact component?

Response - Carmine Trotta: Yes, an EIS can include an economic component.

17) Question: If a decision is made for a preferred alternative, when does all the work get started?

Response - Carmine Trotta: It is going to take a while. The EIS phase will last say, 3 years. The environment design phase will last for about 5 years and actual construction about 10-15 years.

18) Question: Is it possible that Alternative 6 can be broken up into smaller projects so that you will not require an EIS?

Response - Dave Stahnke: Yes, parts of Alternative 6 such as the signal timing and signage improvements will not require an EIS.

19) Question: Will funding for Alternative 6 components outside the highway be funded by the Federal Highway Authority?

Response - Carmine Trotta: I am hoping that FHWA will finance it but I can't tell you for sure. I believe that if it can be demonstrated that Alternative 6 would highway operations or be a component to a Traffic management strategy during construction, FHWA may support financing. It would have to be discussed as the recommendation is further developed.

20) Question: Are the new local streets going to be State or City Streets?

Response - Jim Morrin: They would be City Streets.

21) Question: So the way things stand now on this study, who are you waiting for a response from to move the study to the next phase?

Response - Carmine Trotta: The Advisory Committee.

22) Question: How was it determined that 1,500 jobs would be created with the build scenarios?

Response – Stan McMillen: The number is based upon my judgment. There are a number of unknowns, so assumptions had to be made in order to make a relative comparison between the alternatives. This number can be changed given additional information.

22) Question: What is the timeline for the completion of this study?

Response – Jim Morrin: We would like to begin refinement of a preferred alternative as soon as possible. It will help if we receive feedback from the Committee and City on the preferred alternative.

Response - Carmine Trotta: We hope to complete this study by the summer of 2009.

23) Question: What is the next step if the Advisory Committee or City does not respond with a preferred alternative?

Response – Carmine Trotta: The Department plans to continue towards completing this study with a preferred recommendation.