



# ***THE I-84 HARTFORD PROJECT***

## **Public Advisory Committee Meeting #4**

**April 29, 2014**





# Agenda

1. Welcome & Meeting Purpose (**5 minutes**)
  - a) Agenda
  - b) Where we are in the process
  
2. Needs and Deficiencies (**20 minutes**)
  - a) Update on project costs (risk analysis)
  - b) Topics for future meetings
  
3. Urban Design (**50 minutes**)
  - a) Missed opportunities in I-84's past
  - b) Principles of Urban Design
  - c) Urban Design challenges in the corridor
  - d) Urban Design opportunities in the corridor
    - 1) Transit Oriented Development
    - 2) Complete Streets
    - 3) Context Sensitive Solutions
  
4. Update from P&N working Group (**10 minutes**)
  
5. Next steps (**5 minutes**)

# Where we are today







# THE I-84 HARTFORD PROJECT

## Update on Project Costs





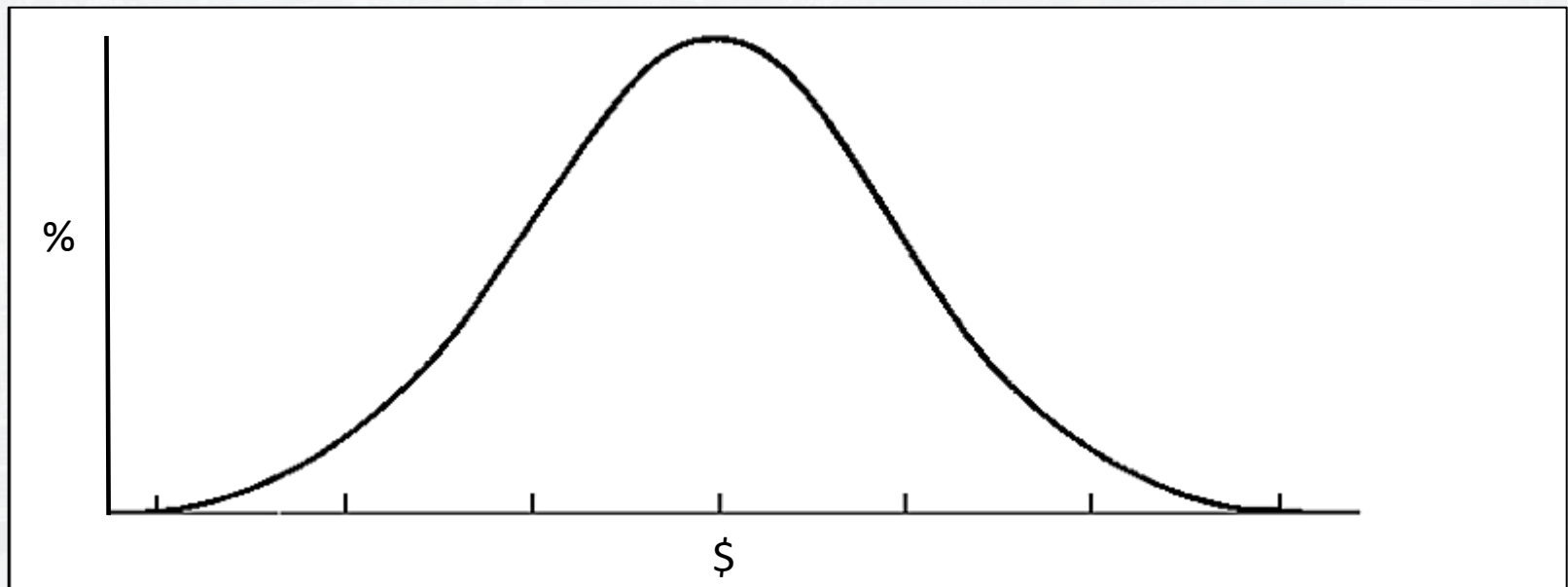
# Cost Estimate Objectives

- Begin the management of the project's cost and budget
- Although design has not begun, have a better sense of the project's possible cost
- Prepare a risk-based, probabilistic cost estimate



# What is a Probabilistic Cost Estimate?

- Taking into account risks, a Probabilistic Cost Estimate reveals the full range of possible costs and associated confidence levels





# Documentation Developed and Reviewed

- Assumed Conceptual Design Alternatives
- Base Cost Estimates for each Assumed Alternative
- Preliminary Project Schedule



# Risk Concepts – Uncertainty

*“We know it is going to happen”*

**Known  
Knowns**

*“We expect it to happen, but do not have enough information to quantify it yet.”*

**Known  
Unknowns**

**Unknown  
Knowns**

*“It might happen, but at least we know about it”*

**Unknown  
Unknowns**

*“We didn’t see that coming!”*





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## Risk Areas/ Categories

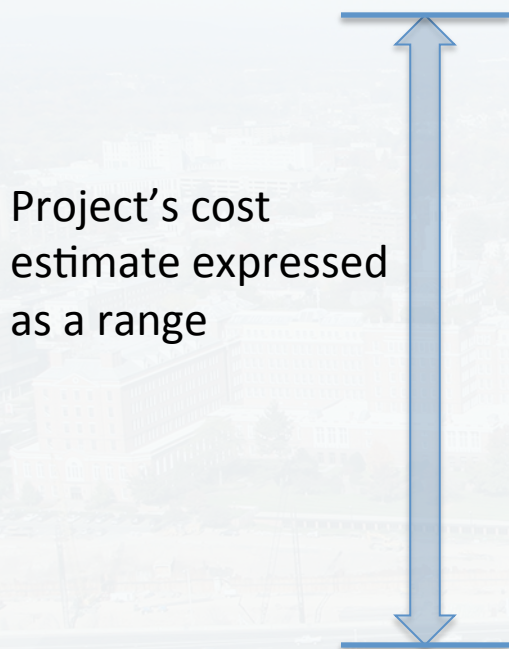


# Risk Register

- Identified risks and opportunities
- Quantified risks and opportunities and established probabilities as to cost and schedule impact
- Model significant risks (threats and opportunities)
- Cost Risk / Schedule Risk



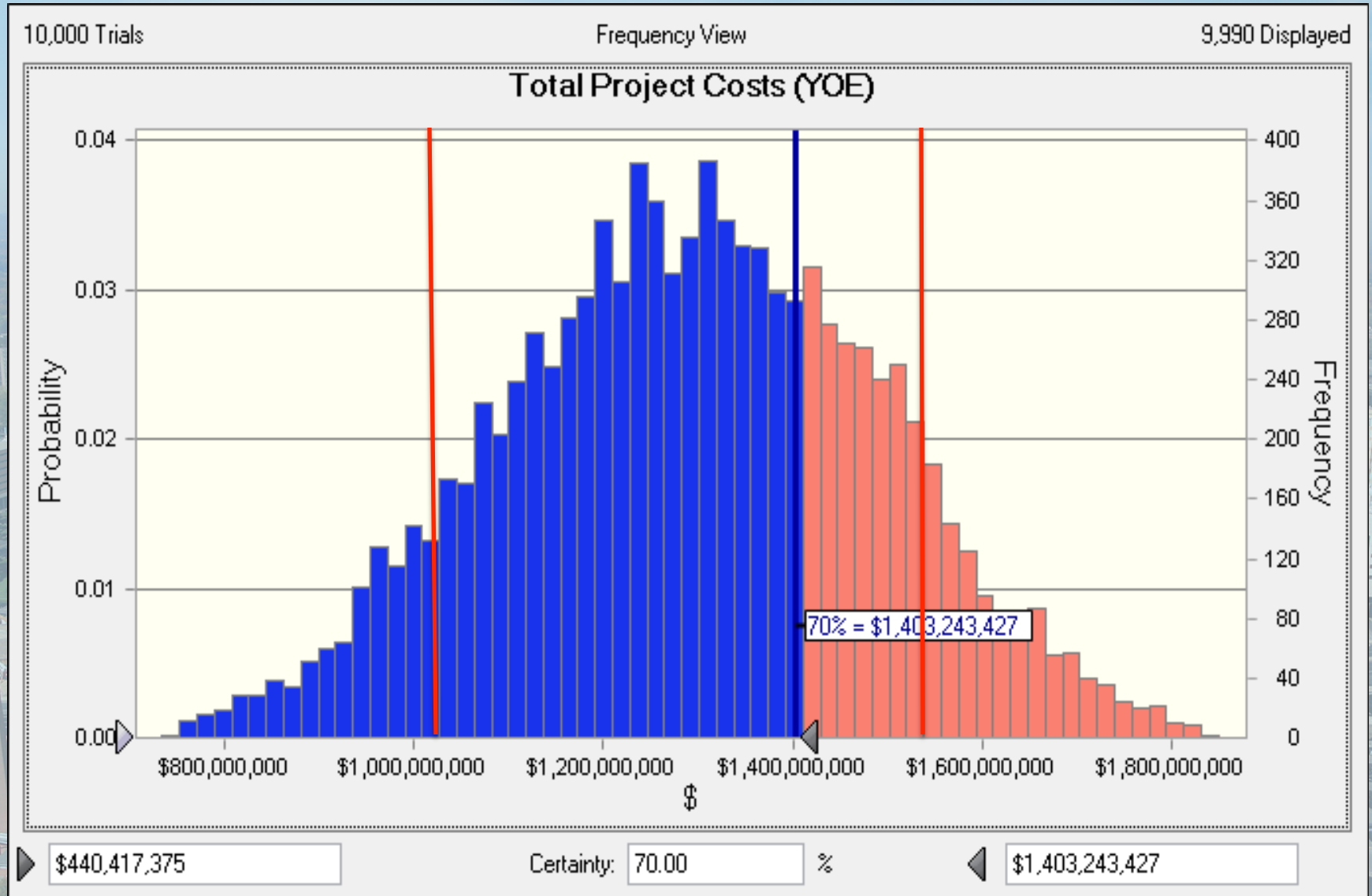
# Example Results



Project's cost estimate expressed as a range

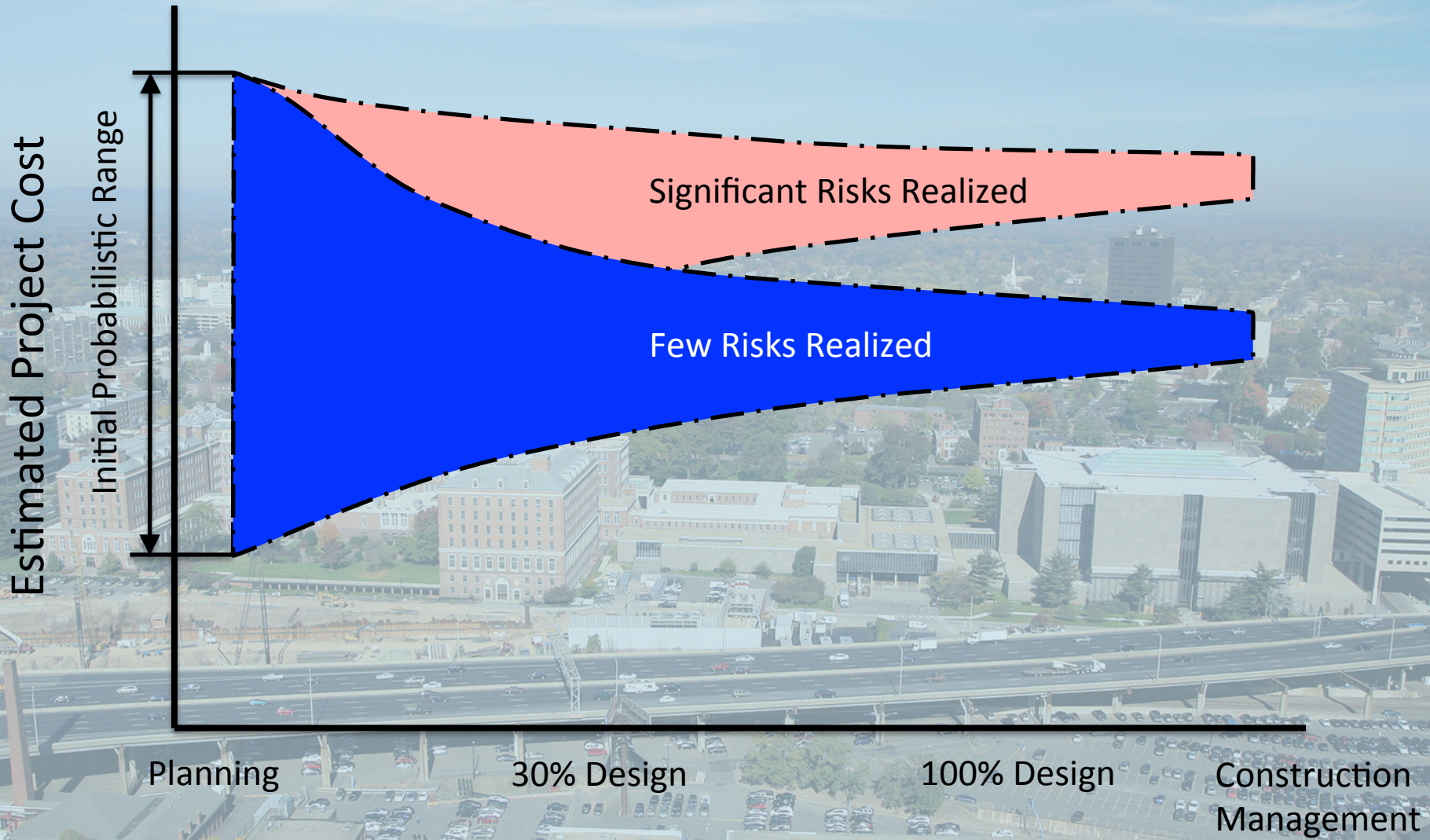
Percentile	Forecast values
0%	\$ 704,915,296
<b>10%</b>	<b>\$1,029,180,225</b>
20%	\$1,119,435,336
30%	\$1,185,521,693
40%	\$1,240,021,457
50%	\$1,294,812,771
60%	\$1,344,997,552
<b>70%</b>	<b>\$1,403,243,427</b>
80%	\$1,467,882,087
<b>90%</b>	<b>\$1,545,180,293</b>
100%	\$1,871,510,386

# Sample Cost Range Output





# Cost Range and Project Status

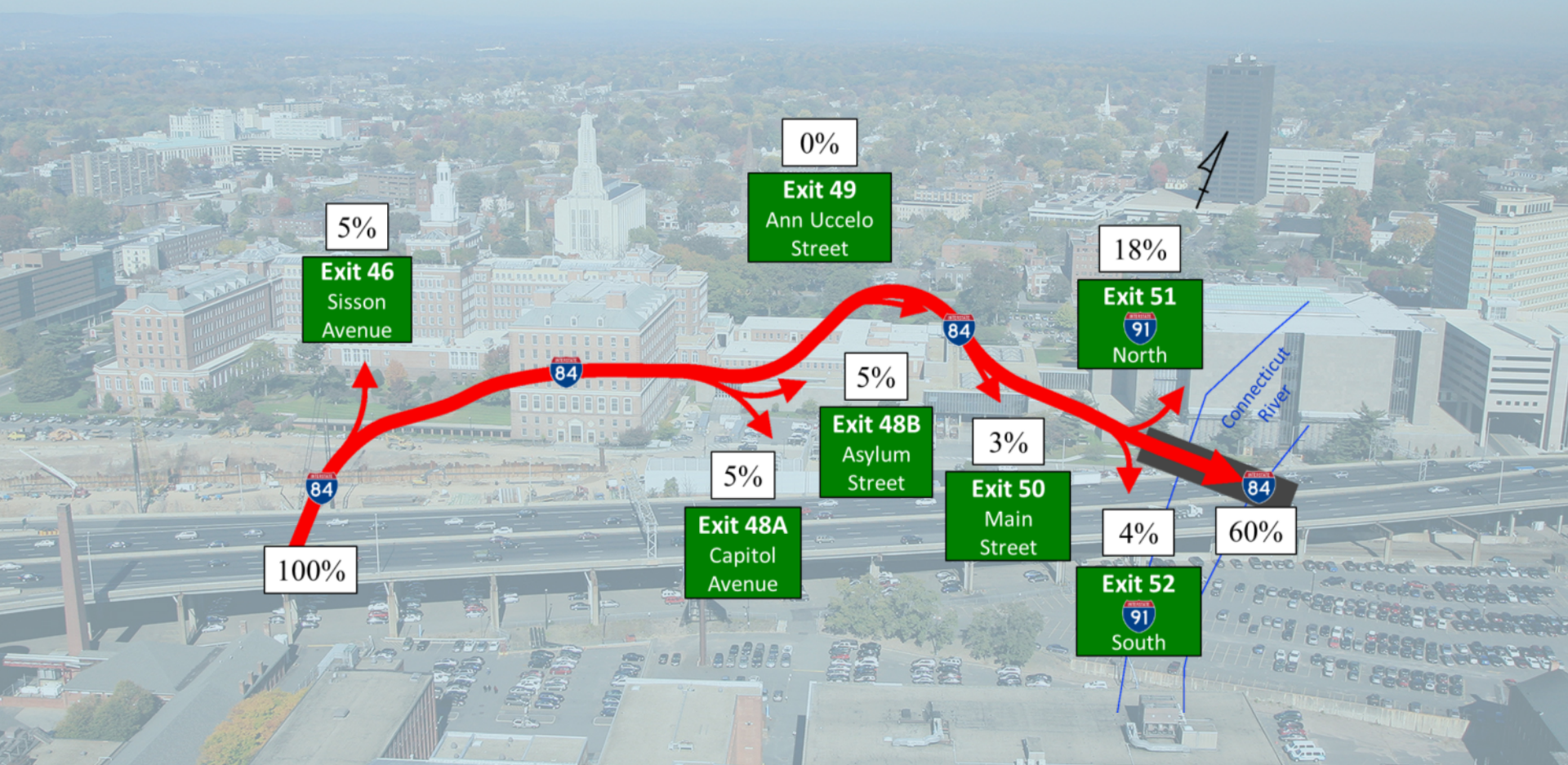






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## Needs & Deficiencies “Look-ahead”





# Topic for Future PAC Meetings

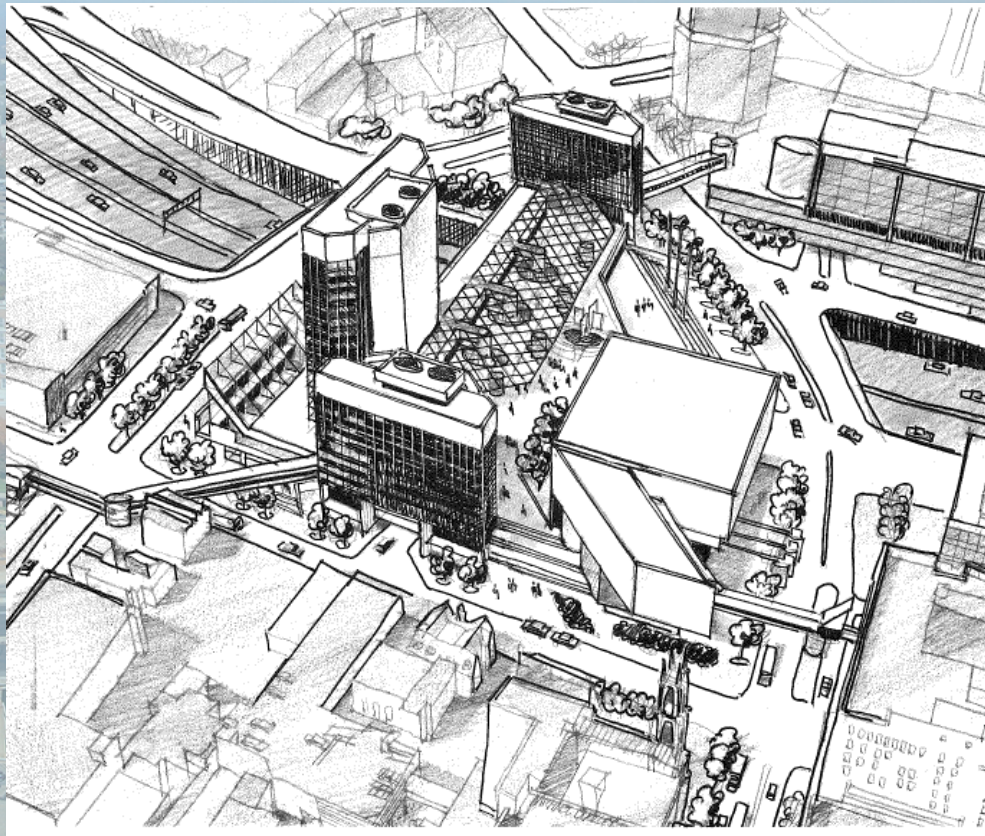
- Structural conditions (presented)
- Safety
- Geometrics
- Traffic
- Bike/Ped conditions
- Environmental conditions





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## Missed opportunities in I-84's past

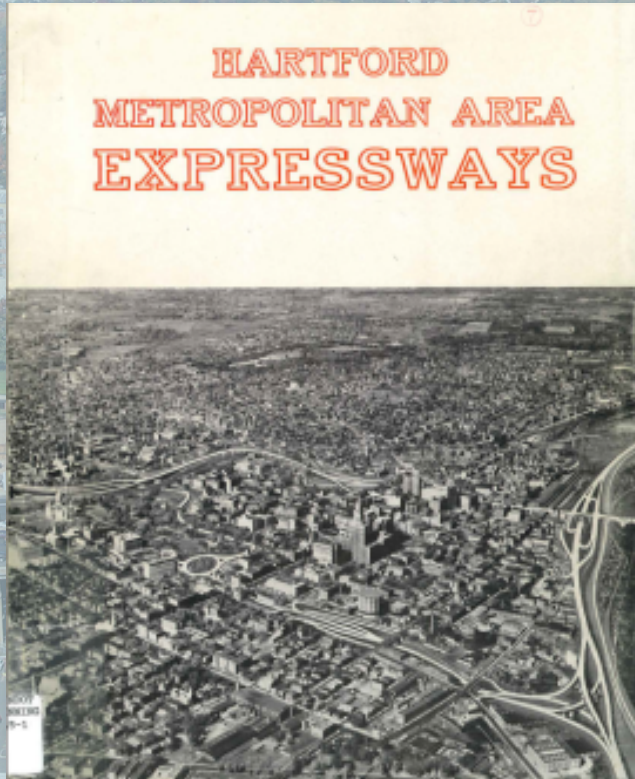






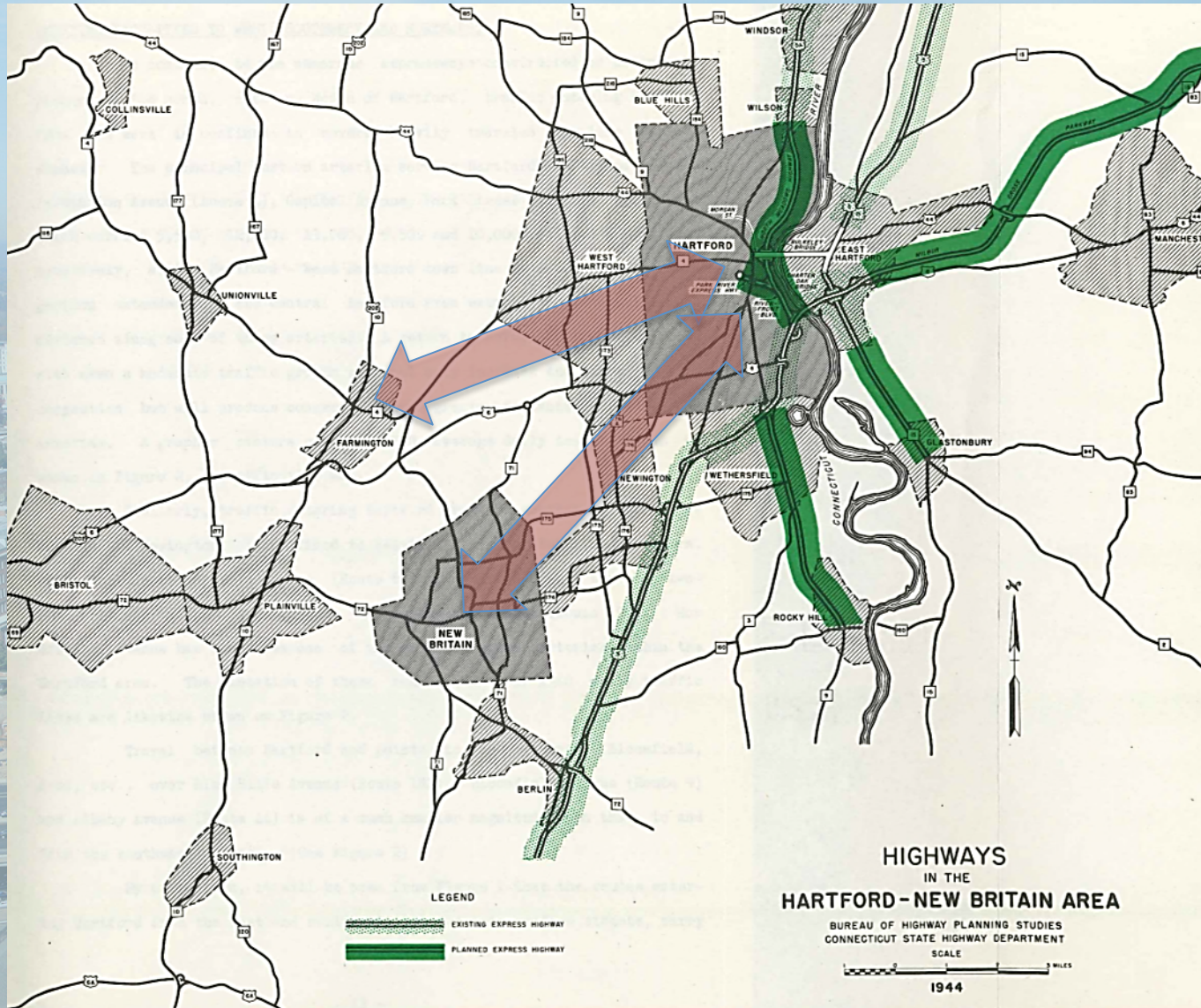
# THE I-84 HARTFORD PROJECT

## Hartford Metropolitan Area Expressways (1945 – CT Highway Department)





# Hartford Metropolitan Area Expressways (1945)





# Hartford Metropolitan Area Expressways (1945)

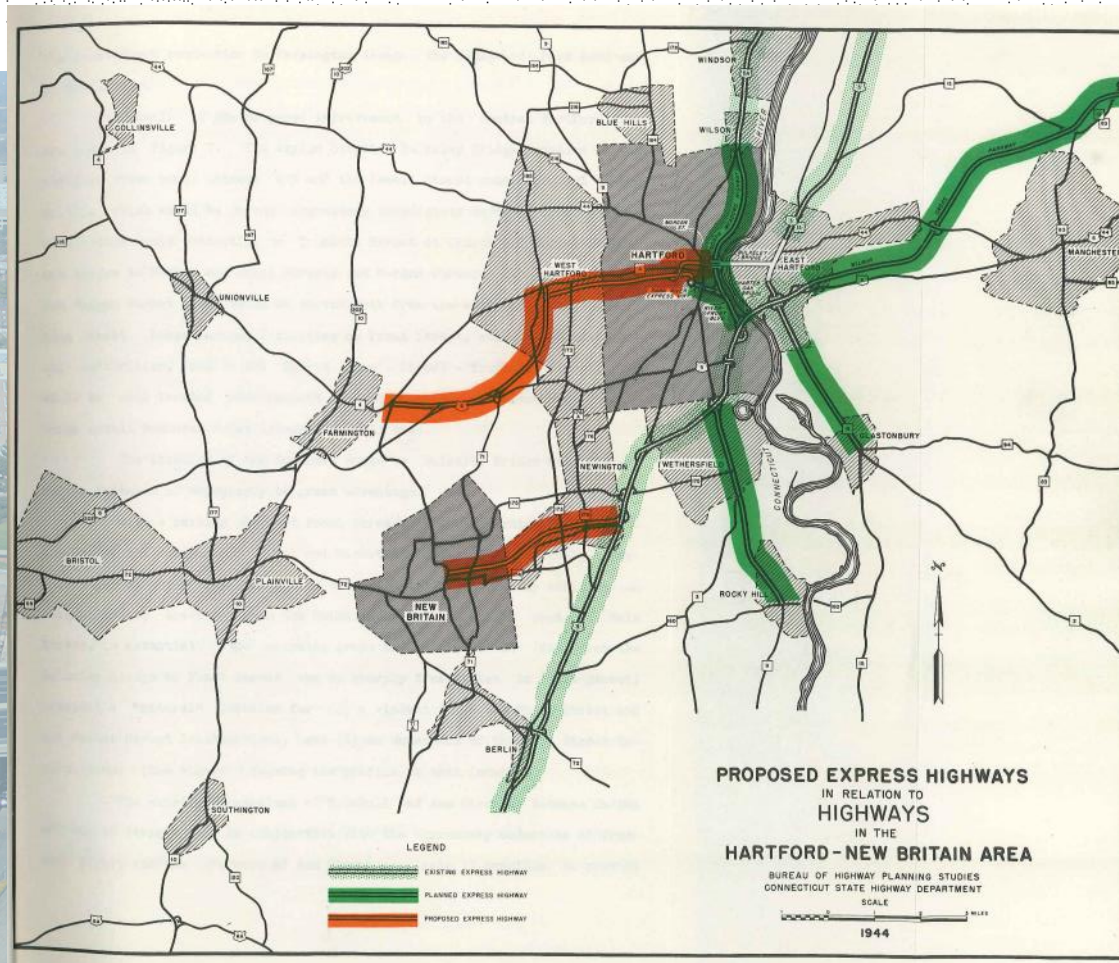
- “The major element in any plan to bring order into what has been a wasteful trend is to provide relief to the intolerable traffic congestion.”
- “It is now recognized, however, that the congestion on the principal city streets is more than a local problem – that its proper solution is essential to the welfare of the State as well as of the cities.”



# Hartford Metropolitan Area Expressways (1945)

The situa-

tion is approaching the time, not of what CAN be done, but, of what MUST be done!



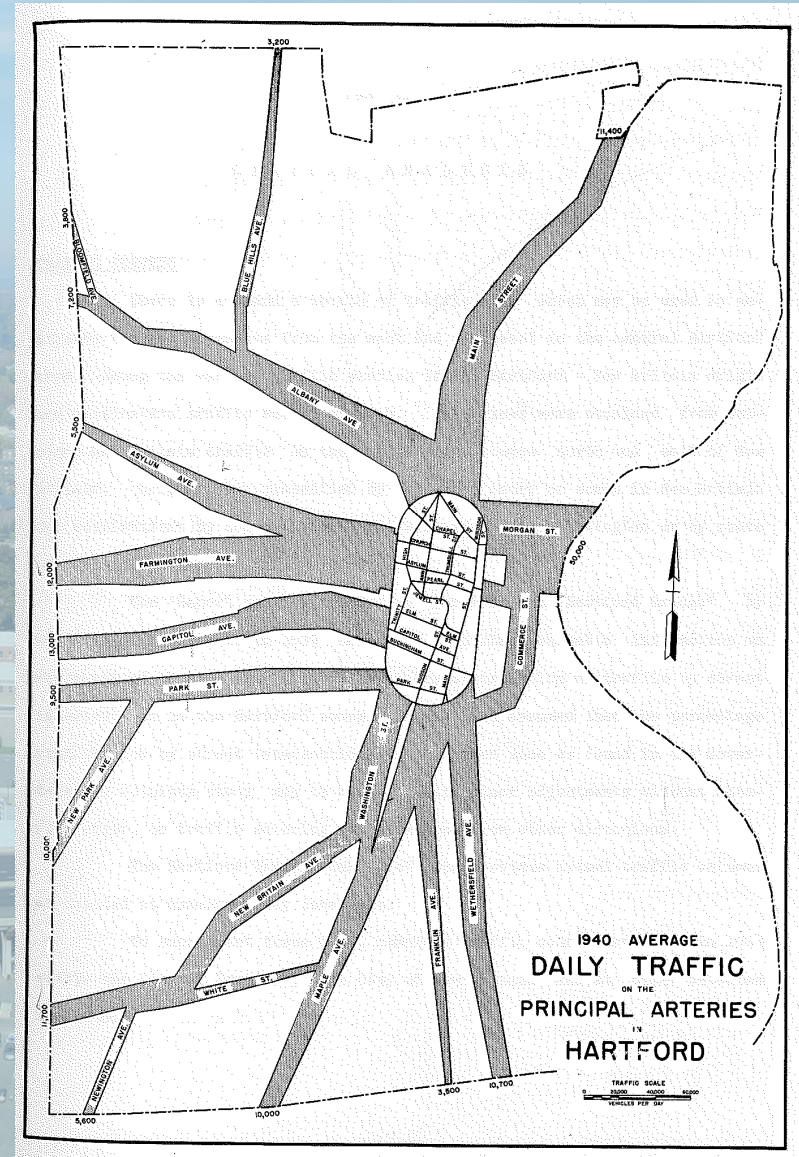
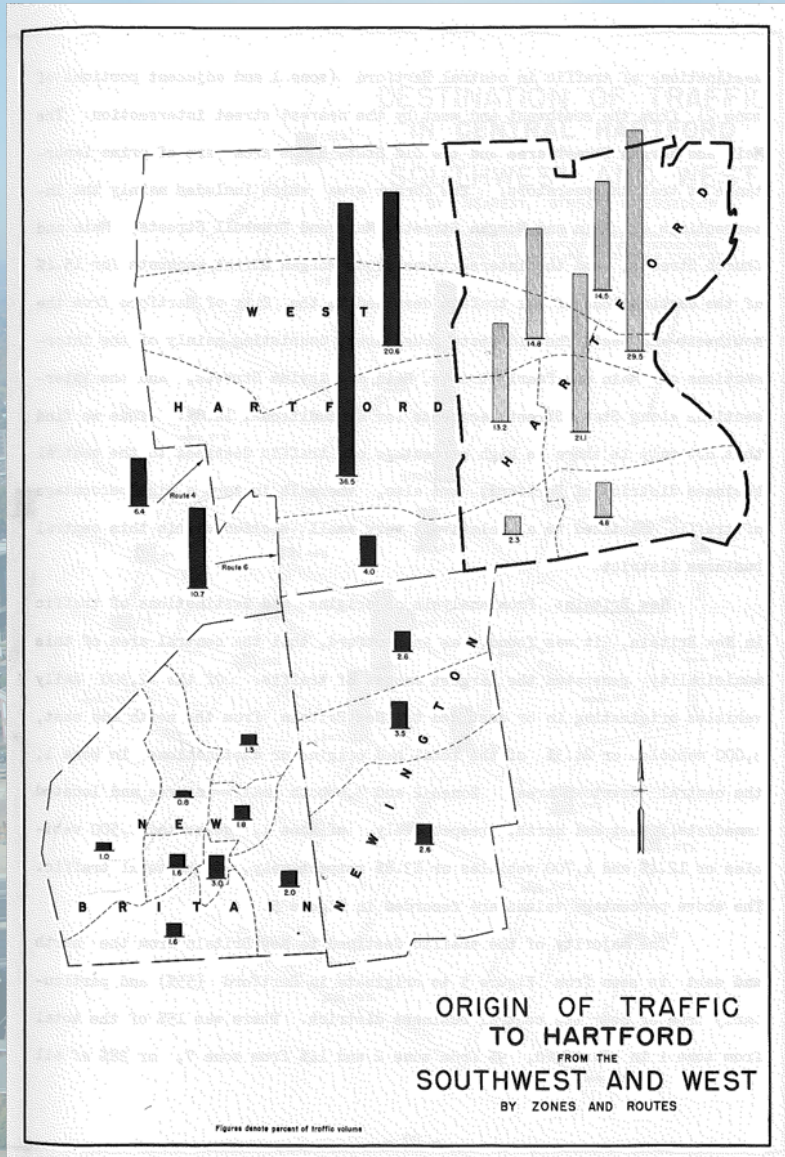


# Hartford Metropolitan Area Expressways (1945)

- “It has been clearly demonstrated...that [expressways] represent the only real solution of the problem of highway congestion.”
- “Great community and business benefits will result from improved traffic conditions.”
- “Properly planned and constructed expressways, utilizing, as they will, present run-down and decadent areas, should not only give greatly increased efficiency to highway transportation, but also provide park-like development throughout the greater portion of their length.”



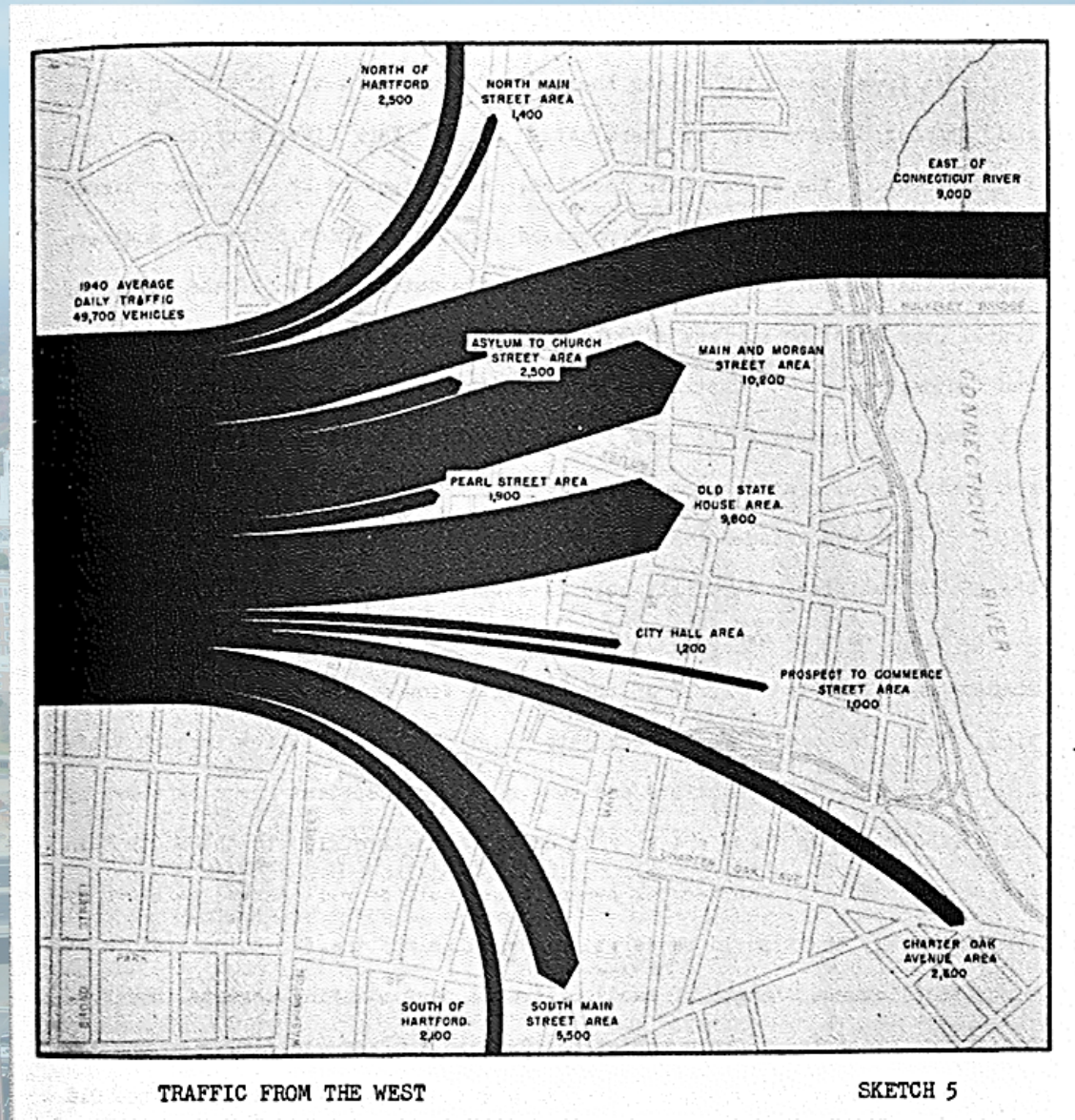
# Hartford Metropolitan Area Expressways (1945)





# Hartford Metropolitan Area Expressways (1945)

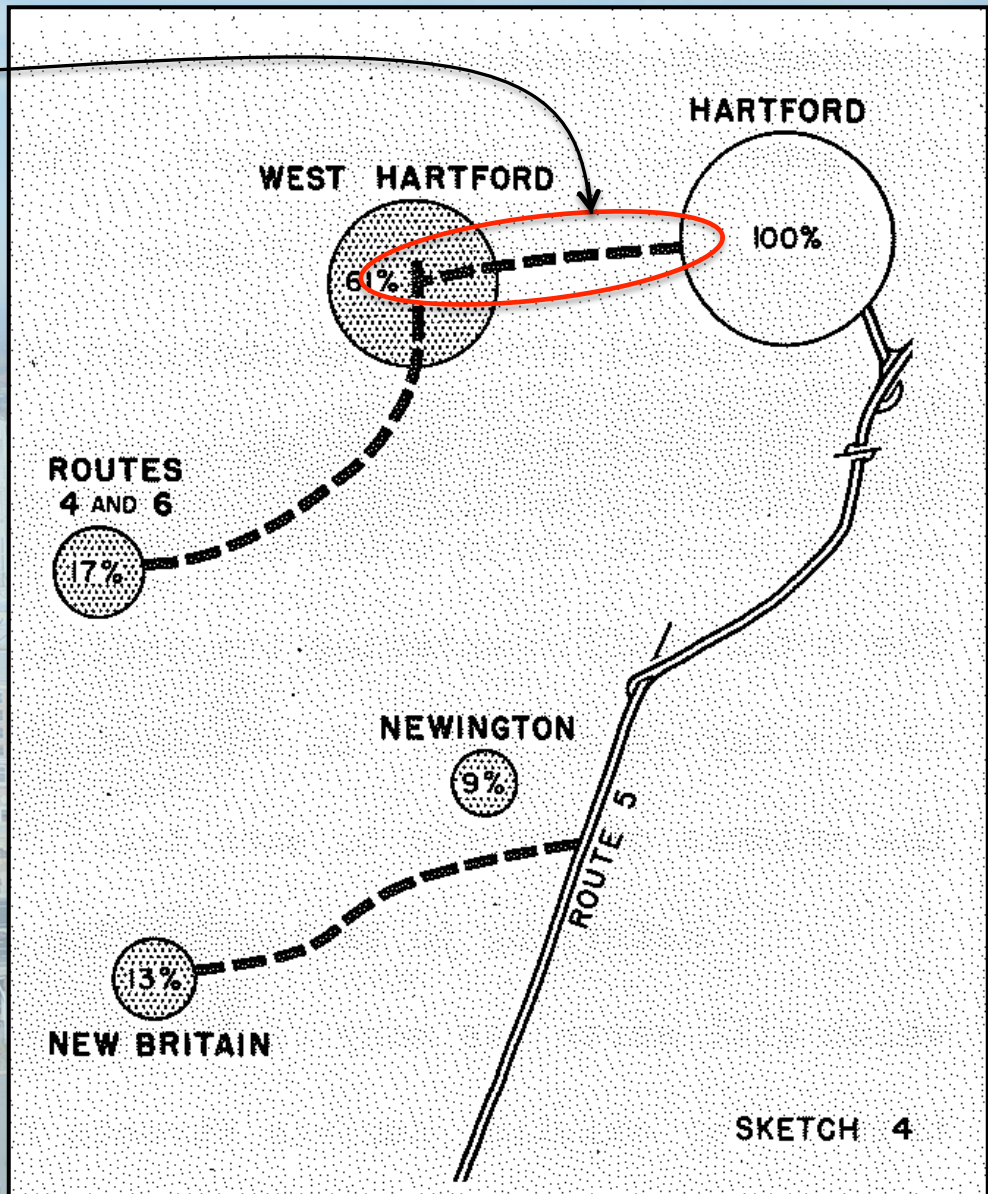
Traffic from the west into Hartford (1940)





# Hartford Metropolitan Area Expressways (1945)

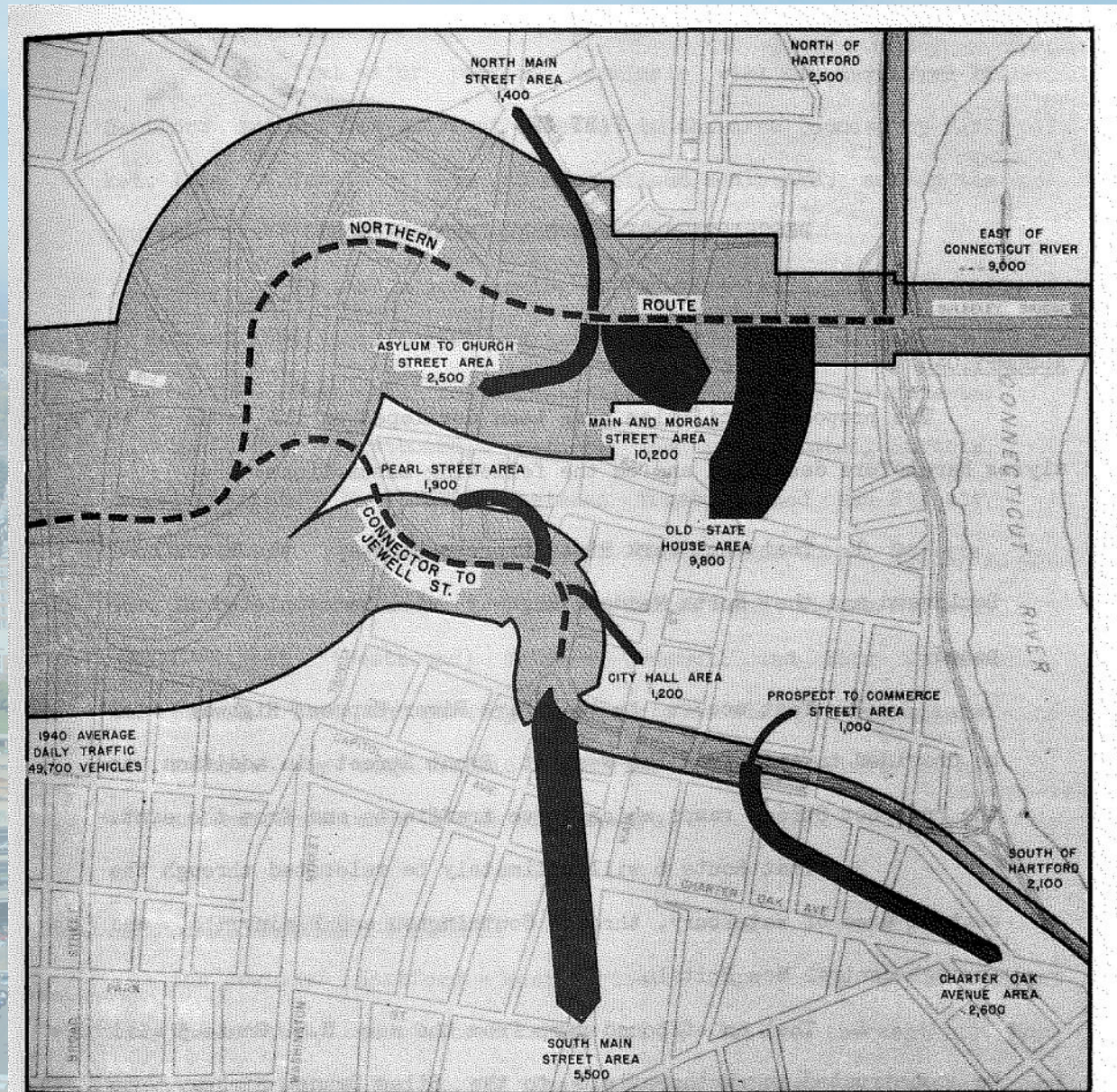
East-West Expressway





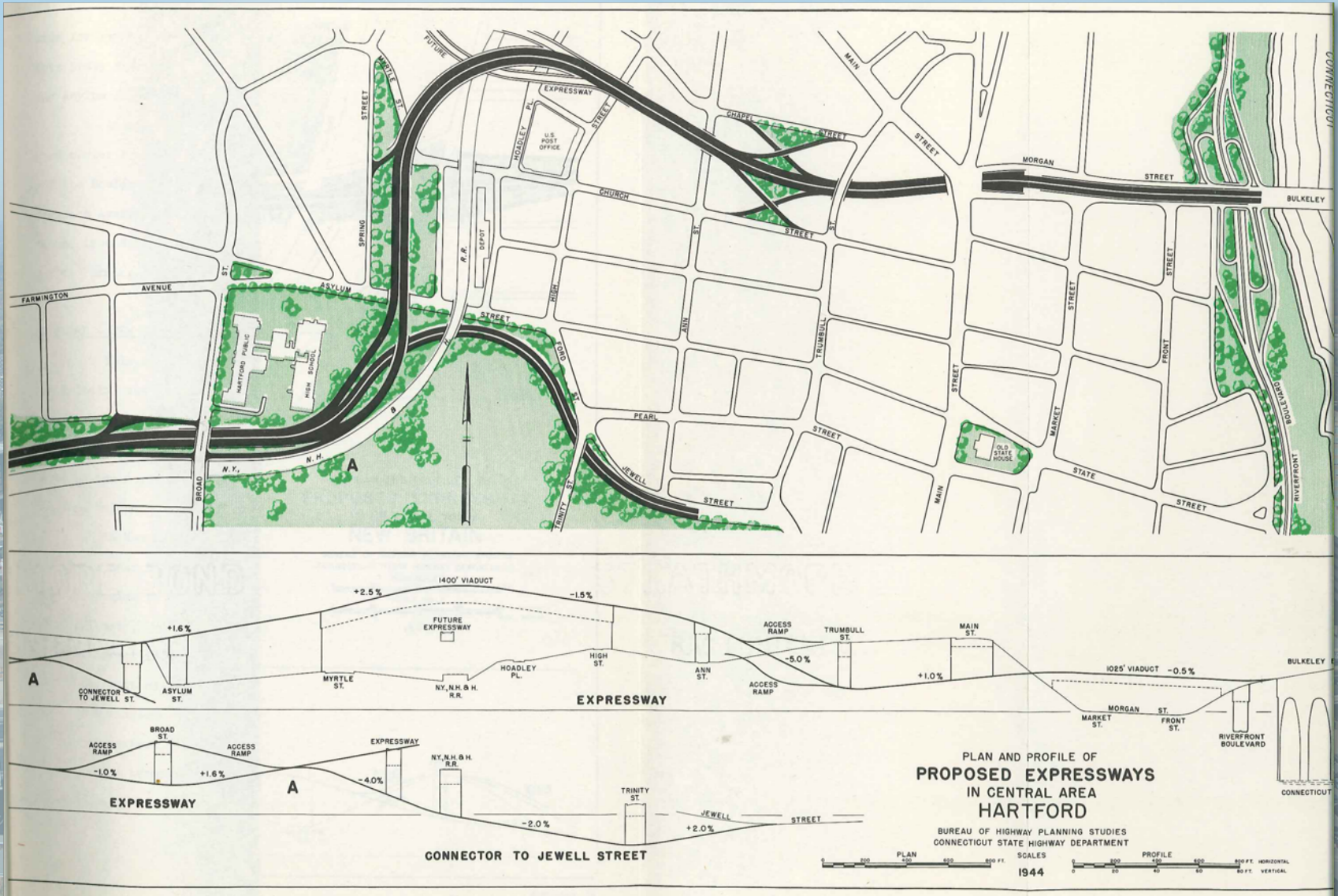
# Hartford Metropolitan Area Expressways (1945)

Service provided by the  
the new east-west  
expressway



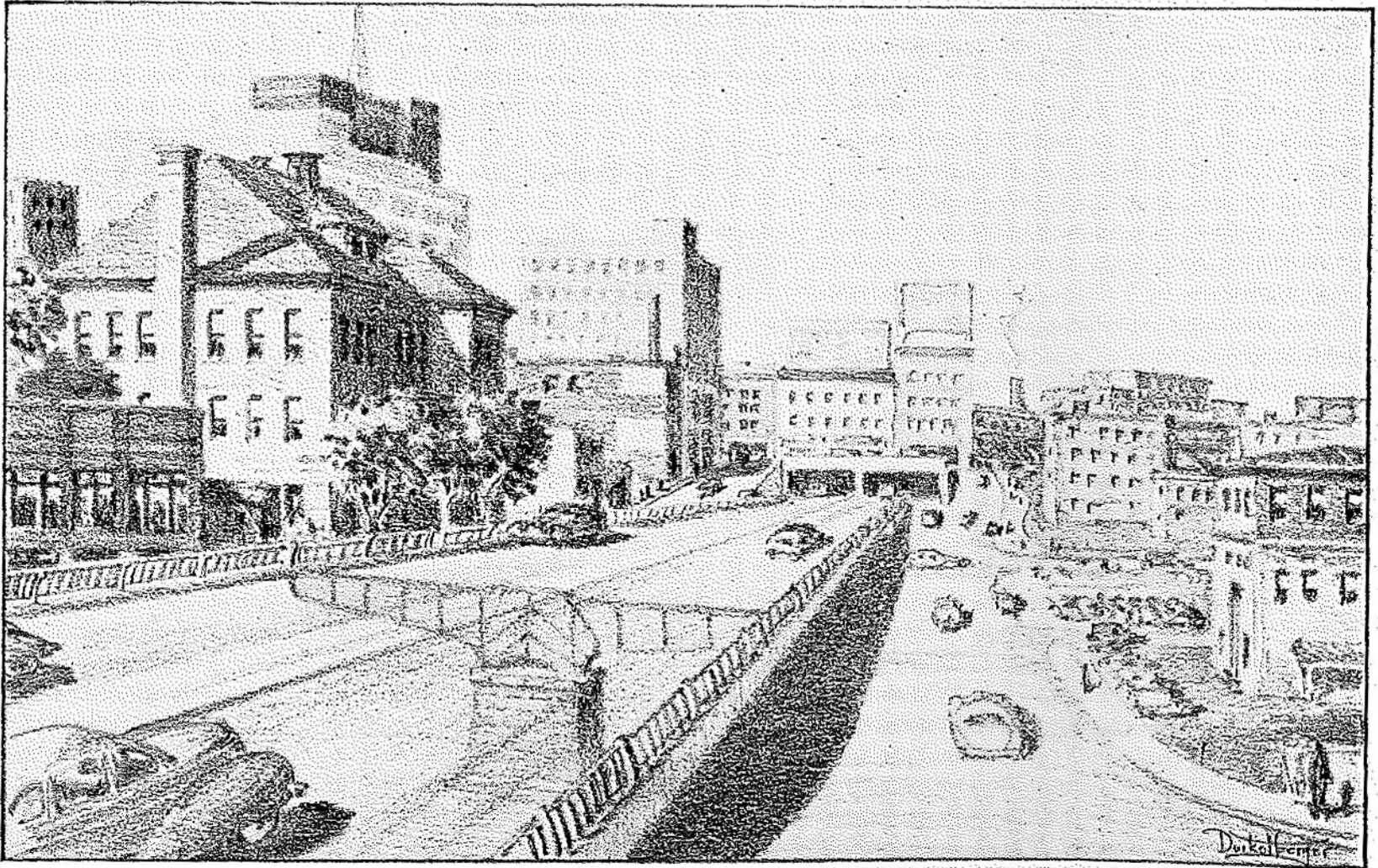


# Hartford Metropolitan Area Expressways (1945)





# Hartford Metropolitan Area Expressways (1945)



LOOKING WEST ALONG MORGAN ST. VIADUCT TOWARD TUNNEL UNDER MAIN ST.



# Hartford Metropolitan Area Expressways (1945)



INDOT  
PLANNING  
15-1

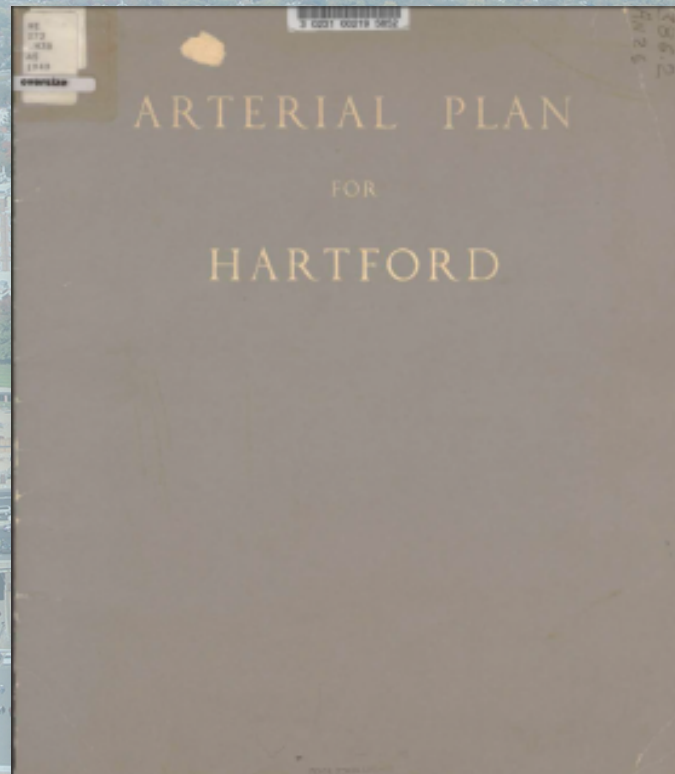
FAIRCHILD AERIAL SURVEYS





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## Arterial Plan for Hartford (May 1949 – Andrews & Clark and Robert Moses)

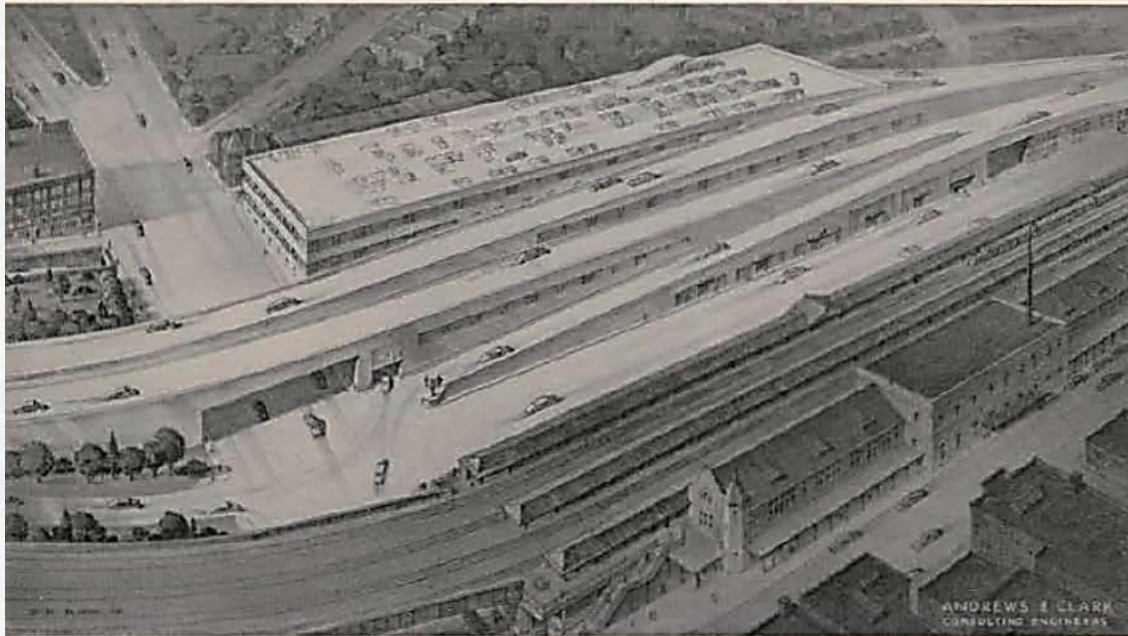




# Arterial Plan for Hartford

- “Doctors, we are told, bury their mistakes, planners by the same token embalm theirs, and engineers inflict them on their children’s children. Of three types of error, the engineering variety is in the long run the most costly to the community.” – Robert Moses

A PARKING GARAGE FOR 900 VEHICLES WOULD CONNECT WITH THE EAST-WEST EXPRESSWAY PROPOSED IN THIS REPORT BY DIRECT RAMPS TO REDUCE STREET CONGESTION.





# Arterial Plan for Hartford

- The proposed plan saves Bushnell Park, “improves” Pulaski Circle, widens Park Street, and bisects the CBD.

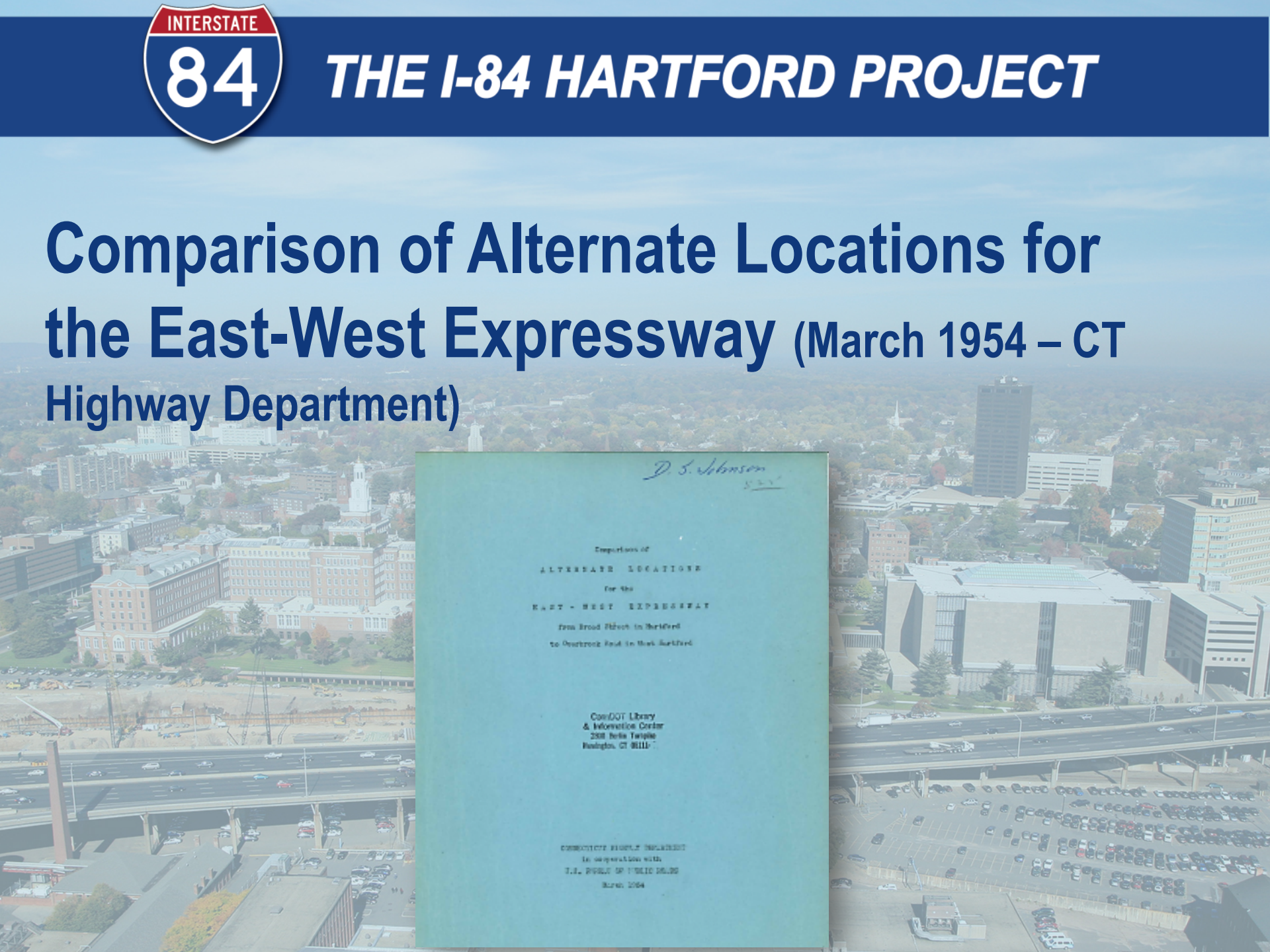
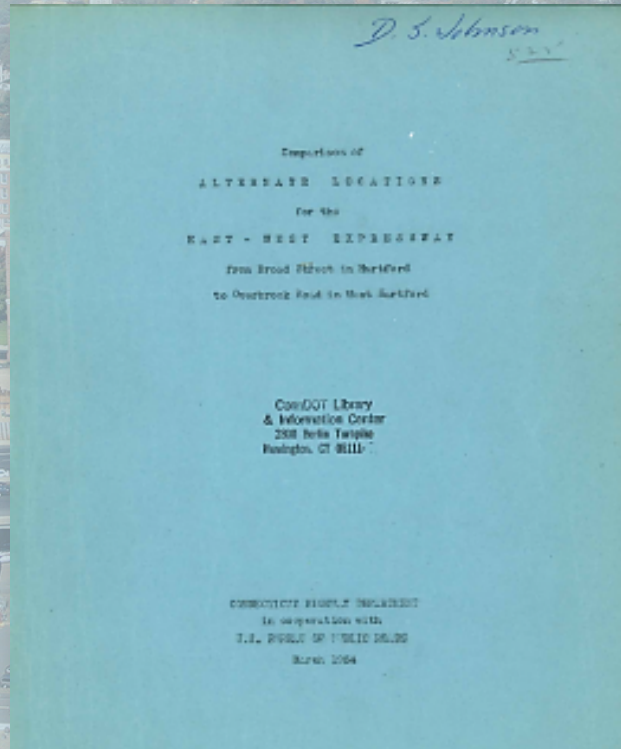






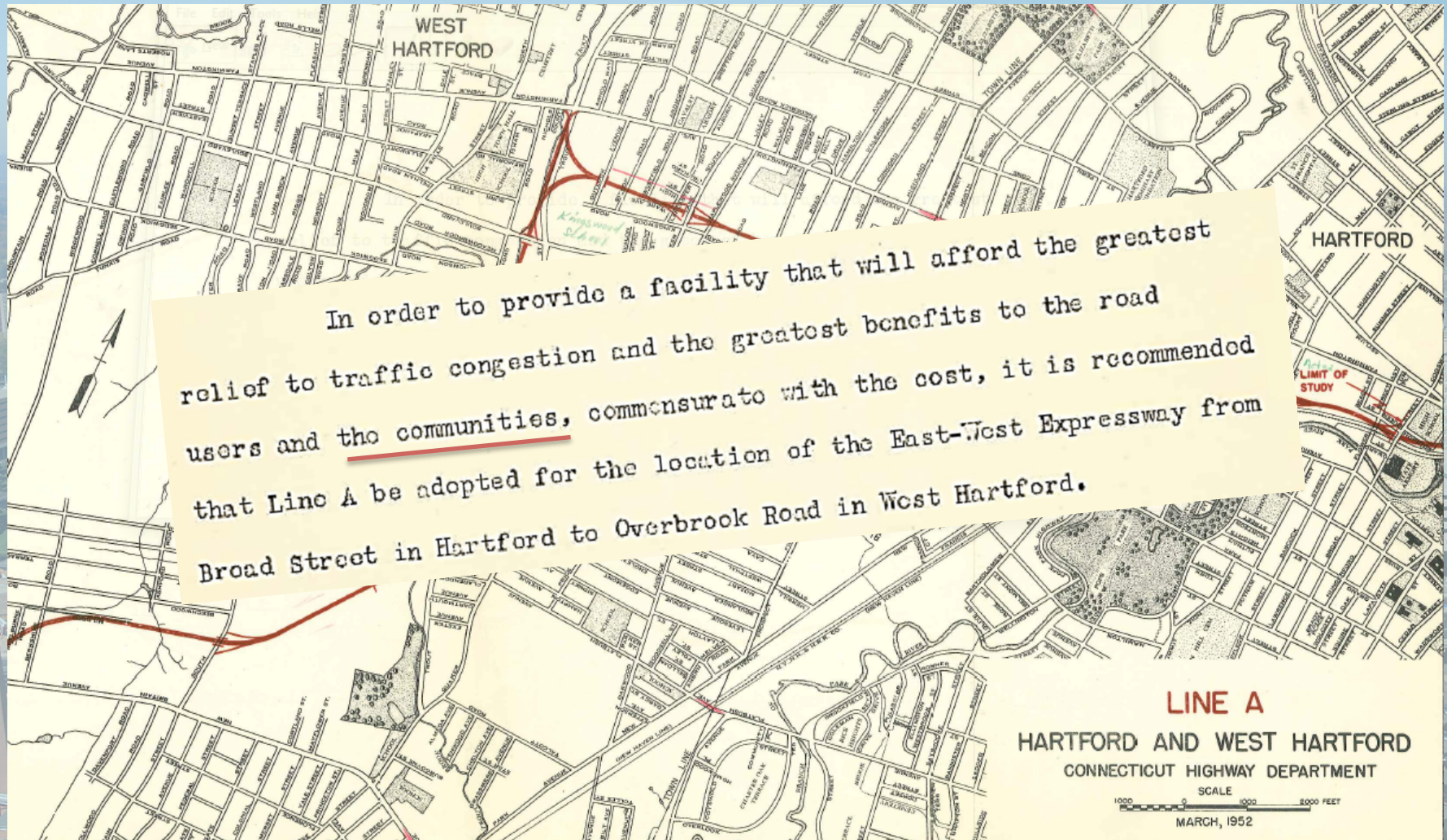
# THE I-84 HARTFORD PROJECT

## Comparison of Alternate Locations for the East-West Expressway (March 1954 – CT Highway Department)





# Comparison of Alternate Locations for the East-West Expressway





# Comparison of Alternate Locations for the East-West Expressway

## DAILY VEHICLE MILES OF TRAVEL FOR DIVERTIBLE VEHICLES ON EXISTING STREETS IN 1970

<u>Line</u>	<u>Without Expressway</u>	<u>With Expressway</u>	<u>Net Decrease</u>
A	587,000	166,000	421,000
B	527,000	183,000	344,000
B with Trout Brook Connector	550,000	140,000	410,000

- VMT = traffic volume (x) average trip length
- According to the Wall Street Journal, "from 1977 to 2001, the number of miles driven every year by Americans rose by 151% -- about five times faster than the growth in population
- Cities that require car trips to meet most daily needs exhibit 20-40% higher VMT than more compact, mixed-used, and walkable neighborhoods – ULI 2007



# Comparison of Alternate Locations for the East-West Expressway

## Displacement of Families, Business and Industry

In February 1951 the following estimate was made of buildings required for right of way and the number of families affected:

<u>Line</u>	U n i t s			
	<u>Residential</u>		<u>Commercial</u>	<u>Industrial</u>
	<u>Houses</u>	<u>Families</u>		
A	269	532	17	1
B	78	214	14	10
B with Trout	80	216	16	10
Brook Connector				

<u>Line</u>	<u>Annual Tax Loss</u>	
	<u>Hartford</u>	<u>West Hartford</u>
A	\$63,000	\$39,000
B	30,000	15,000
B with Trout	30,000	17,000
Brook Connector		

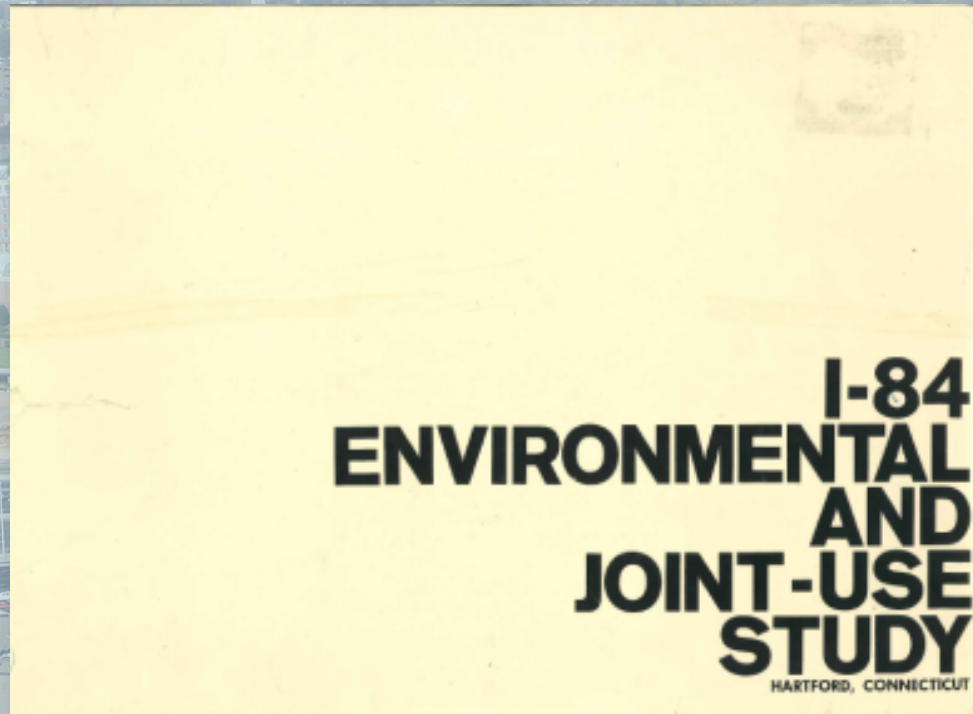
Based on experience elsewhere it is felt that this revenue loss will be short-lived. Improved accessibility will retard the obsolescence of existing business property in Hartford and encourage additional investments in both communities.





# *THE I-84 HARTFORD PROJECT*

## **I-84 Environmental and Joint-Use Study (1970)**





# I-84 Environmental and Joint-Use Study (1970)

**Appearance** – “[The highway] frequently dominates and is out of harmony with its physical environment. How can the freeway be made to fit more comfortably into the urban environment?”

**Function** – “What can be done to achieve better transition of vehicles between the freeway and their terminal destinations and storage areas?”

**Economic Viability** – “Many acres of urban land are used in building the freeway, much of it in valuable, core-area environments. How can more economic use be made of highway lands?”



# I-84 Environmental and Joint-Use Study (1970)



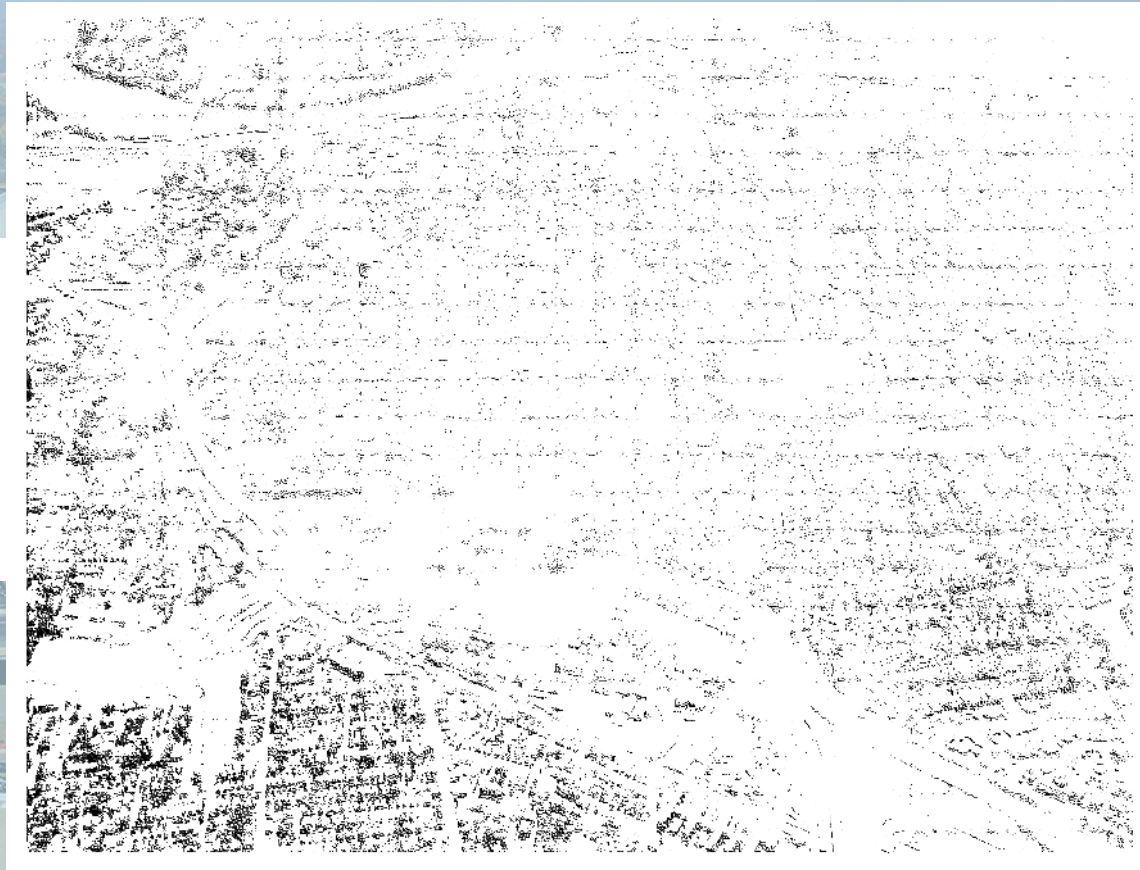


# I-84 Environmental and Joint-Use Study (1970)

“The freeway was built along the general alignment of the Penn Central Railroad, and likewise follows the course of a small stream, the Park River. The route was carefully engineered to preserve the railroad, while much of the stream was placed in conduit...”



“The most significant changes in corridor land-uses occurred where the highway departed from the railroad alignment and disrupted neighborhoods.”





# I-84 Environmental and Joint-Use Study (1970)

During Construction (1965)





# I-84 Environmental and Joint-Use Study (1970)

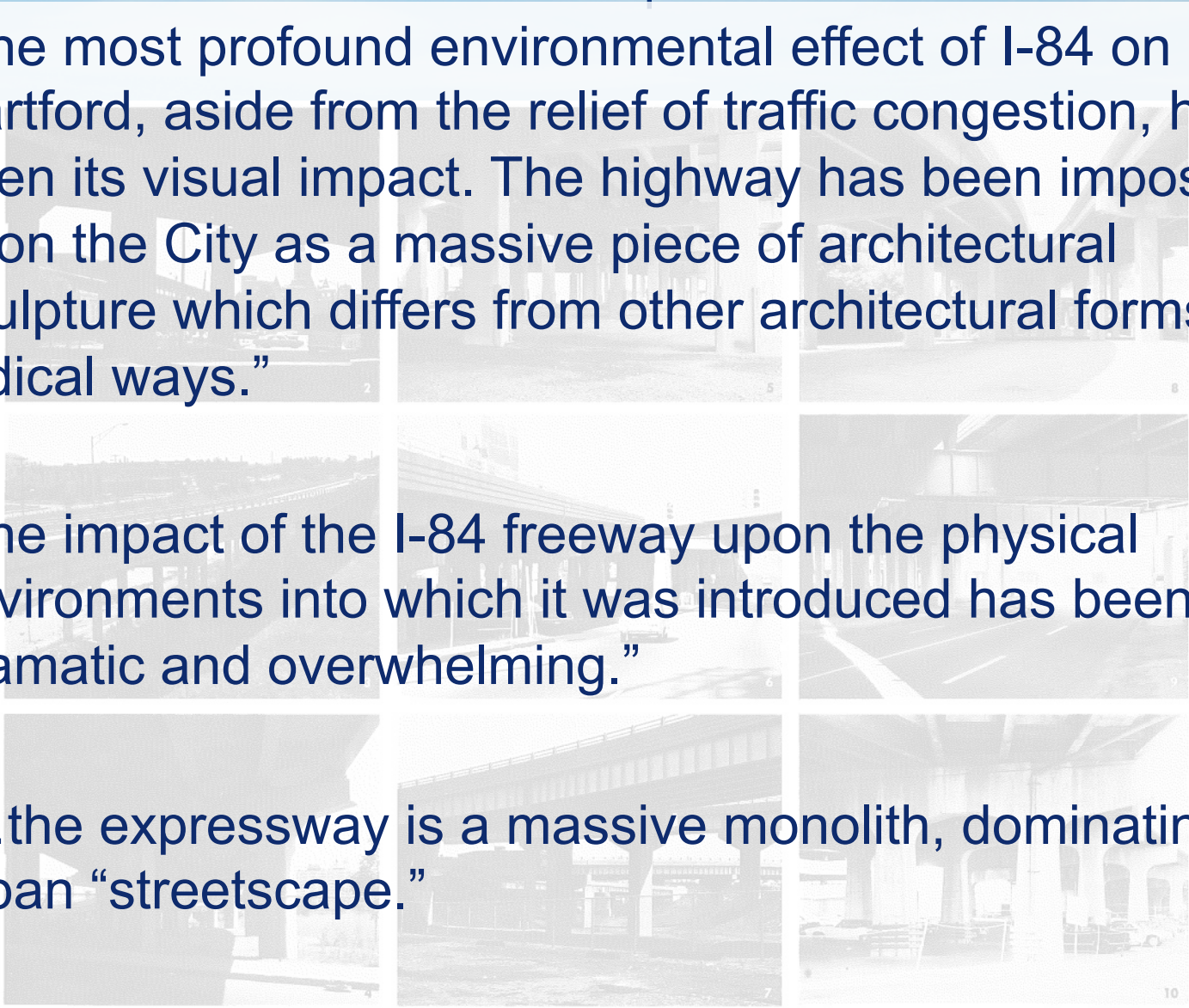




# I-84 Environmental and Joint-Use Study (1970)

## Visual Impacts

- “The most profound environmental effect of I-84 on Hartford, aside from the relief of traffic congestion, has been its visual impact. The highway has been imposed upon the City as a massive piece of architectural sculpture which differs from other architectural forms in radical ways.”
- “The impact of the I-84 freeway upon the physical environments into which it was introduced has been both dramatic and overwhelming.”
- “...the expressway is a massive monolith, dominating the urban “streetscape.”

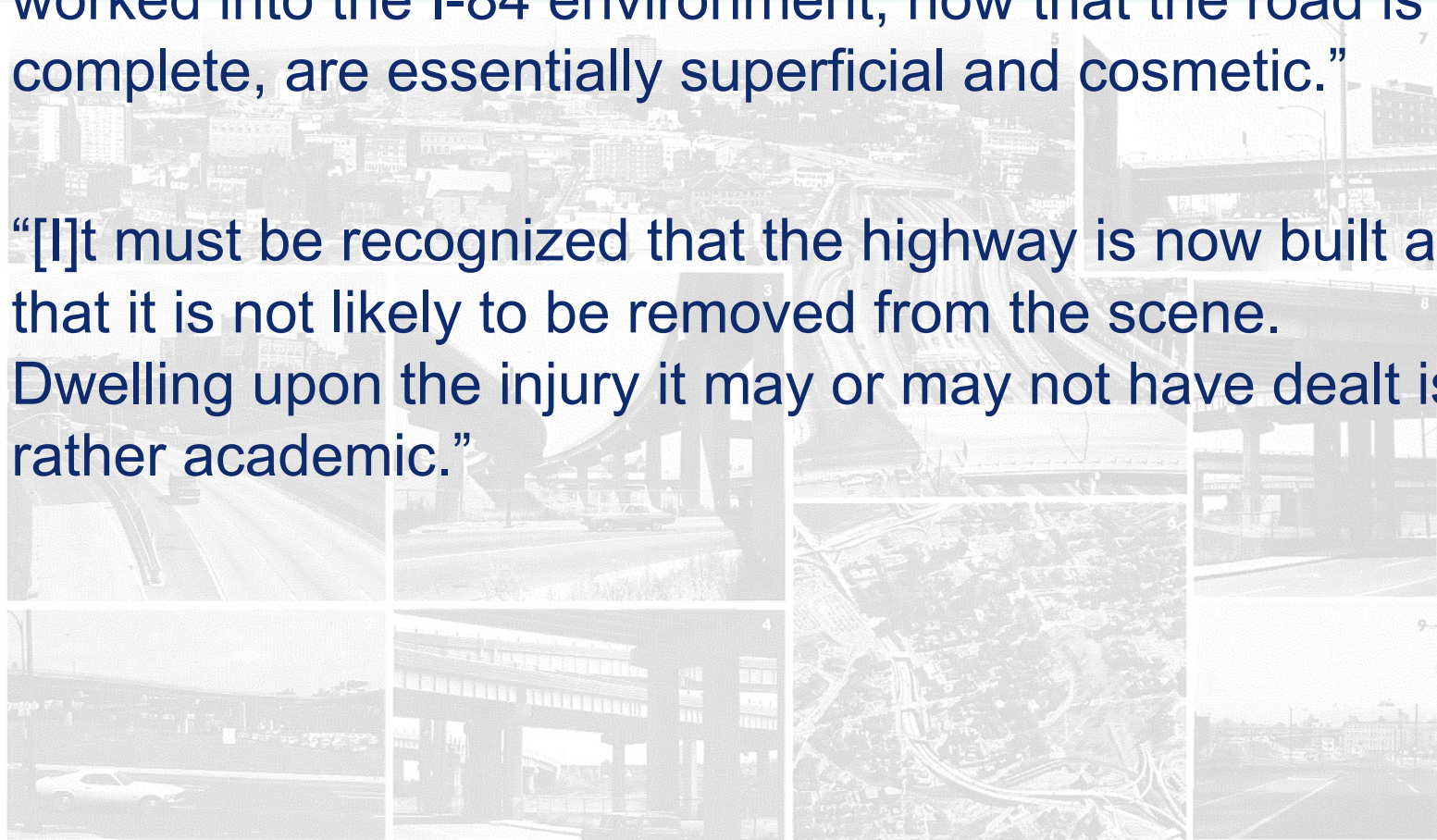




# I-84 Environmental and Joint-Use Study (1970)

## Visual Impacts

- “In general, the aesthetic treatments that might be worked into the I-84 environment, now that the road is complete, are essentially superficial and cosmetic.”
- “[I]t must be recognized that the highway is now built and that it is not likely to be removed from the scene. Dwelling upon the injury it may or may not have dealt is rather academic.”





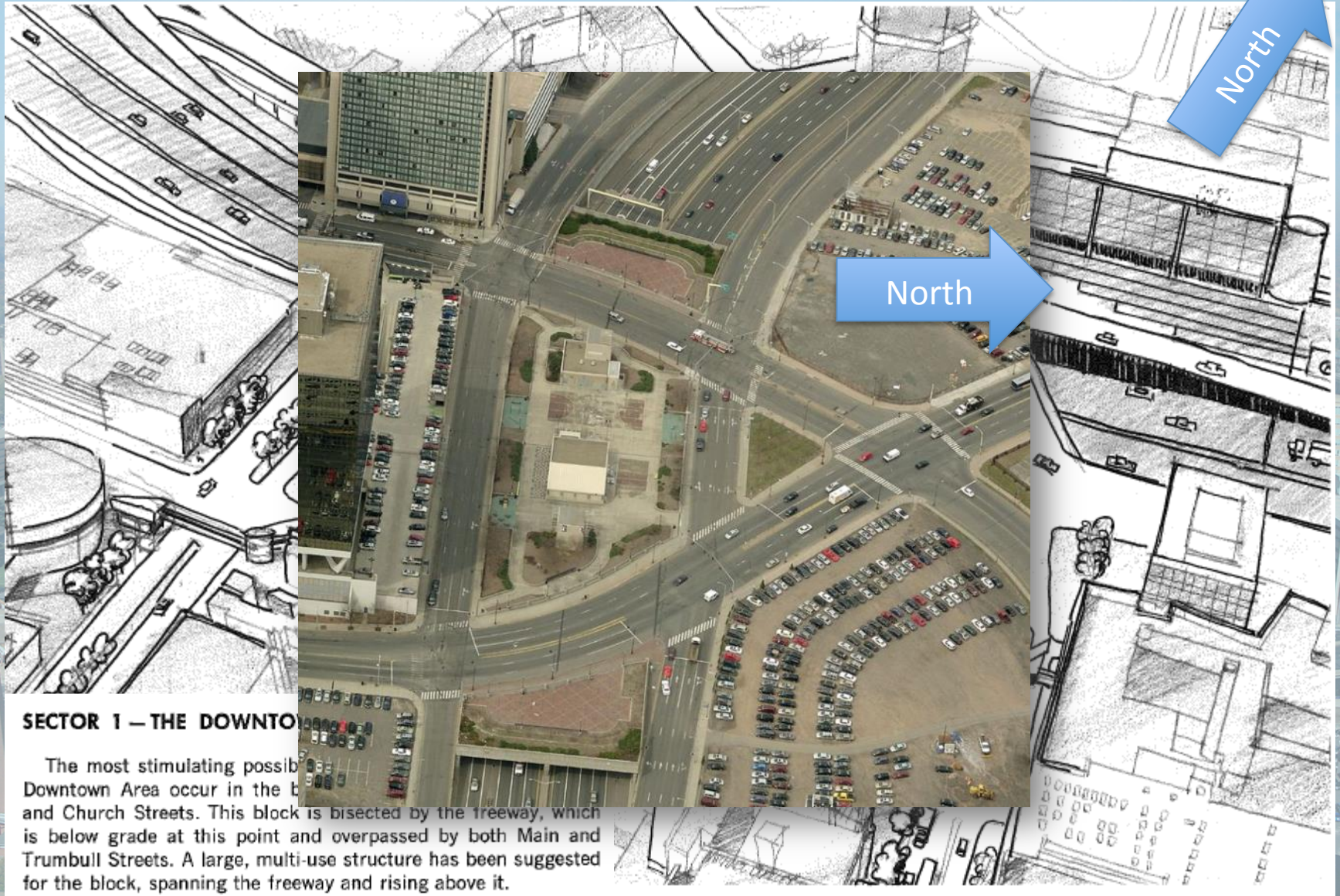
# I-84 Environmental and Joint-Use Study (1970)

“It is the growing awareness of these impacts that has aroused the urban public to insist on more thoughtful and perceptive planning for freeway development.”





# I-84 Environmental and Joint-Use Study (1970)





# I-84 Environmental and Joint-Use Study (1970)

## SECTOR 2 -- THE UNION STATION AREA

The railroad passenger station occupies an equivocal position in central Hartford. Train service is infrequent and the station has fallen into disrepair, as have many other establishments in the immediate vicinity; vacant lots and empty buildings betoken a depressed area with little vitality. This, however, seems likely to be a temporary condition, for the current revitalization of Downtown Hartford, together with expansion of office functions in the State Capitol area and in the insurance complex on Asylum Hill, business district definition would be of the busi- d, over the





# I-84 Environmental and Joint-Use Study (1970)





# I-84 Environmental and Joint-Use Study (1970)



block. Landscaped parking facilities constitute the main space user in this central area. The development of the office and parking facilities could be carried out over several years, as demand permitted.



# I-84 Environmental and Joint-Use Study (1970)



Image Date: June 2011





# What have we learned?

- An east-west expressway was originally sought to alleviate congestion on local streets
- The Federal Aid Highway Act sought to improve the nation's mobility by building expressways
- Building highways on viaducts was a way to maintain local access under the highway
- Significant city impacts were realized once the highway and its viaducts were constructed
- Our planning and thinking is done differently today





# THE I-84 HARTFORD PROJECT

**Urban design:  
What is it and why does it matter?**



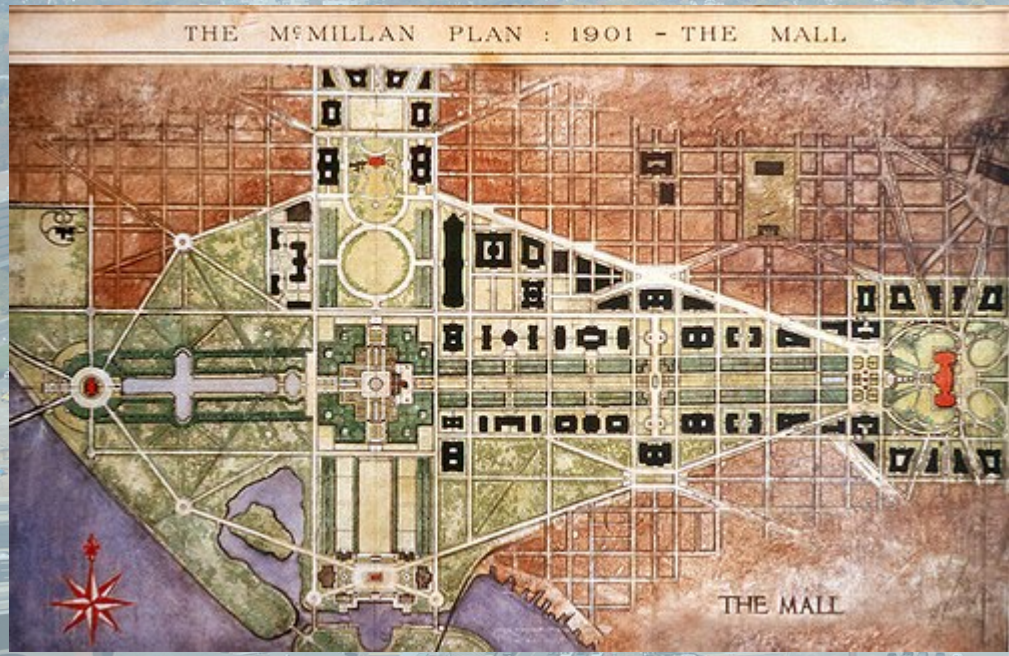


# Origins of Urban Design in the United States

- City Beautiful Movement
- City Scientific Movement



1909 Burnham Plan for Chicago



THE MALL



# Urban Design in recent times

- Responds to perceived failures of both City Beautiful and City Scientific philosophies
- Focus on city building and strong place making
- Seeks city-design solutions that work from multiple perspectives
- Integrates land use, economic development, open space, transportation, infrastructure and environmental perspectives —to create social, economic and environmental value

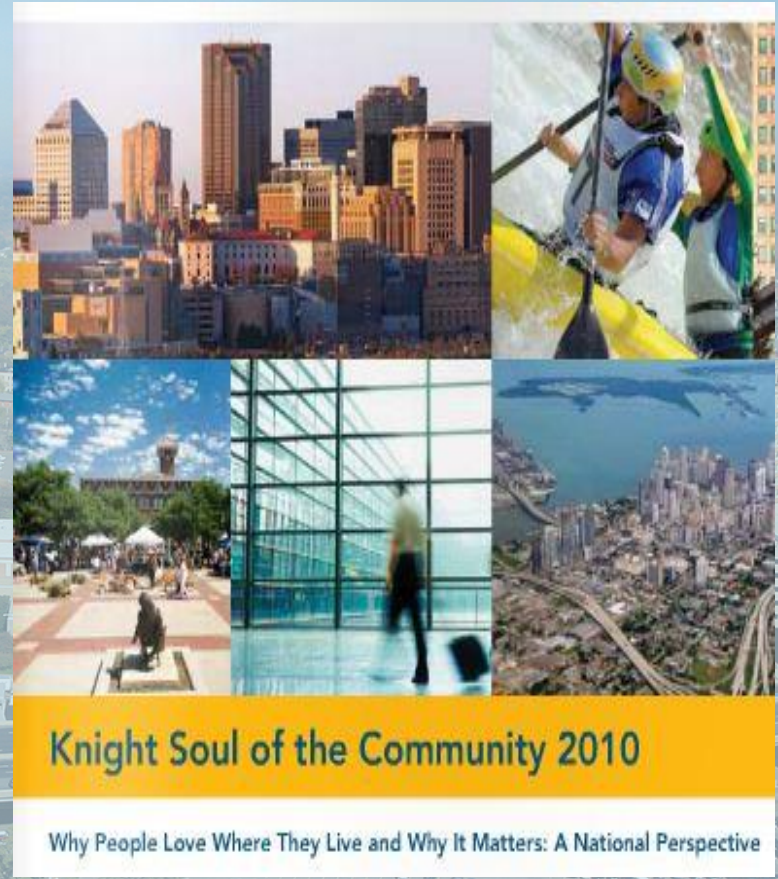


Concept development for bridging over I-90 in Boston



# Why is urban design important?

- Successful urban design is increasingly seen as a critical factor in the economic success of cities
- High-quality jobs that are drivers of local economies
- Recent research concluded that the physical beauty of the public environment is one of the top factors that connects people to their communities and contributes directly to local economic growth







# THE I-84 HARTFORD PROJECT

## I-84 Challenges





# Urban design challenges in the I-84 corridor

## I-84 divides the city

- Neighborhoods are separated from downtown limiting social and economic interaction and synergies
- The employment center created by Aetna and The Hartford is separated from the core of downtown, eliminating the possibility of some key social and economic synergies





# Urban design challenges in the I-84 corridor

I-84 and its associated ramps consume large quantities of valuable urban land

- The I-84 corridor creates a no-mans land that is both a barrier and blighting influence on surrounding areas
- Land within the corridor, especially around Union Station, is some of the best transit-served land in the state. The absence of TOD in this area is a major lost opportunity.





# How do we meet the challenges?

- Transit-Oriented Development
- Complete Streets
- Context Sensitive Design







# THE I-84 HARTFORD PROJECT

## I-84 Opportunity: Transit Oriented Development





# What is TOD

- TOD is typically mixed use commercial and residential development designed to maximize public transportation ridership
- Generally located between  $\frac{1}{2}$  and  $\frac{1}{4}$  mile from a train, bus, subway or ferry terminal
- Tends to be higher density than surrounding areas



# Elements of Successful TOD

- Walkability
- Density
- Mix of Uses
- Travel Options
- Public Spaces
- Community Engagement





# Urban Design Opportunities: TOD

Provide new transit oriented development opportunities to create vital links across the corridor

- Development (TOD) within the highway corridor in key locations will be essential if the barrier is to be eliminated
- Unless this development is actively planned for as an ingredient of the project, it is very unlikely to be feasible at some later point



Recent planning for development in the former I-195 Corridor in Providence





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## I-84 Opportunity: Complete Streets





# What are Complete Streets?

Safe    Comfortable    Convenient





# What are Complete Streets?

Safe    Comfortable    Convenient



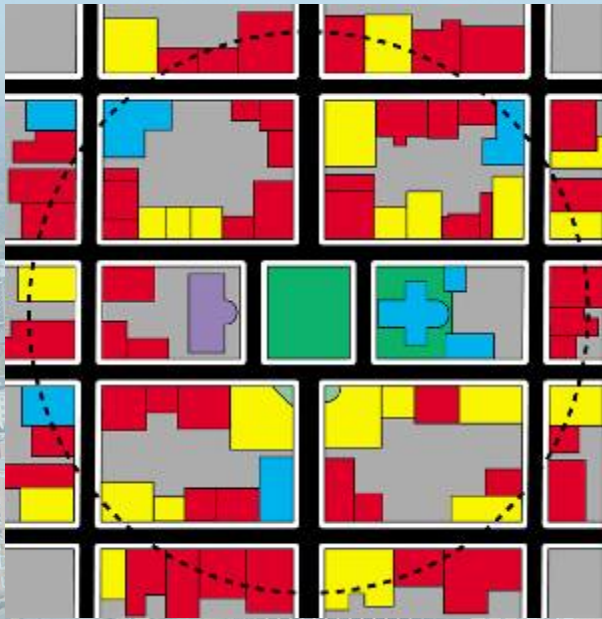


# Are Complete Streets New?

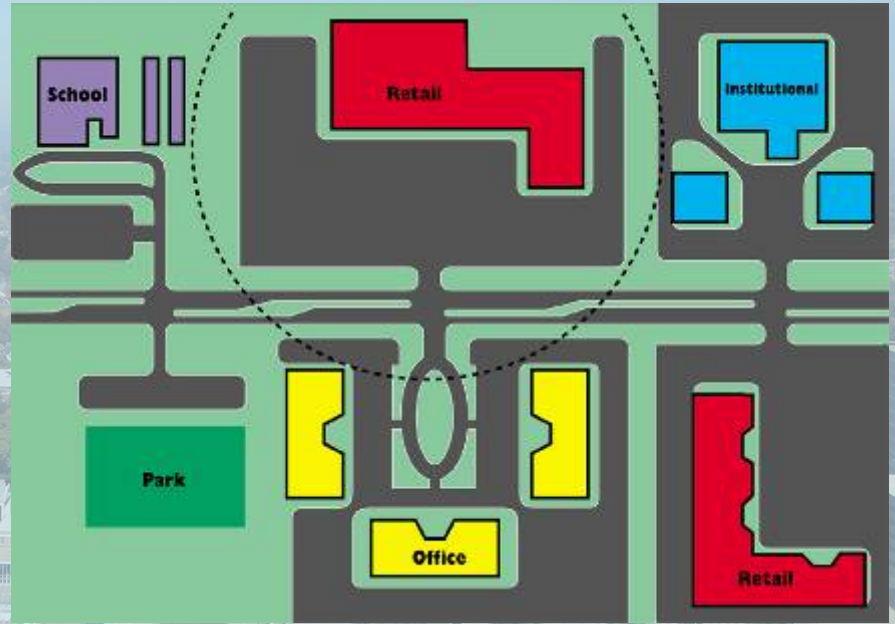




# Modern –vs- Traditional Streets



Traditional street network



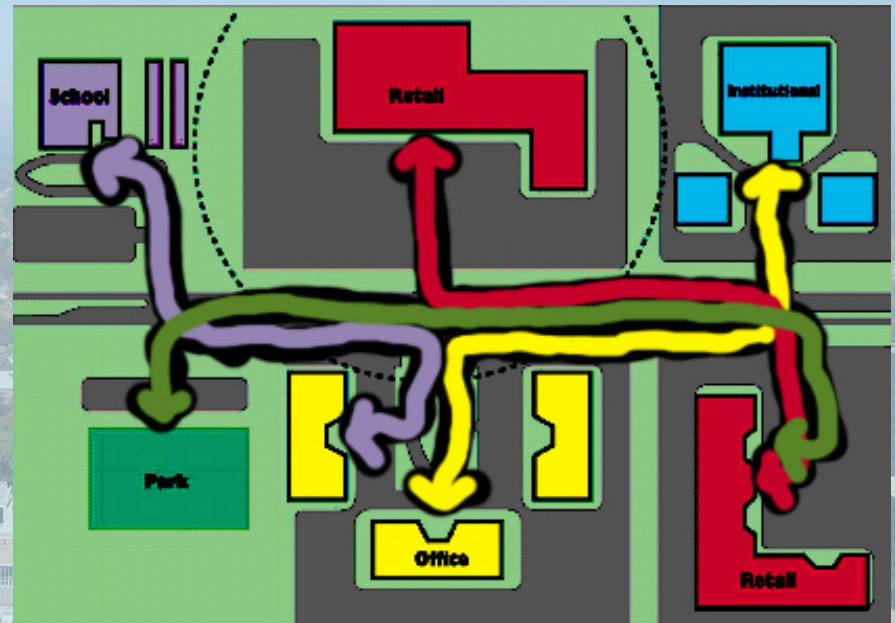
Modern street network



# Modern –vs- Traditional Streets



Traditional street network



Modern street network



# How Do We Travel?

Of all trips:

**39%**

are less than  
3 miles

**17%**

are less than  
1 mile

**47%**

are driven



of these trips...





# Who wants Complete Streets?

Millennials are driving less and looking for other transportation options.

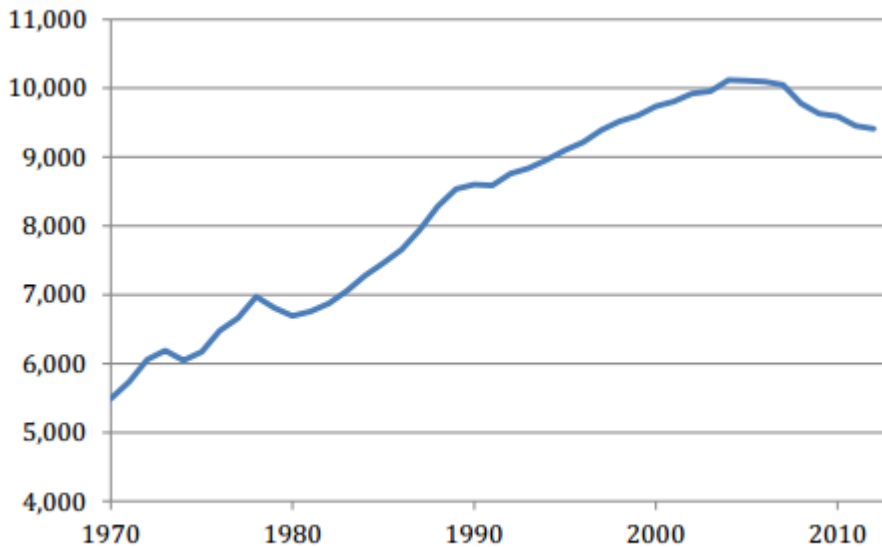


Figure 2. Annual VMT per capita in the United States. Source: FHWA and Census Bureau.



# Who wants Complete Streets?

47%

of older Americans say it is unsafe to cross a major street near their home.

54%

of older Americans living in inhospitable neighborhoods say they would walk and bike more often if the built environment improved.

56%

express strong support for adoption of Complete Streets policies.





# Urban Design Opportunities: CS

## Reconnect the city across the highway

- Key factors include the number, location and quality of connections across the corridor. A **Complete Streets** philosophy can help to address this concern
- Given the width of the corridor, the quality of the design of connector streets alone will be insufficient to successfully reconnect the city; unless new development and open space are integrated within the highway corridor, the perception of a city divided by the highway is likely to persist





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## I-84 Opportunity: Context Sensitive Solutions





# What is CSS?

“a collaborative, interdisciplinary approach that involves all stakeholders in providing a transportation facility that fits its setting. It is an approach that leads to preserving and enhancing scenic, aesthetic, historic, community, and environmental resources, while improving or maintaining safety, mobility, and infrastructure conditions.”

- FHWA



# What is CSS?

CSS processes should build consensus around these issues before solutions are identified:

- Project context, including geography and community values
- Problem to be addressed
- Implementation plan and decision-making process and roles
- Vision, goals, and evaluation factors



# Finding the Balance...

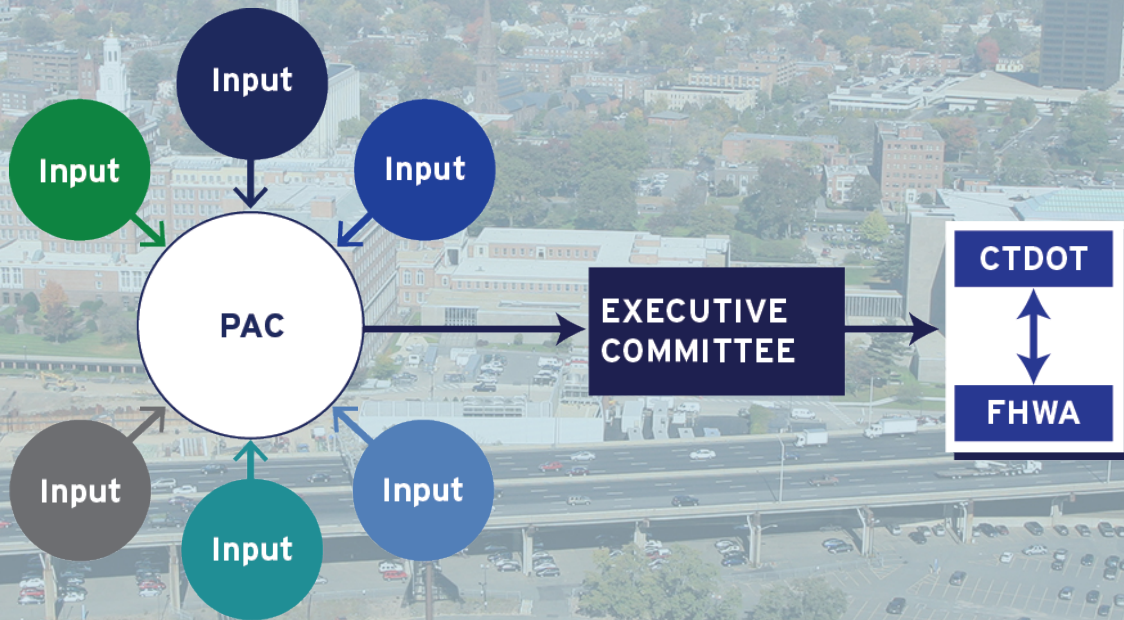
Each urban highway is unique. New urbanists posit that highway removal is essential for a vibrant city. Highway proponents argue that efficient transportation is needed to feed the local, regional, and state economies. The I-84 Project Team believes that both healthy cities and efficient regional mobility are necessary to keep Connecticut competitive in the future. Our job is to find the right balance between the science and art of urban highway design to deliver a win-win solution.





# THE I-84 HARTFORD PROJECT

## Update on Purpose & Need





# Thank You!

We deeply appreciate your time and your commitment to helping us reach the best possible solution for the State, the region and the City.

*Your I-84 Hartford Project Team*