I-91 Viaduct Study

Working Group Meeting #3

UMass Center at Springfield
Tower Square
1500 Main Street
Springfield, Massachusetts
Welcome & Introductions
Overview of Working Group Meeting #2
Review of Existing Conditions
Review of Issues and Constraints
Health Impact Assessment Update
Existing Viaduct 3-D Simulation
Alternatives Development Discussion
Next Steps
Welcome & Introductions

- Ethan Britland – Project Manager (MassDOT)
- Michael Clark – Transportation Planner (MassDOT)
- Margaret Round – (Mass Public Health)
- Ben Wood – (Mass Public Health)
- Mark Arigoni, L.A. – Principal-in-Charge (MMI)
- Van Kacyannakis, P.E. – Traffic (MMI)
- John Hoey – Facilitator (MMI)
- Rebecca Augur, AICP – Planning (MMI)
- Rod Motamedi – Economics (UMass Donahue Institute)
- Nancy Farrell – Public Involvement (Regina Villa)
- Sarah Paritsky – Public Involvement (Regina Villa)
Overview of Task 2 Efforts

- Completed Data Collection
  - Environmental
  - Planning
  - Traffic/Transportation

- TransCAD Modeling Underway

- Update on Public Health Data
Reconfiguration of the I-91 Viaduct and Longmeadow curve may facilitate safety and circulation improvements for all modes

- Link Riverwalks in Agawam and Springfield
- Link Forest Park to the Riverwalk
- Create Stronger Link to the New Union Station
- Create a Regional Draw to an expanded Riverfront
- Transit Oriented Developments
- Economic Development Areas
5 Pedestrian Fatalities between 2010 - 2014
- Lack of Designated Provisions for Bicycles
- Number of On & Off Ramps in a Short Distance
- No connection to Memorial Bridge from I-291
- Location of N-S Rail Line, Riverfront Barrier
  - Only 3 connections between the Riverfront & the Bikeway with Downtown Core
  - At-grade crossing @ Riverfront Park is a Passive Crossing
Economic & Land Use

- Shift in Local Market to Live/Work Areas
- Cohesive Redevelopment
- Physical Barriers
Natural Resources

- Connecticut, Mill & Westfield Rivers

Public Health

- Water, Air & Noise Quality
- Recreation, Parks & Open Space
- Business & Residential

Cultural Resources

- Historic Properties
Traffic / Safety

Planning
Additional Crash Data
### Existing Zoning

<table>
<thead>
<tr>
<th>Springfield Zone</th>
<th>Approx. FAR</th>
<th>Approx. Res. Density</th>
<th>Height Limit</th>
<th>Typical Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business A</td>
<td>3.00</td>
<td>32 DU/ac</td>
<td>60 ft</td>
<td>Shopping district, residential allowed</td>
</tr>
<tr>
<td>Business B</td>
<td>3.20</td>
<td>150 DU/ac</td>
<td>60 ft</td>
<td>General business</td>
</tr>
<tr>
<td>Business C</td>
<td>25.33</td>
<td>150 DU/ac</td>
<td>400 ft</td>
<td>Downtown business, residential allowed</td>
</tr>
<tr>
<td>Commercial A</td>
<td>1.10</td>
<td>N/A</td>
<td>30 ft</td>
<td>Neighborhood retail and services</td>
</tr>
<tr>
<td>Riverfront</td>
<td></td>
<td>Not specified</td>
<td></td>
<td>Mixed use, medium density residential, recreation &amp; entertainment</td>
</tr>
<tr>
<td>Industrial A</td>
<td>6.33</td>
<td>N/A</td>
<td>100 ft</td>
<td>Business/Industrial uses</td>
</tr>
<tr>
<td>Office A</td>
<td>1.10</td>
<td>N/A</td>
<td>35 ft</td>
<td>Offices (residential conversions)</td>
</tr>
<tr>
<td>Open Space</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td>Active/passive recreation</td>
</tr>
<tr>
<td>Residential A</td>
<td>N/A</td>
<td>6 DU/ac</td>
<td>35 ft</td>
<td>Low density residential (single family)</td>
</tr>
<tr>
<td>Residential B</td>
<td>N/A</td>
<td>11 DU/ac</td>
<td>35 ft</td>
<td>Moderate density residential (one-two family)</td>
</tr>
<tr>
<td>Residential C</td>
<td>N/A</td>
<td>17.5DU/ac</td>
<td>35 ft</td>
<td>High density residential (one, two, and multi-family)</td>
</tr>
<tr>
<td>West Columbus</td>
<td>As per underlying zoning</td>
<td></td>
<td></td>
<td>Retail, commercial, recreation &amp; entertainment</td>
</tr>
</tbody>
</table>

- Most of the Primary Study Area lies within the City of Springfield, cutting through a variety of Business, Commercial, Industrial, Office, Open Space, Residential, and Multi-use zones.

- West Columbus Overlay Zone and Riverfront Zone intend to encourage redevelopment along River with additional design standards.
Much of Primary Study Area projected to grow by approximately 9-10%

Areas of highest growth concentrated in western Springfield
One-person households the most common household type in much of Primary Study Area
Minimal growth expected in basic, retail sectors throughout region

Strong growth projected (30-200%) in service sector employment within Springfield Primary Study Area
Baseline Health Data For I-91 Viaduct Study

Presented by

Ben Wood
Department of Public Health
Bureau of Community Health and Prevention

Margaret Round
Department of Public Health
Bureau of Environmental Health
Outline

I. Introduction to Health Impact Assessments
II. Steps of HIA
III. Health Determinants
IV. Scoping
V. Baseline health data
VI. Next steps: Break out and Establishing HIA Subcommittee
What impacts health?

Health Outcomes

Health Behaviors

Determinants
Identify and illustrate the relationships between, and consequences of, a proposed plan, project and policy and the health of a population;

Support more informed and transparent decision making regarding the potential effects and impacts of a proposal on health;

Help engage community stakeholders in the decision making process and contribute to public and stakeholder awareness of the health implications of plan, project and policy decisions;

Identify options to maximize the positive and minimize the negative impacts of the proposed plan, project and policy.
Health Impact Assessment

- **Screening:** Determines the need and value of a HIA
- **Scoping:** Determines which health impacts to evaluate, methods for analysis and a work plan
- **Assessment:** Provides (1) describes baseline health conditions and (2) predicts potential health impacts
- **Recommendations:** Provides strategies to manage identified adverse health impacts
- **Reporting:** Includes the development of the HIA report and communication of findings and recommendations
- **Monitoring:** Tracks the impact on decision-making processes and the decision and the impacts of the decision on health determinants
Health Determinants

- Physical environment factors (e.g., air quality, water quality, hazards)
- Built environment factors (e.g., buildings, public spaces, roads, sidewalks, bike lanes)
- Social and community factors (e.g., social support, family structure, access to services)
- Livelihood factors (e.g., income, employment)
- Lifestyle factors (e.g., diet, exercise, alcohol and tobacco use)
Transportation Related Health Determinants

- Walkability/Active Transport
- Safety from Crime
- Economic Opportunity
- Displacement/Gentrification
- Affordable Housing
- Green Housing
- Social Cohesion
- Green Space
- Access to Healthy Affordable Food
- Safety from Traffic
- Air Quality
- Environmental Contamination
Scoping

The HIA was structured to be conducted in tandem with an active MassDOT study to provide supplemental health data to better inform optimal transportation design alternatives.

MassDOT’s existing study protocol lends uniquely to the HIA process by establishing a stakeholder working group composed of community representatives to evaluate alternatives.

Approach

- Consider I-91 Viaduct Study Evaluation Criteria and other data
- Establish a HIA Subcommittee
- Conduct extensive literature review
- Work closely with MassDOT Project Manager and consultants
- Develop a workplan for assessing baseline health conditions, and evaluated the health outcomes for each of the alternatives.
Health Impact Assessment

Immediate Impacts
- Δ in housing and commercial/retail/green space
- Δ in transportation options
- Δ in traffic patterns

Intermediate Impacts
- Δ in displacement and gentrification
- Δ in social cohesion/activity
- Δ in environmental quality and contamination
- Δ in economic opportunity
- Δ in access to healthy foods
- Δ in crime (real and perceived)
- Δ in physical activity
- Δ in vehicle miles traveled

Outcomes
- Δ in stress/mental health
- Δ in chronic disease
- Δ in safety (real and perceived)
- Δ in acute exacerbations
Mobility & Connectivity

- Change in Highway Structure
  - Change in sidewalk space
  - Change in number of intersections/crosswalks on corridor
  - Change in pedestrian and bicycle network
  - Changes in parking availability
- Change in mobility and connectivity along corridor and adjacent communities
- Change in vehicle mobility/congestion
- Change in active transportation: physical activity from walking to biking
- Change in access to public transit
- Change in access to open space, parks, recreation
- Change in access to accessible public resources (schools, libraries)
- Change in access to local goods and services
- Increase in physical activity
- Changes in cardio-vascular disease
- Changes in mental health (e.g., stress, depression)
- Change in obesity, Type II diabetes
- Change in injuries and fatalities (See Public Safety)
Assessment of Existing Conditions

- Characterizing baseline health information that are directly related to transportation and land-use decisions
  
  - BRFSS data:
    
    - We collected information from the BRFSS for the following zip codes: 01101, 01106, 01103, 01104, 01105, 01107, 01108 (comprising the core study area) and for the towns of Holyoke, W. Springfield and Chicopee
    
    - 5 Indicators: Hypertension, Obesity, Diabetes, F/V consumption, Physical Activity rates
  
  - Hospitalizations for Asthma and Heart Attack and Pediatric Asthma data:
    
    - Date from Environmental Public Health Tracking Portal for Agawam, Chicopee, Holyoke, Longmeadow, Springfield and West Springfield
    
    - Determine if rates are statistically significantly higher compared to statewide rate

Assessment of Alternatives
Demographic Characteristics of Agawam, Chicopee, Holyoke, Longmeadow, Springfield, and West Springfield

<table>
<thead>
<tr>
<th>Demographic Characteristics</th>
<th>Agawam</th>
<th>Chicopee</th>
<th>Holyoke</th>
<th>Longmeadow</th>
<th>Springfield</th>
<th>West Springfield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population Total</td>
<td>28,555</td>
<td>55,478</td>
<td>40,029</td>
<td>15,835</td>
<td>153,428</td>
<td>28,498</td>
</tr>
<tr>
<td>Percent White</td>
<td>93.1%</td>
<td>85.8%</td>
<td>82.3%</td>
<td>90.7%</td>
<td>52.5%</td>
<td>86.4%</td>
</tr>
<tr>
<td>Black or African American</td>
<td>1.6%</td>
<td>3.5%</td>
<td>4.2%</td>
<td>0.8%</td>
<td>21.7%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Hispanic or Latino (of any race)</td>
<td>4.8%</td>
<td>15.3%</td>
<td>48.3%</td>
<td>4.0%</td>
<td>40.5%</td>
<td>8.4%</td>
</tr>
<tr>
<td>Median Household Income</td>
<td>$63,609</td>
<td>$46,709</td>
<td>$31,628</td>
<td>$106,173</td>
<td>$34,311</td>
<td>$54,126</td>
</tr>
<tr>
<td>Per Capita Personal Income</td>
<td>$29,857</td>
<td>$24,810</td>
<td>$19,968</td>
<td>$53,767</td>
<td>$18,133</td>
<td>$27,853</td>
</tr>
</tbody>
</table>
Environmental Justice Populations

Census 2010 Environmental Justice Populations
- Minority
- Income
- English Isolation
- Minority and Income
- Minority and English Isolation
- Income and English Isolation
- Minority, Income and English Isolation
### Baseline Health Data and Data Sources

<table>
<thead>
<tr>
<th>Health Determinants</th>
<th>Baseline Health Data</th>
<th>Available Data Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical Environment</strong></td>
<td>Hospitalizations for:</td>
<td>Hospitalization Data from the Center for Health Information and Analysis, CHIA (1)</td>
</tr>
<tr>
<td></td>
<td>• Asthma</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Myocardial infarction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Congestive Heart Failure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Stroke</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Hypertension</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Childhood Lead Poisoning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pediatric Asthma (Grades K-8)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cancer</td>
<td></td>
</tr>
<tr>
<td><strong>Built Environment</strong></td>
<td>Connectivity</td>
<td>Supplement I-91 Viaduct Study</td>
</tr>
<tr>
<td></td>
<td>Vehicular, Pedestrian and Bicycle Safety</td>
<td></td>
</tr>
<tr>
<td><strong>Lifestyle Factors</strong></td>
<td>• Adult Obesity</td>
<td>MA DPH BCHAP Behavioral Risk Factor Surveillance Survey (BRFSS)</td>
</tr>
<tr>
<td></td>
<td>• Adults Reporting No Exercise</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Adults Eating 5 Fruits And Vegetables/Day</td>
<td></td>
</tr>
<tr>
<td><strong>Community and Social Factors</strong></td>
<td>Access to medical and social services</td>
<td>Community input</td>
</tr>
<tr>
<td></td>
<td>Social support services</td>
<td></td>
</tr>
<tr>
<td><strong>Livelihood Factors</strong></td>
<td>Income, Race, Employment Socio-economic impacts</td>
<td>Supplement I-91 Viaduct Study</td>
</tr>
</tbody>
</table>
### Example of Findings from BRFSS

<table>
<thead>
<tr>
<th>01105</th>
<th>01107</th>
<th>01106</th>
</tr>
</thead>
</table>
| • Over 1/3 of adults are considered obese.*  
• Almost 1/3 of adults report they have been told they have hypertension.  
• 13.2% of adults report they have been told they have diabetes.  
• 63.5% do not engage in regular physical activity.  
• 21.2% of adults report consuming at least 5 fruits or vegetables per day | • 29.6% of adults are considered obese.*  
• 1/3 of adults report they have been told they have hypertension.  
• 15.2% of adults report they have been told they have diabetes.  
• 62.7% of adults do not engage in regular physical activity.  
• 18.3% of adults report consuming at least 5 fruits or vegetables per day | • 14.5% of adults are considered obese.*  
• 1/4 of adults report they have been told they have hypertension.  
• Diabetes estimates were suppressed due to instable values.  
• Almost half of adults do not engage in regular physical activity.  
• 1/3 of adults report consuming at least 5 fruits or vegetables per day |

* BMI was calculated from reported height and weight
### Statistical Significance of Rates of Hospitalizations for Asthma, Heart Attack, and Prevalence of Pediatric Asthma Compared to the Statewide Rates in 2012

<table>
<thead>
<tr>
<th></th>
<th>Hospitalizations for Asthma</th>
<th>Emergency Department Visits for Asthma</th>
<th>Hospitalization for Heart Attack</th>
<th>Pediatric Asthma Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agawam</td>
<td>LOWER</td>
<td>LOWER</td>
<td>NO DIFFERENCE</td>
<td>HIGHER</td>
</tr>
<tr>
<td>Chicopee</td>
<td>HIGHER</td>
<td>HIGHER</td>
<td>NO DIFFERENCE</td>
<td>HIGHER</td>
</tr>
<tr>
<td>Holyoke</td>
<td>HIGHER</td>
<td>HIGHER</td>
<td>HIGHER</td>
<td>HIGHER</td>
</tr>
<tr>
<td>Longmeadow</td>
<td>NS</td>
<td>LOWER</td>
<td>NO DIFFERENCE</td>
<td>LOWER</td>
</tr>
<tr>
<td>Springfield</td>
<td>HIGHER</td>
<td>HIGHER</td>
<td>HIGHER</td>
<td>HIGHER</td>
</tr>
<tr>
<td>West Springfield</td>
<td>NO DIFFERENCE</td>
<td>HIGHER</td>
<td>NO DIFFERENCE</td>
<td>NO DIFFERENCE</td>
</tr>
</tbody>
</table>

**NS** = indicates number or prevalence is not shown due to small numbers. These small numbers are suppressed to protect privacy.

**Statistical Significance** - The likelihood that the difference found between groups was not due to chance alone. Statistical significance can be based on the use of statistical tests and comparison of confidence intervals. Overlapping confidence intervals indicate that any difference in the screening or prevalence observed may be due to chance. Confidence intervals that do not overlap are considered statistically significant and indicate a small likelihood that the difference is due to chance.
Baseline Health Data

Take Home Message

There are regional differences in health behaviors and outcomes in the study area that are meaningful for understanding the impacts of transportation-related projects.
Next Steps

- In breakout session we will discuss prioritizing the most important health issues considered by stakeholders

- Establish HIA Subcommittee and convene a meeting in September to complete the Scoping phase of the HIA
  - Help refine pathways for the HIA
  - Identify/Prioritize research questions
  - Identify additional baseline data for the HIA from stakeholders
Transportation
Planning/Economics
Public Health
Connectivity
## Previous Concepts

### Vollmer Associates 1998 Study/
Pioneer Valley Planning Commission 2014 Study

<table>
<thead>
<tr>
<th>Concept 1.0 (Figure 3)</th>
<th>Concept 1.1 (Figure 4)</th>
<th>Concept 3.0 (Figure 5)</th>
<th>Concept 6.0 (Figure 6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>close Exit 3 Northbound on-ramp</td>
<td>extend East Columbus Avenue to south of Exit 1 (Route 5)</td>
<td>extend East Columbus Avenue to the south of Exit 1 (Route 5)</td>
<td>construct a new interchange 600 feet south of Exit 1</td>
</tr>
<tr>
<td>construct a new on-ramp north of Main Street (reverse of Exit 4 off-ramp)</td>
<td>reconstruct East Columbus Avenue east of Exit 3 loop ramps, eliminating Longhill Street on ramp to I-91 Southbound</td>
<td>reconstruct Exit 2 as a diamond interchange with East Columbus Avenue and Longhill Street.</td>
<td>construct a new bridge over the Connecticut River that reconnects Route 5 and Route 57</td>
</tr>
<tr>
<td>close Exit 3 Southbound off-ramp</td>
<td>close Exit 3 inner loop ramp to I-91 Northbound</td>
<td>reconstruct West Columbus Avenue from Exit 1 to 3 and provide access at the new diamond interchange</td>
<td>construct an interchange of Route 5/57 on the west side of river</td>
</tr>
<tr>
<td>Close Exit 5 Southbound off-ramp and on-ramp at Broad Street</td>
<td>reconstruct West Columbus Avenue connection at Longhill Street (Exit 2)</td>
<td>reconstruct East Columbus Avenue east of Exit 3 loop ramps</td>
<td>extend East and West Columbus Avenues to the south of Exit 1</td>
</tr>
<tr>
<td></td>
<td>construct an overpass (braided ramp) for the Southbound on-ramp at Exit 4 Main Street with the Southbound off-ramp to the South End Bridge</td>
<td>eliminate the Southbound on-ramp from West Columbus Avenue (Main Street Exit)</td>
<td>construct a diamond interchange at Longhill Street and Columbus Avenue</td>
</tr>
<tr>
<td></td>
<td>maintain the Exit 5 ramp configuration from concept 1.0</td>
<td>eliminate the Northbound on-ramp and off-ramp from and to Broad Street</td>
<td>eliminate the Longhill Street connection to I-91</td>
</tr>
<tr>
<td></td>
<td></td>
<td>eliminate the Southbound off-ramp to Broad Street.</td>
<td>remove the Longhill Street</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>bridge, eliminating Exit 3 (South End Bridge Interchange)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>improve I-91 geometry</td>
</tr>
</tbody>
</table>

1998 Cost Estimate $4.5  
2013 Cost Estimate $7  

1998 Cost Estimate $8.5-28.5  
2013 Cost Estimate $13.2-44.4  

1998 Cost Estimate $27  
2013 Cost Estimate $42  

1998 Cost Estimate $64  
2013 Cost Estimate $99.7

*Cost Estimates in Million Dollars. 2013 Project Cost Adjustment Factor for Inflation (3%/year) = 1.55.
Study/Pioneer Valley Planning Commission 2014 Study
Study/Pioneer Valley Planning Commission 2014 Study
Next Steps

- Complete the Regional Transportation Demand Model for:
  - Existing Conditions 2010
  - Future No Build 2040

- Apply 2040 No-Build Conditions to Micro Simulations

- Working Group Meeting #4/Public Meeting #1

- Continue Alternatives Development
Contact:
Ethan Britland, Project Manager
Phone: 857-368-8840
Email: ethan.britland@state.ma.us

Study Website Link:
www.massdot.state.ma.us/i91viaductstudy