

I-91 VIADUCT STUDY

Springfield, Massachusetts



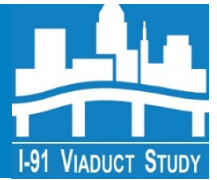
Public Meeting #1

Sheraton Springfield Monarch Place Hotel
One Monarch Place – The Mahogany Room
Springfield, Massachusetts



December 15, 2015

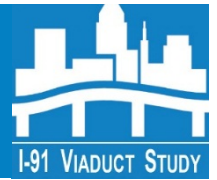
Welcome & Introductions



- Ethan Britland – Project Manager (MassDOT)
- Michael Clark – Transportation Planner (MassDOT)
- Margaret Round – MassDPH
- Ben Wood – MassDPH
- Mark Arigoni, L.A. – Principal-in-Charge (MMI)
- Rebecca Augur, AICP – Planner (MMI)
- Van Kacoyannakis, P.E. – Traffic/Transportation (MMI)
- John Hoey – Facilitator (MMI)
- Sarah Paritsky – Public Involvement (Regina Villa)



Agenda

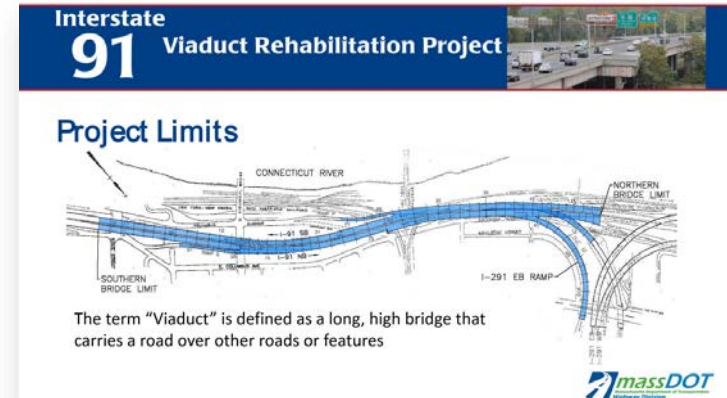


- Welcome & Introductions
- Study Purpose & Process
- Public & Stakeholder Involvement Process
- Regional & Primary Study Areas
- Goals & Objectives
- Evaluation Criteria
- Existing Conditions- Issues, Constraints, & Opportunities
- Public Health – Integrated Health Impact Assessment (HIA)
- (2040) Future “No Build Conditions
- Next Steps – Questions & Answers

Study Background



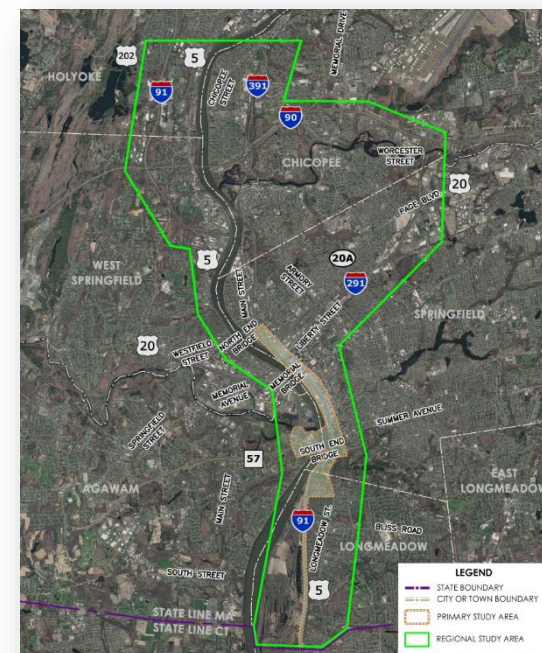
- I-91 Deck Replacement Project
- Connecting the Quadrangle to the River & Revitalizing the Heart of Downtown Springfield
- Previous Planning Documents & Reports
 - Interstate I-91 Corridor Planning Study (PVPC Draft 10/13)
 - Springfield Riverwalk and Bikeway Survey Report
 - Urban Land Institute – Springfield, Massachusetts



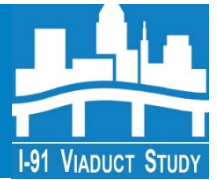
Study Purpose



- Develop a Conceptual Planning Study which produces short-, medium-, and long-term recommendations and will ultimately result in an actual project
- Evaluate Highway Alternatives which:
 - Move traffic safely and efficiently on I-91
 - Enhance the Viaduct's presence within the community
 - Improve overall safety for all modes of transportation
 - Increase multimodal connectivity and accessibility between the downtown urban core and the riverfront



Study Process



- Task 1: Study Area, Goals & Objectives, Evaluation Criteria, and Public Involvement Plan
- Task 2: Existing Conditions, Future No-Build Conditions & Issues Evaluation
- Task 3: Alternatives Development
- Task 4: Alternatives Analysis
- Task 5: Recommendations
- Task 6: Final Report

Revised Schedule



		2014				2015												2016							
		SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG
Task 1	Study Area, Goals & Objectives, Evaluation Criteria, and Public Involvement Plan	■	■	▲																					
Task 2	Existing Conditions, Future No Build Conditions and Issues Evaluation		■	■	■	■	■	■	▲	■	■	■	▲	■	■	■	▲	★							
Task 3	Alternatives Development											■	■	■	■	■	■	▲	■						
Task 4	Alternatives Analysis																	■	■	■	▲	★			
Task 5	Recommendations																				■	■	▲		
Task 6	Final Report																						■	★	

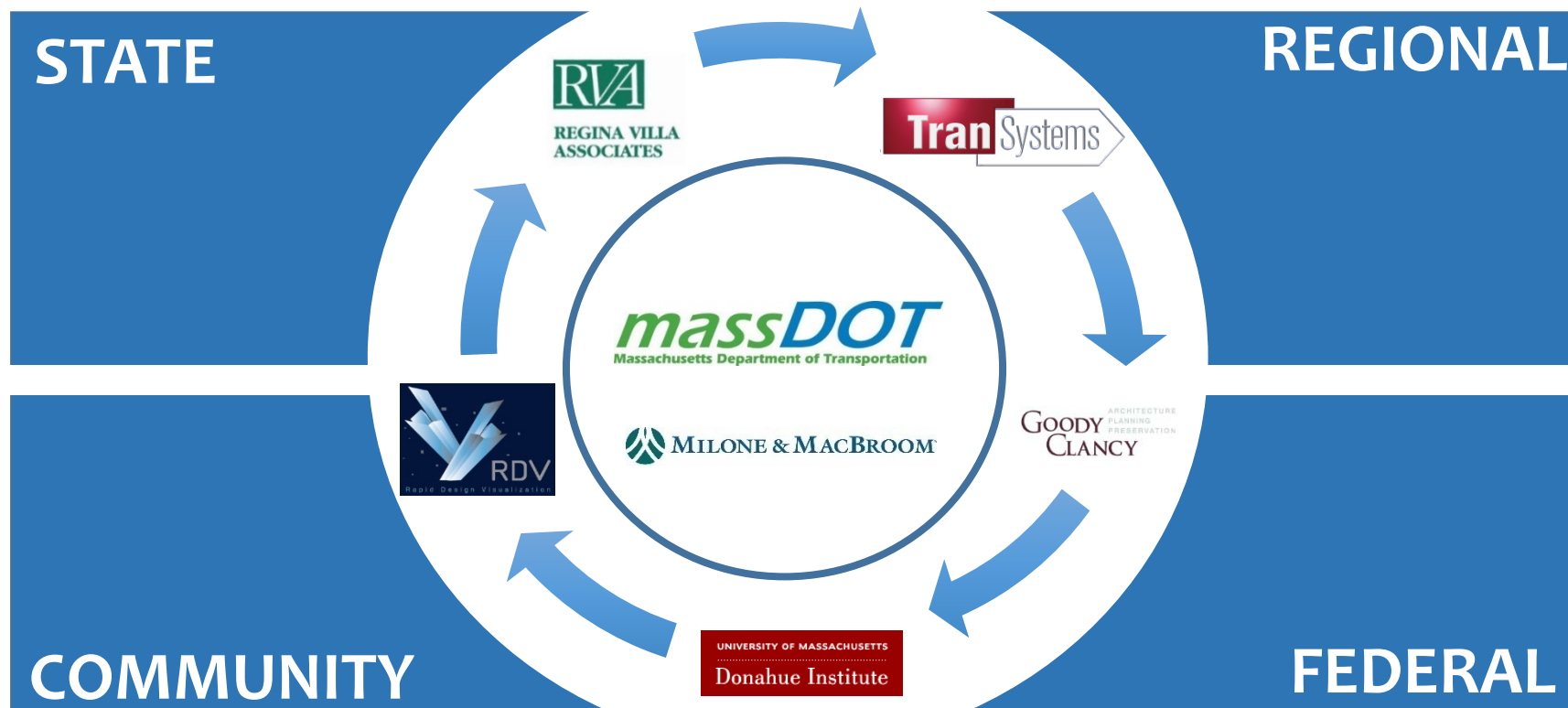
Working Group Meeting



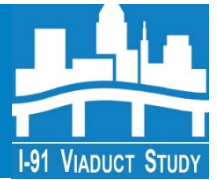
Public Meeting



Study Team



Public Involvement Plan



■ Responsive Study Team

■ Working Group

- Represents both local and regional study area
- Multimodal participants
- Nine Working Group meetings
 - Fall 2014 through spring/summer 2016



■ Public Outreach

- Project website
- Three public meetings
 - Fall 2015
 - Winter 2016
 - Spring 2016
- MassDOT Social Media



Working Group



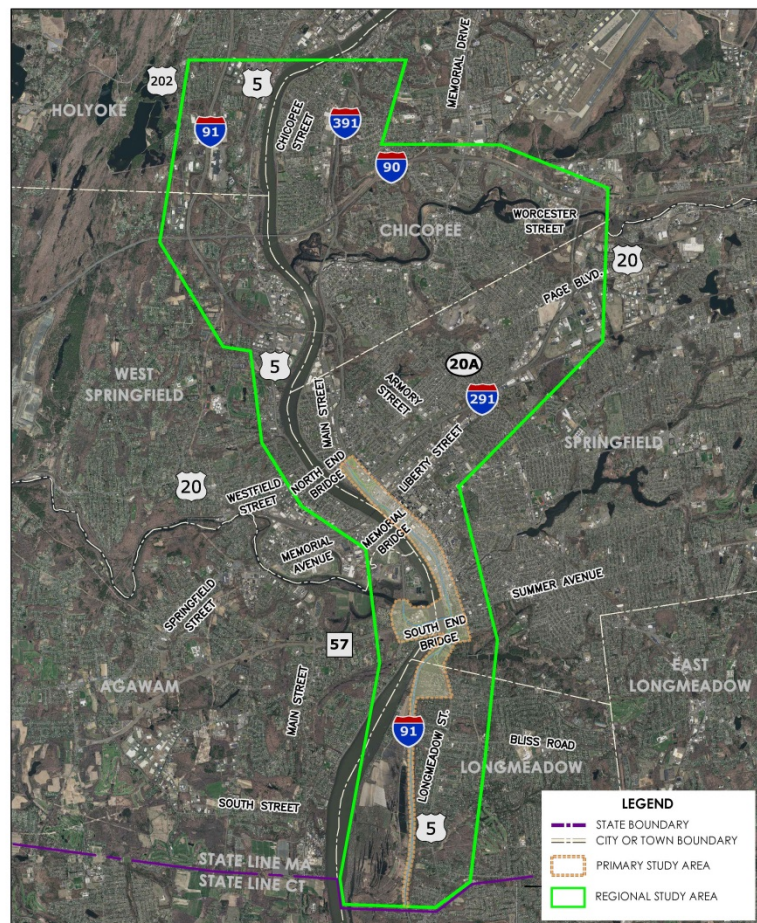
■ Group of Invited Representatives from Local and Regional Communities including:

- Federal, state, and local elected officials and agencies
- Neighborhood community groups
- Local advocacy and business groups
- Pioneer Valley Planning Commission (PVPC)
- Transit Agencies (Amtrak, CSX Railroad, Peter Pan Bus, PVRTA)

■ Role of the Working Group

- To provide input to the team on the study process
- Bring information back and forth and provide status reports to their represented organizations

Study Areas



**Primary & Regional
Study Areas**



**MILONE &
MACBROOM**

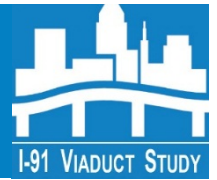


Study Goals



- Maintain or improve the safe and efficient function of I-91 Interstate and local street network within the project study area while significantly improving the connection between the downtown urban core and the riverfront
- Improve the quality of life for city residents (surrounding neighborhoods), existing/future business owners, daily commuting workforce, and visitors to the City of Springfield and surrounding communities

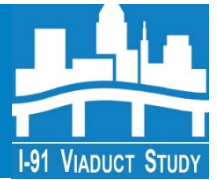
Study Objectives



- Maintain or improve highway operations: I-91 North & South; I-91 & I-291 Interchange; I-291 on and off ramps within study area
- Improve safety on the Interstate
- Maintain or improve functionality, level of service, and safety at key intersections within project area (regional and local)
- Enhance entrances/access points to the City of Springfield from West (Memorial Bridge) and the riverfront
- Enhance and create new ADA compliant pedestrian (walking, jogging, bicycling, rollerblading, strollers, etc.) connections from the downtown (neighborhoods and business center) to the riverfront, as well as to the Hall of Fame and Union Station



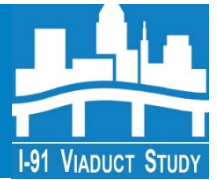
Study Objectives



- Coordinate Knowledge Corridor improvements and operations
- Create multimodal accommodations at street level for safe mobility to and from key destinations in conjunction with corridor improvements
- Create more attractive, economically viable waterfront connection(s)
- Enhance access to existing development parcels, and create new development parcels
- Minimize environmental impacts (air, water, noise)
- Improve public health and awareness
- Environmental Justice
- Enhance intermodal connectivity (passenger vehicle, bus, rail, parking)
- Improve the overall visual presence of the Interstate on the community(ies) traversed or served



Evaluation Criteria



- Mobility & Accessibility
- Safety
- Environmental Effects
- Land Use & Economic Development
- Community Effects
- Cost

** Assess the Health Pathways for each criteria*

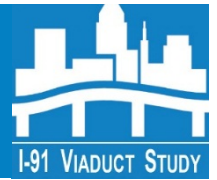
Evaluation Criteria



Mobility & Accessibility	
Evaluation Criteria	Measure of Effectiveness
Roadway Operational Functionality	<ul style="list-style-type: none"> • Intersection delay & level of service (LOS) • Volume to capacity ratio (V/C) - 50th and 95th percentile queues • Merge, diverge, and weaving LOS • Highway and ramp LOS
Travel Time	<ul style="list-style-type: none"> • Average travel time through the Primary Study Area • Average travel time within Regional Study Area • Overall network delay
Bicycle & Pedestrian Functionality & Connectivity	<ul style="list-style-type: none"> • Urban Core connection to Riverfront • Connections to Recreation & Activity Centers • Access to Union Station • Connections to Regional Bicycle & Pedestrian Systems
Mode Shift	<ul style="list-style-type: none"> • Increase transit mode share • Increase Bike & Pedestrian mode share



Evaluation Criteria



Safety	
Evaluation Criteria	Measure of Effectiveness
Pedestrian & Bicycle	<ul style="list-style-type: none">• Minimize number of conflicts with vehicles• ADA compliance• Minimize Intersection crossing times• Provision of designated facilities
Vehicular Safety	<ul style="list-style-type: none">• Conformance with AASHTO & MassDOT standards• Mitigation of high crash locations• Emergency vehicle routes & access
Public Safety	<ul style="list-style-type: none">• Emergency vehicle access• Minimize factors contributing to actual crime and perceived fear of crime

Evaluation Criteria



Environmental Effects	
Evaluation Criteria	Measure of Effectiveness
Sustainability	<ul style="list-style-type: none"> • Impacts to environmental resources • Impervious area – net changes • Low Impact Design standards (LID) • Areas of open space/development
Air Quality	<ul style="list-style-type: none"> • Impacts to chronic and acute respiratory & cardiovascular diseases • Near roadway pollutant exposure • Impacts to corridor residences & business • Reduce greenhouse gas emissions • Impacts to mental health (interference with cognitive abilities)
Noise	<ul style="list-style-type: none"> • Impacts to adjacent residences and business • Impacts to hypertension, mental health, and cardiovascular disease



Evaluation Criteria



Land Use & Economic Development	
Evaluation Criteria	Measure of Effectiveness
Promotes Economic Development	<ul style="list-style-type: none"> • Created land for open space or development • Square footage of existing space redeveloped • Accessibility to new or redeveloped parcels • Bike and pedestrian infrastructure surrounding new development or redevelopment
Socio-Economic Impacts	<ul style="list-style-type: none"> • Number of new jobs • Number of new housing units • Change in consumer spending • Generated disposable income • Property tax generation/revenue • Impacts to chronic diseases • Impacts to social determinants/cohesion • Impacts to mental health
Parking under Viaduct	<ul style="list-style-type: none"> • Changes in total number/quantity

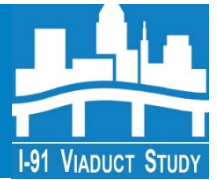


Evaluation Criteria



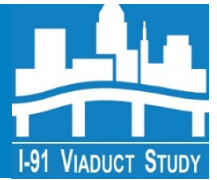
Community Effects	
Evaluation Criteria	Measure of Effectiveness
GreenDOT Initiative – Pedestrian & Bicycle Operations	<ul style="list-style-type: none">• Access points to riverfront and landmarks• Pedestrian delay• Linear feet of sidewalks• Linear feet of bike paths• Increased safety measures for pedestrians and bikes
Visual Impacts	<ul style="list-style-type: none">• Change in horizontal or vertical alignment of viaduct structure in proximity to activity centers
Construction Impacts	<ul style="list-style-type: none">• Duration• Closure and detours• Right-of-Way impacts• Local businesses access

Evaluation Criteria



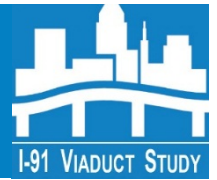
Community Effects Continued	
Evaluation Criteria	Measure of Effectiveness
Compatibility	<ul style="list-style-type: none">• Cohesiveness with local and regional plans (including transportation plans, plans of conservation & development, and strategic plans)• Consistency with MassDOT goals, policies, and directives
Environmental Justice	<ul style="list-style-type: none">• Availability of Jobs in• Availability of Education & Health Services• Mobility Impacts• Environmental Impacts

Evaluation Criteria



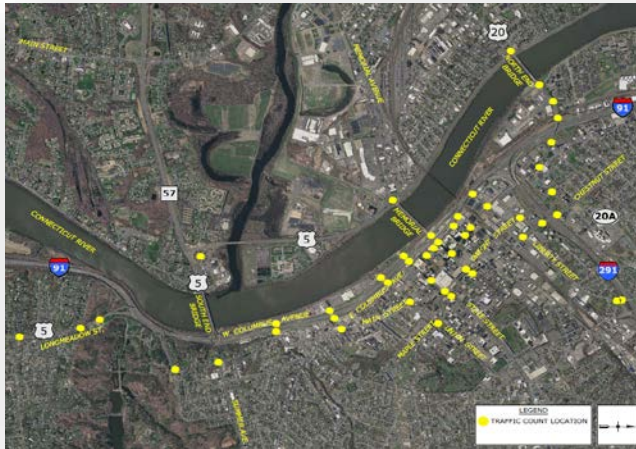
Cost	
Evaluation Criteria	Measure of Effectiveness
Construction Costs	<ul style="list-style-type: none">• Order of magnitude implementation costs• Right-of-way (ROW) impacts
Maintenance Costs	<ul style="list-style-type: none">• Annual maintenance costs• Life-cycle maintenance costs

Existing Conditions



- Traffic & Multimodal
- Land Use & Economic Development
- Environmental
- Public Health

Traffic & Multimodal



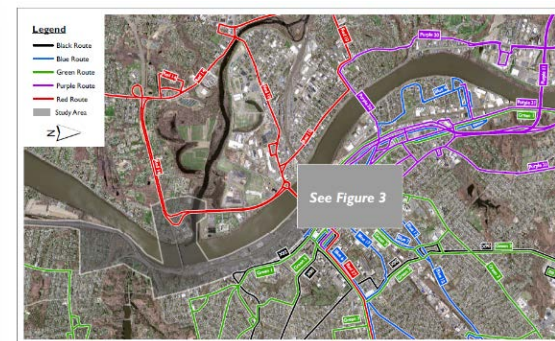
Intersection Traffic Counts



Regional Traffic Volumes



Bike & Pedestrian Routes



PVRTA, Rail & Bus Routes
& Headways



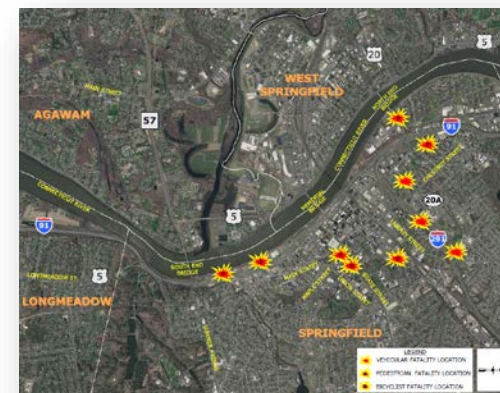
Traffic & Multimodal



- Between 2010 and 2012, there were 1,004 accidents along I-91, I-291, and on and off ramps within the primary study area; 10 of these accidents involved pedestrians.
- In 2013 and 2014, there were four fatalities within the primary study area, three involved pedestrians.
- There are 13 intersections within the primary study area on the PVPC 2007 – 2009 Top 100 List.
- South End Bridge listed MassDOT 2012 Top Crash Locations Report.



Crash Clusters



Fatalities

MILONE &
MACBROOM



Traffic

Issues & Constraints



- Number of Pedestrian Fatalities
- Lack of Designated Provisions for Bicycles
- Number of On & Off Ramps in a Short Distance
- Weaving and Merging Traffic along Ramps
- No connection to Memorial Bridge from I-291
- Locations of N-S Rail Line
 - Only three connections between the Riverfront & the Bikeway with Downtown Core
 - At-grade crossing at Riverfront Park is a passive crossing

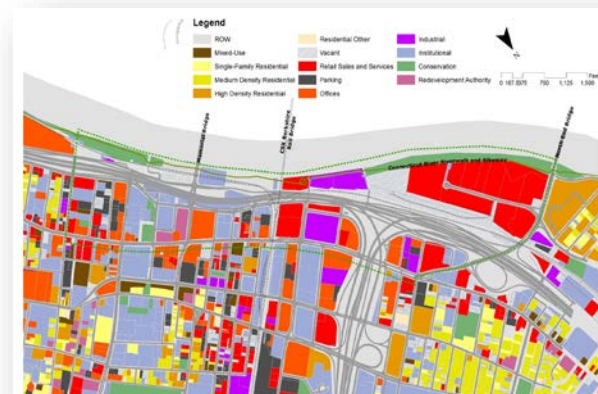
Land Use & Economics



- Regional & Local Economic Structure
- Net Absorption Rates – Office/Retail
- Lease Rates – Property Values
- Housing Characteristics
- Local & Regional Business Patterns
- Current & Planned Future Economic Development Project

Category	Average 2009-2013
Population	4,066
Labor Force	1,336
Unemployment	25%
Jobs (2014 Only)	13,930
Median Home Value	\$176,400
Median Rent (Monthly)	\$1,339
Lease Rates (per sq. ft.)	\$12.64

Key Economic Indicators



Existing Land Use

MILONE & MACBROOM



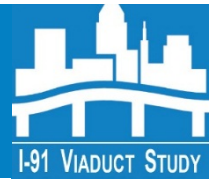
Land Use & Economics

Issues & Constraints



- Early Stage Economic Renaissance – Future?
- Shift in Local Market to Live/Work Areas
- Cohesive Redevelopment
- Many Physical Barriers

Environmental



Wetlands, FEMA & Flood Hazards



Surficial Geology & Topography



Open Space & Cultural Resources

- Connecticut & Westfield River Systems
- ACOE Certified Flood Control System
- State Listed AUL Sites & Watersheds
- Protected Historic & Cultural Properties

- Connecticut & Westfield Rivers
- Soils & Groundwater
- Protection of Historic & Cultural Resources

Incorporating Public Health Considerations into the I-91 Viaduct Study Process

Ben Wood

Department of Public Health
Bureau of Community Health and Prevention

Margaret Round

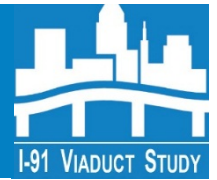
Department of Public Health
Bureau of Environmental Health

Outline



- Transportation Reform in Massachusetts
- Health Impact Assessment (HIA)
- Steps of HIA
- Health Determinants
 - Transportation-Related Health Determinants
- Scoping
- Baseline Health Assessment Approach
 - Baseline Health Data & Data Sources
- Example of Pathway Diagram Mobility and Connectivity
- Environmental Justice Populations
- Next Steps

Transportation Reform in Massachusetts



In June 2009 Governor Deval Patrick signed the Transportation Reform Law – M.G.L. Chapter 6C



The primary goal was to consolidate all state transportation agencies in Massachusetts to reduce duplicate efforts and enhance transportation planning

Transportation Reform in Massachusetts



- M.G.L Chapter 6C established the Healthy Transportation Compact composed of:
 - Secretary of Transportation (co-chair)
 - Secretary of Health and Human Services (co-chair)
 - Secretary of Energy and Environmental Affairs
 - Administrator of Transportation for Highways
 - Administrator of Transportation for Mass Transit
 - Commissioner of Public Health

- Under M.G.L. Chapter 6C, Section 33 the Healthy Transportation Compact is directed to:
 - (v) establish methods to implement the use of health impact assessments (HIAs) to determine the effect of transportation projects on public health and vulnerable populations; and
 - (x) institute a health impact assessment for use by planners, transportation administrators, public health administrators and developers.



Health Impact Assessment (HIA)



- 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



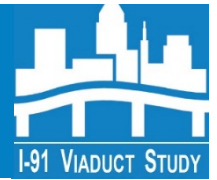
Steps of HIA



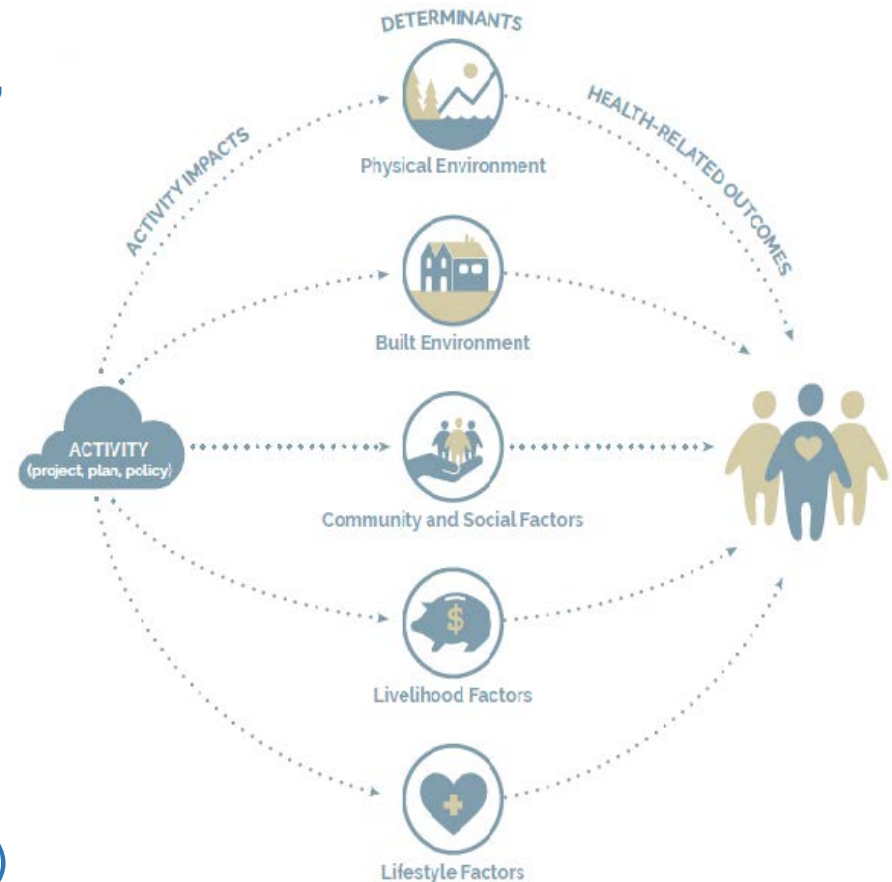
- **Screening:** Determines the need and value of a HIA
- **Scoping:** Determines which health impacts to evaluate, methods for analysis and a work plan
- **Assessment:** Provides (1) describes baseline health conditions and (2) predicts potential health impacts
- **Recommendations:** Provides strategies 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 Public Health Subcommittee
- Incorporate Public Health Criteria to Evaluate Alternatives to No-Build Conditions
- Conduct literature review
- Work closely with MassDOT project manager and consultants
- Develop a workplan for assessing baseline health conditions, and evaluating the health outcomes for each of the alternatives



Baseline Health Assessment Approach



■ Assessment of Existing Conditions

- Characterizing baseline health information that are directly related to transportation and land-use decisions
 - Hospitalizations for Asthma and Heart Attack and Pediatric Asthma data:
 - Data 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
 - BRFSS data:
 - 5 Indicators: Hypertension, Obesity, Diabetes, F/V consumption, Physical Activity rates

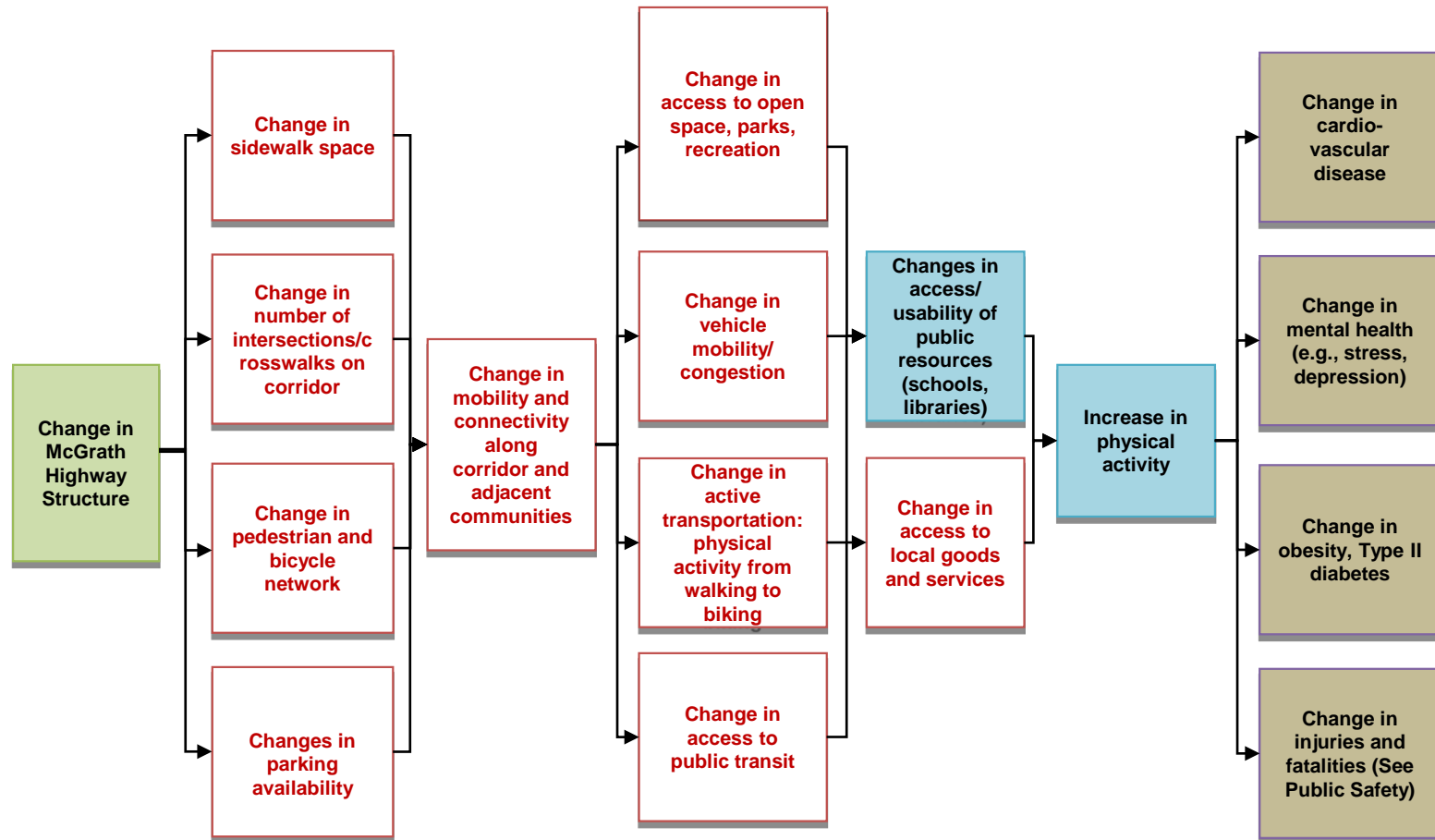


Baseline Health Data & Data Sources

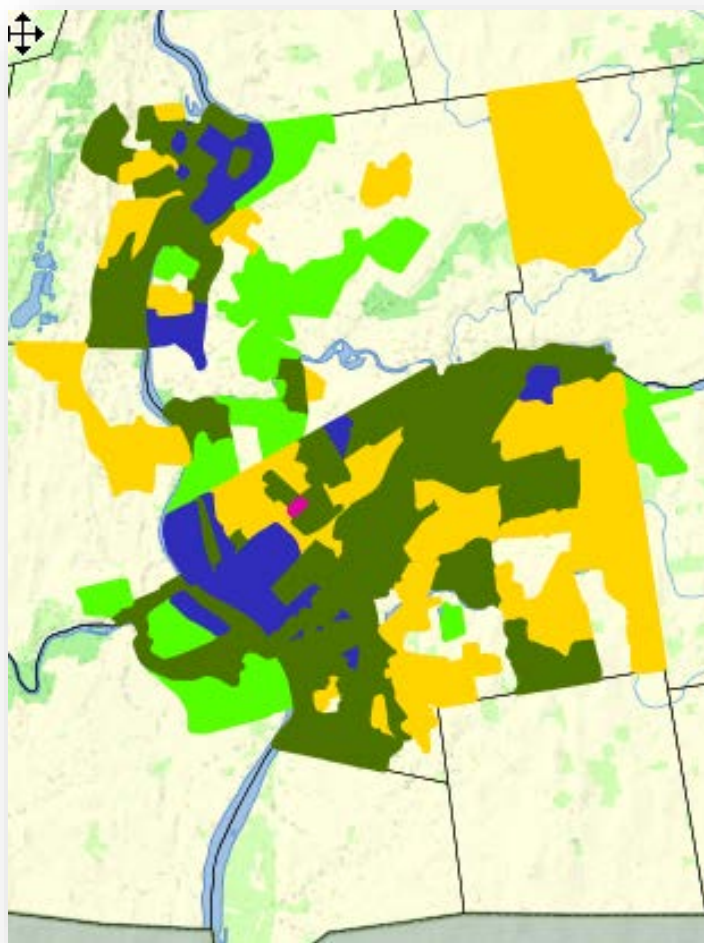


Health Determinants	Baseline Health Data	Available Data Sources
Physical Environment Built Environment Livelihood Factors	Hospitalizations for: <ul style="list-style-type: none"> Asthma Myocardial infarction Congestive Heart Failure Stroke Hypertension 	Hospitalization Data from the Center for Health Information and Analysis, CHIA (1)
	Childhood Lead Poisoning	MA DPH BEH EPHT Portal
	Pediatric Asthma (Grades K-8)	MA DPH BEH EPHT Portal
	Cancer	MA DPH EPHT Portal
Lifestyle Factors	<ul style="list-style-type: none"> Adult Obesity Adults Reporting No Exercise Adults Eating 5 Fruits And Vegetables/Day 	MA DPH BCHAP Behavioral Risk Factor Surveillance Survey (BRFSS)
Built Environment	Connectivity Vehicular, Pedestrian and Bicycle Safety	Supplement I-91 Viaduct Study
Community and Social Factors	Access to medical and social services Social support services	Community input
Livelihood Factors	Income, Race, Employment Socio-economic impacts	Supplement I-91 Viaduct Study

Example of Pathway Diagram Mobility and Connectivity



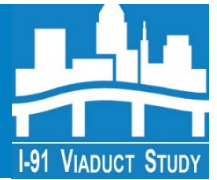
Environmental Justice Populations



Census 2010 Environmental Justice Populations

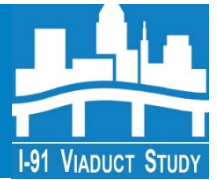
- Minority
- Income
- English Isolation
- Minority and Income
- Minority and English Isolation
- Income and English Isolation
- Minority, Income and English Isolation

Next Steps



- Incorporate public health criteria into Evaluation Criteria Matrix
- Establish Public Health Subcommittee and convene a meeting in January to:
 - Review health criteria for Evaluation Criteria Matrix
 - Identify baseline public health data
 - Refine pathways
 - Identify/Prioritize research questions

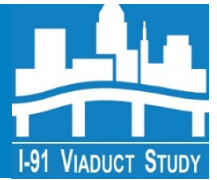
Study Opportunities



- Reconfiguration of the I-91 Viaduct and Longmeadow curve may facilitate safety & circulation improvements for all modes or transportation
- Continuation/Links to Riverwalks in Agawam and Springfield & Chicopee
- Link Forest Park to the Riverwalk
- Create Stronger Link to the New Union Station
- Create a Regional Draw to an expanded, healthier urban riverfront
- Transit Oriented Developments
- Economic Development & Redevelopment Areas



Summary of Work Completed



■ Study Area

■ Goals & Objectives

■ Fine Tuning the Evaluation Criteria

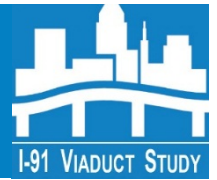
■ Public Involvement Plan

■ Existing Conditions

- Transportation
- Economic Development & Land Use
- Environmental

■ Future No-Build Conditions 2040 – Transportation Demand Model (TransCAD)

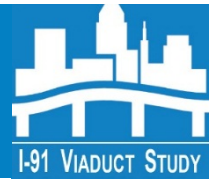
Preliminary Modeling Results



Freeways

- Interstates and Roadways Analyzed – I-90, I-91, I-291, I-391 and U.S. Route 5
- No significant changes to the LOS and density for the freeways in the regional study area
- We will look to carry three lanes in each direction along
- I-91 for all alternatives

Preliminary Modeling Results



Ramps

- 42 Ramps were analyzed during the AM and PM Peak periods
- Four (4) locations had an LOS E or worse for existing conditions 2014
- Six (6) locations had an LOS E or worse for the 2040 No-Build Conditions

Preliminary Modeling Results



Weaving Sections

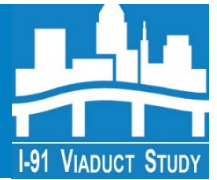
- Sixteen (16) locations analyzed at AM and PM Peak
- Seven (7) locations had LOS E or worse existing conditions
- Ten (10) locations had LOS E or worse for the 2040 No-Build

Unsignalized Intersections

- Fifteen (15) locations analyzed at AM and PM Peak
- Six (6) locations had LOS E or worse for existing conditions (2014)
- Nine (9) locations had LOS E or worse for the 2040 No-Build



Preliminary Modeling Results



Signalized Intersections

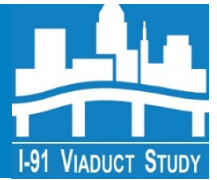
- 39 locations analyzed at the AM and PM Peak periods
- 5 locations had LOS E or worse for existing conditions
- 14 locations had LOS E or worse for the 2040 No-Build

Recent & Future Tasks



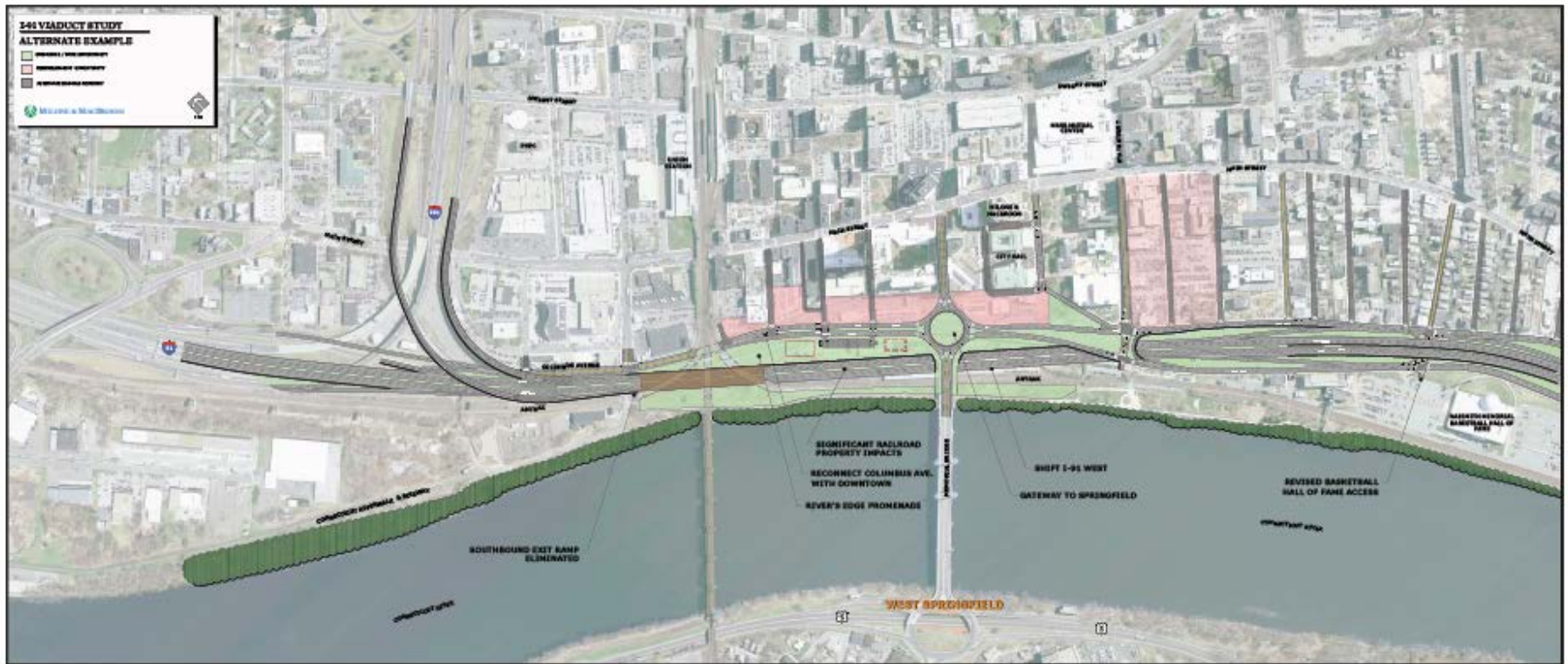
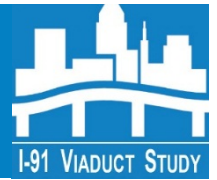
- Completed Future No-Build Conditions 2040 Transportation Demand Model (TransCAD)
- Completed implementing the Future No Build Model into traffic micro-simulations (Individual Study Intersection Levels of Service – LOS)
- Beginning process of Preliminary Alternatives Development – Potential Impacts & Benefits

Next Steps



- Complete Future No-Build Traffic Micro-Simulations
- Finalize Evaluation Criteria
- Define Short-term and Medium-term Alternatives to Improve Safety, Traffic Flow and Health-based on 2040 No-Build Micro-Simulations
- Development of Preliminary Alternatives
- Conduct additional Working Group meetings to refine Alternatives
- Finalize Alternatives
- Next Scheduled Public Meeting April 2016

Long-Term Alternatives Example



Revised Schedule



		2014				2015												2016							
		SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG
Task 1	Study Area, Goals & Objectives, Evaluation Criteria, and Public Involvement Plan	█	█	▲																					
Task 2	Existing Conditions, Future No Build Conditions and Issues Evaluation		█	█	█	█	█	█	▲	█	█		▲	█	█	█	█	▲	★						
Task 3	Alternatives Development											█	█	█	█	█	█	▲	█						
Task 4	Alternatives Analysis																	█	█	█	▲	★			
Task 5	Recommendations																			█		▲			
Task 6	Final Report																					█	▲	★	

Working Group Meeting



Public Meeting



Questions & Comments



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