I-90 Interchange Study

# Working Group Meeting

October 2, 2019
3:00 pm to 5:00 pm
MassDOT District 1 Conference Room
270 Main Street, Lenox

massDOT
Massachusetts Department of Transportation

# I-90 Interchange Study

Meeting Agenda

- Welcome and Introductions
- Recap of Progress to Date
- Additional Analysis of the Alternatives
- Draft Study Findings
  - Alternative Feasibility
  - Recommendations
  - Potential Funding Pathways
  - MassDOT Project Development Process
  - Next Steps and Conclusion
- Other Business
  - Project Schedule
  - Opportunity for Public Comment

# I-90 Interchange Study

## Progress Recap: Goals, Mission, Criteria

- Goals, Objectives, Mission Statement

**Study Goals**

- Primary: Improve access to and from I-90 for towns in center of regional study area
- Secondary: Mitigate I-90-bound traffic to and from Lee and Westfield

**Evaluation Criteria**

- Design and operations
- Environmental resources
- Socioeconomic effects
- Financial and regulatory

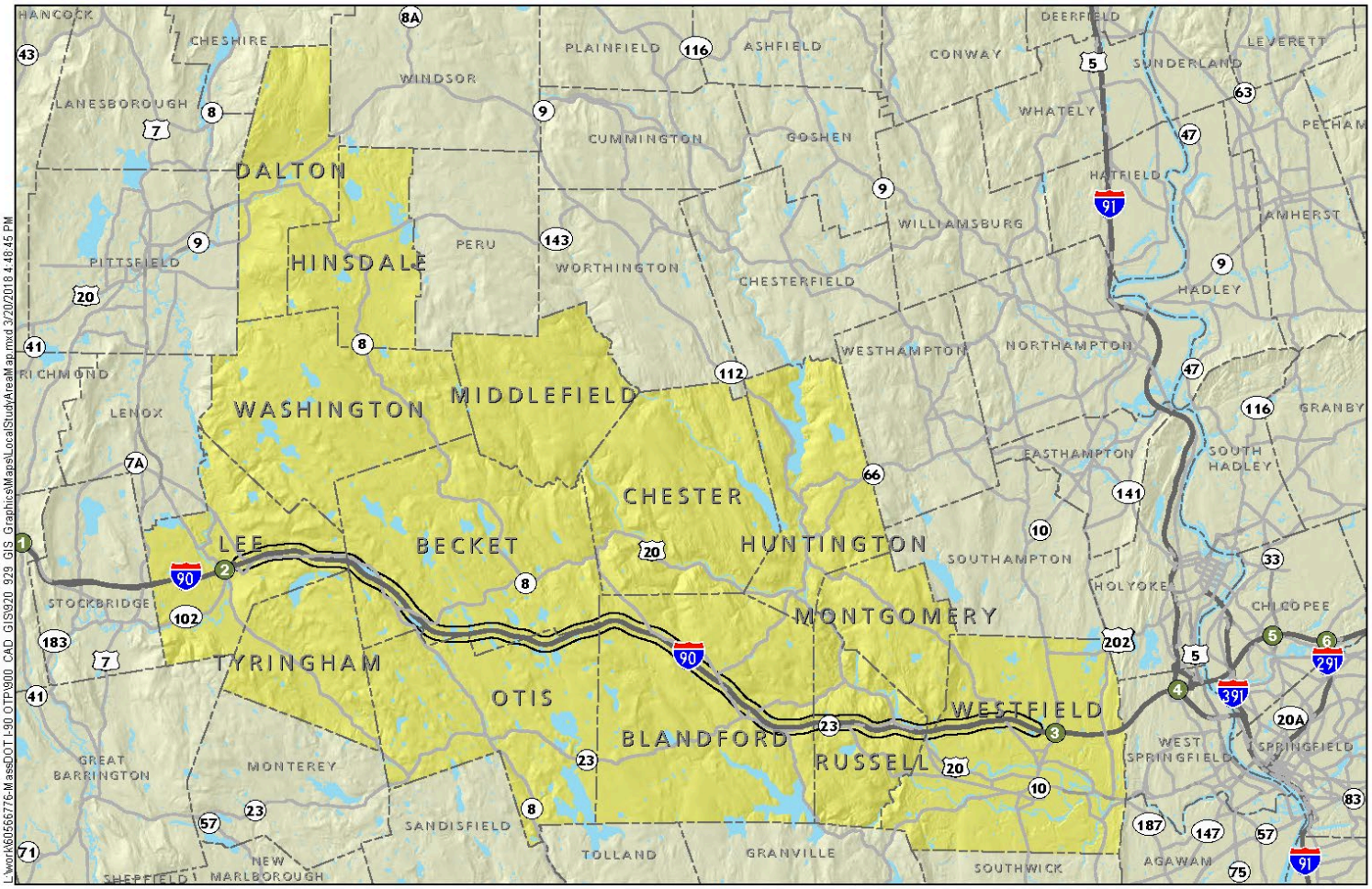
**Mission Statement**

"**The purpose of the I-90 Interchange Study is to identify feasible potential locations for a new interchange that will provide improved access and mobility for residents and businesses in the regional study area.** These locations must acknowledge the gap in access of nearly 30 miles between Exits 2 and 3, and the safety and access issues created by that distance. Interchange locations will be evaluated based on their ability to avoid or minimize impacts to environmental resources and abutting properties. The study will identify improvements to connecting roadways that are necessary to accommodate changes in passenger vehicle and truck traffic, and will identify the effects of that traffic on affected communities. The ability for improved access to serve as a benefit to economic development will be evaluated, as will the ability for communities to maintain their existing land use patterns and character. Potential interchange locations will be expected to provide benefits to health and air quality by providing an alternative that allows residents and businesses to reduce their travel times and miles traveled by providing improved access, resulting in reduced fuel consumption and emissions and less traffic at adjacent I-90 interchanges."

# I-90 Interchange Study

## Progress Recap: Study Area

- Study area

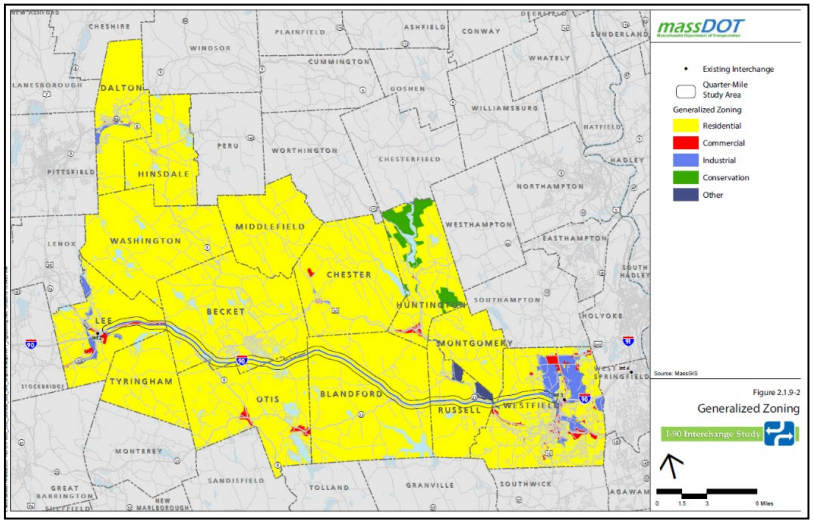


# I-90 Interchange Study

## Progress Recap: Existing Conditions

- Existing conditions
  - Wetland and Water Resources
  - Rare, Threatened, and Endangered Species
  - Topography, Geology, and Soil
  - Protected Open Space
  - Hazardous Material Sites
  - Historic and Cultural Resources
  - Environmental Justice
  - Land Use and Zoning
  - Local Planning Documents
  - Socioeconomic Conditions

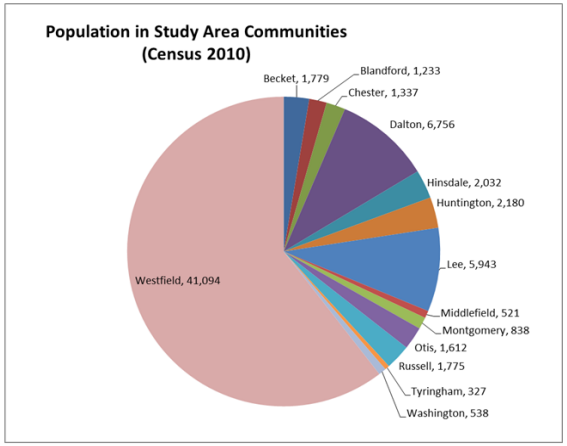
| Employment Sectors of I-90 Study Area* | | | |
|---|---|---|---|
| Sectors | Total Jobs | Establishments | Sales ($) (000s) |
| 11: Agriculture, Forestry, Fishing and Hunting | 138 | 22 | 18,456 |
| 21: Mining, Quarrying, and Oil and Gas Extraction | 22 | 3 | 2,243 |
| 22: Utilities | 276 | 12 | 166,164 |
| 23: Construction | 1,526 | 274 | 303,144 |
| 31-33: Manufacturing | 4,379 | 155 | 873,411 |
| 42: Wholesale trade | 1,744 | 105 | 2,113,339 |
| 44-45: Retail trade | 4,374 | 425 | 1,038,450 |
| 48-49: Transportation and warehousing | 940 | 62 | 112,248 |
| 51: Information | 283 | 38 | 44,510 |
| 52: Finance and insurance | 663 | 205 | 133,673 |
| 53: Real estate and rental and leasing | 696 | 120 | 82,872 |
| 54: Professional, scientific, & technical svcs | 1,154 | 212 | 127,462 |
| 55: Management of Companies and Enterprises | 89 | 3 | 1,553 |
| 56: Admin&supp. and waste mgt &remed. svcs | 1,098 | 93 | 159,076 |
| 61: Educational Services | 3,474 | 83 | 3,164 |
| 62: Health care and social assistance | 4,264 | 458 | 285,406 |
| 71: Arts, entertainment, and recreation | 566 | 62 | 37,794 |
| 72: Accommodation and food services | 3,607 | 217 | 415,581 |
| 81: Other services (except pub admin) | 1,918 | 342 | 61,549 |
| 92: Public Administration | 1,574 | 217 | |
| 99: Unassigned | 402 | 93 | |
| TOTAL All Industries | 33,187 | 3,201 | 5,980,095 |

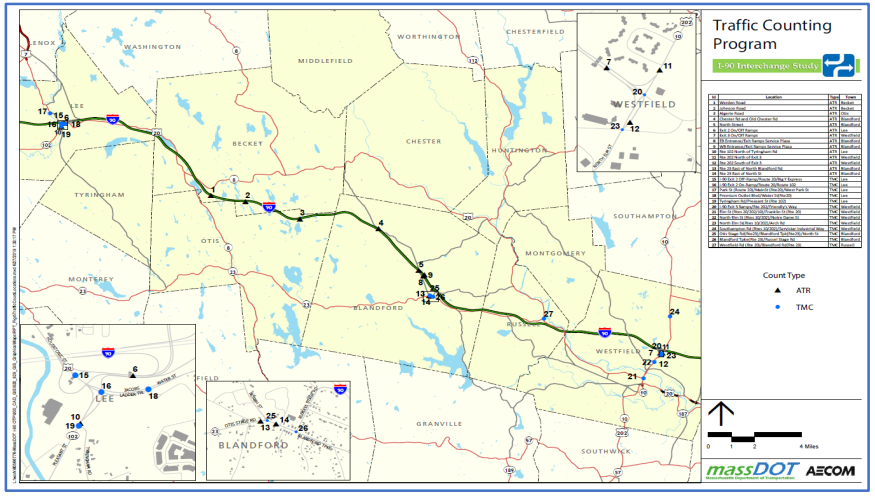


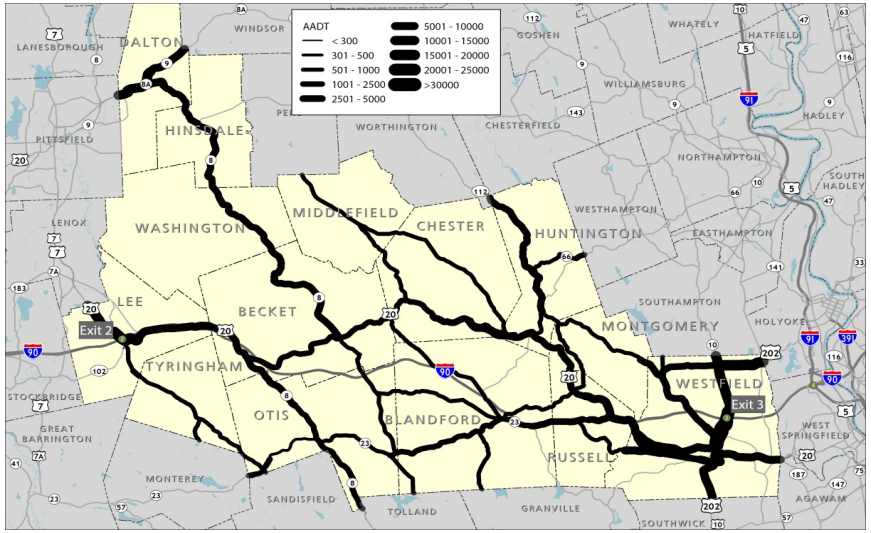
# I-90 Interchange Study

## Progress Recap: Existing Conditions

- Existing conditions
  - Public Health
  - Local Roadway Network
  - Traffic Conditions
  - Seasonal Variation
  - Truck Traffic
  - Representative Travel Times
  - Crash Data
  - Multimodal Transportation



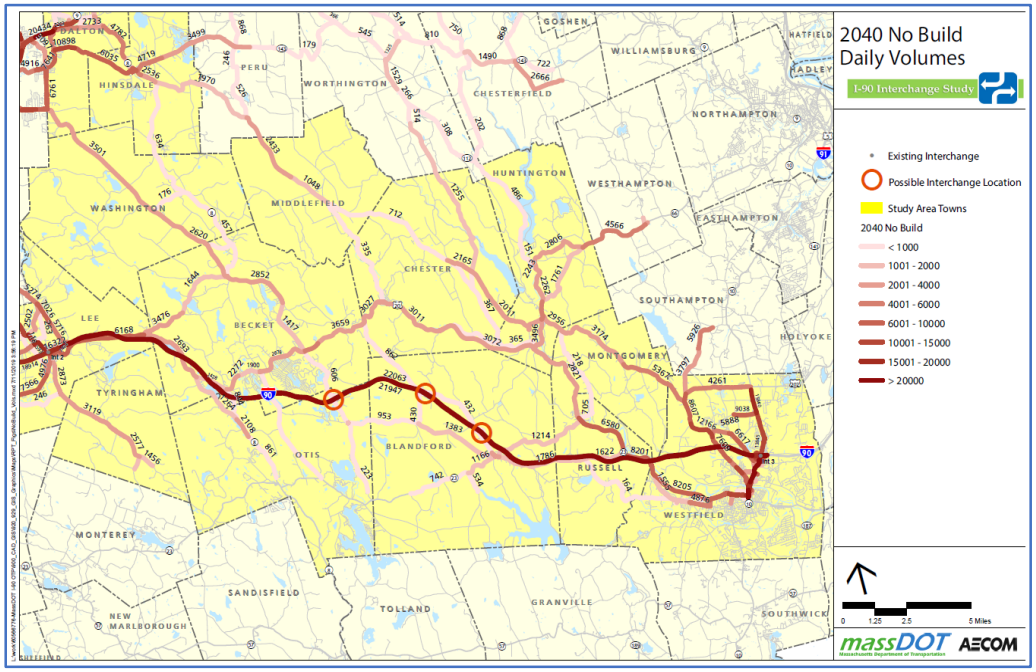



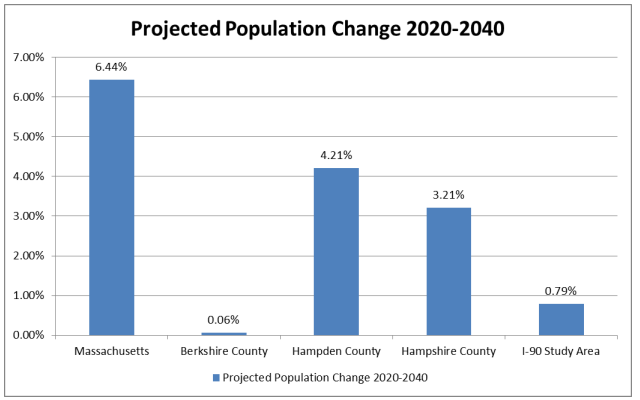



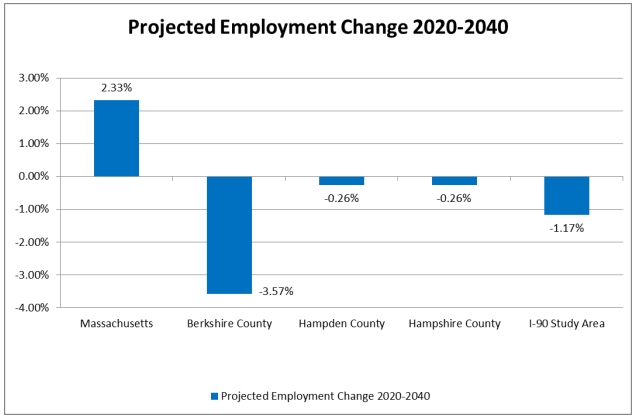
# I-90 Interchange Study

## Progress Recap: Future Year (2040) No-Build Conditions

- Statewide Travel Demand Model



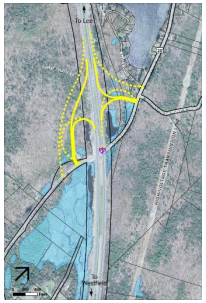
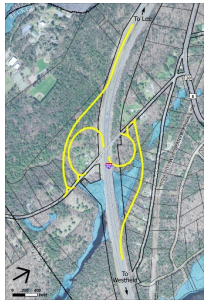
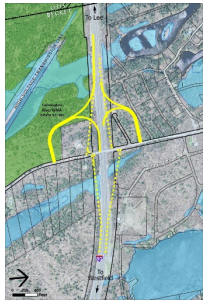



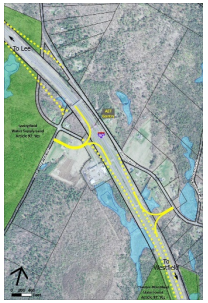
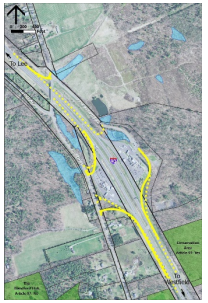
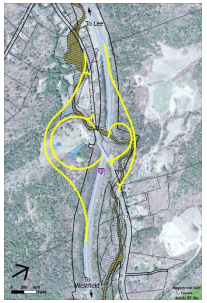



# I-90 Interchange Study

Progress Recap:
Alternatives Development

- Alternatives development and initial screening
- Original seven alternatives
  - Loose Tooth Road/Route 20, Becket
  - Werden Road, Becket
  - Johnson Road, Becket
  - Algerie Road, Otis
  - Blandford Maintenance Facility, Blandford
  - Blandford Service Center, Blandford
  - Route 23, Russell

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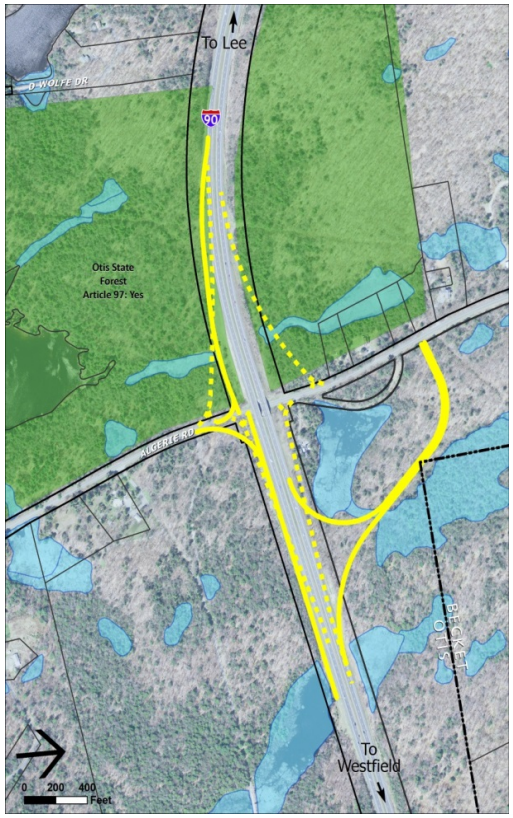
# I-90 Interchange Study

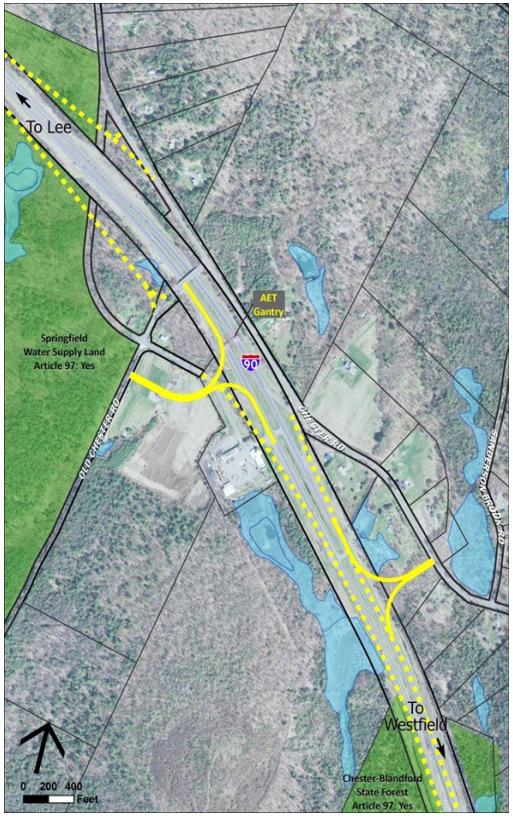
Progress Recap:
Alternatives Development

- Three alternatives chosen for further analysis

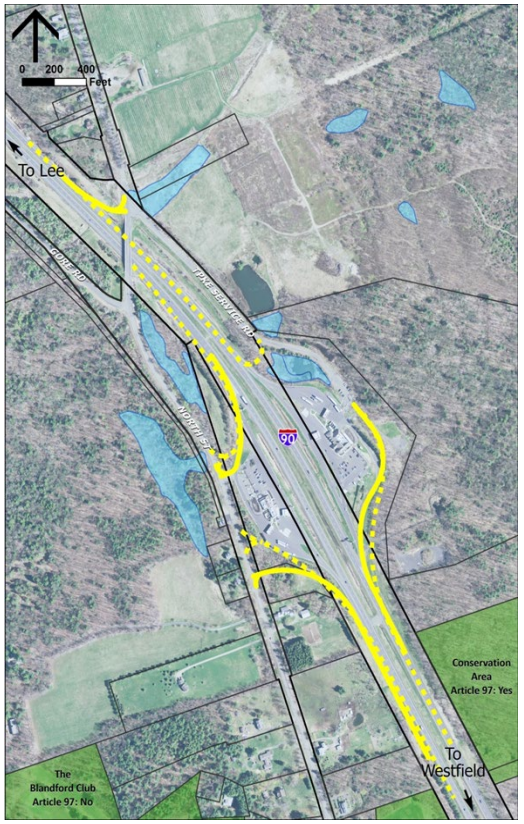
Alternative 1:
Algerie Road, Otis




Alternative 2:
Blandford Maintenance Facility, Blandford




Alternative 3: Blandford
Service Plaza, Blandford



# Progress Recap: Alternatives Analysis

- Environmental Considerations

| Criteria | Alternative 1 Algerie Road, Otis | Alternative 2 Blandford Maintenance Facility | Alternative 3 Blandford Service Plaza |
|---|---|---|---|
| Right-of-Way (SQ. FT.)* | 148,856 | 89,936 | 18,119 |
| Wetlands (SQ. FT.) | Less than 500 | None | Less than 500 |
| Water Resources (SQ. FT.) | None | 180,000 | 106,600 |
| Steep Slopes/Topography (SQ. FT.) | Yes | None | None |
| Open Space (Article 97) (SQ. FT.) | 685 | None | None |
| Natural Heritage & Endangered Species Program Impact | None | None | None |
| Hazardous Materials | None | None | UST associated with Plaza |
| Environmental Justice Impacts | Yes | None | None |

*Reflects square footage of entire parcel(s) impacted by interchange footprint

# Progress Recap: Alternatives Analysis

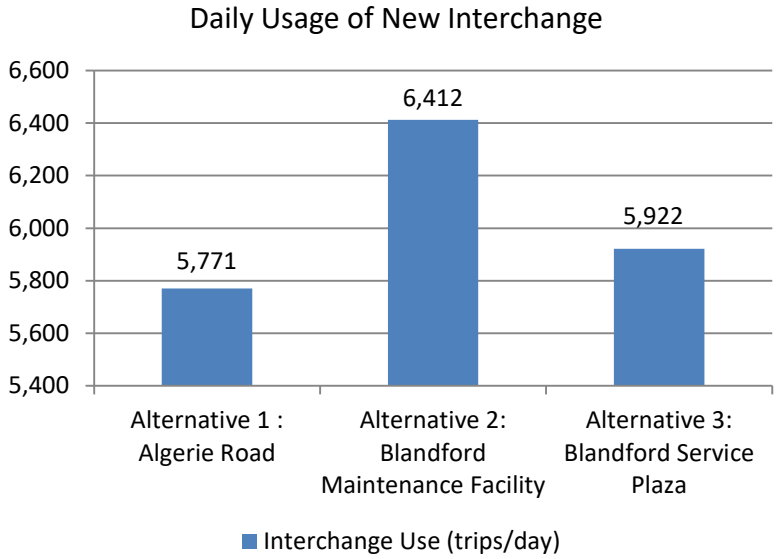
- Conceptual Construction Costs
  - Do not include ROW acquisition, environmental permitting, or engineering design

| Cost | Alternative 1 Algerie Road, Otis | Alternative 2 Blandford Maintenance Facility, Blandford | Alternative 3 Blandford Service Plaza, Blandford |
|---|---|---|---|
| **Interchange** | $26.3 million | $19.4 million | $20.4 million |
| **Local Road Upgrades** | $11.5 million | $10.1 million | $13.6 million |
| **Total** | **$37.8 million** | **$29.5 million** | **$34.0 million** |

# I-90 Interchange Study

## Progress Recap: Alternatives Analysis

- Interchange use/diversion

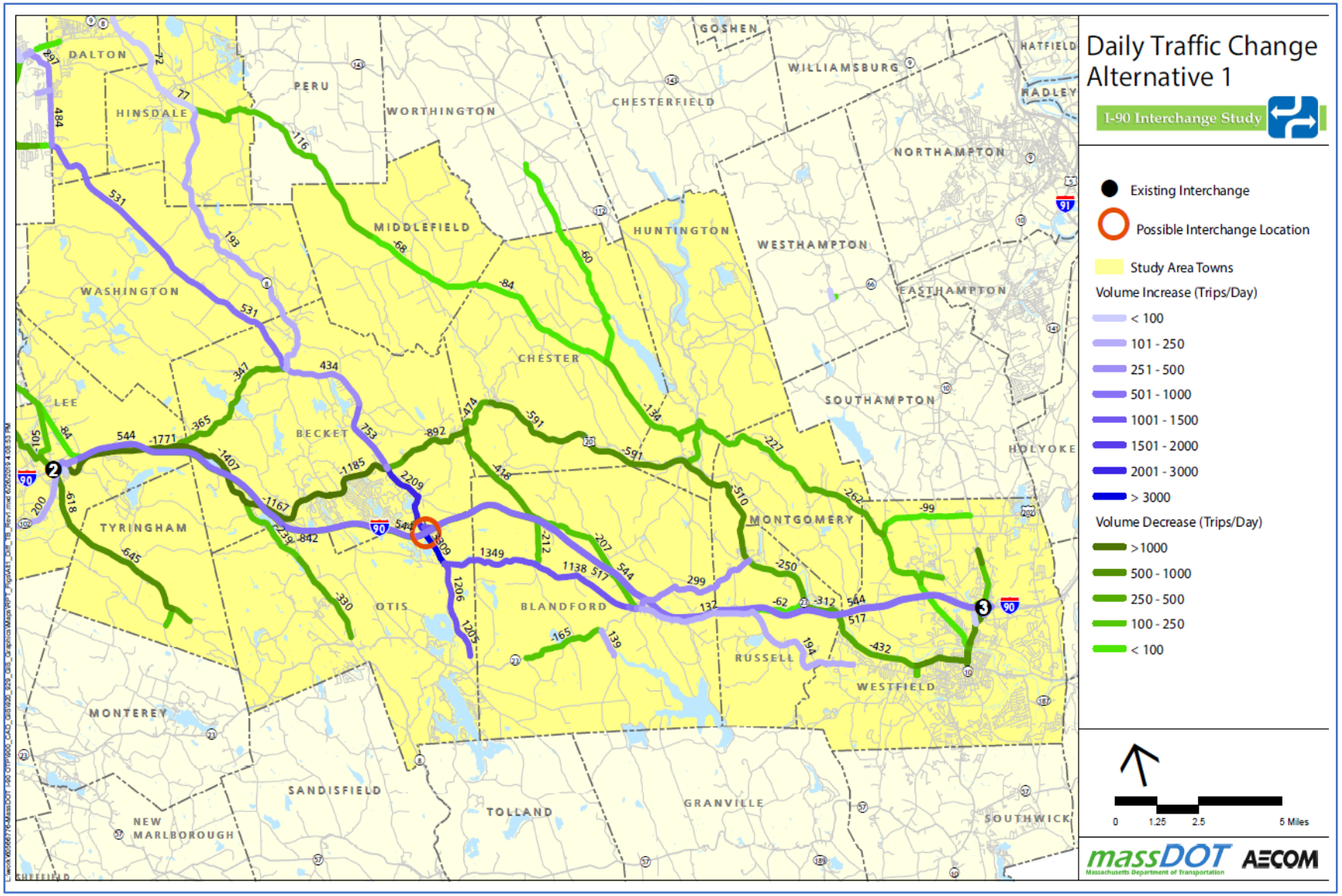



Trip Diversion with New Interchange

| Interchange Location | Daily | AM Peak Hour | PM Peak Hour |
|---|---|---|---|
| Alt 1 - Exit 2 diversion | -64 trips/day | -22 trips/hour | -2 trips/hour |
| Alt 1 - Exit 3 diversion | -597 trips/day | -46 trips/hour | -44 trips/hour |
| Alt 2 - Exit 2 diversion | -346 trips/day | -28 trips/hour | -14 trips/hour |
| Alt 2 - Exit 3 diversion | -1,044 trips/day | -99 trips/hour | -75 trips/hour |
| Alt 3 - Exit 2 diversion | -134 trips/day | -10 trips/hour | -5 trips/hour |
| Alt 3 - Exit 3 diversion | -1,433 trips/day | -120 trips/hour | -138 trips/hour |

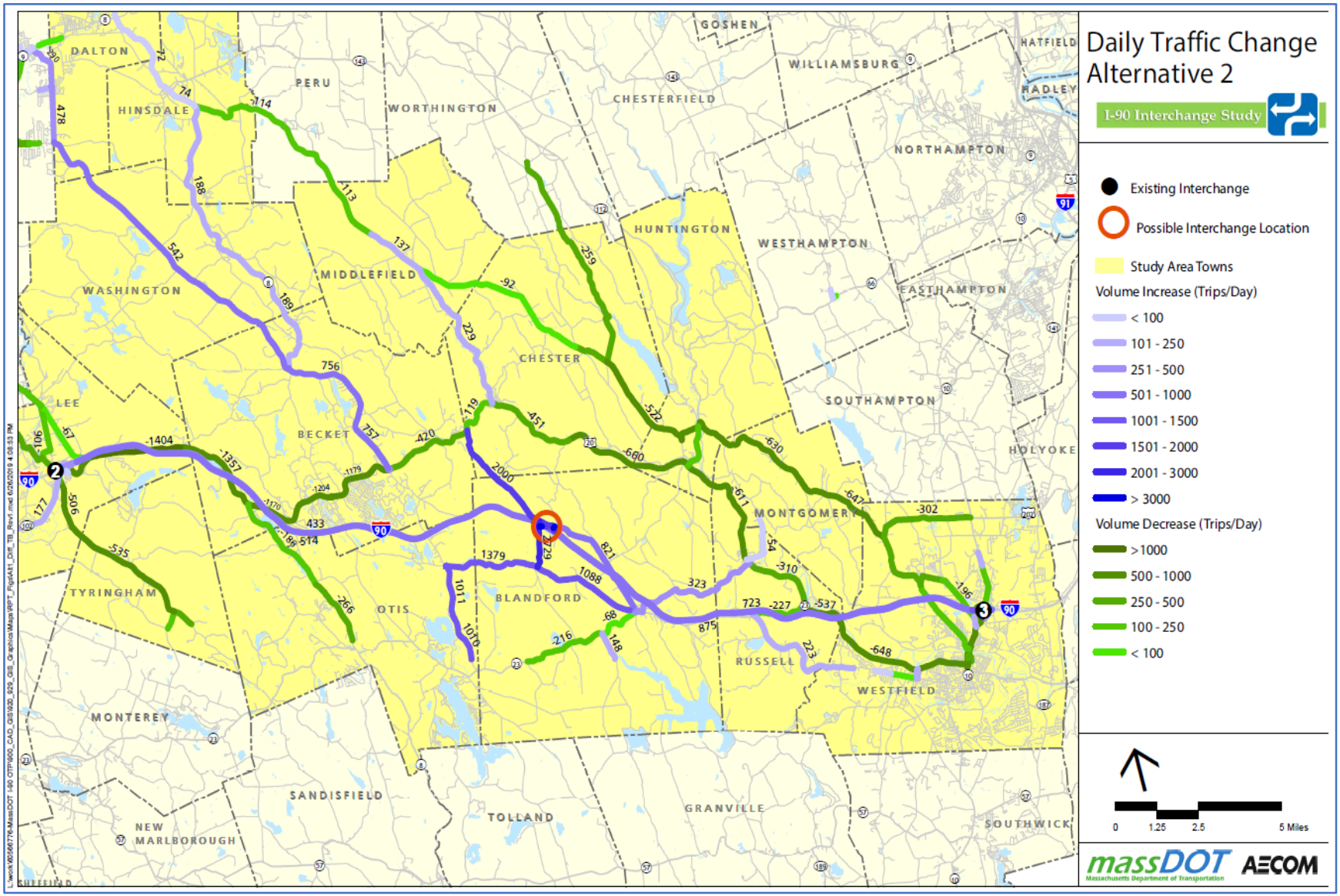
# I-90 Interchange Study

## Progress Recap: Alternatives Analysis



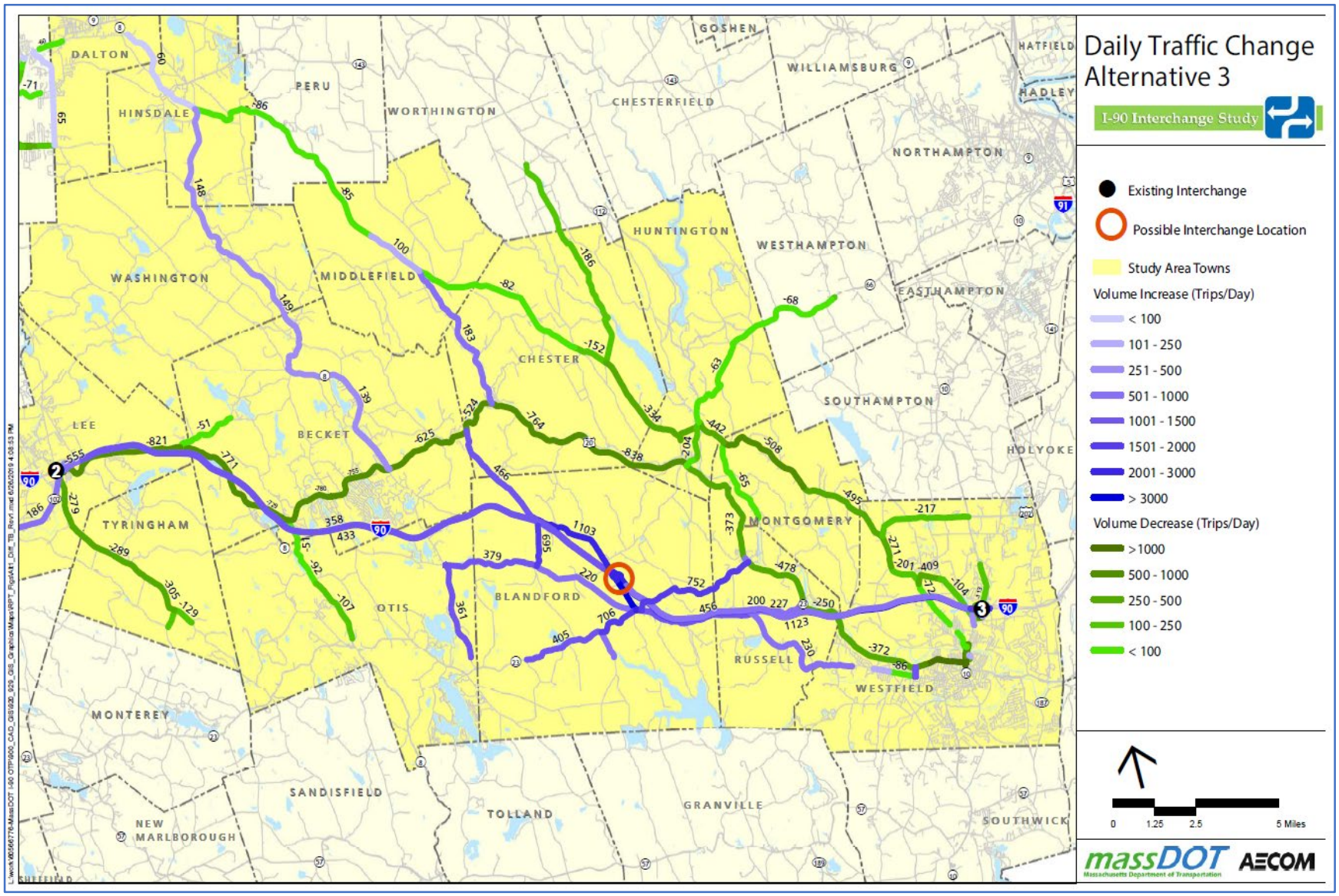
# I-90 Interchange Study

Progress Recap:
Alternatives Analysis



# I-90 Interchange Study

Progress Recap:
Alternatives Analysis



# I-90 Interchange Study

Analysis Completed since February 2019 Working Group Meeting

- Alternatives analysis
  - Network Operations
  - Safety
  - Multimodal transportation
  - Public health
  - Connectivity and mobility
  - Economic considerations
  - Community impacts
  - Land use
- Conducted additional requested research
- Developed draft study findings

# Network Operations: Level of Service (LOS)

- Network operations show how transportation network will operate under certain conditions
- Level of Service (LOS) is used to measure the efficiency of peak-hour traffic operating conditions at intersections
- Peak hours vary but generally:
  - AM Peak is 7:00AM – 8:00AM
  - PM Peak is 4:00PM – 5:00PM

# Network Operations: Level of Service (LOS)

- Based on density or delay, rating of A - F is assigned, calculated using various measures:
  - Traffic volumes
  - Geometrics
  - Number of lanes and lane changes
  - Length of acceleration/deceleration lanes
  - Travel speeds
- Collected for 2040 No-Build and Build scenarios for:
  - Existing interchanges and their intersections
  - New interchanges and their intersections
  - Local signalized and unsignalized intersections

# I-90 Interchange Study

## Network Operations: Level of Service (LOS)

Interchange LOS Criteria

| Level of Service (LOS) | Density (vehicles/mile/lane) |
|---|---|
| LOS A | ≤10 |
| LOS B | >10 – 20 |
| LOS C | >20 – 28 |
| LOS D | >28 – 35 |
| LOS E | >35 |
| LOS F | Demand Exceeds Capacity |

LOS Criteria for Intersections

| Level of Service (LOS) | Signalized Intersections Delay Per Vehicle (seconds) | Unsignalized Intersections Delay Per Vehicle (seconds) |
|---|---|---|
| LOS A | < 10.0 | < 10.0 |
| LOS B | 10.1 to 20.0 | 10.1 to 15.0 |
| LOS C | 20.1 to 35.0 | 15.1 to 25.0 |
| LOS D | 35.1 to 55.0 | 25.1 to 35.0 |
| LOS E | 55.1 to 80.0 | 35.1 to 50.0 |
| LOS F | > 80.0 | > 50.0 |

I-90 Interchange Study

# Network Operations: Level of Service (LOS)

## No-Build and Build Interchange Movement LOS, Peak Hours (see handout)

| | | | No-Build | | | | Alternative 1 | | | | Alternative 2 | | | | Alternative 3 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AM peak hour | | PM peak hour | | AM peak hour | | PM peak hour | | AM peak hour | | PM peak hour | | AM peak hour | | PM peak hour | |
| **Location** | **Type** | **Segment** | **LOS** | **Density** | **LOS** | **Density** | **LOS** | **Density** | **LOS** | **Density** | **LOS** | **Density** | **LOS** | **Density** | **LOS** | **Density** | **LOS** | **Density** |
| I-90 / Exit 2 | Diverge | I-90 EB | B | 13.3 | B | 12 | B | 13.6 | B | 12.7 | B | 13.6 | B | 12.2 | B | 13.6 | B | 12.2 |
| I-90 / Exit 2 | Merge | I-90 EB | C | 20.5 | B | 19.3 | B | 16.9 | B | 16.1 | B | 16.9 | B | 16 | B | 16.8 | B | 15.9 |
| I-90 / Exit 2 | Diverge | I-90 WB | B | 16.7 | B | 15.1 | B | 17.2 | B | 15.3 | B | 17.2 | B | 15.2 | B | 17.2 | B | 15.1 |
| I-90 / Exit 2 | Merge | I-90 WB | B | 15.3 | B | 15.9 | B | 14.7 | B | 14.1 | B | 14.7 | B | 17.1 | B | 14.7 | B | 14 |
| I-90 / Exit 3 | Diverge | I-90 EB | B | 15.5 | B | 14 | B | 16.2 | B | 14.1 | B | 16.6 | B | 14 | B | 17.2 | B | 13.9 |
| I-90 / Exit 3 | Merge | I-90 EB | D | 28.4 | C | 23.4 | C | 20.6 | B | 19.2 | C | 20.9 | B | 19 | C | 21.4 | B | 18.9 |
| I-90 / Exit 3 | Diverge | I-90 WB | C | 20.5 | C | 20.7 | C | 22.1 | C | 20.7 | C | 21.8 | C | 21 | C | 21.8 | C | 20.8 |
| I-90 / Exit 3 | Merge | I-90 WB | B | 17.4 | B | 15.9 | B | 16.2 | B | 15.1 | B | 15.9 | B | 15.4 | B | 15.7 | B | 14.9 |
| I-90/Algerie Road | Diverge | I-90 EB | | | | | B | 16.1 | B | 15.2 | | | | | | | | |
| I-90/Algerie Road | Merge | I-90 EB | | | | | B | 17.6 | B | 15.8 | | | | | | | | |
| I-90/Algerie Road | Diverge | I-90 WB | | | | | B | 16.5 | B | 15.3 | | | | | | | | |
| I-90/Algerie Road | Merge | I-90 WB | | | | | B | 17.7 | B | 16 | | | | | | | | |
| I-90/Blandford Maintenance Facility | Diverge | I-90 EB | | | | | | | | | B | 16 | B | 15.1 | | | | |
| I-90/Blandford Maintenance Facility | Merge | I-90 EB | | | | | | | | | B | 18 | B | 15.7 | | | | |
| I-90/Blandford Maintenance Facility | Diverge | I-90 WB | | | | | | | | | B | 16.2 | B | 15.5 | | | | |
| I-90/Blandford Maintenance Facility | Merge | I-90 WB | | | | | | | | | B | 17.6 | B | 15.9 | | | | |
| I-90/Blandford Service Plaza | Diverge | I-90 EB | | | | | | | | | | | | | B | 16 | B | 15 |
| I-90/Blandford Service Plaza Ramp | Merge | I-90 EB | | | | | | | | | | | | | B | 16.3 | B | 14.5 |
| I-90/Blandford Interchange Entrance Ramp | Merge | I-90 EB | | | | | | | | | | | | | B | 18.3 | B | 15.4 |
| I-90/Blandford Service Plaza | Diverge | I-90 WB | | | | | | | | | | | | | B | 15.9 | B | 15.1 |
| I-90/Blandford Service Plaza Ramp | Merge | I-90 WB | | | | | | | | | | | | | B | 16.4 | B | 15.1 |
| I-90/Blandford Interchange Entrance Ramp | Merge | I-90 WB | | | | | | | | | | | | | B | 18.1 | B | 16 |

# I-90 Interchange Study

## Network Operations: Level of Service (LOS)

Future Year (2040) New Unsignalized Intersections at New Interchanges LOS, Peak Hours (see handout)

| Intersection | AM Peak LOS | PM Peak LOS |
|---|---|---|
| **Alternative 1** | | |
| **Algerie Road at I-90 EB Ramps** | **A** | **A** |
| Left turns from Algerie Road SB | A | A |
| All turns from I-90 EB Off-ramp | B | B |
| **Algerie Road at I-90 WB Ramps** | **A** | **A** |
| Left turns from Algerie Road NB | A | A |
| All turns from I-90 WB Off-ramp | B | B |
| **Alternative 2** | | |
| **Old Chester Road at I-90 EB Ramps** | **A** | **A** |
| Left turns from Old Chester Road SB | A | A |
| All turns from I-90 EB Off-ramp | B | B |
| **Chester Road at I-90 WB Ramps** | **A** | **A** |
| Left turns from Chester Road WB | A | A |
| All turns from I-90 WB Off-ramp | B | B |
| **Alternative 3** | | |
| **North Street at I-90 EB Ramps** | A | A |
| Left turns from North Street EB | A | A |
| All turns from I-90 EB Off-ramp | B | B |
| **North Street at I-90 WB Ramps** | **A** | **A** |
| Left turns from North Street SB | A | A |
| All turns from I-90 WB Off-ramp | B | B |

# I-90 Interchange Study

## Network Operations: Level of Service (LOS)

Future Year (2040) Existing Interchange Intersections LOS, Peak Hours (see handout) (table 1/2)

| | No-Build | | Alternative 1 | | Alternative 2 | | Alternative 3 | |
|---|---|---|---|---|---|---|---|---|
| **Intersection** | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS |
| **Lee - Route 20 & I-90 Exit 2** | **B** | **B** | **B** | **B** | **B** | **B** | **B** | **B** |
| Route 20 EB Thru | A | A | A | A | A | A | A | A |
| I-90 Ramp SB Left | D | D | D | D | D | D | D | D |
| Route 20 WB Thru | A | A | A | A | A | A | A | A |
| **Lee - Route 102/I-90 Exit 2 Entrance & Route 20** | **B** | **C** | **B** | **C** | **B** | **C** | **B** | **C** |
| Route 102 NB Left | D | E | D | E | D | E | D | E |
| Route 102 NB Thru | D | D | D | D | D | D | D | D |
| Route 102 NB Right | A | A | A | A | A | A | A | A |
| Route 20 EB Left | D | E | D | D | D | D | D | D |
| Route 20 EB Thru | B | B | B | B | B | B | B | B |
| Route 20 EB Right | A | B | A | B | A | B | A | B |
| Route 20 WB Left | D | D | D | D | D | D | D | D |
| Route 20 WB Thru | A | A | A | A | A | A | A | A |

# I-90 Interchange Study

## Network Operations: Level of Service (LOS)

Future Year (2040) Existing Interchange Intersections LOS, Peak Hours (see handout) (table 2/2)

| | No-Build | | Alternative 1 | | Alternative 2 | | Alternative 3 | |
|---|---|---|---|---|---|---|---|---|
| **Intersection** | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS |
| **Westfield - Southampton Rd. (Route 10/202) & Friendly's Way/I-90 Exit 3** | **C** | **D** | **C** | **D** | **C** | **D** | **C** | **D** |
| Southampton Rd NB Thru | D | D | D | D | D | D | D | D |
| I-90 Ramp EB Left | D | A | D | A | D | A | D | A |
| I-90 Ramp EB Thru | B | D | B | D | B | D | B | D |
| I-90 Ramp EB Right | B | B | B | B | B | B | B | B |
| Northampton Rd SB Thru | D | D | D | D | C | D | D | D |
| Northampton Rd SB Right | A | C | A | C | A | C | A | C |
| Friendly's Way WB Left | D | F | D | E | D | E | D | D |
| Friendly's Way WB Thru | C | D | C | D | C | D | C | D |

# I-90 Interchange Study

## Network Operations: Level of Service (LOS)

Future Year (2040) Signalized Intersections LOS, Peak Hours (see handout) (table 1/3)

| | No-Build | | Alternative 1 | | Alternative 2 | | Alternative 3 | |
|---|---|---|---|---|---|---|---|---|
| **Intersection** | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS |
| **Pleasant Street (Route 102) at Tyringham Road and Big Y Plaza** | **B** | **C** | **B** | **C** | **B** | **C** | **B** | **C** |
| Big Y Driveway EB Left | C | C | C | C | C | C | C | C |
| Big Y Driveway EB Thru/Right | B | B | B | B | B | B | B | B |
| Tyringham Road WB Left | C | C | C | C | C | C | C | C |
| Tyringham Road WB Thru/Right | B | C | B | C | B | C | B | C |
| Route 102 NB Left | A | B | A | B | A | B | A | B |
| Route 102 NB Thru/Right | B | C | B | C | B | C | B | C |
| Route 102 SB Left | A | B | A | B | A | B | A | A |
| Route 102 SB Thru/Right | B | B | B | B | B | B | B | B |
| **Route 20 at Premium Outlet Boulevard** | **A** | **A** | **A** | **A** | **A** | **A** | **A** | **A** |
| Route 20 EB Thru/Right | A | A | A | A | A | A | A | A |
| Route 20 WB Left | A | A | A | A | A | A | A | A |
| Route 20 WB Thru | A | A | A | A | A | A | A | A |
| Premium Outlets NB Left/Right | B | B | B | B | B | B | B | B |

# I-90 Interchange Study

## Network Operations: Level of Service (LOS)

Future Year (2040) Signalized Intersections LOS, Peak Hours (see handout) (table 2/3)

| | No-Build | | Alternative 1 | | Alternative 2 | | Alternative 3 | |
|---|---|---|---|---|---|---|---|---|
| **Intersection** | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS |
| **North Elm Street (Route 202/Route 10) at Arch Road and Westfield Industrial Park Road** | **B** | **C** | **B** | **C** | **B** | **C** | **B** | **C** |
| Arch Road EB Left/Thru | E | E | E | E | E | E | E | E |
| Arch Road EB Right | A | A | A | A | A | A | A | A |
| Rtes. 10/202 NB Left | E | E | E | E | E | E | E | E |
| Rtes. 10/202 NB Thru/Right | A | A | A | A | A | A | A | A |
| Rtes. 10/202 SB Thru/Right | B | C | B | C | B | C | B | C |
| **North Elm Street (Route 202/Route 10) at Notre Dame Street** | **D** | **E** | **D** | **E** | **D** | **D** | **D** | **D** |
| Notre Dame St. EB Left/Thru | D | D | D | D | D | D | D | D |
| Notre Dame St. EB Right | B | A | B | A | B | A | B | A |
| Notre Dame St. WB Let/Thru/Right | C | D | C | D | C | D | C | D |

# Network Operations: Level of Service (LOS)

Future Year (2040) Signalized Intersections LOS, Peak Hours (see handout) (table 3/3)

| | No-Build | | Alternative 1 | | Alternative 2 | | Alternative 3 | |
|---|---|---|---|---|---|---|---|---|
| **Intersection** | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS |
| Rtes. 10/202 NB Left | C | C | C | C | C | C | C | C |
| Rtes. 10/202 NB Thru/Right | D | D | D | D | D | D | D | D |
| Rtes. 10/202 SB Left | C | C | C | C | C | C | C | C |
| Rtes. 10/202 SB Thru/Right | D | F | D | E | D | E | D | E |
| **Elm Street at Franklin Street and Mobil Gas Station Driveway** | **D** | **F** | **D** | **F** | **D** | **F** | **D** | **F** |
| Franklin Street EB Left/Thru | F | D | F | D | E | D | E | D |
| Franklin Street EB Right | A | A | A | A | A | A | A | A |
| Elm Street NB Left | C | F | C | F | C | F | C | F |
| Elm Street NB Thru/Right | C | D | C | D | D | D | D | D |
| Elm Street SB Thru | F | F | F | F | F | F | F | F |
| Elm Street SB Right | A | A | A | A | A | A | A | A |

I-90 Interchange Study

# Network Operations: Level of Service (LOS)

Future Year (2040) Unsignalized Intersections LOS, Peak Hours (see handout) (table 1/3)

| | No-Build | | Alternative 1 | | Alternative 2 | | Alternative 3 | |
|---|---|---|---|---|---|---|---|---|
| **Intersection** | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS |
| **Lee** | | | | | | | | |
| **West Park Street at Park Street/Main Street** | **E** | **F** | **E** | **F** | **E** | **F** | **E** | **F** |
| West Park Street EB Left | F | F | F | F | F | F | F | F |
| West Park Street EB Thru | F | F | F | F | F | F | F | F |
| Park Street WB Thru | F | F | F | F | F | F | F | F |
| Main Street SB Left/Thru/Right | A | A | A | A | A | A | A | A |
| **Becket** | | | | | | | | |
| **Route 20 at Bonny Rigg Hill Road (Route 8)** | **A** | **A** | **A** | **A** | **A** | **A** | **A** | **A** |
| Route 20 EB Left/Thru/Right | A | A | A | A | A | A | A | A |
| Route 20 WB Left/Thru | A | A | A | A | A | A | A | A |
| Route 20 WB Right | A | A | A | A | A | A | A | A |
| Bonny Rigg Hill Road NB Left/Thru/Right | B | B | B | B | A | A | A | A |
| Main Street SB Left/Thru | B | B | B | B | B | A | B | B |
| Main Street SB Right | A | A | A | A | A | A | A | A |

I-90 Interchange Study

# Network Operations: Level of Service (LOS)

Future Year (2040) Unsignalized Intersections LOS, Peak Hours (see handout) (table 2/3)

| | No-Build | | Alternative 1 | | Alternative 2 | | Alternative 3 | |
|---|---|---|---|---|---|---|---|---|
| **Intersection** | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS |
| **Blandford** | | | | | | | | |
| **Otis Stage Road/Main Street (Route 23) at North Street** | **A** | **A** | **A** | **A** | **A** | **A** | **A** | **A** |
| Route 23 EB Left/Thru | A | A | A | A | A | A | A | A |
| Route 23 WB Thru/Right | A | A | A | A | A | A | A | A |
| North Street SB Left/Right | B | B | B | B | B | B | B | C |
| **Main Street (Route 23)/ Russell Stage Road** | **A** | **A** | **A** | **A** | **A** | **A** | **A** | **A** |
| Route 23 EB Left/Thru | A | A | A | A | A | A | A | A |
| Route 23 WB Thru/Right | A | A | A | A | A | A | A | A |
| Russell Stage Road SB Left/Right | A | A | A | A | A | A | B | B |

# I-90 Interchange Study

## Network Operations: Level of Service (LOS)

Future Year (2040) Unsignalized Intersections LOS, Peak Hours (see handout) (table 3/3)

| | No-Build | | Alternative 1 | | Alternative 2 | | Alternative 3 | |
|---|---|---|---|---|---|---|---|---|
| **Intersection** | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS | AM Peak LOS | PM Peak LOS |
| **Russell** | | | | | | | | |
| **Westfield Road (Route 20)/ Blandford Road (Route 23)** | **A** | **A** | **A** | **A** | **A** | **A** | **A** | **A** |
| Route 23 EB Left | B | C | B | C | C | C | C | C |
| Route 23 EB Right | B | B | B | B | B | B | B | B |
| Route 20 NB Left | A | A | A | A | A | A | A | A |
| Route 20 NB Through | A | A | A | A | A | A | A | A |
| Route 20 SB Thru | A | A | A | A | A | A | A | A |
| Route 20 SB Right | A | A | A | A | A | A | A | A |
| **Westfield** | | | | | | | | |
| **Southampton Road (Route 202/Route 10) /Servistar Industrial Way** | **A** | **A** | **A** | **A** | **A** | **A** | **A** | **A** |
| Servistar Ind. Way EB Left/Right | D | F | D | F | D | F | D | F |
| Route 202/10 NB Left/Thru | A | A | A | A | A | A | A | A |
| Route 202/10 SB Thru/Right | A | A | A | A | A | A | A | A |

# Network Operations: Level of Service (LOS)

- Level of Service (LOS) Summary
  - Network would operate at generally acceptable LOS
  - Most intersections and turning movements see no LOS change between 2040 Build and No-Build Conditions
  - Several merge/diverge/turning movements see improvement in LOS
  - Several turning movements see deterioration in LOS
  - One intersection sees an improvement
    - North Elm Street (Route 202/Route 10) at Notre Dame Street in Westfield

## Safety Considerations

- MassDOT has design standards for all projects, which seek to ensure that improvements are optimized for safety
  - All three interchange concepts follow those standards and require no design exceptions
- Some of the local street systems would likely need modifications to accommodate bike and pedestrian facilities
  - Especially if more vehicular volume is expected

# I-90 Interchange Study

Multimodal Transportation

- It is not anticipated that a new interchange would impact existing transit, though it presents potential opportunity for new transit
  - Transit is currently limited to Lee and Westfield

# Public Health

- Public Health Consideration: Noise
- Number of peak hour trips within proximity of residences is a good indicator of anticipated noise impacts of interchange itself

| Alternative 1<br>Algerie Road, Otis | Alternative 2<br>Blandford Maintenance Facility | Alternative 3<br>Blandford Service Plaza |
|---|---|---|
| • 457 AM peak hour trips<br>• 7 residences within ¼ mile<br>• **Potential to impact the least number of residents**<br>• Truck traffic from local quarries and summer camp activity already use local roads and would contribute to existing ambient noise levels | • 560 AM peak hour trips<br>• 18 residences within ¼ mile<br>• **Potential to impact the most number of residents**<br>• MassDOT maintenance facility functions would continue as they have and would contribute to existing ambient noise levels | • 568 AM peak hour trips<br>• 15 residences within ¼ mile<br>• Second most potential impact to area residences of the three alternatives<br>• MassDOT service plaza facility functions would continue to contribute to existing ambient noise levels |

# I-90 Interchange Study

Public Health

**Public Health Consideration: Environmental Quality**

- Air quality is an indicator of environmental quality

**Reduced emissions and improved network operations can positively impact overall air quality**

- Slight improvement in Level of Service (LOS) of intersections in Lee and Westfield, thereby reducing emissions locally

Potential Emissions Reductions and Fuel Savings in Study Area

| Alternative | Average Weekday VMT Reduction (miles/day) | Average Weekday Fuel Savings (gallons/day) | Average Weekday Greenhouse Gas Reduction (metric tons/day)* | Annual Weekday VMT Reduction (miles/year) | Annual Weekday Fuel Savings (gallons/year) | Annual Weekday Greenhouse Gas Reduction (metric tons/day)* |
|---|---|---|---|---|---|---|
| Alternative 1: Algerie Road, Otis | 14,914 | 678 | 6.0 | 4.0 million | 183,000 | 1,627 |
| Alternative 2: Blandford Maintenance Center, Blandford | 12,874 | 585 | 5.2 | 3.5 million | 158,000 | 1,404 |
| Alternative 3: Blandford Service Plaza, Blandford | **17,326** | **788** | **7.0** | **4.7 million** | **212,000** | **1,890** |

*$CO_2$ equivalent

Using EPA average of 22 miles/gallon
https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator
Using 270 weekdays/year

- Measured by Vehicle Miles Traveled (VMT) and Vehicle Hours Traveled (VHT) savings

Travel Time Savings by Interchange Alternative

| | Alternative 1 Algerie Road Interchange | Alternative 2 Blandford Maintenance Facility Interchange | Alternative 3 Blandford Service Plaza Interchange |
|---|---|---|---|
| **Total Trips** | 5,771 (trips/day) | 6,412 trips/day | 5,922 trips/day |
| **Decrease in VHT** | 900 hours/day | 1,146 hours/day | 1,295 hours/day |
| **Travel Time Savings** | 9.36 minutes/trip | 10.72 minutes/trip | **13.12 minutes/trip** |

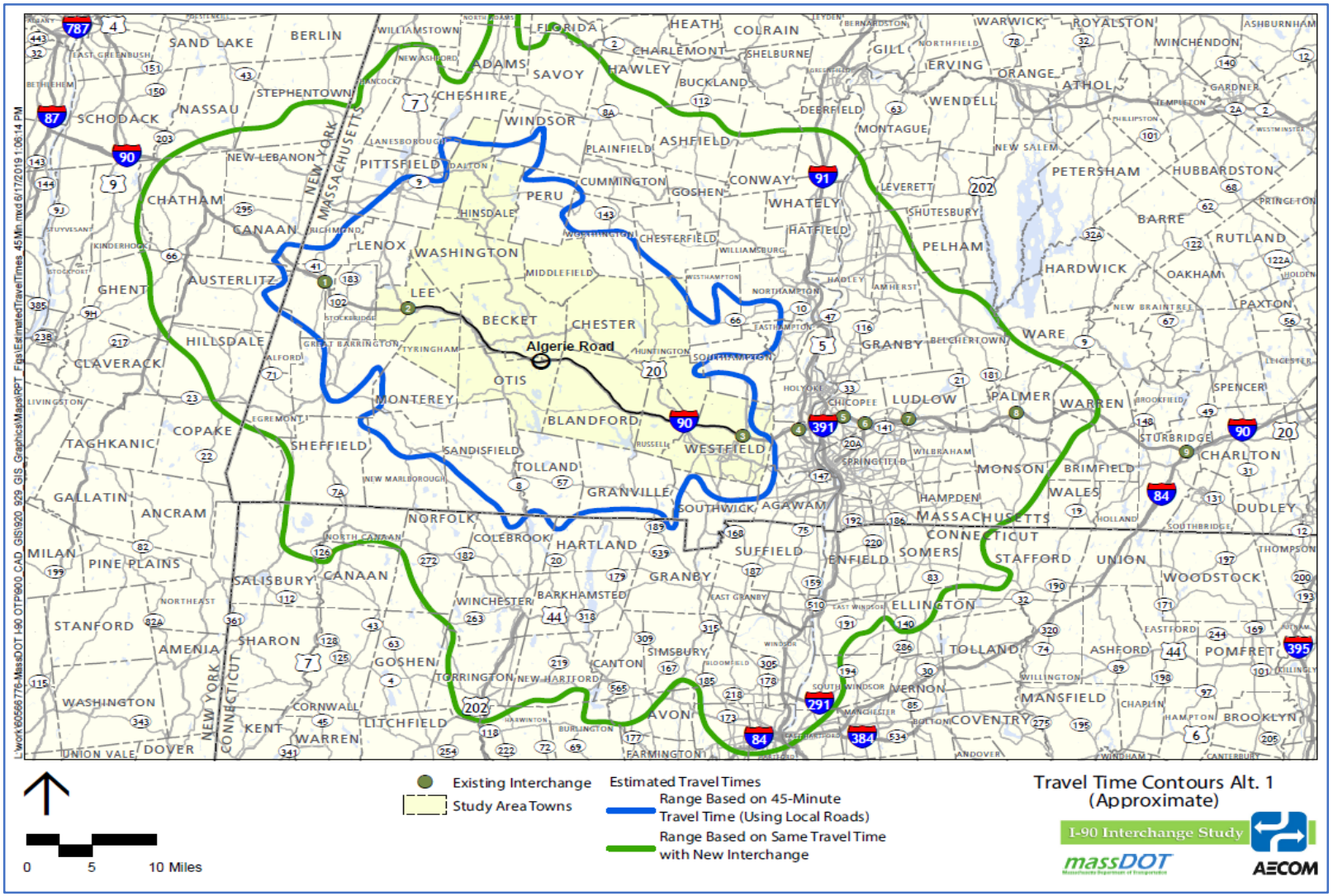
Mileage Savings by Interchange Alternative

| | Alternative 1 Algerie Road Interchange | Alternative 2 Blandford Maintenance Facility Interchange | Alternative 3 Blandford Service Plaza Interchange |
|---|---|---|---|
| **Total Trips** | 5,771 trips/day | 6,412 trips/day | 5,922 trips/day |
| **Decrease in VMT** | 14,914 miles/day | 12,874 miles/day | 17,326 miles/day |
| **Mileage Savings** | 2.58 miles/trip | 2.01 miles/trip | **2.93 miles/trip** |

# I-90 Interchange Study

Connectivity and Mobility

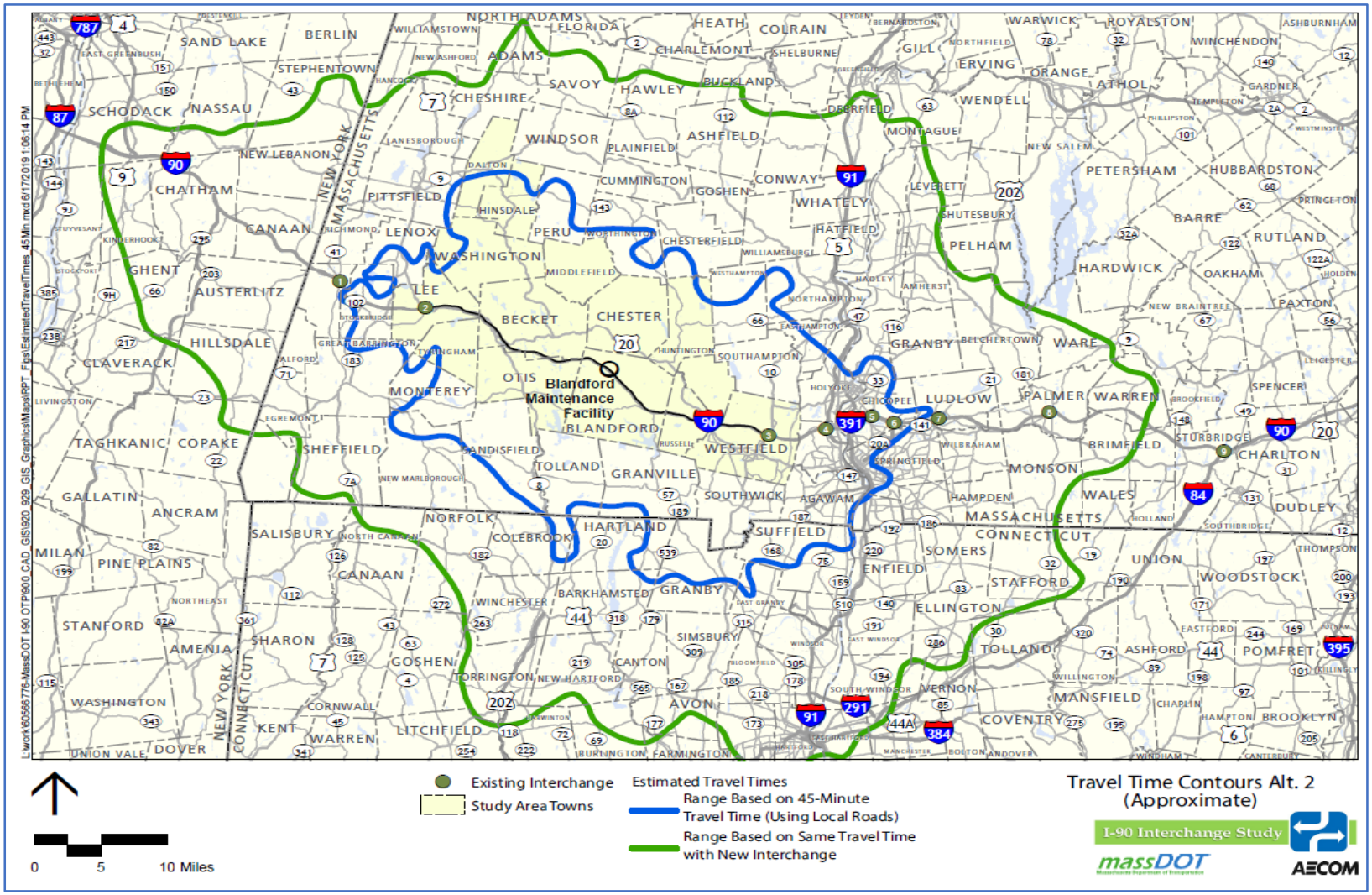
## Alternative 1: Potential Change in Connectivity



# I-90 Interchange Study

Connectivity and Mobility

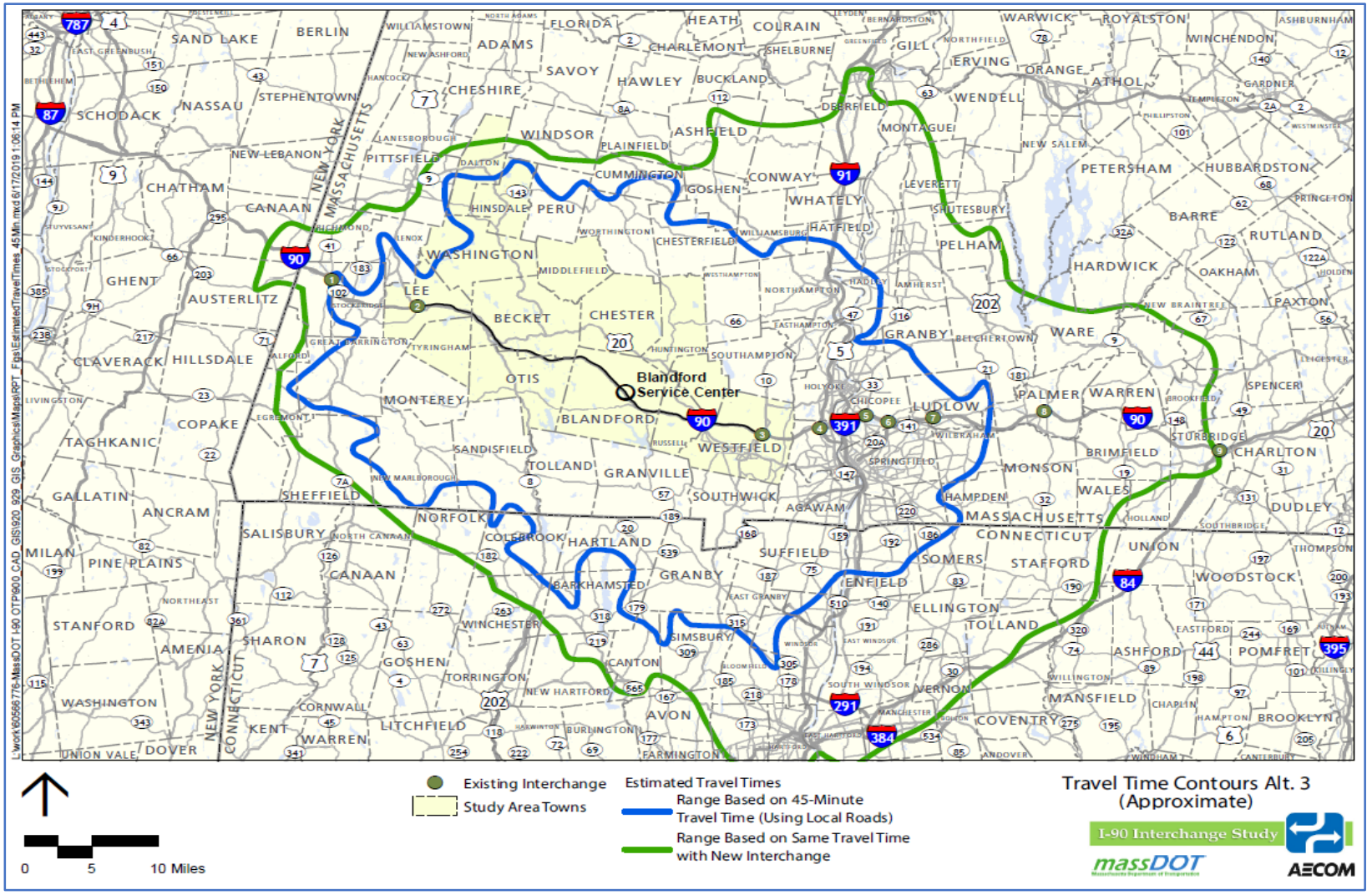
## Alternative 2: Potential Change in Connectivity



# I-90 Interchange Study

Connectivity and Mobility

## Alternative 3: Potential Change in Connectivity



- Alternative 2 provides the largest change overall with furthest reach into New York State and Central Massachusetts

Access to Opportunities Based on Estimated Travel Time Savings (45-minute drive time)

| | Population | Households | Household Income | Employment | Businesses | Business Sales |
|---|---|---|---|---|---|---|
| **Alt. 1 Algerie Road** | | | | | | |
| Existing | 140,000 | 58,000 | $ 5,118,984,000 | 89,000 | 9,000 | $ 15,743,461,000 |
| Build | 410,000 | 169,000 | $ 13,871,639,000 | 257,000 | 25,000 | $ 49,299,649,000 |
| *Difference* | *270,000* | *111,000* | *$ 8,752,654,000* | *168,000* | *16,000* | *$ 33,556,188,000* |
| *% Difference* | *193%* | *191%* | *171%* | *189%* | *178%* | *213%* |
| **Alt. 2 Blandford Maintenance** | | | | | | |
| Existing | 185,000 | 76,000 | $ 6,688,065,000 | 111,000 | 11,000 | $ 21,859,321,000 |
| Build | 546,000 | 220,000 | $ 17,425,597,000 | 341,000 | 33,000 | $ 59,429,151,000 |
| *Difference* | *361,000* | *144,000* | *$ 10,737,532,000* | *230,000* | *22,000* | *$ 37,569,830,000* |
| *% Difference* | *195%* | *189%* | *161%* | *207%* | *200%* | *172%* |
| **Alt. 3 Blandford Service Center** | | | | | | |
| Existing | 453,000 | 183,000 | $ 14,256,507,000 | 274,000 | 26,000 | $ 47,759,369,000 |
| Build | 628,000 | 251,000 | $ 20,488,053,000 | 392,000 | 38,000 | $ 69,470,834,000 |
| *Difference* | *175,000* | *68,000* | *$ 6,231,546,000* | *117,000* | *11,000* | *$ 21,711,465,000* |
| *% Difference* | *39%* | *37%* | *44%* | *43%* | *42%* | *45%* |

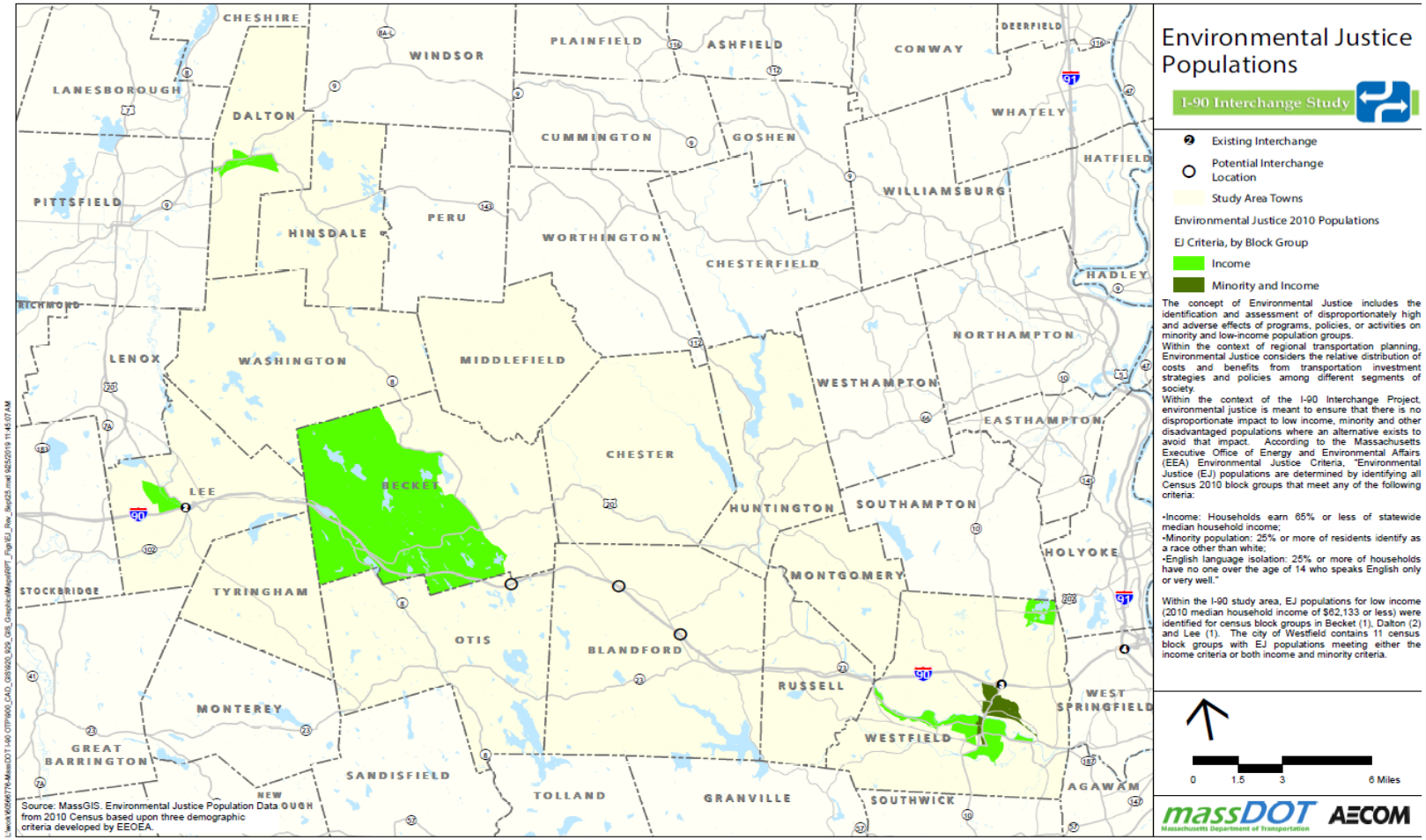
# Economic Considerations

- Travel time savings and economic considerations
  - Enhanced prospects of study area residents finding jobs within a reasonable commuting time
  - People can reach more businesses; businesses can reach more customers
  - For goods movements, businesses can reduce costs of shipping
  - Reduced commute times impact the amount of time spent in more pleasurable and/or more productive activities

# I-90 Interchange Study

## Community Impacts

- Alternative 1 overlaps with an Environmental Justice (EJ) population



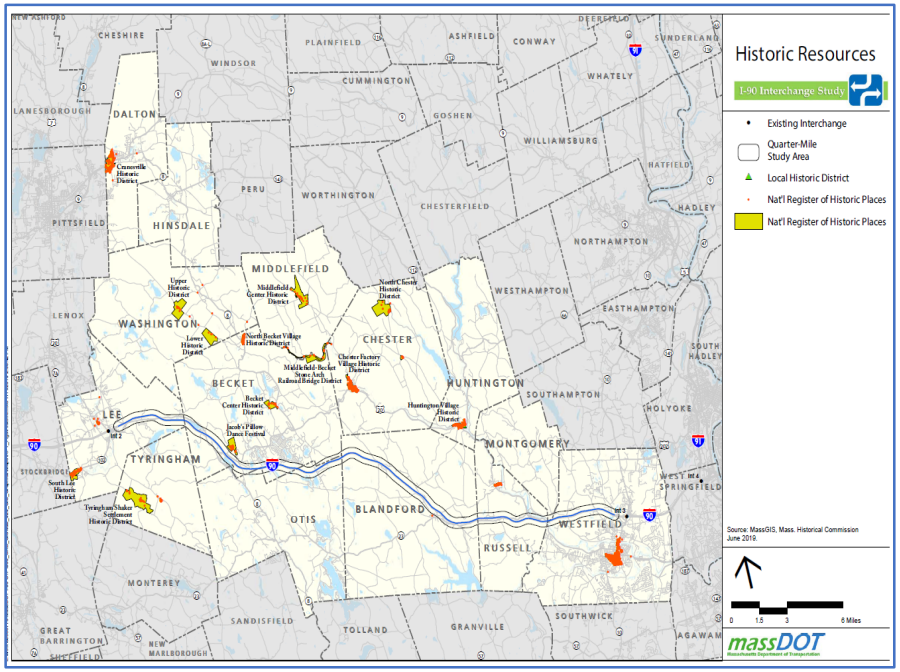
# Community Impacts

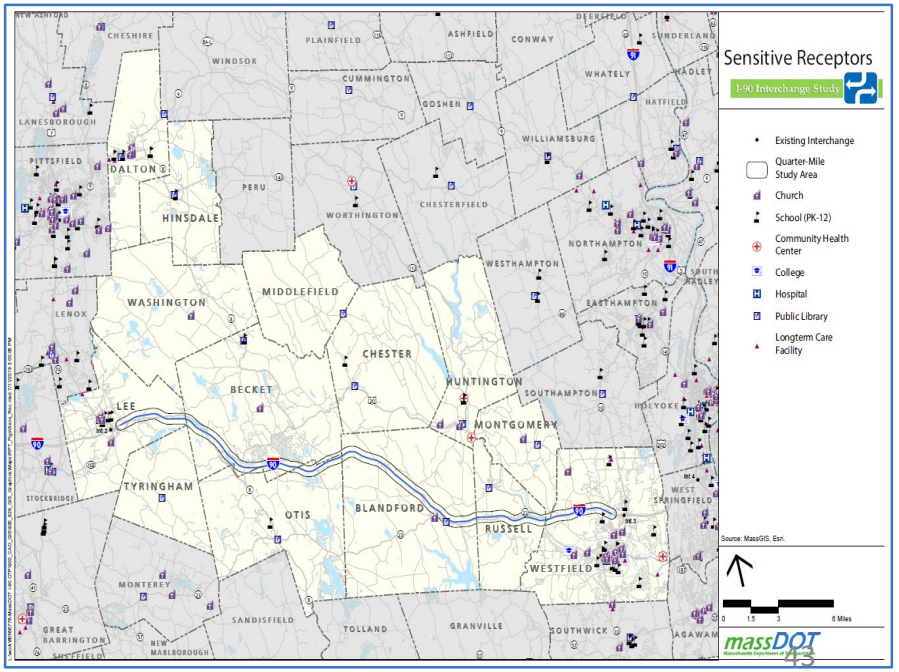
- EJ census block groups meet any of the following criteria:
  - Income: Households earn 65% or less of state median household income
  - Minority population: 25% or more of residents identify as a race other than white
  - English language isolation: 25% or more of households have no one over the age of 14 who speaks English only or very well
- It is necessary to consider the relative distribution of costs and benefits from interchange alternatives as they relate to EJ groups
- EJ consideration ensures there is no disproportionate impact to a disadvantaged population, especially when there are other alternatives
  - The Blandford alternatives do not have an impact on EJ population

# I-90 Interchange Study

## Community Impacts

- Each alternative is near various historical resources, sensitive receptors, or recreational resources
  - Alternative 1 is close to several in particular:
    - Girl Scout Camp, Indian Lake, Jacob's Pillow
- No specified impacts at conceptual level, but proximity must be considered

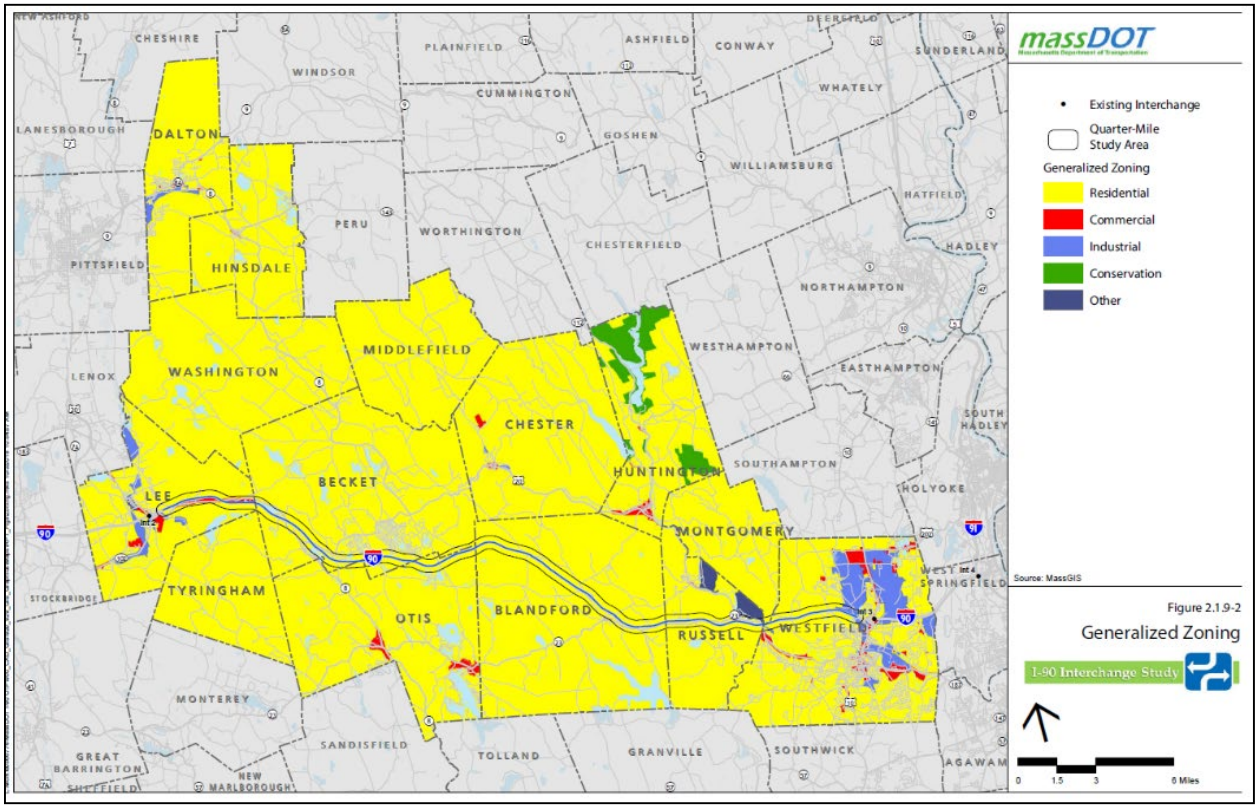


# I-90 Interchange Study

Land Use

- Zoning regulation currently only allows residential development around interchange alternatives
  - Regulation changes or zoning exceptions would be needed for other land uses



# I-90 Interchange Study

## Other Considerations

**Parcel Impacts**

| Alternative | Parcels Impacted | Parcels with Residences | Square Footage Impacted* | Distance from Interchange to Residence (feet) |
|---|---|---|---|---|
| Alternative 1: Algerie Road, Otis | 4 (2 MA owned) | 0 | 17,093 | N/A |
| Alternative 2: Blandford Maintenance Center, Blandford | 4 | 2 | 91,686 | 465, 340 |
| Alternative 3: Blandford Service Plaza, Blandford | 2 | 1 | 20,316 | 242 |

*Reflects square footage of portion of parcel impacted by interchange footprint

**Comparison of Volume Magnitude at nearby Interchanges**

| Interchange | Location/Route | 2018 Average Daily Interchange Volumes (vehicles/day) |
|---|---|---|
| Exit 1 | West Stockbridge/Routes 41 and 102 (partial interchange) | 765 |
| Exit 2 | Lee/Route 20 | 13,116 |
| Interchange Alternative | Alternative 1/2/3 | 5,771/6,412/5,922 |
| Exit 3 | Westfield/Routes 10-202 | 20,507 |
| Exit 4 | West Springfield/I-91, I-391, Route 5 | 29,507 |

*Average Daily Interchange Volumes for Interchange Alternatives are 2040 estimates

# I-90 Interchange Study

## Alternatives Analysis Summary Matrix

| | Alternative 1<br>Algerie Road, Otis | Alternative 2<br>Blandford Maintenance Facility | Alternative 3<br>Blandford Service Plaza |
|---|---|---|---|
| Proximity to Adjacent Interchanges | Exit 2: 11.8 Miles<br>Exit 3: 17.9 Miles | Exit 2: 15.7 Miles<br>Exit 3: 14 Miles | Exit 2: 18.4 Miles<br>Exit 3: 11.3 Miles |
| Local Road Connections | Minor Collector | Local | Major Collector |
| Jurisdiction | Town | Town | State |
| National Highway System | No | No | No |
| Condition | Fair | Fair | Fair |
| Wetland Impact | Less than 500 SF | None | Less than 500 SF |
| Water Resource Impact | None | 180,000 SF | 106,600 SF |
| Open Space/Article 97 Impact | 31,000 SF | Less than 300 SF | None |
| ROW Impact* | 17,000 SF | 92,000 SF | 21,000 SF |
| Environmental Justice Population Impact | Yes | No | No |
| Potential Property Taking | 4 parcels (2 MA owned) | 4 parcels | 2 parcels |
| Parcels with Residences | 0 | 2 | 1 |
| Residences within ¼ Mile | 7 | 18 | 15 |
| Daily $CO^2$ Emissions Reduction | 6.2 metric tons | 5.2 metric tons | 7.0 metric tons |
| Average Travel Time Savings/Trip | 9.36 minutes | 10.72 minutes | 13.12 minutes |
| Average Mileage Savings/Trip | 2.58 miles | 2.01 miles | 2.93 miles |
| Projected Daily Use | 5,771 trips | 6,412 trips | 5,922 trips |
| Estimated Conceptual Cost | $37.8 million | $29.5 million | $34 million |

*Reflects square footage of entire parcel(s) impacted by interchange footprint

SF = Square Feet

# Draft Study Findings

# Draft Findings: Feasibility

- MassDOT tasked with examining *feasibility*

  *"Lee/Westfield Turnpike Interchange Study*

  SECTION 139. (a) The Massachusetts Department of Transportation shall conduct a **feasibility study relative to the establishment of an interchange on interstate highway route 90 between the existing interchanges located in the city of Westfield and the town of Lee**."

- All presented alternatives are feasible from engineering prospective
  - However, each would require environmental permitting due to identified impacts
  - Would also require substantial support from local stakeholders to move forward

# Draft Findings: Feasibility

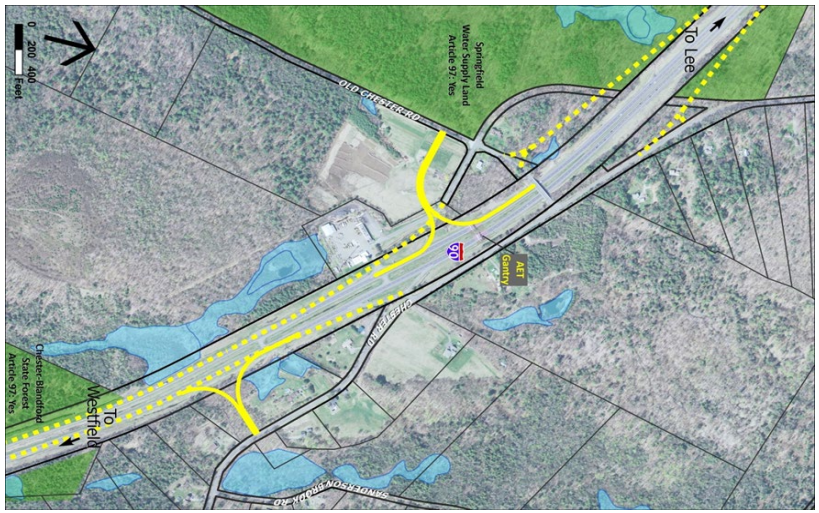
- MassDOT looked beyond feasibility to develop recommendations should a project advance
  - Alternatives have variations in cost, impacts, benefits, and public opposition
  - Allows for decision making between alternatives

# I-90 Interchange Study

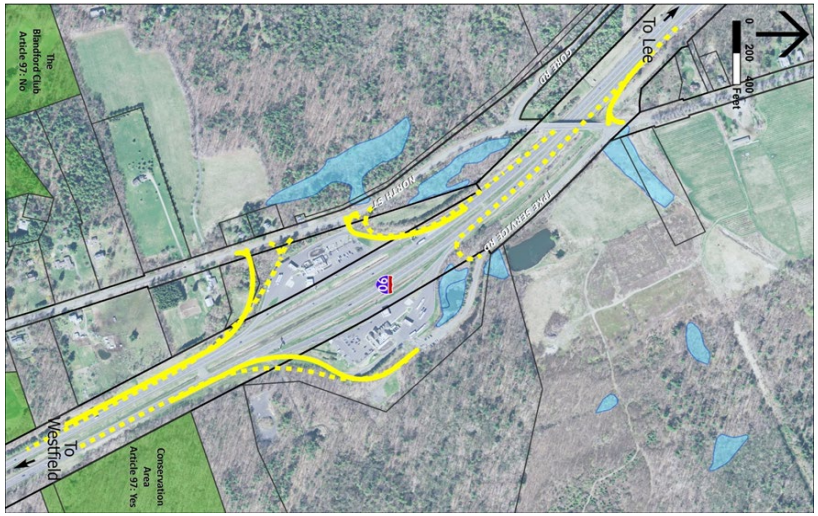
Draft Findings:
Recommendations

- **Of the three alternatives, Alternatives 2 and 3 are more favorable options for further consideration**
  - Least expensive options
  - Generally less impacts and more benefits
  - Public support expressed for these locations

Alternative 2:
Blandford Maintenance Facility, Blandford




Alternative 3: Blandford
Service Center, Blandford



Draft Findings:
Recommendations

- **Dismissal of Alternative 1, Algerie Road in Otis**
  - Most expensive
    - $37.8 million
  - Most complex terrain
    - Steep slopes at on/off ramp locations, local roads
  - Less benefits comparatively
    - Least projected daily use
    - Least travel time savings
    - Least trip diversion from existing interchanges
    - Least improvement on network operations

Draft Findings:
Recommendations

- **Dismissal of Alternative 1 on Algerie Road in Otis**
  - Highest potential negative impact
    - Open Space/Article 97
    - Environmental Justice population
  - Strong public opposition for this location
    - Opposition cites nearby cultural/recreational/historical resources; volume increases on local roads; geometry of Bonny Rigg Hill Road



- Draft findings also include:
  - Potential Funding Pathways
    - Federal Funding
      - Federal Discretionary Programs
      - Metropolitan Planning Organization (MPO) Programming
    - Toll Revenue
      - Western Turnpike Toll Revenue
      - New Interchange Toll Revenue
    - State Funding
      - Commonwealth Bond Cap
  - MassDOT Project Development Process

# Draft Findings: Potential Paths for Funding

- Federal Funding: Federal Discretionary Programs
  - Grants could fund an interchange project
    - INFRA: addresses critical issues facing the nation's highways and bridges. Focus is deteriorating infrastructure, national and regional economic vitality goals, and use of innovative technologies; $856 million awarded nationally in 2019
      - Grant maximum is $500 million
      - Project readiness required - construction within 18 months of award
      - INFRA share is 60%
    - BUILD: provides road, rail, transit and port infrastructure investments that will better connect rural and urban communities, with a large regional impact. Selection criteria includes safety, economic competitiveness, quality of life aspects, and innovation; $900 million awarded nationally in 2019
      - Grant maximum is $25 million
  - **Challenge**: project would need to align with grant mission; would need to compete against other projects; project must be ready; non-federal share funds needed for INFRA

# I-90 Interchange Study

Draft Findings: Potential Paths for Funding

- Federal Funding: MPO Programming
  - Each year, funds are allocated to MPOs based on a set formula from MARPA
  - MPOs use Transportation Improvement Programs (TIPs) to allocate funds towards various projects and programs
    - Study area includes both the Berkshire Regional MPO and the Pioneer Valley MPO
  - Project must be included in Regional Transportation Plan (RTP) before being programmed for funding
    - Berkshire Regional MPO listed a new interchange in study area as a project recommended for funding in its 2019 RTP Update
    - Pioneer Valley MPO listed a new interchange in study area as a visionary project in its 2019 RTP Update

# Draft Findings: Potential Paths for Funding

- Federal Funding: MPO Programming (continued)
  - MPOs score and prioritize projects as input into what is included and funded in TIPs
  - **Challenge**: project would need to compete with others; would comprise a significant percentage of available funds; would likely displace other projects
    - 2020-2024 Berkshire Regional TIP includes 7 highway projects with $44 million of funding
    - 2020-2024 Pioneer Valley TIP includes 18 highway projects with $133 million of funding

# Draft Findings: Potential Paths for Funding

- Challenge associated any federal funding
  - Using federal funds would require bringing the entire Western Turnpike up to federal standards
    - Shoulder width, medians, geometry
    - Financial obligation and a potential engineering challenge
  - Only elements *not* on the Turnpike could be funded without triggering the need for significant upgrades
    - Secondary highways and local roads
  - This applies to:
    - Federal Discretionary Programs
    - MPO Programming

# Draft Findings: Potential Paths for Funding

- Toll Revenue: Western Turnpike Toll Revenue
  - Includes toll revenue collected from Route 128 to NYS border
  - First priority is operations and maintenance
    - Remaining funds dedicated to existing projects, then new projects
  - There is approximately $90 million available annually for existing and new projects
    - Fully programmed in the current 2020-2024 CIP
  - New projects are presented to the Highway Division's Project Review Committee (PRC), where they are scored and ranked along with other projects
  - **Challenge**: a new interchange would need to be competitive against any other new project, an interchange would require a large portion of funds available

# Draft Findings: Potential Paths for Funding

- Toll Revenue: New Interchange Toll Revenue
  - Analysis conducted on potential for toll revenue from new interchange as leverage for capital costs
    - Assumes 10-year loan payback scenario, 6% interest rate
    - New gantry required to collect tolls
  - Each alternative generates enough for operations and maintenance, but not enough to satisfy loan repayment
  - **Challenge**: toll revenue would not generate enough money to pay for a new interchange

**10-Year Total Revenue & Expense Summary for New Interchange in 2019 Dollars**

| | Alternative 1 | Alternative 2 | Alternative 3 |
|---|---|---|---|
| Toll Revenue | $5,963,000 | $6,327,000 | $5,902,000 |
| Fee and Fine Revenue | $429,000 | $440,000 | $392,000 |
| Toll Collection O & M | $(4,424,000) | $(4,463,000) | $(4,394,000) |
| Interchange O & M | $(99,600) | $(99,600) | $(133,500) |
| Revenue available for Debt Service | $1,868,400 | $2,204,400 | $1,766,500 |
| Total Debt Service after 10 Years | $(53,400,000) | $(42,100,000) | $(48,200,000) |
| Net Revenue after 10 Years | $(51,531,600) | $(39,895,600) | $(46,433,500) |

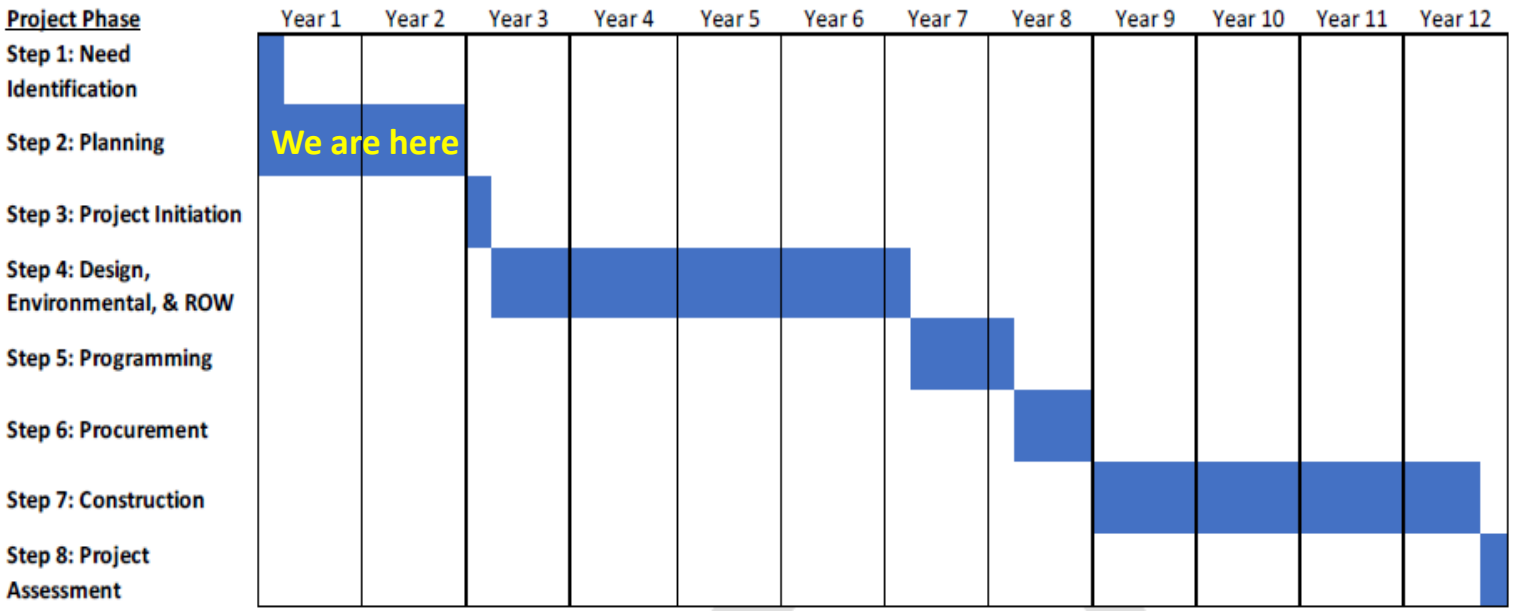


- State Funding: Commonwealth Bond Cap
  - Funds many projects and programs statewide
  - A certain amount of bond proceeds are allocated for transportation
  - Existing projects take first priority, then funds are programmed for new projects as available
  - New projects are reviewed and scored by committee
  - **Challenge**: funding availability, a new interchange would need to compete against many other existing and new projects

# Draft Findings: Current MassDOT Project Development Timeline

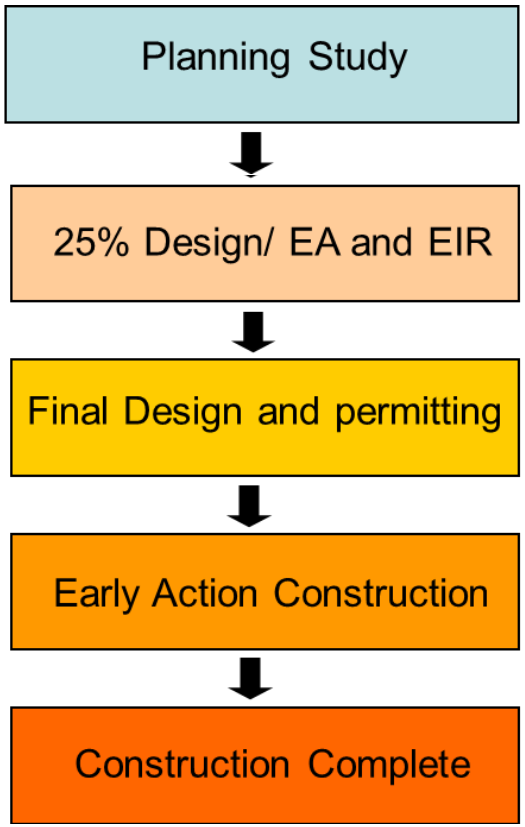
- Typical MassDOT projects of this type and size take many years to complete

**Example of Current MassDOT Project Timeline**



# I-90 Interchange Study

Draft Findings: Next Steps




- We are here
- Support from local stakeholders would be critical to move project forward
- Funding path would need to be identified in order to initiate a project and continue with next steps

## Draft Findings: Conclusion

- MassDOT has determined that a new interchange is feasible, but not without hurdles:
  - Stakeholder support necessary
    - Local public support, municipal support, MPO support
  - All funding sources present challenges
  - Permitting requirements must be met
- If an interchange project advanced:
  - Alternatives 2 and 3 are more favorable
  - Alternative 1 should be dismissed from any future consideration

# Other Business

- Next Steps
  - Meeting materials will be posted online
    - Email notice will be sent when available
  - Public Open House
    - Thursday, October 10th
    - 6:30 – 9:00 pm at the Blandford Town Hall
  - Working Group check-in to discuss public input
  - Complete draft report and release for 30-day public comment period
    - Available on study webpage
    - Email notices will be sent when available
  - Finalize report, publish online and deliver to Legislature

# Other Business

- Comments and/or discussion from the Working Group Members
- Open for Comments and/or Discussion from the Public