



Traffic Congestion in the Boston Region: Beyond the Daily Commute

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An aerial photograph of a multi-lane highway with heavy traffic congestion. The road is filled with cars, trucks, and buses, moving slowly. The image is darkened to serve as a background for the text.

Purpose of study

- To quantify nontraditional congestion patterns using big data
- To locate corridors that are congested during nonpeak period times and events

What is Nontraditional Congestion?

- Sporting Events
- Weekends
- Parades
- Holidays
- Fridays



Case Study and Corridor Selection

Selected events from 2015 based on the following:

- Data availability
- Perceived impact of event

Selected corridors for analysis:

- Network of interest for each event may include specific corridors or the entire transportation network

Performance Monitoring

- **Highway Performance Measures**
INRIX
- **Safety Performance Measures**
MassDOT Crash database
- **Transit Performance Measures**
MBTA Back on Track data
- **Freight Performance Measures**
NPMRDS Freight Dataset



Case Studies

- **New England Patriots Regular Season Games**
- **Saturdays**
- **Fridays**
- **Red Sox Weekday Games**
- **Super Bowl Parade**
- **Wednesday before Thanksgiving**
- **Black Friday**



Case Study: Patriots Game Days

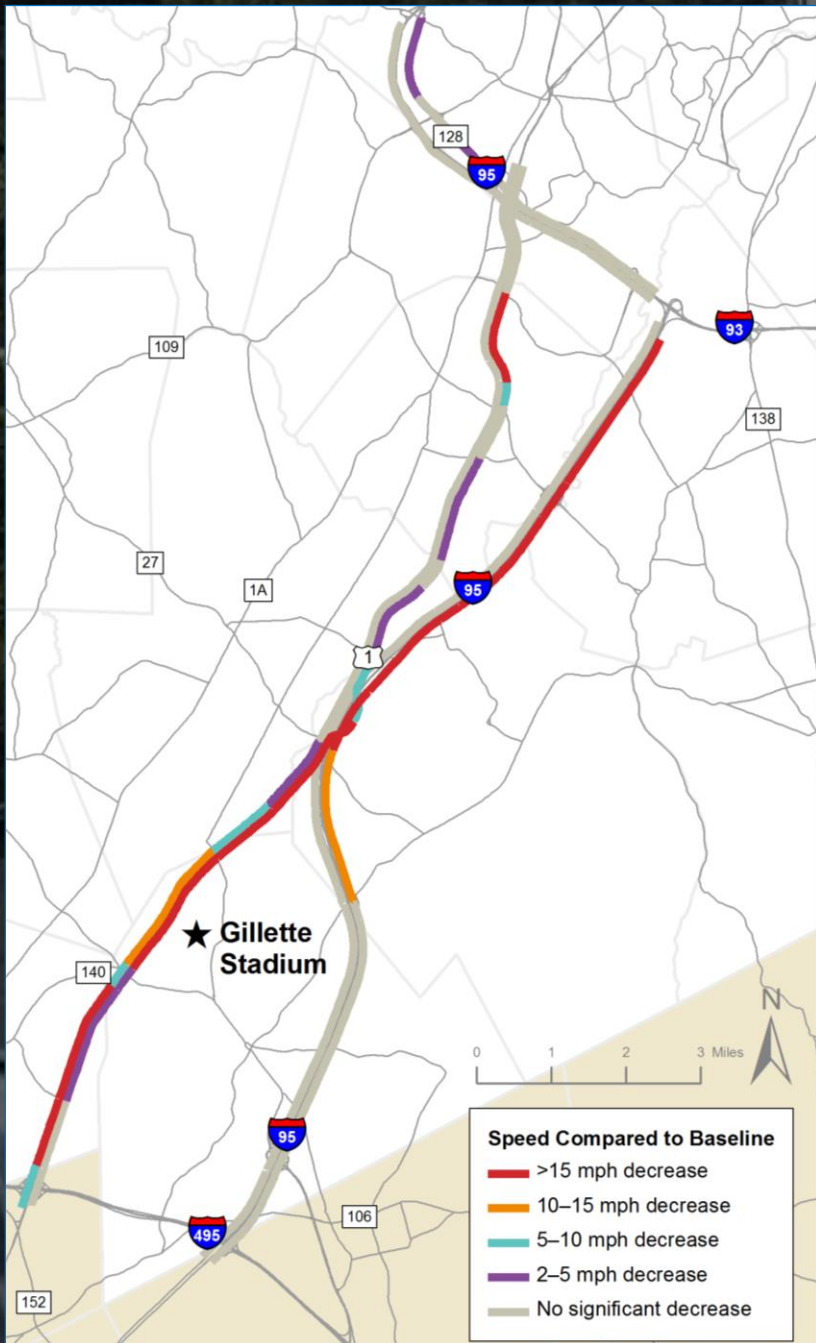
Game times: 1:00 PM games

Dates: Six regular season games between September and December 2015

Times monitored: 9:00 AM to 8:00 PM

Roadways analyzed: I-95 and Route 1

Route 1 Northbound 4:45 PM to 5:45 PM



| Performance Measure | Route 1 Northbound Weekday | Route 1 Northbound Game Day |
|-------------------------------|----------------------------|-----------------------------|
| Distance (miles) | 13.76 | 13.76 |
| Congested minutes per hour | 5:52 | 16:24 |
| Average travel time (minutes) | 22:57 | 34:06 |
| Average speed (MPH) | 35.97 | 24.21 |
| Average delay (minutes) | 6:13 | 17:22 |
| Travel time index | 1.37 | 2.04 |

**Most congested location:
Between North Street and I-95**

Case Study: Saturday Congestion

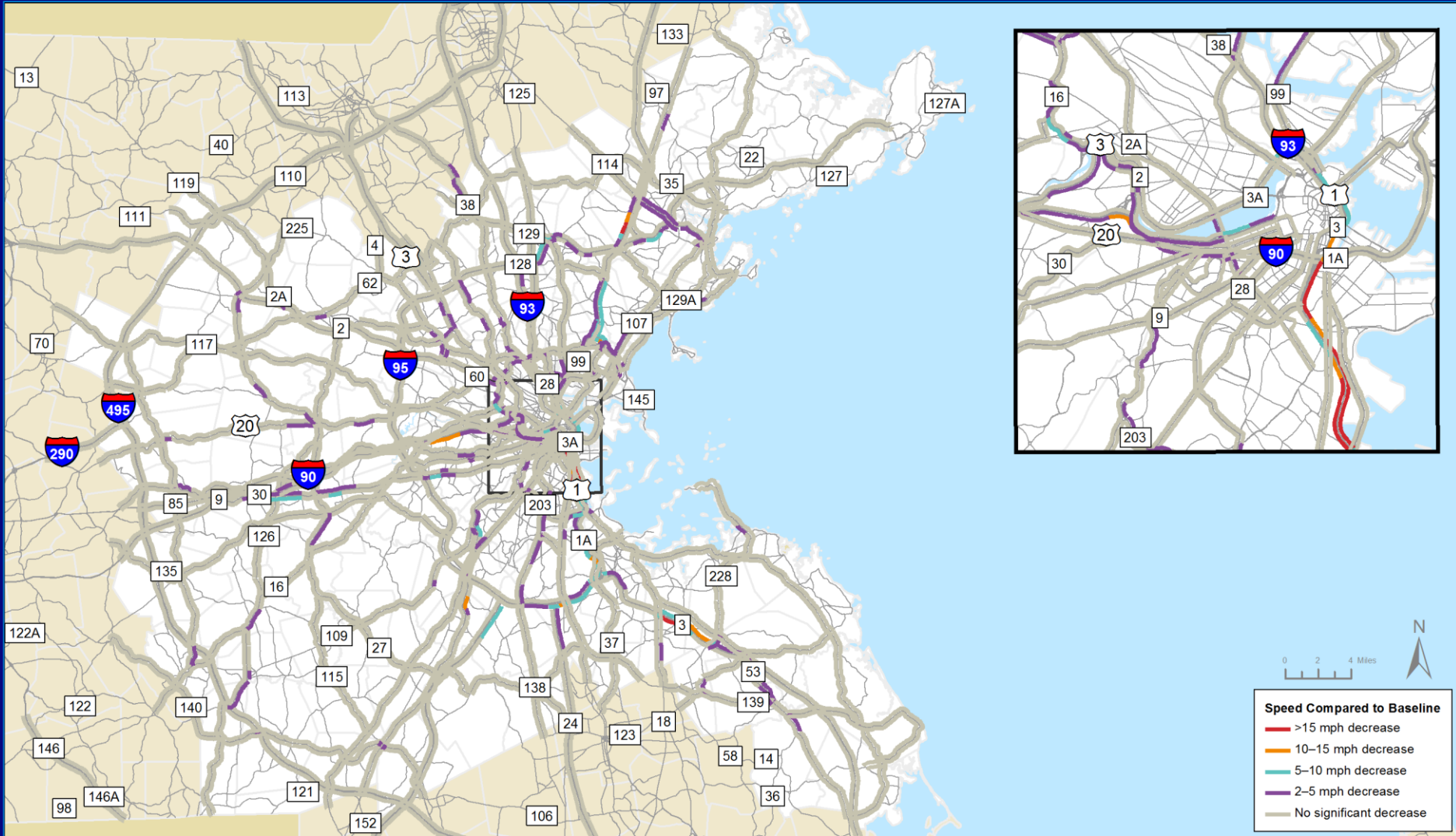
Comparison: Compares Saturday congestion with corresponding times during the weekdays

Dates: 18 Saturdays in Spring and Fall 2015

Times monitored: 12:00 PM to 4:00 PM, 4:00 PM to 8:00 PM

Roadways analyzed: All expressways and arterials

Saturday Congestion

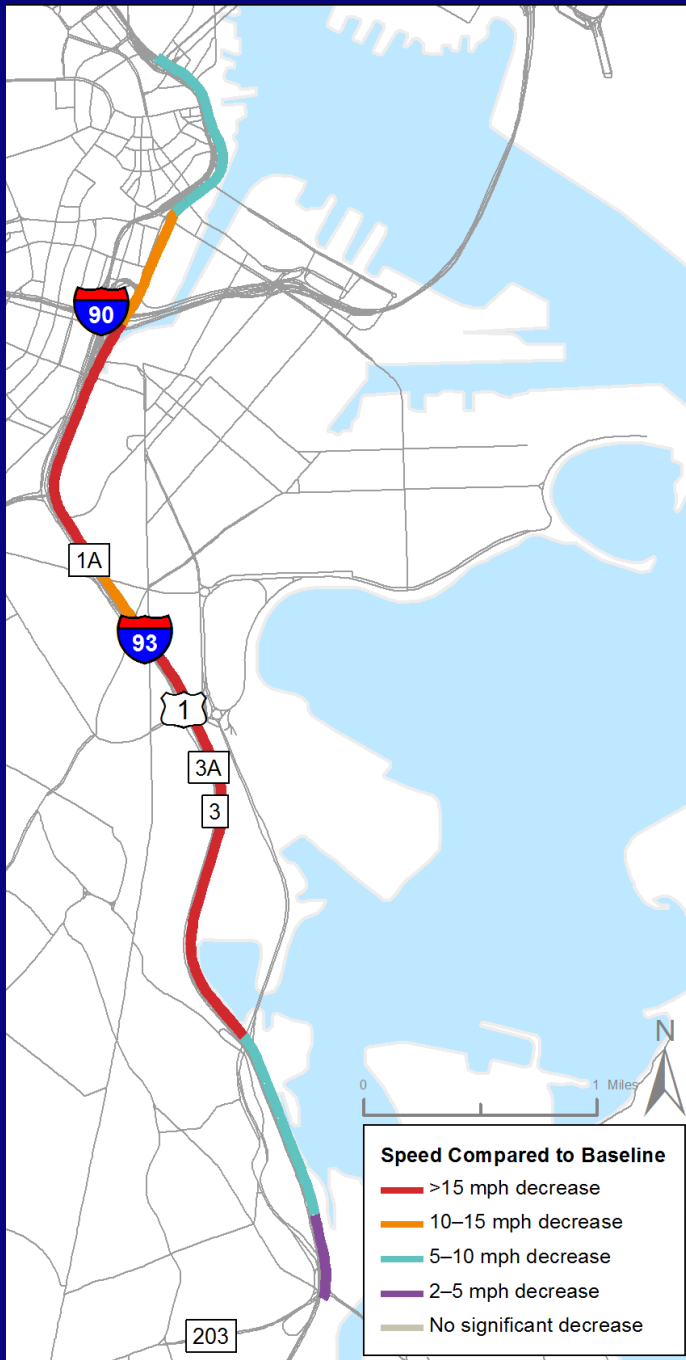


Saturdays 12:00 PM to 4:00 PM

- I-93 Northbound at Columbia Road (22 MPH decrease, 43 percent worse)
- Route 3 Southbound between Route 18 and Derby Street (21.5 MPH decrease, 36 percent worse)
- Route 1 Southbound at I-95 in Peabody (18 MPH decrease, 42 percent worse)



I-93 Northbound Saturdays 12:00 PM to 4:00 PM



| Performance Measure | I-93 Northbound Weekday | I-93 Northbound Saturday Afternoon |
|-------------------------------|-------------------------|------------------------------------|
| Distance (miles) | 6.03 | 6.03 |
| Congested minutes per hour | 8:01 | 31:49 |
| Average travel time (minutes) | 7:28 | 10:18 |
| Average speed (MPH) | 48.5 | 35.14 |
| Average delay (minutes) | 1:18 | 4:08 |
| Travel time index | 1.21 | 1.67 |

Conclusions

- **Different events will have variable effects on congestion**
- **The availability of big data is enabling transportation agencies to expand their congestion monitoring**
- **The INRIX data allow us to identify problem locations on our transportation system**
- **These nontraditional congestion events are becoming as problematic as the typical weekday congestion**

Next Steps

- **Conduct staff review of congested locations to see where more in-depth studies should be conducted based on the findings**
- **Potentially create visualizations of congestion during these events for public use**



Questions/Comments