Technology Driven Planning with Online Dashboards

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Importance of Data to Engineers

- Data Collection for Informed Decisions
  - Engineers collect data before starting any design work
  - Helps make more informed decisions and build better infrastructure
MassDOT Statewide Travel Time Dashboard

- Travel Time Dashboard supports commuter travel decisions
  - Shows busiest travel times on different corridors
  - Based on INRIX data and nightly scripts
  - Helps commuters plan travel and avoid congestion
Sumner Tunnel Detour Route Dashboard

- Sumner Tunnel Detour Route Dashboard
  - Displays average travel times for seven detour routes during the Sumner Tunnel Closure in 2023
  - Dashboard is being reconfigured for 2024 Summer Closure
  - Embedded on the project website and updated weekly
Statewide Speed Dashboard

- Shows rolling annual average 50th and 85th percentile speeds for selected roadways in Massachusetts
  - Uses INRIX data
  - Updated monthly
  - Can be viewed by hour and month

- Helps MassDOT and municipalities to plan for safe speeds
Dashboard Technology

- Built on Esri/GeoDOT Platform
- Web Apps—ArcGIS Dashboards and Experience Builder
  - Present data in an easy-to-read format
  - Visualize tabular data (INRIX) spatially on a map
  - Interactive design
  - Ability to create MassDOT Internal and Public Facing Dashboards
  - Delivered through GeoDOT
Getting the INRIX Data

- INRIX data called through Custom Code through the Regional Integrated Transportation Information System (RITIS) PDA API
  - The API Returns
    - TMC—unique road segment ID
    - Data Range
    - Day of Week
    - Granularity (hourly, 15-minute, etc.)
    - Percentiles
- VHB Code aggregates the data returned by the AP
  - Rolls the data up by TMC, Day of Week, and Hour
  - creates an average for the specified time-period (Weekly, Monthly, Yearly)
- Automatically updates the web services consumed with the dashboards
MassDOT Statewide Speed Dashboard

Introduction

The MassDOT Statewide Speed Dashboard is a tool that can be used to help understand travel speeds on roadways in the Commonwealth.

The dashboard is based on INRIX data and displays speeds on roadway segments included in the INRIX TMC network only. For this reason, data is shown for only a portion of roadways within the Commonwealth.

The dashboard shows rolling annual average speeds, updated monthly. Speeds for the selected roadway are shown during weekdays and weekends and can be viewed by hour (from 5:00 AM to 7:00 PM) and by month in graphs. More detailed data is shown in a table. The dashboard includes 50th percentile (median) and 85th percentile speeds:

- 50th percentile speed, or median speed, is a measured value of prevailing speeds at which 50% of all vehicles are traveling at or below in free-flowing traffic.
- 85th percentile speed is a measured value of prevailing speeds at which 85% of all vehicles are traveling at or below in free-flowing traffic.

Dashboard Methodology

The methodology for analyzing TMC segments using INRIX raw data includes the following key steps:

1. Data Collection and Preparation: INRIX raw data, including unique 9-digit TMC values, speed, and timestamps, are obtained. Data is cleaned and preprocessed, addressing outliers and inconsistencies.

2. Segment Identification: Data is extracted and organized by TMC segments of interest.

3. Timeframe Selection: Analysis focuses on the time period from 5 AM to 7 PM. Data is filtered to include measurements within this timeframe.

4. Statistical Speed Analysis: Descriptive statistics (mean) for speeds within the timeframe and TMC segments are computed.

5. Percentile Speed Analysis: 85th percentile speed, a safety indicator, is calculated.
The charts below showcase the speed metrics at the 85th percentile and the 50th percentile (median) speed, segmented by the hour of the day.

**Weekday Speed - 5 AM to 7 PM**

**Weekend Speed - 5 AM to 7 PM**
The charts below showcase the speed metrics at the 85th percentile and the 50th percentile (median speed), segmented by the hour of the day.

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The charts below illustrate the speed metrics at the 85th percentile and the 50th percentile (median) speed across different months.

The tables below provide the speed metrics for the 85th percentile and 50th percentile (median) speeds by various categories.
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MassDOT Historical Travel Time Dashboard

Travel Time by Hour with Selected Day of Week
Dashboards updated nightly with averages representing the past 30 days

Travel Time North/East

Variations by Day:
- AM Peak: 5AM to 9AM
  - Typical Speed: 65.2 mph
  - Typical Travel Time: 21.5 minutes

Travel Time South/West

Variations by Day:
- AM Peak: 5AM to 9AM
  - Typical Speed: 66 mph
  - Typical Travel Time: 21.3 minutes

Select sub-section of Corridor
- I-95
- I-93
- Other Roads

Select Day:
- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday
- Sunday

Select a Time Period:
- Full Day: 24 Hour
- AM Peak: 5AM to 9AM
- PM Peak: 1PM to 7PM
- Off Peak: 7PM to 9AM

STEP 2: Select Day(s) of...
- Monday, Tuesday

STEP 3: Select a Time Peri...
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