Mainline Detection

- MnDOT has utilized a variety of detector types – magnetic, ultrasonic, pressure plates, photocell, microwave, radar, induction loops

- Began using inductive loop detectors in mid 1960’s

- Majority of detectors in Twin Cities are still inductive loops
Mainline Detection

Providing real-time traffic flow information (late 1970’s)

Ramp Metering

• Deployed in late 1960’s – one of first metro areas
• Initially run on timed plans
• Mainline detection added to allow for adaptive control
• Queue detectors added to ramps

1969 – I-35E near County Road B
**Data Archiving and Sharing**

- Began in 1994
- 2 data points (volume and occupancy) per detector per 30 seconds
- Approximately 400 billion data points dating back to 1994
- Available via DataExtract, TrafDat API, University hosted archives
Current Uses (Real-Time)

RTMC operations

- Adaptive ramp metering
- DMS posted travel times
- MnPASS pricing
- Smart work zones
  (queue warning, travel times)
- Traveler information

Current Uses (Traffic Research)

- Travel demand modeling
- Microsimulation modeling
- MnDOT congestion report
- Travel time reliability analysis
- Corridor and system-wide prioritization studies
- Safety research projects
- Cost-benefit analyses
- Many others
What about probe data??

Pros:
- No roadside infrastructure needed
- Greater coverage
- Detailed travel patterns

Cons:
- Provides only a sample of trips, biased
- Limited to segments and time bins of provider
- Lacks volume data
  - Limits many research uses
  - Some limitations for real-time operations
- Data not owned by MnDOT (limits on sharing)
- MnDOT has current contract with HERE to provide probe data statewide

Future Uses

- Real-time predictive traffic modeling (e.g. traffic in 15 min or half hour)
- Automated incident detection
- Machine learning to predict travel times and travel behavior
- More extensive model calibration and analysis (not just typical day)
Improvements for Data Sharing and Processing

- Data storage
- Application Programming Interface (API)
- Standard data aggregation methods
- Documentation
- Sharing of data and code (GitHub)

Questions?

Thank you to RTMC!

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