

Integrating Intersection Traffic Signal Data into a Traffic Monitoring Program

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Summary

GDOT's Office of Transportation Data (OTD) currently gathers traffic count data from portable and permanent traffic data collection devices that are installed at data collection sites. OTD uses this data to perform a variety of functions including establishing and managing the functional classifications of public highways and publishing mandatory federal reports (Highway Performance Monitoring System report). The current study will quantify the accuracy of the vehicle count data that can be obtained from vehicle detectors connected to traffic controllers and gather statistical evidence confirming (or disproving) the feasibility of using these data-streams to substitute the portable data collection efforts at available locations.

Highway Performance Monitoring System

- ❖ "The Highway Performance Monitoring System (HPMS) is a national level highway information system that includes data on the extent, condition, performance, use, and operating characteristics of the Nation's highways" (Source: FHWA website)
- ❖ GDOT's Office of Transportation Data (OTD) currently gathers traffic count data from portable and permanent traffic data collection devices that are installed at data collection sites. OTD uses this data to perform a variety of functions including establishing and managing the functional classifications of public highways and publishing mandatory federal reports (Highway Performance Monitoring System report).

Project Objectives

- ❖ Conduct a review of the literature on previous efforts at using traffic signal detector data
- ❖ Compare traffic signal detector data and data from portable traffic data collection devices from test sites chosen such that they include a variety of traffic volume levels and geometric and operational characteristics
- ❖ Develop a methodology for estimating mainline traffic counts (bi-directional) from traffic signal detectors
- ❖ Make recommendations regarding data quality standards
- ❖ Determine eligibility criteria for intersections to be used for performance monitoring data collection

Data Streams

- ❖ Offset detectors at intersections generating counts
- ❖ Counts are available in real time via XML data streams from central server at TMC
 - Missing data issues with XML data stream
- ❖ Archived database data
 - 15 minute aggregates of lane-by-lane data
 - Data pushed from GDOT to GT on a daily basis

Candidate Site Selection

- ❖ Selection Criteria: Test accuracy under different conditions
 - Volumes saturation
 - Presence of turn lanes
 - Distance between intersections (number of cross-streets)
 - Rural Intersections
 - Medium to low volume intersections
 - Intersections with data on all approaches
- ❖ Regional Traffic Operations Program (RTOP) corridors are chosen because of remote data availability from intersections on these corridors

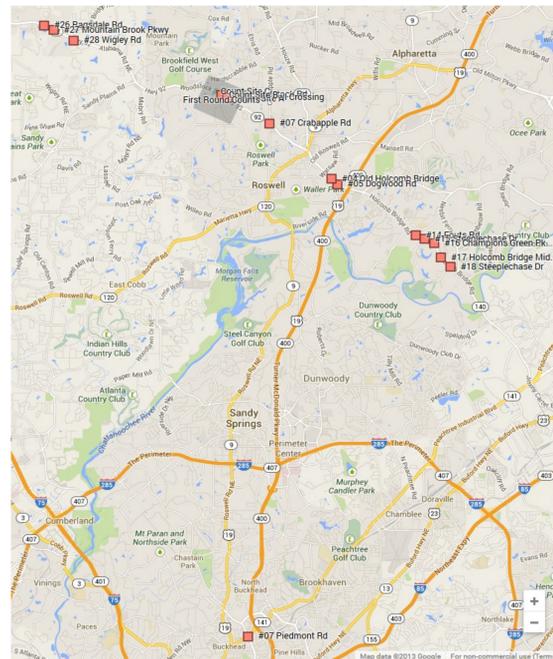


Figure 1: Potential Candidate Intersections



Figure 2: Portable Data Collection Sites and Intersections for First Round

- ❖ Lane by lane bi-directional counts
- ❖ Midblock counts versus counts near intersection approaches
- ❖ Validation of portable counts (pneumatic tube based) with video based manual counts

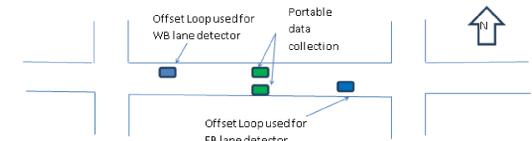
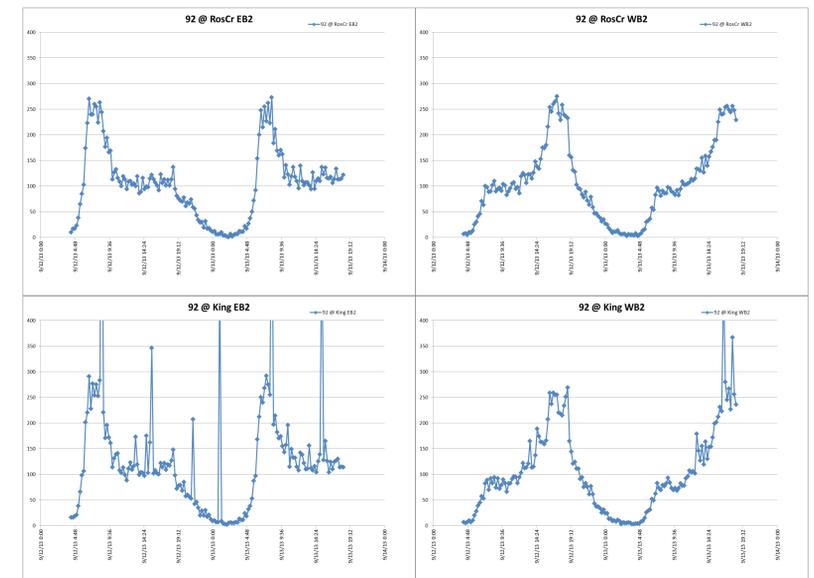


Figure 3: Detector and Portable Count Detection Setup

Filtering and Aggregation

- ❖ Filtering for missed data and spikes (possible outliers) in data
- ❖ Data aggregation strategies across intersections to generate estimates of midblock counts



Develop Intersection Eligibility Criteria Detectors

- ❖ Factors affecting quality of data
- ❖ Factors affecting representativeness of offset-detector counts in estimating midblock counts e.g. saturation levels, turn volumes etc.

Expected Results

The study will help clearly define the feasibility of using traffic signal detector data in traffic monitoring. The study will also study the feasibility of obtaining accurate bi-directional traffic volume estimates using unidirectional lane detector data. In addition, this study will establish criteria for selecting intersections that have a higher potential for generating data useful for highway performance monitoring.

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