Pooled Fund on Length Based Classification
Statement of Work

Background

Vehicle classification data are important for transportation agencies in a wide range of applications, from freight, to pavement engineering, to safety, to cost allocation. Axle-based vehicle classification has been used for two decades but length-based vehicle classification is newer. The capabilities, limitations, and issues involved with collecting length-based vehicle classification (LBVC) data need to be researched. Agencies need to know how to properly install and calibrate the LBVC installations. LBVC uses traditional loops and other technologies. Agencies need to know the pros and cons of different technologies to best utilize their resources. The proper length bins to aggregate LBVC data need to be established.

A pooled-fund has been formed among the States and vendors to conduct this research.

Objective

Field test installation methods and procedures for LBVC devices to compare the effort required for proper installation and calibration. Field test various length bins to find the best known distances to use for length based classification by region. Determine the number of bins that LBVC data can support. Determine the variances involved with collecting LBVC data in recreational areas. Find and document the seasonal variations of LBVC data. Determine the best way to relate LBVC data to axle-based vehicle classification data, in particular to the 13 vehicle types in the Traffic Monitoring Guide (TMG).

A Technical Advisory Committee (TAC) will be formed to provide guidance over the entire duration of the pooled fund. The TAC's responsibilities will include oversight of the pooled fund goals and objectives and ensure the pooled fund remains on track during the entire pooled fund. The initial TAC kick off meeting will be in Washington DC during the 2008 NATMEC. Travel for pooled fund state representatives to coordination meetings (scope, Kick off, progress, deployment, demonstration) will be covered by the pooled-fund.

TAC Deliverable: Finalized Statement of Work outlining the pooled fund goals, objectives, and scope of research.

Work Plan

Using the lead State's contracting provisions hire a contractor to perform the research.

Task 1 - Literature Review: Prior to commencement of the research a literature review will be conducted of LBVC data collection.

Task 2 - Determine the errors associated with collecting LBVC data and how those errors can be reduced or eliminated. This will include determining the best sensor and electronics to use. Possible areas of interest are optimal loop size, shape, number of turns, configuration (array), and construction techniques. Determine the effect equipment variances have on the loop length measurement. Determine if there is a preferred inductance range loops should be within.

Deliverables: Field test various vendors loop based equipment and prepare a fact finding report that details those results so the next tasks can be better developed to minimize these results.

Task 3 – Establish LBVC calibration standards. Acceptable tolerances and needed checks will help ensure quality length-based measurements. Determine the standard counting process agencies should use for collecting LBVC data. (video, manual, probe vehicle, or some other method).

Deliverables: Produce the necessary methods agencies can use to calibrate their LBVC devices to ensure quality results.

Task 4 – Determine the feasibility of having common bins for LBVC. The binning method commonly used is for bin 1 to represent classes 1-3, bin 2 to represent classes 4-7, bin 3 to represent classes 8-10 and bin 4 to represent classes 11-15. Is this the best breakdown from axle classification to length classification? Should some other break down be done? What lengths should each of the bins cover? Various sizes have been found from different agencies doing length-based classification. Determine the effect that recreation vehicles and other specialized vehicles have on the correlation between LBVC and axle based vehicle classification.

Deliverables: Produce a table that shows the number of bins, the length for each of those bins and the errors associated with each of these bins. Included in this area would be the effect recreation vehicles have on the LBVC data accuracy.

Task 5 – Provide real multi-state results of the use of the proposed length bins to demonstrate how it will work and the errors that may occur using these parameters. A minimum of 50 sites in at least 5 States with a minimum of 10 different roadway functional classifications represented in the findings. To know the effect recreation areas have on this study there should be at least 2 known recreation sites included in the list.

Deliverables: Reports showing how these various sites, States and roadway types produce the desired results.

Task 6 – Determine if quality LBVC data can be obtained from single loop arrays or single non-intrusive length based devices. Determine if three loop arrays will improve the accuracy of length based classification.

Deliverables: The minimum number of loops necessary to obtain quality LBVC data.

Task 7 – Final Report. Provide a draft final report to the TAC. Address comments from the TAC in the final report.

Deliverable: a final report in hard-copy and electronic format for all States in the pooled-fund plus 200 copies.

Estimate of Funding for this pooled fund: $600,000 (20 States at $30,000 per State). Vendors are encouraged to contribute both funds and in-kind equipment which will only further the research.

Estimated duration of the length based classification pooled fund: 2.5 to 3 years

Persons Developing the Pooled Fund:

Lead agency - Minnesota DOT / Gene Hicks
FHWA liaison – Steven Jessberger 202-366-5052

Payoff Potential and Implementation Plan:

By understanding the accuracies and errors of LBVC we can better use the data from these systems to design our roads and provide our customers with quality traffic data. Knowing the LBVC data attributes and how they effect the quality will help agencies concentrate on those issues and will lead to the best return for their dollar. Agencies will also be able to properly obtain the correct equipment which will help them collect better data. Knowing the correct methods is the first step in being able provide the best possible data. Having standardized length bins will help States share data and provide better inputs for pavement designs. By utilizing more LBVC data States will save money.