Central Data Repository – Foundation for Unlocking the Value of Information in Traffic Data

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From Data to Wisdom

Data – 0 and 1

Wisdom – the soundness of a decision

Information – useful data relationships

Knowledge – the understanding of a subject

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TMG Reference

• Traffic data and information are needed to assess current and past performance and predict future performance. Traffic data are typically used to support highway activities that include design, maintenance, operations, safety, environmental analysis, finance, engineering economics, and performance management.

• From traffic data to wisdom – making sound decisions on investment, policies, operations etc. based on traffic data collected
Data - Source

- It starts with the data
- Need for
  - Availability
  - Accuracy
  - Reliability

- Challenge – different vendors, proprietary protocols, communications
Data - Source

• Three approaches
  • Agency polls data using third party proprietary equipment
  • Agency outsources to engineering company providing customized solution
  • Agency uses standardized off-the-shelf tools providing web based service

• Trend – agencies starting to want access to data without having to deal with how to get to them
  • For temporary and permanent stations
Data - Quality

• What is data quality?
  • Initial checks (quality check 1) for data file integrity etc.
  • Data quality checks using rule sets – each agency has their own rules

• Quality Analysis Software as Enterprise System function
  • Benefit: custom developed in house to fit agency’s needs
  • Challenge: maintainability, knowledge transfer, enhancements, upgrades
Data - Quality

• Trend – use of off-the-shelf tools working with different vendor file formats
• Result: quality checked data files and check results
• Input to analysis functions to provide information
Data Quality Check Solutions

- Intelligent Quality Check software to create rules
  - The percentage of class 2 vehicles should normally be between 60 and 80 percent of all vehicles in a lane for lanes 2, 3 and 4 on site ABC. If the percentage is not between 60 and 80 percent, mark the data for review as it may not be good for classification data
- Goal – to determine whether data is usable for specific purpose
Information

• Use of quality checked data to determine relationships between the data
• Visualization
• Reports
• Analysis and Interpretation
From Data to Information

• Toolkit to provide information (analysis) relevant to agency

• Several approaches
  • In house development using scripted solutions (Excel, VB) or enterprise systems to develop a custom ‘Traffic Data System’
  • Collaboration with engineering company to provide customized solution
  • Outsourcing of traffic data management software to solutions provider
Information Trends

• Central software scope is increasing
  • Integrated data processing, QC, calculation and reporting functions
  • Inclusion of GIS and LRS information
  • Mobile applications to allow field crews to document their activities and upload data
  • Management of count operations

• At the same time – continued custom requirements
  • Creation of agency specific reports
  • Provision of agency specific interfaces to connect to other agency and interagency systems
Maintenance Management

• Trend: automated monitoring of health and performance of components
  • Servers
  • Roadside electronic systems and sensors
• Reporting
• Role based access control
Central Data Repository

Field Device / Counter

Equipment Check Software

Data File Upload Software

Upload Report

Data File

Data Quality Check Software

QC’d Data File

QC report

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Analysis

• Central Data Repository is basis providing unified access for further analysis to create valuable and relevant information

• Options:
  • Provision of additional reporting and analysis tools as part of Data Repository System
  • Standardized interfaces to other third party or agency enterprise system
Value Proposition

• Centralized web based data repository guarantees reliable delivery of complete data with integrated and consistent quality control checks
• Intermediary between devices and enterprise systems
• Platform to allow additional data analysis and device centric monitoring
• Modular system allow easy upgrade and enhancements
• Automates time expensive processes to obtain reliable and accurate data and relevant information so that agency can focus on Knowledge Acquisition