GIS-T Symposium
Integrating Traffic Data
Into the Enterprise Database
18th March 2003
Overview

- Traffic data integration
  - Vision
  - Software
- Traffic data lifecycle
Why Traffic Data Matters

- Unifying element that binds virtually every DOT decision whether
  - deciding on the carrying capacity of a bridge,
  - how best to maintain a highway, or
  - how to prevent accidents at a particular intersection.

- The analysis, integration, and accessibility of quality traffic data are crucial to the effectiveness of decisions made throughout a highway agency.
Traffic Data Stovepipe

- **Justified stovepipes?**
  - Specialized skills
  - Departmental responsibility

- **Integrated stovepipes?**
  - Preserve specialization
  - Remove isolation

- **Two-way street**
  - Integrate traffic data
  - Make enterprise data support traffic data collection
Integrated Vision

TRADAS Traffic Database
- Data collection supervision
- Raw data format checks
- Measurement validity checks
- Usage checks
- Measurement aggregation

TRADAS Public Database

Highways Enterprise Database

Web server
- Safety Analysis
- Pavement Management
- Asset Data Maintenance
- Network Data Maintenance

Traffic Data Collection Management
- Permanent or short-term data collection device
- Modem
- Raw data, context information
COTS Software Context

- Interface between TRADAS and Highways
  - TRADAS—specialist traffic monitoring software
    - Loading/validation, summarization, publishing, reporting
  - Highways—specialist highway management software
    - Enterprise database, network data model, integrated asset database
- MRWA—bought both and needed interface
  - Close relationship between firms, much thought about interface
- Traffic Manager was born
Traffic Data Lifecycle

- Planning
- Reporting
- Counting
- Publishing
- Loading
- Summarization

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Integration Phases

Planning

Reporting

Publishing

Summarization

Counting

Loading
Planning with Traffic Sections

- Define traffic sections on network
- Synchronize Count Sites Traffic Sections
  - Match using dynamic segmentation
- Plan counts to provide section statistics
Why Linear Referencing

And many others ...
Edit TRADAS in Highways

- Count sites edited in Highways
- Changes audited and passed to TRADAS
- Example of enterprise database supporting traffic monitoring
Count Sites and Traffic Sections are held as Assets on the road network.

Powerful Multiple linear referencing capabilities allow the sites and sections to be located easily using the preferred location referencing method.

Flexible attributes allow the user to identify what attributes they want to maintain against each count site and traffic section.
Traffic Data Lifecycle

Planning

Counting

Reporting

Publishing

Loading

Summarization

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Traffic Data Sources

- **Permanent sites**
- **Short-term counts**
  - Many devices, few accepted standards
- **Manual counts**
- **No place for enterprise integration**
  - Except
    - Adding ITS data, coming soon
Traffic Data Lifecycle

Planning

Reporting

Counting

Publishing

Loading

Summarization
Data Entry

- Quality is crucial
  - Determines usefulness of traffic statistics
- Controls needed to filter questionable data before aggregating into higher level statistics.
  - Purging
  - Binding
  - Editing
- TRADAS has these
- No place for integration

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Traffic Data Lifecycle

Planing

Reporting

Counting

Publishing

Loading

Summarization
Count site Summaries

- Permanent (ATR and ITS) summarized
  - Daily
  - Monthly
  - Annually

- Short-term and manual counts summarized
  - as they are presented to TRADAS

- TRADAS core function

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Traffic Section Summaries

- Still calculated by TRADAS
- Now on demand from Highways
Traffic Data Lifecycle

Planning

Reporting

Publishing

Counting

Loading

Summarization
Publish to Enterprise

- Traffic data counted for small subset of the total road system
- Need traffic statistics for all road system segments
  - Planning activities
  - Estimates of vehicle distance traveled
- Publish statistics to enterprise
  - Count site statistics
  - Traffic section statistics

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Publish Process

- Synchronize
- Calculate traffic section statistics
- Publish temporary statistics
- Commit statistics to database
  - No editing of statistics in database

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Publishing Statistics Process

- User selects year and network date
- Temporary statistics published first for quality checking
- Data mismatches are logged for quality checking
- Published statistics available to all authorized Highways users

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An easy to use HTML web page is used to synchronize data between Traffic Manager and TRADAS.

To TRADAS:
- Count site to traffic section relationship
- Attribute information

From TRADAS:
- Site statistics
- Section statistics
- Temporary statistics for QC

All of the data on the web page is used to synchronize data between Traffic Manager and TRADAS.
Integration with other enterprise data
- High action section crash rates
- Pavement section deterioration rates

Reporting
- HPMS
- VMT

GIS
ITS ADUS Data Mart

- Traffic Data Source and Destination
  - Issues of quality and definition
Traffic Data Lifecycle

Planning

Reporting

Counting

Publishing

Loading

Summarization
Standard and Ad Hoc Reports

- Standard reports remain
  - In-house and federal
    - FHWA OHPI
    - Long-Term Pavement Performance
    - HPMS

- Now add traffic data to other reports

- Standard map views

- Ad hoc query capability
  - Use as filter

- Report via Internet
Traffic Data Lifecycle

Planning

Reporting  Counting

Publishing  Loading

Summarization
Closing the loop

- **Manage Historic Data**
  - Keep history of network, including Traffic Sections
  - Keep history of count site locations

- **Plan future work**
Thank You

Marc Krätzschmar
(619) 521 2594
mkratzschmar@exorcorp.com

Credit due to Joe Wilkinson of Chaparral Information Systems, makers of TRADAS