Visualizing the Long-Range Health of Rural Recreational and Agricultural Corridors

Prepared for the
IDAHO TRANSPORTATION DEPARTMENT
2009 PROJECT DEVELOPMENT CONFERENCE

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Presentation Outline

1. Objectives
2. The Visualization Tool
3. Defining Corridor Health
4. Conclusions and Next Steps
Coverage Area – District 6

Visualizing the Long-Range Health of Rural Recreational and Agricultural Corridors
Objectives

- Better Use of Information
- Consistency in Forecasts
- Transparent Decisions
- Tools for Visualization
- Clear Priorities
Visualization Tool Flow Chart

Roadway Data
- No. of Lanes
- Speed Limit
- Lane Width
- Shoulder Type
- Median Type
- Terrain
- Access
- Passing Lane
- Alignment

Traffic Data
- Short Term Counts
- ATR Counts
- Turning Movement Counts
- Truck Percentages
- Land Use Traffic Data

Land Use Data
- Zonal Information
- Existing and Projected Population
- Existing and Projected Employment
- Other Environmental Data

Accident Data
- Historical Data

Scenario Builder
- Year for Analysis
- Growth Assumptions
- Roadway Improvements
- Management Strategies

Excel Spreadsheet
- Data Processing
- Generate Travel Forecast
- Perform LOS Analysis
- Estimate Traffic Growth
- Estimate Seasonal Variation

GIS

Graphical Display
- Seasonal Variation
- Time-of-Day Variation
- Direction Analysis

Graphical Display
- Roadway Characteristics
- Traffic Counts
- Traffic Growth Rates
- Traffic Forecast
- Land Use Information
- Land Use Forecasts
- Corridor Health
  - LOS
  - Safety
  - Point of Access
  - Ride Quality
- Improvements
- Photos
**GIS Layers - Intersection Nodes**

- Identify major intersections along the state route system
- Store specific information for intersections
  - Type of control (signalized, all-way stop, etc)
  - N/S and E/W streets
  - Existing turning movement counts if available
- New nodes will be added as information becomes available
Travel Forecast - Growth Factors

- Factors based on traffic count data or land-use based model
- Periodic counts used for segment baseline and growth trends and for truck percentages
- Seasonal, time-of-day and day-of-week variation based on permanent count locations
Travel Forecast

- Interactive tool to generate estimates and graphs
- Generate monthly weekday ADT graph
- Generate hourly volume distribution for weekday of January, April, July, and October
LOS Analysis

4 approaches:

- Two-lane Uninterrupted Flow (Rural Undeveloped Area)
- Two-lane Uninterrupted Flow (Through Small Towns)
- Multi-lane Uninterrupted Flow Procedure
- Signalized Roadway (Urban Street) Procedure
Corridor Health

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## Corridor Health Scoring

<table>
<thead>
<tr>
<th>Factor</th>
<th>Weight</th>
<th>Factor Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>40%</td>
<td>$0.5 / X$ if $X \geq 0.5$ and 1.0 otherwise</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Where $X = 0.7 \times (\text{Fatal + Injury Accident Rate for Segment} / \text{Average for the Facility Category}) + 0.3 \times (\text{Total Accident Rate for Segment} / \text{Average for the Category})$</td>
</tr>
<tr>
<td>Travel Time and Delay</td>
<td>30%</td>
<td>$1 / \text{LOS}$ where $\text{LOS} = 0.5 \times (\text{Link LOS for Average Peak Hour Conditions}) + 0.2 \times (\text{Link LOS for Design Hour Volume}) + 0.2 \times (\text{Int. LOS for Average Peak Hour Conditions}) + 0.1 \times (\text{Int. LOS for Design Hour Volume})$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Where $\text{LOS} = 1$ for C or better, 2 for D, 3 for E and 5 for F</td>
</tr>
<tr>
<td>Ride Quality</td>
<td>10%</td>
<td>$1 / \text{PC}$ where $\text{PC} = 1$ for Good, 2 for Fair, 3 for Poor and 5 for Very Poor Pavement Condition Rating</td>
</tr>
<tr>
<td>Points of Access</td>
<td>10%</td>
<td>$= 1 - (\text{Number of Access Points per mile}) / (\text{Number Allowed by Guidance for the Roadway Type})$</td>
</tr>
<tr>
<td>Shoulder Width</td>
<td>10%</td>
<td>Average of Width / Standard up to 1</td>
</tr>
</tbody>
</table>
Safety - Accident Rate

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Travel Time and Delay – LOS

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Travel Time and Delay – LOS

Legend:
- Existing Segment LOS
  - A-B
  - C-D
  - E-F
- Existing Intersection LOS
  - A-B
  - C-D
  - E-F

Legend:
- Stop Sign
Conclusions

A computerized, district-wide database can:

- Make data that are routinely collected more transparent to others
- Improve consistency in how data are collected and used
- Allowing interactive use of multiple data sources
- Display differences using the concept of existing and future heath
Next Steps (Other Perspectives)

- Economic Development
- Asset Management
- Safety
- Operations
- Corridor Management and Access
- Stewardship
Environmental Stewardship

- Western Perspective – value outdoor space, wildlife and natural setting
- Create - significant environmental, economic, and cultural benefits
- Challenges – changes in land use
- Due to – ↑ land values, ↑ population growth, and ↑ development of rural-urban fringe
- Habitat Fragmentation – communities and wildlife
Western Governor’s Association Wildlife Corridors Initiative

- Protection of wild corridors & critical habitat a priority for transportation planners, design & construction
- Facilitate inter-jurisdictional coordination, planning & implementation
- Manage & coordinate transportation, crucial area, & corridor data and methods
- Build long term fiscal capacity to fund initiatives
Pain

- Emotional, physical, and mental pain carries with it a specific message about our life, but generally fits into two categories:
  1) We would be more alive if we did more of this
  2) Life would be more lovely if we did less of that

- Once we get the pain’s message and follow the advice, the pain goes away.