Iowa Corridor Management
Pilot Project Overview

Recommendations For A Corridor Management Program

August 2004
Presentation Overview

- Project goals
- Pilot project selection process
- Analysis results
  - Segment types 1, 2, and 3
  - Driveway and traffic signal inventory/density analysis
  - Safety
  - Land use
- Key findings
  - Segment types and their typical issues
- Recommended program (summary)
  - Retrofit studies on existing corridors with issues (mainly Segment 1 situations)
  - Corridor management agreements on corridors where future corridor management issues are likely to arise (Segment 2 situations)
  - Cooperative planning with local jurisdictions (Segment 3 situations)
Project Goals

- Identify typical Iowa corridor management issues and problems
- Develop safety and land use analysis techniques to be used on other corridors
- Develop a framework for corridor management in Iowa
- Involve several Iowa DOT offices plus Districts and metropolitan/regional planning organizations
Two pilot projects were selected by Iowa DOT management.

Both of the pilot corridors selected for detailed analysis ranked in the top ten in a previous study that identified the top priority candidates for corridor management in Iowa based on:

- Crash statistics
- Importance for commuting
- Likelihood of future access management issues
Key Commuting Routes
In Iowa: 2004 Estimated Work Trips
Three Corridor Segment Types

1 Urban
2 Fringe
3 Rural
Urban Segments

“Segment 1”

- Urbanized
- Largely built out
- Predominately commercial land use
- Relatively well-managed in terms of commercial driveway density and medians
- Relatively high traffic signal density
- Low incidence of left-turning crashes; higher rates of right turn and (especially) rear-end collisions at traffic signals
- Some opportunity for retrofit access management improvements
US 20 Urban Segment (1)
Fringe Segments

“Segment 2”

- Urbanizing (suburban and urban fringe)
- Largely undeveloped
- Considerable land development potential
  - Likely use: mixture of commercial, industrial, and large lot residential
- Relatively well-managed in terms of commercial driveway density and medians at present
- A few traffic signals at major intersections or ramps
- Low incidence of left-turning crashes; higher rates of right turn and rear-end collisions
- Considerable potential for future access management problems
Rural Commuter Route Segments

“Segment 3”

- Rural, but within 30 minute commuter range
- Largely undeveloped
- Predominately agricultural land use
- Relatively well-managed in terms of commercial driveway density and medians
- No traffic signals
- Low incidence of left-turning crashes; low rates of right turn and rear-end collisions
- Opportunities for “spot” access management problems at a few locations
US 20 Rural Segment (3)
Example Analysis Results:
US 20 Corridor Near Dubuque

- Driveway locations and density
- Traffic signal location and density
- Safety: crashes frequency, type, and rate
- Land use: present and planned future
## Driveway Density Analysis: US 20

<table>
<thead>
<tr>
<th>Segment</th>
<th>Length</th>
<th>Count</th>
<th>Driveways/Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Segment 1</td>
<td>2.0 miles</td>
<td>9</td>
<td>4.5 (low)</td>
</tr>
<tr>
<td>Segment 2</td>
<td>8.0</td>
<td>30</td>
<td>3.8 (low)</td>
</tr>
<tr>
<td>Segment 3</td>
<td>15.8</td>
<td>5</td>
<td>0.3 (very low)</td>
</tr>
</tbody>
</table>

Segment 2 has several instances of moderate density.
Traffic Signals And Driveways: Segment 1 And Portion Of Segment 2 US 20 In Dubuque
Segment 2 Driveways

Areas of concern
Segment 3 Driveways

Very well managed segment
Safety Analysis

Crash frequency
- Focus on access-related crashes
- Left-turn, right-turn, and rear-end collisions

Access-related crash rates

Access-related crash severity
# Current Safety Analysis US 20: Access-Related Crashes

<table>
<thead>
<tr>
<th></th>
<th>Segment 1</th>
<th>Segment 2</th>
<th>Segment 3</th>
<th>Corridor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rear End</strong></td>
<td>67 (35%)</td>
<td>27 (25%)</td>
<td>0 (0%)</td>
<td>94 (26%)</td>
</tr>
<tr>
<td><strong>Right Turn</strong></td>
<td>18 (9%)</td>
<td>8 (7%)</td>
<td>1 (2%)</td>
<td>27 (7%)</td>
</tr>
<tr>
<td><strong>Left Turn</strong></td>
<td>1 (1%)</td>
<td>3 (3%)</td>
<td>3 (5%)</td>
<td>7 (2%)</td>
</tr>
<tr>
<td><strong>All Access-Related</strong></td>
<td>86 (44%)</td>
<td>38 (35%)</td>
<td>4 (6%)</td>
<td>128 (35%)</td>
</tr>
<tr>
<td><strong>Total Crashes</strong></td>
<td>194 (100%)</td>
<td>108 (100%)</td>
<td>64 (100%)</td>
<td>366 (100%)</td>
</tr>
</tbody>
</table>

*Note: Columns do not total to bottom number. Difference is non-access crashes.*
<table>
<thead>
<tr>
<th>Access-Related Crash Rates</th>
<th>Segment 1</th>
<th>Segment 2</th>
<th>Segment 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access-Related</td>
<td>4.2</td>
<td>1.5</td>
<td>Near Zero</td>
</tr>
<tr>
<td>(Moderate)</td>
<td></td>
<td>(Low)</td>
<td></td>
</tr>
</tbody>
</table>

Probable access-related crash rates per million vehicle-miles traveled. Includes right-turn, left-turn, and rear-end collisions.
Crash Hot Spots: Segment 1
Rear-End Collisions Predominate
Safety Analysis For US 20: Conclusions

Overall
- Roughly 35% of all crashes in the corridor are access-related, but these are concentrated in the urban and suburban portions (Segments 1 and 2)
- Access-related crashes tend to be severe
- Driveway densities are generally not high on the route, but there are several concentrations of commercial driveways that could be consolidated

Segment 1
- Has significant numbers of rear-end collisions and right turn crashes
- This is consistent with a multilane divided corridor with a high public road intersection density and high traffic signal density

Segment 2
- Has a less significant access-related safety problem than Segment 1
- There are three problem subsegments
- Some safety problems are associated with public road intersections rather than with driveways

Segment 3
- Safety problems are generally not access-related (crashes are run off the road, weather-related, animal crashes, etc.)
Land Use Analysis

- Analysis process employed current and projected future land development in GIS format

Segment 1
- Largely commercial
- Essentially built-out; little potential for further development except if re-developed

Segment 2
- Mixture of commercial, industrial, and agriculture
- Considerable potential for new commercial and industrial development with associated demand for driveways

Segment 3
- Largely agricultural except in and around cities
- Limited development at the edges of small cities
Segment 1: Largely Commercial And Mainly Built-Out
Segment 2: Mixed Land Use With Much Room For More Development

Classic “strip” development
Segment 3: Mainly Agricultural With Mixed Use Near Cities
Future Land Use Analysis: US 20

- Segment 1 will continue to exist as a commercial strip with some changes in individual parcels and businesses.
- Segment 2 will likely continue to develop as a commercial/industrial strip (eastern half) and large lot residential (western half).
  - This segment has (by far) the most potential for future land development.
- Segment 3 will likely remain largely agricultural except in and near Peosta, Epworth, Farley, and Dyersville (small cities along the corridor).
Segment 2: Planned Industrial Development (Yellow)
Segment 2: Planned Development At The Dubuque Fringe (Yellow and Red)
Large Portions Of Segment 2 Are Planned As Low Density Residential

Commercial uses (red) are clustered—positive feature
Segment 3: Limited New Development Planned
Corridor Management Issues By Segment Type

Segment 1

- High density of public road intersections and median breaks
- High density of traffic signals
  - Close spacing leads to a decline in mean travel speed, reduction in LOS, and an increase in rear end collision rates
- Lack of dedicated turning lanes at major intersections
- Discontinuous frontage road system
  - Frontage road system too close to the mainline
- A handful of direct driveway accesses could be closed or consolidated
Corridor Management Issues By Segment Type

Segment 2

- Several areas with direct driveway accesses that could be closed or consolidated
- Areas of high crash rates that are usually related to land development and access decisions
- Discontinuous frontage road system
- Large potential for future access management issues as land develops
  - Especially important in areas slated for commercial and industrial development
Corridor Management Issues By Segment Type

Segment 3

- “Spot” safety issues associated with individual developments
- Examples:
  - Existing and potential commercial development near Farley and Epworth located around at-grade intersections
  - Large, new BMX (cycling) facility located in a rural area
Overall

Corridor Management Goals

- Reduce at-grade public road intersection density (full intersections), full median break density, and traffic signal density along Segment 1
- Reduce direct driveway accesses where possible through driveway sharing and alternative access way development along Segment 2
- Develop a complete frontage and backage road system where appropriate with a substantial separation from the mainline
- Improve land use planning along Segments 2 and 3 so that new commercial developments are clustered around existing and planned interchanges
- Clear commercial driveways a reasonable distance away from interchanges and major intersections
“Ideal” Corridor Configuration

Segment 1
- Urban expressway with high level of access control (or a freeway)
- 45-55 mph mean travel speed
- Traffic signals spaced at least ½ mile apart
- No direct driveway accesses
- Full frontage road system with accesses to mainline at interchanges at least ½ miles apart (ideally 1 mile apart)

Segments 2 and 3
- Suburban/rural expressway with high level of access control
- 55-65 mph mean travel speed
- Full median break spacing >1 mile (no traffic signals)
- Driveway spacing >0.25 miles (right-in right out only, where possible)
- Backage road system with accesses to mainline separated at least 1 mile apart
Suggested Iowa Corridor Management Program Framework

Segment 1
- Develop retrofit access management plans

Segment 2
- Develop corridor management 28E agreements
- New Iowa US 6 agreement as a model (District 4, Iowa DOT)
- NCHRP Synthesis as a tool

Segment 3
- Cooperative planning with local land use planning jurisdictions
- Spot corridor safety improvements

Overall
- Improved inventories of driveway permit locations, access priority classification levels, and access rights obtained
- Automated access permitting system?
Suggested Items To Be Addressed In A Retrofit Access Management Study

Segment 1 Situations

- Inventory: driveways, medians,
- Safety analysis: crash rates, locations, and types
- Present and future land use
- Traffic signal location and spacing
- Improved traffic control systems
- Dedicated turning lanes
- Frontage or backage road system and internal circulation in adjacent developments
- Consolidation and clearance of commercial driveways
Suggested Items Recommended To Be Included In A Corridor Management Intergovernmental Agreement

Segment 2 Situations

- Public road interchanges and intersections
- Traffic signal locations
- Medians and median break locations
- Driveway locations and directions (e.g. right-in, right-out)
- Dedicated turning lane locations
- Alternative access ways (e.g. development of frontage and backage road systems)
- Generalized land use planning
Items That Could Be Pursued In Rural Parts Of Corridors

Segment 3 Situations

- Some communities along key commuting corridors have no comprehensive land use plans or badly outdated plans
  - Encourage them to develop and update plans
- Cooperatively review new development proposals for potential access and safety issues, especially those that involve commercial and industrial development
- Conduct “spot” safety and access analyses at current and potential problem locations
Expected Benefits Of A Corridor Management Program

- Preservation of the Iowa DOT’s multi-million dollar investments in major corridors
- Maintain mean travel speed and LOS, especially on Segment 1s
- Lower rear-end collision rates (mainly on Segment 1s)
- Lower right and left turning crash rates (mainly on Segment 2s)
- Preservation of Segment 3s, which are generally well-managed and safe now
- Maintenance of business environment on Segment 1s, which might otherwise begin to suffer due to higher travel times and greater congestion
Current Program Status

Several Iowa DOT offices (Development, Location, Safety, Planning) are involved.

Each Iowa DOT District (1 through 6) is identifying a corridor for which an Intergovernmental Corridor Management Agreement will be developed between Iowa DOT and local governments.

Retrofit access management studies are being programmed as needed.

MPOs and Regional Planning Affiliations are being included as partners.
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