Indiana Statewide Access Management Implementation

Training Sessions:
June 15, 2009 – Greenfield
July 7, 2009 – Vincennes
July 8, 2009 – Fort Wayne
Study Team

- INDOT: Steve Smith & Bill Flora
- Implementation Advisory Group
- Consultant Team:
  - AECOM (Urbitran)
  - Bernadin Lochmueller
  - Special Advisors: Bud Koepke and Herb Levinson
  - Engaging Solutions
Training Areas

- TECHNICAL PRESENTATION (9:30 am)
  - Overview of access management
  - Legal authority
  - How can you institute access management?
  - Break
  - FHWA Video: “Safe Access is Good For Business”
  - Elements of INDOT’s access management program
  - Resources available

- LUNCH (12:00 to 1:00 pm)
- WORKSHOP (1:00 pm)
- WRAP-UP (2:50 pm)
Training Areas

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- WRAP-UP (2:50 pm)
INDOT Mission Statement:

INDOT will build, maintain and operate a superior transportation system enhancing safety, mobility and economic growth.
Overview of Highway Access Management

- What is access management?
- What are the benefits?
- What are the principles of access management?
What happens if you don’t manage access?

...in the beginning...
What happens if you don’t manage access?

...as time progresses...
What happens if you don’t manage access?

…the result…
Need for Local Coordination

WHY WON'T THE ROAD AUTHORITY MAKE THE ROAD IMPROVEMENTS NECESSARY TO ACCOMMODATE THE TRAFFIC FROM ALL THE NEW DEVELOPMENT?

WHY DO LOCAL PLANNERS APPROVE NEW SITE PLANS THAT UNDERMINE OUR RECENT ROAD IMPROVEMENTS?

PLANNING COMMISSION

Graphic prepared by: John Warbach, Planning and Zoning Center, Inc
BUSINESS GROWTH AND ROADWAY IMPROVEMENT CYCLE

INCREASED BUSINESS ACTIVITY
INCREASED TRAFFIC DEMANDS
CHICKEN OR EGG ISSUE
ROADWAY IMPROVEMENTS
INCREASED TRAFFIC DEMANDS

Source: Michigan DOT.
What is Access Management?
Access Management is...

- The control and regulation of the spacing and design of:
  - Driveways
  - Medians
  - Median Openings
  - Traffic Signals
  - Freeway Interchanges

What are the benefits of Access Management?
Benefits of Access Management

- Roadway safety
- Traffic operations
- System preservation
- Economic
- Environmental
- Aesthetic
Safety Benefits

Effect of Access Spacing on Crash Rates (Composite)
Safety Benefits

Crash Rates in Urban & Suburban Areas

Safety Benefits

Crash Rates in Urban & Suburban Areas

Traffic Operations Benefits: Decreased Travel Time

Traffic Operations
Benefits: Reduced Delay

Good access management allows traffic to move closer to posted speed limits, thereby reducing delay.

<table>
<thead>
<tr>
<th>Streets</th>
<th>Regular Arterials</th>
</tr>
</thead>
<tbody>
<tr>
<td>COLFAX</td>
<td>23 mph</td>
</tr>
<tr>
<td>ALAMEDA</td>
<td>28 mph</td>
</tr>
<tr>
<td>FEDERAL BLVD</td>
<td>25 mph</td>
</tr>
<tr>
<td>WADSWORTH</td>
<td>25 mph</td>
</tr>
<tr>
<td>HAVANA</td>
<td>30 mph</td>
</tr>
</tbody>
</table>

Highly Access Managed Arterials

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>PARKER</td>
<td>48 mph</td>
</tr>
<tr>
<td>ARAPAHOE</td>
<td>46 mph</td>
</tr>
</tbody>
</table>

Traffic Operations Benefits: Increased Capacity

A typical four-lane arterial road with good access management can handle nearly 10,000 more vehicles per day.

Source: Florida Department of Transportation.
System Preservation Benefits

- **Building a Bypass in Marshalltown, Iowa**
- **Problem**: Traffic Congestion on US Highway 30
- **Solution**: Build Bypass

Source: Iowa Access Management Handbook
System Preservation Benefits

- **Problem**: Poor Access Control on Bypass Leads to Traffic Congestion
- **Solution**: Build Bypass of the Bypass

Source: Iowa Access Management Handbook
Economic Benefits

<table>
<thead>
<tr>
<th>Reduction in Avg. System Speed</th>
<th>Market Area Relative to previous size</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>10%</td>
<td>81%</td>
</tr>
<tr>
<td>20%</td>
<td>65%</td>
</tr>
<tr>
<td>30%</td>
<td>45%</td>
</tr>
<tr>
<td>40%</td>
<td>36%</td>
</tr>
<tr>
<td>50%</td>
<td>25%</td>
</tr>
</tbody>
</table>

45 mph
30 mph
January 24, 2007 – In order to shave money off its annual $200 million fuel bill, UPS has developed software that maps out driver routes with no left turns.
UPS Experts Offer Tips for Better Gas Mileage

- **Avoid left turns.** UPS routes are designed to avoid left turns. We have learned that idling waiting to turn left wastes gas. Not to mention the cars idling behind you waiting for you to turn. It is also safer to avoid left turns since you reduce the number of times you turn across oncoming traffic.
Environmental Benefits

- Reduced pollution
- Less fuel consumption
Aesthetic Benefits
Who Benefits?

- **Motorists**
  - Fewer conflict and decision points
  - Driving task safer and more simplified

- **Cyclists and Pedestrians**
  - Fewer conflicts with vehicles
  - Median refuge

- **Transit riders**
  - Reduced delays and travel times
Who Benefits?

- **Business persons**
  - Broader market area and more stable property values

- **Freight delivery carriers**
  - Shorter transport times and lower delivery costs

- **Government agencies**
  - Lower cost to deliver safe & efficient transportation system

- **Communities**
  - Safer and more attractive driving environment
What are the Principles of Access Management?
Access Management Principles

- Limit the number of conflict points
- Separate the conflict points
- Remove turning vehicles and queues from through movements
- Maintain progression speeds along arterials
- Encourage access to streets with the lowest functional classification, where this option exists
Access Management Principles

- **Limit the number of conflict points**
- Separate the conflict points
- Remove turning vehicles and queues from through movements
- Maintain progression speeds along arterials
- Encourage access to streets with the lowest functional classification, where this option exists
Conflicts
5 lane section
Conflicts

Right-turn in
Right-turn out
Left-turn in (1 direction)

1 Major
6 Minor
7 CONFLICTS
Undivided

Many conflicts with all turns permitted

Divided

Reduced conflicts

Increased traffic at first median opening
Limit the number of conflict points...
Access Management Principles

- Limit the number of conflict points
- Separate the conflict points
- Remove turning vehicles and queues from through movements
- Maintain progression speeds along arterials
- Encourage access to streets with the lowest functional classification, where this option exists
Techniques to Separate Conflict Points

- Provide adequate spacing between:
  - Median openings
  - Traffic signals
  - Intersections
  - Driveways
Driveway Separation Principles

- No “open frontages” (to prevent backing out)
- Avoid driveways along right-turn lanes
- Access directed to side streets
- Access away from intersections (use driveway spacing guidelines)
Separating Conflict Points
Managing Access to Cross Streets near Interchanges

- No access allowed
- Right-Turn Access Allowed
- Queuing Distance Criteria
- No access allowed

Public Road or Access Drive
Access Management Principles

- Limit the number of conflict points
- Separate the conflict points
- Remove turning vehicles and queues from through movements
- Maintain progression speeds along arterials
- Encourage access to streets with the lowest functional classification, where this option exists
Techniques to Remove Turns and Queues from Through Lanes

- Provide exclusive turn lanes and tapers
- Apply good internal site design techniques
- Provide adequate driveway width & radius
Techniques to Remove Turns and Queues from Through Lanes

- Provide exclusive turn lanes and tapers
- Apply good internal site design techniques
- Provide adequate driveway width & radius
Provide Exclusive Right-Turn Lane

FULL RIGHT TURN LANE
Provide Exclusive Left-Turn Lane
Techniques to Remove

Turns and Queues from Through Lanes

- Provide exclusive turn lanes and tapers
- Apply good internal site design techniques
- Provide adequate driveway width & radius
Provide Adequate Driveway Throat Length

Insufficient

Adequate

Insufficient Throat Length

Adequate Throat Length
Techniques to Remove
Turns and Queues from Through Lanes

- Provide exclusive turn lanes and tapers
- Apply good internal site design techniques
- Provide adequate driveway width & radius
Provide Adequate Driveway Width and Radius

Encroachment on driveway exit lane

Path of Following Vehicle

Encroachment on through lane
Training Areas

- TECHNICAL PRESENTATION (9:30 am)
  - Overview of access management
  - **Legal authority**
  - How can you institute access management?
  - Break
  - FHWA Video: “Safe Access is Good For Business”
  - Elements of INDOT’s access management program
  - Resources available

- LUNCH (12:00 to 1:00 pm)

- WORKSHOP (1:00 pm)

- WRAP-UP (2:50 pm)
Legal Authority for Access Management in Indiana
Legal Authority in Indiana: Conclusions

- INDOT could use its existing statutory authority to:
  - Designate additional limited access facilities
  - Implement an access classification system
  - Apply access management techniques
Legal Authority in Indiana: Conclusions, cont’d.

- Common access management techniques that could be applied:
  - Purchase of access rights
  - Introduction of a median
  - Closing of a median opening
  - Eliminating left-turn access
  - Limiting or reducing the number of driveways
  - Replacing direct access with service road access
Legal Authority in Indiana: Conclusions, cont’d.

• Compensation may be required for:
  • Changes that would result in the creation of zoning violations
  • Alternative access that would substantially or materially interfere with ingress and egress
Kimco Case

- Plaza East shopping center on NE quadrant of Route 66/Green River Road in Evansville

- 3 issues:
  - Median installation
  - Reconfigured entrances
  - White edge line on the pavement
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Opportunities to Institute Access Management

- Permitting
- Road improvements
- State and local government cooperation
Opportunities to Institute Access Management, cont’d.

- Permitting
  - New developments
  - Expanded developments
INDOT Driveway Permit Process Elements

- Permit Application
- Other documentation (if necessary)
  - Permit Bond
  - Traffic Impact Analysis
  - Agreement to Execute Access Control Document
  - Future Traffic Signal Commitment
  - Covenant Limiting Land Uses
Provisions in *Driveway Permit Manual*: Number of Driveways

- Number of driveways should be a minimum to adequately serve the needs of the abutting property.
- Access should be limited to a single driveway per property unless frontage exceeds 400 feet.
- Commercial developments on the corner of a State arterial and State collector should be restricted to access on the collector only.
Opportunities to Institute Access Management, cont’d.

- Road improvements
  - Widenings
  - Intersection upgrades
  - Installing new raised medians
  - New roads
Opportunities to Institute Access Management, cont’d.

- Cooperation with local governments
  - Site plan review
  - Improved subdivision regulations
    - Larger minimum frontage
    - No more “flag” lots
  - Joint access / cross access
  - Access management plans
INDOT Access Management Plans

- Prepared an Access Management Plan (AMP) for US 31 in northern Hamilton County and Tipton County (SR 38 to SR 26)

- Currently preparing two AMPs for the following study corridors:
  - SR 135, from CR 500N to CR 700N, in Johnson County
  - SR 1 in Fort Wayne, from I-469 to Wabash River in Bluffton
SR 135 Access Management Plan

2.0 miles

4 miles

2 miles
SR 1 Access Management Plan

14.5 miles
Access Management Plans:
Conclusions and Lessons Learned

- Intergovernmental cooperation and foresight remain the key to effective access management.

- For Tier 1 limited-access highways in rural areas, INDOT may desire more stringent guidelines.

- Of the Tier 1, 2 and 3 segments examined, it was expected that few driveways would meet minimum stopping sight distances and many driveways would fall within the functional area of intersections.
Access Management Plans: Conclusions and Lessons Learned, cont’d.

- In retrofit, application of guidelines involves good engineering judgment in balancing tradeoffs between improved access control and safety.

- Most local jurisdictions need to adopt basic access management guidelines as a benchmark for effective development review.

- Local jurisdictions must determine the driveway treatment for the functional area of intersections of arterials and collectors not on the State system.
Opportunities to Institute Access Management, cont’d.

- Improving access management in Indiana involves:
  - Education of stakeholders
  - Training of technical staff
  - Institutional changes
  - Expanded local legal authority
  - Resources
Break
(5 minutes)
Training Areas

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Elements of INDOT Access Management Program

- Access Classification System
- Access spacing and related criteria
- Enhanced local coordination
- Training and education
- Applying retrofit techniques
- Other actions
Elements of INDOT Access Management Program

- **Access Classification System**
- Access spacing and related criteria
- Enhanced local coordination
- Training and education
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- Other actions
What is an Access Classification System?

A hierarchy of access categories that provides the framework for implementation of access management.
Steps in Developing an Access Management Program

- **Step 1** – Define an access classification system consisting of various access categories

- **Step 2** – Establish access management criteria for each access category

- **Step 3** – Assign an access category to all roadways and/or segments of roadways
Movement / Access Balance

Increasing Mobility for Through Movements

Increasing Access to Property

Freeway
Principal Arterial
Minor Arterial
Collector
Local Street
Cul-de-sac
Access Classification System for INDOT

- Access Classification System incorporates features from:
  - INDOT 25-Year Plan – Mobility Corridor Concept
  - INDOT Roadway Design Manual – Area Types
  - INDOT Driveway Permit Manual – Driveway Types
INDOT Mobility Corridor Hierarchy

- Statewide Mobility Corridors
- Regional Corridors
- Sub-Regional Corridors
Refinement of the INDOT Access Classification System

- Initial classification performed: all State roadways assigned an access category and associated spacing guidelines
- INDOT’s District System Assessment Engineers reviewed access categories and guidelines versus real-world conditions
- ACS was refined based on feedback received
- Districts reviewing access classifications for State highways
## Overview of INDOT Access Classification System

<table>
<thead>
<tr>
<th>Access Category</th>
<th>Type</th>
<th>Cross-Section</th>
<th>At-grade intersections</th>
<th>Commercial Major Driveways</th>
<th>Other Driveways</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interstate Highways and Freeways</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tier 1: Statewide Mobility Corridors</td>
<td>A</td>
<td>Multi-Lane</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>2-lane</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tier 2: Regional Corridors</td>
<td>A</td>
<td>Multi-lane</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>2-lane</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tier 3: Sub-Regional Corridors</td>
<td>A</td>
<td>Multi-lane</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>2-lane</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Tier 3: Sub-Regional Corridors

### Type A: Multi-Lane Roadways

<table>
<thead>
<tr>
<th>Spacing criteria</th>
<th>Urban areas</th>
<th>Rural areas</th>
<th>Access Driveways&lt;sup&gt;1,2&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Commercial Major</td>
</tr>
<tr>
<td>Permitted?</td>
<td>Yes</td>
<td>Restricted</td>
<td>Restricted</td>
</tr>
<tr>
<td>Traffic movements allowed</td>
<td>Full movements&lt;sup&gt;3&lt;/sup&gt;</td>
<td>Full movements&lt;sup&gt;3&lt;/sup&gt;</td>
<td>RIRO&lt;sup&gt;4&lt;/sup&gt;</td>
</tr>
<tr>
<td>Traffic control devices</td>
<td>Traffic signal&lt;sup&gt;5&lt;/sup&gt;</td>
<td>Traffic signal&lt;sup&gt;5&lt;/sup&gt;</td>
<td>STOP&lt;sup&gt;6&lt;/sup&gt;</td>
</tr>
<tr>
<td>Spacing criteria</td>
<td>Unsignalized spacing per Driveway Permit Manual&lt;sup&gt;7&lt;/sup&gt;</td>
<td>Unsignalized spacing per Driveway Permit Manual&lt;sup&gt;7&lt;/sup&gt;</td>
<td>Spacing per Driveway Permit Manual</td>
</tr>
<tr>
<td></td>
<td>Ideal signalized spacing = 1/2 mile&lt;sup&gt;8,9&lt;/sup&gt;</td>
<td>Ideal signalized spacing = 1/2 mile&lt;sup&gt;8,9&lt;/sup&gt;</td>
<td></td>
</tr>
</tbody>
</table>

Footnotes provide additional details.
Selected ACS Footnotes

- Driveways are to be avoided in functional area of an intersection.

- Driveways on Tier 1 highways are allowed only if no alternative access is available.

- Signal spacing is limited to ½ mile. ¼ mile spacing is acceptable for highways where speed is \( \leq 40 \) mph in built-up urban areas.

- Where existing signal spacing is less than or equal to the minimum guidelines, no additional signals are allowed without a waiver.
Elements of INDOT Access Management Program

- Access Classification System
- Access spacing and related criteria
- Enhanced local coordination
- Training and education
- Applying retrofit techniques
- Other actions
Access Spacing and Related Criteria: General Notes

- Spacing for all unsignalized intersections per AASHTO stopping sight distances (based on speed)

- Signalization allowed only at State highway intersections with:
  - Public streets
  - “Commercial Major” driveways
  - Note: All signals must meet MUTCD warrant criteria

- Cross-road access management guidelines based on intersection functional area
## Unsignalized Access Spacing

<table>
<thead>
<tr>
<th>Highway Speed (mph)</th>
<th>Minimum Spacing (feet)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>155</td>
</tr>
<tr>
<td>30</td>
<td>200</td>
</tr>
<tr>
<td>35</td>
<td>250</td>
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<tr>
<td>40</td>
<td>305</td>
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<tr>
<td>45</td>
<td>360</td>
</tr>
<tr>
<td>50</td>
<td>425</td>
</tr>
<tr>
<td>55</td>
<td>495</td>
</tr>
<tr>
<td>60</td>
<td>570</td>
</tr>
<tr>
<td>65</td>
<td>645</td>
</tr>
</tbody>
</table>

*Based on AASHTO Stopping Sight Distance (2004)*
## Traffic Signal Spacing

<table>
<thead>
<tr>
<th>Tier</th>
<th>Ideal Signalized Intersection Spacing Guideline*</th>
<th>Minimum Acceptable Bandwidth for Deviation from Ideal Signalized Intersection Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A and 1B</td>
<td>½ mile</td>
<td>Urban: 45%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rural: 50%</td>
</tr>
<tr>
<td>2A and 2B</td>
<td>½ mile</td>
<td>Urban: 40%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rural: 45%</td>
</tr>
<tr>
<td>3A and 3B</td>
<td>½ mile</td>
<td>Urban: 35%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rural: 40%</td>
</tr>
</tbody>
</table>

* A ¼-mile spacing guideline applies to State highways with speeds ≤ 40 mph located within a built-up urban area, regardless of tier.
Cross-road Access Spacing:

Intersection Physical Area vs. Functional Area

Source: INDOT Driveway Permit Manual, Figure 7-1.
Cross-road Access Spacing

Cross-road Access Spacing

Major Road Upstream Clearance

Deceleration Completed

Vehicle "Cleans" Traffic Lane, Speed Differential < 10 mph (16 km/h)

Lateral Movement Completed, Full Deceleration Begins

Begin Deceleration & Lateral Movement

Begin PIEV

\( d_1 \) = distance traveled during perception-reaction time

\( d_2 \) = distance traveled while driver decelerates and maneuvers laterally

\( d_3 \) = distance traveled during full deceleration and coming to a stop

\( d_4 \) = storage length

## Major Road Upstream Clearance

<table>
<thead>
<tr>
<th>Speed (mph)</th>
<th>Maneuver Distance&lt;sup&gt;2,6&lt;/sup&gt; (ft.)</th>
<th>PIEV&lt;sup&gt;3,4&lt;/sup&gt; Plus Maneuver Distance&lt;sup&gt;5,6&lt;/sup&gt; (ft.)</th>
<th>Limiting Conditions</th>
<th>PIEV&lt;sup&gt;6&lt;/sup&gt; Plus Maneuver Distance&lt;sup&gt;5,7&lt;/sup&gt; (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>70</td>
<td>130</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>25</td>
<td>110</td>
<td>185</td>
<td>105</td>
<td>140</td>
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<tr>
<td>30</td>
<td>160</td>
<td>250</td>
<td>145</td>
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<td>510</td>
<td>600</td>
</tr>
<tr>
<td>65</td>
<td>710</td>
<td>900</td>
<td>590</td>
<td>685</td>
</tr>
<tr>
<td>70</td>
<td>820</td>
<td>1,025</td>
<td>680</td>
<td>785</td>
</tr>
</tbody>
</table>

Example: Calculating Major Road Upstream Clearance

- **Given:**
  - Posted speed = 50 mph
  - 95\(^{\text{th}}\) percentile queue length = 100 feet (determined through intersection capacity analysis)
  - Undeveloped area

- Calculate functional length
### Example: Calculating Major Road Upstream Clearance

<table>
<thead>
<tr>
<th>Speed (mph)</th>
<th>Maneuver Distance</th>
<th>PIEV$^3,4$ Plus Maneuver Distance</th>
<th>Limiting Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(ft.)</td>
<td>(ft.)</td>
<td>Maneuver Distance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(ft.)</td>
</tr>
<tr>
<td>20</td>
<td>70</td>
<td>130</td>
<td>70</td>
</tr>
<tr>
<td>25</td>
<td>110</td>
<td>185</td>
<td>105</td>
</tr>
<tr>
<td>30</td>
<td>160</td>
<td>250</td>
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<td>70</td>
<td>820</td>
<td>1,025</td>
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</tbody>
</table>


**Functional Length = 100’ + 570’ = 670’**
Downstream Clearance Distances

# Downstream Clearance Distances

“B” and “D” based on speed and AASHTO stopping sight distance:

<table>
<thead>
<tr>
<th>Roadway Speed (mph)</th>
<th>Minimum Spacing (feet)</th>
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<tbody>
<tr>
<td>25</td>
<td>155</td>
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<td>30</td>
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</table>
Cross-road Upstream Clearance

Cross-road Upstream Clearance

- “C” = greater of:
  - Distances based on speed and AASHTO stopping sight distance (table) →
  - 95th percentile design queue length

<table>
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<th>Roadway Speed (mph)</th>
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<td>25</td>
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</tbody>
</table>
Elements of INDOT Access Management Program

- Access Classification System
- Access spacing and related criteria
- Enhanced local coordination
- Training and education
- Applying retrofit techniques
- Other actions
Need for Local Coordination

Small, uncoordinated land use decisions...

create problems over time.

When problems become apparent...

the best solutions are no longer available.
Enhanced Local Coordination

- Rezoning actions and land use approvals
- Residential subdivisions
- Commercial developments
- Site plan review
- Other intergovernmental coordination
Elements of INDOT Access Management Program

- Access Classification System
- Access spacing and related criteria
- Enhanced local coordination
- **Training and education**
- Applying retrofit techniques
- Other actions
Training and Education

- Technical workshops and short-courses for technical staff
- “Executive overview” training for non-technical staff
- Educational efforts for other stakeholders
2009 Training Dates and Locations

- **Monday, June 15: Greenfield**
  - 9:30 am to 3:00 pm
  - INDOT Greenfield District office

- **Tuesday, July 7: Vincennes**
  - 9:30 am to 3:00 pm
  - Vincennes University – 1500 Chestnut Street, Room 142

- **Wednesday, July 8: Fort Wayne**
  - 9:30 am to 3:00 pm
  - INDOT Warsaw Unit, US 30 at Fox Farm Road, Warsaw, Indiana
Elements of INDOT Access Management Program

- Access Classification System
- Access spacing and related criteria
- Enhanced local coordination
- Training and education
- Applying retrofit techniques
- Other actions
Potential for Retrofit?
Consider Retrofit Techniques

- Apply general principles of access management:
  - Limit the number of conflict points
  - Separate the conflict points
  - Remove turning vehicles and queues from through movements
  - Maintain progression speeds along arterials
  - Encourage access to streets with the lowest functional classification, where this option exists
Retrofit Techniques for Driveway Location and Operations

- Consolidate driveways/create shared access
- Coordinate driveway locations on opposite sides of roadways
- Maximize corner clearance
- Provide left-turn lanes and auxiliary lanes
- Install median barriers
- Install channelizing islands
Retrofit Techniques:
Driveway Consolidation and Relocation
Retrofit Techniques: Driveway Location Coordination
Retrofit Techniques for Roadway Design

- Construct/modify median to allow only left-turns
- Install two-way left-turn lane (TWLTL)
- Provide left-turn deceleration lane
- Provide right-turn deceleration lane
- Install right-turn deceleration lane to serve several driveways
- Install non-traversable median with left-turn deceleration lane
Retrofit Technique:
Installation of Non-Traversable Median
Retrofit Technique: Install Two-Way Left-Turn Lane
Elements of INDOT Access Management Program

- Access Classification System
- Access spacing and related criteria
- Enhanced local coordination
- Training and education
- Applying retrofit techniques
- Other actions
Prepare Access Management Plans

- Corridor-specific plans focused on high-priority problem areas (existing or potential future)
- Could be prepared for both developing areas and retrofit situations, although expected outcomes would be different
- Partnership between INDOT and locals
Purchase Access Rights

- The purchase of access rights helps INDOT manage access
- Focus on high-priority corridors
- INDOT has had projects to purchase rights in the past
- INDOT has exchanged access rights for driveway permit
Training Areas

- TECHNICAL PRESENTATION (9:30 am)
  - Overview of access management
  - Legal authority
  - How can you institute access management?
  - Break
  - FHWA Video: “Safe Access is Good For Business”
  - Elements of INDOT’s access management program
- Resources available
- LUNCH (12:00 to 1:00 pm)
- WORKSHOP (1:00 pm)
- WRAP-UP (2:50 pm)
General Resources Available

- Research reports (NCHRP and others)*
- Access Management Conference proceedings*
- Guides and handbooks*
- Outreach materials*

*www.accessmanagement.info
INDOT Resources Available

- Educational brochure
- Pamphlets
  - Do You Need Access to a State Highway?
  - INDOT and You: Partners in Access Management
- Model ordinances
- All available at: http://www.in.gov/indot/3273.htm
INDOT Access Management Guide

- Intended as a day-to-day reference manual for INDOT staff
- Intended for use in conjunction with existing documents:
  - Driveway Permit Manual
  - Applicant’s Guide to Traffic Impact Studies
  - Roadway Design Manual
INDOT Access Management Guide: Table of Contents

1) Introduction
   - Benefits, Principles

2) INDOT Driveway Permit Program
   - Process, forms and documentation

3) INDOT Access Class. System & Design Criteria

4) Access Management Techniques
   - Retrofit techniques, Access Management Plans

5) Inter-Governmental Coordination
   - Opportunities for coordination, elements of decision-making
Brochure: Improving Access Management in Indiana

- What is Access Management?
- Benefits
- Principles
- Information on INDOT Driveway Permit program
Pamphlet #1: Do You Need Access to a State Highway?

- For distribution to permit applicants
- Contains general information:
  - Why a permit is needed
  - Permit process and fees
  - Web-links to forms & documents
  - Contact information for INDOT District Offices
Pamphlet #2: *INDOT and You: Partners in Access Management*

- For distribution to local governments
- Contains general information:
  - What is Access Management?
  - Why do it? Benefits?
  - “10 Ways to Manage Access”
  - Web-links
  - Contact information for INDOT District Offices
Model Ordinances

- Land use actions generally beyond the direct control of INDOT
- Ordinance provides guidance to local governments
- Tool to help implement access management on the local level
Access Management
Workshop Preview
Workshop Overview

- State Trunk Highway (STH) 50 in SE Wisconsin:
  - Major east-west arterial in growing corridor
  - Connects I-94 to the west with established city (Kenosha, WI) to the east
  - WisDOT is studying a 5-mile section
  - High volumes and high crash rates
  - Frequent operational problems
Study section:

- Most critical segment within corridor
- Approximately 4,000 feet long
- Between Union Pacific Railroad and 57th Avenue
- Land use includes retail and residential
- Roadway has a 4-lane divided cross-section
- Right-of-way width averages 200 feet
- Large (50 acres±) undeveloped parcel
Access Management Workshop
Workshop Overview, cont’d.

- **Condition map (4 panels, scale 1”=200’):**
  - Panel 1 (top) – Existing Corridor Conditions (aerial)
    - Street names and land uses
    - Driveway locations
    - Lane configurations and type of traffic control at street intersections
  - Panel 2 – Existing Traffic Conditions
    - AM and PM peak hour turning movement volumes at key intersections
    - AADT volumes
    - Speed limit (40 mph)
Workshop Overview, cont’d.

- **Condition map (4 panels, scale 1”=200’):**
  - Panel 3 – Crash Analysis
    - Bubbles indicate 2-year summary of crashes
    - Accident types also shown
  - Panel 4 (bottom) – Base Map
    - Existing median breaks
Workshop Overview, cont’d.

- **Aerial photos:**
  - Initial aerial photo (1”=200’ scale)
    - Extends east and west of study area
    - Extends approximately 1,600 feet north and south of STH 50
  - Recent aerial photo (1”=400’ scale)
    - Includes Route 31 intersection
    - Identifies 50 acre parcel
Assignment:

- How could access management be implemented in areas that are already developed?
- How can access management be incorporated into future developments?
- Can a continuous secondary street system be developed north and/or south of STH 50?
- Where should access be provided to the 50 acre parcel? What changes are needed to the local street system? How should the internal circulation system be configured?
Access Management Workshop
Suggested Options

How could access management be implemented in areas that are already developed?

- Develop secondary road system.
- Remove or consolidate driveways.
- Close median openings near intersections.
Suggested Options, cont’d.

- How can access management be incorporated into future developments?
  - Establish coordination between transportation and land use agencies.
  - Expand secondary road system.
  - Provide for interconnections between parcels.
  - Implement shared access.
  - Provide for alternative access.
Suggested Options, cont’d.

- **Access to 50 acre parcel:**
  - Develop access management plan.
  - Emphasize access management in site plan review.
  - Extend 71\textsuperscript{st} Avenue south to STH 50, and relocate traffic signal.

- **Provide access to STH 31:**
  - Extension of 78\textsuperscript{th} Street.
  - Extension of 79\textsuperscript{th} Street.

- Extend new street to southern boundary of 50 acre parcel.
Suggested Options, cont’d.

Texas U-Turn
Suggested Options, cont’d.

Michigan U-Turn
Wrap Up
For more information...

TRB Access Management website:

http://www.accessmanagement.info/

Indiana Access Management Study:

http://www.in.gov/indot/3273.htm
Questions