

# Access Management Principles and Practices

Bill Eisele, Ph.D., P.E.  
Bill Frawley, AICP  
Texas A&M Transportation Institute



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## Access Management Principles and Practices

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## Learning Objectives

- 1) Discuss basic principles of access management.
- 2) Summarize safety benefits and economic impact research findings associated with raised medians and access point density.
- 3) Apply various access management techniques.



## Meet Your Instructors



**Bill Eisele**  
Senior Research Engineer  
Texas A&M Transportation  
Institute  
College Station, TX, USA



**Bill Frawley**  
Research Scientist  
Texas A&M Transportation  
Institute  
Arlington, TX, USA



## Course Objectives

- Know basic principles of access management
- Summarize safety benefits and economic impact research findings associated with raised medians and access point density
- Apply various access management techniques



## Course Overview

1. What is access management?
2. What are the typical treatments?
3. Why do we do access management?
4. How do we implement access management?
5. Resources / contact information



## Session 1

# What is Access Management?



## What is Access Management?

*“...the systematic control of the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway.”*



Source: Transportation Research Board, Access Management Manual



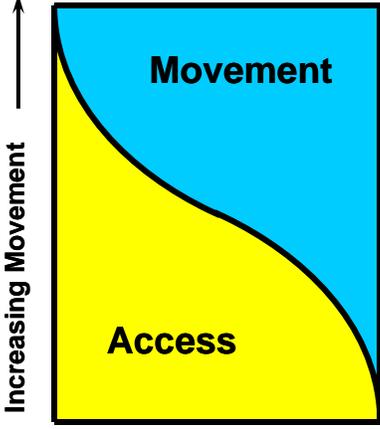
## What is Access Management?

- Balances access to land with traffic mobility needs
  - Works with functional classification hierarchy
- Set of tools to help protect public investments in roadways and improve safety




## Hierarchy of Roadways in a Functionally Designed System

Increasing Movement



Increasing Access

**Functional Class**

**Freeway**

**Principal Arterial**

**Minor Arterial**

**Major Collector**

**Minor Collector**

**Local**

**Cul-de-Sac**




## Functional Hierarchy



Source: Texas A&M Transportation Institute



## Why Use Access Management?

- Improve Public Safety
- Enhance Mobility
- Preserve Functional Classification Integrity
- Protect Infrastructure Investment



## 10 Principles of Access Management: Safety is Focus!

1. Ensure functional integrity
2. Limit direct access to major roadways
3. Promote intersection hierarchy
4. Locate signals to favor through movements
5. Preserve the functional area of intersections/interchanges



Source: TRB AM Manual, see student supplement



## 10 Principles of Access Management: Safety is Focus!

6. Limit the number of conflict points
7. Separate conflict areas
8. Remove turning vehicles from through-traffic lanes
9. Use nontraversable medians to manage left-turn movements
10. Provide a supporting street and circulation system



Source: TRB AM Manual, see student supplement



# ACCESS MANAGEMENT IS NOT ONE-SIZE-FITS-ALL



## Session 2

# What are the Typical Treatments?



## Primary treatments include...

Location, spacing and design of..

- Unsignalized intersections
  - Cross streets
  - Driveways (are intersections too!)
- Raised medians and median openings
- Deceleration / acceleration lanes
- Signalized intersections

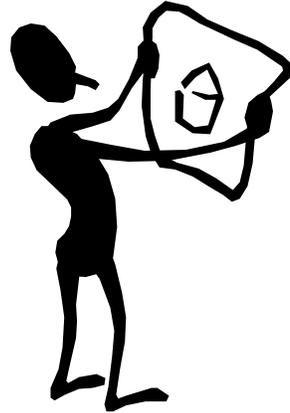


## Unsignalized Intersections

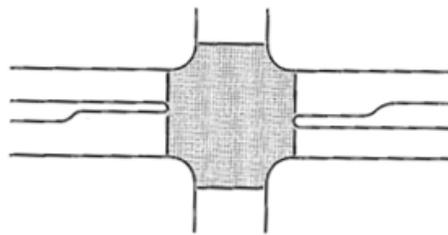


## Unsignalized Access Spacing

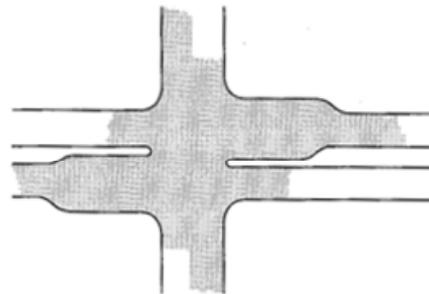
- Engineering considerations:
  - Functional intersection area
  - AASHTO guidance
  - Stopping sight distance
  - Case-by-case
    - Not a cookbook process!



## Functional Area of an Intersection (vs. Physical Area)



Defined by Physical Area



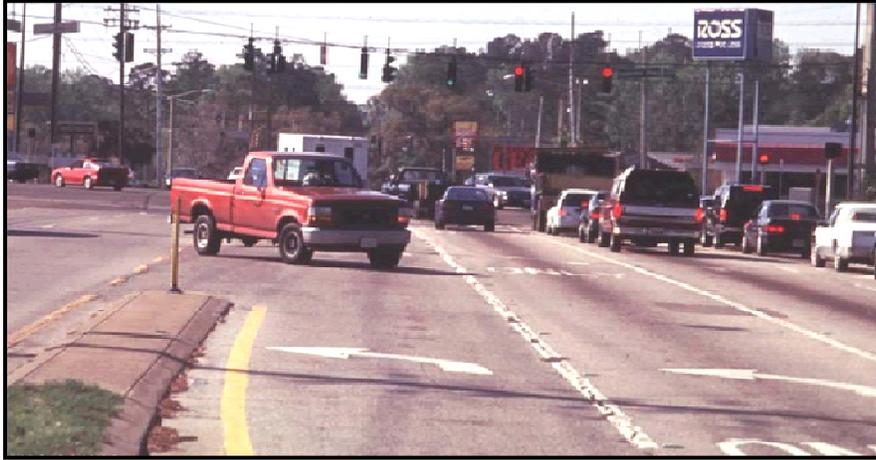
Defined by Functional Intersection



Source: AASHTO Green Book



## Inappropriate Median Opening



Source: Texas A&M Transportation Institute



## Queuing Through Signal



Source: Texas A&M Transportation Institute



## Poor Signal Spacing

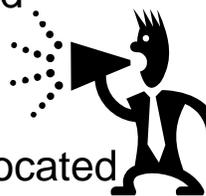


Source: Texas A&M Transportation Institute



## AASHTO Says

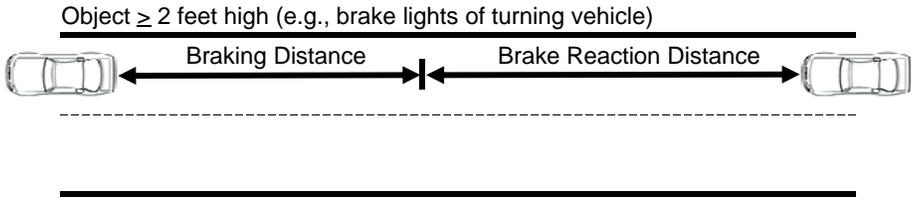
- Intersection functional areas extend beyond the physical boundaries
- “Ideally, driveways should not be located within the functional area of an intersection or in the influence area of an adjacent driveway”



(AASHTO, 2011, “Green Book”, page 9-4)



# Stopping Sight Distance



Source: Texas A&M Transportation Institute



# Good Corner Clearances



Source: Texas A&M Transportation Institute



## What Are We Trying to Fix/Avoid?



The photograph shows a street intersection with several white arrows pointing to specific areas of concern: a crack in the pavement, a curb cut, and a transition in pavement types. In the background, there are signs for 'WASH', 'STIHL', and '4 & 5 CHAIR BATH SHOP'.

 Source: Texas A&M Transportation Institute 

## No Direct Access to Arterial Street



The photograph shows a wide, multi-lane arterial street with a Burger King and Wal-Mart in the background. The street is mostly empty, illustrating a lack of direct access to the arterial street.

 Source: Texas A&M Transportation Institute 

## Raised Medians and Median Openings



### Why and When to Consider a Raised Median

- Play critical role of operations and safety of roadway
- Roadways where aesthetic considerations are a high priority
- Multilane roadways with a high level of pedestrian activity
- High crash locations or where it is desirable to limit left turns to improve safety
  - Clear safety benefit



Source: TRB AM Manual



## Keep in Mind . . .

- Need adequate locations and width to handle U-turns
  - Can flare intersections or use loons
  - Alternative U-turn treatments
- Alternate routes to handle delivery truck traffic



Source: Texas A&M Transportation Institute



## Busy Two-way Left-turn Lane



Source: Texas A&M Transportation Institute



# Pedestrian Safety



Source: Texas A&M Transportation Institute



# Raised Median in Advance of Development



Source: Texas A&M Transportation Institute



## Landscaping and Pavers



 Source: Texas A&M Transportation Institute 

## Raised Median / Cross Access



 Source: Texas A&M Transportation Institute 

## RM with Landscaping and Turn Bays



Source: Texas A&M Transportation Institute



## Retrofit Directional Openings



Source: Texas A&M Transportation Institute



## Raised Median Openings

- Provide selected access
- Consider directional openings to limit access
- Opening could be signalized locations in the future



Photo Source: City of Garland, Texas



## Use of a "Loon"



Mid-block flair with only two lanes (Salem, OR)



Source: Texas A&M Transportation Institute



# Jug-Handle



Left-turn and then merge with traffic (New Jersey)



# Michigan U-turn (1 of 3)



Source: Texas A&M Transportation Institute



## Michigan U-turn (2 of 3)



 Source: Texas A&M Transportation Institute 

## Michigan U-turn (3 of 3)



 Source: Texas A&M Transportation Institute 

# Michigan U-turn



*Suburban Detroit, MI*



Source: Texas A&M Transportation Institute



# Acceleration and Deceleration Lanes



## Deceleration Lane Need



Source: Texas A&M Transportation Institute



## Turn Lanes



Separate Speed Differential and Create Safe Havens



Source: Texas A&M Transportation Institute



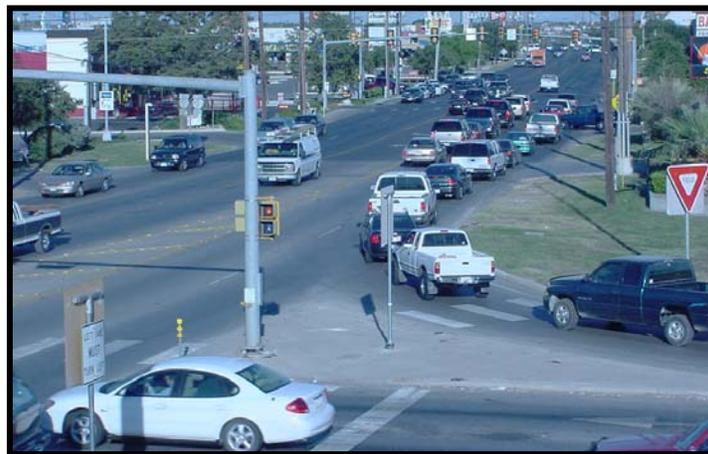
## Acceleration / Deceleration Lanes



Source: Texas A&M Transportation Institute



## Poor Signal Spacing



Source: Texas A&M Transportation Institute



# Roundabouts



# Roundabouts

- Intersection treatment
- Issues include access control/design:
  - Into the roundabout itself
  - Near the roundabout

Source: NCHRP Report 672 (Roundabouts: An Informational Guide, 2<sup>nd</sup> Ed)



## Poll Question

How would you characterize the use of roundabouts in your agency/community over the last few years?

- a) Roundabouts not generally used
- b) Roundabout use generally decreasing
- c) Roundabouts used with same frequency
- d) Roundabout use generally increasing



## Session 1 & 2

Questions?



## Session 3

# Why Do We Implement Access Management?



## Safety

- Reducing conflict points reduces crash potential
- ~ 50% of all crashes are intersection-related
  - Driveways are intersections, too!
- Increase driver expectancy

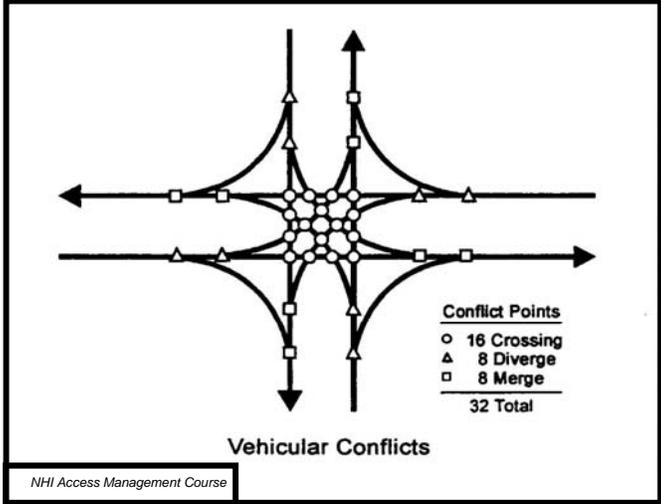


# Safety

## Conflict Points



# 4-Leg Intersection Conflict Points

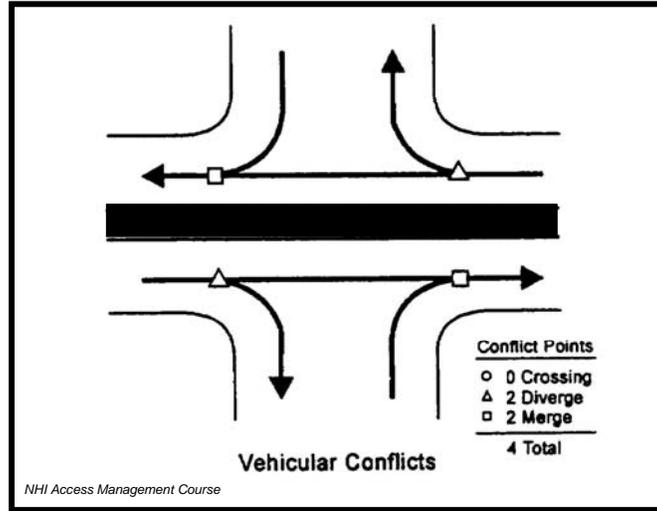


Vehicular Conflicts

NHI Access Management Course



## Conflict Points with Raised Median



NHI Access Management Course



## Safety - Reduce Conflict Points



Source: Texas A&M Transportation Institute



## Safety - Reduce Crashes



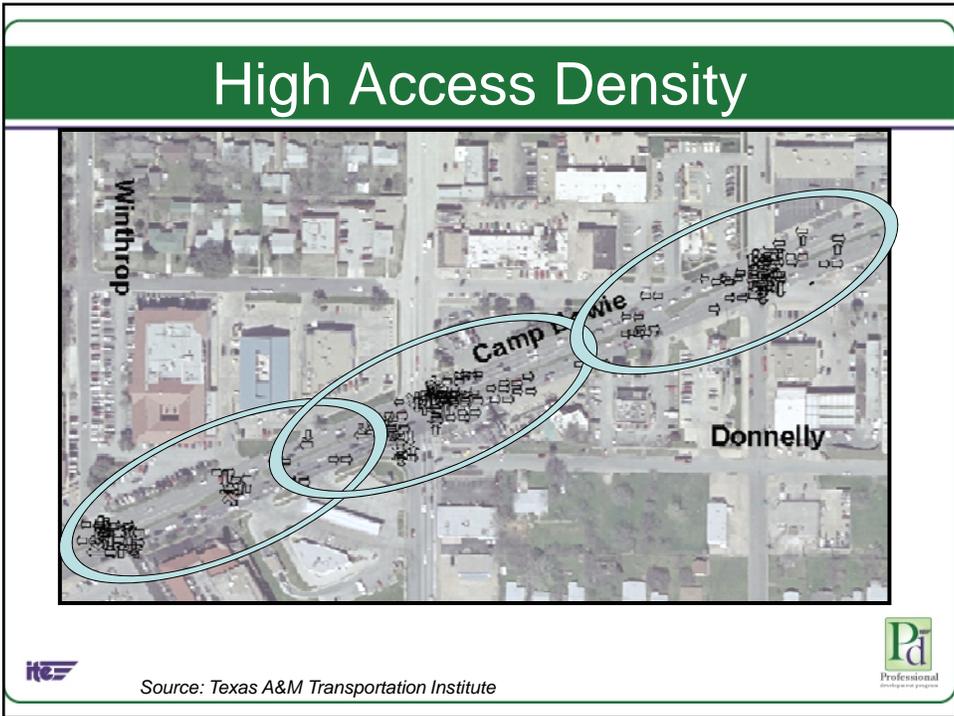
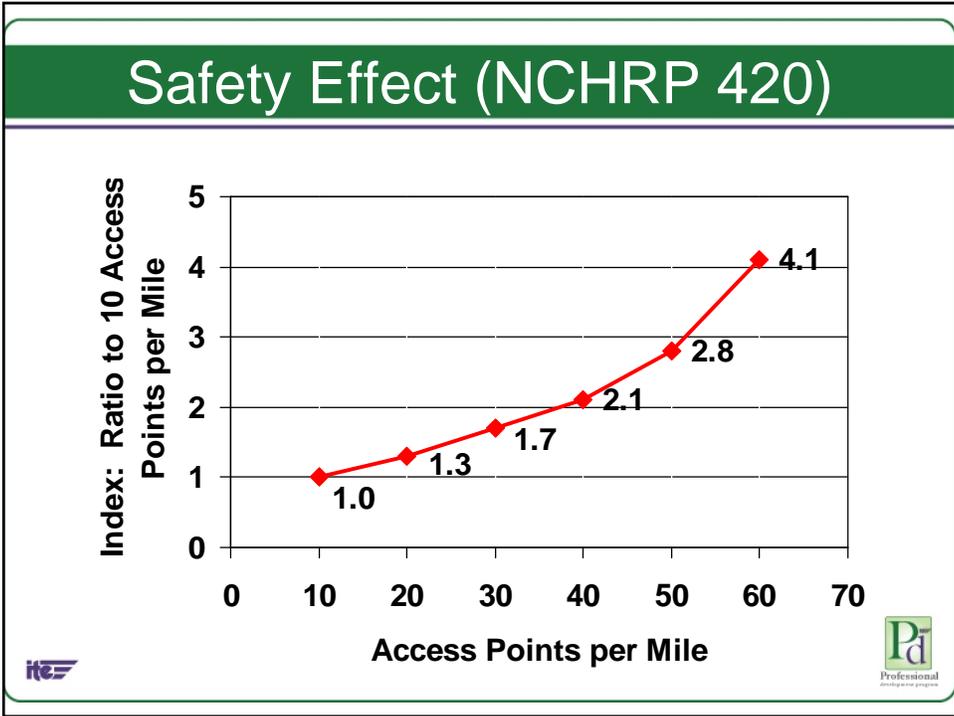
Source: Texas A&M Transportation Institute



## Safety

### Access Density





## Low Access Density—Same Street





Source: Texas A&M Transportation Institute



## Safety

### Raised Medians





## Crash Rates (NCHRP 420)

### Representative Crash Rates (Crashes per Million VMT) by Type of Median – Urban and Suburban Areas

Total Access Points per Mile	Median Type		
	Undivided	Two-Way Left-Turn Lane	Non Traversable Median
<20	3.8	3.4	2.9
20.01-40	7.3	5.9	5.1
40.01-60	9.4	7.9	6.8
>60	10.6	9.2	8.3
<b>Average Rate</b>	<b>9.0</b>	<b>6.9</b>	<b>5.6</b>

## Mobility

Travel Time

## Mobility

- Allow through traffic to move more efficiently (less “stop and go” traffic)
- Preserve roadway capacity
- Separate speed differentials
- Less braking and hard acceleration
- Reduce fuel consumption/emissions



## Access Points and Free-flow Speed

<b>Access Points and Free-flow Speed</b>	
Access points per mile	Reduction in free-flow speed, mph
0	0.0
10	2.5
20	5.0
30	7.5
40 or more	10



Source: NCHRP 420



<b>Travel Time and Signal Density</b>	
<b>Percentage Increase in Travel Times as Signal Density Increases</b>	
Signals per Mile	Percent Increase in Travel Times (compared with 2 signals per mile)
2.0	0
3.0	9
4.0	16
5.0	23
6.0	29
7.0	34
8.0	39

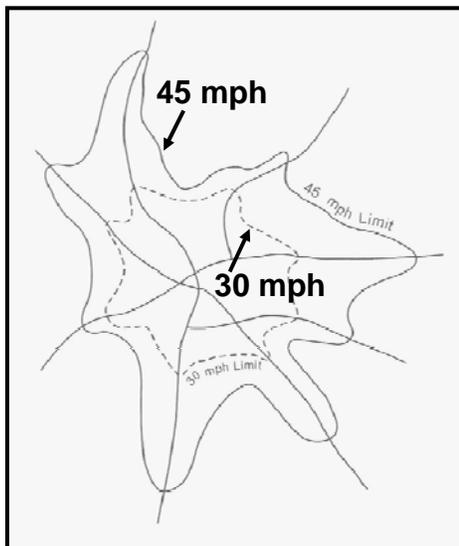
Source: NCHRP 420

## Economic

# Findings



## Economic Effects



- Market area is important to business success
  - Reduction of travel speeds means smaller market areas

Source: ITE Transportation and Land Development



## Economic Effects

- Access management techniques, in general, are not directly related to retail sales
  - Texas, Florida, Kansas, Iowa
- Poorly designed access treatments can present traffic hazards and congestion that create a negative image of a center
  - Shopping Center Development Handbook, Urban Land Institute
- FHWA *Safe Access is Good for Business*
  - Primer and Video



## Economic Effects

- Research in Texas - raised medians have no direct impact on retail sales in general
- Issues that businesses can control are more vital to success
  1. Product Price
  2. Product Quality
  3. Customer Service
  4. Access to Store
  5. Distance to Travel
  6. Hours of Operation



Source: TTI Report 3904-4



## Other Benefits



## Other Benefits of Access Management

- Financial – reduce need for “double and triple bypasses”
- Promote properly designed access and circulation systems by development community
- Aesthetics – landscaping and overall appearance
- Pedestrian and bicycle safety



## Session 3

Questions?



## Session 4

# How Do We Implement Access Management?



## Local Government Partnerships

- Coordination and cooperation in development and access review critical
- Ensures all agencies are “on the same page”
- Facilitates implementation consistency



## Local Agency Coordination

- Look for opportunities for coordination
  - Focus on the reasons for doing AM
  - Provide reasonable access
- Typically, local areas have authority the State does not have
  - Land use controls
  - Important to work with local jurisdictions
- State level legislative authority varies



## Poll Question

*Would you characterize that your agency/community has state-local coordination on access management elements?*

- “Yes” or “No”



## Reasonable Access

### Example Definition:

- *The minimum number of connections, direct or indirect, necessary to provide safe ingress and egress to the State Highway System based on the access classification, projected connection and roadway traffic volume, and type or intensity of the land use.*



Source: Florida DOT



## Promote Local Government Partnerships

### San Antonio Example – Plats

- Developer submits plats to TxDOT
- Developer and TxDOT work out issues
- TxDOT keeps track of number of allowed driveways per plat
- TxDOT provides comments to city
- City includes comments on final plat



## Promote Local Government Partnerships

### San Antonio Example – Driveways

- Developer submits permit request to TxDOT
- TxDOT staff verifies number of driveways against plat approval letter
- Keep ledger of driveways approved per plat
- Area engineer approves or denies driveway permit



## Access Easements



Source: Texas A&M Transportation Institute



## Cross Access



- Reduce Conflict Points
- Increase Driveway Spacing



Source: Texas A&M Transportation Institute



## Future Cross Access



Source: Texas A&M Transportation Institute



# Corridor Access Management Plans



## Corridor Access Management Plan

- State and local governments adopt agreement
- All future access in conformance
- Modifications approved by
  - State
  - Affected local governments
- Employs regulatory authority and design elements

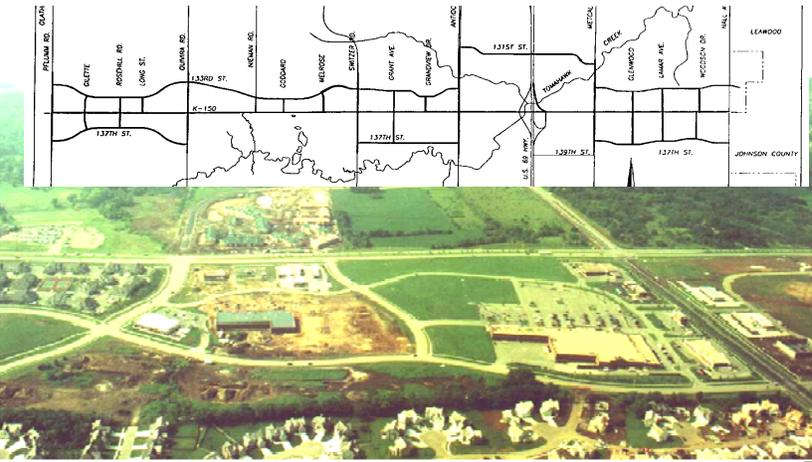


## Relatively Common

- Michigan
- Kansas
- Texas
- Florida
- Others
  
- Sometimes termed “corridor plans” and include an access component




## Corridor Access Plan Example



**Overland Park, KS**



Source: Stuecheli, 1996, 2<sup>nd</sup> National AM Conference



## Corridor Access Management Plan

- Greater Houston Area
  - Westheimer Road (FM 1093)
  - FM 518
  - FM 1960
  - FM 2920
- Available <http://www.h-gac.com/>



## Session 4

Questions?



## Session 5

# Resources and Contact Information



## Resources: Supplement

Further discussion of:

- Photographic examples
- Conflict points and relationship to crashes
- Safety and economic analysis results



## Resources

- TRB Access Management Committee Internet Site  
– <http://www.accessmanagement.info>
- TRB, *Access Management Manual*
- AASHTO, Green Book
- NCHRP Report 420, *Impacts of Access Management*
- NCHRP Report 672, *Roundabouts: An Informational Guide, 2<sup>nd</sup> Edition*
- Texas A&M Transportation Institute  
– <http://tti.tamu.edu>



## ITE Resources

- *Transportation and Land Development, 2<sup>nd</sup> Edition*
- *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach*
- *Promoting Sustainable Transportation Through Site Design*
- *Urban Street Geometric Design Handbook (Chapter 3)*
- *Informational Report on Separated Bikeways*
- *Accommodating Pedestrians and Bicyclists at Interchanges (Draft Recommended Practice)*



## Contact Info

Bill Eisele, Ph.D., P.E.  
Texas A&M Transportation Institute  
979/845-8550  
bill-eisele@tamu.edu

Bill Frawley, AICP  
Texas A&M Transportation Institute  
817/462-0533  
w-frawley@tamu.edu



## Questions?



## Thank You!

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Questions/Comments  
Professional Development Department  
ITE  
1627 Eye Street NW, Ste 600  
Washington, DC 20006  
202-785-0060 ext. ;fax: 202-785-0609; [pdinfo@ite.org](mailto:pdinfo@ite.org)

