Applying Access Management Principles to Existing Roadways

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2

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Access Management Principles and Practices

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Meet Your Instructors

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Course Objectives

- Define access management.
- Recommend successful techniques for applying access management retrofits when adequate right-of-way is available or limited.

Course Overview

1. What are typical regulatory capabilities of different agencies related to access management implementation?
2. How can corridor (access) management plans facilitate implementation?
3. What are design opportunities when space is limited (and when space is adequate)?

Session 1

What Are Typical Regulatory Capabilities of Different Agencies Related to Access Management Implementation?

How Can We Avoid Limited ROW Problems?

- Identify a common desire for a safe and efficient transportation system
- Coordination and cooperation between local and state agencies
- Efficiently use the strengths of each agency

Providing Reasonable Access

- Common “Guiding Principles” for state implementation of access management
  - Safety
  - Transportation and land development must exist together
  - Key for economic vitality

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.*

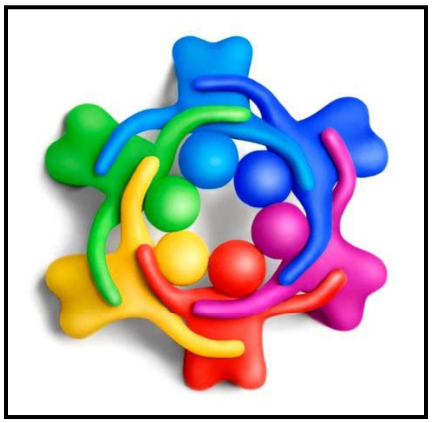
Source: Florida DOT

Agency Coordination

- Need for coordination and cooperation in development and access review
- Facilitates…
  - all agencies are “on the same page”
  - developer gets consistent message/requirements
  - implementation consistency

Local Agency Coordination

- Look for proactive opportunities for coordination
  - Focus on the reasons for doing AM (key themes)
    - Safety, operations, while providing reasonable access



Local Agency Coordination

- Local agencies have policing authority the State does not have
  - City, county, and townships can have land use controls (varies by state)
  - Important to work with local jurisdictions

Typical City Regulations / Ordinances

- Platting requirements
  - Within subdivision regulations
- Access easements
- Redevelopment provides opportunities to review access
- Overlay zoning (districts)

Subdivision Process

- Subdivision - *the division of land into two or more parts for the purpose, whether immediate or future, of sale, division of ownership, or building development*
- Regulates conversion of undivided land
- Establishes requirements for infrastructure (location, size and standard)

Source: TTI Research Report 0-4429-1

Why is Platting Important?

- Manage development
- Tool to implement plans and regulations
- Provide legal record
- Protection for future property purchaser
- Ensure compliance with local plans for infrastructure extension

Source: TTI Research Report 0-4429-1

Early State and City Coordination

- Involvement needed in <u>preliminary</u> plats to:
  - Manage access
  - Coordinate thoroughfare planning
  - Protect and preserve state ROW

Source: TTI Research Report 0-4429-1

Platting Involvement to Manage Access

- Assist in planning / management of driveways through plats
- Review parcel frontage lengths when properties subdivide
  - Prevent platting that would allow proliferation of driveways
  - State DOT work with local agencies require access easements
- Early / effective means to manage driveways along corridors

Source: TTI Research Report 0-4429-1

Access Easements in Local Codes…

- Example Code: *"A joint access easement may be required between adjacent lots fronting on arterial or collector streets in order to minimize the number of access points along those streets and to facilitate traffic flow between lots."*
- Types
  - Shared / joint easements
  - Cross-access easements

Source: TTI Research Report 0-4429-1

When Can Cities Review Access?

Possible Opportunities….

- New development or redevelopment
- Local ordinance example:
  - *Driveway permits will be required for any significant structure change, land use change, or property boundary change…*
    - Can reduce number of driveways
    - Can change location of driveways

Source: TTI Research Report 0-4429-1

San Antonio, Texas Example

- Plat review process in place since early 1990s
- City requires plat go to TxDOT first—then submitted to the city
- TxDOT's performs review and provides comments to city
- City includes appropriate comments as approval conditions

Source: TTI Research Report 0-4429-1

San Antonio, Texas Example

- AM is primary purpose for coordination
- District notes number of driveways on the plat (due to frontage)
- Driveway permits (total number) are reconciled with plat

Source: TTI Research Report 0-4429-1

San Antonio, Texas Example

- Developer required to submit an approved plat with driveway permit application
  - Must include construction plans
- District also reviews:
  - Sidewalks, noise and drainage, recharge zone issues, ramp locations, and ROW
- Informal process: no formal agreement in place

Source: TTI Research Report 0-4429-1

A Success Story: Shopping Center with Out-Parcels

Source: Texas A&M Transportation Institute

Plat Considered Future ROW

- Good Parking Setback
- Good Driveway Throat Depth
- No Loss of Improvements in Future Widening

Source: Texas A&M Transportation Institute

State Involvement in Site Plan Review

- Review all site plans adjacent to state roads
- Work with locals to ensure site developed in accord with plan, plat, and regulations
- Ensure site layout considers future widening / rehab plans
- Coordinate early, well before driveway permit

Source: TTI Research Report 0-4429-1

Site Plan Review Elements

- Review location, spacing, and design of access and opportunities to consolidate
- Review other site elements impacting State interests
  - Setbacks, building and parking
  - Circulation, potential off-site queuing
  - Drainage
  - Landscaping
  - Signage

Source: TTI Research Report 0-4429-1

State DOT Development Review as a Routine Work Activity

Lessons for Success

- Should be a routine / consistent work activity
- Element of local agency process
- Overseen by engineer or planning staff member
  - Needs authority to make decisions on behalf of the state and represent agency at local development meetings
- Level of staff needed is a function of “district / region” size / extent of development activity

Source: TTI Research Report 0-4429-1

The Power of Local Controls

Some municipalities have architectural ordinances

Source: Texas A&M Transportation Institute

Discussion Questions

- Do any participants have experience working with access management ordinances?
- Does anyone have an example of other interesting types of local ordinances that control or regulate land development?

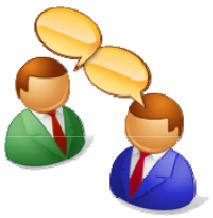
Session 2

How Can Corridor (Access) Management Plans Facilitate Access Management Implementation?

Poll Question

Has your state/city performed access management plans or corridor management plans with an access management component?

a) Yes
b) No

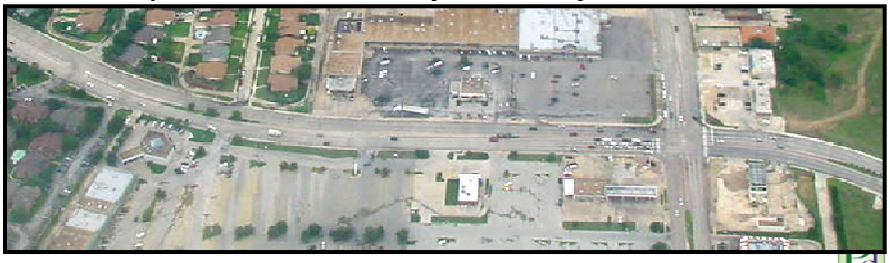


Corridor Access Management Plan

- State and local governments adopt agreement
- All future access in conformance
- MPOs can adopt plans and supporting resolutions
- Modifications approved by
  - State, all affected local governments

Corridor Access Management Plan

- Preservation for roadway segment
- Priority corridors
  - High volume
  - Safety concerns
  - Important connectivity / mobility



Source: Texas A&M Transportation Institute

Corridor Access Management Plan

- May include the following elements
  - Existing and future access
  - All major access elements
  - Parcels with highway segment frontage
  - Bicycle / ped amenities and associated safety implications
  - Transit facility considerations
  - All supporting technical materials

Corridor Management Tools/Techniques

More specifically….

1. Access management
2. Acquisition of access rights
3. Non-traversable medians
4. Signalized intersection location and spacing
5. Arterial frontage and backage roads
6. Lot dimension requirements
7. Zoning overlay districts

Source: TTI Research Report 0-5606-1

Corridor Management Tools/Techniques

More specifically (continued)….

8. Enhanced building and parking setbacks
9. Regulation of driveway throat length
10. Internal access for outparcels
11. Local street connections adjacent to state roadways
12. ROW dedication/reservation through platting
13. Joint and shared access easements
14. Operational measures and ITS

Source: TTI Research Report 0-5606-1

Corridor Zoning Overlay Districts

- One of the best corridor management tools
- Supplemental regulations which overlay zoned property along a specified corridor
- Existing requirements of the base (primary) zoning district of each parcel retained
- Allows ‘corridor-wide’ in lieu of ‘site’ approach
- Commonly used

Source: TTI Research Report 0-5606-1

Key Items That Can Be Used in Overlays

Those with direct transportation benefits

- Access plan, future access points
- Increased driveway throats
- Internal connections between parcels
- No direct access to outparcels
- Increased setbacks

Others

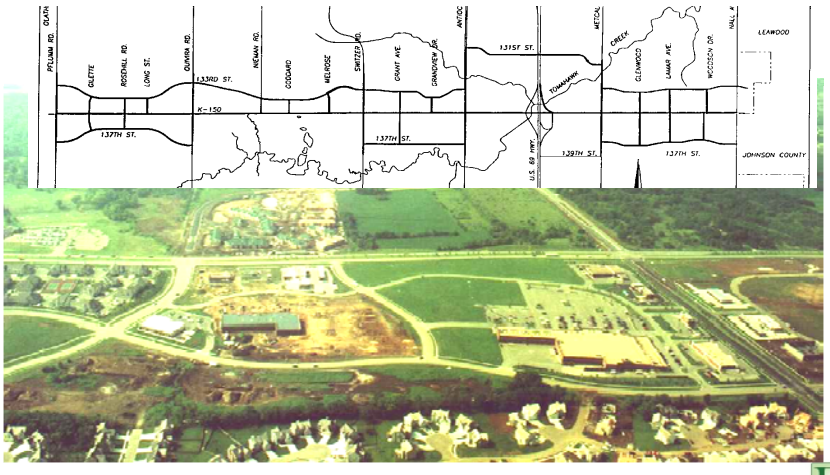
- Land use prohibitions, intensity regulations
- Utility placement
- Aesthetics

Source: TTI Research Report 0-5606-1

Corridor Access Management Plan

- Many examples across the country
  - Kansas
  - Michigan
  - Texas
  - Florida
  - Others

Corridor Access Plan Example



Overland Park, Kansas

Source: Stuecheli, 1996, 2nd National AM Conf

Corridor Access Management Plan—Michigan

- Statewide Program in 2002
- 30+ Access Management Plans
  - Zoning overlay (that follows AM plan)
  - Site planning coordination flowchart
- Obtain “buy-in” from local agencies
  - Townships
  - Cities
  - County Road Commissions

Session 3

What are Design Opportunities When Space is Limited (and When Space is Adequate)?

What Can Be Done By Design?

Limited ROW / Retrofits…

- Driveway consolidation
  - Negotiated with property owners
- Barrier treatments
  - Channelization, medians of narrow width
  - Curbing, pylons/reflectors
  - Loons
- Acceleration / deceleration lanes

Residential Access to Arterials

Something to prevent on new roads; and to address on existing – creative driveways?

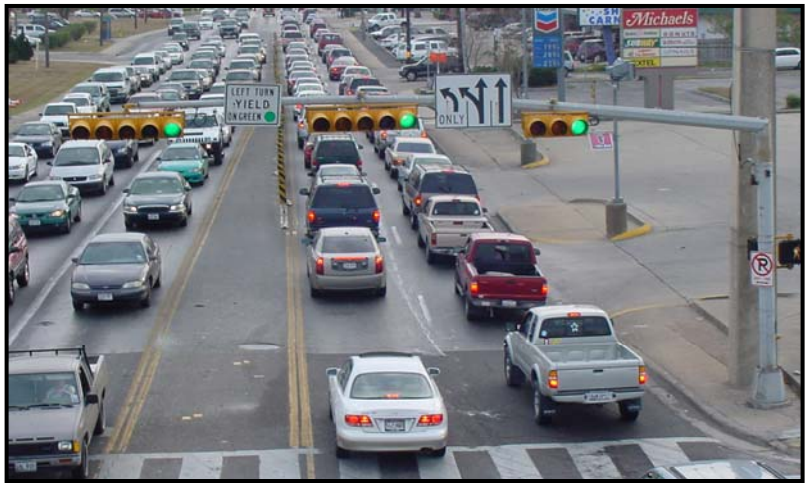
Source: Texas A&M Transportation Institute

Flexible Pylons to Control Left-Turns

As a temporary, test, or low-cost alternative to raised medians

Source: Texas A&M Transportation Institute

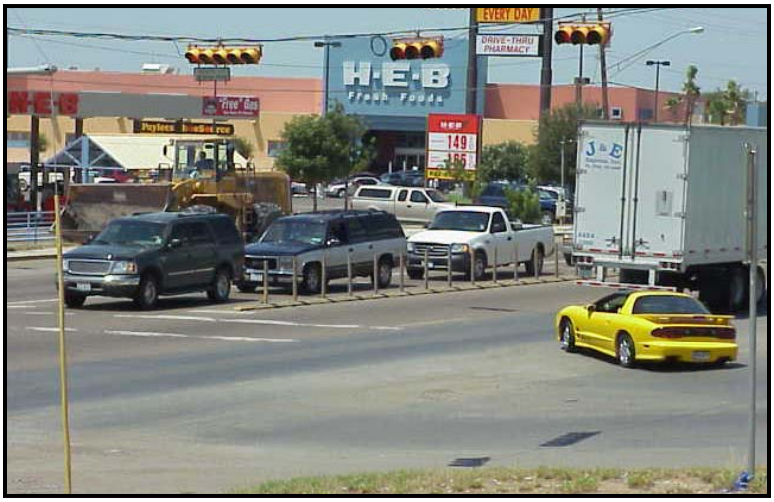
Flexible Reflectors on Undivided Street



Physically prevent left-turns on arterial street

Source: Texas A&M Transportation Institute

Pylons at Signalized Intersection



Source: Texas A&M Transportation Institute

Pylons Restricting Shopping Center Access

Source: Texas A&M Transportation Institute

Pylons to Restrict Left-turn Access

Photo courtesy City of College Station, Texas

Pylons to Close Raised Median Opening

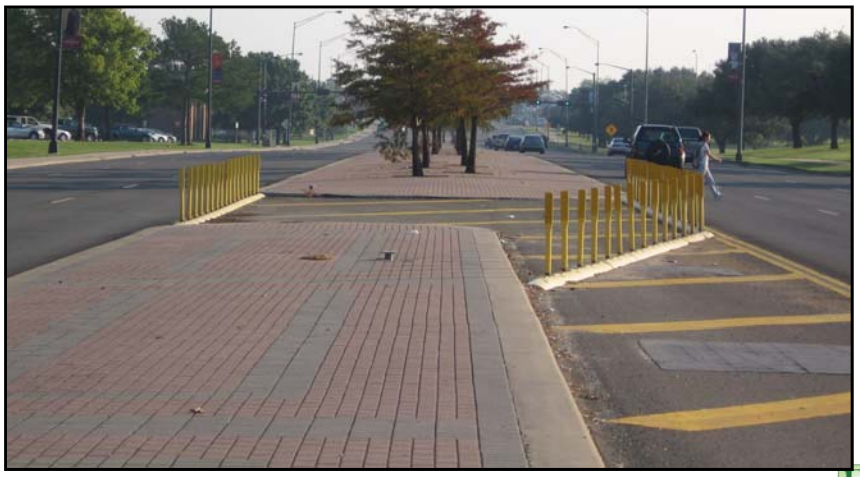


Photo courtesy City of College Station, Texas

Retrofit Raised Median to Replace TWLTL

Fixing Functional Intersection Area Overlap…

Photo courtesy City of College Station, Texas

Retrofit Raised Median to Replace TWLTL

Fixing Functional Intersection Area Overlap…

Photo courtesy City of College Station, Texas

Narrow Raised Median Retrofit

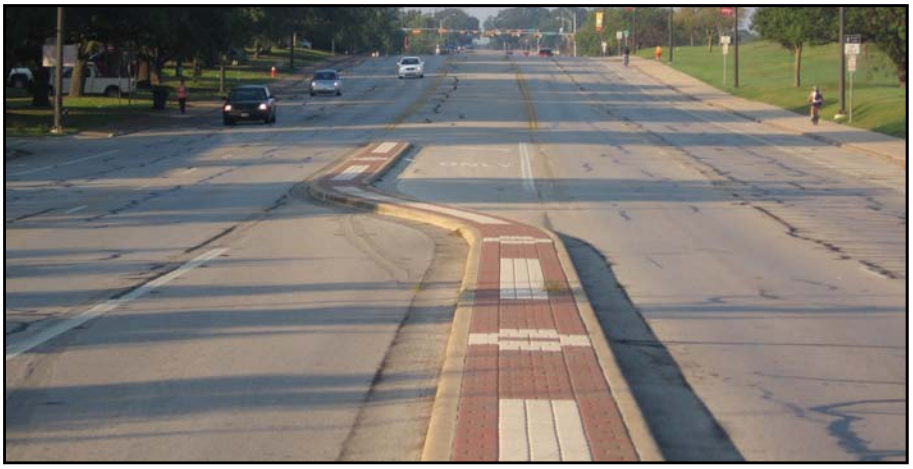


Photo courtesy City of College Station, Texas

An Alternative with Constrained ROW

- Mid-block U-Turns with constrained ROW
- Use of loons and flared intersections

Poll Question

Has your state/city implemented, or are they planning to implement, alternative left-turn treatments?

a) Yes
b) No

Median U-Turn Intersection Treatment

Advantages…

- Reduced delay and better progression for through traffic on the major arterial
- Increased capacity at the main intersection
- Fewer stops for through traffic
  - Especially if STOP-controlled directional crossovers

Source: FHWA-HRT-07-033 TechBrief

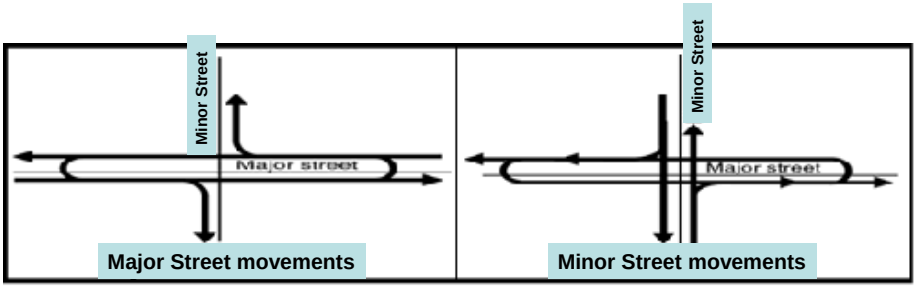
Median U-Turn Intersection Treatment

Advantages…

- Reduced risk to crossing pedestrians
- Fewer and more separated conflict points
- Two-phase signal control allows shorter cycle lengths
  - More flexibility in traffic signal progression

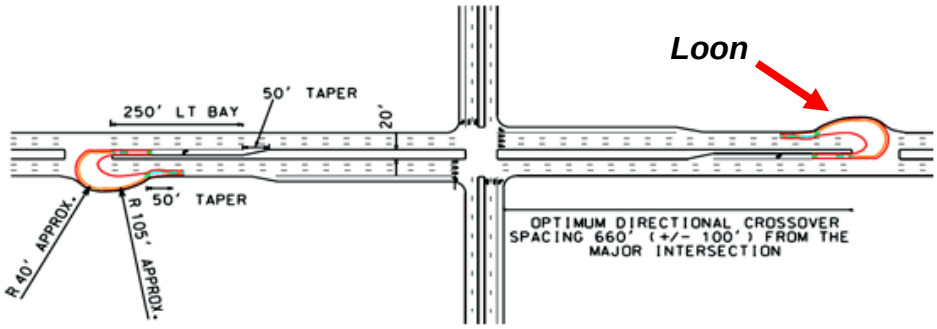
Source: FHWA-HRT-07-033 TechBrief

Vehicular Movements at Michigan U-turn



Source: FHWA-HRT-07-033 TechBrief

Loon Implementation Schematic



Note: U-Turn locations could be signalized

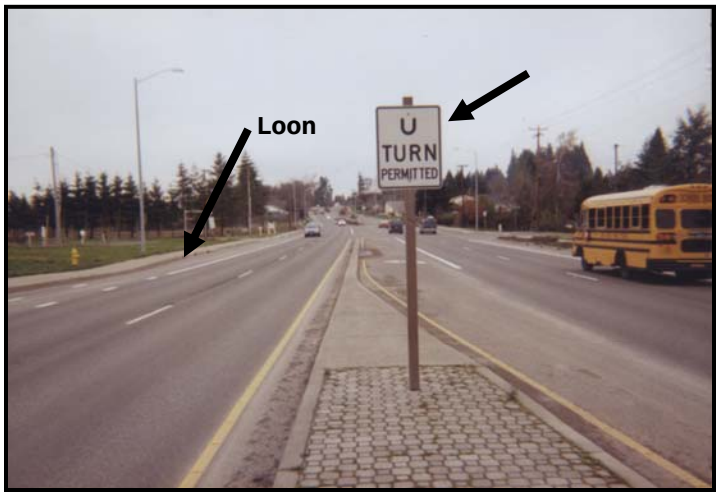
Source: FHWA-HRT-07-033 TechBrief

Loon Implementation for Michigan U-turn

Signalized Mid-block intersection with loon

Source: FHWA-HRT-07-033 TechBrief

Use of a Loon



Salem, Oregon

Source: Texas A&M Transportation Institute

Median U-Turn Intersection Treatment

Disadvantages…

- Possible driver confusion and disregard of left-turn prohibition at the main intersection
- Possible increased delay, travel distances, and stops for left-turning traffic
- Larger ROW required for arterial
  - Can be mitigated with loons

Source: FHWA-HRT-07-033 TechBrief

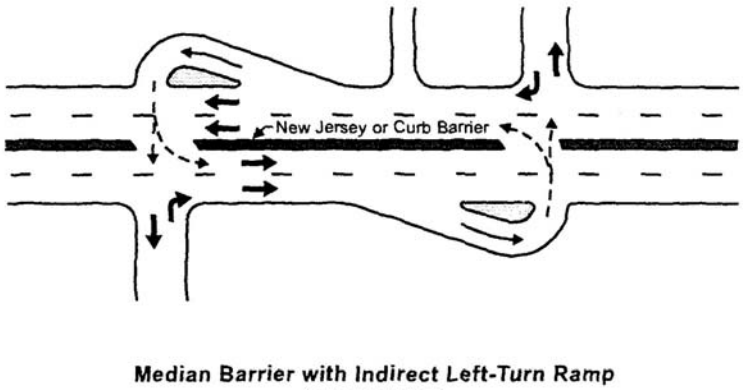
Median U-Turn Intersection Treatment

Disadvantages…

- Higher operation and maintenance costs if signalized directional openings
- Longer minimum green times for cross-street phases or two-cycle pedestrian crossing

Source: FHWA-HRT-07-033 TechBrief

Jug-Handle Indirect Left-Turn



Median Barrier with Indirect Left-Turn Ramp (Jug-Handle)

Source - NHI Course 15255

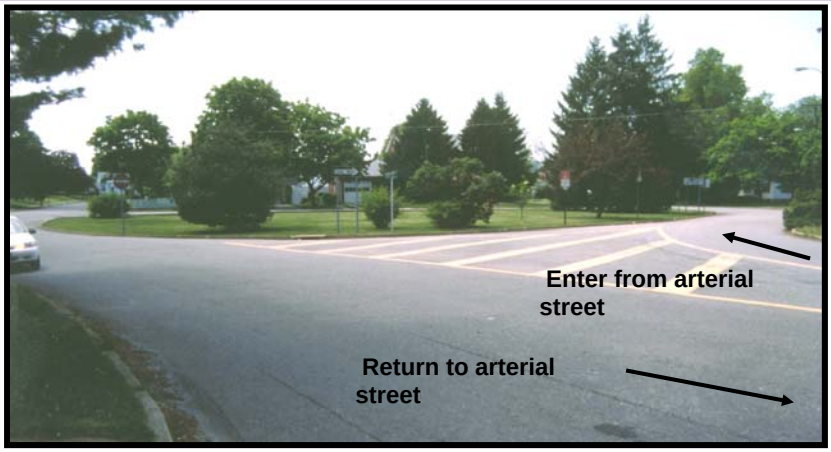
Mid-block Treatment - Loon

New Jersey

Allows U-turn on street with limited ROW/pavement width

Source: Texas A&M Transportation Institute

Roundabout as Element of Alternative Left-Turn



Driver turns right from arterial, goes through roundabout, returns to arterial intersection from side street, cross arterial (to complete a left-turn movement or make left-turn to complete a U-turn movement

Source: Texas A&M Transportation Institute

"Flared" Intersection (with Bus Stop)

Anaheim, California

Source: Texas A&M Transportation Institute

Limited Length Deceleration Lane

Utility Poles Costly to Move…

Photo courtesy City of Garland, Texas

Parking Lot Egress

Channelized right-turn lane physically prevents left-turns out of parking lot and discourages movement to TWLTL

Source: Texas A&M Transportation Institute

What Can Be Done By Design?

With Adequate Available ROW…

- Less constrained environment
  - The entire toolbox is available
    - Median treatments, consolidation, turn lanes
- Alternative left-turn treatments

Why and When to Consider a Raised Median

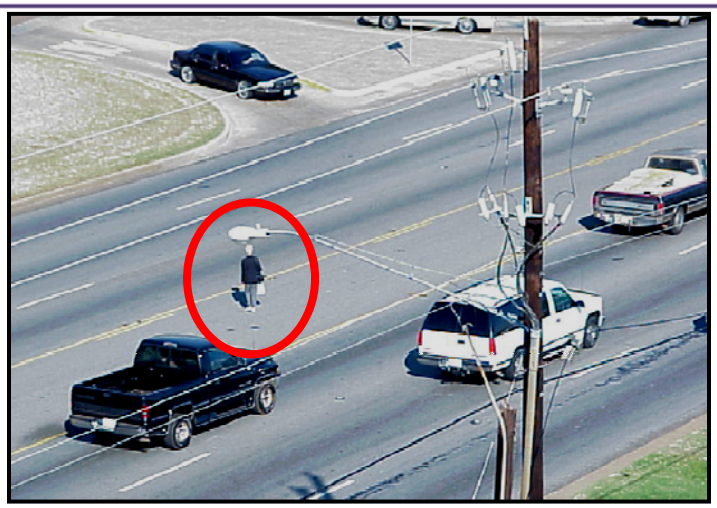
- Play critical role of operations and safety of roadway
- Roadways where aesthetic considerations are a high priority
- Multilane roadways with a high level of pedestrian activity
- High crash locations or where it is desirable to limit left turns to improve safety
  - Clear safety benefit

Source: TRB AM Manual

Keep in Mind . . .

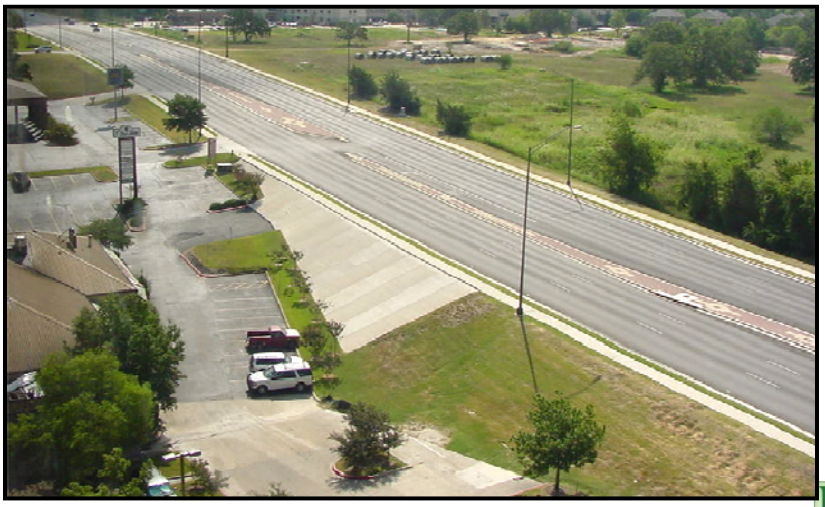
- Need adequate locations and width to handle U-turns
  - Can flare intersections or use loons
  - Alternative U-turn treatments
- Alternate routes to handle delivery truck traffic

Pedestrian Safety



Source: Texas A&M Transportation Institute

Raised Median in Advance of Development



Source: Texas A&M Transportation Institute

"One potential treatment to combat congestion and safety problems at intersections is the Median U-Turn Intersection, which has been used in Michigan for many years and has been implemented successfully in Florida, Maryland, New Jersey, and Louisiana in recent years"

Better Roads Magazine, December 2007 cites the application of this corridor treatment as an "Industry Trend".


TECHBRIEF

Synthesis of the Median U-Turn Intersection Treatment, Safety, and Operational Benefits

Publication No.: FHWA-HRT-07-033

FHWA Contact: Joe Bared, HRDS-05, 202-493-3314, or Wei Zhang, HRDS-05, 202-493-3317

Objective

In the United States, congestion at intersections throughout urban and suburban areas continues to worsen. Crashes reported at intersections have continued to increase. One potential treatment to combat congestion and safety problems at intersections is the Median U-Turn Intersection Treatment (MUTIT), which has been used extensively in Michigan for many years and has been implemented successfully in Florida, Maryland, New Jersey, and Louisiana in recent years (Figure 1).

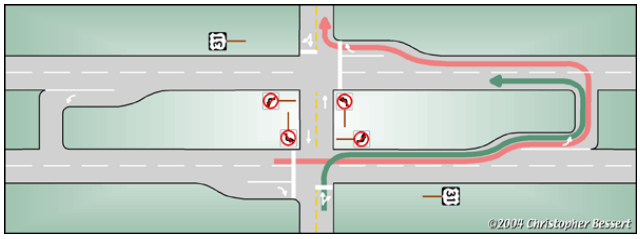
Figure 1. Example of MUTIT on Michigan corridors (Source: Michigan).

U.S. Department of Transportation
Federal Highway Administration

Research, Development, and Technology
Turner-Fairbank Highway Research Center
6300 Georgetown Pike
McLean, VA 22101-2296

www.tfhrc.gov

Median U-Turn Intersection Treatment



Source: Michiganhighways.org

Source: Wikipedia.com

"Michigan U-turn" (1 of 3) (Wide Raised Median)

Source: Texas A&M Transportation Institute

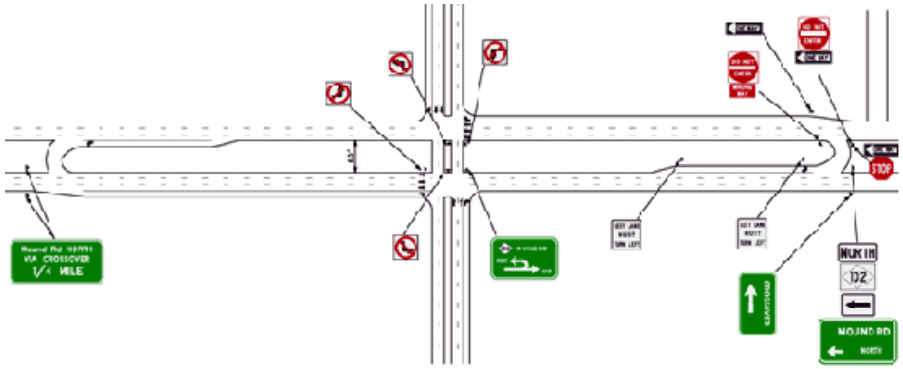
"Michigan U-turn" (2 of 3)

Source: Texas A&M Transportation Institute

"Michigan U-turn" (3 of 3)

Source: Texas A&M Transportation Institute

Typical Michigan U-turn Signing



Source: FHWA-HRT-07-033 TechBrief

U-Turn Guidance Sign

Source: Texas A&M Transportation Institute

Maricopa County Project

- I-10 – Hassayampa Valley Roadway Framework Study (MAG 2007)
  - Identified alternative high capacity roadway concept
    - Higher capacity than conventional arterial
    - More roadside access than freeway
    - Lower cost than freeway
  - Proposed "Arizona Parkway" corridor concept

Source: Jim Witkowski, Morrison Maierle, Inc., 2008 ITE Annual Meeting Proceedings, Anaheim, CA

Maricopa County Project

- MCDOT Enhanced Parkway Study
  - Evaluate recommended “Arizona Parkway” concept
    - Michigan Left-Turn (MLT) corridor with design standards and features to fit Maricopa County’s needs
  - Provide detailed corridor traffic operations analysis

Source: Jim Witkowski, Morrison Maierle, Inc., 2008 ITE Annual Meeting Proceedings, Anaheim, CA

Hassayampa Valley Framework Study

Today

- 1,400 Sq. Mi. Study Area
- 2.8 Million new residents at buildout.

A distant tomorrow

Source: Jim Witkowski, Morrison Maierle, Inc., 2008 ITE Annual Meeting Proceedings, Anaheim, CA

Maricopa County Study Results

- Performed extensive micro-simulation (VISSIM)
- Michigan Left-turn versus conventional roadway corridor
  - Delay reduced by 33 percent
  - Stops reduced by 21 percent
  - Capacity increased 45-50%

Source: Jim Witkowski, Morrison Maierle, Inc., 2008 ITE Annual Meeting Proceedings, Anaheim, CA

Median U-Turn Intersection Treatment

Selected TechBrief conclusions..

- Successfully used for over 40 years
- Has been implemented at isolated intersections
- Directional median crossovers provide better operational and safety benefits compared to bidirectional median crossovers

Source: FHWA-HRT-07-033 TechBrief

Median U-Turn Intersection Treatment

Selected TechBrief conclusions..

- Reducing signal phases provides increased capacity relative to conventional intersections
  - 20% to 50% better
- Total network travel time savings outweighs additional turning travel time

Source: FHWA-HRT-07-033 TechBrief

Median U-Turn Intersection Treatment

Selected TechBrief conclusions..

- Safety is better than conventional intersections because of reduced conflict points
  - Reductions range from 20% to 50%
  - Head-on and angle crashes are reduced

Source: FHWA-HRT-07-033 TechBrief

Resources

- TRB, *Access Management Manual*
  - *http://www.accessmanagement.info for link to order*
- TRB Access Management Committee Internet Site
  - http://www.accessmanagement.info
    - NCHRP reports, conferences, presentations, etc
- Texas Transportation Institute
  - http://tti.tamu.edu

Resources

- FHWA TechBrief
  - Turner-Fairbank Highway Research Center
    - http://www.tfhrc.gov/about.htm
- Corridor Management Plans
  - Many available on Internet
  - Several Texas examples
    - http://www.h-gac.com
- 2008 ITE Annual Meeting Conference Proceedings (Jim Witkowski paper)

Resources

- Center for Urban Transportation Research
  - http://www.cutr.usf.edu/index.shtml
    - *Guide for Analysis of Corridor Management Policies and Practices*
    - Model Ordinances Supporting Corridor Management and Access Management
- The Web Seminar Supplement
  - TTI report 0-4429-1 PDF link
  - TTI report 0-5606-1 PDF link
  - FHWA TechBrief
    - *Synthesis of the Median U-turn Intersection Treatment, Safety, and Operational Benefits*
  - TRB AM Manual, selected pages

Questions?

Resources: Supplement

- Links to TTI Reports from the course
- FHWA TechBrief, *Synthesis of Median U-Turn Intersection Treatment, Safety, and Operational Benefits*
- NCHRP Report 524 summary

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 524, *Safety of U-turns at Unsignalized Median Openings*
- NCHRP Report 659, *Guide for the Geometric Design of Driveways*

ITE Resources

- *Transportation and Land Development, 2nd Edition*
- *Manual of Transportation Engineering Studies, 2nd 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)

Thank You!

Please provide your feedback. A link to an online Web seminar evaluation will follow in an e-mail to Web seminar registrants. Please distribute this email to participants at your site. The survey will close in one week.

Questions/Comments
Professional Development Department

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