

Corridor Management and Preservation in Texas

2010 Workshops

TxDOT Research Implementation Project 5-5606-01



This is the introductory slide that should be shown in the morning when participants are arriving for the workshop.

8:30-8:45 Introduction

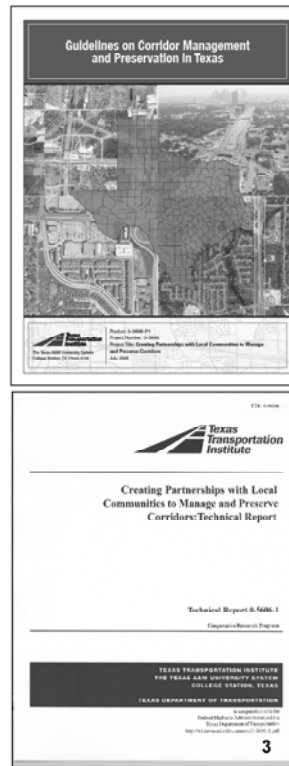
- Welcome and Introductions
- Workshop Objectives
- Research Basis for Workshop
- Acronyms
- Agenda Overview

2

This slide should be up when the instructors are doing introductions. First, the instructors introduce themselves and provide brief biographical information. Then, the instructors go around the room and ask participants to provide their name, who they are with, and what it is that they do.

Basis for Workshop

- 2007 RMC Project 0-5606
 - Report 5606-1, *Creating Partnerships with Local Communities to Manage and Preserve Corridors*
 - 5606-P1, *Guidelines on Corridor Management and Preservation*
 - 5606-S, Summary Report
- Workshop is an 'Implementation' Project



The workshop is based on TxDOT's 2007 RMC project 0-5606. It included the main (full) research report 5606-1, a follow-up guidebook for the research – 5606-P1, and a brief 2-page summary report – 5606-S.

Workshop Objectives

- To promote understanding and importance of CM&P
- To facilitate CM&P through coordination of transportation and land use planning



Self explanatory.

Workshop Objectives

- Promote TxDOT/local partnerships
- Show CM&P tools, practices, and studies
- Promote development and adoption of CM/CP plans



Self explanatory.

Workshop Objectives

- To bend your ear on CM&P and help you remember benefits
- Get your input and feedback
- Keep it informal !



• Tell me and I forget
• Show me and I remember
• Involve me and I understand
Chinese Proverb



I'm a PC.

I'm a Mac.

Self explanatory.

What the 5606 Research Covered



1	Role of local and regional plans in CM&P
2	TxDOT/local authority and regs. in CM&P
3	Methods to acquire and preserve ROW
4	Current practices/case studies in CM and CP
5	Mechanisms for implementing CM&P
6	Recommendations on partnerships in CM&P for TxDOT

The 5606 research included 5 general areas – as shown in the slide, along with recommendations for TxDOT/local partnerships in CM/CP.

Acronym Quiz

See any that you don't know?

- CM&P
 - CM
 - CP
 - AM
 - TxDOT
 - MPO
 - RMA
 - COG
 - RPO
 - ROW
 - ETJ
- NEPA
 - ISTEPA
 - SAFETEA-LU
 - EA
 - EIS
 - FONSI
- ...and not to forget
- LULU
 - SOB
 - NIMBY
 - BANANA
 - NIMTOO



...abbreviations

- Comp. plan
- T-fare plan
- Coord.
- w/ and w/o

Bonus: OSSF

On this slide, review most of the acronyms in the left-most column to make sure they understand the key ones.

Icebreakers include:

LULU – locally unwanted land use

SOB – sexually oriented business

NIMBY – not in my backyard

BANANA – build absolutely nothing anytime near anyone

NIMTOO – not in my term of office

OSSF – on-site septic facility (e.g. aerobic septic systems)

Agenda Overview

Turn to the first page
of your workbook

Essentially...
CM before lunch
CP after lunch

Session	TOPICS
Opening 8:30- 8:45	<ul style="list-style-type: none"> Welcome and Introductions Workshop Objectives Today's Agenda
1 8:45-9:15	<ul style="list-style-type: none"> CM and CP: Definitions and Overview Purpose and Benefits of CM&P Authority and Abilities of CM&P in Texas
2 9:15-10:30	<ul style="list-style-type: none"> Development Policies That Support CM CM Tools, Access Related
BREAK 10:00 – 10:15	
	<ul style="list-style-type: none"> CM Tools, Zoning and Development Related CM Tools, Platting Related
3 10:30-11:00	<ul style="list-style-type: none"> CM Plans Discussion of CM in Host Area
4 11:00-11:30	<ul style="list-style-type: none"> CM Case Studies
LUNCH 11:30 – 1:00 (on your own)	
5 1:00-1:45	<ul style="list-style-type: none"> CP Overview ROW Acquisition and Preservation Tools
6 1:45-2:30	<ul style="list-style-type: none"> Develop CP Strategies Early Environmental in CP
BREAK 2:30 – 2:45	
7 2:45-3:00	<ul style="list-style-type: none"> CP Conclusions Discussion of CP in Host Area
8 3:15-3:45	<ul style="list-style-type: none"> Bills in the 80th Legislative Session Impacting CM&P Intergovernmental Agreements CM/CP Practice in Select States
Closing 3:45-4:15	<ul style="list-style-type: none"> Summary Recommendations Participant Feedback Course Evaluation

Briefly go over the agenda for the day.

Essentially explain that CM is before lunch and CP is after lunch and note the times for the morning and afternoon breaks and lunch.

**Before we get
started....**

*be aware that some you work
with may have the Knack*



Play this media file as an ice-breaker. It's funny.

8:45 – 9:15 Session 1

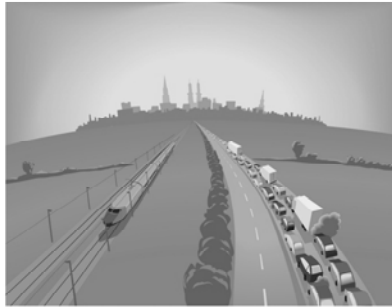
- Definitions of CM and CP
- Purpose and Benefits of CM and CP?
- Authority and Abilities for CM&P

11

Before we get started on the details of CM and CP, we need to first define CM and CP, talk about their importance and benefits, and review the local and state authorities and abilities (or lack thereof) regarding these activities.

Definition of a Corridor

Corridor—a pathway that provides for the flow of people and goods within and between activity centers, and that includes one or more transportation facilities, abutting land uses, and access facilities for development.



The Transportation Research Board (TRB) defines corridor as follows: (read definition on the slide)

Key points are that ‘corridor’ does not necessarily mean one transportation facility or mode and also includes abutting land uses and development.

Corridor Management (CM) Defined

- Management of land development and the transportation facilities within an **existing** corridor to ensure that they develop in accordance with
 - ✓ adopted land use plans
 - ✓ roadway improvement plans
 - ✓ access management
 - ✓ future ROW needs
 - ✓ or any specially adopted plans or objectives for the corridor.
- Application of multiple strategies to achieve specific land development and transportation objectives

13

In addition to definitions provided, note that CM is all about ‘getting it right the first time’. Developing a plan to ensure that development and redevelopment occurs in accordance with the ultimate design and function of the roadway.

CM Overview

- Is a planning strategy coordinating transportation and land use/development components
- Should be a continual process, way of business
- Is a 'system' in lieu of 'piecemeal' approach
- Includes many components
- Includes various types of plans, objectives
- Shows foresight, preparedness

14

Corridor management is comprised of measures or practices to preserve or protect ROW in combination with managing how development occurs along an existing transportation corridor. A 2000 National Cooperative Highway Research Report (NCHRP) synthesis on corridor management generally defined it as 'the application of multiple strategies to achieve specific land development and transportation objectives along segments of a corridor.'

CM involves ample communication and coordination on local planning and development activities that impact TxDOT facilities such as property subdivision, zoning and rezoning, site review, public utilities, and access management.

All of these aspects of CM, shown in the bullet points, will become evident upon completion of today's workshop.

CM Tools and Ability By Area

	CM Tool or Technique	City	ETJ	County
Access Management	Driveway Spacing	✓	limited	limited
	Non-Traversable Medians	✓	✓	✓
	Signalized Intersection Spacing	✓	✓	limited
	Arterial Frontage and Backage Roads	✓	limited	
	Acquisition of Access Rights	✓	✓	✓
Zoning and Development Regs	Site Plan review	✓	limited	
	Land Use/Density Controls	✓	limited	v. limited
	Building and Parking Setbacks	✓	v. limited	v. limited
	Corridor Zoning Overlays	✓		
	Driveway Throat Length	✓	limited	
Subdivision Regulations	ROW Dedication Through Platting	✓	✓	v. limited
	ROW Reservations Through Platting	✓	✓	v. limited
	Access Easements	✓	limited	limited
	Minimum Lot Size	✓	limited	limited
	Minimum Lot Width	✓	limited	limited

The key point of this slide is to communicate that there are numerous tools that can be used in CM and that they are categorized as those in AM, local subdivision regulations, and local zoning and development ordinances. Also point out that there is more ability and authority to accomplish CM in cities than in ETJs or counties – as is shown in the slide.

Definition of Corridor Preservation

- The practice of acquiring, preserving, or protecting ROW needed for a **future** transportation corridor.
- A concept utilizing the coordinated application of various measures to control or otherwise protect the ROW for a planned transportation facility.

Corridor preservation generally refers to the practice of acquiring, preserving, or protecting ROW needed for a planned transportation facility. It starts with long-range transportation planning, often on a regional or statewide scale, and requires coordination and involvement at the local, state, and federal levels.

The key point here is ‘future’.

Reiterate that CP will be covered in the afternoon sessions.

Overview of CP

- Fed has mostly left CP to States
- TxDOT has no formal program, funding
- Starts with long-range transportation planning
- Requires involvement/coordination at all levels – federal, state, local
- Adopted plans (statewide, MPO, local) serve as basis
- Very important for future system

17

TxDOT, like many state DOTs, does not have enabling legislation that specifically provides a formal corridor preservation program. In lieu of specific CP authority, TxDOT must coordinate and rely on local jurisdictions and MPOs in transportation planning to assist in corridor preservation, where possible.

Due to a lack of funding or program at the state level, for TxDOT to engage in CP in a meaningful way it must be in partnership with cities and counties.

As will be discussed later in the workshop, local plans and subdivision authorities are key to CP.

Why the Need for CM and CP?

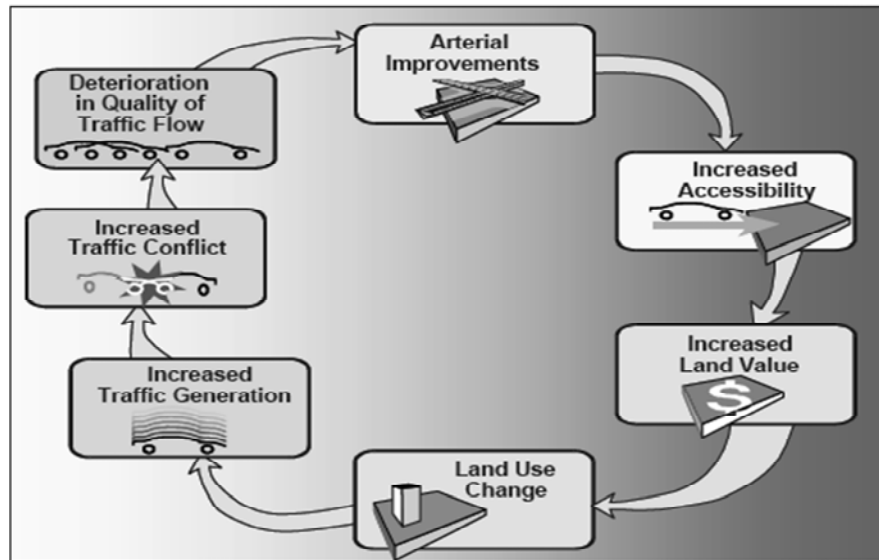
- Make the most/best use of existing ROW
- Make sure we have sufficient ROW for future
- Coordinate transportation and land use planning and decision making
- Save money, time
- As coordination mechanism
- To avoid the “typical cycle”

Typical corridor problems include numerous and poorly spaced driveways, roadway designs conducive to strip development, closely spaced signals, lack of interconnectivity between adjacent developments, and the inability to preserve or protect ROW for future corridors due to development.

These problems include both transportation and land use components which are interdependent. Solutions to the problems lie in coordinated corridor management and preservation activities that help bring together land use and transportation planning decision making among the affected jurisdictions and agencies. CM and CP promote local-TxDOT coordination and better planned, more orderly development along TxDOT facilities.

As shown by the bullet points, CM/CP is an important transportation planning activity that coordinates transportation and land use/development. It also serves to coordinate DOTs with cities, counties, and MPOs.

Transportation-Land Use Cycle



Source: Institute of Traffic Engineers (ITE), *Transportation and Land Development*, 2nd Edition

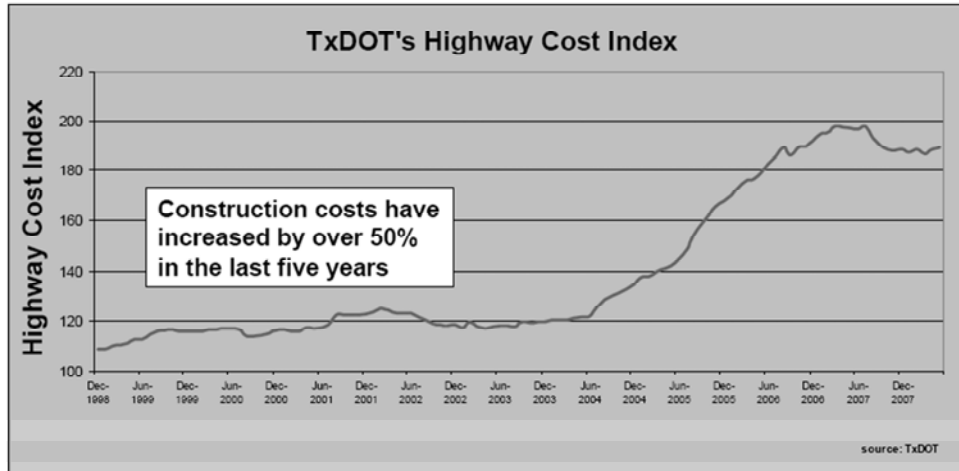
19

Some communities in Texas are breaking the transportation-land use cycle using CM&P, though others continue to go through this age-old cycle.

The transportation-land use cycle, illustrated by this slide, begins when major arterial or thoroughfare improvements are made which increase the value and accessibility of adjacent land. The roadway improvements spur new development and re-development, which increase access points and traffic generation. As this cycle continues, over the years the cumulative increases in the amount and intensity of development create traffic conflicts and congestion, which require more arterial improvements – thus starting the cycle again.

Why the Need for CM and CP?

Escalating costs!



20

This slide shows why CM/CP is needed from a cost standpoint.

Note that the chart shows costs from 1998 to 2007 and it does not include costs of right of way.

Other Benefits of CM & CP

- Improves safety, reduces congestion and improves mobility
- Economic
- Promotes orderly growth
- Aesthetics



Self explanatory.

Economic can include increases in property values, protecting infrastructure investments, and that businesses seek attractive, well planned corridors.

Without CM ...



This slide shows typical 'reactionary' development along roadways with no planning.

It shows too many haphazardly spaced driveways, signals spaced too close together, lack of sign and landscaping controls/ordinances, remedial fixes such as the vertical delineators that to prohibit left turn movements.

With CM



23

This slide shows corridors where CM has been planned and implemented and proactive approaches to development were taken. It shows facilities with few conflict points along the roadways, connectivity between developments, and more sustainable developments.

Basis for CM & CP in Texas

- Related TxDOT policies and manuals
- Local comprehensive plans
- Zoning and development regulations
- City and county subdivision regulations
- City and county transportation plans
- MPO/regional transportation plans

.....TxDOT cannot accomplish alone

24

Related TxDOT policies could include the agencies policies on coordinating with local jurisdictions on access and platting, its policy of purchase of access rights and use of frontage roads, and its coordination with locals on MPO planning and project development.

Related TxDOT manuals could include TxDOT's Access Management Manual, Roadway Design Manual, and Right-of-Way Manual.

TxDOT Policies that Support CM & CP

- AM, including purchase of access rights (*Access Management and ROW Manuals*)
- Early/advanced ROW acquisition (*ROW Manual*)
- Roadway design policies (*Roadway Design Manual*)
- Statewide Transportation Plan (*per Commission*)
- Local Agency Coordination

25

Like most state DOTs, TxDOT does not have enabling legislation that provides a formal corridor management or corridor preservation program.

TxDOT's ability and authority to undertake CM and CP primarily comes from the following:

- AM, including purchase of access rights (*Access Management and ROW Manuals*)
- Early/advanced ROW acquisition (*ROW Manual*)
- Roadway design policies on frontage roads and medians (*Roadway Design Manual*)
- Statewide Transportation Plan (per TTC)
- Involvement in MPO plans/policies

CM&P Authority/Ability Texas Cities

- Comprehensive plans (92%)
- Transportation plans (90%)
- CM&P tools in subdivision regs
- CM&P tools in zoning (96%)
- Access ordinances (73%)



(% of cities that have, based on 51 surveyed)

26

The greatest opportunity to undertake CM and CP on or for TxDOT roadways is in cities with adopted comprehensive plans and zoning.

Most of the tools needed for CM and CP are contained within local subdivision regulations and zoning ordinances, which are the two key tools cities use to implement their comprehensive plans. Local plans may also contain specific components, policies, or objectives on CM and CP, including prioritization of corridors within the community for CM and/or CP treatment.

Comprehensive plans (92%)

Can't have zoning w/out adopted plan

Coordinate land use with road function

Provide basis for regulatory actions

CM&P Tools in Subdivision regs – lot dimensions, access, street connectivity

CM&P Tools in Zoning - land use, density, setbacks, aesthetic, PUDs, clustering, overlays

CM&P Authority/Ability of Texas Counties

- County subdivision regs
 - Min. lot size and width requirements (limited)
 - Ability to deny plat if in ID'd corridor (HB 1857, 2007)
 - Minimum lot size requirements for OSSF
- County transportation plans and reasonable setbacks (LGC §232.100)
- Extension of some city powers in ETJ

27

Compared to cities, there is far less ability in Texas counties to practice CM/CP. This is mainly because counties (with a few exceptions) have little authority to regulate development and little authority to regulate land use.

The best authority counties have to engage in CM or CP is through their subdivision regulations.

Possible City Powers in ETJ for CM & CP

- Municipal T-fare plans and subdivision regs.
- Some city ordinances such as
 - access
 - parkland dedication
 - drainage
 - adequate facilities
- Use of development agreements
- City policies on infrastructure extensions

28

Some cities enforce their subdivision regulations and related ordinances within their extra-territorial jurisdiction (ETJ).

The extra-territorial jurisdiction, or ETJ, is the unincorporated territory extending beyond city limits, but located within a county jurisdiction. In Texas, the size of the ETJ around a municipality varies depending on its population. In addition to county authorities, the following municipal authorities can be extended to, and applied in, the ETJ area:

- subdivision regulations;
- transportation plans;
- access and park land dedication ordinances; and
- development agreements with developers.

Ask them if they have the problem in their area with urban (density) development occurring in rural ETJ/county areas where the infrastructure (namely rural county roads) is not adequate to support the impacts.

9:15-10:45 Session 2: CM Tools

- Development Policies
- Access Management Related

MORNING BREAK 10:00-10:15

- Zoning and Site Related
- Platting Related

In Session 2, we will talk about CM tools that fall into 4 general categories, beginning with development policies. We'll then talk about access management related tools, take a break, and then cover zoning and platting related tools.

Development Policies that Support CM

1. Encourage activity center instead of strip development
2. Require neighborhood connectivity
3. Limit unnecessary local street connections
4. Consider Infrastructure extensions into ETJ areas carefully

30

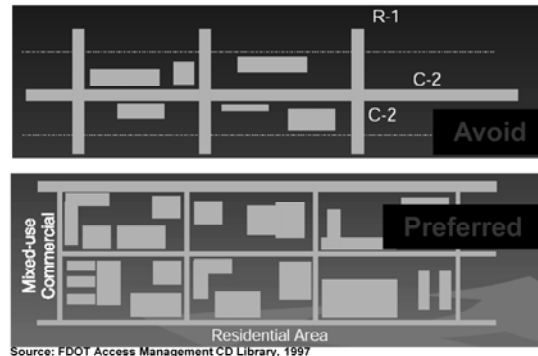
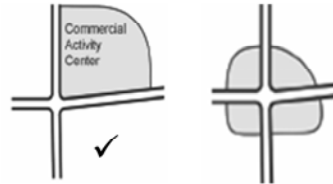
These are four different development policies that can be undertaken at the local level that support CM. Each are discussed in more detail in slides to follow.

Promote Activity-Based Development

- Require greater lot depths and frontage amounts for commercial zones

- Improves site circulation
- Reduces likelihood of strip
- Fewer access points

- Promote activity centers with supporting roads



Source: FDOT Access Management CD Library, 1997

31

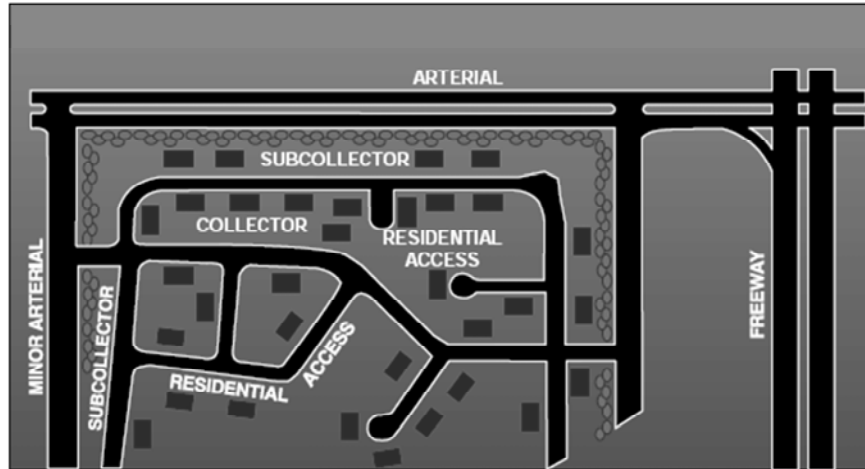
In a sense, activity-based development is the opposite strip development. One is planned, aggregate development and the other is a more unplanned disaggregate development pattern.

Greater lot depths along corridors help reduce the likelihood of strip commercial development. Some cities in Texas require minimum lot depths in one or more of their commercial zoning districts as a means to help prevent 'strip' commercial development.

Deeper and wider parcels along arterials and corridors help facilitate improved access spacing, design, and internal site circulation. Lot dimensional requirements may be included in local zoning districts and include minimum lot frontage amounts and maximum lot width-to-depth ratios. Such requirements can help to prevent the creation of long and narrow or irregularly shaped lots, such as flag lots, that can cause access and site circulation problems, which have a detrimental impact to the corridor.

Use Functional Hierarchy in Local Street Planning

Avoid/limit minor local street connections to corridors



Source: Listokin, D. and Walker, C. The Subdivision and Site Plan Handbook, New Jersey, The State University of New Jersey. Figure excerpted from Florida DOT Access Management CD Library, 2005.

32

Local and regional transportation plans show the general size and spacing of roadways by functional classes such as freeways, arterials, and collectors. These plans can support CM by prescribing that local street networks adjacent to major corridors are sized and laid out following the rules of functional street hierarchy. Under these rules, minor streets serving local short trips should not take direct access to major corridors as shown in the slide. TxDOT should be a key participant in local transportation planning to minimize unnecessary minor street connections to state highways.

Example: Functional Street Hierarchy

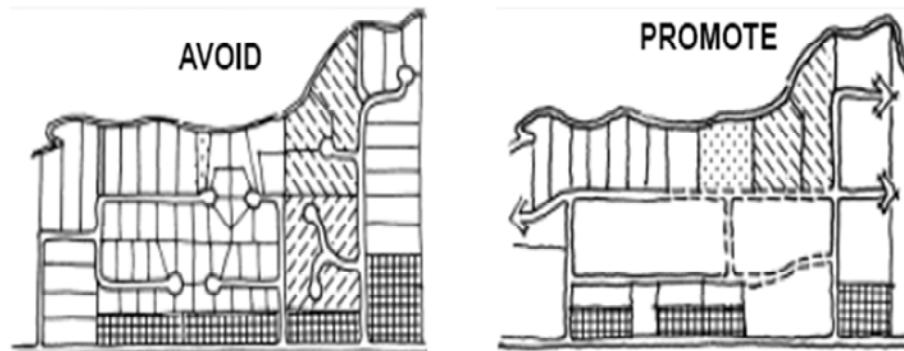


This is an example in the El Paso area showing the functional hierarchy of streets. Note their size, spacing and lengths by category.

Connect Subdivisions

Connect local streets to

- serve as secondary support system
- remove shorter local trips
- reduce congestion



Source: A Guide to Land Use and Public Transportation, Volume 2, Snohomish County Transportation Authority

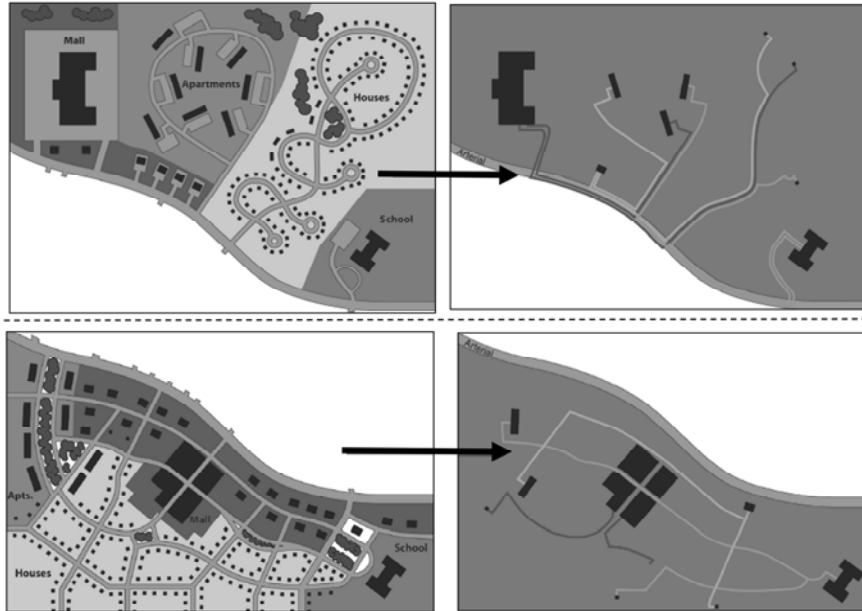
34

Too many local street connections can have the same detrimental impacts on corridors as private driveways. In the planning and platting of local streets, all connections to TxDOT roadways should conform to adopted spacing standards relative to functional class of the connecting street as well as that of the TxDOT roadway.

Properly spaced and laid out local streets can reduce demand on a corridor by serving as a secondary street system. In many cases, local streets paralleling the corridor with reasonably spaced side street intersections will achieve this objective.

Connect subdivisions/local streets adjacent to state roads!

Impacts of Lack of Connectivity



Source: K. Williams, CUTR, University of S. Florida

35

Start discussion with the top half of this graphic that shows the lack of connectivity between commercial, multifamily, single family residential, and the school. Show how the routes from each one of these types of land uses impacts the state highway – all must come out on the main road to get to the other land use.

Contrast the top scenario with that of the bottom where the development is better planned (using more of a step-down land use approach) and these different local land use activities are connected and there is not need to get back out on the state roadway to make the shorter local trips.

Consider Infrastructure Extensions Into ETJ Carefully

- Premature extension of infrastructure into ETJs can
 - Create densities that can't be handled by rural roadways
 - Be counter to infill development policies
- Cities should consider extending development policies into ETJs to level playing field
 - Transportation plans
 - Parkland dedication ordinances
 - Drainage ordinances
 - Access ordinances
- Development agreements

36

If cities allow their extension of sewer service into the ETJ, it can facilitate sprawl and 'city' subdivisions with urban densities along rural county and state roadways.

In some areas, development agreements between local jurisdictions and developers can be used in ETJs which establish land use controls and provisions for infrastructure and utilities

Extension of parkland dedication ordinances into the ETJ are used in some areas. This makes development in the ETJ area more financially comparable to that in a city. Cities could require direct land dedication or a fee in lieu of land.

Basic Access Related CM Tools

1. Driveway Spacing
2. Corner Clearance
3. Non-Traversable Medians
4. Signalized Intersection Location and Spacing
5. Arterial Frontage and Backage Roads

37

The Transportation Research Board defines access management as ‘the systematic control of the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway’.

This section summarizes a toolbox of access management related methods and techniques that can be used for corridor management.

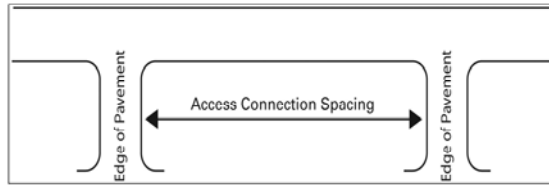
Access in the good old days...



The days of lay down curb are over. We simply have too much traffic on our roadways to allow this to occur now.

The slide showing the police cars was borrowed from another presentation. It was not taken from the website shown, so it is unknown what is on this website so if you go there it is not at the recommendation of the researchers!

Driveway Spacing



- Limits number of driveways through min. separation requirements
- Increases likelihood of shared/cross access
- TxDOT regs and/or local ordinance

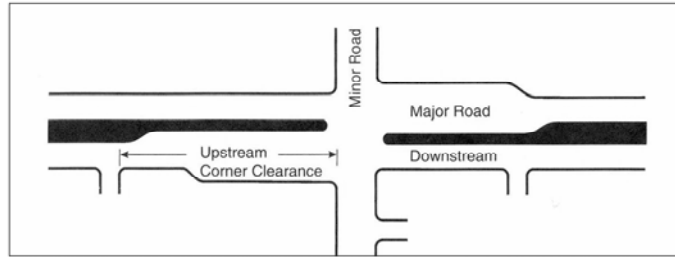
Posted Speed (mph)	Minimum Distance (Feet)		
	Existing State Highways (excluding freeways and frontage roads)	Frontage Roads	
		1-way	2-way
≤ 30	200	200	200
35	250	250	300
40	305	305	360
45	360	360	435
≥ 50	425	425	510

39

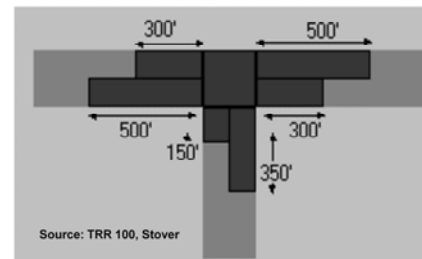
Driveway spacing guidelines limit the number of driveways on a roadway by establishing a minimum separation distance between driveways. Spacing requirements help reduce the probability of incidents as vehicles enter and exit the roadway. They also increase the likelihood of shared and or cross access between developments. Spacing distance between driveways, as shown in the slide, is measured from the closest edge of pavement of the first access to the closest edge of pavement of the second access.

Regulations Sources include TxDOT's Access Management Manual (Tables 2-1 and 2-2)
Local Ordinances

Corner Clearance



- Prevent conflicts between driveways & intersections
- Avoid driveways in functional area of intersection
- Manual: corner clearance = spacing distance for roadway



40

Corner clearance is the distance or separation between an intersection and the nearest access point. Corner clearance standards are needed in order to avoid or reduce conflicts between driveway traffic and vehicle queues and turning movements at intersections. If at all possible, driveways should not be permitted in the functional area of an intersection, which includes all areas where auxiliary lanes (e.g. left and/or right turn lanes) are present.

Corner Clearance Local Provisions



- Require shared/x-access easements for all corners
- No full movement driveways in functional area
- Require min. lot size requirements for corners
- Outparcels must obtain access from within

41

Corner clearance is the distance or separation between an intersection and the nearest access point. Corner clearance standards are needed in order to avoid or reduce conflicts between driveway traffic and vehicle queues and turning movements at intersections. If at all possible, driveways should not be permitted in the functional area of an intersection, which includes all areas where auxiliary lanes (e.g. left and/or right turn lanes) are present.

Shared or cross-access easements should be required or pursued to all abutting properties of corner parcels

Full movement driveways should not be permitted in the functional area of a signalized intersection. Restricted movement driveways may be considered on a case by case basis based on an engineering study as appropriate or at the discretion of the local development (review) engineer

Minimum lot size requirements and/or land use limitations for corner parcels can be established through zoning.

Outparcels should obtain access from within the site (e.g., shopping center) with no direct access to the public roadways.

What's wrong with this picture?

Any of these
in your area?



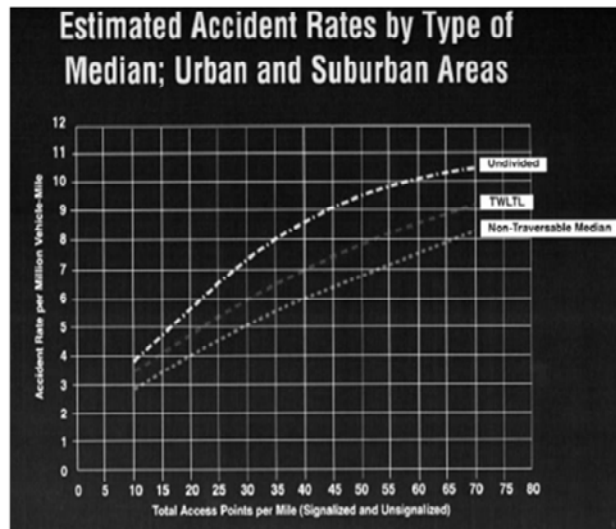
42

Ask the class if they can identify what is wrong with this picture.

Problem: the corner development does not share access with surrounding development. This problem could have been prevented if access easements were required in platting.

Non-Traversable Medians

- Important CM component
- Improve progression, safety
- Install ahead of development
- Establish a median policy, TxDOT/locals should partner
- Include medians in local arterial design standards
- Locals/MPOs should assist in education, benefits



Source: NCHRP Report 420

Non-traversable medians are one of the most effective access management tools and in some cases can be the most important component in corridor management. Not only do they improve progression and safety due to reduction in conflict points, but they can also play an important role in influencing land use and how property develops along a TxDOT corridor.

Raised or divided medians installed on urban or suburban corridors ahead of development reduce the likelihood of ‘strip’ commercial development and increase or force the use of inter-parcel connections (e.g. cross-access) between properties.

Non-Traversable Medians Ahead of development

**FM 158
Booneville Rd.,
Bryan**



**FM 734
Parmer Lane,
Austin**



Examples in the Bryan and Austin districts where TxDOT has installed medians ahead of development.

Non-Traversable Medians Retrofit

**Loop 323
Tyler**



**SH 6
Texas Ave.
College Station**



Examples of retrofit median installations in the Tyler and Bryan districts.

Median Retrofit - Tyler District's Process



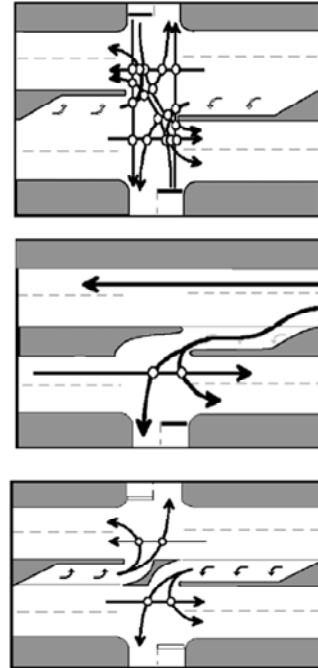
46

This slide shows the general approach used in planning and development for a median retrofit project where TxDOT includes ample public involvement in project development.

The key component of this process is block meetings along the corridor where affected property and business owners can review and discuss the median, median open locations, new access points and/or access consolidations, and aesthetics.

Limited Access Medians

- Use in lieu of full opening
- Fewer conflict points
- Allow only specific turning movements
- Study needed for suitability
- Potentially used in lieu of signal



47

When a full median opening can not be permitted, a directional median opening may be a possible option. A directional median opening has fewer conflict points than a full opening and can be designed to allow only specific turning movements and restrict others. The slide shows limited median openings and illustrates the differences in conflict points (shown as hollow dots).

Limited Access Medians

**Hooded Left Turns
Commercial Blvd.
Ft. Lauderdale, FL**



**SH 303
Pioneer Pkwy
Arlington**



Examples of limited access medians. The picture on top is a often referred to as 'hooded' left turn treatment. The example on bottom is a 'left turn in only' treatment.

Signalized Intersection Location and Spacing

- Important component of CM plan
- Long uniform spacing needed
- Consider in local street planning, driveway permitting, median openings
- Adopt CM plan to ensure proper signal spacing
- w/o CM plan
 - Difficult to uphold signal spacing guidelines
 - New signal locations determined by development

49

The spacing of signalized intersections is a key component of an access and/or corridor management plan. Long and uniform spacing of traffic signals is needed in order to coordinate signal timings, provide for progression, and maintain continuous traffic flow at the speed appropriate for the arterial or corridor. Long signal spacing increases the flexibility with which signals can be timed in order to accommodate peak and off-peak demand and increasing traffic volumes as new development occurs over time.

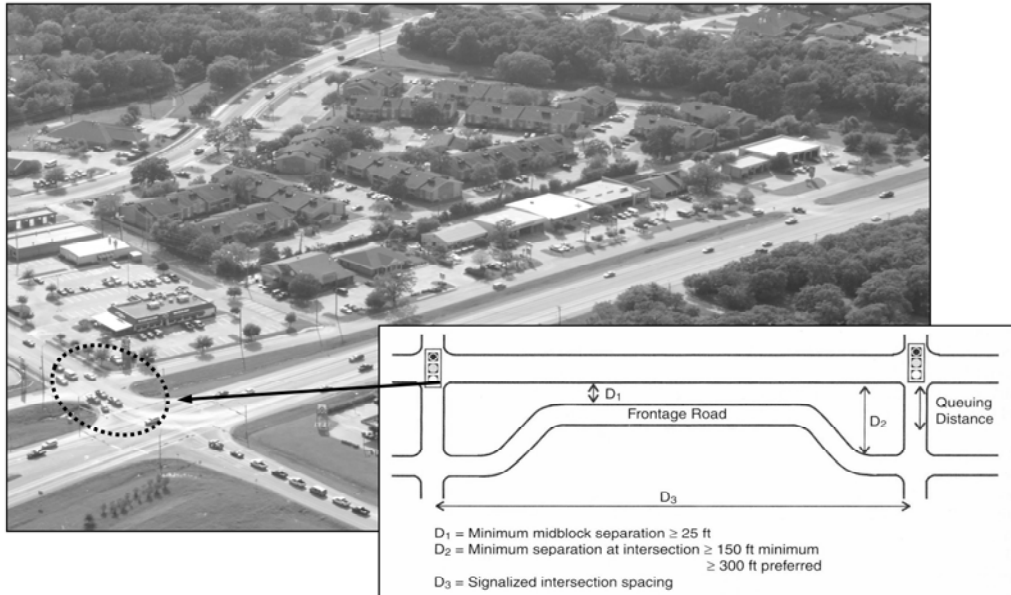
Arterial Frontage / Backage Roads

- Precludes direct access to arterial/corridor
- Minimizes, consolidates access, yet provides good visibility
- Use to meet access, signal spacing criteria
- Must plan them early, hard for retrofit
- Consider in development master plans, CM plans
- Adequate separation between frontage and arterial at connector intersections is crucial

50

Frontage and backage roads can be used to provide access to individual developments, in lieu of each individual parcel taking access to the major thoroughfare. They minimize or eliminate access points along a corridor or arterial, yet still can provide good visibility and reasonable access to development. Frontage and backage roads can be used as a means to meet access, signal, and corner clearance spacing requirement criteria. They can also be used to consolidate access for multiple developments and as part of corridor management plans.

Arterial Frontage Roads



Example of an arterial frontage road along south Texas avenue in College Station, TX. It is no longer there as there has since been a major upgrade in this area.

The frontage road was installed by a local developer in coordination with TxDOT and the city as part of a major subdivision development (Southwood Valley) at the time.

Arterial Backage Roads



52

Examples of arterial backage roads. The picture on top is that of a major commercial development along FM 60 in College Station that had numerous outparcels being platted along the state roadway. As part of the platting process, the city required the access easement in the rear of the outparcels such that access to these site could be taken from the backage road, as opposed to each of them getting access to FM 60. This area was included as part of a zoning overlay district.

The illustration on the bottom right shows a backage road along numerous sites that front the arterial.



10:00 - 10:15

Morning Break

Zoning and Development Regs.

1. Lot dimension requirements
2. Building and parking setbacks
3. Internal access for outparcels
4. Driveway throat length
5. Zoning overlay districts

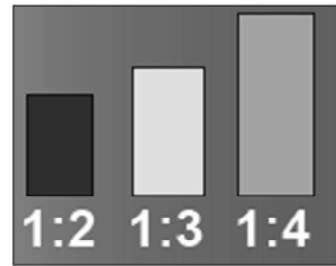
54

This next series of slides covers tools that can be used in local zoning and development regulations to assist in meeting CM plans or objectives.

Zoning is an application of the police power by a government agency. It was originally based on the concept of nuisance (or the interference with the use or enjoyment of one's property) and was created to separate incompatible land uses. The allowable uses of land and structures, the intensity or density of development, and the bulk of the building are differentiated by zone or district.

Lot Dimension Requirements

- Require deeper, wider lots along corridors via
 - Min. frontage amounts
 - Max lot width to depth ratios
- Prevent long narrow, flag lots
- Implement in zoning districts, sub. regs
- Guidance from FDOT study
 - 1:4 rural areas
 - 1:2 or 1:3 urban, suburban

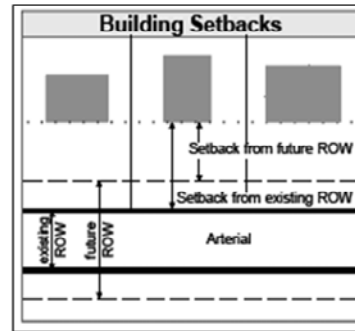


Source: FDOT: Model Land Development and Subdivision Regulations That Support Access Management

Deeper and wider parcels along arterials and corridors help facilitate improved access spacing, design, and internal site circulation. Lot dimensional requirements can be included in local zoning districts and include minimum lot frontage amounts and maximum lot width-to-depth ratios. Such requirements can help to prevent the creation of long and narrow or irregularly shaped lots, such as flag lots, that can cause access and site circulation problems which have a detrimental impact to the corridor.

Building and Parking Setbacks

- Require ample setbacks
 - From existing ROW
 - Request, negotiate from future ROW
- Numerous benefits
- Can not be used to preserve ROW or applied arbitrarily
- Enhanced setbacks common in overlays



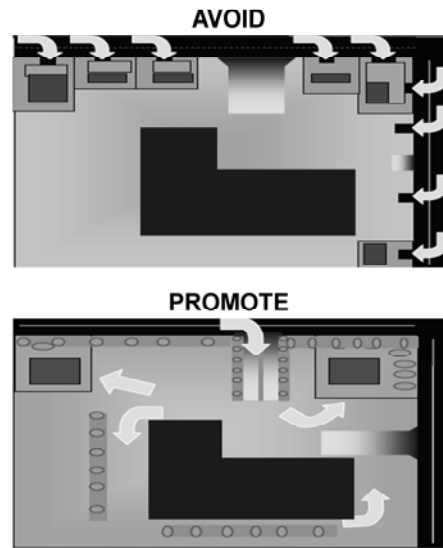
56

A setback is an area where permanent structures or improvements are prohibited and required to be 'set back' from the existing ROW line. Setbacks are commonly established for front, rear, and sides of parcels and are measured from the property line back to a point where improvements can be constructed. Cities with zoning may establish different setback requirements for different zoning classifications

The slide shows the setback dimension from both the existing and future ROW line. Under normal circumstances, setbacks can only be based off of the existing ROW line. However, if TxDOT has a schematic prepared which shows the location of the future ROW line and it is consistent with what is represented on an adopted local transportation plan, some local jurisdictions may have the legal comfort level to require setbacks from the future ROW line.

Internal Access for Outparcels

- Require outparcels to take access from within development
- Prohibit direct access to roadway
- Numerous way to Implement



57

Outparcels are smaller individual lots typically located on or around the perimeter of a larger parcel that abuts a major roadway. Oftentimes, these are the smaller developments such as franchise restaurants or convenience store/gas stations that are located within a shopping center with big box retailers and other anchor stores.

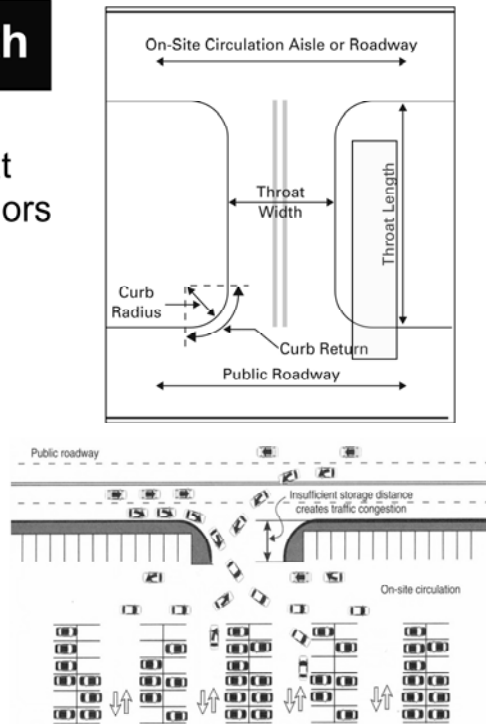
Local development regulations and policies can be used to require that outparcels take access internal to the development and not take direct access to the public roadway. The slide is a general illustration showing that access from the public street to outparcels should be avoided and that access to these tracts from within the development should be promoted.

Access to outparcels should be internalized and incorporated into the layout and circulation of the overall development or shopping center. A requirement for 'unified access and circulation' for developments containing outparcels can be incorporated into local development policies and ordinances. Cross access easements or blanket access easements covering the entire development can be used to implement unified access and circulation.

Internal access for outparcels can be gained through development policies, TxDOT/local AM requirements, access easements in platting, Zoning/PUDs/Overlays, Development Agreements or a combination of the tools.

Driveway Throat Length

- Cities should regulate throat lengths along TxDOT corridors
- Florida DOT study
 - 200' for > 200,000ft² GLA
 - 75-95' for < 200,000ft² GLA
 - 40-60' small site
- Has effect of increasing parking setback



Source: TRB Access Management Manual, 2003

30

Driveway throat length, as shown in the top graphic, is generally measured from the face of curb or edge of street pavement of the roadway to the closest edge of the on-site parking aisle or circulation roadway. It represents the storage length of the driveway which allows vehicles turning from the roadway to be able to queue on-site rather than waiting in the roadway due to conflicts on-site.

While TxDOT has generally little, if any authority to regulate driveway throat length, cities in Texas with the proper plans and ordinances in place can regulate throat length:

- on the basis of a roadway's functional classification,
- on a case-by-case basis depending on the site specific conditions and development intensity, and
- considering a combination of functional class and development intensity.

Corridor Zoning Overlay Districts

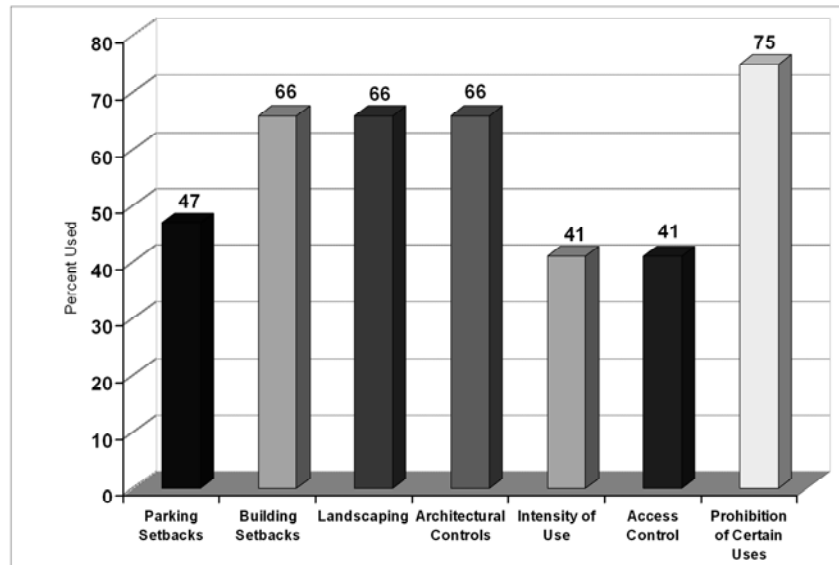
- Best CM, partnering tool
- Supplemental regs overlay zoned property
- Existing requirements of the base zoning district of each parcel retained
- Allows 'corridor-wide' in lieu of 'site' approach
- Commonly used on TxDOT roadways
- 2007 survey; 63% of Texas cities have used

59

An overlay zone is a set of one or more special requirements that are 'overlaid' onto the existing requirements of the base zoning districts to which it is applied. It superimposes certain additional requirements along a corridor, while still retaining the requirements of the underlying base zoning district of each parcel. Cities in Texas primarily use zoning overlays for prohibiting certain uses and aesthetic purposes, but requirements that have significant transportation benefits can also be added.

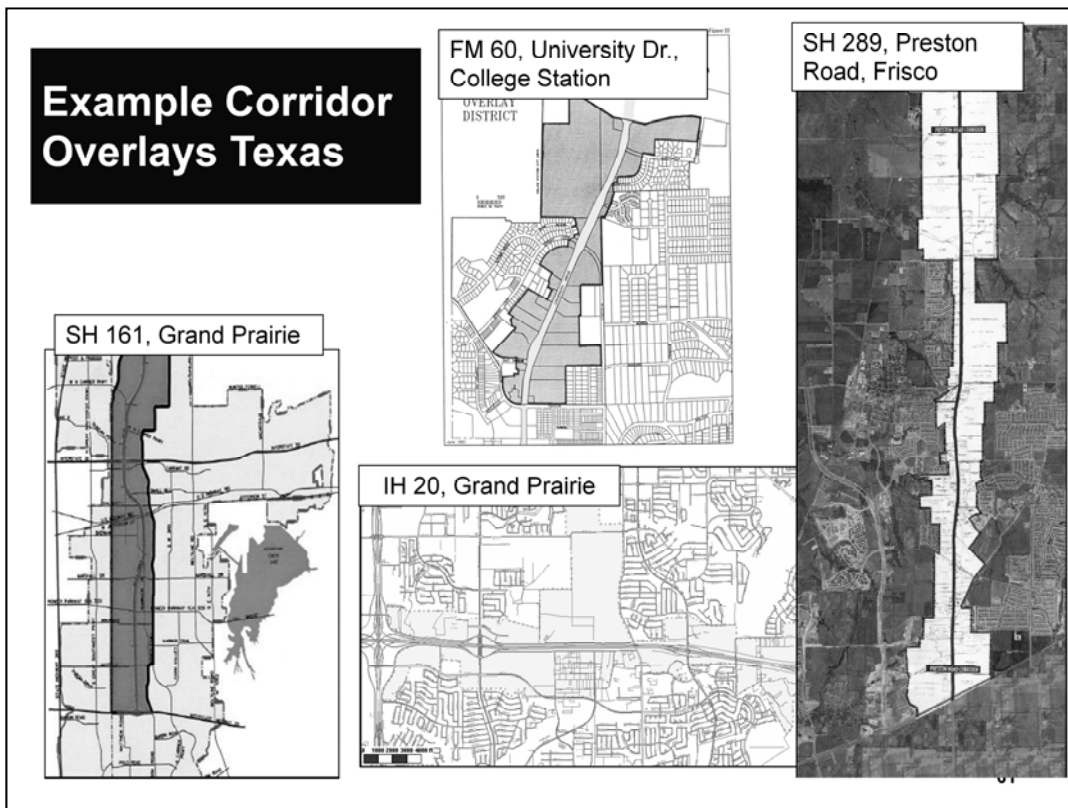
Requirements Used in Zoning Overlays

2007 Survey of Texas Cities



60

A zoning overlay can be an excellent tool for cities and TxDOT to partner and practice CM along a TxDOT corridor. Zoning overlays can be tailored to address the specific needs or unique conditions of each corridor. This bar chart shows the types and percentage use of special requirements that are included in zoning overlays based on a 2007 survey to Texas cities.



Cities with zoning in Texas have used zoning overlay districts for decades. There are numerous examples of corridor zoning overlays on state roadways. In many cases they were developed for non-transportation related reasons and with coordination with TxDOT. However, in some cases there was local partnering with TxDOT and the zoning overlay was used to achieve transportation benefits – chiefly access management applied on a corridor-wide basis.

Key Items That Can Be Used in Overlays

Those with direct TxDOT/ 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 regs.
- Utility placement
- Aesthetics

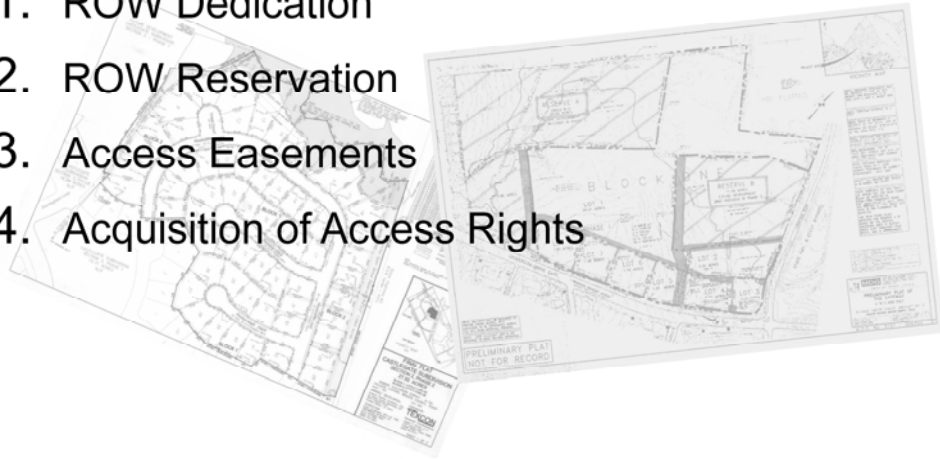


62

This slide shows items in local zoning overlays that can have direct TxDOT/transportation benefits.

Platting Related CM Tools

1. ROW Dedication
2. ROW Reservation
3. Access Easements
4. Acquisition of Access Rights



63

This next series of slides covers platting related tools that can be used to meet CM objectives.

TxDOT/Local Coordination on Plats

- Coordination needed in PRELIMINARY plats to:
 - Manage access
 - Coordinate in T-fare planning
 - Protect and preserve state ROW



TxDOT-local coordination (for properties along state roads) must occur no later than at the preliminary platting stage in order for TxDOT to have input. Once a plat has proceeded to the final plat stage it is too late for input because by state statute local authorities can not make any changes at this point in the process.

Coordination at the preliminary plat stage (or at the concept planning stage) is imperative in relation to managing access, coordinating in local thoroughfare planning, and in protecting and preserving TxDOT's ROW interest as part of local platting.

ROW Dedication Through Platting

- Conveyance of property to the public
- Texas cities/counties should require ROW dedication along TxDOT roads when
 - It is needed to gain compliance with their adopted transportation plan
 - Amount of dedication is roughly proportional to impact of development and reasonably related
- Coordination important to determine
 - TxDOT ROW needs for state facilities
 - Correct functional designations, cross-sections for state roads adopted in local plans

65

Right-of-way dedication is the conveyance of property needed for a transportation facility or site related improvement(s) from a private land owner to the public. It is an exaction (e.g. mandatory contribution) placed on a developer requiring ROW dedication in accordance with a locally adopted plan.

It is common practice by most cities in Texas to require ROW dedication and/or reservation of ROW along state facilities as part of their platting process. Important factors that cities consider in dedication include the amount of ROW required, its reasonableness related to the development in question, and the stage of planning TxDOT is in on the project for which ROW is needed.

TxDOT districts and area offices should coordinate with cities on state facilities in need of additional ROW. The amount of ROW required for state roadways via functional designations on adopted local plans should be reviewed and changed as necessary to accommodate future TxDOT cross-sections. TxDOT or mutually agreed upon ROW and/or design requirements could also be incorporated into local development regulations.

ROW Reservation in Platting

- Area designated for future ROW on a plat
- Purpose: prevent development, improvements in future ROW
- Does not transfer ownership of property
- Premise that ROW will be purchased in future
- Reservation may be negotiated or compromise option to dedication
- Helps reduce cost for future ROW acquisition

66

A reservation is the designation of future ROW on a subdivision plat. The purpose of a reservation is to prevent development in the reserved ROW. Unlike a dedication, a reservation does transfer ownership of property. In cases where the impact of the development may not justify dedication of ROW, a reservation may be a possible (negotiated) compromise option.

When property is designated as 'reserved' ROW on a subdivision plat, developers should not be able to make permanent improvements on the portion of their site that has been so designated. This ensures that parking lots and structures are not built on the portion of the tract that is reserved for future state ROW. When TxDOT is ready to develop the facility, perhaps many years in the future, it will then purchase the ROW reserve from the landowner.

Access Easements

- Most important tool in carrying out TxDOT and local driveway spacing criteria
- Locals should require when property being subdivided into frontage amounts that can't meet spacing
- Types: shared, cross, and blanket easements

**This does not
count as cross
access**

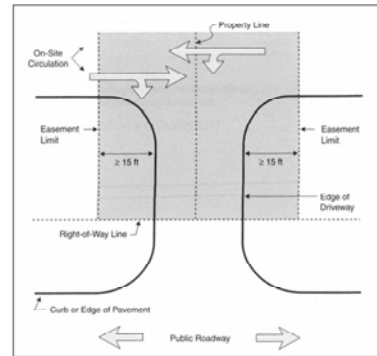


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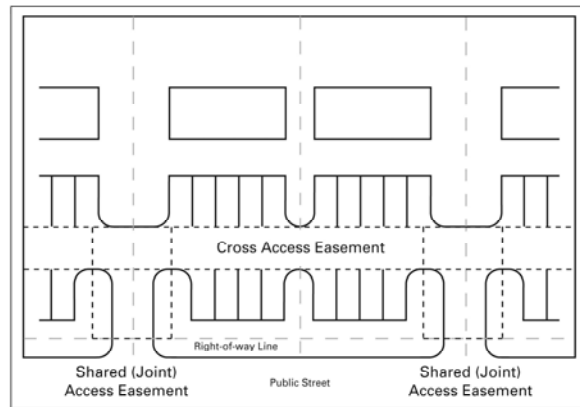
An access easement is a voluntary or required grant of the right of access on or across property by a property owner for use by the public. Access easements are perhaps the single most important tool in carrying out local and TxDOT access spacing criteria as part of the local development process. When property is being subdivided into frontage amounts that cannot meet adopted driveway spacing criteria, local jurisdictions can require access easements in order that proper spacing can be achieved.

Access Easements

Shared access easement centered on a property line



Cross access easements are often situated on parking aisle parallel to the roadway.



A shared access easement is centered on the property line between two abutting parcels, which allows these parcels to share a single driveway. An illustration showing generally how shared access easements could be reflected on a plat is shown in the top graphic as the shaded area. Note that the easement begins at the ROW line and is drawn large enough to encompass internal turning movements associated with the driveway.

An example of a cross access easements is shown in the bottom figure. Here, the easement is situated parallel to the street ROW line and they are often centered on parking aisles or circulation roadways. The use of increased driveway throat lengths can result in cross-access easements being located further into the site.

Platted Access Easements



Blue access easements on plat are yellow areas on aerial



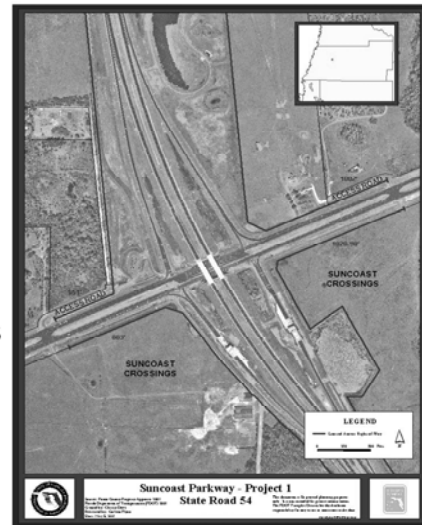
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This slide shows an example of a master preliminary plat for a typical large shopping center. The access easements for the development are shown by the blue lines. The easements, required by the city planning staff, we situation along proposed property lines such that as parcels were sold off individually they would each have access to the internal circulation system for the center in the future.

The graphic on the bottom right shows an aerial view of the access easement that extends parallel to the state roadway and behind all of the lots that have frontage along the state road. In this case, the access easement was used to create a backage road for all of these outparcels to take access from – instead of taking it from the state arterial.

Acquisition of Access Rights

- Right of access acquired, purchased or condemned
- Consider early, commonly done during ROW acquisition
- Precludes future takings claims
- Used primarily for new highways via 'access control lines'
- Permanent access control



70

Acquisition of access rights to a roadway from abutting parcels is another tool that can be used in CM and CP. Under this method, the property right of access for abutting parcels is acquired through purchase or eminent domain. Compensating property owners for access rights precludes the ability for future claims of a regulatory taking due to denial of access since the right of access is removed. Control of access rights is discussed in Section 15 of TxDOT's *ROW Manual*.

Access control by the acquisition of access rights is federally mandated on the Interstate Highway System. While full control of access is purchased along federal interstate highways, typically only partial access rights are purchased or acquired along state and local non-freeways and arterials. Acquisition of *partial access rights* is where the right of access is prohibited along a highway segment but openings are left at specific locations in the access control line where access may be considered.

Acquisition of access rights is a CM method that is used by TxDOT primarily for new highways and new alignments that the Commission has determined to be controlled access facilities. It can also be used by districts on upgrades to existing highway facilities, particularly those where additional ROW is acquired.

Acquisition of Access Rights Other Uses

- Control access and sight distance at intersections
- Preclude future access in the area of ramps and intersections
- Case-by-case basis for safety, design considerations
- Opportunities as they arise



Loop 12, Garland

71

Acquisition of access rights is a CM method that is used by TxDOT primarily for new highways and new alignments that the Commission has determined to be controlled access facilities. It can also be used by districts on upgrades to existing highway facilities, particularly those where additional ROW is acquired.

This technique can be used:

- for prohibiting access on facilities designated as controlled access;
- to control access and sight distance at intersections;
- for establishing long-term or permanent access control;
- to preclude future access in the area of ramps or intersections;
- on a case-by-case basis for safety or design considerations; and
- on opportunities as they arise in ROW acquisition and project development.

In Texas, new bypasses and loops around communities (or rehabilitation of existing ones) should be developed with a high degree of access control in order to ensure that these facilities maintain their intended function as a means to serve longer trips at higher speeds. Acquiring access rights is one CM method TxDOT can use to develop loops and bypasses as expressway-type facilities to ensure they serve their intended function long into the future.

10:30-11:00 Session 3

- Corridor Management Plans
 - Overview and Types
 - What they can address
 - Typical objectives
- CM Case Studies



This session is essentially the culmination of all that we have talked about this morning and putting it all together into a plan.

What is a CM Plan?

- Long-range comp. plan for a corridor
- Detailed planning study coordinating some/all of
 - Roadway design
 - Land use / development
 - Access and operations
 - Local street networks
- Combination '**roadway improvement/land development**' policy guide
- Coordination mechanism
- Growth management tool

73

A CM plan is a long-range planning document that addresses all aspects of transportation, land use, and development along a designated corridor. It is a detailed planning study on roadway design, access, land use, and traffic operations. When prepared by partnerships of local agencies with TxDOT districts, they are strategic documents that can be used to guide city policy and private development decisions such that they are suitable to the ultimate design and function of the TxDOT corridor. CM plans can be used to address:

- corridor safety, operations, and progression;
- land use types and intensity;
- development patterns, quality, and design standards;
- landscaping and corridor aesthetics;
- revitalization and economic development; and
- location and placement of utilities.

CM plans are of most benefit to corridors situated in the path of growth and development trends, which not coincidentally, are often TxDOT corridors included on MPO transportation improvement plans (TIPs) slated for rehabilitation, widening, and/or urbanization.

CM plans are growth management tools that show local and state foresight and preparedness . They pay significant dividends in the future in terms of more orderly growth, better progression, enhanced aesthetics, increased tax base and values of private investment, and less costs for future transportation improvements.

Typical CM Plan Objectives

- Prevent/minimize development in pathway
- Preserve/enhance safety, mobility
- Promote local street, development connections
- Match land intensity with roadway function
- Promote economic development
- Preserve/enhance appearance

74

Each corridor management plan will be unique to address the unique conditions, circumstances, or issues of each corridor.

Corridor management plans can have many objectives including minimizing the impacts of development to the corridor, preservation of safety and efficiency, promoting an adjacent supporting local street network, coordinating land use intensity with the desired corridor function, preserving or enhancing the appearance or unique character of the corridor, promoting economic development, and revitalization.

The scope of a CM plan can vary widely depending on the issues and objectives and the future land use plan along the corridor.

CM Plans Can Address

1. Safety, operations, progression
2. Land use types, intensity
3. ROW preservation, protection
4. Development patterns, quality, design
5. Utility location, placement
6. Visual clutter, aesthetics
7. Revitalization, economic development
8. Natural, cultural, historic interests

75

CM Plan can address all or some of the areas listed in the slide, depending on the scope and amount of resources (\$\$\$) available

Historically, cities have used them for aesthetic and economic development reasons...but over about the past decade more cities are using them to achieve transportation-related benefits such as access management.

CM Plans Are Unique

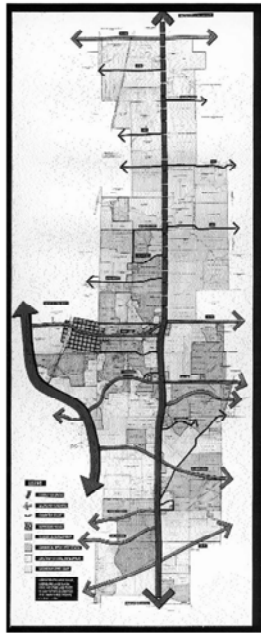
- Different types, shapes and sizes
 - Comprehensive or access only focus
 - Local arterial section or regional highway
 - Urban or rural areas
- Different Objectives
- Tailored to TxDOT, local goals, objectives

76

CM Plans are unique and come in all different shapes and sizes. The form they take will depend upon the desired objectives, resources available, and the plans and regulatory framework of the area.

The can be comprehensive in nature and include many areas such future land use and development type, roadway design, aesthetics or be more limited in scope and only focus on one key area such access or blight.

CM Plan Varieties or Components



Full Blown – Comprehensive, Trans
and LU components

Corridor Zoning Overlay – Focus on LU,
development standards



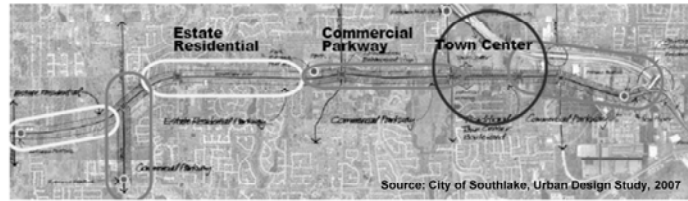
77

Here are a couple of examples of CM Plans. The one on the left is a full blown CM plan that addresses future land use, the local street network, roadway design, and a high degree of development and aesthetic controls – this one is in Frisco and is SH 289 (Preston Road)

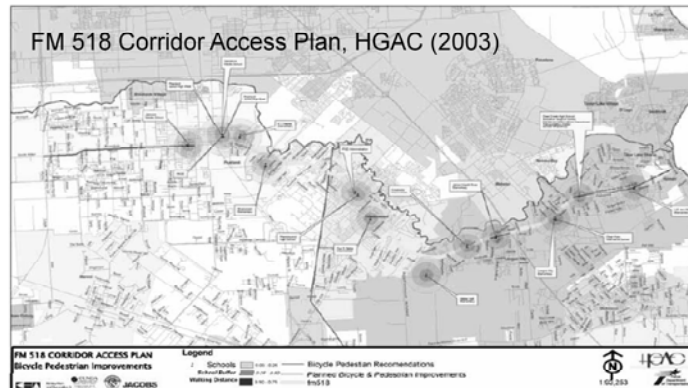
The one of the right is a CM plan on the portion of IH 20 that runs through Grand Prairie, TX. It focuses on land use and aesthetic controls of development along this corridor.

CM Plan Varieties or Components

Emphasis on
streetscape,
design
context



Emphasis
on AM,
safety,
progression



78

Here are a couple of more CM plan examples.

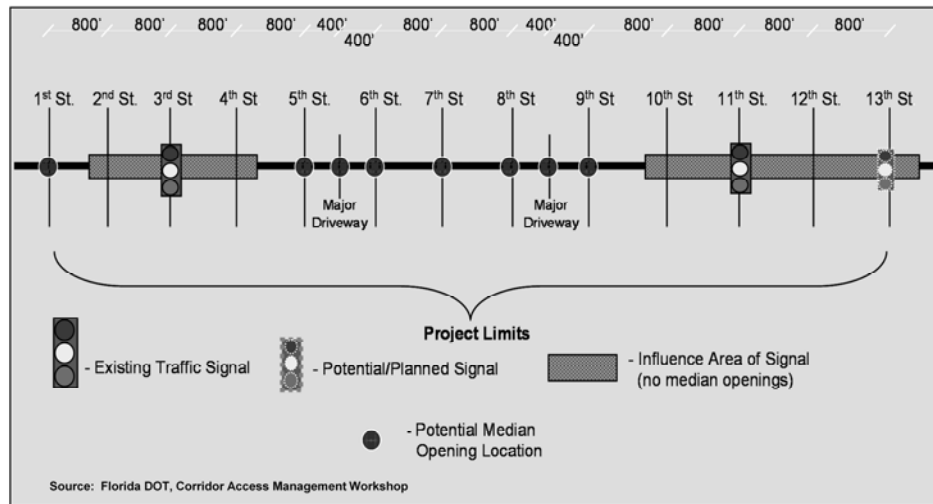
The one on top is in Southlake, TX. It focuses on roadway design and streetscape along the corridor with the objective of one section of the corridor having estate residential characteristics or feel with other sections having features that are more in keeping with a commercial parkway and a town center.

The CM plan on the bottom is the FM 518 Corridor AM Plan in the south Houston area. Its focus is purely on traffic progression and safety. It addresses median needs/design, signal operations, roadway design, and access. This one will be discussed in more detail later.

The benefit of a corridor access plan is that, rather than applying TxDOT's access policy or a local access ordinance in a piecemeal fashion as part of the development process, it is applied at the planning stage on a corridor-wide basis considering ultimate roadway design and land use.

CM Plan Varieties or Components

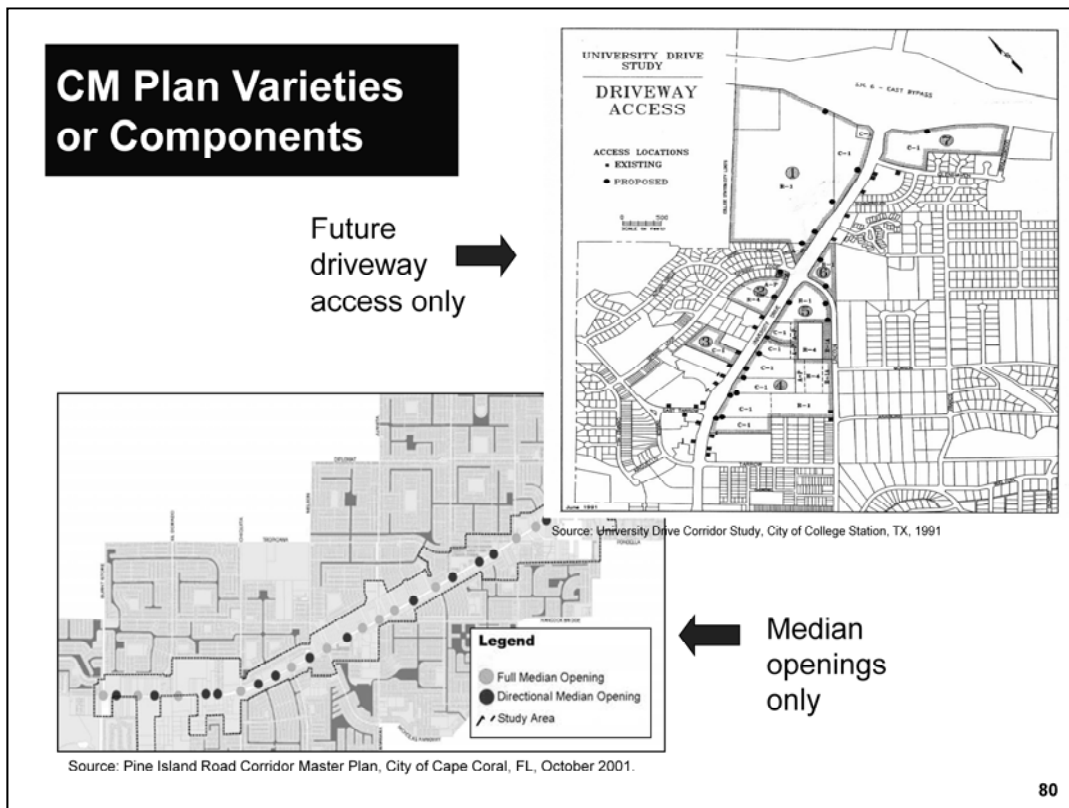
Median Openings and Signalized Intersection Spacing



79

This CM plan from Florida addresses corridor signal spacing and median openings only.

While it doesn't cover much, it includes arguably the most important components and directly targets traffic flow and progression.



80

Here are couple other CM plans that address only access components. The one on the bottom addresses median openings.

The one on the top right shows an example of a possible aspect of an access management plan – a driveway location plan. It is developed by considering existing access points and applying TxDOT or local access guidelines to undeveloped parcels along the corridor to determine where future access locations can occur and where existing ones may need to be closed or consolidated.

11:00-11:30 Session 4

- Corridor Management Case Studies
 - SH 289, Preston Road, Frisco, TX
 - FM 518, South Houston area

In this final Session before lunch, we want to show you a couple of corridor management case studies.

CM Case Study 1

Preston Road (SH 289)
Corridor Management Study
Frisco, TX

82

Self Explanatory.

Preston Road / SH 289

Corridor Location

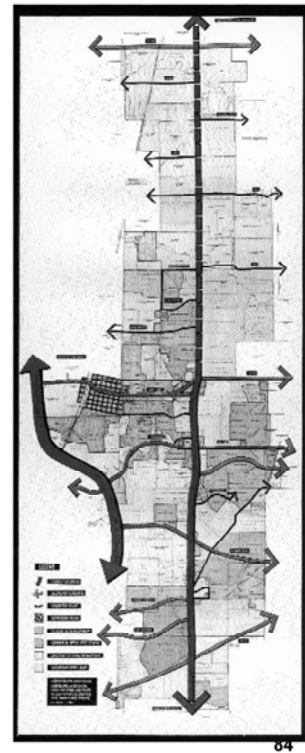
- Frisco, TX
- North Dallas area
- Between US 380 and SH 121
- Midway between McKinney and Lake Dallas



The Preston Road corridor management study and plan is in Frisco, TX located in the north Dallas area. The study and subsequent plan is on the section of Preston Road (SH 289) located between US 380 to the north and SH 121 to the south. As shown on the map, the center of the City of Frisco is located along Preston Road about midway between US 380 and SH 121.

Preston Road Corridor Study Frisco, TX (2000)

- Comprehensive LU and transportation study
- 11 mile section
- Emphasis on civic identity, aesthetics
- Street design, landscape, and development standards created
- Study products
 - Strategic plan for corridor
 - Overlay district



64

In 2000, the City of Frisco conducted a corridor analysis on an 11-mile section of Preston Road (SH 289) generally from SH 121 north to US 380. The study addressed street design, landscape, and development standards and emphasized civic identity and aesthetics.

Products of this comprehensive land use and transportation study were the development of (1) a strategic plan for the corridor and (2) the Preston Road (Zoning) Overlay District. The district was developed in close cooperation with the City of Frisco's Millenium Plan, which sets forth the city's desired land use pattern and thoroughfare network. The development of the overlay and its requirements are catalogued in the City of Frisco's *Preston Road Overlay District Development Standards*.

Preston Road / SH 289 Study Process

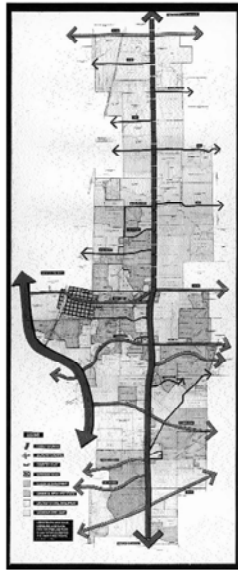
- Consensus-based planning approach
- Series of community workshops covering
 - Existing corridor conditions, analysis
 - Planning and land use concepts
 - Street framework/design
 - Landscaping and development standards
 - Desire for unique civic identity
- Surveys used to ID community desire on planning concepts, corridor identity.

85

The Preston Road study used a consensus based planning process where aspects of plan and development standards for the corridor were reviewed and discussed at a series of community workshops that covered existing conditions, planning concepts, street design, landscaping and development standards. The process resulted in design standards for development along Preston Road and creation of identifiable civic and commercial cores..

Preston Road Study, Land Use Aspects

Existing Development and Dynamics



Existing Zoning



Future LU Plan

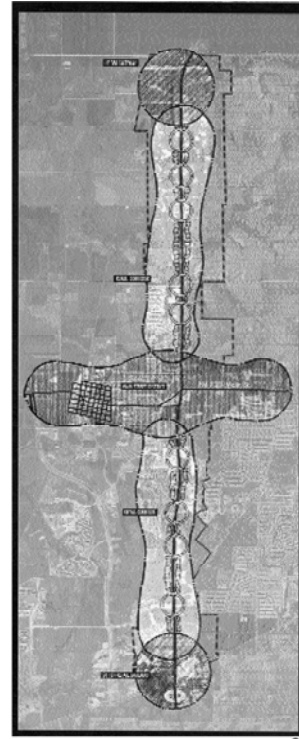


The purpose of this slide is to show the land use aspects covered in the Preston Road Plan. The graphic on the left shows existing development and the relative importance (function) of the thoroughfares in the area that cross Preston Road – some being collectors and other arterials. Note the spacing between these intersections.

The graphic in the middle shows the city's existing zoning along the corridor, while the one on the far right shows the future land use plan and how the land might be rezoned as development occurs in the future. Generally, the future land use plan has commercial land uses concentrated at adequately spaced intersections along the corridor.

Preston Road Overlay District

- Extends out 750' from roadway centerline
- Includes subdistricts
 - US 380 and SH 121 gateways
 - Rural corridor
 - Main street
 - Retail
- Different development regs in each subdistrict



The zoning overlay district, the mechanism to implement the study, extends out 750 feet perpendicular from the centerline of SH 289 and excludes existing single-family residential development.

Recognizing the 11-mile Preston Road Corridor would not be homogeneous, the overlay district was divided into subdistricts in order to address the unique set of issues and concerns in each of these subareas. Separate development standards were adopted for each of the following subdistricts:

- US 380 and SH 121 Gateways,
- Rural Corridor,
- Main Street, and
- Retail Corridor.

Preston Road Overlay District Components

- Prohibited uses
- Uses with conditional development standards
- Enhanced bldg. and parking setbacks
- Special requirements on access
- Roadway design standards
- Building standards



88

The overlay district addressed some or all of the following requirements and standards with the subdistricts:

Prohibited Uses. Common prohibited uses included auto sales, repair, and rental (allowed in retail corridor); light industrial and heavy commercial, mobile/modular homes.

Uses with conditional development standards. Typical uses listed in this category include office and professional, banking, certain retail, restaurants, and auto service and repair.

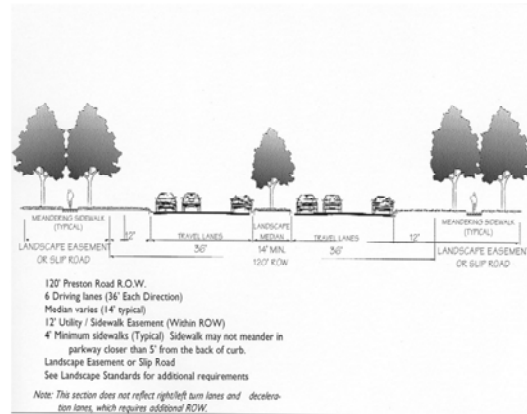
Enhanced building and parking setbacks. For example, a minimum 50-foot building setback is required in the SH 121 gateway and minimum 100-foot setback required in the US 380 gateway. The setbacks are as low as 30 feet for other subdistricts.

Building Standards such as primary building facades must face the street; locations of buildings must consider roadway access and preservation of natural vegetation; and exterior appearance and architectural controls - including materials, colors, projections and recesses, and screening of service areas and equipment.

The picture in this slide shows a portion of Preston Road (actually in nearby Plano, TX) where many years ago the City of Plano set aside ample ROW to allow for a grade separated interchange.

Preston Road Corridor Study Roadway Design

- Preston Road
 - 120' ROW
 - Six 12' lanes
 - 14' median (varies)
 - Landscape easement or slip road
 - 12' utility, sidewalk easement in ROW



- Designs also included for collectors in corridor

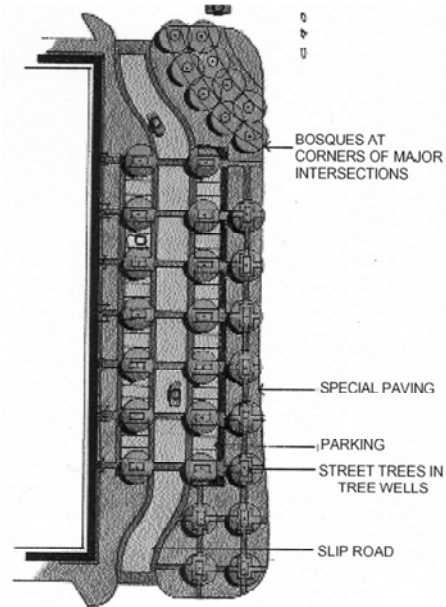
This slide shows a graphic of the ultimate roadway design planned for the Preston Road corridor.

It includes 6 travel lanes, a minimum 14-foot landscaped center median, meandering sidewalks, and a double row of trees along both sides of the roadway contained within a landscape easement.

Currently, sections of Preston road are only a 2-lane FM road but since the plan and overlay district have been adopted, development decisions along the corridor are now based off of the 120 feet right-of-way needed and the roadway's ultimate design as shown.

Preston Road Overlay District Access Related Requirements

- 14' center landscaped median
- Use of slip roads (arterial frontage roads)
- No parking or driving aisles between buildings and street
- For sites with >200 pkg. spaces
 - medians in driveways
 - 150' min. driveway throat length



The special access related requirements in the Preston Road corridor management plan include:

- a minimum 14-foot landscaped center median
- requirements for 'slip roads' to provide access into and out of developments (it functions essentially as an arterial frontage road);
- no parking or driving aisles located between a building and the street;
- medians in driveways (for sites with >200 parking spaces);
- a minimum driveway throat length of 150 feet (for sites with >200 parking spaces); and
- enhanced landscape standards, special planting and paving for driveway entries.

Preston Road Overlay District Building Setbacks

- Varies by subdistrict
- 75% of bldg must be on built-to-line, additional 25% may setback an additional 10'
- 100' in US 380 gateway
- 50' in SH 121 gateway

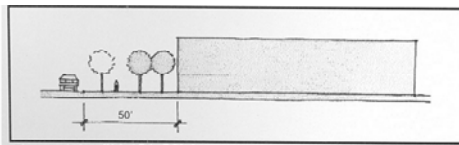


Figure 1.1 - SH 121 50' front yard

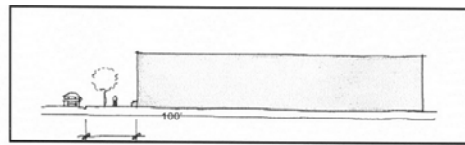


Figure 1.2 - US 380 100' front yard

An important component of the Preston Road overlay are its enhanced building setbacks.

The setbacks vary by subdistrict within the corridor. For example, in the city's main street section 75% of the building must be on the 'built-to' line, which has the effect of bringing the buildings closer to the street. However, a minimum 50-foot building setback is required in the SH 121 gateway and minimum 100-foot setback required in the US 380 gateway. The setbacks are as low as 30 feet for other subdistricts.

HGAC/Houston District CM Plans

- MPOs in TMAs must do Congestion Management Process (CMP)
- HGAC includes corridor studies in UPWP
- Numerous CM studies conducted in past 6-8 years
- CMAQ \$s used to fund, implement improvements
- Good TxDOT/HGAC cooperative process in place

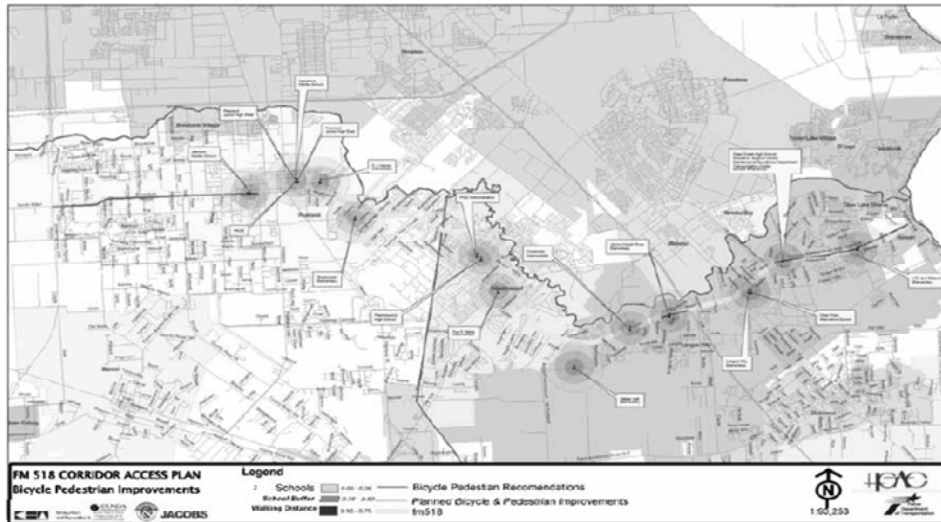
92

Since about 2002, the Houston Galveston Area Council of Governments has conducted large-scale corridor access management studies on several rapidly growing and congested highways in the Houston region. The agency has completed studies on segments of FM 1093 (Westheimer Road), FM 518, and FM 1960, FM 2920, and SH 6. HGAC has incorporated these corridor access management studies and subsequent improvement projects into their planning process and the agency's UPWP. HGAC's CM studies that have been conducted to date include the following:

- Westheimer Corridor Mobility Study, April 2002
- FM 518 Corridor Access Management Plan, Sept. 2004
- FM 1960 Access Management Study, Nov. 2004
- SH 6 Corridor Access Management Plan, Nov. 2007
- FM 2920 Access Management Study, Nov. 2008

CM Case Study 2

FM 518 Corridor Access Management Plan



The next case study we will review is the FM 518 Corridor Access Management Plan located in the Houston area.

FM 518 Corridor Access Management Plan

- HGAC, Houston District 2002
- Corridor extends through
 - Pearland, Friendswood, League City, Kemah
 - Brazoria and Galveston counties
 - Jurisdictions with different planning, development controls
- 26 miles, majority 5-lane with C2WLT lanes
- Area experiencing rapid growth, safety concerns, congestion



HGAC, through the use of a consultant, began the study on the FM 518 corridor in late 2002.

The agency partnered with TxDOT, and numerous cities, and counties to undertake the study. The study section of the corridor bisected four cities, 2 counties, and extends 26 miles. It required a tremendous amount of intergovernmental coordination.

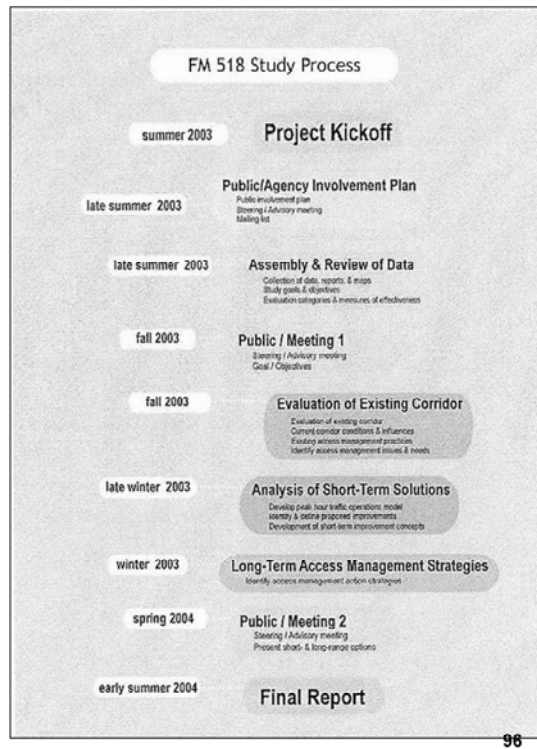
FM 518 was selected for study because of its high crash history, congestion and safety concerns, and the area's rapid growth.

Corridor Goals and Objectives

- Improve safety by reducing driveway density, total conflict points per mile
- ID short-term transportation solutions, provide list of recommended projects
- Improve traffic flow, level of service
- Reduce motorist delay, decrease travel time
- Assess long-term corridor needs and recommend policy and regulation changes

This slide show lists the goals and objective identified for the FM 518 corridor study.

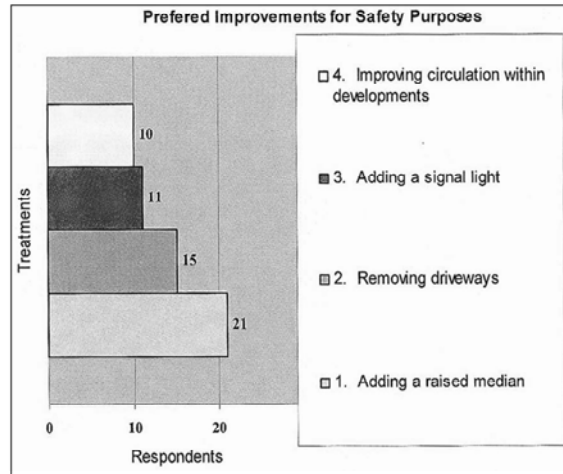
FM 518 Corridor Study Process and Timeline



The purpose of this slide is generally show the overall study process and general timeline. It involved a project kickoff meeting and numerous opportunities for public input. From project kick-off to final report, the study took about 1 year.

FM 518 Corridor Public Involvement Process

- Public, stakeholder, and steering committee meetings
- 85 percent of survey respondents satisfied with public outreach effort
- 60 percent agreed with the raised median recommendation



This slide shows the results of the project's public involvement process.

Review bullet points.

Interestingly, the majority of those that attended agreed that a median should be installed in FM 518.

FM 518 Corridor

Existing Conditions

- AADT up to 38,000 veh/day
- Speeds vary between 30 and 45 mph
- Crash rates are higher than regional average
- 58 signalized intersections (all TxDOT)
- ROW varies from 60 ft to 200 ft
- Much of the corridor has a two-way left turn lane

98

The FM 518 corridor is generally a 4-lane divided roadway with a two-way left turn lane for a large majority of the 26 mile section. A 4-mile section through the city of Friendswood has a raised median. Overall, the corridor has a high driveway density.

Existing AADT along the 26 mile corridor ranges from about 9100 to 38000 vehicles/day and the posted speeds are from 30 to 45 mph.

There are a total of 58 TxDOT traffic signals within the study corridor with 40 of these coordinated in closed loop system and remaining isolated and actuated.

Existing Conditions (cont.)

- Access Inventory
 - 1002 access points ID'd
 - Density by segments calculated, ranged from 14 to 65 access points per mile
 - Maximum access density goal: 30 per mile
 - Current AM regulations in the 4 cities reviewed
 - AM provisions arbitrarily mentioned in city codes

99

An access inventory conducted as part of the study found a high driveway density with over 1000 driveways being identified.

The development regulations in all cities were reviewed and few provisions for access management were found. As part of the CM plan for the corridor, a measure 30 driveways per mile was established to help improve safety.

Existing Conditions (cont.)

Corridor Sections			LOS	LOM
SH 288 West Side	to	FM 865 (Cullen)	E	Moderate
FM 865 (Cullen)		CR 89	E	Moderate
CR 89	to	Woody / Corrigan	F	Serious
Woody / Corrigan	to	Halbert / McLean	E	Moderate
Halbert / McLean	to	SH 35 / Main	F	Serious
SH 35 / Main	to	Sherwood	F	Serious
Sherwood	to	Woodcreek	F	Severe
Woodcreek	to	Dixie Farm	F	Serious
Dixie Farm	to	Williamsport	A - D	Tolerable
Williamsport	to	Newport	F	Serious
Newport	to	Interurban	F	Serious
Interurban	to	SH 3	F	Severe
SH 3	to	FM 270 / FM 2094	F	Serious
FM 270 / FM 2094	to	South Shore	F	Severe
South Shore	to	SH 146	A - D	Tolerable

The purpose of this slide is just to show a quick 'snapshot' view of the of the existing operating conditions along the corridor.

For the 15 sections of FM 518 shown, 10 of them operate at LOS F (shown in red), three operate at LOS E (shown in yellow), and only two operate at LOS D or better (shown in green).

Recommended Corridor Improvements

Short and Medium Term, Operational

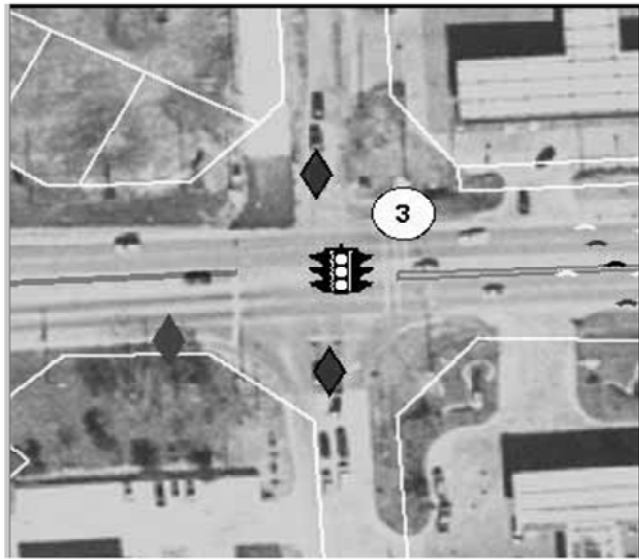
- Recs. or each signalized intersection in corridor
 - Phasing and striping changes
 - Eliminate all split phased signal sequences
 - Evaluate 'protected only' vs. 'protected- permitted' lefts
- Incorporate isolated signals into closed loop
- Upgrade signal communication infrastructure
- Minor roadway widening projects to accommodate turn lanes at intersections

101

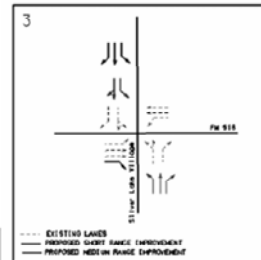
The study included short-term, medium term, and long-range improvements for the corridor. The short-term improvements concentrated on those that did not require major purchases of ROW, had a short construction period, and required only minor coordination with property owners.

Read bullet points for the recommended short and medium term operational improvements.

Example Operational Change Recommended



- Re-stripe NB and SB from left-only, left-or-straight, and right-only to left-only, straight-only, and right-only
- Change N-S signal sequence from split-phased to quad-left



102

This slide shows an example of a typical short-term operational change that was recommended as part of the FM 518 CM plan. It shows changes to lane assignments at an intersection as well as changes to the signal sequence.

All recommended improvements along the 518 corridor, such as this one, were included in the FM 518 Corridor Plan document. These visual illustrations rendered it very easy to understand and easy for persons to thumb through the report and view all recommendations along the corridor.

Corridor Improvements

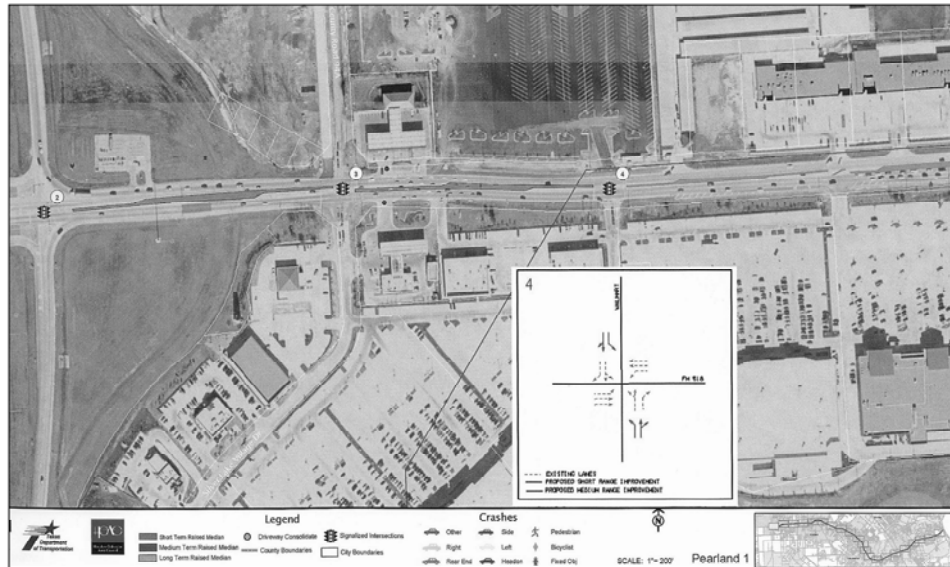
Short and Medium Term, Safety

- Install medians for 600 feet on either side of selected intersections
 - Intersections selected based on crash history and alternative access to adjacent property
- Medium-term recommendations include a more extensive system of medians
- Consolidate driveways, all locations ID'd.
- Other – signage, lighting, landscaping

103

This slide lists more short-term improvements recommended in the CM plan.

FM 518 Corridor Example Segment Recommendation



This slide shows an illustration of a recommended median installation along a certain section of the corridor. It also shows proposed short-term and medium term improvements to lane assignments at an existing signalized intersection.

11:30-1:00
LUNCH on your own