



DRIVEWAYS

SIGNALS

MEDIAN OPENINGS

INTRODUCTION TO
ACCESSMANAGEMENT



Your Instructors

Tim White, P.E., PTOE

- 22 years' experience in traffic safety and operations
- Presented at 2nd National Access Management conference in 1996 in Vail, Colorado
- Started Access Management Committee at VDOT in mid '90s
- On Policy Committee for creating access management standards at VDOT in mid '00s

John McWilliams, P.E.

- 13 years' experience in traffic operations and transportation planning in Florida
- Prepared numerous access management plans for FDOT projects in South Florida
- Represented developers on hundreds of FDOT access management issues throughout the State



2

Course Objectives

Introduction
to Access
Management
Training

- To introduce attendees to access management concepts, especially as they pertain to site access
- To demonstrate how the FDOT access management standards are applied using hands-on activities
- To help participants understand how the FDOT access management regulations are used in real life situations

3

What Burning Questions do you Have?

Access Management Introductory Training



4



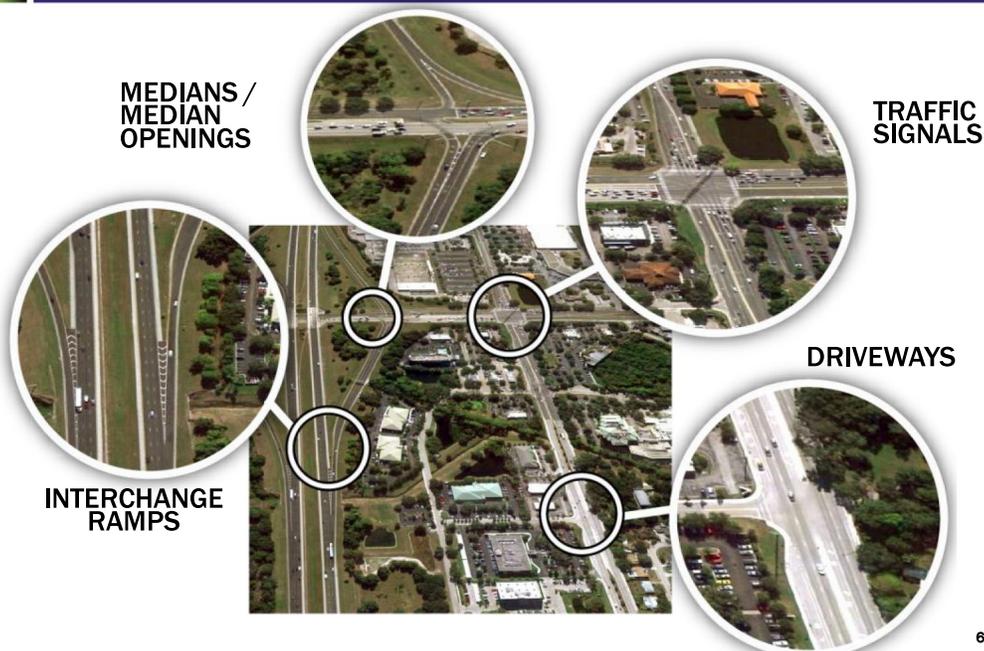
What is Access Management?

Access management involves the location, spacing, and design of driveways, medians, median openings, traffic signals, and interchanges.

The roadway network must be viewed as a system of all the features mentioned above, not as one isolated element.

5

Components





Driveway

Provides the physical transition between a site and the abutting roadway. Balance competing interests for larger turning radii (vehicular benefit) and shorter crossing distances (pedestrian benefit).

7



Median

Restricts left-turn traffic on a roadway and left-turn and through traffic from a side street or driveway. Provides for a separation of opposing directions of traffic, which enhances driver comfort. Also provides a refuge for pedestrians crossing the street.

8



Full Access Median Openings

Allows all movements to and from a side street or driveway.

Is there a difference between full access at an unsignalized side street and full access at a driveway? 9



Directional Median Opening

Allows left turns entering a side street or driveway but prohibits exiting left turns and through movements.

Which of these three driveways would you choose to exit if destined to the left?

10



Traffic Signal

Controls all traffic under signalized conditions with various possible turning movement prohibitions and phasing configurations. Creates time for pedestrians to cross the street at a controlled location.

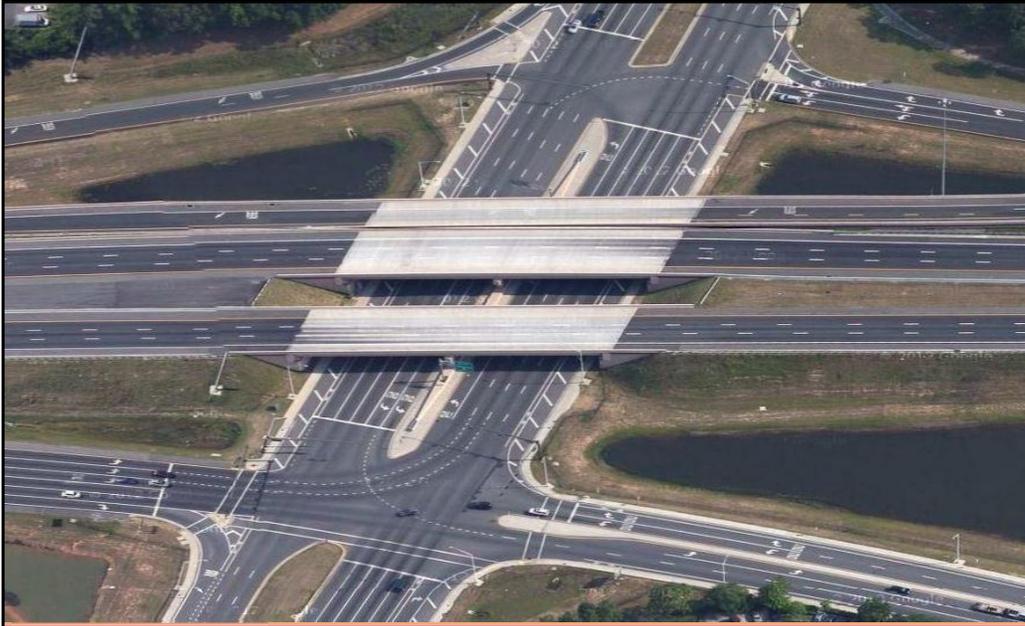
11



Traffic Signal

Double left-turn lanes on each approach, channelized right-turn lanes on each approach, a minimum of two through lanes on each approach, commercial entrances within the functional area of the intersection, and pedestrian crosswalks present numerous access management challenges at this intersection.

12



Interchange

Connection of the roadway to a limited-access facility. The entrance and exit ramps may be signalized or unsignalized. Driveways located close to interchanges can create driver confusion.

13



Why is Access Management Important?



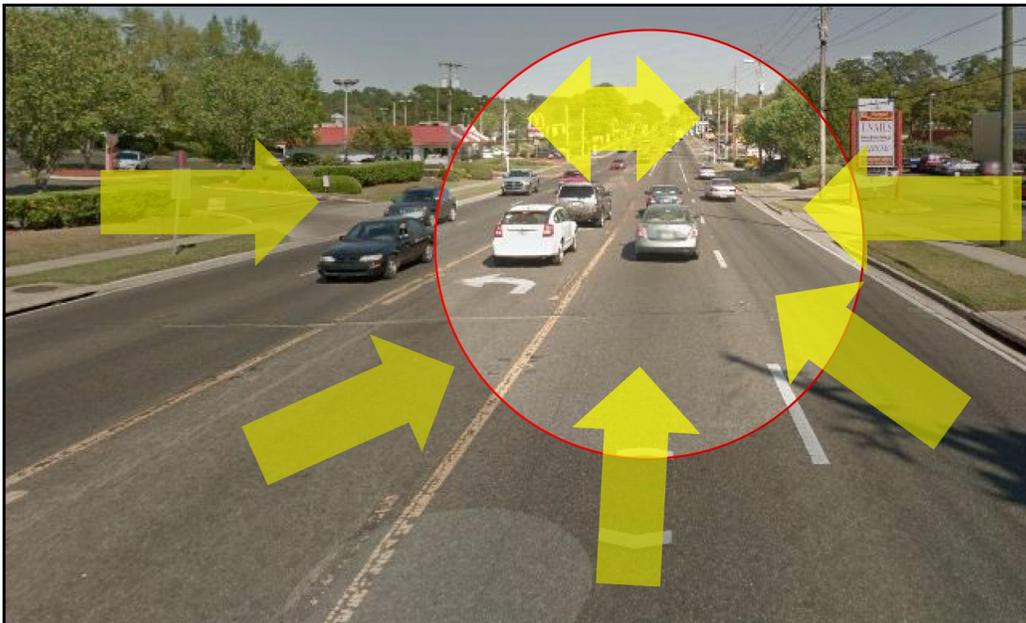
Access management improves **safety** and **efficiency** for all travel modes.

14

Goals

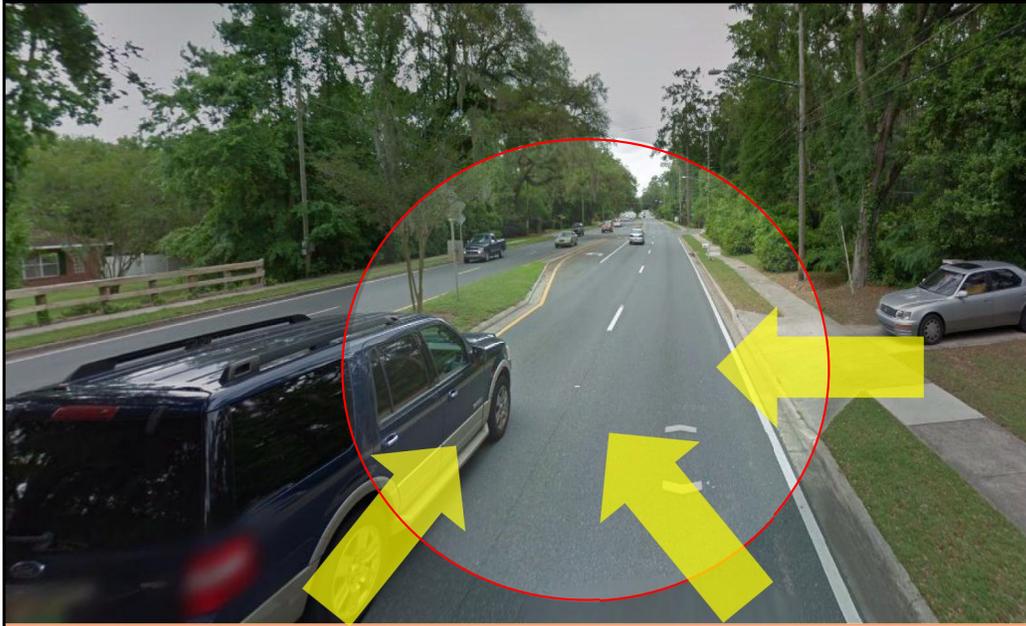


- Consider multi-modal
- Impacts to:
 - ▣ Vehicles
 - ▣ Pedestrians
 - ▣ Cyclists
 - ▣ Transit
- Avoid creating confusing situations thereby putting motorists and other users in a position to fail
- Consider impacts to businesses



Two-Way Left-Turn Lane Perspective

Multiple conflicts from vehicles in driveways on both sides of the roadway, in the center turn lane and in adjacent lane(s).



Median Perspective

Conflicts from vehicles in driveways on one side of the roadway, in the median opening and in adjacent lane(s).

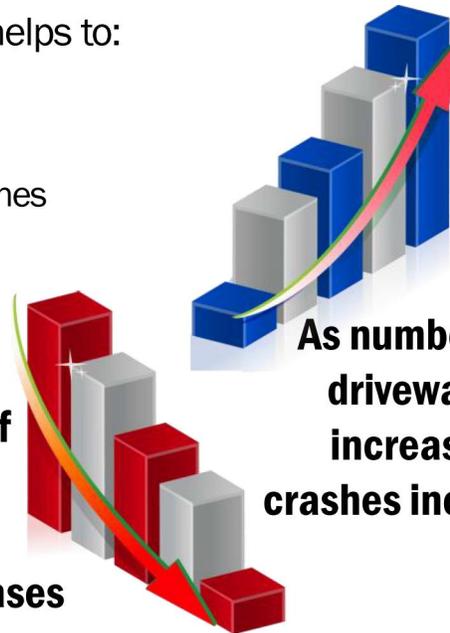
17

Benefits

□ Access management helps to:

- ▣ Reduce conflicts
- ▣ Enhance safety
- ▣ Lessen severity of crashes
- ▣ Improve mobility
- ▣ Increase connectivity
- ▣ Develop aesthetics

As number of driveways increase, capacity decreases



As number of driveways increase, crashes increase

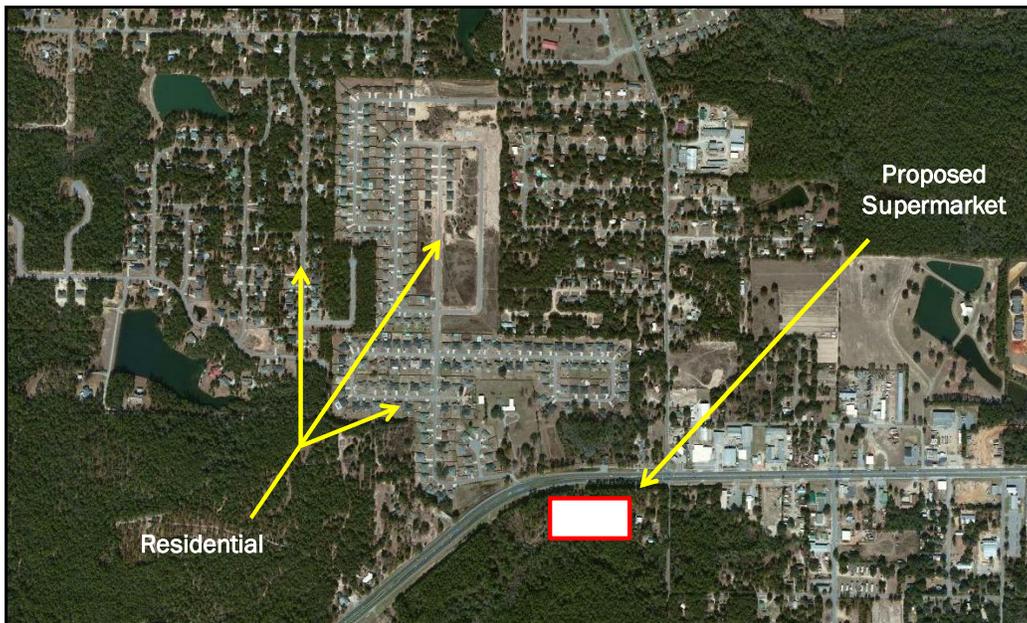
18

Business Implications

- Access management doesn't have to be detrimental to businesses
- Benefits include:
 - ▣ Safety
 - ▣ Improved access
 - ▣ Mobility (reduced impacts of queuing)



19



Business Implications

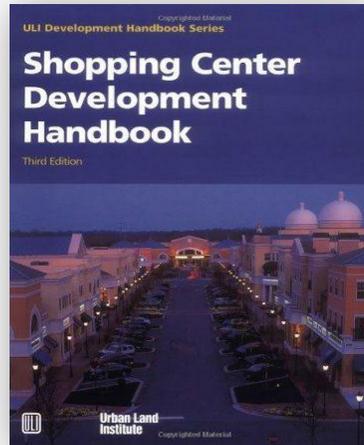
How important is good access to and from the residential developments to the north?

20

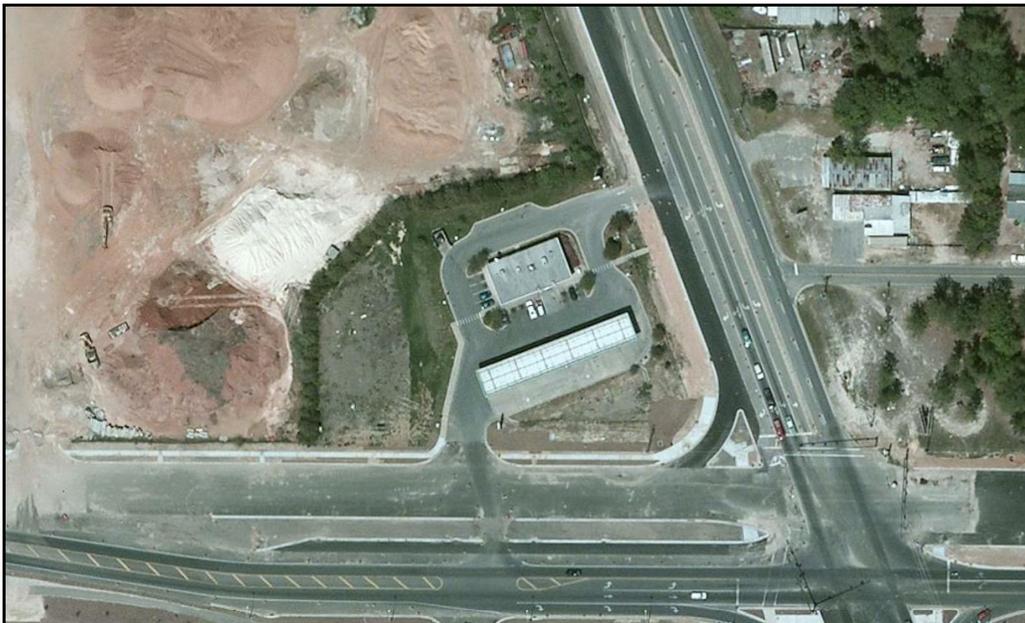
Business Implications

Urban Land Institute

- Poorly designed access treatments can present traffic hazards and congestion that created a negative image of a center
 - ▣ Shopping Center Development Handbook, Urban Land Institute (1985)



21



Business Implications

How important is access to this single use?

22



Business Implications

How important is access to this large multi-use development?

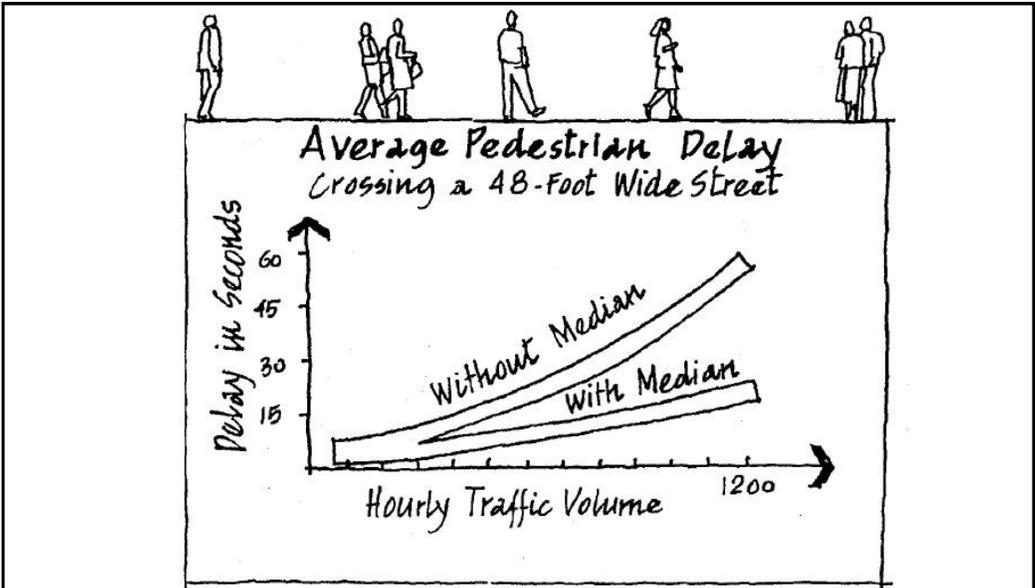
23



Pedestrians

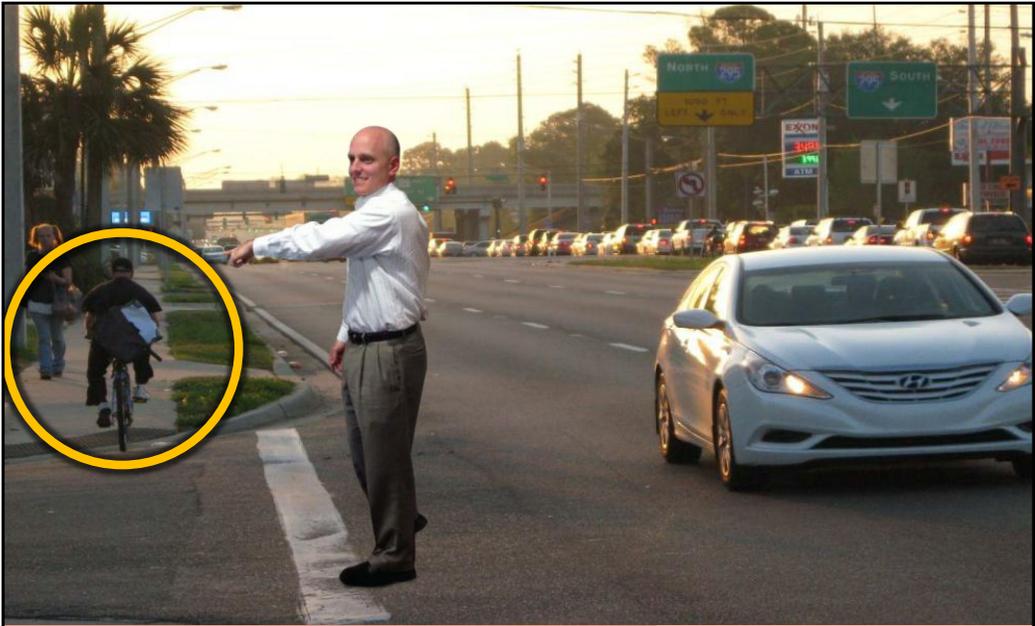
This pedestrian is attempting to cross a busy, urban, 6-lane section with numerous driveways between two signals. How does she know if an oncoming vehicle is signaling to turn right at a driveway before or after her location?

24



Source: NCHRP 294A

Pedestrian Crossing Delay
 On roadways with hourly traffic volumes near 1,200 vehicles, the crossing delay for a facility with no median is 3 times more than if a median were present.



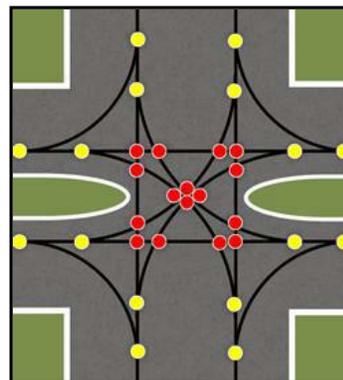
Bicycles
 Many bicyclists behave more as pedestrians than as vehicles in urban areas where cycling is a primary mode of transportation. Cyclists riding on the sidewalk in the opposite direction of traffic violate driver expectation.



27

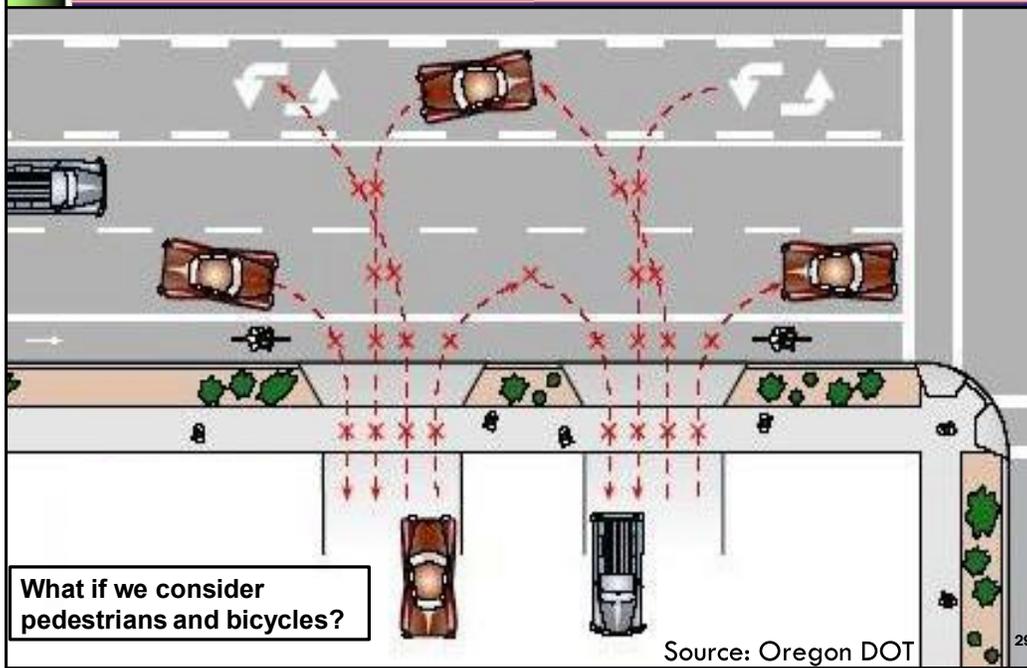
Conflict Points

- What are conflict points?
 - ▣ Potential locations for crashes between vehicles, pedestrians, and/or bicyclists (all users)
 - ▣ Locations where two or more roadway users could occupy the same space at the same time
- Conflicts
 - ▣ Crossing
 - ▣ Merge
 - ▣ Diverge



28

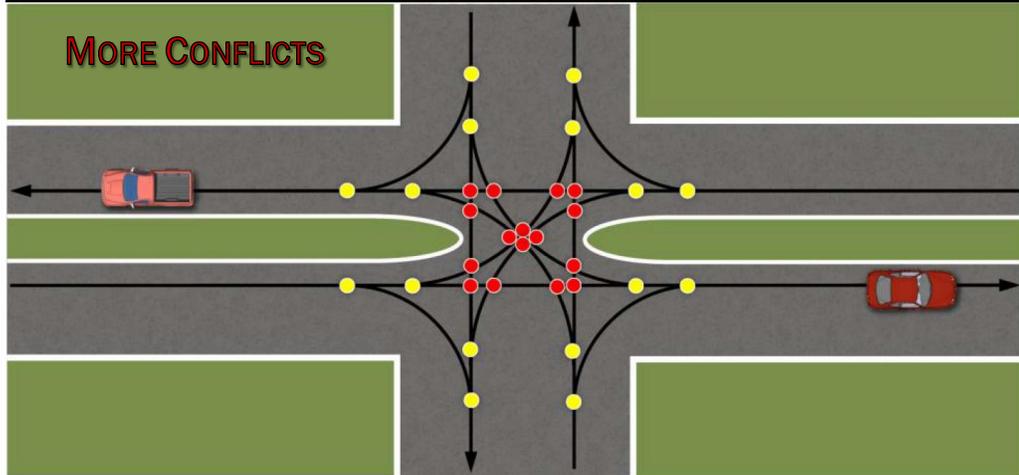
Conflict Points



Conflict Points

Full unsignalized median opening

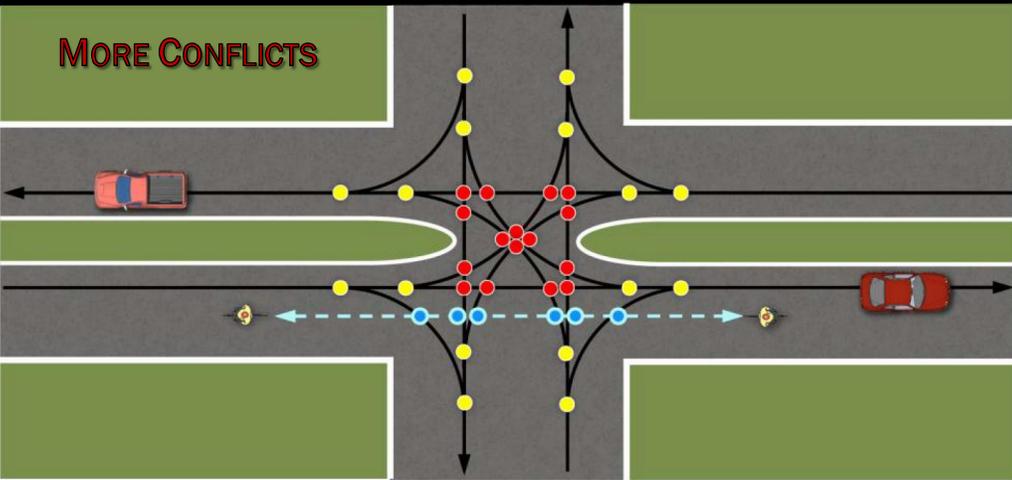
MORE CONFLICTS



Conflict Points

Full unsignalized median opening

MORE CONFLICTS



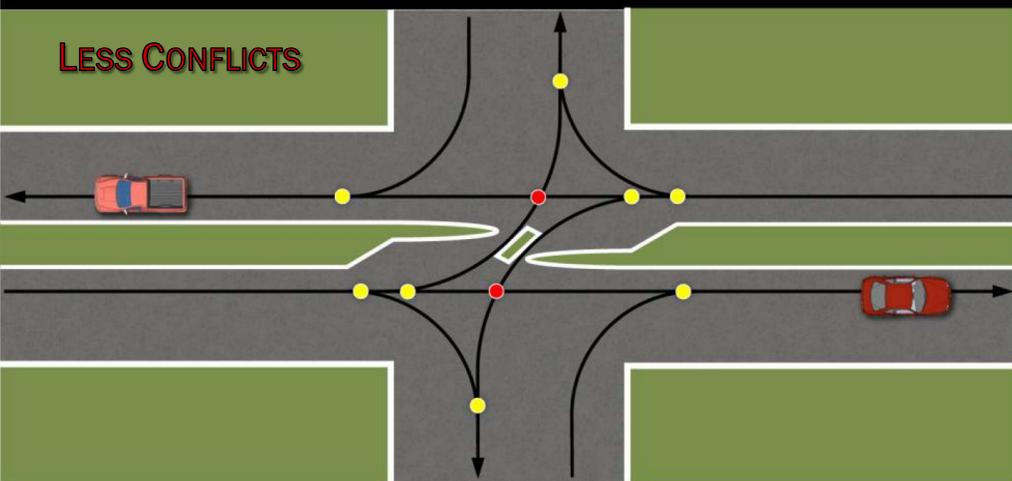
What if we consider bicycles?

31

Conflict Points

Directional median opening

LESS CONFLICTS

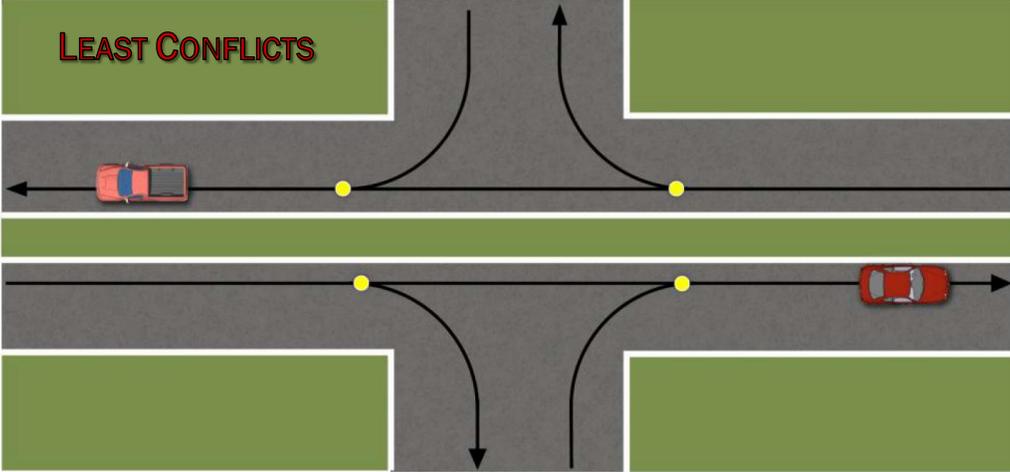


32

Conflict Points

Right-In/Right-Out Driveway

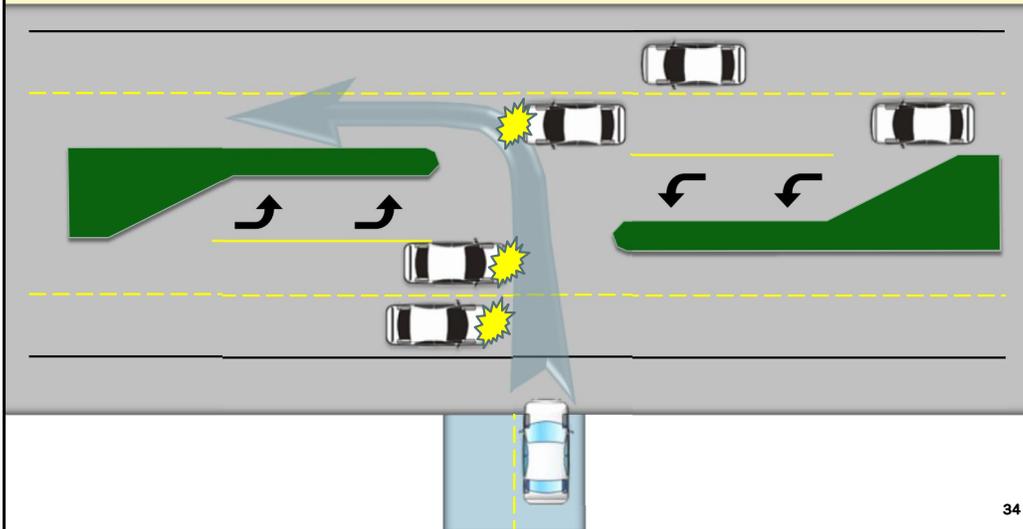
LEAST CONFLICTS



33

Left-Turn Crash Potential

Left turns are the most dangerous low-speed driving maneuver you can make from an unsignalized driveway.



34

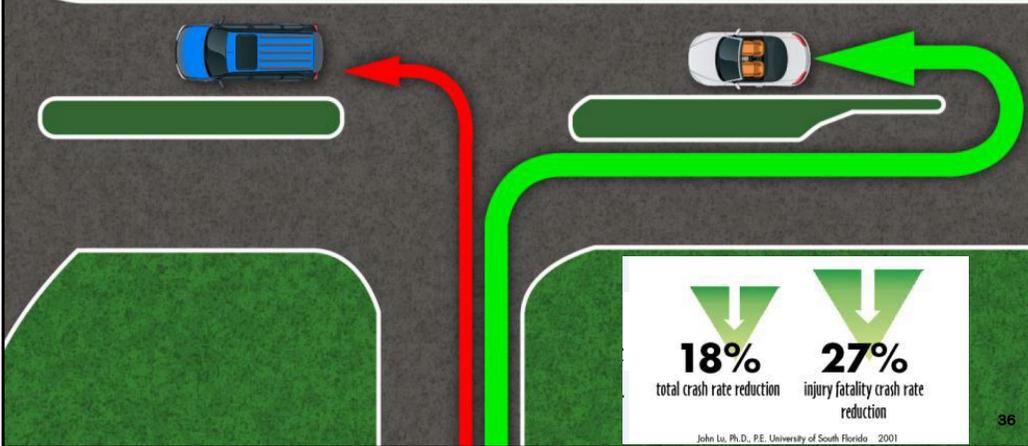


Advantage of Indirect Left Turns

In this case, the indirect left turn saves significant time, sometimes making the difference of 'making the light' at the intersection or not.

Conflict Points

- When access is restricted, vehicles must travel downstream to make a u-turn
- Studies have shown that right turns followed by u-turns are still safer than left turns





Integrated Bulb-Out at Intersection

37



Mid-Block Bulb-Out

38

Guiding Principles

- Limit the number of conflict points
- Separate conflict points
 - ▣ How do we do this?
 - Reduce the number of median openings
 - Provide directional median openings
 - Improve driveway design
 - Consolidate driveways to reduce frequency
 - Eliminate offset intersections
- Look at conflict points from a network perspective

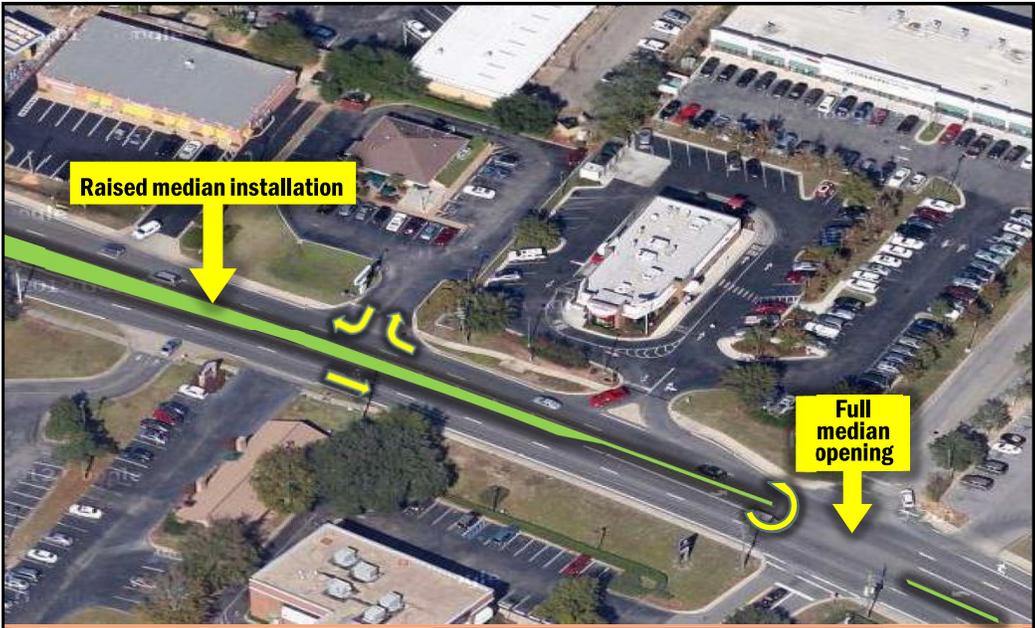
39



Limiting Conflict Points

Converting a non-restrictive median (two-way left-turn lane) to a raised median helps to limit the number of conflict points along a corridor.

40

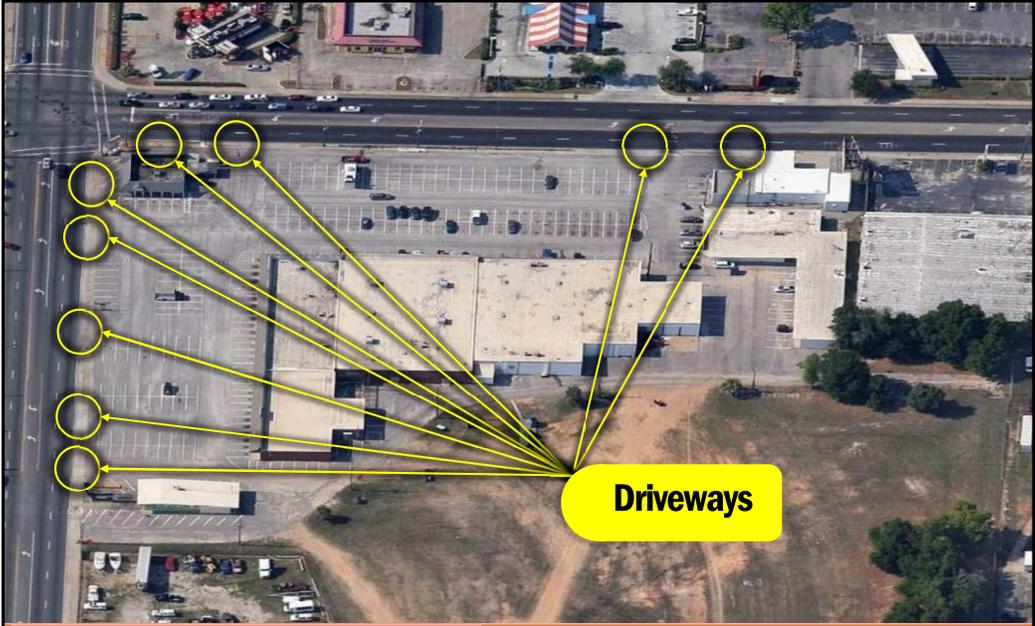


Raised median installation

Full median opening

Limiting Conflict Points

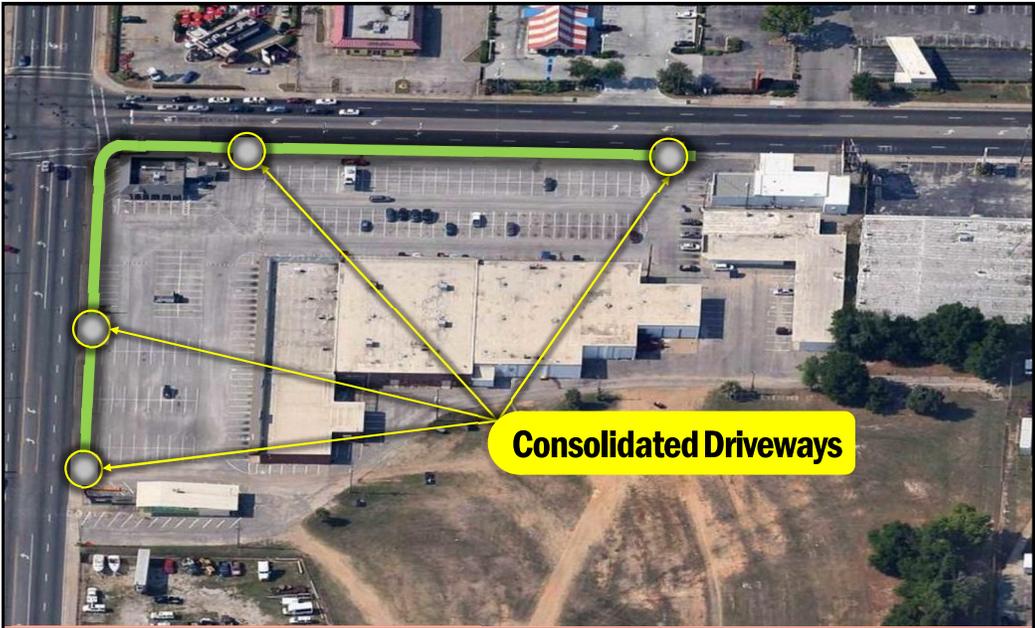
The addition of a raised median eliminates left-turn movements across the centerline, thus reducing the number of conflict points. Vehicles that previously made the left-turn movement are now provided access via a U-turn at nearby median openings.



Driveways

Separating Conflict Points

Consolidation of numerous unnecessary driveways improves safety and provides better direction to drivers.

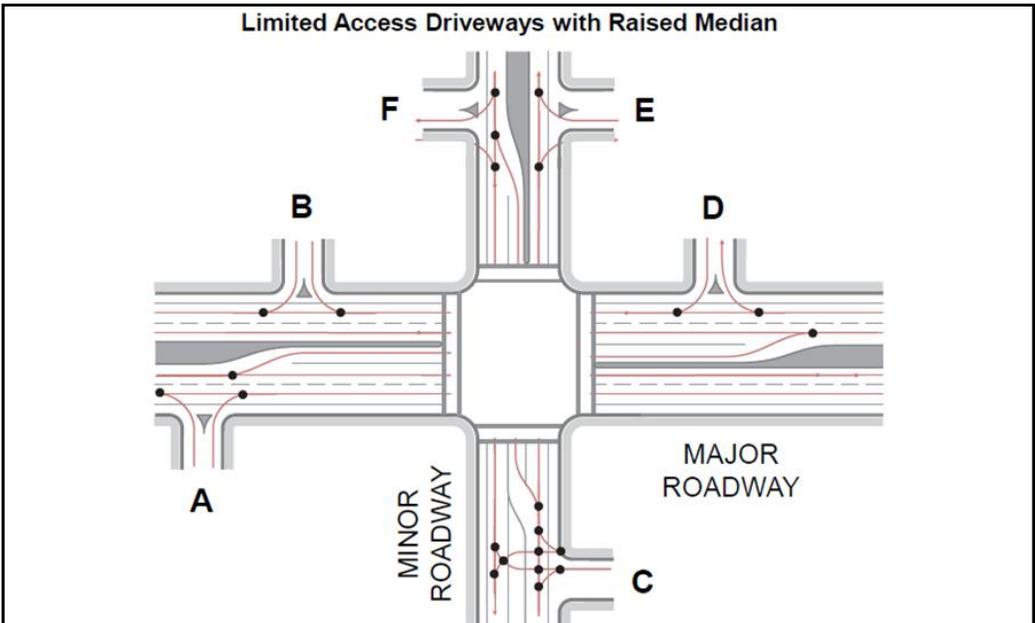


Consolidated Driveways

Separating Conflict Points

Consolidating the existing 9 site driveways into 4 increases the separation between each access, thus reducing the number of conflict points.

43



Network Conflict Points

Conflicts for one site should not be considered alone. Adjustments to the type of access control will impact conflicts at adjacent sites.

44



Concept Illustrations

Some examples of actual state road facilities with good or bad access management...

Can you tell which ones are good and which ones are not so good?

45



Driveway Frontage

This driveway extends the entire length of the business frontage creating numerous opportunities for conflicts between entering vehicles, exiting vehicles, and pedestrians on the sidewalk.

46

Intersection Influence Area

The edge of this driveway is only 20 feet from the stop bar. This may cause rear-end or sideswipe crashes (into other vehicles in the through lane or bicycles in the bike lane) as a vehicle slows suddenly for the driveway rather than the intersection.

47

Closely Spaced Access Points

This stretch of North Monroe St. in Tallahassee, FL has a strip of businesses, each with its own driveway. Are there any opportunities to reduce the number of access points?

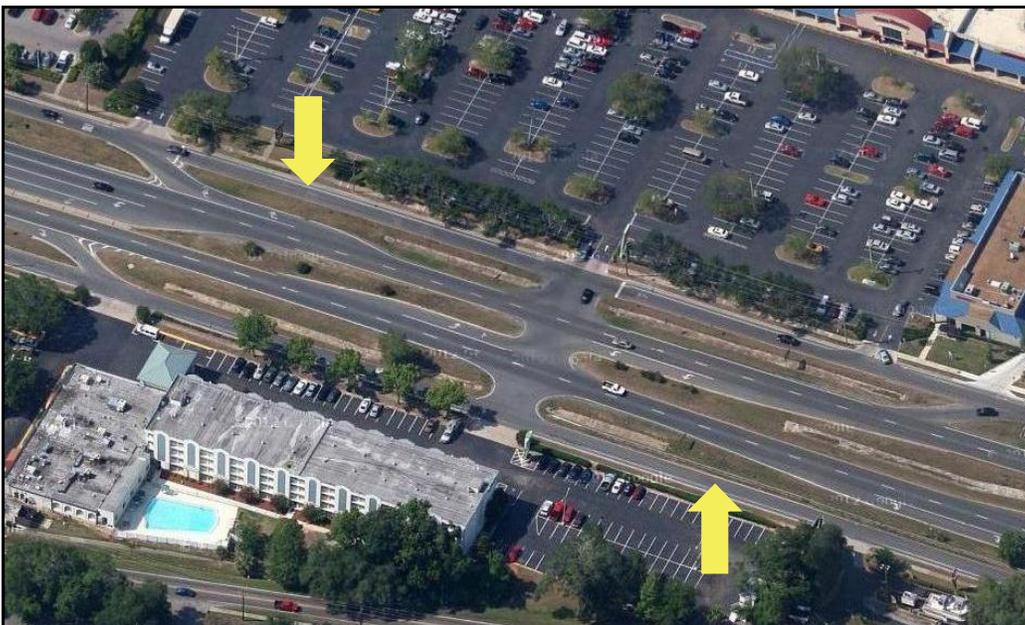
48



Driveways Located Near Directional Median Openings

Drivers exiting the site often misuse the median opening by turning left across it. As a result, flex post delineators were added between the left-turn lanes to prohibit this movement. What are the potential solutions to modify this access?

49



Frontage Roads

Proper use of frontage roads can help eliminate conflict points on the state facility. Inadequately designed frontage roads can create additional conflict points and driver confusion regarding yielding the right-of-way.

50



Wide Channelization

Channelization of driveways and side streets can help separate conflict for opposing movements. Excessively wide channelization can create more driver confusion as to whether each side is a separate road or a single divided road.

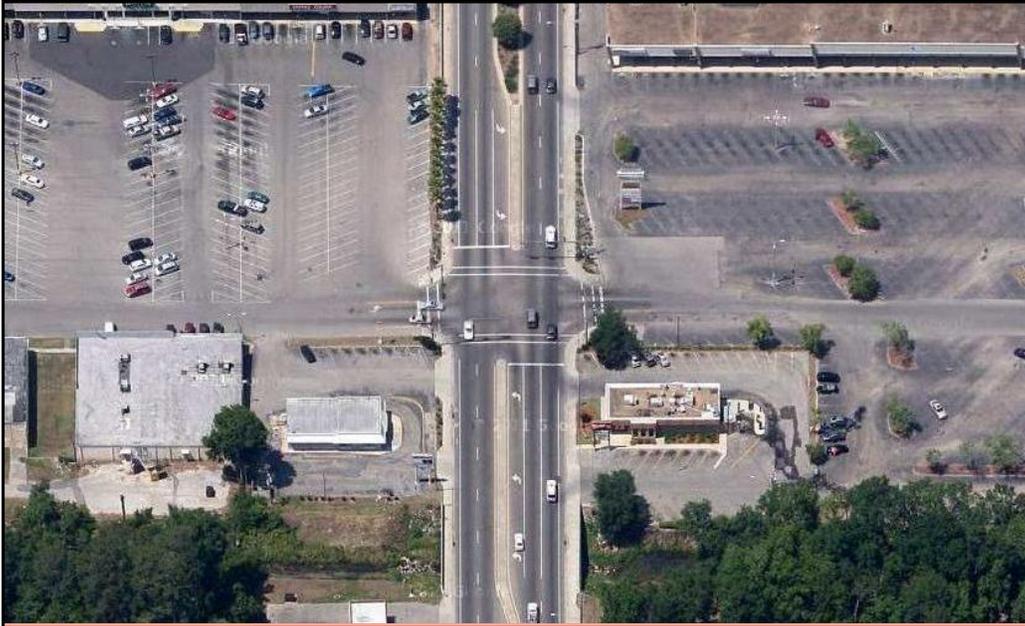
51



Driveways within Turn Lanes

Driveways located within the limits of left or right-turn lanes can lead to angle crashes as drivers attempt to drive perpendicular to queued traffic to turn left or enter the turn lane.

52



Site Layout

The left and right approaches to this signal flow directly into large shopping center parking. The parking is designed without any raised separation, which allows for many conflicting vehicular movements.

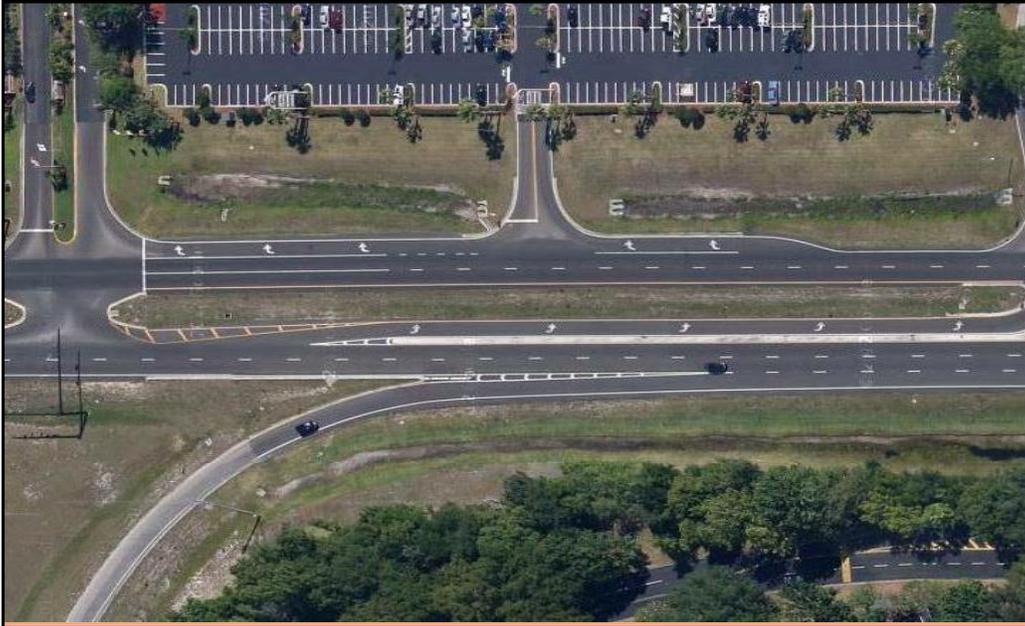
53



Exclusive U-Turn Lane

Construction of an exclusive u-turn location, either signalized or unsignalized, can be used to accommodate displaced left turns following median improvements. Proper spacing and design of u-turn locations can improve efficiency and reduce delay to affected drivers.

54



Other Median Use – Channelized Left

A narrow raised median can be used to separate a left-turn lane to reduce weaving. In this case, the intent is to prevent the off-ramp traffic from weaving over three lanes in a short distance to access the shopping center. They must continue downstream to make a u-turn.

55



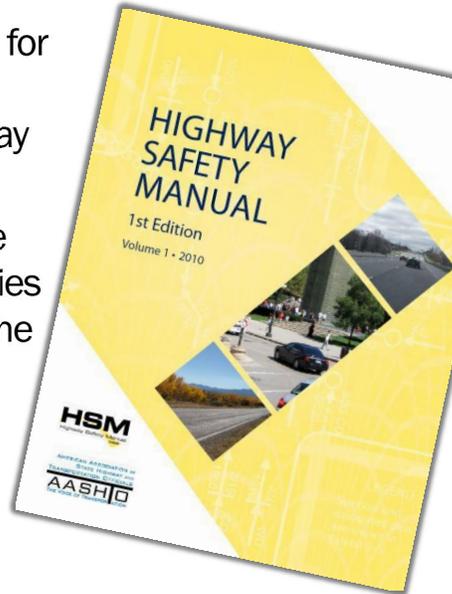
Other Median Use – Channelized Through

A raised median can also be used to separate a through lane to allow it to operate outside the signalized intersection. The traffic in the **rightmost through lane may continue past the intersection in a free-flow condition**, whereas the inside through traffic must stop to allow left turns exiting from the off-ramp.

56

Highway Safety Manual

- The AASHTO Highway Safety Manual details methodologies for predicting average crash frequency given certain roadway characteristics
- It also categorizes factors to be applied to existing crash histories that can be used to estimate the number of crashes eliminated after performing certain improvements
- Both include types of access management changes



57

Highway Safety Manual

- Predictive Method Roadway Characteristics
 - ▣ Median presence
 - ▣ Median width
 - ▣ Driveway type
 - ▣ Driveway density
- Example: One-mile, suburban 4-lane arterial at 45 mph

Divided with 16' median
3.9 crashes/year/mile

Divided with driveways
4.9 crashes/year/mile

Undivided (no median)
5.8 crashes/year/mile

Undivided with driveways
11.5 crashes/year/mile

58

Highway Safety Manual

- Crash Modification Factors
 - ▣ CMF is the percentage of crashes remaining after an improvement, i.e. 0.90 means 10% reduction in crashes
 - ▣ Examples of factors for access management improvements:

Add Median CMF=0.75 25% fewer crashes	Widen Median by 10ft. CMF=0.85 15% fewer crashes	Reduce Access Points CMF=0.70 30% fewer crashes	Install Signal CMF=0.75 25% fewer crashes
--	---	--	--

59

Highway Safety Manual



Draft Highway Safety Manual Case Study: Implementing the Predictive Method in Florida for SR 574

CRASH TYPE	4 LANE, DIVIDED	5 LANE WITH TWLTL
Multi-Vehicle	\$1,492,000	\$2,856,000
Single Vehicle	\$155,000	\$235,000
Driveways	\$561,000	\$3,337,000
Total	\$2,208,000	\$6,428,000

60

Highway Safety Manual

BENEFIT-COST RATIO: 4-LANE DIVIDED TO 5-LANE

4-LANE CRASH COST =	\$2,208,397		Benefit/Cost Ratio:
5-LANE CRASH COSTS =	\$6,427,529		
4-LANE RIGHT OF WAY COSTS =	\$2,200,000		Societal Costs (due to crashes) \$6,427,529 (5 lanes) - \$2,208,397 (4 lanes) = \$4,219,132 (cost difference)
5-LANE RIGHT OF WAY COSTS =	\$600,000		
B/C = 2.64			Additional Cost to Build 4-Lane (ROW) \$2,200,000 (4 lanes) - \$600,000 (5 lanes) = \$1,600,000 (cost difference)
			\$4.2M (benefit) / \$1.6M (cost) = 2.64

Classification: Functional vs. Access

- Although some states apply the access classification the same as the functional classification, in Florida:

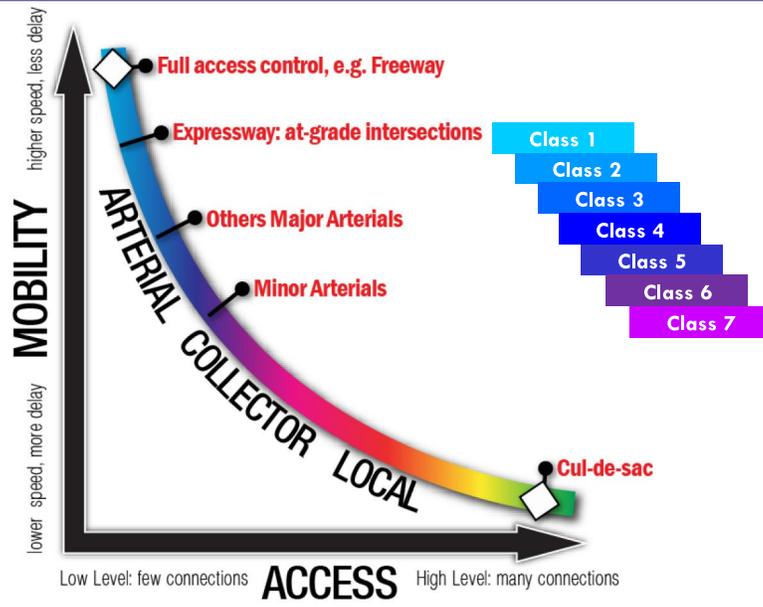


Functional Class and Hierarchy



63

Access vs. Functional Classifications



FUNCTIONAL HIERARCHY

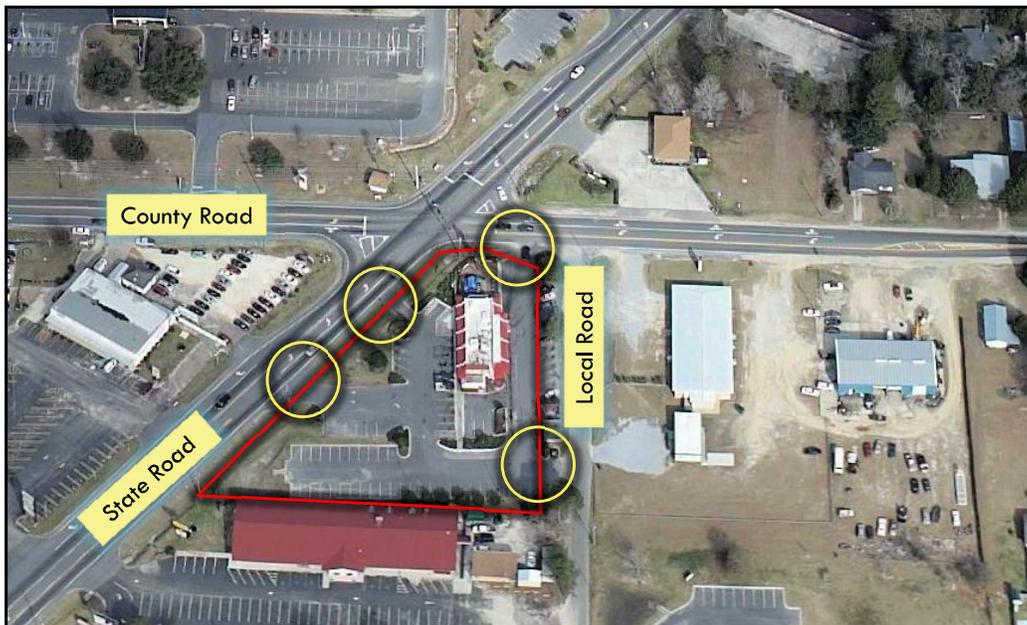
64



Workshop #1

Fast-Food Restaurant Site

65



Workshop #1: Fast-Food Restaurant Site

1. Identify existing access management spacing deficiencies
2. Identify existing safety issues
3. Develop a proposed access plan based on standards

66

COUNTY ROAD AADT=2,800 AADT=14,000 AADT=3,700 Speed Limit = 30
 Access Class = 06 Speed Limit = 35
 AADT=15,100
 MAIN ST (STATE ROAD)
 CARLISLE RD

The site is a fast-food restaurant located at the intersection of a State road and a County road. Additional access is provided by a local road on the east side of the property. Yellow arrows depict the existing driveway configurations.

Tasks:
 1. Identify access management spacing deficiencies
 2. Identify safety issues
 3. Develop a proposed access plan

67

Right to Access

- Must provide reasonable access to roadway
 - What does “reasonable” mean?
 - Does everyone get a driveway?
- An owner has a right to property access but not a right to direct or unrestricted access



68

Right to Access

- FDOT can limit the types of turns

“Nothing in this subsection limits the department’s authority to restrict the operational characteristics of a particular means of access.”

335.184(3)(d)FS



Lefts are not a right



69

Significant Change

- Site changes or new development must seek approval from the Department if either:
 - ▣ There is a change in the use of the property, including land, structures or facilities, OR
 - ▣ There is an expansion of the size of the structures or facilities causing an increase in the trip generation of the property **exceeding 25% more trip generation (either peak hour or daily) and exceeding 100 vehicles per day more than the existing use.**
- A new permit may be required based on this review

70



What are the Access Standards?



The FDOT Access Management standards are established in Florida Administrative Code Chapter 14-97, otherwise known as Rule 14-97. Whereas Chapter 14-96, State Highway System Connection Permits, establishes rules and procedures for connection permitting.

Rule 14-97: Table 1

Access Class	Area Type	Segment Location	Interchange Spacing (MILES)
1	Area Type 1	CBD & CBD Fringe for Cities in Urbanized Areas	1.0
	Area Type 2	Existing Urbanized Areas other than Area Type 1	2.0
	Area Type 3	Transitioning Urbanized Areas and Urban Areas other than Area Type 1 or 2	3.0
	Area Type 4	Rural Areas	6.0



Rule 14-97: Table 2

Access Class	Medians	Connection Spacing (FEET)		Median Opening Spacing (FEET)		Signal Spacing (FEET)
		> 45 mph	≤45mph	Directional	Full	
2	Restrictive with Service Roads	1320	660	1320	2640	2640
3	Restrictive	660	440	1320	2640	2640
4	Non-Restrictive	660	440			2640
5	Restrictive	440	245	660	*2640/ 1320	*2640/ 1320
6	Non-Restrictive	440	245			1320
7	Both	125		330	660	1320

*2640 feet for > 45 mph; 1320 feet for < 45 mph
 "Restrictive" = physically prevent vehicle crossing
 "Non-Restrictive" = allow turns across at any point

73

Rule 14-97: Table 2

Access Class	Medians	Connection Spacing (FEET)		Median Opening Spacing (FEET)		Signal Spacing (FEET)
		> 45 mph	≤45mph	Directional	Full	
2	Restrictive with Service Roads	1320	660	1320	2640	2640
3	Restrictive	660	440	1320	2640	2640
4	Non-Restrictive	660	440			2640
5	Restrictive	440	245	660	*2640/ 1320	*2640/ 1320
6	Non-Restrictive	440	245			1320
7	Both	125		330	660	1320

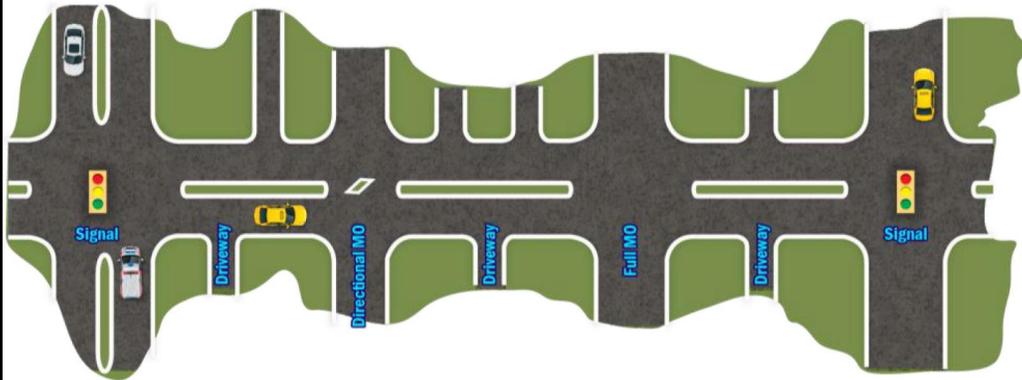
Typically Undeveloped

Typically Developed

*2640 feet for > 45 mph; 1320 feet for < 45 mph
 "Restrictive" = physically prevent vehicle crossing
 "Non-Restrictive" = allow turns across at any point

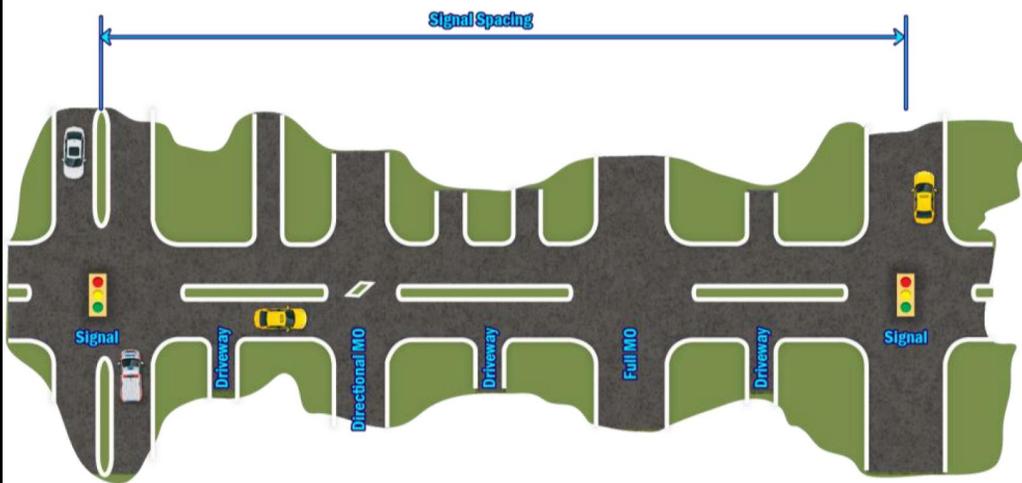
74

Measuring Spacing



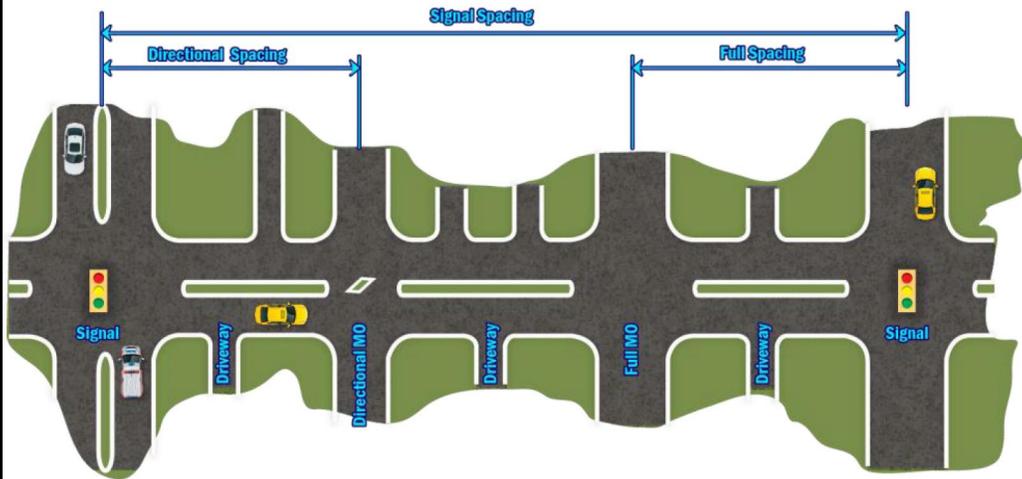
75

Measuring Spacing



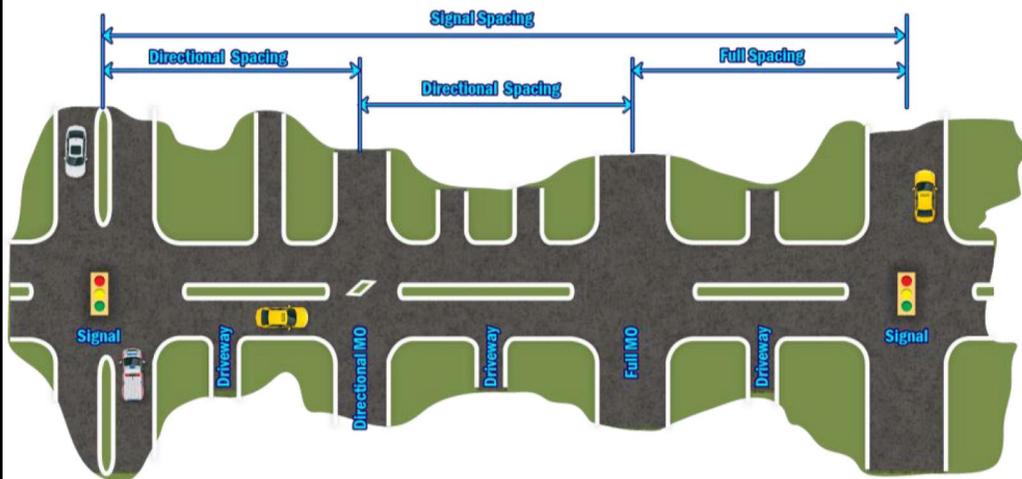
76

Measuring Spacing



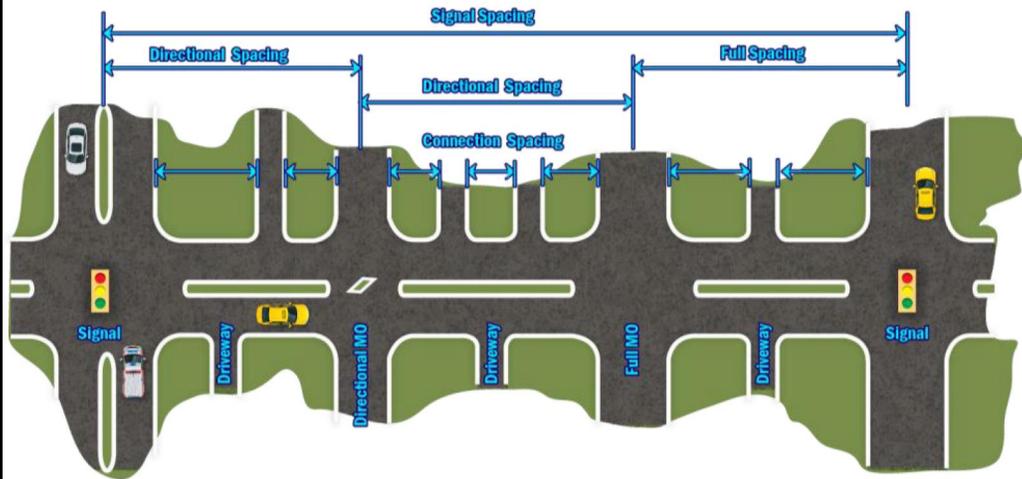
77

Measuring Spacing



78

Measuring Spacing



79



Measuring Spacing

Measure median opening spacing between the partial directional median opening and the signalized intersection.

Speed limit = 45 mph

Access classification = 3

80

Procedures

- Systems Planning Topic No. 625-010-021-h: Median Openings and Access Management
 - ▣ Provides direction on applying the standards in Rule 14-97 to promote consistency across Districts



81

Procedures

- Each district shall have an Access Management Review Committee (AMRC) to review deviations from spacing standards of more than 10% for full median opening
- The AMRC is appointed by the District Secretary and consists of head level positions (District Design Engineer, District Planning Manager, etc.) and meetings are given public notice

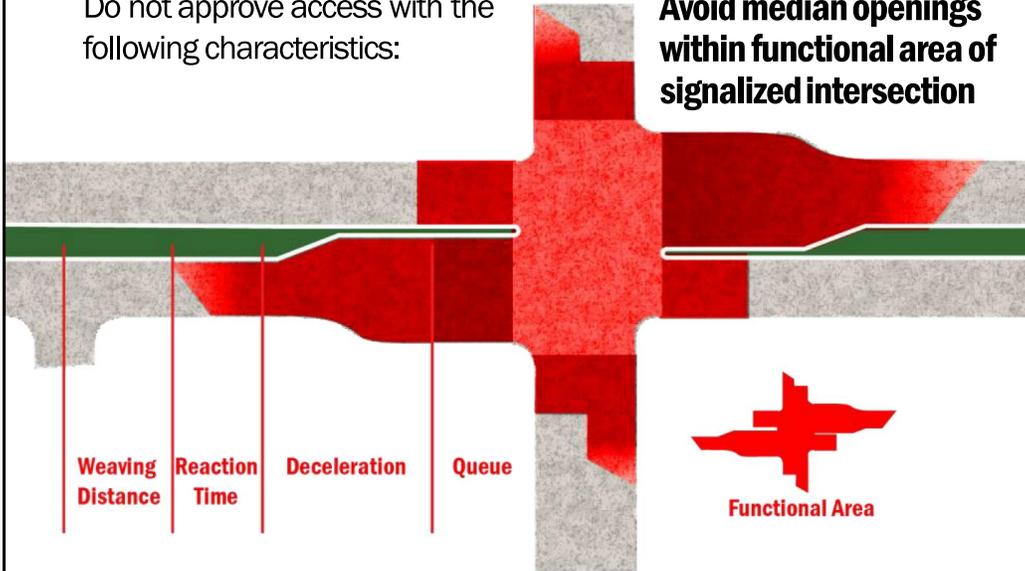


82

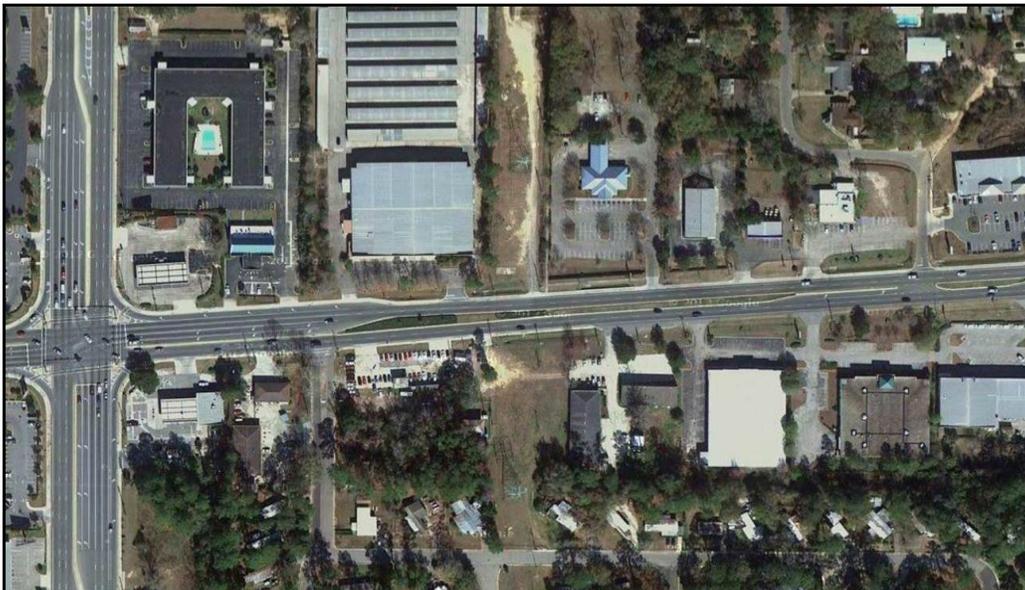
Deviations from Standards

Do not approve access with the following characteristics:

Avoid median openings within functional area of signalized intersection



83



Access Management Review Committee

A developer wants to purchase one of these two parcels and apply for a directional median opening.
Speed limit = 45 mph
Access class = 5
Directional spacing = 660 ft

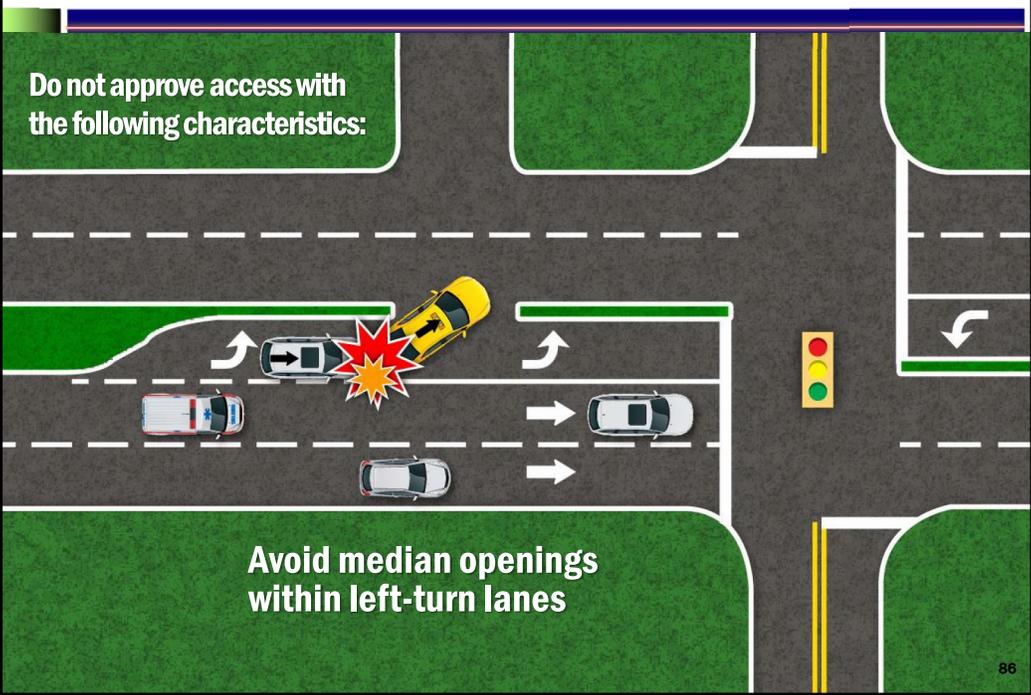
84

Site B may be reviewed by AMRC



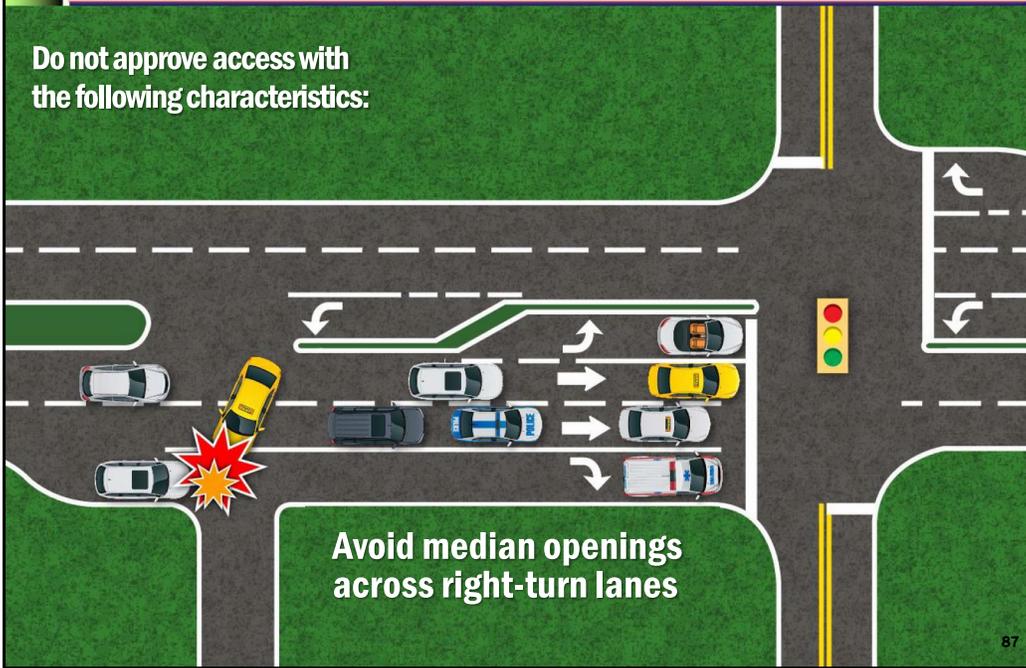
Access Management Review Committee
A developer wants to purchase one of these two parcels and apply for a directional median opening.
Speed limit = 45 mph
Access class = 5
Directional spacing = 660 ft

Deviations from Standards



Deviations from Standards

Do not approve access with the following characteristics:

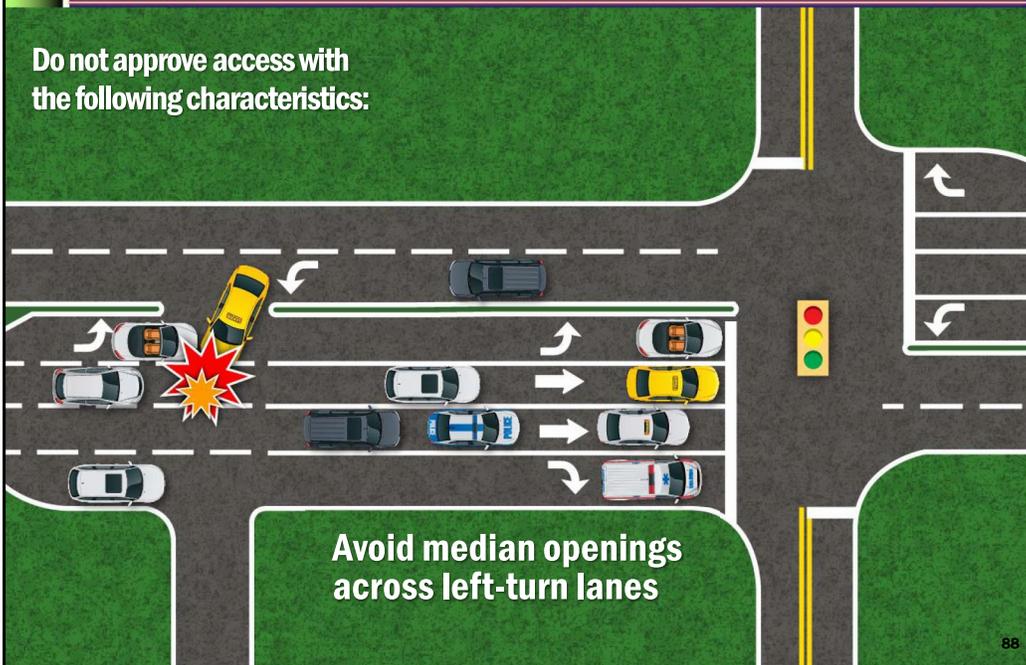


Avoid median openings across right-turn lanes

87

Deviations from Standards

Do not approve access with the following characteristics:

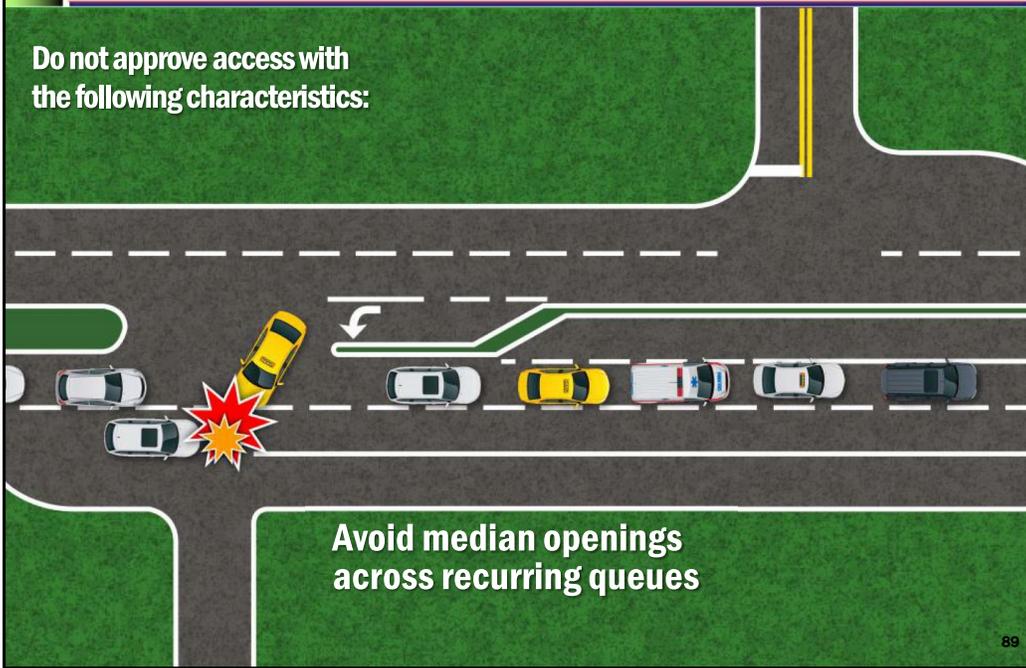


Avoid median openings across left-turn lanes

88

Deviations from Standards

Do not approve access with the following characteristics:

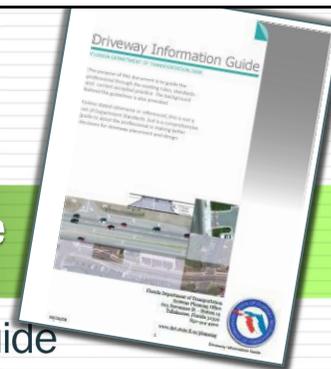


Avoid median openings across recurring queues

89



Driveway Information Guide



A Department document to guide professionals through the existing rules, standards, and procedures, as well as to provide some background behind the guidelines and best practice for driveway planning.

This is GUIDANCE, not STANDARD.

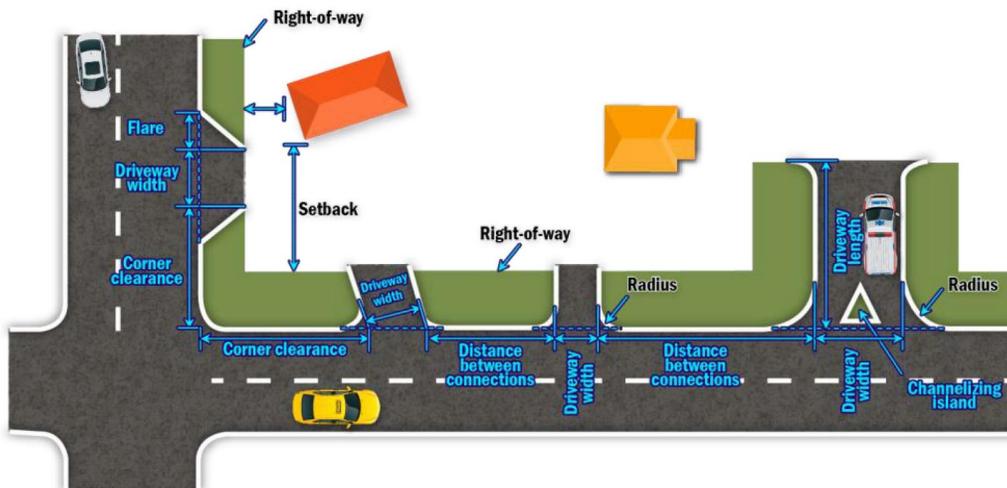
90

Driveway Information Guide

- Topics covered:
 - Connection radius and flare
 - Driveway width
 - Driveway grade
 - Driveway channelization
 - Driveway length/circulation
 - Right-turn lanes
 - Sight distance
 - Driveway location/shared driveways
 - Driveways and the pedestrian environment

91

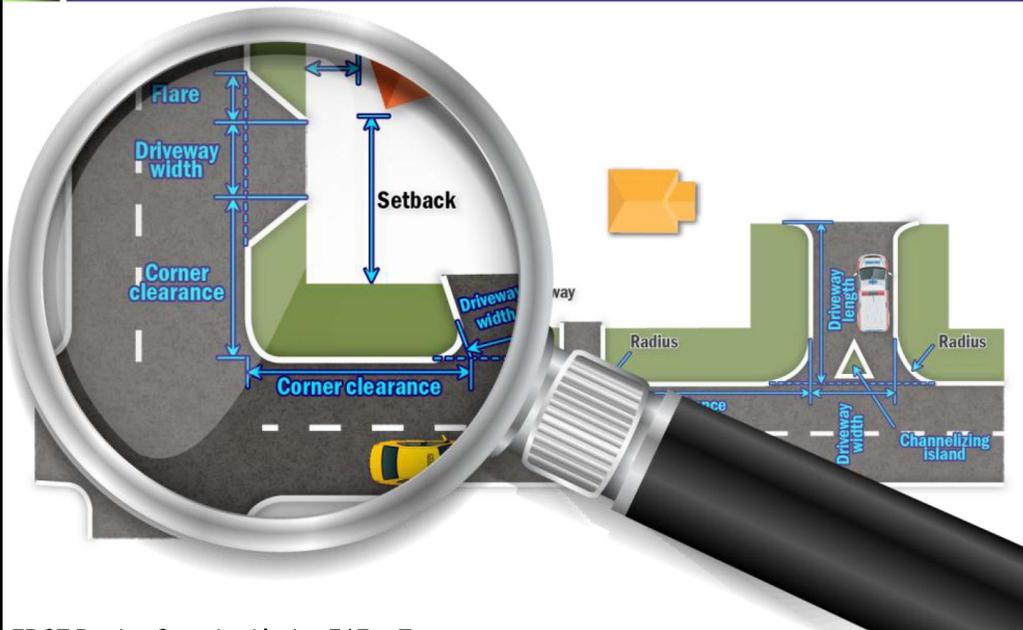
Driveway Information Guide



FDOT Design Standard Index 515 – Turnouts

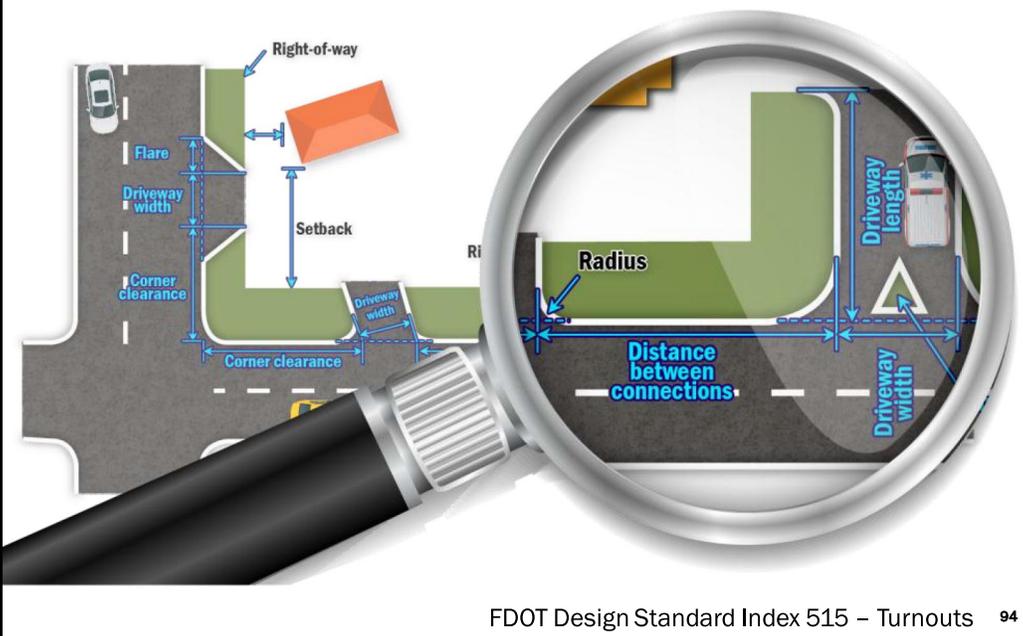
92

Driveway Information Guide



FDOT Design Standard Index 515 – Turnouts

Driveway Information Guide



FDOT Design Standard Index 515 – Turnouts 94

Driveway Information Guide

Exhibit 3 for determining appropriate driveway design

Expected Driveway Trips	Example Land Uses	How to Design Driveway
1-20 trips/day 1-5 trips/hour	1 or 2 single family homes	Usually minimum requirements
21-600 trips/day 6-60 trips/hour	3 to 60 housing or apartment units; small office in converted home; small business	Driveway with some high volume features
601-4,000 trips/day 61-400 trips/hour	Small strip mall (20-75,000 sf); gas station with market	Driveway with some high volume features
Over 4,000 trips/day Over 400 trips/hour	150,000 sf shopping center; grocery anchor with 10-15 smaller stores	Design as full intersection in cooperation with local government

Driveway Information Guide

Connection Radius



Driveway Information Guide

Connection Flare



DIG - Page 20

97

Driveway Information Guide

Driveway Width



DIG - Page 28

98

Driveway Information Guide

Driveway Grade



DIG - Page 36

99

Driveway Information Guide

Driveway Grade



DIG - Page 36

100

Driveway Information Guide

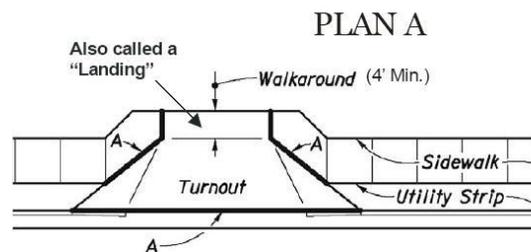
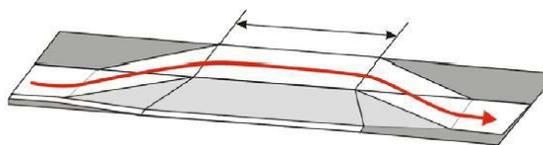
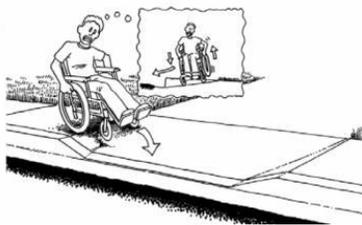
- Driveway Grade



NCHRP REPORT 2010
Guide for the Geometric Design
of Driveways

Driveway Information Guide

- The Wheelchair User



Whenever possible, driveway crossings without level landings (or "walk arounds") should be replaced.

Driveway Information Guide

Driveway Channelization

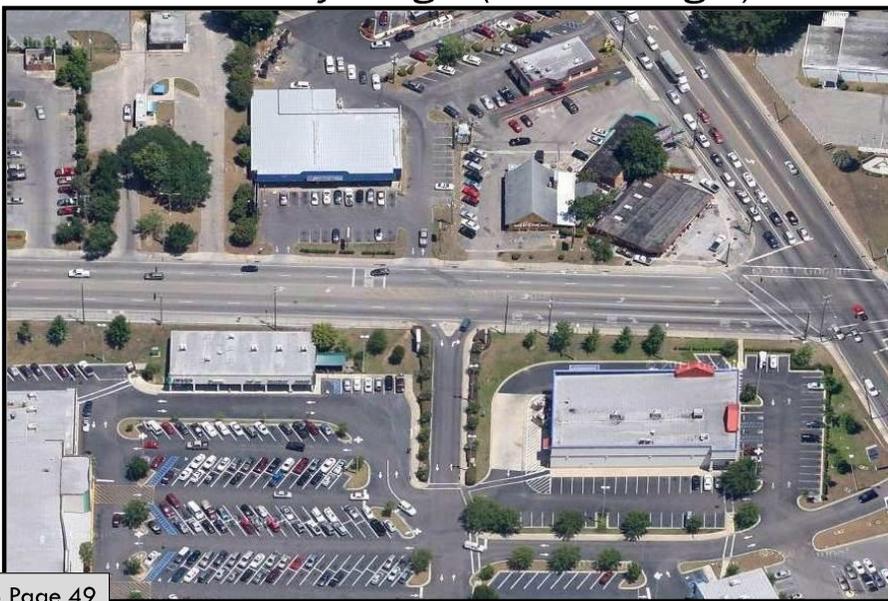


DIG - Page 40

103

Driveway Information Guide

Driveway Length (Throat Length)

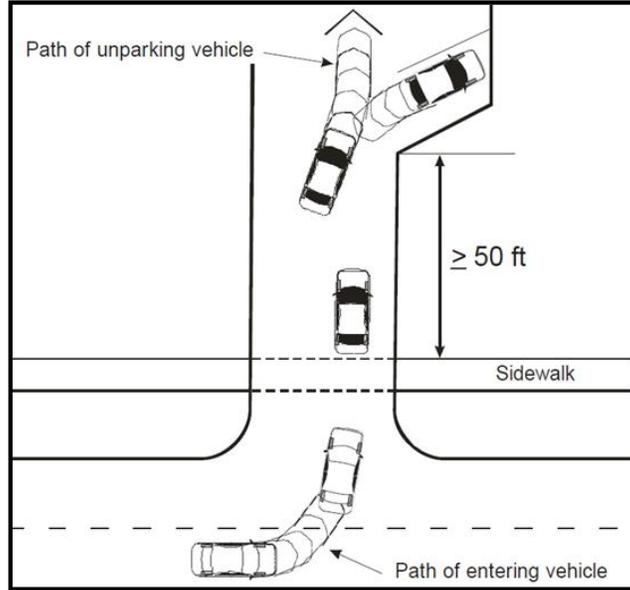


DIG - Page 49

104

Driveway Information Guide

Driveway Length and Parking Movements



DIG - Page 50

105

Driveway Information Guide

Right-Turn Lanes



DIG - Page 56

106

Driveway Information Guide

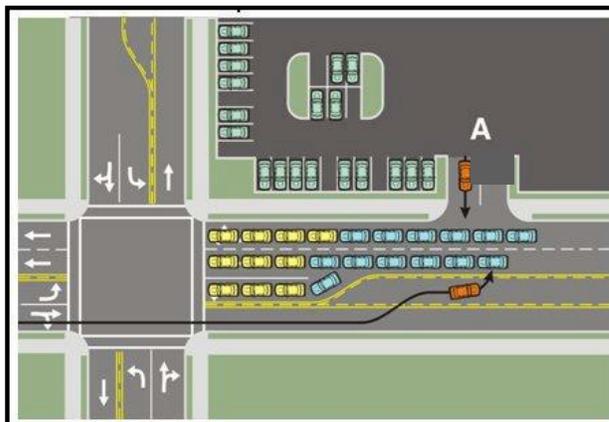
Right-Turn Lane Design per FDOT Standard Index 301

Deceleration Distances from the Design Standards Index #301

Design Speed (mph)	Entry Speed (mph)	Total Deceleration (ft)
35	25	145
45	35	185
50 Urban	40	240
50 Rural	44	320
55 Rural	48	385

Driveway Information Guide

- Vehicular and pedestrian movements into, out of, and around a site play an important role on the safety and efficiency of the adjacent roadway
- Poor site circulation can result in:
 - Queuing
 - Delay
 - Crashes



Driveway Information Guide

Sight Distance



DIG - Page 61

109

Driveway Information Guide

Driveway Location

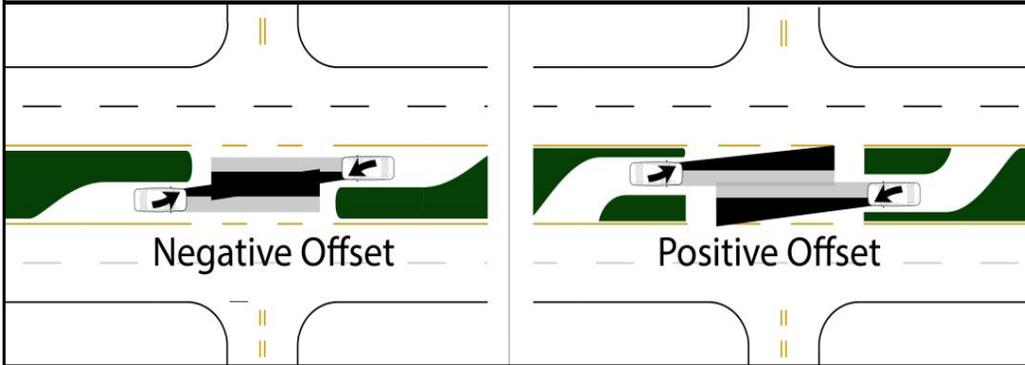


DIG - Page 80

110

Driveway Information Guide

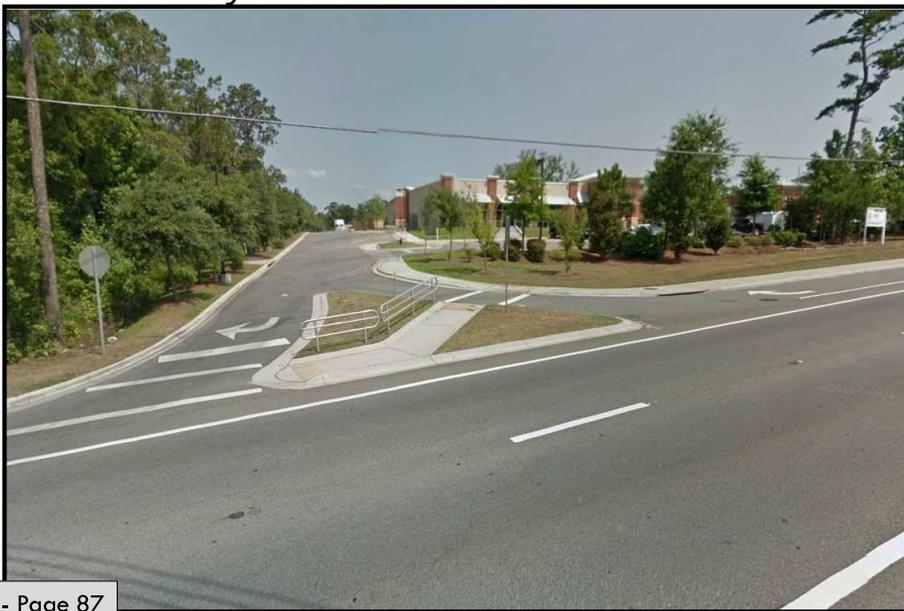
Left-Turn Lane Offset



For more information, refer to the
Plans Preparation Manual
Section 2.13.3

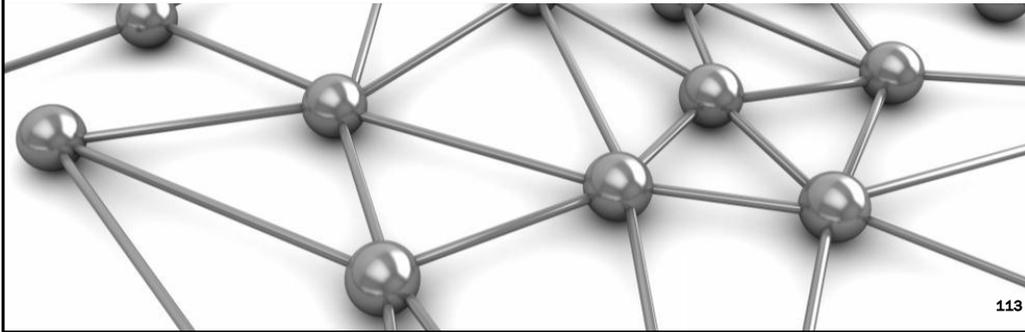
Driveway Information Guide

Driveway and the Pedestrian Environment

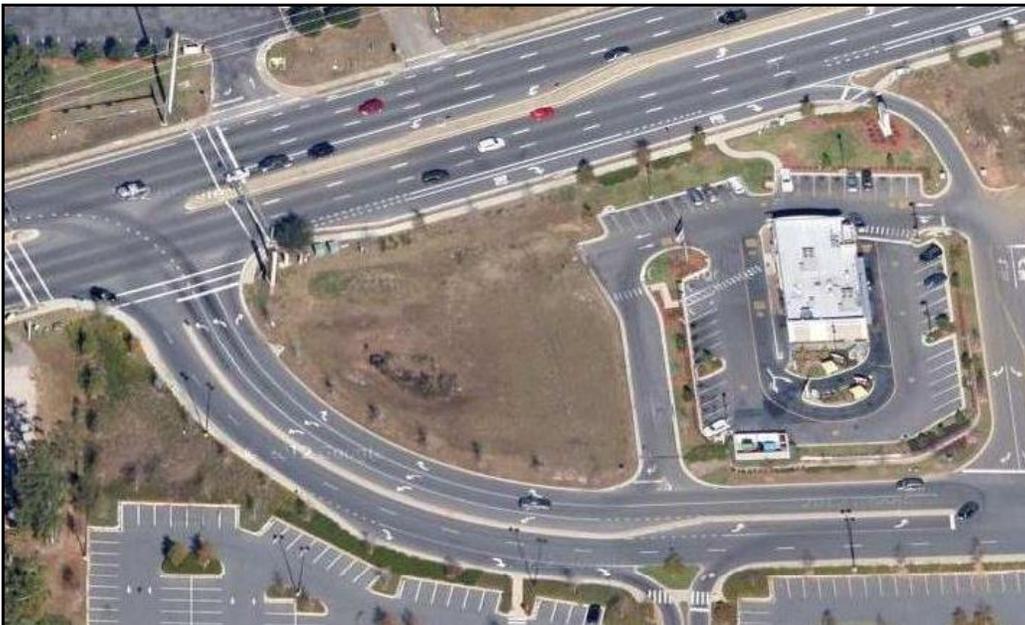


Driveway Information Guide

- Benefits of connectivity
 - ▣ Improves the operation and safety of the main highways
 - ▣ Encourages pedestrian trips
 - ▣ Reduces number of driveways on major streets
 - ▣ Encourages shorter trips in autos
 - ▣ Helps local governments achieve level of service goals



113



Site Circulation

This fast food restaurant has an exclusive right-turn lane from the state road as well as indirect access to a signal. To exit, vehicles use the internal street and can travel either direction on the state road from the signal.

114



Shared Driveways
This large plaza with two signalized driveways provides connections to six other parcels that would otherwise have individual driveways. It also connects to the adjacent plaza.

115



Shared Driveways
This large plaza with two signalized driveways provides connections to six other parcels that would otherwise have individual driveways. It also connects to the adjacent plaza.

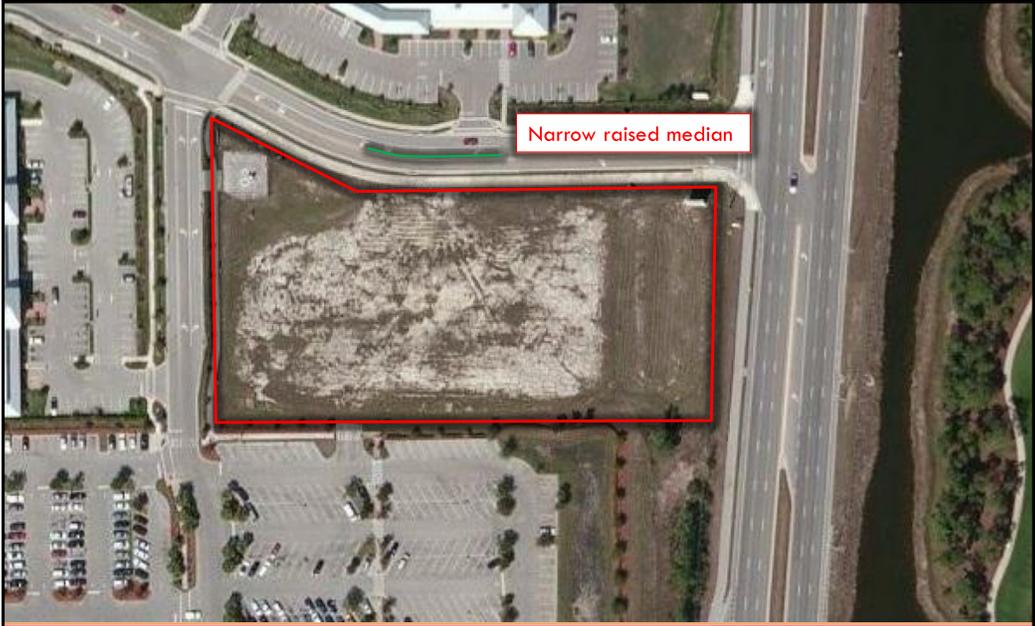
116

Driveway Information Guide



Workshop #2

Restaurant Outparcel Site



Workshop #2: Restaurant Outparcel Site

1. Where should driveways be located?
2. What types of driveways should be recommended (i.e., full, right-in/right-out, right-in only)
3. Develop a proposed access plan based on standards

119

BUSINESS CIR (LOCAL ROAD)
Speed Limit = 30

COLLIER BLVD (COUNTY ROAD)
AADT = 27,500
Speed Limit = 45

951

The site is proposed to have a sit-down restaurant.
The site is bounded by a County road to the east and a local road to the north.

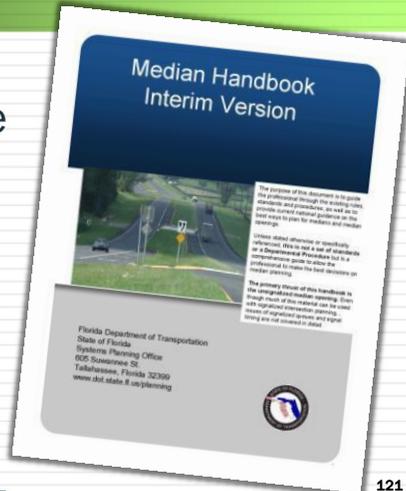
Tasks:

1. Where should accesses be placed?
2. What types of driveways should be used (i.e. full, right-in/right-out)?



Median Handbook

A Department document to guide professionals through the existing rules, standards, and procedures, as well as to provide current national guidance on the best ways to plan for medians and median openings.



This is GUIDANCE, not STANDARD.

121

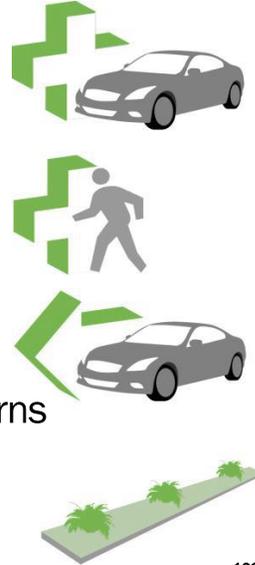
Median Handbook

- Topics covered
 - ▣ Median concepts
 - What you want the median to do
 - ▣ Understanding median opening placement
 - ▣ Sight distance
 - ▣ Median width
 - ▣ Special u-turn considerations
 - ▣ Roundabouts

122

Median Handbook

- Medians are beneficial to:
 - ▣ Improve vehicle safety
 - ▣ Improve pedestrian safety
 - ▣ Increase efficiency
 - ▣ Improve aesthetics
- The function of a median is to restrict vehicular movements
- The function of a median opening is to allow for cross traffic, left turns, and u-turns



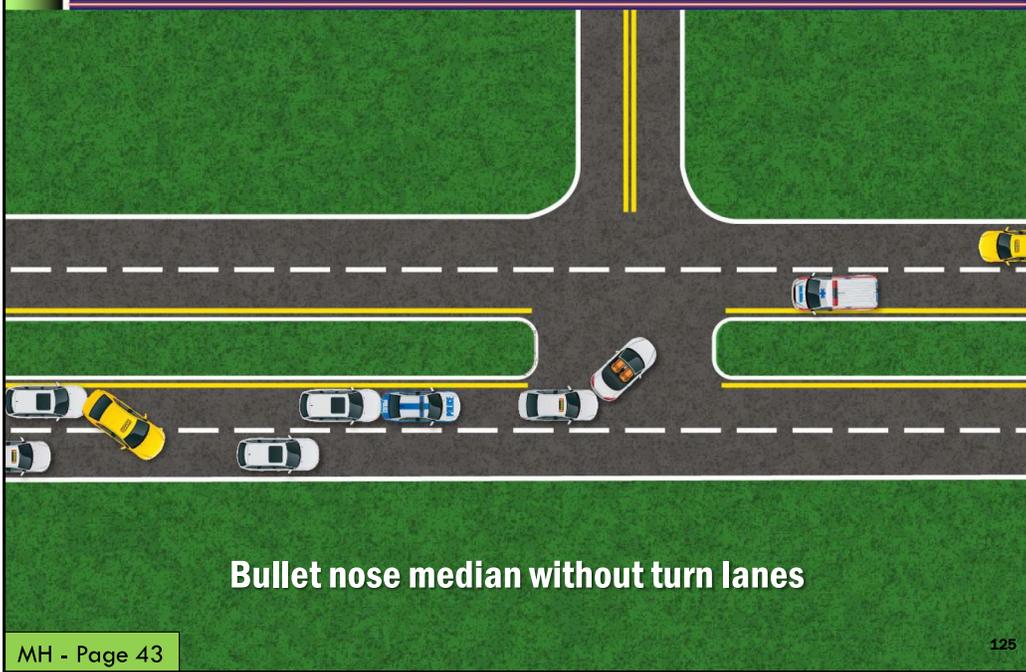
123

Median Handbook

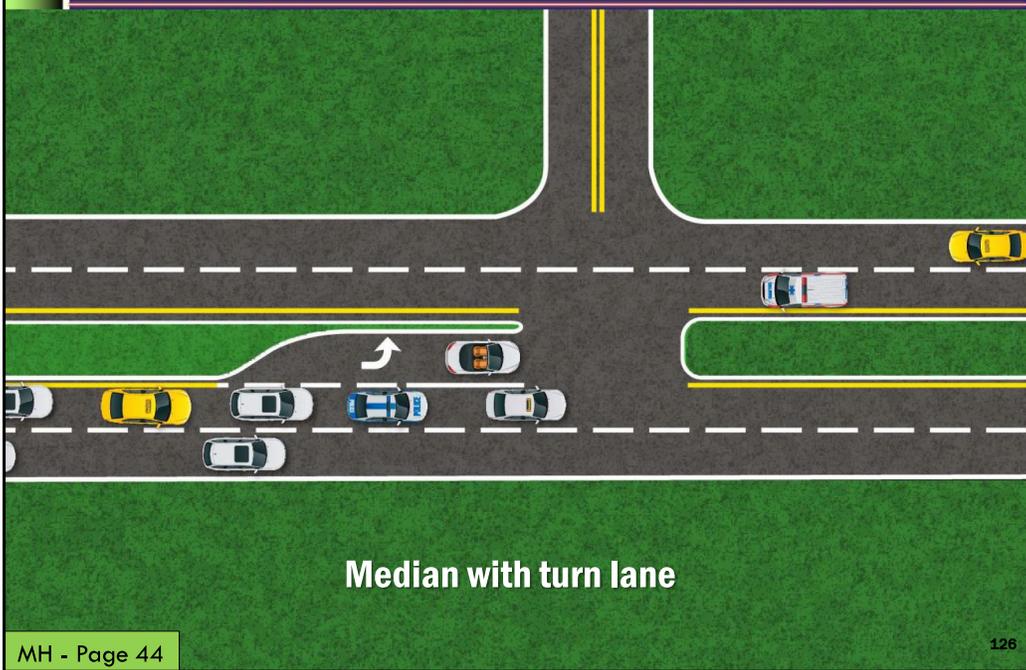
- Full median openings are appropriate for:
 - ▣ Existing or planned signalized intersections
 - ▣ Conforming intersections
 - ▣ Divided roadways with adequate gaps for turning maneuvers with little delay
 - ▣ Locations where sight distance is sufficient for unimpeded turning maneuvers
- Directional median openings are appropriate for limiting cross traffic and exiting turns

124

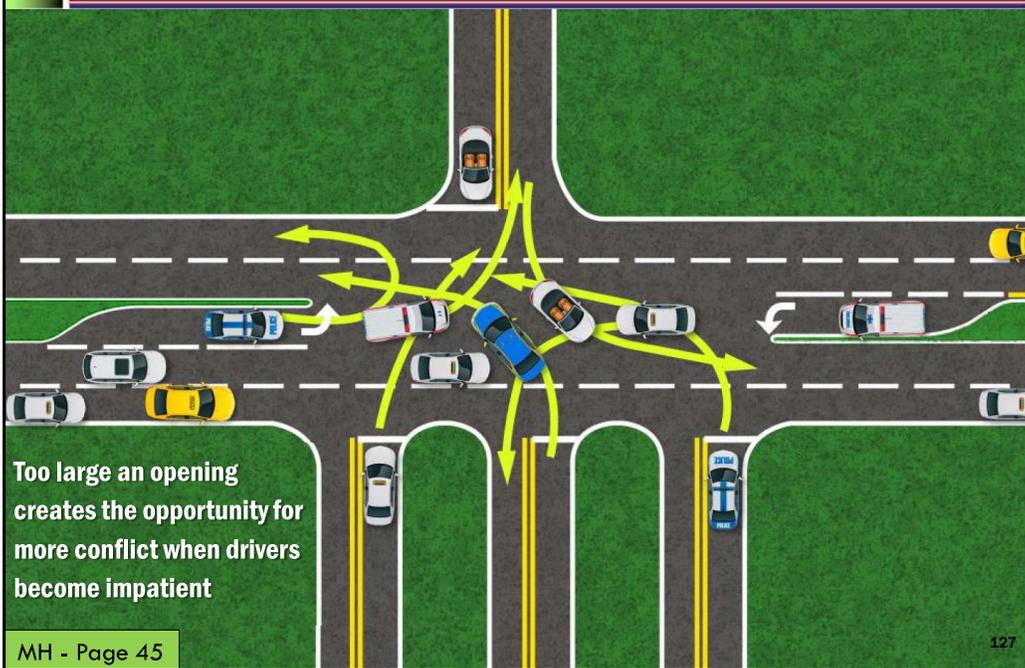
Median Handbook



Median Handbook



Median Handbook



Median Handbook

- This document can be your reference for all things access management!
 - ▣ Rule 14-97 Spacing Tables
 - ▣ Procedure 625-010-021-h guidelines
 - ▣ Standard Index #301 deceleration
 - ▣ Recommended minimum queue storage
 - ▣ Weaving, stopping, and intersection sight distance



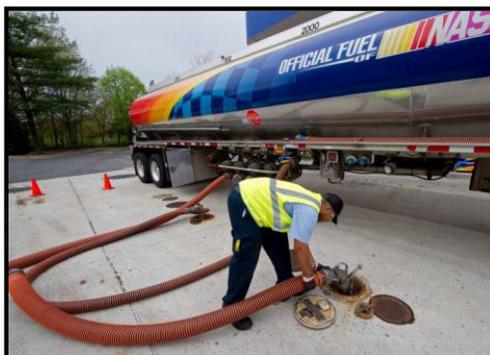
Site Design Considerations

Delivery Truck Impacts

129

Delivery Truck Considerations

- Limited maneuverability
- Larger radii
- Design vehicle type
- Truck route/dock location



130

Delivery Truck Considerations

- AASHTO truck turning templates

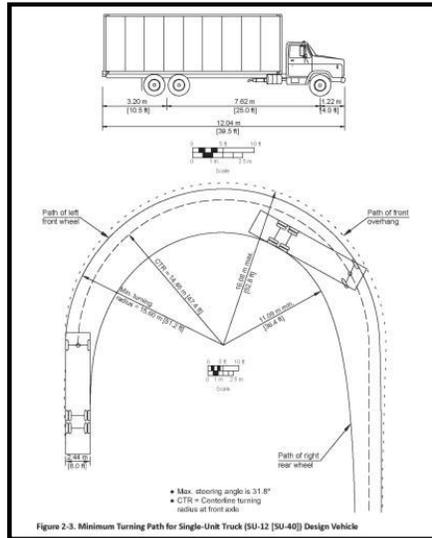


Figure 2-3. Minimum Turning Path for Single-Unit Truck (SU-12 [SU-40]) Design Vehicle

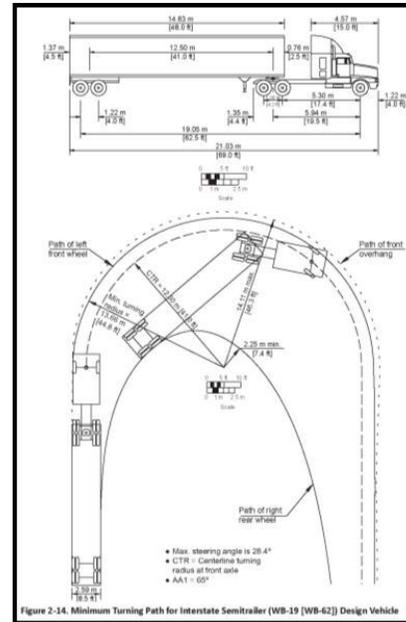
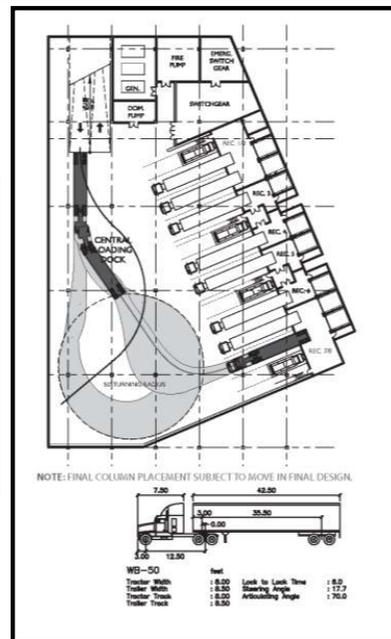
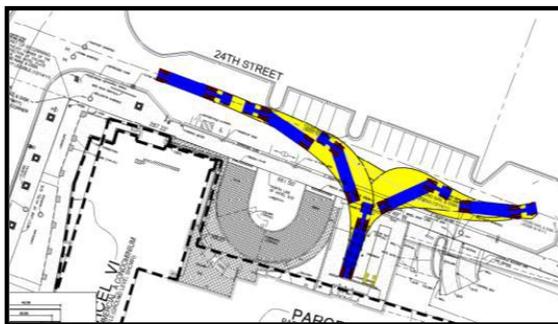


Figure 2-14. Minimum Turning Path for Interstate Semitrailer (WB-19 [WB-62]) Design Vehicle

131

Delivery Truck Considerations

- Computer software



132



Workshop #3

Shopping Center Site

133



Workshop #3: Shopping Center Site

1. Where should driveways be located?
2. What types of driveways should be recommended (i.e., full, right-in/right-out, right-in only)
3. Develop a proposed access plan based on standards

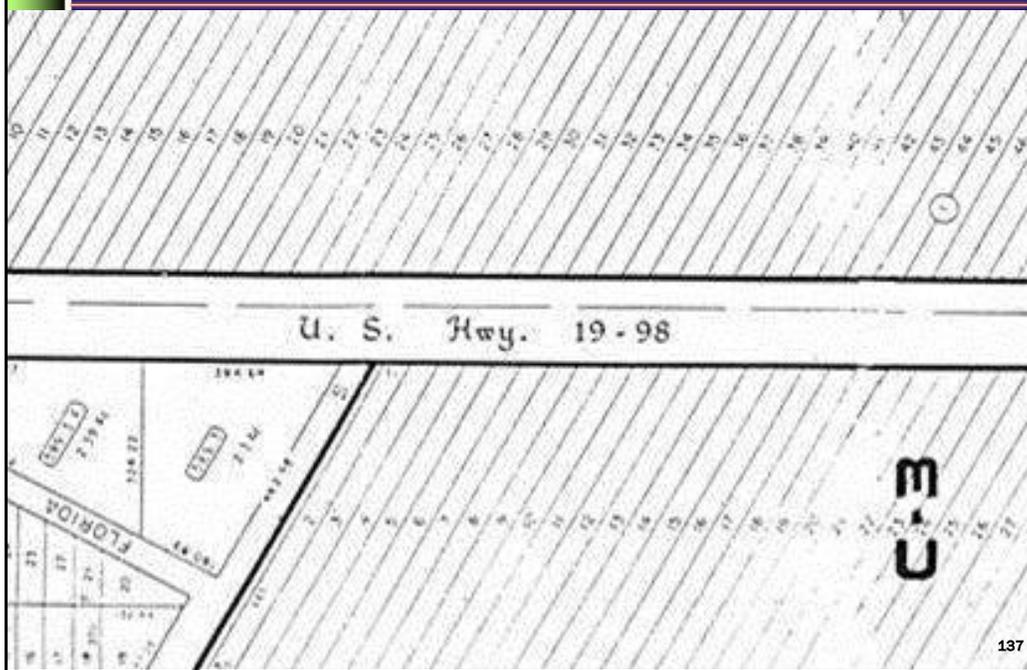
134



Local Government



Narrow Lots on Strategic Highway



Access Management Practices

Model
Land Development &
Subdivision Regulations
That Support
Access Management

for Florida
Cities and Counties



138

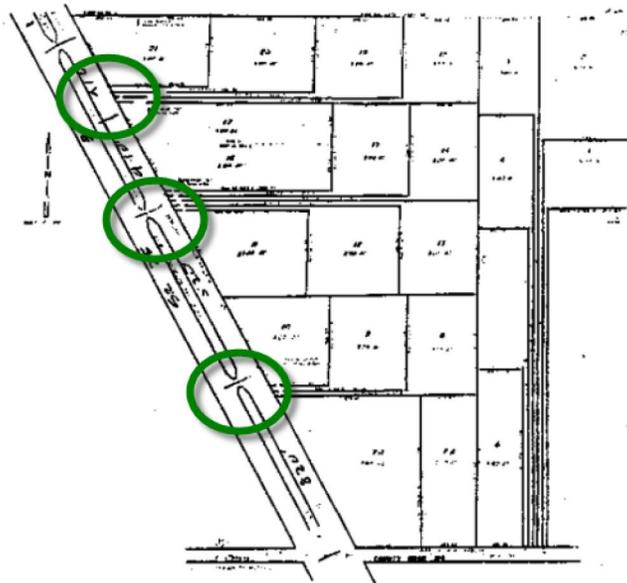
Access Management Practices

Technique	Polk County	Lake County	City of Clermont	City of Minneola
Joint Access	YES	YES	NO	YES
Driveway Design	YES	YES	PARTLY	PARTLY
Corridor Overlay	NO	NO	NO	NO
PUD Zoning	YES	YES	YES	YES
Stub Out Connections	YES	YES	YES	NO
Minor Subdivision Reg.	YES	YES	NO	YES
Reverse Frontage	YES	YES	YES	YES
Access Review Criteria	YES	YES	PARTLY	PARTLY
Refers to FDOT Rules	YES	YES	PARTLY	YES
Access Classification (Local)	NO	YES	YES	NO
Driveway Spacing Standards	YES	YES	PARTLY	PARTLY
Limits on Driveways	YES	NO	YES	YES
Interchange Area Access	NO	NO	NO	NO
Internal Access to Outparcels	YES	YES	NO	NO
Flag Lot Standards	NO	YES	YES	YES
Corner Clearance	YES	YES	PARTLY	NO
Minimum Lot Frontage	YES	YES	YES	YES
Lot Width to Depth	NO	NO	NO	NO
Redevelopment Requirements	YES	YES	NO	NO

139

Access Management Practices

Figure 1: Flag Lots on a State Highway



140

Access Management Practices

Access Easement

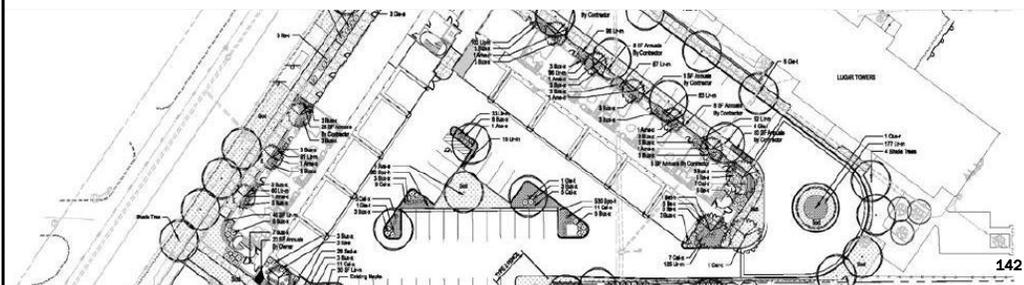


141



Site Development Solutions

Some before and after examples of actual Florida access management plans for proposed developments



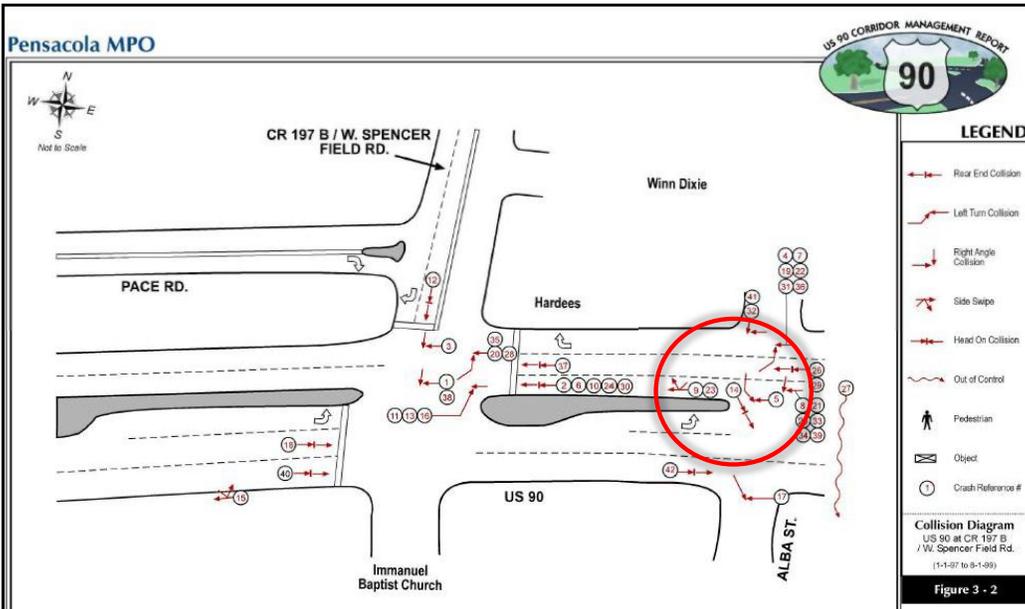
142



Safety Considerations of Access Management

This site is a grocery store located along a US highway in Pace, FL. One of the driveways is located across from a full median opening. A safety study determined that a significant number of crashes occurred at this location. What are the potential solutions to reduce the number of crashes at this site?

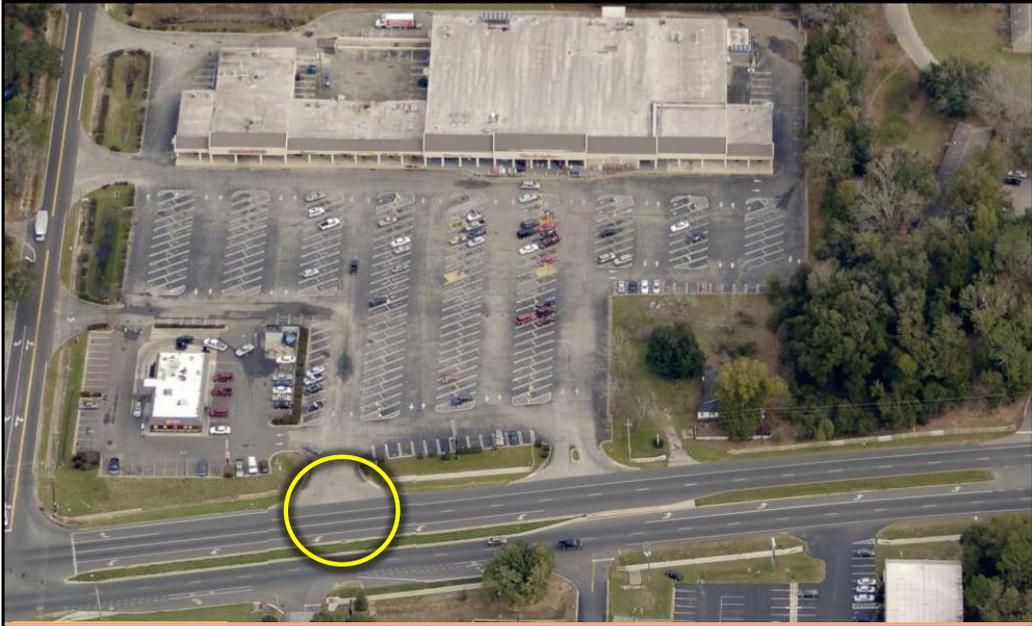
143



Safety Considerations of Access Management

The collision diagram above shows the number and types of crashes during a 2-year period in the vicinity of the site. It is apparent that a large number of angle crashes occurred at the west driveway/median opening location.

144



Solution?

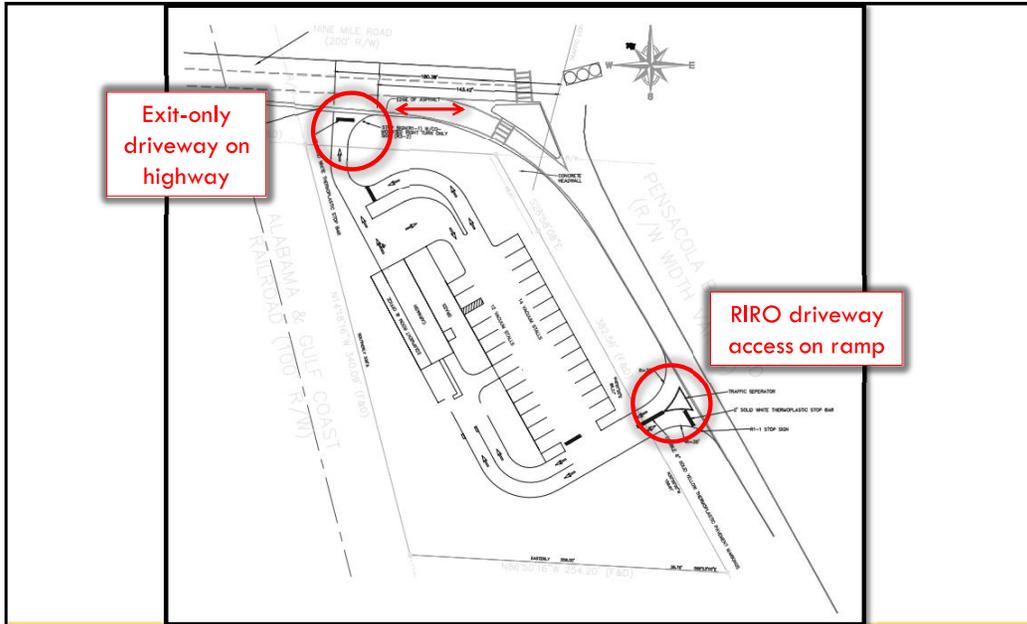
The median opening was closed at the west driveway location and the left-turn lane was extended to the intersection. Closing this median opening reduced the number of conflict points, potentially reducing the number of crashes. What other improvements were created as a result of this project?¹⁴⁵



Sites Located Along Interchange Ramps

This site is a proposed carwash located along an interchange ramp between two US highways in Ensley, FL. Since this is not an ideal location, providing access is challenging.

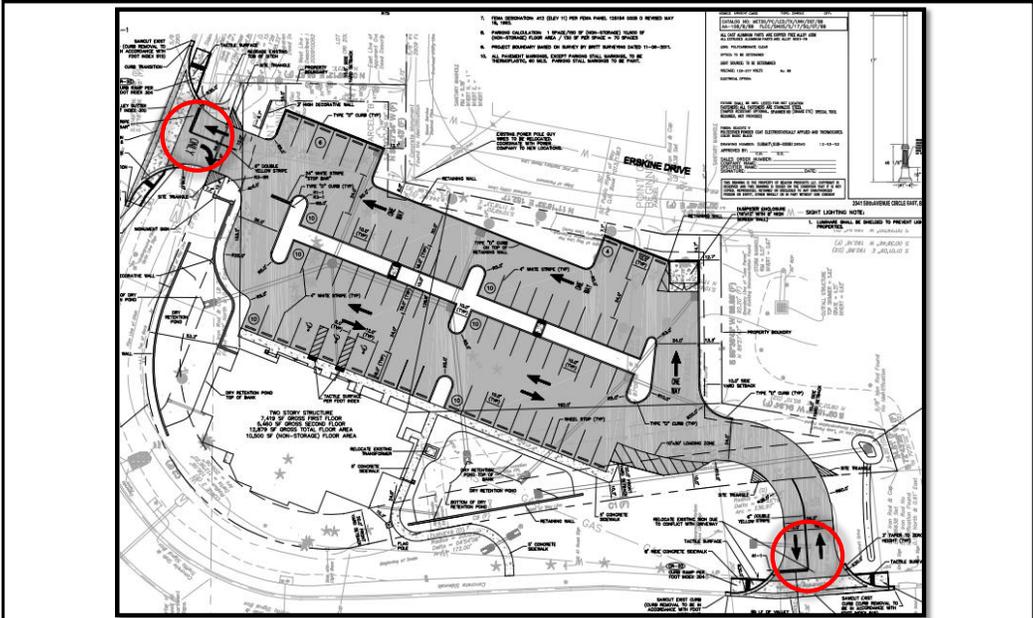
146



Sites Along Interchange Ramps – Solution?
 This site is a proposed carwash located along an interchange ramp between two US highways in Ensley, FL. Since this is not an ideal location, providing access is challenging

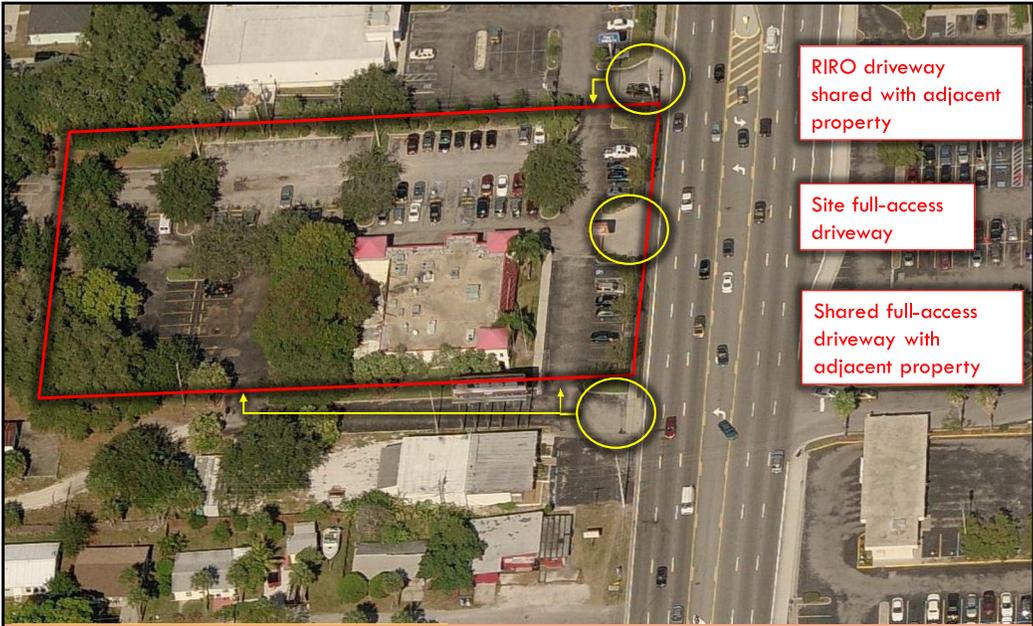


Site Redevelopment #1
 The above site is located at the intersection of US 41/US 41B in Venice, FL. The site is proposed to be redeveloped as an Urgent Care Center; existing driveways are shown. Are there any access issues with this site? What are some potential solutions to improve site access?



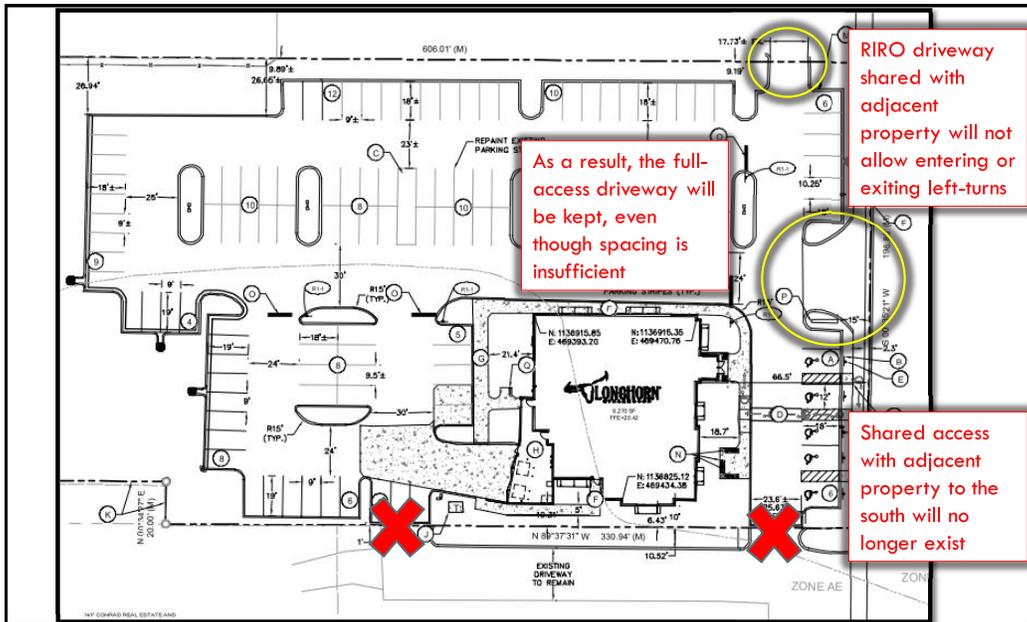
Site Redevelopment #1: Access Improved?
 The above site plan shows the proposed layout for the Urgent Care Center. The parking area was reconfigured, and as a result, the access driveway to the east was shortened; however, neither access was moved or significantly modified.

149



Site Redevelopment #2
 The above site is located along 14th St. in Bradenton, FL. The site is proposed to be redeveloped as a sit-down restaurant – existing driveways are shown. Are there any access issues with this site? Do the driveways meet spacing standards?

150



Site Redevelopment #2: Reduced Access

The initial plan for this site was to close the full-access driveway in the middle and use the shared accesses with the adjacent properties; however, the property owner to the south no longer wanted to allow the shared access. The driveway to the north is RIRO, so the site would have no left-turn access; therefore, it was decided to keep the on-site full-access driveway.

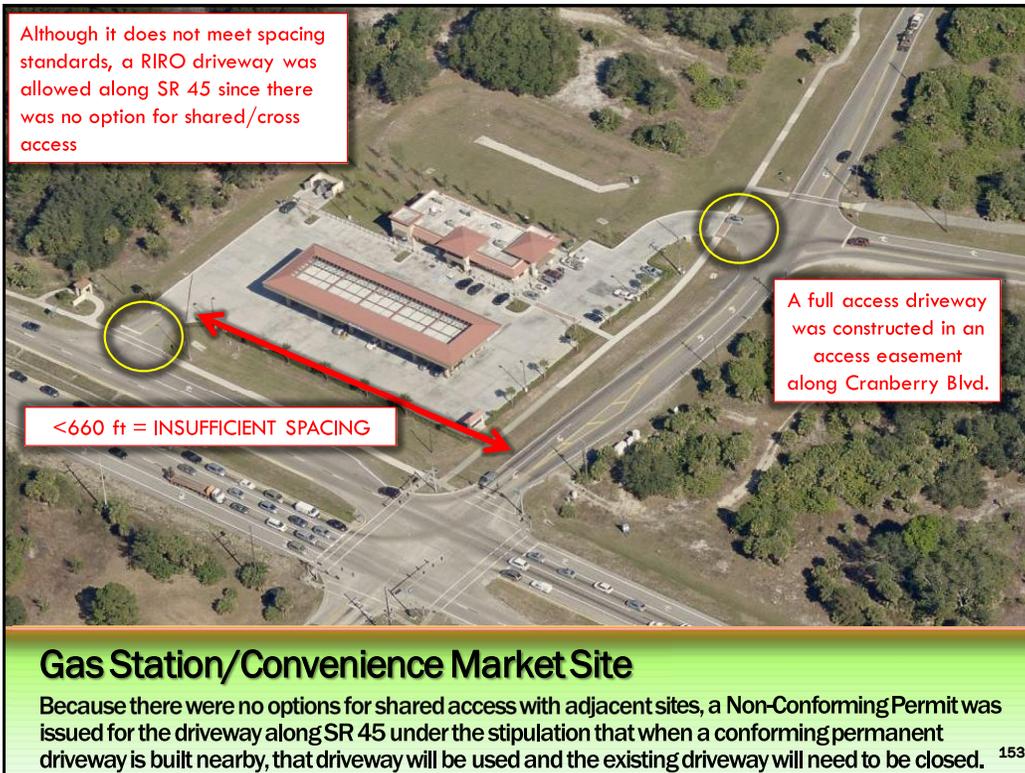
151



Gas Station/Convenience Market Site

This gas station/convenience market site in Port Charlotte, FL is located at the intersection of US 41 and Cranberry Blvd (SR 45). There is no other development in the vicinity of the site. Where should accesses be placed to meet spacing standards?

152



Additional Resources

- FDOT Access Management
 - ▣ <http://www.dot.state.fl.us/planning/systems/sm/accman>
- National Access Management Website
 - ▣ <http://www.accessmanagement.info>
- Federal Highway Administration
 - ▣ http://ops.fhwa.dot.gov/access_mgmt/index.htm

Promotional Materials

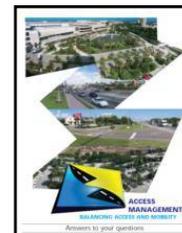
- Florida-based median video is available (3 minutes long)
- Link and file available
 - ▣ <http://www.teachamerica.com/fdot/MedianVideo/Median2012.mp4>
 - ▣ <http://www.teachamerica.com/fdot/MedianVideo/player.html>



155

Other On-Line Tools

- FHWA Video – Safe Access is Good for Business
 - ▣ <http://www.youtube.com/watch?v=j58siSPT6S8>



- Animated Access Management Principles
 - ▣ <http://www.accessmanagement.info/10principles.html>
- FDOT Access Management Brochure
 - ▣ <http://www.accessmanagement.info/pdf/Q&A%20FL.pdf>

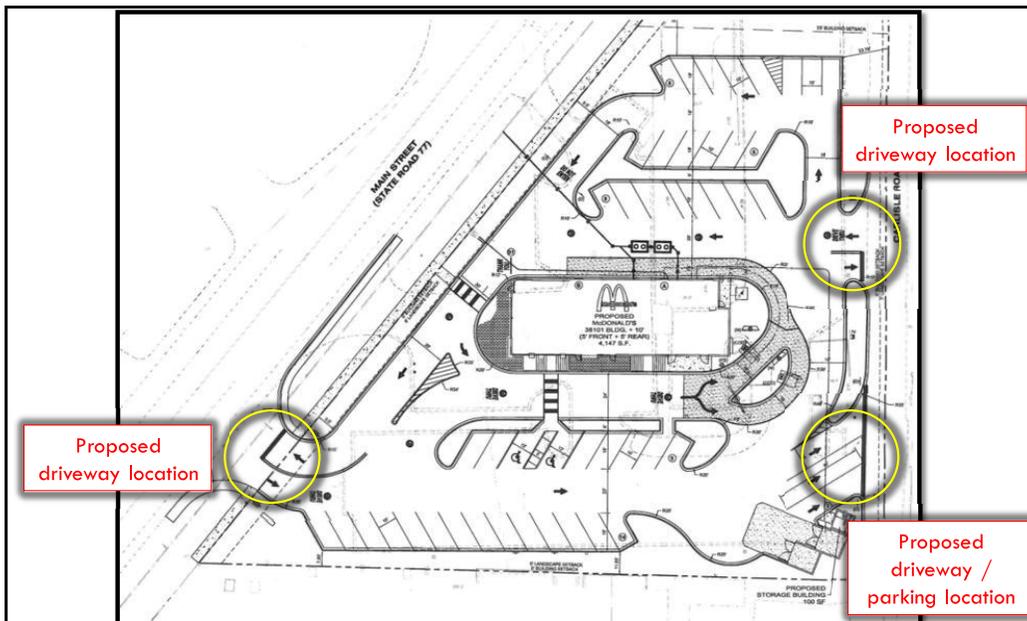
156

Other On-Line Tools

- National Access Management Website
 - www.accessmanagement.info
- Resource Materials
 - Presentations
 - Videos
 - Brochures
- Upcoming Conferences



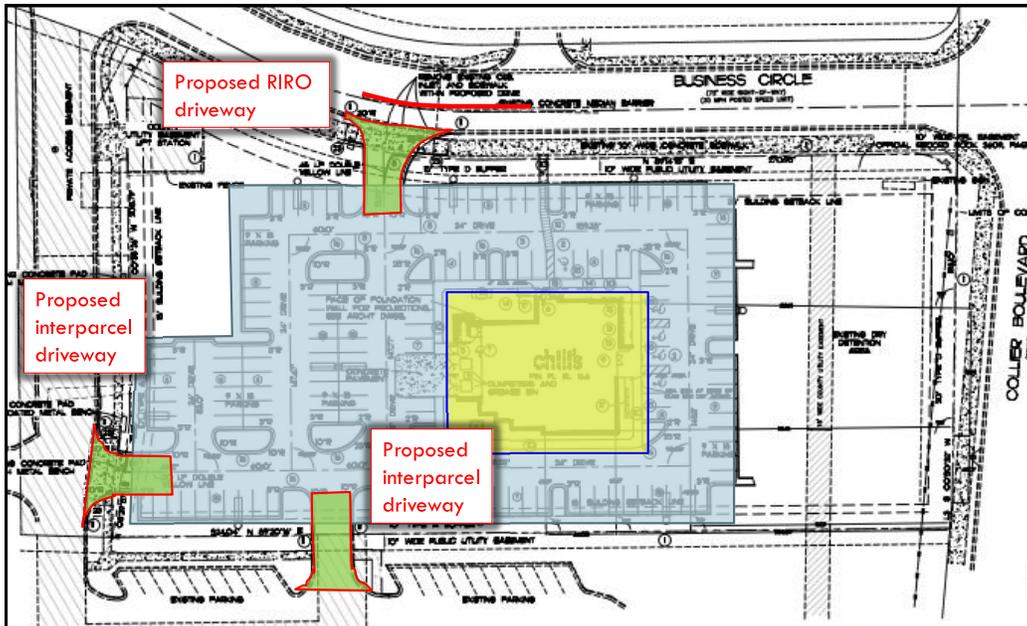
157



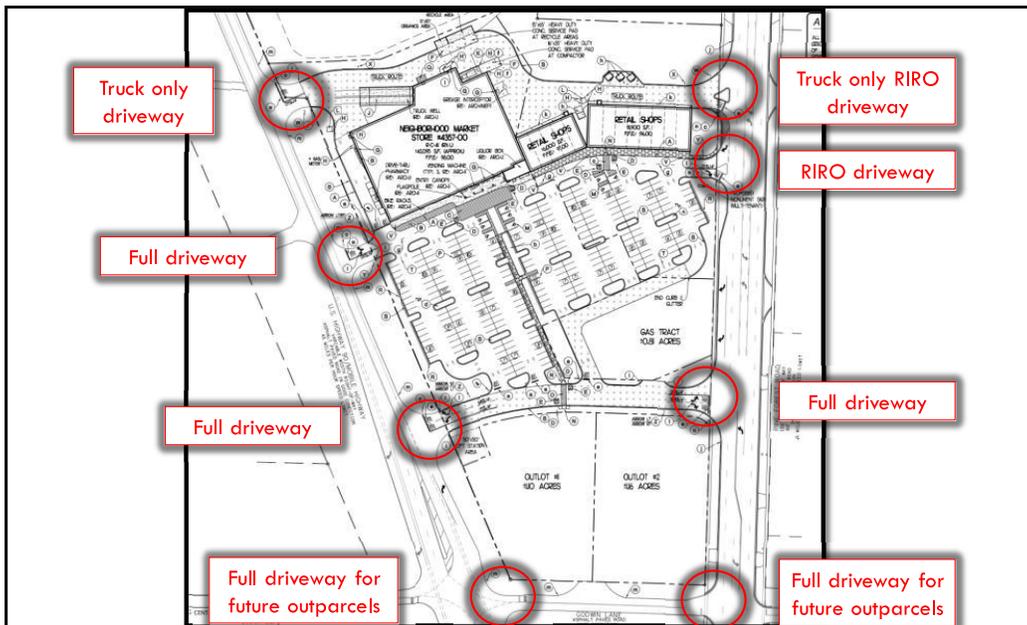
Workshop #1 Solution: Fast-Food Restaurant Site

The above site plan displays a new potential layout for the site. The proposed solution included relocating the building and consolidating four driveways into two 2-way driveways.

158



Workshop #2 Solution: Restaurant Outparcel Site
 Due to a one foot wide raised concrete median along the north side of the site, a RIRO driveway is proposed to provide access to Business Cir. The other two proposed driveways provide interparcel access to the existing access and parking area for the discount superstore.



Workshop #3 Solution: Shopping Center Site
 The above site plan displays the proposed layout for the shopping center and future outparcels. A combination of full and right-in/right-out driveways were used to provide access to and from both sides of the site.