

Florida's Median and Driveway Handbooks

Median Handbook Interim Version



The purpose of this document is to guide the professional 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.




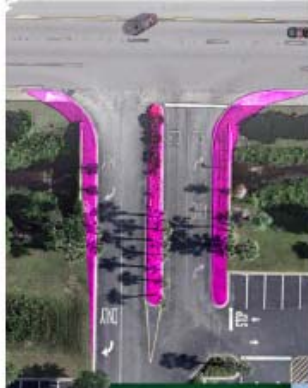
Unless stated otherwise or specifically referenced, this is not a set of standard or a Departmental Procedure but is a comprehensive guide to allow the professional to make the best decisions on median planning.

The primary thrust of this handbook is the unsignalized median opening. Even though much of this material can be used with signalized intersection planning, issues of signalized queues and signal timing are not covered in detail.

Florida Department of Transportation
State of Florida
Systems Planning Office
605 Suwannee St.
Tallahassee, Florida 32399
www.dot.state.fl.us/planning




DRIVEWAY HANDBOOK



The purpose of this document is to guide the professional through the existing rules, standards and procedures, as well as to provide current national guidance on the best ways to plan driveways. Unless stated otherwise or specifically referenced, this is not a set of standards or a Departmental Procedure but is a comprehensive guide to allow the professional to make the best decisions on driveway planning.

Systems Planning Office
State of Florida
Department of Transportation
605 Suwannee St. - Station 19
Tallahassee, Florida 32399
850-414-4900
www.dot.state.fl.us/planning



Access Management Documents



Handbooks

Presentations

Forms, Procedures

Brochures

Reports

Videos

Internet Links

Load Search Index for v 7.0

This is a collection of materials from many sources. If a document is not specifically an FDOT statute, rule, policy, procedure, manual, or handbook, it is not necessarily the opinion of the FDOT.

Most Used Documents



Driveway Handbook



Median Handbook

Answers to your Questions



Corridor AM Guide

Intro to Access Management

14-96 Forms



Economic Impacts



Land Development Regulations



Top 10 Issues



Corridor Intro

Site Traffic Studies: Top Pitfalls



Median Handbook

See Page 9

Chapter 1

Introduction and Overview of Medians and Their Benefits

Introduction

1



INTRODUCTION

Median Handbook

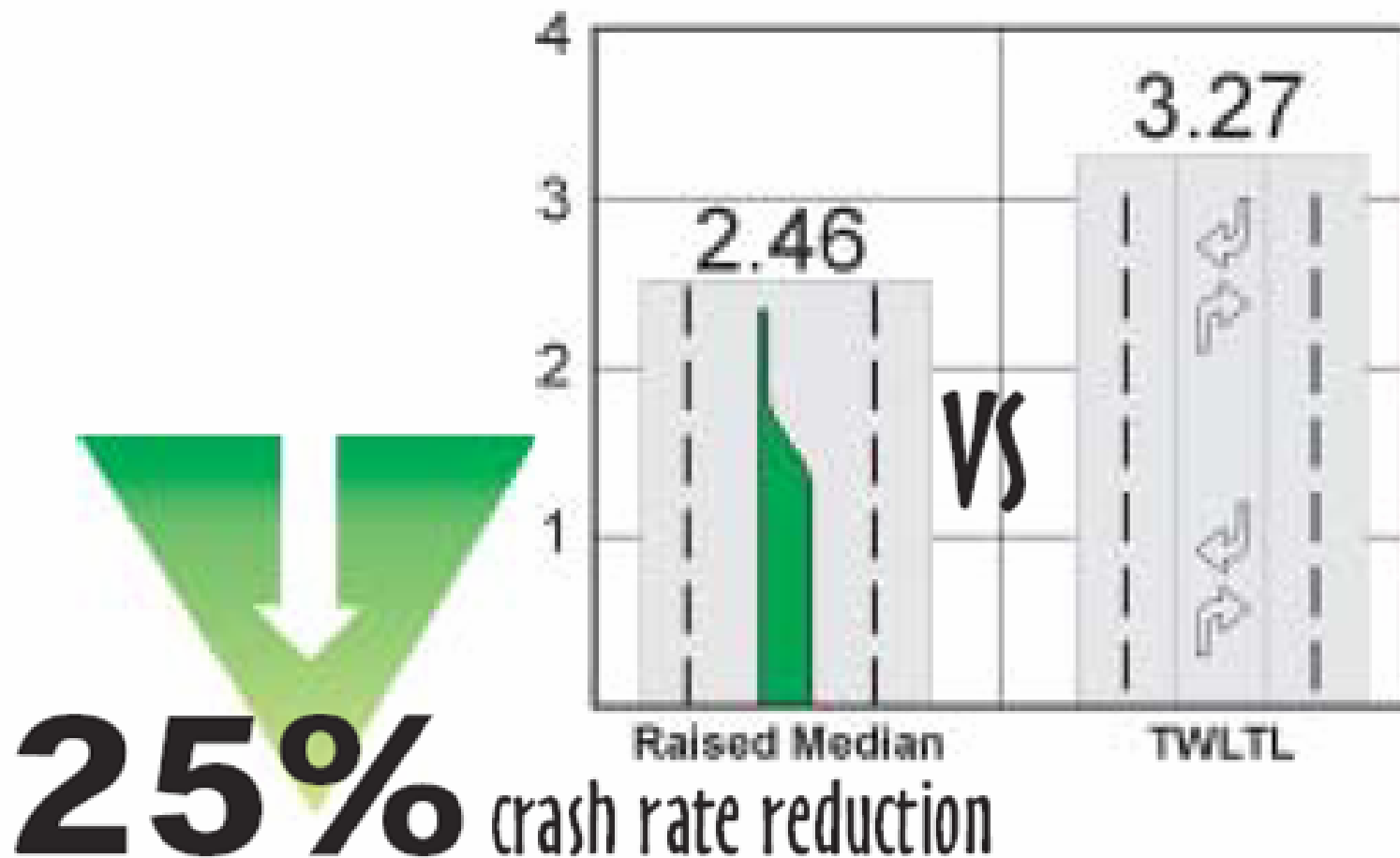
Purpose

From Page 3

The purpose of this document is to provide guidance on designing and placing median and median openings. Unless stated otherwise, **this is not a set of standards or a Departmental Procedure**. Its purpose is to guide the designer, planner or reviewer through the existing rules, standards and procedures, as well as current national and international guidance on the subject of medians.....

Medians Improve Safety

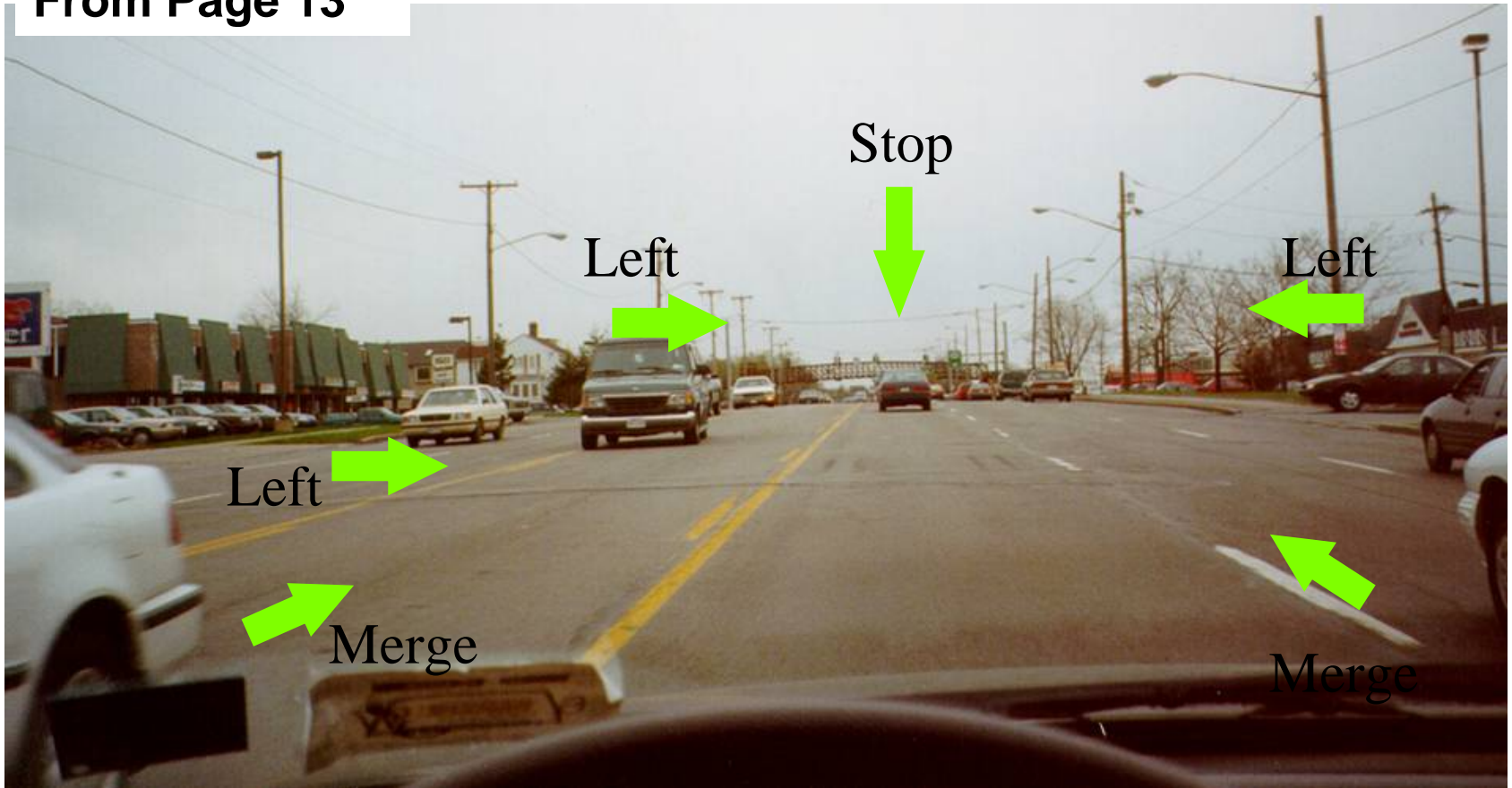
Crash Rates for Median Treatments
Florida Crash Study



Long, Gan, Morrison, University of Florida 1993

Center Turn Lane Driver Perspective

From Page 13



Focus Areas - 3

Approach Directions - 6

Source: Sear Brown Group and NYDOT

Median - Driver Perspective

From Page 14



Focus Areas - 2

Approach Directions - 2

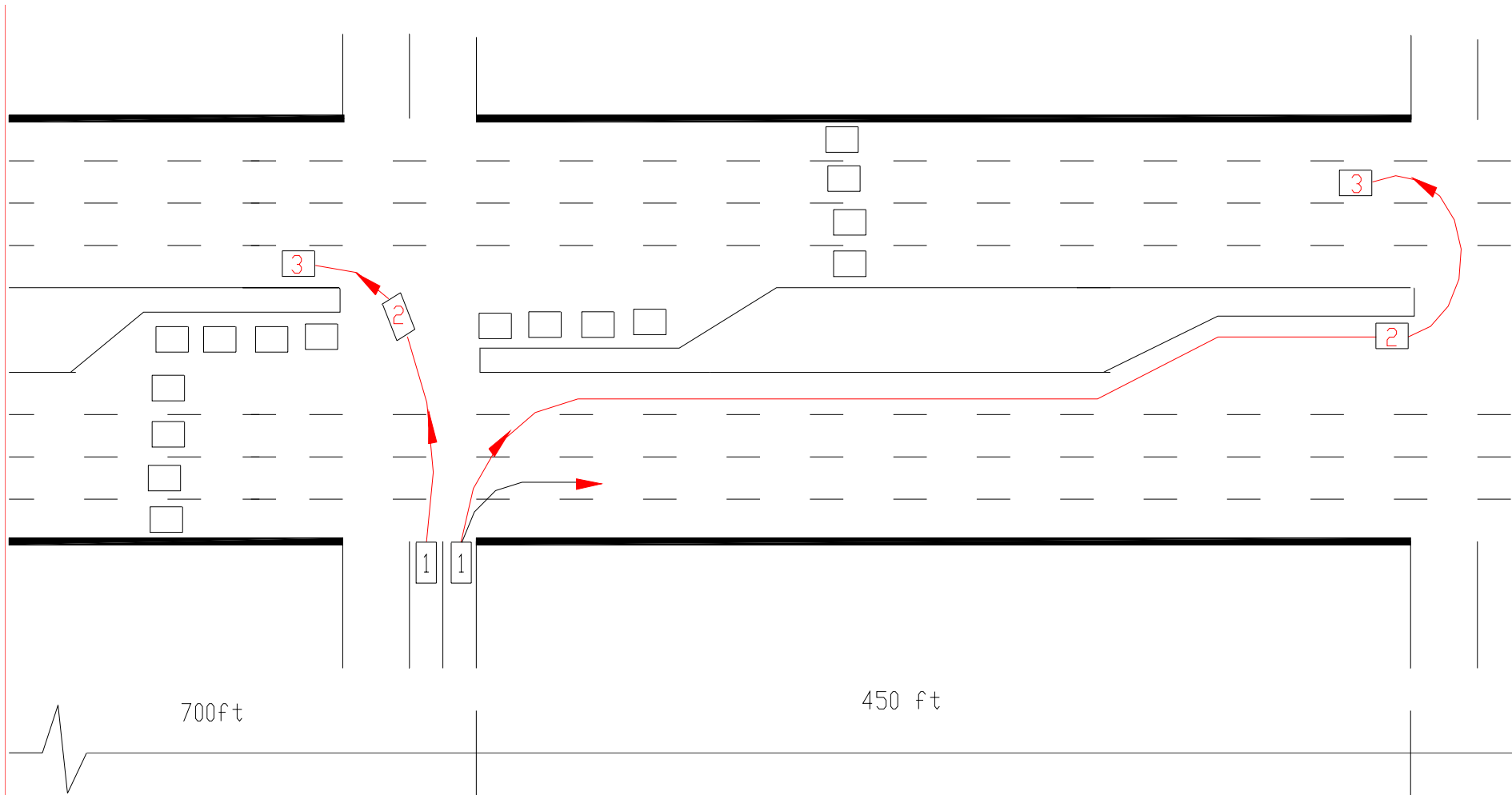
Source: Sear Brown Group and NYDOT

Apalachee Parkway Tallahassee, F - OLD



Pedestrian

Safety Evaluation of Left Turns vs. Right Turn Plus U-turns



Operational Study

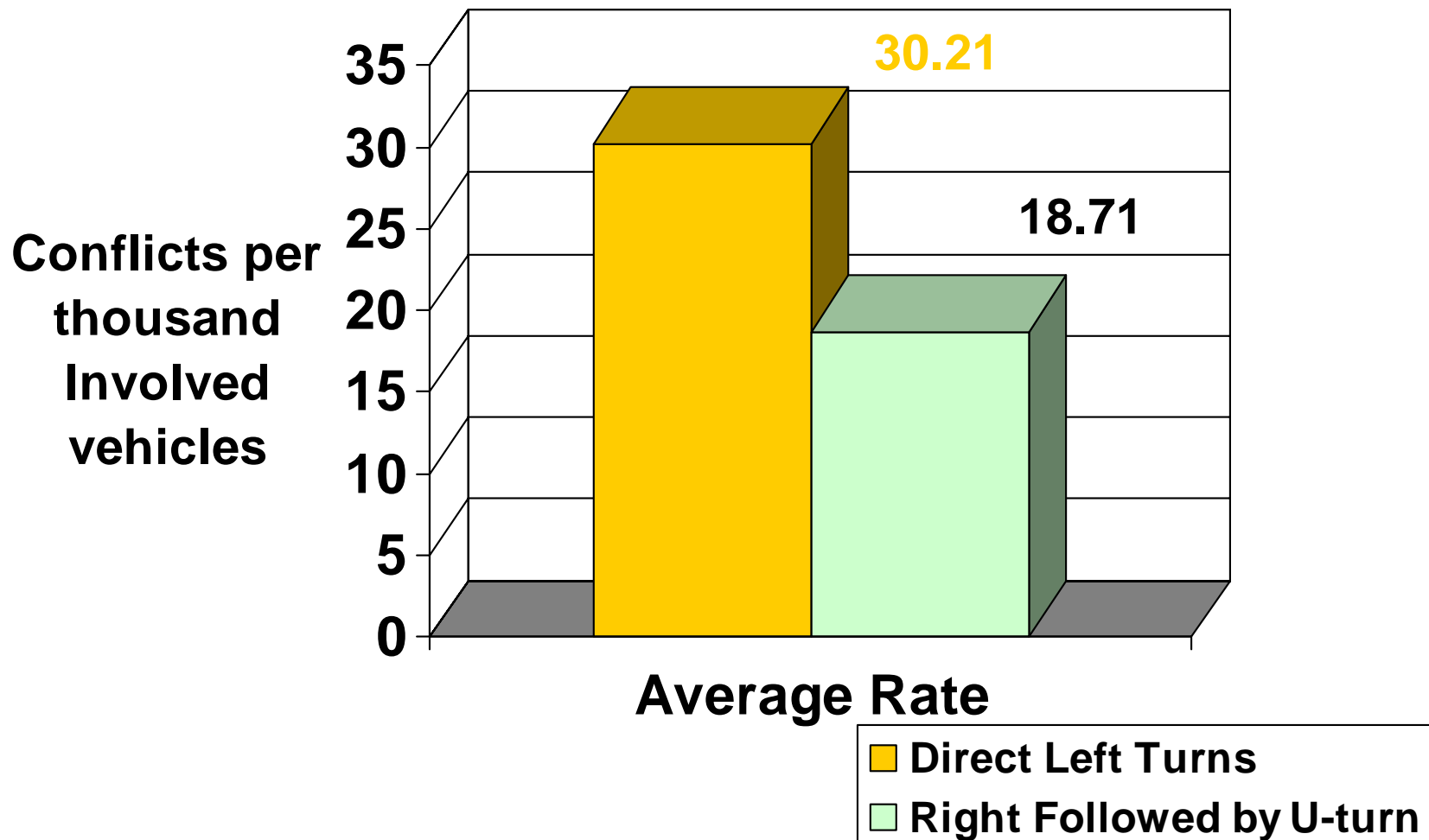
- Over 300 hours of video
- Actual analysis of evasive maneuvers (Conflicts)
- Eight sites in Tampa Bay area
 - ***Before and After*** available for one modified site (showed 50% reduction in conflicts)

**Before and After Location
US 19 & 116th Ave
Tampa Area**

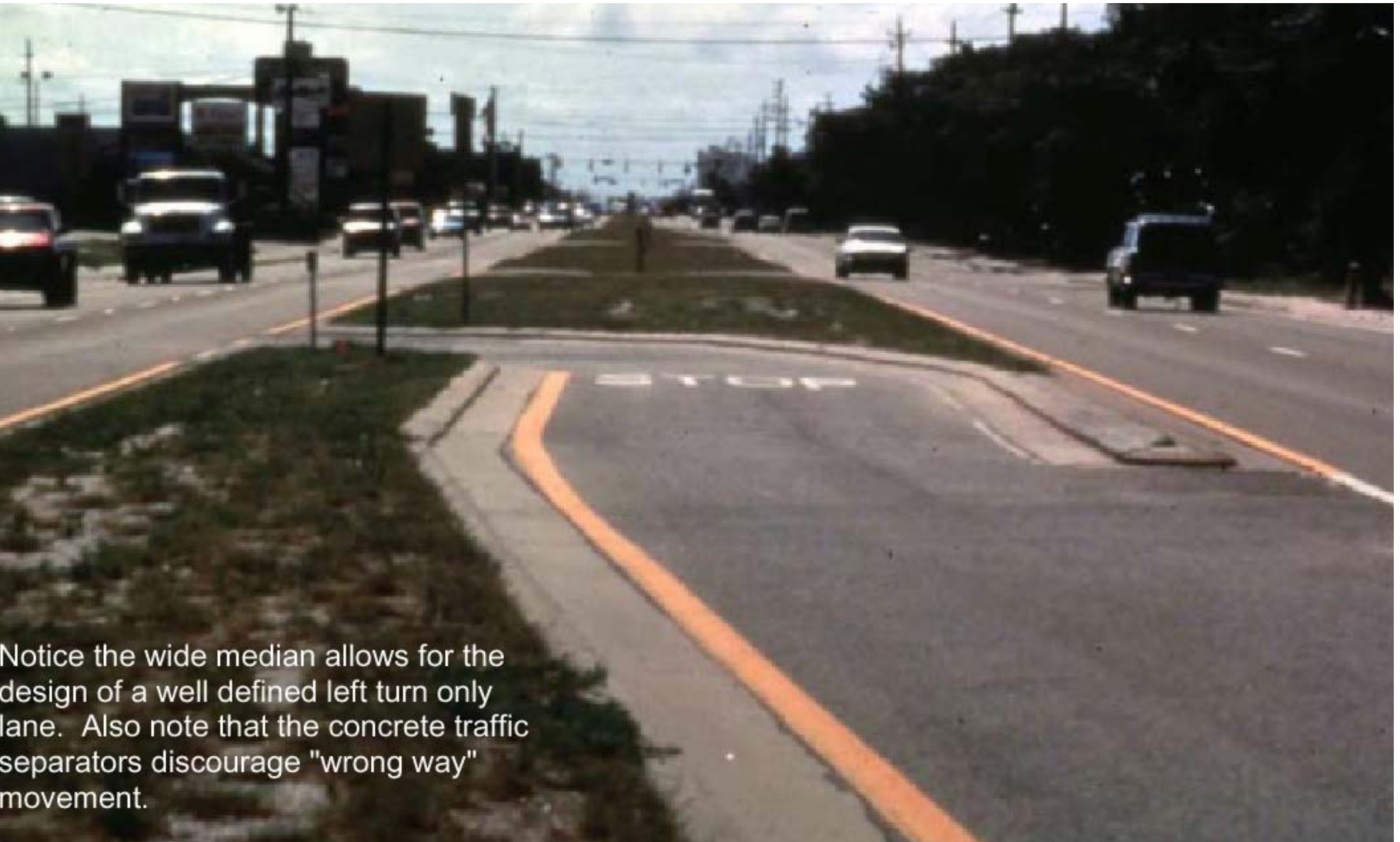


JUL 14 2000
7:19:25 AM

Conflict Rates for Direct Lefts vs. Right Turn followed by U Turn



Directional US 98



Notice the wide median allows for the design of a well defined left turn only lane. Also note that the concrete traffic separators discourage "wrong way" movement.

Narrow Median Directional

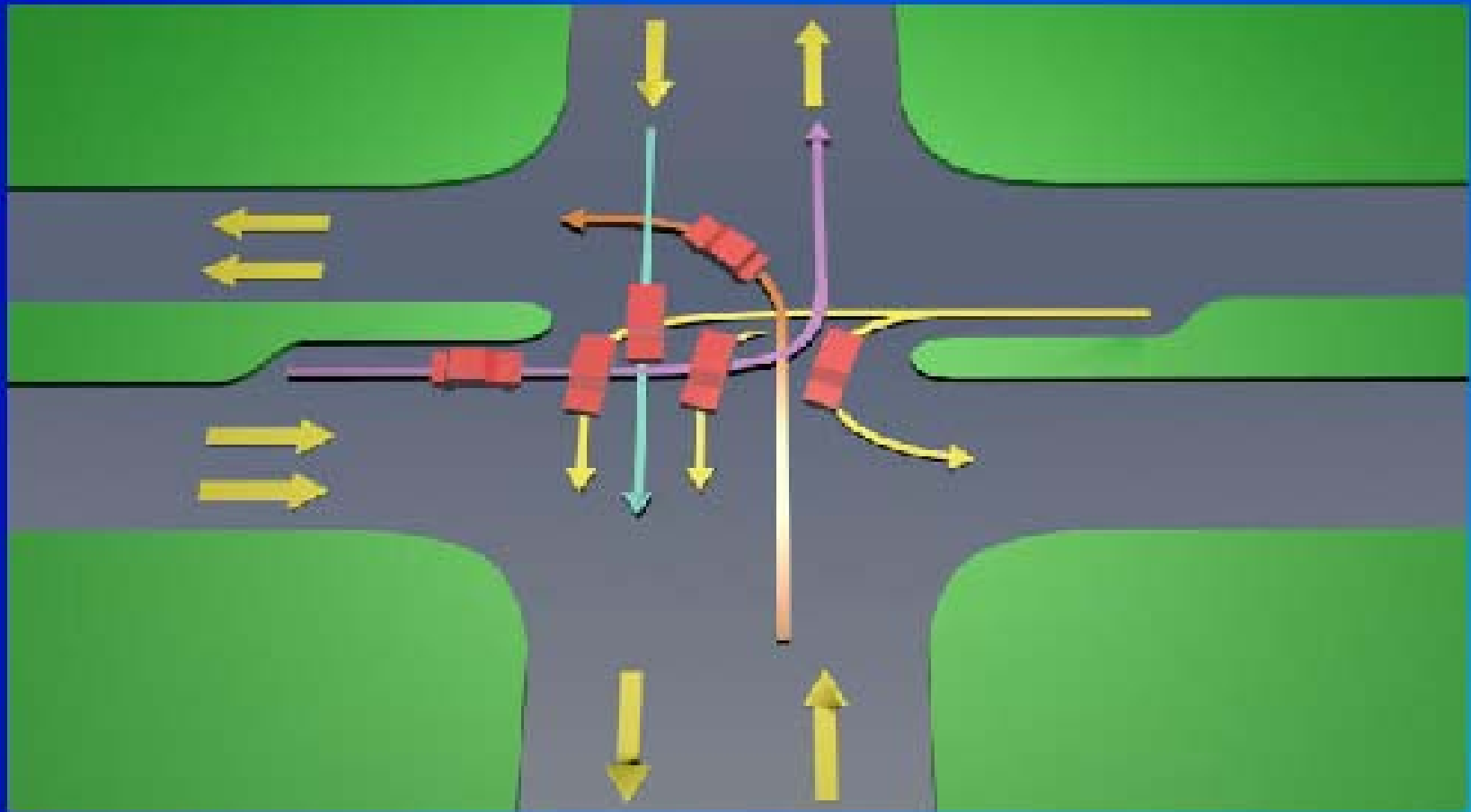


This is a directional median opening in a narrow median. Notice the use of painted lines to guide the vehicle. This does not prohibit "wrong way" movement.

Not as much control with a 22 foot wide median

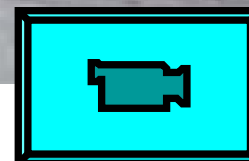


**What can go wrong
at full openings ?**





These vehicles are crowded in an opening right before a signal.



Multilane Median Policy

- Directs all Department multi-lane projects over 40 mph (60 km\h) in design speed to have a restrictive median

Median Handbook

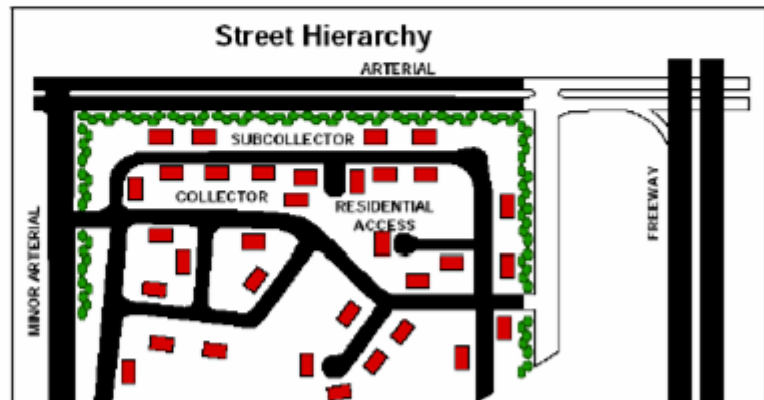
From Page 23

Chapter 2

Important Concepts in Understanding Medians and Median Opening Placement

IMPORTANT CONCEPTS

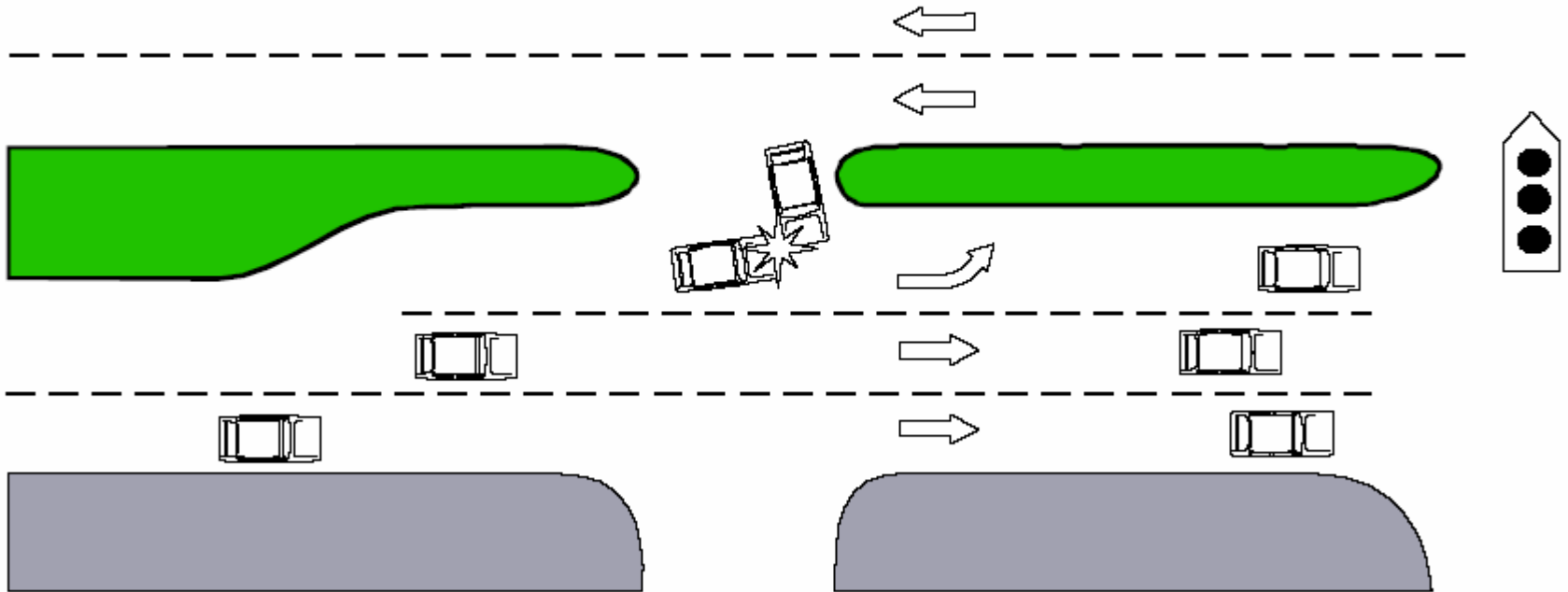
2



IMPORTANT CONCEPTS IN UNDERSTANDING MEDIANS
AND MEDIAN OPENING PLACEMENT

No openings in left turn lanes

From Page 27



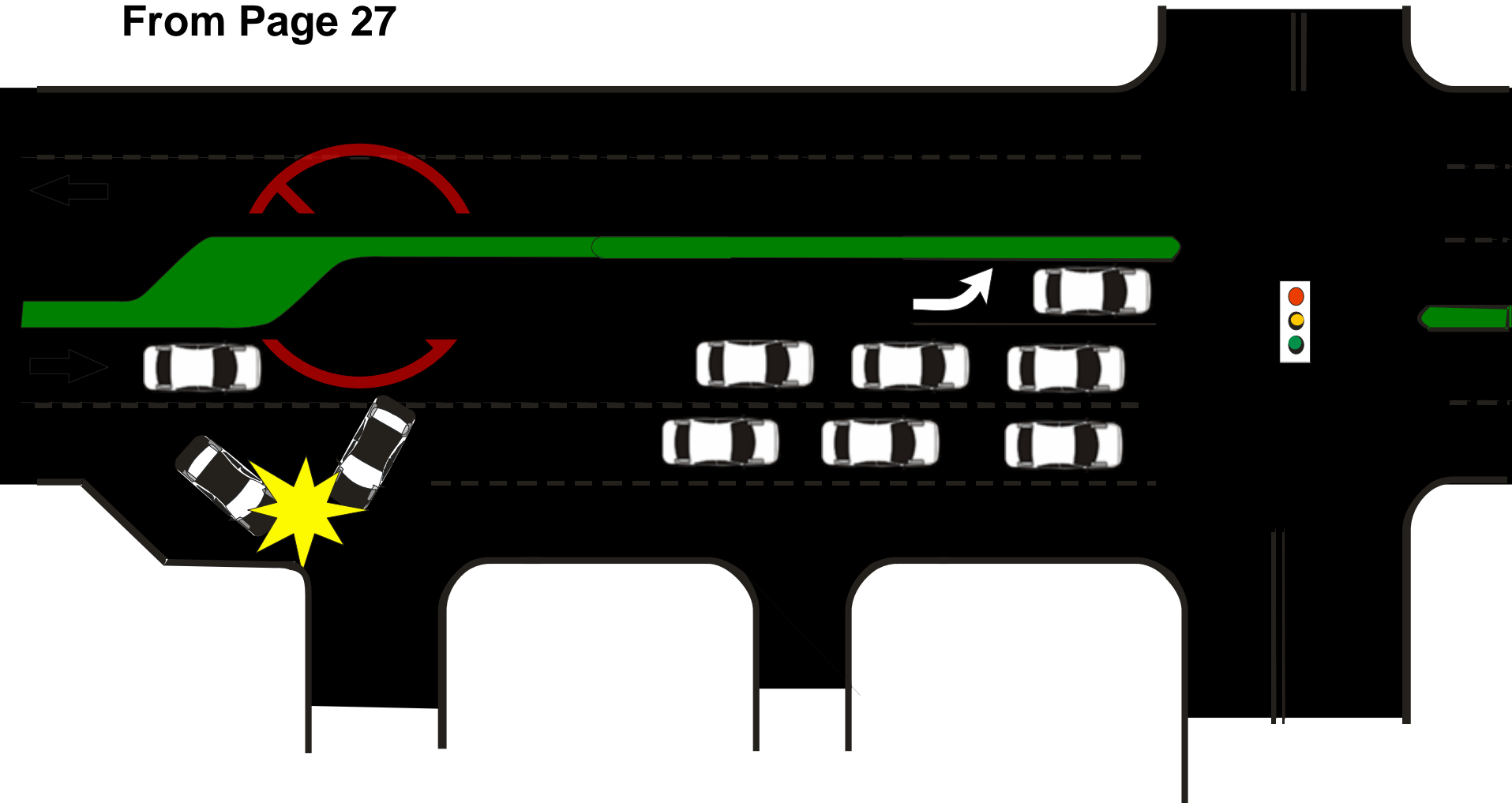




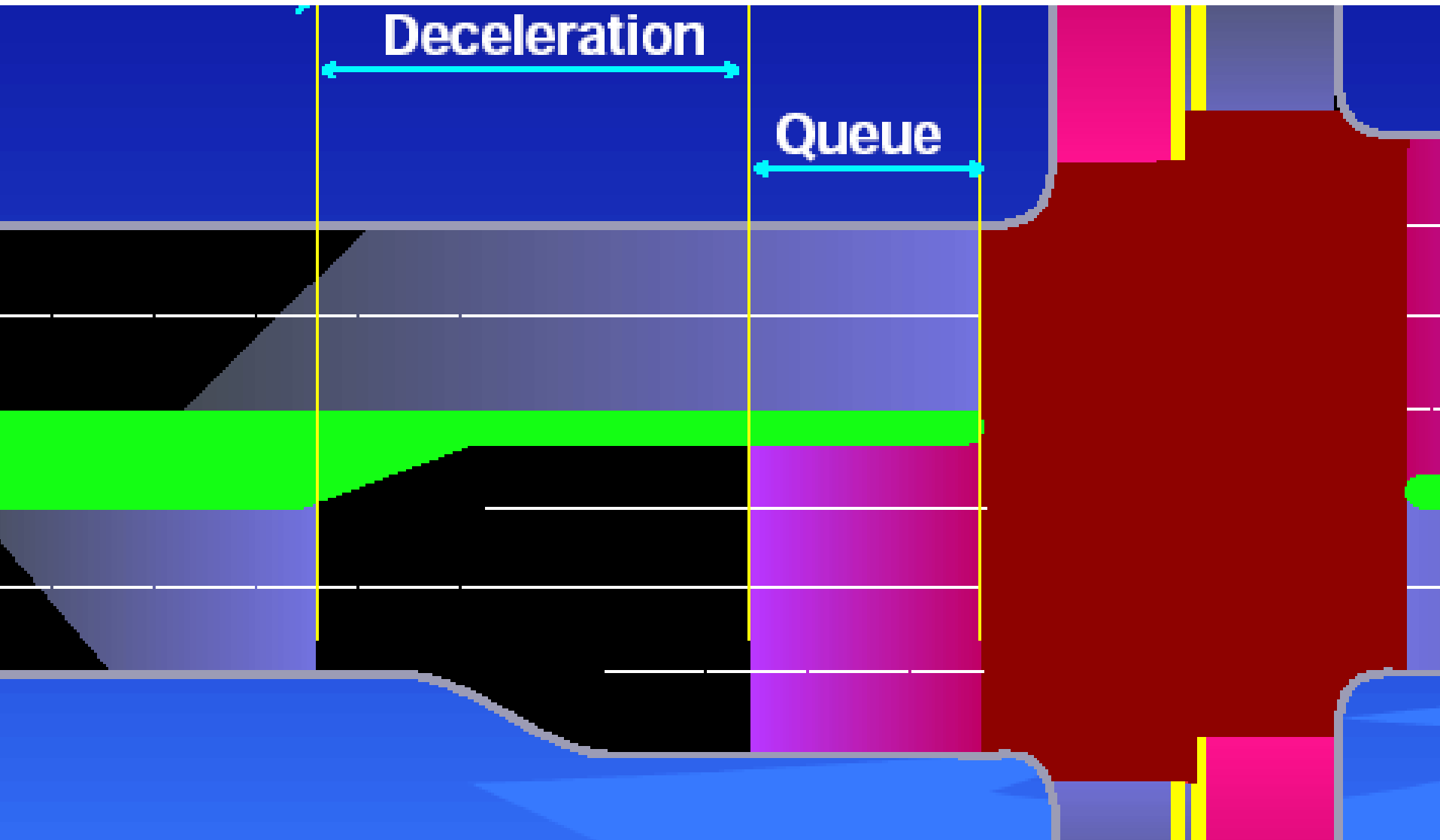
This photo is second, in a series of five, which illustrates openings within the left-turn portion of a signalized intersection.

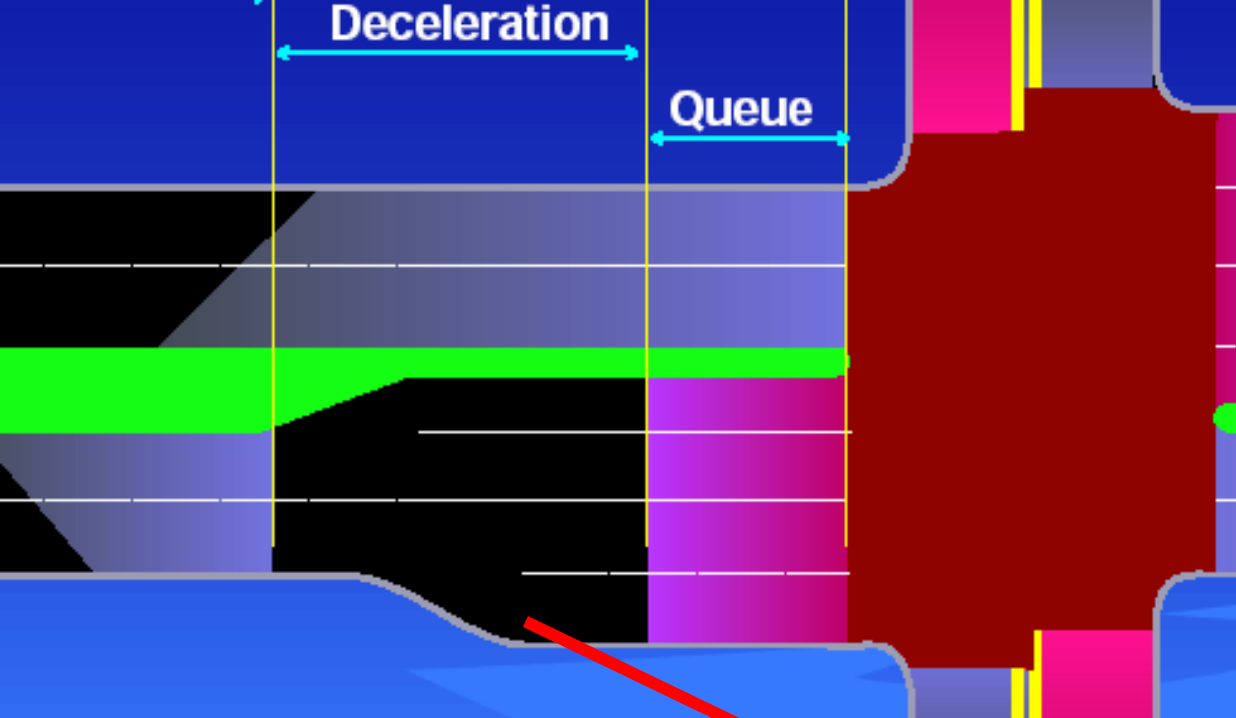
Avoid Median Openings Across Right Turn Lanes

From Page 27



Deceleration And Queue Will Dictate Spacing





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



Recommended Queues

As measured or projected by traffic study



4 cars urban
minimum



2 cars rural
or small town



unless it serves a major generator
(large discount store, shopping center, etc.)

25 Feet per Passenger Car

What Happens If There Are Too Many Vehicles In The Queue?





One Very Tight Possible Scenario

Urban conditions @ 45 mph design

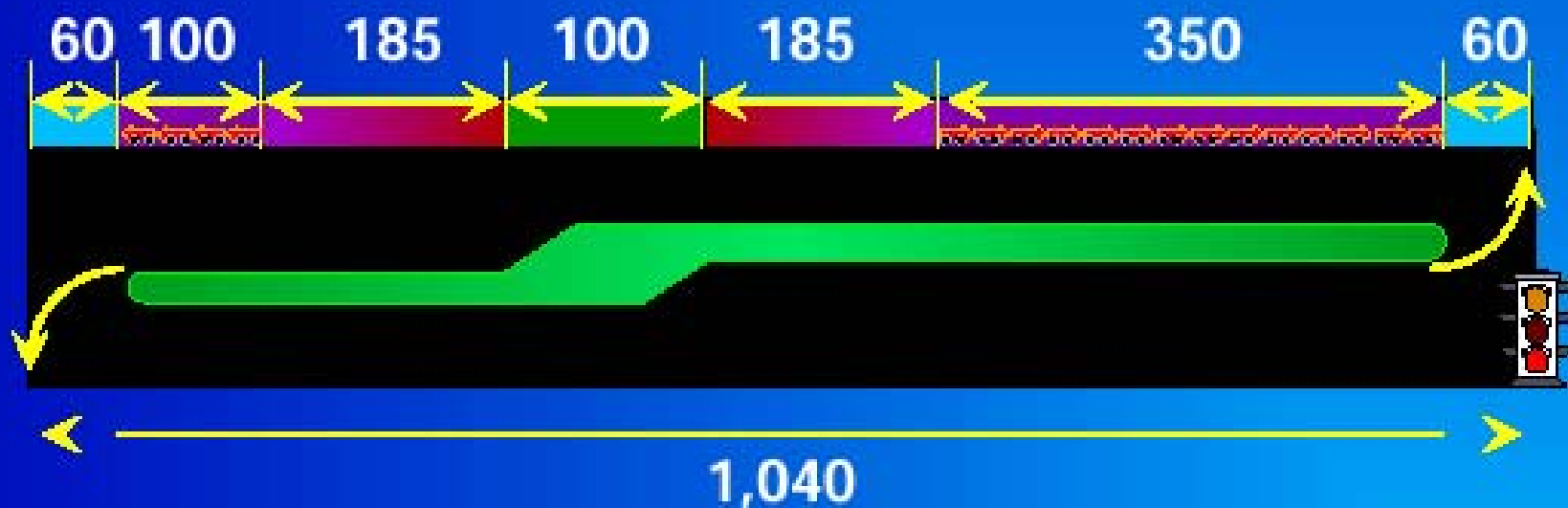


Picture not in book



More realistic minimum scenario

Urban conditions @ 45 mph design



Traffic Mix



Source: Reuters Ltd. 1995

Median Handbook

From Page 47

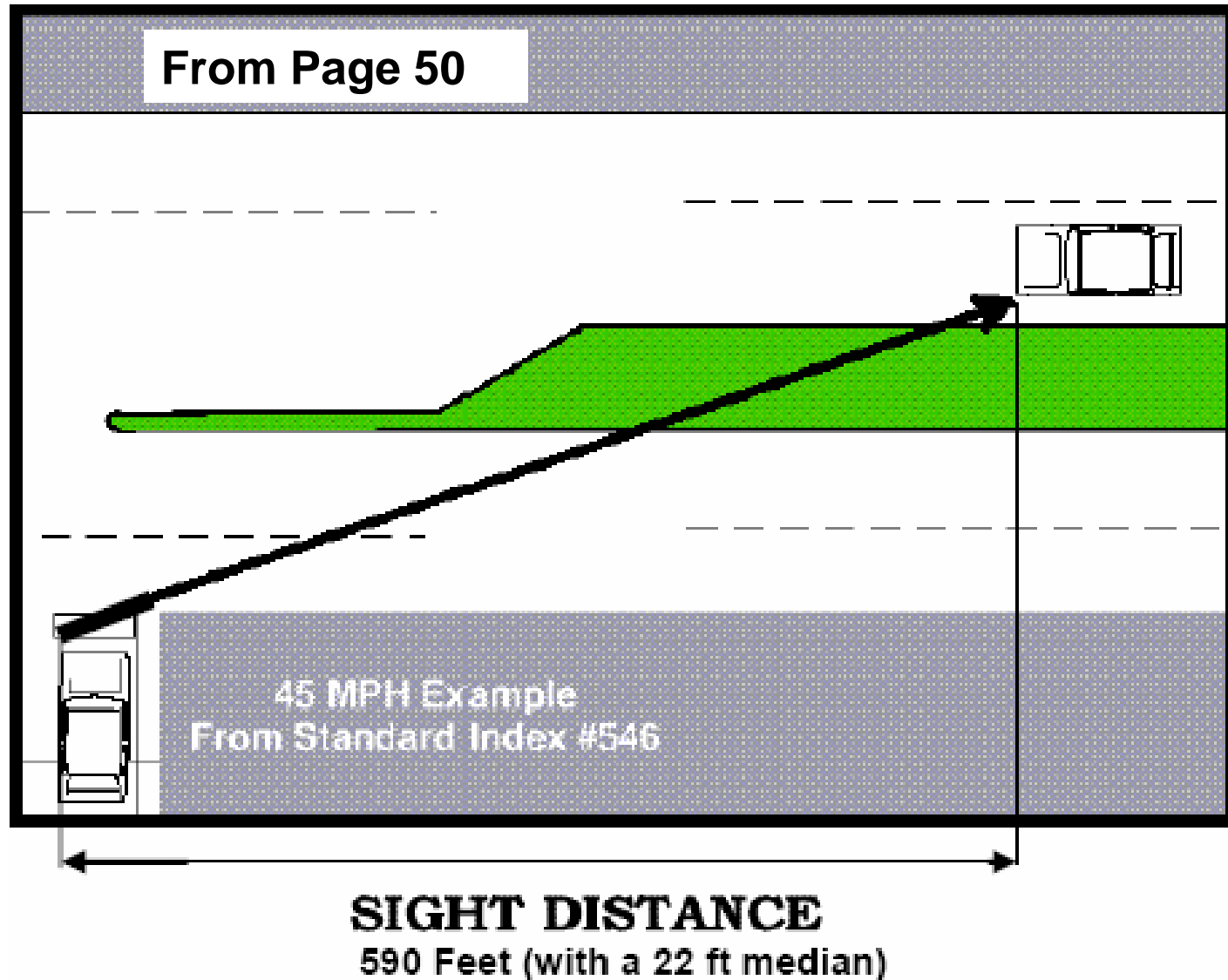
Chapter 3

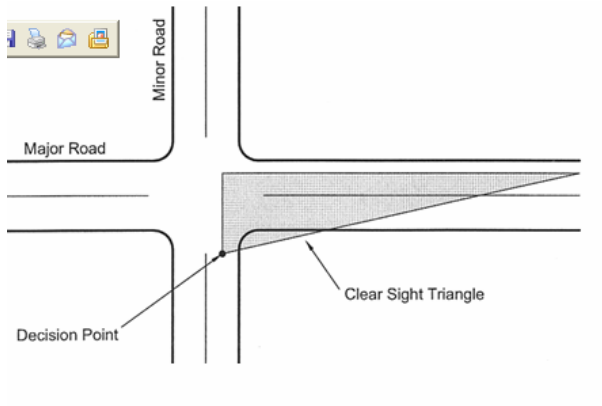
Sight Distance As It Relates to Medians and Median Opening Design



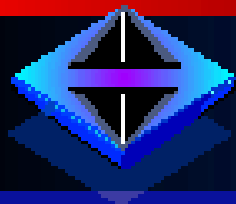
Source: Florida Highway Landscape Guide - 1995

Sight Distance



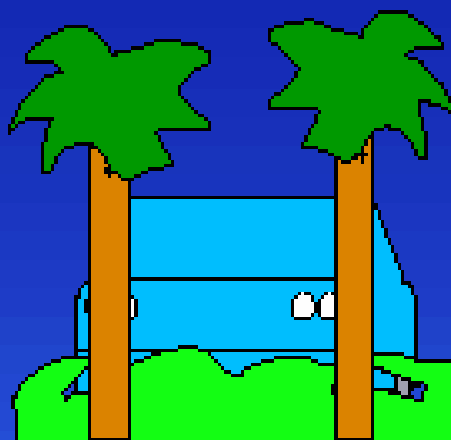
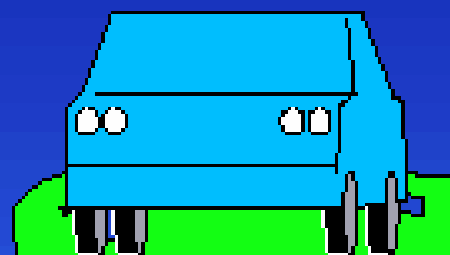




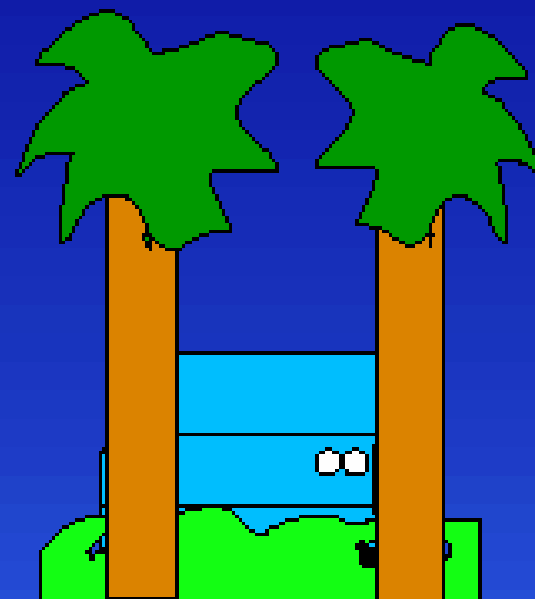


Area Size of Vehicle

Two 6" caliper trees



Two 11" caliper trees



top of ground cover
(12" above top of curb)

Driver can see 50% of the vehicle

Index No. 546
45 MPH



Time of Visibility

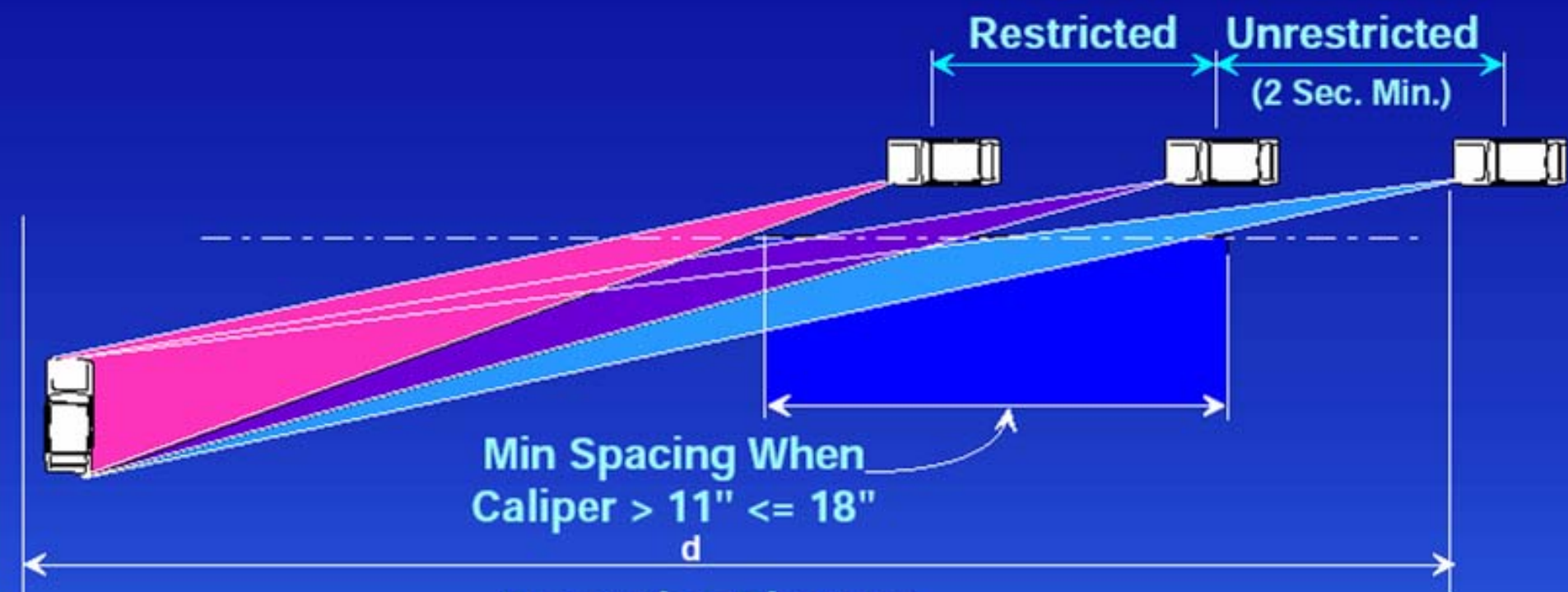
Where visibility is blocked by over 50%, the Department

will allow for **2** seconds unobstructed visibility.





Setting Sabal Palm Spacing



Perception Diagram
Setting Sabal Palm (State Tree) Spacing



Median Tree Spacing

Speed (mph)	35		45	
Maximum Caliper (Diameter) [Within Limits of Sight Window] (mm)	> 4" < or = 11"	>11" < or = 18"	> 4" < or = 11"	>11" < or = 18"
Minimum Spacing [c. to c. Of Trunk] (ft)	27	108	40	146

Excerpt from Standard 546



Left Turn Lane Offset

From Page 52



Negative Offset between opposing left-turn lanes



Positive Offset between opposing left-turn lanes



Source: Norbert Munoz - FHWA



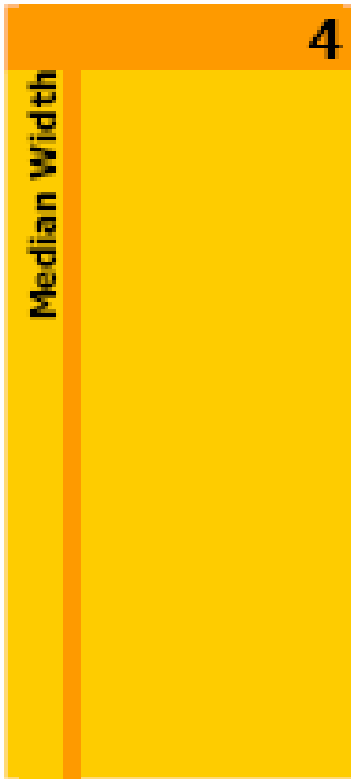
Source: Norbert Munoz - FHWA



Median Handbook

From Page 59

Chapter 4 Median Width



MEDIAN WIDTH



Seattle Washington: Use of
a New Jersey barrier for
many miles.

Source: Vergil Stover



Narrow medians may not provide enough protection for pedestrians at intersections.

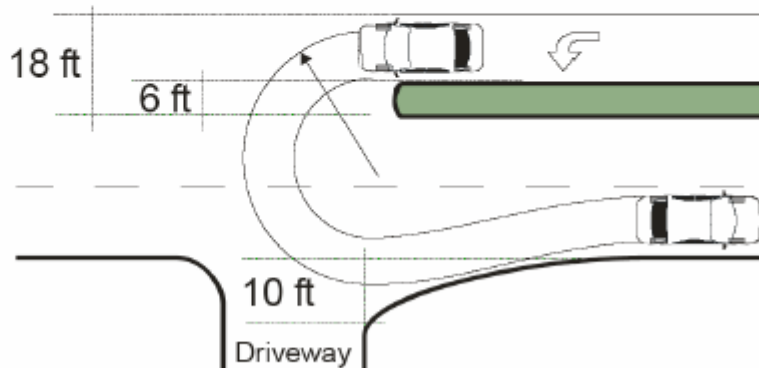
Median Handbook

Chapter 5

Special U-Turn Considerations


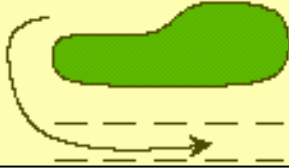

5

Special U-Turn Considerations



SPECIAL U-TURN CONSIDERATIONS

Width of Median for U-Turn (4-Lane)

	Measures in feet	Passenger P	Single Unit SU	Semi Trailer WB-50
	Turn Lane to Inner Lane	42	75	83
	Turn Lane to Outer Lane	30	63	71
	Turn Lane to Shoulder	20	53	61

Source: AASHTO Figure IX-67 (with added 12 ft for turn lane width)

AASHTO 2001 - Exhibit 9-92



US 27 Marion County

Isolated Bulb-Out — US 27 Marion Co.





US 27 Marion County



ROBERT BURKE/Tribune photo

The project for landscaping the median at Progress Village was made possible by many people who donated money and time to provide plants.

A HAPPY MEDIAN

The county's beautification project has blossomed into a successful venture.





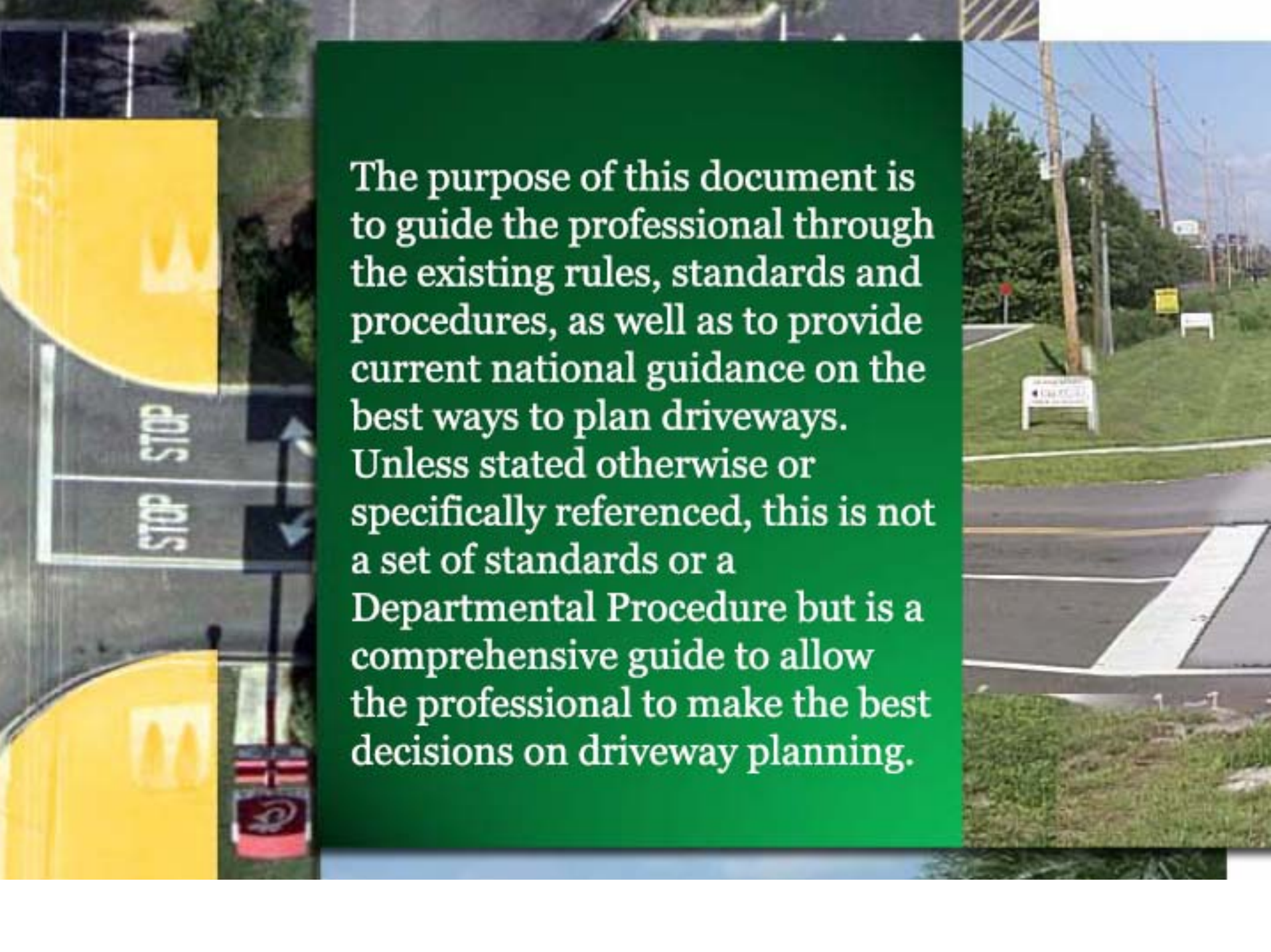
DRIVEWAY HANDBOOK

An Overview



Systems Planning Office
State of Florida
Department of Transportation
605 Suwannee St. - Station 19
Tallahassee, Florida 32399
850-414-4900

www.dot.state.fl.us/planning

The background of the slide is a collage of three images. On the left, a yellow car is partially visible, with a 'STOP' sign painted on the pavement and a blue arrow pointing forward. On the right, a residential driveway is shown with a white sign that reads '100% OFF' and a yellow sign in the background. The central text is overlaid on a green rectangular background.

The purpose of this document is to guide the professional through the existing rules, standards and procedures, as well as to provide current national guidance on the best ways to plan driveways. Unless stated otherwise or specifically referenced, this is not a set of standards or a Departmental Procedure but is a comprehensive guide to allow the professional to make the best decisions on driveway planning.

Introduction

Driveways provide the physical transition between a site and the abutting roadway. Driveways should be located and designed to minimize impacts on traffic while providing safe entry and exit from the development served.



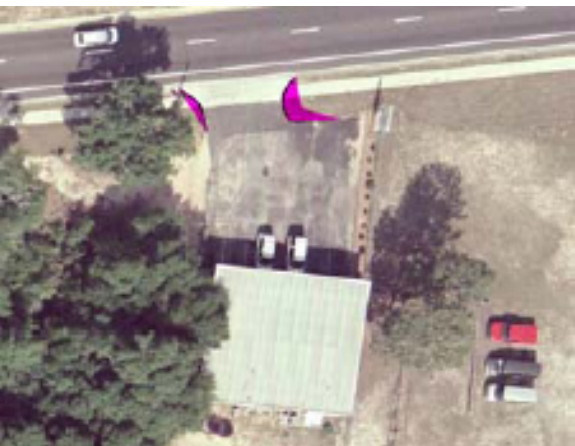
INTRODUCTION

Driveways Should Be Designed Based On The Expected Traffic

Expected Driveway Trips	Example Land Uses	How to Design Driveway
	(Guidance not found specifically in Index 515)	
1-20 trips/day or 1-5 trips/hour	1 or 2 single family homes	Usually minimum requirements – possibly some high speed features in rural high speed locations



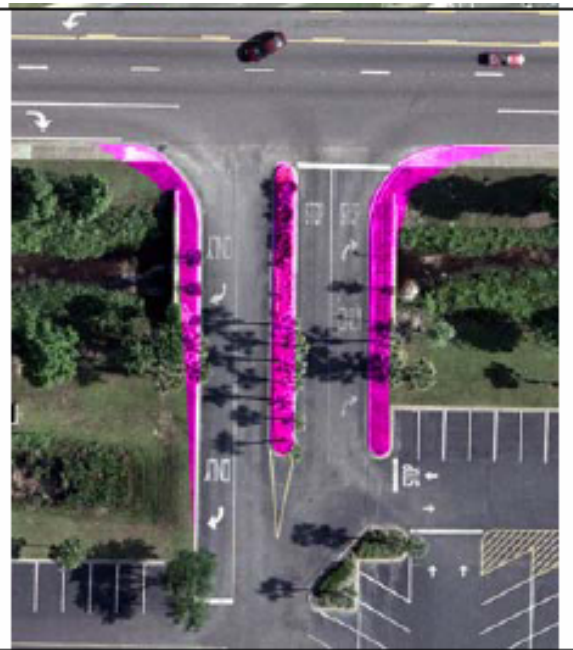
Driveways Should Be Designed Based On The Expected Traffic



Expected Driveway Trips	Example Land Uses	How to Design Driveway
	(Guidance not found specifically in Index 515)	
21-600 trips/day or 6-60 trips/hour	3 to 60 housing or apartment units Small office in converted home "Mom & Pop" business	Driveway with some high volume features (possibly radial return, turn lanes, or other features)
601-4,000 trips/day or 61-400 trips/hour	Small "Strip" shopping center (20-75,000 sq. ft.) Gas station/ convenience market	

Driveways Should Be Designed Based On The Expected Traffic

Expected Driveway Trips		Example Land Uses	How to Design Driveway
		(Guidance not found specifically in Index 515)	
Over the Range of Standard Index 515	Over 4,000 trips/day	150,000 ft shopping center	Design as full intersection in cooperation with the local government (see General Note 6 in Standard Index 515)
	Over 400 trips/hour	Grocery/drugstore with 10-15 smaller stores (9,000 daily trips split w/2 driveways)	



Uncurbed Driveway “Rural”



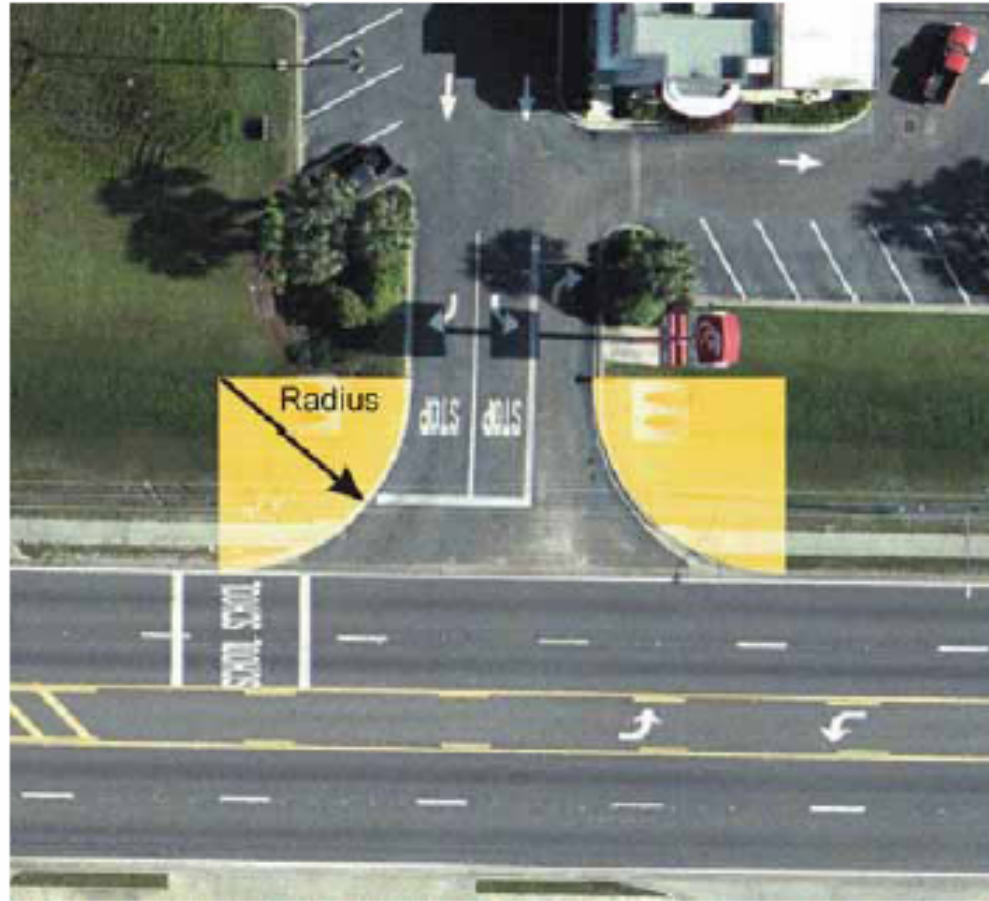
From Page 14

Curb and Gutter “Urban”



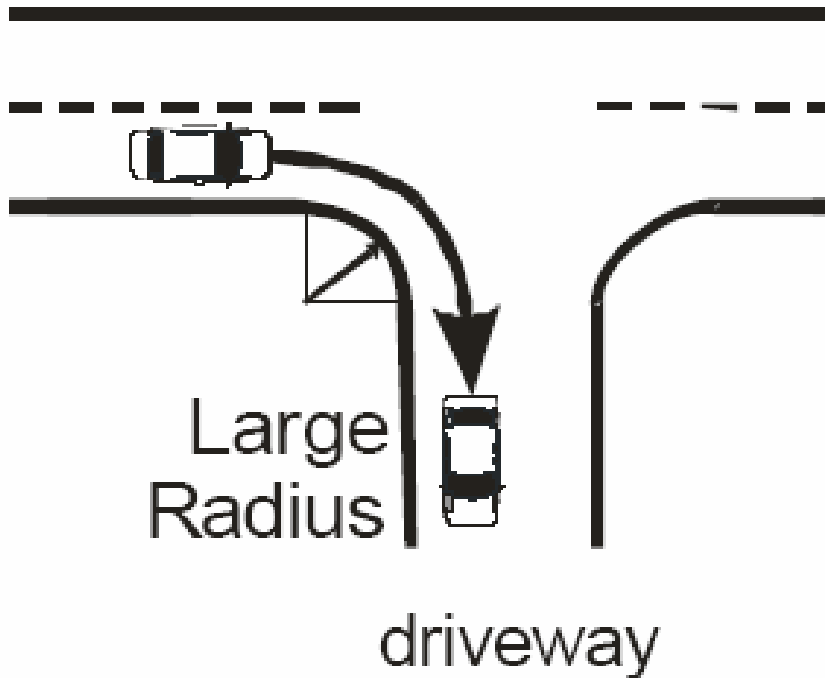
From Page 15

Radius and Flare

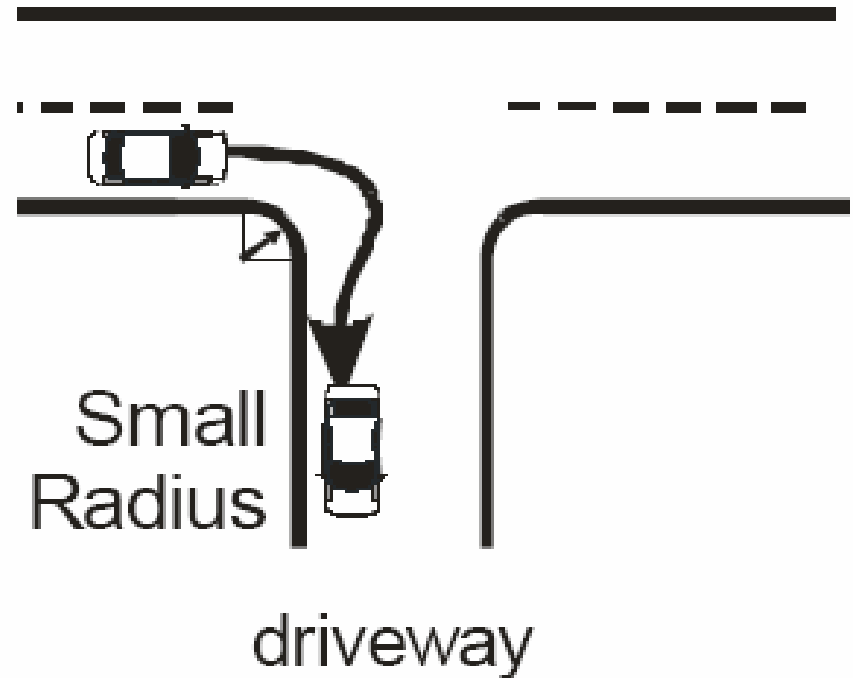


Driveway Radius

Adequate



Too Small



Driveway Width

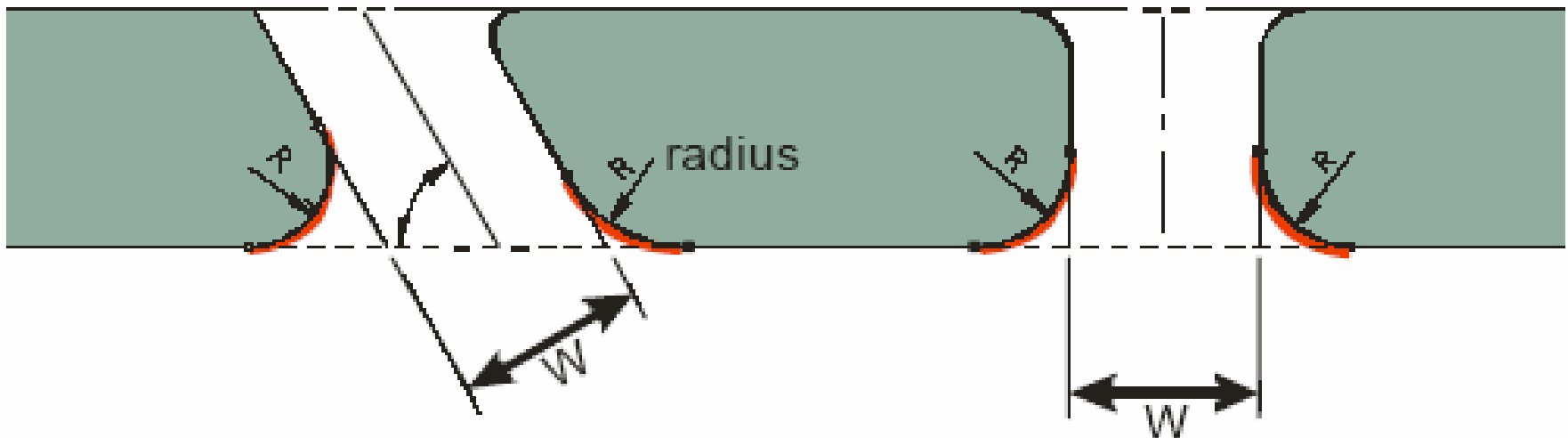


DRIVEWAY WIDTH

Driveway Width

width

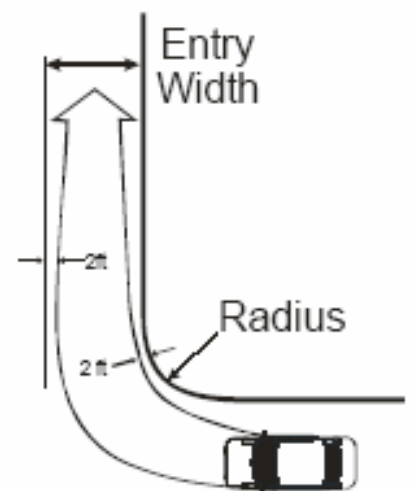
width



Source: Adapted from Standard Index 515

Driveway Width

Exhibit 15



Radius or Flare (ft.)

**Single Lane Width for Entry
for Passenger Vehicles (ft.)**

Typical flared driveway

22 ft (Pavement striping should be used if entry is this wide)

10 ft Radius

19 ft

15 ft Radius

17 ft

20 ft Radius

14 ft

25 ft Radius

14 ft

Over 25 ft Radius

12-14 ft

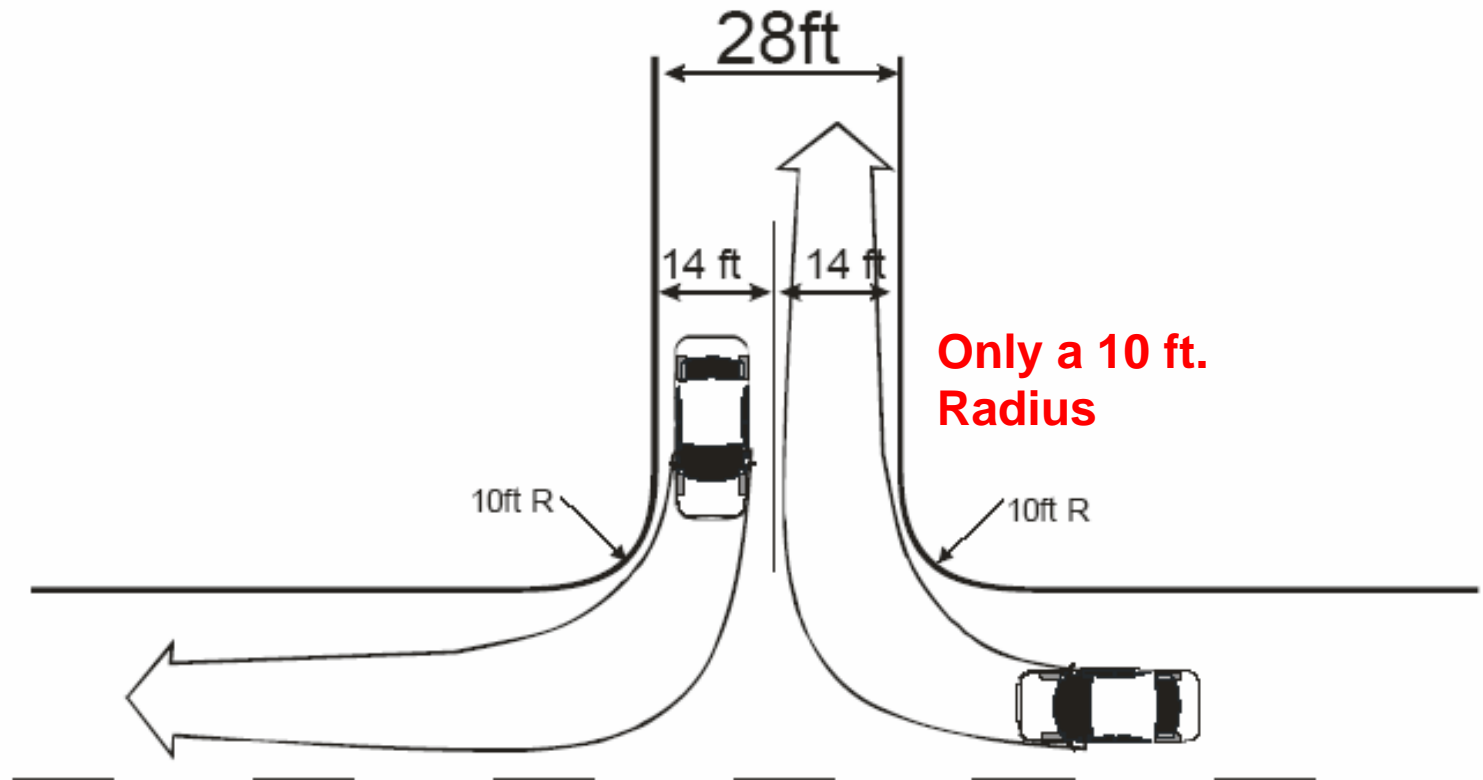
Source: adapted from *Access Management for Streets and Highways*, Flora and Keith, FHWA, 1982 p 63

Important Notes For Use of Exhibit 15

- A wider driveway is required if simultaneous two-way operation with a truck or bus is desired.
- A driveway with a radius of greater than 25 feet requires a 14 foot entry width and is not impacted by the presence or lack of a bike or parking lane.
- If you are using flare, radius or width measures outside of those in ***Standard Index 515***, you will need to document the need, and it should be approved by the Department.

Also see Section 2.5 for more

Driveway Width



Curb Return Radius

*Source: Adapted from Transportation and Land Development,
Vergil Stover 2002*

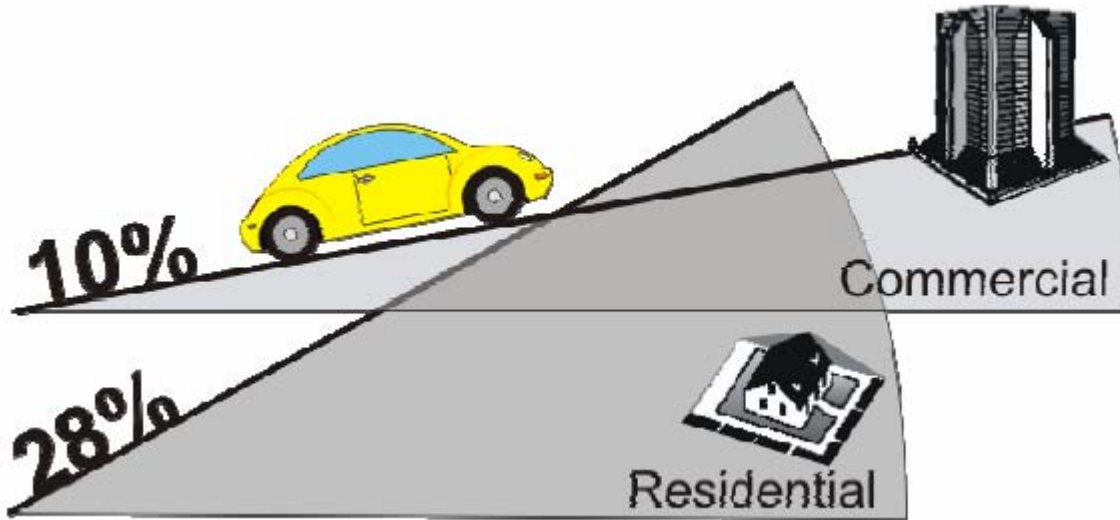
Driveway Grade



DRIVEWAY GRADE

From Page 39

Driveway Grade – standard 515



Research has shown that the highest practical grades are 14% for low volume driveways and 5% for higher volume driveways.

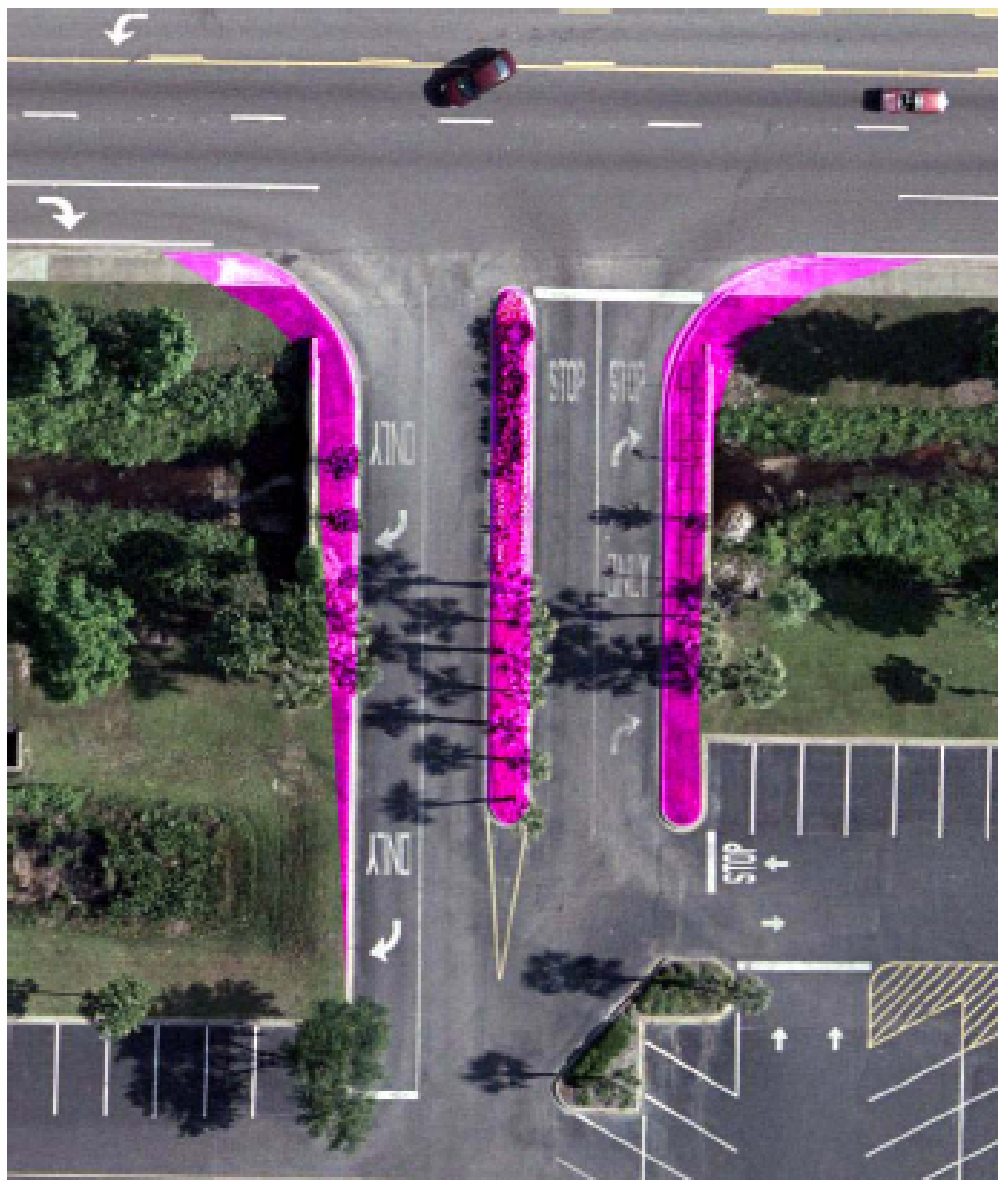
Source: Vergil Stover unpublished course notes



Driveway Channelization

5

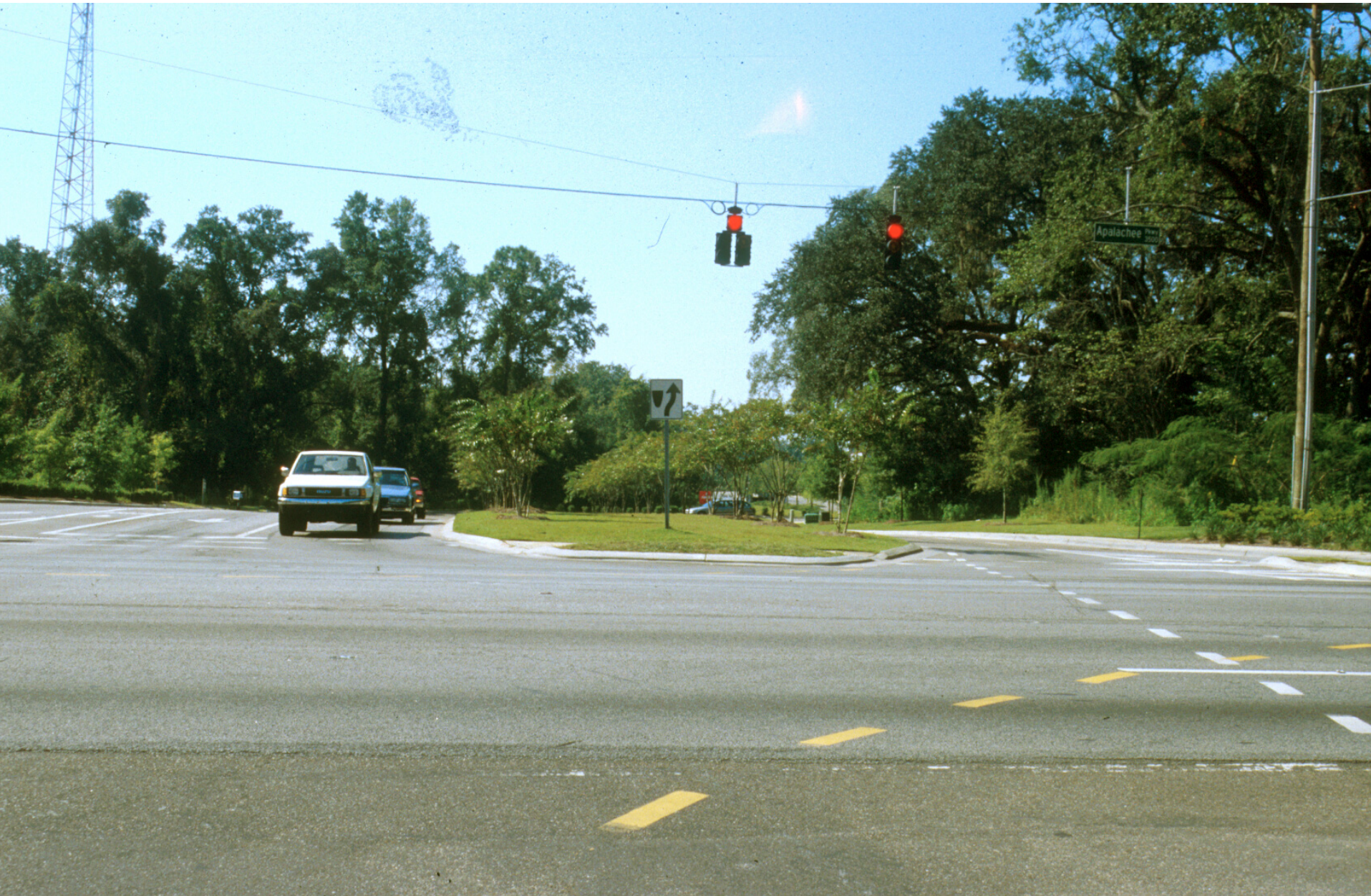
Driveway Channelization



DRIVEWAY CHANNELIZATION

From Page 45

Divisional Islands

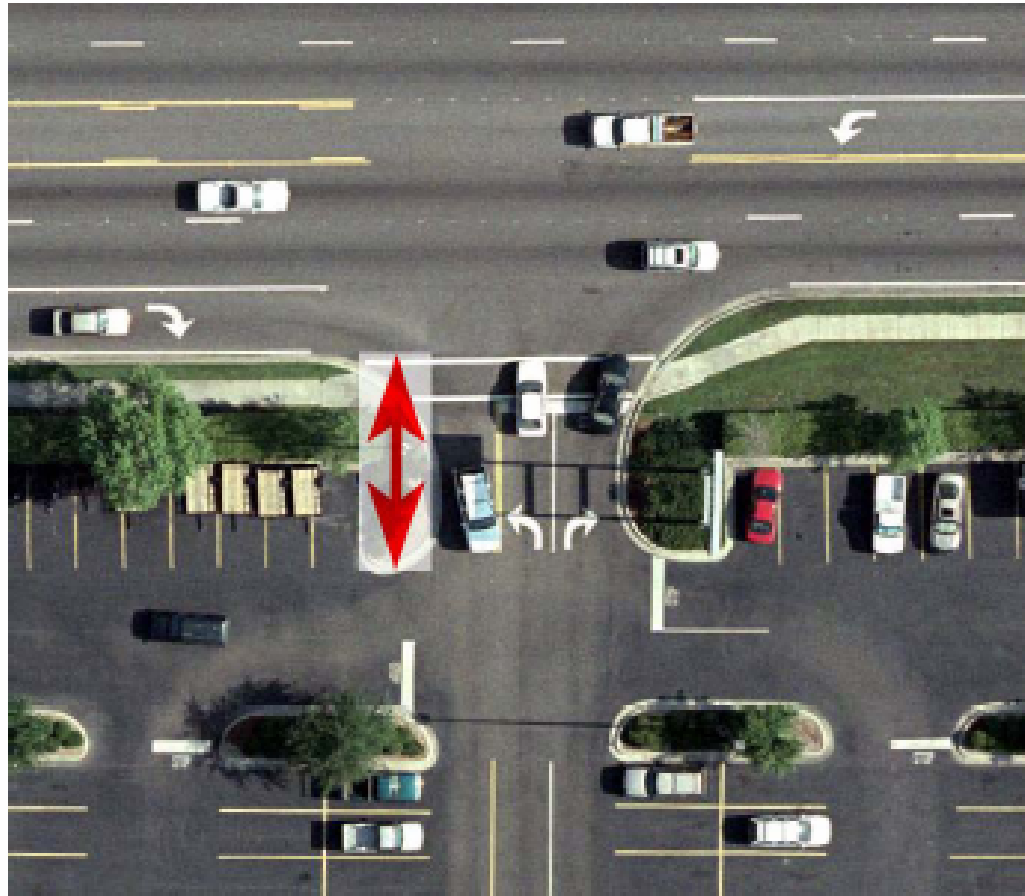


Area of Triangular Island



From Pages 48 and 49

Driveway Length



DRIVEWAY LENGTH

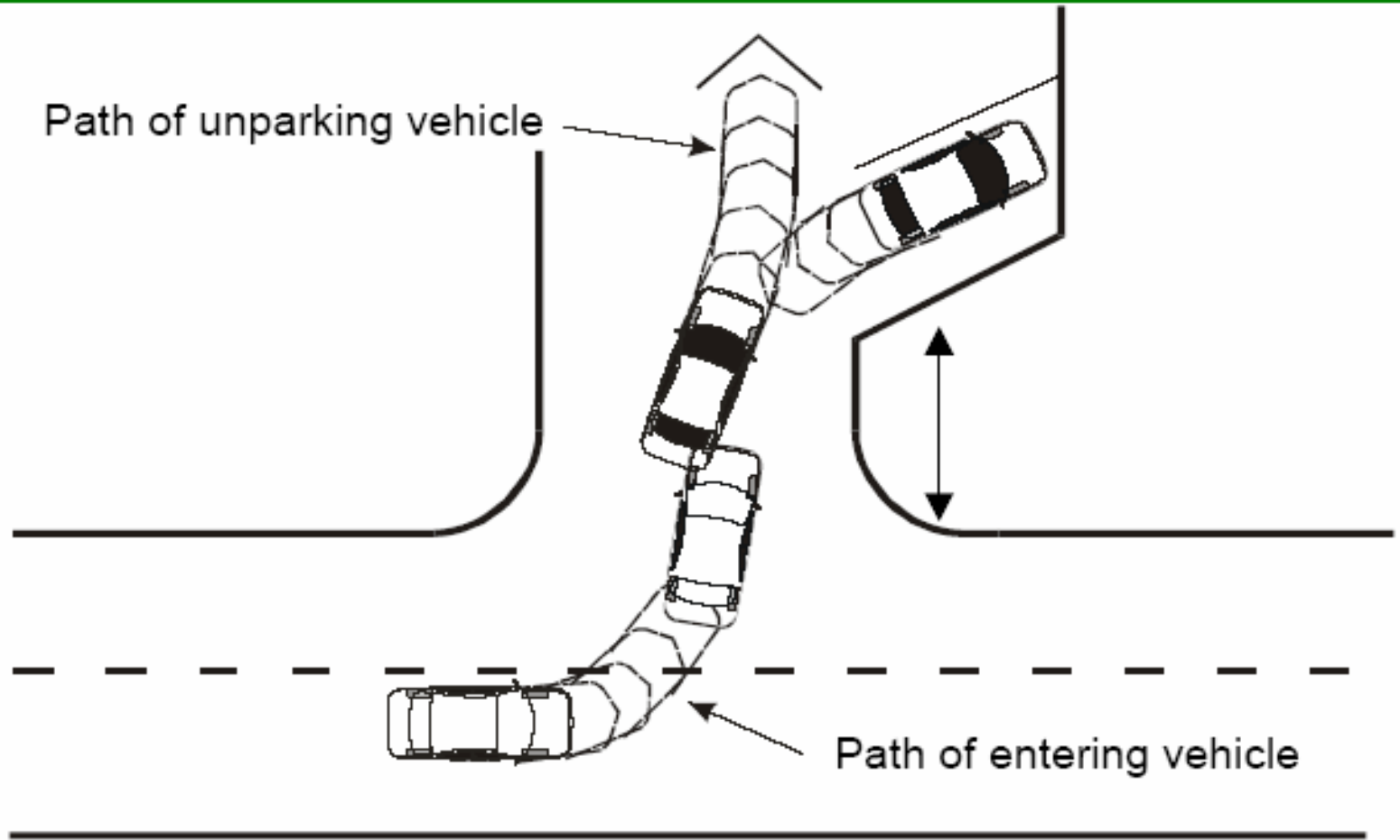
From Page 51

Driveway Length

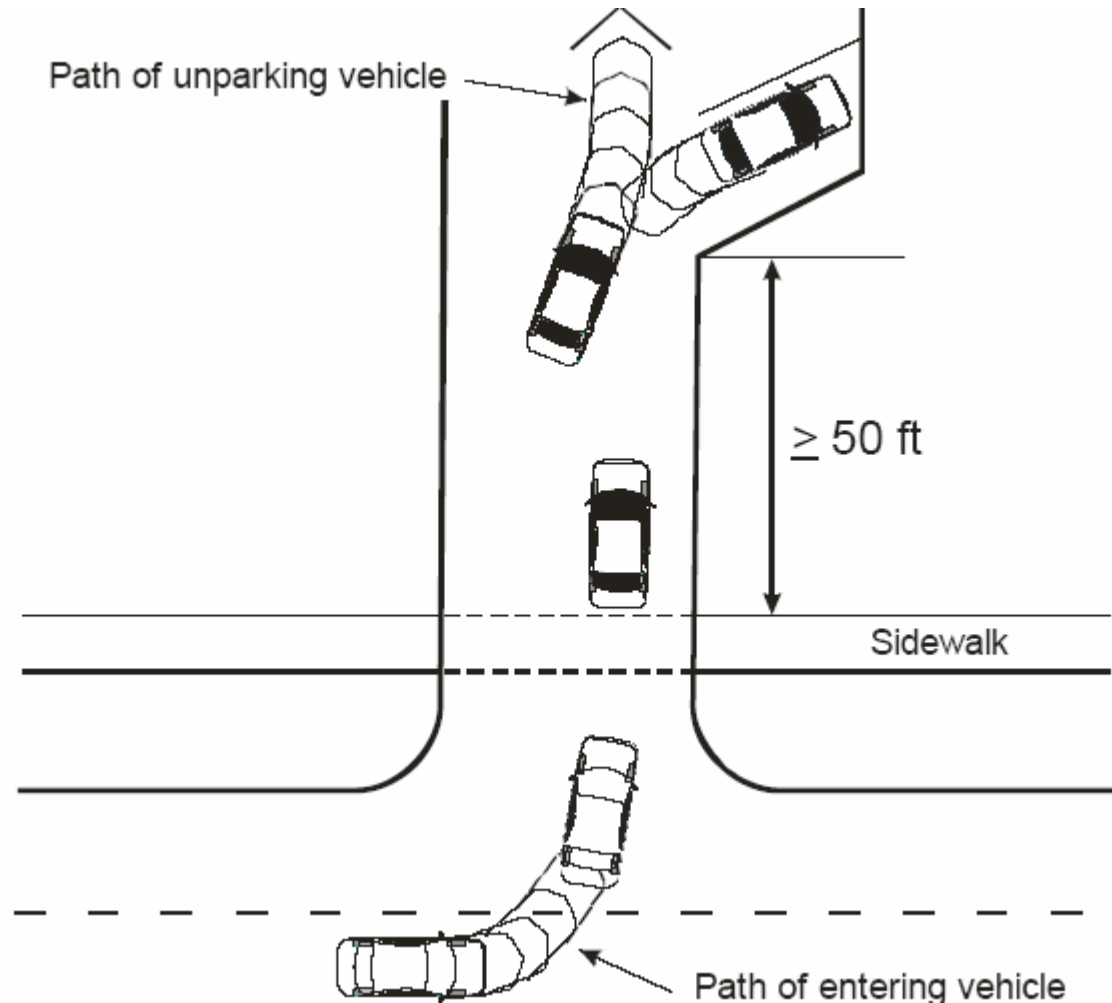


- *“Driveway length” is from edge of traveled way to the first conflict point*

Driveway Length and Parking Movements



Driveway Length and Parking Movements



From Page 55

Right Turn Lanes



RIGHT TURN LANES

Right Turn Lanes

Roadway Posted Speed Limit	Number of Right Turns Per Hour
45 mph or less	80-125 ¹
Over 45 mph	35-55 ²

*May not be appropriate for signalized locations where signal phasing plays an important role in determining the need for right turn lanes.

Sight Distance

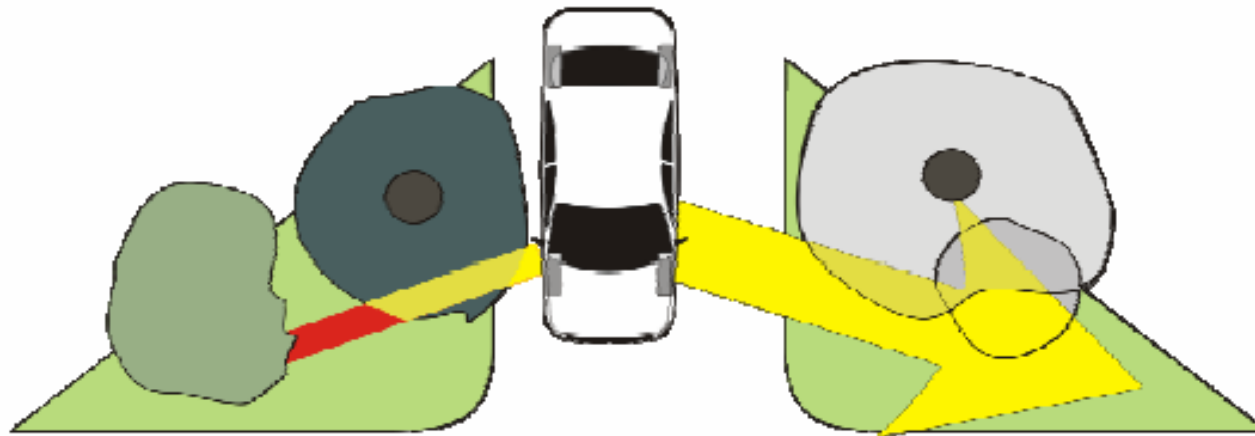


SIGHT DISTANCE AT DRIVEWAYS

From Page 65

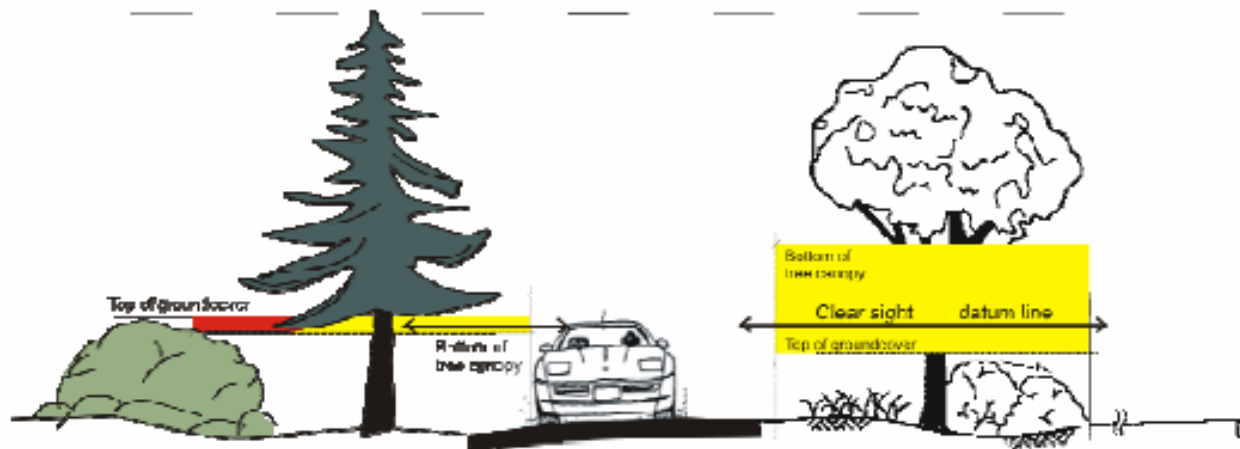
Sight Distance – Landscaping

Exhibit 54
POOR SIGHT DISTANCE



No clear sight

Clear sight



Poor Example

Good Example

Driveway Sight Distance



Source: Dan Burden

Driveway Location



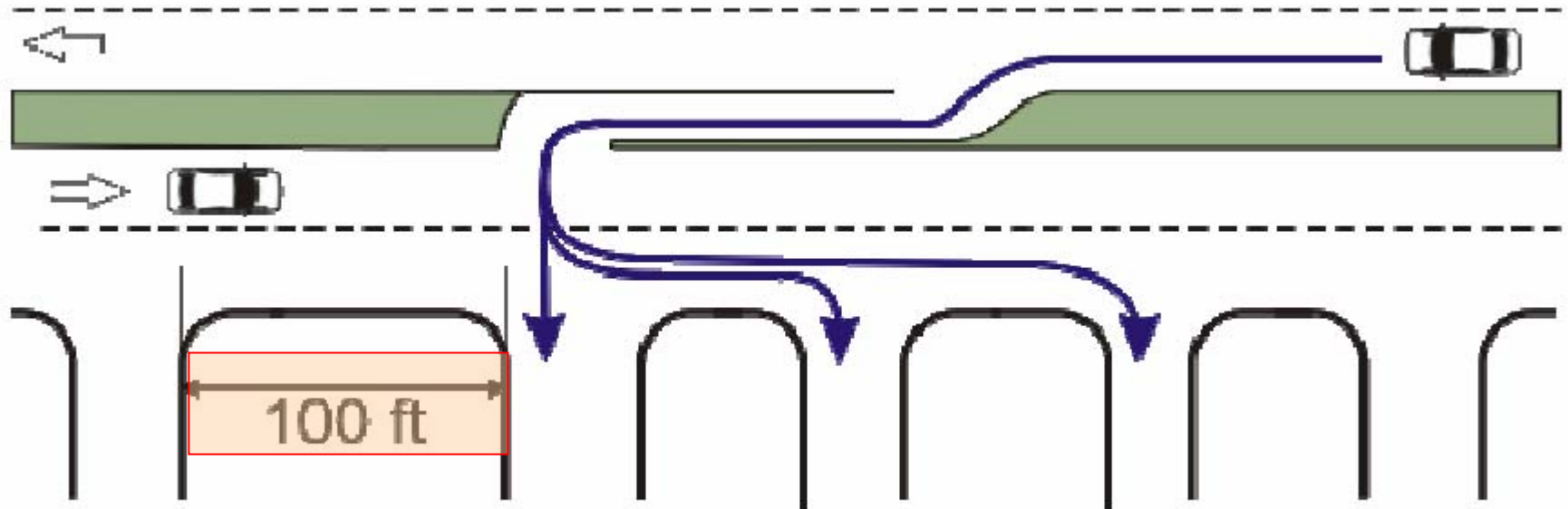
DRIVEWAY LOCATION

From Page 75

Inadequate Corner Clearance



Driveways and Median Opening Operations



Driveways either across or downstream from median opening

The Pedestrian Environment

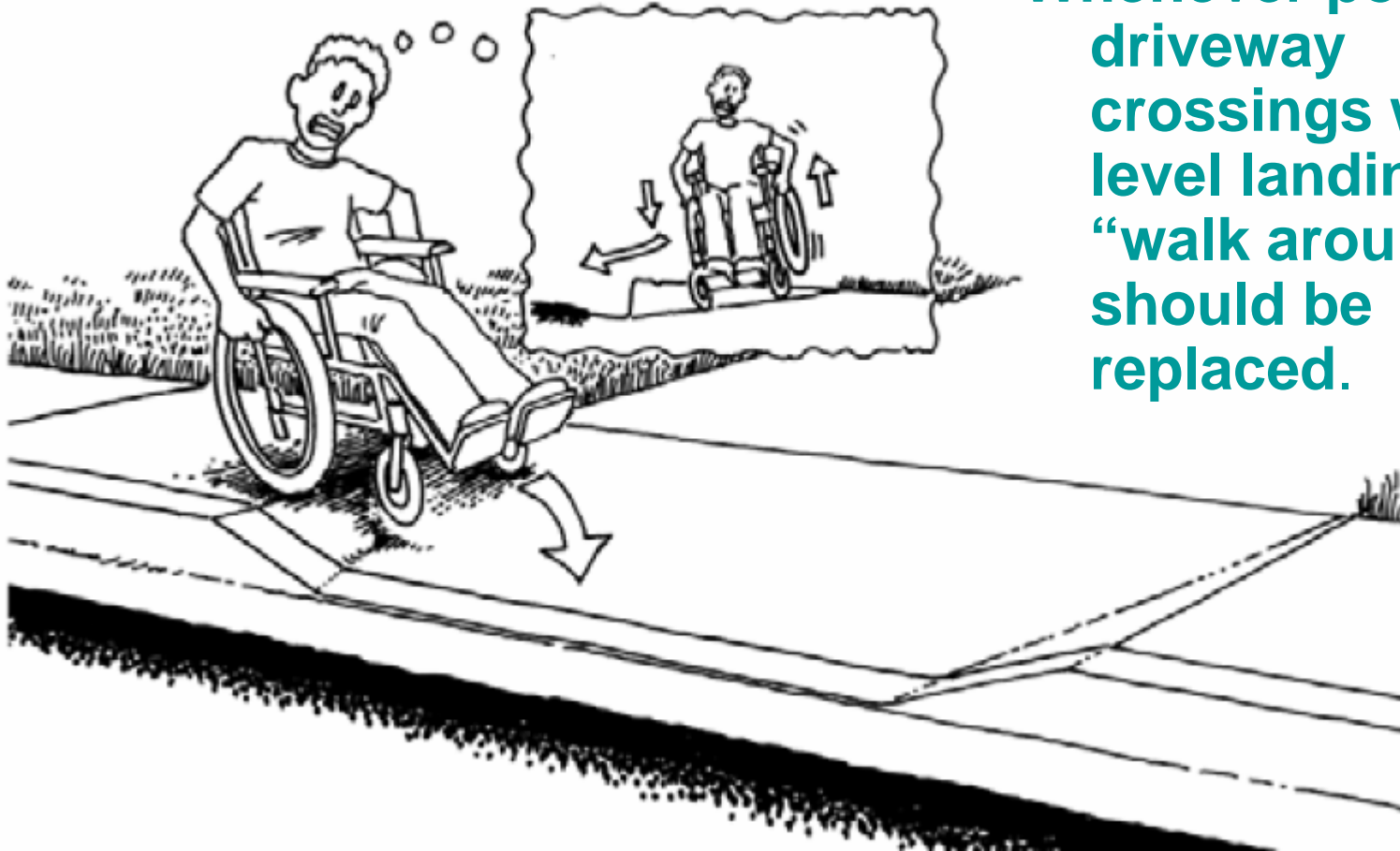


From Page 93

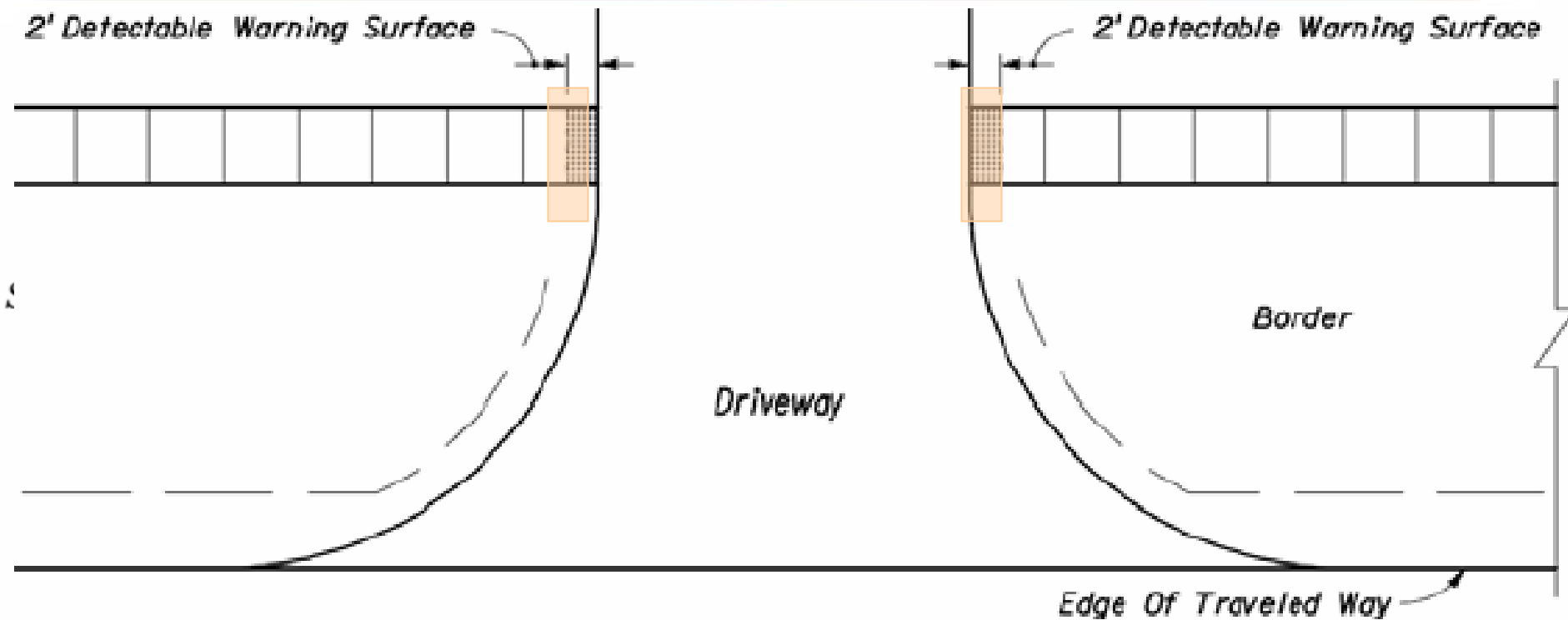
**DRIVEWAYS AND THE PEDESTRIAN
ENVIRONMENT**

The Wheelchair User

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



Detectable Warning Surfaces



Access Management Documents



Handbooks

Presentations

Forms, Procedures

Brochures

Reports

Videos

Internet Links

Load Search Index for v 7.0

This is a collection of materials from many sources. If a document is not specifically an FDOT statute, rule, policy, procedure, manual, or handbook, it is not necessarily the opinion of the FDOT.

Most Used Documents



Driveway Handbook



Median Handbook

Answers to your Questions



Corridor AM Guide

Intro to Access Management

14-96 Forms



Economic Impacts



Land Development Regulations



Top 10 Issues



Corridor Intro

Site Traffic Studies: Top Pitfalls

