



STATEWIDE MULTIMODAL ACCESS MANAGEMENT AND TRANSPORTATION SITE IMPACT

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WEBINAR SERIES 2023-2024





FLORIDA DEPARTMENT OF TRANSPORTATION

GINA BONYANI

SENIOR TRANSPORTATION PLANNER

SYSTEMS IMPLEMENTATION OFFICE

Gina.Bonyani@dot.state.fl.us

850-414-4707



Agenda



CREDITS AND WEBINAR
MATERIAL

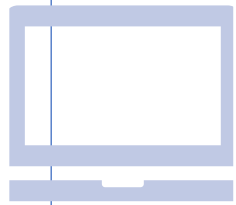


MULTIMODAL
TRANSPORTATION SITE IMPACT

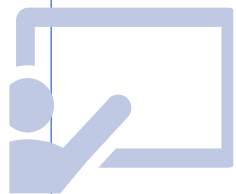


CONTACT INFO

Credits Information



Certificates will be distributed through email.



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- You will need to attend to the entire webinar with the unique link provided by GoToWebinar.

STATEWIDE MULTIMODAL ACCESS MANAGEMENT AND
TRANSPORTATION SITE IMPACT WEBINAR SERIES 2023-24

FLORIDA DEPARTMENT OF TRANSPORTATION

This certifies that

Name Last Name

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Webinar # 1

Course Number: XXXX
FBPE Provider number: XXXXXXX
Presented on: XX/XX/XX

And has qualified for 1.5 CE credits

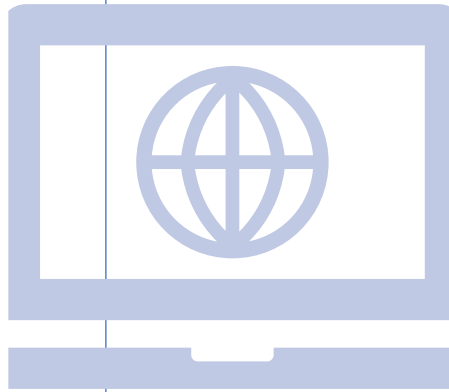
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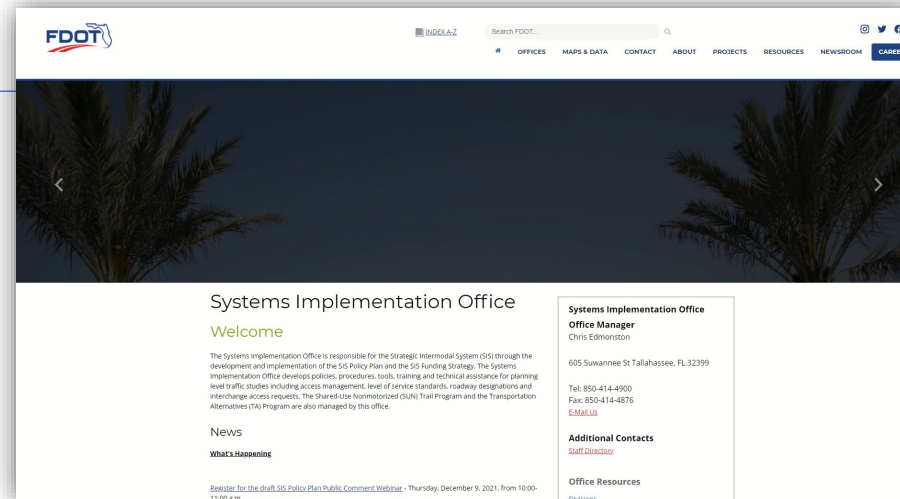


Webinar Material



Recorded webinars and presentation material will be posted on the Systems Implementation Office website:

<https://www.fdot.gov/planning/systems/systems-management/trainings-webinars>



What organization do you represent?



FDOT



Local
Government



Private Firm



Other

Statewide Multimodal Access Management And Transportation Site Impact

WEBINAR SERIES 2023-2024



Webinar #1
Multimodal Site Impact Analysis

Tuesday, August 15, 2023

Webinar #2
Multimodal Quality Level of Service

Tuesday, November 14, 2023

Webinar #3
Multimodal Access Management

Tuesday, February 20, 2024

Webinar #4
Trip Generation Research on High-Volume Fast-Food Restaurants and Coffee Shops

Tuesday, May 21, 2024

Statewide Multimodal Access Management And Transportation Site Impact

WEBINAR SERIES 2023-2024



Today's Webinar

Multimodal Site Impact Analysis

Tuesday, August 15, 2023

2:00PM – 3:30PM

Credits: 1.5

How familiar are you with Multimodal Transportation Site Impact Analysis?

VERY FAMILIAR

SOMEWHAT FAMILIAR

NOT FAMILIAR

New Handbook

Retiled and
Reorganized

Mitigation
Chapter

FDOT
Documents

Ped and Bike
Analysis

Safety
Guidelines



Multimodal Transportation Site Impact Handbook

June 2023



Goals and Objectives

MTIA Goals

- Promote safe and efficient movement of people and goods
- Maintain and enhance quality of life
- Determine the needed infrastructure to support developments and the surrounding community
- Support developments to attract and best serve their customers
- Build community partnerships and deliver community-centric projects

MTIA Objectives

- Assess transportation impacts of a proposed development
- Identify mitigation measures needed to:
 - Serve the proposed development
 - Maintain the integrity of and minimize operational and safety impacts of the proposed development on the state-maintained facilities (all modes)

Types of Multimodal Transportation Impact Analyses

Most MTIAs reviewed by FDOT are associated with one of the following activities:

Local government
comprehensive plan
amendments

Driveway connection
permits to the
State Highway System

Courtesy reviews
at the request of local
governments

MTIA (Multimodal Transportation Impact Analysis)

MTIA Process



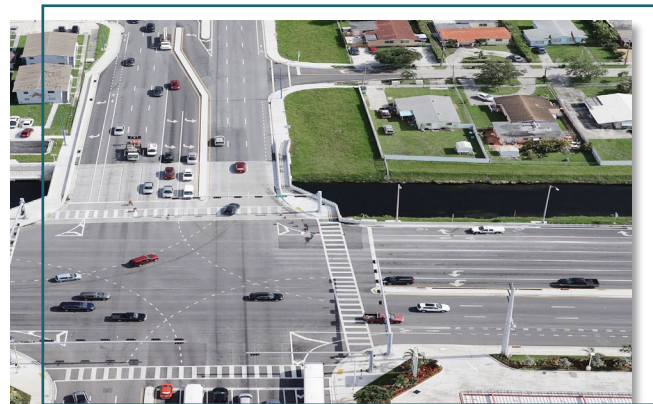
Size



Location



Type of Development



Type of Impact



Jurisdiction Requirements

Basic Framework of MTIA

METHODOLOGY DEVELOPMENT

1. Study Area
2. Study Components
3. Analysis Horizon Years and Periods
4. Performance Measures of Effectiveness

BACKGROUND DATA COLLECTION AND REVIEW

1. Proposed Site Development Characteristics
2. Transportation System Data
3. Data Considerations for Future Transit Service
4. Traffic Counts and Other Transportation Data

TRIP GENERATION

1. Trip Generation by Mode

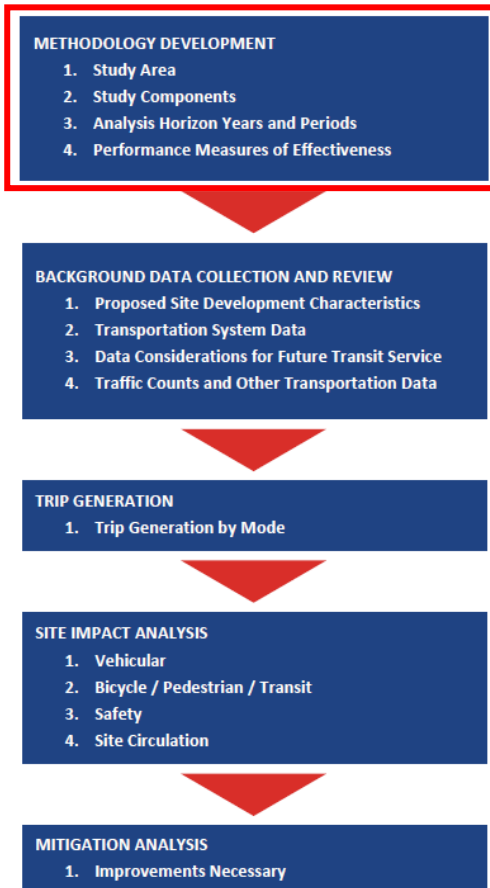
SITE IMPACT ANALYSIS

1. Vehicular
2. Bicycle / Pedestrian / Transit
3. Safety
4. Site Circulation

MITIGATION ANALYSIS

1. Improvements Necessary

Basic Framework of MTIA

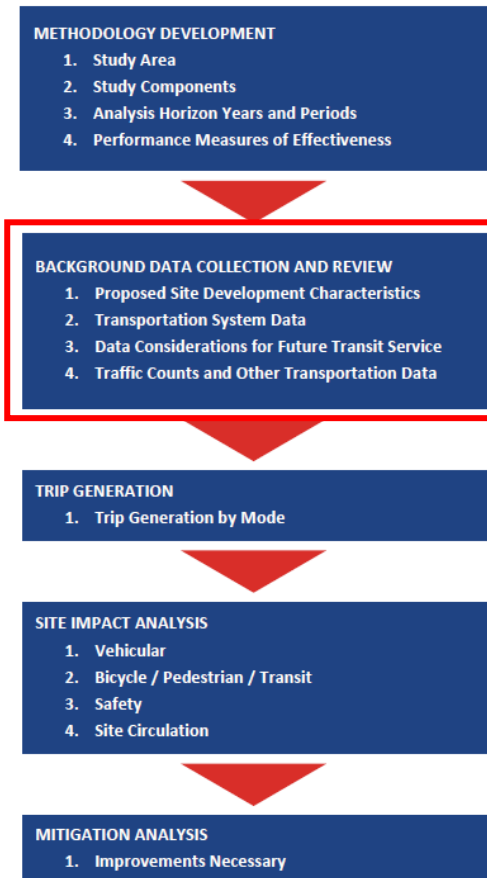


METHODOLOGY DEVELOPMENT

1. Study Area
2. Study Components
3. Analysis Horizon Years and Periods
4. Performance Measures of Effectiveness

- Should define the data, methodology, tools, practices, and assumptions that will be used while preparing a MTIA.
- The methodology should include time horizons and the study area.
- The parties should reach agreement regarding the data to be considered, analysis tools to be used, and the basic factors to be used in the study.

Basic Framework of MTIA

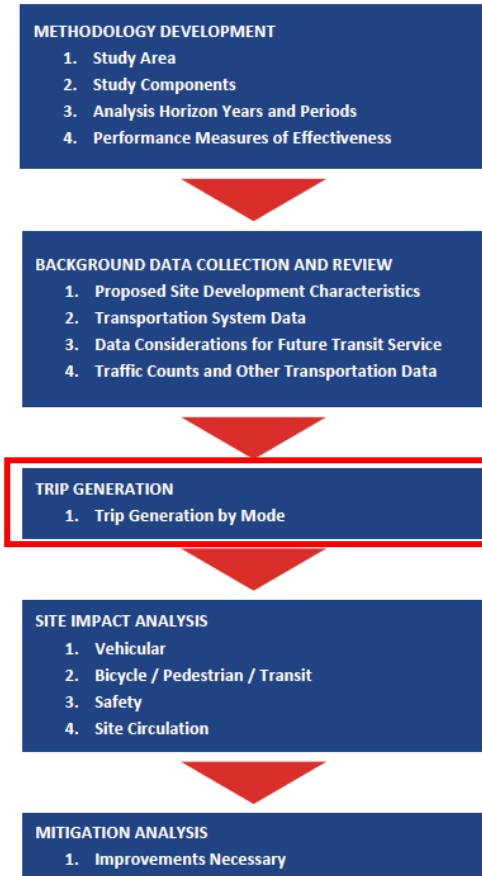


BACKGROUND DATA COLLECTION AND REVIEW

1. Proposed Site Development Characteristics
2. Transportation System Data
3. Data Considerations for Future Transit Service
4. Traffic Counts and Other Transportation Data

- Suggested background data for collection and review include land use and demographics, transportation system availability, and transportation system use.
- Proposed site development characteristics should be defined to identify the location, type, size, phasing, etc.
- Existing transportation demand data
 - Current and historical traffic volumes, turning movement counts, traffic characteristics such as peak and directional factors, transit ridership data, and bicycle/pedestrian activity.

Basic Framework of MTIA

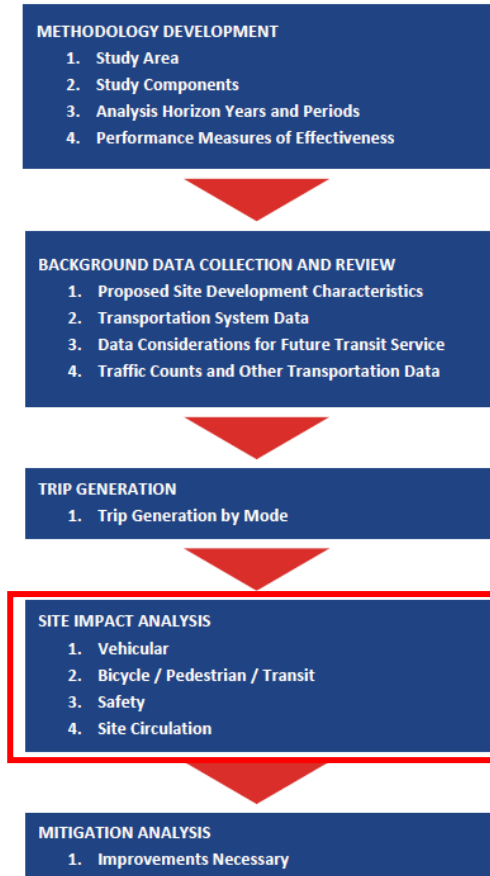


TRIP GENERATION

1. Trip Generation by Mode

- Trip generation is estimated in person trips which can be divided into personal passenger vehicle, bicycle, transit, truck, and walk trips.
- A person trip is a trip made by any mode of travel by an individual person from an origin to a destination.

Basic Framework of MTIA

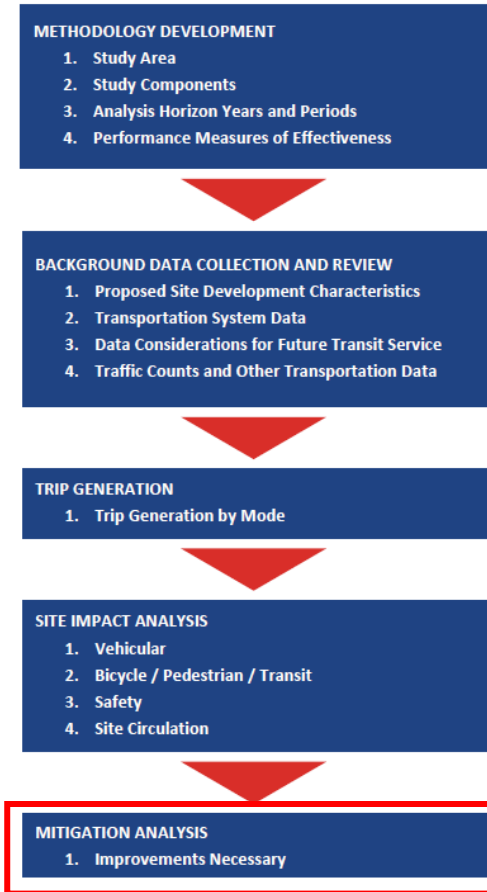


SITE IMPACT ANALYSIS

1. Vehicular
2. Bicycle / Pedestrian / Transit
3. Safety
4. Site Circulation

- MTIAs can assess a site's impact on the transportation system by analyzing bicycle/pedestrian, vehicular, safety, and site circulation impacts.
- MOEs such as a Q/LOS are calculated for both motorized and non-motorized traffic.
- The scope of this analysis can vary and should be based on considerations such as the type of development and context classification.
- Study components: planning documents, internal site design, bicycle/ped connections, trip generation, network connectivity analysis, and Q/LOS analysis.

Basic Framework of MTIA



MITIGATION ANALYSIS

1. Improvements Necessary

- Reduce impacts related to transportation systems that will operate below the desirable MOE target, or when a safety or operational issue is identified.
- Mitigation should be relative to the size of the transportation impact expected.

Review of Comprehensive Plan Amendments

Review local government comprehensive plans and plan amendments

Provide technical assistance to local governments

Support the implementation of the FDOT Complete Streets policy

Support collaborative planning approaches

Provide expertise to the state on transportation policy, planning, and implementation.

Driveway Permits

All new driveways associated with a new or expanded development must be permitted in accordance with Florida Administrative Code (F.A.C.): Rule 14-96 (State Highway System Connection Permits).



Driveway Permit Review Process

- Per FDOT *Rule 14-96.003(1) F.A.C.*, “connection permits authorize the initiation of construction of connections within Department right-of-way and the maintenance of connection(s) according to the permit provisions and adopted department standards...”
- “No person may construct, relocate, or alter a connection temporarily or permanently without first obtaining a connection permit from the Department, as provided in this rule chapter, regardless of governmental entity permits and approvals.” FDOT *Rule 14-96.003(1) F.A.C.*



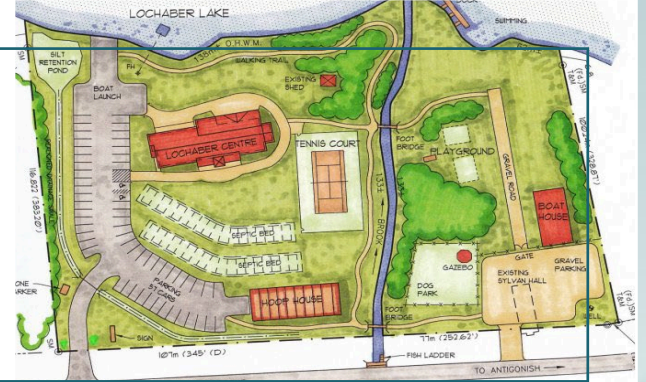
Application Requirements



Connection Permit Application



Application Fee



Site Plan



Drawings

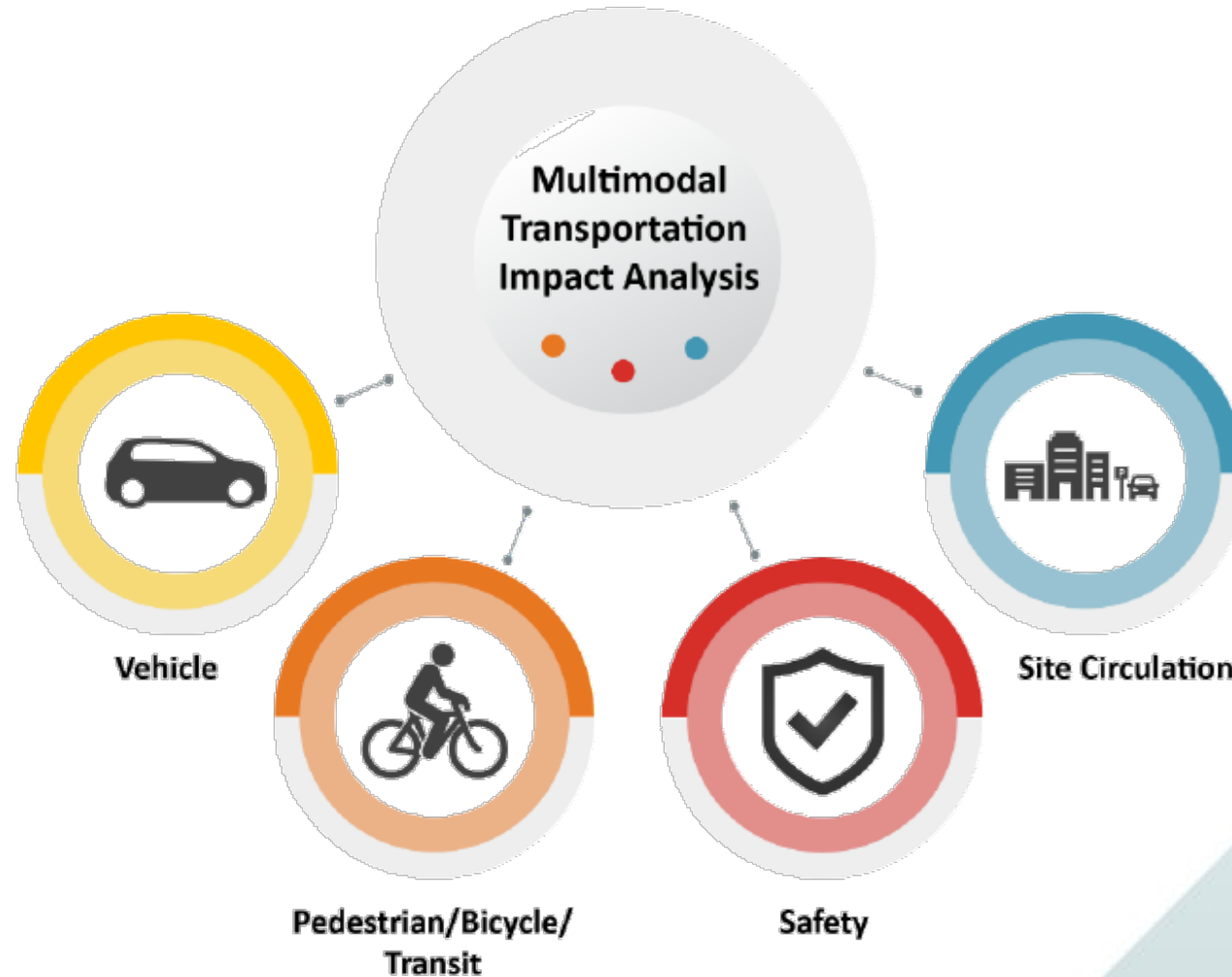


Traffic Data



Other Specified in Rule 14-96

Multimodal Transportation Impact Analysis



Study is Required

A complete traffic study is required for all access connection permit applications for Driveway Categories C, D, E, F, and G, or any application requesting or requiring a new traffic signal, new median opening, auxiliary lane, or modified median opening.



Pre-Application Meeting

Discussion of the project and program details

Proposed site plan

Suggested methodology for the MTI

Potential impacts to the SHS

Potential design of the connection(s) to the property

Any previous studies and/or agreements

Multimodal Transportation Impact Analysis



STATE HIGHWAY SYSTEM CONNECTION PERMIT PRE-APPLICATION MEETING CHECKLIST AND SCOPING FORM

Pre-application Meeting Date: _____

PERMIT APPLICATION	
<ul style="list-style-type: none"> A driveway permit is required for a change in the use of the property causing an increase in the trip generation of the property exceeding 25% more trip generation (either peak hour or daily) and exceeding 100 vehicles trips per day more than the existing use - Significant Change Florida Statutes 335.182(9)(b); The permit submittal must include a complete set of signed and sealed design plans and traffic control plans, a signed and sealed traffic study, and the required project related information in accordance with Florida Administrative Code 14-96. All property under ownership to be included in the complete submittal. Entire property to be included in both plans and traffic study. All relevant permit submittals should be made simultaneously via the One Stop Permitting (OSP) website. Proposed or modifications to access points not within state right of way must be coordinated and approved by the appropriate maintaining entity. Proof of the maintaining entity's approval must be provided. Any proposed development adjacent to the state road, irrespective of access connection, is required to submit for a drainage permit. 	
PRE-APPLICATION MEETING	
<ul style="list-style-type: none"> All permit Categories C through G (>600 vehicle trips per day) must request a pre-application meeting with FDOT Staff and provide the permit application details and proposed site plan for the meeting. The purpose of the pre-application meeting with the department is to review the site plan, proposed access connection(s), establish the connection category, and establish the required documentation and traffic study requirements. Upon request, the department will meet with the applicant, on-site and/or in-office, to discuss the project, projected impacts to the state highway system, and the suggested methodology for the analysis of traffic impacts. Proposed site plan or aerial exhibit illustrating the proposed access connection(s), buildings, roadway features, is recommended to facilitate discussion in the pre-application meeting. The pre-application meeting is advisory only and the results of this meeting are not binding on the department or the applicant. An application must be submitted, and a connection permit must be issued before the applicant can initiate construction. 	
PROJECT SITE AERIAL EXHIBIT (FOR THE PRE-APPLICATION MEETING)	
<input type="checkbox"/> Proposed site aerial exhibit should include: <ul style="list-style-type: none"> All connections and median features Locations of the nearest driveways Adjacent parcels, label ownership, and all known easements Location of all property boundaries Locations of the nearest traffic signals Locations of the nearest median openings Location of all existing multimodal facilities, such as on-street bicycle lanes, sidewalks, shared-use paths, etc., that are located along state roadways or the parcel for which the state highway connection permit is being sought Right-of-way and property lines 	
PROPOSED SITE PLAN	
<input type="checkbox"/> Per FDOT rule 14-96, proposed site plan should be provided in the pre-application meeting for review, including the following features: <ul style="list-style-type: none"> All proposed buildings and outparcels All proposed driveways/connections Cross access or joint access driveways All parcels to be served with requested access connection(s) All parking and internal site circulation plan Connection/driveway design and geometrics (lane widths, radii, length, throat depth, etc.) Safe and convenient access for non-motorized users – separate non-motorized connections, bicycle parking within the site, etc. The bicycle/pedestrian access should connect the external bicycle and pedestrian network/s to the main entrance of the site's building/s Internal site design bicycle/pedestrian accommodations Bicycle/pedestrian connections to adjacent properties and transit stops, where applicable Pedestrian and bicycle access should be safe and convenient with minimal conflicts with vehicular modes Minimized travel distance for pedestrian and bicyclists with the most direct route 	
TRAFFIC STUDY	
<input type="checkbox"/> Traffic Impact Study is required for Categories C through G (>600 vehicle trips per day including pass-by trips) or any application requesting or requiring a new traffic signal, new median opening, auxiliary lane, or modified median opening.	
<input type="checkbox"/> Project Description <ul style="list-style-type: none"> Proposed project site Size - building square footages, units, etc. Information about project site outparcels Project site type of uses Construction schedule – opening and build-out years Traffic study area determination – area of significant traffic impact 	Details:
<input type="checkbox"/> Existing Conditions/Data Collection <ul style="list-style-type: none"> Posted and planned speed limits, target/design speeds for major roadways Context classification Nearest driveways Nearest median openings Adjacent signalized intersections and signal timings Access classification Study area intersection turn-lane lengths and queueing conditions during peak hours Multimodal facilities such as sidewalks, bicycle lanes, shared use paths, transit stops, etc. AM/PM turning movement counts (TMCs) - include trucks, pedestrians, and bicycles Other planned off-site developments in the area Planned and programmed improvements on state and local roads in the study area Any discussions/agreements with local entity 	Details:
<input type="checkbox"/> Access Management Spacing Considerations <ul style="list-style-type: none"> Spacing requirements for the roadway/s access classification Driveway spacing requirements 	Details:

<ul style="list-style-type: none"> Median spacing requirements Signal spacing requirements Multimodal access spacing considerations 	Details:
<input type="checkbox"/> Project Vehicle Trip Generation: <ul style="list-style-type: none"> Trip Generation estimates for the entire project site including outparcels (assume highest and best use for the unknown outparcels) Utilize the most recent version of the ITE Trip Generation Manual (currently 11th Edition) Documentation of any alternative data used to estimate trip generation and the source of data Daily/AM/PM peak hours Provide source, trip rates, and table of calculations by land-use Use ITE approved pass-by and internal capture rates or other alternative documented and agreeable rates 	Details:
<input type="checkbox"/> Project Vehicle Trip Distribution: <ul style="list-style-type: none"> Model data and/or existing traffic pattern to be used for analysis 	Details:
<input type="checkbox"/> Background Motorized Traffic Estimation: <ul style="list-style-type: none"> Model data and/or historical data to estimate the build-out year traffic growth rates Include traffic from planned off-site developments 	Details:
<input type="checkbox"/> Motorized Traffic Analysis <ul style="list-style-type: none"> Identify the impacted roadway segments and intersections for the traffic analysis AM and PM peak hour analyses - unless special circumstances require mid-day/weekends Traffic analysis methodology – HCS, Synchro, Sidra, Vissim, etc. Connections/driveways, turn lane requirements/warrants – NCHRP, etc. U-turn traffic considerations Signal evaluation - reasonable signal timings Signal warrant analysis if new signal/s proposed 	Details:
<input type="checkbox"/> ICE Analysis for new signals (except midblock pedestrian signals), major reconstruction of signalized intersections, changing a directional or bi-directional median opening to a full median opening, or driveway connection permit application for Category E, F, or G <ul style="list-style-type: none"> Intersection queue length analysis – potential blocking of adjacent intersections Intersection turn-lane analysis On-site queuing analysis for sites with drive-throughs Mitigation measures result in acceptable traffic operations 	Details:
<input type="checkbox"/> Multimodal (Non-motorized) Traffic Study Considerations <ul style="list-style-type: none"> Identify any impacts to existing pedestrian, bicycle, and transit facilities Incorporate geometric features to minimize the impacts of driveway connection/s to existing or proposed non-motorized facilities Provide appropriate recommendations for safe and efficient movement of pedestrians, bicyclists, and transit Multimodal (Non-motorized) Traffic Study Requirements <ul style="list-style-type: none"> Review of pedestrian/bicycle access to site. Review of compatibility with local agency and project area planning documents Internal site design bicycle/pedestrian accommodations Bicycle/pedestrian connections to offsite parking, adjacent properties, transit stops, or other attractors. Estimation of daily and/or peak hour trip generation of pedestrians, bicyclists, and transit users, to identify the needs of the multimodal network – ITE methodology, person trips, non-motorized mode share, etc. (Optional *) Determination of the type and level of multimodal evaluation based on the project area context classification and the peak hour volume of non-motorized trips (Optional *) Multimodal study area determination if network connectivity analysis and multimodal LOS analysis are performed (Optional *) Network connectivity analysis – potential non-motorized trip origin/destinations within the study area, completeness and quality of routes, route directness ratio, etc. (Optional *) 	Details:
<input type="checkbox"/> Multimodal LOS analysis – Pedestrian LOS (PLOS), Bicycle Level of Traffic Stress (BLTS), PLOS and BLTS targets, etc. (Optional *) <ul style="list-style-type: none"> Multimodal LOS analysis – Pedestrian LOS (PLOS), Bicycle Level of Traffic Stress (BLTS), PLOS and BLTS targets, etc. (Optional *) Non-motorized (pedestrians and bicycles) trip distribution method (Optional *) 	Details:
<input type="checkbox"/> Safety Analysis <ul style="list-style-type: none"> Crash history for the past three years (minimum) at/near proposed site. Determination of the level of safety evaluation within the study area – Intersection/segment crash data analysis, HSM application, etc. 	Details:
<input type="checkbox"/> Curbside Management <ul style="list-style-type: none"> Propose a curbside management plan consistent with current FDOT policies and practices – established zones for pick-up/drop-off, commercial loadings, parking, etc. 	Details:

* Context-based steps are required for multimodal (non-motorized) assessment. If the applicant opts for additional analysis, for example to document and justify additional or alternative mitigation measures, the steps noted as Optional should be completed as appropriate.



Study Methodology

1

An appropriately sized study area and time horizon based upon the type and size of the development

2

Critical peak hour vehicular turning movements from each proposed connection and abutting public road in graphic form

3

Bicycle and pedestrian trip generation for the critical peak hour

4

Vehicular and non-vehicular traffic operations analysis of the impacts of the development on the surrounding transportation system and consistent with the FDOT *Multimodal Transportation Site Impact Handbook*

Category C applications are exempt from some of the requirements listed above if the applicant can show that the information would have no significant bearing on the permitting decision process.

Study Area

Site Access Driveways
and adjacent roadways

Indirect Site Access
Point

Signalized intersection

Interchange ramp
terminals

Other:

- Indirect Impact Area
- Limited Access Facilities and Ramp Junctions
- Other Intersections

Study Area

Other Terms

- Traffic Impact Area
- Impact area

Based on MTIA purpose, development type, size, area context, and safety or operational concerns

The pedestrian and bicycle analysis study area should extend to the same limits as established for vehicular trips, or at a minimum have the same requirements as discussed for CPAs.

Analysis Horizons Years and Periods

- Can vary based on the type of analysis and other considerations.
- Transportation impact analyses are usually based on a peak-hour analysis.
- Selecting a proper time period to analyze is crucial for planning and designing transportation facilities.
- The analysis period selected should be the period that has the highest combination of development and background traffic.
- The selected analysis period should be clearly stated in the methodology.

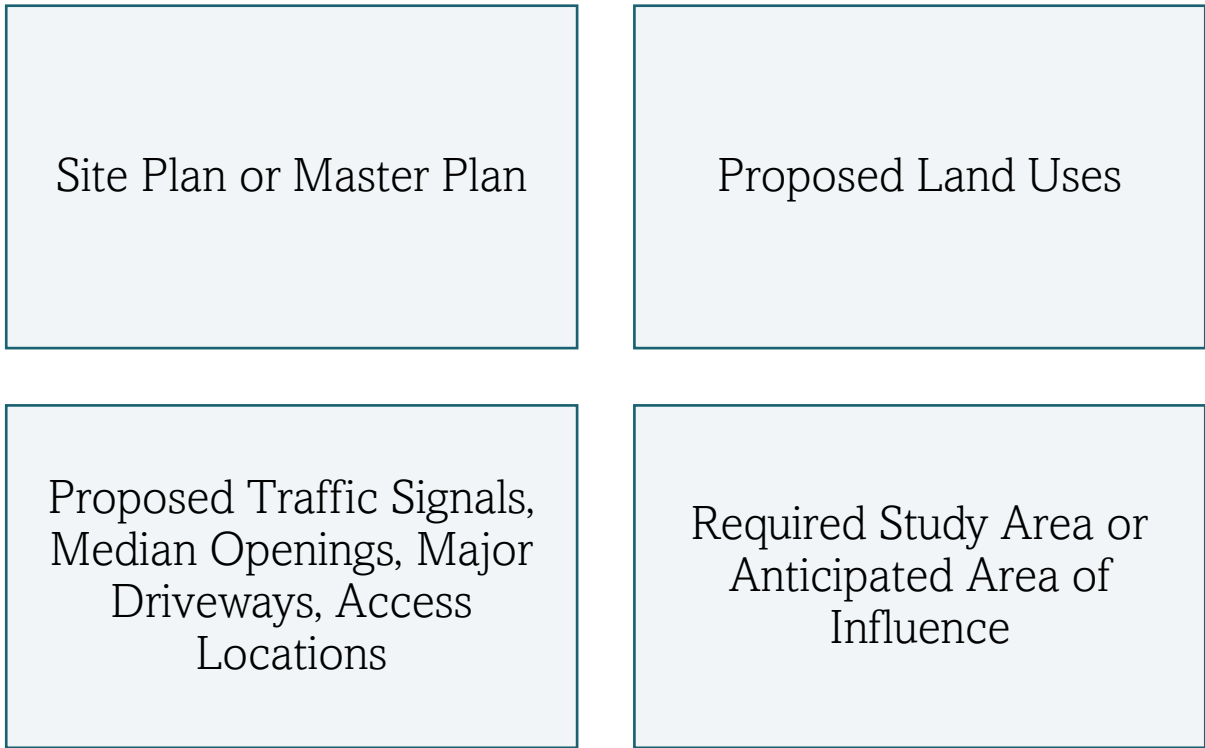
Performance Measures of Effectiveness and Targets (MOEs)

- The automobile mode level of service targets for the State Highway System during peak travel hours are “D” in urbanized areas and “C” outside urbanized areas.
- The targets shall be responsive to all users, for context, roadway function, network design, and user safety.
- The appropriate MOE for the pedestrian and bicycle analysis should be based on the size, scale, and context of the development.
- The Pedestrian/Bicycle/Transit Impact Analysis section of this chapter provides the suggested scope and MOEs for pedestrian and bicycle analysis.

Level of Service Targets for the SHS Policy 000-525-006

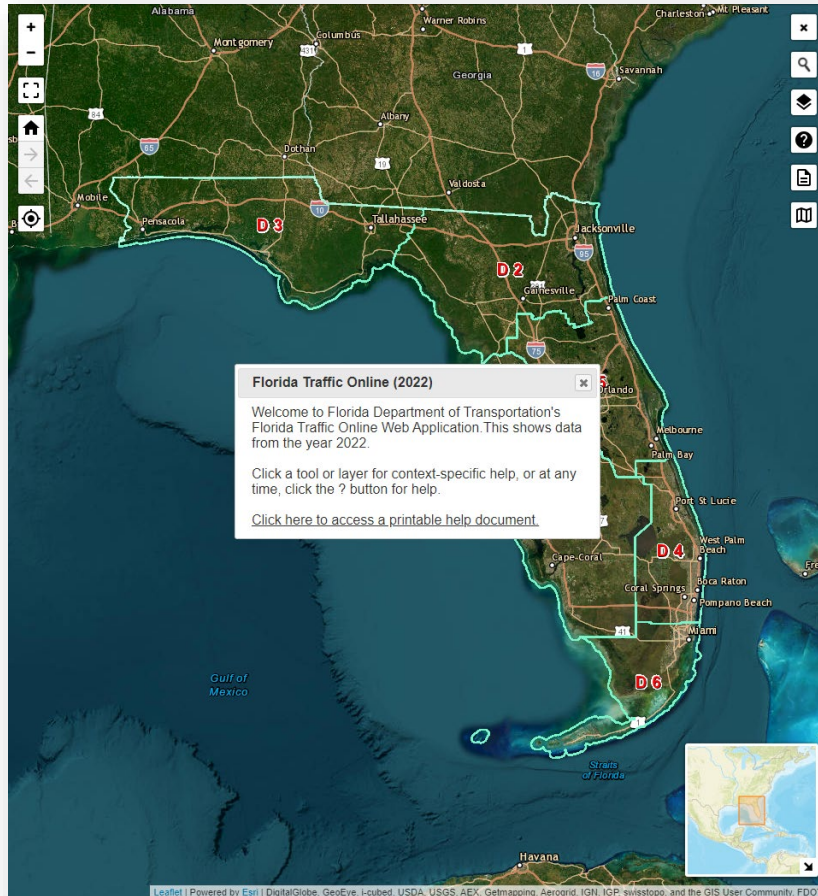
Background Data Collection and Review

Proposed Site Development Characteristics

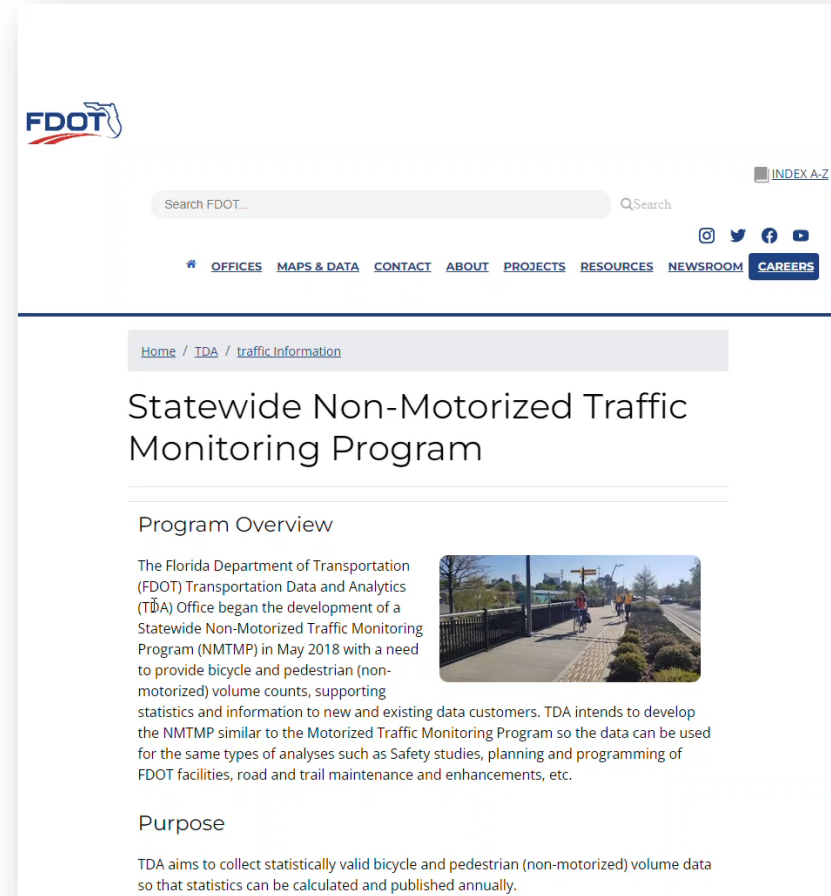


Category	Data Types
Land Use and Demographics	Current land use types, densities, and levels of occupancy/vacancy
	Approved development projects with planned land use types, densities, and completion dates
	Anticipated development as yet unapproved
	Comprehensive land use plan
	Zoning
	Current/future population and employment by census tract or transportation analysis zone (as needed for site trip distribution)
	Other relevant characteristics (preponderance of persons of certain ages or limited abilities)
Transportation System Availability	Current street system characteristics, including direction of flow, number and types of lanes, right-of-way width, type of access control and traffic control
	Roadway functional classification, access management classification, and context classification
	Roadway governmental jurisdiction
	Traffic signal locations, coordination, and timing
	Adopted transportation system plans
	Planned, programmed, and committed transportation system improvements
	Parking availability, cost, and usage
	Traffic flow
	Curb space management, including zones for parking, loading, bus stops, and mobility-as-a-service (MaaS) providers
	Transit system coverage, frequency, and span of service
	Pedestrian linkages by type
	Bicycle linkages by type
	Obstacles to the implementation of planned projects
Implementation timing, funding source/certainty for programmed and planned projects and services	
Transportation System Use	Origin-destination or trip distribution data
	Current (and if needed for trends analysis) historical daily and hourly vehicular counts
	Recent intersection turning movement counts
	Seasonal variations
	Projected future volumes from previous studies or plans
	Relationship of counts to average and design days
	Transit system ridership
	Pedestrian volumes
	Bicyclist volumes
	Other notable modes (e.g., scooters)
	Other notable characteristics (e.g., MaaS presence, goods movement considerations)
Crash history (minimum of 3 years if available), particularly if hazardous conditions have been identified	

Background Data Collection and Review

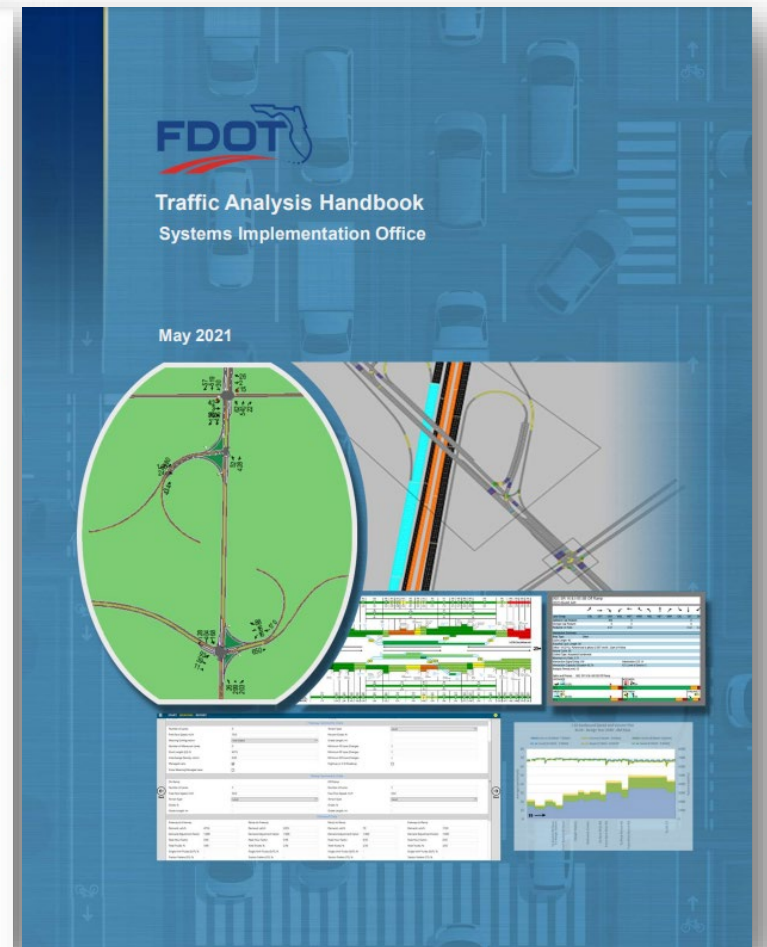


<https://tdaappsprod.dot.state.fl.us/fto/>

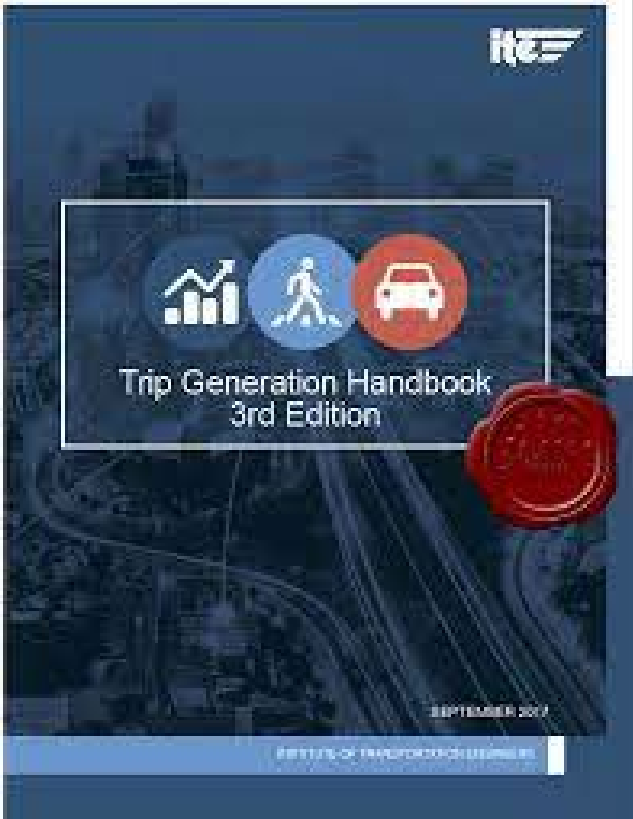
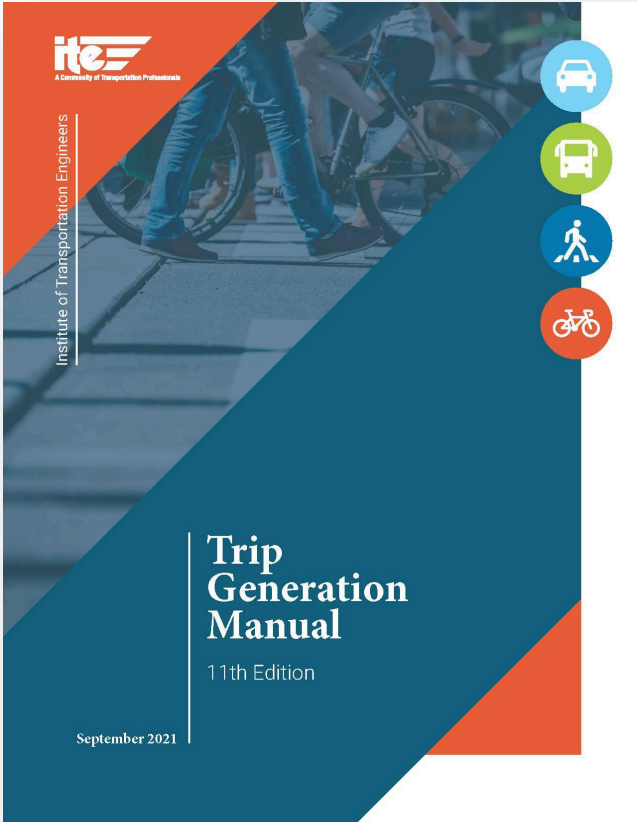


<https://www.fdot.gov/statistics/trafficinfo/florida-non-motorized-traffic-monitoring#top>

Background Data Collection and Review

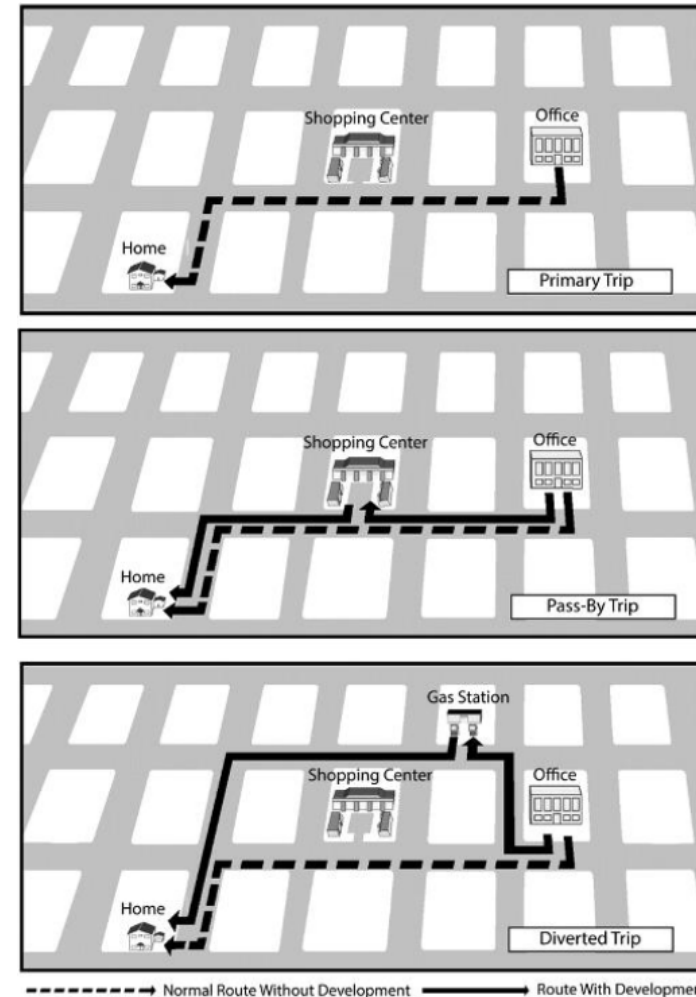


Trip Generation



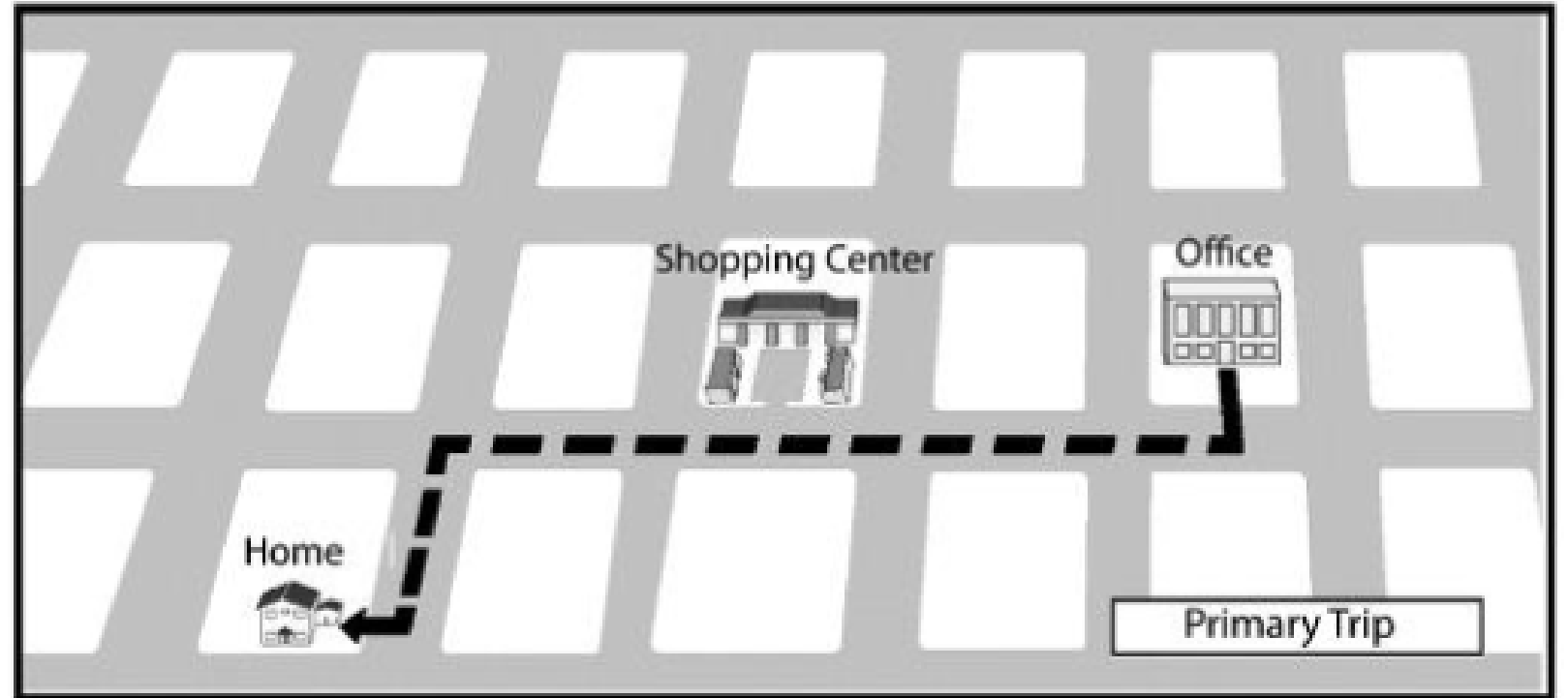
Primary, Pass-by, and Diverted Trips

The ITE Trip Generation Manual defines three basic types of trips generated by a development: primary, pass-by, and diverted.



Primary, Pass-by, and Diverted Trips

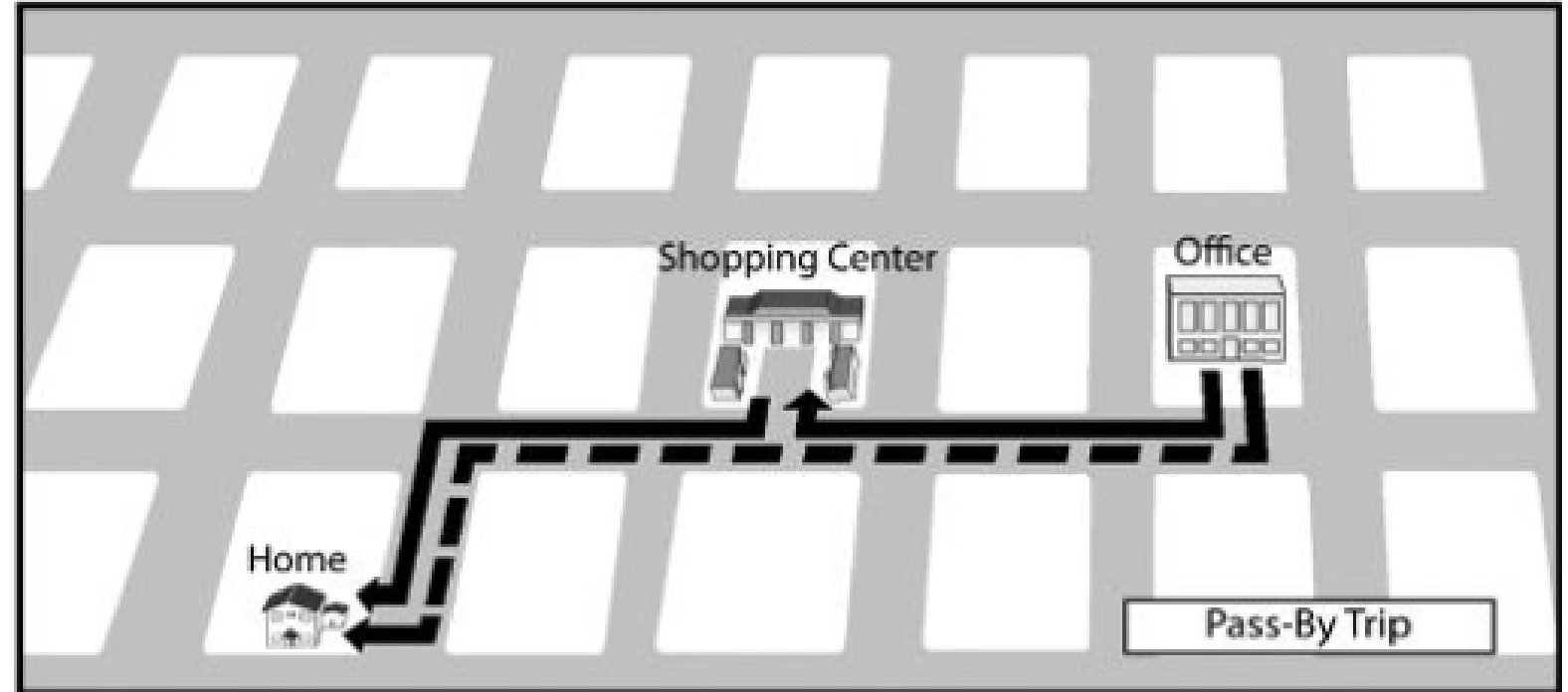
Primary trips are trips made for the specific purpose of visiting the generator (development).



-----> Normal Route Without Development —————> Route With Development

Primary, Pass-by, and Diverted Trips

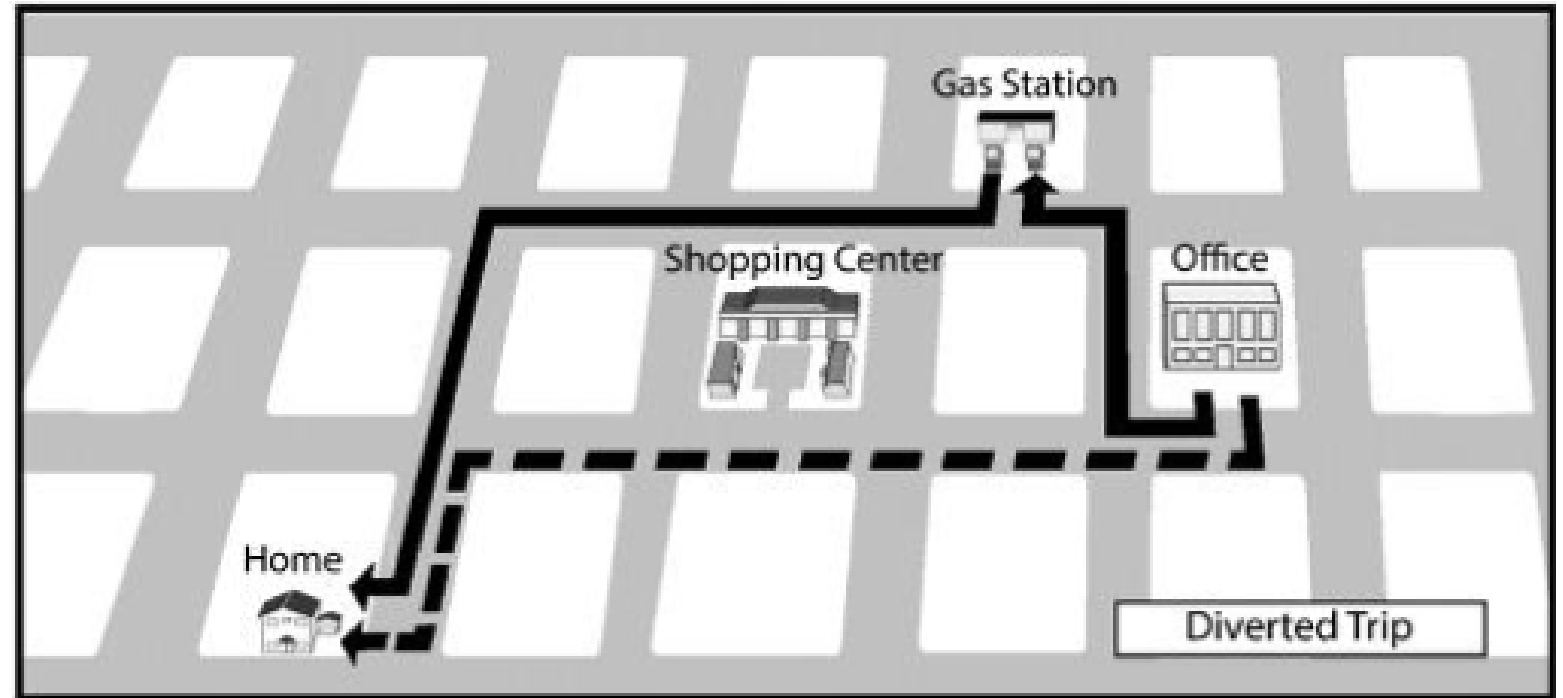
Pass-by trips are trips that are currently on the roadway system and pass directly by a generator on the way to the primary destination.



-----> Normal Route Without Development —————> Route With Development

Primary, Pass-by, and Diverted Trips

Diverted trips, like pass-by trips, are not new to the system. However, diverted trips are now using a segment of the roadway system that they previously were not.



-----> Normal Route Without Development —————> Route With Development

Internal Capture Trip Generation

NCHRP

REPORT 684

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Enhancing Internal Trip Capture Estimation for Mixed-Use Developments

TRANSPORTATION RESEARCH BOARD OF THE NATIONAL ACADEMIES

NCHRP 8-51 Internal Trip Capture Estimation Tool						
Project Name:			Organization:			
Project Location:			Performed By:			
Scenario Description:			Date:			
Analysis Year:			Checked By:			
Analysis Period:			Date:			
AM Street Peak Hour						

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)		Total	Estimated Vehicle-Trips		
	ITE LUC ¹	Quantity		Units	Entering	Exiting
Office			0			
Retail			0			
Restaurant			0			
Cinema/Entertainment			0			
Residential			0			
Hotel			0			
All Other Land Uses ²			0			
Total			0	0	0	0

Table 2-A: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-A: Average Land Use Interchange Distances (feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix ³						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office	0	0	0	0	0	0
Retail	0	0	0	0	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0

Table 5-A: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	0	0	0
Internal Capture Percentage	0%	0%	0%
External Vehicle-Trips ⁴	0	0	0
External Transit-Trips ⁵	0	0	0
External Non-Motorized Trips	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use			
Land Use	Entering Trips	Exiting Trips	
Office	N/A	N/A	
Retail	N/A	N/A	
Restaurant	N/A	N/A	
Cinema/Entertainment	N/A	N/A	
Residential	N/A	N/A	
Hotel	N/A	N/A	

¹Land Use Codes (LUCs) from *Trip Generation Information Report*, published by the Institute of Transportation Engineers.
²Total estimate for all other land uses at mixed-use development site not subject to internal trip capture computations in this estimator.
³Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.
⁴Person-Trips.
⁵Indicates computation that has been rounded to the nearest whole number.
Estimation Tool Developed by the Texas Transportation Institute

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends						
Land Use	Table 7-A (D) Entering Trips			Table 7-A (E) Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips ²	Veh. Occ.	Vehicle-Trips	Person-Trips ²
Office	1.00	0	0	1.00	0	0
Retail	1.00	0	0	1.00	0	0
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	0	0	1.00	0	0
Hotel	1.00	0	0	1.00	0	0

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office	0	0	0	0	0	0
Retail	0	0	0	0	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0

Table 8-A (E): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office	0	0	0	0	0	0
Retail	0	0	0	0	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0

Table 9-A (D): Internal and External Trips Summary (Entering Trips)						
Destination Land Use	Person-Trip Estimates			External Trips by Mode ⁴		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ³
Office	0	0	0	0	0	0
Retail	0	0	0	0	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses ²	0	0	0	0	0	0

Table 9-A (E): Internal and External Trips Summary (Exiting Trips)						
Origin Land Use	Person-Trip Estimates			External Trips by Mode ⁴		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ³
Office	0	0	0	0	0	0
Retail	0	0	0	0	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses ²	0	0	0	0	0	0

¹Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.
²Person-Trips.
³Total estimate for all other land uses at mixed-use development site not subject to internal trip capture computations in this estimator.
⁴Indicates computation that has been rounded to the nearest whole number.

Trip Generation

ITE Limitations

The plots presented in the ITE *Trip Generation Manual* cover only the range of independent variables for which data are available. Caution should be used if the development that is being reviewed is greater than the ranges provided in the ITE Land Use codes.

Therefore, professional judgment is required.

Florida's unique demographic makeup and the influence of tourism on travel in Florida may require variances from these national averages for certain land use types.

Vehicular Impact Analysis

Existing Conditions

Future Background
Conditions

Vehicular Trip Distribution
and Assignment

Future Build Conditions
Analysis

ICE

Interchange Areas

Vehicular Impact Analysis

Existing Conditions

Future Background
Conditions

Vehicular Trip Distribution
and Assignment

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ICE

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Vehicular Impact Analysis

Existing Conditions

Future Background
Conditions

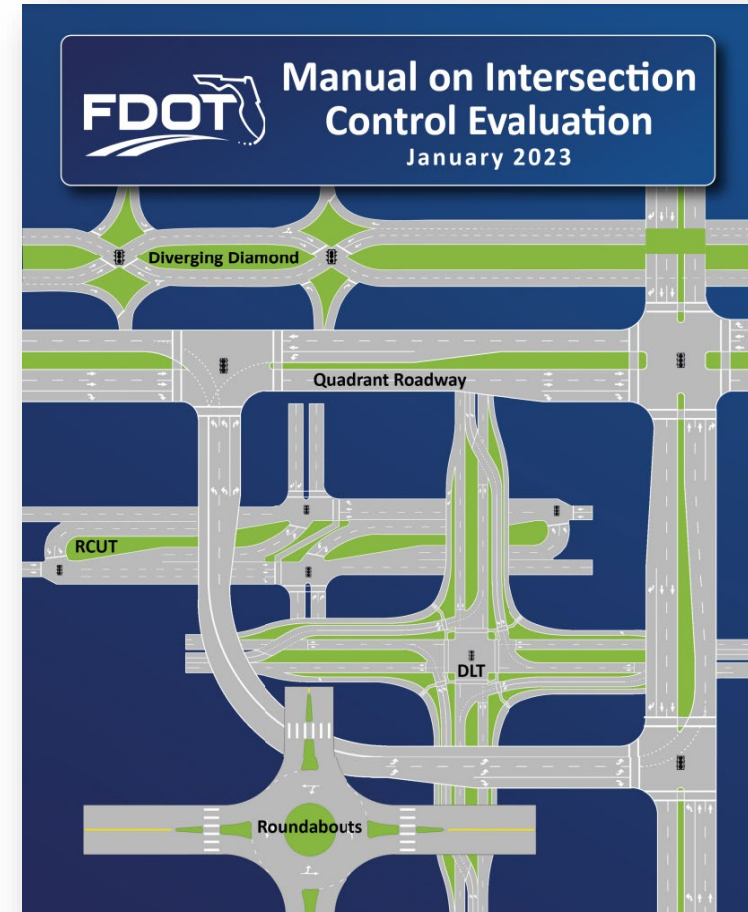
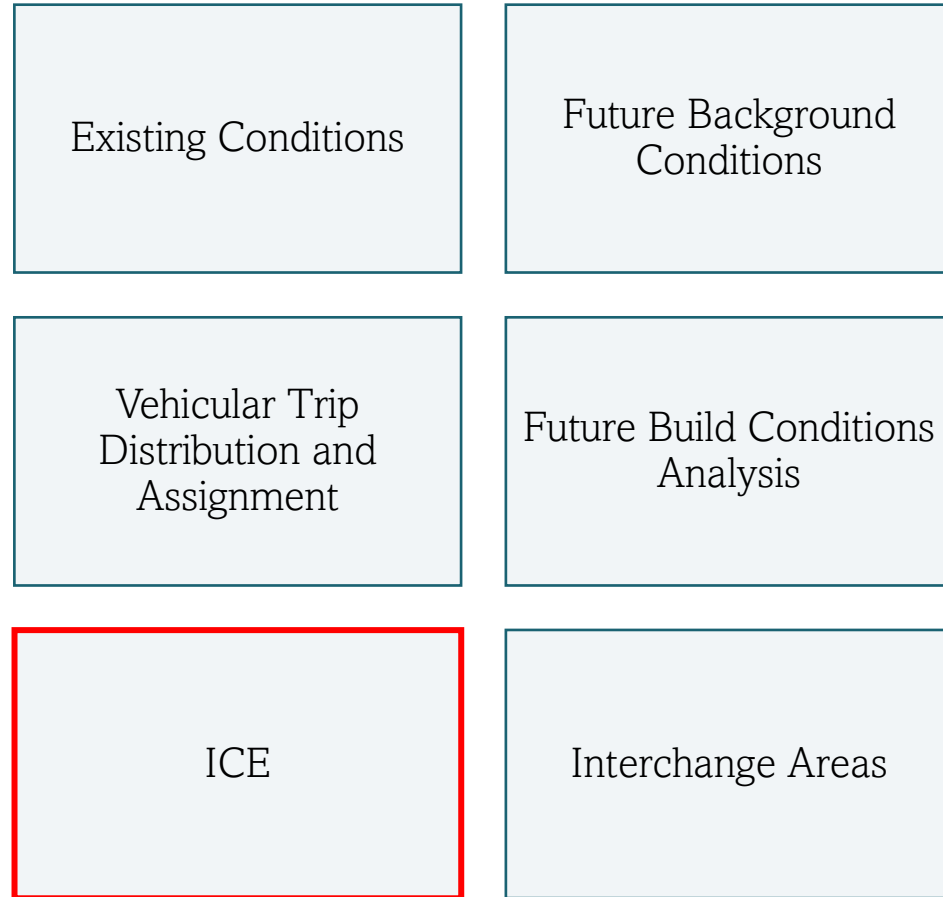
Vehicular Trip Distribution
and Assignment

Future Build Conditions
Analysis

ICE

Interchange Areas

Vehicular Impact Analysis



Vehicular Impact Analysis

Existing Conditions

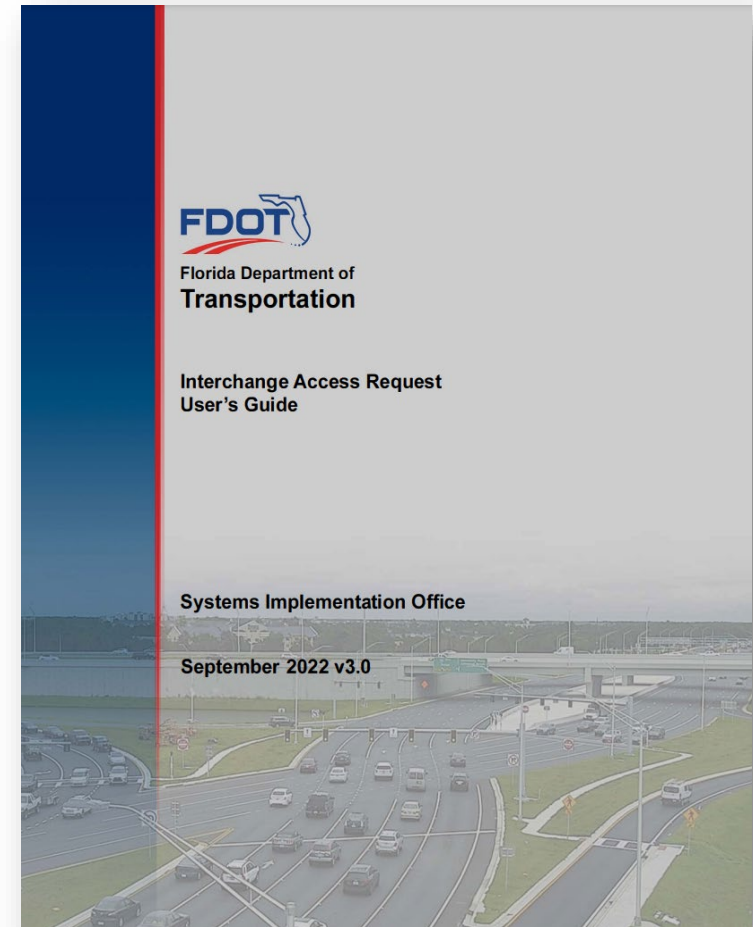
Future Background
Conditions

Vehicular Trip
Distribution and
Assignment

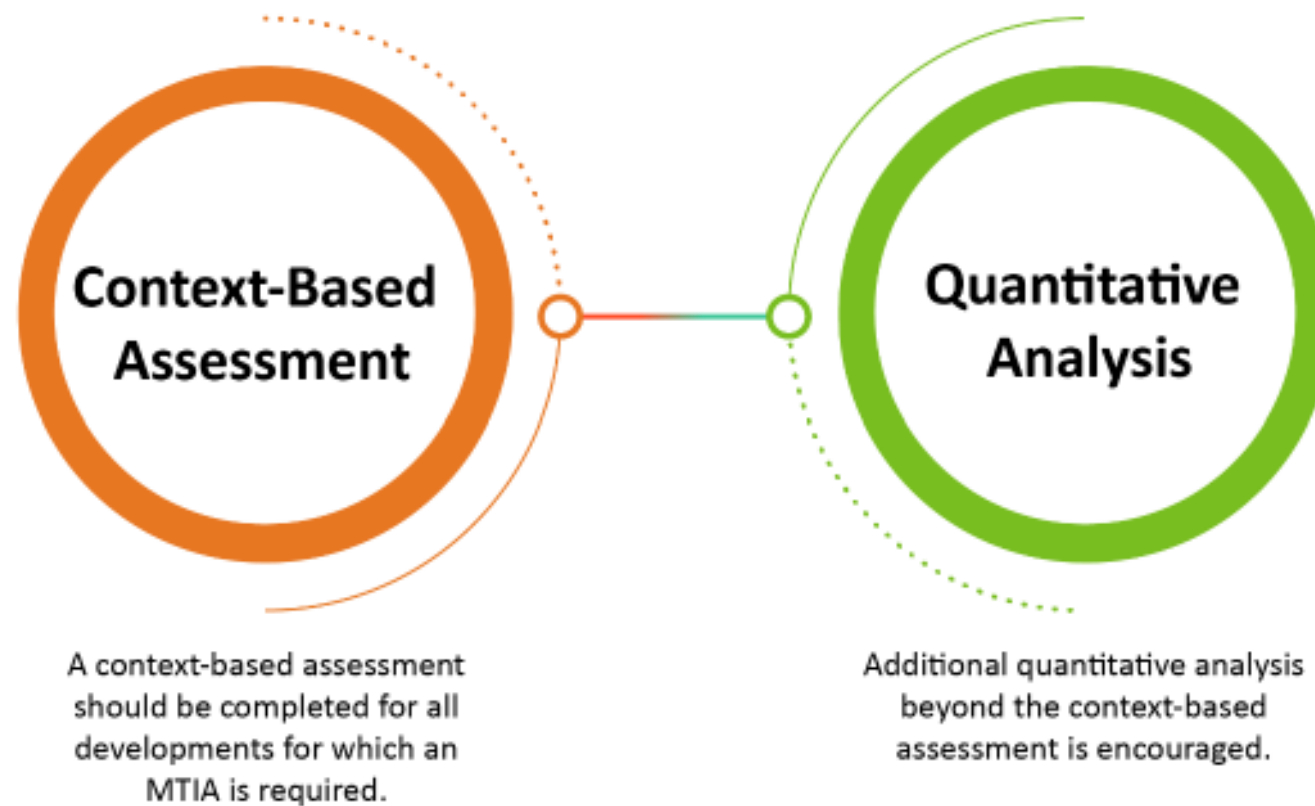
Future Build Conditions
Analysis

ICE

Interchange Areas



Pedestrian/Bicycle/Transit Impact Analysis



Pedestrian/Bicycle/Transit Impact Analysis



1

Review for Compatibility with
Planning Documents

2

Internal Site Design Bicycle/
Pedestrian Accommodations

3

Bicycle / Pedestrian Connections
to Adjacent Properties and/or
Transit Stops

Pedestrian/Bicycle/Transit Impact Analysis



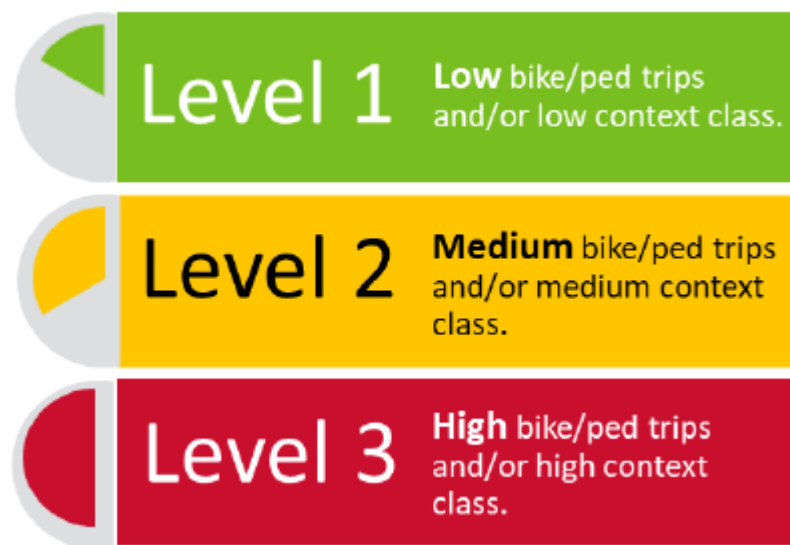
- 1 Review for Compatibility with Planning Documents
- 2 Internal Site Design Bicycle/ Pedestrian Accommodations
- 3 Bicycle / Pedestrian Connections to Adjacent Properties and/or Transit Stops

Pedestrian/Bicycle/Transit Impact Analysis



- 1** Review for Compatibility with Planning Documents
- 2** Internal Site Design Bicycle/ Pedestrian Accommodations
- 3** Bicycle / Pedestrian Connections to Adjacent Properties and/or Transit Stops

Pedestrian/Bicycle/Transit Impact Analysis



Q/LOS

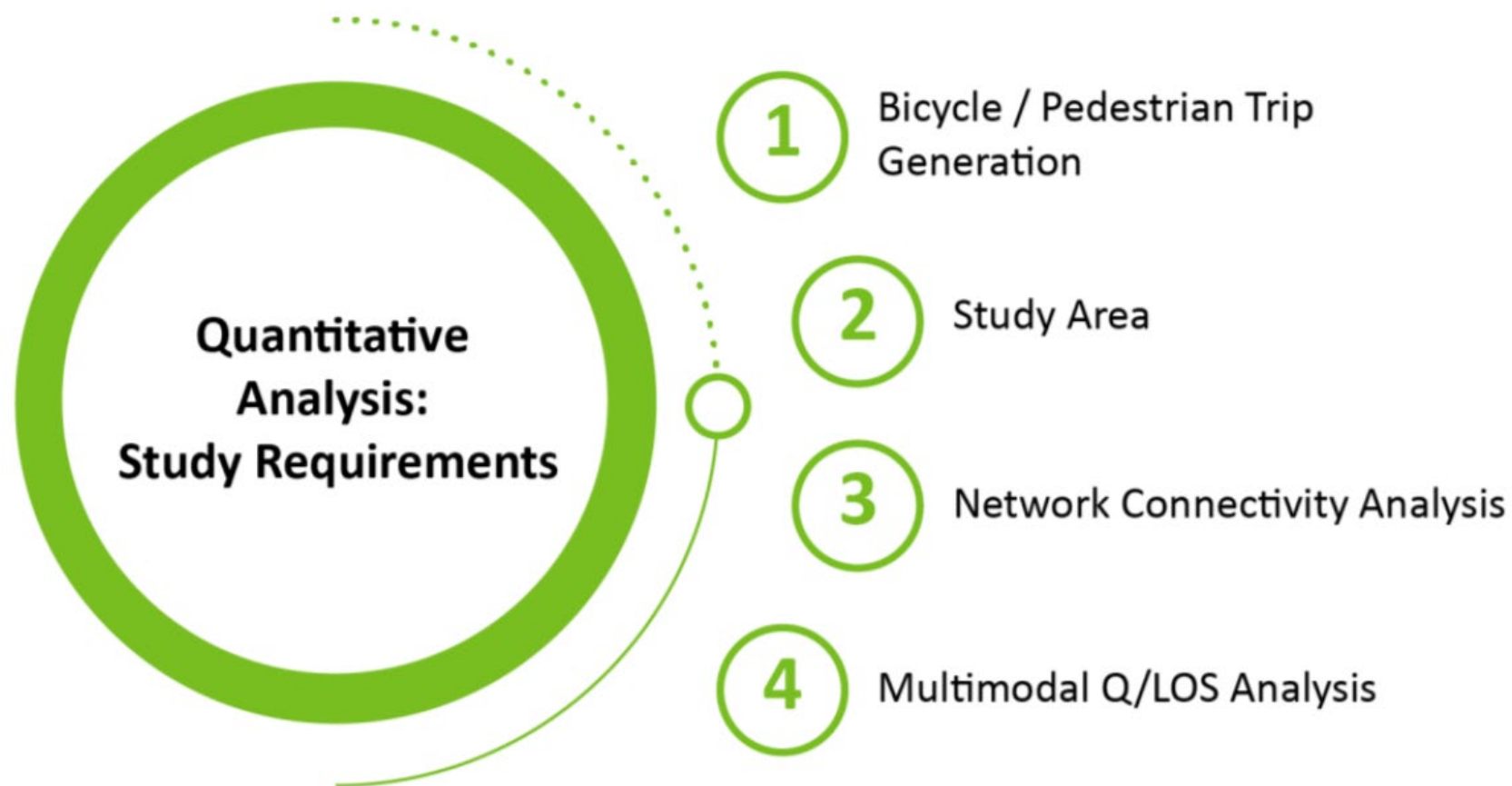


NETWORK
CONNECTIVITY

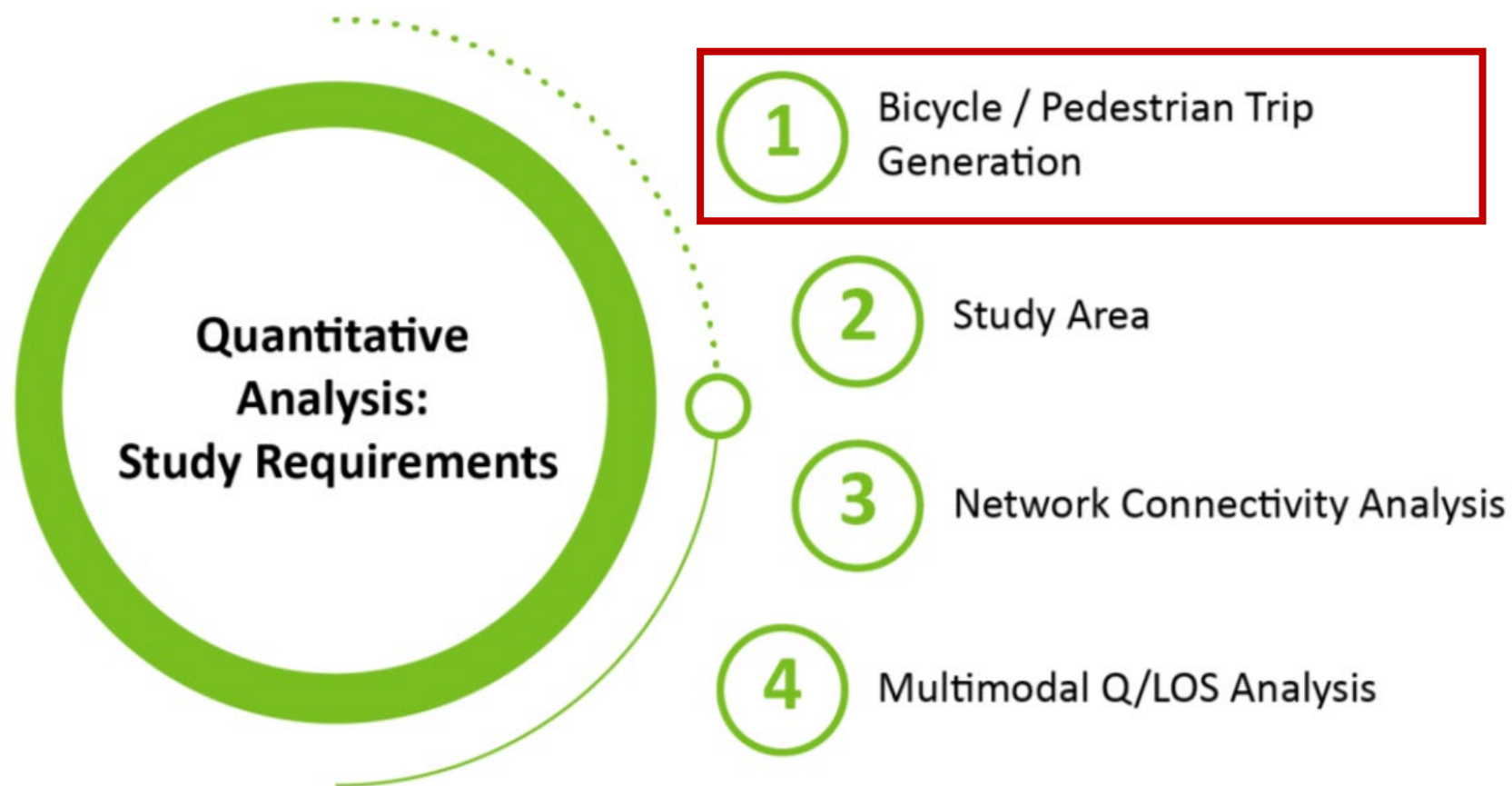


SYSTEM
COMPLETENESS

Pedestrian/Bicycle/Transit Impact Analysis



Pedestrian/Bicycle/Transit Impact Analysis



Pedestrian/Bicycle/Transit Impact Analysis

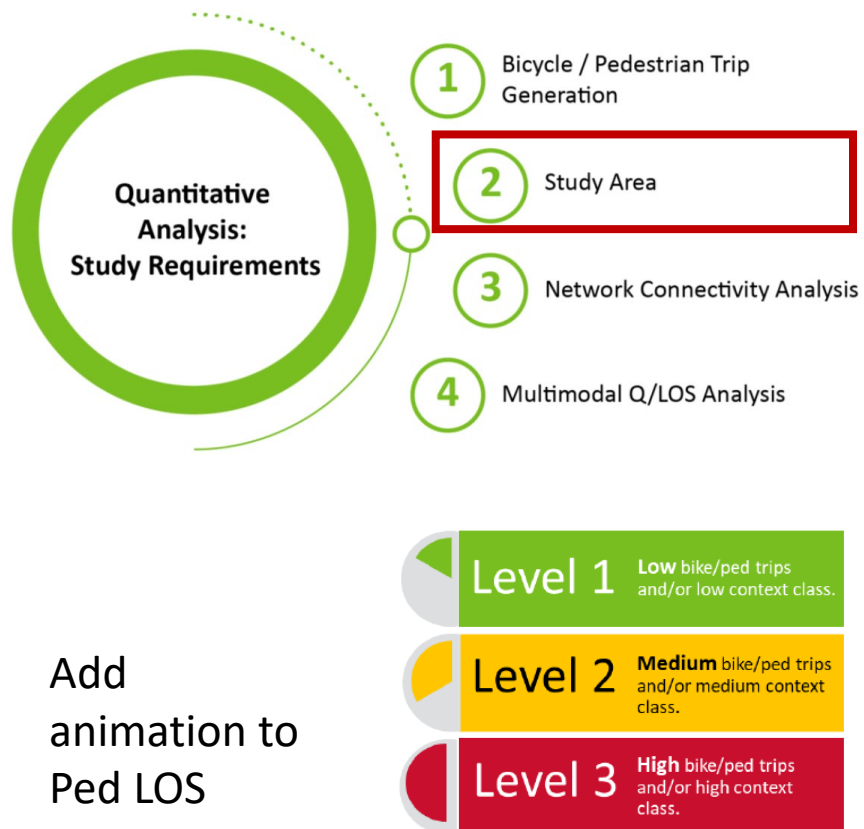


Table 11 | Pedestrian and Bicycle Study Requirements – Quantitative Analysis

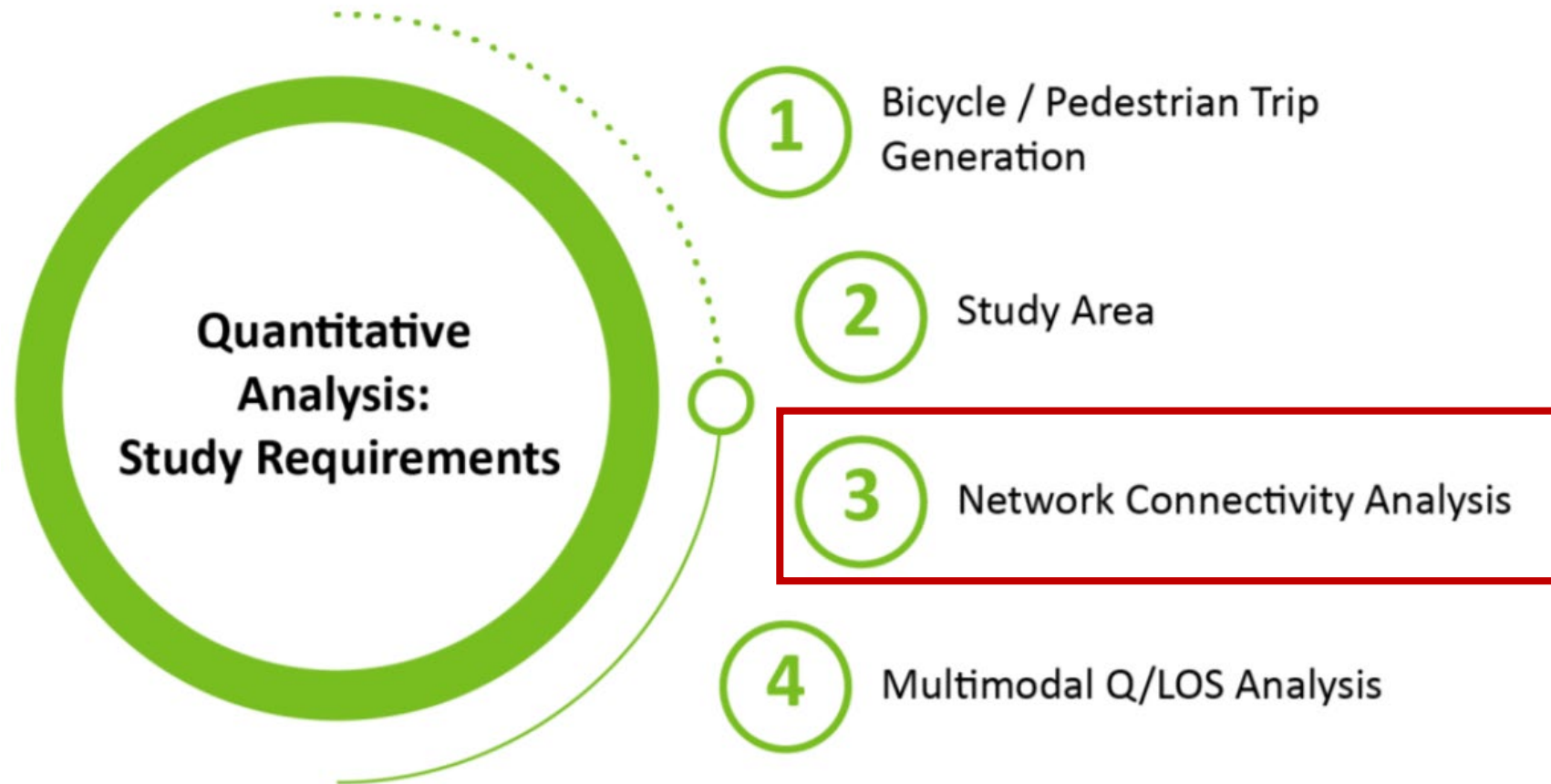
Analysis Type	Study Requirements	Level of Pedestrian and Bicycle Study		
		Level 1 (Low)	Level 2 (Medium)	Level 3 (High)
Quantitative Analysis	1. Bicycle / Pedestrian Trip Generation	Required when total vehicle trips per day exceeds 600 (driveway connection permit categories C-G). Optional for other study types.		
	2. Study Area	N/A	500-foot radius or nearest signalized intersection beyond 500 feet ¹	1,500-foot radius or nearest signalized intersection beyond 1,500 feet ¹
	3. Network Connectivity Analysis	N/A	Optional	Optional
	4. Multimodal Q/LOS Analysis	N/A	Optional	Optional

Note:

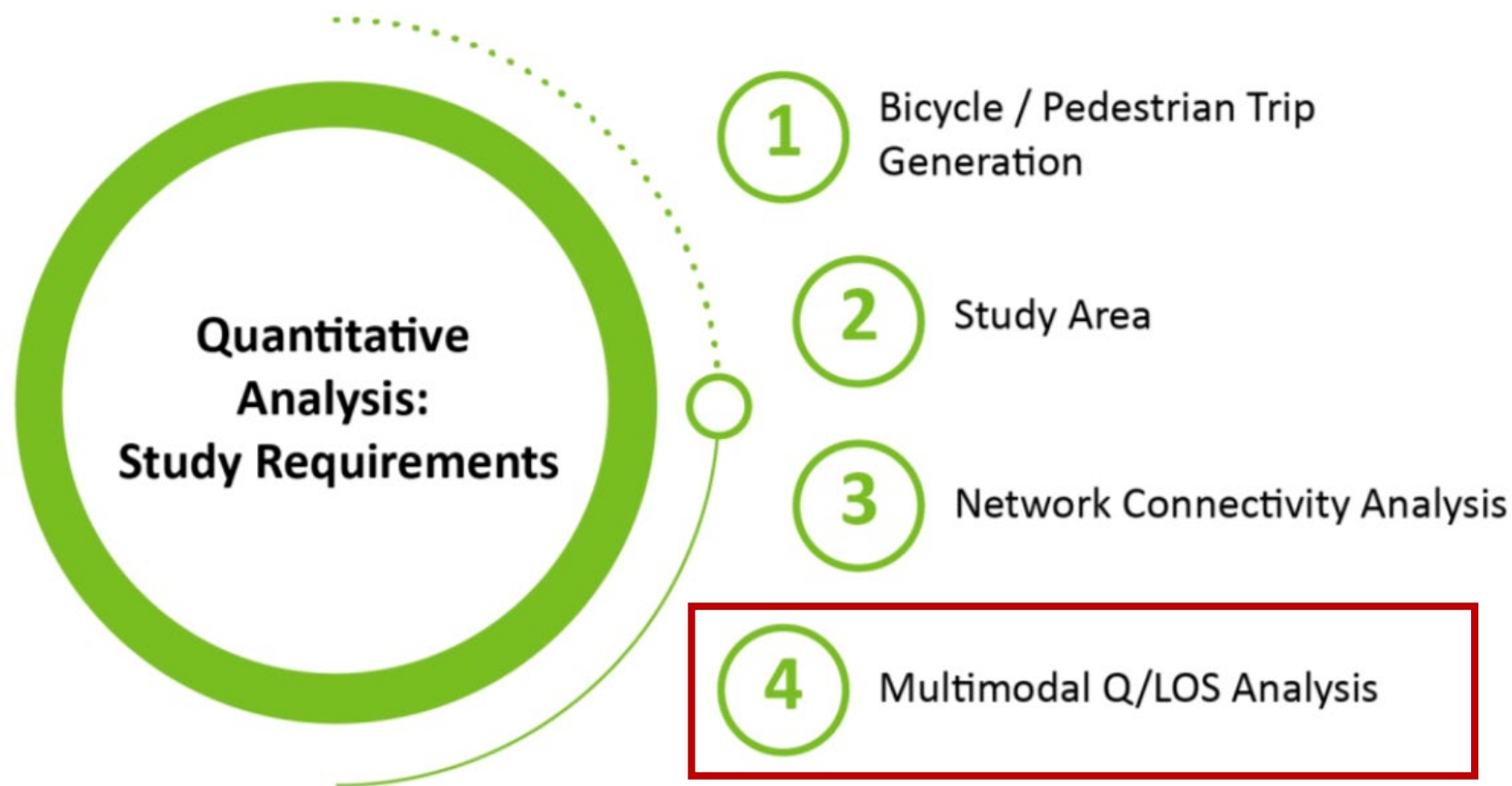
¹ Access connection permit applications for Driveway Categories C, D, E, F, and G should meet the above study area guidance as a minimum or utilize the same study area being evaluated for vehicle trips.

Add animation to Ped LOS

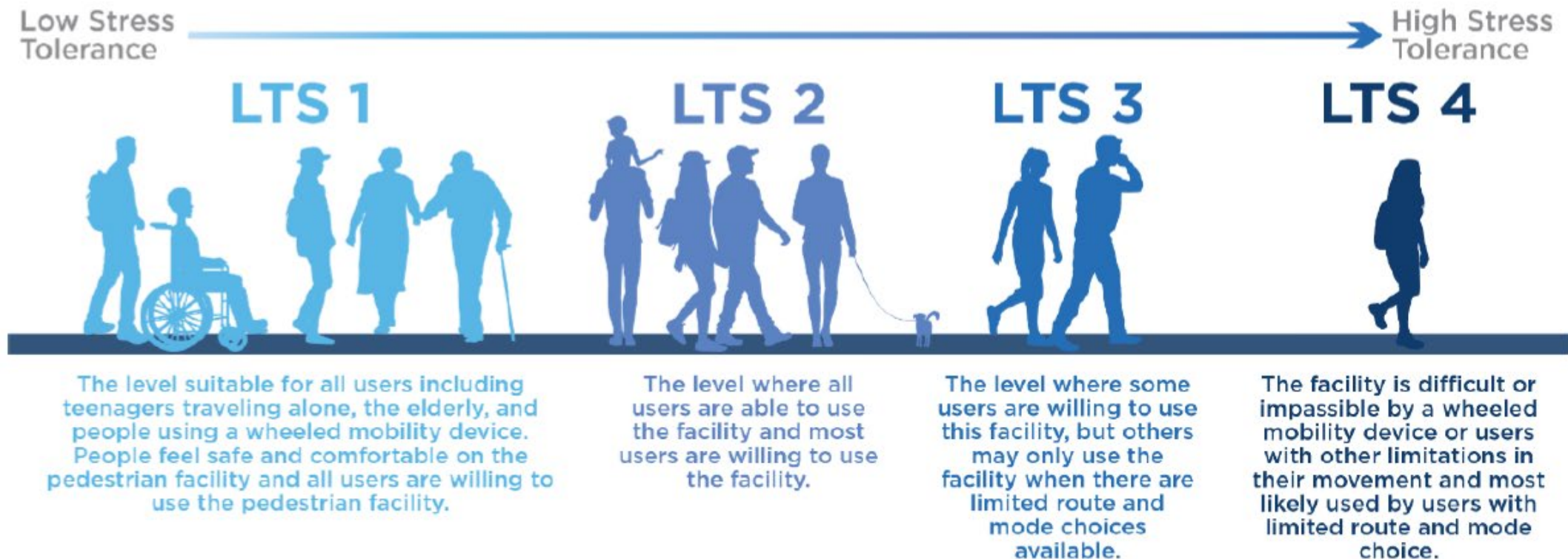
Pedestrian/Bicycle/Transit Impact Analysis



Pedestrian/Bicycle/Transit Impact Analysis

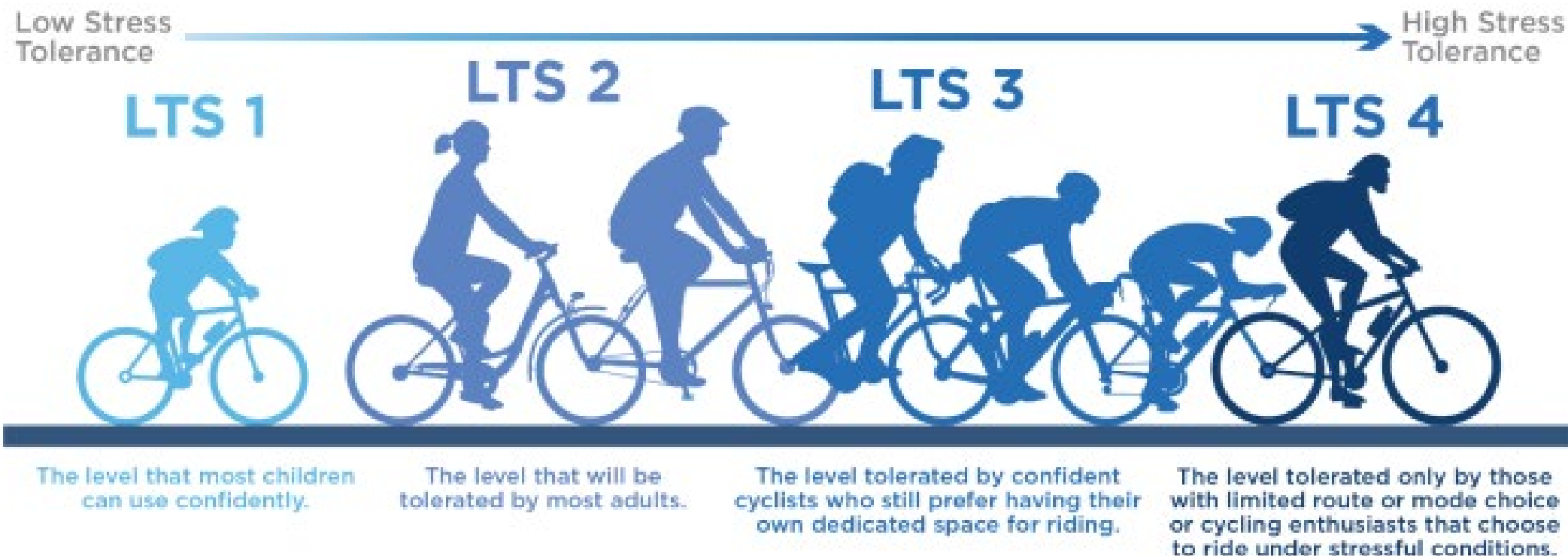


Pedestrian/Bicycle/Transit Impact Analysis



Source: *FDOT Multimodal Quality/Level of Service Handbook*

Pedestrian/Bicycle/Transit Impact Analysis

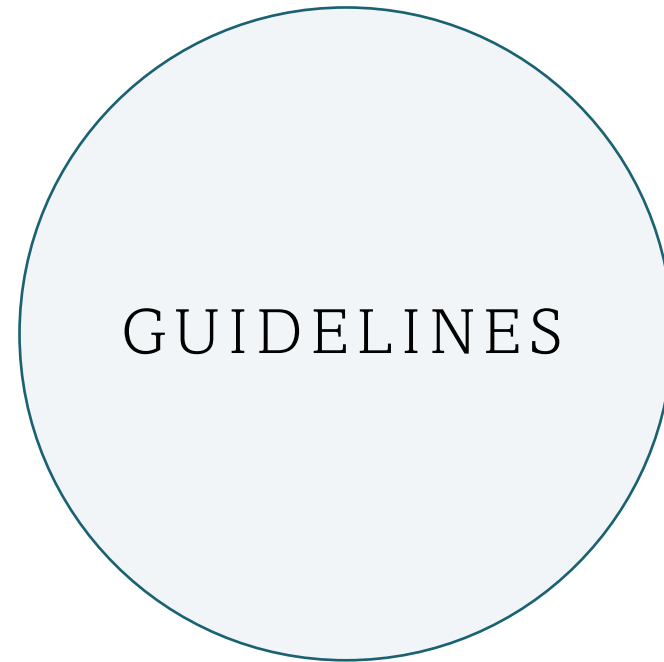


Pedestrian/Bicycle/Transit Impact Analysis

A detailed review of transit stop/shelter facilities, or existing and future transit operations may be required if impacted by the proposed development.



Safety Analysis



REVIEW CRASH DATA



SITE AND STUDY
ASSESSMENT

Safety Analysis



MOST RECENT 5
YEARS

CRASH
PATTERNS

ENGINEERING
JUDGMENT

Safety Analysis



MOST RECENT
5 YEARS

CRASH
PATTERNS

ENGINEERING
JUDGMENT

Safety Analysis



MOST RECENT 5
YEARS

CRASH PATTERNS

ENGINEERING
JUDGMENT

Safety Analysis



Median Modification	Turn Lanes	Sight Distance
Minimize Access Points	Curb Extensions	Reduce Curb Radii
Remove Unneeded Channelized Right Turn Lanes	Square-up Skewed Intersections	Bike Lanes
Narrow Lanes	Accessibility Provisions	Raised Crosswalks



Mitigation

REGULATIONS
AND
AUTHORITY

EXTENT OF
REQUIRED
MITIGATION

MITIGATION
STRATEGIES

FUNDING OF
MITIGATION
IMPROVEMENT

Comprehensive
Plan Amendments

Driveway
Connection Permit

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Reviewers should utilize both quantitative and qualitative methods of analyzing the transportation impacts of new development.

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For local governments using transportation concurrency, it is important that FDOT reviewers be aware of the principles, guidelines, standards, and strategies in the local comprehensive plan that guide mitigation and the relevant strategies to be employed.

Mitigation

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General Mitigation Strategies

- *Early and Continuous Coordination*
- *Corridor Access Management*
- *Network Enhancements*
- *Increase Other Modal Options*
- *Transportation Demand Management Techniques (TDM)*
- *Transportation Systems Management & Operation (TSM&O)*
- *Increasing System Capacity*
- *Reduce Development Plan*

Comprehensive Plan Amendment Mitigation Strategies

- *Mitigation Agreements for Comprehensive Plan Amendment*
- *Transportation Concurrency & Alternatives*
- *Transportation Sufficiency Plans*

Driveway Connection Permit Mitigation Strategies

- *Pre-Application Meeting*
- *Conditions of the Notice of Intent to Issue Permit*

Mitigation

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Comprehensive Plan Amendment Mitigation Strategies

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**Mitigation
Strategies**



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Driveway Connection Permit Mitigation Strategies

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Mitigation





QUESTIONS



CONTACT INFO

Gina.Bonyani@dot.state.fl.us

Jenna.Bowman@dot.state.fl.us

Karla.Matos@dot.state.fl.us

**THANK
YOU!**