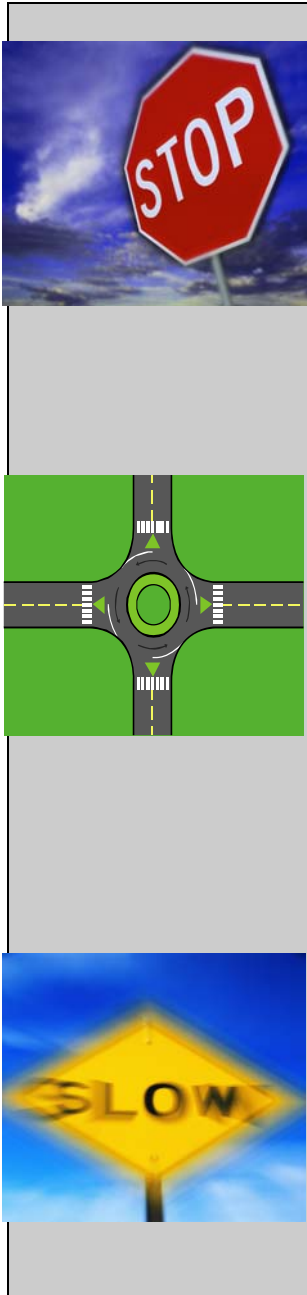




SECTION IV

TRAFFIC IMPACT STUDY





TRAFFIC IMPACT STUDY

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TRAFFIC IMPACT STUDY

I. PURPOSE

- A. The purpose of this manual is to provide guidance and establish policy for developers / applicants in meeting the transportation concurrency requirements of the City of Palm Coast (City) as provided in [Chapter 7](#) of the [Unified Land Development Code \(LDC\)](#). In order for the City to determine if a proposed development meets the transportation concurrency requirements of the [LDC](#) and State, a Traffic Impact Study (TIS) must be prepared in order to be reviewed by the City.
- B. The purpose of a TIS is to identify the potential impacts of new development on the City transportation network and to provide sufficient information to allow a concurrency determination on the proposed project. The study shall review the traffic impacts of project-related traffic on nearby roadways and intersections, identifying those road segments on which the adopted Level of Service (LOS) will be exceeded. Where applicable, the study shall also identify all major intersections that will exceed the adopted LOS. If adopted service levels are exceeded, appropriate improvement recommendations will be required.

II. INTENT

- A. The intent of this Manual is to define the requirements, procedures and methodology for the submission of a *TIS* to the City and to provide an equitable, consistent and systematic means of determining the future impact of proposed Developments while maintaining the adopted service levels on all roadways.
- B. Nothing contained in this document shall waive any requirement contained in the [LDC](#).

III. APPLICABILITY

- A. The requirements, procedures and methodology for a *TIS* contained in this Section shall apply to all applications for development orders. In all cases, it will be the responsibility of the applicant to demonstrate to the City that a proposed development will not cause congestion or unduly impact to the road system.
- B. **Multi-Phase Project.**
 - 1. A *TIS* for a multi-phase project shall be submitted in conjunction with the first application for concurrency determination for the project. The *TIS* shall include all future development phases and shall remain valid and in effect for a year period.
 - 2. For multi-phase projects, partial concurrency may be granted consistent with [Chapter 7](#) for the early phases of the project. For build-out to occur, subsequent development phases will be required to apply for Concurrency by updating the *TIS* with more current data.



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IV. TYPES OF TRAFFIC IMPACT STUDIES

A. Small Project Studies

Applicants for developments generating less than eleven (11) average weekday PM peak hour trips off-site will be considered to have a negligible impact on the Major Road Network. No further review of the transportation impacts of small projects will be required and a final concurrency determination may be such issued subject to other Concurrency provisions in [Chapter 7](#).

B. Minor Traffic Review

1. Applicants for developments generating 11 or more average weekday PM peak hour trips off site, but less than 50 average weekdays PM peak hour trips shall submit a Minor Traffic Review.
2. The Minor Traffic Review shall include:
 - a. A description and location of the project and the traffic impact area studied; and
 - b. The land use category and number of average daily trips generated using the City's trip generation spreadsheet or the latest edition of the *Institute of Transportation Engineers (ITE) Trip Generation Manual*, or estimates based on an actual weekday PM peak period traffic count at 2 similar sites; and
 - c. For residential projects, a listing of all roadway links listed in the *City of Palm Coast Traffic Concurrency Spreadsheet* that the project directly accesses and any arterials or collectors are located within a minimum 1 mile radius of the site boundaries; and
 - d. For commercial projects, a listing of all roadway links listed in the *City of Palm Coast Traffic Concurrency Spreadsheet* that the project directly accesses; and
 - e. The number of net new project trip ends that will impact each of these links (e.g. after internal capture and/or adjacent street by-pass capture is considered); and
 - f. An update of the latest *City of Palm Coast Traffic Concurrency Spreadsheet* through inclusion of the net new project trips; and
 - g. Identification of any committed improvements to segments or intersections in the study area; and
 - h. The identification of any improvements needed to segments and intersections in the study area; and
 - i. The identification of turning lanes or acceleration lanes needed for good project access

C. Major Traffic Review

1. Applicants for developments generating 50 or more average weekday PM peak hour trips shall submit a Major Traffic Review.
2. Applicants shall submit a study methodology or attend a preapplication conference to discuss the traffic study requirements and final report outline as it pertains to the specific development prior to conduct of the study. The preapplication conference may be waived by the City if the study methodology is suitable.
3. The Major Traffic Review must be submitted by a qualified traffic planner or transportation engineer. The individual submitting the study shall be acting as the designated representative of the owner. Three-(3) copies of the completed Major Traffic Review must be submitted with signature and proper seal if applicable.



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4. The City shall determine if all required data has been submitted and is acceptable. This determination, as well as the determination that additional data is necessary, will be made according to the procedures and time frames identified in the concurrency section of the [LDC](#).
5. The appeals process for a Major Traffic Review shall be governed by the procedures set forth in [Chapter 7](#).
6. Site access for a proposed development shall be consistent with the requirements identified in the [LDC](#). The applicant shall provide a site access plan as part of the study methodology or at the preapplication conference. The site access plan is subject to review and approval by the City. This review will be made according to generally accepted traffic engineering principals.
7. To simplify staff review, each Major Traffic Review will be required to follow the outline below. Further definition and clarification of the items listed in the outline may be found in subsequent sections. All submissions shall be computer generated in word and excel format (computer files with formulas for all calculations must be supplied). Figures and maps shall be used to the maximum extent possible.
 - a. Letter of transmittal.
 - b. Title page.
 - c. Project description (location of the development, number and location of access drives, amount of development by type and the year of full occupation and use for each phase of the development).
 - d. Study area identification (determination of impacted road segments to be included in the study network based on a radius from external boundaries consistent with [Section VII](#). A map with the study area boundaries must be included.
 - e. Trip generation calculations for each land use type, including internal capture calculations. *ITE* trip rates and or equations are acceptable; however, the highest trip generation shall be used.
 - f. Trip distribution and traffic assignment methodology, including a detailed explanation of how the distributions were made. Use the most current version of the Flagler county transportation model that was developed through the City for assessing trip distribution otherwise; specify reason(s) if a particular model is used, turning movements or other methodology used.
 - g. Total traffic volumes (include existing traffic plus reserved traffic from other approved developments plus project traffic) within the study area.
 - h. Updated *City of Palm Coast Traffic Concurrency Spreadsheet* and concurrency determination.
 - i. Intersection analysis (required when the peak hour traffic volume on one or more links forming the leg of a major intersection is equal to or exceeds 80% of the maximum service volume of the adopted LOS standard). Specify the roadway segments and intersections that meet or exceed the 80% requirement.
 - j. Roadway needs (identification of proposed improvements).
 - k. Internal site circulation and access needs including need for turning lanes and acceleration lanes.



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- I. Include an estimate of the cost of needed intersection and roadway improvements. For failing road segments (not intersections) calculate the project's fair share amount using the City Proportionate Fair-Share methodology in [Chapter 7](#).
- m. Appendices, such as:
 - i. Traffic count data
 - ii. Trip distribution and assignment worksheets
 - iii. Intersection capacity analysis printouts

V. PREAPPLICATION CONFERENCE

- A. The purpose of the preapplication conference for a Major Traffic Review is to provide guidance and direction to the applicant concerning the conduct of the study.
- B. The applicant shall request a preapplication conference, or shall transmit a general description of the proposed development and study methodology to the City at least 5 working days prior to the meeting.
- C. At a minimum, the following topics will be discussed and approval obtained from the City at the pre-application conference:
 - 1. Review of the traffic study format.
 - 2. The latest *City of Palm Coast Traffic Concurrency Spreadsheet* will be provided to the applicant.
 - 3. Availability and use of any City data.
 - 4. Procedures for traffic counts, the location of current traffic count stations, and the identification of possible additional locations.
 - 5. Trip generation procedures including any internal capture or pass-by adjustments.
 - 6. Traffic distribution and assignment techniques.
 - 7. Methodology and approach for intersection analysis.
 - 8. Methodology and approach for segment analysis.
- D. Failure by the applicant to discuss and obtain resolution to the above topics may result in disapproval of the traffic impact study or a request for additional information.
- E. The methodologies and assumptions agreed upon at the preapplication conference will be valid for a period of 90 days from the date of the preapplication conference.
- F. If the concurrency determination application is not submitted to the City within ninety days of the preapplication conference, the applicant must obtain approval from the City for the continued use of these methodologies and assumptions, or must revise the methodologies and assumptions as necessary with updated information.



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VI. LEVEL OF SERVICE STANDARDS

- A. The LOS standards used for concurrency determination shall be consistent with the [Transportation Element](#) of the *City of Palm Coast Comprehensive Plan*.
- B. When two roads of differing classification or performance standards intersect and an intersection analysis is required, the lower LOS performance standard shall govern the intersection.

VII. STUDY AREA

For projects generating Peak Hour Trips (PHT)	Residential Project Study Area (Measured from Project Boundaries)*	Commercial/Industrial Project Study Area (Measured from Project Boundaries)
Less than 250 PHT	1 Mile	1 Mile
251 to 500 PHT	2 Miles	1 ½ Miles
501 to 750 PHT	3 Miles	2 Miles
750 or more PHT	4 Miles	2 ½ Mile

* A mixed-use project where more than 50% of the acreage is devoted to commercial development would utilize the Commercial/Industrial Project Study Area.

Note: All major intersections and segments nearest to the project that has more than 10% of the project's trips but lie outside of the study area shall also be analyzed and included as part of the study area.

VIII. CITY DATA

The City shall maintain and update several types of data. These types of data are described below.

- A. **Traffic Count Data.** The City maintains traffic counts data on all segments of the Major Road Network. New traffic counts, as well as traffic counts data obtained from approved traffic studies, will be used to update the traffic counts in the concurrency management database on an annual basis.
- B. **PM Peak Hour Trip Rate and Percent New Trips Data Table.** A PM peak hour trip rate and percent new trips data table developed by the City shall be available for use. This table will be updated periodically with trip rate and percent new trips information from traffic impact studies as approved by the City and from information contained in the most recent edition of the *ITE Trip Generation Informational Report*, or from other published studies.
- C. **Roadway Characteristics Inventory.** A roadway characteristics inventory will be maintained on each link in the City of Palm Coast Comprehensive Plan. The inventory will include the major roadway network segment identification number, Florida Department of Transportation (FDOT) count station number, roadway name (including street name and state or City road number), roadway segment termini (from/to), existing roadway area type, roadway functional classification, roadway number of lanes (existing and committed), and existing right-of-way. This inventory will be updated with new information on a periodic basis.



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- D. Traffic Concurrency Spreadsheet.** A *Traffic Concurrency Spreadsheet* will be maintained by the City. This spreadsheet will include traffic and facility information for each roadway link in the City's major roadway network. The spreadsheet will include the link identification number, FDOT count station number, roadway name (including street name and state or City road number), roadway segment termini (from/to), link length, existing roadway area type, number of lanes to be used in the concurrency analysis (existing or committed), median type, presence or absence of left turn lanes, functional classification, number of traffic signals, facility type for use in identifying LOS thresholds, signals per mile, adopted minimum LOS standard, PM peak hour service volumes for LOS A through E, Annual Average Daily Traffic count, annual growth factor, peak hour percentage, link K-factor, Base PM peak hour traffic, Reserved PM peak hour traffic, total committed PM peak hour traffic, and current LOS. The Traffic Concurrency Spreadsheet will be periodically updated with new information.
- E. Traffic Impact Study File.** The City shall maintain a file of approved Major Traffic Reviews, and Development of Regional Impact/Florida Quality Development (DRI/FQD) reports. The City shall provide information and data, when available, to prevent duplication of efforts and unnecessary costs.

IX. PROCEDURES FOR TRAFFIC COUNTS

- A.** The concurrency management database will contain an inventory of all current traffic count locations and the most recent daily and peak hour traffic counts.
- B.** The applicant may use available traffic counts information for all impacted segments from the concurrency management database. If traffic counts information is unavailable for the current calendar year on an impacted segment, the applicant may elect to conduct a current traffic counts according to the procedures identified in **Sections IX (C)** and **IX (D)**. Traffic counts not collected in the current calendar year will be factored by the approved annual growth rate to determine the current year traffic volume.
- C.** The applicant will provide traffic counts, by direction, for a minimum of 72 consecutive hours between 12:00 p.m. Monday and 12:00 p.m. Friday. Legal holidays or other days as specified by the City shall be excluded. The data will include a summary of traffic volumes by direction in 15-minute increments. The average daily traffic counts shall be adjusted to Annual Average Daily Traffic (AADT) using appropriate FDOT seasonal adjustment factors and truck axle adjustment factors. The peak hour segment volume will be determined by applying the approved K-factor for that segment to the AADT volume. All data will be subject to review and acceptance by the City.
- D.** Whenever an intersection analysis is required, the applicant shall provide updated intersection turning movement counts. These turning movement counts shall be made during peak periods of 1 typical weekday (Tuesday, Wednesday, or Thursday). The data shall include a listing of traffic volumes in 15-minute increments, and shall provide a summary of the traffic counts for the PM peak hour. All data will be subject to review and acceptance by the City.



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X. TRIP GENERATION

- A. Each traffic impact study will list all project land uses, the applicable *ITE Land Use Code*, building size, number of dwelling units, etc.
- B. Allowable sources for trip generation rates for each land use are as follows:
 - 1. The trip generation rate for the specific land use as identified in the *City of Palm Coast PM Peak Hour Trip Rate and Percent New Trips Data Table*.
 - 2. The trip generation rate from a previously approved City traffic impact study for a similar land use.
 - 3. The trip generation rates or equations contained in the most recent version of the *ITE Trip Generation Informational Report*.
 - 4. A site specific PM peak hour trip generation study of the same type, or a similar land use, as approved by the City at the preapplication conference. Such a site-specific study will be conducted at three separate and similar land use sites. The survey data will be collected for at least a 2 hour PM peak period on a typical Tuesday, Wednesday or Thursday, or as otherwise determined by the City. Legal holidays or other days specified by the City will be excluded. All data will be subject to review and acceptance by the City. This review will be based on currently accepted traffic engineering principals.

XI. INTERNAL CAPTURE

- A. The use of an internal capture factor will be allowed for certain types and sizes of Commercial and Mixed-Use Developments. Allowable sources for internal capture rates are as follows:
 - 1. The internal capture rate from a previously approved City traffic impact study of a similar land use.
 - 2. The internal capture rate procedures contained in the most recent version of the *ITE Trip Generation Handbook*.
 - 3. A site-specific internal capture study of the same type or similar development as approved by the City at the preapplication conference. Such a site-specific study will be conducted at three separate and similar land use sites.
- B. The total internal capture trip ends shall not exceed 20% of the gross project trip ends except that higher rates may be allowed for development within "Village Center Zoning Districts" as provided for in the City's adopted *Future Land Use Map*.

XII. PERCENT NEW TRIPS

- A. The percent new trips factor represents the percent by which the trip rate is multiplied to obtain only those new trips that are added to the roadway by the proposed development. Those trips going to the proposed development that would have been on the roadway anyway (referred to as "pass-by" trips) may be deducted from the total trips.



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- B. Allowable sources for the percent new trips factor for each land use are listed below:
 - 1. The percent new trips factor identified in the *City of Palm Coast PM Peak Hour Trip Rate and Percent New Trips Data Table*.
 - 2. Percent new trips factor from a previously approved study of a similar land use or a published study, as approved by the City.
 - 3. A site-specific personal interview survey of an identical or similar land use as approved by the City. Copies of the original surveys shall be submitted as part of the study. All data will be subject to review and acceptance by the City. This review will be based on currently accepted traffic engineering principles.
- C. Adjustments for pass-by trips shall be made after any adjustment for internal capture.

XIII. TRIP DISTRIBUTION AND TRAFFIC ASSIGNMENT

- A. The distribution and assignment of project traffic shall be made in accordance with the following procedures and in conformity with accepted traffic engineering principles.
- B. Observations and counts of similar developments in the vicinity of the proposed development are preferred for the distribution and assignment of trips in the immediate vicinity of the site. Except in the immediate vicinity of the site, the use of intersection turning movement counts is preferred for the assignment of site trips. All supporting traffic counts shall be included in the report appendix. Trips may also be distributed based on appropriate population or employment data.
- C. Traffic distribution may be based upon a previously approved traffic impact study of a similar land use in the vicinity of the proposed development. Such use of a prior study must be based upon sound traffic engineering principles and techniques and approved for use by the City.
- D. The traffic distribution and assignment technique should be presented by the Applicant at the pre-application conference, and reviewed and approved by the City. This review will be based on generally accepted traffic engineering principles.
- E. Trip decay will not be permitted. All new external trips that are generated must pass through the entire study area.

XIV. INTERSECTION ANALYSIS

- A. A signalized intersection analysis must be performed on each major intersection where the total peak hour traffic volume on one or more links forming a leg of the intersection is projected to equal or exceed 80% of the maximum service volume of the adopted LOS standard for any phase of the project for which a final concurrency determination is being sought.
- B. The procedure for performing an intersection analysis will be based upon the methodology contained in the most recent edition of the *Highway Capacity Manual* (and accompanying *HCS* software) and will make use of the operational analysis. Optimized signal timings shall be used based on the SOAP-2K module contained within the *HCS* software. All data inputs used for the *HCS* analysis must be properly supported and justified. Any questions, issues or methodology



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other than that referenced in the above publication must be submitted at the preapplication conference and will be subject to the review and approval from the City.

- C. Major un-signalized intersections that require capacity analysis are to be analyzed as signalized intersections using an appropriate signal phasing plan and SOAP-2K optimized timings.
- D. For each intersection at which total traffic results in a LOS below the acceptable adopted LOS, the applicant shall recommend appropriate improvements to the intersection that will result in an acceptable LOS.
- E. Documentation of the analysis shall include:
 - 1. Printouts and worksheets for all capacity analyses performed for the intersection.
 - 2. Copies of the traffic counts used in the analysis.
 - 3. The methodology used to seasonally adjust the traffic counts used in the analysis.

XV. SEGMENT CAPACITY ANALYSIS

- A. If the peak hour traffic on an impacted segment is projected to exceed the maximum service volume of the adopted LOS standard for any phase of the project for which a final concurrency determination is being sought, a transportation analysis must be performed to determine if the actual roadway segment operating characteristics are such that additional capacity is available. The Applicant will submit, in writing, the methodology and approach to be used for each segment analysis prior to conducting the analysis, and will be subject to review and approval by the City. This review will be based on currently accepted traffic engineering principles.
- B. The segment analysis shall use the latest edition of FDOT's ART-PLAN, HIGH-PLAN, or FREE-PLAN software, depending on the type of roadway segment under study or other latest software as recommended by FDOT.
- C. As an alternative to the use of the FDOT programs, a floating car travel time study may be performed to determine the operating speed and corresponding LOS at which the roadway segment under study is operating. All data and analysis from each travel time run must be submitted as part of the analysis. The methodology for conducting a travel time study, including the number of sample runs, time periods, and length of the relevant roadway segment, must be submitted in writing and receive approval by the City prior to conducting the study.