Appendix F
HERNANDO COUNTY
TRAFFIC IMPACT STUDY PROCEDURES

Section 1 - Purpose, Intent, Applicability and Standards
Sec. 01.100 - Purpose
Sec. 01.101 - Intent
Sec. 01.102 - Applicability
Sec. 01.103 - Standards

Section 2 - Definitions

Section 3 - Small Projects

Section 4 - Minor Land Development Traffic Assessment (LDTA)
01.400 - General Requirements
01.401 - Impact Study Area
01.402 - Concurrency Determination

Section 5 - Major LDTA
01.500 - General Requirements
01.501 - Format of an LDTA
01.502 - Pre-application Conference
01.503 - Traffic Impact Area
01.504 - Default on an Agreement
01.505 - County Traffic Data
01.506 - Trip Generation
01.507 - Percent New Trips
01.508 - Traffic Distribution and Assignment
01.509 - Intersection Analysis
01.510 - Facility Analysis
Section 6 - Comprehensive Plan Amendment Traffic Study Methodology

01.600 - General Requirements

01.601 - Applicability

01.602 – Methodology

01.603 – Study Objectives

01.604 – Format of Comprehensive Plan Amendment Traffic Study
SECTION 1. Purpose, Intent, Applicability and Transportation System Manual

Sec. 01.100 - Purpose
A traffic impact study shall identify the potential impacts of new development on Hernando County's road network. Such a study shall provide information for making concurrency determination on each impacted segment of the road network. This study will identify traffic volumes on each impacted segment due to the development; identify those segments on which the adopted Level of Service cannot be maintained; include segment and intersection analyses; and recommend potential solutions for those segments and intersections on which the adopted Level of Service is not being met.

Sec. 01.101 - Intent
This document describes the requirements, procedures and methodology for the submission of a traffic impact study in Hernando County and provides an equitable, consistent and systematic means of determining the future impact of proposed developments while maintaining the adopted service levels on all roadways in the County.

Sec. 01.102 - Applicability
The requirements, procedures, and methodology for a traffic impact study contained in this section shall apply to all development within the unincorporated area of Hernando County as defined in the Adequate Public Facilities Ordinance (Hernando Code Section 23). In all cases, it shall be the responsibility of the applicant to demonstrate to the County Concurrency Manager that a proposed development shall not result in a reduction in Level of Service below the adopted Level of Service standard on the impacted link. For Developments of Regional Impact, the traffic study requirements for the purpose of determining concurrency and Level of Service compliance shall be the methodology described herein for preparing the application of development approval required by 380.06(10), Florida Statutes.
Sec. 01.103 - Standards

The Tier I Report Spreadsheet shall be used as a reference in preparing the reports required by this section. Level of Service standards are identified in the Comprehensive Plan and Tier I Report Spreadsheet.
SECTION 2. Definitions

(a) **Average Annual Daily Traffic Volume (AADT)**: The average seasonally adjusted 24-hour traffic volume at a given traffic count location. This also represents the existing traffic conditions as presented in the Annual Concurrency Report.

(b) **Average Daily Trips (ADT)**: The maximum of Average Vehicle Trip Ends either on a weekday or Saturday or Sunday utilizing the applicable Institute of Transportation Engineers (ITE) land use code for the proposed development.

(c) **Background Traffic**: Traffic from vested development and previously approved development that could occur during the one year time period between the current and next approved Annual Concurrency Report on segments of the Concurrency Determination Network. The calculation of background traffic will be done using the adopted 3 year or 5 year growth rates in the current Annual Concurrency Report or other County provided growth rates for the respective roadways as determined at the pre-application conference.

(d) **Concurrency Determination Network**: A listing of all existing and planned roadway segments within the Hernando County Annual Concurrency Report that comprise the roadway network to be used when evaluating the traffic impacts of a proposed development.

(e) **Concurrency Determination Network Map**: A map illustrating all existing and planned roadway segments within Hernando County in the Annual Concurrency Report that comprise the roadway network to be used when evaluating the traffic impacts of a proposed development.

(f) **Concurrency Review Process**: The procedure, review time frame, and appeal process pursuant to The Adequate Public Facilities Ordinance (Hernando Code 23-261).

(g) **Critical Transportation Link**: Any location where the sum of existing plus background traffic is at or above 90 percent of the Generalized Planning Capacity or other calculated segment capacity as approved by the Concurrency Manager.

(h) **Directly Accessed Segment**: The first road segment on the Concurrency Determination Network on which traffic from the project's site is expected to travel. If a development has more than one access point, it may be possible that two or more Directly Accessed Segments exist.

(i) **Facility**: A link or a series of sequential links identified on the Concurrency Determination Network in which the beginning and ending points are defined using...
criteria that includes changes in roadway operating characteristics, locations of
signalized intersections and municipal boundaries.

(j) **Generalized Planning Capacity**: The Generalized Daily, Peak Hour Two-Way or Peak Hour/Peak Directional service volumes as identified in the Florida Department of Transportation, *Quality Level of Service Handbook*, current edition and pursuant to the adopted Level of Service standard in the Hernando County Comprehensive Plan.

(k) **Impacted Segment**: For Minor LDTA, any segment on the Concurrency Determination Network within 1/2 mile of the access connection to the project site plus any link upon which the project's total site traffic consumes 3 percent or more of the peak hour two way Maximum Service Volume at the adopted Level of Service standard or more than 70 peak hour two way trips. For Major LDTA, any segment on the Concurrency Determination Network within 1 mile of the access connection to the project site plus any link upon which the project's total site traffic consumes 3 percent or more of the peak hour two way Maximum Service Volume at the adopted Level of Service standard or more than 70 peak hour two way trips.

(l) **Internal Capture**: Trips generated by a mixed use project which travel from one on-site land use to another on-site land use without using the external road network, i.e., the roads on the Concurrency Determination Network.

(m) **Internal Capture Factor**: The percentage of the total trips generated by a mixed use project that travel from one on-site land use to another on-site land use without using the external road system, i.e., the roads on the Concurrency Determination Network.

(n) **Intersection Analysis**: An engineering operations analysis of two intersecting roadways to evaluate their vehicular capacity and Level of Service.

(o) **Land Development Traffic Assessment (LDTA)**: The LDTA is a traffic impact study to identify the potential impacts of new Development on the Hernando County Concurrency Determination Network and to provide information which will allow a concurrency determination to be made on each impacted segment. The LDTA will identify development traffic volumes on each impacted segment, identify those segments on which the adopted Level of Service cannot be maintained, include link and intersection analysis, and recommend potential solutions for those segments and intersections on which the adopted Level of Service is not being met. Based on the size of the development and/or number trips produced by the development, the LDTA has been divided into two types:

1. **Minor LDTA**: Traffic impact study to identify the potential impacts of new
development which generate 100 or more daily trips, but less than or equal to 1,000 daily trips according to the Institute of Transportation Engineers, *Trip Generation Manual*, current edition.

2. Major LDTA: Traffic impact study to identify the potential impacts of new development, which generate greater than 1,000 daily trips according to the Institute of Transportation Engineers, *Trip Generation Manual*, current edition.

(p) **Level of Service**: A qualitative measure describing the operational conditions within a traffic stream in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, delay, comfort, convenience, and safety. Six levels of service are defined for each type of facility with letter designations A through F. Level of Service A represents the best operating conditions, and Level of Service F the worst operating conditions.

(q) **Level of Service Standard**: The adopted standard as contained in the Transportation Element of the local Comprehensive Plan. For Strategic Intermodal System roadways and Transportation Regional Incentive Project funded roadways, the Level of Service standard is established by the Florida Department of Transportation.

(r) **Link or Segment**: A portion of a roadway located on the Concurrency Determination Network typically defined by two intersecting roadways.

(s) **Link Improvement**: A change in the physical or operating characteristics of a significant portion of a roadway segment that results in increased capacity and/or improvements to the Level of Service and safety characteristics of the link.

(t) **Major Intersection**: The location at which two roadway segments located on the Concurrency Determination Network intersect each other.

(u) **Maximum Service Volume**: Maximum Service Volume is defined as the maximum rate of flow which may be accommodated under prevailing traffic and roadway conditions while still maintaining the adopted Level of Service standard for each roadway on the Concurrency Determination Network.

(v) **Origin/Destination Survey**: The collection of data at a site resulting from an on-site interview to determine characteristics about travel to and from that site.

(w) **Passerby Trips**: Trips that enter and exit a site that would have otherwise been traveling on the street adjacent to the site regardless of whether they enter or exit the site daily.

(x) **Percent New Trips Factor**: A factor by which the trip rate is multiplied in order to calculate only those new trips that are added to the roadway by the new development.
This factor is calculated by the formula 1 - (passerby trips/total trips generated by the land use).

(y) **Segment or Link:** A portion of a roadway located on the Concurrency Determination Network typically defined by two intersecting roadways.

(z) **Traffic Analysis Zone:** A geographic sub-area of the County used to tabulate socioeconomic and trip characteristic information used in transportation modeling and traffic impact studies.

(aa) **Traffic Assignment:** The procedure of estimating trips to a specific segment on the Concurrency Determination Network as travel occurs from a proposed development to other locations on the Concurrency Determination Network.

(bb) **Traffic Count Station:** A location where periodic traffic counts are recorded by the Florida Department of Transportation, Hernando County, or local jurisdiction; and where additional traffic counts may be required as part of the submission requirements of a LDTA.

(cc) **Trip Generation Rate:** The number of vehicular trips generated by a unit of land use as defined in the most current version of the Institute of Transportation Engineers (ITE), "Trip Generation" publication or as approved or provided by the Concurrency Manager.

(dd) **Turning Movement Count:** The collection of data at an intersection which depicts the volumes of traffic that turn and go straight through the intersection during the peak period.
SECTION 3. Small Projects

No traffic impact study will be required for developments generating less than 100 average daily trips, according to the Institute of Transportation Engineers, *Trip Generation*, current edition. Trips generated by Small Projects will be reviewed and assigned by the Concurrency Manager who will determine if adequate capacity is available on the road network in the impacted area.

(a) Determination of adequate capacity will be made for projects which do not access any segment identified on the Concurrency Determination Network.

(b) If traffic generated by the proposed development is expected to travel on the Concurrency Determination Network, a determination of adequate capacity will be made for the project if the Directly Accessed Segment(s) resulting Level of Service meets the adopted Level of Service standard.

(c) If the Directly Accessed Segment for the proposed development does not meet the adopted Level of Service standard, the Concurrency Manager will notify the applicant that evaluation of future roadway operating conditions may be undertaken pursuant to Section 4 to demonstrate acceptable operating conditions.
SECTION 4. Minor Land Development Traffic Assessment (LDTA)

Sec. 01.400 - General Requirements
(a) Applicants proposing developments which generate 100 but less than or equal to 1,000 average daily trips, according to the Institute of Transportation Engineers, *Trip Generation*, current edition, shall submit 8 copies of a Minor LDTA for concurrency determination. The Minor LDTA shall be prepared, signed, and sealed by a Professional Engineer registered in the State of Florida qualified to perform traffic impact studies. The applicant and/or his engineer may request a pre-application conference to discuss submission requirements. The review shall include, but not be limited to, the following information:
1. Description and location of the project;
2. Each land use category and number of units;
3. An estimate of the number of daily and peak hour trips generated (by direction);
4. The Generalized Peak Hour/Peak Direction Capacity at the adopted Level of Service standard for impacted segments within ½ mile of the access point(s) to the development project plus those impacted segments that consume 3 percent or more of the peak hour two way Maximum Service Volume at the adopted Level of Service standard or more than 70 peak hour two way trips; and
5. The number of net external peak hour trips on each impacted segment for both the peak and off-peak directions (e.g., after internal capture and/or adjacent street capture is considered).

(b) The format of an LDTA shall follow the outline identified in. 01.501.

Sec. 01.401 - Impact Study Area
The impact study area shall be determined as indicated by the definition of impacted segments in Section 2. Additional impacted segments may be added by the County Concurrency Manager in order to maintain the adopted Level of Service standards.

Sec. 01.402 - Concurrency Determination
Based upon the Minor LDTA, the County Concurrency Manager shall determine whether or not the road facilities are adequate to maintain the adopted Level of Service standards upon build-out of the proposed development. If the information provided in the traffic review indicates that the Level of Service is at or above 90 percent of the Maximum Service Volume at the adopted
Level of Service standard, then the applicant shall undertake a more detailed evaluation of future roadway operating conditions pursuant to Section 5 to demonstrate acceptable operating conditions.
SECTION 5. Major Land Development Traffic Assessment (LDTA)

Sec. 01.500 - General Requirements
A Major LDTA shall be required for all proposed developments generating more than 1,000 average daily trips, according to the Institute of Transportation Engineers, *Trip Generation*, current edition. For land use categories not included in the Institute of Transportation Engineers, *Trip Generation*, current edition, the County Concurrency Manager shall prescribe the independent variable and the maximum development size at the pre-application conference. The applicant and/or his engineer is required to attend a pre-application conference, as defined in Section 01.502 to discuss the traffic study requirements pertaining to the proposed development, prior to the study being conducted. Each Land Development Traffic Assessment must meet the submission requirements outlined in the following subparagraphs to receive a determination of application completeness.

(a) At the time of application for Concurrency Review, 8 copies of the completed Land Development Traffic Assessment shall be submitted to the Hernando County Planning Department.

(b) A Major LDTA shall be prepared, signed, and sealed by a Professional Engineer registered in the State of Florida qualified to perform traffic impact studies.

(c) The format of an LDTA shall follow the outline identified in. 01.501 of this Section.

(d) Site access and circulation for a proposed development shall be consistent with the requirements of the Hernando County Subdivision Regulations (Hernando County Code 26 Article III). The applicant and/or his engineer shall provide a site access plan at the pre-application conference. The site access plan shall identify the existing roadway characteristics (pavement width, median cuts, opposite driveway cuts and intersecting streets). The site access plan shall be subject to the Concurrency Manager's review and approval. This review shall be made according to currently accepted traffic engineering principles.

Sec. 01.501 - Format of an LDTA
Each LDTA shall follow the outline below unless approved otherwise by the County Concurrency Manager:

(a) Letter of transmittal;

(b) Title page;

(c) Table of contents to include, sections, list of figures, list of tables, and list of appendices;
(d) Provide page numbers for the entire report, including the appendices;
(e) Introduction which includes description and location of the proposed development (including parcel numbers where the site is located), current and proposed zoning, size of the project and summary of the methodologies agreed to in the pre-application conference;
(f) Submittal of a completed Tier I Report Spreadsheet provided in both the report and attached CD or DVD (electronic file in Microsoft Excel format) including:
   1. Description of existing and future conditions:
      a. Description of existing Level of Service conditions for the peak hour, which includes existing traffic volumes and roadway characteristics, for all segments within the study area;
      b. Description of future conditions for the peak hour, which includes the following information:
         i. Background Traffic Growth and Future Traffic shall be based on the following:
            1. The calculation of background traffic will be done using the adopted 3 year or 5 year growth rates in the current Annual Concurrency Report or other County provided growth rates for the respective roadways as determined at the pre-application conference.
            2. The concurrency test will be the existing traffic volumes plus the background growth traffic for 3 or 5 years plus the project traffic. If this volume is less than or equal to 90% of the Peak Hour Two-Way Maximum Service Volume at the adopted Level of Service standard, concurrency is satisfied. If this volume is greater than 90% of the Peak Hour Two-Way Maximum Service Volume at the adopted Level of Service standard, a facility Level of Service analysis will be required pursuant to Section 01.510.
         ii. The analysis will be documented and provided to the County in both hard copy and electronic format as prescribed by the County.
      c. Traffic analyses shall be reviewed for reasonableness and consistency with the agreed upon methodology by the applicant prior to submittal.
   2. Trip generation estimate (from the Institute of Transportation Engineers, Trip Generation, current edition) or an alternative method included within the study in a...
table format approved or provided by the Concurrency Manager;
3. Percent new trips and internal capture estimates;
4. Traffic distribution and assignment methodology;
5. Area of influence (determination of road segments to be included in the study network);
6. Impacted segments traffic volumes (peak and off-peak directions);
7. All analyses shall evaluate conditions during the peak hour (highest 100th hour of the year). Other time periods or AM analysis may be requested in conjunction with the first sufficiency review;
8. Intersection analysis (required when the approach links are operating at 90% or more of the adopted Level of Service standard Peak Hour Two-Way Generalized Maximum Service Volume) or more than 70 peak hour two way trips; and
9. Facility analysis (required if the total traffic on an impacted roadway segment consumes 90 percent or more of the adopted Level of Service standard Peak Hour Generalized Planning Capacity or if the project traffic consumes equal to or greater than 3 percent of the adopted Level of Service standard Peak Hour Two-Way Generalized Maximum Service Volume or more than 70 peak hour two way trips;

(g) Roadway needs (identification of proposed improvements and cost);
(h) Internal site circulation and access needs; and
(i) An appendix which includes:
   1. The approved written traffic methodology letter;
   2. Traffic count data;
   3. Trip generation with internal and adjacent street capture worksheets;
   4. Trip distribution and assignment worksheets;
   5. Intersection capacity analysis worksheets;
   6. Link capacity analysis worksheets;
   7. Computerized modeling documentation; and
   8. Any other relevant analysis worksheets. The applicant must provide a CD or DVD containing input and output files for all analyses performed:
      i) Spreadsheets;
      ii) Level of Service data files;
      iii) Intersection Level of Service analysis files;
      iv) Travel demand forecasting files;
      v) Etc.
Along with a Tier I Report Spreadsheet the following files shall be submitted electronically, in addition to hardcopies, unless specified by the Concurrency Manager.

1. Report Content
   i) Complete Traffic Impact Study (TIS) Report in pdf format
   ii) Complete TIS Report in text format (Provide Word, Word Perfect, etc.)
   iii) Study area (map)
   iv) Description of proposed land uses
   v) Site Location relative to surrounding roadway network (map)
   vi) Proposed build out schedule

2. Model Forecasts
   i) Alternatives (Label all alternative model forecasts)

3. Worksheets
   i) Trip Generation (Excel file)
   ii) Trip Distribution and Assignment (Excel file)
   iii) Tier I Table (Excel file)

4. Raw Data
   i) Count Data
   ii) Turning Movement Count Data
   iii) Signal Timing Data
   iv) Signal Warrant Data
   v) Summary Tables

5. Level of Service Data
   i) ArtPlan files
   ii) Highway Capacity Software (HCS) files
   iii) Synchro files
   iv) Other data

Sec. 01.502. Pre-application Conference

(a) The purpose of a mandatory pre-application conference for a Land Development Traffic Assessment is to provide guidance and direction to the applicant and/or his engineer for conducting the study. For a Minor LDTA, the applicant may request a pre-application conference to discuss submission requirements.

(b) The applicant shall obtain a Pre-application Conference Request Form provided by the County and submit it to the Concurrency Manager at least two weeks prior to the
conference. This request shall include a general description of the proposed development and study methodology.

(c) At a minimum, the following topics shall be discussed with the Concurrency Manager at the pre-application conference:

1. Site location, access and internal circulation plan;
2. Review of the traffic study format;
3. Information about the Concurrency Determination Network;
4. Procedure to determine the proposed development's study network (impacted segments);
5. Availability and use of County data, including traffic count information;
6. Procedures for obtaining traffic counts, the location of current traffic count stations, and the identification of possible additional locations and needed traffic counts;
7. Source of trip generation for project traffic;
8. Source of percent new trips factor and determination of the need for local origin-destination survey sites for determination of percent new trips factor;
9. Traffic distribution and assignment methodology;
10. Applicability of using internal capture factors for mixed use developments;
11. Methodology and approach for intersection analysis, including the need for turning movement counts;
12. Methodology and approach for facility analysis; and
13. Identification and costing of potential improvements necessary to mitigate impacts of proposed development.

(d) Failure by the applicant and/or his engineer to discuss and obtain written resolution to the above topics may result in disapproval of the LDTA or a request for additional information. The approved written traffic methodology, as approved and signed by the Concurrency Manager, shall be included in the LDTA submittal.

Sec. 01.503 - Traffic Impact Area

The following procedure shall be used to determine the extent of the road network to be studied:

(a) Traffic attributable to the proposed development shall be assigned on all segments on the Concurrency Determination Network that are impacted by the total site traffic to a level equal to or greater than 3 percent of the adopted Level of Service standard Peak Hour Generalized Planning Capacity and according to the following criteria:

1. For a Minor LDTA, all impacted segments within ½ mile of the project site and all
segments where the project consumes greater than 3 percent of the Generalized Peak Hour Two-Way Maximum Service Volume or more than 70 peak hour two way trips.

2. For a Major LDTA, all impacted segments within 1 mile of the project site and all segments where the project consumes greater than 3 percent of the Generalized Peak Hour Two-Way Maximum Service Volume or more than 70 peak hour two way trips.

(b) The project's total site traffic shall be used to determine the impacted segments including all prior phases of the same development or adjacent development under common ownership. The total site traffic will be the sum of traffic generated by:
   1. The existing development on the site;
   2. The specific development for which concurrency approval is being requested; and
   3. Future phases of development for which approval may be requested.

(c) Only traffic from the specific development for which concurrency approval is being requested shall be placed on the impacted segments.

(d) Additional impacted segments may be added to the study network by the County Concurrency Manager in order to maintain the adopted Level of Service standards.

(e) The impact of the proposed development's traffic on all Directly Accessed Roadway Segments shall be evaluated for ensuring the maintenance of the adopted Level of Service standard on those roadways.

(f) For the purposes of an LDTA, the impacted segments due to a proposed development's traffic shall consist of only those roadways and future roadways:
   1. Shown on the Concurrency Determination Network;
   2. Proposed for inclusion as part of the Concurrency Determination Network and scheduled for initiation of construction within the first year of the Florida Department of Transportation, Hernando County, or other responsible jurisdiction's current adopted Five-Year Work Program and/or CIE; or
   3. Other roadways, as required by the County Concurrency Manager, scheduled for completion prior to the initial date of proposed development's impact on the roadway, if such roadway or improvement is to be completed within one year pursuant to a local government Development Agreement or binding contract and proposed for inclusion as part of the Concurrency Determination Network.

Sec. 01.504 - Default on an Agreement
Where an improvement based on a local government Development Agreement or order is relied upon to achieve the acceptable Levels of Service, default on any such agreement by any party other than Hernando County shall result in invalidation of the final development order and Certificate of Concurrency unless the improvement is completed by the developer within the specified time period.

Sec. 01.505 - County Traffic Data
The Hernando County Engineering Department will maintain and update several types of data including traffic count data, turning movement counts, and signal timings. The Hernando County Planning Department will use this data to maintain the Tier I Report Spreadsheet. The spreadsheet will report roadway characteristics for each segment on the Concurrency Determination Network Map. The County Planning office will also maintain a file of approved LDTA's and DRI reports. The County shall provide information and data, when available to prevent duplication of efforts and unnecessary costs. On segments for which data is not currently available, or as specified during the pre-application conference, it shall be the responsibility of the applicant and/or his engineer to obtain any such data as required by the County Concurrency Manager.

Sec. 01.506 - Trip Generation
Allowable sources for trip generation rates for each land use are listed below.

(a) The trip generation rate and equations contained in the Institute of Transportation Engineers, *Trip Generation*, current edition. The Concurrency Manager shall be consulted on the use of the fitted curve equation if the average trip rate varies significantly from the rates generated from the fitted curve equation.

(b) A site specific trip generation study for a land use not included in the Institute of Transportation Engineers, *Trip Generation*, current edition approved by the County Concurrency Manager at the pre-application conference. The data shall include a summary of traffic count data by 15 minute increments, average daily volume, and volume during the a.m. and p.m. peak hours of the adjacent street, and peak hour of the generator, if different from the a.m. and p.m. peak hours of the adjacent street. Generally the average trip rate from the Institute of Transportation Engineers, *Trip Generation*, current edition shall be used. Trip generation information shall be included within the study in a table format approved or provided by the Concurrency Manager and all data shall be subject to review and approval by the County Concurrency Manager.
Sec. 01.507 - Percent New Trips

(a) For a Major LDTA, 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 or new development. Thus those trips going to or coming from a new development that would have been on the roadway anyway and are included in the trip rate should be deducted from the total trips. Minor LDTAs are required to use the total trips generated by the development.

(b) Allowable sources for the percent new trips factor for each land use are listed below.


2. Percent new trips factor from a previously approved study of a similar land use or a published study as approved by the County Concurrency Manager.

3. A site specific origin/destination survey of an identical or similar land use as approved by the County Concurrency Manager. The origin/destination survey shall collect and present, at a minimum, the following information:
   a. Date;
   b. Location;
   c. Time of interview;
   d. From where did the interviewee trip begin immediately prior to arriving home, work, retail or other;
   e. The city, area or zip code where the trip began;
   f. The nearest intersecting streets closest to the location of where the trip began;
   g. Transportation mode--Car, walk, bike, bus or taxi drop off;
   h. Where the interviewee trip will end immediately upon leaving--Home, work, retail or other;
   i. The nearest intersection streets closest to the final destination;
   j. The location at each origin and destination shall be plotted graphically on a map and the trip lengths calculated;
   k. A minimum of a 150 origin/destination surveys will be collected during at least a 4 hour period which includes the peak hour.
   l. To determine whether the trip is a new trip:
      i) A rectangle shall be drawn on the map in such a manner so as to locate the origin of the trip in one corner and the destination of the trip in the opposite
corner;
ii) If the interview location is outside the rectangle, the trip shall be considered a new trip; and
iii) If the interview site is inside the rectangle, the trip shall not be classified as a new trip; and
m. Copies of the original surveys and maps indicating trip ends shall be submitted as part of the LDTA; all data shall be subject to review and approval of the County Concurrency Manager.

Sec. 01.508. Traffic Distribution and Assignment
(a) The traffic distribution and assignment technique must be presented by the applicant or engineer at the pre-application conference, and reviewed by the Concurrency Manager.
(b) The distribution and assignment of traffic due to the proposed development shall be made in conformity with accepted traffic engineering principles, such as those documented in NCHRP Report 187, "Quick-Response Urban Travel Estimation Techniques and Transferable Parameters-Users Guide," and in accordance with the procedures listed below.
1. For a Major LDTA, use of a gravity model as approved by the Concurrency Manager. The Tampa Bay Regional Planning Model (TBRPM) is recommended.
2. Methods to distribute and assign traffic as approved by the Concurrency Manager.
3. The latest, adopted, Tampa Bay Regional Planning Model is acceptable in determining the trip distribution percentages and trip assignments. The results of the model will be reviewed by Hernando County for reasonableness to ensure the existing and future travel patterns are correctly simulated. Manual trip distribution and assignment may also be acceptable as long as it is reviewed and accepted by the Hernando Concurrency Manager at the pre-application conference and logically replicates the existing and future travel patterns. Traffic distribution may also be based upon a previously approved LDTA within the last two years of a similar land use in the vicinity of the proposed development, subject to the Concurrency Manager's approval.

Sec. 01.509 Intersection Analysis
(a) An operational and safety intersection analysis shall be performed on each major intersection in the study network, currently signalized and those proposed to be
signalized, where the total traffic on the facility consumes 90 percent or more of the adopted Level of Service standard Peak Hour Two-Way Generalized Maximum Service Volume or more than 70 peak hour two way trips on any connecting roadway.

(b) The total traffic shall be the sum of:
1. Existing traffic.
2. Background growth traffic; and
3. Project traffic.

(c) The procedure for performing an intersection analysis shall be based upon the methodology found in the Transportation Research Board, *Highway Capacity Manual*’s current edition. Any questions, issues or methodology other than that referenced in the HCM shall be submitted at the pre-application conference and shall be subject to the review and approval of the Concurrency Manager. The latest version of Highway Capacity Software (HCS) is the preferred software for analyzing the delay and the Level of Service at unsignalized intersections. For all signalized intersections, the latest version of Synchro Software using the percentile delay methodology is required. The electronic copy of the analysis files shall be provided. The hard copy of the summary sheets shall be provided unless otherwise requested by the County.

(d) For each intersection at which the total traffic results in a Level of Service more than one letter grade below the highest adopted Level of Service standard of the intersection roadway segments, the applicant and/or engineer shall be required to do an operational analysis to identify improvements to the intersection for restoring it to at least a Level of Service no worse than one letter grade below the highest adopted Level of Service standard of the roadway segments. For signalized intersections, the existing signal timings shall be used to determine the existing Level of Service and capacity. Any proposed changes to the signal timings, proposals to install signals or changes to roadway geometry will be based on accepted traffic engineering principles and indicated as recommended improvements. The cost of all recommended improvements shall be estimated by a registered professional engineer following the requirements established in the Hernando County Proportionate Fair Share Ordinance. Such recommended improvements must be approved by the County Concurrency Manager and the responsible jurisdiction.

(e) The following information shall be included in the LDTA for each intersection analysis:
1. Printouts and worksheets for all highway capacity analysis performed on the intersections or roadway links;
2. Copies of any traffic counts performed or used in the analysis, including the source of count data;
3. Documentation of any assumptions used in the analysis including trip generation data, if not already specified for the analysis;
4. Turning movement volumes and documentation of methodology used to project existing, background growth and project traffic; and
5. Any other applicable data or information.

Sec. 01.510. Facility Level of Service Analysis

(a) If the total traffic on an impacted roadway segment consumes 90 percent or more of the Adopted Peak Hour Two-Way Maximum Service Volume within the study area or if the project traffic consumes equal to or greater than 3 percent of the Adopted Peak Hour Two-Way Maximum Service Volume or more than 70 peak hour two way trips, a transportation analysis must be performed to determine if the actual roadway segment operating characteristics are such that additional capacity may be available.

(b) The total traffic shall be the sum of:
   1. Existing traffic.
   2. Background growth traffic; and
   3. Project traffic.

(c) The applicant and/or engineer shall submit the methodology and approach for each segment analysis at the pre-application conference. The methodology and approach shall be subject to review and approval by the Concurrency Manager.

(d) The applicable procedures as contained in the Transportation Research Board, *Highway Capacity Manual*, current edition, shall be used to determine the existing Level of Service and available capacity for each road facility under review.
   1. For road facility analysis of Interrupted Flow Arterials and Collectors, the preferred software are:
      a. SYNCHRO (Latest Version)
      b. ART-PLAN (Latest Version)
      c. Other software as approved by the County Concurrency Manager
   2. For road facility analysis of Uninterrupted Flow Arterials and Collectors (more than 3-miles in signal spacing), the preferred software is:
a. HIGHPLAN (Latest Version)

b. Other software as approved by the County Concurrency Manager

3. If any analysis software is used as an alternative to the FDOT's generalized tables, a detailed intersection analysis shall be required. The input data for the software shall be field verified and provided in the report including, but not limited to:

a. Geometry, including lane widths and turn-lane lengths.

b. Heavy vehicle factor unless other approved by the County Concurrency Manager.

c. Directional factor (D Factor).

d. Peak-hour factor (PHF).

e. Existing signal timing and phasing (can be obtained from the County or FDOT). The existing signal timing, including its maximum and minimum settings, shall not be changed. Any timing change outside of the minimum and maximum setting may be presented for County approval as part of the mitigation strategy.

f. Segment lengths.

4. Other parameters that govern the roadway/intersection capacity analysis shall be based on the parameters described in the latest version of the Highway Capacity Manual, and will be subject to the review and approval of the County Concurrency Manager.

(e) Any Maximum Service Volume increase which results in a higher maximum service volume than the Generalized Table Volumes shall be subject to review and approval by the County Concurrency Manager. Once approved, the new Maximum Service Volume shall be utilized for concurrency determination purposes.

(f) Any proposed changes to the signal timings, proposals to install signals or changes to roadway geometry will be based on accepted traffic engineering principles and indicated as recommended improvements. The cost of all recommended improvements shall be estimated by a registered professional engineer following the requirements established in the Hernando County Proportionate Fair Share Ordinance. Such recommended improvements must be approved by the County Concurrency Manager and the responsible jurisdiction.
SECTION 6. Comprehensive Plan Amendment Traffic Study Methodology

Sec. 01.600 – General Requirements
If required, the applicant shall submit 8 printed copies of the Comprehensive Plan Amendment Traffic Study and one digital copy including all raw data and analysis in an organized format as outlined in Sec 01.501. The Comprehensive Plan Amendment Traffic Study shall be prepared, signed, and sealed by a Professional Engineer registered in the State of Florida qualified to perform traffic impact studies. The applicant and/or his engineer shall be required to attend a pre-application conference to discuss methodology and submission requirements, unless otherwise determined not to be necessary by the County Concurrency Manager and County Engineer. The Comprehensive Plan Amendment Traffic Study shall include, but not be limited to, the following information:

(a) The methodology appropriate for the transportation study.
(b) The allowable assumptions including land use and roadway networks.
(c) How the review met each of the study objectives identified below.
(d) Other information as required by the County Concurrency Manager.

Sec. 01.601 – Applicability
A Comprehensive Plan Amendment Traffic Study will be required for all land use plan amendments that consider 10 acres or more of land or small scale plan amendments that are projected to generate over 1,000 daily trips. If the project encompasses 10 acres or more of land, but generates less than 1,000 daily trips, then the applicant may have the option to perform a 5 year concurrency analysis if accepted during the methodology meeting.

Sec. 01.602 – Study Objectives
The objectives of the transportation review of a proposal to change the allowable development intensity are:

(a) To consider the effect of the parcel(s) of land under consideration as setting a precedent for similarly situated land to also be granted similar changes in intensity, and the extent of surrounding lands that might also be granted similar changes in intensity.
(b) To identify the transportation facilities and services needed to serve the “long-term” build-out of the area in which the proposed change is situated to ensure that “short-term” development approvals do not close opportunities for their implementation,
(c) To evaluate the impact that the proposed amendment will have on existing and projected roadway Level of Service.

(d) To identify a transportation solution for the changed intensity that is consistent with Land Development Regulations with respect to transportation corridor alignment and spacing, the need to add lanes to existing or planned arterials, the need for grade-separations and expressways, the need to extend or improve the quality of public transportation service, and provide for bicycle and pedestrian facilities,

(e) To determine the consistency of the transportation solution with the adopted Long Range Transportation Plan of the MPO,

(f) To establish or reconfirm a financial program to provide for the needed solution,

(g) To ensure that roadway corridors of appropriate width and alignment through and adjacent to the site are preserved, in accordance with County’s Comprehensive Plan policies concerning right of way and corridor preservation.

Sec. 01.603. Methodology

Applicants shall complete the Comprehensive Plan Amendment Traffic Study subject to the requirements found in this section and summarized on Table 1: Traffic Study Alternatives and Volumes to be Evaluated.
The forecast volumes shall be based on a review of forecast model volumes from the Tampa Bay Regional Planning Model ... Growth Rates from the Hernando County Annual Concurrency Report. The specific methodology for the development of future

For the 5 Year Analysis, amendment volumes may be capped at a specific intensity level if agreed to by the County Concurrency Manager and County Engineer.

Table 1: Traffic Study Alternatives and Volumes to be Evaluated

<table>
<thead>
<tr>
<th>Alternatives to be Evaluated</th>
<th>Volumes to be Evaluated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Existing traffic volumes from the Hernando County Annual Concurrency Report</td>
</tr>
<tr>
<td></td>
<td>5 Years of Baseline Traffic from Hernando County Annual Concurrency Report</td>
</tr>
<tr>
<td></td>
<td>3 Years of Baseline Traffic from Hernando County Annual Concurrency Report</td>
</tr>
<tr>
<td></td>
<td>Forecast Model Volumes</td>
</tr>
<tr>
<td></td>
<td>(Total Existing Land Use Trip)</td>
</tr>
<tr>
<td></td>
<td>Potential Adjacent Land Use Changes</td>
</tr>
<tr>
<td></td>
<td>(Note 1)</td>
</tr>
<tr>
<td></td>
<td>(Note 2)</td>
</tr>
<tr>
<td></td>
<td>(Note 3)</td>
</tr>
<tr>
<td></td>
<td>(Note 4)</td>
</tr>
<tr>
<td></td>
<td>(Note 5)</td>
</tr>
<tr>
<td></td>
<td>(Note 6)</td>
</tr>
<tr>
<td></td>
<td>(Note 7)</td>
</tr>
</tbody>
</table>

Note 1: Reduced total land use intensities may be used if accepted by the County at the time of the methodology meeting.

Note 2: For the 5 Year Analysis, amendment volumes may be capped at a specific intensity level if agreed to by the County Concurrency Manager and County Engineer.

Note 3: Time horizon of analysis to be provided by the County during the methodology meeting. Reduced total land use intensities may be used if accepted by the County at the time of the methodology meeting.

Note 4: Forecast Long Term Volumes should be higher than existing volumes plus reasonable long term growth rates unless it can be demonstrated that a parallel improvement or change in other land uses results in decreased travel demand at a specific location.

Note 5: Analysis shall include Long-term analysis of the timeframe within which build-out or other agreed impacts of the plan amendment will occur and in which the five year analysis does not include the full impacts of the amendment. The long-term analysis is typically at least 10 years and is consistent with the existing Comprehensive Plan/Long Range Transportation Plan planning horizon.

Note 6: The forecast volumes shall be based on a review of forecast model volumes from the Tampa Bay Regional Planning Model (TBPRM) FSUME model and Historical Growth Rates from the Hernando County Annual Concurrency Report. The specific methodology for the development of future volumes shall be consistent with the build-out timeframe being evaluated and the methodology shall be agreed upon during the pre-application conference and documented in writing as part of the accepted methodology.

Note 7: As needed when deficient segments are identified additional analysis shall be performed that demonstrates that a specific improvement restores the roadway to the adopted standard.
(a) The study technical foundation will be the Hernando County Annual Concurrency Report, Hernando County currently adopted Long Range Transportation Plan and the Tampa Bay Regional Planning Model and related socioeconomic data, as provided by the Hernando County MPO.

(b) Analysis will be based on peak hour two way Maximum Service Volumes. Daily traffic volumes shall also be provided by the Applicant.

(c) The analysis shall include but not limited to the evaluation of the timeframes as documented in Table 1: Traffic Study Alternatives and Volumes to be Evaluated.

(d) Traffic volumes, Maximum Service Volumes, and Levels of Service will be the responsibility of the applicant to develop. Existing data may be used and may include the current approved Annual Concurrency Report, and other sources as may be used with the approval of the Hernando County Concurrency Manager and County Engineer, as appropriate.

(e) Impacted Segments for Comprehensive Plan Amendment Traffic Study will include all segments that meet one or more of the following criteria:
   - within 1 mile of the access connection to the project site
   - any link upon which the project's total site traffic consumes 5 percent or more of the peak hour two way Maximum Service Volume at the adopted Level of Service standard
   - any link where more than 120 peak hour two way trips are added on the following networks:

(f) The Plan Amendment Traffic Analysis will be completed for each of the following scenarios (these scenarios are described in further detail in Table 1: Traffic Study Alternatives and Volumes to be evaluated).

1. For Existing Conditions
2. For the 5 Year Analysis (Note for the 5 Year Analysis, Amendment volumes may be capped at a specific intensity level if agreed to by the County Concurrency Manager and County Engineer)
3. For long term analysis
   a. The Tampa Bay Regional Planning Model and associated socioeconomic data will be used.
   b. The Long Range Transportation Plan socioeconomic data will be updated according to the following:
i. The maximum density or intensity allowed by the proposed land use category, or a reduced land use density or intensity as agreed to by the applicant, or the maximum density or intensity approved by the Hernando County Board of County Commissioners, if less than either of the above.

ii. Updated socioeconomic data will consider the balance between population and employment based on historical and projected future trends.

iii. Other potential adjacent land use changes will be identified and a separate set of socioeconomic data will be created that includes these potential changes.

iv. Additional and updated traffic analysis zones and centroid connectors based on land use changes and network traffic loading

c. The MPO Long Range Transportation Plan Needs and Cost Affordable Plan network number of lanes will be updated based on the projected road system needs required to maintain the Comprehensive Plan adopted Level of Service standards needed to serve the additional traffic resulting from the proposed plan amendment. Additionally, road system area and facility types will be updated as appropriate.

d. The on-site highway network should include the proposed arterial roads, major County collectors, and subdivision collector roads open for public travel through the area of the plan amendment. At the time of site plan approval, the site’s roadway phasing plan will conform to the roadway network developed in this study. Highway network facility coding for on-site roads will be consistent with the intended functional classification of the roadway and consistent with practices used to code roads in the Hernando County portion of the Tampa Bay Regional Planning Model (TBRPM) FSUTMS travel demand model. A map shall be provided illustrating the proposed functional classification of the on-site roadways consistent with the County’s land development regulations for arterial and collector spacing and design standards (e.g. as Arterial, Major County Collector, or Subdivision Collector) to establish the minimum right-of-way width standards. The traffic analysis zone structure discussed previously should provide for realistic loading of this network. The roads in the model should align and provide connections in reasonable scale as indicated in the site development plan.
e. The Tampa Bay Regional Planning Model (TBRPM) FSUTMS travel demand model should be applied in a step-wise fashion, with interaction with County staff. Prior to meeting with County staff to discuss interim and final findings, the complete model files shall be delivered with a technical memorandum or letter summarizing features of the model run, changes from the previous network test, findings, and proposed solutions for consideration in the next iteration. This material should be provided at least two weeks before the meeting with County staff. County staff reserves the right to request select link analyses or other further analysis of model data to assist with finding solutions to congestion.

f. The forecast volumes shall be based on a review of both forecast model volumes from the Tampa Bay Regional Planning Model (TBRPM) FSUTMS model and Historical Growth Rates as provided in the Hernando County Annual Concurrency Report. The specific methodology for the development of future volumes shall be consistent with the build-out timeframe being evaluated and the methodology shall be agreed upon during the pre-application conference and documented in writing as part of the accepted methodology. The following conditions shall be evaluated:
   i. Future Year without amendment
   ii. Future Year with amendment
   iii. Future Year amendment and potential other adjacent land use changes

g. Where the evaluation demonstrates a deficient condition with the inclusion of the amendment traffic, an additional model analysis shall be performed with a specific improvement that restores the roadway segment(s) to the adopted standard.

(g) Trip distribution will require the use of the trip distribution procedures required for a LDTA provided for in Sec. 01.508.

(h) Project traffic generation will be based on ITE Trip Generation Rates computed based on:
   1. The maximum density or intensity allowed by the proposed land use category, or
   2. A reduced land use density or intensity as agreed to by the applicant or
   3. The maximum density or intensity approved by the Hernando County Board of County Commissioners, if less than either 1 or 2 above.

(i) Internal capture and pass-by traffic rates shall be consistent with the procedures of a LDTA as provided for in Sec. 01.507.
(j) A financial analysis will be completed that includes:

1. The capital cost for roadway and multi-modal improvements to the transportation system (e.g. roads, sidewalks, bicycle facilities, transit shelters and facilities), and the annual operating cost for transportation system (e.g. roadway resurfacing, extended transit routes, enhanced transit service, etc.) above and beyond those already included in the County’s Six Year Capital Funding Strategy shall be estimated using procedures consistent with those used in the Comprehensive Plan and the most recent Hernando County Impact Fee Study.

2. The analysis will address and propose needed modifications to the current transportation finance program (e.g. gasoline taxes, sales taxes, transportation impact fees, ad valorem taxes, special assessments, etc.) to provide for the enhanced transportation system needed to support the proposed development intensity and maintain Comprehensive Plan financial feasibility.

(k) Include system-wide statistics that includes summary data on the state of the network such as:

1. Weighted saturation level
2. % Vehicle Miles of Travel Below the Level of Service Standard
3. Lane Miles of roadway below the Level of Service Standard
4. Costs of Improvements
5. Average cost per Vehicle Miles of Travel

(l) Failure by the applicant and/or his engineer to discuss and obtain written resolution for the Comprehensive Plan Amendment Traffic Study may result in disapproval of the Traffic Study or a request for additional information. The approved written traffic methodology, as approved and signed by the Concurrency Manager and County Engineer, shall be included in the Comprehensive Plan Amendment Traffic Study submittal.

(m) Solutions to failing segments, for all analysis planning horizons, will be identified in present day costs.

(n) The minimum stipulated improvements, if applicable, will become a condition of the ordinance adopting the amendment.

(o) The use of a Comprehensive Plan Amendment Traffic Study shall require written approval from the County Concurrency Manager and County Engineer prior to submittal of the Plan Amendment for approval by the Hernando County Board of County Commissioners.
Completion of a Comprehensive Plan Amendment Traffic Study and approval of the Plan Amendment by the Hernando County Board of County Commissioners does not provide for Concurrency approval. At the time of development, the applicant shall obtain Concurrency approval as included in Section 5 of these procedures. Mitigation/improvements may be required as determined through the Concurrency Management System and Proportionate Fair Share Ordinance. Any resulting Development Agreement will require the approval of the Hernando County Board of County Commissioners.

Sec. 01.604. Format of Comprehensive Plan Amendment Traffic Study

(a) The Comprehensive Plan Amendment Traffic Study will:

1. Follow the general outline of a Major Land Development Traffic Assessment.
2. Include a section that demonstrates that the study objectives in Section 01.602 have been met.
3. Include a section that addresses the financial costs and revenues for the improvements needed to support the plan amendments.
4. Include draft development agreements
5. Include maps and tables consistent with those in the County’s Comprehensive Plan Transportation Element.
6. Include draft language for any required comprehensive plan amendments
7. Other items as requested by the County Concurrency Manager.