**RESOLUTION NO. 2006-299**

**A RESOLUTION OF THE BOARD OF COUNTY COMMISSIONERS OF COLLIER COUNTY, FLORIDA, TO RESCIND AND SUPERSEDE RESOLUTION NO. 2003-410 AND TO ADOPT UPDATED STANDARD TRAFFIC IMPACT STATEMENT PROCEDURES AND GUIDELINES FOR THE REVIEW OF PROPOSED DEVELOPMENT IN COLLIER COUNTY.**

**WHEREAS**, the Collier County Land Development Code (LDC) requires that roadways be planned and constructed so as to provide adequate public facilities; and

**WHEREAS**, there are numerous references within the LDC referring to minimum requirements for roadways and streets; and

**WHEREAS**, the Transportation Planning Department's Development Review Section is charged with assuring that all proposed new development will adequately address the roadway needs of Collier County; and

**WHEREAS**, the implementation of a standard format, along with defined criteria for the preparation of Traffic Impact Statements is in the public interest; and

**WHEREAS,** on November 18, 2003, the Board of County Commissioners adopted Resolution No. 2003-410, which set forth Collier County's current Procedures and Guidelines for Traffic Impact Studies; and

**WHEREAS,** the Collier County Planning Commission and the Board of County Commissioners has requested more detailed AM and PM traffic analysis as well as intersection analysis; and

**WHEREAS,** the Transportation Planning Department's Development Review Section has identified improved methods and criteria to provide a more accurate and detailed review of transportation impacts from proposed development.

**NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF COLLIER COUNTY, FLORIDA**, that the Procedures and Guidelines for Traffic Impact Studies set forth in Exhibit "A", attached hereto and made a part hereof, is hereby authorized for implementation and shall be used for the preparation of all Traffic Impact Statements required by the LDC.

**THIS RESOLUTION ADOPTED** after motion, second and majority vote in favor of adoption this 14th day of November, 2006.

ATTEST:
DWIGHT E. BROCK, CLERK

By: _____, D.C.
Deputy Clerk

Attest as to Chairman's signature only.

BOARD OF COUNTY COMMISSIONERS
COLLIER COUNTY, FLORIDA

By: _____
FRANK HALAS, Chairman

Approved as to form
and legal sufficiency:

_____
Jeffrey A. Klatzkow
Assistant County Attorney

# PURPOSE AND APPLICABILITY

The purpose of the traffic impact study (TIS) is to quantify the potential traffic impacts, ensure compliance with the transportation concurrency requirements consistent with the comprehensive plan and identify site related operational deficiencies that impact the health, safety and welfare of the traveling public. The TIS shall also, where applicable, analyze access points, median openings and intersections significantly impacted by the development on the transportation system and develop mitigation strategies to offset the impacts according to the methodologies and provisions as described herein. These guidelines are in addition to the requirements of the access-management regulations and in the event of any conflict between these guidelines and such regulations, the more stringent requirements shall apply. The TIS is required for all applications for:

- **Comprehensive Plan Amendments**
- **All zoning changes including DRIs**
- **Site Development Plans**
- **Subdivisions/Platting**
- **All development applications that produce additional traffic or modifies existing traffic** (Excluding applications for building permits)

## 1. METHODOLOGY STATEMENT

Prior to conducting any study, a methodology statement shall be prepared by the applicant and submitted for review and approval by the County[1]. The purpose of the methodology statement is to establish agreed upon methodologies and assumptions prior to the start of the study. A methodology statement shall be prepared using the guidelines provided in the following paragraphs. The methodology statement will be first reviewed by a County representative, if necessary, through a methodology meeting with the applicant's consultant. The applicant's consultant will then revise the statement based upon agreed methodologies. The applicant shall ensure the consultant does not prepare a traffic study without an approved methodology statement signed by the appropriate County representative. The applicant shall be required to pay the applicable fee with the submittal of the methodology statement and prior to the review of the TIS, the applicant shall pay any additional fees due based on the schedule of fees as set forth in **EXHIBIT "A"**.

## 2. APPLICANT AND REVIEWER QUALIFICATIONS

All Traffic Impact Studies (TIS) are to be prepared by a transportation professional with training and experience in traffic analysis and transportation planning.

All Traffic Impact Studies (TIS) are to be reviewed by staff or consultants of the Collier County Transportation Development Review Team (TDRT) with training and experience in traffic analysis and transportation planning.

[1] Any reference to the "County" in these guidelines shall mean the County or its consultants, contractors, or employees, as applicable.

## 3. REVIEW FEES AND STUDY CLASSIFICATIONS

An applicable consultant review fee in accordance with the schedule set forth in Exhibit A shall be paid to the appropriate County department, along with a minimum of four copies of the TIS and methodology statement. Transportation studies will be classified and considered under the following criteria. The Criteria is meant to be used as a guide but in no way prohibits the county from requiring additional study information on a case by case basis.

### 1. Small Scale Study

(NO SIGNIFICANT OPERATIONAL OR ROADWAY IMPACTS)

**CRITERIA**

- The project generates less than 50 net new total 2-way AM and less than 50 net new total 2-way PM peak hour trips, and
- The access point to the adjacent roadway network does not require modification inside the Right-Of-Way above a standard driveway connection. (No turn lanes or median modifications), and
- The project is a stand alone project and not part of a larger development, and
- If the project uses a shared access point, the addition of the project traffic does not trigger any operational deficiencies or additional work within the right-of-way.

Small scale studies shall provide a trip generation and distribution consistent with the TIS guidelines. The study shall provide this graphically and in a table format. The study shall use the data from the latest County adopted concurrency and AUIR tables to demonstrate that the project will not generate significant impacts, as defined by Section 8 of the TIS Guidelines, on the roadway network and that the project does not directly access a roadway that is currently operating above 110% of the adopted service volume capacity or will exceed 110% of the adopted service capacity with the addition of the proposed project trips. The table shall include the existing roadway capacity, background traffic, trip bank, project trips and subsequent remaining capacity for each impacted segment as stipulated by Section 9 of the TIS Guidelines. For new access points the study shall define the access class if applicable and demonstrate compliance with the access class guidelines. Please refer to EXHIBIT "**Small Scale Study**" as a guideline for this application.

## 2. Minor Study

(NO SIGNIFICANT OPERATIONAL IMPACTS WITH MINIMAL ROADWAY IMPACTS AND WORK WITHIN THE COUNTY RIGHT-OF-WAY)

**CRITERIA**

- The project does not satisfy ALL of the criteria for a Small Scale Study.
- The project generates fewer than 100 net new total 2-way AM or fewer than 100 net new total 2-way PM peak hour trips and less than 2% of adopted LOS service volume on the roadway segment(s) it directly accesses, and
- The access point to the adjacent roadway network may not require modifications inside the right-of-way beyond the scope of turn lanes and median modifications, and
- If the project uses a shared access point and the addition of the project traffic, based on the applicable analysis scenario, does trigger or cause operational deficiencies or require additional work within the right-of-way, and
- The only mitigation required is ingress and egress turn lane(s) and median modifications, and
- No impacted major intersections, as defined by Section 8.b herein, are currently failing or expected to fail with the addition of the project traffic

Minor studies shall provide a trip generation and distribution consistent with the TIS guidelines. The study shall provide this graphically and in a table format. The study shall use the data from the latest County adopted concurrency and AUIR tables to show that the significantly impacted roadway network, as determined by the study trip generation and distribution, has sufficient capacity. The table shall include, as appropriate, the existing roadway capacity, background traffic, trip bank, project trips and subsequent remaining capacity for each impacted roadway as required by Section 9 of the TIS Guidelines. For new access points the study shall define the access class if applicable and demonstrate compliance with the access class guidelines. The study shall provide detailed PM, and when requested AM, analysis and conclusions consistent with this guide, the land development code, and the most recently approved right-of-way ordinance that all modifications in the right-of-way provide safe ingress and egress including but not limited to turn lane analysis. Please refer to the EXHIBITS as referenced throughout this document as a guideline for this submittal.

## 3. Major Study

(SIGNIFICANT ROADWAY AND/OR OPERATIONAL IMPACTS)

**CRITERIA**

- The project does not satisfy ALL of the criteria established for either a Small Scale or Minor Study. (ie. the project generates more than 100 net new total 2-way AM or PM peak hour trips, the project significantly impacts one or more roadway facilities or causes them to become deficient, or the project requires access management improvements and intersection improvements above and beyond turn lanes and/or median modification)

Major studies shall provide a trip generation and distribution consistent with the TIS guidelines. The study shall provide this graphically and in a table format. The study shall determine using the data from the latest County adopted concurrency and AUIR tables whether the significantly impacted roadway network, as determined by the study trip generation and distribution has sufficient capacity. The table shall include the existing roadway capacity, background traffic, trip bank, project trips and subsequent remaining capacity for each impacted roadway as required by Section 9 of the TIS Guidelines. For new access points the study shall define the access class if applicable and demonstrate compliance with the access class guidelines. The study shall provide detailed AM and PM analysis and conclusions consistent with this guide and the most recently approved right-of-way ordinance that all modifications in the right-of-way provide safe ingress and egress including but not limited to turn lane analysis, roadway analysis and intersection analysis. Please refer to the EXHIBITS as referenced throughout this document as a guideline for this submittal. If the Major Study identifies capacity or traffic operations deficiencies, the applicant may elect, by way of their TIS study submittal, to propose mitigation strategies and demonstrate the effectiveness of those strategies at resolving the deficiencies.

## 4. TRIP GENERATION

The trips from/to the site shall be estimated using the latest Institute of Transportation Engineers (ITE) *Trip Generation* publication or other rates as requested and/or approved by the County. An example of trip generation is shown in **Exhibit 4A**. In selecting between Trip Generation Average Rates and Equation, ITE guidelines as depicted in Figure 3.1 page 10 of the ITE *Trip Generation Handbook* should be followed. Figure 3.1 has been reproduced as **Exhibit 4B**. If the county and the applicant cannot agree on an acceptable trip generation, the applicant shall provide a study of three locally similar uses. The study shall be prepared consistent with ITE policies and procedures and must be approved by the county prior to beginning the study.

In order to estimate the net new trips from a project, vested trips and trips from existing use, if any, should be subtracted from the total trip generation potential of the proposed project. Trip reduction for existing land use, however, will be permissible only if the site was operational within the last twelve (12) months and will be determined at the Methodology Meeting.

## 5. INTERNAL CAPTURE

Internal capture is permitted for multi-use developments as defined in Chapter 7 of the ITE *Trip Generation Handbook*. The multi-use developments should typically be between 100,000 to 2 million sq.ft. and should be planned as a single real-estate project. The calculation for internal capture should be done according to the procedure outlined in Chapter 7 of the ITE *Trip Generation Handbook*. **Exhibit 5A** depicts the ITE procedure for internal capture. Alternatively, use the county developed Excel spreadsheet with an example of internal capture for estimating net external trips (the trips at the site driveways). **Exhibits 5B and 5C** depict the county procedure for internal capture. The internal capture trips should be reasonable and **should not exceed 20%** of the total project trips. Internal capture rates higher than 20% shall be adequately substantiated and approved by the County staff.

## 6. PASS-BY CAPTURE

The total gross external trips for retail uses may qualify to be reduced by a pass-by factor to account for the project traffic that is already traveling on the adjacent roadway. As per FDOT's *Site Impact Handbook* page 58, the number of pass-by trips should not exceed 10% of the adjacent street traffic during the peak hour or 25% of the project's external trip generating potential (**Exhibit 6A**). If the ITE Equation Ln(T)= - 0.29Ln(X) + 5.0 (*ITE Trip Generation Handbook, Page 47*) for estimating pass-by capture for Shopping Centers (LUC 820) results in more than 25% pass-by capture, the pass-by rate should be reduced to 25% for the peak hour. The daily capture rate is assumed to be 10% lower than the peak hour capture rate. The entering pass-by trips should be equal to the exiting pass-by trips and in the same direction as the entering pass-by trips i.e. if 20 pass-by trips heading EB entered the project driveway, then 20 pass-by trips should exit the project driveway to go EB. The approved pass-by percentage shall be applied to the total traffic and the resulting number of pass-by trips should be equally split between the inbound and outbound trips. **Exhibit 6B** from ITE *Trip Generation Handbook* (Figure 5.2 Page 32) depicts the application of pass-by trips. In the analysis of the site-access intersections, the pass-by trips shall be included and separately identified.

The following pass-by rates may qualify to be permitted for other land-uses with higher potential for pass-by capture:

- ***50% Pass-By:***
  - Gasoline Stations with and without convenience store (LUC 844, 845)
  - Fast Food Restaurants with Drive-Thru Windows (LUC 834)
  - Pharmacy with and Without Drive-Thru Windows (LUC 880, 881)
  - Convenience Market with and without Gasoline Pumps (LUC 851, 853)
  - Drive-In Bank (LUC 912)
- ***40% Pass-By:***
  - Quality Restaurants and High Turnover Sit-Down Restaurants (LUC 831, 832)

The pass-by rates for all other retail land uses should comply with FDOT's guidelines. Any pass-by rates higher than the above permitted rates shall require justification and prior approval from the County staff.

## 7. TRIP DISTRIBUTION/ASSIGNMENT

The most current version of the appropriate Collier County Model is acceptable in determining the trip distribution percentages and trip assignments. The results of the model will be reviewed by Collier County for reasonableness to ensure the existing and future travel patterns are correctly simulated. Manual trip distribution and assignments may also be acceptable as long as they are reviewed and accepted by Collier County and logically replicate the existing and future travel patterns. This review may take place during the Methodology Meeting if the manual trip distribution has been performed at this juncture. Otherwise, the manual trip distribution must be reviewed and approved by Collier County prior to identification of the Significantly Impacted Roadway Network or other subsequent steps of the TIS process.

The trip distribution shall be shown graphically in both percentages and number of trips. The total project trip distribution and assignment at project driveways and adjacent intersections are different for project sites with and without full access median openings. Therefore, the trip distribution shall also be shown separately for Total Project Trips and the Net New Project trips. The maximum directional project trips on roadway segments shall be highlighted in these figures. **Exhibits 7A** through **7C** provide a sample for trip distribution and assignment.

The trip distribution percentages in the study network should add up. Any mid-block reduction in trip percentages shall be graphically depicted with adequate information and shall be discussed and approved by staff at the methodology meeting.

## 8. SIGNIFICANTLY IMPACTED ROADWAYS/INTERSECTIONS

Significantly impacted roadways and intersections are identified based on the following criteria:

a. The proposed project highest peak hour trip generation (net new total trips) based on the peak hour of the adjacent street traffic will determine the limits of the trip distribution and analysis.

- Trips distributed on links directly accessed by the project where the project traffic by direction is equal to or exceeds 2% of the peak hour service volume for the adopted LOS standard.

- Trips on one link adjacent to the link directly accessed by the project where the project traffic by direction is equal to or greater than 2% the peak hour service volume for the adopted LOS standard.

- Trips on all subsequent links where the project traffic by direction is equal to or greater than 3% the peak hour service volume for the adopted LOS standard.

b. Major intersections (signalized and/or unsignalized intersections of major roadways as determined during methodology meeting) that are part of the significantly impacted roadways, major intersections that are within 1,320 feet of the site access, and all site-access intersections are considered significantly impacted.

c. With the Traffic Study Report, the applicant, on a separate page, shall provide a list and number of the intersections studied for the purpose of establishing the review fee per the fee schedule as outlined in **EXHIBIT "A"**.

d. Any intersection or link which may be adversely impacted as identified by the County at the methodology meeting based on the size and degree of the project that may, at the county's discretion, be included for analysis in the Significantly Impacted Roadway/Intersection Network

# 9. ANALYSIS SCENARIOS and DEFINITIONS:

## Scenarios:

a. **Existing Scenario** is defined as the documentation of existing traffic on the existing significantly impacted roadway network.

b. **Base Scenario** is defined as the analysis of existing traffic, plus background traffic for the estimated build-out year on the E+C (existing plus committed) significantly impacted roadway network.

c. **Proposed Scenario(s)** As defined by Table 9.1 below

### Table 9.1: Proposed Scenario(s) Requirements

Table 9.1

| | Build Out Horizon | Development Trips | Background Traffic (3) | Network Capacities | Incremental Scenarios | Operational Analysis |
|---|---|---|---|---|---|---|
| **Comprehensive Land Use Amendment** | 5 Years or Less | Maximum Allowable (1) | AUIR + Background Growth to Build-Out | 5-year CIE | NO | Methodology Meeting |
| | Over 5 Years | Maximum Allowable (1) | AUIR + Background Growth to Build-Out | 5-year CIE (4) | 5 Year Increments | Methodology Meeting |
| **Re-Zoning (including Conditional Use applications)** | 5 Years or Less (from zoning application) | Maximum Allowable | AUIR + Background Growth to 5-year Horizon | 5-year CIE | NO | Methodology Meeting |
| | Over 5 years | Maximum Allowable | AUIR + Background Growth to Build-Out | 5-year CIE (4) | 5 Year Increments | Methodology Meeting |
| **PUD Re-Zoning** | 5 Years or Less (from zoning application) | Maximum Allowable (2) | AUIR + Background Growth to 5-year Horizon | 5-year CIE | NO | Methodology Meeting |
| | Over 5 years | Maximum Allowable (2) | AUIR + Background Growth Build-Out | 5-year CIE (4) | 5 Year Increments | Methodology Meeting |
| **Site Plan/Subdivision** | 2 Years or Less | Proposed - Current Phase (5) | AUIR | E+C | E+C | Mandatory Per TIS Study Guidlines |
| | Over 2 Years | Proposed - Current Phase (5) | AUIR + Background Growth to Build-Out | E+C | 2 year, 5 Year, Additional 5 Years | Mandatory Per TIS Study Guidlines |

(1) Maximum allowable Trip Generation may be reduced subject to the Methodology Meeting and adoption of corresponding conditional or phasing language in the Land Use Ammendment

(2) Planned Unit Development rezoning may serve to limit the maximum allowable trips over the build-out horizon compared to comparable Zoning

(3) Or as stipulated during methodology meeting

(4) Applicant may be allowed or required to consider additonal roadway networks (ie. Interim Cost Affordable Plan) based on methodology Meeting

(5) The Significantly Impacted Network shall be determined based on the traffic generation and distribution of the current proposed phase.

## Scenario Definitions:

a. **Significantly Impacted Roadway Network:** As defined in Section 8, above.

b. **Network Capacities:** Based on either the E+C network, or in the case of zoning and land use amendments, the existing roadway network + projects fully funded in the 5 year CIE

c. **Build-Out Year:** The year in which that quantity of development considered by the TIS is anticipated to be substantially complete and eligible for Certificate of Occupancy. The build-out year shall be documented in the approved methodology statement.

d. **Background Traffic:** As defined in Section 12, below.

e. **E+C Network:** The E+C network is defined as all the existing roads, plus all the improvements that are funded for construction within the first two years of the local government's or the FDOT's adopted Transportation Improvement Programs for applications requiring a Certificate Of Public Adequacy (COA).

f. **Incremental Scenarios: Future scenarios based on 5 year increments beyond the build-out year.**

# 10. GENERAL ANALYSIS REQUIREMENTS AND SOFTWARE

a. Level of Service (LOS) and turn-lane length analysis (in accordance with the County's access management standards) are required for all significantly impacted intersections described under Section 8.

b. All roadway adopted LOS and corresponding Service Volumes will be taken from the currently adopted AUIR or as agreed during the methodology meeting.

c. Use of the analysis software is allowed in accordance with the following:

(1) The latest version of Highway Capacity Software (HCS) and Synchro software can be used for signalized and unsignalized intersection analysis. For certain complex and saturated traffic conditions, the County may require traffic analysis through SimTraffic or CORSIM.

(2) The electronic copy of the analysis files shall be provided. The hard copy of the summary sheets with sufficient details of the input data and the MOEs (measures of effectiveness) shall be provided unless otherwise requested by the County. (See Sample **Exhibits 1A** and **1B**)

(3) Other analysis software may be used if requested and/or approved by the County.

(4) The input data to the software shall be field verified, where applicable, and provided in the report including, but not limited to:

(a) Existing AM and PM peak hour volumes with geometry, including lane widths and turn-lane storage lengths at intersections (without taper). Similar information should be included for future analysis years. (See Sample **Exhibits 2A** through **2C**)

(b) Traffic factors such as the K, D, and T factors (See Sample **Exhibit 3**). The K factors shall be documented when travel demand forecast volumes are used for developing peak hour segment volumes and intersection turning movement volumes for the analysis year(s). The documentation of K factor, however, will not be required if historic growth rates are used for extrapolating the existing traffic data (segment volumes and intersection turning movement volumes) for the analysis years(s).

(c) Heavy vehicle factor of five percent in the urban area if data is not available. Major Studies outside the urban area will be required to verify the factor if not available from existing sources less than 1 year old. This method will be established at the methodology meeting.

(d) Directional distribution factor (D Factor) from AUIR.

(e) Peak-hour factor (PHF) for the intersections. This value should not be greater than 0.95.

(f) Existing signal timing and phasing (to be obtained from the County with a hard copy provided in the report). The existing signal timing of a signal which is part of a signal system, including its maximum and minimum settings, shall not be changed pursuant to determination of adequate intersection or roadway segment capacity without the prior approval of the County staff.

(5) 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.

## 11. TRAFFIC COUNTS

All counts shall be conducted based on acceptable engineering standards. Raw turning movement counts (TMCs) shall include passenger cars and trucks and shall be provided for all Significantly Impacted intersections as agreed upon at the methodology meeting. Daily directional machine counts (minimum 48 hours) for all Significantly Impacted road segments as deemed necessary by the County staff for operational analysis purposes shall also be provided. If requested by the County, at least one of the daily count locations for each impacted roadway facility will be a vehicle classification count conducted for a minimum of 48 hours. The TMC data shall be summarized in the format similar to the example depicted in **Exhibits 8A** or **8B**. The raw TMCs shall be adjusted using the most recent and appropriate Peak Season Conversion Factors (PSCF) published by FDOT or Collier County. The machine counts shall be adjusted using the most recent PSCF and axle adjustment factors. To the extent that any adjusted machine count volumes indicate lower traffic volumes than those adopted in the current AUIR, these counts shall be discussed with and approved by Collier County prior to use for subsequent components of the TIS. Adjustment factors shall be approved at the methodology meeting.

The intersection turning movement volumes collected in the field indicate the throughput for every individual movement at the intersection and may or may not reflect the demand for the individual movements. If residual queues are observed for any movement at an intersection, the turning movement volume will not reflect the true demand for that movement. Approach counts will be needed for those approaches where the demand is exceeding the capacity and residual queue builds up during the peak hour. The placement of the approach count machine is equally important to measure the demand. The count machines shall be placed at a location where the queues would not extend past the count machines. The locations and need for approach counts will be determined during the methodology meeting or requested as part of a sufficiency review.

The approach volume for the peak hour of the intersection shall be used to develop approach turning movement volumes based on the approach turning movement percentages. This shall be done for approaches with residual queue build-up during peak hours. The approach count machines shall be placed at a location where the queues would not extend past the count machines. In no event, however, should the estimated turning-movement counts be less than the existing field counts. Segment tube counts shall be done concurrently with the intersection turning movement counts where the segment is part of the intersection. The segment machine counts at mid-blocks shall be checked against turning-movement counts at the adjacent intersections. In general, the mid-block counts and turning-movement counts should not be substantially different unless the difference can logically be explained. Approved FDOT or County-maintained counts may be used for verification if they are

less than one year old in the high growth areas. Counts from a similar approved study may be used if the information is less than one (1) year old. New counts will be requested if there are recent improvements to the transportation system that may cause significant traffic diversions. Counts more than one year old from the year of the TIS submittal will not be acceptable unless otherwise approved by Collier County. The counts will be done on Tuesdays, Wednesdays, and Thursdays of a typical work week and are not to be done immediately before, during, or after a major holiday.

## 12. BACKGROUND TRAFFIC GROWTH/FUTURE TRAFFIC

The existing traffic counts shall be increased by a growth factor up to the project's build-out date (shall be reasonably specified) to account for increases in existing traffic due to other approved developments. The build-out year shall be in accordance with table 9.1. The estimation of the background traffic-growth rate and background traffic shall be based on the following:

a. Historical growth rates (minimum of the past three years) may be used in areas where the expected growth is representative of the past growth. (See Sample **Exhibit 9)**

b. The growth/future traffic on committed roads that do not currently exist shall be based on the most appropriate adopted model, as directed by the County staff for each specific application.

c. If the appropriate adopted model as directed by the County staff is used, the traffic growth rate for existing roads shall be based on the growth rate as determined by comparing the most recent, validated year, model volume to the future model volume. The future model volume is determined by applying the project's build-out year, socioeconomic data to the committed network. The build-out year, socioeconomic data may be obtained by interpolating between MPO's or the County's adopted validated year and the adopted interim or future year, socioeconomic data.

d. The socioeconomic data of the model shall reasonably represent, if appropriate, the recently approved developments in the vicinity of the project as approved by the County during the methodology process. At a minimum, the build-out year socioeconomic data is to consider development approvals (DRIs, Planned Unit Developments or major rezonings) that may not be included in the model, a minimum of ten miles from the project boundary. It will be the responsibility of the Applicant to review and prepare the amended data set unless otherwise available from the County.

e. The TIS will consider all vested development on the significantly impacted links and intersections. This information shall be obtained from the County and agreed upon at the methodology meeting.

f. Minimum, annual growth rates in all cases shall be two percent, unless otherwise approved by the County.

g. The assumed growth rate and method of calculation for each impacted roadway segment shall be presented in a table.

h. Development of the future intersection turning movement count shall be adequately documented. (See Sample **Exhibit 10)**

## 13. APPLICABLE STANDARDS

a. The LOS standards for all major road segments shall be consistent with the letter standards per the County's latest adopted concurrency tables in the Annual Update and Inventory Report (AUIR).

b. Although it is acknowledged that Collier County does not have an adopted LOS concurrency standard for intersections of major roadways, the performance of intersections on the network is critical to maintaining the adopted LOS on the adjacent segments. As such, the operating LOS of significantly impacted intersections (the intersections as a whole, as well as individual movements) may be evaluated in the TIS using appropriate indicators such as volume to capacity ratio (V/C), delay, and ICU (Intersection Capacity Utilization), with respect to the identification of any appropriate solutions or mitigation measures for the Existing, Base, and Future Scenarios.

c. The delay for individual turning-movements and through-movements may exceed the segment standard by one letter grade, but not below LOS "E", provided that the volume/capacity (v/c) ratio for the subject movement remains less than or equal to one. Average control delays up to 100 seconds are acceptable for individual turning movements and through movements where the corresponding v/c ratio is less than 0.8.

d. All other design and traffic operations standards as specified in the Land Development Regulations, Right-of-Way Handbook, Access Management resolution and other applicable County ordinances.

## 14. INVENTORY OF THE EXISTING AND FUTURE CONDITIONS

The following additional information may be required:

a. The Horizon (Build-Out) year of the project must be a reasonable date and in accordance with table 9.1.

b. Tabular presentation of the LOS standard of all the existing significantly impacted roadways and tabular presentation of the LOS standard for the significantly impacted segments with committed roadway improvements.

c. Graphical presentation of the existing and E+C link and intersection geometry with storage lengths for turn lanes, speed limits and traffic control devices. (Sample **Exhibits 2A through 2C**)

d. Tabular presentation of the date(s) of the traffic data collection and the appropriate peak season and axle adjustment factors used for adjusting the raw traffic counts. (Sample **Exhibit 3**)

e. Graphical presentation of the existing link AADTs, directional peak hour volumes for the links, and peak hour turning movement volumes at the intersections. (Sample **Exhibits 2A through 2C**)

f. Tabular presentation of the approved traffic factors (K, D, T) for the roadway segments within the study area. (Sample **Exhibit 3**)

g. Graphical presentation of the project's proposed access locations, types, and internal roads with connections to the County's build-out or long-range plan of roadways. The graphic shall also cover the area beyond the boundary of the project to include all the external, major roadways and existing or future, access points and types of developments surrounding the project as agreed upon at the methodology meeting.

h. Pavement marking plans/concept plans of roadways that provide direct access to the project and have completed or are undergoing design or route study phase, if available.

i. Graphical presentation of total (adjusted for internal capture, if any) and net new project traffic distribution both in percentages and number of project trips. (Sample **Exhibits 7B** and **7C**)

~~j.~~ The trip distribution percentages in the study network should add up. Any mid-block reduction in trip percentages shall be graphically depicted with adequate information.

## 15. PHASED DEVELOPMENTS

The traffic-generation estimate shall consider the total traffic generation of the cumulative development (including traffic from previously developed or approved phases) for purposes of operational analysis. For purposes of evaluating mitigation needs, only the impacts of the traffic above and beyond the traffic from the previously developed uses or prior approved phases (where mitigation is already accomplished in accordance with the TIS guidelines) need to be considered.

## 16. FREEWAY/INTERSTATE IMPACTS

Traffic studies will not be required to analyze the traffic impacts on interstate/freeways except at interchanges. Interchange analysis shall include analysis of exit ramp storage capacity, as would be the case with any intersection analysis, pursuant to maintaining safe operating conditions on the limited access facility

## 17. EQUAL MITIGATION FOR OPERATIONAL IMPACTS

Operational impacts of the development project traffic will have to be mitigated for intersections failing to achieve acceptable levels of service (as outlined under the APPLICABLE STANDARDS section). To mitigate the impact of the development traffic, a concept called equal mitigation will be used except as otherwise required by the Board of County Commissioners (BCC). Equal mitigation shall mean the implementation of an improvement that, at minimum, results in the reduction of delay per vehicle on each lane group at deficient intersections prior to the addition of the development traffic. Equal mitigation will apply to improvements such as extending existing turn-lane lengths at intersections but will require delay estimation through traffic simulation. Other improvements such as installation of hard-wire signal coordination and installation of real-time demand responsive signal coordination system such as SCOOT or equivalent intelligent traffic management systems (ITMS) may also be acceptable if approved by the County staff.

Acceptable mitigation improvements will offset the impacts of the development without adversely impacting the below-standard movements as measured by capacity and delay, and as further described below.

Improvements will be deemed acceptable if capacity is added (through the addition of general purpose through-lanes, auxiliary turn-lanes, or ITMS options that are accepted by Collier County) that restores or improves the delay and V/C ratio to the level it was in the "base scenario."

The developer shall only be responsible for the equal mitigation improvement; however, for informational purposes only, if equal mitigation improvements are identified at any deficient location(s) that would result in delay being reduced to the "base scenario" but not to the acceptable LOS, then additional improvements that may be needed to bring the entire deficient location(s) back to the LOS standard, shall also be identified and reported separately. For example, an existing intersection is operating at LOS F with 120 seconds of delay per vehicle. After adding the project trips, the delay increases to 140 sec/veh. Providing a second left-turn lane reduces the overall delay to 120 sec/veh but the intersection is still operating at LOS F. The applicant will only be responsible for providing a second left-turn lane which brings down the intersection delay to the original level. If the left-turn improvement reduces the overall delay from 140 sec/veh to 100 sec/veh, the applicant will be required to pay only 50% of the cost of the left-turn lane improvement. However, the intersection still failing and the applicant will need to identify other improvements that would be

required to achieve an acceptable LOS E with a delay of less than 80 sec/veh.

The design and construction of any mitigation improvements shall be in accordance with Collier County or FDOT standards, as applicable.

The analysis of intersections to demonstrate the adequacy of an improvement to achieve equal mitigation must be based on a consistent traffic-signal timing strategy and must follow the steps below:

a. Analyze the "base scenario" condition which would include the existing traffic plus the background traffic on an E+C network for the analysis year. For this scenario, the existing timing plan is required. If the signal operates as an isolated intersection, optimization of cycle length, phasing, and splits can be performed. However, **if the signal is part of a signal system, any modifications or adjustments must be highlighted and approved by the county before finalizing the analysis and submitting the TIS.** The choice of signal-timing methodology in this step must be carried consistently into the next step. From the analysis, an overall Intersection Signal Delay and an Intersection Capacity Utilization are reported by *Synchro*.

b. The next analysis is to evaluate the total future traffic (background plus project traffic) on E+C network (future scenario). **For this analysis, the signal timing plan in Paragraph 17.a may be optimized by *Synchro***. If the LOS standard is met, no further analysis is required. If the LOS standard is not met, further analysis to identify appropriate mitigation is required.

c. The next analysis is to evaluate total future traffic on an improved intersection concept (future scenario with mitigation). The same signal-timing strategy used in Paragraph 17.a is required. If the overall Intersection Signal Delay and the Intersection Capacity Utilization are equal or less than in Paragraph No. 17.a, the improvement is considered to be adequate to offset the impacts of the development.

d. Any changes to existing conditions, including traffic-signal timing or phasing changes shall be noted and **highlighted** in the conclusions of the report.

e. If the developer presents evidence acceptable to the Transportation Administrator or designee that the required equal mitigation improvements are not feasible in relation to the development proposed, mitigation strategies at alternative location(s), other than the primary location(s), may be proposed and may be accepted if approved by the Transportation Administrator or designee. At minimum, the improvements shall meet the following criteria:

   (1) The location(s) must be within the impacted area and must be at or near deficiency.

   (2) The improvement must be other than simply a signal-timing or phasing change.

   (3) Mitigation must, at the minimum, improve the overall vehicle-hours of delay, intersection-capacity utilization, and/or speed of the alternative location(s) by the equivalent amount of the reduced vehicle-hours of delay, intersection-capacity utilization, and/or speed at the primary location(s).

   (4) The improvements must not already be, or in the process of being condition of approval of another development.

   (5) All the applicable analysis requirements for the primary location(s) shall apply to the analysis of alternate location(s).

## 18. ALTERNATIVE MITIGATION FOR OPERATIONAL IMPACTS

An applicant may request alternative mitigation in the local area when equal mitigation fails to completely offset the impact of the development. Alternative mitigation recognizes that in certain situations it may be a benefit to the county and the traveling public to allow for additional forms of mitigation to be incorporated within the review and approval of new development and the redevelopment of existing property. The following items may be considered and approved by the Transportation Administrator or designee in conjunction with or as an alternative to equal mitigations as defined above:

a. Donation of right-of-way for future improvements.
b. Payments of an additional roadway impact fees set to fund future improvements.
c. Installation and/or purchase of Intelligent Traffic Management Systems (ITMS) approved by the county.
d. Participation in various forms of alternative transportation including but not limited to: the inclusion of a park and ride site into the development, the inclusion of public transit shelters, the purchase of a public transit vehicle and maintenance on an existing or new route.
e. Commuter subsidies.
f. Pedestrian connections.
g. Interconnections with existing developments.
h. Area wide system improvements to adjacent intersections and roadways that improve the level of service above and beyond the impacts of the proposed project.

## 19. FAIR-SHARE MITIGATION

If the developer presents evidence acceptable to the Transportation Administrator or designee that the required equal mitigation is not cost feasible in relation to the development proposal, the developer may propose fair-share mitigation which must be approved by the Transportation Administrator or designee.

The fair-share payment shall be calculated as follows:

a. Identify all the needed improvements to bring all deficient locations back to the LOS standard.

b. Submit a signed and sealed cost estimate of the required improvements as approved by the County. The estimate will include all costs associated with the completion of the improvement from concept to finished product.

c. Calculate the fair-share cost of those improvements per the following formula:

***For Intersection Improvements***

A = MOE for Base Scenario (Background Traffic with E+C network)

B = MOE for Total Traffic (Background plus Project Traffic) without Improvements

C = MOE for Total Traffic (Background plus Project Traffic) with Improvements

D = Cost of Improvement

$$\text{Fair Share} = \frac{\text{[Change in MOE from A to C]}}{\text{[Change in MOE from B to C]}} \text{ x Total Cost of Improvements [D]}$$

For example, if A = 120 sec/veh delay; B = 140 sec/veh delay; C = 100 sec/veh delay

$$\text{Fair Share} = \frac{A - C = 120 - 100 = 20}{B - C = 140 - 100 = 40} \text{ x Total Cost of Improvements [D]}$$

## 20. Construction Traffic

Any development (minor and major) anticipated to produce construction traffic that would significantly affect the flow of traffic on adjacent roadways shall provide mitigation measures if requested by the County. The County reserves the right to make this determination and the applicant shall be responsible for providing details of the anticipated construction traffic volumes, hours of operations, and proposed mitigation measures and obtain approval from the County. At the County's discretion, the County may require all off site operational improvements identified and approved in the TIS to be in place prior to any on site construction.

# EXHIBIT A

Collier County
Traffic Impact Study Review Fee Schedule

Fees will be paid incrementally as the development proceeds: Methodology Review, Analysis Review, and Sufficiency Reviews. Fees for additional meetings or other optional services are also provided below.

**Methodology Review - $500 Fee**

Methodology Review includes review of a submitted methodology statement, including review of submitted trip generation estimate(s), distribution, assignment, and review of a "Small Scale Study" determination, written approval/comments on a proposed methodology statement, and written confirmation of a re-submitted, amended methodology statement, and one meeting in Collier County, if needed.

**"Small Scale Study" Review - No Additional Fee (Includes one sufficiency review)**

Upon approval of the methodology review, the applicant may submit the study. The review includes: a concurrency determination, site access inspection and confirmation of the study compliance with trip generation, distribution and maximum threshold compliance.

**"Minor Study Review" - $750 Fee (Includes one sufficiency review)**

Review of the submitted traffic analysis includes: optional field visit to site, confirmation of trip generation, distribution, and assignment, concurrency determination, confirmation of committed improvements, review of traffic volume data collected/assembled, review of off-site improvements within the right-of-way, review of site access and circulation, and preparation and review of "sufficiency" comments/questions.

**"Major Study Review" - $1,500 Fee (Includes two intersection analysis and two sufficiency reviews)**

Review of the submitted traffic analysis includes: field visit to site, confirmation of trip generation, special trip generation and/or trip length study, distribution and assignment, concurrency determination, confirmation of committed improvements, review of traffic volume data collected/assembled, review of traffic growth analysis, review of off-site roadway operations and capacity analysis, review of site access and circulation, neighborhood traffic intrusion issues, any necessary improvement proposals and associated cost estimates, and preparation and review of up to two rounds of "sufficiency" comments/questions and/or recommended conditions of approval.

**"Additional intersection Review" - $500 Fee**

The review of additional intersections shall include the same parameters as outlined in the "Major Study Review" and shall apply to each intersection above the first two intersections included in the "Major Study Review"

**"Additional Sufficiency Reviews" - $500 Fee)**

Additional sufficiency reviews beyond those initially included in the appropriate study shall require the additional Fee prior to the completion of the review.

**Other Miscellaneous Services:**

Additional optional services, if necessary, will be provided per the schedule below

**Optional Services:**

1. Attend review meetings in Collier County outside of the office $300
2. Attend public meetings $600

# SAMPLE EXHIBITS

# Exhibit 1A: Sample Synchro 6 Report (3 pages)

Lanes, Volumes, Timings

4: Univ Pkwy & US 41

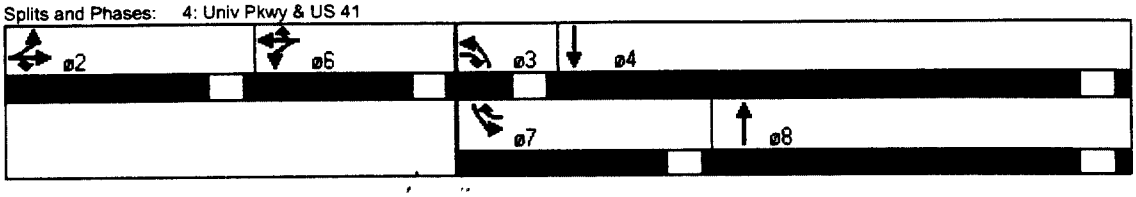
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Leading Detector (ft) | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | | 50 | 50 | |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 | 0.97 | 0.95 | 0.95 |
| Frt | | | 0.850 | | | 0.850 | | 0.961 | | | 0.995 | |
| Flt Protected | 0.950 | | | 0.950 | 0.966 | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1681 | 1709 | 1583 | 1770 | 3401 | 0 | 3433 | 3522 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | 0.966 | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 1863 | 1583 | 1681 | 1709 | 1583 | 1770 | 3401 | 0 | 3433 | 3522 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 9 | | | 286 | | 36 | | | 4 | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Link Speed (mph) | | 30 | | | 45 | | | 45 | | | 45 | |
| Link Distance (ft) | | 682 | | | 738 | | | 985 | | | 875 | |
| Travel Time (s) | | 15.5 | | | 11.2 | | | 14.9 | | | 13.3 | |
| Volume (vph) | 52 | 75 | 19 | 482 | 85 | 836 | 25 | 1048 | 364 | 945 | 1772 | 66 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 52 | 75 | 19 | 482 | 85 | 836 | 25 | 1048 | 364 | 945 | 1772 | 66 |
| Lane Group Flow (vph) | 52 | 75 | 19 | 276 | 291 | 836 | 25 | 1412 | 0 | 945 | 1838 | 0 |
| Turn Type | Split | | pt+ov | Split | | pt+ov | Prot | | | Prot | | |
| Protected Phases | 2 | 2 | 2 3 | 6 | 6 | 6 7 | 3 | 8 | | 7 | 4 | |
| Permitted Phases | | | | | | | | | | | | |
| Detector Phases | 2 | 2 | 2 3 | 6 | 6 | 6 7 | 3 | 8 | | 7 | 4 | |
| Minimum Initial (s) | 7.0 | 7.0 | | 10.0 | 10.0 | | 7.0 | 20.0 | | 7.0 | 20.0 | |
| Minimum Split (s) | 31.0 | 31.0 | | 26.0 | 26.0 | | 13.0 | 41.7 | | 13.0 | 41.7 | |
| Total Split (s) | 32.0 | 32.0 | 45.0 | 26.0 | 26.0 | 59.0 | 13.0 | 54.0 | 0.0 | 33.0 | 74.0 | 0.0 |
| Total Split (%) | 22.1% | 22.1% | 31.0% | 17.9% | 17.9% | 40.7% | 9.0% | 37.2% | 0.0% | 22.8% | 51.0% | 0.0% |
| Maximum Green (s) | 26.0 | 26.0 | | 20.0 | 20.0 | | 7.0 | 47.3 | | 27.0 | 67.3 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| All-Red Time (s) | 1.5 | 1.5 | | 1.5 | 1.5 | | 1.5 | 2.2 | | 1.5 | 2.2 | |
| Lead/Lag | | | | | | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | Yes | Yes | | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | Min | Min | | Min | Min | | None | None | | None | None | |
| Walk Time (s) | 7.0 | 7.0 | | | | | | 7.0 | | | 7.0 | |
| Flash Dont Walk (s) | 18.0 | 18.0 | | | | | | 28.0 | | | 28.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | | | | | 0 | | | 0 | |
| Act Effct Green (s) | 12.6 | 12.6 | 21.8 | 22.0 | 22.0 | 55.0 | 9.0 | 50.0 | | 29.0 | 75.3 | |
| Actuated g/C Ratio | 0.10 | 0.10 | 0.16 | 0.17 | 0.17 | 0.42 | 0.07 | 0.39 | | 0.22 | 0.58 | |
| v/c Ratio | 0.30 | 0.41 | 0.07 | 0.97 | 1.00 | 1.00 | 0.21 | 1.06 | | 1.23 | 0.90 | |
| Control Delay | 58.8 | 61.8 | 18.7 | 99.2 | 107.6 | 56.2 | 63.2 | 79.6 | | 157.4 | 32.5 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 58.8 | 61.8 | 18.7 | 99.2 | 107.6 | 56.2 | 63.2 | 79.6 | | 157.4 | 32.5 | |
| LOS | E | E | B | F | F | E | E | E | | F | C | |
| Approach Delay | | 55.1 | | | 75.3 | | | 79.3 | | | 74.9 | |
| Approach LOS | | E | | | E | | | E | | | E | |
| Queue Length 50th (ft) | 41 | 60 | 5 | 245 | ~261 | 530 | 20 | ~673 | | ~504 | 750 | |
| Queue Length 95th (ft) | 84 | 111 | 21 | #451 | #478 | #868 | 52 | #859 | | #663 | #1008 | |
| Internal Link Dist (ft) | | 602 | | | 658 | | | 905 | | | 795 | |
| Turn Bay Length (ft) | | | | | | | | | | | | |
| Base Capacity (vph) | 342 | 360 | 398 | 285 | 290 | 836 | 118 | 1333 | | 768 | 2048 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 0.15 | 0.21 | 0.05 | 0.97 | 1.00 | 1.00 | 0.21 | 1.06 | | 1.23 | 0.90 | |

**Intersection Summary**

Area Type: Other
Cycle Length: 145
Actuated Cycle Length: 129.7
Natural Cycle: 145
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.23
Intersection Signal Delay: 75.6 Intersection LOS: E
Intersection Capacity Utilization 108.2% ICU Level of Service G
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Univ Pkwy & US 41



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 54 | 2282 | 11 | 63 | 2599 | 111 | 5 | 0 | 47 | 30 | 0 | 21 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 54 | 2282 | 11 | 63 | 2599 | 111 | 5 | 0 | 47 | 30 | 0 | 21 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 2710 | | | 2293 | | | 3409 | 5232 | 766 | 3696 | 5182 | 922 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 2710 | | | 2293 | | | 3409 | 5232 | 766 | 3696 | 5182 | 922 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.5 | 6.5 | 6.9 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 63 | | | 71 | | | 0 | 100 | 86 | 0 | 100 | 92 |
| cM capacity (veh/h) | 148 | | | 217 | | | 1 | 0 | 345 | 1 | 0 | 272 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | EB 4 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|---|---|---|---|
| Volume Total | 54 | 913 | 913 | 467 | 63 | 1040 | 1040 | 631 | 52 | 51 |
| Volume Left | 54 | 0 | 0 | 0 | 63 | 0 | 0 | 0 | 5 | 30 |
| Volume Right | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 111 | 47 | 21 |
| cSH | 148 | 1700 | 1700 | 1700 | 217 | 1700 | 1700 | 1700 | 15 | 1 |
| Volume to Capacity | 0.37 | 0.54 | 0.54 | 0.27 | 0.29 | 0.61 | 0.61 | 0.37 | 3.56 | 37.33 |
| Queue Length 95th (ft) | 38 | 0 | 0 | 0 | 29 | 0 | 0 | 0 | Err | Err |
| Control Delay (s) | 42.7 | 0.0 | 0.0 | 0.0 | 28.3 | 0.0 | 0.0 | 0.0 | Err | Err |
| Lane LOS | E | | | | D | | | | F | F |
| Approach Delay (s) | 1.0 | | | | 0.6 | | | | Err | Err |
| Approach LOS | | | | | | | | | F | F |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 198.0 | | | |
| Intersection Capacity Utilization | 69.0% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |

Exhibit 1B: Sample HCS Report



# SHORT REPORT

| General Information | | Site Information | |
|---|---|---|---|
| Analyst | | Intersection | Univ Pkwy & US 41 |
| Agency or Co. | 2005AM_Existing Conditions | Area Type | All other areas |
| Date Performed | 12/29/2005 | Jurisdiction | |
| Time Period | 5:00 pm | Analysis Year | |

## Volume and Timing Input

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT |
| Num. of Lanes | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 2 | 2 | 0 |
| Lane group | L | T | R | L | LT | R | L | TR | | L | TR | |
| Volume (vph) | 52 | 75 | 19 | 482 | 85 | 836 | 25 | 1048 | 364 | 945 | 1772 | 66 |
| % Heavy veh | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Actuated (P/A) | A | A | A | A | A | A | A | A | A | A | A | A |
| Startup lost time | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Ext. eff. green | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.7 | | 4.0 | 4.7 | |
| Arrival type | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | 3 | 3 | |
| Unit Extension | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Ped/Bike/RTOR Volume | 0 | 0 | 8 | 0 | | 167 | 0 | 0 | 22 | 0 | 0 | 2 |
| Lane Width | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | | 12.0 | 12.0 | |
| Parking/Grade/Parking | N | 0 | N | N | 0 | N | N | 0 | N | N | 0 | N |
| Parking/hr | | | | | | | | | | | | |
| Bus stops/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Unit Extension | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |

| Phasing | EB Only | WB Only | 03 | 04 | Excl. Left | SB Only | Thru & RT | 08 |
|---|---|---|---|---|---|---|---|---|
| Timing | G = 10.6 | G = 20.0 | G = | G = | G = 4.1 | G = 16.9 | G = 49.7 | G = |
| | Y = 6 | Y = 6 | Y = | Y = | Y = 6 | Y = 6 | Y = 6.7 | Y = |

Duration of Analysis (hrs) = 0.25 | Cycle Length C = 132.0

## Lane Group Capacity, Control Delay, and LOS Determination

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adj. flow rate | 55 | 79 | 12 | 289 | 307 | 704 | 26 | 1463 | | 995 | 1932 | |
| Lane group cap. | 169 | 178 | 224 | 295 | 300 | 660 | 82 | 1356 | | 755 | 2013 | |
| v/c ratio | 0.33 | 0.44 | 0.05 | 0.98 | 1.02 | 1.07 | 0.32 | 1.08 | | 1.32 | 0.96 | |
| Green ratio | 0.10 | 0.10 | 0.14 | 0.17 | 0.17 | 0.42 | 0.05 | 0.40 | | 0.22 | 0.57 | |
| Unif. delay d1 | 55.7 | 56.4 | 49.0 | 54.8 | 55.0 | 38.5 | 60.9 | 39.8 | | 51.5 | 26.9 | |
| Delay factor k | 0.11 | 0.11 | 0.11 | 0.48 | 0.50 | 0.50 | 0.11 | 0.50 | | 0.50 | 0.47 | |
| Increm. delay d2 | 1.1 | 1.8 | 0.1 | 46.7 | 58.1 | 54.2 | 2.2 | 48.7 | | 152.3 | 12.0 | |
| PF factor | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | | 1.000 | 1.000 | |
| Control delay | 56.9 | 58.2 | 49.1 | 101.4 | 113.1 | 92.7 | 63.2 | 88.5 | | 203.8 | 38.9 | |
| Lane group LOS | E | E | D | F | F | F | E | F | | F | D | |
| Apprch. delay | 56.9 | | | 99.4 | | | 88.1 | | | 95.0 | | |
| Approach LOS | E | | | F | | | F | | | F | | |
| Intersec. delay | 93.3 | | | Intersection LOS | | | | | | F | | |

## BACK-OF-QUEUE WORKSHEET

### General Information

Project Description

### Average Back of Queue

| | EB | | | WB | | | NB | | | SB | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT |
| Lane group | *L* | *T* | *R* | *L* | *LT* | *R* | *L* | *TR* | | *L* | *TR* | |
| Init. queue/lane | *0.0* | *0.0* | *0.0* | *0.0* | *0.0* | *0.0* | *0.0* | *0.0* | | *0.0* | *0.0* | |
| Flow rate/lane | *55* | *79* | *12* | *289* | *307* | *704* | *26* | *1463* | | *995* | *1932* | |
| Satflow per lane | *1770* | *1863* | *1583* | *1770* | *1799* | *1583* | *1770* | *1794* | | *1770* | *1852* | |
| Capacity/lane | *169* | *178* | *224* | *295* | *300* | *660* | *82* | *1356* | | *755* | *2013* | |
| Flow ratio | *0.03* | *0.04* | *0.01* | *0.16* | *0.17* | *0.44* | *0.01* | *0.43* | | *0.29* | *0.55* | |
| v/c ratio | *0.33* | *0.44* | *0.05* | *0.98* | *1.02* | *1.07* | *0.32* | *1.08* | | *1.32* | *0.96* | |
| I factor | *1.000* | *1.000* | *1.000* | *1.000* | *1.000* | *1.000* | *1.000* | *1.000* | | *1.000* | *1.000* | |
| Arrival type | *3* | *3* | *3* | *3* | *3* | *3* | *3* | *3* | | *3* | *3* | |
| Platoon ratio | *1.00* | *1.00* | *1.00* | *1.00* | *1.00* | *1.00* | *1.00* | *1.00* | | *1.00* | *1.00* | |
| PF factor | *1.00* | *1.00* | *1.00* | *1.00* | *1.00* | *1.00* | *1.00* | *1.00* | | *1.00* | *1.00* | |
| $Q_1$ | *1.9* | *2.7* | *0.4* | *10.6* | *11.3* | *25.8* | *0.9* | *28.2* | | *18.8* | *35.3* | |
| $k_B$ | *0.3* | *0.3* | *0.4* | *0.4* | *0.4* | *0.7* | *0.2* | *0.7* | | *0.5* | *0.9* | |
| $Q_2$ | *0.1* | *0.2* | *0.0* | *3.5* | *4.5* | *10.9* | *0.1* | *12.5* | | *17.3* | *8.3* | |
| Q avg. | *2.0* | *3.0* | *0.4* | *14.1* | *15.7* | *36.8* | *1.0* | *40.6* | | *36.1* | *43.6* | |
| **Percentile Back of Queue (95th percentile)** | | | | | | | | | | | | |
| $f_{B\%}$ | *2.0* | *2.0* | *2.1* | *1.8* | *1.8* | *1.6* | *2.1* | *1.6* | | *1.6* | *1.6* | |
| BOQ, Q% | *4.1* | *6.0* | *0.8* | *25.0* | *27.5* | *58.0* | *2.1* | *63.5* | | *57.1* | *67.7* | |
| **Queue Storage Ratio** | | | | | | | | | | | | |
| Q spacing | *25.0* | *25.0* | *25.0* | *25.0* | *25.0* | *25.0* | *25.0* | *25.0* | | *25.0* | *25.0* | |
| Q storage | *50* | *0* | *0* | *0* | *0* | *0* | *300* | *0* | | *650* | *0* | |
| Avg. $R_Q$ | *1.0* | | | | | | *0.1* | | | *1.4* | | |
| 95% $R_{Q\%}$ | *2.1* | | | | | | *0.2* | | | *2.2* | | |

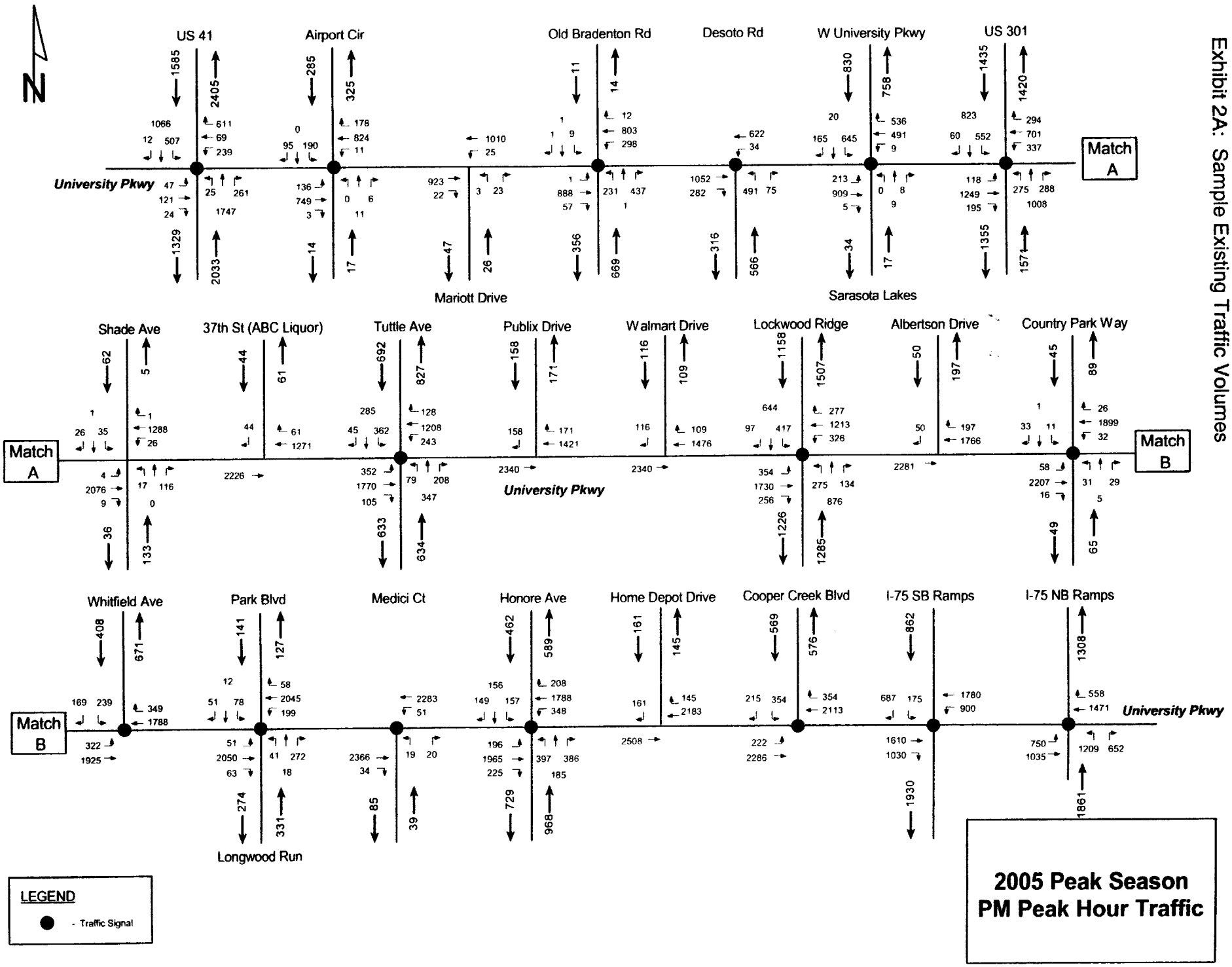


Exhibit 2A: Sample Existing Traffic Volumes
N
US 41
Airport Cir
Old Bradenton Rd
Desoto Rd
W University Pkwy
US 301
Match A
University Pkwy
Mariott Drive
Sarasota Lakes
Shade Ave
37th St (ABC Liquor)
Tuttle Ave
Publix Drive
Walmart Drive
Lockwood Ridge
Albertson Drive
Country Park Way
Match A
Match B
University Pkwy
Whitfield Ave
Park Blvd
Medici Ct
Honore Ave
Home Depot Drive
Cooper Creek Blvd
I-75 SB Ramps
I-75 NB Ramps
Match B
University Pkwy
Longwood Run
LEGEND
- Traffic Signal
2005 Peak Season
PM Peak Hour Traffic

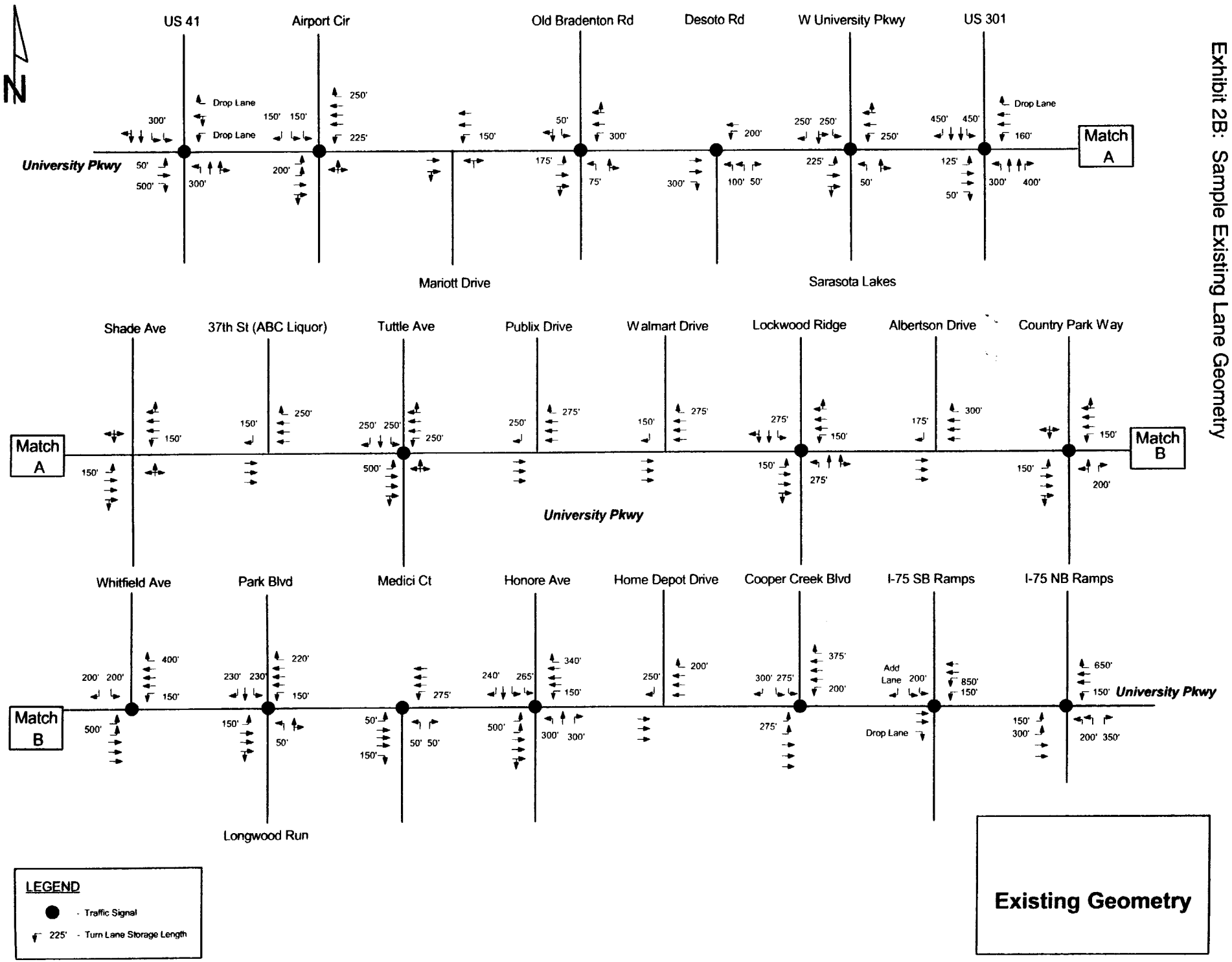



Exhibit 2B: Sample Existing Lane Geometry

Exhibit 2C: Sample Existing Traffic Volumes and Lane Geometry

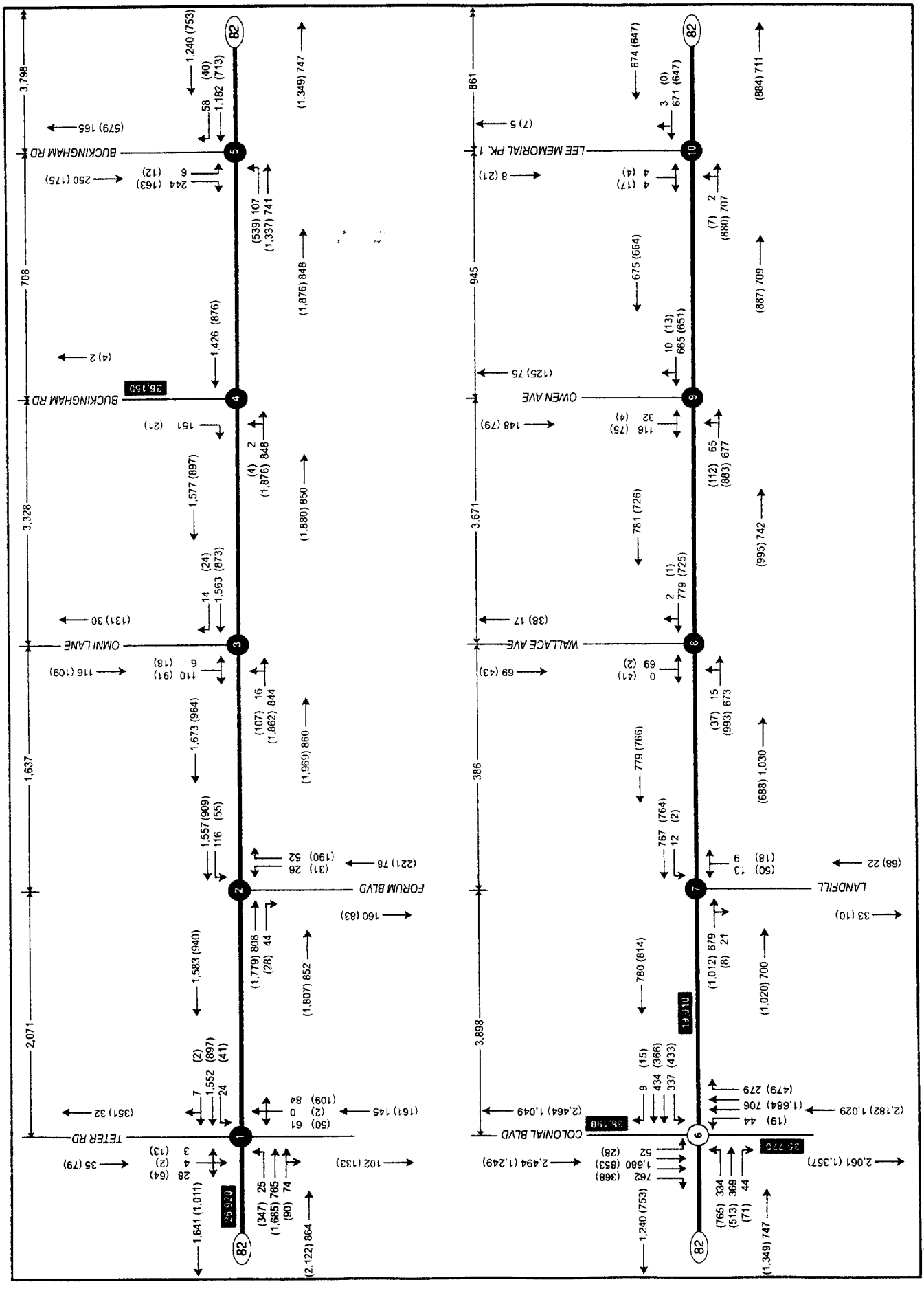


Exhibit 3: Sample Design Traffic Factors

# BLE 2.ADOPTED TRAFFIC FACTORS

## SR 82 Corridor Access Management Plan

| Description | | Factors | Time Period | | | |
|---|---|---|---|---|---|---|
| | | | 5/2/2004 - 5/8/2004 | 5/9/2004 - 5/15/2004 | 5/16/2004 - 5/22/2004 | 5/23/2004 - 5/29/2004 |
| **2004 Seasonal Factors** | | | | | | |
| Lee County (SR 82) | | PSCF [1] | 1.04 | 1.05 | 1.07 | 1.10 |
| | | SF [2] | 0.98 | 0.99 | 1.01 | 1.03 |
| Collier County (Countywide) | | PSCF [1] | 1.09 | 1.11 | 1.13 | 1.15 |
| | | SF [2] | 0.96 | 0.98 | 0.99 | 1.01 |
| **2004 Axle Correction Factors** | | | | | | |
| Lee County | I-75 to CR 884 | | 0.94 | | | |
| | CR 884 to Alabama Rd | | 0.93 | | | |
| | Alabama Rd to Hendry County Line | | 0.89 | | | |
| Collier County | Hendry County Line to SR 29 | | 0.89 | | | |

**2004 K, D, and T Factors**

| Description | $K_{30}$ | $D_{30}$ | Daily Truck $T_{24}$ | Peak Hr Truck $T_f$ ($T_{24}$/2) | FDOT Count Site |
|---|---|---|---|---|---|
| ***Lee County*** | | | | | |
| SR 82 between I-75 and Buckingham Rd | 10.02 | 55.13 | 15.32 | 7.66 | 120064 [3] |
| SR 82 between Buckingham Rd and Colonial Blvd | 10.02 | 55.13 | 9.91 | 4.96 | 120021 [3] |
| SR 82 between Colonial Blvd and Gunnery Rd | 10.02 | 55.13 | 8.70 | 4.35 | 120077 [3] |
| SR 82 between Gunnery Rd and Alabama Road | 10.02 | 55.13 | 10.25 | 5.13 | 120101 [3] |
| SR 82 between Alabama Road and Bell Blvd | 10.02 | 55.13 | 18.91 | 9.46 | 120068 [3] |
| ***Collier County*** | | | | | |
| SR 82 between Bell Blvd and South Church Road | 10.47 | 54.99 | 9.45 | 4.73 | 030183 [3] |
| SR 82 between South Church Road and SR 29 | 10.47 | 54.99 | 18.64 | 9.32 | 030200 [4] |
| SR 29 south of SR 82 | 10.47 | 54.99 | 14.00 | 7.00 | 030143 [4] |

(1) PSCF = Peak Season Conversion Factor (2) SF = Seasonal Factor

(3) Prior Year Data (4) Actual Data

Source: 2004 Traffic Information CD

Exhibit 4A: Sample Trip Generation

## TABLE XX: TRIP GENERATION (BASED ON INTERNAL CAPTURE & PASS-BY RATES)

**PASS-BY RATE (DAILY) =** 15%

**PASS-BY RATE (PM PEAK) =** 25%

| LAND-USE (CODE) | UNIT | SIZE | TOTAL TRIPS (1) | | | | INTERNAL CAPTURE TRIPS (2) | | | | PASS-BY TRIPS (3) | | | | NET (NEW) TRIPS | | | | FINAL TRIP GEN. RATES | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | DAILY | PM PK-HR | | | DAILY | PM PK-HR | | | DAILY | PM PK-HR | | | DAILY | PM PK-HR | | | | |
| | | | (2-WAY) | ENTER | EXIT | (2-WAY) | (2-WAY) | ENTER | EXIT | (2-WAY) | (2-WAY) | ENTER | EXIT | (2-WAY) | (2-WAY) | ENTER | EXIT | (2-WAY) | DAILY | PM-PK HR |
| RETAIL (820) | SQ. FEET | 200,000 | 10,656 | 475 | 514 | 989 | 507 | 9 | 50 | 59 | 1,522 | 116 | 116 | 232 | 8,627 | 350 | 348 | 698 | 53.28 | 4.95 |
| OFFICE (710) | SQ. FEET | 120,000 | 1,535 | 36 | 177 | 213 | 304 | 21 | 10 | 31 | 0 | 0 | 0 | 0 | 1,231 | 15 | 167 | 182 | 12.79 | 1.78 |
| RESIDENTIAL (221) (MULTI-FAMILY) | DWELLING UNITS | 200 | 1,412 | 81 | 43 | 124 | 293 | 34 | 4 | 38 | 0 | 0 | 0 | 0 | 1,119 | 47 | 39 | 86 | 7.06 | 0.62 |
| TOTAL | | | 13,603 | 592 | 734 | 1,326 | 1,104 | 64 | 64 | 128 | 1,522 | 116 | 116 | 232 | 10,977 | 412 | 554 | 966 | | |

(1) Total trips were determine based on the trip rates contained in the ITE Trip Generation, 7th Edition.

(2) Internal trips were obtained from the internal capture calculations.

(3) As per ITE Trip Generation 7th Edition, page 46, a retail center has an average pass-by capture of 34%. Using the ITE Equation Ln(T)= -0.29Ln(X)+5.0 results in 32% pass-by capture. As per FDOT's Traffic Impact Handbook, the total pass-by trips should not exceed 25% of the project's external trips and 10% of the adjacent street traffic. Hence, the pass-by rate was reduced to 15% and 25% for daily and PM peak hour, respectively. The entering pass-by trips should be equal to the exiting pass-by trips and in the same direction as the entering pass-by trips i.e. if 20 pass-by trips heading EB entered the project driveway, 20 pass-by trips should exit the project driveway to go EB.

Land Use Code 820: Daily Trip Generation Ln(T) = 0.65 Ln(X)) + 5.83 PM Peak Hour of Adjacent Street Traffic Ln(T) = 0.66 Ln(X) + 3.40 with 48% Entering and 52% Exiting

Land Use Code 710: Daily Trip Generation Ln(T) = 0.77 Ln(X)) + 3.65 PM Peak Hour of Adjacent Street Traffic T = 1.12(X) + 78.81 with 17% Entering and 83% Exiting

Land Use Code 221: Daily Trip Generation T=5.12(X) + 387.53 PM Peak Hour of Adjacent Street Traffic Ln(T) = 0.88 Ln(X) + 0.16 with 65% Entering and 35% Exiting

Exhibit 4B: Recommended Procedure for Selecting Between Trip Generation Average Rates and Equations (Figure 3.1, Page 10 of ITE Trip Generation Handbook)

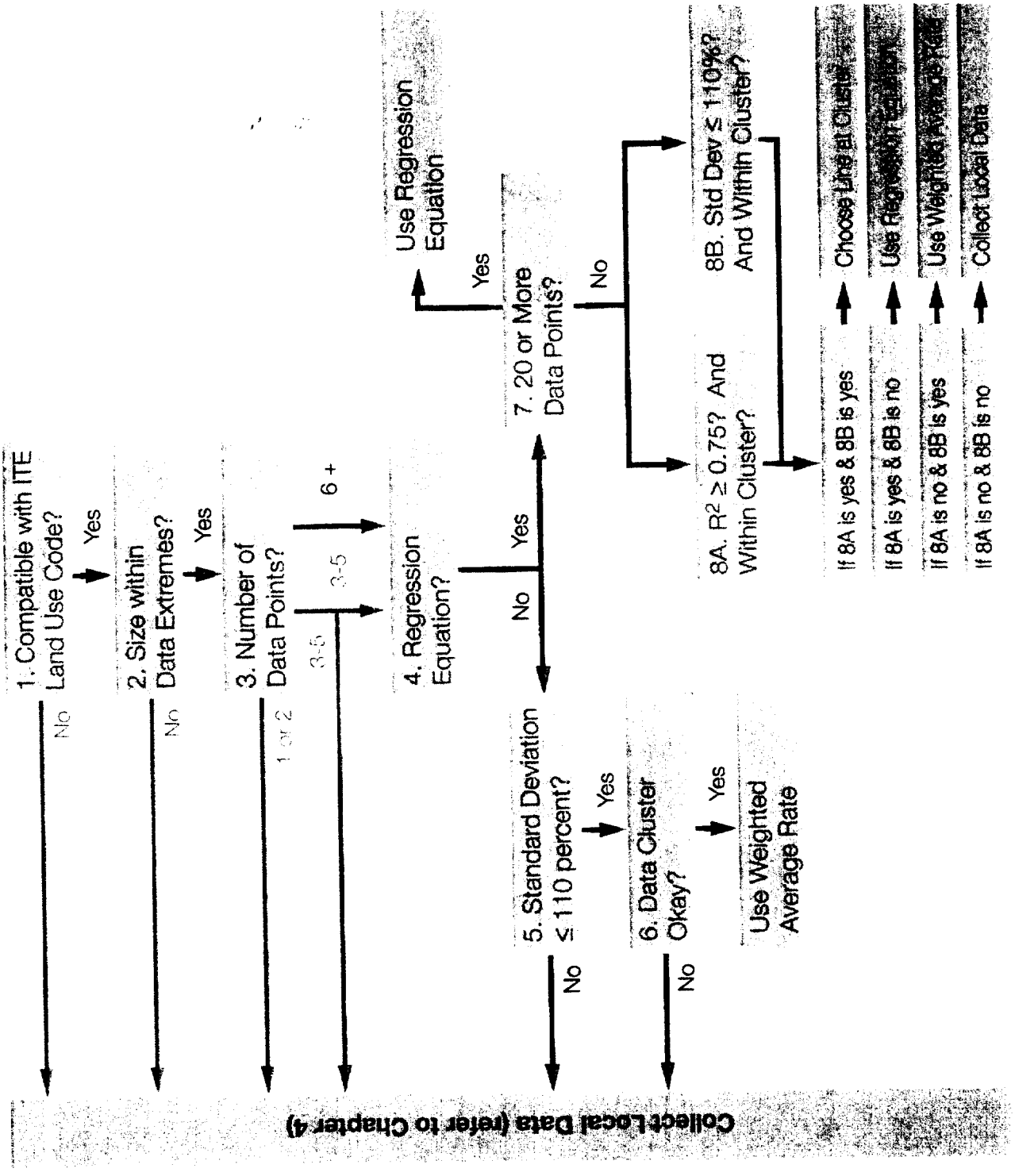


Exhibit 5A: Sample ITE Internal Capture (Fig 7.5 Page 93, ITE Trip Generation Handbook)

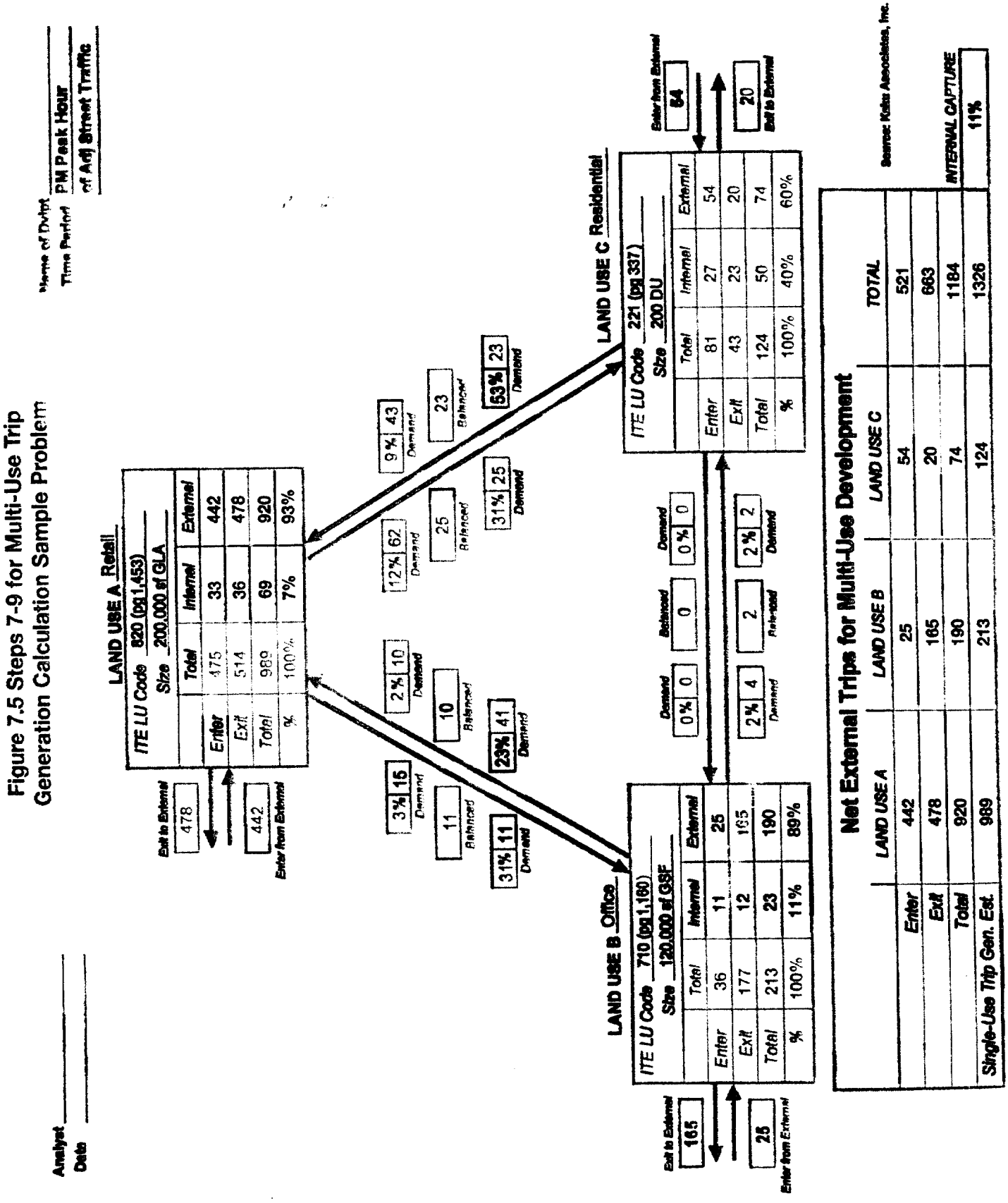


Exhibit 5B: Sample Internal Capture

## TABLE XX: INTERNAL CAPTURE

**INTERNAL CAPTURE RATES**

| FROM ORIGIN LAND-USES (EXIT) | TO DESTINATION LAND-USE (ENTER) | | | | | |
|---|---|---|---|---|---|---|
| | RETAIL | | OFFICE | | RESIDENTIAL | |
| | DAILY | PM PK-HR | DAILY | PM PK-HR | DAILY | PM PK-HR |
| RETAIL | 0.0% | 0.0% | 2.0% | 2.0% | 2.0% | 3.0% |
| OFFICE | 3.0% | 3.0% | 0.0% | 0.0% | 2.0% | 2.0% |
| RESIDENTIAL | 2.5% | 2.5% | 1.0% | 1.0% | 0.0% | 0.0% |

**INTERNAL CAPTURE TRIPS**

| FROM ORIGIN LAND-USES (EXIT) | | | TO DESTINATION LAND-USE (ENTER) | | | | | | ORIGIN TOTAL | | % Internal Capture | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | RETAIL | | OFFICE | | RESIDENTIAL | | | | | | |
| DAILY | PM PK | PK DIR* | DAILY | PM PK-HR | DAILY | PM PK-HR | DAILY | PM PK-HR | DAILY | PM PK-HR | DAILY | PM PK-HR | PK DIR |
| RETAIL | | | | | | | | | | | | | |
| 10,656 | 989 | 514 | 0 | 0 | 213 | 20 | 213 | 30 | 426 | 50 | 4.8% | 6.0% | 9.7% |
| OFFICE | | | | | | | | | | | | | |
| 1,535 | 213 | 177 | 46 | 6 | 0 | 0 | 31 | 4 | 77 | 10 | 19.8% | 14.6% | 5.6% |
| RESIDENTIAL | | | | | | | | | | | | | |
| 1,412 | 124 | 43 | 35 | 3 | 14 | 1 | 0 | 0 | 49 | 4 | 20.8% | 30.6% | 9.3% |
| DESTINATION | | | 81 | 9 | 227 | 21 | 244 | 34 | 552 | 64 | | | |
| TOTAL | | | | | | | | | 552 | 64 | | | |
| 13,603 | 1,326 | 734 | | | | | | | 1104 | 128 | | | |

* Although the PM peak direction trips for residential land-use are the vehicles entering the development, the overall PM peak direction trips for the development are the vehicles exiting the development.

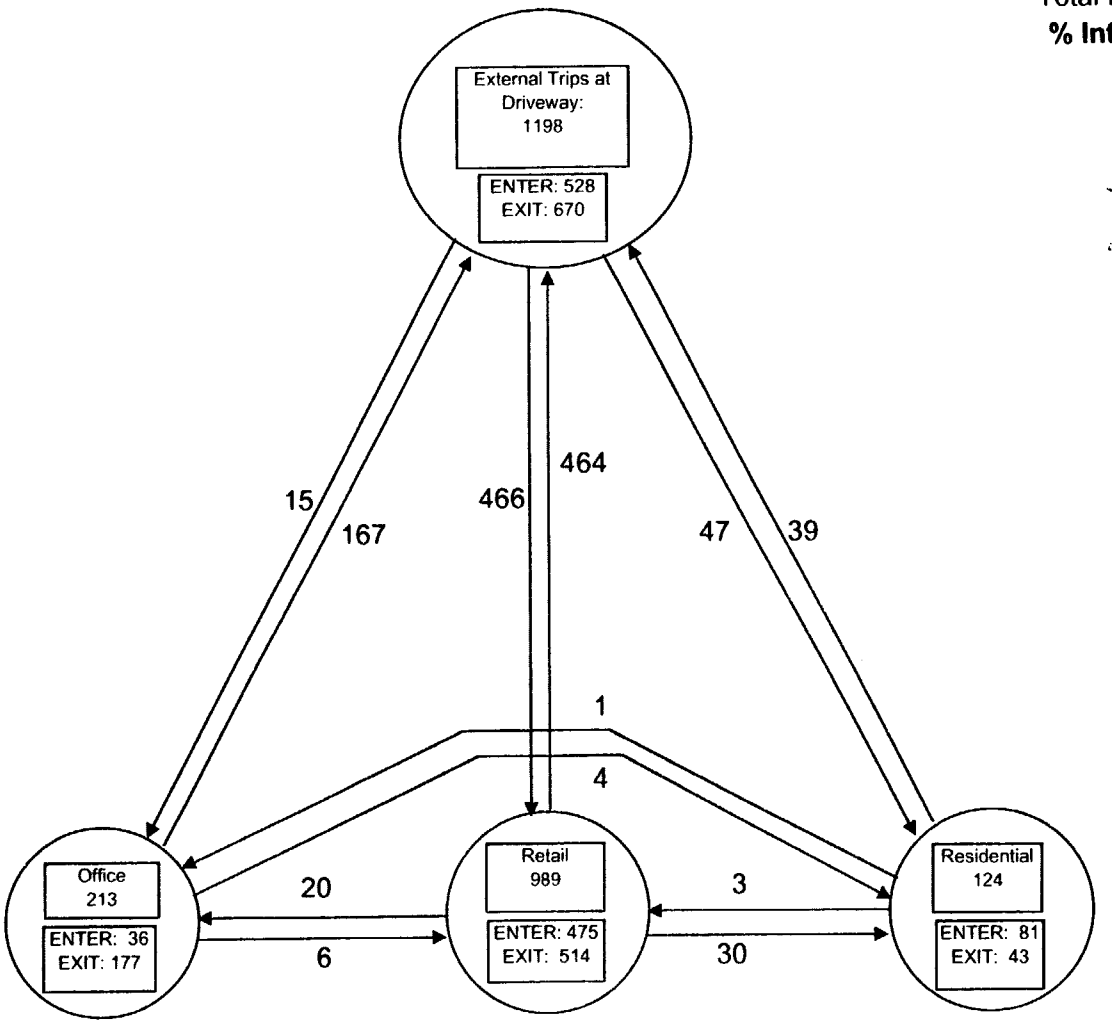
Note: The interaction between same land uses (office and office, retail and retail, etc.) has not been considered here. This interaction is anticipated to further increase the internal capture than shown on these tables.

**INTERNAL % OF TOTAL TRIPS = 8.12% 9.65%**

Exhibit 5C: Sample Internal Capture Bubble Diagram

## FIGURE XX: PM PEAK HOUR INTERNAL CAPTURE BUBBLE DIAGRAM

| | |
|---|---|
| Total Peak Hour Trips = | 1,326 |
| Total Trips at External Driveway = | 1,198 |
| Total Internal Trips = | 128 |
| **% Internalization =** | **9.65%** |



When considering pass-by trips, the distribution of driveway volumes may change and be related to the street traffic. The analysis of pass-by trips should occur in two steps: (1) determine the number of new trips and pass-by trips for the site, then (2) assign the pass-by trips in proportion to the street traffic and the driveways and then assign the new trips in accordance with standard trip distribution procedures.

The pass-by trips estimated in the trip generation step are preliminary. Final pass-by trips are estimated following assignment when the number of pass-by trips considered can be compared with the total traffic on the facility.

**In general, the number of pass-by trips should not exceed 10 percent of the adjacent street traffic during the peak hour or 25 percent of the project's external trip generating potential.**

**Diverted trips**, like pass-by trips, are not new to the system overall; however, diverted trips are now utilizing a segment of the transportation system that they previously were not using to access the proposed development site. The new roads a diverted trip uses may or may not have direct access to the proposed development site. Facilities that receive diverted trips may require analysis of the impacts of the development trips. An example of a diverted trip is provided on Figure 21.

**With diverted trips, the total driveway volumes are not reduced. Diverted trips are counted as new trips where they travel on segments required to reach the site where they previously did not travel.**

ITE proposes the following methodology for estimating the percent of pass-by and diverted trips.

$$N_{pb} = p(VOL_{Pb})$$
$$N_D = p(VOL_D)$$

Where:

$p$ = probability of a driver already in the traffic stream, stopping at the generator, $0 \geq p \geq 1$

$VOL_{Pb}$ = volume available to produce pass-by trips

$VOL_D$ = volume on other streets available to produce diverted trips

Average daily pass-by trip percentages trip and diverted trip percentages are provided as a function of GLA and average daily traffic on the adjacent roadways for several shopping centers in ITE's *Trip Generation* for shopping centers (ITE: *Trip Generation*, p. 1-24-36). Peak-hour percentages are suggested to be 10 percent less than these daily percentages.

The percentage of pass-by trips in the PM peak hour for shopping centers is provided in Figure VII-1A and using the following equation in ITE's *Trip Generation*.

$$Ln\ (P_{PB}) = -0.341\ Ln\ (X) + 5.376$$

Where:

$P_{PB}$ = percent pass-by

X = 1,000 GLA of shopping center

The PM peak-hour, pass-by trip percentages are usually 10 percent greater than in other times during day. (ITE: *Trip Generation*, p. 1-23).

**In all cases, pass-by and diverted trip rates must be justified by the applicant and approved by the Department prior to use.**

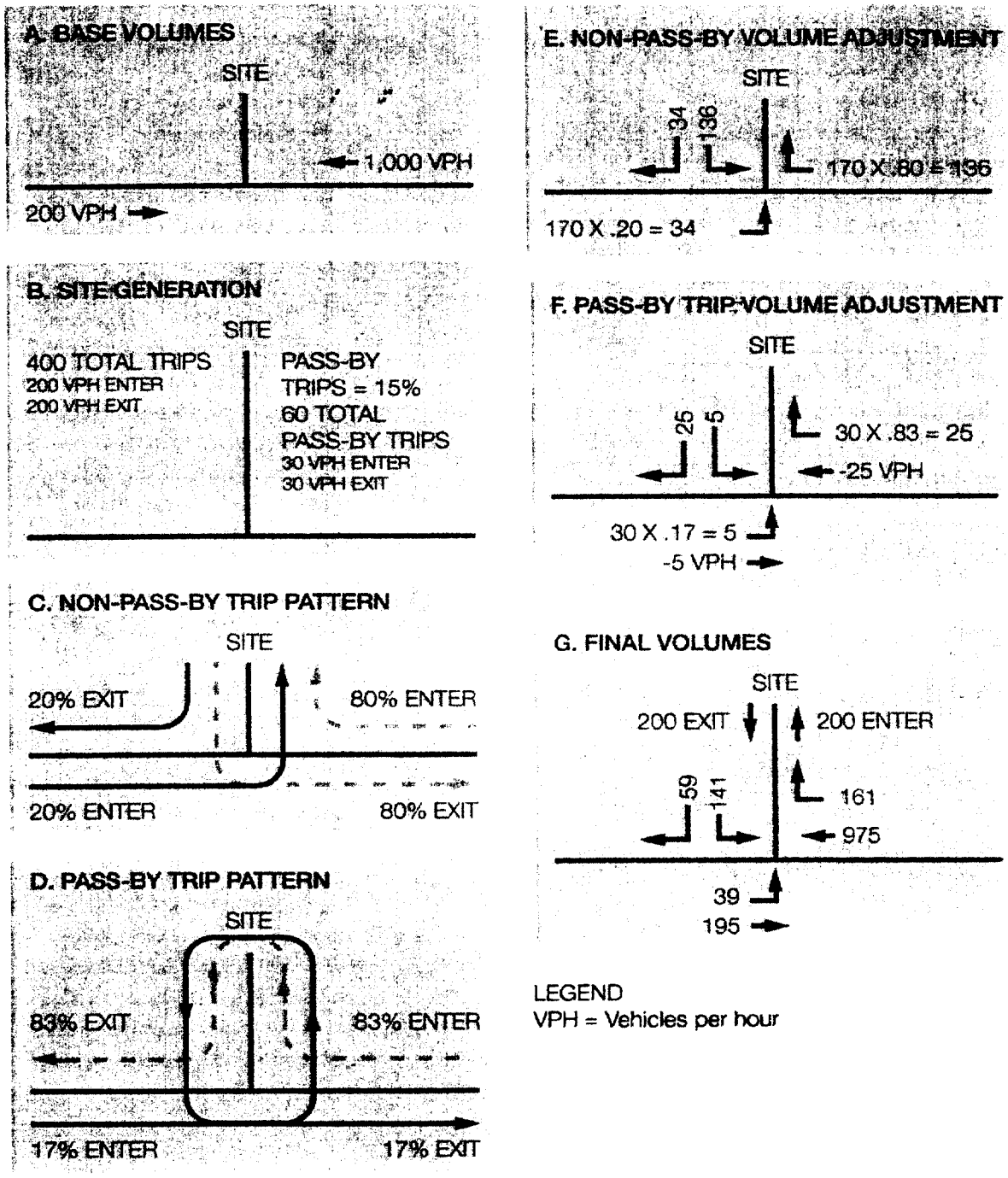
When retail land uses are involved with a mixed-use development that attracts pass-by traffic, each land use must be analyzed separately using the following procedure:

1. Estimate the peak-hour, pass-by trip percentage for each retail parcel (shopping centers, convenience store, gas station, etc.) within the development. ITE's *Trip Generation* (page 1-21) provides guidance on this step. The estimated pass-by trip percentage depends on the retail site's square footage.

2. Some of the pass-by trips will likely proceed to (or come from) other proposed development project land uses for their primary destinations. These trips cannot be claimed as pass-by trips to be reduced from total project trip generation because they are new trips generated by the project. Trips between the commercial parcel and other project land uses are internal trips.

Exhibit 6B: Sample ITE Pass-By Application (Fig 5.2 Page 30, ITE Trip Generation Handbook)

**Figure 5.2 Application of Pass-By Trips**




LEGEND
VPH = Vehicles per hour

Exhibit 7A: Sample Trip Distribution From Travel Demand Model

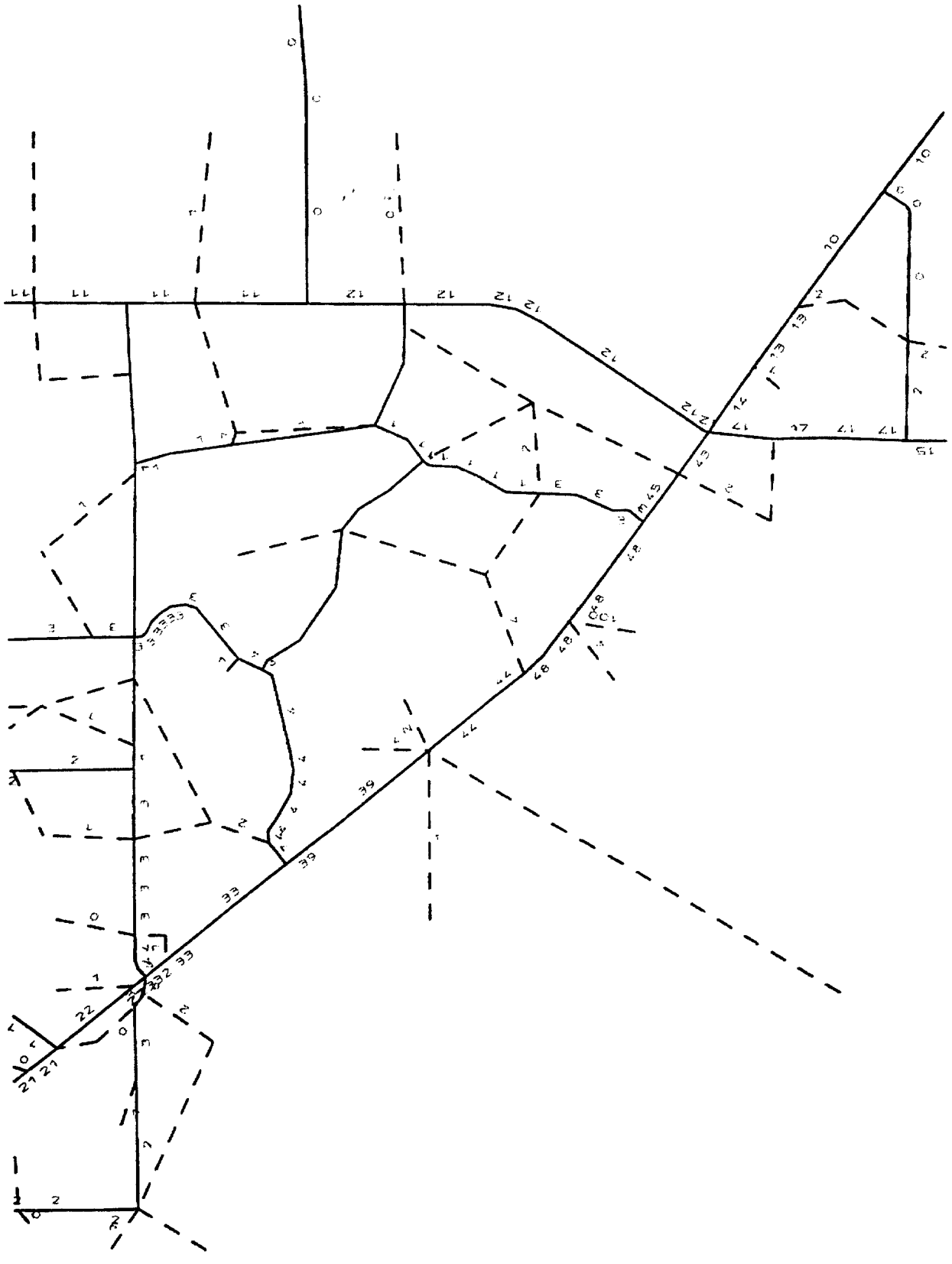


Exhibit 7B: Sample Total Project Trip Distribution

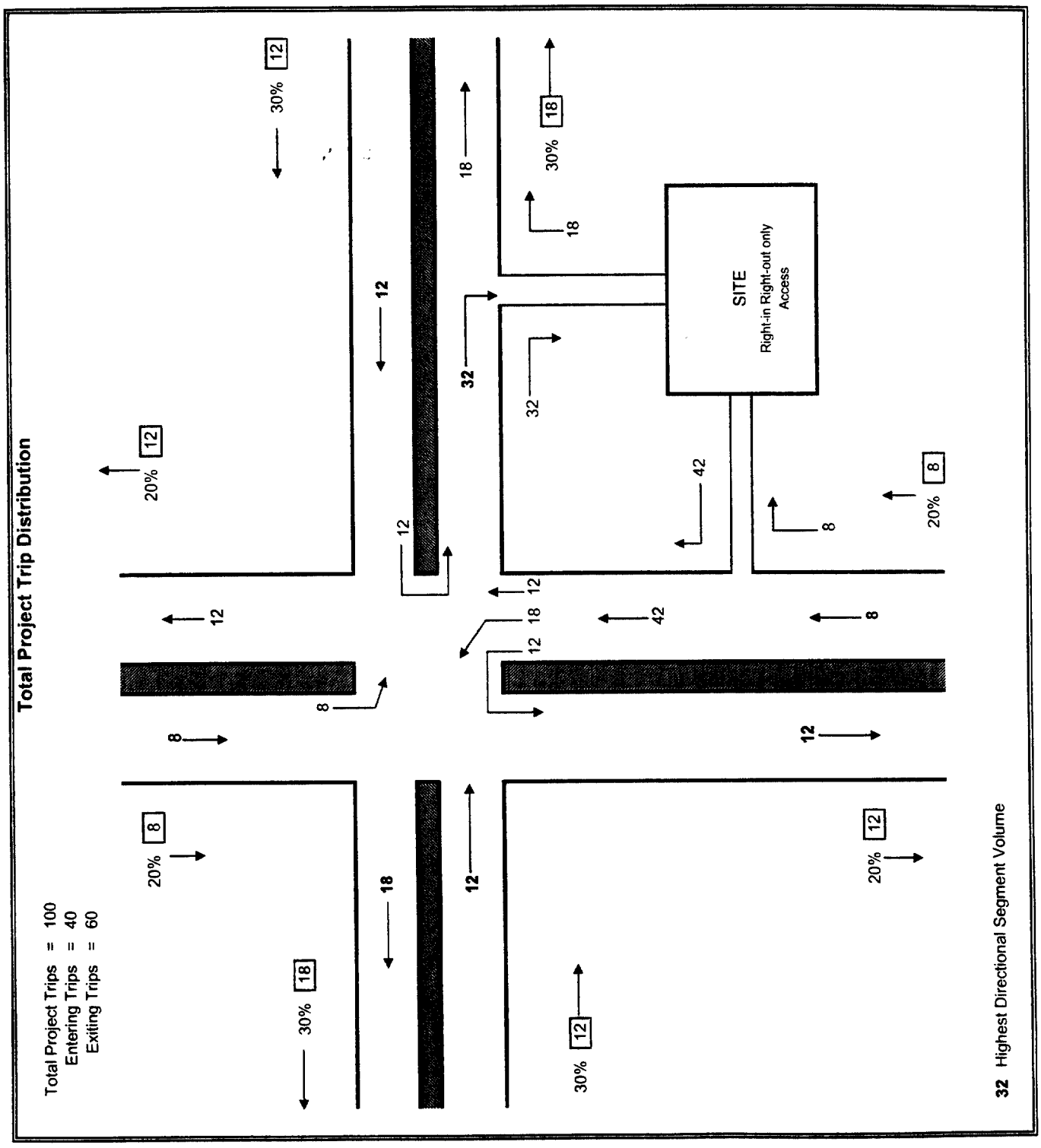
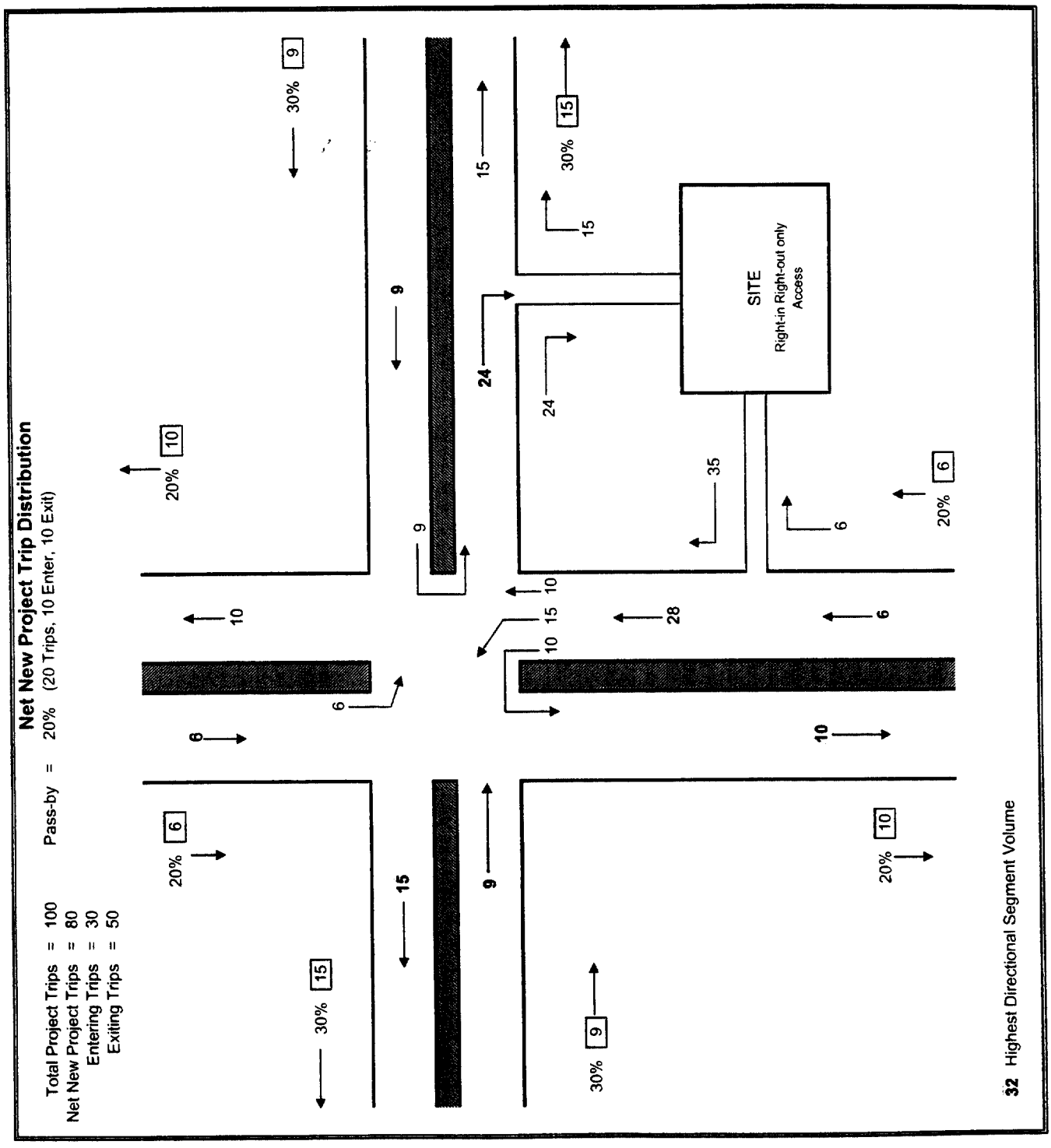


Exhibit 7C: Sample Net New Project Trips Distribution



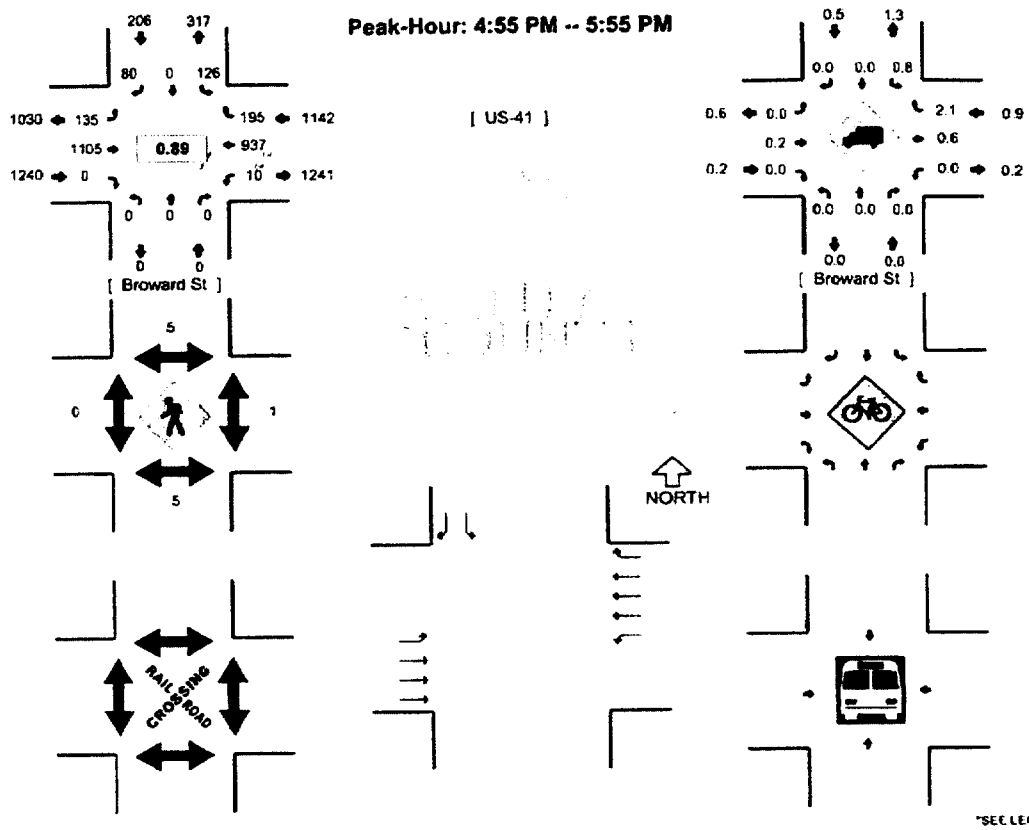
# Exhibit 8A: Sample Existing TMC Summary 1

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

**INTERSECTION:** Broward St--US-41
**WEATHER:**

**QC JOB #:** 10177101
**DATE:** 6/28/2006




*SEE LEGEND SHEET

| 5-MIN COUNT PERIOD BEGINNING AT | Broward St (Northbound) | | | | Broward St (Southbound) | | | | US-41 (Eastbound) | | | | US-41 (Westbound) | | | | TOTAL | HOURLY TOTALS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 4:00 PM | 0 | 0 | 0 | 0 | 14 | 0 | 7 | 0 | 10 | 68 | 0 | 2 | 0 | 86 | 24 | 1 | 212 | |
| 4:05 PM | 0 | 0 | 0 | 0 | 8 | 0 | 8 | 0 | 4 | 81 | 0 | 1 | 0 | 84 | 19 | 2 | 207 | |
| 4:10 PM | 0 | 0 | 0 | 0 | 8 | 0 | 2 | 0 | 4 | 85 | 0 | 0 | 0 | 80 | 16 | 0 | 195 | |
| 4:15 PM | 0 | 0 | 0 | 0 | 9 | 0 | 1 | 0 | 6 | 80 | 0 | 0 | 0 | 80 | 28 | 0 | 204 | |
| 4:20 PM | 0 | 0 | 0 | 0 | 11 | 0 | 6 | 0 | 7 | 70 | 0 | 1 | 0 | 69 | 17 | 0 | 181 | |
| 4:25 PM | 0 | 0 | 0 | 0 | 7 | 0 | 3 | 0 | 16 | 93 | 0 | 1 | 0 | 86 | 9 | 1 | 216 | |
| 4:30 PM | 0 | 0 | 0 | 0 | 12 | 0 | 4 | 0 | 6 | 78 | 0 | 0 | 0 | 83 | 12 | 0 | 195 | |
| 4:35 PM | 0 | 0 | 0 | 0 | 13 | 0 | 5 | 0 | 8 | 69 | 0 | 0 | 0 | 76 | 16 | 0 | 187 | |
| 4:40 PM | 0 | 0 | 0 | 0 | 15 | 0 | 2 | 0 | 15 | 100 | 0 | 1 | 0 | 78 | 16 | 1 | 228 | |
| 4:45 PM | 0 | 0 | 0 | 0 | 11 | 0 | 3 | 0 | 3 | 85 | 0 | 2 | 0 | 80 | 17 | 1 | 202 | |
| 4:50 PM | 0 | 0 | 0 | 0 | 10 | 0 | 5 | 0 | 4 | 65 | 0 | 0 | 0 | 71 | 8 | 2 | 165 | |
| 4:55 PM | 0 | 0 | 0 | 0 | 9 | 0 | 10 | 0 | 8 | 85 | 0 | 0 | 0 | 80 | 13 | 2 | 207 | 2399 |
| 5:00 PM | 0 | 0 | 0 | 0 | 14 | 0 | 8 | 0 | 13 | 86 | 0 | 0 | 0 | 71 | 9 | 0 | 201 | 2388 |
| 5:05 PM | 0 | 0 | 0 | 0 | 7 | 0 | 8 | 0 | 5 | 77 | 0 | 1 | 0 | 93 | 14 | 0 | 205 | 2386 |
| 5:10 PM | 0 | 0 | 0 | 0 | 13 | 0 | 6 | 0 | 15 | 110 | 0 | 0 | 0 | 74 | 24 | 2 | 244 | 2435 |
| 5:15 PM | 0 | 0 | 0 | 0 | 9 | 0 | 7 | 0 | 11 | 106 | 0 | 2 | 0 | 82 | 9 | 0 | 226 | 2457 |
| 5:20 PM | 0 | 0 | 0 | 0 | 12 | 0 | 3 | 0 | 13 | 114 | 0 | 0 | 0 | 90 | 23 | 0 | 255 | 2531 |
| 5:25 PM | 0 | 0 | 0 | 0 | 10 | 0 | 3 | 0 | 8 | 92 | 0 | 2 | 0 | 70 | 24 | 4 | 213 | 2528 |
| 5:30 PM | 0 | 0 | 0 | 0 | 12 | 0 | 5 | 0 | 7 | 84 | 0 | 2 | 0 | 96 | 13 | 1 | 220 | 2553 |
| 5:35 PM | 0 | 0 | 0 | 0 | 13 | 0 | 9 | 0 | 12 | 88 | 0 | 1 | 0 | 67 | 19 | 1 | 210 | 2576 |
| 5:40 PM | 0 | 0 | 0 | 0 | 13 | 0 | 12 | 0 | 8 | 76 | 0 | 1 | 0 | 70 | 20 | 0 | 200 | 2548 |
| 5:45 PM | 0 | 0 | 0 | 0 | 4 | 0 | 6 | 0 | 9 | 87 | 0 | 2 | 0 | 68 | 13 | 0 | 189 | 2535 |
| 5:50 PM | 0 | 0 | 0 | 0 | 10 | 0 | 3 | 0 | 13 | 100 | 0 | 2 | 0 | 76 | 14 | 0 | 218 | 2588 |
| 5:55 PM | 0 | 0 | 0 | 0 | 10 | 0 | 8 | 0 | 15 | 77 | 0 | 6 | 0 | 52 | 12 | 0 | 180 | 2561 |

| PEAK 15-MIN FLOW RATES | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 0 | 0 | 0 | 0 | 136 | 0 | 64 | 0 | 156 | 1320 | 0 | 8 | 0 | 984 | 224 | 8 | 2900 |
| Heavy Trucks | 0 | 0 | 0 | | 4 | 0 | 0 | | 0 | 0 | 0 | | 0 | 12 | 8 | | 24 |
| Pedestrians | | 4 | | | | 0 | | | | 0 | | | | 0 | | | 4 |
| Bicycles | | | | | | | | | | | | | | | | | |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Counter Comments:*

Report generated on 7/10/2006

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Exhibit 8B: Sample Existing TMC Summary 2

Kimley-Horn and Associates, Inc.
1227 Del Prado Boulevard Suite 203
Cape Coral, Florida 33990

Intersection: US 41 & Barefoot Williams
City/County: Naples/Collier
Counted By: KHA

File Name : untitled1
Site Code : 00000001
Start Date : 07/11/2006
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles - U-Turns

| | US 41 Southbound | | | Eagle Lakes Park Entrance Westbound | | | US 41 Northbound | | | Barefoot Williams Rd Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | App. Total | Thru | Right | App. Total | Left | Right | App. Total | Left | Thru | Right | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| Factor | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | | | | |
| 05:00 PM | 17 | 12 | 29 | 3 | 2 | 5 | 10 | 0 | 10 | 16 | 0 | 6 | 22 | 0 | 66 | 66 |
| 05:15 PM | 10 | 10 | 20 | 0 | 3 | 3 | 14 | 0 | 14 | 9 | 0 | 5 | 14 | 0 | 51 | 51 |
| 05:30 PM | 16 | 8 | 24 | 0 | 4 | 4 | 8 | 1 | 9 | 11 | 0 | 4 | 15 | 0 | 52 | 52 |
| 05:45 PM | 13 | 13 | 26 | 0 | 2 | 2 | 3 | 3 | 6 | 7 | 0 | 4 | 11 | 0 | 45 | 45 |
| Total | 56 | 43 | 99 | 3 | 11 | 14 | 35 | 4 | 39 | 43 | 0 | 19 | 62 | 0 | 214 | 214 |
| Grand Total | 56 | 43 | 99 | 3 | 11 | 14 | 35 | 4 | 39 | 43 | 0 | 19 | 62 | 0 | 214 | 214 |
| Apprch % | 56.6 | 43.4 | | 21.4 | 78.6 | | 89.7 | 10.3 | | 69.4 | | 30.6 | | | | |
| Total % | 26.2 | 20.1 | 46.3 | 1.4 | 5.1 | 6.5 | 16.4 | 1.9 | 18.2 | 20.1 | | 8.9 | 29.0 | 0.0 | 100.0 | |

| | US 41 Southbound | | | Eagle Lakes Park Entrance Westbound | | | US 41 Northbound | | | Barefoot Williams Rd Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | App. Total | Thru | Right | App. Total | Left | Right | App. Total | Left | Right | App. Total | Int. Total | |
| Peak Hour From 05:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | |
| Intersection | 05:00 PM | | | | | | | | | | | | | |
| Volume | 56 | 43 | 99 | 3 | 11 | 14 | 35 | 4 | 39 | 43 | 19 | 62 | 214 | |
| Percent | 56.6 | 43.4 | | 21.4 | 78.6 | | 89.7 | 10.3 | | 69.4 | 30.6 | | | |
| 05:00 Volume | 17 | 12 | 29 | 3 | 2 | 5 | 10 | 0 | 10 | 16 | 6 | 22 | 66 | |
| Peak Factor | | | | | | | | | | | | | 0.811 | |
| High Int. | 05:00 PM | | | 05:00 PM | | | 05:15 PM | | | 05:00 PM | | | | |
| Volume | 17 | 12 | 29 | 3 | 2 | 5 | 14 | 0 | 14 | 16 | 6 | 22 | | |
| Peak Factor | | | 0.853 | | | 0.700 | | | 0.696 | | | 0.705 | | |

# Exhibit 9: Sample Growth Rate Estimation

**Project:** Barefoot Plaza
**Location:** Collier County
**Date:** 7/10/2006
**Analyst:** KHA
**Notes:**

**Volume Source #1:** US 41 east of Rattlesnake Hammock Road
**Volume Soruce #2:**
**Volume Source #3:**
**Volume Source #4:**
**Volume Source #5:**

| Line | Month | Year | Volume Source #1 | Volume Source #2 | Volume Source #3 | Volume Source #4 | Volume Source #5 | Average Volume |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | |
| 2 | | 2004 | 37973 | 27758 | | | | 32866 |
| 3 | | 2003 | 36199 | 27069 | | | | 31634 |
| 4 | | 2002 | 36301 | 26082 | | | | 31192 |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |

**INPUT DATA**

| Line | Month | Year | Aggregate Traffic Volume |
|---|---|---|---|
| 1 | | | |
| 2 | | 2004 | 32866 |
| 3 | | 2003 | 31634 |
| 4 | | 2002 | 31192 |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |

**OUTPUT DATA**

| Line | Month | Year | Best Fit Volume Trend |
|---|---|---|---|
| 1 | | | |
| 2 | | 2004 | 32734 |
| 3 | | 2003 | 31897 |
| 4 | | 2002 | 31060 |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |

**Slope:** 837
**Intercept:** -1644614
**$R^2$:** 0.931
**Standard Error:** 322

**Exponential Growth Rate:** 2.66%
Future = Existing (1+Growth)^N

**Linear Growth Rate:** 2.69%
Future = Existing (1+Growth*N)

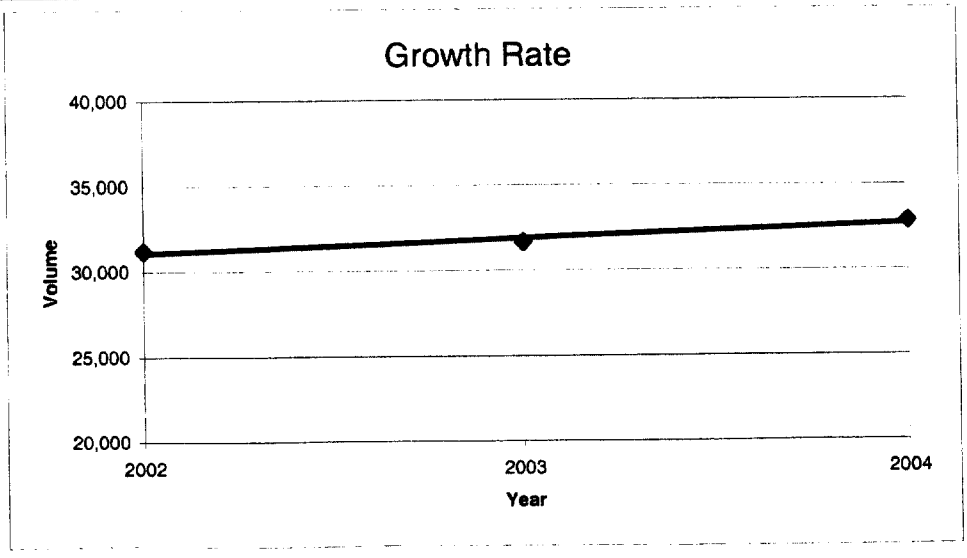


Exhibit 10: Sample Future Intersection Traffic Volume Development Using Growth Rate

# INTERSECTION TRAFFIC VOLUME DEVELOPMENT

## U.S. 41 & Broward Street

**TRAFFIC CONTROL:** Signalized
**COUNT DATE:** June 28, 2006
**TIME PERIOD:** 4:55 p.m. - 5:55 p.m.
**PEAK HOUR FACTOR:** 0.89

| "EXISTING TRAFFIC" | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Raw Turning Movement Counts | 135 | 1,105 | | | 937 | 195 | | | 126 | | 80 | |
| Peak-Season Correction Factor | | | | | | | 1.22 | 1.22 | | | 1.22 | 1.22 |
| 2006 PEAK-SEASON VOLUMES | 165 | 1,348 | | | 1,143 | 238 | | | | 154 | | 98 |

| "NON-PROJECT TRAFFIC" | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BACKGROUND TRAFFIC GROWTH | 0 | 437 | | | 437 | 0 | | | | 0 | | 0 |
| 2008 NO BUILD TRAFFIC (2009) | 3 | 3 | | | 3 | 3 | | | 3 | | 3 | |
| Yearly Growth Rate | | | | | | | 2.0% | 2.0% | | | 2.0% | 2.0% |
| | | | | | | | | | | | | |
| | 175 | 1,868 | | | 1,650 | 253 | | | | 163 | | 104 |

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Barefoot Plaza

| "PROJECT TRAFFIC" TOTAL PROJECT TRAFFIC | TYPE | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LAND USE 2009 TOTAL TRAFFIC | | | | | | | | | Pass - By | | | | |
| | | | 14 | | | 51 | 5 | | New | | 1 | | |
| | | 0 | 14 | | | 51 | 5 | | | | 1 | | 0 |

| "TOTAL TRAFFIC" | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 175 | 1,882 | | | 1,701 | 258 | | | | 164 | | 104 |