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Department of Transportation

## PROJECT TRAFFIC FORECASTING

### AUTHORITY:

Sections 20.23(3)(a) and 334.048(3), Florida Statutes (F.S.)

### REFERENCES:

- Sections 334.03(25), 334.046(1) and (2); 334.063, 334.17, 334.24, and 338.001(5), F.S.
- [Project Traffic Forecasting Handbook](#), 2014, Florida Department of Transportation (FDOT), Systems Implementation Office
- General Interest Roadway Data (GIRD), Topic No. 525-020-310, Florida Department of Transportation, Transportation Data and Analytics Office
- Florida Annual Traffic Classification Report, Florida Department of Transportation, Transportation Data and Analytics Office
- [Florida Standard Urban Transportation Model Structure \(FSUTMS\) Standards](#), Florida Department of Transportation, Forecasting and Trends Office
- New or Modified Interchanges, Topic No. 525-030-160, Florida Department of Transportation, Systems Implementation Office
- Project Development and Environment Manual, Topic No. 650-000-001, Florida Department of Transportation, Office of Environmental Management
- Manual on Uniform Traffic Studies, Topic No. 750-020-007, Florida Department of Transportation, Traffic Engineering and Operations Office
- FDOT Design Manual (FDM) Topic No. 625-000-001, Florida Department of Transportation, Roadway Design Office
- Flexible Pavement Design Manual, Topic No. 625-010-002, Florida Department of Transportation,

## Roadway Design Office

- A Policy on Geometric Design of Highways and Streets, 6<sup>th</sup> Edition, American Association of State Highway and Transportation Officials (AASHTO)
- Guidelines for Traffic Data Programs, 2<sup>nd</sup> Edition, American Association of State Highway and Transportation Officials (AASHTO)
- [Traffic Monitoring Guide \(TMG\)](#), Federal Highway Administration (FHWA), October 2016
- Most recent edition of the Highway Capacity Manual (HCM), Transportation Research Board (TRB)
- Portland Cement Concrete Pavement Evaluation System (COPES), National Cooperative Highway Research Program Report 277, M. L. Darter, J. M. Becker, M. B. Snyder and R. E. Smith, Transportation Research Board, latest published version

## STATEMENT OF POLICY:

It is the policy of the Florida Department of Transportation to provide instructions for using design traffic criteria to forecast corridor traffic, project traffic, and the 18-KIP Equivalent Single Axle Load (ESAL). The procedure also assigns the responsibility for the review, approval, certification, and distribution of data.

## PURPOSE:

Project Traffic Forecasting estimates are needed for planning, Project Development and Environmental (PD&E) studies, design, construction, traffic improvements, and pavement design projects. The Florida Department of Transportation's [FDOT Design Manual \(FDM\)](#) requires project traffic data and its major parameters to be included in a project's Typical Section Sheet. Project traffic volume using design traffic criteria is necessary for designing highway facilities.

## SCOPE:

This procedure is used by the Central Offices, including Policy Planning, Systems Implementation, Forecasting and Trends, Transportation Data and Analytics, Environmental Management, Design, and Traffic Engineering and Operations; District Offices including Planning and Environmental Management, Design and Consultant Management.

## DEFINITIONS:

Terms in this procedure, other than those defined below, are used as defined in the most recent editions of the *Highway Capacity Manual* (HCM, TRB) and *A Policy on Geometric Design of Highways and Streets* as stated by AASHTO.

**18-KIP Equivalent Single Axle Load (ESAL):** a commonly used factor to establish a damage relationship for trucks and other large vehicles. It is the traffic load information used for pavement thickness design.

**Action Plan:** a document identifying both low cost, short term, and major capacity improvements necessary to bring a controlled access facility to Strategic Intermodal System (SIS) standards within 20 years

**Corridor:** a broad geographical band that follows a general directional flow connecting major origins and destinations of trips, and that may contain several alternate transportation alignments

**K Factor:** the ratio of the traffic volume during the study hour to the annual average daily traffic

**Local Government Comprehensive Plan (LGCP):** the plan (and amendments thereto) developed and approved by the local governmental entity pursuant to **Chapter 163, F.S.**, and **Rule Chapter 9J-5, Florida Administrative Code (F.A.C.)**, and found in compliance by the Florida Department of Community Affairs

**Long Range Plan:** a document with a long-term planning horizon, typically ranging from 20 to 35 years, required of each Metropolitan Planning Organization (MPO) that forms the basis for the annual MPO Transportation Improvement Program (TIP), developed pursuant to **Title 23 United States Code 134** and **Title 23 Code of Federal Regulations Part 450 Subpart C**

**Master Plan:** a document identifying both short and long-term capacity improvements to limited access highways (i.e., Interstate, Turnpike and other expressways) consistent with SIS / State Highway System (SHS) policies and standards. Master Plans also identify potential new or modifications to existing interchanges.

**Strategic Intermodal System (SIS):** a transportation system comprised of facilities and services of statewide and interregional significance, including appropriate components of all modes. The highway component includes all designated SIS Highway Corridors, Emerging SIS Highway Corridors, SIS Intermodal Connectors, and Emerging SIS Highway Intermodal Connectors.

## **PROCEDURE:**

### **1. USERS OF PROJECT TRAFFIC STUDIES**

The following District offices are involved in the preparation and use of project traffic forecasting reports and studies:

- Planning and Environmental Management Office (PLEMO)
- Roadway Design Office
- Traffic Operations Office
- Consultant Management Office
- Project Management Office

This procedure is not intended to be used for traffic operations. However, this procedure will apply to the extent that certain traffic operations, such as major intersection movements, are involved in corridor or other project traffic studies and analyses.

This procedure outlines three processes used to meet three different traffic forecasting needs:

- corridor studies,
- project level forecasting studies, and
- 18-KIP Equivalent Single Axle Load (ESAL) studies.

Although these three types of studies have different approaches and tools, they use the same methodology to determine some of the Project Traffic Forecasting characteristics, specifically: design year, directional design hourly volume (DDHV), and future traffic and truck volume forecasts.

## **2. TYPES OF TRAFFIC FORECAST STUDIES**

Corridor traffic forecasting is required before establishing a new alignment or making improvements to existing facilities, such as widening or transportation system management and operation (TSM&O) strategies. Corridor traffic forecasting is used in the analysis of transportation alternatives in order to identify the type of improvements needed to meet future anticipated traffic demands.

Project traffic forecasting studies identify specific link volumes, turning movements, and other project-specific data necessary for the geometric design of, and operational improvements to roadways or intersections. They can also identify the project traffic requirements for the Interstate and Intrastate Highway Systems, the Interchange Access Requests (IAR), and the Master and Action Plans for the SIS.

The 18-KIP ESAL forecast is required for the pavement design of new construction, reconstruction, and resurfacing projects. The pavement design for new alignment, reconstruction, and resurfacing projects will require a structural loading forecast using the 18- KIP ESAL process.

## **3. PROJECT TRAFFIC FORECASTING HANDBOOK**

The ***Project Traffic Forecasting Handbook*** provides guidelines and techniques on the Design Traffic Forecasting Process. The ***Handbook*** supplements this procedure by providing directions for producing the design traffic parameters, AADT, Standard K, D, and T.

## **4. CENTRAL OFFICE RESPONSIBILITIES**

The Central Office Systems Implementation and Transportation Data and Analytics Offices are responsible for providing the required tools and general guidelines for performing traffic forecast studies.

#### **4.1 SYSTEMS IMPLEMENTATION OFFICE**

The Central Office, Systems Implementation Office is responsible for:

- 1) Providing the required tools and general guidelines for performing traffic forecast studies.
- 2) Maintaining and updating the ***Project Traffic Forecasting Handbook*** and ***Procedure No. 525-030-120***.
- 3) Maintaining and improving traffic forecasting tools. These are Excel spreadsheets which can be used to perform historical trend analysis, estimate forecast year's turning movements, and 18-KIP ESAL estimates.
- 4) Developing required computer-based training and testing materials to help explain the traffic forecast terminologies and processes.
- 5) Issuing certificates for planners and engineers who take and pass the Project Traffic Forecasting 101 Course.

#### **4.2 TRANSPORTATION DATA AND ANALYTICS OFFICE**

The Central Office, Transportation and Analytics Office is responsible for:

- 1) Maintaining and updating the Traffic Characteristics Inventory (TCI) framework, including providing Annual Average Daily Traffic (AADT), Standard K Factor, Directional Factor (D), and Truck Factor (T), based on site-specific counts through the Traffic Count Program.
- 2) Publishing and updating the [Florida Traffic Online](#) website.

### **5. DISTRICT OFFICE RESPONSIBILITIES**

The District is responsible for carrying out the traffic forecasting process consistent with this procedure and the Traffic Forecasting Handbook. Traffic forecasting reports are developed in coordination with requesting offices such as Project Development, Design, and Consultant Management. The traffic forecast reports are generally prepared by, or under the direction of, the Transportation Statistics section within the District Planning office.

These responsibilities include:

- 1) Monitoring the Department's Work Program (WP) to identify the projects that require traffic forecasts.
- 2) Establishing the forecast years of the project.
- 3) Determining the traffic model suitability and the consistency of the traffic forecast process and its outputs with the adopted MPO Long Range Plan and/or Local Government

Comprehensive Plan (LGCP).

- 4) Determining the design hour volume (DHV), Directional Design Hour Volume (DDHV), and Design Hour Truck Percentage (DHT) by assigning appropriate Standard K, D, and T Factors for the project, and estimating the AADT for the project.
- 5) Performing historical trend analysis and testing its reasonableness. The trend analysis shall include a statement of the method, and the assumptions used to perform the analysis.
- 6) Determining the 18-KIP ESAL when required, and checking its validity if the forecast has previously been performed.
- 7) Performing turning volume forecasts, as required for planning and management purposes.
- 8) Preparing the traffic forecasting report based on the comparison of the FHWA and FDOT's Level of Service (LOS) Targets. This report should include all supporting documents used and statements for the traffic forecasting process. If turning movements are involved, schematics diagrams should be included.
- 9) Transmitting the traffic forecast reports and its supplemental materials to the requesting office or person.

## **6. TRAINING**

Available training includes the Project Traffic Forecasting 101 Course, a web-based course that covers project forecasting terminology, basic and advanced, and familiarizes the forecaster with the Florida Traffic Online. It also includes detailed instructions on how to use the tools developed by the FDOT Central Office to help generate consistent yet quick project forecasting analyses. The Project Traffic Forecasting 101 Course and assessment modules can be found at:

<http://wbt.dot.state.fl.us/OIS/projecttrafficforecasting/>

## **7. FORMS**

No forms are required by this procedure.