pennsylvania
DEPARTMENT OF TRANSPORTATION

494-22-07

DATE: October 25, 2022

SUBJECT: Publication 46, Chapter 12 – Traffic Engineering Software

TO: District Executives

FROM: Daniel Farley, P.E., Director
Bureau of Operations

Daniel Farley, P.E.

This Strike-off Letter (SOL) is time and resource neutral and provides the attached updates to Chapter 12 of Publication 46: *Traffic Engineering Manual*, regarding acceptable Traffic Engineering software. This update was reviewed in accordance with Publication 693: *Specification Review Manual*, Chapter 2.1 Standard Clearance Transmittal Process. The revisions from the Step-One CT were minor, and concurrence from the commenters was obtained since a Step-Two CT was not warranted.

Following is a summary of changes:

- References to the Traffic Resources, Education, and Computing Support (TRECS) Group were removed since the group is no longer active.
- The software table has been labeled as Exhibit 12-1 and columns were added to identify the facility types from the *Highway Capacity Manual* (HCM) for which each analysis tool is applicable.
- References to the HCM were updated from the 2010 edition to the 7th Edition (2022).
- The Highway Design and Technology Division has reviewed various analysis tools/software for roundabouts. The approved tools for completing HCM-based analysis of roundabouts are indicated in Exhibit 12-1.
- SignCAD was removed since it is used for design, not for analysis.

This update is to be implemented as soon as practical without affecting project lettings, but no later than December 1, 2022 for projects in Preliminary Engineering. For Transportation Impact Studies being prepared under Publication 282: *Highway Occupancy Permit Manual*, this update is to be implemented for all projects which do not have an approved scoping meeting application as of the date of this letter.

Should you have any questions or require additional information, please contact Stephen Gault, P.E., PTOE, Chief, TSMO Arterials and Planning Section, at 717.787.6988.

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cc: FHWA Pennsylvania Division Office
Assistant District Executives – Maintenance
Assistant District Executives – Design
Assistant District Executives – Construction
Emmanual Anastasiadis, P.E., Acting Assistant District Executive – Operations, District 6
District Traffic Engineers
District Traffic Signal Supervisors
District HOP Managers
District Plans Engineers
PennDOT Local Technical Assistance Program
Municipal Advisory Committee
Daryl St. Clair, P.E., Special Assistant, Highway Administration
Douglas Tomlinson, P.E., Chief, Highway Safety and Traffic Operations Division, BOO
Joseph Robinson, P.E., Acting Director, Bureau of Construction and Materials
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Anja Walker, STIC Manager, Bureau of Innovations
MCK Read File
JRF Read File
GAG Read File

12. TRAFFIC ENGINEERING SOFTWARE

12.1 General

Purpose

Various software packages are available for use by traffic engineers. Traffic analysis software packages are used to optimize traffic flows and capacity, or to simulate traffic flow. In general, the definition of simulation is the *"dynamic representation of some part of the real world achieved by building a computer model and moving it through time."*

The purpose of this chapter is to summarize the Department's ~~position~~ policy on the use of traffic engineering software.

~~Traffic Resources, Education, and Computing Support (TRECS) Group~~

~~The Department established the Traffic Resources, Education, and Computing Support (TRECS) Group to address computer hardware, software, and training issues as they pertain to the District Traffic Units and the Bureau of Maintenance and Operations (BOMO). In addition, the TRECS Group procures needed traffic engineering reference materials. The TRECS Group is comprised of representatives of every District Traffic Unit and BOMO. The Group meets on a regular basis, and it has dedicated funding within BOMO's budget to fulfill its responsibilities.~~

~~One of the TRECS Group's objectives is the review and evaluation of traffic engineering software packages to determine which software will be used and supported by the Department. Supported software means that the Department will continually purchase software upgrades for use by the Engineering Districts and Central Office, and that training has been, and will continue to be provided for appropriate Department personnel.~~

12.2 ~~-~~Specific Software

Supported Software

The Department supports the following traffic analysis tools, methods, and commercial software packages for analysis of the facility types indicated~~, which are organized according to traffic analysis tool category~~:

Exhibit 12-1 Supported Traffic Engineering Software

Tools/Software	Category[1]	Facility Type					
		Stop Control	Single Lane Roundabout	Two-Lane Roundabout[2]	Signalized Intersection	Urban Streets	Uninterrupted Flow
HCM Generalized Service Volume Tables	Sketch-Planning				X	X	X
ICU (Intersection Capacity Utilization)	Sketch-Planning				X		
FREEVAL-PA	Sketch-Planning						X
Highway Capacity Software	HCM-Based Analytical	X	X	X	X	X	X
TRANSYT-7F	Optimization				X	X	

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Synchro Version 11	Optimization and HCM-Based	X			X	X	
SimTraffic Version 11	Microscopic Simulation	X	X		X	X	
Trip Generation Software	Sketch-Planning	N/A					
PTV Vistro	Optimization and HCM-Based	X			X		
TruTraffic	Optimization					X	
GDOT Roundabout Analysis Tool	HCM-Based Analytical		X	X			

Notes:

[1]Refer to HCM, Chapter 6, for definitions of Traffic Analysis Tool and Model categories.

[2]Two lane roundabouts refer to two lanes on any approach or within the circulating roadway.

[3]HCM 6th Edition reports in Synchro may be accepted since the HCM 7th Edition did not change the methodology.

~~Tools / Software~~	~~Traffic Tool Category~~
~~HCM2010 Generalized Service Volume Tables~~	• ~~Sketch-Planning Tool~~
~~ICU (Intersection Capacity Utilization)~~	• ~~Sketch-Planning Tool~~
~~QuickZone~~	• ~~Sketch-Planning Tool~~
~~PennDOT's current version of FREEVAL-PA tool~~	• ~~Sketch-Planning Tool~~
~~FREEPLAN, ARTPLAN, and LOSPLAN~~	• ~~Sketch-Planning Tool~~
~~Highway Capacity Software, 2010 (HCS2010)~~	• ~~HCM-Based Tool~~
~~TRANSYT7-F~~	• ~~Optimization Tool~~
~~Synchro Version 8.0, 9.0, 10.0~~	• ~~Optimization Tool~~
~~SimTraffic Version 8.0, 9.0, 10.0~~	• ~~Microscopic Simulation Tool~~
~~SignCAD~~	• ~~Sketch-Planning Tool~~
~~Trip Generation Software~~	• ~~Sketch-Planning Tool~~
~~PTV Vistro~~	• ~~Optimization Tool~~
~~TruTraffic~~	• ~~Optimization Tool~~

Traffic Analysis Tool Selection Process

Based on the recommended traffic analysis tool category or categories identified in Publication 46, Chapter 10.3, the process ~~identified below~~provided in Chapter 10.3, Traffic Analysis Tool Selection, should be ~~used~~ applied to ~~identify the candidate~~determine which software package(s) shown in Exhibit 12-1 should~~to~~ be used when evaluating traffic capacity.

If the desired analytical or simulation software is not found within Publication 46, Chapter 12.2:

1) A written request ~~should~~ is to be sent to the appropriate Engineering District Office for consideration;

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2) Within the request, the reasons why an alternative analytical or simulation software should be clearly identified along with the added benefits of using the alternative software compared to the Department supported software platforms;

3) The Engineering District Office will evaluate each request and the District Traffic Engineer ~~should~~ will provide a written response as to whether the alternative analytical or simulation software could be used on a particular project;

4) Note that an alternative analytical or simulation software analysis should not be submitted to the Department until a written response has been received by the District Traffic Engineer; and

5) If an Engineering District Office receives an alternative analytical or simulation software then coordination with the Bureau of ~~Maintenance and~~ Operations, ~~Traffic Operations~~TSMO Arterials and Planning Section is recommended to ensure that an appropriate way of evaluating the accuracy of the model has been determined.

Required Use by Department and Consultants

Applicable work done by the Department, or by engineering consultants making submissions for Department review and approval, including but not necessarily limited to design, operational assessments, or Highway Occupancy Permit (HOP) projects, should use the ~~2010~~ Highway Capacity Manual (~~5th~~ 6th Edition or 7th Edition) and supporting software packages as directed in Publication 46, Chapter 10, and ~~Chapter 12~~listed in Exhibit 12-1, unless directed otherwise in writing by the Department, and as dictated by a subject project's scope of work.

Unless an alternative analysis tool is used, level-of-service (LOS) calculations and resultant measures of effectiveness should be calculated using the methodologies established by the ~~2010~~ Highway Capacity Manual (~~HCM2010~~6th Edition or 7th Edition) using a supported HCM-based tool identified in Publication 46, Chapter 12.2. ~~Currently, this means LOS calculations should be completed and reported using HCS2010.~~

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Synchro Version 11	Optimization and HCM-Based	X[3]	X		X[3]	X[3]	
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1) A written request is to be sent to the appropriate Engineering District Office for consideration;

2) Within the request, the reasons why an alternative analytical or simulation software should be clearly identified along with the added benefits of using the alternative software compared to the Department supported software platforms;

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