

Standards and Regulations For Subdivision Streets and State Highway Access

Chapter 2: Traffic Impact Studies



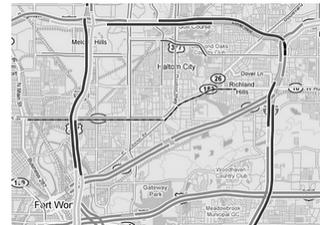
Why do I need a TIS?

- Answers to
 - What will be the operational conditions when a development is added to the existing transportation infrastructure?
 - What transportation improvements will be needed?
 - Will the new access impact traffic operations and safety near the site?
- Presents the implications of proposed land use/zoning changes
- Provides a basis to determine the "fair share" of the improvement cost to be paid by the developer



Chapter 2: Background

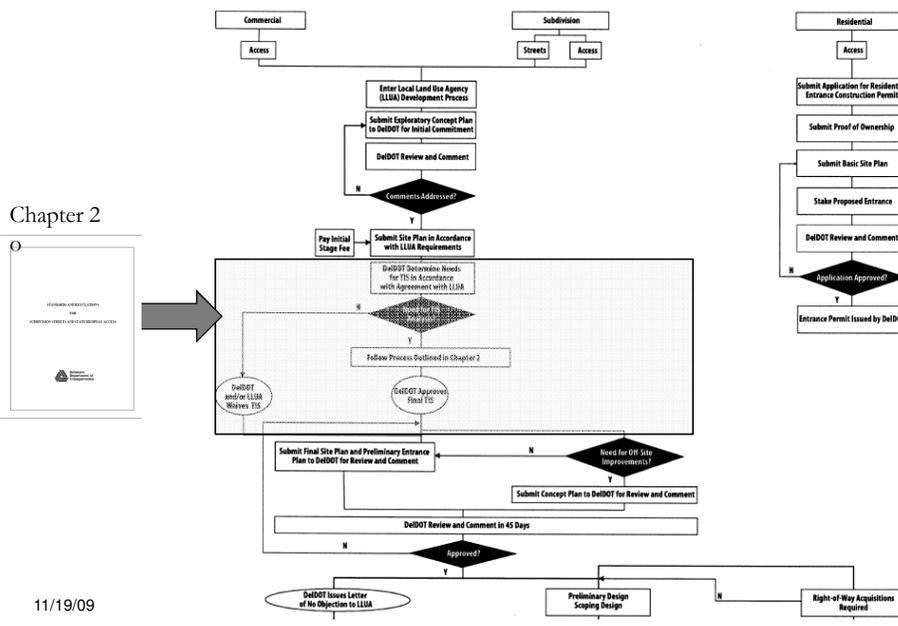
- When a new development is added existing traffic in the area and the expected new site traffic should
 - Operate Safely
 - At a satisfactory Level Of Service (LOS)
- Chapter 2
 - Provides a standard methodology for Traffic Impact Studies
 - Lays out DelDOT expectations in a systematic manner
 - Helps consistency in study process, preparation and review
- TIS may be initiated by DelDOT, land use agency or by the developer



11/19/09

3

Where does TIS come in to play in the Land Development Process?



When is a TIS required?



YES, required when:

- Development generates 400 vehicles per day (vpd) or more in average weekday or weekend trips or 50 vehicles per hour (vph) or more during any one hour time period
- Proposed in an area operating with LOS D in developed, developing or planned development areas or LOS C in rural areas
- DelDOT deems it is in public interest to obtain further information
- ❖ *Note: For developments that generate at least 400 vpd and 50 vph but fewer than 2000 vpd and 200 vph, the developer generally has an option to contribute to an area wide study rather than conduct their own TIS. In addition to these criteria, local criteria may also be applicable, i.e. New Castle and Kent County*



NO, not required when:

- Development generates less than 400 vehicles per day (vpd) or more in average weekday or weekend trips or 50 vehicles per hour (vph) or more during any one hour time period
- Meets all conditions to satisfy a waiver due to location in Transportation Improvement Districts (TID)

11/19/09

5

Traffic Impact Study Warrants (Section 2.3)

Volume Based Warrants

Land Use	TIS Not Warranted (Fewer than 400 vpd and 50 vph)	Eligible To Pay Area-Wide Study Fee (Fewer than 2,000 vpd and 200 vph)
Single Family Detached Houses	35 units	194 units
Apartments	41 units	304 units
Townhouses or Condominiums	57 units	380 units
Mobile Homes	34 units	341 units
Age-Restricted Single Family Detached Houses	70 units	465 units
Motel	44 rooms	236 rooms
General Office Building	20,000 square feet	134,200 square feet
Medical/Dental Office Building	11,100 square feet	45,000 square feet
Specialty Retail Center (Excludes convenience stores, pharmacies, banks, restaurants and gas stations)	9,000 square feet	39,800 square feet
Convenience Store (no fuel pumps)	N/A	2,700 square feet
Pharmacy with Drive-Through Window	N/A	21,000 square feet
Drive-in Bank	N/A	3,700 square feet
Fast Food Restaurant with Drive-Through Window	N/A	3,300 square feet
Gasoline/Service Station with Convenience Market	N/A	12 vehicle fueling positions

Area-Wide Study Fee Option

- Funds equal to \$5.00 (current) per daily trip generated by the development. Proposed \$10.00 per daily trip
- DelDOT shall apply the fee to complete an Area-Wide Study
- Applicant continues to be responsible for funding and/or construction of its share of off-site improvements
- Proposed change-DelDOT would have discretion whether fee may be paid in lieu of a TIS

No TIS Required as per Volume

11/19/09

6

When is a TOA required?

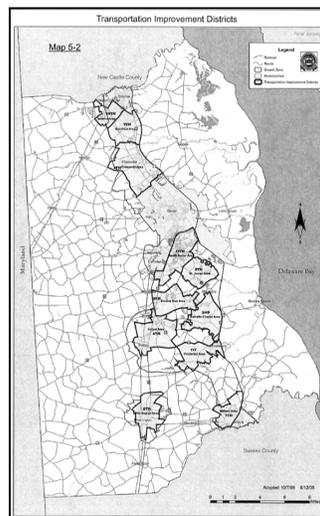
- TIS (or a new TIS) is not needed but some analysis is needed to determine entrance or off-site improvements
- Warrant of 200 vehicle trips per day is being considered

11/19/09

7

Waiver due to Location in TID

- Transportation Improvement Districts (TIDs) are areas where rather than relying upon individual TIS, the County, DelDOT, the MPO, and the community develops a more complete plan addressing a larger area for transportation improvements
- DelDOT, at its sole discretion, may waive its requirement for a TIS if ALL conditions in Section 2.3.4 are met

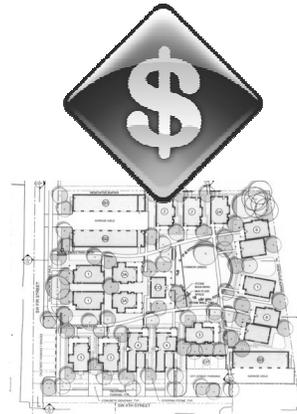


11/19/09

8

Costs?

- The applicant shall assume full responsibility for all costs incurred in their TIS preparation
- When the applicant pays the Area-Wide study fee they have no further obligation towards a TIS or Area-Wide study. But they may still need to do a TOA



11/19/09

9

Who performs the TIS ?

- Qualifications to Perform a TIS
 - All TIS document submittals shall be signed and sealed by a professional engineer licensed in the State of Delaware
 - Applicant can hire his own consultant to perform the TIS or pay to have DelDOT's consultants to perform the TIS

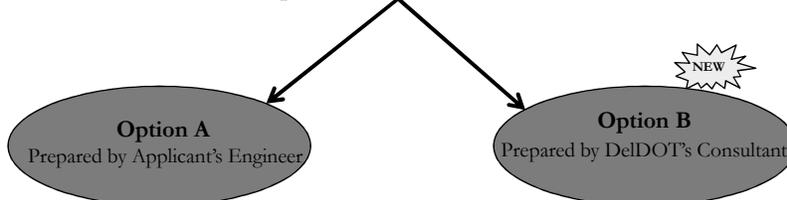


11/19/09

10

Options?

Two Options to Perform a TIS/TOA



11/19/09

11

Option A

- Developer works with his own consultant
- DelDOT and Developer's Consultant have Scoping Meeting
- Developer's Consultant performs Traffic Counts
- DelDOT reviews Traffic Counts
- Developer's Consultant prepares Preliminary TIS
- DelDOT reviews Preliminary TIS
- Developer's Consultant prepares Final TIS
- DelDOT provides Final TIS to DelDOT's Consultant for review
- DelDOT's Consultant prepares draft Final TIS letter and recommendations
- DelDOT reviews draft Final TIS letter and discusses recommendations with the Developer
- DelDOT transmits Final TIS letter to the Developer and local government
- Typical duration from the scoping meeting to the end of the process is about 6 months



11/19/09



Option B

- DelDOT and Developer have Scoping Meeting
- DelDOT's Consultant prepares draft TIS and recommendation letter in 40 business days
 - All steps in the TIS generation are handled by DelDOT's Consultant
- DelDOT's Consultant coordinates with DelDOT throughout the TIS development process
- DelDOT's Consultant prepares the draft Final TIS letter and recommendations
- DelDOT reviews the draft Final TIS letter and discusses recommendations with the Developer
- DelDOT transmits Final TIS letter to the Developer and local government
- Typical duration from the scoping meeting to the end of the process is about 3 months

11/19/09

13

Scope Of Work Determination
(Section 2.5)

Starting up

Step 1: Request Meeting

- **Scoping Meeting Request Form** found in Appendix O

Step 2: Scoping Meeting

- DelDOT will schedule the Scoping Meeting and discuss details of study
- Agenda and draft Memorandum prepared by Developer's Consultant (current) or by DelDOT (proposed)



Step 3: Decision Time

- Provide DelDOT with confirmation (agree with the Scoping Meeting Memorandum or with any changes)
- Identify if Developer wants to proceed with Option A or Option B
- Option A-provide check for \$5,000 (pending Legislator approval)
- Option B
 - Request estimate from DelDOT
 - Receive estimate in 1-2 days
 - Submit check in the full amount of the estimate for Option B, made out to DelDOT

11/19/09

14

Sizing up expected improvements

- Use DelDOT Land Review Database to see expected improvements in the study area

DelDOT Land Review Database
Offsite Improvement Participants

** Inactive Project's Site ADT is shown for information purposes only and is not included in the Total Site ADT shown.

Type	Offsite Improvement	Offsite Improvement Description	Est. Cost
Signal	US 13 & Carter Rd	Signal Agreement made July 24, 2007 by RAP Smyrna, LLC referencing Smyrna Rite Aid Pharmacy. Developer shall enter into a traffic signal agreement with DelDOT for the intersection of US 13 & Carter Road and include ped. signals, crosswalks, and interconnection at DelDOT's discretion. Funding may be used at the existing intersection or future realigned intersection.	\$200,000

SRID	Project	% Shared Contribution	Use Type Description	Units	ADT	AM Peak	PM Peak	Site Peak
SKR2094	Cambria Village (Ika Brookwood Crossing)	4.10%	Residential Condominium/Townhouse	280.00	1,540	118	140	124
Total Project ADT:					1,540	118	140	124
SKR1985	Centerville and Graceville (Ika Meadows of Smyrna)	19.94%	Single-Family Detached Housing	856.00	7,496	609	741	0
Total Project ADT:					7,496	609	741	0
SKR4495	Christina Apartments (Ika Stone Gate Apts.)	3.40%	Apartment - Dwelling Units	188.00	1,280	96	122	0
Total Project ADT:					1,280	96	122	0
SKR2012	Hickory Hollow	8.18%	Single-Family Detached Housing	325.00	3,075	237	310	330
Total Project ADT:					3,075	237	310	330
SKR4480	Liborio III Commercial	10.51%	General Light Industrial	92,000.00	3,950	0	0	0
Total Project ADT:					3,950	0	0	0
SKR4788	Rite Aid Pharmacy-7981-Smyrna	3.42%	Pharmacy/Drugstore with Drive-Through	14.56	1,284	0	126	115
Total Project ADT:					1,284	0	126	115
SKR2179	Simon's Corner	36.55%	General Light Industrial	320,000.00	13,741	0	0	0
Total Project ADT:					13,741	0	0	0
SKR2074	Worthington	13.91%	Single-Family Detached Housing	579.00	5,231	415	521	579
Total Project ADT:					5,231	415	521	579
Total Offsite Improvement ADT:					37,597	1,475	1,960	1,148

Scope Of Work Determination (Section 2.5)

Note:

- DelDOT may revise a scope of work if
 - TIS is not submitted within a 12-month period
 - Less than 12 months if conditions change
- A revised scope of work may require
 - Restart of the TIS process
 - May require a new processing fee



Conducting the TIS

- Site Visit
- Existing Traffic Data Collection
- Traffic Forecasts
- Analysis
 - Existing
 - Future Year No-Build
 - Future Year Build
- Identify Deficiencies
- Determine Mitigation
- Others: Crash/Bicycle/Transit/Pedestrians
- Make Recommendations
- Prepare Report



11/19/09

17

TIS Study Area Description
(Section 2.9.4)

Study Area Site Visit

To collect base study area information, for example;

- Intersection Geometry
 - Turn Lane Storage
 - Shoulder Widths and Usage
 - Median Storage
- Speed Limits
- Traffic Signals—Phasing and Timing
- Bus Stops/Sidewalks/On-Street Bike Lanes
- Nearby committed/under construction developments
- Peak Hour Queue Observations
- Distances to nearby Entrances
- Digital Photos of each approach of each intersection

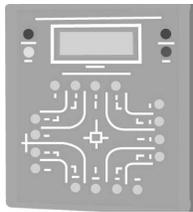


11/19/09

18

Traffic Data Collection

- Traffic Turning Movement Counts
 - AM and PM peak hours on a typical Tuesday, Wednesday or Thursday
 - Additional Summer Saturday counts may be required
 - Shall include heavy vehicles, pedestrians and RTOR (as applicable)
- ATR counts are also required to be performed for one week in the vicinity of the site entrances
- Counts are submitted as PETRA/Excel files and on report figures with peak hour volumes and peak hour intervals. Universal Traffic Data Format (UTDF) is also acceptable



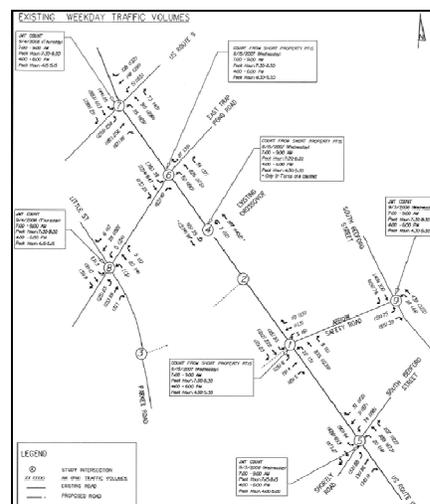
- ❖ For Option A, Developer's Consultant submits traffic count to DelDOT for review
- ❖ For Option B, DelDOT's consultant performs the counts and coordinates with DelDOT for consistency

11/19/09

19

Existing Traffic Conditions

- Description of study area intersections
- Compile traffic count data
- Prepare peak hour traffic volumes diagram
- Apply seasonal adjustment factors to traffic counts
- Prepare existing condition figure for seasonally adjusted peak hour traffic through the study area



11/19/09

20

Future No Build Conditions

- DelDOT provides growth factors
- Apply growth factor to seasonally adjusted existing traffic data
- Collect data for committed developments and status of completion
- Perform/obtain trip generation and trip distribution for committed developments (to be included in Appendix in Final TIS)
- Develop Future Year traffic without project
 - For residential
 - 2 years from Scoping Meeting date plus
 - A minimum of one year per 50 dwelling units of predominant type
 - For non-residential
 - 2 years from Scoping Meeting date plus
 - A minimum of one year of construction
 - DelDOT may modify build-out year at its discretion

11/19/09

21

Site Trips

- Trip Generation as per ITE Trip Generation report and handbook
- Distribute trips separately for each land use
- Trips to be routed on public roadways and applicant site only (unless approved by DelDOT)
- Apply internal capture and pass-by
 - To be discussed at the scoping meeting
- Prepare site traffic volume figures



11/19/09

22

Preliminary TIS

For Option A only, prior to analysis:

- Preliminary TIS report shall be completed
- DelDOT shall review the Preliminary TIS and respond
 - By approving the Preliminary TIS either as submitted or with required amendments or additions

For Option B, PTIS is developed in coordination with DelDOT



11/19/09

23

Analysis

Depending on size and expected trip distribution, the following types of analyses may be included:

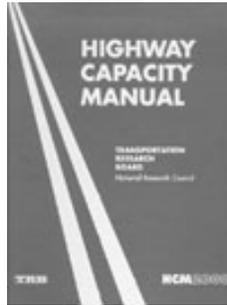
- LOS Analysis
- Queuing Analysis
- Progression Analysis
- Safety Analysis
 - Sight Distance Analysis
 - Crash Analysis
 - Roadway Geometry Analysis
 - Sufficiency of Signing and Striping
- Bicycle, Pedestrian and Transit Facility Analysis



11/19/09

24

LOS Analysis



- The latest version of HCS software is typically used conforming with the Highway Capacity Manual
- LOS Analysis is carried out for existing and future conditions with and without the proposed development
- The results of the analyses are presented as LOS and delay in seconds for both signalized and unsignalized intersections

11/19/09

25

Example

- Results of Highway Capacity Analyses as presented in a final TIS review letter

Signalized Intersection (HCS Analysis) ^{1,2,5}	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
US Route 13 SB & Delaware Route 14				
2009 Existing Conditions (Case 1)	C (23.9)	C (29.8)	C (24.1)	C (27.9)
2011 without Royal Farms development (Case 2)	C (27.2)	C (30.7)	C (25.8)	C (29.7)
2011 with Royal Farms development (Case 3 with full access on Delaware Route 14)	C (28.1)	C (31.4)	C (25.8)	C (29.4)
2011 with Royal Farms development (Case 3 with right in/right-out only on Delaware Route 14)	C (28.1)	C (31.4)	C (25.8)	C (29.5)
2011 with Royal Farms development (Case 3 with right in/right-out/left-in on Delaware Route 14)	C (28.1)	C (31.4)	C (25.8)	C (29.5)
2011 with Royal Farms development (Case 3 with right-in only access on Delaware Route 14) ⁷	-	-	C (25.9)	C (29.6)

11/19/09

26

LOS Analysis

New Points to Note

- Peak Hour Calculations—Not By Lane Groups
 - For existing conditions—use total entering volume to determine peak 15 minute interval and peak hour.
Compute overall intersection PHF
 - For future conditions—if existing counts are not indicative of future build traffic, use PHF = 0.92 unless
 - Total intersection volume is 501-1000 vph: use PHF = 0.88
 - Total intersection volume is 500 vph or less: use PHF = 0.80

11/19/09

27

LOS Analysis

New Points to Note

- Percentage of Heavy Vehicles (HV)
 - To be calculated separately for each turning movement from traffic counts
 - If existing HV counts are not indicative of future build traffic (counts are low, significant growth is expected)
 - Use 7% and 9% for two-lane and multilane highways in rural areas
 - Use 6% and 8% for two-lane and multilane highways in other areas
 - 3% for intersections
 - For specific land uses (like industrial) that generate high heavy vehicle volumes, DelDOT may specify higher percentages

11/19/09

28

LOS Analysis

New Points to Note

- Base Saturation Flow Rates for Signalized Intersections
 - North of C&D Canal
 - Use default value of 1900 pcphgpl*
 - South of C&D Canal
 - Use reduced value of 1750 pcphgpl* (unless data that indicates otherwise is available/provided)

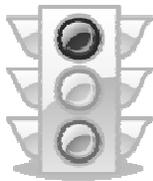
*Pcphgpl—Passenger Cars Per Hour of Green Per Lane

11/19/09

29

Signalized Intersection Analysis

Points to Note



- Signal timing data is to be obtained from DelDOT
- Signal phasing is not to be altered without DelDOT Traffic approval
- Left-turns at the signals on main street are required to be analyzed as a protected-only phase even if existing is protected-permitted

11/19/09

30

LOS Standards

	Measure	LOS	Tool	Note
Uninterrupted-flow	V/C Ratio	D (Developed/Developing/ Planned Development)	HCS	Separate Calc for multilane highways and freeways
		C (Rural)		
Signalized Intersection	Delay, Queue	D (Developed/Developing/ Planned Development)	HCS	<ul style="list-style-type: none"> •Turn lanes to be higher of 95th percentile Q or Manual •If another traffic signal is close by--Arterial Analysis •CMS forms to be submitted
		C (Rural)		
Roundabouts	Delay	D (Developed/Developing/ Planned Development)	NCHRP Report 572, SIDRA	Not to be considered on Evacuation Routes
		C (Rural)		
Unsignalized Intersection	Delay	D (Developed/Developing/ Planned Development)	HCS	<ul style="list-style-type: none"> •Unacceptable delay at site entrance does not mean signal •If FWP volume < 10 vph--no mitigation for LOS problems
		C (Rural)		
Weaving Area	Weaving Speed		HCS	Aim to balance weaving and non-weaving speeds
Ramp	Density	D (Developed/Developing/ Planned Development)	HCS	
		C (Rural)		

11/19/09

31

Queuing Analysis

- Check if existing and proposed turning lane storage at the site entrance(s) and nearby intersections is adequate
- Assess U-turn lane storage adequacy
- Determine that lane queuing does not block access to turn lanes or spill back into upstream intersections



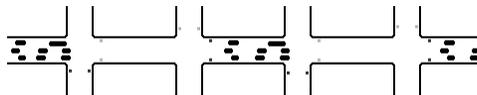
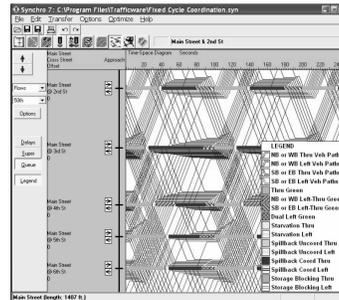
- Specifically important in closely spaced intersections, typically with a number of shopping/retail entrances along a main road
- For unsignalized intersections, storage lengths are based on DelDOT subdivision manual. For signalized intersections, storage lengths are provided based on the results of 95th percentile queue or DelDOT manual requirement, whichever is higher

11/19/09

32

Progression Analysis

- Applies to closely spaced signals along a corridor
- Traffic on the major street forms “platoons”
- Maximize Green bandwidth
- Synchro software used to optimize signal timings
 - Achieved by coordinating signal green times and optimizing offsets
 - Simtraffic simulation component can be used to visually check for progression



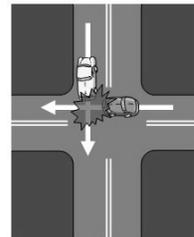
11/19/09

33

Analyses and Purpose
(Section 2.1)

Safety Analysis

- Sight Distance Analysis
- Crash Analysis
 - Crash information for the last three years is to be obtained from DelDOT and examined for safety concerns
 - Improvements to any study intersections listed on the HEP (Hazard Elimination Program) site shall be coordinated with DelDOT Safety Section to coincide with recommendations
- Roadway Analysis
- Sufficiency of Signing and Striping



11/19/09

34

Bicycle, Pedestrian and Transit Facility Analysis

- Evaluate existing pedestrian, bike and transit facilities
 - Bike Maps
 - Transit Schedules
- Contact DelDOT ped and bike section for recommendations
- Contact DART for planned routes and facility needs
- May need to coordinate with local school district for a bus stop



Bicycle, Pedestrian and Transit Facility Analysis

DelDOT Contacts

- Pedestrian Facilities-Jennifer Baldwin
- Bicycle Facilities-Anthony Aglio
- DART

PLANNER	AREA OF RESPONSIBILITY
Lisa Collins	Kent County/Resort/Kent & Sussex Shuttles/Sussex West/Intercounty
David Dooley	City of Wilmington
Semia Hackett	NCC/Brandywine Hundred/DE City/City of New Castle
Wayne Henderson	NCC/KC/SC (Statewide support)
Ivan Mitchell	Western NCC/Newark/Pike Creek/Elsmere/Hockessin/Elkton/US 40/Bear/Christiana

When my development has impact...

When deficiencies occur, mitigation measures may include constructing off-site improvements at deficient intersections

Hierarchy of improvements as preferred by DelDOT

- When a two-way stop control fails, try
 - Adding new lanes to the approach(s)
 - Reconfiguring the intersection as an all-way stop control (AWSC)
 - Adding turn lanes to AWSC
 - Signal control and Roundabout analysis (unless one of the roadways is defined by DelDOT as an evacuation route)

- When a signalized intersection fails, try
 - Optimizing cycle lengths
 - Optimizing signal phasing (only with DelDOT approval)
 - Adding auxiliary turn lanes
 - Adding through lanes

11/19/09

37

When my development has impact...

- On-site improvements, including access controls and site circulation
 - Limit access
 - Provide additional street interconnections and street extensions
 - Provide frontage roads

- Phasing of development in order to relate site development to the construction of the required roadway system
 - Planned geometric improvements such as lane geometry improvements, intersection realignments, new signals, structure widening

11/19/09

38

Let us know what you are thinking!

- Mitigation measures that involve changes in number or usage of lanes at any intersection or phasing at the signal require conceptual approval from DelDOT prior to the submission of the TIS
- If such mitigation measures are required by developer or by DelDOT's engineer, the developer shall meet with DelDOT Traffic and Subdivision Sections, preferably at the same time to seek approval or come up with an acceptable alternate scheme



Typical Recommendations

- Operational and Functional Classification improvements to the roadway network
 - Improving roadway segment as per DelDOT Standards
 - Addition of turn lanes, channelizing islands to prevent unsafe movements
- Construction of off-site improvements by the Applicant
 - Improving intersections deficiency to achieve or maintain required LOS
- Travel Demand Management Strategies
 - Improve interconnectivity
 - Installing connector road
- Improvements for safe and efficient flow of vehicle, bicycle, pedestrian, transit movements and access;
 - Adding multi-use paths, pedestrian crosswalks on roads
 - Providing bike lanes, bike symbols, signs on lanes, bike racks near commercial entrances
 - Installing concrete bus pads and covered bus stops

Special Recommendations

- If site is a part of HEP study:
 - Improvements to match those of the HEP committee recommendations
 - Turning movement restrictions, signing, pavement marking improvements, etc
 - Federally funded project
 - Developer's equitable portion would be based solely on the State matching funds

11/19/09

41

Recommendations
(Section 2.11)

Special Recommendations

- If site is near a Railroad crossing:
 - Railroad grade crossing agreement
 - Improvements may be based on Rail-Highway Grade Crossing Safety Program
 - Federally-funded project
 - Developer's equitable portion would be based solely on the State matching funds
- If near an Airport:
 - Deed restrictions required similar to the Aviation Nuisance Easement and Non-Suit Covenant
 - Restrictions may apply within the Runway Protection Zone



11/19/09

42

See What is Already Happening



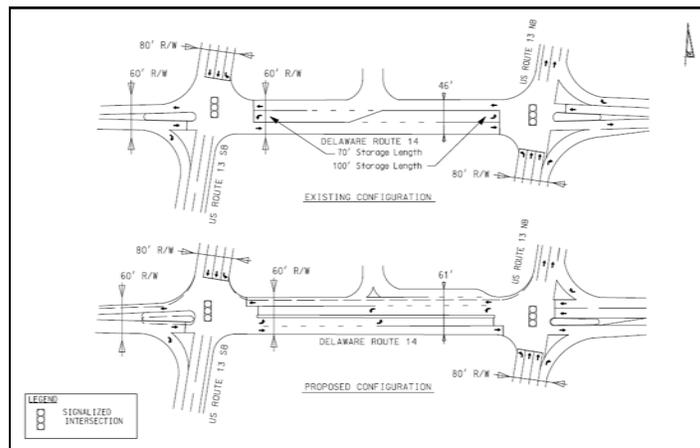
- All proposed improvements shall be supported by and consistent with the analyses performed
- Review the recommendation for consistency
 - With the local government comprehensive plans
 - With other committed developments in the area
 - With any planned DelDOT projects (including pavement rehabilitation) in the area
 - With any HEP recommendations for the study intersections (if applicable)

11/19/09

43

Sample

- Proposed Right-in/Right-out site entrance
- Adding median, channelizing island, increasing turn lane storage



11/19/09

44

Sample



Source: Brocktonbridge Village, Kent County

- Safety improvements along the S-curve road on site frontage
- Striping, rumble strips, signage, reflectors

11/19/09

45

Sample

- Improvements to match corridor wide Planning Study
- Conceptual layout of US Route 13 with service roads
- Service roads to be incorporated in site design to enhance interconnectivity



Source: US Route 13 Corridor Study, Bridgerille Area

11/19/09

46

Contents of the TIS Report

- All TIS submittals shall be signed and sealed on the first page by a licensed Delaware Professional Engineer
- Items shall be addressed in the same sequence as follows:
 - a) Table of Contents;
 - b) List of Figures;
 - c) List of Tables;
 - d) Executive Summary;
 - e) Project Description;
 - f) Study Area;
 - g) Existing Traffic and Transportation Conditions;
 - h) Trip Generation;
 - i) Pass-by and Internal Capture Trips;
 - j) Trip Distribution;
 - k) Trip Assignment;
 - l) Future Traffic;
 - Traffic Analysis
 - Analysis Years
 - Peak Hour Factors
 - m) Safety Evaluation and Adequacy of Sight Distance;
 - n) Geometric Design, Operational and Circulation Improvements;
 - o) Impacts on Bicycles, Pedestrians and Transit;
 - p) Capacity Analyses;
 - q) Mitigation Identification;
 - r) Recommendations;
 - s) Conclusions; and
 - t) Appendices



11/19/09

47

Last but not the least...

- Appendices should include the following:
 - *DelDOT and Applicant correspondence
 - Traffic count summary sheets
 - Collision diagrams
 - List of committed developments
 - Trip generation, distribution and assignment calculations for the site and all committed developments
 - Capacity analysis worksheets
 - Critical movement summation forms and signal timing sheets for all signalized intersections in the study area
 - Support for recommendations

11/19/09

48

When conditions change after a TIS is complete...

Before issuing a Letter of No Objection or before approving entrance plans

- DelDOT may require a new, revised, or updated TIS if existing or projected future conditions in the study area have changed significantly after the completion of the TIS

Once DelDOT has issued a Letter of No Objection or has approved entrance plans

- DelDOT may require a new, revised or updated TIS only if the development changes in a way that necessitates a new record plan
- However, during the review of the entrance plans, DelDOT may require an Traffic Operational Analysis if significant condition changes

Where do I look in the Manual?

Background:

Why is a TIS needed? (2.1 Purpose)

What conditions determine the TIS requirement? (2.3 Traffic Impact Study Warrants)

How to proceed and the Options? (2.4 Traffic Impact Study Process)

Sizing up the TIS and choosing the Option (2.5 Scope Of Work And Confirmation)

Details of the submissions to DelDOT

➤ 2.6 Traffic Impact Study Report Format (*Option A and Option B*)

➤ 2.7 Content Of Traffic Count And Trip Distribution Submission (*Option A only*)

➤ 2.8 Preliminary Traffic Impact Study Report Content (*Option A only*)

Inside the TIS

-Information in the TIS : Site area info; trip generations/ distributions; Analyses and LOS standards (2.9 Traffic Impact Study Content)

-Solutions to deficiencies identified in the TIS (2.10 Mitigation Identification)

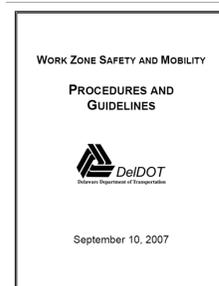
-Final recommendations for Site Entrance, mitigation recommendations (2.11 Recommendations)

-Supporting documentation for the TIS (2.12 Required Appendices)

Other Requirements-Transportation Management Plan (TMP)

“Improvements in this TIS may be considered “significant” under DelDOT’s Work Zone Safety and Mobility Procedures and Guidelines”

- These guidelines are available on DelDOT’s website at http://www.deldot.gov/information/pubs_forms/manuals/de_mutcd/index.shtml.
- Deciding whether a project is “significant” dictates what level of detail is required in a TMP



11/19/09

51

Work Zone TMP

- TMP describes a set of coordinated strategies used to manage work zone impacts of a project. The level of detail included in the TMP should be tailored to match the complexity of the project
- The components of a TMP are based on the expected work zone impacts of a project and whether the project is determined to be significant
- Two types of TMPs are defined based on the effects of the project on the roadway system
 - Type A (Minimal Impact)
 - Type B (Major Impact)



11/19/09

52

Types of TMP



- Type A TMP:
 - Required for projects that will result in minimal disruption
 - Includes only a Traffic Control Plan (TCP)
 - Standards, guidance provided in
 - Part 6-Temporary Traffic Control of DelDOT MUTCD
 - DelDOT's Road Design Manual
 - Chapter 9-Traffic Barriers, Traffic Control Devices, and Other Safety Features for Work Zones of the AASHTO Roadside Design Guide
- Type B TMP:
 - Required for Significant projects
 - Must include Public Information and Transportation Operations components, and a Work Zone Impacts Assessment (in addition to the TCP)

11/19/09

53

Other Reviews

- Final TIS review letter generally focuses on capacity and level of service issues
- Additional safety and operational issues will be further addressed through DelDOT's Subdivision review process discussed in other chapters

11/19/09

54

DelDOT TIS Group

- Thomas (Bill) Brockenbrough
 - (302) 760-2109
 - Thomas.Brockenbrough@state.de.us
- Todd Sammons
 - (302) 760-2134
 - todd.sammons@state.de.us
- Troy Brestel
 - (302) 760-2167
 - troy.brestel@state.de.us

