PENNDOT INTERSECTION CONTROL EVALUATION (ICE) POLICY CASE STUDY #1

PROJECT LOCATION

EXECUTIVE SUMMARY

Case Study #1 highlights the application of the ICE policy for a relatively straightforward Highway Occupancy Permit (HOP) application. The case study is intended to illustrate an example where a clear preferred control strategy is identified in Stage 1.

PROJECT DESCRIPTION

Private Development Company A is proposing to develop a new residential development on a currently vacant plot of land adjacent to Pennsylvania Route 500 in Concord Township. The concept development plan, which includes 75 single-family homes, proposes access to SR 500 via a single, new intersection.

Best described as a suburban area, the surrounding land uses include private residential developments, vacant plots, and an 18-hole golf course a half-mile to the east. This section of SR 500 is a two-lane, undivided arterial featuring curb-and-gutter, a shared-use path running along its north side, and a 35 mile-per-hour posted speed limit. It primarily serves as a means of accessing the adjacent private residential developments and experiences little through traffic. As the land directly opposite the proposed development on SR 500 is currently undeveloped, no intersections or site access points lie along the frontage of the proposed development. Consequently, a new access point to SR 500 is proposed, and an Intersection Control Evaluation (ICE) was undertaken.

CONDUCTING AN ICE

Given the project type, Private Development Company A (i.e., the HOP applicant) and their consultant were responsible for conducting an ICE and submitting the associated forms and analyses to the District 6 District Traffic Engineer (DTE) for approval. Much of the existing conditions data required for Stage 1 analyses were already known, and no formal data collection was required. As no intersection currently exists, turning movement counts could not be collected and there was no applicable historical crash data. Tube counts along SR 500 were collected by the applicant.

Given the existing conditions along SR 500, only three intersection control strategies were deemed viable through the Stage 1 preliminary analyses:

- Two-way Stop-Control
- Traffic Signal
- Roundabout

Many of the other intersection control types would require widening SR 500 or major impacts to adjacent properties. These impacts were not considered commensurate to the proposed level of development, which is anticipated to generate 62 weekday a.m.-, 81 weekday p.m.-, and 79 Saturday midday-peak hour trips.

While a traffic signal was deemed a viable control strategy to adequately accommodate traffic volumes at the proposed intersection, a review of the anticipated traffic volumes determined a traffic signal would not be warranted. It was also determined the footprint of a roundabout would result in impacts to the shared-use paths and drainage structure to the north of SR 500. Though these impacts may be relatively minor, a two-way stop-controlled intersection is anticipated to adequately accommodate the projected traffic levels at the intersection. As a result, the two-way stop-controlled intersection control was recommended for advancement by the applicant, and subsequently, approved by the District 6 DTE.

Project Location: Concord Township
County: Delaware
PennDOT District: District 6
Project Type: Highway Occupancy Permit (HOP) Application
Project Setting: Suburban
Existing Intersection Control: None (New Intersection Proposed)
Outcome: Minor Road Stop-Control
Stages: 1

Pennsylvania Department of Transportation
Intersection Control Evaluation (ICE) Form
Stage I: Screening

To fulfill the requirements of Stage 1 (Screening) of PennDOT's ICE procedures, complete the following form and append all supporting documentation. Completed forms can be submitted to the District Traffic Engineer (DTE) for the project's location.

Project Information

Project Name	Case Study #1	Project Setting	Suburban	Project ICE Reference Number	XXXX-XXXX
Submitted By	XXX	Agency/Company	Private Development Company A	Email	XXXX.XXXX@privatedevelopmentcompanya.com
Project Purpose and Goals (*What is the catalyst for this project and what are the intended outcomes?*)	Private Development Company A is proposing to develop a new residential development consisting of 75 single-family homes. Located on a currently vacant plot of land in Concord Township, the development would create a new intersection with State Route 500.				
Project Setting Description (*Describe the area surrounding the intersection*)	The proposed development is located on a currently vacant lot along SR 500. Best described as a suburban area, the surrounding land uses include other private residential developments and a golf course. SR 500 primarily serves as a means of accessing the private residential developments and experiences little through traffic.				
County	Delaware	Project Locality (Township/Borough/City)	Concord Township		
PennDOT District	District 6	Project Type (select most appropriate)	Highway Occupancy Permit (HOP) Application		
Multimodal Context (*Describe pedestrian, bicycle, and transit activity in the area and the potential for activity based on surrounding land uses and development pattern*)	A 10-foot shared-use path runs along the northern side of SR 500, providing a shared space for both pedestrians and bicyclists. As the proposed site lies along the southern side of SR 500, developing a new, three-legged intersection would likely not present any conflicts with pedestrians and bicycles along the shared-use path. SEPTA Bus Line 325 currently operates along SR 500 on weekdays between 6 a.m. and 7 p.m. The closest stop to the proposed site is 0.4 miles to the east on SR 500.				

Basic Intersection Information

Major Street

Major Street Route Number(s)	500	Major Street Route Name(s)	Perry Road			SR Segment #	10	SR Offset	200
Primary Functional Classification	Principal Arterial	Secondary Functional Class. (if app.)				Existing AADT	10,000	Existing Control	None/New Intersection
Major Street Ownership	PennDOT			Sidewalks are present along:	One side of the roadway				
Crosswalks? ☐	On-Street Bike Facilities? ☐	Multi-Use Path? ☑		Scheduled Bus Service? ☑		Bus stop at intersection? ☐			

Approach #1	Number of Lanes (Count Shared Lanes as Through):	Left-Turn		Through	1	Right-Turn			
	AM Peak Hour Traffic Volumes:	Left-Turn	10	Through	425	Right-Turn			
	PM Peak Hour Traffic Volumes:	Left-Turn	23	Through	350	Right-Turn			
Approach #2	Number of Lanes (Count Shared Lanes as Through):	Left-Turn		Through	1	Right-Turn			
	AM Peak Hour Traffic Volumes:	Left-Turn		Through	300	Right-Turn	5		
	PM Peak Hour Traffic Volumes:	Left-Turn		Through	390	Right-Turn	25		

Minor Street

Existing ☐ New ☑

Minor Street Route Number(s)	N/A	Minor Street Route Name(s)	N/A			SR Segment #	N/A	SR Offset	N/A
Primary Functional Classification	Privately-Owned Roadway	Secondary Functional Class. (if app.)				Existing AADT (if available)			
Minor Street Ownership	Private Development Company A			Sidewalks are present along:					
Crosswalks? ☐	On-Street Bike Facilities? ☐	Multi-Use Path? ☐		Scheduled Bus Service? ☐		Bus stop at intersection? ☐			

Approach #1	Number of Lanes (Count Shared Lanes as Through):	Left-Turn		Through		Right-Turn			
	AM Peak Hour Traffic Volumes:	Left-Turn	20	Through		Right-Turn	22		
	PM Peak Hour Traffic Volumes:	Left-Turn	26	Through		Right-Turn	23		
Approach #2	Number of Lanes (Count Shared Lanes as Through):	Left-Turn		Through		Right-Turn			
	AM Peak Hour Traffic Volumes:	Left-Turn		Through		Right-Turn			
	PM Peak Hour Traffic Volumes:	Left-Turn		Through		Right-Turn			
Approach #3	Number of Lanes (Count Shared Lanes as Through):	Left-Turn		Through		Right-Turn			
	AM Peak Hour Traffic Volumes:	Left-Turn		Through		Right-Turn			
	PM Peak Hour Traffic Volumes:	Left-Turn		Through		Right-Turn			

Crash History (Existing Intersections Only)

Append the most recent five-years of crash data for the intersection from the CDART. If the crash data evidences any issues relating to safety performance, discuss briefly here:

Not applicable (new intersection)

Screening Evaluation

Provide a brief justification as to why each of the following control strategies should be advanced or not. Justification should consider potential environmental impacts.

Note: FHWA's CAP-X tool is helpful for assessing the viability of alternative intersection forms.

Control Strategy	Strategy Viable?	Justification	Strategy to be Advanced?
Two-way Stop-Controlled	Yes	A two-way stop-controlled intersection is anticipated to adequately accommodate the number of trips generated by the site.	Yes
All-way Stop-Controlled	No	Given the high number of through movements on SR 500, developing an all-way stop-controlled intersection would create unnecessary delay for mainline movements at the expense of a relatively low number of minor street movements.	No
Signalized Control	Yes	While viable control strategy, the low number of trips forecast to be generated by the proposed development would not warrant a signal.	No
Roundabout	Yes	While a viable control strategy, the footprint of a roundabout would have unnecessary impacts to the north of SR 500. The path of the shared-use path would need to be shifted further north into the adjacent detention pond and drainage infrastructure.	No
Median U-Turn	No	SR 500 is a two-lane, undivided arterial. To implement this strategy, significant widening would need to occur along SR 500 to develop a median.	No
Restricted Crossing U-Turn (RCUT) Signalized	No	SR 500 is a two-lane, undivided arterial. To implement this strategy, significant widening would need to occur along SR 500 to develop a median.	No
Restricted Crossing U-Turn (RCUT) Unsignalized	No	SR 500 is a two-lane, undivided arterial. To implement this strategy, significant widening would need to occur along SR 500 to develop a median.	No

Jughandle	No	There are a relatively low number of major street left-turns anticipated given the proposed level of development. This strategy would require the creation of a fourth leg to the intersection and force eastbound left-turns to cross two lanes of mainline traffic. This would also impact the shared-use path and drainage infrastructure to the north of Route 500.	No
Displaced Left-Turn	No	This control strategy is not viable, as it would require the development of a median and installation of traffic signals. Signal warrants are not expected to be met given anticipated levels of development.	No
Continuous Green Tee	No	Introducing a continuous green tee intersection would require the restriction of access to several of the existing developments along SR 500. Rerouting trips to adjacent intersections to perform U-turn maneuvers to access these sites is not a desired outcome on any intersection improvements.	No
Quadrant Roadway	No	Given the anticipated number of turning movements at the proposed intersection, this control strategy would not present any benefits over a traditional intersection and would have significant impacts to the site.	No
Other			

Resolution				
To be filled out by PennDOT District Traffic Engineer or designee only.				
Project Determination	Identified Control Strategy Approved			
Comments				
DTE or Designee Name *(Type)*		Signature		Date