



KENNETT PIKE CORRIDOR STUDY



Delaware Department
of Transportation

September 22, 2015
Centreville, Delaware

History of the Study

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- The working group was formed in 2013 as a result of the 2013 CCA Annual Meeting.

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Mr. Jeff Greene

Mr. Irv Hollingsworth

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- Centreville is an “18th century village with 21st century traffic.”
- This was the first study since the streetscape project has been completed in late 2011.

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History of the Study

August
2013

- Met with Centreville Civic Association (CCA) core group
- DeIDOT agreed to perform a comprehensive traffic safety study in Centreville

January
2014

- Results of study presented to CCA core group
- Recommendations provided based on study's results

April 2014

- Internal, independent vote taken by CCA to determine interest in having DeIDOT pursue each recommendation given in the study.

August
2014

- Signing modifications made and Speed Reduction Pavement Markings installed along Kennett Pike.

September
2014

- Public workshop held at the Centreville School to solicit public comment regarding DeIDOT's recommendations

May 2015

- Installation of the traffic signal was put on hold until a second public workshop could be held.

September
2015

- Second public workshop held at the Centreville School to gain additional feedback

Community Concerns and Requests

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- Issues raised during the August 22, 2013 meeting:
 - Sign Clutter
 - Bicycle and Parking signage
 - “Strictly Enforced” plaques
 - Speed Limit & Enforcement
 - Pedestrians and Jaywalking Enforcement
 - Crosswalks & Lighting
 - Intersection sight distance
 - Truck traffic

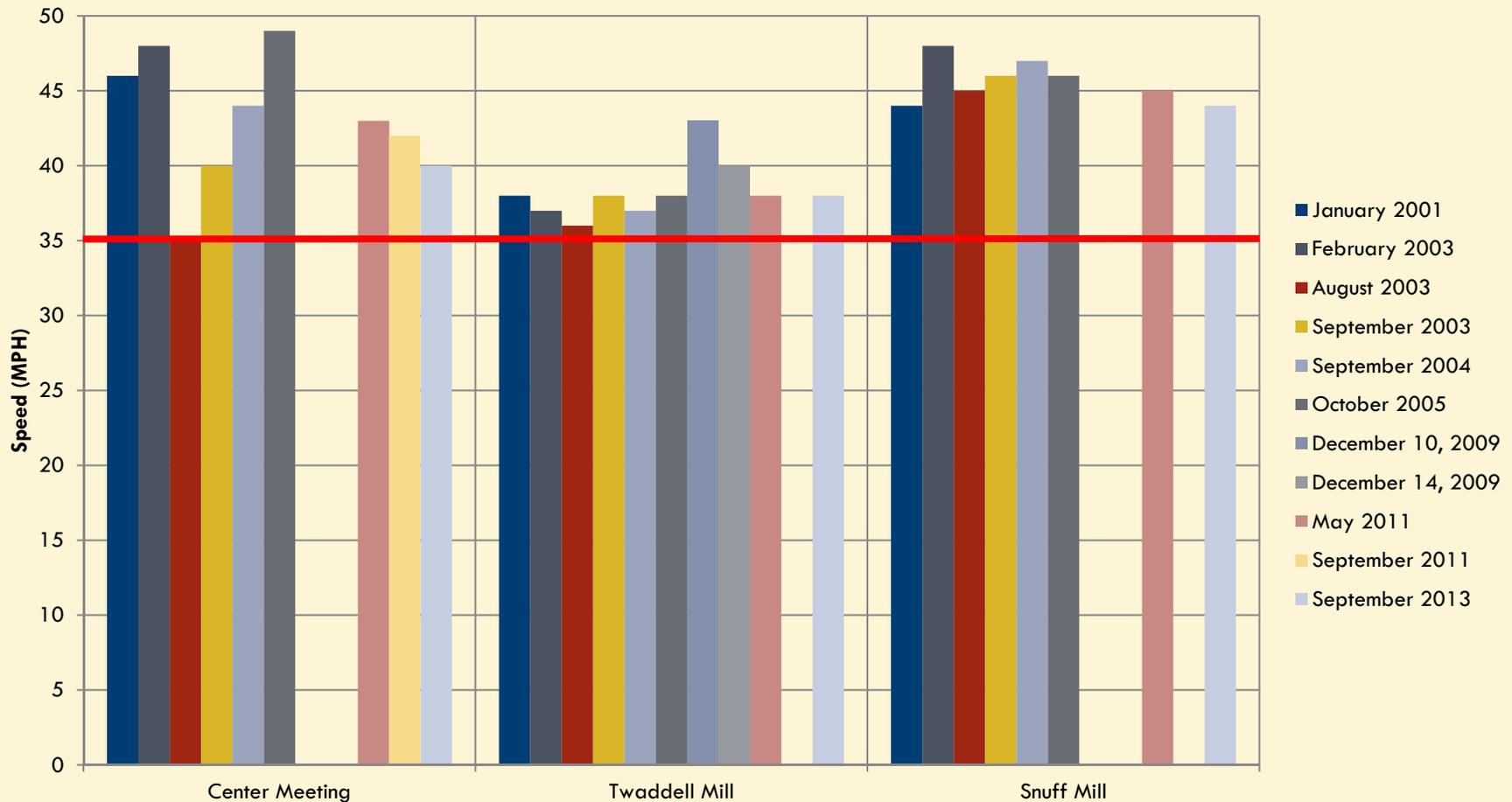
Speed Study

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- Speed studies performed by DeIDOT utilize radar technology to capture vehicle speeds along a roadway under ideal conditions, including off-peak hours, dry roadways and away from traffic signals or other possible hindrances to free-flowing vehicular speeds.
- Section 2B.13 of the Delaware Manual on Uniform Traffic Control Devices (DE-MUTCD) states:
 - *“When a speed limit...is posted, it should be within 5 mph of the 85th-percentile speed of free-flowing traffic.”*
- The 85th-percentile speed is the speed at or below which 85 percent of vehicles travel.

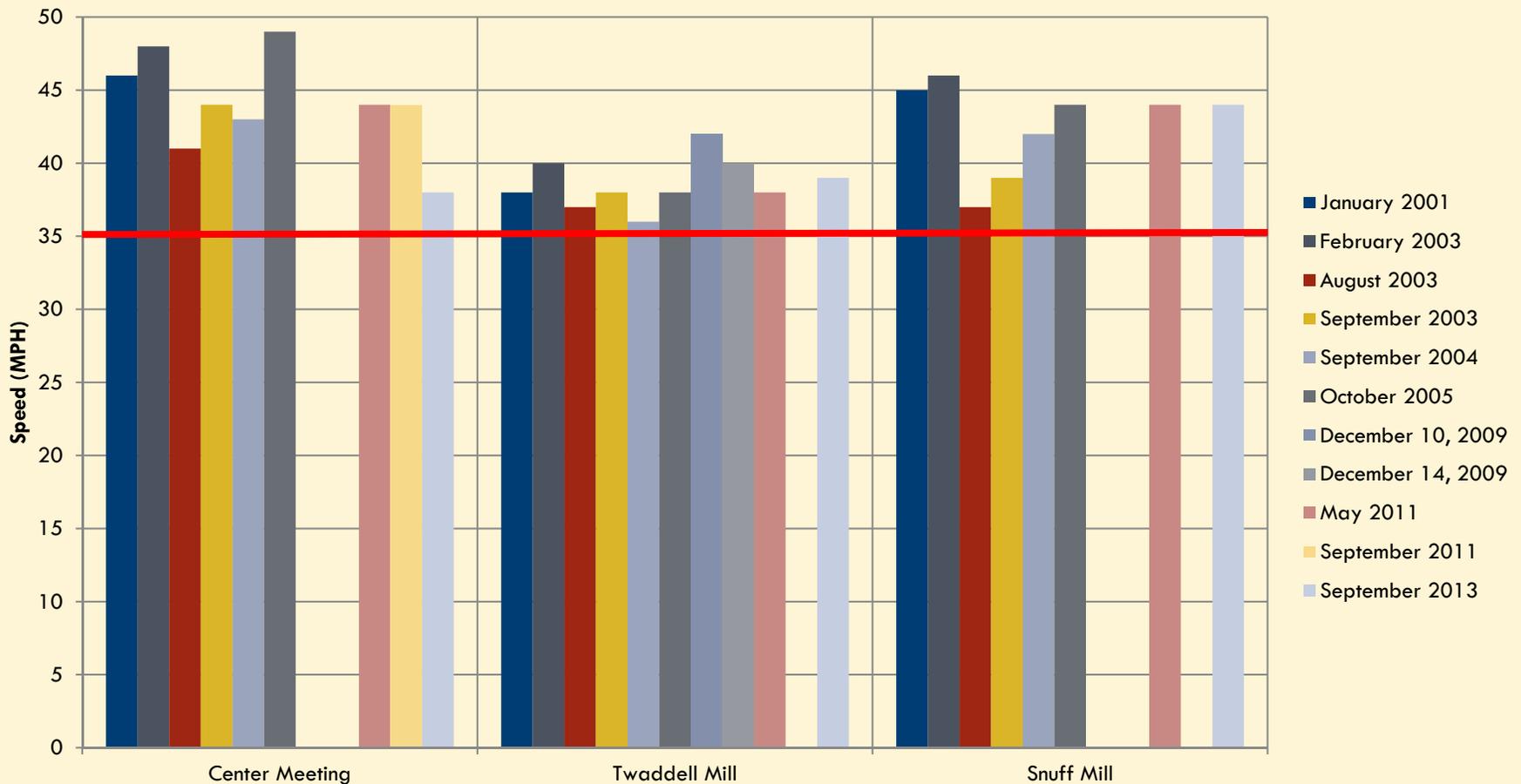
Speed Study

Northbound Kennett Pike Historical 85th Percentile Speeds



Speed Study

Southbound Kennett Pike Historical 85th Percentile Speeds



Speed Study

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➤ **Center Meeting Road to Center Avenue**

- The 85th-percentile speeds are within 5 MPH of the posted speed limit.
- Overall, motorists exhibited good compliance with the 35 MPH posted speed limit.

➤ **Center Avenue to Snuff Mill Road**

- The 85th-percentile speeds are 9 MPH above the posted speed limit.

Speed Study

□ Conclusions and Recommendations

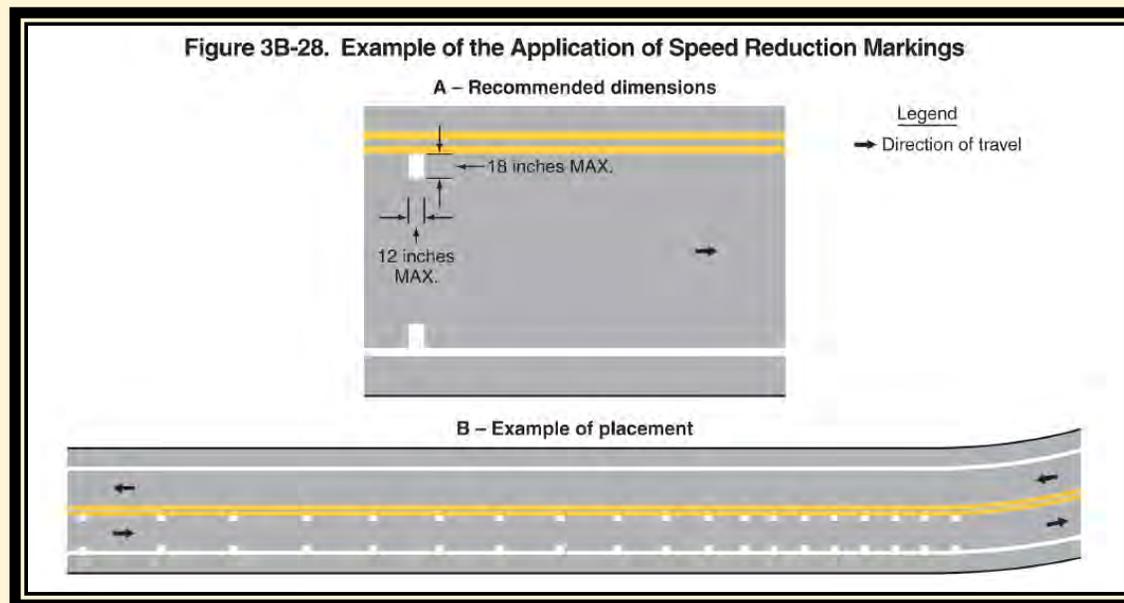
- The 35 MPH speed limit is an appropriate speed through Centreville
 - Artificially lowering the speed limit can lead to:
 - General disregard for the unreasonably set speed limit
 - Higher crash rates due to increased speed differential
 - Tailgating and Aggressive Driving
- Approaching gateway islands, speeds are marginally higher.
 - Recommend installation of speed reduction markings
 - Recommend additional periodic speed enforcement

Speed Study

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➤ Speed Reduction Markings

- Installed at the gateway islands in both directions in an effort to reduce speeds approaching Centreville.
- The decreasing distance between the lateral markings is designed to give the perception of the motorist traveling too fast.
- Installed by DeIDOT in both directions of Kennett Pike in August 2014



Delaware Manual on Uniform Traffic Control Devices, 2011

Crash History

Annual Crashes
Kennett Pike between Centreville gateway islands
1/1/2005 - 7/31/2015



5-Year Crash History

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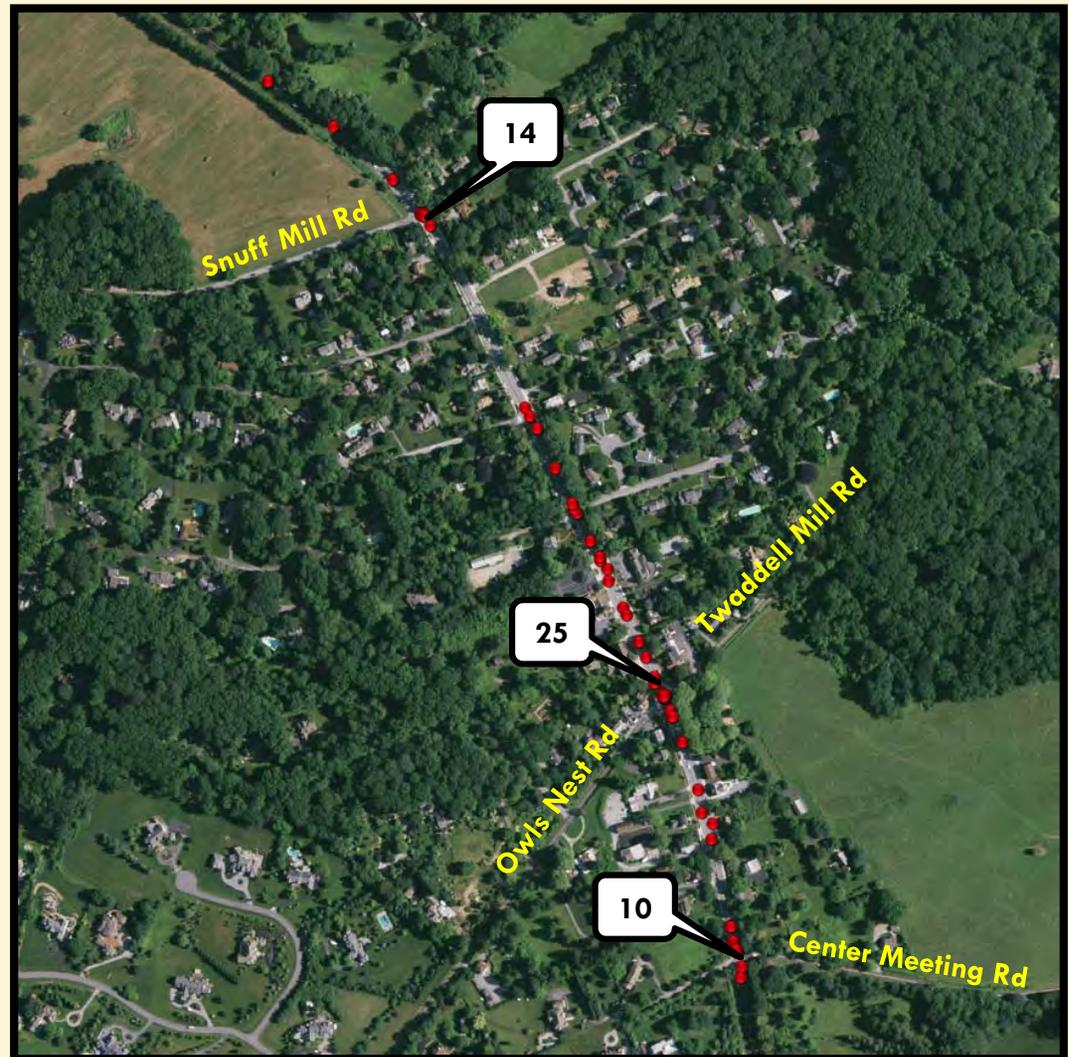
**Kennett Pike between
Centreville
gateway islands**

8/1/2010 - 7/31/2015

69 Crashes

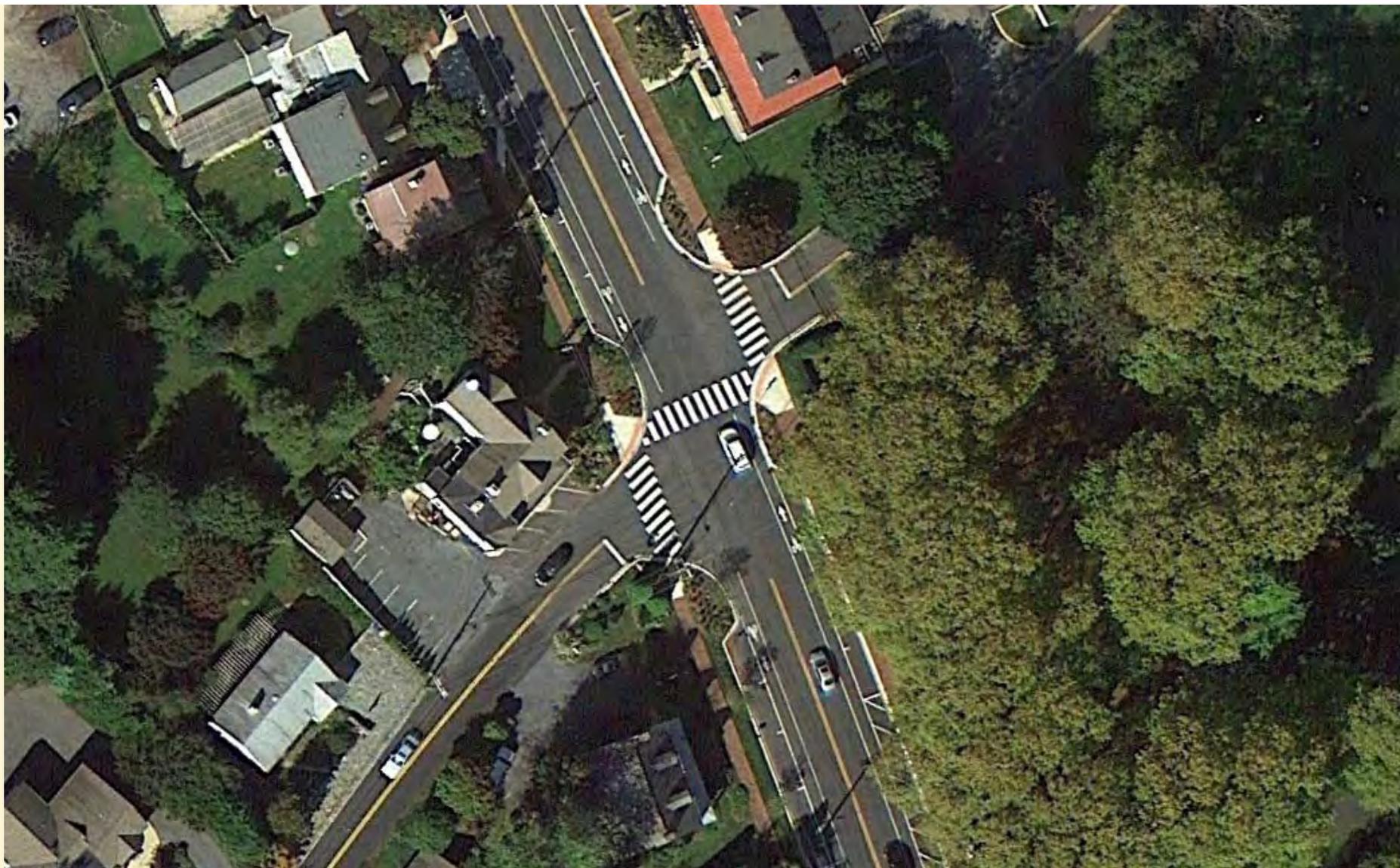
Crash Clusters:

Center Meeting Road
Owls Nest Road/Twaddell Mill Road
Snuff Mill Road



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Kennett Pike & Owls Nest Road/ Twaddell Mill Road



Kennett Pike & Owls Nest Road/Twaddell Mill Road

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- Peak hours
 - 7:30 AM – 8:30 AM
 - Predominantly southbound flow
 - 11:45 AM – 12:45 PM
 - Northbound & southbound balanced
 - 5:00 PM – 6:00 PM
 - Predominantly northbound flow

Daily Traffic Volumes (veh/day)

Kennett Pike	11,565
Owls Nest Road	1,872
Twaddell Mill Road	1,252

- Observations
 - Vehicles “double stack” (a left/through vehicle stops adjacent to a right turning vehicle) on the eastbound Owls Nest Road approach.
 - Significant side street delays during the AM and PM peak hours.
 - School bus stops in the area.
 - DART Route 10 travels through the intersection and makes a left turn onto Owls Nest Road from northbound Kennett Pike.

Kennett Pike & Owls Nest Road/Twaddell Mill Road

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□ Crash Data (from 8-1-2010 to 7-31-2015)

Crash Type	#	%
Property Damage Only	18	72%
Personal Injury	6	24%
Fatality	1	4%
Angle	14	56%
Rear End	4	16%
Single Vehicle	3	12%
Sideswipe, Same Direction	2	8%
Sideswipe, Opposite Direction	1	4%
Other	1	4%

The data shown above includes a 250-foot radius around the entire intersection.

Kennett Pike & Owls Nest Road/Twaddell Mill Road

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**Crashes at the Intersection of Kennett Pike and Twaddell
Mill Road/Owls Nest Road by Year
8-1-2010 to 7-31-2015**



Pedestrians –

Kennett Pike & Owls Nest Road/Twaddell Mill Road

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Alternatives Explored

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- Reduce sign clutter along Kennett Pike
 - DeIDOT removed 40 signs within the Village in August of 2014

- Reduce speed limit through the Village
 - As mentioned previously, the 35 mph speed limit is appropriate for this section of Kennett Pike.

- Install speed humps/tables
 - According to DeIDOT's *Traffic Calming Manual*, speed humps or tables "should not be installed on primary emergency vehicle routes."
 - *Kennett Pike is classified as a Principal Arterial and carries approximately 12,000 vehicles per day.*
 - Speed humps may affect emergency response times and may divert traffic to other area streets.
 - Installation of speed humps may increase speed differentials, potentially leading to an increase in crash severity.

Alternatives Explored

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- **Install in-pavement crosswalk lighting**
 - Due to snowplow and general maintenance concerns, DeIDOT currently does not install in-pavement crosswalk lights.
- **Coordinate traffic signals to create gaps in traffic**
 - DeIDOT's practice is to allow for free-flowing through traffic unless demand on side streets is present.
 - Unnecessarily stopping traffic can potentially lead to rear-end crashes, red light running, and aggressive driving
- **Elimination of on-street parking spaces near intersection**
 - Parking plan developed by Centreville Civic Association with residential and commercial property owner buy-in
- **Trim shrubs at crosswalk "bump outs"**
 - DeIDOT will communicate with the Centreville Civic Association to trim any shrubs or bushes that may be hindering sight distances at intersections.

Alternatives Explored

- Installation of additional pedestrian crosswalks within the Village across Kennett Pike (if necessary)
 - Near 5710 Kennett Pike (south of Owls Nest Road/Twaddell Mill Road) toward southern end of sidewalk
 - At Center Avenue/Valley Way
 - At Gregg Avenue/Mount Airy Drive

Alternatives Explored

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➤ Modern Roundabout

- Installing a modern roundabout would involve major right-of-way impacts
- Traffic volumes on Kennett Pike do not allow for the efficient flow of traffic through the roundabout
 - Side street traffic would likely experience major difficulty entering the roundabout

➤ Mini-Roundabout

- Requires a flush center island through which motorists may drive instead of circulating
- Does not effectively accommodate vehicles larger than a passenger car
- May be confusing to motorists, leading them to turn left prior to the center island

Modern Roundabout Concept

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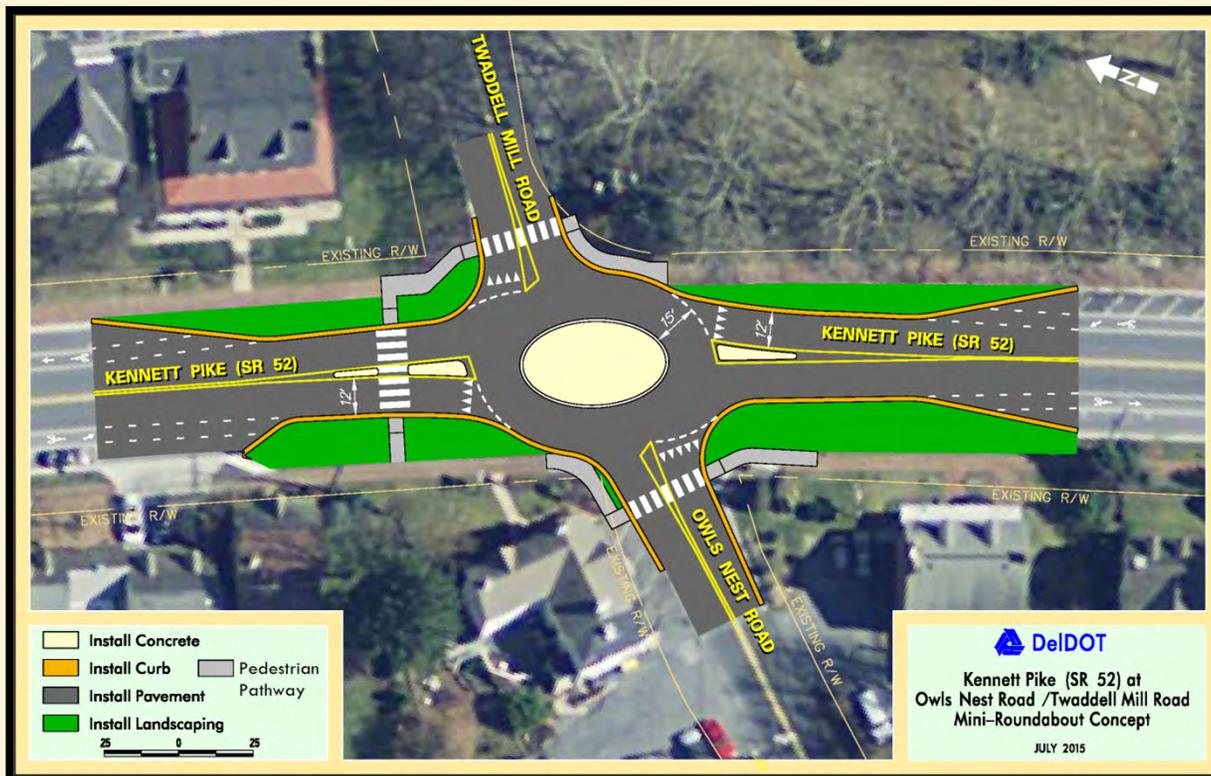
Modern Roundabout Concept

Installation of a modern roundabout

PROS	CONS
Speeds and crashes within the area of the roundabout will be reduced greatly.	Extensive right-of-way required for construction.
The free-flowing nature of the roundabout will improve LOS on Owls Nest Road/ Twaddell Mill Road.	Though Owls Nest Road/Twaddell Mill Road's LOS will improve, Kennett Pike's will deteriorate dramatically, creating long queues.
More aesthetically pleasing compared to a traffic signal.	Construction of the roundabout will have regional impacts and will most likely require road closures.
Lighting is required within a roundabout, providing previously unavailable illumination at the intersection.	High volumes of traffic on Kennett Pike may "choke off" access to the roundabout for Owls Nest Road/Twaddell Mill Road traffic.

Mini-Roundabout Concept

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- High traffic volumes on Kennett Pike will cause the roundabout to be over capacity and will likely “choke off” side street traffic, not allowing them to enter the roundabout.
- DART Route 10 travels north on Kennett Pike and makes a left turn onto Owls Nest Road. The roundabout can only be designed to accommodate turning movements for a passenger vehicle, thus making the buses turning movement nearly impossible without traveling over the central island.
- The atypical roundabout design may lead to driver confusion, potentially causing motorists to turn left prior to the central island rather than circulate around it.

Mini-Roundabout Concept

Installation of a mini-roundabout

PROS	CONS
Right-of-way impacts are significantly less than a modern roundabout	Severely unbalanced volumes can lead to extensive queuing on Kennett Pike.
Shorter pedestrian crosswalk lengths with slower vehicular approach speeds make the intersection more pedestrian-friendly	A traversable central island may encourage motorists to disregard the intended circulatory traffic pattern altogether
Lighting the intersection will increase nighttime visibility among the intersection, making pedestrians and cyclists more visible to drivers	DART Route 10 and large trucks will not be able to make left turns without impacting the central island
Elimination of on-street parking approaching the roundabout may help channelize drivers into the proper pathway to navigate the roundabout	High volumes of traffic on Kennett Pike may “choke off” access to the roundabout for Owls Nest Road/Twaddell Mill Road traffic.
Crashes are likely to be less severe in a roundabout	The skew of the intersection and small central island may confuse motorists who may turn left in front of the central island instead of circulating around it.

Alternatives Explored

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➤ Traffic signal

- Allows for a safer, controlled crossing of pedestrians
- May reduce speeds through Village
- Constrained right-of-way will not allow for left turn lanes on Kennett Pike.
- Low left turn volumes negate the need for left turn arrows on Kennett Pike.
- Offset side streets require the use of “split” side street phasing
 - Owls Nest Road traffic will proceed through the intersection separately from Twaddell Mill Road

Traffic Signal Concept

Installation of a traffic signal

PROS	CONS
Delays and queues on Owls Nest Road/ Twaddell Mill Road improve during each peak period.	Offset side streets require the use of “split” phasing, potentially causing longer delays along Kennett Pike.
Signal control allows for a safer navigation of the intersection for all modes of transportation.	Levels of service in peak directions along Kennett Pike deteriorate to LOS B and C during AM and PM peak hours, respectively.
Speeds may be reduced through Centerville due to the presence of the signal.	Potential for increases in rear-end crashes.
Pedestrians may be more likely to use crosswalks at a signalized intersection rather than at an uncontrolled mid-block location.	Left turns on Kennett Pike may cause additional delay to through traffic with no separate left turn lanes.
Reduction in more severe, angle-type crashes.	

Traffic Signal Concept

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- **What would the traffic signal look like?**
 - The traffic signal will be mounted on one overhead pole (mast arm), carrying all eight signal heads for all four approaches.
 - Pedestrian signals will be installed at all four corners of the intersection.
 - Pedestrian crosswalks will remain at the same locations.
 - Decorative signal poles will be used to maintain a context sensitive signal installation.
 - Through a site review conducted in April 2015, no trees will require removal for the installation of a traffic signal and visibility of the signal heads will not require tree trimming.

Traffic Signal Concept

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Traffic Signal Concept

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- **How would the traffic signal operate?**
 - Both directions of Kennett Pike would flow at the same time.
 - Side street “split” phasing
 - Pedestrian crossing phases
 - No left turn phases on Kennett Pike
 - Emergency vehicle pre-emption detection

Conclusions

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- Crash cluster at the intersection of Kennett Pike and Owls Nest Road/Twaddell Mill Road
 - Queuing vehicles on side street approaches
 - Sight distance issues
- Increase in crashes since completion of streetscape project in 2011
- Pedestrians are crossing midblock at unmarked locations
 - Traffic signal would provide a controlled pedestrian crossing
- The 35 mph speed limit is appropriate for the roadway setting and environment.
 - Artificially lowered speed limit will not improve compliance
- Thresholds have been met to support the installation of a traffic signal.
- All remedial options, generated both internally and externally, have been considered for the intersection.

Recommendations

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➤ Phase One:

- Remove unnecessary signage along the entire corridor
 - Completed by DeIDOT in August 2014
- Install speed reduction pavement markings in both directions of Kennett Pike at the gateway islands
 - Completed by DeIDOT in August 2014
- Reach out to Delaware State Police to provide additional speed enforcement when deemed necessary.
 - Ongoing effort.

Recommendations

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➤ **Phase Two:**

- Install a traffic signal at the intersection of Kennett Pike and Owls Nest Road/Twaddell Mill Road
 - Include pedestrian signals
 - No additional turn lanes or left turn phases

➤ **Additional options (if necessary):**

- Install crosswalks at locations with higher mid-block pedestrian activity
 - Near 5710 Kennett Pike (south of Owls Nest Road/Twaddell Mill Road) toward southern end of sidewalk
 - At Center Avenue/Valley Way
 - At Gregg Avenue/Mount Airy Drive
- Consider restricting parking and trimming/removing shrubs to improve intersection sight distance at applicable locations

Next Steps

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- 30-day comment period following the public workshop
 - Comment deadline October 22, 2015
- DeIDOT will collect and assess all comments before making a final decision.
- For more information, visit:

http://www.deldot.gov/information/projects/centreville_safety_study/index.shtml



Thank You

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