

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION

800 BAY ROAD
P.O. BOX 778
DOVER, DELAWARE 19903

December 2, 2010

CAROLANN WICKS, P.E.
SECRETARY

Ms. Sarah E. Keifer
Director of Planning
Department of Planning Services
Kent County Administrative Complex
555 Bay Road
Dover, DE 19901

Dear Ms. Keifer:

The enclosed Traffic Impact Study (TIS) review letter for the **Palomar North and South** development has been completed under the responsible charge of a registered professional engineer whose firm is authorized to work in the State of Delaware. They have found the TIS to conform to DelDOT's Standards and Regulations for Subdivision Streets and other accepted practices and procedures for such studies. DelDOT accepts this review letter and concurs with the recommendations. We are providing it to you in fulfillment of our joint agreement regarding the review of TIS. If you have any questions concerning this letter or the enclosed review letter, please contact me at (302) 760-2134.

Sincerely,

T. William Brockenbrough, Jr.
County Coordinator

TWB:km
Enclosures

cc with enclosures: Ms. Constance C. Holland, Office of State Planning Coordination
Ms. Juanita Wiezcoreck, Dover/Kent County MPO
Mr. Scott Lobdell, VanCleeef Engineering Associates
Mr. Mir Wahed, Johnson, Mirmiran, and Thompson
DelDOT Distribution

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Theodore G. Bishop, Assistant Director, Development Coordination
Thomas Greve, Central District Engineer, Central District
Lisa Collins, Service Development Planner, Delaware Transit Corporation
Marc Coté, Subdivision Engineer, Development Coordination
T. William Brockenbrough, Jr., County Coordinator, Development Coordination
Anthony Aglio, Bicycle and Pedestrian Coordinator, Statewide & Regional Planning
Todd J. Sammons, Kent County Manager, Development Coordination
Julio Seneus, Subdivision Manager, Development Coordination
Troy Brestel, Project Engineer, Development Coordination



December 2, 2010

Mr. T. William Brockenbrough, P.E.
County Coordinator
DelDOT Division of Planning
P O Box 778
Dover, DE 19903

RE: Agreement No. 1406
Traffic Impact Study Services
Task 233A-Palomar North and South

Dear Mr. Brockenbrough:

Johnson, Mirmiran and Thompson (JMT) has completed the review of the Traffic Impact Study (TIS) for the Palomar North and South, prepared by Van Cleef Engineering Associates, dated May, 2010. This review was assigned Task Number 233A. Van Cleef Engineering Associates prepared the report in a manner generally consistent with DelDOT's *Standards and Regulations for Subdivision Streets and State Highway Access*.

The TIS evaluates the impacts of the Palomar North and South subdivisions, which are proposed on the north and south sides of Central Church Road (Kent Road 155) approximately halfway between McKee Road (Kent Road 156) and Kenton Road (Kent Road 104) in Kent County. The developments would consist of 51 single-family homes on the north side of Central Church Road and a mix of 108 single-family homes, townhouses, and multi-family houses on the south side, on an approximately 47.8-acre assemblage of parcels. The parcels are currently zoned AR (Agricultural Residential) and will be developed under the same zoning or within the City of Dover limits with a MR2 zoning designation. The developer is proposing two full access points on Central Church Road across from each other, one for the North development and one for the South development. Construction is anticipated to be completed by 2017.

Section 5.3.k.2 of the Kent County Adequate Public Facilities Ordinance (APFO) states: "The specific traffic mitigation measures shall be chosen based on their ability to reduce the impact of traffic generated by the proposed subdivision or land development, in order to achieve and maintain the Level of Service standards for a minimum of two (2) years for roadway segments and intersections within the area of influence." Based on an April 14, 2008 meeting between DelDOT and Kent County Planning regarding the interpretation of the APFO, JMT has been instructed to perform the future two-year Level of Service maintenance analysis, for a date two years from when construction of the development is anticipated to be complete. The two-year Level of Service maintenance analysis results (referred to as Case 4) are contained in this final TIS letter.

DelDOT currently has no relevant or ongoing projects within the study area. However, DelDOT in conjunction with the City of Dover performed the Kenton Road Study in 2007. The Kenton Road Study corridor was approximately 2.5 miles long, from Denneys Road to the north to



Delaware Route 8/Forrest Avenue to the south. The purpose of the plan was to develop a set of integrated transportation and roadway capacity improvement concepts to support the area's designation as a growth zone. The proposed improvements include roadway widening, adding auxiliary lanes at intersections, signalization and the installation of pedestrian and bicycle facilities. This includes adding auxiliary lanes on Chestnut Grove Road at the Kenton Road intersection and adding auxiliary lanes and signal improvements at the intersection of Kenton Road/West Denneys Road. However, all the improvements proposed on the Kenton Road Study are still in the conceptual phase and have not been officially adopted by DelDOT.

In addition, one of the study area intersections for this TIS was evaluated under DelDOT's 2005 Hazard Elimination Program (HEP f.k.a. Highway Safety Improvement Program) as part of the Site U study. Site U included a 0.99 mile section of US Route 13 from 0.07 miles south of Denneys Road (Kent Road 100) to 0.03 miles north of Hatchery Road (Kent Road 154). It included the intersection of US Route 13 and Fork Branch/Dyke Branch Road (Kent Road 153) which was unsignalized at the time of the study. The report noted that a traffic signal warrant study had been performed at the intersection and as a result a traffic signal was installed after the HEP crash data period. This intersection was signalized in April 2006.

Also, one of the study area intersections was evaluated under DelDOT's 2008 High Risk Rural Roads Program (HRRRP) as part of Site 5. Site 5 included a 0.29 mile roadway segment along Pearsons Corner Road from 0.15 miles south of Blue Heron Road to 0.08 miles south of Central Church Road. The study included the unsignalized intersection of Pearsons Corner Road and Blue Heron Road. The HRRRP report included a crash data summary as well as evaluated the sight distances along Pearsons Corner Road relative to the curvature east and west of Blue Heron Road. The improvements suggested by the study included the installation of a stop line along northbound Blue Heron Road, the installation of raised pavement markers along the Pearsons Corner Road centerline east and west of Blue Heron Road and, the upgrade of the existing curvature (W1-2) warning signs and advisory speed signs along Pearsons Corner Road within the study limits. All the recommended improvements from HRRRP report have been implemented.

Based on our review, we have the following comments and recommendations:

The following intersections exhibit level of service (LOS) deficiencies without the implementation of physical roadway and/or traffic control improvements.



| <i>Intersection</i> | <i>Situations for which deficiencies occur</i> |
|--|--|
| Kenton Road and Central Church Road | 2017 AM and PM with and without Palomar North and South (Cases 2 and 3), 2019 AM and PM with Palomar North and South (Case 4) |
| Kenton Road and Pearsons Corner Road | 2017 PM with and without Palomar North and South (Case 3), 2019 PM with Palomar North and South (Case 4) |
| Kenton Road and Delaware Route 42 (Seven Hickories Road) | 2017 PM with and without Palomar North and South (Cases 2 and 3), 2019 PM with Palomar North and South (Case 4) |
| U.S. Route 13 and Fork Branch Road/Dyke Branch Road | 2017 AM and PM with and without Palomar North and South (Cases 2 and 3), 2019 AM and PM with Palomar North and South (Case 4) |
| Kenton Road and Chestnut Grove Road | 2017 PM with and without Palomar North and South (Cases 2 and 3), 2019 AM and PM with Palomar North and South (Case 4) |

The intersection of Kenton Road and Central Church Road would exhibit LOS deficiencies under all future conditions even without the development of the Palomar North and South subdivision. The LOS deficiencies would occur on the eastbound and westbound Central Church Road approaches. To address the LOS deficiency at this intersection we recommend that a single lane roundabout be installed at the intersection of Kenton Road and Central Church Road. Two other developers (Villages of Noble's Pond and Cherrington) are expected to enter into an agreement to install a single lane roundabout at this intersection as well.

The intersection of Kenton Road and Pearsons Corner Road would exhibit LOS deficiencies under all future PM peak hour scenarios. The LOS deficiencies in future conditions would occur on the northbound Kenton Road approach. To address the LOS deficiency at this intersection we recommend that a single lane roundabout be installed at the intersection of Kenton Road and Pearsons Corner Road. Two other developers (Villages of Noble's Pond and Cherrington) are expected to enter into an agreement to install a single lane roundabout at this intersection as well.

The intersection of Kenton Road and Delaware Route 42 (Seven Hickories Road) would exhibit LOS deficiencies under all future PM peak hour scenarios. The LOS deficiencies in future conditions would occur on the northbound Kenton Road approach. The 95th percentile queue lengths on the approach during the typical peak hours are expected to be about 35 feet in the AM and 225 feet in the PM peak hours. Furthermore, to safely merge the low volume westbound left-turn traffic onto the free flowing eastbound Delaware Route 42 right-turn traffic, a stop sign currently exists on southbound Kenton Road a short distance south of the Kenton Road and Delaware Route 42 intersection. All the westbound vehicles that currently turn left onto Kenton Road could easily use the left-turn at the intersection of Pearsons Corner Road and Delaware Route 42.

In order to fully address the LOS and operational deficiency at the intersection of Kenton Road and Delaware Route 42 we would recommend a single lane roundabout be installed at the intersection of Kenton Road and Delaware Route 42. As part of this improvement the skewed



geometry of Kenton Road would need to be realigned and additional right-of-way acquisition would be needed. However, we do not believe it would be reasonable to assign responsibility for the improvements required to fully correct the LOS deficiencies at this intersection. As such, we instead recommend prohibiting left-turns out from westbound Delaware Route 42 at the intersection of Kenton Road and Delaware Route 42. The existing storage area for the second stage left-turn movement should be removed. Two other developers (Villages of Noble's Pond and Cherrington) are expected to enter into an agreement to improve this intersection as well.

The intersection of US Route 13 and Fork Branch Road/Dyke Branch Road would exhibit LOS deficiencies under all future conditions even without the development of the Palomar North and South subdivision. In addition, the northbound US Route 13 left-turn queue would extend beyond the available storage of approximately 160 feet. To address the LOS deficiency at this intersection we recommend installing an exclusive eastbound Fork Branch Road right-turn lane and extending the northbound left-turn storage lane to provide 750-foot storage. With the implementation of these planned improvements, this intersection will operate at an acceptable level of service during 2017 build out year (Case 3). At least one other developer (Villages of Noble's Pond) is expected to be responsible for these improvements as well. However, with these recommended improvements this intersection still would not meet the Kent County APFO LOS standards (Case 4). To meet the APFO LOS standards, a second exclusive northbound US Route 13 left-turn lane would need to be installed at this intersection.

However, installing a second exclusive northbound US Route 13 left-turn lane may not be feasible due to the physical constraints to introduce two receiving lanes along westbound Fork Branch Road. In summary, in addition to installing an exclusive eastbound Fork Branch Road right-turn lane and extending the northbound left-turn storage lane to provide 750-foot storage, we do not recommend any additional improvements be implemented by the developer at this intersection.

The intersection of Kenton Road and Chestnut Grove Road would exhibit LOS deficiencies under all future PM peak hour scenarios. The LOS deficiencies in future conditions would occur on the eastbound Chestnut Grove Road approach. The improvements required to meet DelDOT's LOS standards include adding separate eastbound Chestnut Grove Road left-turn and right-turn lanes. However, the Palomar north and South subdivisions traffic would have minimum impact at the intersection of Kenton Road and Chestnut Grove Road and the 95th percentile queue length on the eastbound approach during the typical 2017 PM peak hour is expected to be less than 110 feet. As such, we do not recommend any improvements be implemented by the developer at this intersection.

While the intersection of McKee Road and Central Church Road would operate with acceptable LOS under all future conditions, the northbound McKee Road alignment and the eastbound Central Church Road stop control treatment present operational issues. Currently northbound and westbound McKee Road operate as free flow movements and eastbound Central Church Road operates as stop controlled. The geometric layout of the intersection would make it difficult for eastbound Central Church Road motorists to turn onto southbound and eastbound McKee Road. In addition, the future traffic growth patterns (Case 2 and Case 3) indicate that more traffic is



expected on eastbound Central Church Road approach than northbound McKee Road approach at this intersection. We recommend that the eastbound Central Church Road approach be realigned as such the eastbound Central Church Road connects with McKee Road as a T-intersection. With this modification motorists who would turn from Central Church Road onto McKee Road would have longer sight distance. The geometry of northbound and westbound McKee Road would remain as it is. Based on this modified T-intersection layout, the intersection of Central Church Road and McKee Road would operate with acceptable LOS under all future conditions. The intersection conceptual improvement plan is shown as Figure 1 on page 8.

Should the County approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan. All applicable agreements (i.e. letter agreements for off-site improvements and traffic signal agreements) should be executed prior to entrance plan approval for the proposed development.

1. The developer should improve Central Church Road from the east end of the Palomar North site frontage to the west end of the Palomar South site frontage to meet DelDOT's major collector road standards. These standards include, but are not limited to, two twelve-foot travel lanes and two eight-foot shoulders on both sides of the road. The developer should provide a bituminous concrete overlay to the existing travel lanes, at DelDOT's discretion. DelDOT should analyze the existing lanes' pavement section and recommend an overlay thickness to the developer's engineer if necessary.
2. The developer should construct a full access site entrance on Central Church Road for Palomar North and South to be consistent with the proposed lane configuration as shown in the table below.

| Approach | Current Configuration | Proposed Configuration |
|-------------------------------|-------------------------|---|
| Northbound Site Approach | Approach does not exist | One shared through/left-turn/right-turn lane |
| Southbound Site Approach | Approach does not exist | One shared through/left-turn/right-turn lane |
| Westbound Central Church Road | One through lane | One left-turn lane, one through lane, and one right-turn lane |
| Eastbound Central Church Road | One through lane | One left-turn lane, one through lane, and one right-turn lane |

The recommended minimum storage lengths (excluding tapers) of the separate turn lanes are listed below.

| Approach | Left-Turn Lane | Right-Turn Lane |
|-------------------------------|----------------|-----------------|
| Westbound Central Church Road | 190 feet | 175 feet |
| Eastbound Central Church Road | 190 feet | 125 feet |



The storage length provided here is based on the DelDOT's *Standards and Regulations for Subdivision Streets and State Highway Access*. The storage length based on the HCS analysis provides a shorter queue length than what is reported here.

3. The developer should enter into an agreement with DelDOT to fund an equitable portion of the improvements required to install a single lane roundabout at the intersection of Kenton Road and Central Church Road. A preliminary concept will need to be designed in order to determine if this improvement is feasible. Should a roundabout be determined to be infeasible at this intersection, the developer should enter into a traffic signal agreement with DelDOT for this intersection. The traffic signal agreement should include pedestrian signals, crosswalks, and interconnection at DelDOT's discretion. The developer should coordinate with DelDOT on the implementation and equitable cost sharing of the traffic signal.
4. The developer should enter into an agreement with DelDOT to fund an equitable portion of the improvements required to install a single lane roundabout at the intersection of Kenton Road and Pearsons Corner Road. A preliminary concept will need to be designed in order to determine if this improvement is feasible. Should a roundabout be determined to be infeasible or otherwise undesirable, the intersection should be further improved by adding an exclusive left-turn lane on the northbound Kenton Road approach.
5. The developer should enter into an agreement with DelDOT to fund an equitable portion of the improvements at the intersection of Kenton Road and Delaware Route 42 by modifying the intersection geometry to prohibit left-turns from westbound Delaware Route 42. The existing storage area for the second stage of the westbound left-turn movement should be removed. The improvements should also include installation of a concrete island designed to prevent westbound left turns at this intersection. Two other developers (Villages of Noble's Pond and Cherrington) are expected to be responsible for these improvements as well.
6. The developer should enter into an agreement with DelDOT to fund an equitable portion of the improvements at the intersection of US Route 13 and Fork Branch Road/Dyke Branch Road. These improvements should include the addition of an exclusive right-turn lane on the eastbound Fork Branch Road approach and extending the northbound left-turn storage lane on the US Route 13 approach to provide 750-foot storage (excluding taper) length.
7. The developer should enter into a traffic signal agreement with DelDOT for the intersection of US Route 13 and Fork Branch Road/Dyke Branch Road. The agreement will cover the signal head adjustments required by the physical improvements noted in Item No. 7. The agreement should include pedestrian signals, crosswalks and interconnection at DelDOT's discretion. At least one other developer is expected to enter into a traffic signal agreement for this intersection as well. The developer should coordinate with DelDOT on the implementation and equitable cost sharing of the traffic signal.



8. The developer should improve the intersection of McKee Road and Central Church Road by realigning the eastbound Central Church Road to be perpendicular to the northbound McKee Road. This should also include relocating the stop sign on the eastbound Central Church Road approach. The intersection conceptual improvement plan is shown as Figure 1 on page 8. Preliminarily, it appears that this improvement can be built within the existing right-of-way. To the extent possible, that should be done.
9. The following bicycle, pedestrian, and transit improvements should be included:
 - a. A minimum fifteen-foot wide permanent easement from the edge of the right-of-way should be dedicated to DelDOT within the site frontage along Central Church Road. Within this easement, a ten-foot wide multi-use path that meets current AASHTO and ADA standards should be constructed. A five-foot minimum setback should be maintained from the edge of the pavement to the multi-use path.
 - b. ADA compliant curb ramps and marked crosswalks should be provided at the site entrance. The use of Type 3 curb ramp is discouraged.
 - c. Where right-turn lanes are added on Central Church Road a bicycle lane should also be provided. A Right-Turn Yield to Bikes sign (MUTCD R4-4) should be added at the start of each right-turn lane.
 - d. Bicycle Warning signs (W11-1) should be placed on both the eastbound and westbound approaches on Central Church Road.

Please note that this review generally focuses on capacity and level of service issues; additional safety and operational issues will be further addressed through DelDOT's subdivision review process.

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. For any additional information regarding the work zone impact and mitigation procedures during construction please contact Mr. Adam Weiser of DelDOT's Traffic Section. Mr. Weiser can be reached at (302) 659-4073 or by email at Adam.Weiser@state.de.us.

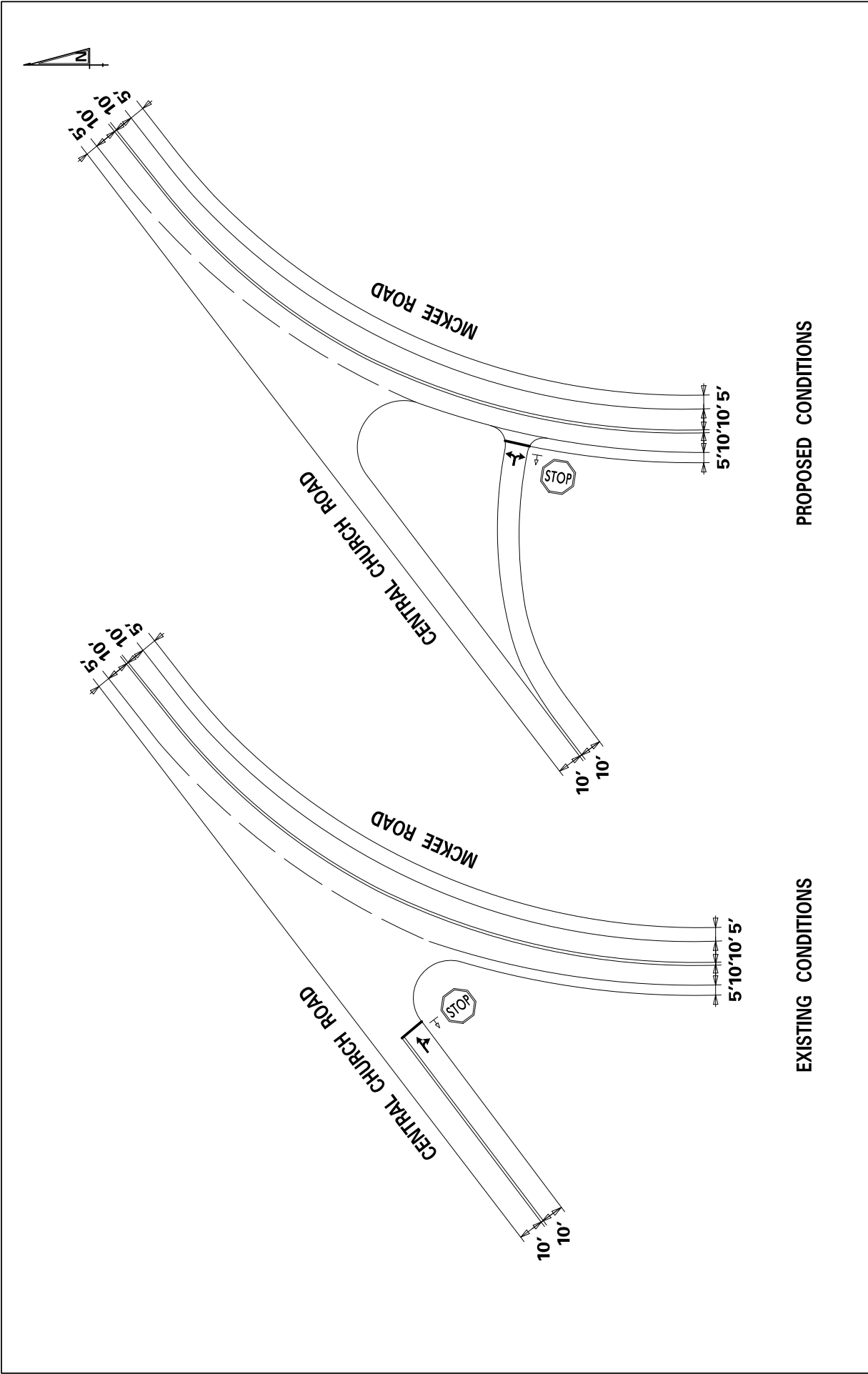
Additional details on our review of the TIS are attached. Please contact me at (302) 266-9600 if you have any questions concerning this review.


Sincerely,
Johnson, Mirmiran, and Thompson, Inc.

David DuPlessis, P.E.
cc: Mir Wahed, P.E., PTOE
Enclosure

Palomar North and South

*December 2, 2010
Page 7*



| | | | |
|--|----------|---|--|
|  JOHNSON, MIRMIIRAN & THOMPSON <i>Engineering A Brighter Future</i> | | PALOMAR NORTH AND SOUTH TRAFFIC IMPACT STUDY KENT COUNTY, DELAWARE | |
| N.T.S | FIGURE 1 | DECEMBER, 2010 | |

General Information

Report date: May, 2010.

Prepared by: Van Cleef Engineering Associates.

Prepared for: Palomar North and South.

Tax Parcels: ED00-056.00-01-09.04 and 21.01.

Generally consistent with DelDOT's *Standards and Regulations for Subdivision Streets and State Highway Access*: Yes.

Project Description and Background

Description: 51 single-family homes on the north side of Central Church Road and a mix of 108 single-family homes, townhouses, and multi-family housing on the south side.

Location: The project is proposed on the north and south sides of Central Church Road approximately halfway between McKee Road (Kent Road 156) and Kenton Road (Kent Road 104) in Kent County.

Amount of Land to be developed: Approximately 47.81 acres of land.

Land Use approval(s) needed: Subdivision Approval.

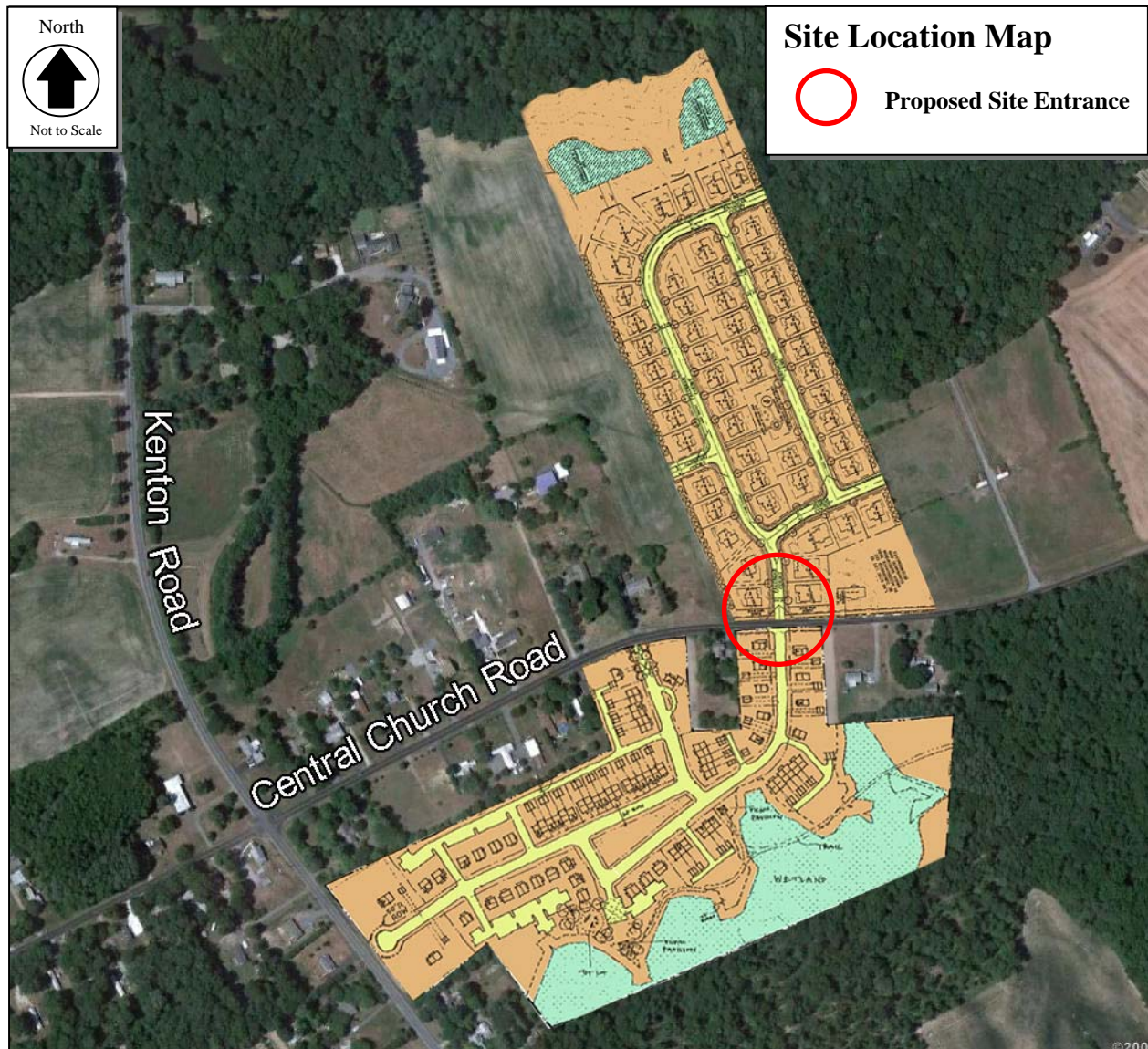
Proposed completion date: 2017.

Proposed access locations: Two access points are proposed on Central Church Road.

Daily Traffic Volumes:

- 2009 Average Annual Daily Traffic on Central Church Road: 2,243 vehicles per day.
- 2009 Average Annual Daily Traffic on Kenton Road: 5,171 vehicles per day.

Site Map



**Graphic is an approximation based on the site plan received from Van Cleef Engineering Associates on September 1, 2010.*

Relevant and On-going Projects

DelDOT currently has no relevant or ongoing projects within the study area. However, DelDOT in conjunction with the City of Dover performed the Kenton Road Study in 2007. The Kenton Road study corridor, approximately 2.5 miles long, from Denneys Road to the north to Delaware Route 8/Forrest Avenue to the south. The purpose of the plan was to develop a set of integrated transportation and roadway capacity improvement concepts to support the area's designation as a growth zone. The proposed improvements include roadway widening, adding auxiliary lanes at intersections, signalization and the installation of pedestrian and bicycle facilities. This includes adding auxiliary lanes on Chestnut Grove Road at the Kenton Road intersection and adding Palomar North and South

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auxiliary lanes and signal improvements at the intersection of Kenton Road/West Denneys Road. However, all the improvements proposed on the Kenton Road study are still in the conceptual phase and have not been officially adopted by DelDOT.

In addition, one of the study area intersections was evaluated under DelDOT's 2005 Hazard Elimination Program (HEP f.k.a. Highway Safety Improvement Program) as part of the Site U study. Site U included a 0.99 mile section of US Route 13 from 0.07 miles south of Denneys Road (Kent Road 100) to 0.03 miles north of Hatchery Road (Kent Road 154). It included the intersection of US Route 13 and Fork Branch/Dyke Branch Road (Kent Road 153) which was unsignalized at the time of the study. The report noted that a traffic signal warrant study had been performed at the intersection and as a result a traffic signal was installed after the HEP crash data period. This intersection was signalized in April 2006.

Also, one of the study area intersections was evaluated under DelDOT's 2008 High Risk Rural Roads Program (HRRRP) as part of Site 5. Site 5 included a 0.29 mile roadway segment along Pearsons Corner Road from 0.15 miles south of Blue Heron Road to 0.08 miles south of Central Church Road. The study included the unsignalized intersection of Pearsons Corner Road and Blue Heron Road. The HRRRP report included a crash data summary as well as evaluated the sight distances along Pearsons Corner Road relative to the curvature east and west of Blue Heron Road. The improvements suggested by the study included the installation of a stop line along northbound Blue Heron Road, the installation of raised pavement markers along the Pearsons Corner Road centerline east and west of Blue Heron Road and, the upgrade of the existing curvature (W1-2) warning signs and advisory speed signs along Pearsons Corner Road within the study limits. All the recommended improvements from HRRRP report have been implemented.

Livable Delaware

(Source: Delaware Strategies for State Policies and Spending, July 2004)

Location with respect to the Strategies for State Policies and Spending Map of Delaware:
The proposed development is located within Investment Level 2.

Investment Level 2

These areas, generally adjacent to Investment Level 1 Areas, include less developed areas within municipalities, rapidly growing areas that have or will have public water and wastewater services, and may include smaller towns, rural villages, and suburban areas. These areas typically include single-family detached housing developments, commercial and office uses serving primarily local residents, and a limited range of entertainment, parks and recreation, cultural and institutional facilities.

In Investment Level 2 Areas, state investments and policies should be based on available infrastructure to accommodate orderly growth, encourage departure from the typical single-family dwelling developments and promote a broader mix of housing types and commercial sites, and encourage development that is consistent with the character of the area. Transportation projects should expand or provide roadways, public transportation, pedestrian walkways, bicycle

paths, and other transportation modes that manage flow, support economic development efforts, and encourage connections between communities and the use of local streets for local trips.

Proposed Development's Compatibility with Livable Delaware:

The proposed Palomar North and South developments fall within Investment Level 2 and are to be developed as one single-family detached housing development and one mixed housing development. Palomar North and South are to be developed in a manner consistent with the character of the other existing residential developments in the area. As such, these developments appear to be generally consistent with the 2004 update of the Livable Delaware "Strategies for State Policies and Spending."

Comprehensive Plans

Kent County Comprehensive Plan:

The proposed development is located in an area designated as Low Density Residential which allows for 1 to 2.9 dwelling units per acre.

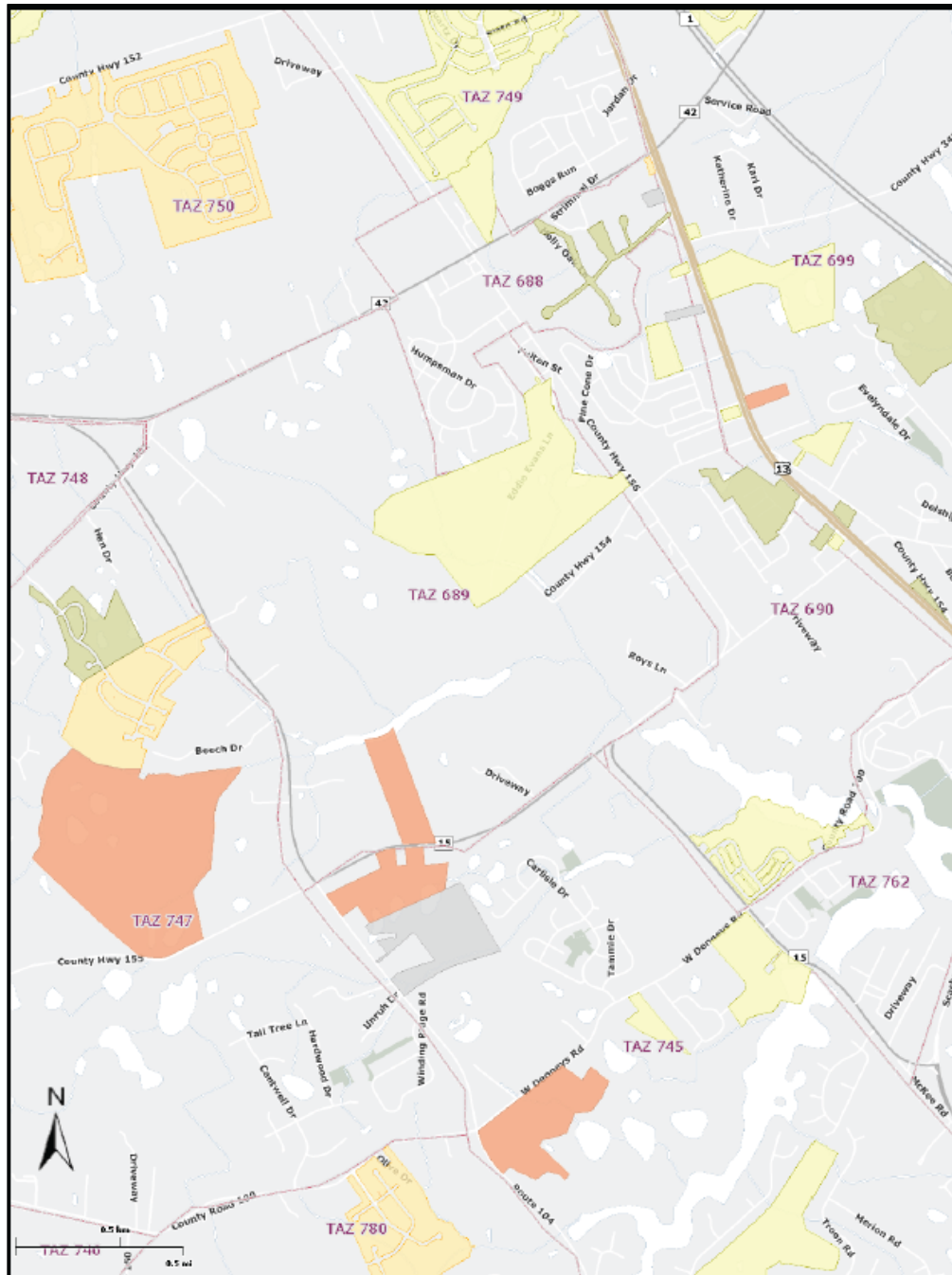
Proposed Development's Compatibility with the County Comprehensive Plan:

Palomar North proposes 2.41 dwelling units per acre, which is within the permitted density and is generally in accordance with the Comprehensive Plan. Palomar South proposes 4.33 dwelling units per acre, which is higher than the permitted density recommended in the Kent County Comprehensive Plan. However, based on the City of Dover Growth and Annexation Map dated May 10, 2005, Palomar South has already been evaluated for annexation by the City of Dover. With the proposed annexation the Palomar South site would be within the permitted density. As such, the development is generally compatible with Kent County's Comprehensive Plan.

Transportation Analysis Zones (TAZ)

Transportation Analysis Zones (TAZ) where development would be located: 689, 745

TAZ Boundaries:



**Graphic has been taken from the Planning and Development Coordination Application.*

Current employment estimate for TAZ (689 & 745): 233 in 2005

Future employment estimate for TAZ (689 & 745): 323 in 2030

Current Population estimate for TAZ (689 & 745): 2714 in 2005

Future Population estimate for TAZ (689 & 745): 3736 in 2030

Current household estimate for TAZ (689 & 745): 1076 in 2005

Future household estimate for TAZ (689 & 745): 1528 in 2030

Relevant committed developments in the TAZ (689 & 745): None.

Would the addition of committed developments to current estimates exceed future projections (689 & 745): No.

Would the addition of committed developments and the proposed development to current estimates exceed future projections (689 & 745): No.

Trip Generation

Trip generation for the proposed development was computed using comparable land uses and equations contained in the *Trip Generation, 8th Edition: An ITE Informational Report*, published by the Institute of Transportation Engineers (ITE). The following land uses were utilized to estimate the amount of new traffic generated for this development.

- 51 single-family homes in Palomar North - (ITE Land Use Code 210)
- 108 single-family homes in Palomar South - (ITE Land Use Code 210)

The peak period trip generations for the Palomar North and South developments are included in Table 1.

Table 1
PALOMAR NORTH AND SOUTH TRIP GENERATION

| Land Use | ADT | AM Peak Hour | | | PM Peak Hour | | |
|---|--------------|-----------------|-----------|------------|-----------------|-----------|------------|
| | | In | Out | Total | In | Out | Total |
| Palomar North (51 Single-Family Homes) | 560 | 11 | 34 | 45 | 36 | 21 | 57 |
| | | | | | | | |
| Palomar South (108 Single-Family Homes) | 1,116 | 21 | 64 | 85 | 71 | 42 | 113 |
| | | | | | | | |
| Total Trips | 1,676 | 32 | 98 | 130 | 107 | 63 | 170 |

Note: However, based on the site layout plan provided on September 1, 2010 the TIS is proposing 54 multi-family units, 41 townhouses, and 13 single-family detached units (total 108 units) in the Palomar South.

Overview of TIS

Intersections examined:

1. Central Church Road and Site Access Road (North)

2. Central Church Road and Site Access Road (South)
3. Kenton Road and Central Church Road
4. Central Church Road and McKee Road (Spur Road)
5. McKee Road and Fork Branch Road
6. Central Church Road and Pearsons Corner Road
7. Pearsons Corner Road and Blue Heron Road
8. Kenton Road and West Denneys Road
9. Kenton Road and Pearsons Corner Road
10. Kenton Road and Seven Hickories Road
11. Fork Branch Road and U.S. Route 13
12. Kenton Road and Chestnut Grove Road

Conditions examined:

1. Case 1 - 2010 Existing conditions
2. Case 2 - 2017 No Build conditions without Palomar North and South
3. Case 3 - 2017 Build conditions with Palomar North and South
4. Case 4 - 2019 Post Build conditions with Palomar North and South (Kent County APFO Compliance)

Peak hours evaluated: Weekday morning and weekday evening peak hours

Committed Developments considered:

1. Bush Property (73 single-family detached houses, 108 semi-detached houses, and 124 townhouses)
2. Fox Pointe (357 mobile homes , 284 unoccupied)
3. Thoroughbred Farms (35 single-family detached houses)
4. Yoder Property (91 single-family detached houses)
5. Dover Meadows (160 single-family detached houses)
6. Villages of Nobles Pond (1,031 age restricted dwellings)
7. Whitetail Run (167 single-family detached houses)
8. Saratoga (f.k.a. Jo-Eve Farms) (806 single-family detached houses, 162 townhouses)
9. Johnson Farms (214 single-family detached houses)
10. Cherrington (200 single-family detached houses)
11. Maidstone (62 single-family detached houses)
12. Forty-nine Pines (107 single-family detached houses)

Intersection Descriptions

1. Central Church Road and Site Access Road (North and South)

Type of Control: stop-controlled intersection

Eastbound Approach: (Central Church Road) one shared through/left-turn/right-turn lane

Westbound Approach: (Central Church Road) one shared through/left-turn/right-turn lane

Northbound Approach: (Proposed Site Access) one shared through/left-turn/right-turn lane, stop-controlled

Southbound Approach: (Proposed Site Access) one shared through/left-turn/right-turn lane, stop-controlled

2. Kenton Road and Central Church Road

Type of Control: stop-controlled intersection

Eastbound Approach: (Central Church Road) one shared through/left-turn/right-turn lane, stop controlled

Westbound Approach: (Central Church Road) one shared through/left-turn/right-turn lane, stop controlled

Northbound Approach: (Kenton Road) one shared through/left-turn/right-turn lane

Southbound Approach: (Kenton Road) one shared through/left-turn/right-turn lane

3. Central Church Road and McKee Road

Type of Control: stop-controlled intersection

Eastbound Approach: (Central Church Road) one shared through/right-turn lane, stop controlled

Westbound Approach: (McKee Road) one shared through/left turn lane

Northbound Approach: (McKee Road) one shared through/left-turn lane

4. McKee Road and Fork Branch Road

Type of Control: stop-controlled intersection

Eastbound Approach: (McKee Road) one shared through/right-turn lane

Westbound Approach: (Fork Branch Road) one shared through/right-turn lane, stop controlled

Southbound Approach: (McKee Road) one shared through/left-turn lane

5. Central Church Road and Pearsons Corner Road

Type of Control: stop-controlled intersection

Westbound Approach: (Central Church Road) one shared left-turn/right-turn lane, stop controlled

Southbound Approach: (Pearsons Corner Road) one shared through/left-turn lane

Northbound Approach: (Pearsons Corner Road) one shared through/right-turn lane

6. Pearsons Corner Road and Blue Heron Road

Type of Control: stop-controlled intersection

Westbound Approach: (Pearsons Corner Road) one shared through/left-turn lane

Eastbound Approach: (Pearsons Corner Road) one shared through/right-turn lane

Northbound Approach: (Blue Heron Road) one shared left-turn/right-turn lane, stop controlled

7. Kenton Road and West Dennys Road

Type of Control: signalized intersection

Eastbound Approach: (West Dennys Road) one shared through/left-turn/right-turn lane

Westbound Approach: (West Dennys Road) one shared through/left-turn/right-turn lane

Northbound Approach: (Kenton Road) one shared through/left-turn/right-turn lane

Southbound Approach: (Kenton Road) one shared through/left-turn/right-turn lane

8. Kenton Road and Pearsons Corner Road

Type of Control: unsignalized intersection, all-way stop controlled

Eastbound Approach: (Pearsons Corner Road) one shared through/left-turn/right-turn lane, stop controlled

Westbound Approach: (Pearsons Corner Road) one shared through/left-turn/right-turn lane, stop controlled

Northbound Approach: (Kenton Road) one shared through/left-turn/right-turn lane, stop controlled

Southbound Approach: (Kenton Road) one shared through/left-turn/right-turn lane, stop controlled

9. Kenton Road and Seven Hickories Road

Type of Control: Two unsignalized intersections

Intersection 1

Eastbound Approach: (Seven Hickories Road) one through lane and one free flow right-turn lane

Westbound Approach: (Seven Hickories Road) one shared through/left-turn lane

Northbound Approach: (Kenton Road) one shared left-turn/right-turn lane, stop controlled

Intersection 2

Eastbound Approach: (eastbound right from Seven Hickories Road) one through lane

Southbound Approach: (westbound left from Seven Hickories Road) one through lane, stop controlled

10. Fork Branch Road/Dyke Branch Road and US Route 13

Type of Control: signalized intersection

Eastbound Approach: (Fork Branch Road) one shared through/left-turn/right-turn lane,

Westbound Approach: (Dyke Branch Road) one shared through/left-turn/right-turn lane

Northbound Approach: (US Route 13) one left-turn, two through and one right-turn lane

Southbound Approach: (US Route 13) one left-turn, two through and one right-turn lane

11. Kenton Road and Chestnut Grove Road

Type of Control: unsignalized intersection

Northbound Approach: (Kenton Road) one shared through/left-turn lane

Southbound Approach: (Kenton Road) one shared through/right-turn lane

Eastbound Approach: (Chestnut Grove Road) one shared left-turn/right-turn lane

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: There are currently no transit services near the proposed site location.

Planned transit service: JMT contacted Lisa Collins, Service Development Planner of DTC. In an email dated September 16, 2010, she noted that the DTC had no future service proposed in the study area.

Existing bicycle and pedestrian facilities: According to DelDOT's *Delaware Bicycle Facility Master Plan* (October 2005), Central Church Road is designated as a State and Local Road.

Per the *Kent County Bicycle Map*, the following bicycle routes exist in the vicinity of the site:

- A Statewide Bicycle Route 1 that contains a bikeway exists approximately 0.60 miles east of the subject property along McKee Road. Connections to this route are located at the McKee Road intersections with Central Church Road and Fork Branch Road. Within the site vicinity, this Statewide Bicycle Route provides mobility along Moorton Road, McKee Road, and Saulsbury Road. This bike route runs north-south along McKee Road through two of the site's intersections, including McKee Road/Central Church Road and McKee Road/Fork Branch Road.
- A Connector Bicycle Route with a bikeway is located approximately 2 miles north of the subject property along Seven Hickories Road. This route can be accessed via Pearsons Corner Road and Kenton Road.
- A Connector Bicycle Route that does not contain a bikeway exists approximately 1 mile south and west of the site and can be accessed at the Kenton Road intersection with West Denneys Road. Within the vicinity of the project site, this Connector Bicycle Route traverses through Blue Heron Road, Maidstone Branch Road, Chestnut Grove Road, and Kenton Road.

Planned bicycle and pedestrian facilities: JMT, Inc. contacted Mr. Anthony Aglio, DelDOT's Bicycle Coordinator. In an email dated September 10, 2010 he requested the following bicycle improvements:

- A minimum of fifteen-foot wide permanent easement from the edge of the right-of-way should be dedicated to DelDOT within the site frontage along Palomar North and South. Within this easement, a ten-foot wide multi use path that meets current AASHTO and ADA standards should be constructed. A minimum of five-foot setback should be maintained from the edge of the pavement to the multi use path.
- Shoulders should be extended from the site entrances to McKee Road if possible.
- Should right turn lanes be required, bike lanes should be provided if shoulders are being provided.
- ADA compliant curb ramps and crosswalks should be provided at the site entrance.
- Bicycle Warning signs (W11-1) should be placed on both the eastbound and westbound approaches on Central Church Road.
- Any intersection improvements planned on other study intersections including McKee Road and West Denneys Road should include pedestrian and bicycle facilities.

Previous Comments

All comments from the preliminary TIS have been addressed in the final TIS.

General HCS Analysis Comments

(See table footnotes on the following pages for specific comments)

- 1) JMT performed analysis for Case 4 (2019 post build scenario) as per Kent County APFO requirement. The TIS did not conduct this analysis.
- 2) JMT applied the peak hour factors in accordance to the guidelines provided in the *DelDOT Standards and Regulations for Subdivision Streets and State Highway Access*. The TIS used inconsistent peak hour factors in certain future analyses.
- 3) Van Cleef Engineering Associates (VCEA) performed analyses using HCS Plus+ Version 5.2. JMT used HCS+T7F, Version 5.5.
- 4) The *DelDOT Standards and Regulations for Subdivision Streets and State Highway Access* recommends using 3% heavy vehicles for each movement at intersections when there is significant change in intersection volume. The specific movements that required changes to the truck percentages were identified based on the increase in traffic volumes by more than 75 vph per approach.
- 5) The TIS and JMT used different cycle lengths and/or signal timing parameters when analyzing the signalized intersections in some cases.

Table 2
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Unsignalized Intersection¹ Two-Way Stop Control | LOS per TIS | | LOS per JMT | |
|---|------------------------|---------------|------------------------|---------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| Central Church Road & Site Entrances² | | | | |
| 2017 with Palomar (Case 3) ³ | | | | |
| Northbound Site Entrance | B (11.1) | B (11.5) | B (11.6) | B (12.0) |
| Southbound Site Entrance | B (10.1) | B (12.0) | B (13.1) | C (17.8) |
| Eastbound Central Church Entrance-Left | A (7.4) | A (8.1) | A (7.5) | A (8.2) |
| Westbound Central Church Entrance-Left | A (7.9) | A (7.7) | A (8.0) | A (7.8) |
| | | | | |
| 2019 with Palomar (Case 4) | | | | |
| Northbound Site Entrance | - | - | B (11.6) | B (12.1) |
| Southbound Site Entrance | - | - | B (13.2) | C (17.9) |
| Eastbound Central Church Entrance-Left | - | - | A (7.5) | A (8.2) |
| Westbound Central Church Entrance-Left | - | - | A (8.0) | A (7.8) |

¹ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

² TIS used peak hour factors based on lane group. JMT used overall intersection peak hour factors as recommended by DelDOT.

³ The TIS analysis switched southbound left and right turn movement in both peak hour analyses. JMT used the updated southbound volumes based on the volume diagram.

Table 3
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Unsignalized Intersection ⁴ Two-Way Stop Control | LOS per TIS | | LOS per JMT | |
|--|----------------|---------------|----------------|---------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| Kenton Road & Central Church Road^{5,6} | | | | |
| 2010 Existing (Case 1) | | | | |
| Northbound Kenton Road-Left | A (8.5) | A (7.9) | A (7.9) | A (7.7) |
| Southbound Kenton Road-Left | A (8.2) | A (9.1) | A (7.7) | A (8.1) |
| Eastbound Central Church Road | C (24.1) | C (21.5) | B (14.5) | B (14.6) |
| Westbound Central Church Road | D (30.5) | E (47.8) | B (14.0) | C (17.8) |
| | | | | |
| 2017 without Palomar (Case 2) | | | | |
| Northbound Kenton Road-Left | A (8.5) | A (8.2) | A (8.2) | A (8.1) |
| Southbound Kenton Road-Left | A (8.1) | A (8.9) | A (8.1) | A (8.8) |
| Eastbound Central Church Road | F (155.2) | F (*) | F (110.0) | F (1008) |
| Westbound Central Church Road | F (53.5) | F (868.1) | E (38.6) | F (645.6) |

* HCS+T7F did not generate a result due to excessive delay.

⁴ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

⁵ TIS used peak hour factors based on lane group. JMT used overall intersection peak hour factors as recommended by DelDOT.

⁶ The TIS utilized incorrect heavy vehicle percentages during the existing PM and all future AM and PM peak hour analysis. JMT used heavy vehicle percentage based on DelDOT guidelines.

Table 3 (Continued)
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Unsignalized Intersection ⁷ Two-Way Stop Control | LOS per TIS | | LOS per JMT | |
|--|----------------|---------------|----------------|---------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| Kenton Road & Central Church Road^{5,6} | | | | |
| 2017 with Palomar (Case 3) | | | | |
| Northbound Kenton Road-Left | A (8.2) | A (8.2) | A (8.2) | A (8.1) |
| Southbound Kenton Road-Left | A (8.2) | A (9.0) | A (8.1) | A (8.8) |
| Eastbound Central Church Road | F (175.9) | F (*) | F (124.9) | F (*) |
| Westbound Central Church Road | F (141.7) | F (1257.0) | F (76.6) | F (853.2) |
| | | | | |
| 2019 with Palomar (Case 4) | | | | |
| Northbound Kenton Road-Left | - | - | A (8.2) | A (8.1) |
| Southbound Kenton Road-Left | - | - | A (8.1) | A (8.9) |
| Eastbound Central Church Road | - | - | F (143.9) | F (*) |
| Westbound Central Church Road | - | - | F (97.1) | F (1011) |

* HCS+T7F did not generate a result due to excessive delay.

⁷ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

Table 3 (Continued)
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Roundabout ^{8,9} | LOS per TIS | | LOS per JMT | |
|--|----------------|---------------|----------------|---------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| Kenton Road and Central Church Road | | | | |
| 2017 with Palomar (Case 3) | | | | |
| Northbound Kenton Road | B (11.6) | B (14.8) | B (10.5) | B (12.4) |
| Southbound Kenton Road | A (9.8) | B (15.0) | A (9.4) | B (12.8) |
| Eastbound Central Church Road | C (17.0) | B (13.4) | B (13.1) | B (11.2) |
| Westbound Central Church Road | B (11.4) | C (27.1) | B (10.2) | C (21.6) |
| | | | | |
| 2019 with Palomar (Case 4) | | | | |
| Northbound Kenton Road | - | - | B (10.6) | B (12.4) |
| Southbound Kenton Road | - | - | A (9.4) | B (13.1) |
| Eastbound Central Church Road | - | - | B (13.4) | B (11.3) |
| Westbound Central Church Road | - | - | B (10.2) | C (22.4) |

⁸ JMT analyzed the roundabout at Kenton Road and Central Church Road using SIDRA Intersection 5.0. The numbers in parentheses following level of service are average delay per vehicle, measured in seconds, calculated with the SIDRA Intersection US HCM Model. The analysis assumed an environment factor of 1.2.

⁹ A 100 foot diameter, one circulating lane; with single approach and exit lane is on all approaches and is proposed as a mitigation measure at this location.

Table 4
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Unsignalized Intersection ¹⁰ Two-Way Stop Control | LOS per TIS | | LOS per JMT ¹¹ | |
|---|----------------|---------------|------------------------------|---------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| McKee Road and Central Church Road^{12,13} | | | | |
| 2010 Existing (Case 1) | | | | |
| Northbound McKee Road-Left | A (8.0) | A (7.7) | - | - |
| Eastbound Central Church Road | B (10.9) | B (10.8) | - | - |
| | | | | |
| 2017 without Palomar (Case 2) ¹⁴ | | | | |
| Northbound McKee Road | B (12.4) | B (14.1) | B (12.6) | B (13.0) |
| Westbound McKee Road-Left | A (8.6) | A (8.0) | A (8.6) | A (7.9) |
| | | | | |
| 2017 with Palomar (Case 3) ¹⁴ | | | | |
| Northbound McKee Road | B (14.4) | C (17.7) | B (14.4) | C (15.5) |
| Westbound McKee Road-Left | A (8.9) | A (8.1) | A (9.0) | A (8.0) |
| | | | | |
| 2019 with Palomar (Case 4) | | | | |
| Northbound McKee Road | - | - | B (14.5) | C (15.9) |
| Westbound McKee Road-Left | - | - | A (9.0) | A (8.0) |

¹⁰ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

¹¹ In addition to the existing roadway alignment, JMT performed an additional analysis by modifying the intersection geometry with northbound McKee Road as a stop controlled approach.

¹² TIS used peak hour factors based on lane group. JMT used overall intersection peak hour factors as recommended by DelDOT.

¹³ The TIS utilized incorrect heavy vehicle percentage during all AM and PM peak hour analysis. JMT used heavy vehicle percentage by lane group.

¹⁴ TIS incorrectly considered northbound McKee Road as stop controlled for baseline Case 2 and Case 3 analysis. JMT analyzed the intersection as it is currently operating in a separate table.

Table 4 (Continued)
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Unsignalized Intersection¹⁵ Two-Way Stop Control | LOS per TIS | | LOS per JMT | |
|--|------------------------|-----------------------|------------------------|-----------------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| McKee Road and Central Church Road^{12,13} | | | | |
| 2010 Existing (Case 1) | | | | |
| Northbound McKee Road-Left | - | - | A (7.9) | A (7.6) |
| Eastbound Central Church Road | - | - | B (10.4) | B (10.3) |
| | | | | |
| 2017 without Palomar (Case 2) ¹⁴ | | | | |
| Northbound McKee Road-Left | - | - | A (8.4) | A (8.3) |
| Eastbound Central Church Road | - | - | C (19.3) | C (17.6) |
| | | | | |
| 2017 with Palomar (Case 3) ¹⁴ | | | | |
| Northbound McKee Road-Left | - | - | A (8.5) | A (8.6) |
| Eastbound Central Church Road | - | - | D (27.2) | C (23.2) |
| | | | | |
| 2019 with Palomar (Case 4) | | | | |
| Northbound McKee Road-Left | - | - | A (8.5) | A (8.6) |
| Eastbound Central Church Road | - | - | D (28.6) | C (24.0) |

¹⁵ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

Table 5
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Unsignalized Intersection ¹⁶ Two-Way Stop Control | LOS per TIS | | LOS per JMT | |
|---|----------------|---------------|----------------|---------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| McKee Road & Fork Branch Road^{17,18,19} | | | | |
| 2010 Existing (Case 1) | | | | |
| Southbound McKee Road | A (9.9) | A (7.8) | - | - |
| Eastbound Fork Branch Road-Left | A (7.4) | B (11.6) | - | - |
| | | | | |
| 2017 without Palomar (Case 2) | | | | |
| Southbound McKee Road | B (13.4) | D (29.0) | - | - |
| Eastbound Fork Branch Road-Left | A (7.7) | A (9.0) | - | - |
| | | | | |
| 2017 with Palomar (Case 3) | | | | |
| Southbound McKee Road | B (14.8) | E (41.9) | - | - |
| Eastbound Fork Branch Road-Left | A (7.7) | A (9.3) | - | - |

¹⁶ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

¹⁷ TIS incorrectly analyzed this intersection considering East-West as major street. JMT correctly analyzed this intersection considering North-South as major street in a separate table. In addition, JMT applied the turn-lane volumes as it is currently operating at the intersection.

¹⁸ TIS used peak hour factors based on lane group. JMT used overall intersection peak hour factors as recommended by DelDOT.

¹⁹ The TIS utilized incorrect heavy vehicle percentage during all future AM and PM peak hour analysis. JMT used heavy vehicle percentage by lane group.

Table 5 (Continued)
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Unsignalized Intersection ²⁰ Two-Way Stop Control | LOS per TIS | | LOS per JMT | |
|---|----------------|---------------|----------------|---------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| McKee Road & Fork Branch Road^{17,18,19} | | | | |
| 2010 Existing (Case 1) | | | | |
| Westbound Fork Branch Road | - | - | A (9.9) | B (10.8) |
| | | | | |
| 2017 without Palomar (Case 2) | | | | |
| Westbound Fork Branch Road | - | - | B (12.9) | C (21.5) |
| | | | | |
| 2017 with Palomar (Case 3) | | | | |
| Westbound Fork Branch Road | - | - | B (13.9) | D (31.2) |
| | | | | |
| 2019 with Palomar (Case 4) | | | | |
| Westbound Fork Branch Road | - | - | B (14.1) | D (33.5) |

²⁰ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

Table 6
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Unsignalized Intersection ²¹ Two-Way Stop Control | LOS per TIS | | LOS per JMT | |
|---|----------------|---------------|----------------|---------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| Central Church Rd & Pearsons Corner Road^{22,23} | | | | |
| 2010 Existing (Case 1) | | | | |
| Southbound Pearsons Corner Road-Left | A (7.6) | A (7.5) | A (7.6) | A (7.4) |
| Westbound Central Church Road | A (9.9) | A (9.9) | A (9.7) | A (9.6) |
| | | | | |
| 2017 without Palomar (Case 2) | | | | |
| Southbound Pearsons Corner Road-Left | A (7.6) | A (7.6) | A (7.8) | A (7.6) |
| Westbound Central Church Road | B (10.4) | B (10.5) | B (10.6) | B (10.8) |
| | | | | |
| 2017 with Palomar (Case 3) | | | | |
| Southbound Pearsons Corner Road-Left | A (7.6) | A (7.6) | A (7.8) | A (7.7) |
| Westbound Central Church Road | B (10.4) | B (10.6) | B (10.7) | B (10.9) |
| | | | | |
| 2019 with Palomar (Case 4) | | | | |
| Southbound Pearsons Corner Road-Left | - | - | A (7.8) | A (7.7) |
| Westbound Central Church Road | - | - | B (10.8) | B (11.0) |

²¹ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

²² TIS used peak hour factors based on lane group. JMT used overall intersection peak hour factors as recommended by DelDOT.

²³ The TIS utilized incorrect heavy vehicle percentage during all AM and PM peak hour analysis. JMT used heavy vehicle percentage by lane group.

Table 7
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Unsignalized Intersection ²⁴ Two-Way Stop Control | LOS per TIS | | LOS per JMT | |
|---|----------------|---------------|----------------|---------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| Blue Heron Road & Pearsons Corner Rd²⁵ | | | | |
| 2010 Existing (Case 1) | | | | |
| Northbound Blue Heron Road | A (9.0) | A (9.7) | A (8.8) | A (9.5) |
| Westbound Pearsons Corner-Left | A (7.4) | A (7.4) | A (7.4) | A (7.4) |
| | | | | |
| 2017 without Palomar (Case 2) | | | | |
| Northbound Blue Heron Road | A (9.2) | B (10.3) | A (9.1) | B (10.3) |
| Westbound Pearsons Corner-Left | B (7.5) | B (7.5) | A (7.5) | A (7.5) |
| | | | | |
| 2017 with Palomar (Case 3) | | | | |
| Northbound Blue Heron Road | A (9.2) | B (11.4) | A (9.1) | B (10.3) |
| Westbound Pearsons Corner-Left | B (7.5) | A (7.5) | A (7.5) | A (7.5) |
| | | | | |
| 2019 with Palomar (Case 4) | | | | |
| Northbound Blue Heron Road | - | - | A (9.1) | B (10.4) |
| Westbound Pearsons Corner-Left | - | - | A (7.5) | A (7.5) |

²⁴ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

²⁵ TIS used peak hour factors based on lane group. JMT used overall intersection peak hour factors as recommended by DelDOT.

Table 8
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Signalized Intersection ²⁶ (HCS Analysis) | LOS per TIS | | LOS per JMT | |
|---|----------------|---------------|----------------|---------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| Kenton Road & West Denneys Road^{27,28,29} | | | | |
| 2010 Existing (Case 1) ³⁰ | A (7.3) | A (7.9) | B (13.1) | B (12.5) |
| | | | | |
| 2017 without Palomar (Case 2) | A (8.3) | B (11.6) | B (15.1) | B (18.2) |
| | | | | |
| 2017 with Palomar (Case 3) | A (9.9) | B (12.1) | B (15.2) | B (18.7) |
| | | | | |
| 2019 with Palomar (Case 4) | - | - | B (15.5) | B (19.5) |

²⁶ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

²⁷ TIS used some right-turn-on-red volumes. JMT didn't use right-turn-on-red volumes as all approaches are single lanes.

²⁸ TIS used incorrect yellow and red time in the intersection analysis. JMT used correct yellow and red time as provided by DelDOT.

²⁹ TIS used an arbitrary heavy vehicle percentage (2%) for all analysis. JMT used heavy vehicle percentage by lane group.

³⁰ TIS used peak hour factor based on lane group. JMT used overall intersection peak hour factor as recommended by DelDOT.

Table 9
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Unsignalized Intersection ³¹ Two-Way Stop Control | LOS per TIS | | LOS per JMT | |
|--|----------------|---------------|----------------|---------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| Pearsons Corner Road & Kenton Road^{32,33,34} | | | | |
| 2010 Existing (Case 1) ³⁵ | | | | |
| Northbound Kenton Road-Left | A (8.3) | A (7.9) | - | - |
| Southbound Kenton Road-Left | A (7.7) | A (8.3) | - | - |
| Eastbound Pearsons Corner Road | C (17.8) | C (22.7) | - | - |
| Westbound Pearsons Corner Road | C (18.2) | D (25.4) | - | - |
| | | | | |
| 2017 without Palomar (Case 2) | | | | |
| Northbound Kenton Road-Left | A (8.2) | A (8.0) | - | - |
| Southbound Kenton Road-Left | A (7.8) | A (8.2) | - | - |
| Eastbound Pearsons Corner Road | D (25.2) | E (36.4) | - | - |
| Westbound Pearsons Corner Road | D (30.3) | F (258.3) | - | - |
| | | | | |
| 2017 with Palomar (Case 3) | | | | |
| Northbound Kenton Road-Left | A (8.4) | A (8.0) | - | - |
| Southbound Kenton Road-Left | A (8.2) | A (8.2) | - | - |
| Eastbound Pearsons Corner Road | F (120.4) | E (39.0) | - | - |
| Westbound Pearsons Corner Road | F (126.6) | F (279.2) | - | - |

³¹ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

³² This intersection was incorrectly analyzed as a TWSC intersection in the TIS. JMT analyzed the intersection as an AWSC intersection based on the field condition.

³³ TIS used peak hour factor based on lane group. JMT used overall intersection peak hour factor as recommended by DelDOT.

³⁴ TIS did not use heavy vehicle percentages. JMT used the heavy vehicle percentages based on DelDOT guidelines.

³⁵ TIS used the incorrect southbound PM peak Kenton Road right-turn volume. JMT used the corrected southbound right-turn volume.

Table 9 (Continued)
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Unsignalized Intersection ³⁶ All-Way Stop Control | LOS per TIS | | LOS per JMT | |
|--|----------------|---------------|----------------|---------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| Pearsons Corner Road & Kenton Road^{32,33,34} | | | | |
| 2010 Existing (Case 1) ³⁵ | | | | |
| Northbound Kenton Road | - | - | A (9.4) | B (12.0) |
| Southbound Kenton Road | - | - | B (11.0) | B (10.9) |
| Eastbound Pearsons Corner Road | - | - | A (9.2) | A (9.3) |
| Westbound Pearsons Corner Road | - | - | A (9.0) | A (10.0) |
| Overall Intersection | - | - | B (10.1) | B (11.1) |
| | | | | |
| 2017 without Palomar (Case 2) | | | | |
| Northbound Kenton Road | - | - | B (14.4) | E (38.5) |
| Southbound Kenton Road | - | - | C (17.8) | C (15.5) |
| Eastbound Pearsons Corner Road | - | - | B (13.2) | B (13.3) |
| Westbound Pearsons Corner Road | - | - | B (11.7) | C (16.7) |
| Overall Intersection | - | - | C (15.1) | D (25.4) |
| | | | | |
| 2017 with Palomar (Case 3) | | | | |
| Northbound Kenton Road | - | - | B (14.7) | E (40.7) |
| Southbound Kenton Road | - | - | C (18.2) | C (16.0) |
| Eastbound Pearsons Corner Road | - | - | B (13.4) | B (13.5) |
| Westbound Pearsons Corner Road | - | - | B (11.9) | C (17.1) |
| Overall Intersection | - | - | C (15.4) | D (26.6) |

³⁶ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

Table 9 (Continued)
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Unsignalized Intersection ³⁷ All-Way Stop Control | LOS per TIS | | LOS per JMT | |
|---|----------------|---------------|----------------|---------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| Pearsons Corner Road & Kenton Road | | | | |
| 2019 with Palomar (Case 3 With Improvement) ³⁸ | | | | |
| Northbound Kenton Road | - | - | B (12.9) | C (21.8) |
| Southbound Kenton Road | - | - | C (18.3) | C (15.4) |
| Eastbound Pearsons Corner Road | - | - | B (13.0) | B (12.7) |
| Westbound Pearsons Corner Road | - | - | B (11.7) | C (15.8) |
| Overall Intersection | | | B (14.9) | C (17.8) |
| | | | | |
| 2019 with Palomar (Case 4) | | | | |
| Northbound Kenton Road | - | - | C (15.4) | E (48.2) |
| Southbound Kenton Road | - | - | C (19.6) | C (17.0) |
| Eastbound Pearsons Corner Road | - | - | B (13.8) | B (14.0) |
| Westbound Pearsons Corner Road | - | - | B (12.2) | C (17.9) |
| Overall Intersection | | | C (16.3) | D (30.3) |
| | | | | |
| 2019 with Palomar (Case 4 With Improvement) ³⁸ | | | | |
| Northbound Kenton Road | - | - | B (13.3) | C (23.9) |
| Southbound Kenton Road | - | - | C (19.7) | C (16.2) |
| Eastbound Pearsons Corner Road | - | - | B (13.4) | B (13.1) |
| Westbound Pearsons Corner Road | - | - | B (11.9) | C (16.5) |
| Overall Intersection | | | C (15.6) | C (19.0) |

³⁷ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

³⁸ JMT performed additional analysis with a separate northbound left-turn lane.

Table 9 (Continued)
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Roundabout ³⁹ | LOS per TIS | | LOS per JMT | |
|---|----------------|---------------|----------------|---------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| Kenton Road and Pearsons Corner Road | | | | |
| 2017 with Palomar (Case 3) | | | | |
| Northbound Kenton Road | A (9.4) | A (9.6) | B (10.8) | B (10.1) |
| Southbound Kenton Road | A (9.1) | B (11.4) | B (10.4) | B (12.1) |
| Eastbound Pearsons Corner Road | B (12.8) | B (11.7) | B (11.2) | A (9.4) |
| Westbound Pearsons Corner Road | B (11.1) | B (15.7) | A (9.9) | B (13.2) |
| | | | | |
| 2019 with Palomar (Case 4) | | | | |
| Northbound Kenton Road | - | - | B (10.9) | B (10.6) |
| Southbound Kenton Road | - | - | B (10.4) | B (12.2) |
| Eastbound Pearsons Corner Road | - | - | B (11.4) | A (9.6) |
| Westbound Pearsons Corner Road | - | - | B (10.1) | B (13.7) |

³⁹ JMT analyzed the roundabout at Kenton Road and Pearsons Corner Road using SIDRA Intersection 5.0. The numbers in parentheses following level of service are average delay per vehicle, measured in seconds, calculated with the SIDRA Intersection US HCM Model. The analysis assumed an environment factor of 1.2.

Table 10
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Unsignalized Intersection ⁴⁰ Two-Way Stop Control | LOS per TIS | | LOS per JMT | |
|--|----------------|---------------|----------------|---------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| Kenton Road & Delaware Route 42 (Seven Hickories Road) ^{41,42,43,44} | | | | |
| 2010 Existing (Case 1) | | | | |
| Northbound Kenton Road | B (13.4) | C (22.5) | B (11.2) | C (16.8) |
| Westbound Seven Hickories Road-Left | A (8.4) | A (8.0) | A (7.6) | A (7.5) |
| | | | | |
| 2017 without Palomar (Case 2) | | | | |
| Northbound Kenton Road | C (16.1) | F (91.1) | B (13.3) | E (36.5) |
| Westbound Seven Hickories Road-Left | A (8.9) | A (8.3) | A (7.8) | A (7.6) |
| | | | | |
| 2017 with Palomar (Case 3) | | | | |
| Northbound Kenton Road | C (16.3) | F (57.8) | B (13.4) | E (37.3) |
| Westbound Seven Hickories Road-Left | A (8.8) | A (8.2) | A (7.8) | A (7.6) |

⁴⁰ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

⁴¹ TIS incorrectly analyzed eastbound Seven Hickories Road as a shared through/right turn lane. JMT analyzed eastbound Seven Hickories Road as a separate through and right turn lane as is currently existing.

⁴² JMT used overall intersection peak hour factors for existing and future condition based on DelDOT guidelines.

⁴³ The TIS utilized incorrect heavy vehicle percentage during existing PM peak and all future AM and PM peak hour analysis.

⁴⁴ The total intersection volume was greater than 1,000 vph during the PM peak, thus JMT analyzed future PM peak hour with a peak hour factor of 0.92 compared to 0.88 utilized in the TIS.

Table 10 (Continued)
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Unsignalized Intersection ⁴⁵ Two-Way Stop Control | LOS per TIS | | LOS per JMT | |
|---|----------------|---------------|----------------|---------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| Kenton Road & Delaware Route 42 (Seven Hickories Road) | | | | |
| 2017 with Palomar (Case 3 With Proposed Improvement) ⁴⁶ | | | | |
| Northbound Kenton Road | - | - | B (13.3) | E (35.8) |
| | | | | |
| 2019 with Palomar (Case 4) | | | | |
| Northbound Kenton Road | - | - | B (13.7) | E (43.7) |
| Westbound Seven Hickories Road-Left | - | - | A (7.8) | A (7.6) |
| | | | | |
| 2019 with Palomar (Case 4 With Proposed Improvement) ⁴⁶ | | | | |
| Northbound Kenton Road | - | - | B (13.6) | E (42.5) |

⁴⁵ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

⁴⁶ Proposed Improvement consists of eliminating the westbound Delaware Route 42 left-turn movement.

Table 10 (Continued)
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Signalized Intersection (HCS Analysis) | LOS per TIS | | LOS per JMT | |
|---|----------------|---------------|----------------|---------------|
| Kenton Road and Delaware Route 42 (Seven Hickories Road) | Weekday AM) | Weekday PM | Weekday AM | Weekday PM |
| 2017 with Palomar (Case 3) | - | - | A (8.8) | B (14.9) |
| | | | | |
| 2019 with Palomar (Case 4) | - | - | A (8.8) | B (15.2) |

| Roundabout ⁴⁷ | LOS per TIS | | LOS per JMT | |
|---|----------------|---------------|----------------|---------------|
| Kenton Road and Delaware Route 42 (Seven Hickories Road) | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| 2017 with Palomar (Case 3) | | | | |
| Northbound Kenton Road | - | - | B (17.5) | B (17.7) |
| Westbound Seven Hickories Road | - | - | B (10.8) | C (15.0) |
| Eastbound Seven Hickories Road | - | - | A (9.3) | A (9.2) |
| | | | | |
| 2019 with Palomar (Case 4) | | | | |
| Northbound Kenton Road | - | - | B (17.7) | B (17.9) |
| Westbound Seven Hickories Road | - | - | B (10.9) | C (15.6) |
| Eastbound Seven Hickories Road | - | - | A (9.3) | A (9.2) |

⁴⁷ JMT performed additional roundabout analysis at the intersection of Kenton Road & Central Church Road using SIDRA Intersection 5.0. The numbers in parentheses following level of service are average delay per vehicle, measured in seconds, calculated with the SIDRA Intersection US HCM Model. The analysis assumed an environment factor of 1.2.

Table 11
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Signalized Intersection ⁴⁸ | LOS per TIS | | LOS per JMT | |
|--|-------------|------------|-------------|------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| Fork Branch Road/Dyke Branch Road & US Route 13 ^{49,50,51,52,53} | | | | |
| 2010 Existing (Case 1) | F (146.2) | C (20.7) | D (35.2) | C (29.7) |
| | | | | |
| 2017 Without Palomar (Case 2) | F (96.2) | F (83.7) | F (80.7) | E (56.8) |
| | | | | |
| 2017 With Palomar (Case 3) | F (130.1) | F (108.7) | F (96.7) | E (67.1) |
| | | | | |
| 2017 With Palomar (Case 3) <i>With Improvement Option 1</i> ⁵⁴ | - | - | D (54.0) | D (48.5) |
| | | | | |
| 2019 With Palomar (Case 4) | - | - | F (109.5) | E (75.1) |
| | | | | |
| 2019 With Palomar (Case 4) <i>With Improvement Option 1</i> | - | - | E (56.4) | D (52.9) |
| | | | | |
| 2019 With Palomar (Case 4) <i>With Improvement Option 2</i> ⁵⁵ | - | - | D (50.5) | D (38.4) |

⁴⁸ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

⁴⁹ JMT analyzed this intersection using field-observed signal timings and an actuated signal.

⁵⁰ JMT analyzed this intersection with a protected left turn on both northbound and southbound U.S. Route 13 as observed in the field. TIS analyzed northbound and southbound left as protected/permissive left-turn.

⁵¹ TIS used incorrect peak hour factors. JMT used overall peak hour factors based on DeIDOT guidelines.

⁵² TIS didn't use truck percentages. JMT used truck percentages based on traffic counts.

⁵³ Similar to TIS, JMT used right-turn-on-red for the eastbound and westbound approaches. However, JMT didn't use any right-turn-on-red for the northbound and southbound right-turn approaches, rather it was modeled as permissive.

⁵⁴ Improvement Option 1 adds an exclusive eastbound right-turn lane.

⁵⁵ Improvement Option 2 adds a second exclusive northbound left-turn lane.

Table 12
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Unsignalized Intersection ⁵⁶ Two-Way Stop Control | LOS per TIS | | LOS per JMT | |
|--|----------------|---------------|----------------|---------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| Kenton Road & Chestnut Grove Road^{57,58} | | | | |
| 2010 Existing (Case 1) | | | | |
| Northbound Kenton Road-Left | A (8.9) | A (8.9) | A (8.8) | A (8.8) |
| Eastbound Chestnut Grove Road | C (20.1) | C (21.5) | C (19.0) | C (16.5) |
| | | | | |
| 2017 without Palomar (Case 2) | | | | |
| Northbound Kenton Road-Left | A (9.0) | A (9.6) | A (9.3) | A (9.5) |
| Eastbound Chestnut Grove Road | D (27.1) | F (50.9) | D (32.4) | E (36.6) |
| | | | | |
| 2017 with Palomar (Case 3) | | | | |
| Northbound Kenton Road-Left | A (9.4) | A (9.6) | A (9.3) | A (9.5) |
| Eastbound Chestnut Grove Road | E (35.7) | F (51.9) | D (32.6) | E (38.5) |
| | | | | |
| 2017 with Palomar (Case 3) <i>With Improvement Option 1⁵⁹</i> | | | | |
| Northbound Kenton Road-Left | - | - | A (9.3) | A (9.5) |
| Eastbound Chestnut Grove Road | - | - | D (26.3) | C (23.6) |

⁵⁶ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

⁵⁷ JMT used overall intersection peak hour factors for existing and future condition based on DelDOT guidelines.

⁵⁸ The TIS utilized incorrect heavy vehicle percentage during all future AM and PM peak hour analysis.

⁵⁹ Improvement Option 1 includes separate left-turn and right-turn lanes for the eastbound approach.

Table 12 (Continued)
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Unsignalized Intersection ⁶⁰ Two-Way Stop Control | LOS per TIS | | LOS per JMT | |
|---|----------------|---------------|----------------|---------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| Kenton Road & Chestnut Grove Road | | | | |
| 2019 with Palomar (Case 4) | | | | |
| Northbound Kenton Road-Left | - | - | A (9.5) | A (9.7) |
| Eastbound Chestnut Grove Road | - | - | E (36.5) | E (46.2) |
| | | | | |
| 2019 with Palomar (Case 4) <i>With Improvement Option 1</i> | | | | |
| Northbound Kenton Road-Left | - | - | A (9.5) | A (9.7) |
| Eastbound Chestnut Grove Road | - | - | D (28.8) | D (25.9) |

⁶⁰ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

Table 13
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Two-Lane Rural Highway ⁶¹ | LOS per TIS | | LOS per JMT | |
|--|-------------|------------|-------------|------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| Central Church Road, Pearsons Corner Road to Kenton Road | | | | |
| 2010 Existing (Case 1) | - | - | A (33.7%) | A (30.6%) |
| | | | | |
| 2017 without Palomar (Case 2) | - | - | A (37.2%) | A (40.0%) |
| | | | | |
| 2017 with Palomar (Case 3) ^{62,63} | B (52.2%) | C (55.6%) | A (37.6%) | B (40.7%) |
| | | | | |
| 2019 with Palomar (Case 4) | - | - | A (37.8%) | B (41.0%) |

⁶¹ For two-lane highway segments, the numbers in parentheses following levels of service are percent time –spent–following.

⁶² TIS analyzed the two-lane highway with 60 mph free flow speed, 12-foot lane width and a zero mile segment length. JMT analyzed the two-lane highway based on the field condition and as required by HCS.

⁶³ TIS performed the two-lane highway analysis by considering three segments (segment one, from Pearsons Corner Road to Kenton Road; segment two, from Kenton Road to the Site Driveway; segment three, from the Site Driveway to McKee Road) for Central Church Road. JMT performed the two-lane highway analysis by considering two separate segments. The first between Pearsons Corner Road and Kenton Road and the second between Kenton Road and McKee Road.

Table 13 (Continued)
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Palomar North and South
Report dated May 30, 2010
Prepared by Van Cleef Engineering Associates

| Two-Lane Rural Highway ⁶⁴ | LOS per TIS | | LOS per JMT | |
|---|-------------|------------|-------------|------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| Central Church Road, Kenton Road to McKee Road | | | | |
| 2010 Existing (Case 1) | - | - | A (39.1%) | B (40.4%) |
| | | | | |
| 2017 without Palomar (Case 2) | - | - | C (57.7%) | C (61.1%) |
| | | | | |
| 2017 with Palomar (Case 3) ^{62,63} | C (64.2%) | C (64.6%) | C (61.8%) | C (64.0%) |
| | | | | |
| 2019 with Palomar (Case 4) | - | - | C (62.0%) | C (64.1%) |

⁶⁴ For two-lane highway segments, the numbers in parentheses following levels of service are percent time –spent–following.