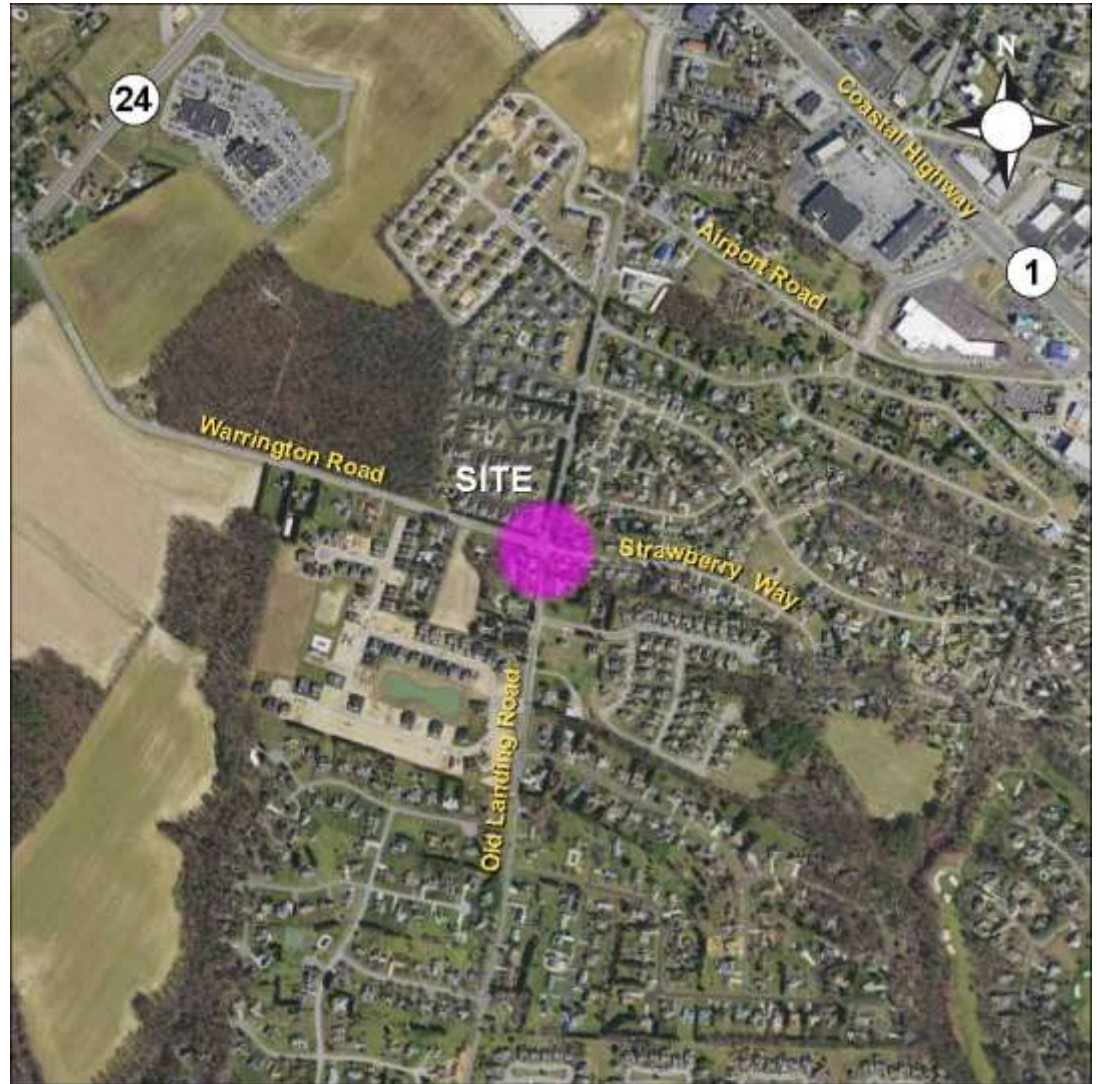


# Warrington Road at Old Landing Road

Lewes, DE

## Intersection Control Study

June 14, 2021

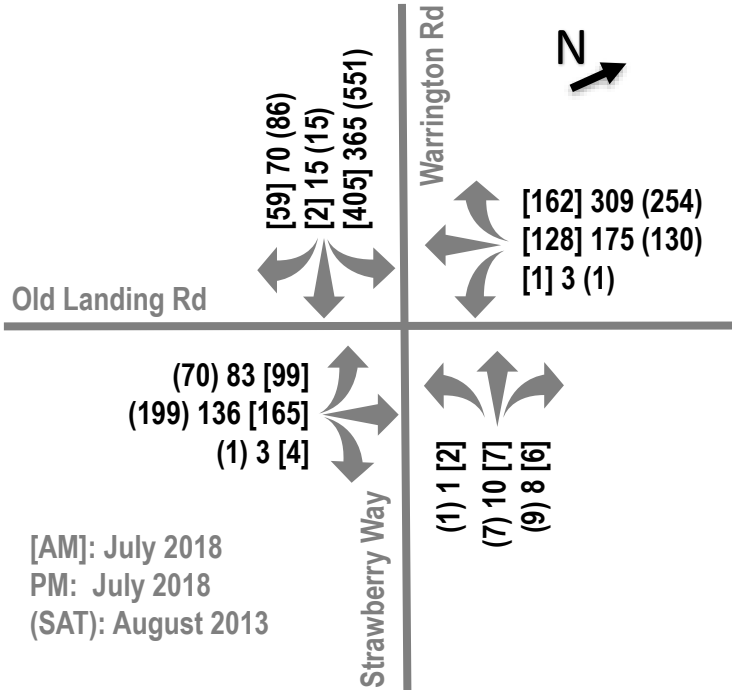


# Existing Conditions

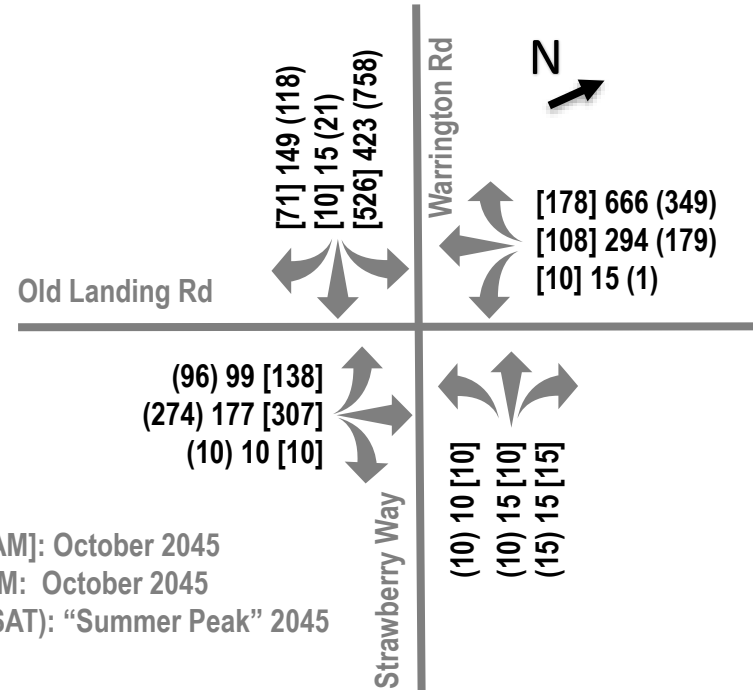
- All-Way stop controlled (AWSC) intersection
- Warrington Road dedicated southbound left-turn lane; single lane on all other approaches
- Minimal through traffic on Strawberry Way
- Old Landing Road is an east/west connector to SR 1 (Coastal Highway)
- Warrington Road is an extension of SR 1D, which ends at SR 24
- No existing roadway lighting

# Traffic Volume Data

## Existing Volumes



## Future 2045 Volumes



**Notes:**

- The 2045 AM and PM volumes were taken from the DeIDOT Henlopen Transportation Improvement District (TID) Transportation Study (more information here: <https://deldot.gov/Programs/transportation-improvement-districts/index.shtml?dc=tidsunderoperation>)
- The 2045 AM and PM TID volumes were based on October 2017 counts and assume "full build-out" of potential area transportation improvements, including the Airport Road Extension project
- The 2045 "Summer Peak" traffic volumes are based on 2013 summer Saturday and 2018 summer weekday traffic counts with growth rates applied to approximate the 2045 TID traffic volume projections

# Existing Traffic Evaluation

- **INTERSECTION CONGESTION:** The southbound left turn from Warrington Road to Old Landing Road has less than 200 feet of storage
  - Existing Non-Summer Peak Hours = *Moderate Congestion*
    - Approx. Max Queues: EB: ~75 ft, WB: ~250 ft, NB: ~25 ft, SB: ~225 ft
  - Existing Summer Peak Hours = *Significant Congestion*
    - Approx. Max Queues: EB: ~100 ft, WB: ~150 ft, NB: ~25 ft, SB: ~575 ft
  - 2045 Future Peak Hours = *Extreme Congestion*
    - Approx. Max Queues: EB: ~275 ft, WB: ~1,700 ft, NB: ~25 ft, SB: ~900 ft
- **CRASHES**
  - **22** reported crashes during **6+ year study period** (Jan 1, 2015 through May 15, 2021)
    - By Severity: 4 injury (zero fatalities, 2 alcohol-involved)
    - By Light Condition: 8 dark/unlit
    - By Type: 6 rear-end, 3 fixed-object
  - 1 bicycle crash (no reported crashes involving pedestrians)

# Alternatives Considered

- Alternative 1: Compact Roundabout
- Alternative 2: Signalized Intersection Existing Lanes
- Alternative 3: Signalized Intersection Added Lanes

# Alternative 1: Compact Roundabout

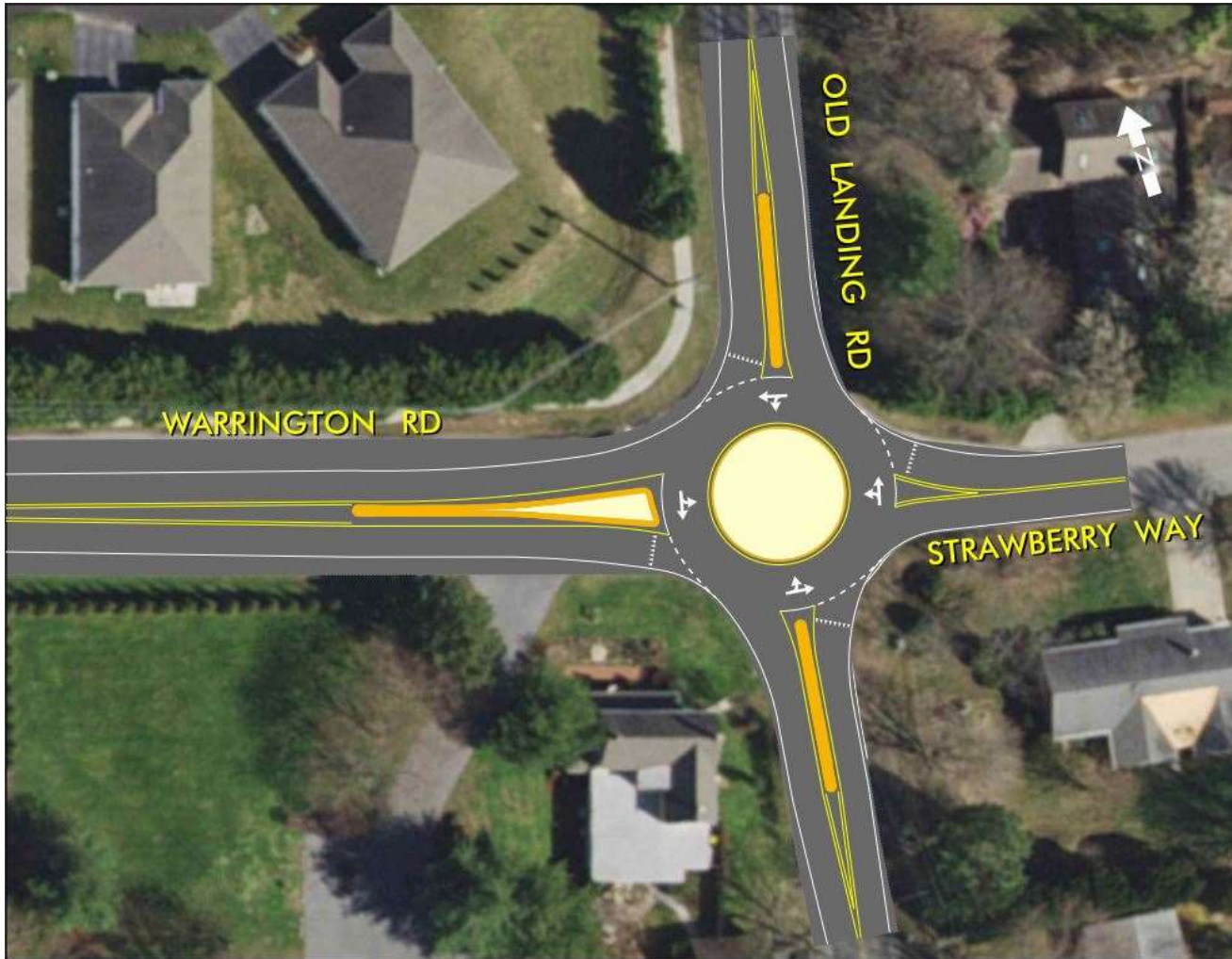
- Compact Roundabout Concept Design
  - Compact roundabout can be constructed within limits of existing pavement with minor widening along intersection radii
  - Inscribed diameter = 76 feet
  - Fully mountable central island
  - Raised, fully mountable and painted splitter islands
  - Geometry designed to accommodate passenger vehicle movements without using central island and WB-40 traversing central island
  - Designed to accommodate future pedestrian improvements
  - Lighting is proposed to illuminate the approaches and the roundabout

# Alternative 1: Compact Roundabout

- **INTERSECTION CONGESTION (2045 Projections)**
  - Non-Summer Weekday Peak Hours = *Low Congestion*
    - 85%-92% reduction in overall intersection delay from 2045 existing AWSC
    - Approx. Max Queues: EB: ~125 ft, WB: ~350 ft, NB: no queue, SB: ~125 ft
  - Summer Peak Hour = *Low Congestion*
    - 89% reduction in overall intersection delay from 2045 existing AWSC
    - Approx. Max Queues: EB: ~150 ft, WB: ~175 ft, NB: no queue, SB: ~350 ft
- **SAFETY EFFECTS**
  - Minimal impact on crash frequency and severity anticipated with conversion of AWSC intersection to roundabout
  - Reduction in intersection conflict points
  - Change in intersection geometry encourages slower speeds compared to pure reliance on motorist's adherence to traffic control devices with AWSC
  - Sight distance from yield line is met to observe entering traffic; however, if additional sight distance on the approaches is desired clearing and grubbing/property owner coordination may be required



# Alternative 1: Compact Roundabout



Warrington Road at Old Landing Road



# Alternative 1: Compact Roundabout

- Estimated design duration: 8-10 months
- Estimated construction duration: 2 months
  - Construction phasing expected to maintain traffic along Old Landing Road and Strawberry Way with a detour expected on Warrington Road
  - Contingent upon allowable work hour timeframes
- Estimated construction cost: **\$435,000**

## Alternative 2: Signalized Intersection Existing Lanes

- Maintain existing lane configurations
- Permanent easement needed for signal pole on the northeast corner of the intersection
- Construct pedestrian connections on all corners of the intersection
- No roadway paving operations anticipated
- Minimal changes to existing striping; addition of crosswalks and relocation of stop lines
- No proposed roadway lighting improvements

# Alternative 2: Signalized Intersection Existing Lanes

- **INTERSECTION CONGESTION (2045 Projections)**

- Non-Summer Weekday Peak Hours = *Significant Congestion*
  - 65%-77% reduction in overall intersection delay from 2045 existing AWSC
  - Approx. Max Queues: EB: ~450 ft, WB: ~1,100 ft, NB: ~75 ft, SB: ~500 ft
- Summer Peak Hour = *Significant Congestion*
  - 64% reduction in overall intersection delay from 2045 existing AWSC
  - Approx. Max Queues: EB: ~550 ft, WB: ~650 ft, NB: ~75 ft, SB: ~850 ft

- **SAFETY EFFECTS**

- Conversion from AWSC or roundabout to traffic signal control generally increases the frequency and severity of crashes due to higher speeds through the intersection, red light running, rear ends due to sudden braking, etc.
  - Conversion from signalized intersection to roundabout is expected to reduce total crashes from 48% to 67%
- Does not encourage lower speeds
  - Speeding will still occur, particularly when the signal is green

# Alternative 2: Signalized Intersection Existing Lanes



Warrington Road at Old Landing Road

## Alternative 2: Signalized Intersection Existing Lanes

- Estimated design duration: 8-10 months
- Estimated construction duration: 2 months
  - Traffic would be maintained along all roads during construction (intersection flagging during off-peak periods)
  - Contingent upon allowable work hour timeframes
- Estimated construction cost: **\$300,000**
  - Improvements would be installed by DeIDOT's Traffic Contractor



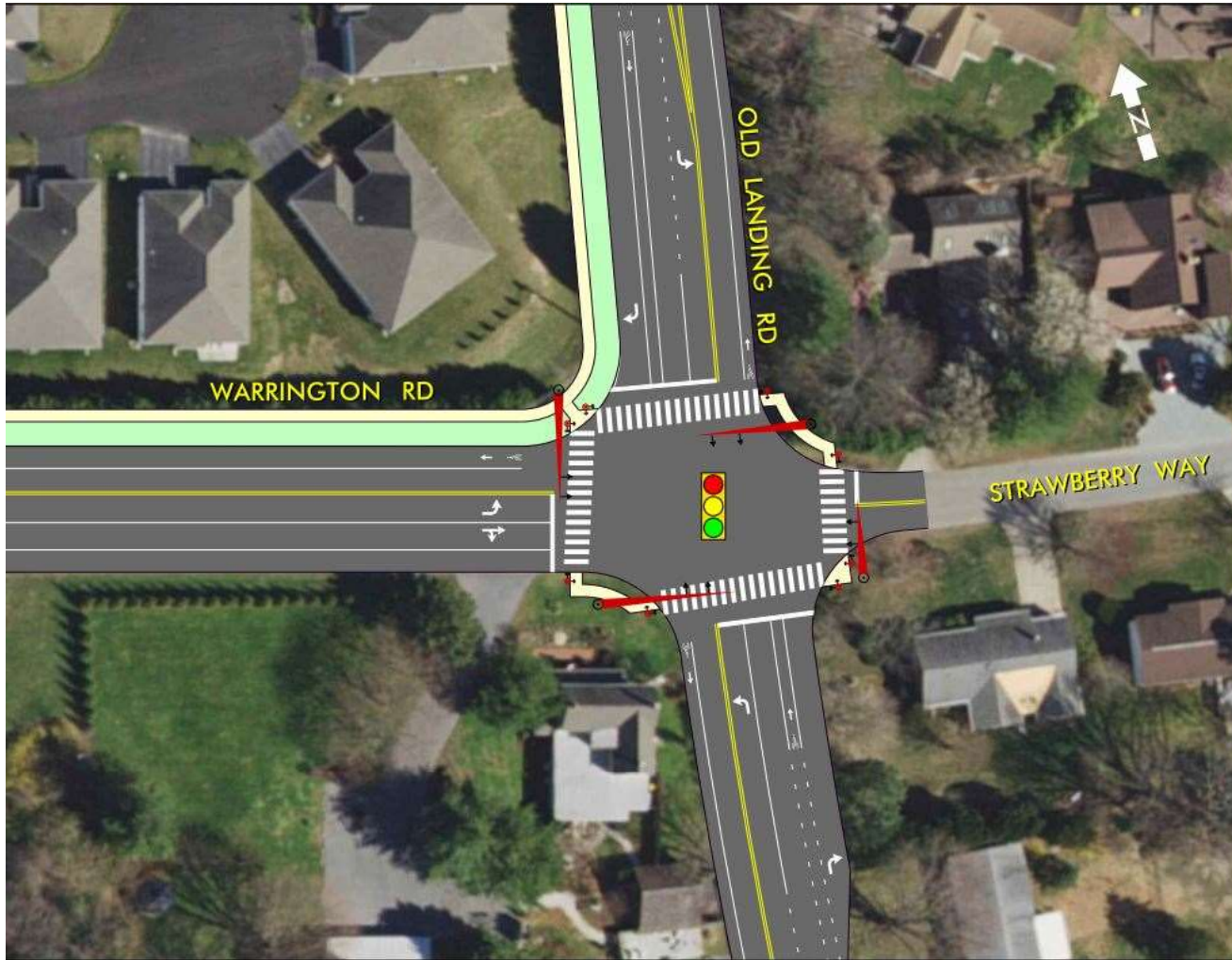
## Alternative 3: Signalized Intersection Added Lanes

- Widen Warrington Rd and Old Landing Rd to provide TID recommended turn lanes: dedicated left and right-turn lanes on Old Landing Road and extension of Warrington Road left-turn lane
- Maintain existing pavement width and travel lanes on Strawberry Way
- Construct new sidewalk in areas where existing sidewalk is impacted due to widening
- Install pedestrian crossings on all legs of the intersection
- Significant right-of-way impacts on residential parcels, including removal of mature landscape screening, to accommodate widening and drainage improvements including construction of roadside swales and stormwater management pond
- Requires extensive aerial and underground electric and communication utility relocations
- No proposed roadway lighting improvements

# Alternative 3: Signalized Intersection Added Lanes

- **INTERSECTION CONGESTION (2045 Projections)**
  - Non-Summer Weekday Peak Hours = *Low Congestion*
    - 65%-90% reduction in overall intersection delay from 2045 existing AWSC
    - Approx. Max Queues: EB: ~300 ft, WB: ~225 ft, NB: ~50 ft, SB: ~500 ft
  - Summer Peak Hour = *Moderate Congestion*
    - 80% reduction in overall intersection delay from 2045 existing AWSC
    - Approx. Max Queues: EB: ~200 ft, WB: ~225 ft, NB: ~50 ft, SB: ~600 ft
- **SAFETY EFFECTS**
  - Installation of dedicated left-turn and right-turn lanes are shown to reduce the frequency and severity of crashes, providing a safety benefit over the “Signalized Intersection with Existing Lanes” alternative, however, signalized intersections experience greater crash frequency and severity than roundabouts and AWSC intersections
  - Does not encourage lower speeds
    - Speeding will still occur, particularly when the signal is green

# Alternative 3: Signalized Intersection Added Lanes



## Warrington Road at Old Landing Road

## Alternative 3: Signalized Intersection Added Lanes

- Design expected to begin in FY 2025 based on FY21-FY26 CTP (updated Dec 10, 2020)
- Estimated construction duration: 8 months
  - Additional time required for right-of-way acquisition and utility relocations
  - Contingent upon allowable work hour timeframes
  - Short-term road closures/detours may be required for widening
- Estimated construction cost: **\$1,400,000**
  - Does not include the cost of right-of-way acquisition, utility relocations, etc.
  - Contingent upon detailed design process

# Summary of Alternatives

	Compact Roundabout	Signalized Intersection Existing Lanes <sup>1</sup>	Signalized Intersection Added Lanes
2045 Weekday Peak Congestion <sup>2</sup>	Low	Significant	Low
2045 Summer Peak Congestion <sup>3</sup>	Low	Significant	Moderate
Safety (compared to AWSC)	Lower speeds Minimal impact on crash frequency & severity	Higher speeds when green Higher crash frequency & severity	Higher speeds when green Higher crash frequency & severity
Cost <sup>4</sup>	\$435,000	\$300,000	\$1,400,000
Ability to Implement	Traffic Contractor	Traffic Contractor	CTP project

<sup>1</sup> Signalization alone is not expected to meet long-term needs in the region

<sup>2</sup> Henlopen TID “2045 All-Improvements Scenario” traffic volumes (assumes construction of Airport Road Extension project between Old Landing Road and SR 24)

<sup>3</sup> Projected 2045 “peak summer” traffic volumes based on 2013 summer Saturday and 2018 summer weekday peak hour counts with an applied growth factor similar to the Henlopen TID

<sup>4</sup> Contingent upon detailed design process and other designs aspects



# Thank you!

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