

|                                |                                |         |         |        |
|--------------------------------|--------------------------------|---------|---------|--------|
| DISTRICT                       | COUNTY                         | ROUTE   | SECTION | SHEET  |
| 6-0                            | CHESTER                        | -       | -       | 1 OF 3 |
| WESTTOWN & THORNBURY TOWNSHIPS |                                |         |         |        |
| REVISION NUMBER                | REVISIONS                      | DATE    | BY      |        |
| 1                              | REVISIONS PER PENNDOT COMMENTS | 5/15/20 | SBW     |        |

| PROPERTY IMPACTS                |                      |                                 |                         |
|---------------------------------|----------------------|---------------------------------|-------------------------|
| OWNER NAME                      | REQUIRED PENNDOT R/W | TEMPORARY CONSTRUCTION EASEMENT | TRAFFIC SIGNAL EASEMENT |
| JAMES AND DAVID ROBINSON        | 1,710 SF             |                                 | 379 SF                  |
| RANDALL & HERBERT SPACKMAN (SW) | 1,653 SF             | 5,521 SF                        | 160 SF                  |
| RANDALL & HERBERT SPACKMAN (SE) | 1,061 SF             | 5,380 SF                        | 407 SF                  |

RUDISILL JAMES J II  
JANICE M  
1150 S NEW ST  
WEST CHESTER, PA  
19382  
PARCEL ID #6706 00110000

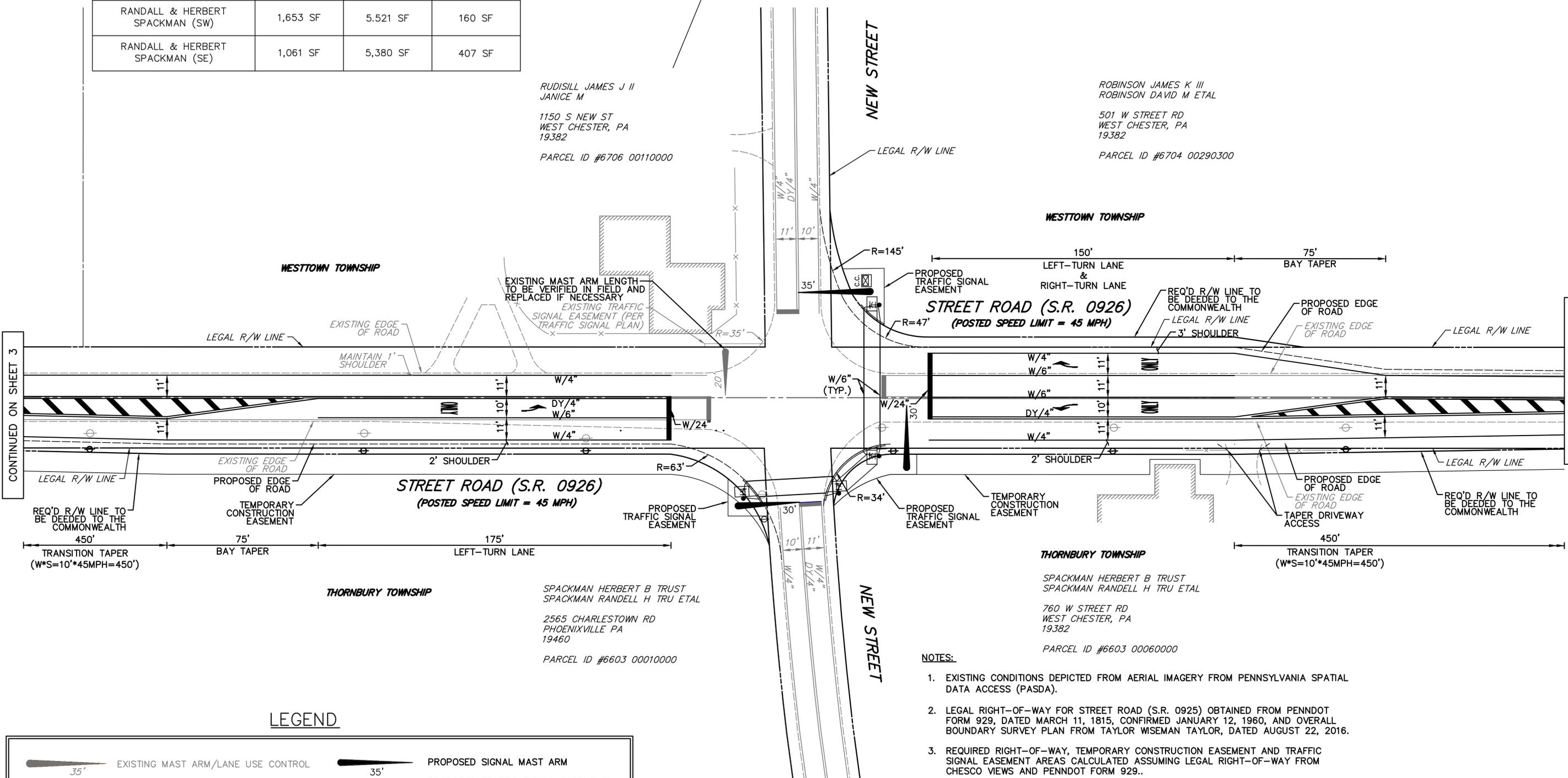
ROBINSON JAMES K III  
ROBINSON DAVID M ETAL  
501 W STREET RD  
WEST CHESTER, PA  
19382  
PARCEL ID #6704 00290300

SPACKMAN HERBERT B TRUST  
SPACKMAN RANDELL H TRU ETAL  
2565 CHARLESTOWN RD  
PHOENIXVILLE PA  
19460  
PARCEL ID #6603 00010000

SPACKMAN HERBERT B TRUST  
SPACKMAN RANDELL H TRU ETAL  
760 W STREET RD  
WEST CHESTER, PA  
19382  
PARCEL ID #6603 00060000

CONTINUED ON SHEET 3

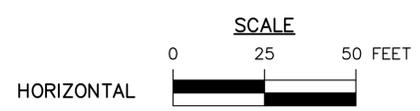
CONTINUED ON SHEET 2



**NOTES:**

- EXISTING CONDITIONS DEPICTED FROM AERIAL IMAGERY FROM PENNSYLVANIA SPATIAL DATA ACCESS (PASDA).
- LEGAL RIGHT-OF-WAY FOR STREET ROAD (S.R. 0925) OBTAINED FROM PENNDOT FORM 929, DATED MARCH 11, 1815, CONFIRMED JANUARY 12, 1960, AND OVERALL BOUNDARY SURVEY PLAN FROM TAYLOR WISEMAN TAYLOR, DATED AUGUST 22, 2016.
- REQUIRED RIGHT-OF-WAY, TEMPORARY CONSTRUCTION EASEMENT AND TRAFFIC SIGNAL EASEMENT AREAS CALCULATED ASSUMING LEGAL RIGHT-OF-WAY FROM CHESCO VIEWS AND PENNDOT FORM 929..
- 75' BAY TAPERS UTILIZED TO REDUCE IMPACT TO PROPERTIES TO THE SOUTHEAST.
- DESIGN VEHICLE: 36-FT SCHOOL BUS
- DESIGN SPEED: 45 MPH
- ALL RELOCATED UTILITY POLES ARE TO BE PLACE AT LEAST 4-FT FROM THE EDGE OF SHOULDER.

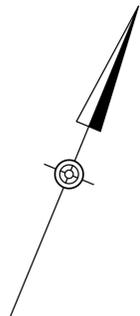
| LEGEND |                                    |
|--------|------------------------------------|
|        | EXISTING MAST ARM/LANE USE CONTROL |
|        | PROPOSED SIGNAL MAST ARM           |
|        | REQUIRED RIGHT-OF-WAY LINE         |
|        | EXISTING RIGHT-OF-WAY LINE         |
|        | TEMPORARY CONSTRUCTION EASEMENT    |
|        | PROPOSED CURB RAMP                 |
|        | PROPOSED TRAFFIC SIGNAL EASEMENT   |
|        | EXISTING TRAFFIC SIGNAL EASEMENT   |
|        | EXISTING UTILITY POLE              |
|        | RELOCATED UTILITY POLE             |
|        | PROPOSED PEDESTRIAN STUB POLE      |



**DRAFT**

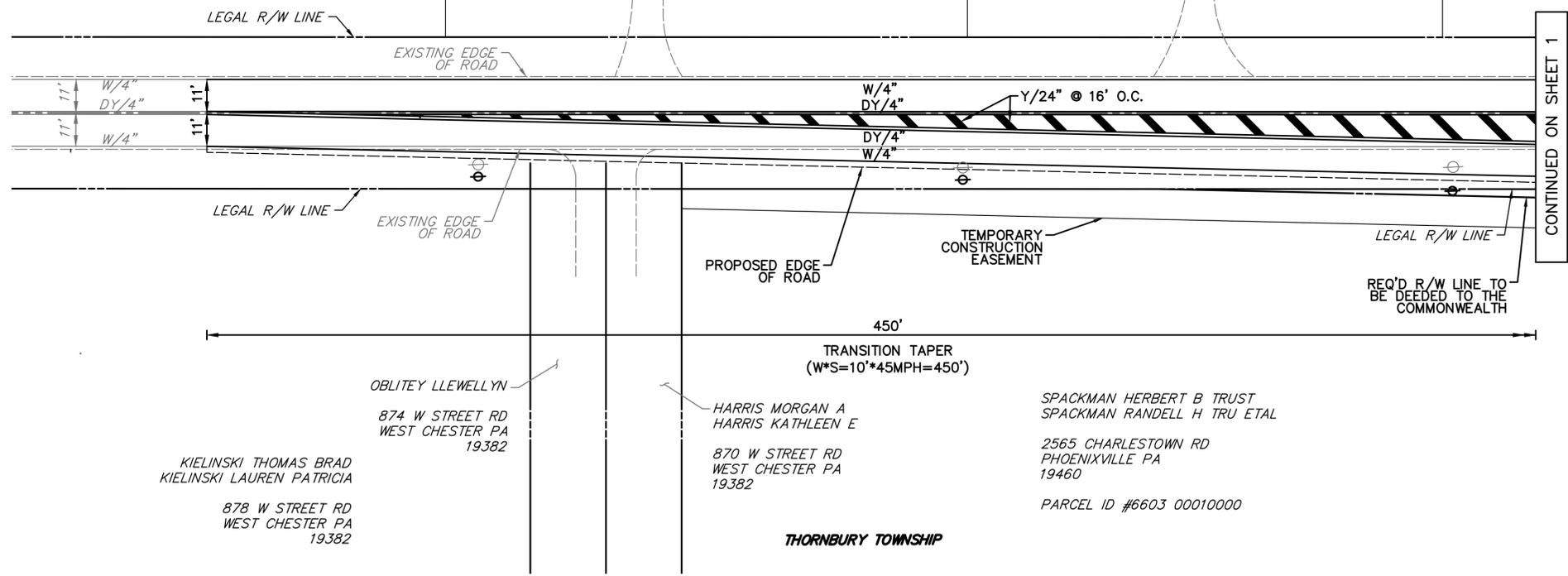


|                                |                                |         |         |        |
|--------------------------------|--------------------------------|---------|---------|--------|
| DISTRICT                       | COUNTY                         | ROUTE   | SECTION | SHEET  |
| 6-0                            | CHESTER                        | -       | -       | 3 OF 3 |
| WESTTOWN & THORNBURY TOWNSHIPS |                                |         |         |        |
| REVISION NUMBER                | REVISIONS                      | DATE    | BY      |        |
| 1                              | REVISIONS PER PENNDOT COMMENTS | 5/15/20 | SBW     |        |
|                                |                                |         |         |        |
|                                |                                |         |         |        |

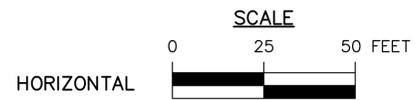


WESTTOWN TOWNSHIP

**STREET ROAD (S.R. 0926)**  
(POSTED SPEED LIMIT = 45 MPH)



CONTINUED ON SHEET 1



DRAFT

I:\projects\19-0001\19-0001.dwg Conceptual\19-0001.dwg, P:\Way 15\19-0001\2020.DWG TO PDI.PCS



835 SPRINGDALE DRIVE  
SUITE 200  
EXTON, PA 19341  
PH: (610) 594-9995  
FAX: (610) 594-9565

DESIGN BY: SAK  
DRAWN BY: SBW  
CHECKED BY: AV

JOB NO: 816451  
DWG: 451CPT01  
DATE: 3/06/2020

**TOLL BROTHERS, INC.**  
250 GIBALTAR ROAD  
HORSHAM, PA 19044

**ROBINSON TRACT RESIDENTIAL DEVELOPMENT**  
**STREET ROAD (S.R. 0926) AND NEW STREET**  
WESTTOWN & THORNBURY TOWNSHIPS  
CHESTER COUNTY

CONCEPTUAL DESIGN EXHIBIT  
ALTERNATIVE A

|                   |                                |         |         |        |
|-------------------|--------------------------------|---------|---------|--------|
| DISTRICT          | COUNTY                         | ROUTE   | SECTION | SHEET  |
| 6-0               | CHESTER                        | -       | -       | 2 OF 2 |
| WESTTOWN TOWNSHIP |                                |         |         |        |
| REVISION NUMBER   | REVISIONS                      | DATE    | BY      |        |
| 1                 | REVISIONS PER PENNDOT COMMENTS | 5/15/20 | SBW     |        |
|                   |                                |         |         |        |
|                   |                                |         |         |        |



| OWNER NAME                      | REQUIRED PENNDOT R/W | TEMPORARY CONSTRUCTION EASEMENT | TRAFFIC SIGNAL EASEMENT |
|---------------------------------|----------------------|---------------------------------|-------------------------|
| JAMES AND DAVID ROBINSON        | 1,710 SF             |                                 | 379 SF                  |
| RANDALL & HERBERT SPACKMAN (SE) | 1,061 SF             | 5,380 SF                        | 407 SF                  |

CONTINUED ON SHEET 1

- NOTES:**
- EXISTING CONDITIONS DEPICTED FROM AERIAL IMAGERY FROM PENNSYLVANIA SPATIAL DATA ACCESS (PASDA).
  - LEGAL RIGHT-OF-WAY FOR STREET ROAD (S.R. 0925) OBTAINED FROM PENNDOT FORM 929, DATED MARCH 11, 1815, CONFIRMED JANUARY 12, 1960, AND OVERALL BOUNDARY SURVEY PLAN FROM TAYLOR WISEMAN TAYLOR, DATED AUGUST 22, 2016.
  - REQUIRED RIGHT-OF-WAY, TEMPORARY CONSTRUCTION EASEMENT AND TRAFFIC SIGNAL EASEMENT AREAS CALCULATED ASSUMING LEGAL RIGHT-OF-WAY FROM CHESCO VIEWS AND PENNDOT FORM 929..
  - 75' BAY TAPERS UTILIZED TO REDUCE IMPACT TO PROPERTIES TO THE SOUTHEAST.
  - DESIGN VEHICLE: 36-FT SCHOOL BUS
  - DESIGN SPEED: 45 MPH
  - ALL RELOCATED UTILITY POLES ARE TO BE PLACE AT LEAST 4-FT FROM THE EDGE OF SHOULDER.

**LEGEND**

|  |     |                                    |  |     |                                  |
|--|-----|------------------------------------|--|-----|----------------------------------|
|  | 35' | EXISTING MAST ARM/LANE USE CONTROL |  | 35' | PROPOSED LANE USE CONTROL        |
|  |     | REQUIRED RIGHT-OF-WAY LINE         |  |     | PROPOSED TRAFFIC SIGNAL EASEMENT |
|  |     | EXISTING RIGHT-OF-WAY LINE         |  |     | EXISTING TRAFFIC SIGNAL EASEMENT |
|  |     | TEMPORARY CONSTRUCTION EASEMENT    |  |     | EXISTING UTILITY POLE            |
|  |     | PROPOSED CURB RAMP                 |  |     | RELOCATED UTILITY POLE           |
|  |     | PROPOSED PEDESTRIAN STUB POLE      |  |     | PROPOSED ASPHALT PAVEMENT        |



|                                |                                |         |         |        |
|--------------------------------|--------------------------------|---------|---------|--------|
| DISTRICT                       | COUNTY                         | ROUTE   | SECTION | SHEET  |
| 6-0                            | CHESTER                        | -       | -       | 1 OF 2 |
| WESTTOWN & THORNBURY TOWNSHIPS |                                |         |         |        |
| REVISION NUMBER                | REVISIONS                      | DATE    | BY      |        |
| 1                              | REVISIONS PER PENNDOT COMMENTS | 5/15/20 | SBW     |        |

| PROPERTY IMPACTS                |                      |                                 |                         |
|---------------------------------|----------------------|---------------------------------|-------------------------|
| OWNER NAME                      | REQUIRED PENNDOT R/W | TEMPORARY CONSTRUCTION EASEMENT | TRAFFIC SIGNAL EASEMENT |
| RANDALL & HERBERT SPACKMAN (SW) | 1,653 SF             | 5,521 SF                        | 160 SF                  |

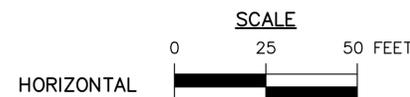


CONTINUED ON SHEET 2

**NOTES:**

- EXISTING CONDITIONS DEPICTED FROM AERIAL IMAGERY FROM PENNSYLVANIA SPATIAL DATA ACCESS (PASDA).
- LEGAL RIGHT-OF-WAY FOR STREET ROAD (S.R. 0925) OBTAINED FROM PENNDOT FORM 929, DATED MARCH 11, 1815, CONFIRMED JANUARY 12, 1960, AND OVERALL BOUNDARY SURVEY PLAN FROM TAYLOR WISEMAN TAYLOR, DATED AUGUST 22, 2016.
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- 75' BAY TAPERS UTILIZED TO REDUCE IMPACT TO PROPERTIES TO THE SOUTHEAST.
- DESIGN VEHICLE: 36-FT SCHOOL BUS
- DESIGN SPEED: 45 MPH
- ALL RELOCATED UTILITY POLES ARE TO BE PLACE AT LEAST 4-FT FROM THE EDGE OF SHOULDER.

|     |                                    |     |                                  |
|-----|------------------------------------|-----|----------------------------------|
| 35' | EXISTING MAST ARM/LANE USE CONTROL | 35' | PROPOSED LANE USE CONTROL        |
|     | REQUIRED RIGHT-OF-WAY LINE         |     | PROPOSED TRAFFIC SIGNAL EASEMENT |
|     | EXISTING RIGHT-OF-WAY LINE         |     | EXISTING TRAFFIC SIGNAL EASEMENT |
|     | TEMPORARY CONSTRUCTION EASEMENT    |     | EXISTING UTILITY POLE            |
|     | PROPOSED CURB RAMP                 |     | RELOCATED UTILITY POLE           |
|     | PROPOSED PEDESTRIAN STUB POLE      |     | PROPOSED ASPHALT PAVEMENT        |



835 SPRINGDALE DRIVE  
SUITE 200  
EXTON, PA 19341  
PH: (610) 594-9995  
FAX: (610) 594-9565

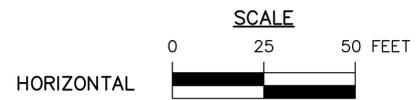
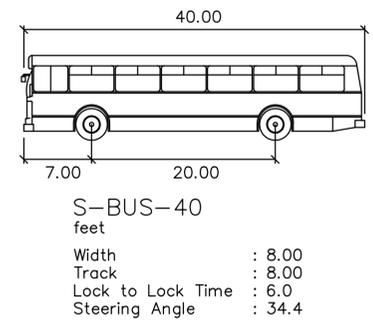
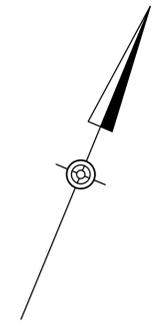
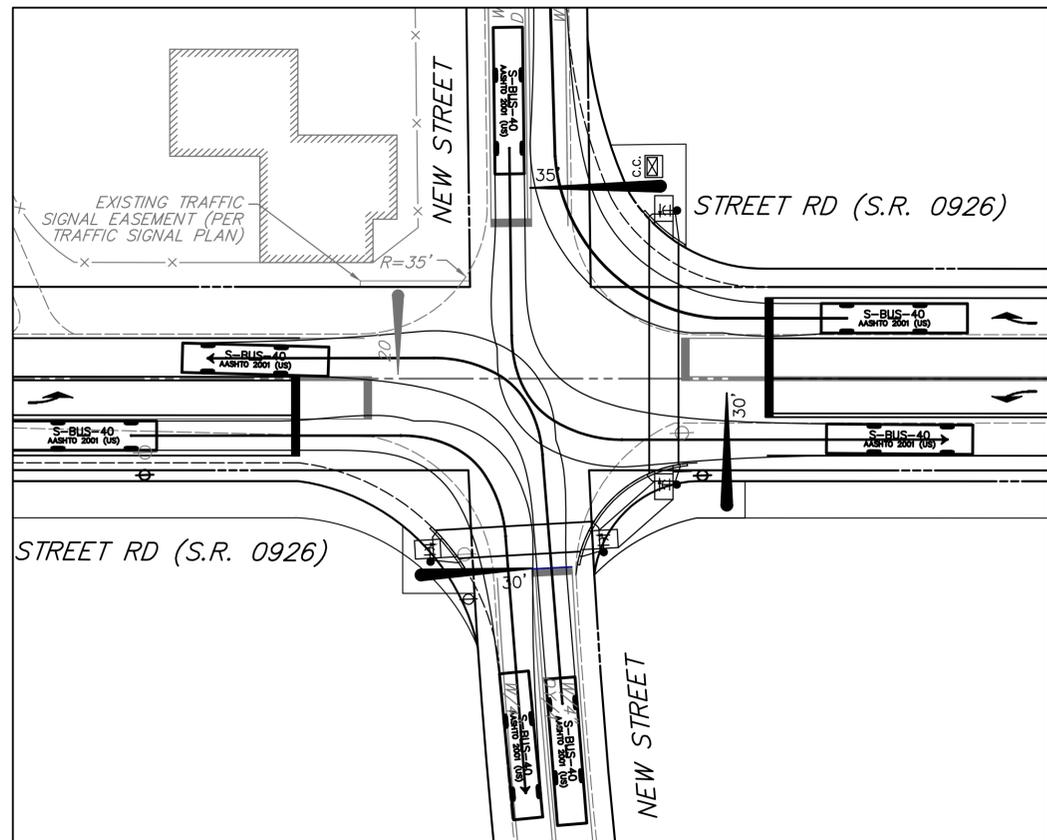
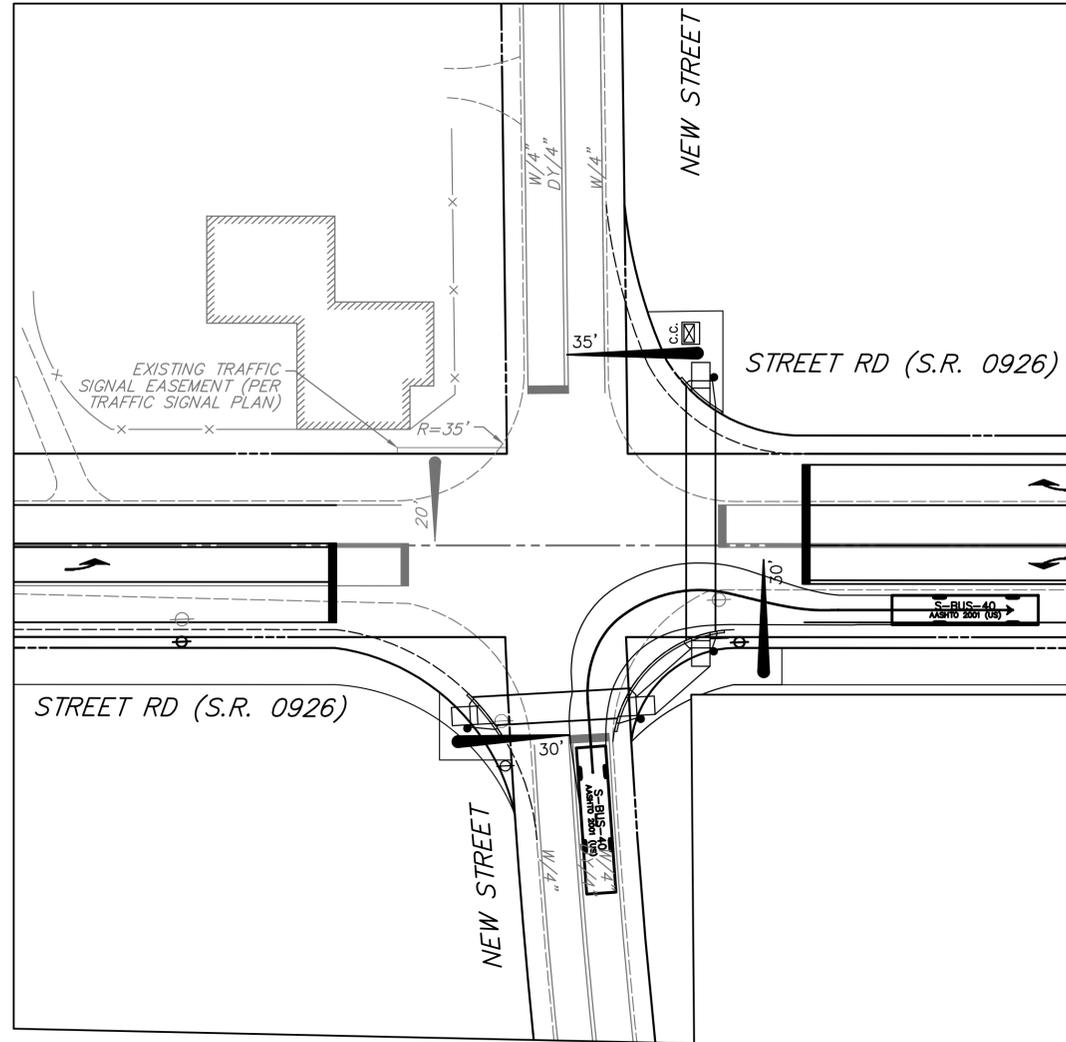
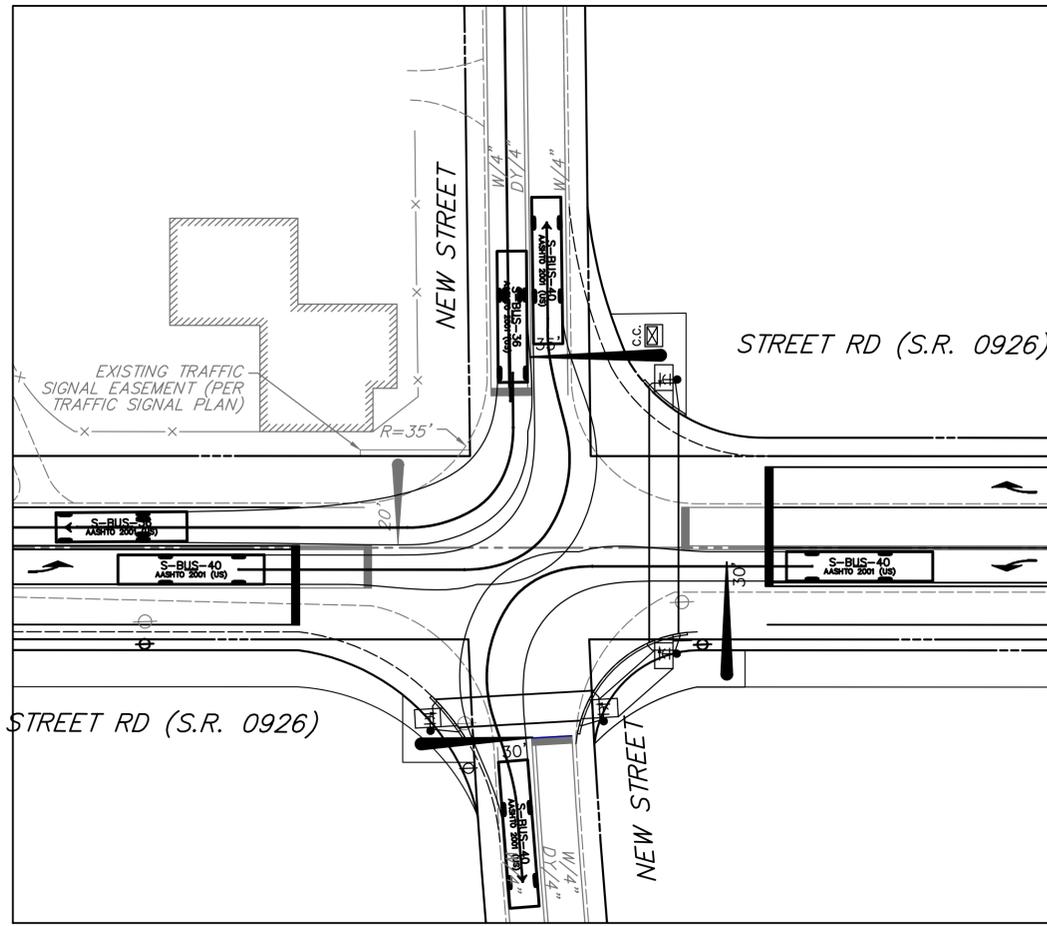
DESIGN BY: SAK      JOB NO: 816451  
DRAWN BY: SBW      DWG: 451CPT01  
CHECKED BY: AV      DATE: 3/10/2020

**TOLL BROTHERS, INC.**  
250 GIBALTAR ROAD  
HORSHAM, PA 19044

**ROBINSON TRACT RESIDENTIAL DEVELOPMENT**  
STREET ROAD (S.R. 0926) AND NEW STREET  
WESTTOWN & THORNBURY TOWNSHIPS      CHESTER COUNTY

**CONCEPTUAL DESIGN EXHIBIT**  
ALTERNATIVE A

|                                |                                |       |         |         |     |
|--------------------------------|--------------------------------|-------|---------|---------|-----|
| DISTRICT                       | COUNTY                         | ROUTE | SECTION | SHEET   |     |
| 6-0                            | CHESTER                        | -     | -       | 2 OF 2  |     |
| WESTTOWN & THORNBURY TOWNSHIPS |                                |       |         |         |     |
| REVISION NUMBER                | REVISIONS                      |       |         | DATE    | BY  |
| 1                              | REVISIONS PER PENNDOT COMMENTS |       |         | 5/15/20 | SBW |
|                                |                                |       |         |         |     |
|                                |                                |       |         |         |     |



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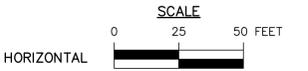
|                                |                                |         |         |        |
|--------------------------------|--------------------------------|---------|---------|--------|
| DISTRICT                       | COUNTY                         | ROUTE   | SECTION | SHEET  |
| 6-0                            | CHESTER                        | -       | -       | 1 OF 1 |
| WESTTOWN & THORNBURY TOWNSHIPS |                                |         |         |        |
| REVISION NUMBER                | REVISIONS                      | DATE    | BY      |        |
| 1                              | REVISIONS PER PENNDOT COMMENTS | 5/15/20 | SBW     |        |



| PROPERTY IMPACTS                |                      |                                 |                         |
|---------------------------------|----------------------|---------------------------------|-------------------------|
| OWNER NAME                      | REQUIRED PENNDOT R/W | TEMPORARY CONSTRUCTION EASEMENT | TRAFFIC SIGNAL EASEMENT |
| JAMES AND DAVID ROBINSON        | 1,710 SF             |                                 | 379 SF                  |
| RANDALL & HERBERT SPACKMAN (SW) | 1,653 SF             | 5,521 SF                        | 160 SF                  |
| RANDALL & HERBERT SPACKMAN (SE) | 1,061 SF             | 5,380 SF                        | 407 SF                  |

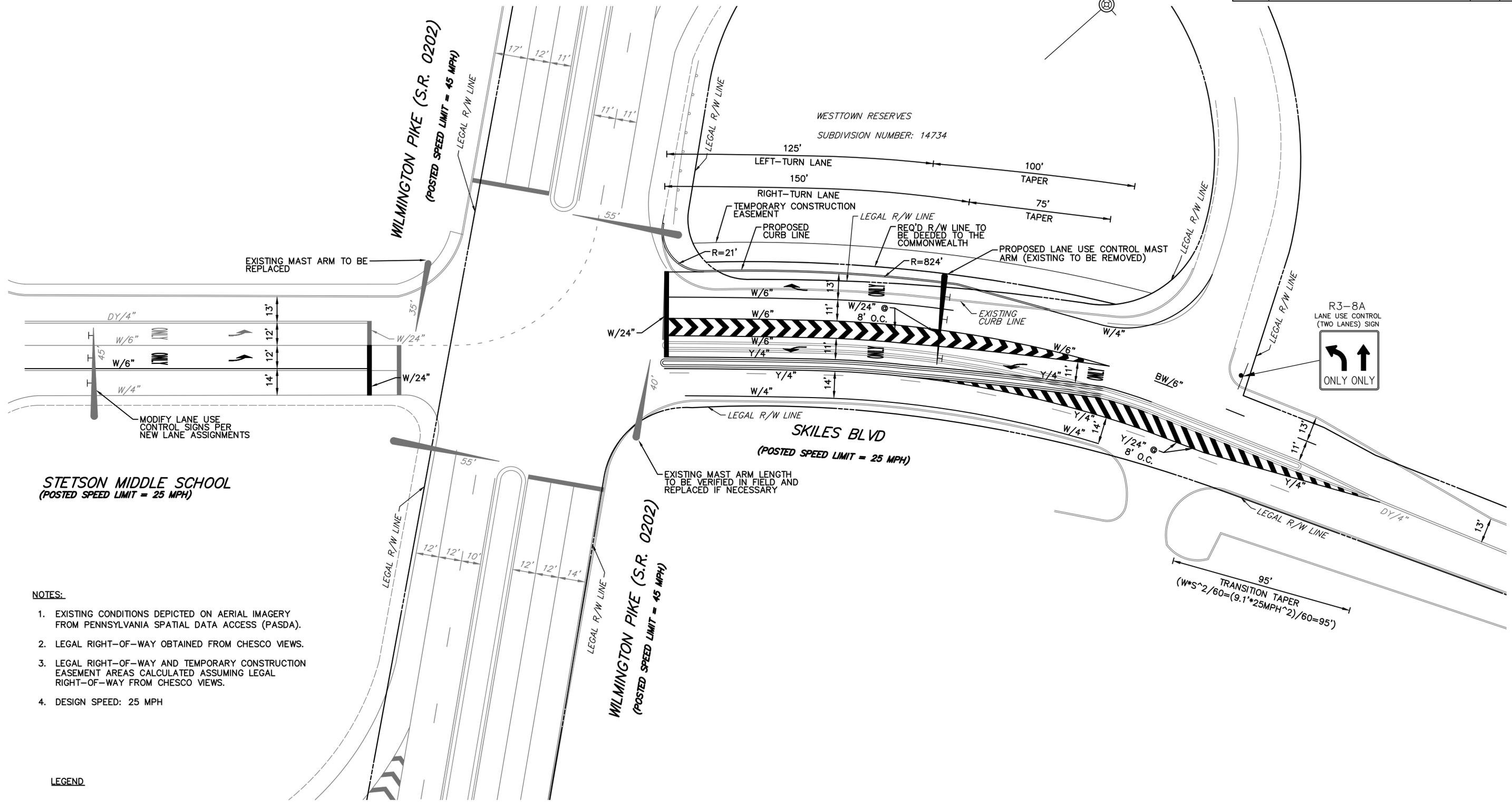
**LEGEND**

|     |                                    |     |                                  |
|-----|------------------------------------|-----|----------------------------------|
| 35' | EXISTING MAST ARM/LANE USE CONTROL | 35' | PROPOSED LANE USE CONTROL        |
|     | REQUIRED RIGHT-OF-WAY LINE         |     | PROPOSED TRAFFIC SIGNAL EASEMENT |
|     | EXISTING RIGHT-OF-WAY LINE         |     | EXISTING TRAFFIC SIGNAL EASEMENT |
|     | TEMPORARY CONSTRUCTION EASEMENT    |     | EXISTING UTILITY POLE            |
|     | PROPOSED CURB RAMP                 |     | RELOCATED UTILITY POLE           |
|     | PROPOSED PEDESTRIAN STUB POLE      |     | PROPOSED ASPHALT PAVEMENT        |



| PROPERTY IMPACTS  |                       |                                 |
|-------------------|-----------------------|---------------------------------|
| OWNER NAME        | REQUIRED TOWNSHIP R/W | TEMPORARY CONSTRUCTION EASEMENT |
| WESTTOWN RESERVES | 1,040 SF              | 2,291 SF                        |

| DISTRICT          | COUNTY                         | ROUTE | SECTION | SHEET   |     |
|-------------------|--------------------------------|-------|---------|---------|-----|
| 6-0               | CHESTER                        | -     | -       | 1 OF 1  |     |
| WESTTOWN TOWNSHIP |                                |       |         |         |     |
| REVISION NUMBER   | REVISIONS                      |       |         | DATE    | BY  |
| 1                 | REVISIONS PER PENNDOT COMMENTS |       |         | 5/15/20 | SBW |



**STETSON MIDDLE SCHOOL**  
(POSTED SPEED LIMIT = 25 MPH)

**NOTES:**

- EXISTING CONDITIONS DEPICTED ON AERIAL IMAGERY FROM PENNSYLVANIA SPATIAL DATA ACCESS (PASDA).
- LEGAL RIGHT-OF-WAY OBTAINED FROM CHESCO VIEWS.
- LEGAL RIGHT-OF-WAY AND TEMPORARY CONSTRUCTION EASEMENT AREAS CALCULATED ASSUMING LEGAL RIGHT-OF-WAY FROM CHESCO VIEWS.
- DESIGN SPEED: 25 MPH

**LEGEND**

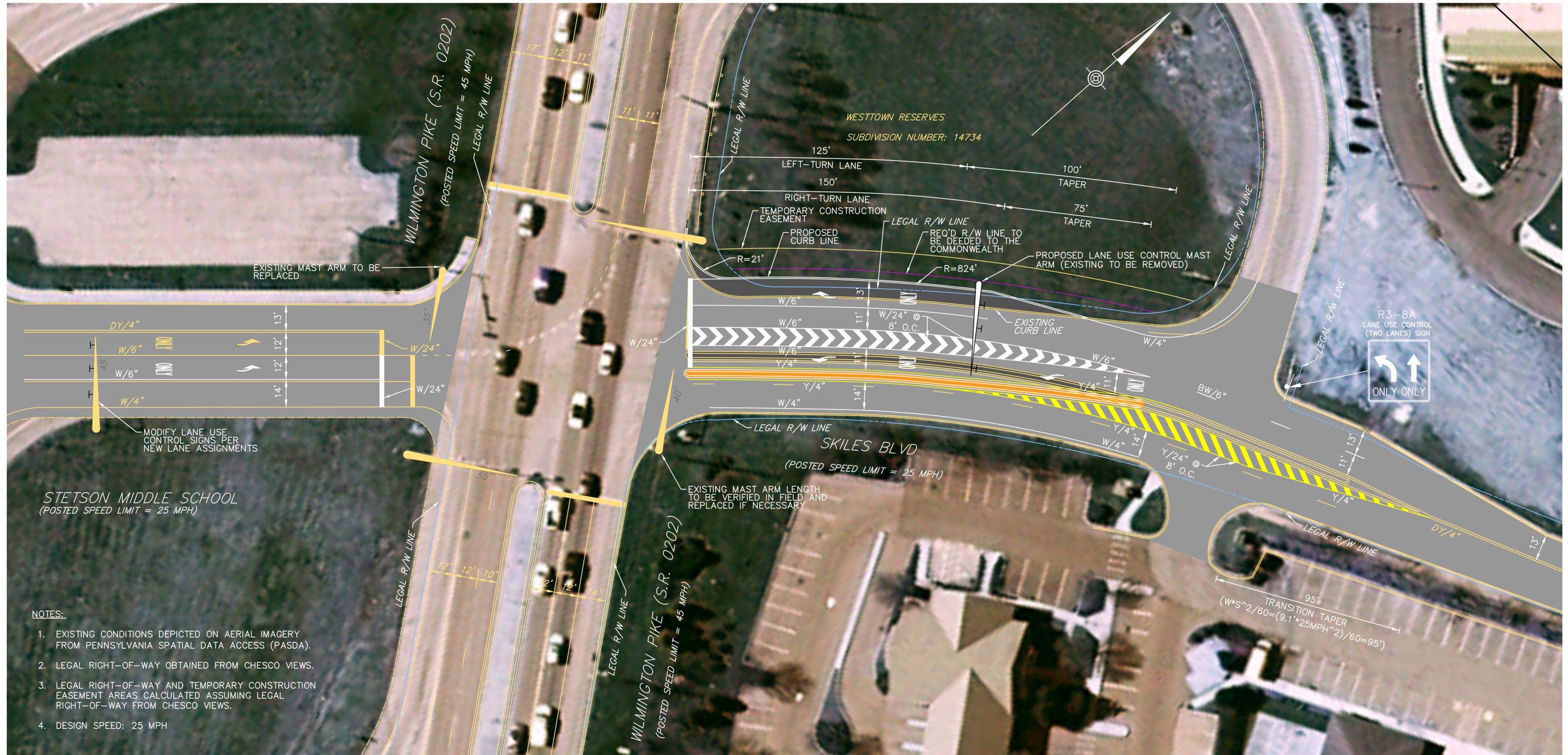
- 45' — EXISTING MAST ARM/LANE USE CONTROL
- 35' — PROPOSED LANE USE CONTROL



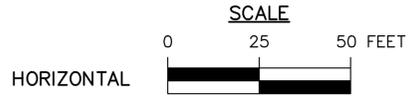
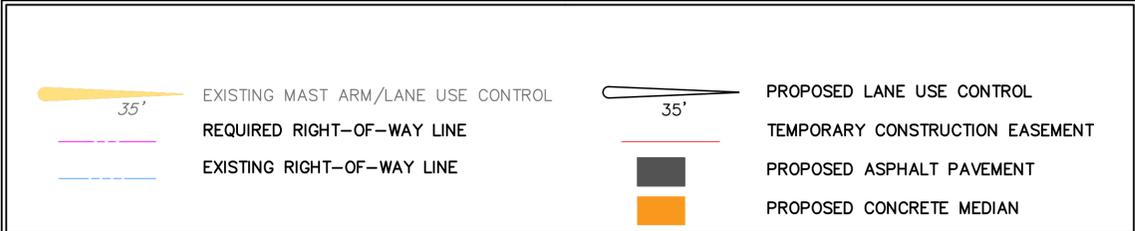
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|                   |                                |         |         |        |
|-------------------|--------------------------------|---------|---------|--------|
| DISTRICT          | COUNTY                         | ROUTE   | SECTION | SHEET  |
| 6-0               | CHESTER                        | -       | -       | 1 OF 1 |
| WESTTOWN TOWNSHIP |                                |         |         |        |
| REVISION NUMBER   | REVISIONS                      | DATE    | BY      |        |
| 1                 | REVISIONS PER PENNDOT COMMENTS | 5/15/20 | SBW     |        |

| PROPERTY IMPACTS  |                       |                                 |
|-------------------|-----------------------|---------------------------------|
| OWNER NAME        | REQUIRED TOWNSHIP R/W | TEMPORARY CONSTRUCTION EASEMENT |
| WESTTOWN RESERVES | 1,040 SF              | 2,291 SF                        |



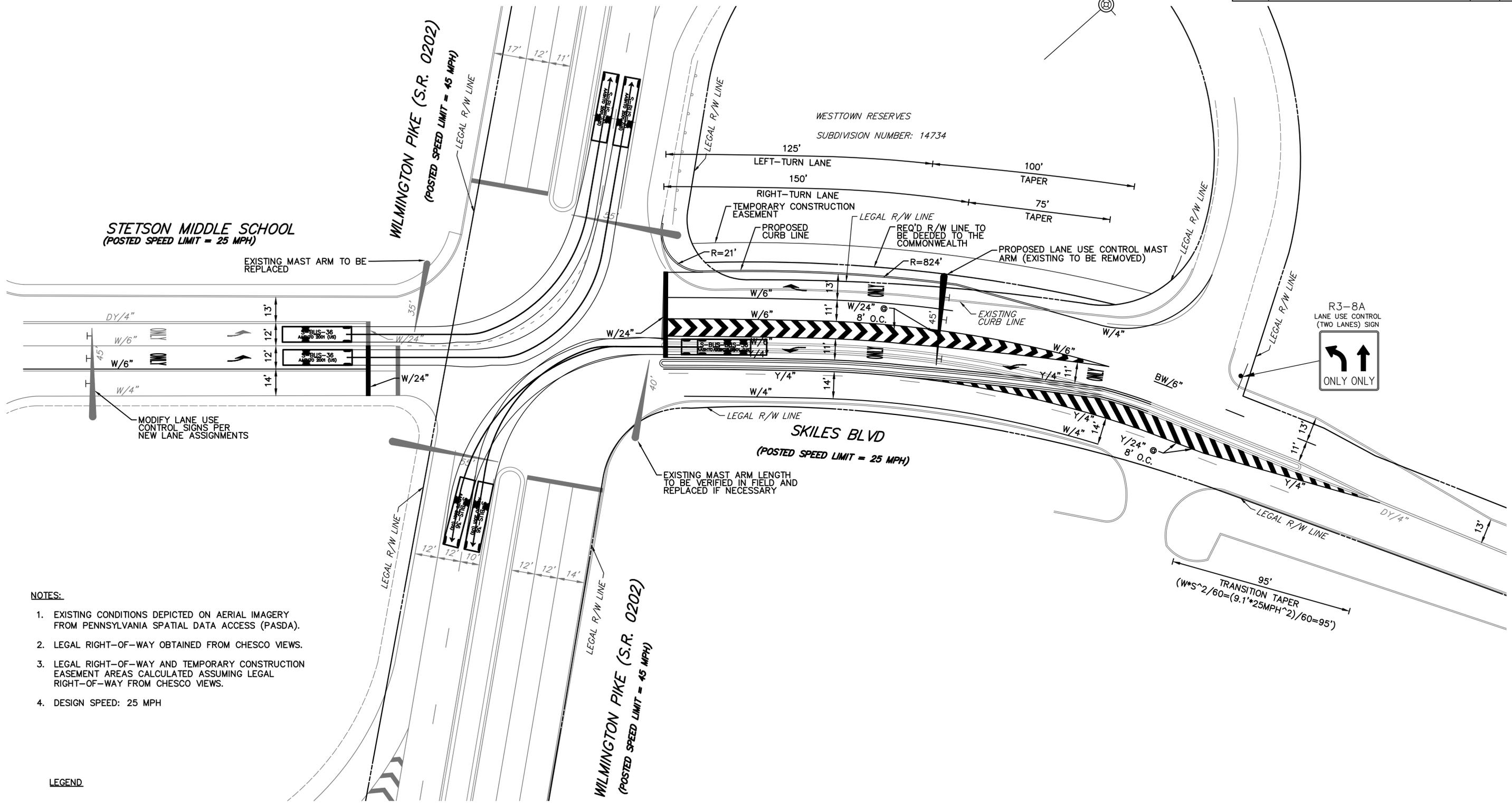
- NOTES:
- EXISTING CONDITIONS DEPICTED ON AERIAL IMAGERY FROM PENNSYLVANIA SPATIAL DATA ACCESS (PASDA).
  - LEGAL RIGHT-OF-WAY OBTAINED FROM CHESCO VIEWS.
  - LEGAL RIGHT-OF-WAY AND TEMPORARY CONSTRUCTION EASEMENT AREAS CALCULATED ASSUMING LEGAL RIGHT-OF-WAY FROM CHESCO VIEWS.
  - DESIGN SPEED: 25 MPH



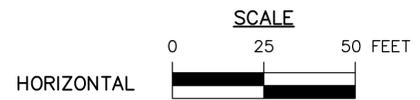
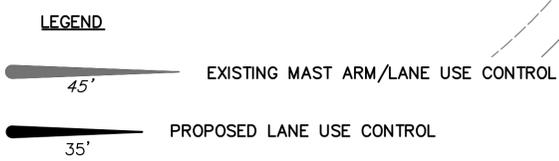
**DRAFT**

| PROPERTY IMPACTS  |                       |                                 |
|-------------------|-----------------------|---------------------------------|
| OWNER NAME        | REQUIRED TOWNSHIP R/W | TEMPORARY CONSTRUCTION EASEMENT |
| WESTTOWN RESERVES | 1,040 SF              | 2,291 SF                        |

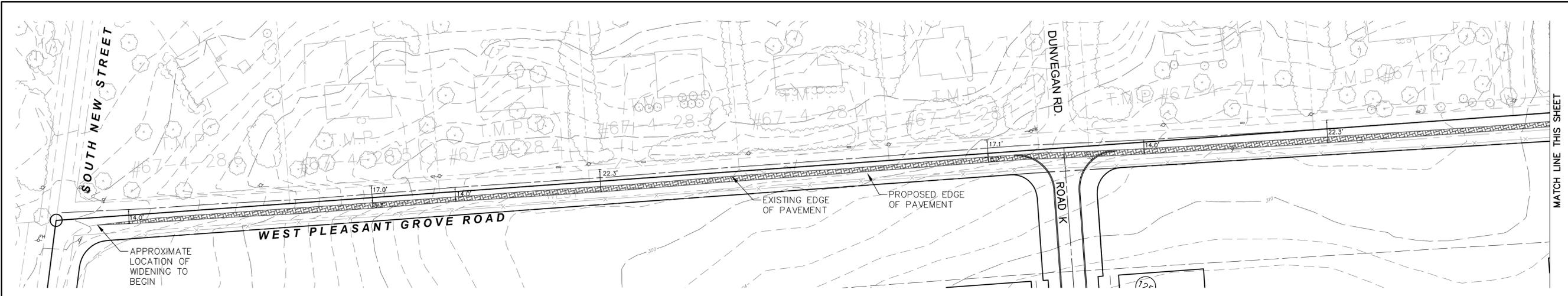
| DISTRICT          | COUNTY                         | ROUTE   | SECTION | SHEET  |
|-------------------|--------------------------------|---------|---------|--------|
| 6-0               | CHESTER                        | -       | -       | 1 OF 1 |
| WESTTOWN TOWNSHIP |                                |         |         |        |
| REVISION NUMBER   | REVISIONS                      | DATE    | BY      |        |
| 1                 | REVISIONS PER PENNDOT COMMENTS | 5/13/20 | SBW     |        |



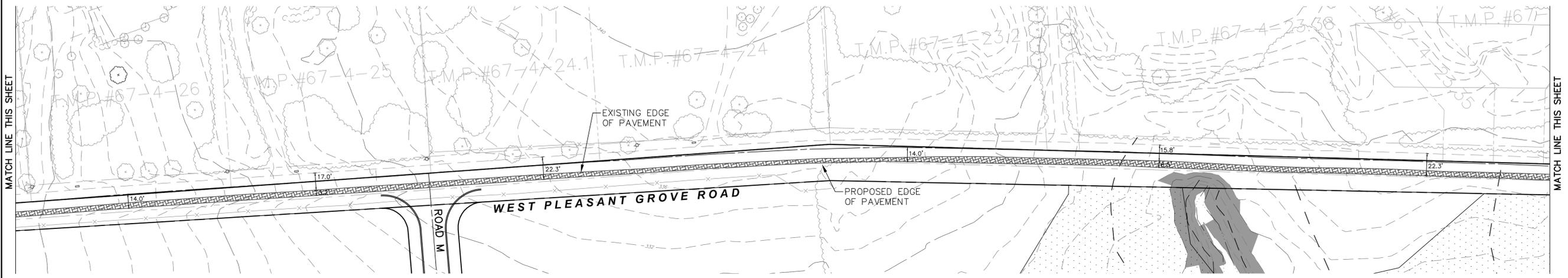
- NOTES:**
- EXISTING CONDITIONS DEPICTED ON AERIAL IMAGERY FROM PENNSYLVANIA SPATIAL DATA ACCESS (PASDA).
  - LEGAL RIGHT-OF-WAY OBTAINED FROM CHESCO VIEWS.
  - LEGAL RIGHT-OF-WAY AND TEMPORARY CONSTRUCTION EASEMENT AREAS CALCULATED ASSUMING LEGAL RIGHT-OF-WAY FROM CHESCO VIEWS.
  - DESIGN SPEED: 25 MPH



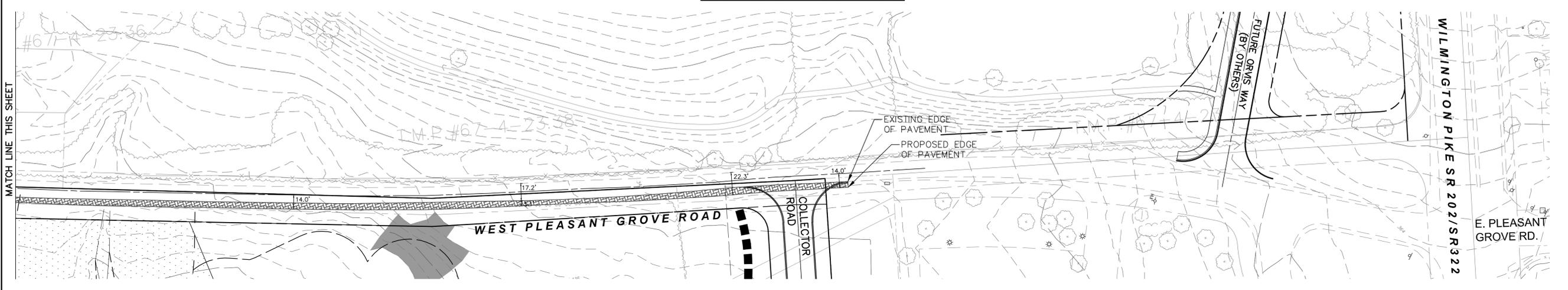
**DRAFT**



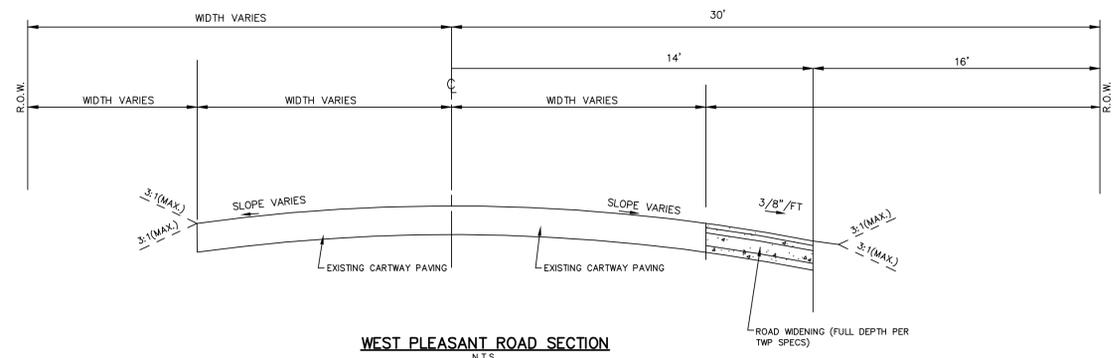
WEST PLEASANT GROVE ROAD



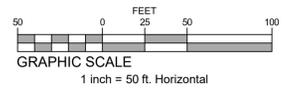
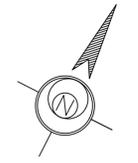
WEST PLEASANT GROVE ROAD



WEST PLEASANT GROVE ROAD



WEST PLEASANT ROAD SECTION  
N.T.S.



**ESE CONSULTANTS**  
ENGINEERING • PLANNING • SURVEYING • ENVIRONMENTAL

ESE Consultants, Inc.  
250 Gibraltar Road • Suite 2E • Horsesham, PA 19044  
T: 215-914-2050

| REV. | DATE | DESCRIPTION | DRAWN |
|------|------|-------------|-------|
|      |      |             |       |
|      |      |             |       |
|      |      |             |       |
|      |      |             |       |

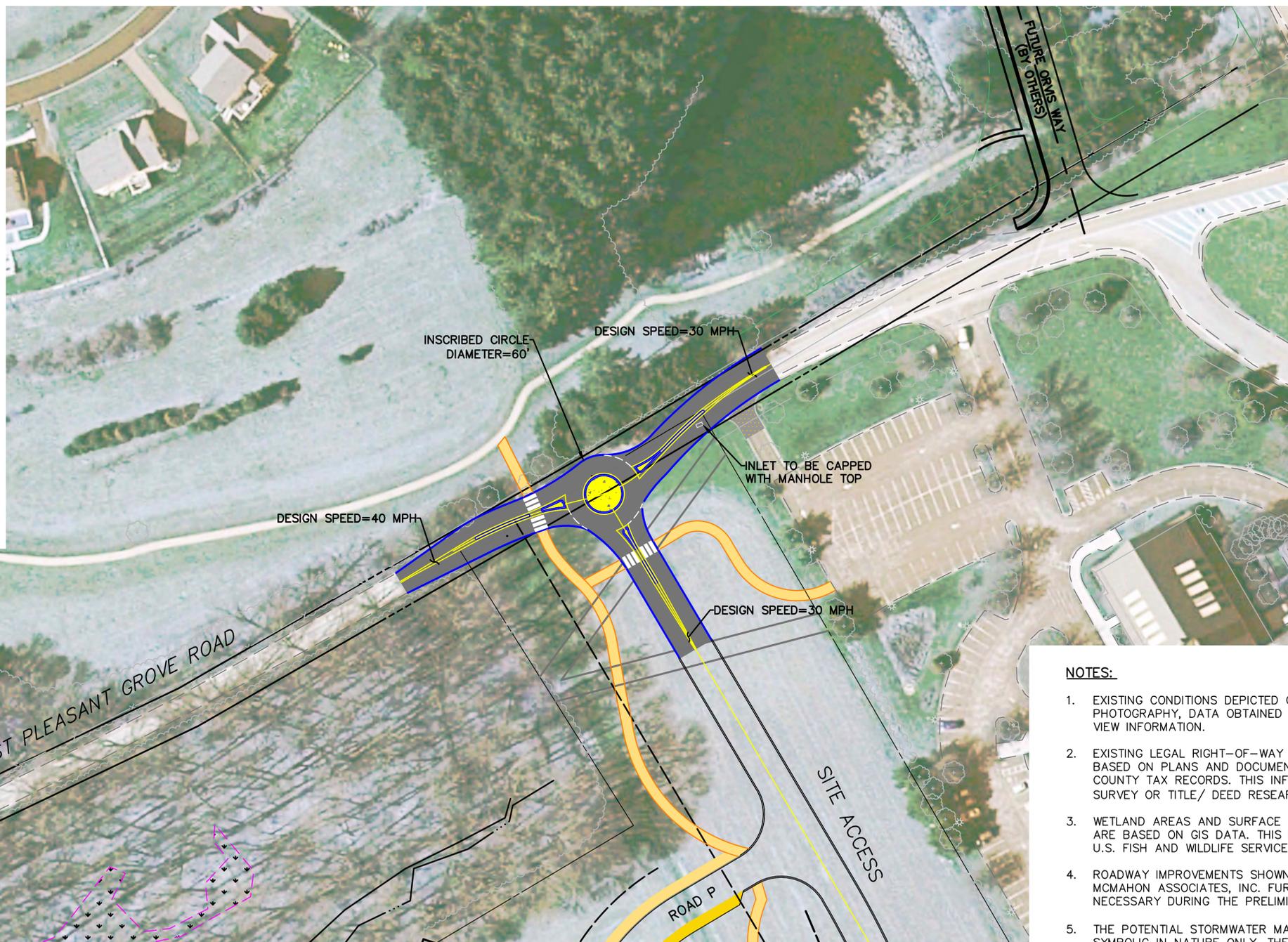
WEST PLEASANT GROVE ROAD WIDENING  
THE ROBINSON TRACT  
WESTTOWN TOWNSHIP, CHESTER COUNTY, PENNSYLVANIA

|                        |                                 |
|------------------------|---------------------------------|
| DATE:<br>5/15/2020     | SCALE:<br>1" = 50'              |
| DESIGN:<br>ESE         | DRAWN:<br>APR                   |
| JOB NO.:<br>4050       | FILE NAME:<br>4050-5-W-PLEASANT |
| REF. NO.:              |                                 |
| SHEET NO.:<br><b>1</b> | OF<br><b>1</b>                  |

# CONCEPTUAL ROUNDABOUT LAYOUT-MINI

|                   |           |       |         |          |
|-------------------|-----------|-------|---------|----------|
| DISTRICT          | COUNTY    | ROUTE | SECTION | SHEET    |
| 6-0               | CHESTER   | -     | -       | 03 OF 03 |
| WESTTOWN TOWNSHIP |           |       |         |          |
| REVISION NUMBER   | REVISIONS | DATE  | BY      |          |
|                   |           |       |         |          |
|                   |           |       |         |          |

- LEGEND:**
- NEW FULL DEPTH PAVEMENT
  - MILL AND OVERLAY OF EXISTING PAVEMENT
  - DRIVEWAY ADJUSTMENT
  - CONCRETE ISLAND
  - TRUCK APRON
  - ROUNDABOUT CENTRAL ISLAND
  - REMOVAL OF EXISTING PAVEMENT
  - WETLANDS (APPROXIMATE)
  - POTENTIAL STORMWATER MANAGEMENT
  - NEW PEDESTRIAN FACILITY
  - NEW PAVEMENT MARKINGS
  - NEW CURB
  - NEW EDGE OF PAVEMENT
  - REQUIRED RIGHT-OF-WAY LINE
  - LEGAL RIGHT-OF-WAY LINE
  - EXISTING PAVEMENT MARKINGS
  - EXISTING PROPERTY LINE
  - EXISTING EDGE OF PAVEMENT



**WEST PLEASANT GROVE ROAD AND SITE ACCESS MINI ROUNDABOUT OPTION ESTIMATED PROJECT IMPACT STATISTICS**

| IMPACT                                      | QUANTITY                                    |
|---|---|
| UTILITY POLE RELOCATIONS (●)                | 0 LARGE<br>0 MEDIUM<br>0 SMALL              |
| AFFECTED PROPERTIES <sup>(1)</sup> (#)      | 1   |
| ESTIMATED TOTAL REQUIRED RIGHT-OF-WAY (AC.) | SITE PROPERTY-0.00<br>OTHER PROPERTIES-0.00 |

1. PROPERTIES WHERE IT IS ESTIMATED THAT PERMANENT RIGHT-OF-WAY, PERMANENT EASEMENTS, OR TEMPORARY CONSTRUCTION EASEMENTS WILL BE NECESSARY.

**NOTES:**

1. EXISTING CONDITIONS DEPICTED ON THE CONCEPTUAL DESIGN EXHIBIT ARE BASED ON AERIAL PHOTOGRAPHY, DATA OBTAINED FROM THE PENNSYLVANIA SPATIAL DATA ACCESS, AND NO FIELD VIEW INFORMATION.
2. EXISTING LEGAL RIGHT-OF-WAY AND PROPERTY INFORMATION SHOWN ON THIS PLAN IS ESTIMATED BASED ON PLANS AND DOCUMENTS RECEIVED FROM PENNDOT AND DIGITAL DATA AVAILABLE FROM COUNTY TAX RECORDS. THIS INFORMATION HAS NOT BEEN INDEPENDENTLY VERIFIED THROUGH FIELD SURVEY OR TITLE/ DEED RESEARCH.
3. WETLAND AREAS AND SURFACE BODIES OF WATER DEPICTED ON THE CONCEPTUAL DESIGN EXHIBIT ARE BASED ON GIS DATA. THIS INFORMATION HAS NOT BEEN INDEPENDENTLY VERIFIED THOUGH THE U.S. FISH AND WILDLIFE SERVICE.
4. ROADWAY IMPROVEMENTS SHOWN ARE BASED ON THE PRELIMINARY TRAFFIC EVALUATION RESULTS BY MCMAHON ASSOCIATES, INC. FURTHER OPERATIONAL ANALYSIS OF THE INTERSECTION WILL BE NECESSARY DURING THE PRELIMINARY ENGINEERING OF THE PROJECT.
5. THE POTENTIAL STORMWATER MANAGEMENT (SWM) AREAS THAT ARE SHOWN ON THIS EXHIBIT ARE SYMBOLIC IN NATURE ONLY. THE SIZE, TYPE AND LOCATION OF ALL REQUIRED SWM FACILITIES WILL NEED TO BE DETERMINED DURING THE PRELIMINARY ENGINEERING OF THE PROJECT.
6. THE TYPE, SIZE AND LOCATION OF ANY DRAINAGE STRUCTURES DEPICTED ON THE CONCEPTUAL DESIGN EXHIBIT ARE SUBJECT TO ANALYSIS, WHICH WILL NEED TO BE COMPLETED DURING THE PRELIMINARY ENGINEERING OF THE PROJECT.
7. TEMPORARY CONSTRUCTION EASEMENTS REQUIRED FOR THE PROJECTS COMPLETION ARE NOT SHOWN. THE SIZE, LOCATION, AND PROPERTIES REQUIRING TEMPORARY CONSTRUCTION EASEMENTS WILL BE DETERMINED DURING THE PRELIMINARY ENGINEERING OF THE PROJECT.
8. THE UTILITY RELOCATIONS IDENTIFIED ON THE FOLLOWING PLAN ARE BASED ON EXISTING AERIAL FACILITIES ONLY. IMPACTS TO EXISTING UNDERGROUND UTILITIES WILL NEED TO BE DETERMINED DURING THE PRELIMINARY ENGINEERING OF THE PROJECT THROUGH SUBSURFACE UTILITY ENGINEERING. DUE TO VISIBLE EVIDENCE OF SUBSURFACE UTILITIES WITHIN THE PROJECT AREA, IT IS RECOMMENDED (AND LIKELY REQUIRED BY LAW) THAT UTILITY TEST PITS BE PERFORMED DURING THE PRELIMINARY ENGINEERING OF THE PROJECT.

| DESIGN INFORMATION                |  |
|-----------------------------------|--|
| DESIGN VEHICLE <sup>(*)</sup>     | PASSENGER VEHICLE (WB-62 THROUGH, SU-30 TURNS) |
| APPROXIMATE SPEEDS <sup>(*)</sup> | 10 MPH - 28 MPH                                |

\*A MINI ROUNDABOUT IS SHOWN AT THIS LOCATION FOR DEMONSTRATION PURPOSES, HOWEVER, SINCE THIS TYPE OF ROUNDABOUT DOES NOT MEET ALL REQUIREMENTS, IT WOULD LIKELY HAVE TO BE INSTALLED WITH A SYSTEM OF OTHER TRAFFIC CONTROL MEASURES ALONG WEST PLEASANT GROVE ROAD AND MY NOT BE ALLOWED AS A STAND ALONE OPTION



1515 MARKET STREET  
SUITE 1360  
PHILADELPHIA, PA 19102  
PH: (215) 433-1660  
FAX: (215) 433-1661

DESIGN BY: AJA  
DRAWN BY: AJA  
CHECKED BY: KDK  
JOB NO: 816451.11  
DWG: 451CPT01  
DATE: 5-13-2020

**TOLL BROTHERS, INC.**  
250 GIBRALTAR ROAD  
HORSHAM, PA 19044

**ROBINSON TRACT RESIDENTIAL DEVELOPMENT**  
WEST PLEASANT GROVE ROAD  
WESTTOWN TOWNSHIP  
CHESTER COUNTY

**CONCEPTUAL DESIGN EXHIBIT  
NOT FOR CONSTRUCTION**



POTENTIAL SPEED TABLE LOCATION

POTENTIAL SPEED TABLE LOCATION

POTENTIAL SPEED TABLE LOCATION

POTENTIAL SPEED TABLE LOCATION

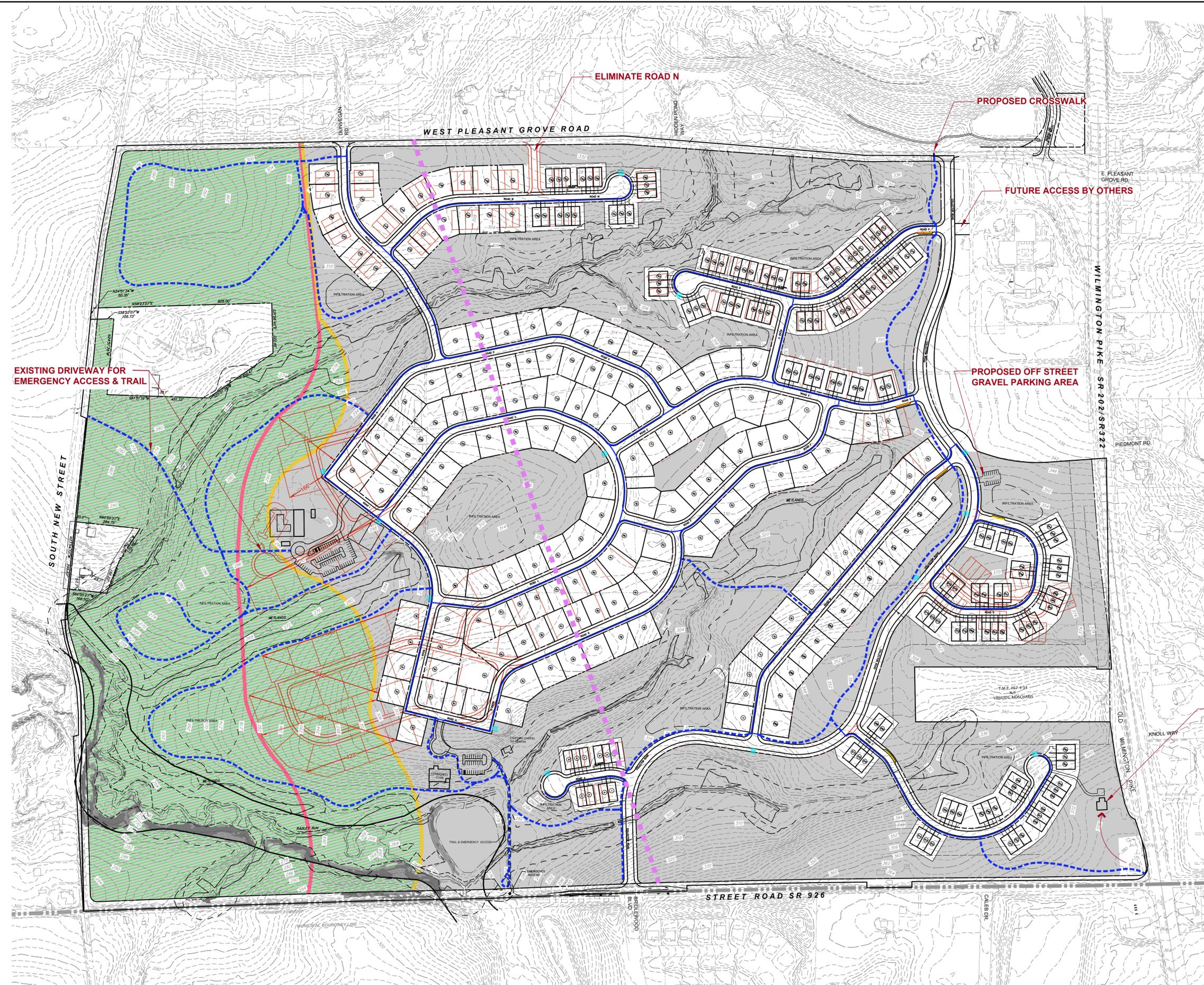
POTENTIAL SPEED TABLE LOCATION

POTENTIAL SPEED TABLE LOCATION

**ORANGE BOXES DENOTE AREAS IN WHICH SPEED TABLES WOULD BE PERMISSIBLE BASED ON GUIDELINES WITHIN PENNSYLVANIA'S TRAFFIC CALMING HANDBOOK AND EXISTING VERTICAL GEOMETRY ALONG WEST PLEASANT GROVE ROAD TO ENSURE A MINIMUM OF 200 FEET OF SIGHT DISTANCE IS AVAILABLE FOR DRIVERS TO SLOW DOWN TO 20 MPH SPEED.**

**MAY 13, 2020**

ESE-CTB  
 IN: PROJECTS/PAENSYLVANIA/4000-ROBINSON TRACT/LANDDEFTY/PLAN/4000-S-ALTPAN-9-RECOVER.DWG - 2/13/2020 6:02 PM



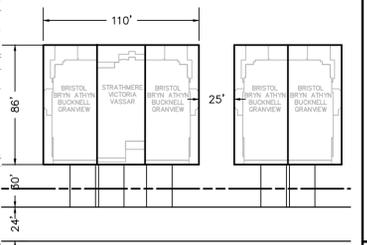
**SITE DATA:**  
 CURRENT ZONING: A/C AGRICULTURAL CLUSTER  
 RESIDENTIAL DISTRICT & R-1  
 PROPOSED: FLEXIBLE DEVELOPMENT OPTION

GROSS SITE AREA: 322.36 ACRES  
 TRACT (NET) ACREAGE: 290.20 ACRES

PERMITTED BASE DENSITY: 1.1 DU/AC (319 DU)  
 PROPOSED DENSITY: 1.1 DU/AC (319 DU)

REQUIRED OPEN SPACE: 60% (193.42 AC)  
 PROPOSED OPEN SPACE: 61% (199.7 AC)

**SITE PLAN:**  
 PROPOSED USES:  
 (2) EXISTING HOMES TO REMAIN (LOTS A & B)  
 (92) ESTATE HOMES (115' X 125')  
 (80) EXECUTIVE/COURTYARD HOMES (90' X 125')  
 (145) CARRIAGE & TOWNHOMES  
 319 TOTAL HOMES

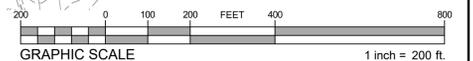
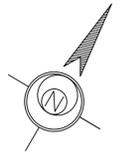


TYPICAL CARRIAGE HOME SPACING  
 NOT TO SCALE

- PROPOSED SIDEWALKS
- - - PROPOSED TRAILS
- PROPOSED BUS PARKING
- FUTURE EQUESTRIAN CROSSING AREA
- PROPOSED SNOW STORAGE EASEMENTS
- 57.09 AC OPEN SPACE WEST OF PINK LINE
- 78.62 AC OPEN SPACE WEST OF YELLOW LINE

APPROXIMATE RELOCATION OF FORMER WESTTOWN INN

- NOTES:
- PLAN REQUIRES CODE RELIEF FROM 60 FT BUILDING SEPARATION REQUIREMENT FOR MULTI-FAMILY TOWNHOMES; 25 FT PROPOSED.
  - CODE RELIEF FOR MAXIMUM NUMBER OF HOMES ON A CUL-DE-SAC FOR ROADS C & M



**ESE CONSULTANTS**  
 ENGINEERING • PLANNING • SURVEYING • ENVIRONMENTAL

ESE Consultants, Inc.  
 250 Gibraltar Road • Suite 2E • Horsham, PA 19044  
 T: 215-914-2050

| REV. | DATE | DESCRIPTION |
|------|------|-------------|
|      |      |             |
|      |      |             |
|      |      |             |

**CONCEPT PLAN**  
 25 FT SPACING

**THE ROBINSON TRACT**  
 WESTTOWN TOWNSHIP, CHESTER COUNTY, PENNSYLVANIA

|                      |                      |
|----------------------|----------------------|
| DATE: 02/13/20       | SCALE: 1" = 200'     |
| DESIGN: EES          | DRAWN: EES           |
| JOB NO.: ###         | FILE NAME: S-ALTPAN9 |
| REF. NO.:            | <b>LAYOUT</b>        |
| SHEET NO.: <b>71</b> | OF <b>71</b>         |



McMAHON ASSOCIATES, INC.  
835 Springdale Drive, Suite 200  
Exton, PA 19341  
p 610-594-9995 | f 610-594-9565

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FOUNDER

Joseph W. McMahon, P.E.

May 15, 2020

Mr. Russell Hatton, Chair  
Westtown Township Planning Commission  
1039 Wilmington Pike  
West Chester, PA 19382

**RE: Robinson Tract Residential Development  
Westtown Township, Chester County, PA  
McMahon Project No. 816451.11**

Dear Mr. Russell:

McMahon Associates, Inc. is in receipt of the letter prepared by Albert Federico Consulting, LLC in their capacity as the Township traffic engineer, dated May 13, 2020, in regards to the Robinson Tract residential development conditional use application traffic review. The development is proposed to be located on the Crebilly Farm property along the west side of U.S. Route 202 (Wilmington Pike), between West Pleasant Grove Road and Street Road (S.R. 0926), in Westtown Township, Chester County, Pennsylvania.

The *Transportation Impact Study (TIS) for the Robinson Tract*, prepared by our office and dated most recently revised May 15, 2020 (original date of August 13, 2019), is part of the conditional use application as submitted by the applicant. On behalf of the applicant, below is a summary of the comments in italics, with our responses following each comment.

*To date the Applicant has not demonstrated compliance with the conditional use criteria in §170-2009.D(1)(h): In consideration of conditional use approval, the Township may require the applicant to submit a development impact study which considers the impact of the proposed flexible development on traffic volume and safety. Most notably:*

- *Traffic analyses which provide the basis for determining project impacts have not been updated to address the outstanding technical aspects associated with the:*
  - *Assumed traffic diversions*  
Response: As documented in the TIS within the conditional use application, based on a conference call conducted on May 14, 2020, PennDOT’s consultant reviewer and the Township’s Traffic Engineer indicated there are no further comments to address regarding the traffic diversions in the applicant’s studies.
  - *Signal operations at PA 926 and New Street*  
Response: As documented in the TIS within the conditional use application, the development has no traffic impact at this intersection, based on

PennDOT overall intersection mitigation criteria. Based on a meeting February 11, 2020, PennDOT required the applicant to revise the signal timings at PA 926 and New Street to provide a minimum of 63 seconds of green time along PA 926. This revision is included in the revised TIS, and results in no changes to the mitigation requirements or recommendations. PennDOT is requiring the applicant to evaluate the ability to provide dedicated left-turn lanes along PA 926. These lanes are needed based on existing conditions, and require right-of-way not controlled by the applicant to implement. The applicant has submitted conceptual plans to PennDOT, Westtown Township, and Thornbury Township for review, and will coordinate with the impacted property owners regarding the acquisition of right-of-way needed to complete the improvements. The current concept plan is attached.

- *An implementation strategy for necessary improvements has not been provided*
  - Response: The applicant will provide an implementation strategy upon final land development approval and the HOP process. The transportation improvements will be completed prior to occupancy, as required.
  
- *The submitted Conditional Use plans do not:*
  - *Illustrate the scope of improvements required to provide compliant sight distance at several accesses*
    - Response: As documented on page 11 of the transportation impact study, dated revised May 15, 2020, the existing available sight distances at the site accesses meet or exceed the Township and PennDOT requirements.
  
  - *Adequately address access to West Pleasant Grove Road*
    - Response: As documented in the transportation impact study, dated May 15, 2020, access is adequately addressed to West Pleasant Grove Road, as industry standard PennDOT traffic operations criteria are satisfied.
  
  - *Include compliant horizontal alignments of internal roadways*
    - Response: Detailed horizontal and vertical profiles are not required during conditional use. Full engineering occurs during the land development process. The application satisfies the conditional use requirements including road profiles to determine preliminary compliance with Township natural feature, site analysis, conservation design process and density requirements. As documented in the conditional use application, the internal roadways are compliant with Township criteria.

*While there has been limited recent coordination with the Applicant's Traffic Engineer and PennDOT these items and the other issues identified in the March 13, 2020 Traffic Review remain outstanding.*

*The following list of recommended transportation related improvements is also provided for the Planning Commission's consideration in the review of this Application.*

- Comment #1: Connector Road, construct:*
- a) Dimensionally compliant with Township standards for a Collector Road*
  - b) With a sufficient pavement structure, as determined by the Township Engineer, to accommodate heavy equipment and truck traffic.*
  - c) Reasonable traffic calming measures to maintain a consistent, appropriate travel speed.*
  - d) Facilities accommodating:*
    - i) Non-vehicular travel*
    - ii) Personal vehicles waiting for school busses.*

- Response:*
- a. This information is not required for conditional use. However, the applicant is providing a Connector Road design that is consistent with the Township standards, with a 28-foot cartway width and a 60-foot right-of-way, as documented in the conditional use application.
  - b. This information is not required for conditional use. However, the applicant has committed within the conditional use application to provide a pavement design in compliance with the Township's standards.
  - c. This information is not required for conditional use. The applicant is providing the Connector Road, as envisioned and as requested by the Township, as documented in the conditional use application. The applicant's original conditional use plan included a roadway design appropriate for a residential street. Traffic calming is inconsistent with the Township's requested Connector Road purpose and design.
  - d.i. This information is not required for conditional use. However, the applicant is providing facilities for non-vehicular traffic along the Connector Road, as documented in the conditional use application.
  - d.ii. This information is not required for conditional use, and school bus stops are not required pursuant to Township code. However, the applicant is providing designated school bus areas within the development, as documented in the conditional use application on the alternate plan.

- Comment #2: West Pleasant Grove Road, modify:*
- a) Along the site frontage in a manner compliant with Township standards for a Collector Road*
  - b) At the proposed local road site access(es) to control turning movements in a manner that enhances safety and aesthetics, preferably with roundabout(s)*

*c) At the Collector Road site access to control turning movements and connectivity with Orvis Way in a manner that enhances safety and aesthetics, preferably with a roundabout*

Response:

- a. This information is not required for conditional use. However, the applicant is providing right-of-way and roadway widening along the West Pleasant Grove Road property frontage consistent with the Township standards for a Collector Road, as documented in the attached exhibit.
- b. This information is not required for conditional use. The transportation impact study demonstrates that the site accesses satisfy industry standard PennDOT traffic operations criteria and safety with stop-control on the site access approach, as proposed by the applicant within the conditional use application. Aesthetics are not required by code.
- c. This information is not required for conditional use. The transportation impact study demonstrates that the Collector Road intersection satisfies industry standard PennDOT traffic operations criteria and safety with stop-control on Collector Road approach. Aesthetics are not required by code. However, the applicant offers to install a mini roundabout at the Collector Road/West Pleasant Grove Road intersection as documented on the attached exhibit, provided the Township acquires any necessary right-of-way to install.

Comment #3

*PA 926 (Street Road), modify as determined appropriate in coordination with PennDOT and Thornbury Township:*

- a) At the Connector Road site access to install a traffic signal and turn lanes*
- b) At New Street to:*
- i) Mitigate project impacts (as determined based on the review of revised analyses, submission pending) and to address PennDOT comments (currently by constructing eastbound and westbound left turn lanes)*
  - ii) Provide appropriate non-vehicular connectivity*
  - iii) Provide equipment for emergency pre-emption*

Response:

- a. Page 2 of the executive summary of the transportation impact study dated revised May 15, 2020 within the conditional use application demonstrates the applicant will provide a traffic signal and turn lanes in accordance with PennDOT criteria at the PA 926/Connector Road intersection.
- b.i. This information is not required for conditional use. As documented in the conditional use application, the development has no traffic impact at this intersection, based on PennDOT overall intersection mitigation criteria. PennDOT is requiring the applicant to evaluate the ability to provide dedicated left-turn lanes along PA 926. These lanes are needed based on existing conditions, and require right-of-way not controlled by the applicant to implement. The applicant has submitted conceptual plans to PennDOT, Westtown Township, and Thornbury Township for review, and will

coordinate with the impacted property owners regarding the acquisition of right-of-way needed to complete the improvements.

b.ii. This information is not required for conditional use. In conjunction with the improvements PennDOT has requested the applicant to evaluate pedestrian facilities cross the southern leg of New Street and the eastern leg of PA 926, as documented in the attached concept plan. There will not be connectivity beyond the intersection since it crosses environmentally sensitive areas.

b.iii. This information is not required for conditional use. Emergency pre-emption exists at the intersection currently, and PennDOT requires it to be maintained.

*Comment #4*

*US Route 202, modify as determined appropriate in coordination with PennDOT*

*a) At West Pleasant Grove Road to provide a southbound right turn lane as determined appropriate in coordination with PennDOT*

*b) At 926 to:*

*i) Mitigate project impacts (as determined based on the review of revised analyses, submission pending) and address PennDOT comments*

*ii) Provide equipment for emergency pre-emption.*

*Response:*

a. The applicant has committed to provide this improvement on page 3 of the executive summary transportation impact study, dated revised May 15, 2020, within the conditional use application in coordination with PennDOT.

b.i. The development does not have a traffic impact at the intersection of US 202/PA 926 with provision of the Connector Road, as documented within the conditional use application.

b.ii. Emergency pre-emption exists at the intersection currently, and PennDOT requires it to be maintained.

*Comment #5:*

*Non-vehicular elements, construct facilities connecting to existing and/or planned nonvehicular facilities, including:*

*i) Arborview*

*ii) Orvis Way*

*iii) Bridlewood Boulevard*

*iv) Signalized intersection of US Route 202 and PA 926*

*Response:*

i. As documented in the conditional use application, the applicant is providing non-vehicular facilities from the development to the edge of the right-of-way at the Arborview property boundary. Connection to the Arborview trail is an offsite improvement that is not required.

ii. A non-vehicular connection is not required for conditional use, as this is an offsite improvement.

iii. As required by PennDOT, non-vehicular facilities will be provided in conjunction with the PA 926 Connector Road/Bridlewood Boulevard signalized intersection within the right-of-way.

iv. As documented in the alternate plan dated February 13, 2020, the applicant is provided non-vehicular facilities to connect the development to US 202/PA 926.

*Comment #6: Westminster Presbyterian Church, as determined appropriate by the Township and in coordination with the Church:*  
*a) Remove the existing westernmost driveway adjacent to the Connector Road*  
*b) Provide for future access from the Westminster Presbyterian Church to the Collector Road at a mutually agreed upon location*

**Response:**  
a. The applicant will not remove the church driveway. The church can close the driveway at their discretion.  
b. As documented in the conditional use application plans, the applicant is providing an easement for the church to connect an access along the Connector Road.

If there are any questions or if additional information is needed, please feel free to contact me at [nkline@mcmahonassociates.com](mailto:nkline@mcmahonassociates.com) or (610) 594-9995.

Sincerely,



Nicole R. Kline-Elsier, P.E., PTOE  
Regional Service Leader - Traffic

NRKE

cc: Robert Pingar, P.E., Westtown Township  
Will Ethridge, Westtown Township  
Andrew Semon, Toll Brothers  
Michael Downs, P.E., Toll Brothers  
Gregg Adelman, Esq., Kaplin Stewart



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FOUNDER

Joseph W. McMahon, P.E.

May 15, 2020

Mr. Russell Hatton, Chair  
Westtown Township Planning Commission  
1039 Wilmington Pike  
West Chester, PA 19382

**RE: Robinson Tract Residential Development  
Westtown Township, Chester County, PA  
McMahon Project No. 816451.11**

Dear Mr. Russell:

McMahon Associates, Inc. is in receipt of the Township’s comment letter, prepared by Albert Federico Consulting, LLC in their capacity as the Township traffic engineer, dated March 13, 2020, in regards to the *Transportation Impact Study for the Robinson Tract*, prepared by our office and last revised December 2, 2019. It is noted that the applicant was not sent a copy of this letter for review. The development is proposed to be located on the Crebilly Farm property along the west side of U.S. Route 202 (Wilmington Pike), between West Pleasant Grove Road and Street Road (S.R. 0926), in Westtown Township, Chester County, Pennsylvania. On behalf of the applicant, below is a summary of the comments in italics, with our responses following each comment.

*Comment #1ai: As previously noted, Table 1 should be updated to identify West Pleasant Grove Road as a Township Collector Roadway. {Westtown Township Comprehensive Plan Update, page 9-7}.*

*Status: In consideration of the ongoing coordination the Applicant has yet to submit a revised TIS. The submitted correspondence does not commit to this revision.*

**Response:** West Pleasant Grove Road does not meet the Collector Road standards under the Township’s road specifications. The applicant has agreed to widen along the property frontage to meet the Township’s Collector Road half-width requirement of 14 feet. Table 1 has been revised to note that the applicant will widen West Pleasant Grove Road along the property frontage to meet the Township’s half-width requirement for Collector Roads.

*Comment #1aii: The sections of the TIS discussing improvements should note that the internal Collector Road provides access to the property.*

*Status: In consideration of the ongoing coordination the Applicant has yet to submit a revised TIS. The submitted correspondence does not commit to this revision.*

Response: Complies. The Collector Road is not necessary for access to the site, but does provide secondary access locations. Page 3 of the TIS has been revised accordingly.

Comment #1aiii: *As previously noted, the Crash Summary only includes data for State "Reportable" collisions. In order to provide a more complete assessment of transportation safety within the study area "Nonreportable" collisions should be included. Note that the Traffic Safety Office is unaware of an outstanding request for "more detailed information". The applicant should resubmit the request to the Traffic Safety Office and Township Traffic Engineer, including the specific details being requested.*

*Status: Supplemental information has been provided to the applicant. Based on coordination with the Applicant it is anticipated that this information will be considered in the revised TIS.*

Response: The Westtown-East Goshen Township Regional Police Department provided additional non-reportable crash data. This data was summarized and provided to the Township Traffic Engineer.

Comment #1aiv: *As previously noted, the scope of physical improvements required to provide acceptable sight distance to public roads should be clearly indicated on the plans.*

*Status: The submitted correspondence requests deferring this item until "detailed engineering" is completed.*

Response: As documented on page 11 of the transportation impact study, dated revised May 15, 2020, the existing available sight distances at the site accesses meet or exceed the Township and PennDOT requirements.

Comment #1v: *As previously noted, confirm that the sight distance measurements consider the widening (approximately seven feet) of West Pleasant Grove Road required to meet Code. {§149-903.A(2)}*

*Status: The submitted correspondence indicates that the measurements are based on the existing roadway.*

Response: No further response required.

Comment #1vi: *Provide calculations supporting the assumed diversions associated with Orvis Way and the proposed Collector Road. Additionally, cross reference the Collector Road diversions within the body of the study with the figures in Appendix K.*

*Status: Supplemental materials have been submitted in response to this comment. Coordination is on-going.*

Response: As documented in the TIS within the conditional use application, based on a conference call conducted on May 14, 2020, PennDOT's consultant reviewer and the Township's Traffic Engineer indicated there are no further comments to address regarding the traffic diversions in the applicant's studies.

Comment #1vii: *The Travel Time Comparisons presented in Appendix K should be revised to address the following:*

*(1) Verify the assumed route lengths. The Diversion Routes generally appear to be shorter than the Base conditions.*

*(2) Ensure that the impacts of the regular queueing along US Route 202 North during the morning peak, extending from the interchange into the study area, is included.*

*(3) The evaluation of diversions should include an alternate that considerations operations following the completion of the PennDOT improvements planned for US Route 202 and PA Route 926.*

*(4) The traffic calming anticipated to be installed along Bridlewood Boulevard should be considered.*

*Status: Supplemental materials have been submitted which address these comments.*

Response: No further response is needed.

Comment #viii: *As previously noted, the anticipated increase in larger vehicles traveling along West Pleasant Grove Road and turning to/from New Street increases the possibility of vehicular conflicts. It is noted that*

*(1) The applicant has indicated a willingness to widen the roadway along the property frontage, but additional clarification regarding the specific scope of work is warranted.*

*(2) West Pleasant Grove Road is designated as a Collector Road and the total Right-of-way shall be 60 feet and cartway width shall be 28 feet. {§149-903.A(2)}*

*Status: The submitted correspondences indicates that the Applicant will widen West Pleasant Grove Road along the frontage to Collector Road standards.*

Response: No further response needed.

Comment #ix: *As previously noted, the future operations presented for PA Route 926 and New Street rely primarily on "optimized" traffic signal timings that appear unlikely to be approved by PennDOT. Written confirmation from PennDOT should be provided that the assumed "optimized" timings can be implemented. If confirmation cannot be provided an alternative analysis utilizing a timing approved by the Township should be provided.*

*Status: Based on direction from PennDOT, it is anticipated that this analysis will be modified in the revised TIS.*

**Response:** Based on a meeting February 11, 2020, PennDOT required the applicant to revise the signal timings at PA 926 and New Street to provide a minimum of 63 seconds of green time along PA 926. This revision is included in the revised TIS, and results in no changes to the mitigation requirements or recommendations.

**Comment #x:** *As previously noted, the Cross-Section Assumptions Exhibit for PA Route 926 and New Street in Appendix I is based on a traditional widening. Alternative alignments that minimize the number of properties from which right-of-way would be needed should be considered. Additionally, the Applicant is not precluded from coordinating with property owners to determine if the right-of-way could be reasonably obtained.*

*Status: The Applicant committed to PennDOT (and represented to the Planning Commission) that revised improvement concept(s) would be prepared for PennDOT and Township review and would be used to coordinate with the potentially affected property owners.*

**Response:** The applicant has submitted a conceptual plan and is continuing to coordinate with PennDOT, Westtown Township, and Thornbury Township regarding improvements at the intersection of Street Road (S.R. 0926) and New Street. Traffic analysis worksheets documenting the results with the additional intersection improvements illustrated in the conceptual plans are attached.

**Comment #xi:** *As previously noted, Cost Estimates for necessary improvements to accommodate future traffic should be provided. {§149-804.A(10)}*

*Status: The submitted correspondences indicates that the Applicant will provide this information once there is "concurrence" regarding the scope of improvements.*

**Response:** No further response needed.

**Comment #xii:** *As previously noted, an Implementation Strategy for necessary improvements to accommodate future traffic should be provided. {§149-804.A(11)}*

*Status: The submitted correspondences indicates that the Applicant will provide this information once there is "concurrence" regarding the scope of improvements.*

**Response:** The applicant will provide an implementation strategy upon final land development approval and the HOP process. The transportation improvements will be completed prior to occupancy, as required.

*Comment #2a: The conclusion that the project does not adversely impact the intersection of US Route 202 and PA Route 926 continues to be based in large part on assumed diversions. As noted above, additional supporting information and analyses should be provided.  
Status: Supplemental materials have been submitted and coordination is on-going. The Applicant has yet to submit a revised TIS.*

*Response: As documented in the revised TIS, based on a conference call conducted on May 14, 2020, PennDOT's consultant reviewer and the Township's Traffic Engineer indicated there are no further comments to address regarding the traffic diversions in the applicant's studies.*

*Comment #2b: The Applicant has indicated that turn lanes will be provided to accommodate post development volumes at the following intersections, but these improvements are not reflected on the plans:  
i. US Route 202 at Pleasant Grove Road – Southbound Right Turn  
Status: The submitted correspondences indicates that the Applicant will make this improvement and that plans will be provided there is "concurrency" regarding the scope of improvements.  
ii. PA Route 926 at New Street – Eastbound Left Turn  
Status: The submitted correspondence offers an opinion that this improvement is unwarranted. Based on direction from PennDOT it is anticipated that the analysis will be modified in the revised TIS.*

*Response: i. No further response is required.  
ii. As documented in the TIS, the development has no traffic impact at this intersection, based on PennDOT overall intersection mitigation criteria. PennDOT is requiring the applicant to evaluate the ability to provide dedicated left-turn lanes along PA 926. These lanes are needed based on existing conditions, and require right-of-way not controlled by the applicant to implement. The applicant has submitted conceptual plans to PennDOT, Westtown Township, and Thornbury Township for review, and will coordinate with the impacted property owners regarding the acquisition of right-of-way needed to complete the improvements.*

*Comment #2ci: Additional grading and/or traffic management measures appear warranted to enhance safety at the three accesses proposed to have insufficient sight distance or the exact minimum distance (with no margin for error):*

- (1) Collector Road at PA Route 926 (grading)*
- (2) Road M at West Pleasant Grove Road (grading and/or roundabout)*
- (3) Collector Road at West Pleasant Grove Road (grading and/or roundabout)*

*Status: The submitted correspondences requests deferring addressing these items until "detailed engineering" is completed.*

**Response:** As documented on page 11 of the transportation impact study, dated revised May 15, 2020, the existing available sight distances at the site accesses meet or exceed the Township and PennDOT requirements. For the intersection of West Pleasant Grove Road and the Connector Road, the transportation impact study demonstrates that this intersection satisfies industry standard PennDOT traffic operations criteria and safety with stop-control on Collector Road approach. Aesthetics are not required by code. However, the applicant offers to install a mini roundabout at the Collector Road/West Pleasant Grove Road intersection, provided the Township acquires any necessary right-of-way to install. Traffic analysis worksheets for a mini roundabout at this location are attached.

**Comment #2cii:** *In order to minimize external conflict points, promote internal connectivity, reduce the number of cul-de-sacs and enhance overall safety along West Pleasant Grove Road:*  
(1) Road M should be removed  
(2) Roads L and N should be extended to form a single road

*Status: The submitted "Alternate" plan removed the external access without connecting the internal roadways. It has been conveyed to the Applicant on several occasions that these items are intended to be addressed together: connect the internal roads (to remove the cul-de-sacs) and remove the external access.*

**Response:** There is no requirement under the ordinance for these two items to be addressed together. The proposed internal roadway design is safe and has sufficient internal connectivity. Removing Road M and extending roads L and N does not create any additional internal connectivity or enhance safety, rather it unnecessarily adversely impacts the environmentally sensitive areas in the northern portion of the property. This comment violates Section 170-1617.C.(2) of the Zoning Ordinance which provides that "potential development areas also shall be delineated so as to minimize intrusion into secondary conversation areas.

**Comment #2ciii:** *The design of the internal Collector Road should incorporate suitable traffic calming measures to maintain a 35 mile per hour average travel speed.*

*Status: The submitted correspondences requests deferring this item until Land Development.*

**Response:** No further response required.

**Comment #2iv:** *The submitted plans should be revised to ensure they accurately reflect existing driveways in the immediate vicinity of the site, in particular the exit-only driveway from the Westminster Presbyterian Church.*

*Status: The driveway is reflected on the plan but is difficult to discern due to drafting. It appears the proposed site access to West Pleasant Grove Road (via the Collector Road) will impact the*

*Church Driveway. Provisions should be made for future access from the Westminster Presbyterian Church to the internal Collector Road at a mutually agreed upon location.*

**Response:** As documented in the alternate plan dated February 13, 2020, the applicant is providing an easement for the church to connect an access along the Connector Road.

**Comment #2v:** *The plans should identify the anticipated limits of required right-of-way and/or easements to accommodate the physical improvements associated with the PennDOT project at US Route 202 and PA Route 926.*

*Status: The submitted correspondences indicates that right-of-way is being offered. The Applicant does correctly note that the PennDOT project is not fully engineered. The plans should include a note indicating that other reasonable right-of-way and/or easement required for the improvements will be provided to PennDOT as needed.*

**Response:** No further response needed.

**Comment #2vi:** *The following internal roadways should be reconfigured to remove geometric irregularities:*  
*(1) Road E and Road F (provide a curve)*  
*(2) Road F and Road G (provide a curve)*  
*(3) Road I and Road J (remove the jog within the intersection)*

*Status: The submitted materials do not adequately address these comments. The Applicant has represented to the Planning Commission that Stop signs will be used to compensate for these irregular designs. To date no information has been provided documenting that the signs would meet accepted warrants.*

**Response:** The internal intersection design complies with section 149-907.A of the Township SALDO, which does not apply during the conditional use process.

**Comment #vii:** *Additional facilities should be provided to address non-vehicular connectivity, including:*  
*(1) A perimeter trail around the portion of the site west of the internal Collector Road. {Westtown Township Comprehensive Plan Update, page 9-15}*  
*(2) Connections to existing and planned facilities along Dunvegan Road and within the Arborview neighborhood. {Westtown Township Comprehensive Plan Update, page 9-15}*  
*(3) Sidewalks along proposed roads, including accessible crossings. {§149-916}*  
*(4) Connectivity to pedestrian attractors, including Stetson Middle School, Westminster Presbyterian Church, and the existing retail uses at US Route 202 and PA Route 926. {§149-916}*

*Status: The submitted materials do not adequately address these comments. It is noted that a supplemental plan was presented to the Planning Commission which included a partial connection to Arborview and a trail from an internal roadway to the intersection of US Route 202 and PA Route 926.*

Response: As documented in the conditional use application, the applicant is providing non-vehicular facilities from the development to the edge of the right-of-way at the Arborview property boundary. Connection to the Arborview trail is an offsite improvement that is not required. As required by PennDOT, non-vehicular facilities will be provided in conjunction with the PA 926 Connector Road/Bridlewood Boulevard signalized intersection within the right-of-way. As documented in the alternate plan, the applicant is provided non-vehicular facilities to connect the development to US 202/PA 926.

Comment #viii: *Provisions should be made for future access from the Westminster Presbyterian Church to the internal Collector Road.*  
*Status: The Alternate Plan does indicate a location for potential access. To date there is no information indicating that this location has been reviewed with the Church. Based on initial coordination with the Church a location further south along the Collector Road may be preferred.*

Response: As documented in the conditional use application plans, the applicant is providing an easement for the church to connect an access along the Connector Road.

Comment #ix: *Provisions should be made for School Bus Stops, including short-term parking for drop-off and pick-up.*  
*Status: The submitted correspondences requests deferring this item until Land Development.*

Response: School Bus Stops are not required pursuant to Township code. However, the applicant is providing designated school bus areas within the development, as documented in the conditional use application on the alternate plan.

If there are any questions or if additional information is needed, please feel free to contact me at [nkline@mcmahonassociates.com](mailto:nkline@mcmahonassociates.com) or (610) 594-9995.

Sincerely,



Nicole R. Kline-Elsier, P.E., PTOE  
Regional Service Leader - Traffic

NRKE

cc: Robert Pingar, P.E., Westtown Township  
Will Ethridge, Westtown Township  
Andrew Semon, Toll Brothers  
Michael Downs, P.E., Toll Brothers  
Gregg Adelman, Esq., Kaplin Stewart

## **ATTACHMENTS**

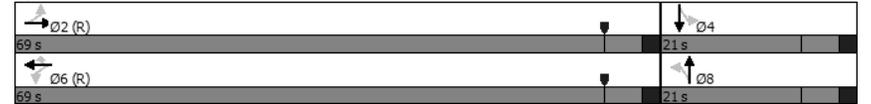
Street Road (S.R. 0926) and New Street

| Lane Group              | EBL   | EBT   | EBR  | WBL   | WBT   | WBR   | NBL       | NBT   | NBR   | SBL   | SBT   | SBR   |
|-------------------------|-------|-------|------|-------|-------|-------|-----------|-------|-------|-------|-------|-------|
| Lane Configurations     | ↔     | ↔     | ↔    | ↔     | ↔     | ↔     | ↔         | ↔     | ↔     | ↔     | ↔     | ↔     |
| Traffic Volume (vph)    | 84    | 663   | 5    | 12    | 393   | 38    | 10        | 106   | 44    | 8     | 133   | 156   |
| Future Volume (vph)     | 84    | 663   | 5    | 12    | 393   | 38    | 10        | 106   | 44    | 8     | 133   | 156   |
| Ideal Flow (vphpl)      | 1800  | 1800  | 1800 | 1800  | 1800  | 1800  | 1800      | 1800  | 1800  | 1800  | 1800  | 1800  |
| Lane Width (ft)         | 10    | 10    | 10   | 10    | 10    | 10    | 10        | 10    | 10    | 10    | 10    | 10    |
| Grade (%)               | -2%   |       |      |       | 1%    |       |           |       | -2%   |       | 1%    |       |
| Storage Length (ft)     | 175   |       | 0    | 150   |       | 150   | 0         |       | 0     | 0     |       | 0     |
| Storage Lanes           | 1     |       | 0    | 1     |       | 1     | 0         |       | 0     | 0     |       | 0     |
| Taper Length (ft)       | 75    |       |      | 75    |       | 75    |           |       | 75    |       |       | 75    |
| Lane Util. Factor       | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00      | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| Frt                     | 0.999 |       |      |       | 0.850 |       |           |       | 0.963 |       | 0.929 |       |
| Flt Protected           | 0.950 |       |      | 0.950 |       | 0.950 |           |       | 0.997 |       |       | 0.999 |
| Satd. Flow (prot)       | 1580  | 1630  | 0    | 1588  | 1562  | 1379  | 0         | 1586  | 0     | 0     | 1530  | 0     |
| Flt Permitted           | 0.503 |       |      | 0.332 |       | 0.910 |           |       | 0.991 |       |       | 0.991 |
| Satd. Flow (perm)       | 837   | 1630  | 0    | 555   | 1562  | 1379  | 0         | 1448  | 0     | 0     | 1518  | 0     |
| Right Turn on Red       |       |       | Yes  |       |       | Yes   |           |       | No    |       |       | No    |
| Satd. Flow (RTOR)       | 1     |       |      |       | 39    |       |           |       |       |       |       |       |
| Link Speed (mph)        | 45    |       |      |       | 45    |       |           |       | 25    |       | 35    |       |
| Link Distance (ft)      | 819   |       |      |       | 2436  |       |           |       | 714   |       | 826   |       |
| Travel Time (s)         | 12.4  |       |      |       | 36.9  |       |           |       | 19.5  |       | 16.1  |       |
| Peak Hour Factor        | 0.97  | 0.97  | 0.97 | 0.97  | 0.97  | 0.97  | 0.97      | 0.97  | 0.97  | 0.97  | 0.97  | 0.97  |
| Heavy Vehicles (%)      | 2%    | 4%    | 0%   | 0%    | 7%    | 3%    | 11%       | 1%    | 5%    | 13%   | 0%    | 2%    |
| Adj. Flow (vph)         | 87    | 684   | 5    | 12    | 405   | 39    | 10        | 109   | 45    | 8     | 137   | 161   |
| Shared Lane Traffic (%) |       |       |      |       |       |       |           |       |       |       |       |       |
| Lane Group Flow (vph)   | 87    | 689   | 0    | 12    | 405   | 39    | 0         | 164   | 0     | 0     | 306   | 0     |
| Number of Detectors     | 1     | 1     |      | 1     | 1     | 1     | 1         | 1     |       | 1     | 1     |       |
| Detector Template       | Left  |       | Left |       | Right |       | Left Thru |       | Left  |       | Thru  |       |
| Leading Detector (ft)   | 30    | 6     |      | 30    | 6     | 30    | 30        | 35    |       | 30    | 35    |       |
| Trailing Detector (ft)  | -10   | 0     |      | -10   | 0     | -10   | -10       | -5    |       | -10   | -5    |       |
| Detector 1 Position(ft) | -10   | 0     |      | -10   | 0     | -10   | -10       | -5    |       | -10   | -5    |       |
| Detector 1 Size(ft)     | 40    | 6     |      | 40    | 6     | 40    | 40        | 40    |       | 40    | 40    |       |
| Detector 1 Type         | CI+Ex | CI+Ex |      | CI+Ex | CI+Ex | CI+Ex | CI+Ex     | CI+Ex |       | CI+Ex | CI+Ex |       |
| Detector 1 Channel      |       |       |      |       |       |       |           |       |       |       |       |       |
| Detector 1 Extend (s)   | 0.0   | 0.0   |      | 0.0   | 0.0   | 0.0   | 0.0       | 0.0   |       | 0.0   | 0.0   |       |
| Detector 1 Queue (s)    | 0.0   | 0.0   |      | 0.0   | 0.0   | 0.0   | 0.0       | 0.0   |       | 0.0   | 0.0   |       |
| Detector 1 Delay (s)    | 0.0   | 0.0   |      | 0.0   | 0.0   | 0.0   | 0.0       | 0.0   |       | 0.0   | 0.0   |       |
| Turn Type               | Perm  | NA    |      | Perm  | NA    | Perm  | Perm      | NA    |       | Perm  | NA    |       |
| Protected Phases        | 2     |       |      |       | 6     |       |           |       | 8     |       | 4     |       |
| Permitted Phases        | 2     |       |      |       | 6     |       |           |       | 8     |       | 4     |       |
| Detector Phase          | 2     |       |      |       | 6     |       |           |       | 8     |       | 4     |       |
| Switch Phase            |       |       |      |       |       |       |           |       |       |       |       |       |
| Minimum Initial (s)     | 22.0  | 22.0  |      | 22.0  | 22.0  | 22.0  | 3.0       | 3.0   |       | 3.0   | 3.0   |       |
| Minimum Split (s)       | 28.0  | 28.0  |      | 28.0  | 28.0  | 28.0  | 9.0       | 9.0   |       | 9.0   | 9.0   |       |
| Total Split (s)         | 69.0  | 69.0  |      | 69.0  | 69.0  | 69.0  | 21.0      | 21.0  |       | 21.0  | 21.0  |       |
| Total Split (%)         | 76.7% | 76.7% |      | 76.7% | 76.7% | 76.7% | 23.3%     | 23.3% |       | 23.3% | 23.3% |       |
| Maximum Green (s)       | 63.0  | 63.0  |      | 63.0  | 63.0  | 63.0  | 15.0      | 15.0  |       | 15.0  | 15.0  |       |
| Yellow Time (s)         | 4.0   | 4.0   |      | 4.0   | 4.0   | 4.0   | 4.0       | 4.0   |       | 4.0   | 4.0   |       |
| All-Red Time (s)        | 2.0   | 2.0   |      | 2.0   | 2.0   | 2.0   | 2.0       | 2.0   |       | 2.0   | 2.0   |       |
| Lost Time Adjust (s)    | 0.0   | -1.0  |      | 0.0   | -1.0  | 0.0   |           | -1.0  |       |       | -1.0  |       |

| Lane Group             | EBL   | EBT   | EBR | WBL   | WBT   | WBR   | NBL  | NBT  | NBR | SBL  | SBT  | SBR |
|------------------------|-------|-------|-----|-------|-------|-------|------|------|-----|------|------|-----|
| Total Lost Time (s)    | 6.0   | 5.0   |     | 6.0   | 5.0   | 6.0   |      | 5.0  |     |      | 5.0  |     |
| Lead/Lag               |       |       |     |       |       |       |      |      |     |      |      |     |
| Lead-Lag Optimize?     |       |       |     |       |       |       |      |      |     |      |      |     |
| Vehicle Extension (s)  | 5.0   | 5.0   |     | 5.0   | 5.0   | 5.0   | 3.0  | 3.0  |     | 3.0  | 3.0  |     |
| Minimum Gap (s)        | 2.0   | 2.0   |     | 2.0   | 2.0   | 2.0   | 3.0  | 3.0  |     | 3.0  | 3.0  |     |
| Time Before Reduce (s) | 42.0  | 42.0  |     | 42.0  | 42.0  | 42.0  | 0.0  | 0.0  |     | 0.0  | 0.0  |     |
| Time To Reduce (s)     | 21.0  | 21.0  |     | 21.0  | 21.0  | 21.0  | 0.0  | 0.0  |     | 0.0  | 0.0  |     |
| Recall Mode            | C-Max | C-Max |     | C-Max | C-Max | C-Max | None | None |     | None | None |     |

| Intersection Summary   |  |
|------------------------|--|
| Area Type:             | Other  |
| Cycle Length:          | 90   |
| Actuated Cycle Length: | 90   |
| Offset:                | 50 (56%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow |
| Natural Cycle:         | 55   |
| Control Type:          | Actuated-Coordinated   |

Splits and Phases: 1: New St & Rt 926





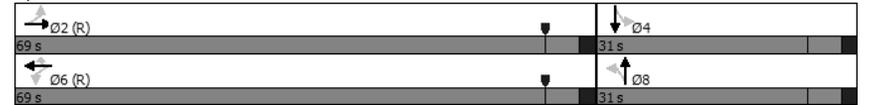
| Movement                     | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations          | ↖    | ↗    |      | ↖    | ↗    | ↖    | ↗    | ↖    | ↗    | ↖    | ↗    | ↖    |
| Traffic Volume (veh/h)       | 84   | 663  | 5    | 12   | 393  | 38   | 10   | 106  | 44   | 8    | 133  | 156  |
| Future Volume (veh/h)        | 84   | 663  | 5    | 12   | 393  | 38   | 10   | 106  | 44   | 8    | 133  | 156  |
| Initial Q (Qb), veh          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)          | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj             | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach        |      | No   |      |      | No   |      |      | No   |      |      | No   |      |
| Adj Sat Flow, veh/h/ln       | 1846 | 1818 | 1818 | 1794 | 1696 | 1752 | 1860 | 1860 | 1860 | 1794 | 1794 | 1794 |
| Adj Flow Rate, veh/h         | 87   | 684  | 5    | 12   | 405  | 39   | 10   | 109  | 45   | 8    | 137  | 161  |
| Peak Hour Factor             | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, %         | 2    | 4    | 4    | 0    | 7    | 3    | 1    | 1    | 1    | 0    | 0    | 0    |
| Cap, veh/h                   | 746  | 1281 | 9    | 479  | 1206 | 1040 | 51   | 220  | 87   | 44   | 134  | 153  |
| Arrive On Green              | 0.70 | 0.71 | 0.70 | 0.93 | 0.95 | 0.93 | 0.17 | 0.18 | 0.17 | 0.17 | 0.18 | 0.17 |
| Sat Flow, veh/h              | 985  | 1802 | 13   | 763  | 1696 | 1485 | 47   | 1240 | 487  | 17   | 756  | 859  |
| Grp Volume(v), veh/h         | 87   | 0    | 689  | 12   | 405  | 39   | 164  | 0    | 0    | 306  | 0    | 0    |
| Grp Sat Flow(s),veh/h/ln     | 985  | 0    | 1815 | 763  | 1696 | 1485 | 1773 | 0    | 0    | 1632 | 0    | 0    |
| Q Serve(g_s), s              | 2.8  | 0.0  | 15.9 | 0.4  | 1.7  | 0.2  | 0.0  | 0.0  | 0.0  | 6.0  | 0.0  | 0.0  |
| Cycle Q Clear(g_c), s        | 5.0  | 0.0  | 15.9 | 16.3 | 1.7  | 0.2  | 7.6  | 0.0  | 0.0  | 15.0 | 0.0  | 0.0  |
| Prop In Lane                 | 1.00 |      | 0.01 | 1.00 |      | 1.00 | 0.06 |      | 0.27 | 0.03 |      | 0.53 |
| Lane Grp Cap(c), veh/h       | 746  | 0    | 1291 | 479  | 1206 | 1040 | 338  | 0    | 0    | 313  | 0    | 0    |
| V/C Ratio(X)                 | 0.12 | 0.00 | 0.53 | 0.03 | 0.34 | 0.04 | 0.49 | 0.00 | 0.00 | 0.98 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h        | 746  | 0    | 1291 | 479  | 1206 | 1040 | 338  | 0    | 0    | 313  | 0    | 0    |
| HCM Platoon Ratio            | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.33 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)           | 1.00 | 0.00 | 1.00 | 0.99 | 0.99 | 0.99 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh     | 5.2  | 0.0  | 6.1  | 4.0  | 0.8  | 0.9  | 33.7 | 0.0  | 0.0  | 37.7 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh       | 0.3  | 0.0  | 1.6  | 0.1  | 0.7  | 0.1  | 1.1  | 0.0  | 0.0  | 44.5 | 0.0  | 0.0  |
| Initial Q Delay(d3),s/veh    | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(95%),veh/ln     | 0.9  | 0.0  | 8.1  | 0.1  | 1.0  | 0.1  | 6.1  | 0.0  | 0.0  | 15.9 | 0.0  | 0.0  |
| Unsig. Movement Delay, s/veh |      |      |      |      |      |      |      |      |      |      |      |      |
| LnGrp Delay(d),s/veh         | 5.5  | 0.0  | 7.6  | 4.1  | 1.5  | 1.0  | 34.8 | 0.0  | 0.0  | 82.2 | 0.0  | 0.0  |
| LnGrp LOS                    | A    | A    | A    | A    | A    | A    | C    | A    | A    | F    | A    | A    |
| Approach Vol, veh/h          |      | 776  |      |      | 456  |      |      | 164  |      |      |      | 306  |
| Approach Delay, s/veh        |      | 7.4  |      |      | 1.5  |      |      | 34.8 |      |      |      | 82.2 |
| Approach LOS                 |      | A    |      |      | A    |      |      | C    |      |      |      | F    |
| Timer - Assigned Phs         |      | 2    |      | 4    |      | 6    |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s     |      | 69.0 |      | 21.0 |      | 69.0 |      | 21.0 |      |      |      |      |
| Change Period (Y+Rc), s      |      | 6.0  |      | 6.0  |      | 6.0  |      | 6.0  |      |      |      |      |
| Max Green Setting (Gmax), s  |      | 63.0 |      | 15.0 |      | 63.0 |      | 15.0 |      |      |      |      |
| Max Q Clear Time (g_c+11), s |      | 17.9 |      | 17.0 |      | 18.3 |      | 9.6  |      |      |      |      |
| Green Ext Time (p_c), s      |      | 7.4  |      | 0.0  |      | 3.5  |      | 0.2  |      |      |      |      |
| <b>Intersection Summary</b>  |      |      |      |      |      |      |      |      |      |      |      |      |
| HCM 6th Ctrl Delay           |      | 21.9 |      |      |      |      |      |      |      |      |      |      |
| HCM 6th LOS                  |      | C    |      |      |      |      |      |      |      |      |      |      |

| Lane Group              | EBL   | EBT   | EBR  | WBL   | WBT   | WBR   | NBL   | NBT   | NBR  | SBL   | SBT   | SBR  |
|-------------------------|-------|-------|------|-------|-------|-------|-------|-------|------|-------|-------|------|
| Lane Configurations     | ↔     | ↔     | ↔    | ↔     | ↔     | ↔     | ↔     | ↔     | ↔    | ↔     | ↔     | ↔    |
| Traffic Volume (vph)    | 66    | 686   | 14   | 23    | 383   | 32    | 10    | 92    | 43   | 52    | 178   | 104  |
| Future Volume (vph)     | 66    | 686   | 14   | 23    | 383   | 32    | 10    | 92    | 43   | 52    | 178   | 104  |
| Ideal Flow (vphpl)      | 1800  | 1800  | 1800 | 1800  | 1800  | 1800  | 1800  | 1800  | 1800 | 1800  | 1800  | 1800 |
| Lane Width (ft)         | 10    | 10    | 10   | 10    | 10    | 10    | 10    | 10    | 10   | 10    | 10    | 10   |
| Grade (%)               |       | -2%   |      |       | 1%    |       |       | -2%   |      |       | 1%    |      |
| Storage Length (ft)     | 175   |       | 0    | 150   |       | 150   | 0     |       | 0    | 0     |       | 0    |
| Storage Lanes           | 1     |       | 0    | 1     |       | 1     | 0     |       | 0    | 0     |       | 0    |
| Taper Length (ft)       | 75    |       |      | 75    |       | 25    |       |       | 25   |       |       | 25   |
| Lane Util. Factor       | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00 |
| Frt                     |       | 0.997 |      |       |       | 0.850 |       | 0.960 |      |       | 0.958 |      |
| Flt Protected           | 0.950 |       |      | 0.950 |       |       |       | 0.997 |      |       | 0.992 |      |
| Satd. Flow (prot)       | 1580  | 1628  | 0    | 1588  | 1562  | 1379  | 0     | 1579  | 0    | 0     | 1547  | 0    |
| Flt Permitted           | 0.488 |       |      | 0.279 |       |       |       | 0.970 |      |       | 0.928 |      |
| Satd. Flow (perm)       | 812   | 1628  | 0    | 466   | 1562  | 1379  | 0     | 1536  | 0    | 0     | 1448  | 0    |
| Right Turn on Red       |       |       | Yes  |       |       | Yes   |       |       | No   |       |       | No   |
| Satd. Flow (RTOR)       |       | 2     |      |       |       | 33    |       |       |      |       |       |      |
| Link Speed (mph)        |       | 45    |      |       | 45    |       |       | 25    |      |       | 35    |      |
| Link Distance (ft)      |       | 819   |      |       | 2436  |       |       | 714   |      |       | 826   |      |
| Travel Time (s)         |       | 12.4  |      |       | 36.9  |       |       | 19.5  |      |       | 16.1  |      |
| Peak Hour Factor        | 0.97  | 0.97  | 0.97 | 0.97  | 0.97  | 0.97  | 0.97  | 0.97  | 0.97 | 0.97  | 0.97  | 0.97 |
| Heavy Vehicles (%)      | 2%    | 4%    | 0%   | 0%    | 7%    | 3%    | 11%   | 1%    | 5%   | 13%   | 0%    | 2%   |
| Adj. Flow (vph)         | 68    | 707   | 14   | 24    | 395   | 33    | 10    | 95    | 44   | 54    | 184   | 107  |
| Shared Lane Traffic (%) |       |       |      |       |       |       |       |       |      |       |       |      |
| Lane Group Flow (vph)   | 68    | 721   | 0    | 24    | 395   | 33    | 0     | 149   | 0    | 0     | 345   | 0    |
| Number of Detectors     | 1     | 1     |      | 1     | 1     | 1     | 1     | 1     |      | 1     | 1     |      |
| Detector Template       | Left  |       |      | Left  |       |       | Left  | Thru  |      | Left  | Thru  |      |
| Leading Detector (ft)   | 30    | 6     |      | 30    | 6     | 6     | 30    | 35    |      | 30    | 35    |      |
| Trailing Detector (ft)  | -10   | 0     |      | -10   | 0     | 0     | -10   | -5    |      | -10   | -5    |      |
| Detector 1 Position(ft) | -10   | 0     |      | -10   | 0     | 0     | -10   | -5    |      | -10   | -5    |      |
| Detector 1 Size(ft)     | 40    | 6     |      | 40    | 6     | 6     | 40    | 40    |      | 40    | 40    |      |
| Detector 1 Type         | CI+Ex | CI+Ex |      | CI+Ex | CI+Ex | CI+Ex | CI+Ex | CI+Ex |      | CI+Ex | CI+Ex |      |
| Detector 1 Channel      |       |       |      |       |       |       |       |       |      |       |       |      |
| Detector 1 Extend (s)   | 0.0   | 0.0   |      | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |      | 0.0   | 0.0   |      |
| Detector 1 Queue (s)    | 0.0   | 0.0   |      | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |      | 0.0   | 0.0   |      |
| Detector 1 Delay (s)    | 0.0   | 0.0   |      | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |      | 0.0   | 0.0   |      |
| Turn Type               | Perm  | NA    |      | Perm  | NA    | Perm  | Perm  | NA    |      | Perm  | NA    |      |
| Protected Phases        |       | 2     |      |       | 6     |       |       | 8     |      |       | 4     |      |
| Permitted Phases        | 2     |       |      | 6     |       | 6     | 8     |       |      | 4     |       |      |
| Detector Phase          | 2     |       |      | 6     |       | 8     | 8     |       |      | 4     |       |      |
| Switch Phase            |       |       |      |       |       |       |       |       |      |       |       |      |
| Minimum Initial (s)     | 22.0  | 22.0  |      | 22.0  | 22.0  | 22.0  | 3.0   | 3.0   |      | 3.0   | 3.0   |      |
| Minimum Split (s)       | 28.0  | 28.0  |      | 28.0  | 28.0  | 28.0  | 9.0   | 9.0   |      | 9.0   | 9.0   |      |
| Total Split (s)         | 69.0  | 69.0  |      | 69.0  | 69.0  | 69.0  | 31.0  | 31.0  |      | 31.0  | 31.0  |      |
| Total Split (%)         | 69.0% | 69.0% |      | 69.0% | 69.0% | 69.0% | 31.0% | 31.0% |      | 31.0% | 31.0% |      |
| Maximum Green (s)       | 63.0  | 63.0  |      | 63.0  | 63.0  | 63.0  | 25.0  | 25.0  |      | 25.0  | 25.0  |      |
| Yellow Time (s)         | 4.0   | 4.0   |      | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   |      | 4.0   | 4.0   |      |
| All-Red Time (s)        | 2.0   | 2.0   |      | 2.0   | 2.0   | 2.0   | 2.0   | 2.0   |      | 2.0   | 2.0   |      |
| Lost Time Adjust (s)    | -2.0  | -1.0  |      | -2.0  | -1.0  | 0.0   |       | -1.0  |      |       | -1.0  |      |

| Lane Group             | EBL   | EBT   | EBR | WBL   | WBT   | WBR   | NBL  | NBT  | NBR | SBL  | SBT  | SBR |
|------------------------|-------|-------|-----|-------|-------|-------|------|------|-----|------|------|-----|
| Total Lost Time (s)    | 4.0   | 5.0   |     | 4.0   | 5.0   | 6.0   |      | 5.0  |     |      | 5.0  |     |
| Lead/Lag               |       |       |     |       |       |       |      |      |     |      |      |     |
| Lead-Lag Optimize?     |       |       |     |       |       |       |      |      |     |      |      |     |
| Vehicle Extension (s)  | 5.0   | 5.0   |     | 5.0   | 5.0   | 5.0   | 3.0  | 3.0  |     | 3.0  | 3.0  |     |
| Minimum Gap (s)        | 2.0   | 2.0   |     | 2.0   | 2.0   | 2.0   | 3.0  | 3.0  |     | 3.0  | 3.0  |     |
| Time Before Reduce (s) | 42.0  | 42.0  |     | 42.0  | 42.0  | 42.0  | 0.0  | 0.0  |     | 0.0  | 0.0  |     |
| Time To Reduce (s)     | 21.0  | 21.0  |     | 21.0  | 21.0  | 21.0  | 0.0  | 0.0  |     | 0.0  | 0.0  |     |
| Recall Mode            | C-Max | C-Max |     | C-Max | C-Max | C-Max | None | None |     | None | None |     |

| Intersection Summary   |  |
|------------------------|--|
| Area Type:             | Other  |
| Cycle Length:          | 100  |
| Actuated Cycle Length: | 100  |
| Offset:                | 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow |
| Natural Cycle:         | 60   |
| Control Type:          | Actuated-Coordinated   |

Splits and Phases: 1: New St & Rt 926





| Movement                     | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations          | ↖    | ↗    |      | ↖    | ↗    | ↖    | ↗    | ↖    | ↗    | ↖    | ↗    | ↖    |
| Traffic Volume (veh/h)       | 66   | 686  | 14   | 23   | 383  | 32   | 10   | 92   | 43   | 52   | 178  | 104  |
| Future Volume (veh/h)        | 66   | 686  | 14   | 23   | 383  | 32   | 10   | 92   | 43   | 52   | 178  | 104  |
| Initial Q (Qb), veh          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)          | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj             | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach        |      | No   |      |      | No   |      |      | No   |      |      | No   |      |
| Adj Sat Flow, veh/h/ln       | 1846 | 1818 | 1818 | 1794 | 1696 | 1752 | 1860 | 1860 | 1860 | 1794 | 1794 | 1794 |
| Adj Flow Rate, veh/h         | 68   | 707  | 14   | 24   | 395  | 33   | 10   | 95   | 44   | 54   | 184  | 107  |
| Peak Hour Factor             | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, %         | 2    | 4    | 4    | 0    | 7    | 3    | 1    | 1    | 1    | 0    | 0    | 0    |
| Cap, veh/h                   | 742  | 1181 | 23   | 408  | 1128 | 972  | 51   | 278  | 122  | 88   | 219  | 119  |
| Arrive On Green              | 0.67 | 0.66 | 0.65 | 1.00 | 1.00 | 1.00 | 0.25 | 0.24 | 0.23 | 0.25 | 0.24 | 0.23 |
| Sat Flow, veh/h              | 1000 | 1776 | 35   | 741  | 1696 | 1485 | 53   | 1184 | 518  | 197  | 930  | 507  |
| Grp Volume(v), veh/h         | 68   | 0    | 721  | 24   | 395  | 33   | 149  | 0    | 0    | 345  | 0    | 0    |
| Grp Sat Flow(s),veh/h/ln     | 1000 | 0    | 1811 | 741  | 1696 | 1485 | 1755 | 0    | 0    | 1634 | 0    | 0    |
| Q Serve(g_s), s              | 2.4  | 0.0  | 22.2 | 1.1  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 13.1 | 0.0  | 0.0  |
| Cycle Q Clear(g_c), s        | 2.9  | 0.0  | 22.2 | 23.3 | 0.0  | 0.0  | 7.0  | 0.0  | 0.0  | 20.1 | 0.0  | 0.0  |
| Prop In Lane                 | 1.00 |      | 0.02 | 1.00 |      | 1.00 | 0.07 |      | 0.30 | 0.16 |      | 0.31 |
| Lane Grp Cap(c), veh/h       | 742  | 0    | 1204 | 408  | 1128 | 972  | 469  | 0    | 0    | 442  | 0    | 0    |
| V/C Ratio(X)                 | 0.09 | 0.00 | 0.60 | 0.06 | 0.35 | 0.03 | 0.32 | 0.00 | 0.00 | 0.78 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h        | 742  | 0    | 1204 | 408  | 1128 | 972  | 511  | 0    | 0    | 482  | 0    | 0    |
| HCM Platoon Ratio            | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)           | 1.00 | 0.00 | 1.00 | 0.97 | 0.97 | 0.97 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh     | 5.8  | 0.0  | 9.3  | 3.8  | 0.0  | 0.0  | 32.0 | 0.0  | 0.0  | 36.9 | 0.0  | 0.0  |
| Incr Delay (d2), s/veh       | 0.2  | 0.0  | 2.2  | 0.3  | 0.8  | 0.1  | 0.4  | 0.0  | 0.0  | 7.4  | 0.0  | 0.0  |
| Initial Q Delay(d3),s/veh    | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(95%),veh/ln     | 0.8  | 0.0  | 12.2 | 0.2  | 0.5  | 0.0  | 5.5  | 0.0  | 0.0  | 13.5 | 0.0  | 0.0  |
| Unsig. Movement Delay, s/veh |      |      |      |      |      |      |      |      |      |      |      |      |
| LnGrp Delay(d),s/veh         | 6.1  | 0.0  | 11.5 | 4.1  | 0.8  | 0.1  | 32.4 | 0.0  | 0.0  | 44.3 | 0.0  | 0.0  |
| LnGrp LOS                    | A    | A    | B    | A    | A    | A    | C    | A    | A    | D    | A    | A    |
| Approach Vol, veh/h          |      | 789  |      |      | 452  |      |      | 149  |      |      | 345  |      |
| Approach Delay, s/veh        |      | 11.1 |      |      | 0.9  |      |      | 32.4 |      |      | 44.3 |      |
| Approach LOS                 |      | B    |      |      | A    |      |      | C    |      |      | D    |      |
| Timer - Assigned Phs         |      | 2    |      | 4    |      | 6    |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s     |      | 71.5 |      | 28.5 |      | 71.5 |      | 28.5 |      |      |      |      |
| Change Period (Y+Rc), s      |      | 6.0  |      | 6.0  |      | 6.0  |      | 6.0  |      |      |      |      |
| Max Green Setting (Gmax), s  |      | 63.0 |      | 25.0 |      | 63.0 |      | 25.0 |      |      |      |      |
| Max Q Clear Time (g_c+11), s |      | 24.2 |      | 22.1 |      | 25.3 |      | 9.0  |      |      |      |      |
| Green Ext Time (p_c), s      |      | 7.4  |      | 0.4  |      | 3.5  |      | 0.4  |      |      |      |      |
| <b>Intersection Summary</b>  |      |      |      |      |      |      |      |      |      |      |      |      |
| HCM 6th Ctrl Delay           |      |      | 16.9 |      |      |      |      |      |      |      |      |      |
| HCM 6th LOS                  |      |      | B    |      |      |      |      |      |      |      |      |      |

West Pleasant Grove Road and Collector Road  
Mini Roundabout



| Lane Group              | EBT   | EBR  | WBL   | WBT   | NBL   | NBR  |
|-------------------------|-------|------|-------|-------|-------|------|
| Lane Configurations     | ↔     |      |       | ↔     | ↔     |      |
| Traffic Volume (vph)    | 71    | 1    | 165   | 118   | 4     | 93   |
| Future Volume (vph)     | 71    | 1    | 165   | 118   | 4     | 93   |
| Ideal Flow (vphpl)      | 1800  | 1800 | 1800  | 1800  | 1800  | 1800 |
| Lane Width (ft)         | 11    | 11   | 11    | 11    | 12    | 12   |
| Grade (%)               | 3%    |      |       | -3%   | 0%    |      |
| Lane Util. Factor       | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00 |
| Frt                     | 0.999 |      |       | 0.871 |       |      |
| Flt Protected           |       |      | 0.972 | 0.998 |       |      |
| Satd. Flow (prot)       | 1712  | 0    | 0     | 1676  | 1534  | 0    |
| Flt Permitted           |       |      | 0.972 | 0.998 |       |      |
| Satd. Flow (perm)       | 1712  | 0    | 0     | 1676  | 1534  | 0    |
| Link Speed (mph)        | 35    |      |       | 35    | 35    |      |
| Link Distance (ft)      | 1878  |      |       | 318   | 459   |      |
| Travel Time (s)         | 36.6  |      |       | 6.2   | 8.9   |      |
| Peak Hour Factor        | 0.70  | 0.70 | 0.70  | 0.70  | 0.70  | 0.70 |
| Heavy Vehicles (%)      | 0%    | 2%   | 2%    | 3%    | 2%    | 2%   |
| Adj. Flow (vph)         | 101   | 1    | 236   | 169   | 6     | 133  |
| Shared Lane Traffic (%) |       |      |       |       |       |      |
| Lane Group Flow (vph)   | 102   | 0    | 0     | 405   | 139   | 0    |
| Sign Control            | Yield |      |       | Yield | Yield |      |

**Intersection Summary**

Area Type: Other  
Control Type: Roundabout

**Intersection**

|                             |           |           |           |
|-----------------------------|-----------|-----------|-----------|
| Intersection Delay, s/veh   | 4.9       |           |           |
| Intersection LOS            | A         |           |           |
| <b>Approach</b>             | <b>EB</b> | <b>WB</b> | <b>NB</b> |
| Entry Lanes                 | 1         | 1         | 1         |
| Conflicting Circle Lanes    | 1         | 1         | 1         |
| Adj Approach Flow, veh/h    | 102       | 405       | 139       |
| Demand Flow Rate, veh/h     | 102       | 415       | 142       |
| Vehicles Circulating, veh/h | 241       | 6         | 101       |
| Vehicles Exiting, veh/h     | 180       | 237       | 242       |
| Ped Vol Crossing Leg, #/h   | 0         | 0         | 0         |
| Ped Cap Adj                 | 1.000     | 1.000     | 1.000     |
| Approach Delay, s/veh       | 4.2       | 5.4       | 3.9       |
| Approach LOS                | A         | A         | A         |

| Lane                  | Left  | Left  | Left  |
|-----------------------|-------|-------|-------|
| Designated Moves      | TR    | LT    | LR    |
| Assumed Moves         | TR    | LT    | LR    |
| RT Channelized        |       |       |       |
| Lane Util             | 1.000 | 1.000 | 1.000 |
| Follow-Up Headway, s  | 2.609 | 2.609 | 2.609 |
| Critical Headway, s   | 4.976 | 4.976 | 4.976 |
| Entry Flow, veh/h     | 102   | 415   | 142   |
| Cap Entry Lane, veh/h | 1079  | 1371  | 1245  |
| Entry HV Adj Factor   | 1.000 | 0.976 | 0.979 |
| Flow Entry, veh/h     | 102   | 405   | 139   |
| Cap Entry, veh/h      | 1079  | 1338  | 1218  |
| V/C Ratio             | 0.095 | 0.303 | 0.114 |
| Control Delay, s/veh  | 4.2   | 5.4   | 3.9   |
| LOS                   | A     | A     | A     |
| 95th %tile Queue, veh | 0     | 1     | 0     |



| Lane Group              | EBT   | EBR  | WBL   | WBT   | NBL   | NBR  |
|-------------------------|-------|------|-------|-------|-------|------|
| Lane Configurations     | ↔     |      | ↔     | ↔     | ↔     | ↔    |
| Traffic Volume (vph)    | 65    | 4    | 414   | 220   | 3     | 162  |
| Future Volume (vph)     | 65    | 4    | 414   | 220   | 3     | 162  |
| Ideal Flow (vphpl)      | 1800  | 1800 | 1800  | 1800  | 1800  | 1800 |
| Lane Width (ft)         | 11    | 11   | 11    | 11    | 12    | 12   |
| Grade (%)               | 3%    |      |       | -3%   | 0%    |      |
| Lane Util. Factor       | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00 |
| Frt                     | 0.993 |      |       | 0.867 |       |      |
| Flt Protected           |       |      | 0.968 | 0.999 |       |      |
| Satd. Flow (prot)       | 1700  | 0    | 0     | 1682  | 1528  | 0    |
| Flt Permitted           |       |      | 0.968 | 0.999 |       |      |
| Satd. Flow (perm)       | 1700  | 0    | 0     | 1682  | 1528  | 0    |
| Link Speed (mph)        | 35    |      | 35    | 35    |       |      |
| Link Distance (ft)      | 1811  |      | 228   | 439   |       |      |
| Travel Time (s)         | 35.3  |      | 4.4   | 8.6   |       |      |
| Peak Hour Factor        | 0.75  | 0.75 | 0.75  | 0.75  | 0.75  | 0.75 |
| Heavy Vehicles (%)      | 0%    | 2%   | 2%    | 1%    | 2%    | 2%   |
| Adj. Flow (vph)         | 87    | 5    | 552   | 293   | 4     | 216  |
| Shared Lane Traffic (%) |       |      |       |       |       |      |
| Lane Group Flow (vph)   | 92    | 0    | 0     | 845   | 220   | 0    |
| Sign Control            | Yield |      |       | Yield | Yield |      |

**Intersection Summary**

Area Type: Other  
Control Type: Roundabout

**Intersection**

Intersection Delay, s/veh 8.7  
Intersection LOS A

| Approach                    | EB    | WB    | NB    |
|-----------------------------|-------|-------|-------|
| Entry Lanes                 | 1     | 1     | 1     |
| Conflicting Circle Lanes    | 1     | 1     | 1     |
| Adj Approach Flow, veh/h    | 92    | 845   | 220   |
| Demand Flow Rate, veh/h     | 92    | 859   | 224   |
| Vehicles Circulating, veh/h | 563   | 4     | 87    |
| Vehicles Exiting, veh/h     | 300   | 307   | 568   |
| Ped Vol Crossing Leg, #/h   | 0     | 0     | 0     |
| Ped Cap Adj                 | 1.000 | 1.000 | 1.000 |
| Approach Delay, s/veh       | 5.8   | 10.1  | 4.4   |
| Approach LOS                | A     | B     | A     |

| Lane                  | Left  | Left  | Left  |
|-----------------------|-------|-------|-------|
| Designated Moves      | TR    | LT    | LR    |
| Assumed Moves         | TR    | LT    | LR    |
| RT Channelized        |       |       |       |
| Lane Util             | 1.000 | 1.000 | 1.000 |
| Follow-Up Headway, s  | 2.609 | 2.609 | 2.609 |
| Critical Headway, s   | 4.976 | 4.976 | 4.976 |
| Entry Flow, veh/h     | 92    | 859   | 224   |
| Cap Entry Lane, veh/h | 777   | 1374  | 1263  |
| Entry HV Adj Factor   | 1.000 | 0.984 | 0.982 |
| Flow Entry, veh/h     | 92    | 845   | 220   |
| Cap Entry, veh/h      | 777   | 1352  | 1240  |
| V/C Ratio             | 0.118 | 0.625 | 0.177 |
| Control Delay, s/veh  | 5.8   | 10.1  | 4.4   |
| LOS                   | A     | B     | A     |
| 95th %tile Queue, veh | 0     | 5     | 1     |

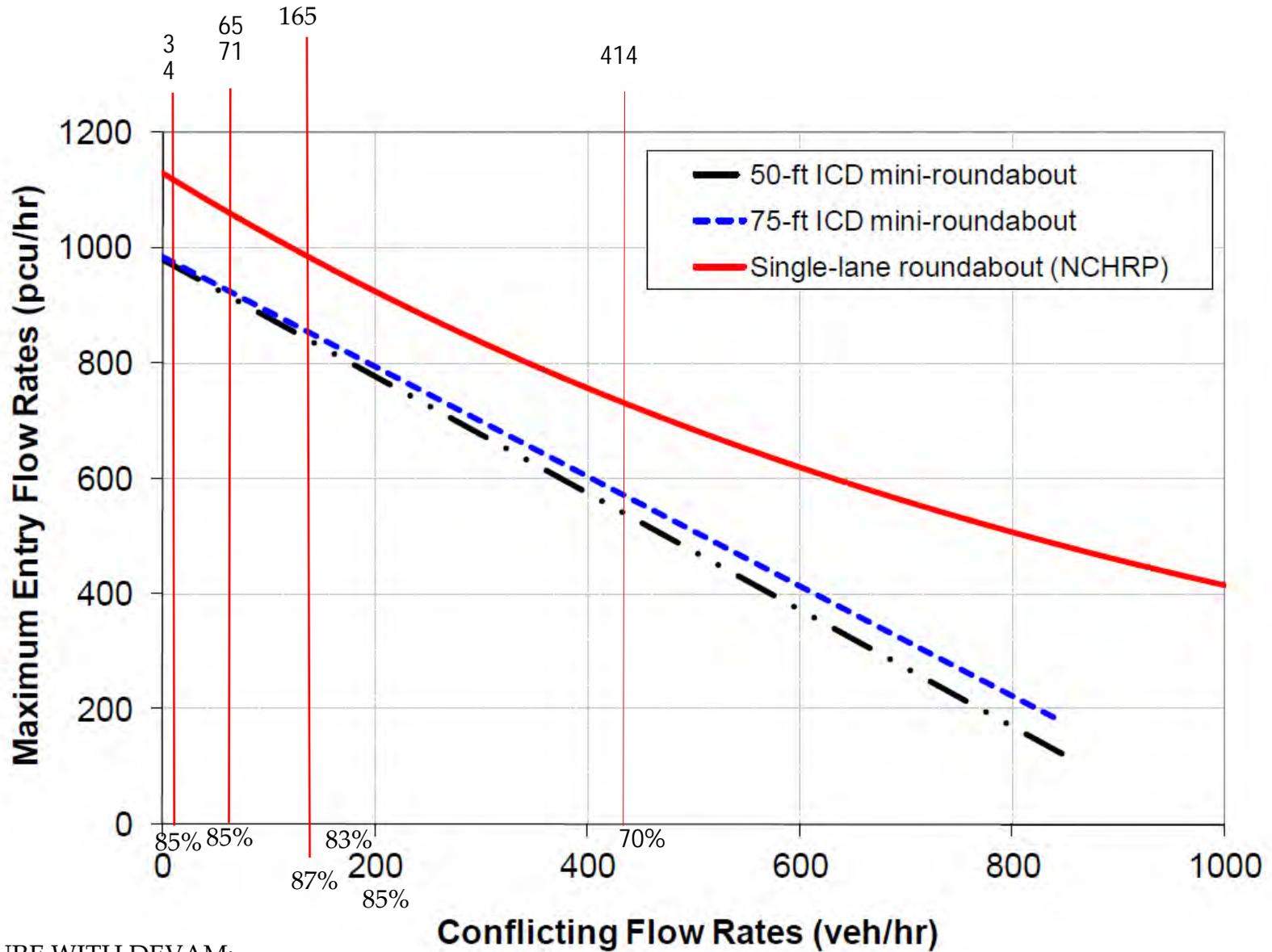
**Table 1. Mini Roundabout Delay Calculation - 2030 Future with Development**

|   | Weekday AM |           |           | Weekday PM |           |           |
|---|------------|-----------|-----------|------------|-----------|-----------|
|   | Northbound | Eastbound | Westbound | Northbound | Eastbound | Westbound |
| Single Lane Roundabout Delay <sup>(1)</sup>     | 3.9        | 4.2       | 5.4       | 4.4        | 5.8       | 10.1      |
| Capacity Compared to Single Lane <sup>(2)</sup> | 85%        | 87%       | 85%       | 85%        | 70%       | 85%       |
| Mini Roundabout Approach Delay                  | 4.5        | 4.7       | 6.2       | 5.1        | 7.5       | 11.6      |
| Approach Volume                                 | 97         | 72        | 283       | 165        | 69        | 634       |
| Mini Roundabout Overall Delay & LOS             | 5.6        |           |           | 10.0       |           |           |
|   | A          |           |           | B          |           |           |

(1) Based on HCM 6th Edition Methodology for a traditional roundabout.

(2) See Figure 1.

FIGURE A



2030 FUTURE WITH DEVAM:  
 NB = 97 entering, 71 conflicting  
 EB = 72 entering, 165 conflicting  
 WB = 283 entering, 4 conflicting

2030 FUTURE WITH DEVPM:  
 NB = 165 entering, 65 conflicting  
 EB = 69 entering, 414 conflicting  
 WB = 634 entering, 3 conflicting