



## TECHNICAL MEMORANDUM

DATE: July 15, 2025

TO: James McCornack  
Senior Engineer  
City of Roswell

FROM: Willie E. Roman, P.E., PTOE

RE: **Sunset Ave Traffic Analysis - Roswell, NM**

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## INTRODUCTION

This report documents an all-way stop control warrant study, capacity analysis, and crash analysis of Sunset Ave in Roswell, New Mexico. The City requested that Lee Engineering evaluate traffic operations on the following intersections:

- Sunset Ave & Hobbs St
- Sunset Ave & Poe St
- Sunset Ave & Brasher St

Data collection includes existing roadway condition, current traffic counts, vehicle travel speeds, and pedestrian volumes. This study aims to evaluate traffic operations and pedestrian usage along the study area. This report documents project proceedings and findings.

## ROADWAY CHARACTERISTICS AND EXISTING CONDITIONS

Sunset Ave is a four-lane undivided minor arterial running north to south, the study area focus is between Brasher Rd and Hobbs St with a posted speed limit of 35 MPH. Figure 1 shows the location of the project area and data collection, Figure 2 shows the existing volumes. This segment of road provides access to residential and institutional land uses.

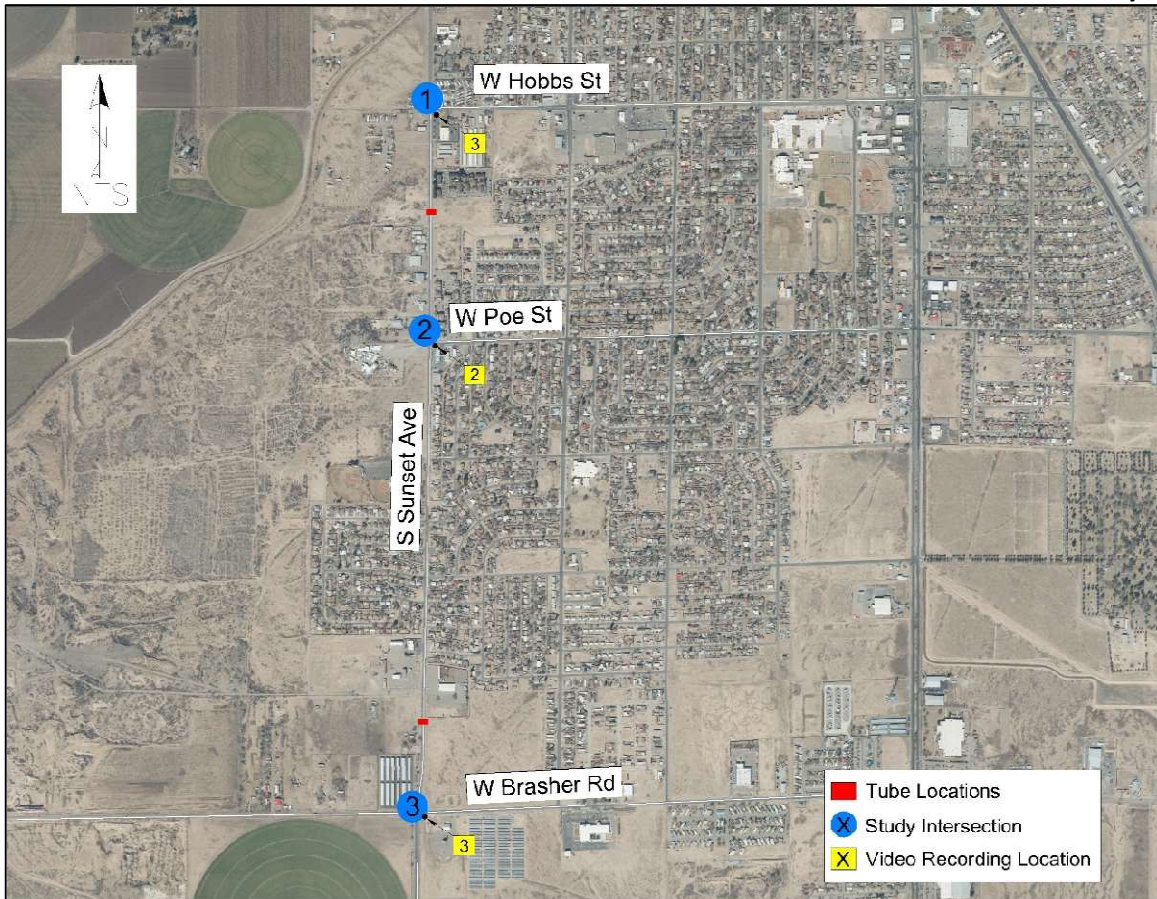


Figure 1: Study Area and Traffic Counter Locations

# EXISTING 2025 TRAFFIC VOLUMES

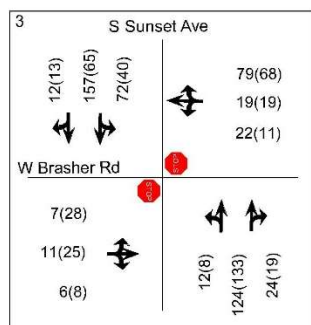
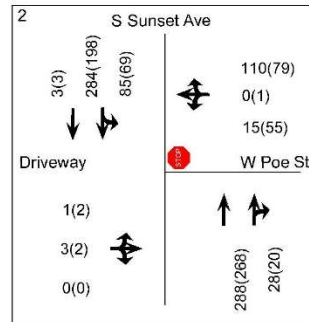
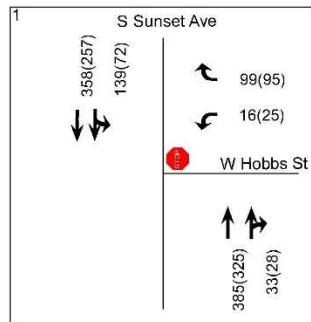
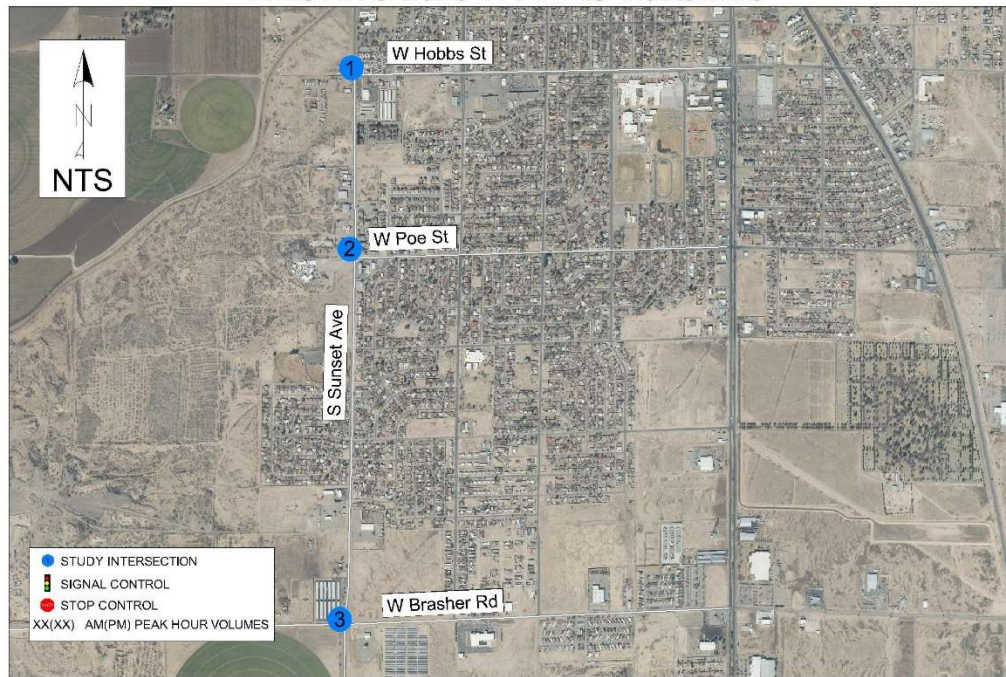


Figure 2: Existing Volumes 2025

## CRASH SUMMARY

Crash data was obtained for the study area from the NMDOT database agency for the most recently available years of data. This included the years 2018 to 2022. Crashes were then summarized by year, type, severity, and cause. To compare and summarize trends, crashes were grouped by study intersection. The crash summary is shown below in Table 1.

*Table 1: Crash Summary*

| Crash Summary               |                                                             | Sunset Ave<br>& Hobbs St | Sunset Ave<br>& Poe St | Sunset Ave<br>& Brasher<br>Rd |
|-----------------------------|-------------------------------------------------------------|--------------------------|------------------------|-------------------------------|
| <b>Total Crashes</b>        |                                                             | <b>13</b>                | <b>11</b>              | <b>10</b>                     |
| <b>By Year</b>              | 2018                                                        | 3                        | 2                      | 1                             |
|                             | 2019                                                        | 3                        | 1                      | 2                             |
|                             | 2020                                                        | 0                        | 2                      | 3                             |
|                             | 2021                                                        | 5                        | 2                      | 4                             |
|                             | 2022                                                        | 2                        | 4                      | 0                             |
| <b>CONTRIBUTING FACTORS</b> | Avoid No Contact Vehicle                                    |                          | 1                      |                               |
|                             | Driver Inattention                                          | 4                        | 1                      | 1                             |
|                             | Excessive Speed                                             | 1                        | 1                      |                               |
|                             | Failed To Yield Right Of Way                                | 2                        | 3                      | 3                             |
|                             | Following Too Closely                                       | 1                        | 1                      |                               |
|                             | Improper Overtaking                                         | 2                        |                        |                               |
|                             | Made Improper Turn                                          | 1                        |                        | 1                             |
|                             | None                                                        | 1                        | 2                      | 5                             |
|                             | Other, No Driver Error                                      |                          | 1                      |                               |
|                             | Speed Too Fast For Conditions                               | 1                        |                        |                               |
|                             | Under The Influence Of Drugs or Medication                  |                          | 1                      |                               |
| <b>SEVERITY</b>             | Visible Injury (B)                                          | 5                        | 4                      | 3                             |
|                             | Property Damage Only (O)                                    | 8                        | 7                      | 7                             |
| <b>LIGHTING CONDITION</b>   | Daylight                                                    | 11                       | 7                      | 8                             |
|                             | Dark-Lighted                                                | 0                        | 3                      | 2                             |
|                             | Dark-Not Lighted                                            | 2                        | 1                      | 0                             |
| <b>CRASH TYPE</b>           | Fixed Object                                                | 3                        | 2                      | 0                             |
|                             | Left Blank                                                  | 0                        | 0                      | 1                             |
|                             | Other Vehicle - From Same Direction/One Left Turn           | 1                        | 0                      | 0                             |
|                             | Other Vehicle - From Same Direction/Sideswipe Collision     | 1                        | 0                      | 0                             |
|                             | Other Vehicle - From Same Direction/Both Going Straight     | 3                        | 2                      | 1                             |
|                             | Other Vehicle - One Left Turn/Entering At Angle             | 1                        | 1                      | 1                             |
|                             | Other Vehicle - One Right Turn/Entering At Angle            | 0                        | 1                      | 0                             |
|                             | Other Vehicle - One Vehicle/Backing From Driveway Access    | 1                        | 0                      | 0                             |
|                             | Other Vehicle - Both Going Straight/Entering At Angle       | 0                        | 3                      | 1                             |
|                             | Other Vehicle - From Opposite Direction/Both Going Straight | 1                        | 0                      | 1                             |
|                             | Other Vehicle - From Opposite Direction/One Left Turn       | 1                        | 0                      | 0                             |
|                             | Other Vehicle - From Opposite Direction/Sideswipe Collision | 0                        | 0                      | 1                             |
|                             | Other Vehicle - From Opposite Direction                     | 0                        | 2                      | 4                             |
|                             | Pedestrian                                                  | 1                        | 0                      | 0                             |

From the above table, the following observations were made for the study intersections:

- **Sunset Ave & Hobbs St**
  - From 2018 to 2022, 13 crashes were reported.
  - The most common contributing factor for vehicle crashes was driver inattention.
  - Most of the vehicle crashes were reported as property damage only, and there were no fatal injured (killed) crashes.
  - The most common lighting condition was daylight.
  - Based on the crash type, most of the vehicle crashes were from same direction/both going straight and fixed object.

- **Sunset Ave & Poe St**
  - From 2018 to 2022, 11 crashes were reported.
  - The most common contributing factor for vehicle crashes was failed to yield right of way.
  - Most of the vehicle crashes were reported as property damage only, and there were no fatal injured (killed) crashes.
  - The most common lighting condition was daylight.
  - Based on the crash type, most of the vehicle crashes were from both going straight/entering at angle.
  
- **Sunset Ave & Poe St**
  - From 2018 to 2022, 10 crashes were reported.
  - The most common contributing factor for vehicle crashes was failed to yield right of way.
  - Most of the vehicle crashes were reported as property damage only, and there were no fatal injured (killed) crashes.
  - The most common lighting condition was daylight.
  - Based on the crash type, most of the vehicle crashes were from opposite direction.

## SIGHT DISTANCE

The following presents a narrative detailing the development's recommended intersection sight distance requirements. Intersection sight distance requirements were calculated using the 2018 AASHTO "Green Book" chapter 9.5. Three sight distance cases were used for this analysis:

- Case B1 – A stopped vehicle turning left from a minor street approach onto a major road
- Case B2 – A stopped vehicle turning right from a minor street approach onto a major road
- Case F – Left turns from the major road into a minor road

Intersection sight distances were calculated based on the following assumptions:

- The required intersection sight distance for Case B1 was calculated based on the design vehicle turning left across the intersection
- The required intersection sight distance for Case B2 was calculated based on the design vehicle crossing into the nearest traffic lane
- The required intersection sight distance for Case F at the intersection was calculated based on the design vehicle turning left from the major road into the minor road

A passenger vehicle was used as the design vehicle. The required sight distance values for S Sunset Ave & W Hobbs St, S Sunset Ave & W Poe St and S Sunset Ave & W Brasher Rd are provided in Table 2, Table 3, and Table 4 respectively, which are rounded up to the nearest 5-foot increment. The formulas, values, and calculations used in the sight distance analysis are in Appendix D.

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*Table 2: Required and Available Sight Distance Values for S Sunset Ave/W Hobbs St*

| Vehicles Exiting W Hobbs St onto S Sunset Ave (Passenger Car) |                                                        |                                          |                                                       |                                          |                                                       |
|---------------------------------------------------------------|--------------------------------------------------------|------------------------------------------|-------------------------------------------------------|------------------------------------------|-------------------------------------------------------|
| Making a Left (Case B1)                                       |                                                        |                                          | Making a Right (Case B2)                              |                                          |                                                       |
| Required Sight Distance to the Right (ft)                     | Approximate Available Sight Distance to the Right (ft) | Required Sight Distance to the Left (ft) | Approximate Available Sight Distance to the Left (ft) | Required Sight Distance to the Left (ft) | Approximate Available Sight Distance to the Left (ft) |
| 415                                                           | 550                                                    | 415                                      | 840                                                   | 335                                      | 840                                                   |
| Sight Distance Available > Required                           |                                                        |                                          |                                                       |                                          |                                                       |
| To the Right                                                  |                                                        | To the Left                              |                                                       | To the Left                              |                                                       |
| Yes                                                           |                                                        | Yes                                      |                                                       | Yes                                      |                                                       |

| Vehicles Entering W Hobbs St from S Sunset Ave (Passenger Car) |                                                               |
|----------------------------------------------------------------|---------------------------------------------------------------|
| Making a Left (Case F)                                         |                                                               |
| Required Sight Distance to Opposing Traffic (ft)               | Approximate Available Sight Distance to Opposing Traffic (ft) |
| 310                                                            | Approximately 2900                                            |
| Sight Distance Available > Required                            |                                                               |
| To Opposing Traffic                                            |                                                               |
| Yes                                                            |                                                               |

*Table 3: Required and Available Sight Distance Values for S Sunset Ave/W Poe St*

| Vehicles Exiting W Poe St onto S Sunset Ave (Passenger Car) |                                                        |                                          |                                                       |                                          |                                                       |
|-------------------------------------------------------------|--------------------------------------------------------|------------------------------------------|-------------------------------------------------------|------------------------------------------|-------------------------------------------------------|
| Making a Left (Case B1)                                     |                                                        |                                          | Making a Right (Case B2)                              |                                          |                                                       |
| Required Sight Distance to the Right (ft)                   | Approximate Available Sight Distance to the Right (ft) | Required Sight Distance to the Left (ft) | Approximate Available Sight Distance to the Left (ft) | Required Sight Distance to the Left (ft) | Approximate Available Sight Distance to the Left (ft) |
| 415                                                         | 1940                                                   | 415                                      | 1140                                                  | 335                                      | 1140                                                  |
| Sight Distance Available > Required                         |                                                        |                                          |                                                       |                                          |                                                       |
| To the Right                                                |                                                        | To the Left                              |                                                       | To the Left                              |                                                       |
| Yes                                                         |                                                        | Yes                                      |                                                       | Yes                                      |                                                       |

| Vehicles Entering W Poe St from S Sunset Ave (Passenger Car) |                                                               |
|--------------------------------------------------------------|---------------------------------------------------------------|
| Making a Left (Case F)                                       |                                                               |
| Required Sight Distance to Opposing Traffic (ft)             | Approximate Available Sight Distance to Opposing Traffic (ft) |
| 310                                                          | Approximately 2830                                            |
| Sight Distance Available > Required                          |                                                               |
| To Opposing Traffic                                          |                                                               |
| Yes                                                          |                                                               |

*Table 4: Required and Available Sight Distance Values for S Sunset Ave/W Brasher Rd*

| Vehicles Exiting W Brasher Rd onto S Sunset Ave (Passenger Car) |                                                        |                                          |                                                       |                                          |                                                       |
|-----------------------------------------------------------------|--------------------------------------------------------|------------------------------------------|-------------------------------------------------------|------------------------------------------|-------------------------------------------------------|
| Making a Left (Case B1)                                         |                                                        |                                          | Making a Right (Case B2)                              |                                          |                                                       |
| Required Sight Distance to the Right (ft)                       | Approximate Available Sight Distance to the Right (ft) | Required Sight Distance to the Left (ft) | Approximate Available Sight Distance to the Left (ft) | Required Sight Distance to the Left (ft) | Approximate Available Sight Distance to the Left (ft) |
| 415                                                             | 1820                                                   | 415                                      | 4000                                                  | 335                                      | 4000                                                  |
| Sight Distance Available > Required                             |                                                        |                                          |                                                       |                                          |                                                       |
| To the Right                                                    |                                                        | To the Left                              |                                                       | To the Left                              |                                                       |
| Yes                                                             |                                                        | Yes                                      |                                                       | Yes                                      |                                                       |

| Vehicles Entering W Brasher Rd from S Sunset Ave (Passenger Car) |                                                               |
|------------------------------------------------------------------|---------------------------------------------------------------|
| Making a Left (Case F)                                           |                                                               |
| Required Sight Distance to Opposing Traffic (ft)                 | Approximate Available Sight Distance to Opposing Traffic (ft) |
| 310                                                              | Approximately 2920                                            |
| Sight Distance Available > Required                              |                                                               |
| To Opposing Traffic                                              |                                                               |
| Yes                                                              |                                                               |

Based on the conditions that existed in the field at the time of the site visit, the estimated available sight distance appears to exceed the required intersection sight distances at the study intersections.

## ALL-WAY STOP CONTROL WARRANT

The intersections were evaluated to determine if a multi-way stop would be appropriate in lieu of a two-way stop control. The MUTCD contains four multi-way stop conditions outlining specific criteria to justify a multi-way stop at an intersection. The criteria considered to warrant a multi-way stop are:

A. *Crash Experience*

- *For a four-leg intersection, there are five or more reported crashes in a 12-month period or six or more reported crashes in a 36-month period that were of a type susceptible to correction by the installation of all-way stop control.*
- *For a three-leg intersection, there are four or more reported crashes in a 12-month period or five or more reported crashes in a 36-month period that were of a type susceptible to correction by the installation of all-way stop control.*

B. *Sight Distance*

- *All-way stop control may be installed at an intersection where an engineering study indicates that sight distance on the minor-road approaches controlled by a STOP sign is not adequate for a vehicle to turn onto or cross the major (uncontrolled) road.*

C. *Transition to Signal Control or Transition to Yield Control at a Circular Intersection*

- *All-way stop control may be installed at locations where all-way stop control is an interim measure that can be installed to control traffic while arrangements are being made for the installation of a traffic control signal at the intersection or for the installation of yield control at a circular intersection.*

D. *8-Hour Volume*

- *The combined motor vehicle, bicycle, and pedestrian volume entering the intersection from the major street approaches is at least 300 units per hour for each of any 8 hours of a typical day.*
- *The combined motor vehicle, bicycle, and pedestrian volume entering the intersection from the minor street approaches is at least 200 units per hour for each of any of the same 8 hours.*

E. *Other Factors*

- *The need to control left-turn conflicts.*
- *An intersection of two residential neighborhood collectors (through) streets of similar design and operating characteristics where all-way stop control would improve traffic operational characteristics of the intersection.*
- *Where pedestrian and/or bicyclist movements support the installation of all-way stop control.*

Each criterion is evaluated at the study intersections under current conditions of a single lane for the northbound and southbound westbound approaches, one through lane, and one left-turn lane for the east- and westbound approach.

### Criterion A

Crashes subject to correction from an all-way stop installation include crashes occurring during right and left turns and right-angle crashes. Using the same crash data from Table 1 it was determined that:

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- For Sunset Ave and Hobbs St, **Criteria A is NOT SATISFIED** because the intersection did not experience four or more crashes in 12 months or five or more crashes in 36 months that may be correctable by installing an all-way stop.
- For Sunset Ave and Poe St, **Criteria A is SATISFIED** because the intersection experienced five or more crashes in 36 months that may be correctable by installing an all-way stop.
- For Sunset Ave and Brasher Rd, **Criteria A is NOT SATISFIED** because the intersection did not experience five or more crashes in 12 months or six or more crashes in 36 months that may be correctable by installing an all-way stop.

#### Criterion B

- For Sunset Ave and Hobbs St, **Criteria B is NOT SATISFIED** because the estimated available sight distance appears to exceed the required intersection sight distance.
- For Sunset Ave and Poe St, **Criteria B is NOT SATISFIED** because the estimated available sight distance appears to exceed the required intersection sight distance.
- For Sunset Ave and Brasher Rd, **Criteria B is NOT SATISFIED** because the estimated available sight distance appears to exceed the required intersection sight distance.

#### Criterion C

A Traffic Control Signal was not warranted at this intersection; thus, **Criterion C DOES NOT apply**.

#### Criterion D

##### Data Collection

13-hour intersection turning movement counts were collected on Wednesday, May 21, 2025, using portable video recording equipment between 6:00 AM and 7:00 PM. Table 5 summarizes the hourly vehicle volume at all study intersections.

*Table 5: Total Volumes*

| Time     | Intersection Volume (Veh/hr)    |                               |                                   |
|----------|---------------------------------|-------------------------------|-----------------------------------|
|          | Intersections                   |                               |                                   |
|          | S Sunset Ave<br>&<br>W Hobbs St | S Sunset Ave<br>&<br>W Poe St | S Sunset Ave<br>&<br>W Brasher St |
| 6:00 AM  | 335                             | 267                           | 277                               |
| 7:00 AM  | 867                             | 726                           | 473                               |
| 8:00 AM  | 651                             | 496                           | 355                               |
| 9:00 AM  | 460                             | 352                           | 277                               |
| 10:00 AM | 499                             | 372                           | 278                               |
| 11:00 AM | 542                             | 433                           | 317                               |
| 12:00 PM | 669                             | 519                           | 375                               |
| 1:00 PM  | 706                             | 550                           | 371                               |
| 2:00 PM  | 633                             | 507                           | 365                               |
| 3:00 PM  | 744                             | 605                           | 435                               |
| 4:00 PM  | 772                             | 606                           | 402                               |
| 5:00 PM  | 791                             | 698                           | 416                               |
| 6:00 PM  | 726                             | 586                           | 345                               |

## Existing Conditions

When analyzing the existing intersection configuration, 100% of the vehicular volumes were used as well as the combined vehicular, pedestrian, and bicycle volumes for the warrant analysis criteria. The relevant threshold values are 300 vehicles per hour (vph) on the major street and 200 vph on the minor street. Figure 3 through Figure 5 below summarize 13 hours of intersection approach volume data collected.

*Figure 3: Sunset Ave and Hobbs St Criteria D Summary*

| Sunset Ave & Hobbs St                          |               |              |                    |
|------------------------------------------------|---------------|--------------|--------------------|
| M. U. T. C. D. MULTIWAY STOP - Criterion D     |               |              |                    |
| Minimum Volume and Average Delay               |               |              |                    |
| Required Average Volume on Major Street        |               | 300          | Criteria D Not Met |
| Required Average Volume on Minor Street        |               | 200          |                    |
| Observed Average 8-hour Volume on Major Street |               | 635          |                    |
| Observed Average 8-hour Volume on Minor Street |               | 106          |                    |
| CRITERION D:                                   |               |              | NOT SATISFIED      |
| RANKING BY MAJOR STREET HOURLY VOLUMES         |               |              |                    |
| RANK                                           | HOURLY VOLUME |              |                    |
|                                                | BEGIN TIME    | MAJOR STREET | MINOR STREET       |
| 1                                              | 7:00 AM       | 780          | 87                 |
| 2                                              | 5:00 PM       | 687          | 104                |
| 3                                              | 4:00 PM       | 651          | 121                |
| 4                                              | 3:00 PM       | 641          | 103                |
| 5                                              | 6:00 PM       | 611          | 115                |
| 6                                              | NOON          | 578          | 91                 |
| 7                                              | 8:00 AM       | 571          | 80                 |
| 8                                              | 1:00 PM       | 562          | 144                |
| 9                                              | 2:00 PM       | 530          | 103                |
| 10                                             | 11:00 AM      | 470          | 72                 |
| 11                                             | 10:00 AM      | 406          | 93                 |
| 12                                             | 9:00 AM       | 384          | 76                 |
| 13                                             | 6:00 AM       | 291          | 44                 |
| 14                                             | 1:00 AM       | 0            | 0                  |
| 15                                             | 2:00 AM       | 0            | 0                  |
| 16                                             | 3:00 AM       | 0            | 0                  |
| 17                                             | 4:00 AM       | 0            | 0                  |
| 18                                             | 5:00 AM       | 0            | 0                  |
| 19                                             | 7:00 PM       | 0            | 0                  |
| 20                                             | 8:00 PM       | 0            | 0                  |
| 21                                             | 9:00 PM       | 0            | 0                  |
| 22                                             | 10:00 PM      | 0            | 0                  |
| 23                                             | 11:00 PM      | 0            | 0                  |
| 24                                             | MIDNITE       | 0            | 0                  |

| RANKED HOURS | AVERAGE OF EIGHT HOURLY VOLUMES |              | CRITERIA MET? |
|--------------|---------------------------------|--------------|---------------|
|              | MAJOR STREET                    | MINOR STREET |               |
| 1 to 8       | 635                             | 106          | No            |
| 2 to 9       | 604                             | 108          | No            |
| 3 to 10      | 577                             | 104          | No            |
| 4 to 11      | 546                             | 100          | No            |
| 5 to 12      | 514                             | 97           | No            |
| 6 to 13      | 474                             | 88           | No            |
| 7 to 14      | 402                             | 77           | No            |
| 8 to 15      | 330                             | 67           | No            |
| 9 to 16      | 260                             | 49           | No            |
| 10 to 17     | 194                             | 36           | No            |
| 11 to 18     | 135                             | 27           | No            |
| 12 to 19     | 84                              | 15           | No            |
| 13 to 20     | 36                              | 6            | No            |
| 14 to 21     | 0                               | 0            | No            |
| 15 to 22     | 0                               | 0            | No            |
| 16 to 23     | 0                               | 0            | No            |
| 17 to 24     | 0                               | 0            | No            |

- The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day, and
- The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour, but
- If the 85th-percentile approach speed of the major-street vehicular traffic exceeds 65 km/h or exceeds 40 mph, the minimum vehicular volume warrants are 70% of the above values.

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*Figure 4: Sunset Ave and Poe St Criteria D Summary*

| Sunset Ave & Poe St                            |              |              |                    |
|------------------------------------------------|--------------|--------------|--------------------|
| M. U. T. C. D. MULTIWAY STOP - Criterion C     |              |              |                    |
| Minimum Volume and Average Delay               |              |              |                    |
| Required Average Volume on Major Street        |              | 300          | Criteria D Not Met |
| Required Average Volume on Minor Street        |              | 200          |                    |
| Observed Average 8-hour Volume on Major Street |              | 492          |                    |
| Observed Average 8-hour Volume on Minor Street |              | 106          |                    |
| CRITERION D:                                   |              |              | NOT SATISFIED      |
| RANKING BY MAJOR STREET HOURLY VOLUMES         |              |              |                    |
| HOURLY VOLUME                                  |              |              |                    |
| RANK                                           | BEGIN TIME   | MAJOR STREET | MINOR STREET       |
| 1                                              | 7:00 AM      | 607          | 119                |
| 2                                              | 5:00 PM      | 558          | 140                |
| 3                                              | 3:00 PM      | 502          | 103                |
| 4                                              | 4:00 PM      | 502          | 104                |
| 5                                              | 6:00 PM      | 485          | 101                |
| 6                                              | 1:00 PM      | 454          | 96                 |
| 7                                              | NOON         | 420          | 99                 |
| 8                                              | 8:00 AM      | 411          | 85                 |
| 9                                              | 2:00 PM      | 408          | 99                 |
| 10                                             | 11:00 AM     | 367          | 66                 |
| 11                                             | 10:00 AM     | 308          | 64                 |
| 12                                             | 9:00 AM      | 298          | 54                 |
| 13                                             | 6:00 AM      | 241          | 26                 |
| 14                                             | 1:00 AM      | 0            | 0                  |
| 15                                             | 2:00 AM      | 0            | 0                  |
| 16                                             | 3:00 AM      | 0            | 0                  |
| 17                                             | 4:00 AM      | 0            | 0                  |
| 18                                             | 5:00 AM      | 0            | 0                  |
| 19                                             | 7:00 PM      | 0            | 0                  |
| 20                                             | 8:00 PM      | 0            | 0                  |
| 21                                             | 9:00 PM      | 0            | 0                  |
| 22                                             | 10:00 PM     | 0            | 0                  |
| 23                                             | 11:00 PM     | 0            | 0                  |
| 24                                             | MIDNITE      | 0            | 0                  |
| AVERAGE OF EIGHT HOURLY VOLUMES                |              |              |                    |
| RANKED HOURS                                   | MAJOR STREET | MINOR STREET | CRITERIA MET?      |
| 1 to 8                                         | 492          | 106          | No                 |
| 2 to 9                                         | 468          | 103          | No                 |
| 3 to 10                                        | 444          | 94           | No                 |
| 4 to 11                                        | 419          | 89           | No                 |
| 5 to 12                                        | 394          | 83           | No                 |
| 6 to 13                                        | 363          | 74           | No                 |
| 7 to 14                                        | 307          | 62           | No                 |
| 8 to 15                                        | 254          | 49           | No                 |
| 9 to 16                                        | 203          | 39           | No                 |
| 10 to 17                                       | 152          | 26           | No                 |
| 11 to 18                                       | 106          | 18           | No                 |
| 12 to 19                                       | 67           | 10           | No                 |
| 13 to 20                                       | 30           | 3            | No                 |
| 14 to 21                                       | 0            | 0            | No                 |
| 15 to 22                                       | 0            | 0            | No                 |
| 16 to 23                                       | 0            | 0            | No                 |
| 17 to 24                                       | 0            | 0            | No                 |

- The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day, and
- The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour, but
- If the 85th-percentile approach speed of the major-street vehicular traffic exceeds 65 km/h or exceeds 40 mph, the minimum vehicular volume warrants are 70% of the above values.

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*Figure 5: Sunset Ave and Brasher Rd Criteria D Summary*

| Sunset Ave & Brasher Rd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |              |              |                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|----------------------|
| M. U. T. C. D. MULTIWAY STOP - Criterion D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |              |              |                      |
| Minimum Volume and Average Delay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |              |              |                      |
| Required Average Volume on Major Street                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |              | 300          | Criteria D Not Met   |
| Required Average Volume on Minor Street                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |              | 200          |                      |
| Observed Average 8-hour Volume on Major Street                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              | 284          |                      |
| Observed Average 8-hour Volume on Minor Street                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              | 114          |                      |
| <b>CRITERION D:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |              |              | <b>NOT SATISFIED</b> |
| RANKING BY MAJOR STREET HOURLY VOLUMES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |              |              |                      |
| HOURLY VOLUME                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |              |              |                      |
| RANK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | BEGIN TIME   | MAJOR STREET | MINOR STREET         |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 7:00 AM      | 365          | 108                  |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 5:00 PM      | 318          | 98                   |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3:00 PM      | 277          | 158                  |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4:00 PM      | 274          | 128                  |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 6:00 PM      | 269          | 76                   |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | NOON         | 262          | 113                  |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1:00 PM      | 256          | 115                  |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 2:00 PM      | 248          | 117                  |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 8:00 AM      | 230          | 125                  |
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 6:00 AM      | 215          | 62                   |
| 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 11:00 AM     | 214          | 103                  |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 9:00 AM      | 184          | 93                   |
| 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 10:00 AM     | 179          | 99                   |
| 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1:00 AM      | 0            | 0                    |
| 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 2:00 AM      | 0            | 0                    |
| 16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3:00 AM      | 0            | 0                    |
| 17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 4:00 AM      | 0            | 0                    |
| 18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 5:00 AM      | 0            | 0                    |
| 19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7:00 PM      | 0            | 0                    |
| 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 8:00 PM      | 0            | 0                    |
| 21                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 9:00 PM      | 0            | 0                    |
| 22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 10:00 PM     | 0            | 0                    |
| 23                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 11:00 PM     | 0            | 0                    |
| 24                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | MIDNITE      | 0            | 0                    |
| AVERAGE OF EIGHT HOURLY VOLUMES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |              |                      |
| RANKED HOURS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | MAJOR STREET | MINOR STREET | CRITERIA MET?        |
| 1 to 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 284          | 114          | No                   |
| 2 to 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 267          | 116          | No                   |
| 3 to 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 254          | 112          | No                   |
| 4 to 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 246          | 105          | No                   |
| 5 to 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 235          | 101          | No                   |
| 6 to 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 224          | 103          | No                   |
| 7 to 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 191          | 89           | No                   |
| 8 to 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 159          | 75           | No                   |
| 9 to 16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 128          | 60           | No                   |
| 10 to 17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 99           | 45           | No                   |
| 11 to 18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 72           | 37           | No                   |
| 12 to 19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 45           | 24           | No                   |
| 13 to 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 22           | 12           | No                   |
| 14 to 21                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0            | 0            | No                   |
| 15 to 22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0            | 0            | No                   |
| 16 to 23                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0            | 0            | No                   |
| 17 to 24                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0            | 0            | No                   |
| <p>1. The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day, and</p> <p>2. The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour, but</p> <p>3. If the 85th-percentile approach speed of the major-street vehicular traffic exceeds 65 km/h or exceeds 40 mph, the minimum vehicular volume warrants are 70% of the above values.</p> |              |              |                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |              |              |                      |

- For Sunset Ave and Hobbs St, **Criteria D is NOT SATISFIED** for vehicle volumes entering the intersection.
- For Sunset Ave and Poe St, **Criteria D is NOT SATISFIED** for vehicle volumes entering the intersection.
- For Sunset Ave and Brasher Rd, **Criteria D is NOT SATISFIED** for vehicle volumes entering the intersection.

## LOS, CAPACITY, AND QUEUEING ANALYSIS

Per the HCM, LOS is presented as a letter grade (A through F) based on the calculated average delay for an intersection or movement. Delay is calculated as a function of several variables, including signal phasing operations, cycle length, traffic volumes, and opposing traffic volumes, but it is a measurement of the average wait time a driver can expect when moving through an intersection. Factors such as total cycle time (for all movements), queueing restrictions, and vehicle volumes can affect measurements of delay, especially for lower-volume movements and side streets. Generally, these factors are only realized when delays reach or exceed LOS E thresholds. In such cases, a narrative is offered in subsequent sections specific to the individual movement in question.

Table 6 below, reproduced from the HCM, show delay thresholds and the associated Level of service assigned to delay ranges for stop-controlled intersections, respectively. Generally, a LOS of D or better is considered an acceptable level of service.

*Table 6: LOS Criteria for Unsignalized Intersections*

| Level of service | Average Control Delay (sec/vehicle) |
|------------------|-------------------------------------|
| A                | ≤10                                 |
| B                | >10 – 15                            |
| C                | >15 – 25                            |
| D                | >25 – 35                            |
| E                | >35 – 50                            |
| F                | >50                                 |

Queueing is reported in vehicles for all intersections. Queues are reported for queue measurements falling within the 95<sup>th</sup> percentile. It should be noted that 95<sup>th</sup> percentile queues are statistically expected to occur during only 5% of the peak hour's sign cycles. It is also noted that unreported average queueing at an intersection would statistically be much shorter than 95th-percentile queueing.

The volume-to-capacity (V/C) ratio is a performance measure that shows the ratio of traffic volume to the lane group capacity. A V/C ratio greater than 1.00 indicates that demand creates a residual queue for the analysis period.

For the purposes of this analysis, acceptable levels of service (LOS) are defined to be a LOS D or better. Based on procedures outlined in the HCM, intersection delay and level of service for stop-controlled intersections are reported as the delay and level of service for the worst-case movement at each intersection. For all other control types, they are taken for the whole intersection. Detailed output sheets can be found in Appendix A.

### Existing Year 2025 Conditions

Table 7 summarizes the intersection delay, level of service, and queueing under Existing Year 2025 conditions. The following conclusions are made from the Existing Conditions analysis shown in Figure 2:

#### *Delay and LOS Results*

At all intersections where LOS results are present, all movements operate at acceptable LOS during the AM and PM peak hours.

### Queuing Results

At all intersections where queue length results are present, existing storage lengths are sufficient to accommodate 95<sup>th</sup> percentile queue lengths.

*Table 7: HCS Results for Existing 2025 Year Conditions*

| Sunset Ave & Hobbs St (Unsignalized)   |          |                        |      |               |     |                    |                  |         |          |                        |      |               |     |                    |                  |
|----------------------------------------|----------|------------------------|------|---------------|-----|--------------------|------------------|---------|----------|------------------------|------|---------------|-----|--------------------|------------------|
| AM Peak                                | Movement | 95% Queue Length (veh) | V/C  | Delay (s/veh) | LOS | Intersection Delay | Intersection LOS | PM Peak | Movement | 95% Queue Length (veh) | V/C  | Delay (s/veh) | LOS | Intersection Delay | Intersection LOS |
|                                        | WBL      | 0.4                    | 0.13 | 30.9          | D   | ---                | ---              |         | WBL      | 0.2                    | 0.07 | 15.1          | C   | ---                | ---              |
|                                        | WBR      | 0.6                    | 0.18 | 11.0          | B   |                    |                  |         | WBR      | 0.4                    | 0.12 | 9.9           | A   |                    |                  |
|                                        | SBL      | 0.6                    | 0.18 | 9.3           | A   |                    |                  |         | SBL      | 0.2                    | 0.06 | 8.2           | A   |                    |                  |
| Sunset Ave & Poe St (Unsignalized)     |          |                        |      |               |     |                    |                  |         |          |                        |      |               |     |                    |                  |
| AM Peak                                | Movement | 95% Queue Length (veh) | V/C  | Delay (s/veh) | LOS | Intersection Delay | Intersection LOS | PM Peak | Movement | 95% Queue Length (veh) | V/C  | Delay (s/veh) | LOS | Intersection Delay | Intersection LOS |
|                                        | WBT      | 1.1                    | 0.27 | 12.7          | B   | ---                | ---              |         | WBT      | 0.8                    | 0.22 | 12.4          | B   | ---                | ---              |
|                                        | SBL      | 0.3                    | 0.10 | 8.6           | A   |                    |                  |         | SBL      | 0.2                    | 0.06 | 8.0           | A   |                    |                  |
| Sunset Ave & Brasher Rd (Unsignalized) |          |                        |      |               |     |                    |                  |         |          |                        |      |               |     |                    |                  |
| AM Peak                                | Movement | 95% Queue Length (veh) | V/C  | Delay (s/veh) | LOS | Intersection Delay | Intersection LOS | PM Peak | Movement | 95% Queue Length (veh) | V/C  | Delay (s/veh) | LOS | Intersection Delay | Intersection LOS |
|                                        | EBT      | 0.3                    | 0.09 | 15.6          | C   | ---                | ---              |         | EBT      | 0.4                    | 0.12 | 12.1          | B   | ---                | ---              |
|                                        | WBT      | 1.2                    | 0.29 | 13.7          | B   |                    |                  |         | WBT      | 0.5                    | 0.14 | 10.4          | B   |                    |                  |
|                                        | NBL      | 0.0                    | 0.01 | 7.8           | A   |                    |                  |         | NBL      | 0.0                    | 0.01 | 7.4           | A   |                    |                  |
|                                        | SBL      | 0.2                    | 0.08 | 7.9           | A   |                    |                  |         | SBL      | 0.1                    | 0.03 | 7.7           | A   |                    |                  |

## FINDINGS AND CONCLUSIONS

Based on the analysis, the following conclusion can be made:

- Sunset Ave & Hobbs St
  - Capacity issues were not observed for this intersection under Existing 2025 Conditions, all the approaches presented were acceptable LOS D or better. Queuing issues were not observed for any movements during the AM and PM peak hours.
- Sunset Ave & Poe St
  - Capacity issues were not observed for this intersection under Existing 2025 Conditions, all the approaches presented were acceptable LOS D or better. Queuing issues were not observed for any movements during the AM and PM peak hours.
- Sunset Ave & Brasher Rd
  - Capacity issues were not observed for this intersection under Existing 2025 Conditions, all the approaches presented were acceptable LOS D or better. Queuing issues were not observed for any movements during the AM and PM peak hours.

### Crash Summary

- Sunset Ave & Hobbs St

From 2018 to 2022, 13 crashes were reported. The most common contributing factor for vehicle crashes was driver inattention. Most of the vehicle crashes were reported as property damage only, and there were no fatal injured (killed) crashes. The most common lighting condition was daylight. Based on the crash type, most of the vehicle crashes were from same direction/both going straight and fixed object.

- Sunset Ave & Poe St

From 2018 to 2022, 11 crashes were reported. The most common contributing factor for vehicle crashes was failed to yield right of way. Most of the vehicle crashes were reported as property damage only, and there were no fatal injured (killed) crashes. The most common lighting condition was daylight. Based on the crash type, most of the vehicle crashes were from both going straight/entering at angle.

- Sunset Ave & Poe St

From 2018 to 2022, 10 crashes were reported. The most common contributing factor for vehicle crashes was failed to yield right of way. Most of the vehicle crashes were reported as property damage only, and there were no fatal injured (killed) crashes. The most common lighting condition was daylight. Based on the crash type, most of the vehicle crashes were from opposite direction.

All-Way Stop Control Warrant

- Sunset Ave & Hobbs St

None of the criteria required for an all-way stop control were satisfied for this intersection. Therefore, an all-way stop is **NOT WARRANTED.**

- Sunset Ave & Poe St

Criteria A (Crash Summary) was satisfied for this intersection. Therefore, an all-way stop is **WARRANTED.**

- Sunset Ave & Poe St

None of the criteria required for an all-way stop control were satisfied for this intersection. Therefore, an all-way stop is **NOT WARRANTED.**