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October 14, 2022

Robert B. Mudd
President and COO
Notes Live Development Company
1830 Jet Stream Drive
Colorado Springs, CO 80921

RE: Polaris Pointe South
Filing No. 4
Traffic Technical Memorandum
Colorado Springs, Colorado
LSC #S224110

Dear Mr. Mudd:

In response to your request LSC Transportation Consultants, Inc. has prepared this traffic technical memorandum for Filing No. 4 of the Polaris Pointe South development. The Polaris Pointe South development is located west of Voyager Parkway and south of Powers Boulevard. Figure 1 shows the location of the site.

The Polaris Pointe South development includes plans for the Sunset Amphitheater, an 8,000-seat outdoor venue for hosting musical performances. The development will also include three on-site restaurant pads totaling 37,000 sq. ft. (including associated individual parking lots), which will developed as a future phase. This report also identifies likely land uses and future trip generation of future development areas within the greater Polaris Point development district.

REPORT CONTENTS

- Inventory of existing conditions;
- Description of the proposed land uses;
- A summary of the Amphitheater Parking Plan, TNC travel and parking lot shuttle operations;
- Traffic count data;
- The projected vehicle-trip generation for the proposed development including event-day peak trip generation estimates;
- A comparison to the trip-generation estimates assumed for this area in previous reports completed by LSC;

- Traffic operations analysis; and
- Recommendations to accommodate daily development traffic and recommendations for the traffic management/control plan for event-day, peak traffic demand for the largest events.

OVERALL APPROACH TO THE TIS REPORT

- With respect to the overall development, which includes the Sunset Amphitheater venue, this report provides a comparison to the prior plan and TIS report – land use, trip generation, and traffic impacts.
- Identify the land uses and locations, as well as vehicular and pedestrian access points and connections.
- For the Sunset Amphitheater venue – identify parking locations, parking capacities, Transportation Network Company (TNC) drop-off and pick-up locations, shuttle operations including parking area and venue shuttle passenger pick up and drop off locations.
- Call out each of these as separate “trip generators.” Attendee private-vehicle trips, shuttle trips, walking trips, TNC trips, etc. have “trip ends”. Trips are quantified for each “trip generator” and by trip type/mode and time.
- The parking lot shuttle-vehicle trips between the off-site lots and the venue have been based on the *Sunset Amphitheater – Parking & Access Plan* report by Kimley Horn dated October 13, 2022, and account for parking lot demand, the desired shuttle vehicle headways (frequency), and the capacity of the shuttle vehicles.
- The TNC vehicle trips have been estimated based on the overall estimated mode split for this transportation mode. The pre-event trip generation estimate for this mode not only accounts for the trips to transport attendees to the venue, but also trips by the TNC vehicles departing the area after passenger drop off. The post-event estimate accounts for trips by TNC vehicles traveling to the venue to pick up passengers and departing with passengers.
- The venue trips by attendees traveling by private vehicles and TNC trips have been distributed to the area roadway network based on the estimated directions from which attendees will be traveling. Trips have been routed to the local area streets and to the trip-generation locations (parking areas/traffic analysis zones (TAZs)) based on estimated shortest travel times.
- Baseline/background traffic volumes have been estimated for the other area land uses, including the residential developments, area restaurants, other entertainment businesses, shops, etc. Through traffic on the area roadways is also included.
- Estimates of trip reductions for multi-purpose trips on event days have been made to account for trips normally generated by uses such as the restaurants as the primary trip purpose, that would shift to a higher percentage of “secondary purpose” trips, with the trips to the Sunset Venue becoming the primary purpose of the trip. This accounts for venue attendees patronizing the restaurants prior to (or following) a musical performance. Secondary purpose trips to the area restaurants would mainly be short

walking trips from parking areas, TNC drop off, or the venue shuttle stop to the restaurant, then short walking trips to the venue itself.

- Total trip estimates for peak periods before and after musical performances are a combination of venue vehicle trips to/from each of the generation locations plus background trips during the same period. These total vehicle trips have been estimated for the key intersections along Voyager Parkway.
- Based on the total pre- and post- event peak traffic volumes, the key intersections along Voyager Parkway have been analyzed for capacity, delay (levels of service) and vehicle queuing.
- An iterative level of service and queuing analysis has been performed to determine the pre- and post-event peak-period special laneage, signal timing/phasing, and traffic control needed to accommodate the venue trip demands and entering/exiting vehicle flow rates.
- Based on the analysis, LSC has recommended event-specific laneage and signal phasing/timings. Events will require event traffic-control devices such as cones, temporary signs, variable message signs, and potentially traffic-control personnel including off-duty law-enforcement officers at some intersections along Voyager Parkway. Changes to the traffic-signal systems at intersections along Voyager will likely be needed. This may include modification or addition of signal heads, overhead signs, hardware and software changes, as well as creation of event-specific timing plans.
- The report also notes that event traffic-control plans, including lane-use plans, signal-timing/phasing plans will evolve over time. Initial plans will be modified/adjusted based on actual operations once events begin taking place to address issues that arise.
- The report also recommends other measures, such as the ability to provide information to attendees at the time of ticketing, in advance of the event, and potentially in real-time on the day of the event , to assist with traffic management based on the venue operations plan.

SITE DEVELOPMENT AND LAND USE

The 18.713-acre Filing No. 4 site is located on the southwest bend of Spectrum Loop. The site is planned to be developed with an outdoor amphitheater for musical performances and three restaurant “pad” sites (future phase). It is anticipated that the restaurant site “end users” will be fine-dining-type establishments. Note: Filing 4 also includes a portion of the internal street network – for connectivity and circulation.

Currently-Proposed Amphitheater Land Use

The outdoor amphitheater is planned to have a capacity of 8,000 attendees. The venue will host musical performances typically May-September. Events will typically be scheduled for Thursday, Friday, and Saturday evenings, with some mid-week events also anticipated.

Typically, visitor parking lots will open between 5:00 and 5:30 p.m. Lease agreements will not allow parking lots to open earlier than 5:00 p.m. Note: due to this, arrivals for events will not conflict with typical TCA mid-afternoon peak school traffic.

Most performances will begin at 7:00 p.m. and end between 10:00 p.m. and 11:00 p.m. The venue is seeking a permit to operate concerts until 10:30 p.m. on Sunday-Thursday and 11:30 p.m. on Friday and Saturday

Amphitheater Parking Plan

The following information has been taken from the report ***Sunset Amphitheater - Parking & Access Plan*** by Kimley Horn October 13, 2022. That report indicates: *to project parking demand at the Venue/restaurants in a variety of conditions, we used a demand model derived from historic parking ratios provided by the Urban Land Institute's Shared Parking, 3rd Edition (2020) and the Institute of Transportation Engineers' Parking Generation Manual, 5th Edition (2019) and adjusted for local and Site-specific conditions.*

The concert venue plans to utilize a mixture of on-site parking lots, off-site parking lots, and on-street parking. City officials and the Client are interested in meeting Venue parking demand by utilizing shared parking agreements with specific nearby businesses and organizations that have excess parking-lot capacity after 5:00 p.m. when lots open and venue visitors start arriving. This approach is more space- and cost-efficient than building all new parking for a limited-use entertainment complex.

The venue management will provide a minimum of 70% of the required parking (1,400 spaces) within a ½-mile radius of the Sunset Amphitheater. For parking resources beyond roughly a ¼-mile (or 1,200 ft) walking distance, the Venue will offer an optional complimentary shuttle service for patrons that do not wish to walk. For large events, employee parking will be accommodated, predominantly off-site at the Roth Industries Parking or at Compassion International. If for some reason the 70-percent minimum cannot be met, the occupancy of the venue and maximum event attendance would be reduced in order to meet the 70 percent.

All parking lots will be actively managed and staffed with parking attendants. Contract security will be provided to monitor the lots before, after, and during the events. All event visitors will be charged a minimum of \$10 per person and those arriving in personal vehicles will be assigned a lot at the point of ticket purchase. The parking is intended to follow an "unbundled parking" model. A varied parking-lot pricing scheme will encourage a more dispersed traffic and shuttle distribution both pre- and post-show. Event information provided at the time of ticket purchase and in event-related emails can provide this parking scheme, with clear details explaining that fee parking lots must be paid in advance at the time of ticket purchase. Attendees will need to choose a specific lot in advance and they will be assigned to the lot selected. Information regarding recommended travel routes to specific parking lots, if provided to attendees, would assist in managing traffic flow and congestion in the vicinity of the venue before and after events.

The use and management of the on- and off-site parking lots will vary depending on the size of the event. For the purposes of this traffic study, the capacity event condition (8,000 attendees) and associated parking management and shuttle operations plan has been assumed.

The Kimley Horn report contains additional detail and recommendations for managing the parking fees and the overall program.

Parking Spaces by Area/Lot

The main self-park, on-site, parking lot (Lot 1) will provide 236 spaces, including 30 ADA spots and 20 spaces backstage.

The City has agreed that on-street parallel parking along Spectrum Loop can be utilized by the Venue as part of the required supply. Spectrum Loop has capacity for approximately 499 spaces, 30 of which will be used for on-street rideshare pickup and drop-off. Due to the difficulty in enforcing on-street parking restrictions, these stalls will likely be available on a “first-come first-served” basis.

For initial operations, 500 interim parking spaces (Project Phase 1) will also be provided on the north side of the venue within Polaris Pointe for a 2-year duration. After that point, that site will be developed, and the Client must establish adequate parking supply elsewhere (Project Phase 2). The Phase 2 parking will likely include an expansion of The Classical Academy (TCA) parking lots to the west and north, with a new vehicular and pedestrian access point off Spectrum loop to the south of the Venue, or through an extension of the Polaris Pointe onsite agreement.

Additional parking demand is planned to be met by utilizing parking lots in the following locations:

- Adjacent to Bass Prop Shops (195 spots)
- The Classical Academy (TCA) (475 existing spots plus 900 future spots to be developed after the interim on-site lot is closed)
- Compassion International (Sites 1-2) (1,164 spots)

The location of the remote lots and number of spaces is shown in Figure 1. For more detail and the operation and use of these off-site lots, please refer to **Sunset Amphitheater - Parking & Access Plan** by Kimley Horn October 13, 2022.

The actual number of vehicles parked within each lot will depend on event attendance and the number of attendees purchasing a parking space in each lot. Analysis contained in this LSC report is based largely on the plan presented in the Kimley Horn report.

Up to twelve parking-lot shuttle vehicles are planned to be used. The actual number for events smaller than capacity events will be dependent on the event attendance and the operations plan/event-specific use of each lot.

TNC Mode of Travel and Employee Trips

The Kimley Horn team, in their report, *“adjusted the ratio of visitors projected to park onsite to 75% of the base ratio. This adjustment is based on TNC (Uber/Lyft) usage data provided by AEG Presents that shows approximately 35-45% of venue customers with similar demographics tend to use TNC transportation to/from performance venues. We took a more conservative adjustment because Colorado Springs personal driving habits are assumed to be greater than the national average and TNC driver supply in the Colorado Springs area is assumed to be lower than the supply needed to support higher peak evening rider demand. A mode share split for TNC travel has been assumed in this analysis.*

The employee driving ratio was adjusted to 93% to account for the venue management’s assumed robust employee transportation demand management (TDM) plan focusing on carpooling resources and incentives as well as an emphasis on employee drop-offs and pickups. No public transit adjustment was applied since local bus routes do not yet extend far enough north to reasonably serve the Venue.”

The Kimley Horn report contains additional detail and recommendations for TNC incentives.

TNC Pickup and drop off

The curb area on the east side of Spectrum Loop between the north backstage ingress/egress and the private drive measures approximately 22 passenger vehicle lengths. This zone has been identified as the preferred TNC (e.g., Uber and Lyft) pickup/drop-off location for the Venue. In this configuration, TNC riders will not have to cross the vehicle lanes on Spectrum Loop.

Employees arriving prior to 5:00 p.m. will not be able to park at TCA, Compassion International, or Bass Pro Shop lots. However, there will be employee parking available at the J.W. Roth offsite parking lot located on Jet Stream Drive. About one third of employees will arrive prior to 4:00 p.m. and two-thirds will arrive after 4:00 p.m.

Non-Concert Events

The Venue will be offered on a rental basis on dates when a concert is not scheduled. These events, such as weddings, high-school graduations, church services, etc., are not anticipated to attract attendance and associated parking demand at the same level as high-attendance concerts. Venue management may agree to run one or more shuttle-lot routes to serve these events, based on anticipated or confirmed attendance that is expected to exceed the onsite parking capacity. The specific parking capacity needed for such events can be scaled according to the attendance tiers established in the Kimley Horn report.

Events at Nearby Venues

During the season, other area events may have scheduled events such as Air Force Academy football games, TCA football games, etc. The owner will coordinate and collaborate with other area event organizers to minimize overlapping events. If event overlap happens to occur, the owner will prepare a special event management and coordination plan. For evenings when TCA football games are scheduled, the management would not schedule any events that require TCA lot parking as the lots would likely be needed for football game attendees.

Existing, Approved, and Proposed/Potential Future Polaris Pointe South Land Uses

LSC completed a traffic impact study (TIS) for the northwest area of Voyager Parkway, then known as Copper Ridge, in September 2009. The currently-proposed Polaris Pointe South Filing No. 4 site was included in that study as part of traffic analysis zone (TAZ) 2. Table 1 presents a summary of the land uses for the existing developed lots and estimates of future development within the area identified as “TAZ 2” in the Copper Ridge TIS.

The 2009 traffic report study was based on a large shopping center with an “entertainment” component consisting of a large, 5,000-seat cinema.

TRIP GENERATION

Filing 4 (Site) Non-Event-Day Trip Generation

The estimates of vehicle trips expected to be generated by the three proposed restaurant pad sites have been made using the nationally published trip-generation rates found in *Trip Generation, 11th Edition, 2021* by the Institute of Transportation Engineers (ITE). Table 2 shows the results of the restaurant trip-generation estimate for Polaris Pointe South Filing No. 4.

As *Trip Generation* does not contain trip-generation rates for an outdoor amphitheater, LSC has estimated the trip generation during the typical day when no concert events are planned to be held (Sunday through Wednesday, generally). This non-event-day estimate is also shown in Table 2. Note: This does not include potential amphitheater facility rentals as described above – trips generated on days rented could vary significantly depending on the size and operational characteristics of each private-party event.

As shown in Table 2, on a typical **non-event** weekday (except for possible private-party facility rental, no events are assumed to occur at the proposed outdoor amphitheater), Polaris Pointe South Filing No. 4 is anticipated to generate approximately 3,152 daily trips. During the morning peak hour, approximately 24 vehicles would enter and 19 vehicles would exit the site. During the evening peak hour, approximately 198 vehicles would enter and 115 vehicles would exit.

Non-Event-Day Trip-Generation Comparison

Table 1 shows the trip-generation estimate for all uses within the area identified as TAZ 2 in the September 2009 Copper Ridge TIS based on the existing, approved, proposed, and potential future land uses within this area and a comparison to the trip generation assumed in the Copper Ridge TIS. The comparison is limited to weekday ITE trip-generation estimates and does not compare amphitheater “event day” trip generation. Typically, the focus of traffic studies is typical weekdays.

The total number of vehicle trips generated by the study-area land uses has been reduced to account for the internal vehicle trips made within the study area between the different land uses. Table 1 shows the number of internal trips assumed for each land use.

As shown in Table 1, the existing, proposed, approved, and future potential land uses for the area south of Powers Boulevard and west of Voyager Parkway served by Spectrum Loop are anticipated to generate about 25,753 daily external trips on the average weekday. This is about 7,890 **fewer** trips per day than was assumed for the same area (TAZ 2) in the September 2009 Copper Ridge TIS. On typical weekdays when no events are being held, about 63 fewer entering vehicles and 392 more exiting vehicles are anticipated during the morning peak hour than were assumed in the Copper Ridge TIS. About 396 **fewer** entering vehicles and 749 **fewer** exiting vehicles are anticipated during the afternoon peak hour than were assumed in the Copper Ridge TIS.

Maximum/Capacity Attendance Event-Day Trip Generation

The amphitheater trip-generation estimate during a concert event day with **maximum/capacity attendance** is presented in Tables 3 and 4. The trip-generation estimate includes separate estimates to and from each of the proposed parking areas, ride-share related trips and shuttle trips to and from the remote lots. These estimates are based on *the Sunset Amphitheater - Parking & Access Plan* by Kimley Horn September 7, 2022. Estimated vehicle trips to be generated are based on the anticipated number of arriving and departing person trips, parking lot priority and number of parked vehicles, trip distribution by time period, and the shuttle plan.

Table 3 shows the trip-generation estimate, based on the Phase 1 parking plan which includes the 500-space **interim** lot just north of the amphitheater site. This phase is planned to be used for the first two years of operation. Table 4 shows the trip-generation estimate, based on the Phase 2 parking plan. The phase 2 plan assumes the interim lot is closed and additional parking is provided at the Classical Academy.

Transportation Mode

The site is located within an area with no mass-transit options. Most attendees will therefore utilize either private vehicles or ride-share apps such as Uber or Lyft. TNC mode-split estimates are presented in the above section of this report.

Pedestrian/walking trips between some parking areas and the venue, and parking-lot shuttle trips are accounted for in the trip-generation estimates based on the Kimley Horn report.

Vehicle Occupancy

The vehicle-trip-generation estimate is based on a vehicle occupancy of 2.5 persons per vehicle. This is the factor used in the Kimley Horn report. Also, a study of Parking at Sporting Events Stadiums in Denver, Colorado performed by the Department of Civil Engineering at the University of Colorado Denver in August 2012 showed that average vehicle occupancy from 2.2 to 3.0 persons per vehicle. The vehicle occupancy used in this study falls in the middle of this range and is consistent with the nationally-published 85th percentile peak-parking demand for Land Use 441 "Live Theater" found in *Parking Generation, 5th Edition, 2019* by ITE.

Dual-Purpose Trips/Internal Trip Capture

Note: The extent of internal capture trips is difficult to predict. There is the potential for a significant percentage of the restaurant trip generation actually being "secondary trip purpose" trips, with the "primary trip purpose" being attending the amphitheater venue. Due to this, estimates of separately calculated "background" trips for the restaurants in the vicinity of the venue may be conservative. This phenomenon may also influence the arrival times. If a significant number of attendees arrive early to patronize the area restaurants or other area businesses, the peak traffic arrivals could be more distributed over time.

TRAFFIC ANALYSIS

Existing Conditions

Existing Traffic Volumes

Figure 2 shows the existing traffic volumes at the intersections of Voyager Parkway/North Gate Boulevard, Voyager/Spectrum Loop (north), Voyager/Spectrum Loop (south)/Copper Center Parkway, Voyager/Powers Boulevard off ramp, Voyager/Powers Boulevard on ramp, Voyager/Stout, and Voyager/Middle Creek during the anticipated peak periods of the proposed concert venue on a Friday night. Friday night was selected for the analysis based on data provided by the City of Colorado Springs which showed that traffic volumes are typically much higher than any other day of the week. The peak periods analyzed in this report include:

- Pre-event peak-hour period: Friday 6:00 – 7:00 pm
- Post-event peak-hour period: Friday 9:30 – 10:30 pm

These volumes are based on manual intersection turning-movement counts conducted by LSC on Friday August 12, 2022, Friday September 16, 2022 and Friday September 23, 2022. Volumes at the Powers Boulevard ramps/Voyager are based on afternoon peak-hour data provided by the City of Colorado Springs Traffic Engineering. The count-data sheets are attached for reference.

Level of Service

Level of service (LOS) is a quantitative measure of the level of delay at an intersection. Level of service is indicated on a scale from “A” to “F.” LOS A represents control delay of less than 10 seconds for unsignalized and signalized intersections. LOS F represents control delay of more than 50 seconds for unsignalized intersections and more than 80 seconds for signalized intersections. Table 1 shows the level of service delay ranges.

Table 1: Intersection Levels of Service Delay Ranges

Level of Service	Signalized Intersections	Unsignalized Intersections
	Average Control Delay (seconds per vehicle)	Average Control Delay (seconds per vehicle) ⁽¹⁾
A	10 sec or less	10 sec or less
B	10-20 sec	10-15 sec
C	20-35 sec	15-25 sec
D	35-55 sec	25-35 sec
E	55-80 sec	35-50 sec
F	80 sec or more	50 sec or more

(1) For unsignalized intersections if V/C ratio is greater than 1.0 the level of service is LOS F regardless of the projected average control delay per vehicle.

Figure 2 presents the results of the **existing** intersection level of service analysis based on the existing traffic volumes and the current traffic-signal timing plans provided by the City of Colorado Springs. The intersections were analyzed using Synchro.

All of the intersections analyzed are currently operating at an overall LOS C or better during the three periods analyzed. Many of the minor side-street movements are currently operating at LOS E. These movements have projected delays in the LOS E range simply because they arrive at the traffic signal at the beginning of the red phase at an intersection with many phases and a long cycle length (138 seconds). These movements would not be considered “failing” since the volume-to-capacity ratios are less than one. The justification is that to progress through traffic along an arterial corridor, the traffic-signal offsets and left-turn phase times have been adjusted to favor the through band, which can result in higher delay for the minor movements even though there is sufficient capacity for them.

PROJECTED FUTURE CONDITIONS

Project Phase 2 (Year 2026) Background Traffic

Background traffic is the traffic estimated to be on the adjacent roadways and at adjacent intersections without the proposed development's trip generation of site-generated traffic volumes. Background traffic includes the through traffic and the traffic generated by nearby developments but assumes zero traffic generated by the site. This TIS includes analysis of a "Project Phase 2" intermediate-term scenario. This scenario assumes the interim 500-space lot north of the venue has been closed, additional parking has provided at the Classical Academy, a bridge for both vehicular and pedestrian access has been constructed between the new TCA parking areas and Spectrum Loop and the remaining vacant parcels within Polaris Pointe has all been developed including the future restaurant pads proposed as part of Polaris Pointe Filing No. 4. The anticipated year for this scenario to occur is 2026. Figure 3 shows the projected background traffic volumes for this Project Phase 2 (Year 2026) scenario. The background traffic volumes were based on the existing traffic-count data and previous work completed by LSC in the area. The background traffic volumes include additional traffic projected to be generated by development within Polaris Pointe and additional through traffic due to regional growth but no traffic due to the proposed event venue.

Directional Distribution and Assignment

The directional distribution of the site-generated traffic volumes on the area roadways is an important factor in determining the site's traffic impacts.

The following general distribution was assumed for event-related traffic:

- 35%: Northwest (Monument/tri-lakes area, Metro Denver, north front range, etc.)
- 40%: Southwest (west Colorado Springs, Canon City, Pueblo, Teller County, etc.)
- 25%: East (Highway 83 corridor north, Black Forest, east Colorado Springs, El Paso County etc.)

Trip-distribution percentages in combination with local area trip-routing estimates by LSC were applied to the trip-generation estimates (from Tables 3 and 4) to develop pre- and post-event site-generated traffic volumes on the study-area roadways and at the study-area intersections.

The following general distribution was assumed for traffic related to other developments within Polaris Pointe including the three proposed future restaurant pads:

- 25%: Northwest (Monument/tri-lakes area, Metro Denver, north front range, etc.)
- 45%: Southwest (west Colorado Springs, Canon City, Pueblo, Teller County, etc.)
- 30%: East (Highway 83 corridor north, Black Forest, east Colorado Springs, El Paso County etc.)

Figure 4 shows the Phase 1 site-generated traffic volumes related to the proposed concert venue during the pre-event and post-event peak hours. These volumes assume the 500-space interim lot is operating north of the site and overflow parking to the off-site lots as shown in the *Sunset Amphitheater - Parking & Access Plan* by Kimley Horn October 13,, 2022. The volumes shown in Figure 4 also include traffic projected to be generated by TNC vehicles and shuttle buses.

Figure 4 also shows the Phase 2 site-generated traffic volumes related to the proposed concert venue during the pre-event and post-event peak hours. These volumes assume the 500-space interim lot has been closed and additional parking has been added at the Classical Academy site. The Phase 2 volumes also assume a vehicle and pedestrian bridge has been constructed between the Classical Academy parking areas and Spectrum Loop.

TOTAL TRAFFIC

Figure 5 shows the sum of the existing traffic volumes (from Figure 2) plus the Phase 1 site-generated traffic volumes (from Figure 4). Figure 6 shows the sum of the Phase 2 (Year2026) background traffic volumes (from Figure 3) and the Phase 2 site-generated traffic volumes (from Figure 4).

Projected Levels of Service

The study-area intersections have been analyzed to determine the projected future levels of service based on the Synchro signalized-intersection procedures. The results of the analysis are contained in Figures 5 and 6. The level of service reports are attached.

The LOS analysis assumes the signal-controlled intersections on Voyager Parkway between North Gate Boulevard and Middle Creek Parkway are operating using special events signal-timing plans. The analysis also assumes the lane geometry and traffic shown in Figures 5 and 6 and detailed below in the recommendations section of this TIS. As shown in Figures 5 and 6, the study-area intersections are all projected to operate at an overall LOS D or better during both the pre-event and post-event peak hours.

QUEUING ANALYSIS

A queuing analysis of the study-area intersections was performed using Synchro/SimTraffic, based on the Phase 2 (Year 2026) total traffic volumes. The pre-event and post-event peak-hour traffic volumes were entered into the Synchro model. The simulation was run five times. The queuing reports are attached.

Voyager/North Gate

The existing auxiliary turn lanes on North Gate Boulevard approaching Voyager Parkway and on Voyager Parkway approaching North Gate Boulevard are anticipated to be able to accommodate

the projected event-related vehicle queues if the existing single westbound left-turn lane on North Gate Boulevard is restriped to provide dual turn lanes (along with associated signal-system modifications).

Voyager/Spectrum Loop (North)

Significant vehicle queues, notably post-event, are anticipated on the eastbound leg of the Voyager/Spectrum Loop (north) intersection. These are primarily due to the high projected eastbound right-turn volume. The recommendations section contains details regarding temporary traffic-control measures before and after events.

Voyager/Powers Boulevard Southbound Off Ramp

Significant vehicle queues are anticipated on the southbound Powers Boulevard ramp approaching Voyager Parkway, primarily during the hour prior to the start of an event. As part of a pre-event traffic-control plan, it will likely be necessary to temporarily allow for an eastbound dual right-turn capability to accommodate the high projected right-turning volume. The recommendations section contains details regarding temporary traffic-control measures during events.

Voyager/Spectrum Loop (South)/Copper

A high southbound right-turn volume is projected, and this turning movement has been modeled as a “free-right” turn in the queuing analysis. Also, the projected maximum queue on eastbound Spectrum Loop approaching Voyager Parkway is about 346 feet. During events, it will likely be necessary to provide a temporary overlap phase for southbound Voyager Parkway to westbound Spectrum Loop during the eastbound left-turn phase. Also, temporary implementation of dual eastbound left-turn lanes on Spectrum Loop approaching Voyager Parkway will likely be needed. The recommendations section contains details regarding temporary traffic-control measures during events.

2045 Analysis

An addendum report will be provided by with projections for 2045 traffic volumes and associated traffic analysis at the intersections along Voyager Parkway. The city working with a consultant on the future configuration of the Powers ramp intersections with the planned extension of Powers south to Highway 83. LSC is working with City staff to integrate the latest projections associated with this amphitheater and development project into the analysis and design of the ramp intersection modifications. This analysis may also include associated future modifications (if needed) at the Voyager/Spectrum Loop intersections.

RECOMMENDATIONS

For the proposed Sunset Amphitheater event days, an iterative level of service and queuing analysis has been performed to determine the pre- and post-event peak-period special laneage, signal timing/phasing, and traffic control needed to accommodate the venue trip demands and entering/exiting vehicle flow rates.

A special-event traffic-control plan will be needed. An event-day-specific traffic-signal timing plan will need to be created for the entire Voyager Parkway corridor. This corridor currently operates in coordination from 6:30 a.m. to 6:30 p.m. On event days, it will likely be necessary to start a special-event plan starting at 5:30 or 6:00 p.m. Preliminary analysis utilizes an event-peak signal-cycle length of 90 seconds between the Northgate/Voyager intersection and the South Spectrum Loop/Voyager intersection.

The following are recommendations to for permanent improvements and temporary/event traffic-control plan elements with respect to lane usage and signal phasing.

Voyager/North Gate

The existing single westbound left-turn lane on North Gate Boulevard at Voyager may need to be converted to a dual turn lane. Signal-system modifications would also be needed with the restriping for dual left turns.

Voyager/Spectrum Loop (North)

Significant vehicle queues, notably post-event, are anticipated on the eastbound leg of the Voyager/Spectrum Loop (north) intersection. It will likely be necessary to add protected permissive phasing for the eastbound and westbound left-turn movements. As part of a post-event traffic-control plan, it may be necessary to temporarily allow for an eastbound to southbound dual right-turn capability through the use of temporary traffic-control measures, such as signage and/or cones to temporarily designate the eastbound through lane (the middle approach lane) as a shared through/right lane. The right lane would continue to operate as an exclusive right-turn lane.

Voyager/Powers Boulevard Northbound On Ramp

For the event traffic-control plan lane assignment, LSC recommends the following:

- Southbound approach: three southbound lanes temporarily utilized in this configuration (from right to left):
 - Exclusive southbound right turn only,
 - Through/right-turn shared lane,
 - Exclusive southbound through lane

- Implement northbound dual left-turn lanes by adding left-turn signal head(s) and restriping for northbound dual left turn lanes.

Voyager/Powers Boulevard Southbound Off Ramp

Significant vehicle queues are anticipated on the southbound Powers Boulevard ramp approaching Voyager Parkway, primarily during the hour prior to the start of an event. As part of a pre-event traffic-control plan, it will likely be necessary to temporarily allow for an eastbound dual right-turn capability through the use of temporary traffic-control measures, such as signage and/or cones, to temporarily designate the eastbound middle lane (currently signed and marked as the No. 2 eastbound left-turn lane) as a second eastbound-to-southbound right-turn lane. This would temporarily create an eastbound-to-southbound dual right-turn capability as the existing right lane would continue to operate as exclusive right-turn lane. The traffic-control plan should utilize cones, temporary delineators, or similar devices to create temporary “free-right” turn configuration for the right lane. Additionally, temporary signs should be placed along the eastbound Powers Ramp on the approach to the Voyager intersection to indicate the temporary change in approach “lane assignments.” Signs should generally indicate:

- "Right Lane: **Right turn only** - to Spectrum Loop; VIP Lot, Lot 1"
- "Middle Lane: **Right turn only** – to Voyager Parkway South; TCA Lots, South Shuttle Lots, Copper Center Parkway"
- "Left Lane: **Left turn only** - Voyager Parkway North"

Note: It is our understanding that future plans for the Voyager/Powers interchange include a **permanent** dual right-turn capability on this eastbound approach.

Voyager/Spectrum Loop (South)/Copper

During events it will likely be necessary to provide a temporary “overlap” phase for the southbound Voyager Parkway to westbound Spectrum Loop during the phase for the eastbound left-turn movement. Also, restripe for dual eastbound left-turn lanes on Spectrum Loop approaching Voyager Parkway and install signal heads for the dual left phasing. A signal head for the westbound left turn may also be needed to utilize an opposing left turn phase. The projected maximum queue on Spectrum Loop approaching Voyager Parkway is about 346 feet. No parking or bike lanes should be allowed during events between Voyager Parkway and the first intersection to the west. Also, pedestrians should be directed to the west along Spectrum loop or across the south and east legs of the intersection (due to the southbound free right turn). Alternatively, the traffic-control plan could allow for periodic pedestrian crossing with traffic control (uniformed law enforcement) officers.

LSC recommends planning for assistance by traffic-control officers during peak event arrival and departure times at the intersection of Voyager/Spectrum Loop (south) and potentially other

intersections to the north. There is heavy traffic flow projected to travel from southbound (locally eastbound) Powers Boulevard to southbound Voyager (short segment) and a relatively high volume will also turn right onto Spectrum Loop (South) just to the south. There is also a high volume projected for the eastbound right turn at the Spectrum Loop (North)/Voyager intersection and for the southbound right turn at the Voyager/Powers northbound (locally westbound) on-ramp intersection. The following recommendations have been made to accommodate these high directional volumes associated with large/capacity events.

- The event-specific laneage and signal phasing/timings will likely require event traffic-control devices such as cones, temporary signs, variable message signs, and traffic-control personnel including off-duty law enforcement officers at some intersections along Voyager Parkway. Changes to the traffic-signal systems at intersections along Voyager will likely be needed. This may include modification or addition of signal heads, overhead signs, hardware and software changes, as well as creation of event-specific timing plans. Please refer to the attached preliminary traffic control plan concept.
- It is important to note that event traffic-control plans, including lane-use plans, signal-timing/phasing plans will evolve over time. Initial plans will be modified/adjusted based on actual operations once events begin taking place to address issues that arise.
- The event organizers will be able to control several factors affecting travel demand through the ticketing process. The organizers will have the opportunity to, and have indicated the commitment to, continue communication with attendees **after** ticket purchase. This communication would occur during the days prior to the event and on event day in order to relay information, via technology (phone apps., text messages, etc.), such as real-time traffic congestion, recommended vehicular travel routes to/from parking areas and the TNC drop off zone, shuttle status and wait times, and recommended walking routes to/from the venue. Dynamic electronic signage is also proposed to relay information to drivers arriving from North Gate Boulevard, Voyager Parkway, and Powers Boulevard.
- The event organizers may be able to utilize real-time information available from the City TOC (Traffic Operations Center) and coordinate real-time messaging on CDOT changeable message signs along Interstate 25 and other area state highways. These elements could become part of the event traffic management plan.

* * * * *

Please contact me if you have any questions regarding this report.

Respectfully submitted,

LSC TRANSPORTATION CONSULTANTS, INC.



By: _____
Jeffrey C. Hodsdon, P.E.
Principal

JCH/KDF:jas

Enclosures: Table 2 – Table 5
Figures 1 - 6
Traffic Count Reports
Level of Service Reports
Queuing Reports
Preliminary traffic Control Plan Concept

Tables



**Table 2
Non-Event Weekday Trip Generation Estimate
Polaris Pointe South Filing No. 4**

Land Use Code	Land Use Description	Trip Generation Units	Trip Generation Rates ⁽¹⁾						Total Trips Generated				
			Non-Event Weekday						Non-Event Weekday				
			Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour		Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour		
			In	Out	In	Out	Traffic	In	Out	In	Out		
---	Amphitheater ⁽²⁾	8,000 seats	---	---	---	---	---	50	10	5	5	20	
931	Fine Dining Restaurant ⁽³⁾	37 KSF ⁽⁴⁾	83.84	0.37	0.37	5.23	2.57	3,102	14	14	193	95	
								3,152	24	19	198	115	

Notes:

(1) Source: *Trip Generation, Institute of Transportation Engineers*, 11th Edition, 2021.

(2) The non-event day amphitheater trip generation is based on operational information provided by the applicant.
See Table 3 for event day trip generation estimate

(3) Note: ITE Estimate - Does not include internal capture trips due to restaurant patrons with the primary trip purpose of attending a concert at the proposed amphitheater

(4) KSF = thousand square feet of floor space

Source: LSC Transportation Consultants, Inc.

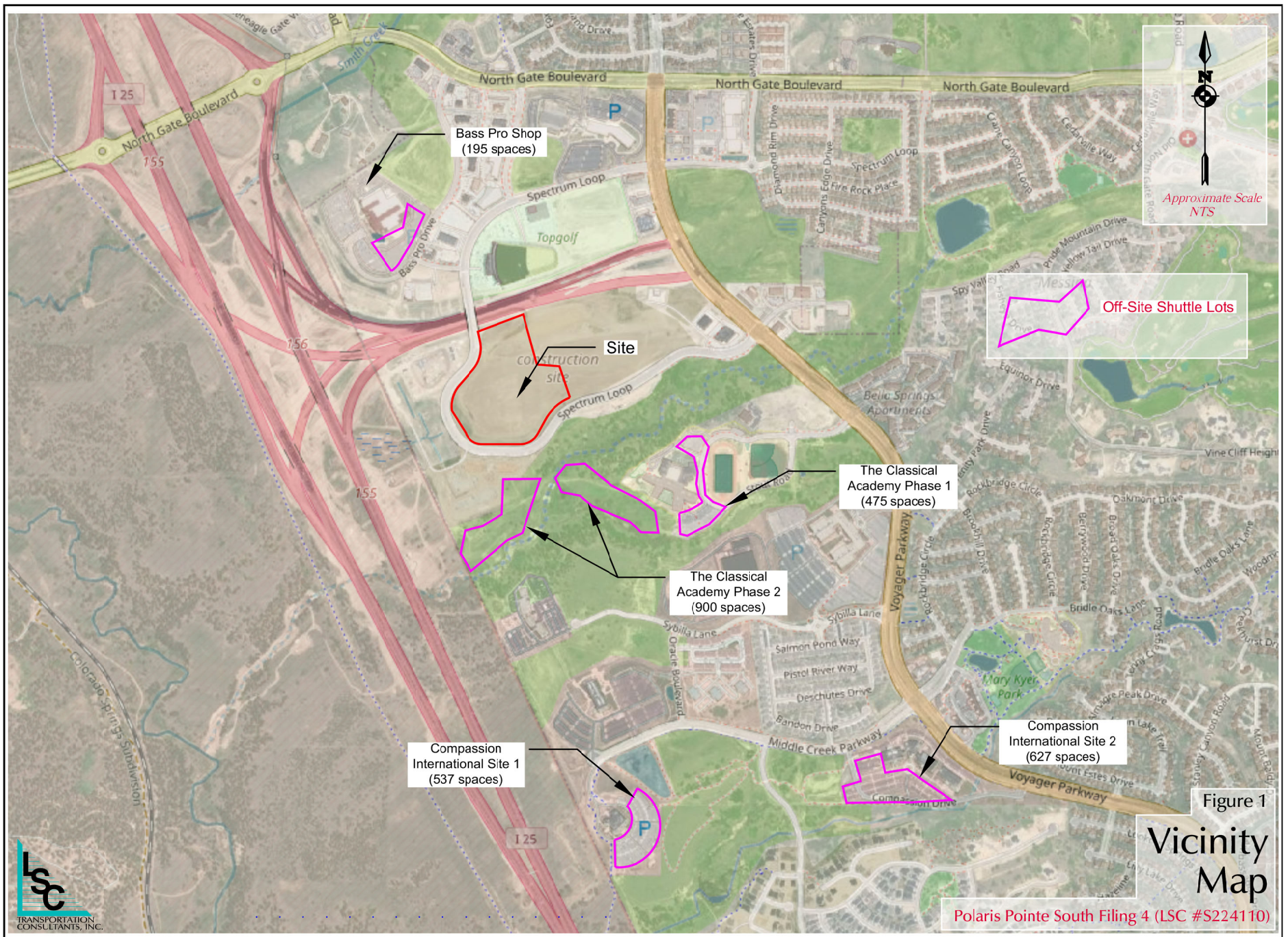
Revised: Sep-22

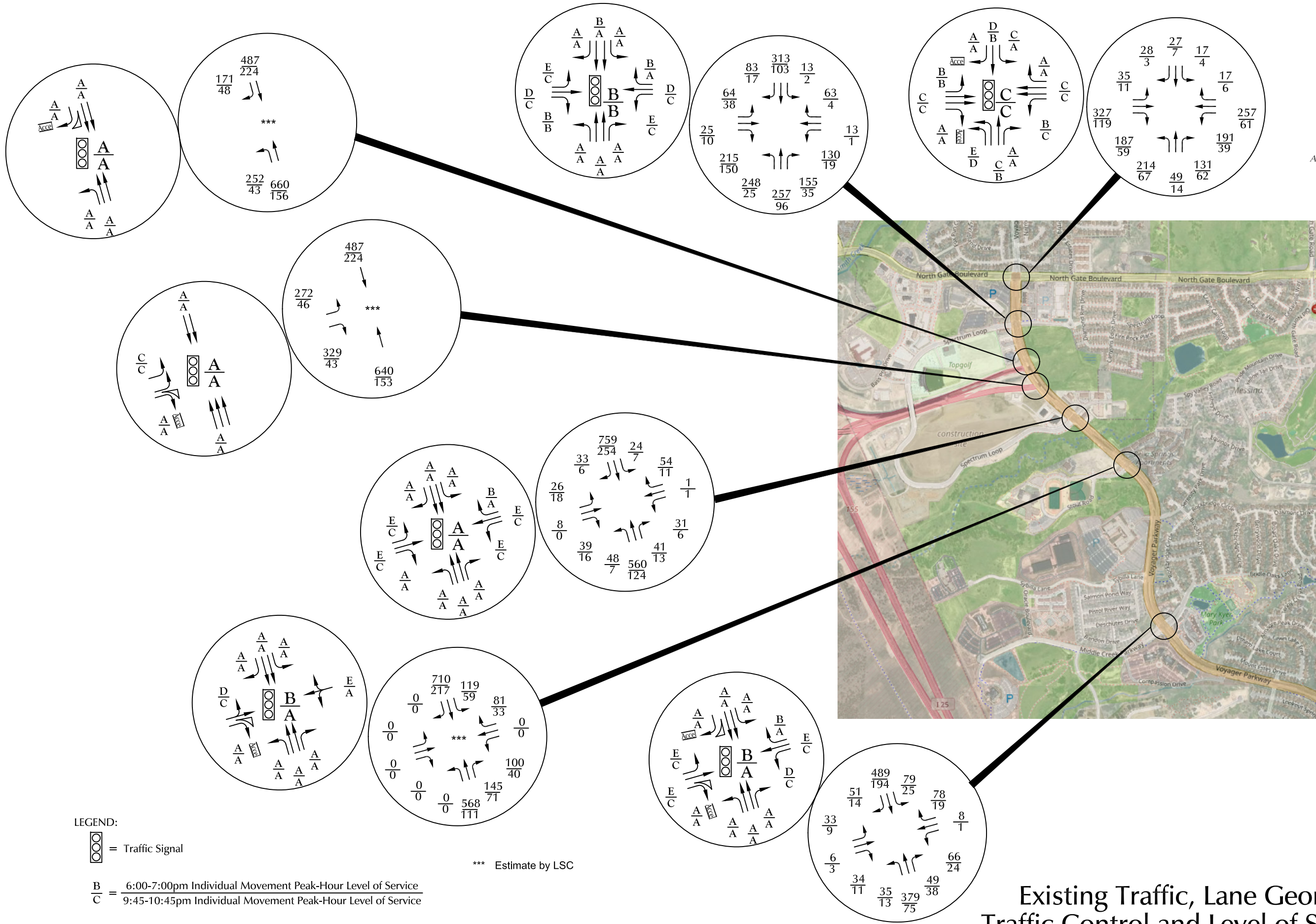
**Table 5
Projected Queue Lengths
Polaris Pointe South Filing No. 4**

Intersection/ Movement	Projected Maximum Queue Lengths								
	2026 Total Traffic								
	Entering Peak				Entering Peak				
	6:00 PM	6:15 PM	6:30 PM	7:00 PM	9:45 PM	10:00 PM	10:15 PM	10:30 PM	
Voyager/Spectrum Loop (North)									
Eastbound Right-turn	425	860	985	1046	305	916	854	428	
Voyager/Powers Southbound Ramp									
Eastbound Right-turn #1	225	567	483	662	50	67	70	47	
Eastbound Right-turn #2					0	143	0	0	
Voyager/Spectrum Loop (South)									
Eastbound Left	160	221	160	224	154	346	342	204	
Southbound Right	719	719	738	755	138	566	290	169	
<i>Source: LSC Transportation Consultants, Inc.</i>								<i>Oct-22</i>	

Figures







LEGEND:
 = Traffic Signal

$\frac{B}{C}$ = $\frac{6:00-7:00pm \text{ Individual Movement Peak-Hour Level of Service}}{9:45-10:45pm \text{ Individual Movement Peak-Hour Level of Service}}$

$\frac{C}{C}$ = $\frac{6:00-7:00pm \text{ Entire Intersection Peak-Hour Level of Service}}{9:45-10:45pm \text{ Entire Intersection Peak-Hour Level of Service}}$

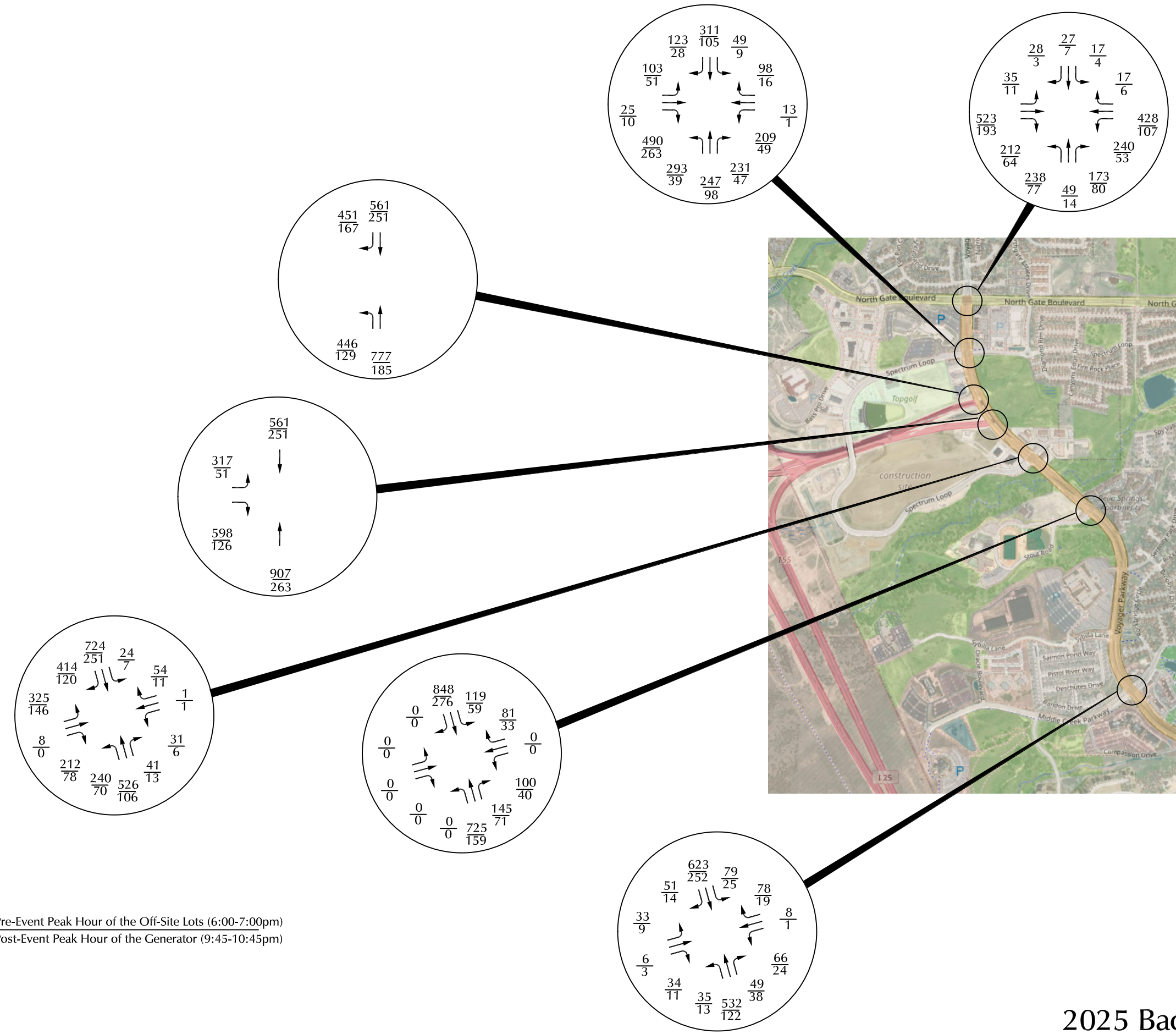
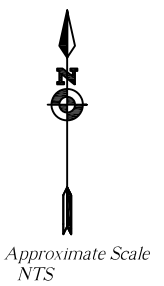
*** Estimate by LSC

$\frac{XX}{XX}$ = $\frac{\text{Pre-Event Peak Hour of the Off-Site Lots (6:00-7:00pm)}}{\text{Post-Event Peak Hour of the Generator (9:45-10:45pm)}}$

Approximate Scale
 NTS



Figure 2
**Existing Traffic, Lane Geometry,
 Traffic Control and Level of Service**
 Polaris Pointe South Filing 4 (LSC #S224110)

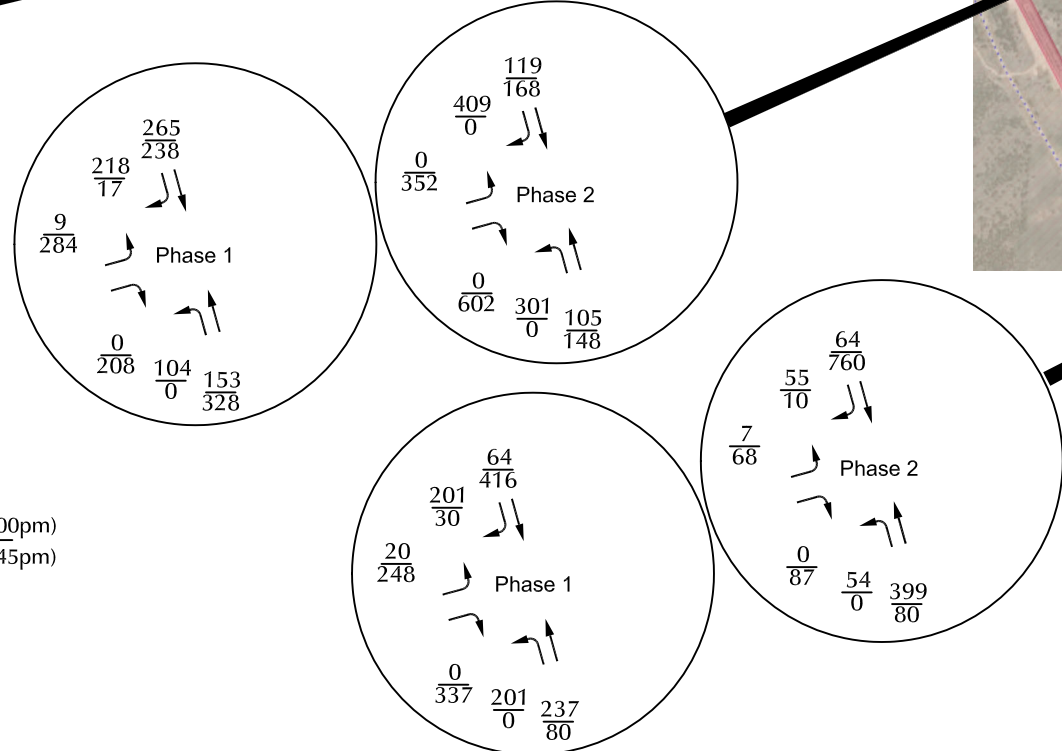
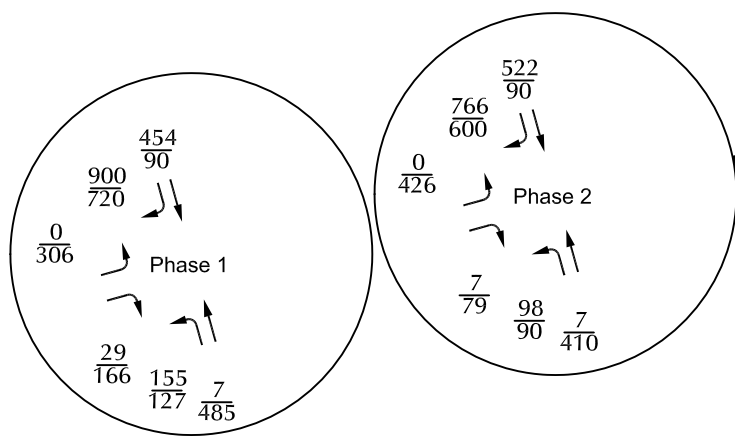
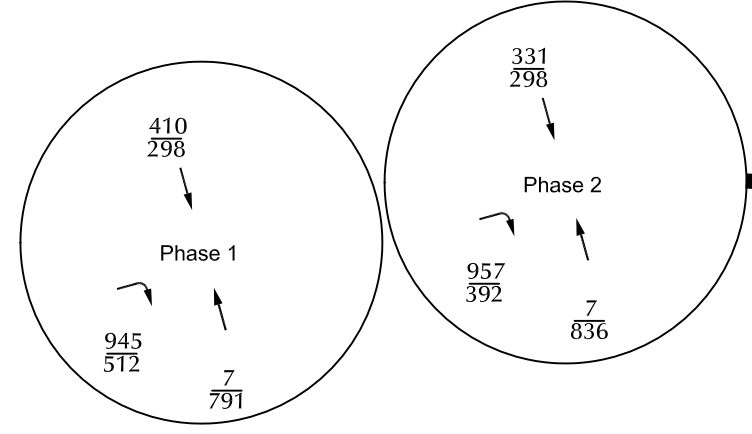
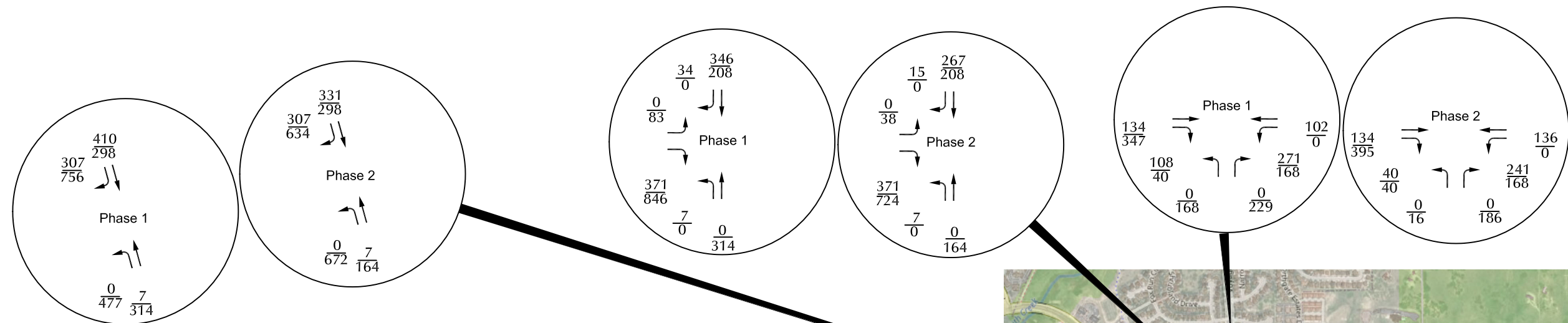


LEGEND:

$\frac{XX}{XX}$ = $\frac{\text{Pre-Event Peak Hour of the Off-Site Lots (6:00-7:00pm)}}{\text{Post-Event Peak Hour of the Generator (9:45-10:45pm)}}$



Figure 3
2025 Background Traffic
 Polaris Pointe South Filing 4 (LSC #S224110)

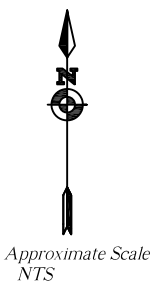
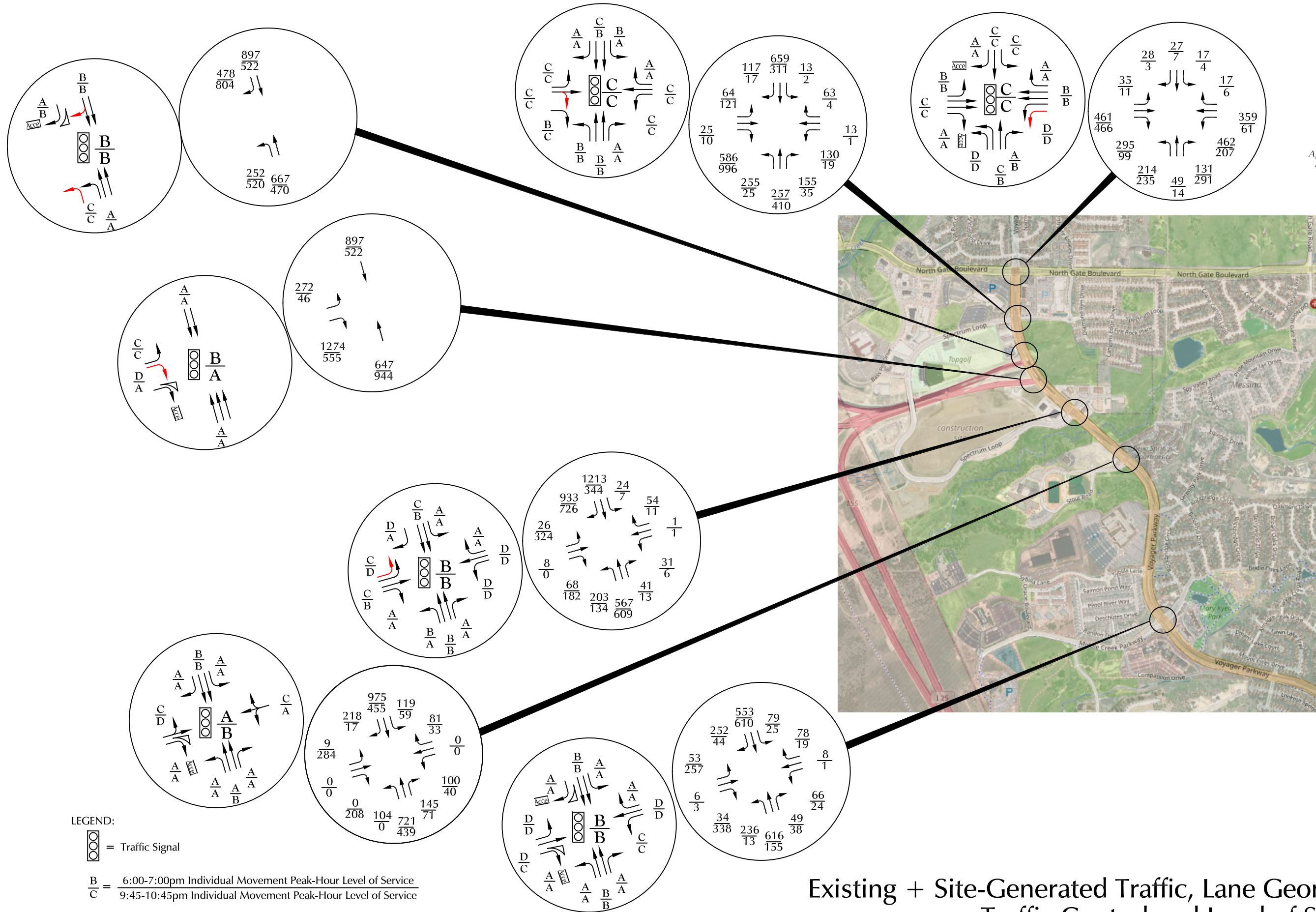


LEGEND:

$\frac{XX}{XX}$ = Pre-Event Peak Hour of the Off-Site Lots (6:00-7:00pm)
 $\frac{XX}{XX}$ = Post-Event Peak Hour of the Generator (9:45-10:45pm)



Figure 4
Site-Generated Traffic Phases 1 and 2
 Polaris Pointe South Filing 4 (LSC #S224110)



LEGEND:

= Traffic Signal

$\frac{B}{C}$ = $\frac{6:00-7:00pm \text{ Individual Movement Peak-Hour Level of Service}}{9:45-10:45pm \text{ Individual Movement Peak-Hour Level of Service}}$

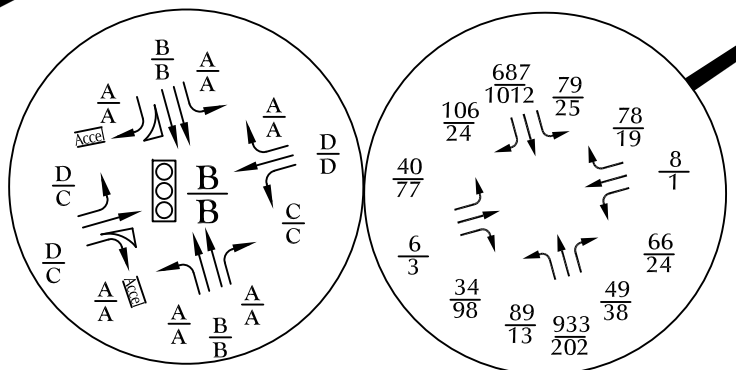
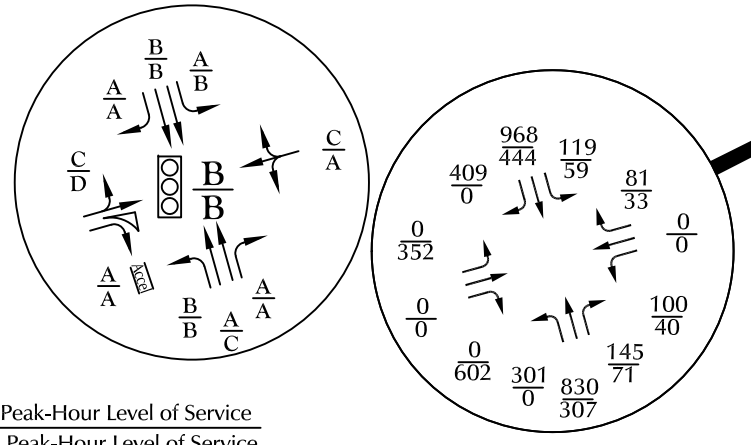
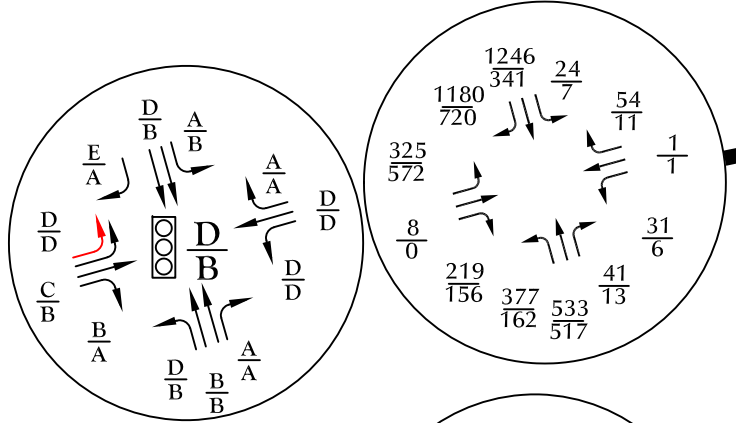
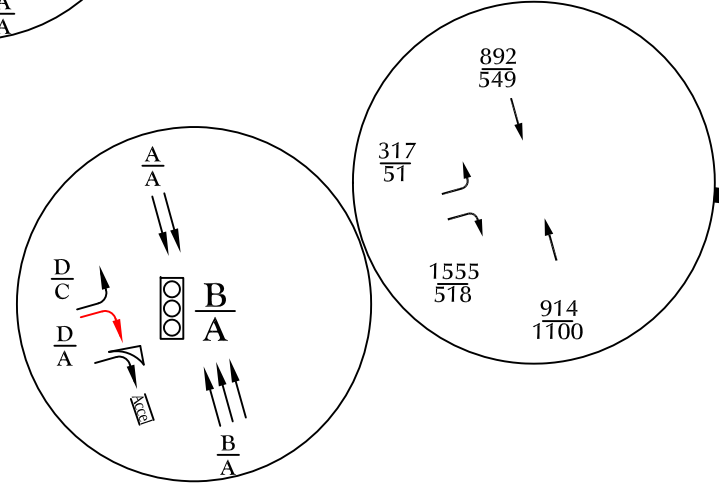
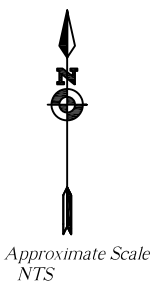
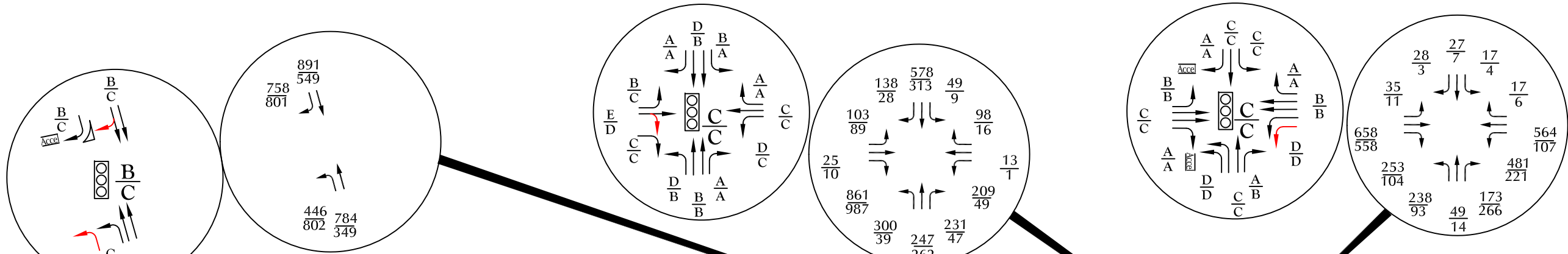
$\frac{C}{C}$ = $\frac{6:00-7:00pm \text{ Entire Intersection Peak-Hour Level of Service}}{9:45-10:45pm \text{ Entire Intersection Peak-Hour Level of Service}}$

$\frac{XX}{XX}$ = $\frac{\text{Pre-Event Peak Hour of the Off-Site Lots (6:00-7:00pm)}}{\text{Post-Event Peak Hour of the Generator (9:45-10:45pm)}}$

Existing + Site-Generated Traffic, Lane Geometry, Traffic Control and Level of Service

Figure 5





LEGEND:
 = Traffic Signal

$\frac{B}{C}$ = $\frac{6:00-7:00pm \text{ Individual Movement Peak-Hour Level of Service}}{9:45-10:45pm \text{ Individual Movement Peak-Hour Level of Service}}$

$\frac{C}{C}$ = $\frac{6:00-7:00pm \text{ Entire Intersection Peak-Hour Level of Service}}{9:45-10:45pm \text{ Entire Intersection Peak-Hour Level of Service}}$

$\frac{XX}{XX}$ = $\frac{\text{Pre-Event Peak Hour of the Off-Site Lots (6:00-7:00pm)}}{\text{Post-Event Peak Hour of the Generator (9:45-10:45pm)}}$



2025 Total Traffic, Lane Geometry, Traffic Control and Level of Service

Figure 6

Traffic Counts



LSC Transportation Consultants, Inc.

2504 E. Pikes Peak Ave, Suite 304
 Colorado Springs, CO 80909
 719-633-2868

File Name : Voyager Pkwy - Northgate Blvd PM

Site Code : S224110

Start Date : 8/12/2022

Page No : 1

Groups Printed- Unshifted

Start Time	Voyager Pkwy Southbound					Northgate Blvd Westbound					Voyager Pkwy Northbound					Northgate Blvd Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
16:45	9	6	5	0	20	3	76	43	1	123	43	15	76	0	134	47	78	7	0	132	409
Total	9	6	5	0	20	3	76	43	1	123	43	15	76	0	134	47	78	7	0	132	409
17:00	11	11	5	0	27	2	81	46	0	129	50	12	86	0	148	46	104	9	0	159	463
17:15	15	14	8	0	37	7	106	41	0	154	63	18	125	0	206	51	100	7	0	158	555
17:30	8	11	5	1	25	11	91	55	0	157	44	28	130	0	202	44	112	8	0	164	548
17:45	6	12	6	0	24	5	66	46	1	118	52	15	100	0	167	50	91	12	0	153	462
Total	40	48	24	1	113	25	344	188	1	558	209	73	441	0	723	191	407	36	0	634	2028
18:00	7	8	3	0	18	6	77	63	0	146	38	9	63	1	111	44	92	11	0	147	422
18:15	11	7	7	0	25	3	75	48	0	126	35	21	55	1	112	55	77	11	0	143	406
18:30	3	6	2	0	11	3	53	40	2	98	35	9	45	0	89	42	88	6	0	136	334
18:45	7	6	5	0	18	5	52	40	0	97	23	10	51	0	84	46	70	7	0	123	322
Total	28	27	17	0	72	17	257	191	2	467	131	49	214	2	396	187	327	35	0	549	1484
*** BREAK ***																					
21:00	2	6	2	0	10	1	19	14	0	34	15	7	26	0	48	24	34	4	0	62	154
21:15	6	3	0	0	9	1	28	8	0	37	18	3	23	0	44	21	39	10	0	70	160
21:30	1	4	2	0	7	3	16	13	0	32	18	3	16	0	37	18	29	2	0	49	125
21:45	2	1	0	0	3	1	18	10	0	29	15	4	21	0	40	7	29	5	0	41	113
Total	11	14	4	0	29	6	81	45	0	132	66	17	86	0	169	70	131	21	0	222	552
22:00	0	1	2	0	3	2	17	6	0	25	14	2	21	0	37	14	33	3	0	50	115
22:15	0	1	0	0	1	0	10	10	0	20	15	5	9	0	29	20	28	1	0	49	99
Grand Total	88	97	52	1	238	53	785	483	4	1325	478	161	847	2	1488	529	1004	103	0	1636	4687
Apprch %	37	40.8	21.8	0.4		4	59.2	36.5	0.3		32.1	10.8	56.9	0.1		32.3	61.4	6.3	0		
Total %	1.9	2.1	1.1	0	5.1	1.1	16.7	10.3	0.1	28.3	10.2	3.4	18.1	0	31.7	11.3	21.4	2.2	0	34.9	

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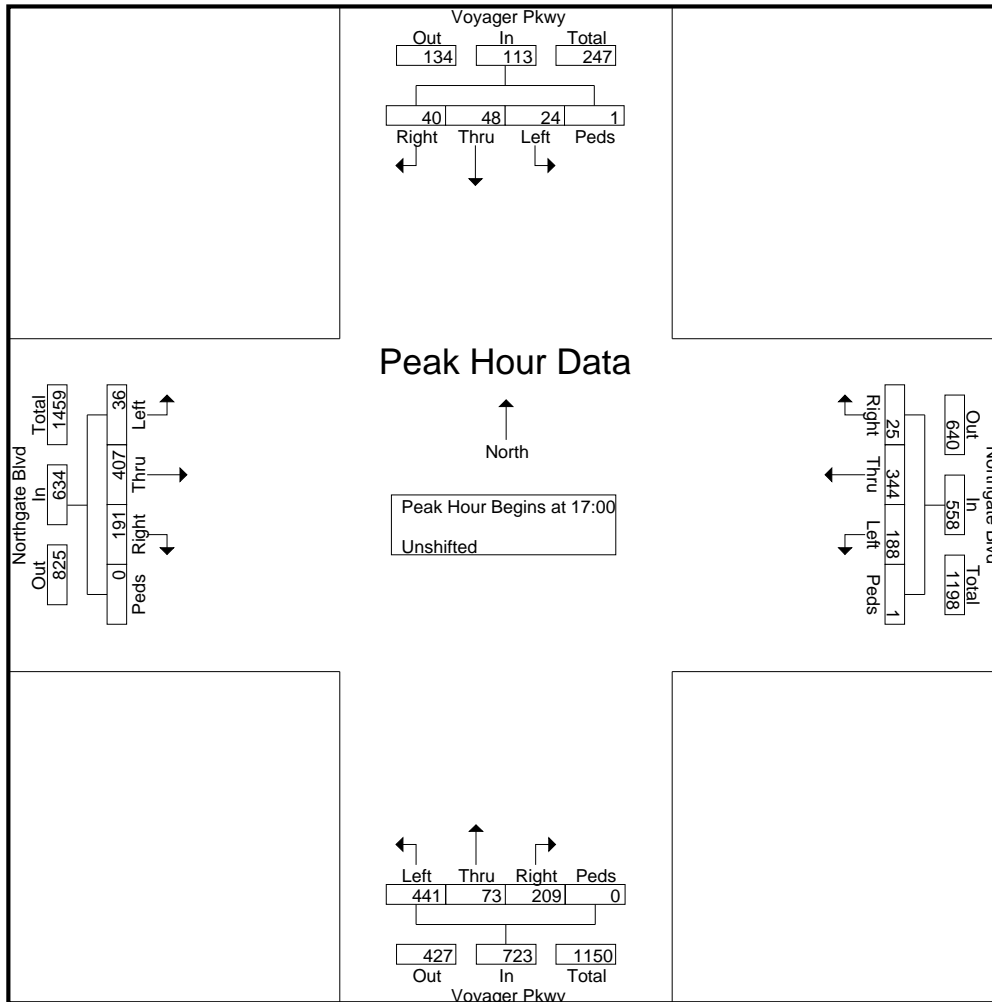
File Name : Voyager Pkwy - Northgate Blvd PM

Site Code : S224110

Start Date : 8/12/2022

Page No : 2

Start Time	Voyager Pkwy Southbound					Northgate Blvd Westbound					Voyager Pkwy Northbound					Northgate Blvd Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 4:45:00 PM to 10:15:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 5:00:00 PM																					
5:00:00 PM	11	11	5	0	27	2	81	46	0	129	50	12	86	0	148	46	104	9	0	159	463
5:15:00 PM	15	14	8	0	37	7	106	41	0	154	63	18	125	0	206	51	100	7	0	158	555
5:30:00 PM	8	11	5	1	25	11	91	55	0	157	44	28	130	0	202	44	112	8	0	164	548
5:45:00 PM	6	12	6	0	24	5	66	46	1	118	52	15	100	0	167	50	91	12	0	153	462
Total Volume	40	48	24	1	113	25	344	188	1	558	209	73	441	0	723	191	407	36	0	634	2028
% App. Total	35.4	42.5	21.2	0.9		4.5	61.6	33.7	0.2		28.9	10.1	61	0		30.1	64.2	5.7	0		
PHF	.667	.857	.750	.250	.764	.568	.811	.855	.250	.889	.829	.652	.848	.000	.877	.936	.908	.750	.000	.966	.914



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File Name : Voyager Pkwy - Spectrum Loop N PM

Site Code : S224110

Start Date : 8/12/2022

Page No : 1

Groups Printed- Unshifted

Start Time	Voyager Pkwy Southbound					Spectrum Loop N Westbound					Voyager Pkwy Northbound					Spectrum Loop N Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
16:45	15	86	9	0	110	10	2	30	0	42	46	101	62	1	210	39	3	15	0	57	419
Total	15	86	9	0	110	10	2	30	0	42	46	101	62	1	210	39	3	15	0	57	419
17:00	9	85	3	0	97	16	1	44	0	61	44	125	54	1	224	57	10	7	0	74	456
17:15	13	85	10	0	108	16	5	20	0	41	52	157	46	0	255	64	4	21	0	89	493
17:30	30	76	4	1	111	24	6	44	0	74	49	171	65	1	286	59	10	17	0	86	557
17:45	26	83	6	0	115	12	5	42	0	59	59	106	74	0	239	50	10	20	0	80	493
Total	78	329	23	1	431	68	17	150	0	235	204	559	239	2	1004	230	34	65	0	329	1999
18:00	30	88	2	0	120	19	1	36	0	56	47	74	65	0	186	59	4	13	0	76	438
18:15	14	91	4	0	109	18	2	35	0	55	44	62	62	1	169	66	5	19	0	90	423
18:30	20	69	2	0	91	12	4	37	3	56	36	68	57	1	162	44	8	17	0	69	378
18:45	19	65	5	0	89	14	6	22	0	42	28	53	64	0	145	46	8	15	1	70	346
Total	83	313	13	0	409	63	13	130	3	209	155	257	248	2	662	215	25	64	1	305	1585
*** BREAK ***																					
21:00	8	40	0	1	49	0	0	8	0	8	10	36	15	1	62	44	5	7	0	56	175
21:15	5	28	1	0	34	4	0	4	0	8	20	24	8	0	52	50	2	14	0	66	160
21:30	4	32	1	0	37	1	1	6	0	8	9	20	11	0	40	37	3	13	0	53	138
21:45	4	21	1	0	26	1	0	6	0	7	8	32	6	0	46	19	3	9	0	31	110
Total	21	121	3	1	146	6	1	24	0	31	47	112	40	1	200	150	13	43	0	206	583
22:00	3	20	0	0	23	2	0	3	0	5	5	23	4	0	32	39	0	8	0	47	107
22:15	6	30	0	0	36	0	0	4	0	4	13	21	4	0	38	55	4	8	0	67	145
Grand Total	206	899	48	2	1155	149	33	341	3	526	470	1073	597	6	2146	728	79	203	1	1011	4838
Apprch %	17.8	77.8	4.2	0.2		28.3	6.3	64.8	0.6		21.9	50	27.8	0.3		72	7.8	20.1	0.1		
Total %	4.3	18.6	1	0	23.9	3.1	0.7	7	0.1	10.9	9.7	22.2	12.3	0.1	44.4	15	1.6	4.2	0	20.9	

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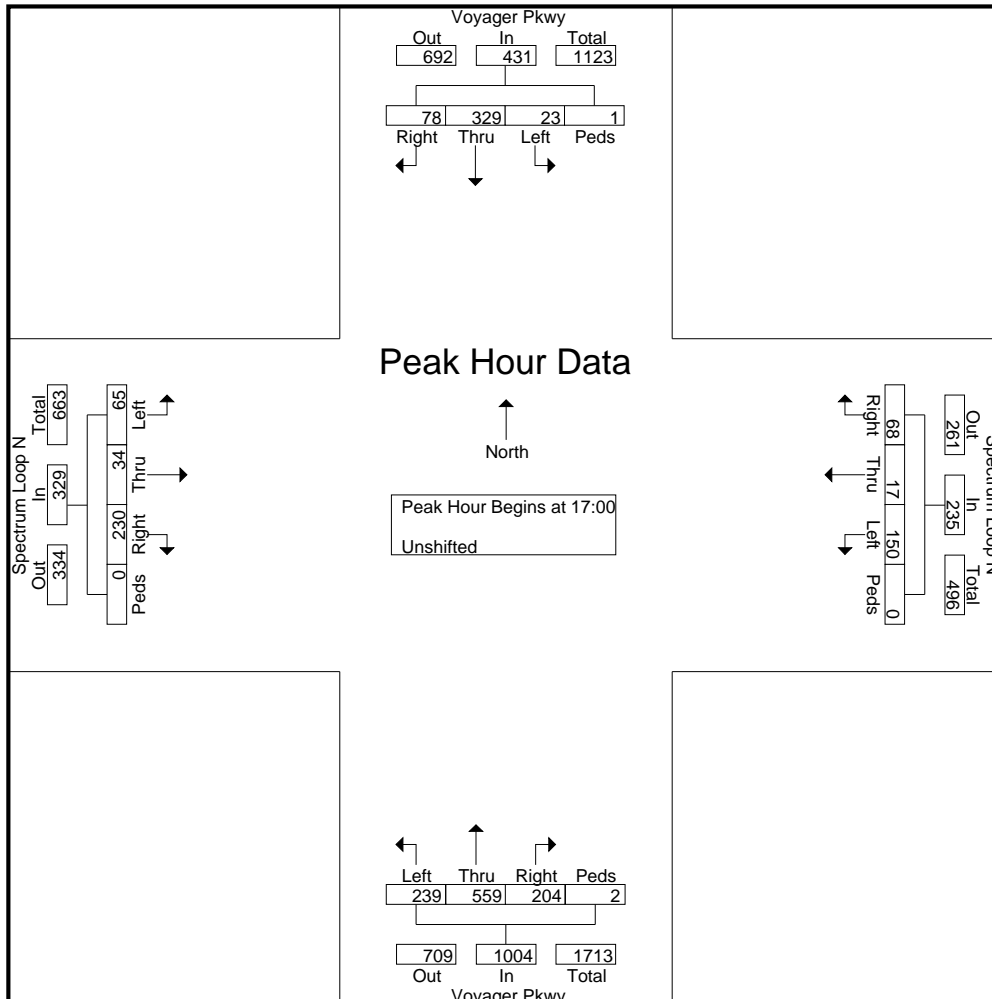
File Name : Voyager Pkwy - Spectrum Loop N PM

Site Code : S224110

Start Date : 8/12/2022

Page No : 2

Start Time	Voyager Pkwy Southbound					Spectrum Loop N Westbound					Voyager Pkwy Northbound					Spectrum Loop N Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 4:45:00 PM to 10:15:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 5:00:00 PM																					
5:00:00 PM	9	85	3	0	97	16	1	44	0	61	44	125	54	1	224	57	10	7	0	74	456
5:15:00 PM	13	85	10	0	108	16	5	20	0	41	52	157	46	0	255	64	4	21	0	89	493
5:30:00 PM	30	76	4	1	111	24	6	44	0	74	49	171	65	1	286	59	10	17	0	86	557
5:45:00 PM	26	83	6	0	115	12	5	42	0	59	59	106	74	0	239	50	10	20	0	80	493
Total Volume	78	329	23	1	431	68	17	150	0	235	204	559	239	2	1004	230	34	65	0	329	1999
% App. Total	18.1	76.3	5.3	0.2		28.9	7.2	63.8	0		20.3	55.7	23.8	0.2		69.9	10.3	19.8	0		
PHF	.650	.968	.575	.250	.937	.708	.708	.852	.000	.794	.864	.817	.807	.500	.878	.898	.850	.774	.000	.924	.897



LSC Transportation Consultants, Inc.

2504 E. Pikes Peak Ave, Suite 304
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File Name : Voyager Pkwy - Spectrum Loop S 9-22 FriPM

Site Code : S224110

Start Date : 9/23/2022

Page No : 1

Groups Printed- Unshifted

Start Time	Voyager Pkwy Southbound					Copper Center Pkwy Westbound					Voyager Pkwy Northbound					S Spectrum Loop Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
16:45	2	167	9	0	178	18	2	10	0	30	10	315	18	0	343	11	2	8	0	21	572
Total	2	167	9	0	178	18	2	10	0	30	10	315	18	0	343	11	2	8	0	21	572
17:00	8	160	10	1	179	14	2	5	0	21	12	324	13	0	349	10	2	11	0	23	572
17:15	6	173	6	0	185	21	1	4	0	26	9	331	5	0	345	12	0	2	0	14	570
17:30	6	174	6	0	186	15	0	5	0	20	9	274	5	0	288	10	1	10	0	21	515
17:45	6	140	7	1	154	14	1	7	0	22	18	209	11	1	239	12	3	4	0	19	434
Total	26	647	29	2	704	64	4	21	0	89	48	1138	34	1	1221	44	6	27	0	77	2091
18:00	6	166	8	0	180	21	1	8	0	30	11	197	12	0	220	10	4	6	0	20	450
18:15	9	124	7	0	140	15	0	8	0	23	11	171	16	0	198	11	0	8	0	19	380
18:30	11	143	5	0	159	13	0	5	0	18	8	166	12	0	186	10	2	7	0	19	382
18:45	7	110	4	2	123	5	0	10	0	15	11	133	8	0	152	8	2	5	0	15	305
Total	33	543	24	2	602	54	1	31	0	86	41	667	48	0	756	39	8	26	0	73	1517
*** BREAK ***																					
21:00	3	82	3	2	90	4	0	5	0	9	4	50	4	0	58	7	0	2	0	9	166
21:15	0	88	3	0	91	5	0	2	0	7	5	37	1	0	43	3	1	2	0	6	147
21:30	3	94	4	0	101	2	1	3	0	6	2	40	0	0	42	4	0	4	0	8	157
21:45	1	91	1	1	94	4	0	2	0	6	3	40	3	0	46	5	0	5	0	10	156
Total	7	355	11	3	376	15	1	12	0	28	14	167	8	0	189	19	1	13	0	33	626
22:00	0	73	1	0	74	2	0	1	0	3	5	33	3	0	41	4	0	6	0	10	128
22:15	2	54	1	2	59	3	0	0	0	3	3	32	1	1	37	3	0	3	0	6	105
Grand Total	70	1839	75	9	1993	156	8	75	0	239	121	2352	112	2	2587	120	17	83	0	220	5039
Apprch %	3.5	92.3	3.8	0.5		65.3	3.3	31.4	0		4.7	90.9	4.3	0.1		54.5	7.7	37.7	0		
Total %	1.4	36.5	1.5	0.2	39.6	3.1	0.2	1.5	0	4.7	2.4	46.7	2.2	0	51.3	2.4	0.3	1.6	0	4.4	

LSC Transportation Consultants, Inc.

2504 E. Pikes Peak Ave, Suite 304
 Colorado Springs, CO 80909
 719-633-2868

File Name : Voyager Pkwy - Middle Creek Pkwy 445-7PM Fri

Site Code : S224110

Start Date : 9/16/2022

Page No : 1

Groups Printed- Unshifted

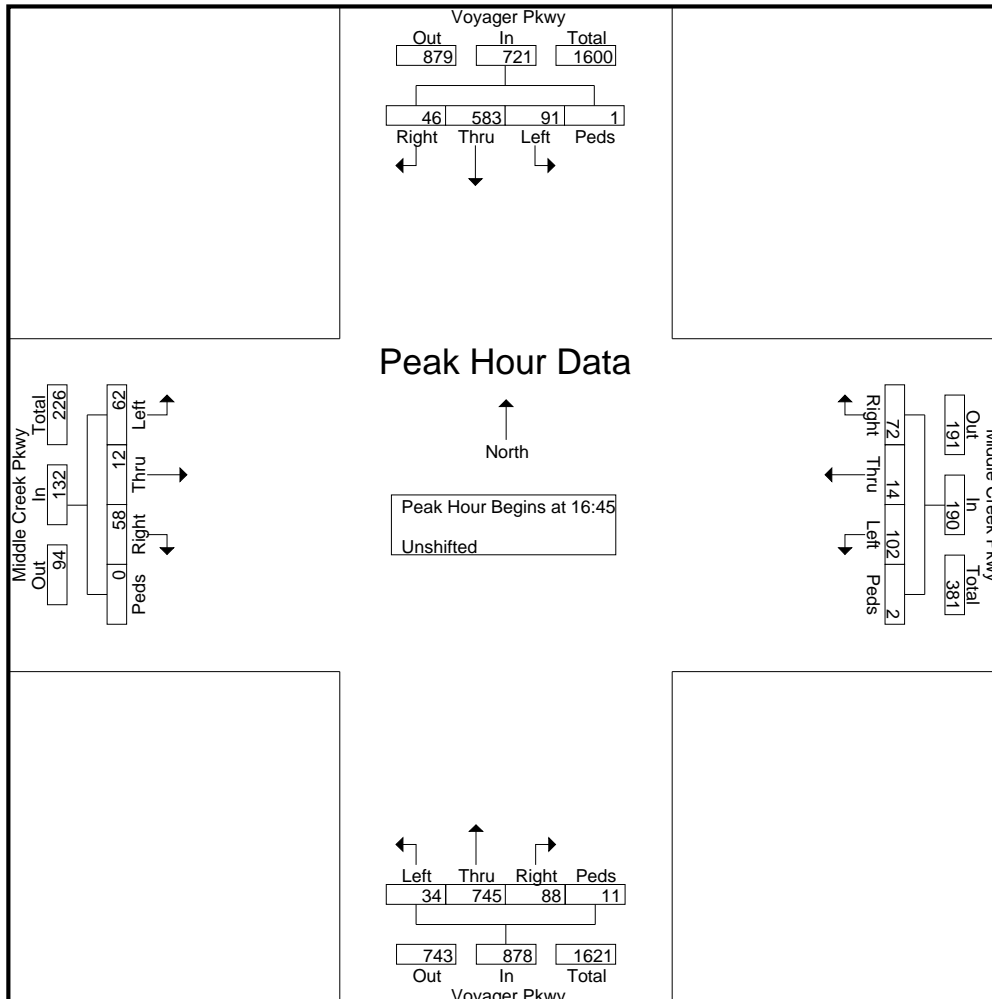
Start Time	Voyager Pkwy Southbound					Middle Creek Pkwy Westbound					Voyager Pkwy Northbound					Middle Creek Pkwy Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
16:45	12	143	19	0	174	18	5	31	0	54	17	213	6	3	239	10	0	16	0	26	493
Total	12	143	19	0	174	18	5	31	0	54	17	213	6	3	239	10	0	16	0	26	493
17:00	15	155	35	1	206	15	3	22	1	41	26	186	7	3	222	17	6	15	0	38	507
17:15	5	151	18	0	174	16	2	26	0	44	20	174	10	1	205	22	2	15	0	39	462
17:30	14	134	19	0	167	23	4	23	1	51	25	172	11	4	212	9	4	16	0	29	459
17:45	14	148	20	1	183	22	2	27	0	51	25	172	15	3	215	12	0	18	1	31	480
Total	48	588	92	2	730	76	11	98	2	187	96	704	43	11	854	60	12	64	1	137	1908
18:00	17	112	21	0	150	20	3	19	0	42	15	95	9	4	123	9	2	12	0	23	338
18:15	11	135	17	0	163	21	2	15	0	38	11	92	10	7	120	8	1	7	0	16	337
18:30	11	110	22	0	143	13	1	16	0	30	15	91	8	3	117	7	3	7	0	17	307
18:45	12	132	19	0	163	24	2	16	0	42	8	101	8	2	119	10	0	7	0	17	341
Total	51	489	79	0	619	78	8	66	0	152	49	379	35	16	479	34	6	33	0	73	1323
Grand Total	111	1220	190	2	1523	172	24	195	2	393	162	1296	84	30	1572	104	18	113	1	236	3724
Apprch %	7.3	80.1	12.5	0.1		43.8	6.1	49.6	0.5		10.3	82.4	5.3	1.9		44.1	7.6	47.9	0.4		
Total %	3	32.8	5.1	0.1	40.9	4.6	0.6	5.2	0.1	10.6	4.4	34.8	2.3	0.8	42.2	2.8	0.5	3	0	6.3	

LSC Transportation Consultants, Inc.

2504 E. Pikes Peak Ave, Suite 304
 Colorado Springs, CO 80909
 719-633-2868

File Name : Voyager Pkwy - Middle Creek Pkwy 445-7PM Fri
 Site Code : S224110
 Start Date : 9/16/2022
 Page No : 2

Start Time	Voyager Pkwy Southbound					Middle Creek Pkwy Westbound					Voyager Pkwy Northbound					Middle Creek Pkwy Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 4:45:00 PM to 6:45:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:45:00 PM																					
4:45:00 PM	12	143	19	0	174	18	5	31	0	54	17	213	6	3	239	10	0	16	0	26	493
5:00:00 PM	15	155	35	1	206	15	3	22	1	41	26	186	7	3	222	17	6	15	0	38	507
5:15:00 PM	5	151	18	0	174	16	2	26	0	44	20	174	10	1	205	22	2	15	0	39	462
5:30:00 PM	14	134	19	0	167	23	4	23	1	51	25	172	11	4	212	9	4	16	0	29	459
Total Volume	46	583	91	1	721	72	14	102	2	190	88	745	34	11	878	58	12	62	0	132	1921
% App. Total	6.4	80.9	12.6	0.1		37.9	7.4	53.7	1.1		10	84.9	3.9	1.3		43.9	9.1	47	0		
PHF	.767	.940	.650	.250	.875	.783	.700	.823	.500	.880	.846	.874	.773	.688	.918	.659	.500	.969	.000	.846	.947



LSC Transportation Consultants, Inc.

2504 E. Pikes Peak Ave, Suite 304
 Colorado Springs, CO 80909
 719-633-2868

File Name : Voyager Pkwy - Middle Creek Pkwy 9-1030

Site Code : S224110

Start Date : 9/16/2022

Page No : 1

Groups Printed- Unshifted

Start Time	Voyager Pkwy Southbound					Middle Creek Pkwy Westbound					Voyager Pkwy Northbound					Middle Creek Pkwy Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
21:00	4	63	6	0	73	5	1	10	0	16	9	38	2	4	53	4	0	4	0	8	150
21:15	4	50	5	0	59	0	0	11	0	11	5	33	3	4	45	2	0	0	0	2	117
21:30	4	62	2	0	68	2	0	4	0	6	8	22	2	3	35	2	1	3	0	6	115
21:45	6	55	8	1	70	4	0	7	0	11	10	17	1	2	30	5	2	3	0	10	121
Total	18	230	21	1	270	11	1	32	0	44	32	110	8	13	163	13	3	10	0	26	503
22:00	2	42	6	0	50	10	0	5	0	15	7	23	4	0	34	2	0	2	0	4	103
22:15	2	35	9	0	46	3	1	8	1	13	13	13	6	2	34	2	0	1	0	3	96
Grand Total	22	307	36	1	366	24	2	45	1	72	52	146	18	15	231	17	3	13	0	33	702
Apprch %	6	83.9	9.8	0.3		33.3	2.8	62.5	1.4		22.5	63.2	7.8	6.5		51.5	9.1	39.4	0		
Total %	3.1	43.7	5.1	0.1	52.1	3.4	0.3	6.4	0.1	10.3	7.4	20.8	2.6	2.1	32.9	2.4	0.4	1.9	0	4.7	

Levels of Service



Timings
1: Voyager Pkwy & North Gate Blvd

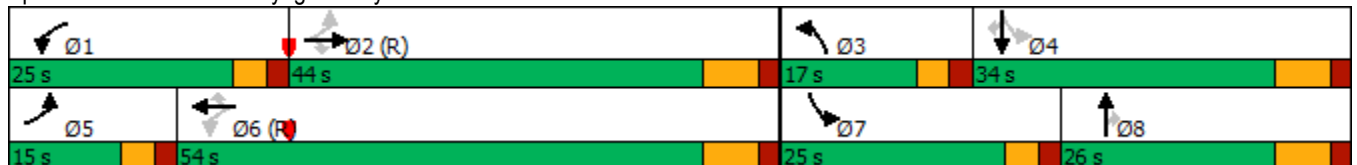
Existing Traffic
6:00 PM-7:00 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	327	187	191	257	17	214	49	131	17	27	28
Future Volume (vph)	35	327	187	191	257	17	214	49	131	17	27	28
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6			8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	20.0	20.0	10.0	20.0	20.0	10.0	20.0	20.0	10.0	20.0	20.0
Total Split (s)	15.0	44.0	44.0	25.0	54.0	54.0	17.0	26.0	26.0	25.0	34.0	34.0
Total Split (%)	12.5%	36.7%	36.7%	20.8%	45.0%	45.0%	14.2%	21.7%	21.7%	20.8%	28.3%	28.3%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effct Green (s)	51.4	42.6	42.6	64.0	54.6	54.6	11.6	36.8	36.8	35.9	27.4	27.4
Actuated g/C Ratio	0.43	0.36	0.36	0.53	0.46	0.46	0.10	0.31	0.31	0.30	0.23	0.23
v/c Ratio	0.08	0.28	0.29	0.43	0.20	0.03	0.72	0.09	0.23	0.05	0.08	0.07
Control Delay	14.7	29.2	4.2	17.7	21.1	0.1	65.5	33.0	1.4	23.9	37.5	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	29.2	4.2	17.7	21.1	0.1	65.5	33.0	1.4	23.9	37.5	0.3
LOS	B	C	A	B	C	A	E	C	A	C	D	A
Approach Delay		19.8			19.0			40.1			19.9	
Approach LOS		B			B			D			B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 24.7
 Intersection LOS: C
 Intersection Capacity Utilization 48.2%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 1: Voyager Pkwy & North Gate Blvd



Timings
2: Voyager Pkwy & Spectrum Loop (north)

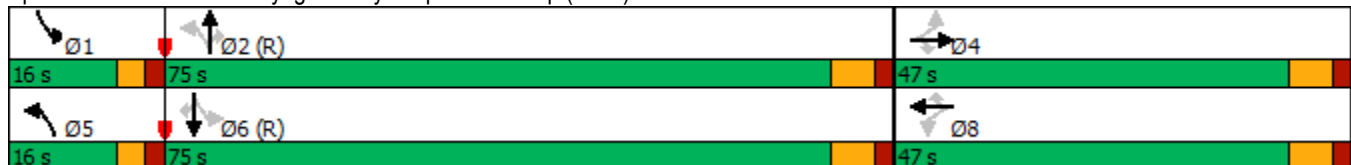
Existing Traffic
6:00 PM-7:00 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	25	215	130	13	63	248	257	155	13	313	83
Future Volume (vph)	64	25	215	130	13	63	248	257	155	13	313	83
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	23.0	23.0	4.0	23.0	23.0
Minimum Split (s)	10.5	10.5	10.5	10.5	10.5	10.5	9.0	29.5	29.5	9.0	29.5	29.5
Total Split (s)	47.0	47.0	47.0	47.0	47.0	47.0	16.0	75.0	75.0	16.0	75.0	75.0
Total Split (%)	34.1%	34.1%	34.1%	34.1%	34.1%	34.1%	11.6%	54.3%	54.3%	11.6%	54.3%	54.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	5.0	6.5	6.5	5.0	6.5	6.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	19.6	19.6	19.6	19.6	19.6	19.6	106.9	101.0	101.0	96.0	88.8	88.8
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.14	0.77	0.73	0.73	0.70	0.64	0.64
v/c Ratio	0.38	0.11	0.57	0.72	0.05	0.24	0.35	0.11	0.14	0.02	0.16	0.09
Control Delay	57.3	49.6	11.0	76.4	48.2	12.5	5.0	5.5	1.8	5.4	11.2	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.3	49.6	11.0	76.4	48.2	12.5	5.0	5.5	1.8	5.4	11.2	2.7
LOS	E	D	B	E	D	B	A	A	A	A	B	A
Approach Delay		24.0			55.1			4.4			9.3	
Approach LOS		C			E			A			A	

Intersection Summary

Cycle Length: 138
 Actuated Cycle Length: 138
 Offset: 75 (54%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 15.8
 Intersection LOS: B
 Intersection Capacity Utilization 61.8%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 2: Voyager Pkwy & Spectrum Loop (north)



Timings
3: Voyager Pkwy & Powers NB Ramp

Existing Traffic
6:00 PM-7:00 PM



Lane Group	NBL	NBT	SBT	SBR
Lane Configurations	↖	↑↑	↑↑	↗
Traffic Volume (vph)	252	660	487	171
Future Volume (vph)	252	660	487	171
Turn Type	pm+pt	NA	NA	Perm
Protected Phases	5	2	6	
Permitted Phases	2			6
Detector Phase	5	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	4.0	4.0	4.0
Minimum Split (s)	10.0	10.0	10.0	10.0
Total Split (s)	21.0	138.0	117.0	117.0
Total Split (%)	15.2%	100.0%	84.8%	84.8%
Yellow Time (s)	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	133.0	138.0	121.5	121.5
Actuated g/C Ratio	0.96	1.00	0.88	0.88
v/c Ratio	0.37	0.22	0.18	0.14
Control Delay	2.3	0.2	1.0	0.2
Queue Delay	0.2	0.0	0.0	0.0
Total Delay	2.6	0.2	1.0	0.2
LOS	A	A	A	A
Approach Delay		0.8	0.8	
Approach LOS		A	A	

Intersection Summary

Cycle Length: 138
 Actuated Cycle Length: 138
 Offset: 121 (88%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 40
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.37
 Intersection Signal Delay: 0.8
 Intersection Capacity Utilization 36.6%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 3: Voyager Pkwy & Powers NB Ramp



Timings
4: Voyager Pkwy & Powers SB Ramp

Existing Traffic
6:00 PM-7:00 PM

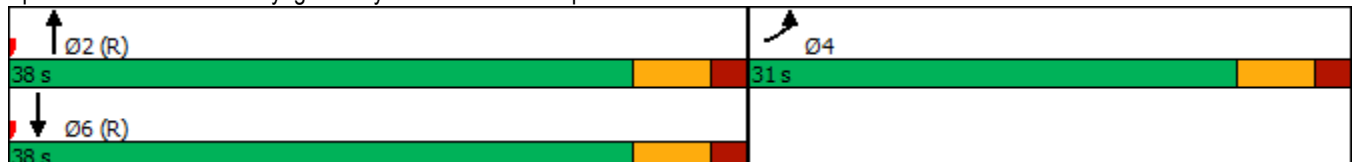


Lane Group	EBL	EBR	NBT	SBT
Lane Configurations	↖↗	↗	↑↑↑	↑↑
Traffic Volume (vph)	272	329	640	487
Future Volume (vph)	272	329	640	487
Turn Type	Prot	Free	NA	NA
Protected Phases	4		2	6
Permitted Phases		Free		
Detector Phase	4		2	6
Switch Phase				
Minimum Initial (s)	4.0		4.0	4.0
Minimum Split (s)	10.0		10.0	10.0
Total Split (s)	31.0		38.0	38.0
Total Split (%)	44.9%		55.1%	55.1%
Yellow Time (s)	4.0		4.0	4.0
All-Red Time (s)	2.0		2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None		C-Max	C-Max
Act Effct Green (s)	11.8	69.0	45.2	45.2
Actuated g/C Ratio	0.17	1.00	0.66	0.66
v/c Ratio	0.55	0.24	0.23	0.25
Control Delay	29.4	0.4	3.4	6.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	29.4	0.4	3.4	6.3
LOS	C	A	A	A
Approach Delay	13.5		3.4	6.3
Approach LOS	B		A	A

Intersection Summary

Cycle Length: 69
 Actuated Cycle Length: 69
 Offset: 40 (58%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 40
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.55
 Intersection Signal Delay: 7.7
 Intersection Capacity Utilization 36.6%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 4: Voyager Pkwy & Powers SB Ramp



Timings
5: Voyager Pkwy & Spectrum Loop (south)/Copper Center Pkwy

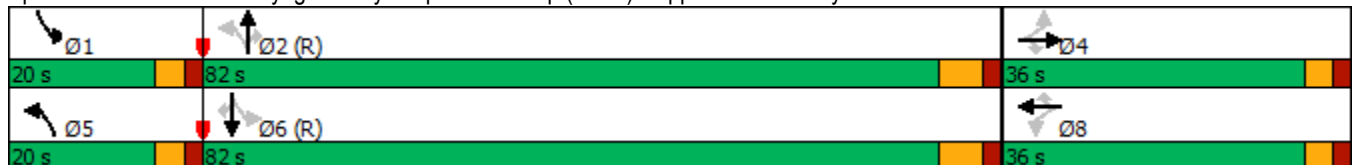
Existing Traffic
6:00 PM-7:00 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	8	39	31	1	54	48	560	41	24	759	33
Future Volume (vph)	26	8	39	31	1	54	48	560	41	24	759	33
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	10.0	20.0	20.0	10.0	20.0	20.0
Total Split (s)	36.0	36.0	36.0	36.0	36.0	36.0	20.0	82.0	82.0	20.0	82.0	82.0
Total Split (%)	26.1%	26.1%	26.1%	26.1%	26.1%	26.1%	14.5%	59.4%	59.4%	14.5%	59.4%	59.4%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.5	6.5	5.0	6.5	6.5
Lead/Lag								Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?								Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	9.6	9.6	9.6	9.6	9.6	9.6	117.7	113.6	113.6	116.1	111.2	111.2
Actuated g/C Ratio	0.07	0.07	0.07	0.07	0.07	0.07	0.85	0.82	0.82	0.84	0.81	0.81
v/c Ratio	0.30	0.07	0.25	0.44	0.01	0.42	0.11	0.22	0.04	0.04	0.32	0.03
Control Delay	67.2	59.0	8.4	74.5	57.0	19.4	1.5	4.0	1.6	1.1	4.4	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.2	59.0	8.4	74.5	57.0	19.4	1.5	4.0	1.6	1.1	4.4	0.9
LOS	E	E	A	E	E	B	A	A	A	A	A	A
Approach Delay		35.1			39.6			3.6			4.1	
Approach LOS		D			D			A			A	

Intersection Summary

Cycle Length: 138
 Actuated Cycle Length: 138
 Offset: 79 (57%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.44
 Intersection Signal Delay: 7.4
 Intersection Capacity Utilization 46.4%
 Analysis Period (min) 15

Splits and Phases: 5: Voyager Pkwy & Spectrum Loop (south)/Copper Center Pkwy



Timings
6: Voyager Pkwy & Stout Rd

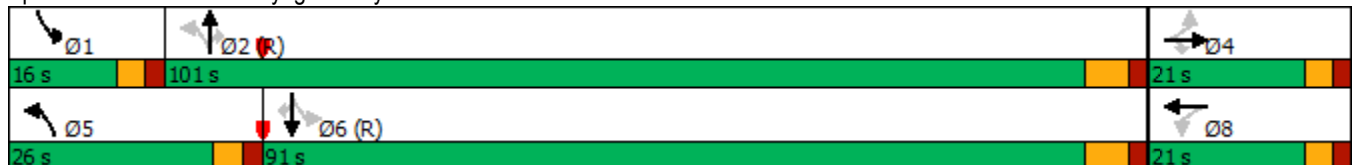
Existing Traffic
6:00 PM-7:00 PM

	→	↘	↙	←	↑	↗	↖	↓	↘	∅5
Lane Group	EBT	EBR	WBL	WBT	NBT	NBR	SBL	SBT	SBR	∅5
Lane Configurations	↔	↗		↔	↕	↗	↖	↕	↗	
Traffic Volume (vph)	1	1	100	0	568	145	119	710	1	
Future Volume (vph)	1	1	100	0	568	145	119	710	1	
Turn Type	NA	Perm	Perm	NA	NA	Perm	pm+pt	NA	Perm	
Protected Phases	4			8	2		1	6		5
Permitted Phases		4	8			2	6		6	
Detector Phase	4	4	8	8	2	2	1	6	6	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	20.0	20.0	4.0	20.0	20.0	4.0
Minimum Split (s)	9.0	9.0	9.0	9.0	26.5	26.5	9.0	26.5	26.5	9.0
Total Split (s)	21.0	21.0	21.0	21.0	101.0	101.0	16.0	91.0	91.0	26.0
Total Split (%)	15.2%	15.2%	15.2%	15.2%	73.2%	73.2%	11.6%	65.9%	65.9%	19%
Yellow Time (s)	3.0	3.0	3.0	3.0	4.5	4.5	3.0	4.5	4.5	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	6.5	6.5	5.0	6.5	6.5	
Lead/Lag					Lag	Lag	Lead	Lag	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max	None
Act Effct Green (s)	13.8	13.8		13.8	100.0	100.0	114.2	112.7	112.7	
Actuated g/C Ratio	0.10	0.10		0.10	0.72	0.72	0.83	0.82	0.82	
v/c Ratio	0.01	0.00		0.88	0.26	0.14	0.22	0.29	0.00	
Control Delay	54.0	0.0		64.2	7.2	1.5	2.1	1.8	0.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	54.0	0.0		64.2	7.2	1.5	2.1	1.8	0.0	
LOS	D	A		E	A	A	A	A	A	
Approach Delay	27.0			64.2	6.0			1.9		
Approach LOS	C			E	A			A		

Intersection Summary

Cycle Length: 138
 Actuated Cycle Length: 138
 Offset: 81 (59%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 10.1
 Intersection LOS: B
 Intersection Capacity Utilization 54.2%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 6: Voyager Pkwy & Stout Rd



Timings
7: Voyager Pkwy & Middle Creek Parkway

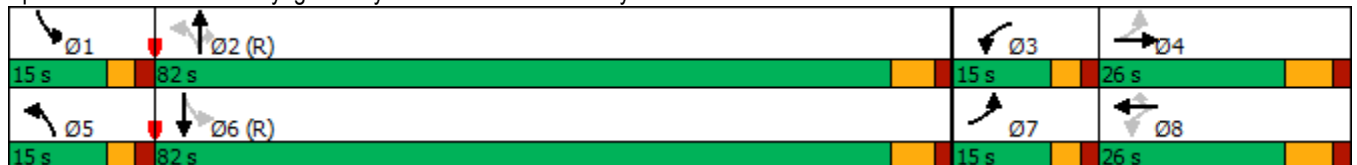
Existing Traffic
6:00 PM-7:00 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	6	34	66	8	78	35	379	49	79	489	51
Future Volume (vph)	33	6	34	66	8	78	35	379	49	79	489	51
Turn Type	pm+pt	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		8	2		2	6		Free
Detector Phase	7	4		3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	32.0	32.0	4.0	32.0	
Minimum Split (s)	9.0	11.0		9.0	11.0	11.0	9.0	38.5	38.5	9.0	38.5	
Total Split (s)	15.0	26.0		15.0	26.0	26.0	15.0	82.0	82.0	15.0	82.0	
Total Split (%)	10.9%	18.8%		10.9%	18.8%	18.8%	10.9%	59.4%	59.4%	10.9%	59.4%	
Yellow Time (s)	3.0	5.0		3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	7.0		5.0	7.0	7.0	5.0	6.5	6.5	5.0	6.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	
Act Effct Green (s)	10.7	6.7	138.0	18.9	6.7	6.7	102.3	94.5	94.5	104.9	97.4	138.0
Actuated g/C Ratio	0.08	0.05	1.00	0.14	0.05	0.05	0.74	0.68	0.68	0.76	0.71	1.00
v/c Ratio	0.30	0.09	0.03	0.35	0.06	0.53	0.06	0.18	0.05	0.11	0.21	0.03
Control Delay	61.5	63.5	0.0	55.0	62.1	19.1	4.7	8.9	0.1	3.3	6.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.5	63.5	0.0	55.0	62.1	19.1	4.7	8.9	0.1	3.3	6.0	0.0
LOS	E	E	A	D	E	B	A	A	A	A	A	A
Approach Delay		32.9			37.0			7.6			5.2	
Approach LOS		C			D			A			A	

Intersection Summary

Cycle Length: 138
 Actuated Cycle Length: 138
 Offset: 122 (88%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.53
 Intersection Signal Delay: 11.9
 Intersection Capacity Utilization 56.8%
 Analysis Period (min) 15

Splits and Phases: 7: Voyager Pkwy & Middle Creek Parkway



Timings
1: Voyager Pkwy & North Gate Blvd

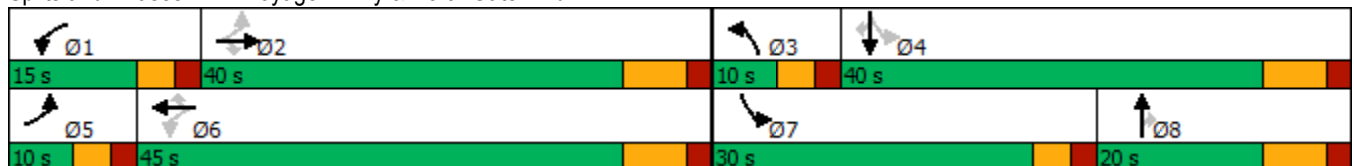
Existing Traffic
9:30-10:30 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	119	59	39	61	6	67	14	62	4	7	3
Future Volume (vph)	11	119	59	39	61	6	67	14	62	4	7	3
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6			8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	17.0	17.0	9.0	17.0	17.0	9.0	11.0	11.0	9.0	11.0	11.0
Total Split (s)	10.0	40.0	40.0	15.0	45.0	45.0	10.0	20.0	20.0	30.0	40.0	40.0
Total Split (%)	9.5%	38.1%	38.1%	14.3%	42.9%	42.9%	9.5%	19.0%	19.0%	28.6%	38.1%	38.1%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	15.1	10.3	10.3	19.1	15.5	15.5	5.1	39.3	39.3	40.0	33.6	33.6
Actuated g/C Ratio	0.21	0.14	0.14	0.26	0.21	0.21	0.07	0.54	0.54	0.55	0.46	0.46
v/c Ratio	0.04	0.29	0.18	0.14	0.10	0.01	0.34	0.02	0.08	0.01	0.02	0.01
Control Delay	19.9	32.3	1.0	20.9	24.8	0.0	39.5	12.0	0.2	8.0	14.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.9	32.3	1.0	20.9	24.8	0.0	39.5	12.0	0.2	8.0	14.3	0.0
LOS	B	C	A	C	C	A	D	B	A	A	B	A
Approach Delay		21.8			22.0			19.7			9.4	
Approach LOS		C			C			B			A	

Intersection Summary

Cycle Length: 105
 Actuated Cycle Length: 72.8
 Natural Cycle: 50
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.34
 Intersection Signal Delay: 20.6
 Intersection Capacity Utilization 31.3%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 1: Voyager Pkwy & North Gate Blvd



Timings
2: Voyager Pkwy & Spectrum Loop (north)

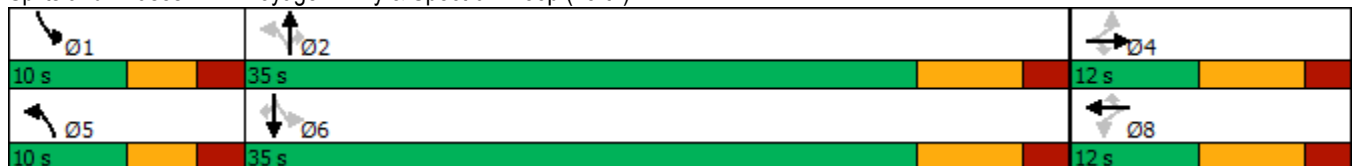
Existing Traffic
9:30-10:30 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	10	150	19	1	4	25	96	35	2	103	17
Future Volume (vph)	38	10	150	19	1	4	25	96	35	2	103	17
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	23.0	23.0	4.0	23.0	23.0
Minimum Split (s)	10.5	10.5	10.5	10.5	10.5	10.5	9.0	29.5	29.5	9.0	29.5	29.5
Total Split (s)	12.0	12.0	12.0	12.0	12.0	12.0	10.0	35.0	35.0	10.0	35.0	35.0
Total Split (%)	21.1%	21.1%	21.1%	21.1%	21.1%	21.1%	17.5%	61.4%	61.4%	17.5%	61.4%	61.4%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	5.0	6.5	6.5	5.0	6.5	6.5
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	5.5	5.5	5.5	5.5	5.5	5.5	34.4	32.0	32.0	33.5	30.2	30.2
Actuated g/C Ratio	0.10	0.10	0.10	0.10	0.10	0.10	0.66	0.61	0.61	0.64	0.58	0.58
v/c Ratio	0.34	0.07	0.58	0.16	0.01	0.02	0.04	0.05	0.04	0.00	0.06	0.02
Control Delay	29.8	23.7	12.5	25.7	23.0	0.0	2.9	5.1	0.1	3.0	6.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	23.7	12.5	25.7	23.0	0.0	2.9	5.1	0.1	3.0	6.3	0.1
LOS	C	C	B	C	C	A	A	A	A	A	A	A
Approach Delay		16.4			21.3			3.7			5.4	
Approach LOS		B			C			A			A	

Intersection Summary

Cycle Length: 57
 Actuated Cycle Length: 52.5
 Natural Cycle: 55
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 10.3
 Intersection LOS: B
 Intersection Capacity Utilization 48.0%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 2: Voyager Pkwy & Spectrum Loop (north)



Timings
3: Voyager Pkwy & Powers NB Ramp

Existing Traffic
9:30-10:30 PM

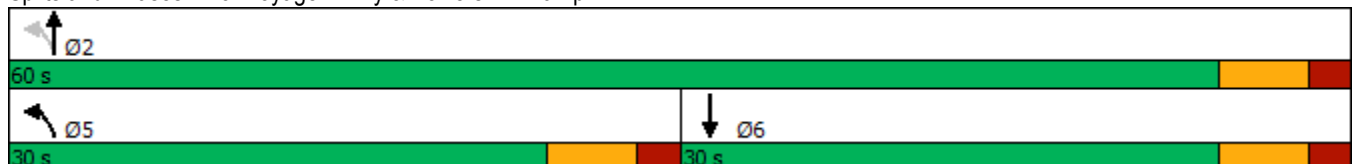


Lane Group	NBL	NBT	SBT	SBR
Lane Configurations	↙	↑↑	↑↑	↘
Traffic Volume (vph)	43	156	224	48
Future Volume (vph)	43	156	224	48
Turn Type	pm+pt	NA	NA	Free
Protected Phases	5	2	6	
Permitted Phases	2			Free
Detector Phase	5	2	6	
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	
Minimum Split (s)	10.0	10.0	10.0	
Total Split (s)	30.0	60.0	30.0	
Total Split (%)	50.0%	100.0%	50.0%	
Yellow Time (s)	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	Max	Max	
Act Effct Green (s)	59.9	66.0	54.4	66.0
Actuated g/C Ratio	0.91	1.00	0.82	1.00
v/c Ratio	0.05	0.05	0.09	0.04
Control Delay	0.4	0.0	2.2	0.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	0.4	0.0	2.2	0.0
LOS	A	A	A	A
Approach Delay		0.1	1.8	
Approach LOS		A	A	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 66
 Natural Cycle: 40
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.09
 Intersection Signal Delay: 1.1
 Intersection Capacity Utilization 19.5%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 3: Voyager Pkwy & Powers NB Ramp



Timings
4: Voyager Pkwy & Powers SB Ramp

Existing Traffic
9:30-10:30 PM

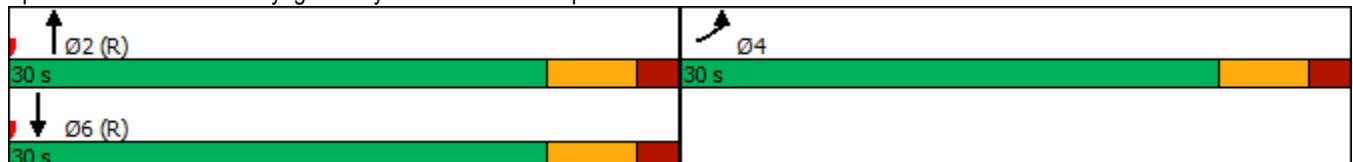


Lane Group	EBL	EBR	NBT	SBT
Lane Configurations	↖↗	↖	↑↑↑	↑↑
Traffic Volume (vph)	46	43	153	224
Future Volume (vph)	46	43	153	224
Turn Type	Prot	Free	NA	NA
Protected Phases	4		2	6
Permitted Phases		Free		
Detector Phase	4		2	6
Switch Phase				
Minimum Initial (s)	4.0		4.0	4.0
Minimum Split (s)	10.0		10.0	10.0
Total Split (s)	30.0		30.0	30.0
Total Split (%)	50.0%		50.0%	50.0%
Yellow Time (s)	4.0		4.0	4.0
All-Red Time (s)	2.0		2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None		C-Max	C-Max
Act Effct Green (s)	6.4	60.0	48.6	48.6
Actuated g/C Ratio	0.11	1.00	0.81	0.81
v/c Ratio	0.15	0.03	0.04	0.09
Control Delay	24.9	0.0	2.6	2.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	24.9	0.0	2.6	2.7
LOS	C	A	A	A
Approach Delay	12.8		2.6	2.7
Approach LOS	B		A	A

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 40 (67%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 40
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.15
 Intersection Signal Delay: 4.6
 Intersection Capacity Utilization 19.5%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 4: Voyager Pkwy & Powers SB Ramp



Timings

5: Voyager Pkwy & Spectrum Loop (south)/Copper Center Pkwy

Existing Traffic

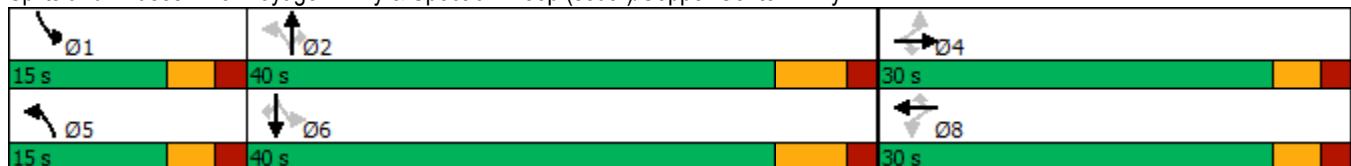
9:30-10:30 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	1	16	6	1	11	7	145	13	7	312	6
Future Volume (vph)	18	1	16	6	1	11	7	145	13	7	312	6
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	10.0	20.0	20.0	10.0	20.0	20.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	15.0	40.0	40.0	15.0	40.0	40.0
Total Split (%)	35.3%	35.3%	35.3%	35.3%	35.3%	35.3%	17.6%	47.1%	47.1%	17.6%	47.1%	47.1%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.5	6.5	5.0	6.5	6.5
Lead/Lag								Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?								Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	6.6	6.6	6.6	6.4	6.4	6.4	42.6	44.4	44.4	42.6	44.4	44.4
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.12	0.80	0.83	0.83	0.80	0.83	0.83
v/c Ratio	0.10	0.00	0.07	0.04	0.00	0.05	0.01	0.06	0.01	0.01	0.13	0.01
Control Delay	22.6	22.0	0.5	22.2	23.0	0.4	2.4	3.7	0.0	2.6	3.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.6	22.0	0.5	22.2	23.0	0.4	2.4	3.7	0.0	2.6	3.6	0.0
LOS	C	C	A	C	C	A	A	A	A	A	A	A
Approach Delay		12.3			8.6			3.4			3.5	
Approach LOS		B			A			A			A	

Intersection Summary

Cycle Length: 85
 Actuated Cycle Length: 53.2
 Natural Cycle: 50
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.13
 Intersection Signal Delay: 4.2
 Intersection LOS: A
 Intersection Capacity Utilization 29.0%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 5: Voyager Pkwy & Spectrum Loop (south)/Copper Center Pkwy



Timings
6: Voyager Pkwy & Stout Rd

Existing Traffic
9:30-10:30 PM

	→	↘	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↕	↖	↕	↗	↖	↕	↗
Traffic Volume (vph)	1	1	40	0	1	111	71	59	217	1
Future Volume (vph)	1	1	40	0	1	111	71	59	217	1
Turn Type	NA	Perm	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4			8	5	2		1	6	
Permitted Phases		4	8		2		2	6		6
Detector Phase	4	4	8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	20.0	20.0	4.0	20.0	20.0
Minimum Split (s)	9.0	9.0	9.0	9.0	9.0	26.5	26.5	9.0	26.5	26.5
Total Split (s)	20.0	20.0	20.0	20.0	10.0	35.0	35.0	10.0	35.0	35.0
Total Split (%)	30.8%	30.8%	30.8%	30.8%	15.4%	53.8%	53.8%	15.4%	53.8%	53.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	6.5	6.5	5.0	6.5	6.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	5.8	5.8		5.8	47.7	44.2	44.2	50.6	49.0	49.0
Actuated g/C Ratio	0.09	0.09		0.09	0.73	0.68	0.68	0.78	0.75	0.75
v/c Ratio	0.01	0.00		0.33	0.00	0.06	0.08	0.07	0.10	0.00
Control Delay	27.0	0.0		5.3	2.0	6.1	1.1	2.3	3.9	0.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	0.0		5.3	2.0	6.1	1.1	2.3	3.9	0.0
LOS	C	A		A	A	A	A	A	A	A
Approach Delay	13.5			5.3		4.2			3.5	
Approach LOS	B			A		A			A	

Intersection Summary

Cycle Length: 65
 Actuated Cycle Length: 65
 Offset: 17 (26%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.33
 Intersection Signal Delay: 4.0
 Intersection Capacity Utilization 38.0%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 6: Voyager Pkwy & Stout Rd



Timings
7: Voyager Pkwy & Middle Creek Parkway

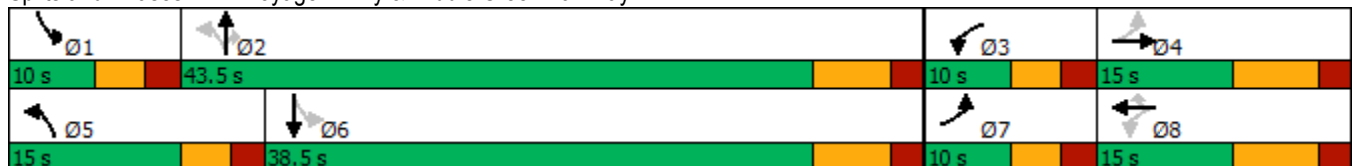
Existing Traffic
9:30-10:30 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	3	11	24	1	19	13	75	38	25	194	14
Future Volume (vph)	9	3	11	24	1	19	13	75	38	25	194	14
Turn Type	pm+pt	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		8	2		2	6		Free
Detector Phase	7	4		3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	32.0	32.0	4.0	32.0	
Minimum Split (s)	9.0	11.0		9.0	11.0	11.0	9.0	38.5	38.5	9.0	38.5	
Total Split (s)	10.0	15.0		10.0	15.0	15.0	15.0	43.5	43.5	10.0	38.5	
Total Split (%)	12.7%	19.1%		12.7%	19.1%	19.1%	19.1%	55.4%	55.4%	12.7%	49.0%	
Yellow Time (s)	3.0	5.0		3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	7.0		5.0	7.0	7.0	5.0	6.5	6.5	5.0	6.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None	None	None	Max	Max	None	Max	
Act Effct Green (s)	6.5	5.9	60.7	7.0	5.8	5.8	48.2	49.1	49.1	48.5	50.7	60.7
Actuated g/C Ratio	0.11	0.10	1.00	0.12	0.10	0.10	0.79	0.81	0.81	0.80	0.84	1.00
v/c Ratio	0.08	0.03	0.01	0.15	0.00	0.07	0.02	0.03	0.03	0.03	0.08	0.01
Control Delay	24.8	29.7	0.0	24.9	30.0	0.5	3.7	6.2	0.1	3.6	4.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.8	29.7	0.0	24.9	30.0	0.5	3.7	6.2	0.1	3.6	4.8	0.0
LOS	C	C	A	C	C	A	A	A	A	A	A	A
Approach Delay		13.6			14.5			4.1			4.3	
Approach LOS		B			B			A			A	

Intersection Summary

Cycle Length: 78.5
 Actuated Cycle Length: 60.7
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.15
 Intersection Signal Delay: 6.1
 Intersection Capacity Utilization 48.8%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 7: Voyager Pkwy & Middle Creek Parkway



Timings
1: Voyager Pkwy /Voyager Pkwy & North Gate Blvd

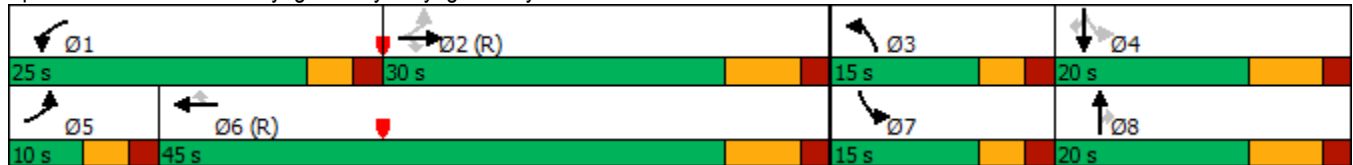
Existing + Phase 1Traffic
6:00 PM-7:00 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	461	295	462	359	17	214	49	131	17	27	28
Future Volume (vph)	35	461	295	462	359	17	214	49	131	17	27	28
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2			6			8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	20.0	20.0	10.0	20.0	20.0	10.0	20.0	20.0	10.0	20.0	20.0
Total Split (s)	10.0	30.0	30.0	25.0	45.0	45.0	15.0	20.0	20.0	15.0	20.0	20.0
Total Split (%)	11.1%	33.3%	33.3%	27.8%	50.0%	50.0%	16.7%	22.2%	22.2%	16.7%	22.2%	22.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effct Green (s)	32.4	25.4	25.4	17.6	42.0	42.0	9.6	23.3	23.3	21.5	13.4	13.4
Actuated g/C Ratio	0.36	0.28	0.28	0.20	0.47	0.47	0.11	0.26	0.26	0.24	0.15	0.15
v/c Ratio	0.10	0.50	0.47	0.74	0.23	0.02	0.63	0.11	0.24	0.05	0.10	0.07
Control Delay	11.9	29.6	5.8	41.1	15.7	0.1	44.7	21.6	3.9	21.1	34.6	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.9	29.6	5.8	41.1	15.7	0.1	44.7	21.6	3.9	21.1	34.6	0.3
LOS	B	C	A	D	B	A	D	C	A	C	C	A
Approach Delay		19.9			29.4			28.3			18.1	
Approach LOS		B			C			C			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 25.2
 Intersection LOS: C
 Intersection Capacity Utilization 54.5%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 1: Voyager Pkwy /Voyager Pkwy & North Gate Blvd



Timings

Existing + Phase 1 Traffic

2: Voyager Pkwy #1/Voyager Pkwy & Spectrum Loop (north)

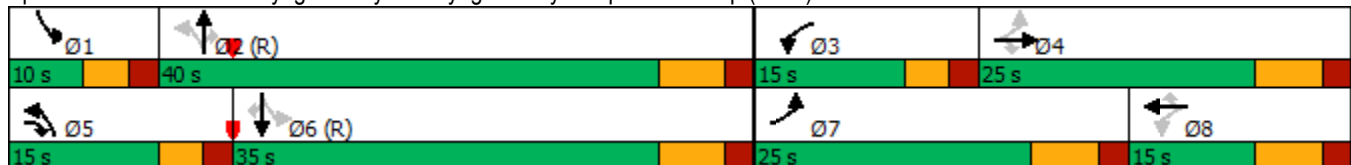
6:00 PM-7:00 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	25	586	130	13	63	255	257	155	13	659	117
Future Volume (vph)	64	25	586	130	13	63	255	257	155	13	659	117
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	5	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	8.5	8.5	4.0	15.0	15.0
Minimum Split (s)	10.5	10.5	9.0	10.0	10.5	10.5	9.0	15.0	15.0	9.0	21.5	21.5
Total Split (s)	25.0	25.0	15.0	15.0	15.0	15.0	15.0	40.0	40.0	10.0	35.0	35.0
Total Split (%)	27.8%	27.8%	16.7%	16.7%	16.7%	16.7%	16.7%	44.4%	44.4%	11.1%	38.9%	38.9%
Yellow Time (s)	4.5	4.5	3.0	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	5.0	5.0	6.5	6.5	5.0	6.5	6.5	5.0	6.5	6.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	19.6	11.6	29.4	23.4	14.0	14.0	52.5	49.0	49.0	41.8	34.8	34.8
Actuated g/C Ratio	0.22	0.13	0.33	0.26	0.16	0.16	0.58	0.54	0.54	0.46	0.39	0.39
v/c Ratio	0.21	0.83	0.58	0.52	0.05	0.15	0.64	0.14	0.17	0.03	0.52	0.17
Control Delay	23.0	30.3	18.9	29.5	31.8	0.7	23.6	10.0	1.3	12.7	31.6	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.0	30.3	18.9	29.5	31.8	0.7	23.6	10.0	1.3	12.7	31.6	8.5
LOS	C	C	B	C	C	A	C	B	A	B	C	A
Approach Delay		24.5			20.9			13.2			27.9	
Approach LOS		C			C			B			C	

Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 25 (28%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 22.1	Intersection LOS: C
Intersection Capacity Utilization 72.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Voyager Pkwy #1/Voyager Pkwy & Spectrum Loop (north)



Timings
3: Voyager Pkwy #1 & Powers NB Ramp

Existing + Phase 1 Traffic
6:00 PM-7:00 PM

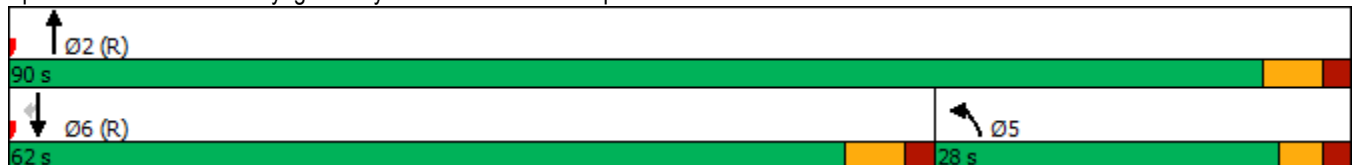


Lane Group	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↑↑	↑↔	↔
Traffic Volume (vph)	252	667	897	478
Future Volume (vph)	252	667	897	478
Turn Type	Prot	NA	NA	Perm
Protected Phases	5	2	6	
Permitted Phases				6
Detector Phase	5	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	4.0	4.0	4.0
Minimum Split (s)	10.0	10.0	10.0	10.0
Total Split (s)	28.0	90.0	62.0	62.0
Total Split (%)	31.1%	100.0%	68.9%	68.9%
Yellow Time (s)	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	23.0	90.0	56.0	56.0
Actuated g/C Ratio	0.26	1.00	0.62	0.62
v/c Ratio	0.31	0.20	0.50	0.44
Control Delay	25.5	0.1	14.5	9.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.5	0.1	14.5	9.6
LOS	C	A	B	A
Approach Delay		7.1	13.0	
Approach LOS		A	B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 67 (74%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 40
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.50
 Intersection Signal Delay: 10.6
 Intersection LOS: B
 Intersection Capacity Utilization 59.6%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 3: Voyager Pkwy #1 & Powers NB Ramp



Timings
4: Voyager Pkwy #1 & Powers SB Ramp

Existing + Phase 1 Traffic
6:00 PM-7:00 PM

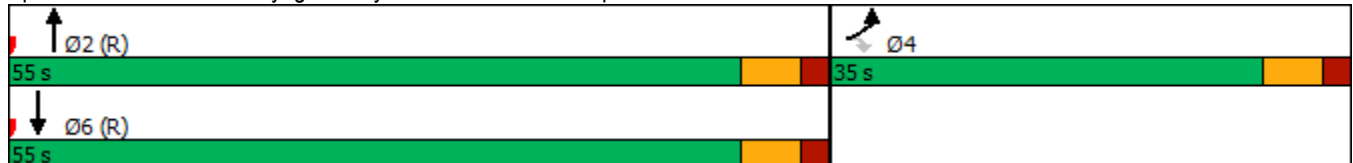


Lane Group	EBL	EBR	NBT	SBT
Lane Configurations	↖	↗	↑↑↑	↑↑
Traffic Volume (vph)	272	400	647	897
Future Volume (vph)	272	400	647	897
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	15.0	15.0	15.0	15.0
Minimum Split (s)	21.0	21.0	21.0	21.0
Total Split (s)	35.0	35.0	55.0	55.0
Total Split (%)	38.9%	38.9%	61.1%	61.1%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	C-Max	C-Max
Act Effct Green (s)	24.2	24.2	53.8	53.8
Actuated g/C Ratio	0.27	0.27	0.60	0.60
v/c Ratio	0.62	0.86	0.23	0.46
Control Delay	33.9	41.1	5.1	3.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	33.9	41.1	5.1	3.1
LOS	C	D	A	A
Approach Delay	38.2		5.1	3.1
Approach LOS	D		A	A

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 78 (87%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 14.3
 Intersection LOS: B
 Intersection Capacity Utilization 59.6%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 4: Voyager Pkwy #1 & Powers SB Ramp



Volume
 104: Voyager Pkwy #1 & Powers SB Free Right

Existing + Phase 1 Traffic
 6:00 PM-7:00 PM



Lane Group	EBL	EBR	SET	SER	NWL	NWT
Traffic Volume (vph)	0	874	1297	0	0	647
Future Volume (vph)	0	874	1297	0	0	647
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	0	950	1410	0	0	703
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	950	1410	0	0	703
Intersection Summary						

Timings

Existing + Phase 1 Traffic

5: Voyager Pkwy/Voyager Pkwy #1 & Spectrum Loop (south)/Copper Center Pkwy 6:00 PM-7:00 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	8	68	31	1	54	203	567	41	24	1213	933
Future Volume (vph)	26	8	68	31	1	54	203	567	41	24	1213	933
Turn Type	Prot	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	5	2	2	1	6	7
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	9.0	9.0	9.0	9.0	9.0	9.0	10.5	10.5	9.0	10.5	9.0
Total Split (s)	20.0	35.0	35.0	15.0	15.0	15.0	17.0	45.0	45.0	10.0	38.0	20.0
Total Split (%)	22.2%	38.9%	38.9%	16.7%	16.7%	16.7%	18.9%	50.0%	50.0%	11.1%	42.2%	22.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.5	6.5	5.0	4.5	5.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	None
Act Effct Green (s)	11.3	21.8	21.8	7.6	7.6	7.6	58.2	52.4	52.4	48.3	43.2	59.0
Actuated g/C Ratio	0.13	0.24	0.24	0.08	0.08	0.08	0.65	0.58	0.58	0.54	0.48	0.66
v/c Ratio	0.06	0.02	0.14	0.29	0.01	0.17	0.75	0.30	0.05	0.05	0.77	0.78
Control Delay	33.2	21.5	0.6	44.0	36.0	1.1	33.3	12.5	0.1	6.2	23.6	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	33.2	21.5	0.6	44.0	36.0	1.1	33.3	12.5	0.1	6.2	23.6	10.3
LOS	C	C	A	D	D	A	C	B	A	A	C	B
Approach Delay		10.5			17.0			17.1			17.7	
Approach LOS		B			B			B			B	

Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 4 (4%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 17.3	Intersection LOS: B
Intersection Capacity Utilization 84.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 5: Voyager Pkwy/Voyager Pkwy #1 & Spectrum Loop (south)/Copper Center Pkwy



Timings
6: Voyager Pkwy & Stout Rd

Existing + Phase 1 Traffic
6:00 PM-7:00 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations												
Traffic Volume (vph)	9	0	1	100	0	104	721	145	119	975	218	
Future Volume (vph)	9	0	1	100	0	104	721	145	119	975	218	
Turn Type	Perm	NA	Free	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	Perm	
Protected Phases		4			8	5	2		1	6		
Permitted Phases	4		Free	8		2		2	6		6	
Detector Phase	4	4		8	8	5	2	2	1	6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	20.0	20.0	4.0	20.0	20.0	
Minimum Split (s)	9.0	9.0		9.0	9.0	9.0	26.5	26.5	9.0	26.5	26.5	
Total Split (s)	20.0	20.0		20.0	20.0	20.0	58.0	58.0	12.0	50.0	50.0	
Total Split (%)	22.2%	22.2%		22.2%	22.2%	22.2%	64.4%	64.4%	13.3%	55.6%	55.6%	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.5	4.5	3.0	4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.0			5.0	5.0	6.5	6.5	5.0	6.5	6.5	
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None	None	Max	Max	None	Max	Max	
Act Effct Green (s)		8.7	83.4		8.7	60.0	51.6	51.6	60.5	53.6	53.6	
Actuated g/C Ratio		0.10	1.00		0.10	0.72	0.62	0.62	0.73	0.64	0.64	
v/c Ratio		0.09	0.00		0.66	0.26	0.35	0.15	0.24	0.46	0.21	
Control Delay		34.6	0.0		20.4	4.4	8.8	1.8	4.1	9.7	1.8	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		34.6	0.0		20.4	4.4	8.8	1.8	4.1	9.7	1.8	
LOS		C	A		C	A	A	A	A	A	A	
Approach Delay		31.4			20.4		7.3			7.9		
Approach LOS		C			C		A			A		

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 83.4
 Natural Cycle: 45
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.66
 Intersection Signal Delay: 8.7
 Intersection Capacity Utilization 63.6%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 6: Voyager Pkwy & Stout Rd



Timings
7: Voyager Pkwy & Middle Creek Parkway

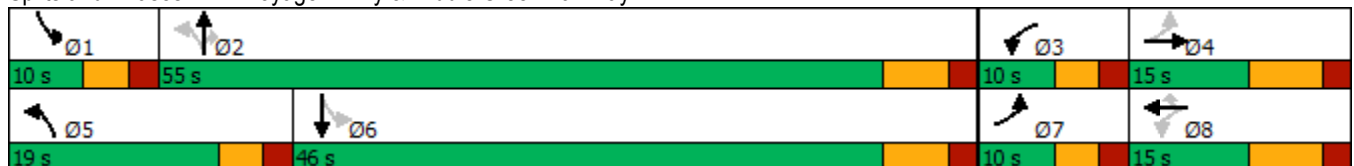
Existing + Phase 1 Traffic
6:00 PM-7:00 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	6	34	66	8	78	236	616	49	79	553	252
Future Volume (vph)	53	6	34	66	8	78	236	616	49	79	553	252
Turn Type	pm+pt	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		8	2		2	6		Free
Detector Phase	7	4		3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	32.0	32.0	4.0	32.0	
Minimum Split (s)	9.0	11.0		9.0	11.0	11.0	9.0	38.5	38.5	9.0	38.5	
Total Split (s)	10.0	15.0		10.0	15.0	15.0	19.0	55.0	55.0	10.0	46.0	
Total Split (%)	11.1%	16.7%		11.1%	16.7%	16.7%	21.1%	61.1%	61.1%	11.1%	51.1%	
Yellow Time (s)	3.0	5.0		3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	7.0		5.0	7.0	7.0	5.0	6.5	6.5	5.0	6.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None	None	None	Max	Max	None	Max	
Act Effct Green (s)	6.8	6.1	81.8	13.9	6.0	6.0	59.4	52.4	52.4	49.7	43.0	81.8
Actuated g/C Ratio	0.08	0.07	1.00	0.17	0.07	0.07	0.73	0.64	0.64	0.61	0.53	1.00
v/c Ratio	0.39	0.05	0.02	0.25	0.03	0.26	0.42	0.29	0.05	0.17	0.32	0.17
Control Delay	43.6	39.2	0.0	31.9	38.6	2.0	7.1	10.1	0.1	6.4	13.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.6	39.2	0.0	31.9	38.6	2.0	7.1	10.1	0.1	6.4	13.7	0.2
LOS	D	D	A	C	D	A	A	B	A	A	B	A
Approach Delay		27.5			16.9			8.8			9.2	
Approach LOS		C			B			A			A	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 81.8
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.42
 Intersection Signal Delay: 10.5
 Intersection LOS: B
 Intersection Capacity Utilization 65.5%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 7: Voyager Pkwy & Middle Creek Parkway



Timings
1: Voyager Pkwy /Voyager Pkwy & North Gate Blvd

Existing + Phase 1 Traffic
9:45-10:45 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	466	99	207	61	6	235	14	291	4	7	3
Future Volume (vph)	11	466	99	207	61	6	235	14	291	4	7	3
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2			6			8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	20.0	20.0	10.0	20.0	20.0	10.0	20.0	20.0	10.0	20.0	20.0
Total Split (s)	10.0	30.0	30.0	25.0	45.0	45.0	15.0	20.0	20.0	15.0	20.0	20.0
Total Split (%)	11.1%	33.3%	33.3%	27.8%	50.0%	50.0%	16.7%	22.2%	22.2%	16.7%	22.2%	22.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effct Green (s)	37.6	30.6	30.6	12.4	46.0	46.0	10.0	25.8	25.8	20.7	13.0	13.0
Actuated g/C Ratio	0.42	0.34	0.34	0.14	0.51	0.51	0.11	0.29	0.29	0.23	0.14	0.14
v/c Ratio	0.03	0.51	0.19	0.58	0.04	0.01	0.81	0.04	0.53	0.01	0.03	0.01
Control Delay	10.4	26.1	0.6	41.0	12.2	0.0	49.1	18.1	12.8	20.8	33.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.4	26.1	0.6	41.0	12.2	0.0	49.1	18.1	12.8	20.8	33.6	0.0
LOS	B	C	A	D	B	A	D	B	B	C	C	A
Approach Delay		21.4			33.7			28.7			22.5	
Approach LOS		C			C			C			C	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 26.6
 Intersection LOS: C
 Intersection Capacity Utilization 50.1%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 1: Voyager Pkwy /Voyager Pkwy & North Gate Blvd



Timings

Existing + Phase 1 Traffic

2: Voyager Pkwy #1/Voyager Pkwy & Spectrum Loop (north)

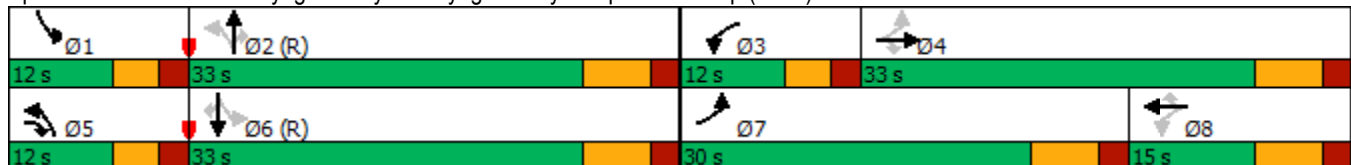
9:45-10:45 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	121	10	996	19	1	4	25	410	35	2	311	17
Future Volume (vph)	121	10	996	19	1	4	25	410	35	2	311	17
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	5	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	23.0	23.0	4.0	23.0	23.0
Minimum Split (s)	10.5	10.5	9.0	10.0	10.5	10.5	9.0	29.5	29.5	9.0	29.5	29.5
Total Split (s)	30.0	33.0	12.0	12.0	15.0	15.0	12.0	33.0	33.0	12.0	33.0	33.0
Total Split (%)	33.3%	36.7%	13.3%	13.3%	16.7%	16.7%	13.3%	36.7%	36.7%	13.3%	36.7%	36.7%
Yellow Time (s)	4.5	4.5	3.0	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	5.0	5.0	6.5	6.5	5.0	6.5	6.5	5.0	6.5	6.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	27.3	22.5	36.2	10.2	7.9	7.9	50.4	47.5	47.5	44.6	37.5	37.5
Actuated g/C Ratio	0.30	0.25	0.40	0.11	0.09	0.09	0.56	0.53	0.53	0.50	0.42	0.42
v/c Ratio	0.33	0.93	0.82	0.12	0.01	0.01	0.06	0.29	0.05	0.01	0.28	0.03
Control Delay	23.2	31.1	20.6	29.3	33.0	0.0	14.1	15.3	0.1	6.5	13.1	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	31.1	20.6	29.3	33.0	0.0	14.1	15.3	0.1	6.5	13.1	0.8
LOS	C	C	C	C	C	A	B	B	A	A	B	A
Approach Delay		25.6			24.7			14.1			12.4	
Approach LOS		C			C			B			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 20.6
 Intersection LOS: C
 Intersection Capacity Utilization 78.2%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 2: Voyager Pkwy #1/Voyager Pkwy & Spectrum Loop (north)



Timings
3: Voyager Pkwy #1 & Powers NB Ramp

Existing + Phase 1 Traffic
9:45-10:45 PM

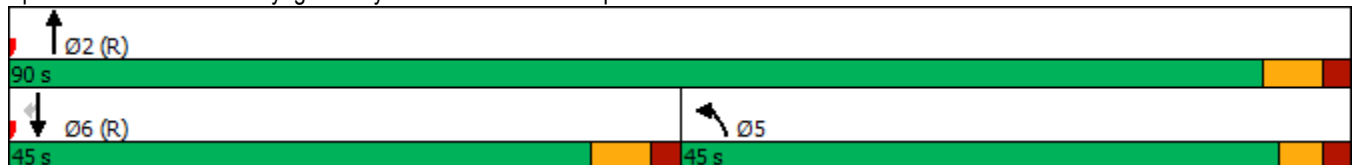


Lane Group	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↑↑	↑↔	↔
Traffic Volume (vph)	520	470	522	804
Future Volume (vph)	520	470	522	804
Turn Type	Prot	NA	NA	Perm
Protected Phases	5	2	6	
Permitted Phases				6
Detector Phase	5	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	4.0	4.0	4.0
Minimum Split (s)	10.0	10.0	10.0	10.0
Total Split (s)	45.0	90.0	45.0	45.0
Total Split (%)	50.0%	100.0%	50.0%	50.0%
Yellow Time (s)	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes
Recall Mode	None	C-Max	C-Max	C-Max
Act Effect Green (s)	40.0	90.0	39.0	39.0
Actuated g/C Ratio	0.44	1.00	0.43	0.43
v/c Ratio	0.45	0.18	0.82	0.79
Control Delay	30.3	0.1	19.5	18.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	30.3	0.1	19.5	18.5
LOS	C	A	B	B
Approach Delay		16.0	19.2	
Approach LOS		B	B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 75 (83%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 17.8
 Intersection LOS: B
 Intersection Capacity Utilization 57.2%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 3: Voyager Pkwy #1 & Powers NB Ramp



Timings
4: Voyager Pkwy #1 & Powers SB Ramp

Existing + Phase 1 Traffic
9:45-10:45 PM

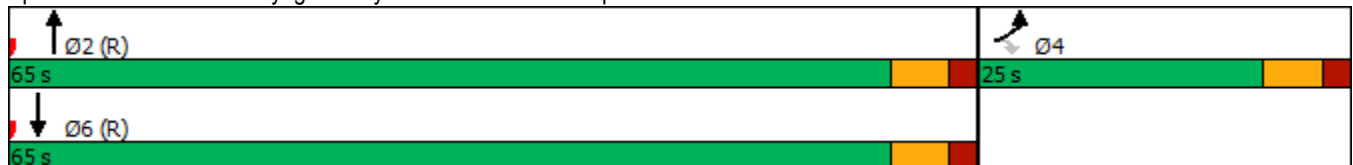


Lane Group	EBL	EBR	NBT	SBT
Lane Configurations	↘	↗	↑↑↑	↑↑
Traffic Volume (vph)	46	100	944	522
Future Volume (vph)	46	100	944	522
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	15.0	15.0	4.0	4.0
Minimum Split (s)	21.0	21.0	10.0	10.0
Total Split (s)	25.0	25.0	65.0	65.0
Total Split (%)	27.8%	27.8%	72.2%	72.2%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	C-Max	C-Max
Act Effect Green (s)	15.0	15.0	63.0	63.0
Actuated g/C Ratio	0.17	0.17	0.70	0.70
v/c Ratio	0.21	0.35	0.35	0.28
Control Delay	34.5	9.1	7.7	0.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.5	9.1	7.7	0.6
LOS	C	A	A	A
Approach Delay	17.1		7.7	0.6
Approach LOS	B		A	A

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 74 (82%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 40
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.35
 Intersection Signal Delay: 6.2
 Intersection Capacity Utilization 57.2%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 4: Voyager Pkwy #1 & Powers SB Ramp



Volume
104: Voyager Pkwy #1 & Powers SB Free Right

Existing + Phase 1 Traffic
9:45-10:45 PM



Lane Group	EBL	EBR	SET	SER	NWL	NWT
Traffic Volume (vph)	0	455	622	0	0	944
Future Volume (vph)	0	455	622	0	0	944
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	0	607	829	0	0	1259
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	607	829	0	0	1259
Intersection Summary						

Timings

Existing + Phase 1 Traffic

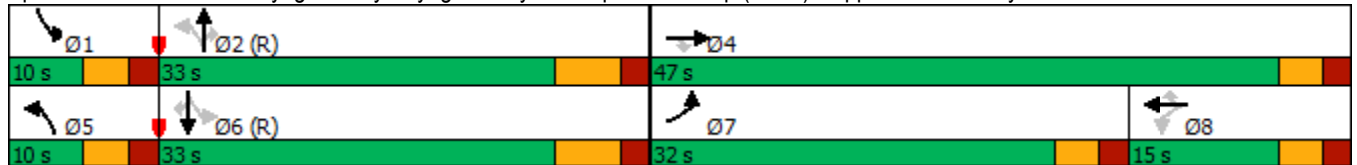
5: Voyager Pkwy/Voyager Pkwy #1 & Spectrum Loop (south)/Copper Center Pkwy 9:45-10:45 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	324	1	182	6	1	11	134	609	13	7	344	726
Future Volume (vph)	324	1	182	6	1	11	134	609	13	7	344	726
Turn Type	Prot	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	9.0	9.0	9.0	9.0	9.0	9.0	10.5	10.5	9.0	10.5	10.5
Total Split (s)	32.0	47.0	47.0	15.0	15.0	15.0	10.0	33.0	33.0	10.0	33.0	33.0
Total Split (%)	35.6%	52.2%	52.2%	16.7%	16.7%	16.7%	11.1%	36.7%	36.7%	11.1%	36.7%	36.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.5	6.5	5.0	6.5	6.5
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	16.5	21.3	21.3	6.1	6.1	6.1	58.7	55.0	55.0	50.1	42.8	42.8
Actuated g/C Ratio	0.18	0.24	0.24	0.07	0.07	0.07	0.65	0.61	0.61	0.56	0.48	0.48
v/c Ratio	0.68	0.00	0.43	0.06	0.01	0.06	0.29	0.37	0.02	0.02	0.27	0.76
Control Delay	39.7	20.0	5.4	39.8	38.0	0.5	9.3	12.1	0.0	9.6	14.6	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	39.7	20.0	5.4	39.8	38.0	0.5	9.3	12.1	0.0	9.6	14.6	7.8
LOS	D	B	A	D	D	A	A	B	A	A	B	A
Approach Delay		27.3			15.1			11.4			10.0	
Approach LOS		C			B			B			A	

Intersection Summary

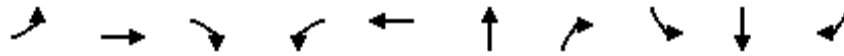
Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 4 (4%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 14.2
 Intersection LOS: B
 Intersection Capacity Utilization 69.5%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 5: Voyager Pkwy/Voyager Pkwy #1 & Spectrum Loop (south)/Copper Center Pkwy



Timings
6: Voyager Pkwy & Stout Rd

Existing + Phase 1 Traffic
9:45-10:45 PM

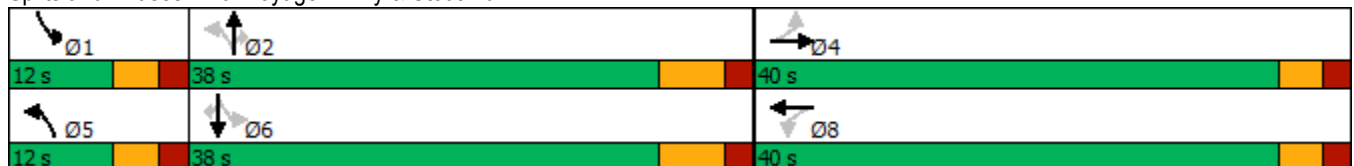


Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBL	SBT	SBR	Ø5
Lane Configurations		↕	↗		↔	↕	↗	↖	↕	↗	
Traffic Volume (vph)	284	0	208	40	0	439	71	59	455	17	
Future Volume (vph)	284	0	208	40	0	439	71	59	455	17	
Turn Type	Perm	NA	Free	Perm	NA	NA	Perm	pm+pt	NA	Perm	
Protected Phases		4			8	2		1	6		5
Permitted Phases	4		Free	8			2	6		6	
Detector Phase	4	4		8	8	2	2	1	6	6	
Switch Phase											
Minimum Initial (s)	4.0	4.0		4.0	4.0	20.0	20.0	4.0	20.0	20.0	4.0
Minimum Split (s)	9.0	9.0		9.0	9.0	26.5	26.5	9.0	26.5	26.5	9.0
Total Split (s)	40.0	40.0		40.0	40.0	38.0	38.0	12.0	38.0	38.0	12.0
Total Split (%)	44.4%	44.4%		44.4%	44.4%	42.2%	42.2%	13.3%	42.2%	42.2%	13%
Yellow Time (s)	3.0	3.0		3.0	3.0	4.5	4.5	3.0	4.5	4.5	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.0			5.0	6.5	6.5	5.0	6.5	6.5	
Lead/Lag						Lag	Lag	Lead	Lag	Lag	Lead
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	Max	Max	None	Max	Max	None
Act Effct Green (s)		26.1	79.1		26.1	32.3	32.3	42.8	41.2	41.2	
Actuated g/C Ratio		0.33	1.00		0.33	0.41	0.41	0.54	0.52	0.52	
v/c Ratio		0.83	0.17		0.23	0.40	0.13	0.18	0.33	0.03	
Control Delay		41.5	0.2		5.2	20.0	5.2	11.6	12.5	0.1	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		41.5	0.2		5.2	20.0	5.2	11.6	12.5	0.1	
LOS		D	A		A	B	A	B	B	A	
Approach Delay		24.1			5.2	17.9			12.0		
Approach LOS		C			A	B			B		

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 79.1
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 17.3
 Intersection LOS: B
 Intersection Capacity Utilization 56.2%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 6: Voyager Pkwy & Stout Rd



Timings
7: Voyager Pkwy & Middle Creek Parkway

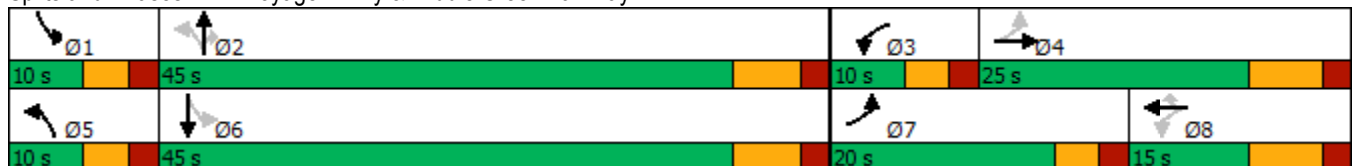
Existing + Phase 1 Traffic
9:45-10:45 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	257	3	338	24	1	19	13	155	38	25	610	44
Future Volume (vph)	257	3	338	24	1	19	13	155	38	25	610	44
Turn Type	pm+pt	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		8	2		2	6		Free
Detector Phase	7	4		3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	32.0	32.0	4.0	32.0	
Minimum Split (s)	9.0	11.0		9.0	11.0	11.0	9.0	38.5	38.5	9.0	38.5	
Total Split (s)	20.0	25.0		10.0	15.0	15.0	10.0	45.0	45.0	10.0	45.0	
Total Split (%)	22.2%	27.8%		11.1%	16.7%	16.7%	11.1%	50.0%	50.0%	11.1%	50.0%	
Yellow Time (s)	3.0	5.0		3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	7.0		5.0	7.0	7.0	5.0	6.5	6.5	5.0	6.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None	None	None	Max	Max	None	Max	
Act Effct Green (s)	16.9	12.0	73.5	10.2	5.7	5.7	42.6	39.4	39.4	42.6	39.4	73.5
Actuated g/C Ratio	0.23	0.16	1.00	0.14	0.08	0.08	0.58	0.54	0.54	0.58	0.54	1.00
v/c Ratio	0.88	0.01	0.28	0.13	0.00	0.08	0.04	0.11	0.05	0.05	0.42	0.04
Control Delay	53.3	31.7	0.4	24.7	38.0	0.5	8.0	11.1	0.1	7.8	13.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.3	31.7	0.4	24.7	38.0	0.5	8.0	11.1	0.1	7.8	13.3	0.0
LOS	D	C	A	C	D	A	A	B	A	A	B	A
Approach Delay		23.3			14.5			8.9			12.2	
Approach LOS		C			B			A			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 73.5
 Natural Cycle: 75
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 16.2
 Intersection LOS: B
 Intersection Capacity Utilization 59.7%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 7: Voyager Pkwy & Middle Creek Parkway



Timings
1: Voyager Pkwy /Voyager Pkwy & North Gate Blvd

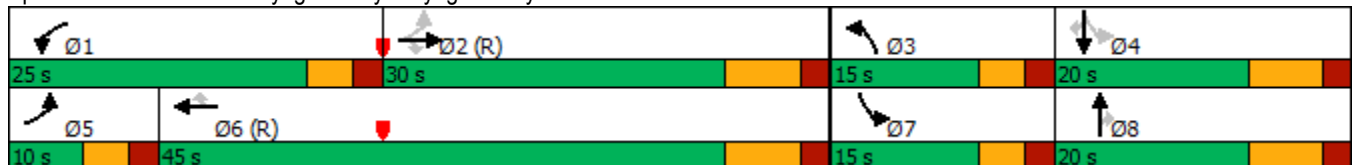
2026 Total Traffic
6:00 PM-7:00 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	658	253	481	564	17	238	49	173	17	27	28
Future Volume (vph)	35	658	253	481	564	17	238	49	173	17	27	28
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2			6			8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	20.0	20.0	10.0	20.0	20.0	10.0	20.0	20.0	10.0	20.0	20.0
Total Split (s)	10.0	30.0	30.0	25.0	45.0	45.0	15.0	20.0	20.0	15.0	20.0	20.0
Total Split (%)	11.1%	33.3%	33.3%	27.8%	50.0%	50.0%	16.7%	22.2%	22.2%	16.7%	22.2%	22.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effct Green (s)	32.1	25.1	25.1	17.9	42.0	42.0	9.7	23.3	23.3	21.4	13.3	13.3
Actuated g/C Ratio	0.36	0.28	0.28	0.20	0.47	0.47	0.11	0.26	0.26	0.24	0.15	0.15
v/c Ratio	0.11	0.72	0.43	0.76	0.37	0.02	0.69	0.11	0.32	0.05	0.11	0.07
Control Delay	12.2	34.6	5.8	41.7	17.1	0.1	40.4	22.3	4.8	21.1	34.6	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.2	34.6	5.8	41.7	17.1	0.1	40.4	22.3	4.8	21.1	34.6	0.3
LOS	B	C	A	D	B	A	D	C	A	C	C	A
Approach Delay		26.1			28.0			25.1			18.1	
Approach LOS		C			C			C			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 26.5
 Intersection LOS: C
 Intersection Capacity Utilization 61.2%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 1: Voyager Pkwy /Voyager Pkwy & North Gate Blvd



Timings

2026 Total Traffic

2: Voyager Pkwy #1/Voyager Pkwy & Spectrum Loop (north)

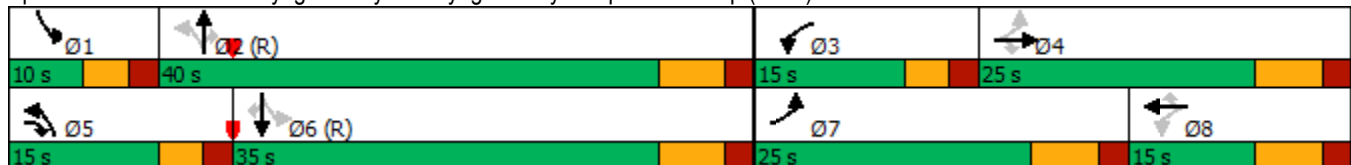
6:00 PM-7:00 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	25	861	209	13	98	300	247	231	49	578	138
Future Volume (vph)	103	25	861	209	13	98	300	247	231	49	578	138
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	5	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	8.5	8.5	4.0	15.0	15.0
Minimum Split (s)	10.5	10.5	9.0	10.0	10.5	10.5	9.0	15.0	15.0	9.0	21.5	21.5
Total Split (s)	25.0	25.0	15.0	15.0	15.0	15.0	15.0	40.0	40.0	10.0	35.0	35.0
Total Split (%)	27.8%	27.8%	16.7%	16.7%	16.7%	16.7%	16.7%	44.4%	44.4%	11.1%	38.9%	38.9%
Yellow Time (s)	4.5	4.5	3.0	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	5.0	5.0	6.5	6.5	5.0	6.5	6.5	5.0	6.5	6.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	27.9	18.6	35.1	29.8	20.3	20.3	45.0	37.5	37.5	35.0	28.5	28.5
Actuated g/C Ratio	0.31	0.21	0.39	0.33	0.23	0.23	0.50	0.42	0.42	0.39	0.32	0.32
v/c Ratio	0.24	1.02	0.73	0.82	0.03	0.20	0.85	0.18	0.31	0.11	0.56	0.22
Control Delay	20.6	68.7	25.8	46.2	31.3	0.8	37.5	15.6	4.8	15.7	36.0	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	68.7	25.8	46.2	31.3	0.8	37.5	15.6	4.8	15.7	36.0	11.1
LOS	C	E	C	D	C	A	D	B	A	B	D	B
Approach Delay		44.7			31.6			20.8			30.2	
Approach LOS		D			C			C			C	

Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 25 (28%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 32.8	Intersection LOS: C
Intersection Capacity Utilization 82.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Voyager Pkwy #1/Voyager Pkwy & Spectrum Loop (north)



Timings
3: Voyager Pkwy #1 & Powers NB Ramp

2026 Total Traffic
6:00 PM-7:00 PM

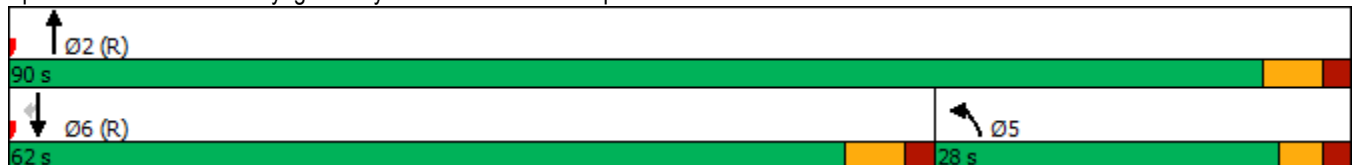


Lane Group	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↑↑	↑↔	↔
Traffic Volume (vph)	446	784	892	758
Future Volume (vph)	446	784	892	758
Turn Type	Prot	NA	NA	Perm
Protected Phases	5	2	6	
Permitted Phases				6
Detector Phase	5	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	4.0	4.0	4.0
Minimum Split (s)	10.0	10.0	10.0	10.0
Total Split (s)	28.0	90.0	62.0	62.0
Total Split (%)	31.1%	100.0%	68.9%	68.9%
Yellow Time (s)	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes
Recall Mode	None	C-Max	C-Max	C-Max
Act Effct Green (s)	23.0	90.0	56.0	56.0
Actuated g/C Ratio	0.26	1.00	0.62	0.62
v/c Ratio	0.55	0.24	0.60	0.59
Control Delay	34.7	0.1	13.3	13.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.7	0.1	13.3	13.1
LOS	C	A	B	B
Approach Delay		12.7	13.3	
Approach LOS		B	B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 67 (74%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 45
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 13.0
 Intersection LOS: B
 Intersection Capacity Utilization 59.4%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 3: Voyager Pkwy #1 & Powers NB Ramp



Timings
4: Voyager Pkwy #1 & Powers SB Ramp

2026 Total Traffic
6:00 PM-7:00 PM

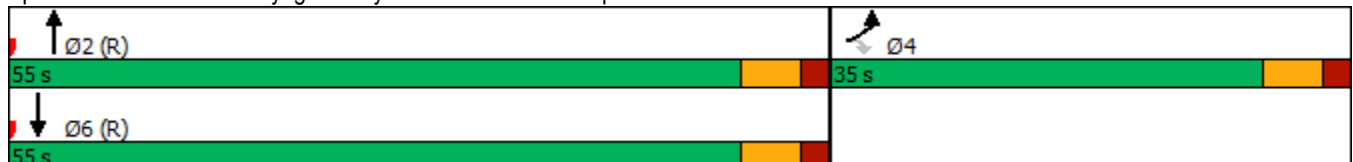


Lane Group	EBL	EBR	NBT	SBT
Lane Configurations	↖	↗	↑↑↑	↑↑
Traffic Volume (vph)	317	400	914	892
Future Volume (vph)	317	400	914	892
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	15.0	15.0	15.0	15.0
Minimum Split (s)	21.0	21.0	21.0	21.0
Total Split (s)	35.0	35.0	55.0	55.0
Total Split (%)	38.9%	38.9%	61.1%	61.1%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	C-Max	C-Max
Act Effct Green (s)	24.1	24.1	53.9	53.9
Actuated g/C Ratio	0.27	0.27	0.60	0.60
v/c Ratio	0.72	0.86	0.32	0.45
Control Delay	38.2	40.9	10.0	1.8
Queue Delay	0.0	0.2	0.0	0.1
Total Delay	38.2	41.1	10.0	1.9
LOS	D	D	B	A
Approach Delay	39.8		10.0	1.9
Approach LOS	D		B	A

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 78 (87%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 15.6
 Intersection LOS: B
 Intersection Capacity Utilization 59.4%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 4: Voyager Pkwy #1 & Powers SB Ramp



Volume
 104: Voyager Pkwy #1 & Powers SB Free Right

2026 Total Traffic
 6:00 PM-7:00 PM



Lane Group	EBL	EBR	SET	SER	NWL	NWT
Traffic Volume (vph)	0	1155	1292	0	0	914
Future Volume (vph)	0	1155	1292	0	0	914
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	0	1255	1404	0	0	993
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1255	1404	0	0	993
Intersection Summary						

Timings

2026 Total Traffic

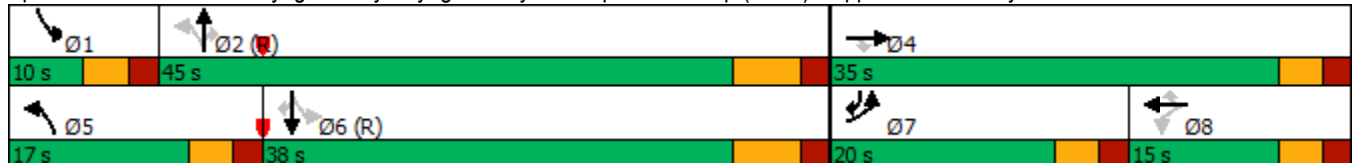
5: Voyager Pkwy/Voyager Pkwy #1 & Spectrum Loop (south)/Copper Center Pkwy 6:00 PM-7:00 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	325	8	219	31	1	54	337	533	41	24	1246	1180
Future Volume (vph)	325	8	219	31	1	54	337	533	41	24	1246	1180
Turn Type	Prot	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	5	2	2	1	6	7
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	9.0	9.0	9.0	9.0	9.0	9.0	10.5	10.5	9.0	10.5	9.0
Total Split (s)	20.0	35.0	35.0	15.0	15.0	15.0	17.0	45.0	45.0	10.0	38.0	20.0
Total Split (%)	22.2%	38.9%	38.9%	16.7%	16.7%	16.7%	18.9%	50.0%	50.0%	11.1%	42.2%	22.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.5	3.0	4.5	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.5	6.5	5.0	4.5	5.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	None
Act Effct Green (s)	15.0	25.5	25.5	7.6	7.6	7.6	54.5	48.7	48.7	38.7	33.5	53.0
Actuated g/C Ratio	0.17	0.28	0.28	0.08	0.08	0.08	0.61	0.54	0.54	0.43	0.37	0.59
v/c Ratio	0.61	0.02	0.40	0.29	0.01	0.17	0.88	0.30	0.05	0.06	1.02	1.06
Control Delay	39.9	20.9	7.2	44.0	36.0	1.1	46.6	13.7	0.1	7.6	54.5	55.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.9	20.9	7.2	44.0	36.0	1.1	46.6	13.7	0.1	7.6	54.5	55.1
LOS	D	C	A	D	D	A	D	B	A	A	D	E
Approach Delay		26.7			17.0			25.3			54.4	
Approach LOS		C			B			C			D	

Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 4 (4%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.06	
Intersection Signal Delay: 43.1	Intersection LOS: D
Intersection Capacity Utilization 107.6%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 5: Voyager Pkwy/Voyager Pkwy #1 & Spectrum Loop (south)/Copper Center Pkwy



Timings
6: Voyager Pkwy & Stout Rd

2026 Total Traffic
6:00 PM-7:00 PM

	→	↘	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗		↔	↖	↕	↗	↖	↕	↗
Traffic Volume (vph)	1	1	100	0	301	830	145	119	968	409
Future Volume (vph)	1	1	100	0	301	830	145	119	968	409
Turn Type	NA	Free	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	4			8	5	2		1	6	
Permitted Phases		Free	8		2		2	6		6
Detector Phase	4		8	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	4.0		4.0	4.0	4.0	20.0	20.0	4.0	20.0	20.0
Minimum Split (s)	9.0		9.0	9.0	9.0	26.5	26.5	9.0	26.5	26.5
Total Split (s)	20.0		20.0	20.0	20.0	58.0	58.0	12.0	50.0	50.0
Total Split (%)	22.2%		22.2%	22.2%	22.2%	64.4%	64.4%	13.3%	55.6%	55.6%
Yellow Time (s)	3.0		3.0	3.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0			5.0	5.0	6.5	6.5	5.0	6.5	6.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None		None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	8.7	83.4		8.7	63.1	51.6	51.6	55.3	47.2	47.2
Actuated g/C Ratio	0.10	1.00		0.10	0.76	0.62	0.62	0.66	0.57	0.57
v/c Ratio	0.01	0.00		0.66	0.70	0.41	0.15	0.27	0.52	0.41
Control Delay	32.0	0.0		20.3	14.0	9.3	1.8	5.2	13.5	2.5
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.0	0.0		20.3	14.0	9.3	1.8	5.2	13.5	2.5
LOS	C	A		C	B	A	A	A	B	A
Approach Delay	16.0			20.3		9.6			9.8	
Approach LOS	B			C		A			A	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 83.4
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 10.3
 Intersection LOS: B
 Intersection Capacity Utilization 74.4%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 6: Voyager Pkwy & Stout Rd



Timings
7: Voyager Pkwy & Middle Creek Parkway

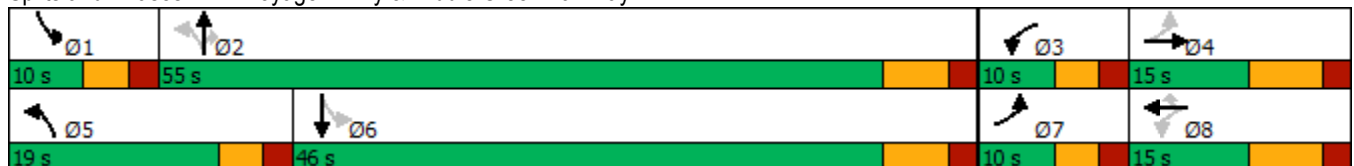
2026 Total Traffic
6:00 PM-7:00 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	6	34	66	8	78	89	933	49	79	687	106
Future Volume (vph)	40	6	34	66	8	78	89	933	49	79	687	106
Turn Type	pm+pt	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		8	2		2	6		Free
Detector Phase	7	4		3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	32.0	32.0	4.0	32.0	
Minimum Split (s)	9.0	11.0		9.0	11.0	11.0	9.0	38.5	38.5	9.0	38.5	
Total Split (s)	10.0	15.0		10.0	15.0	15.0	19.0	55.0	55.0	10.0	46.0	
Total Split (%)	11.1%	16.7%		11.1%	16.7%	16.7%	21.1%	61.1%	61.1%	11.1%	51.1%	
Yellow Time (s)	3.0	5.0		3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	7.0		5.0	7.0	7.0	5.0	6.5	6.5	5.0	6.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None	None	None	Max	Max	None	Max	
Act Effct Green (s)	6.7	6.0	81.7	12.0	5.9	5.9	59.1	53.6	53.6	55.6	51.8	81.7
Actuated g/C Ratio	0.08	0.07	1.00	0.15	0.07	0.07	0.72	0.66	0.66	0.68	0.63	1.00
v/c Ratio	0.29	0.05	0.02	0.29	0.04	0.26	0.18	0.43	0.05	0.22	0.33	0.07
Control Delay	40.0	39.2	0.0	33.2	38.6	2.0	5.2	10.8	0.1	6.3	11.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.0	39.2	0.0	33.2	38.6	2.0	5.2	10.8	0.1	6.3	11.0	0.1
LOS	D	D	A	C	D	A	A	B	A	A	B	A
Approach Delay		22.9			17.5			9.9			9.2	
Approach LOS		C			B			A			A	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 81.7
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.43
 Intersection Signal Delay: 10.6
 Intersection LOS: B
 Intersection Capacity Utilization 57.3%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 7: Voyager Pkwy & Middle Creek Parkway



Timings
1: Voyager Pkwy /Voyager Pkwy & North Gate Blvd

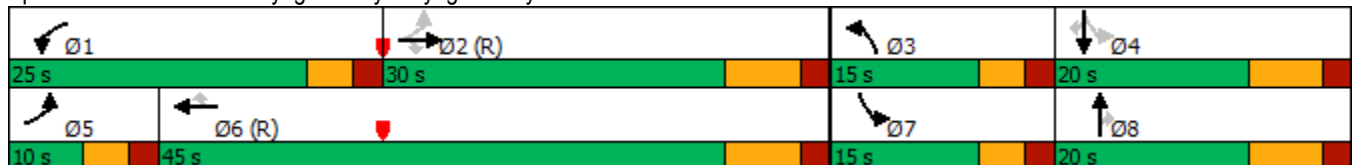
2026 Total Traffic
9:45-10:45 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	588	104	221	107	6	93	14	266	4	7	3
Future Volume (vph)	11	588	104	221	107	6	93	14	266	4	7	3
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2			6			8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	10.0	10.0	4.0	10.0	10.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	20.0	20.0	10.0	20.0	20.0	10.0	20.0	20.0	10.0	20.0	20.0
Total Split (s)	10.0	30.0	30.0	25.0	45.0	45.0	15.0	20.0	20.0	15.0	20.0	20.0
Total Split (%)	11.1%	33.3%	33.3%	27.8%	50.0%	50.0%	16.7%	22.2%	22.2%	16.7%	22.2%	22.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effct Green (s)	37.1	30.1	30.1	12.9	46.0	46.0	8.4	25.8	25.8	22.3	14.6	14.6
Actuated g/C Ratio	0.41	0.33	0.33	0.14	0.51	0.51	0.09	0.29	0.29	0.25	0.16	0.16
v/c Ratio	0.03	0.66	0.20	0.59	0.08	0.01	0.38	0.04	0.50	0.01	0.03	0.01
Control Delay	10.5	29.3	0.8	40.8	12.3	0.0	37.1	22.1	12.5	20.8	33.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.5	29.3	0.8	40.8	12.3	0.0	37.1	22.1	12.5	20.8	33.1	0.0
LOS	B	C	A	D	B	A	D	C	B	C	C	A
Approach Delay		24.8			30.9			19.0			22.3	
Approach LOS		C			C			B			C	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.66
 Intersection Signal Delay: 24.7
 Intersection LOS: C
 Intersection Capacity Utilization 51.9%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 1: Voyager Pkwy /Voyager Pkwy & North Gate Blvd



Timings

2026 Total Traffic

2: Voyager Pkwy #1/Voyager Pkwy & Spectrum Loop (north)

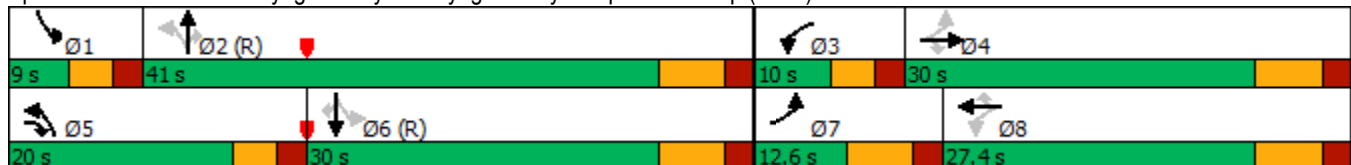
9:45-10:45 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	10	987	49	1	16	39	262	47	9	313	28
Future Volume (vph)	89	10	987	49	1	16	39	262	47	9	313	28
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	5	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	10.0	10.0	4.0	10.0	10.0
Minimum Split (s)	10.5	10.5	9.0	10.0	10.5	10.5	9.0	29.5	29.5	9.0	29.5	29.5
Total Split (s)	12.6	30.0	20.0	10.0	27.4	27.4	20.0	41.0	41.0	9.0	30.0	30.0
Total Split (%)	14.0%	33.3%	22.2%	11.1%	30.4%	30.4%	22.2%	45.6%	45.6%	10.0%	33.3%	33.3%
Yellow Time (s)	4.5	4.5	3.0	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	5.0	5.0	6.5	6.5	5.0	6.5	6.5	5.0	6.5	6.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	28.2	21.8	39.6	16.2	13.5	13.5	48.7	45.4	45.4	36.7	30.9	30.9
Actuated g/C Ratio	0.31	0.24	0.44	0.18	0.15	0.15	0.54	0.50	0.50	0.41	0.34	0.34
v/c Ratio	0.26	0.95	0.83	0.36	0.00	0.05	0.10	0.19	0.07	0.03	0.34	0.05
Control Delay	21.8	36.2	24.0	31.0	28.0	0.2	10.5	11.0	1.0	9.8	16.3	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	36.2	24.0	31.0	28.0	0.2	10.5	11.0	1.0	9.8	16.3	1.9
LOS	C	D	C	C	C	A	B	B	A	A	B	A
Approach Delay		29.4			23.5			9.6			15.0	
Approach LOS		C			C			A			B	

Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 22.8	Intersection LOS: C
Intersection Capacity Utilization 67.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Voyager Pkwy #1/Voyager Pkwy & Spectrum Loop (north)



Timings
3: Voyager Pkwy #1 & Powers NB Ramp

2026 Total Traffic
9:45-10:45 PM

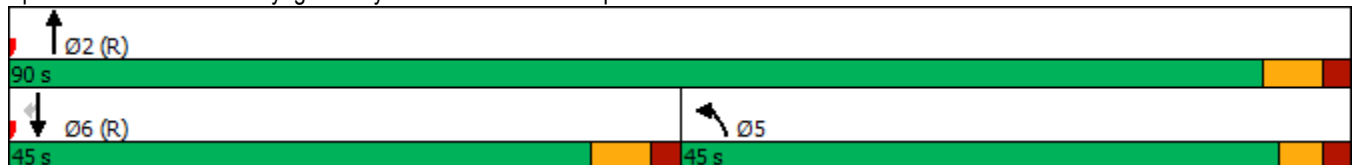


Lane Group	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↑↑	↑↔	↔
Traffic Volume (vph)	802	349	549	801
Future Volume (vph)	802	349	549	801
Turn Type	Prot	NA	NA	Perm
Protected Phases	5	2	6	
Permitted Phases				6
Detector Phase	5	2	6	6
Switch Phase				
Minimum Initial (s)	5.0	4.0	4.0	4.0
Minimum Split (s)	10.0	10.0	10.0	10.0
Total Split (s)	45.0	90.0	45.0	45.0
Total Split (%)	50.0%	100.0%	50.0%	50.0%
Yellow Time (s)	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes
Recall Mode	None	C-Max	C-Max	C-Max
Act Effect Green (s)	40.0	90.0	39.0	39.0
Actuated g/C Ratio	0.44	1.00	0.43	0.43
v/c Ratio	0.69	0.13	0.87	0.87
Control Delay	38.1	0.1	23.9	28.5
Queue Delay	3.2	0.0	0.0	0.0
Total Delay	41.3	0.1	23.9	28.5
LOS	D	A	C	C
Approach Delay		28.8	25.3	
Approach LOS		C	C	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 75 (83%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 26.9
 Intersection LOS: C
 Intersection Capacity Utilization 65.1%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 3: Voyager Pkwy #1 & Powers NB Ramp



Timings
4: Voyager Pkwy #1 & Powers SB Ramp

2026 Total Traffic
9:45-10:45 PM

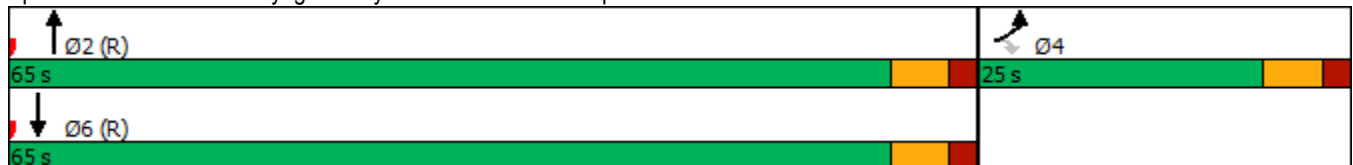


Lane Group	EBL	EBR	NBT	SBT
Lane Configurations	↖	↗	↑↑↑	↑↑
Traffic Volume (vph)	51	100	1100	549
Future Volume (vph)	51	100	1100	549
Turn Type	Prot	Perm	NA	NA
Protected Phases	4		2	6
Permitted Phases		4		
Detector Phase	4	4	2	6
Switch Phase				
Minimum Initial (s)	15.0	15.0	4.0	4.0
Minimum Split (s)	21.0	21.0	10.0	10.0
Total Split (s)	25.0	25.0	65.0	65.0
Total Split (%)	27.8%	27.8%	72.2%	72.2%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	C-Max	C-Max
Act Effct Green (s)	15.0	15.0	63.0	63.0
Actuated g/C Ratio	0.17	0.17	0.70	0.70
v/c Ratio	0.23	0.35	0.41	0.29
Control Delay	34.9	9.1	9.8	0.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.9	9.1	9.8	0.3
LOS	C	A	A	A
Approach Delay	17.8		9.8	0.3
Approach LOS	B		A	A

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 74 (82%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 40
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.41
 Intersection Signal Delay: 7.6
 Intersection Capacity Utilization 65.1%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 4: Voyager Pkwy #1 & Powers SB Ramp



Volume
 104: Voyager Pkwy #1 & Powers SB Free Right

2026 Total Traffic
 9:45-10:45 PM



Lane Group	EBL	EBR	SET	SER	NWL	NWT
Traffic Volume (vph)	0	418	649	0	0	1100
Future Volume (vph)	0	418	649	0	0	1100
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	0	557	865	0	0	1467
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	557	865	0	0	1467
Intersection Summary						

Timings

2026 Total Traffic

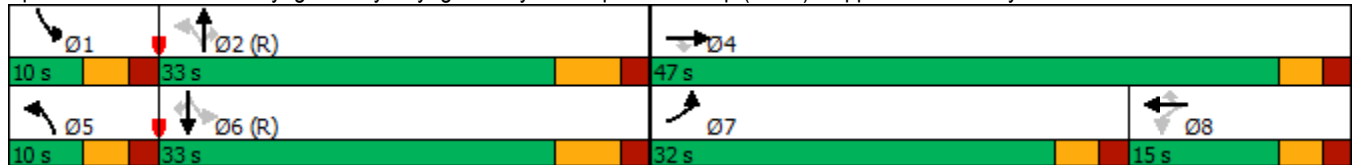
5: Voyager Pkwy/Voyager Pkwy #1 & Spectrum Loop (south)/Copper Center Pkwy 9:45-10:45 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	572	1	156	6	1	11	162	517	13	7	341	720
Future Volume (vph)	572	1	156	6	1	11	162	517	13	7	341	720
Turn Type	Prot	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases			4	8		8	2		2	6		6
Detector Phase	7	4	4	8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	9.0	9.0	9.0	9.0	9.0	9.0	10.5	10.5	9.0	10.5	10.5
Total Split (s)	32.0	47.0	47.0	15.0	15.0	15.0	10.0	33.0	33.0	10.0	33.0	33.0
Total Split (%)	35.6%	52.2%	52.2%	16.7%	16.7%	16.7%	11.1%	36.7%	36.7%	11.1%	36.7%	36.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.5	6.5	5.0	6.5	6.5
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	24.3	29.0	29.0	6.1	6.1	6.1	50.2	47.2	47.2	43.3	36.0	36.0
Actuated g/C Ratio	0.27	0.32	0.32	0.07	0.07	0.07	0.56	0.52	0.52	0.48	0.40	0.40
v/c Ratio	0.82	0.00	0.32	0.06	0.01	0.06	0.42	0.37	0.02	0.02	0.32	0.79
Control Delay	38.4	15.0	3.7	39.8	38.0	0.5	15.2	16.1	0.0	12.1	17.4	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Total Delay	38.4	15.0	3.7	39.8	38.0	0.5	15.2	16.1	0.0	12.1	17.4	9.7
LOS	D	B	A	D	D	A	B	B	A	B	B	A
Approach Delay		31.0			15.1			15.6			12.2	
Approach LOS		C			B			B			B	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 4 (4%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 18.6
 Intersection LOS: B
 Intersection Capacity Utilization 70.6%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 5: Voyager Pkwy/Voyager Pkwy #1 & Spectrum Loop (south)/Copper Center Pkwy



Timings
6: Voyager Pkwy & Stout Rd

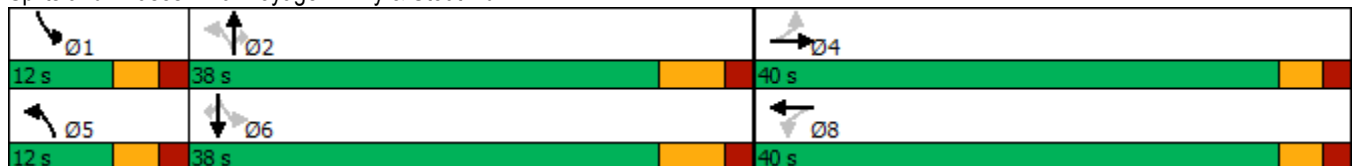
2026 Total Traffic
9:45-10:45 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations												
Traffic Volume (vph)	352	0	602	40	0	1	307	71	59	444	1	
Future Volume (vph)	352	0	602	40	0	1	307	71	59	444	1	
Turn Type	Perm	NA	Free	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	Perm	
Protected Phases		4			8	5	2		1	6		
Permitted Phases	4		Free	8		2		2	6		6	
Detector Phase	4	4		8	8	5	2	2	1	6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	20.0	20.0	4.0	20.0	20.0	
Minimum Split (s)	9.0	9.0		9.0	9.0	9.0	26.5	26.5	9.0	26.5	26.5	
Total Split (s)	40.0	40.0		40.0	40.0	12.0	38.0	38.0	12.0	38.0	38.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%	13.3%	42.2%	42.2%	13.3%	42.2%	42.2%	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.5	4.5	3.0	4.5	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.0			5.0	5.0	6.5	6.5	5.0	6.5	6.5	
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None	None	Max	Max	None	Max	Max	
Act Effct Green (s)		31.6	84.4		31.6	37.8	32.1	32.1	41.9	39.1	39.1	
Actuated g/C Ratio		0.37	1.00		0.37	0.45	0.38	0.38	0.50	0.46	0.46	
v/c Ratio		0.92	0.50		0.24	0.00	0.30	0.14	0.16	0.36	0.00	
Control Delay		51.1	1.1		5.3	12.0	20.8	5.2	12.6	16.6	0.0	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		51.1	1.1		5.3	12.0	20.8	5.2	12.6	16.6	0.0	
LOS		D	A		A	B	C	A	B	B	A	
Approach Delay		19.6			5.3		17.9			16.1		
Approach LOS		B			A		B			B		

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 84.4
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 17.8
 Intersection Capacity Utilization 59.9%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 6: Voyager Pkwy & Stout Rd



Timings
7: Voyager Pkwy & Middle Creek Parkway

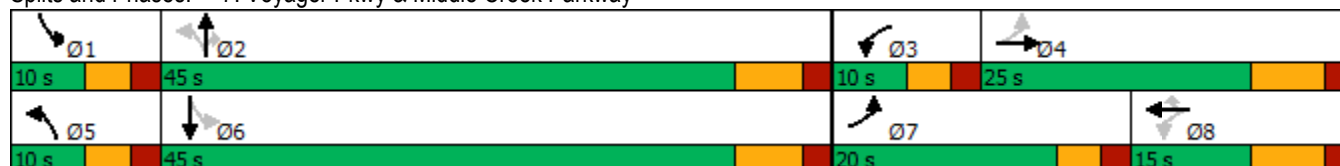
2026 Total Traffic
9:45-10:45 PM



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	3	98	24	1	19	13	202	38	25	1012	24
Future Volume (vph)	77	3	98	24	1	19	13	202	38	25	1012	24
Turn Type	pm+pt	NA	Free	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free	8		8	2		2	6		Free
Detector Phase	7	4		3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	32.0	32.0	4.0	32.0	
Minimum Split (s)	9.0	11.0		9.0	11.0	11.0	9.0	38.5	38.5	9.0	38.5	
Total Split (s)	20.0	25.0		10.0	15.0	15.0	10.0	45.0	45.0	10.0	45.0	
Total Split (%)	22.2%	27.8%		11.1%	16.7%	16.7%	11.1%	50.0%	50.0%	11.1%	50.0%	
Yellow Time (s)	3.0	5.0		3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	7.0		5.0	7.0	7.0	5.0	6.5	6.5	5.0	6.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None	None	None	Max	Max	None	Max	
Act Effct Green (s)	11.5	7.5	69.4	9.6	5.7	5.7	46.4	44.7	44.7	47.2	46.4	69.4
Actuated g/C Ratio	0.17	0.11	1.00	0.14	0.08	0.08	0.67	0.64	0.64	0.68	0.67	1.00
v/c Ratio	0.36	0.02	0.08	0.13	0.00	0.07	0.06	0.12	0.05	0.04	0.56	0.02
Control Delay	29.5	31.7	0.1	24.2	36.0	0.4	7.3	9.4	0.1	6.7	12.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.5	31.7	0.1	24.2	36.0	0.4	7.3	9.4	0.1	6.7	12.0	0.0
LOS	C	C	A	C	D	A	A	A	A	A	B	A
Approach Delay		13.4			14.2			7.9			11.6	
Approach LOS		B			B			A			B	

Intersection Summary
 Cycle Length: 90
 Actuated Cycle Length: 69.4
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.56
 Intersection Signal Delay: 11.3
 Intersection LOS: B
 Intersection Capacity Utilization 50.2%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 7: Voyager Pkwy & Middle Creek Parkway



Queuing Reports



Queuing and Blocking Report

Intersection: 1: Voyager Pkwy /Voyager Pkwy & North Gate Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	87	397	335	115	364	378	152	139	14	118	133	66
Average Queue (ft)	28	203	162	56	131	186	82	69	2	62	90	22
95th Queue (ft)	61	310	273	97	267	295	128	116	9	110	130	52
Link Distance (ft)		630	630	630			916	916			721	721
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	280				360	360			235	275		
Storage Blk Time (%)		4			0	1						
Queuing Penalty (veh)		1			0	3						

Intersection: 1: Voyager Pkwy /Voyager Pkwy & North Gate Blvd

Movement	NB	SB	SB	SB
Directions Served	R	L	T	R
Maximum Queue (ft)	86	31	76	31
Average Queue (ft)	42	11	22	18
95th Queue (ft)	76	34	59	41
Link Distance (ft)			461	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	200	105		105
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Intersection: 2: Voyager Pkwy #1/Voyager Pkwy & Spectrum Loop (north)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	TR	R	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	340	1046	1027	194	291	267	331	72	80	69	54	411
Average Queue (ft)	120	601	643	168	110	44	139	23	26	28	17	204
95th Queue (ft)	305	1058	1095	231	313	119	247	55	63	58	39	357
Link Distance (ft)		2711			276	276		617	617			721
Upstream Blk Time (%)					8	0						
Queuing Penalty (veh)					0	0						
Storage Bay Dist (ft)	240		1000	95			500			250	210	
Storage Blk Time (%)	0	23	1	78	0							8
Queuing Penalty (veh)	0	122	4	10	0							4

Intersection: 2: Voyager Pkwy #1/Voyager Pkwy & Spectrum Loop (north)

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	443	97
Average Queue (ft)	277	32
95th Queue (ft)	411	78
Link Distance (ft)	721	721
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Voyager Pkwy #1 & Powers NB Ramp

Movement	NB	NB	SB	SB	SB
Directions Served	L	L	T	TR	R
Maximum Queue (ft)	206	203	618	641	350
Average Queue (ft)	131	126	117	254	152
95th Queue (ft)	187	187	334	556	330
Link Distance (ft)	389	389	617	617	
Upstream Blk Time (%)			0	1	
Queuing Penalty (veh)			1	10	
Storage Bay Dist (ft)					250
Storage Blk Time (%)				20	1
Queuing Penalty (veh)				75	11

Queuing and Blocking Report

Intersection: 4: Voyager Pkwy #1 & Powers SB Ramp

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	T	T	T	T	T
Maximum Queue (ft)	528	662	51	51	54	389	420
Average Queue (ft)	135	345	13	37	41	125	253
95th Queue (ft)	226	610	40	44	53	342	509
Link Distance (ft)	901	901	36	36	36	389	389
Upstream Blk Time (%)			4	17	22	0	12
Queuing Penalty (veh)			13	51	67	0	50
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: Voyager Pkwy/Voyager Pkwy #1 & Spectrum Loop (south)/Copper Center Pkwy

Movement	EB	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	L	T	R	L	R	L	T	T	R	L	T
Maximum Queue (ft)	192	224	31	180	78	68	342	147	123	43	474	645
Average Queue (ft)	95	127	7	91	32	22	165	37	53	7	24	348
95th Queue (ft)	169	197	27	155	67	53	294	97	113	23	168	682
Link Distance (ft)	528	528	528					1128	1128			646
Upstream Blk Time (%)												0
Queuing Penalty (veh)												2
Storage Bay Dist (ft)				335	115	115	450			200	375	
Storage Blk Time (%)												5
Queuing Penalty (veh)												1

Intersection: 5: Voyager Pkwy/Voyager Pkwy #1 & Spectrum Loop (south)/Copper Center Pkwy

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	714	755
Average Queue (ft)	567	589
95th Queue (ft)	916	910
Link Distance (ft)	646	646
Upstream Blk Time (%)	12	13
Queuing Penalty (veh)	98	103
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Intersection: 6: Voyager Pkwy & Stout Rd

Movement	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	L	T	T	R	L	T	T	R
Maximum Queue (ft)	142	254	238	160	89	82	245	246	97
Average Queue (ft)	91	101	70	63	23	36	122	135	55
95th Queue (ft)	153	198	150	137	58	70	241	252	95
Link Distance (ft)	126		519	519			1128	1128	
Upstream Blk Time (%)	4								
Queuing Penalty (veh)	0								
Storage Bay Dist (ft)		400			125	275			200
Storage Blk Time (%)				1				4	
Queuing Penalty (veh)				2				16	

Intersection: 7: Voyager Pkwy & Middle Creek Parkway

Movement	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	L	T	T	R	L	T	T	R	L	T
Maximum Queue (ft)	74	31	104	25	23	80	71	174	173	47	130	129
Average Queue (ft)	29	6	45	4	2	23	27	79	54	8	42	40
95th Queue (ft)	66	25	88	18	11	49	53	159	128	24	87	102
Link Distance (ft)	749	749		427	427			1268	1268	1268		789
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			130			130	500				225	
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 7: Voyager Pkwy & Middle Creek Parkway

Movement	SB
Directions Served	T
Maximum Queue (ft)	171
Average Queue (ft)	55
95th Queue (ft)	126
Link Distance (ft)	789
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report

Intersection: 104: Voyager Pkwy #1 & Powers SB Free Right

Movement	EB	SE	NW	NW	NW
Directions Served	R	T	T	T	T
Maximum Queue (ft)	1044	55	148	162	250
Average Queue (ft)	519	31	7	23	82
95th Queue (ft)	1187	63	52	75	197
Link Distance (ft)	971	36		646	646
Upstream Blk Time (%)	13	8			
Queuing Penalty (veh)	148	50			
Storage Bay Dist (ft)			300		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 842

Queuing and Blocking Report

Intersection: 1: Voyager Pkwy /Voyager Pkwy & North Gate Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	26	238	218	73	137	203	64	40	14	45	67	66
Average Queue (ft)	5	164	111	34	38	108	15	11	1	15	39	8
95th Queue (ft)	21	225	200	59	113	165	41	30	7	38	68	34
Link Distance (ft)		630	630	630			916	916			721	721
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	280				360	360			235	275		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 1: Voyager Pkwy /Voyager Pkwy & North Gate Blvd

Movement	NB	SB	SB	SB
Directions Served	R	L	T	R
Maximum Queue (ft)	126	31	53	30
Average Queue (ft)	51	2	8	4
95th Queue (ft)	94	15	34	20
Link Distance (ft)			461	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	200	105		105
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Intersection: 2: Voyager Pkwy #1/Voyager Pkwy & Spectrum Loop (north)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	TR	R	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	339	866	916	87	25	44	50	49	108	24	15	160
Average Queue (ft)	78	325	390	37	2	11	15	4	25	7	3	27
95th Queue (ft)	216	729	769	71	12	35	44	17	70	23	12	89
Link Distance (ft)		2711			276	276		617	617			721
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	240		1000	95			500			250	210	
Storage Blk Time (%)	0	4		0								
Queuing Penalty (veh)	1	25		0								

Intersection: 2: Voyager Pkwy #1/Voyager Pkwy & Spectrum Loop (north)

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	158	0
Average Queue (ft)	46	0
95th Queue (ft)	99	0
Link Distance (ft)	721	721
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Voyager Pkwy #1 & Powers NB Ramp

Movement	NB	NB	SB	SB	SB
Directions Served	L	L	T	TR	R
Maximum Queue (ft)	295	323	180	246	207
Average Queue (ft)	217	226	49	153	122
95th Queue (ft)	303	316	115	230	202
Link Distance (ft)	389	389	617	617	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					250
Storage Blk Time (%)				0	
Queuing Penalty (veh)				1	

Queuing and Blocking Report

Intersection: 4: Voyager Pkwy #1 & Powers SB Ramp

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	T	T	T	T	T
Maximum Queue (ft)	95	70	55	74	51	74	118
Average Queue (ft)	43	38	18	30	23	5	9
95th Queue (ft)	80	62	50	66	55	29	54
Link Distance (ft)	901	901	36	36	36	389	389
Upstream Blk Time (%)			2	6	5		
Queuing Penalty (veh)			6	21	18		
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: Voyager Pkwy/Voyager Pkwy #1 & Spectrum Loop (south)/Copper Center Pkwy

Movement	EB	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	L	T	R	L	R	L	T	T	R	L	T
Maximum Queue (ft)	346	342	31	93	29	27	192	156	124	15	21	149
Average Queue (ft)	174	154	3	46	5	12	66	72	53	2	4	33
95th Queue (ft)	301	286	17	80	21	33	144	138	116	10	17	84
Link Distance (ft)	528	528	528					1128	1128			646
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				335	115	115	450			200	375	
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 5: Voyager Pkwy/Voyager Pkwy #1 & Spectrum Loop (south)/Copper Center Pkwy

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	682	566
Average Queue (ft)	82	174
95th Queue (ft)	331	443
Link Distance (ft)	646	646
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Intersection: 6: Voyager Pkwy & Stout Rd

Movement	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	LTR	T	T	R	L	T	T	R
Maximum Queue (ft)	341	86	97	94	52	109	253	264	26
Average Queue (ft)	146	26	52	42	19	30	58	69	2
95th Queue (ft)	257	57	92	85	47	73	149	158	13
Link Distance (ft)	601	126	519	519			1128	1128	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)					125	275			200
Storage Blk Time (%)								1	
Queuing Penalty (veh)								0	

Intersection: 7: Voyager Pkwy & Middle Creek Parkway

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	L	R	L	T	T	R	L	T	T
Maximum Queue (ft)	116	31	65	22	49	66	45	23	22	113	173
Average Queue (ft)	47	2	11	10	8	20	11	6	4	38	64
95th Queue (ft)	82	15	35	26	29	49	32	20	18	95	117
Link Distance (ft)	749	749					1268	1268	1268		789
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)			130	130	500				225		
Storage Blk Time (%)											
Queuing Penalty (veh)											

Intersection: 104: Voyager Pkwy #1 & Powers SB Free Right

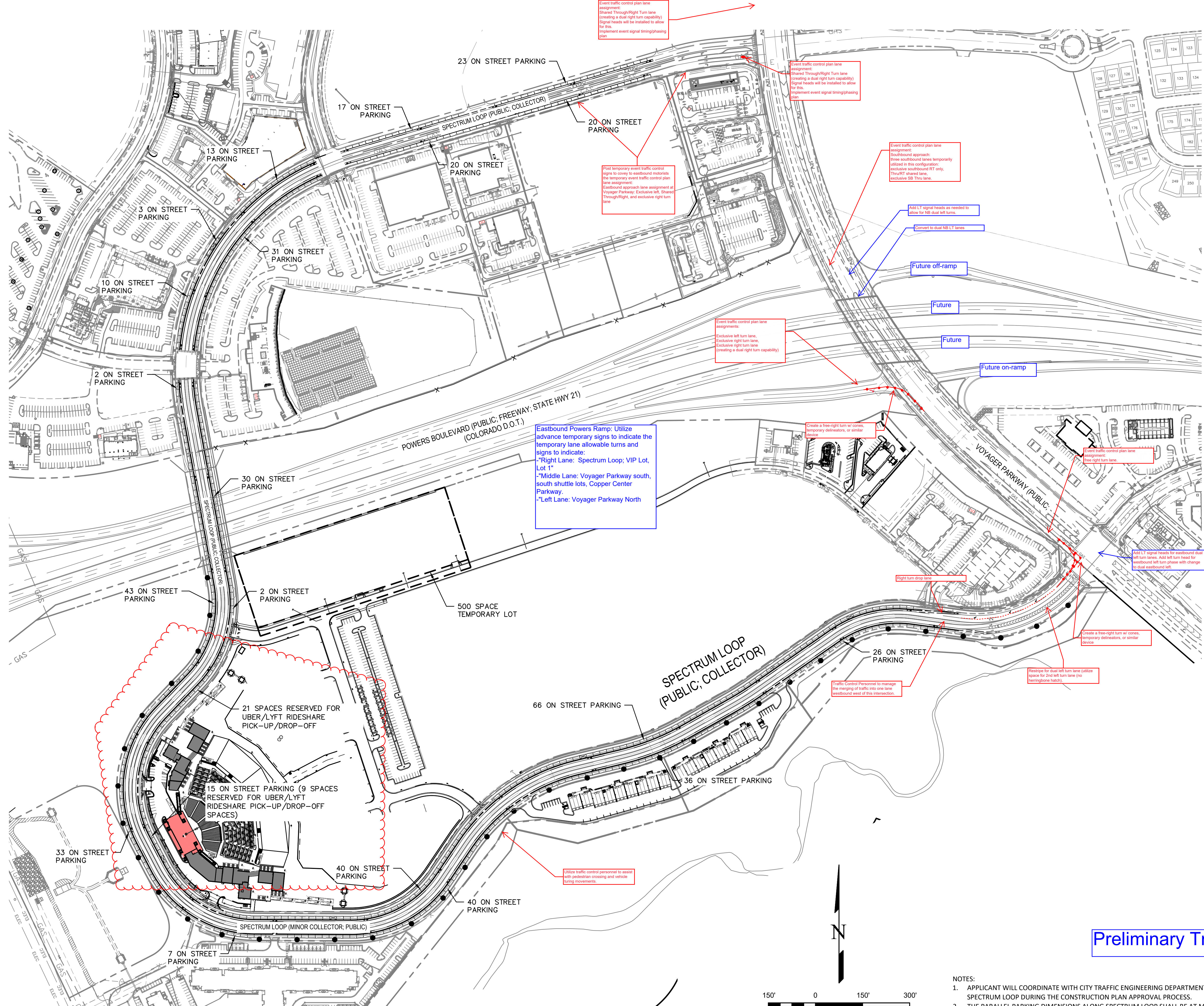
Movement	EB	NW	NW	NW
Directions Served	R	T	T	T
Maximum Queue (ft)	143	79	85	78
Average Queue (ft)	9	7	15	16
95th Queue (ft)	64	33	48	52
Link Distance (ft)	971		646	646
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		300		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 72

Preliminary Traffic Control Plan Concept





Eastbound Powers Ramp: Utilize advance temporary signs to indicate the temporary lane allowable turns and signs to indicate:
 -"Right Lane: Spectrum Loop; VIP Lot, Lot 1"
 -"Middle Lane: Voyager Parkway south, south shuttle lots, Copper Center Parkway.
 -"Left Lane: Voyager Parkway North

Event traffic control plan lane assignment:
 Shared Through/Right Turn lane (creating a dual right turn capability). Signal heads will be installed to allow for this implement event signal timing/phasing plan.

Post temporary event traffic control signs to convey to eastbound motorists the temporary event traffic control plan lane assignment:
 Eastbound approach lane assignment at Voyager Parkway: Exclusive left, Shared Through/Right, and exclusive right turn lane.

Event traffic control plan lane assignment:
 Shared Through/Right Turn lane (creating a dual right turn capability). Signal heads will be installed to allow for this implement event signal timing/phasing plan.

Event traffic control plan lane assignment:
 Southbound approach: three southbound lanes temporarily added in this configuration: exclusive southbound RT only, Through/RT shared lane, exclusive SB Thru lane.

Add LT signal heads as needed to allow for NB dual left turns.

Convert to dual NB LT lanes.

Future off-ramp

Future

Future

Future on-ramp

Event traffic control plan lane assignment:
 Exclusive left turn lane,
 Exclusive right turn lane,
 Exclusive right turn lane (creating a dual right turn capability).

Create a free-right turn or cones, temporary delineators, or similar device.

Event traffic control plan lane assignment:
 Free right turn lane.

Add LT signal heads for eastbound dual left turn lanes. Add left turn head for eastbound left turn lanes with change to dual eastbound left.

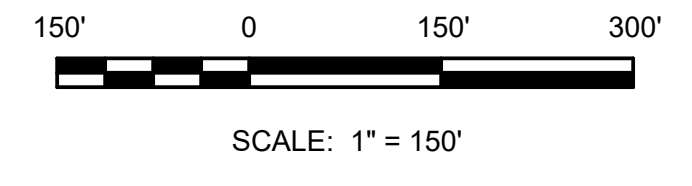
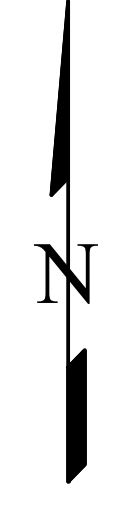
Right turn drop lane

Create a free-right turn or cones, temporary delineators, or similar device.

Traffic Control Personnel to manage the merging of traffic into one lane westbound west of the intersection.

Prohibit for dual left turn lane (utilize space for dual left turn lane (no herringbone hatch)).

Utilize traffic control personnel to assist with pedestrian crossing and vehicle turning movements.



Preliminary Traffic Control Plan Concept

SPECTRUM LOOP ON STREET PARKING & INTERIM PARKING PLAN
 SCALE: 1"=150'-0"

- NOTES:
1. APPLICANT WILL COORDINATE WITH CITY TRAFFIC ENGINEERING DEPARTMENT ON THE RE-STRIPING SPECTRUM LOOP DURING THE CONSTRUCTION PLAN APPROVAL PROCESS.
 2. THE PARALLEL PARKING DIMENSIONS ALONG SPECTRUM LOOP SHALL BE AT MINIMUM 9' WIDE BY 22' LONG SPACES.
 3. THE LOT 1 (THE AMPHITHEATER) DEVELOPER IS RESPONSIBLE FOR THE RE-STRIPING SPECTRUM LOOP TO THREE LANES CROSS-SECTION TO ACCOMMODATE ON-STREET PARKING AND BIKE LANE ALONG BOTH SIDES OF SPECTRUM LOOP.

PLANNING / LANDSCAPE ARCHITECT

IN ASSOCIATION WITH

**LOTS 1 THRU 4,
 TRACT A & B OF
 POLARIS POINTE
 SOUTH FILING
 NO. 4**

**PUD DEVELOPMENT PLAN/
 SITE DEVELOPMENT PLAN**

SPECTRUM LOOP
 COLORADO SPRINGS, CO
 DATE: 09/22/2022
 PROJECT MGR: BHY
 PREPARED BY: BHY

STAMP

ISSUE INFO

DATE:	BY:	DESCRIPTION:
03/18/22	BHY	1ST CITY COMMENTS
05/12/22	BHY	2ND CITY COMMENTS
06/22/22	BHY	CITY COMMENTS
07/26/22	BHY	CITY COMMENTS
09/07/22	BHY	CITY COMMENTS

ISSUE / REVISION

**SPECTRUM LOOP ON
 STREET PARKING PLAN**

SHEET TITLE

31

31 OF 31

SHEET NUMBER

AR PUD 22-00062, AR NV
 22-00480, AR NV 22-00481

PLAN FILE #