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July 2, 2020

Richard Holland Real Estate
c/o Darryl Muir
1515 North Academy Blvd., #400
Colorado Springs, CO 80909

RE: Palmer Park and Powers Commercial Center
El Paso County, Colorado
Traffic Impact Study
LSC #174760

Dear Mr. Muir:

In response to your request, LSC Transportation Consultants, Inc. has prepared this traffic impact study for the proposed commercial development to be located north of Palmer Park Boulevard and east of and Powers Boulevard in El Paso County, Colorado. Figure 1 shows the site location.

REPORT CONTENTS

The report contains the following:

- The existing and proposed land uses for the site.
- The existing and planned roadways in the study area including the number of lanes, classifications, posted speed limits, existing and proposed intersection/access spacing, lane geometries, traffic controls, etc.
- The existing traffic volumes at the key intersections in the vicinity of the site.
- The projected future peak-hour traffic volumes for the site access points and the key intersections in the vicinity of the site.
- The resulting traffic impacts. The traffic impacts have been quantified by determining the future levels of service at the study intersections.
- A queuing analysis for Palmer Park Boulevard and Waynoka Road.
- Findings and recommendations.

Mr. Darryl Muir

Palmer Park and Powers Commercial

Please also discuss the access locations (existing & proposed). State whether or not they meet the access spacing criteria (ECM 2.4) or if they are proposed roadways state whether they meet the intersection spacing criteria. It is not clear if the proposed access points will be roadways or driveways.

RECENT AREA TRAFFIC STUDIES

LSC is not aware of any traffic studies conducted in the vicinity of the site within the last five years.

SITE LAND USE AND ACCESS

The 9.53-acre site is located north of Palmer Park Boulevard between Powers Boulevard and Waynoka Road. There is an existing sit-down restaurant and an existing fast-foot-restaurant located on the site. The remaining area of the site is planned to be developed with about 45,600 square feet of retail floor space, including a car wash and an auto parts store. The site plan is shown in Figure 2.

The site currently has a full-movement signalized access to Palmer Park Boulevard about 440 feet east of Powers Boulevard. The site also has two full-movement access points to Waynoka Road about 1,000-feet and 1,250-feet northwest of Palmer Park Boulevard. Waynoka Road is planned to be realigned through the site to align with the rear service drive for the shopping center to the south. An additional full-movement site access point is proposed to the realigned section of Waynoka Road.

There are two access points shown on the attached site plan. The second is shown near the Golden Corral parking lot. Please revise the text accordingly.

Sight Distance Analysis

Figure 3 shows a sight distance analysis at the access points to Waynoka Road. Based on a posted speed of 30 miles per hour (mph) on Waynoka Road and the criteria contained in Table 2-35 of the ECM, the required sight distance is 300 feet for passenger cars and 390 feet for single unit trucks. The required sight distance of 200 feet along the roadway, based on the criteria contained in Table 2-33, is also shown in the figure.

The required entering sight distance and stopping sight distance can be met, if the areas between the sight distance lines and the curb line have low-level landscaping and are kept free of other obstructions (such as monument signs and parking areas) that would restrict the drivers' line of sight. Landscaping should be low — about 18 inches or lower in height — in these areas.

As the required sight distance for single unit trucks from the south access point extends past Palmer Park Boulevard, Figure 3 also shows the sight distance line from the access to vehicles traveling from westbound on Palmer Park and then turning right onto Waynoka Drive and the sight distance line from the access to vehicles traveling eastbound on Palmer Park and then turning left onto Waynoka Drive. It should be noted that vehicles turning from Palmer Park Boulevard will be traveling at a speed less than the posted 30 miles per hour. Based on a slower turning speed, the available sight distance would be adequate and it would not be necessary to limit obstructions on the northeast and northwest corners of Palmer Park/Waynoka outside of the right-of-way.

Please indicate the slower speed of vehicles turning at intersection and indicate the AASHTO distance for that speed and whether the distance available is acceptable.

Please explain in your narrative why multi-unit trucks has not been utilized as indicated in ECM table 2-36 for commercial land uses.

EXISTING ROADWAY AND TRAFFIC CONDITIONS

Area Roadways

The roadways in the study area are shown in Figure 1 and are described below. Copies of Map 14 2040 Roadway Plan (Classification and Lanes) and Map 17 2060 Corridor Preservation Plan from the El Paso County 2016 Major Transportation Corridors Plan Update (2016 MTCP) with the site location identified are included in the appendix.

Please state the classification of this road. Omaha is a 2-lane roadway with a center two-way left turn lane. Also, the intersection of Powers and Omaha is a Right-in Right-out only intersection. Please revise your traffic analysis accordingly.

- **Powers Boulevard** (State Highway 21) is a six-lane median-divided Expressway (classified as a “Freeway” by CDOT), with planned north/south continuity throughout the Colorado Springs metropolitan area. The Powers Boulevard/Palmer Park Boulevard intersection is currently signalized. However, an interchange is planned in the future.
- **Palmer Park Boulevard** extends from west of Union Boulevard east to Shawnee Drive. Palmer Park Boulevard is classified as a Principal Arterial between Powers Boulevard and Peterson Boulevard. In the site’s vicinity, Palmer Park Boulevard has two through lanes in each direction plus a center two-way left-turn lane and a posted speed limit of 35 miles per hour (mph). The full-movement intersections along Palmer Park Boulevard in the site’s vicinity are located at Powers Boulevard, Waynoka Road, the Wendy’s/Kmart access, and the Kmart rear access.
- **Waynoka Road** is a Non-Residential Collector roadway extending north from Palmer Park Boulevard about 900 feet east of Powers Boulevard to a temporary right-in/right-out intersection with Powers Boulevard south of Constitution Avenue. Waynoka Road is 54 feet in width and has a 30-mph posted speed limit.
- **Omaha Boulevard** is a four-lane street that extends east from Powers Boulevard to just east of Peterson Road. The intersection of Powers/Omaha is currently a full-movement, stop sign-controlled intersection.
- **Paonia Street** is a north/south street extending south from Palmer Park Boulevard just east of Waynoka. Paonia Street is planned to be extended south to Galley Road with planned development northeast of Galley/Powers. The combination of Paonia Street, Waynoka Road, Waynoka Place, and Tutt Boulevard to the north provide a north/south travel route adjacent to Powers Boulevard.

Mr. Darryl Muir
Palmer Park and

Per ECM criteria B.3.1 traffic counts shall be no more than one year old (from date of application submittal). Please provide a discussion in your narrative regarding why the counts used would be a more accurate representation of the existing traffic than counts done today during the restrictions due to COVID. Additionally, should you forecast the counts to 2020 to more accurately depict the traffic patterns in 2020 before the COVID restriction?

Existing Traffic Counts

Figure 4a shows the morning and afternoon peak-hour traffic volumes at the full-movement intersections to Palmer Park Boulevard between Powers Boulevard and Waynoka Road and the intersection of Powers Boulevard/Omaha Boulevard and Waynoka Road/Waynoka Place. Figure 4a also shows the existing traffic volumes during the noon hour at the site access point to Palmer Park Boulevard. The existing traffic volumes shown are based on counts conducted by LSC in October 2017. The traffic count reports are attached.

Long queues were observed in the field on Powers Boulevard northbound during the afternoon peak hour. Also, there is a high demand for the eastbound left-turn movement. The queue extending east back from the Powers/Palmer Park intersection briefly extended back through the signalized site access about three signal cycles during the afternoon peak hour. This queue cleared with the eastbound/westbound signal phase at Powers/Palmer Park. However, these queues did not block the site access during the period of the north/south signal phase due to the coordinated signal timing plan. Shortly after 5:00 p.m., during several signal cycles, relatively long queues formed on the northbound approach. Occasionally a queue of up to three vehicles formed in the eastbound left-turn lane.

Existing Levels of Service

Level of service (LOS) is a quantitative measure of the level of congestion or 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	10.0 sec or less	10.0 sec or less
B	10.1-20.0 sec	10.1-15.0 sec
C	20.1-35.0 sec	15.1-25.0 sec
D	35.1-55.0 sec	25.1-35.0 sec
E	55.1-80.0 sec	35.1-50.0 sec
F	80.1 sec or more	50.1 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.

The intersection of Powers/Palmer Park and the signalized site access point to Palmer Park were analyzed to determine the existing levels of service using Synchro. The existing traffic signal timing plans were obtained from the City of Colorado Springs. Figure 4b shows the detailed level of service analysis results. The level of service (LOS) reports are attached.

The intersection of Powers/Palmer Park is currently operating at an overall LOS E during the morning and afternoon peak hours. The southbound through movement and the westbound left-turn movement are currently operating at LOS F during the morning peak hour. The eastbound left-turn and through movements and the westbound through movement are currently operating at LOS E during the morning peak hour and LOS F during the afternoon peak hour. The left-turn movements and the northbound and southbound through movements are currently operating at LOS E.

The signalized site access point to Palmer Park is currently operating at an overall LOS B or better during the morning, noon, and afternoon peak hours. However, the northbound left-turn movement is currently operating at LOS F during the morning peak hour, the noon hour, and the afternoon peak hour. The southbound left-turn movement is currently operating at LOS D during the morning peak hour and LOS E during the noon hour and afternoon peak hour. These movements have projected delays in the LOS E and F range, in part due to long coordinated signal cycle length (146 seconds) and resulting long side-street “red time.” These movements should not be considered “failing” since their volume-to-capacity ratios are less than one. The long cycle length at this intersection matches the signal at Powers and Palmer Park due to the close spacing and need for coordination.

The rear Kmart access to Palmer Park and the intersections of Palmer Park/Waynoka, Waynoka Road/Waynoka Place, and Omaha/Powers were analyzed, based on the unsignalized method of analysis procedures found in the *Highway Capacity Manual 6th Edition* by the Transportation Research Board.

All movements at the rear Kmart access to Palmer Park and all movements at the intersections of Palmer Park/Waynoka and Waynoka Road/Waynoka Place are currently operating at LOS C or better during the peak hours.

The southbound and westbound left-turn movements at the intersection of Omaha/Powers are currently operating at LOS F during the peak hours.

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.

Mr. Darryl Muir

Palmer Park and Powers Commercial Center

FHU recently provided a traffic analysis for the residential development on Powers/Galley. Please see PCD File No. SP201 for the traffic study and revise your analysis as necessary.

Figure 5a shows the 2040 background traffic volumes. The background traffic volumes are estimates by LSC, based on previous work completed in the area and on the *Powers/Galley Residential Development Traffic Impact Analysis* prepared by Felsburg Holt & Ullevig dated January 2017. The background traffic volume estimates assume the intersection of Powers/Omaha has been restricted to right-in/right-out only.

Figure 5b shows the lane geometry, traffic control, and level of service at the intersections in the vicinity of the site, based on the 2040 background volumes.

TRIP GENERATION

Estimates of the traffic volumes expected to be generated by the development of the currently vacant lots within the site were made using the nationally published trip generation rates found in *Trip Generation, 10th Edition, 2017* by the Institute of Transportation Engineers (ITE). Table 2 shows the trip generation estimates.

The total number of vehicle-trips generated by the future land uses has been reduced by 10 percent to account for the internal vehicle-trips made within the site between land uses, without use of the external streets surrounding the site.

The total number of vehicle-trips generated has also been reduced to take into account the “pass-by” and “diverted link” phenomena. A pass-by trip is made by a motorist who would already be on the adjacent roadways regardless of the proposed development, but who stops in at the site while passing by. The motorist would then continue on his or her way to a final destination in the original direction. A diverted link trip is one made by a motorist who would already be traveling on a nearby (but not adjacent) roadway (i.e. Powers Boulevard) regardless of this development who now uses another roadway to access the site before continuing on his or her way to a final destination in the original direction. The pass-by and diverted link percentages shown in Table 2 are from the *Trip Generation Handbook - An ITE Proposed Recommended Practice, 3rd Edition, 2017* by ITE.

Development of the currently vacant lots is projected to generate about 1,376 additional new external vehicle-trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about 89 additional vehicles would enter and 58 additional vehicles would exit the site. During the noon hour, about 159 additional vehicles would enter and 147 additional vehicles would exit the site. During the afternoon peak hour, which generally occurs for one hour between 4:15 and 6:15 p.m., about 141 additional vehicles would enter and 146 additional vehicles would exit the site.

Please elaborate on your description and reasoning for the trip distribution % provided.

TRIP DISTRIBUTION AND ASSIGNMENT

The estimated directional distribution of the site-generated traffic volumes on the adjacent roadways is an important factor in determining the site’s traffic impacts. Figure 6 shows the directional distribution estimates for the primary site-generated traffic. The estimates have been based on the following factors: the land use proposed for the site and its location; the existing and planned street and roadway system in the vicinity; and the existing/projected traffic volumes.

The pass-by trips from Palmer Park Boulevard and the diverted trips from Powers Boulevard were assigned, based in large part on the magnitude and direction of the existing and projected background traffic volumes on the adjacent roadways.

When the distribution percentages (from Figure 6) were applied to the trip generation estimates (from Table 2), the site-generated traffic volumes on the area roadways were determined. Figure 7 shows the site-generated traffic volumes.

TOTAL TRAFFIC

Figure 8a shows the projected short-term total traffic volumes at the site access point and key area intersections. The short-term background traffic volumes are the sum of the existing traffic volumes from Figure 4a plus the site-generated traffic volumes from Figure 7. The volumes shown in Figure 8a represent the short-term impacts of the development.

Figure 8b shows the lane geometry, traffic control, and level of service at the intersections in the vicinity of the site based on the short-term total volumes.

Figure 9a shows the 2040 total traffic volumes at the site access points and key area intersections. The volumes are the sum of the 2040 background traffic volumes from Figures 5a, plus the site-generated traffic volumes from Figure 7.

Figure 9b shows the lane geometry, traffic control, and level of service at the intersections in the vicinity of the site based on the 2040 total volumes.

PROJECTED LEVELS OF SERVICE

Intersection Levels of Service

The site access points and key area intersections were analyzed to determine the projected levels of service for the short-term and 2040 total traffic volumes. Figures 8b and 9b show the level of service analysis results. The intersection of Powers/Palmer Park and the signalized site access to Palmer Park were analyzed using Synchro. The site access points and other area intersections were analyzed using the method of analysis procedures found in the *Highway Capacity Manual 6th Edition* by the Transportation Research Board. The level of service (LOS) reports are attached.

total

Powers/Palmer Park

The intersection of Powers/Palmer Park is currently operating at LOS E during the morning and afternoon peak hours. By 2040, this intersection is projected to operate at LOS F during the peak hours, based on both the background and total traffic volumes. The *Traffic Analysis Report for Powers Boulevard Environmental Assessment Between Woodmen Road and SH 16* revised in April 2010 recommends this intersection be converted to a grade-separated interchange. However, this report assumes this will occur beyond the 20-year study horizon.

Site Access to Palmer Park

Please state if these LOS are for the short term total, 2040, or both.

The signal-controlled site access to Palmer Park Boulevard is projected to continue to operate at a LOS B or better overall, with a LOS F for the northbound left-turn movement during the morning peak hour, noon hour, and afternoon peak hour. The signal is two-phase (no exclusive left-turn arrow phasing).

provide recommendations for bringing the LOS to a satisfactory condition.

Waynoka/Palmer Park

All movements at the realigned 4-leg, two-way, stop sign-controlled intersection of Waynoka/Palmer Park are projected to operate at LOS D or better during the peak hours based on the projected short-term total traffic volumes. By 2040, the southbound through movement is projected to operate at LOS E during the morning peak hour and the northbound left-turn movement is projected to operate at LOS E during the afternoon peak hour. All other movements are projected to operate at LOS D or better.

Provide analysis for the 2nd proposed access on waynoka near the Golden Corral.

Waynoka/Proposed Site Access

The proposed site access to Waynoka is projected to operate at LOS B or better for all movements during the peak hours as a two-way, stop sign-controlled intersection, based on the projected short-term and 2040 total traffic volumes.

Waynoka Road/Waynoka Place

All movements at the intersection of Waynoka Road/Waynoka Place are projected to continue to operate at LOS C or better during the peak hours, based on the projected short-term and 2040 total traffic volumes.

Omaha is currently restricted to a right-in/right-out. Please revise your analysis.

Powers/Omaha

The southbound and westbound left-turn movements at the intersection of Powers/Omaha currently operate at LOS F during the peak hours. It is our understanding that this intersection is planned to be restricted to right-in/right-out only and eventually closed in the future.

Mr. Darryl Muir

Palmer Park and Powers Commercial Center

In your existing traffic conditions (page 4) you indicate long queues extending east back from Power/Palmer Park intersection that back through the signalized Wendy's access. Please analyze these queues with the total traffic volumes like it was done at the access locations below and provide discussion of it in your narrative.

VEHICLE QUEUING ANALYSIS

A queuing analysis was performed using Synchro/SimTraffic to determine if the access/intersection spacing on Palmer Park Boulevard and Waynoka Road adjacent to the site will be sufficient to accommodate the projected queues, based on the total traffic volumes. The 2040 total morning and afternoon peak-hour traffic volumes were entered into the Synchro model. The simulation was run five times. The queuing reports are attached.

Palmer Park Boulevard

Eastbound Left Turn Lane at Palmer Park/Wendy's Access/Shopping Center Access

There is an existing 120-foot eastbound left-turn lane on Palmer Park Boulevard approaching the site access point. The projected maximum queue for this movement is 49 feet during the morning peak hour, 120 feet during the peak 15-minute interval of the noon hour and 118 feet during the afternoon peak hour.

Back-to-Back Left Turn Lanes between the Wendy's Access and Waynoka (Relocated)

- The maximum westbound left-turn queue on Palmer Park approaching the former K-Mart shopping center access point (aligning with the existing Wendy's access) is about 72 feet during the noon peak hour.
- The maximum eastbound left-turn queue on Palmer Park approaching the realigned Waynoka Road/Palmer Park Blvd. intersection is about 68 feet during the morning peak hour. The spacing between these two intersections is about 280 feet centerline to centerline. The effective stacking distance between the two intersections is about 210 feet (including a shared, painted transition taper).

Realigned Waynoka Road

- The maximum southbound left-turn queue on Waynoka (relocated) approaching Palmer Park Boulevard is projected to be 91 feet during the afternoon peak hour.
- The maximum northbound left-turn queue on Waynoka (relocated) approaching the new site access point on the west side of Waynoka Road is about 31 feet during the afternoon peak hour. The spacing between these two intersections is about 393 feet centerline to centerline.

State what the intersection spacing criteria is and indicate whether it is met.

CONCLUSIONS AND RECOMMENDATIONS

Trip Generation

- Development of the currently vacant lots is projected to generate about 1,376 new external vehicle-trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak hour, about 89 additional vehicles would enter and 58 additional vehicles would exit the site. During the noon hour, about 159 additional vehicles would enter and 147 additional vehicles would exit the site. During the afternoon peak hour, about 141 additional vehicles would enter and 146 additional vehicles would exit the site.

Projected Levels of Service

- The intersection of Powers/Palmer Park is currently operating at LOS E during the morning and afternoon peak hours. By 2040, this intersection is projected to operate at LOS F during the peak hours, based on both the background and total traffic volumes. The *Traffic Analysis Report for Powers Boulevard Environmental Assessment Between Woodmen Road and SH 16* revised in April 2010 recommends this intersection be converted to a grade-separated interchange, however, this report assumes this will occur beyond the 20-year study horizon.
- The signal-controlled site access to Palmer Park Boulevard is currently operating at LOS F for the northbound left-turn movement during the morning peak hour, noon hour, and the afternoon peak hour. The relatively high delay (and thus the low level of service rating) is not due to excessive side street traffic volumes, but rather it is a result of the long signal cycle length. The signal needs to be coordinated with Powers/Palmer Park intersection. Therefore, it needs to operate at the same cycle length (146 seconds).
- All movements at the realigned 4-leg, two-way, stop sign-controlled intersection of Waynoka/Palmer Park are projected to operate at LOS D or better during the peak hours, based on the projected short-term total traffic volumes. By 2040, the southbound through movement is projected to operate at LOS E during the morning hour and the northbound left-turn movement is projected to operate at LOS E during the afternoon peak hour. All other movements are projected to operate at LOS D or better. Due to the close spacing of the existing traffic signal to the west, it is unlikely that this intersection would be converted to signal control.
- All movements at the intersection of Waynoka Road/Waynoka Place are projected to continue to operate at LOS C or better during the peak hours, based on the projected short-term and 2040 total traffic volumes.

From a safety and operations perspective would this corridor be best served by relocating the traffic signal to the realigned Waynoka/Palmer Park intersection? Please address.

Please provide discussion in your narrative regarding the plat note, SIA, and previous condition of approval of the subdivision that indicates that this developer will pay their fair share for relocating the signal to the realigned Waynoka intersection.

Queueing Analysis

- There is an existing 120-foot eastbound left-turn lane on Palmer Park Boulevard approaching the site access point. Based on projected 2040 peak-hour volumes, the projected queue for this left-turn movement is 49 feet during the morning peak hour, 120 feet during the noon hour, and 118 feet during the afternoon peak hour.

Recommendations

- Palmer Park adjacent to the site appears to have about a 105-foot right-of-way. An additional 12-13 feet of right-of-way would need to be dedicated on the north side to meet the ECM requirement for a 130-foot Urban Four-Lane Principal Arterial.

Traffic Control at the Palmer Park/Wendy's Access/Shopping Center (former Kmart) access

- This analysis is based on the assumption of no significant changes to the current traffic conditions on the south legs of the two Palmer Park/former Kmart shopping center access points and associated eastbound right-turn/westbound left-turning movements. Granted, redevelopment and changes in land use (and resulting changes in trip generation/intersection turning movements) are likely to occur at some future time. However, the timing of such future changes is unknown.
- The City of Colorado Springs operates the Powers/Palmer Park and Palmer Park/Wendy's access/former KMart shopping center access signals. The latter signal is coordinated with Powers/Palmer Park intersection and operates on the same cycle length (146 seconds). Eastbound/westbound left-turn signal phasing may become necessary to control/clear queues at the Palmer Park/Wendy's access/south-side shopping center access. This would involve the addition of left-turn signal heads, associated signal hardware, and software components, and wiring.
- It is our understanding that prior discussions were held [on <date(s)>] between the applicant and the former City of Colorado Springs Transportation Manager. The outcome of the meeting was a commitment to continue operation of the traffic signal at the site access/Palmer Park to allow this intersection to remain a full-movement intersection with additional development within the Wendy's commercial site. Continued operation of this signalized intersection would potentially include signal-timing adjustments, as needed, and may include additional signal phases/signal heads and vehicle detection zones (and associated signal system hardware/software), traffic signs, and/or pavement marking etc. Through the review of this TIS, we would anticipate the City of Colorado Springs traffic engineering division may comment on any such signal system and/or intersection improvements (consistent with, different from, and/or in addition to recommendations

Provide the date and any correspondence of previous meetings.

of this report) that will be required to continue to operate the signal as additional development occurs on the proposed lots within the Wendy's commercial center.

- Given the above, LSC recommends that the signal traffic control at the full-movement intersection at the Wendy's/former Kmart access be allowed to remain (provided the traffic safety record remains acceptable) with the understanding that should conditions change within the existing shopping center to the south, the traffic operations at this and adjacent intersections along Palmer Park will be reevaluated. Changes to conditions on the south side of Palmer Park may necessitate the relocation of the signal to the Palmer Park/Waynoka (relocated) intersection to the east and/or turn-movement restrictions at the current Wendy's/former Kmart Shopping Center access.
- As development progresses, should the traffic safety record (despite future signal system potential additional phasing, detection, and/or other modifications/enhancements etc.) begin to suggest the potential need to relocate the signal to the Palmer Park/Waynoka (relocated) intersection to the east and/or restrict turning movements at the current Wendy's/former Kmart Shopping Center access, the applicant would want to be part of the evaluation process to develop options to correct any safety deficiencies.
- Implementation of CDOT plans for a "frontage road" connection/extension of Waynoka Road south of Palmer Park may also necessitate the relocation of the signal to the Palmer Park/Waynoka (relocated) intersection to the east and/or turn-movement restrictions at the current Wendy's/former Kmart Shopping Center access.

Auxiliary Turn Lane Recommendations

- Figure 10 shows the recommended lane geometry for Palmer Park Boulevard. Westbound right-turn deceleration lanes with abbreviated transition tapers should be provided on Palmer Park Boulevard approaching the realigned Waynoka Road and the existing signalized site access. These lanes should be 155 feet long plus a 160-foot taper. Given the spacing between Waynoka (relocated) and the Wendy's access, a continuous right-turn acceleration/deceleration lane between these two intersections is recommended.
- LSC recommends the site plan accommodate the potential for an additional future westbound lane along the north side of Palmer Park Boulevard west of the Wendy's access. The additional ROW needs identified above would likely accommodate this recommendation.
- The realigned section of Waynoka Road should be constructed to match the existing section with sufficient width for a center two-way left-turn lane. Additional six feet of

Please state the ECM criteria for these lanes and state whether the provided design meets it.

width (in addition to the standard 52-foot-wide Non-Residential Collector width) should be provided on the west side of Waynoka (relocated) on the north leg of the intersection with Palmer Park to allow for a southbound right-turn deceleration lane on the southbound approach to Palmer Park Boulevard.

Please provide the turn lane designs for the southbound left turn lane at Waynoka/Palmer Park intersection. Please also provide the turn lane designs for all other auxiliary turn lanes along Waynoka at the proposed access points. Be sure to indicate the ECM criteria and whether it can be met.

Provide the turn lane design lengths that are required for this right turn lane

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

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.

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

JCH:KDF:jas

- Enclosures: Table 2
- Figures 1-10
- Traffic Count Reports
- Level of Service Reports
- Queuing Reports
- MTCP Maps

Please provide the turn lane designs for the east/westbound left turn lanes at the realigned Waynoka intersection and the Wendy's/Palmer Park intersection. State what the criteria requires for these turn lanes, state the existing or proposed turn lane designs, and indicate whether the criteria is met.

Please provide the following:

- State whether the MTCP or other approved corridor study calls for the construction of improvements in the immediate area and state whether or not any improvements affected by the project are reimbursable under the current MTCP.
- State the current applicable Transportation/Road Impact Fees are.
- List all deviations from the County Criteria that the applicant will be making with supporting information.
- Provide evaluation of the pedestrian and bicycle facilities as indicated per ECM Appendix B.
- List the ECM criteria for stacking, storage, and taper for every affected auxiliary lane and access and state whether this access can be met. If it cannot be, state the required modifications so that it can be met.

Tables and Figures

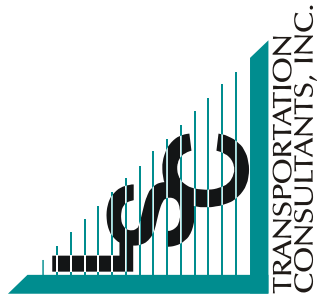


Table 2
Trip Generation Estimate
Palmer Park and Powers Commercial Center

Lot Code	Land Use	Land Use Description	Trip Generation Units	Trip Generation Rates ⁽¹⁾												Total Trips Generated						Total External Trips Generated						New External Trips Generated		
				Morning			Noon Hour			Afternoon			Average Weekday			Morning			Noon			Afternoon			Average Weekday			Pass-By Trips ^(c)	Diverted Link Trips ^(d)	Average Weekday Traffic
				In	Out	Peak Hour	In	Out	Peak Hour	In	Out	Peak Hour	In	Out	Peak Hour	In	Out	Peak Hour	In	Out	Peak Hour	In	Out	Peak Hour	In	Out	Peak Hour			
2	948	Automated Car Wash ⁽⁶⁾	1	tunnel	30.87	18.13	43.62	43.17	38.75	38.75	38.75	31	18	44	43	39	39	10%	801	28	16	40	39	35	35	50%	0%	401		
4&5	820	Shopping Center ⁽⁶⁾	5	KSF	1.87	1.14	3.74	3.32	2.86	3.09	9	6	19	17	14	15	15	10%	318	8	5	17	15	13	14	34%	26%	127		
6	820	Shopping Center	8.4	KSF	1.87	1.14	3.74	3.32	2.86	3.09	16	10	31	28	24	26	25	10%	534	14	9	28	25	22	23	34%	26%	214		
7	843	Automobile Parts Sales	15	KSF	1.42	1.17	2.43	2.35	2.93	3.05	21	17	37	35	44	46	46	10%	747	19	15	33	32	40	41	43%	13%	329		
8	820	Shopping Center	12	KSF	1.87	1.14	3.74	3.32	2.86	3.09	22	14	45	40	34	37	37	10%	763	20	13	41	36	31	33	34%	26%	305		
									3,514	99	65	176	163	155	163	163		3,163	89	58	159	147	141	146			1,376			

Notes:

- (1) Source: "Trip Generation, 10th Edition", September 2017 by the Institute of Transportation Engineers (ITE)
- (2) Source: "Trip Generation Handbook - An ITE Proposed Recommended Practice, 3rd Edition" by ITE
- (3) KSF = one thousand square feet of floor space
- (4) Trip generation rates are based on the fitted curve rates for a shopping center with a floor area that includes all existing and proposed land uses within the development
- (5) Daily and morning peak hour trip generation rates are estimates by LSC based on Land Use 949 Car Wash and Detail Center

Source: LSC Transportation Consultants, Inc.

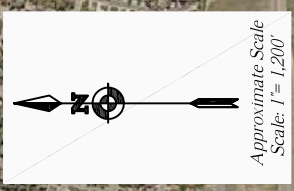


Figure 1

Vicinity Map



Wendy's Commercial Center at Palmer Park & Powers (LSC #174760)





Approximate Scale
Scale: NTS

Please indicate the distance between the access points.

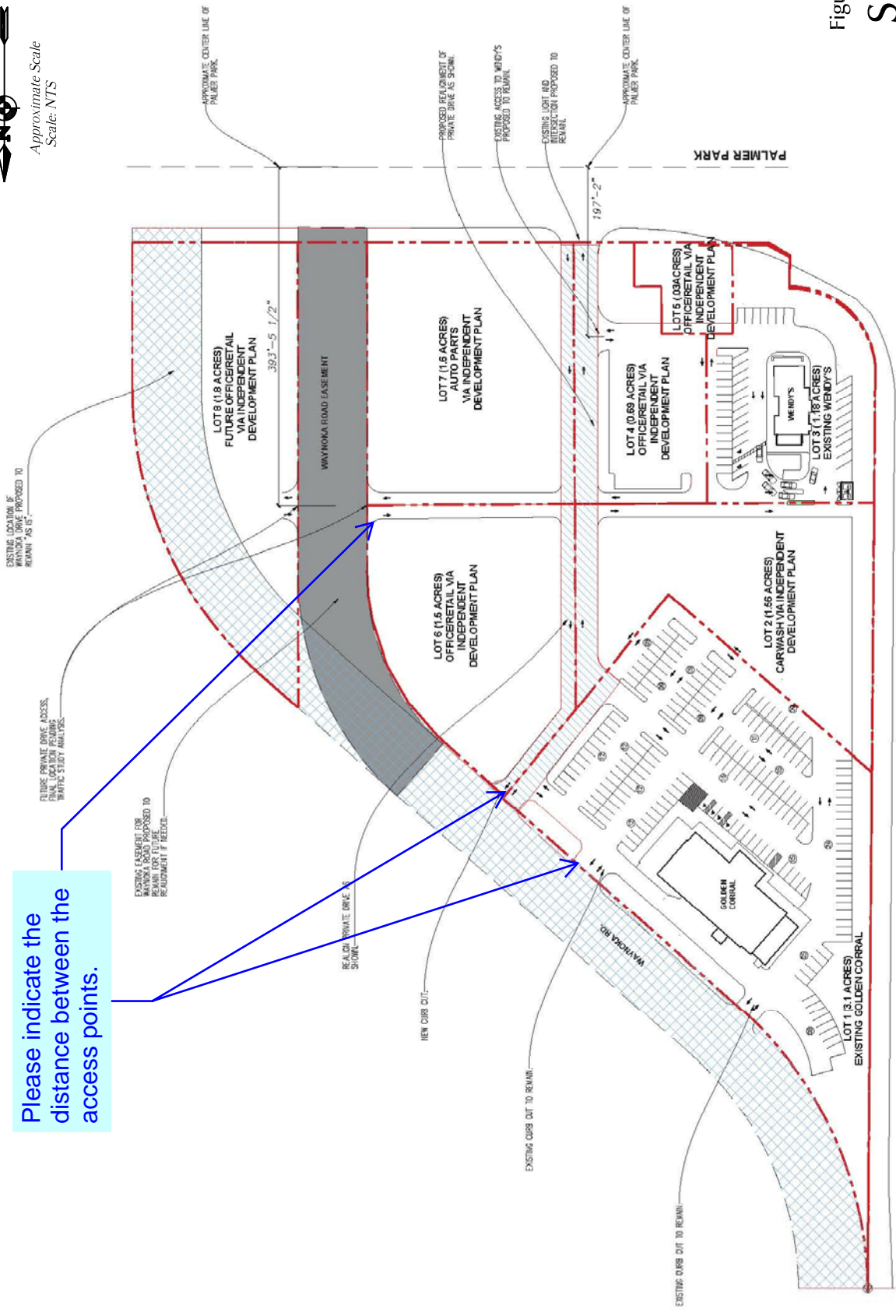
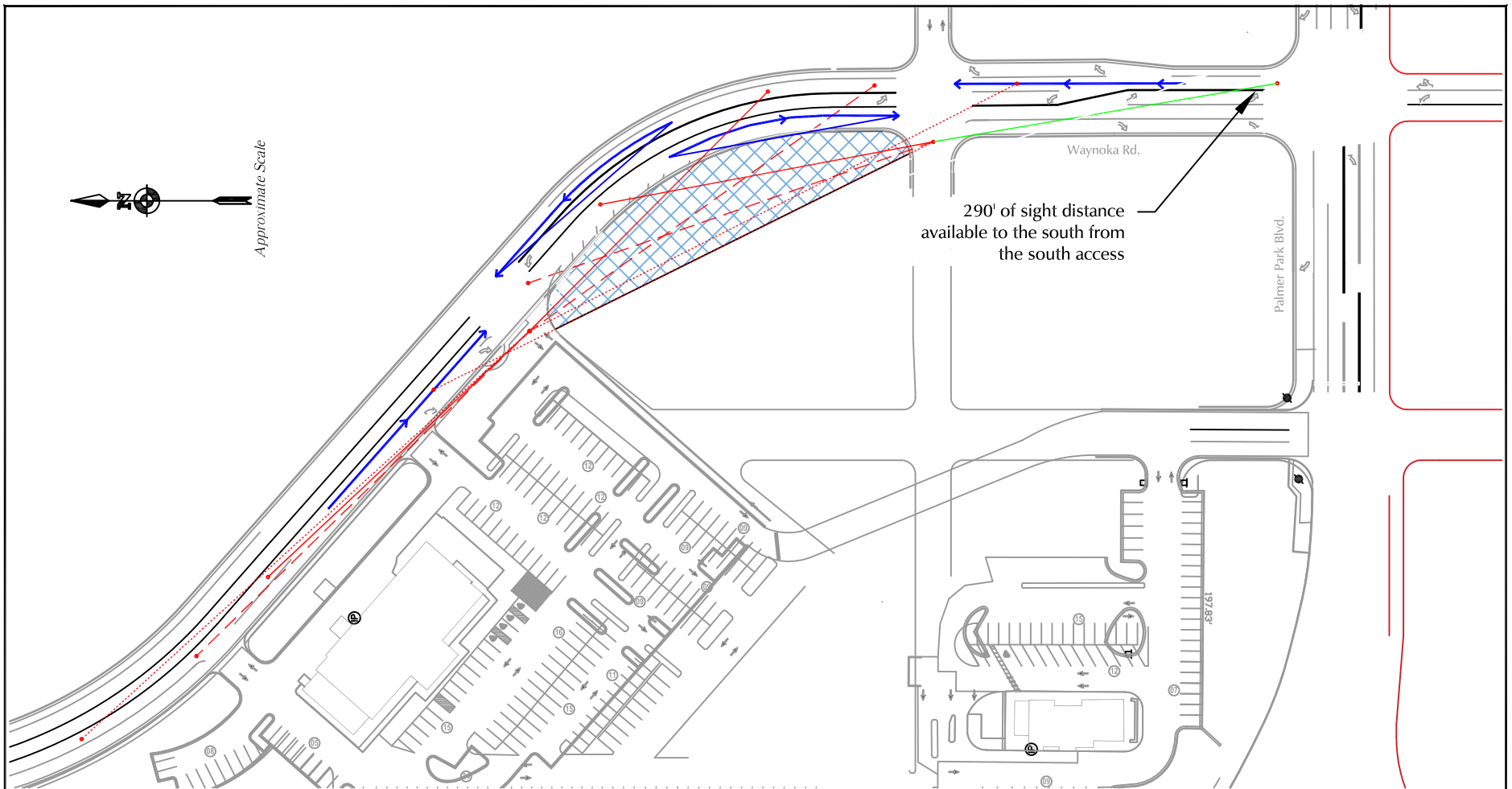


Figure 2
Site Plan

POWERS BLVD.

Wendy's Commercial Center at Palmer Park & Powers (LSC #174760)





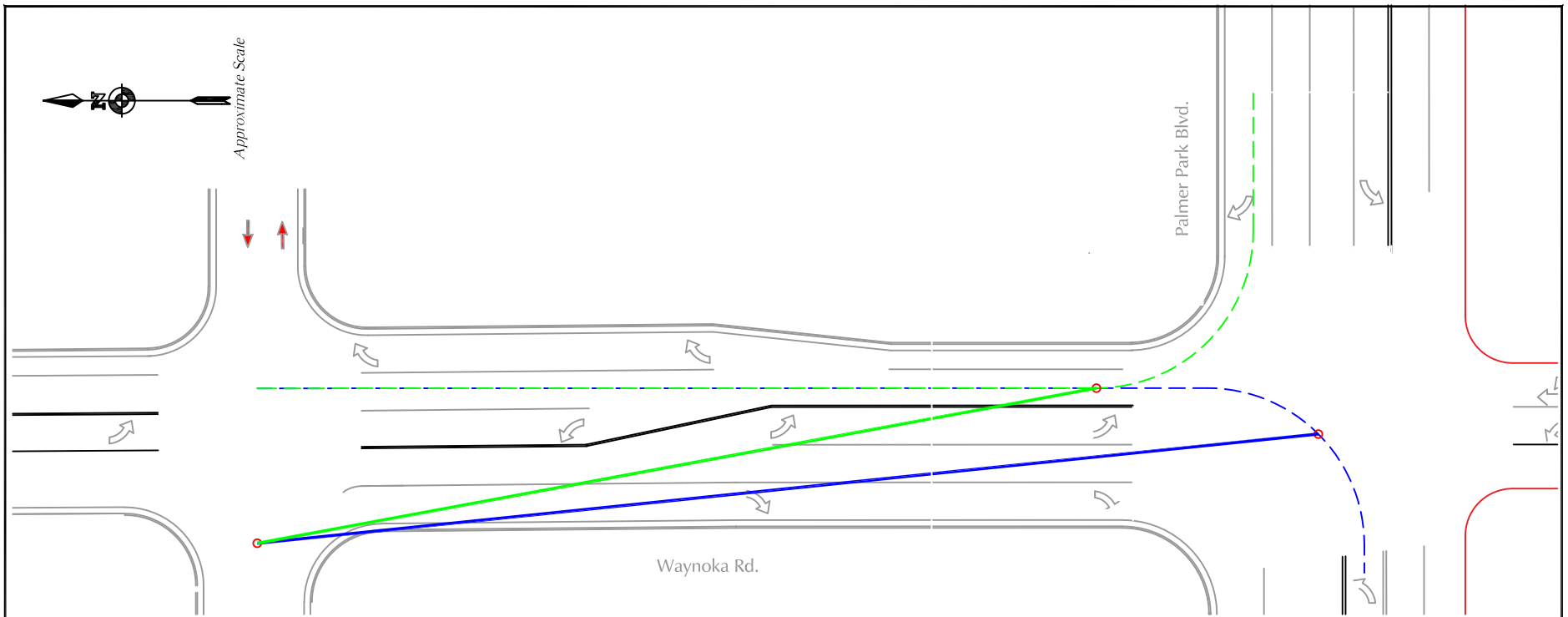
LEGEND:

- = ECM Required Entering Sight Distance For Multi-Unit Trucks (510' from Table 2-35 based on a posted speed limit of 30 mph)
- - - - = ECM Required Entering Sight Distance For Single Unit Trucks (390' from Table 2-35 based on a posted speed limit of 30 mph)
- = ECM Required Entering Sight Distance For Passenger Cars (300' from Table 2-35 based on a posted speed limit of 30 mph)
- > = ECM Required Sight Distance Along the Roadway (200' from Table 2-33 based on a posted speed limit of 30 mph)

Figure 3a

Sight Distance Analysis

Wendy's Commercial Center at Palmer Park & Powers (LSC #174760)



LEGEND:

- - - = Vehicle path from eastbound Palmer Park Blvd to northbound Waynoka Rd
- = Sight distance line to eastbound to northbound vehicle
(Available distance is 342' which meets or exceeds the AASTHO value for a Multi-Unit Truck with an approach speed of 20 mph)
- - - = Vehicle path from westbound Palmer Park Blvd to northbound Waynoka Rd
- = Sight distance line to westbound to northbound vehicle
(Available distance is 267' which meets or exceeds the AASTHO value for a Multi-Unit Truck with an approach speed of 16 mph)

Figure 3b

Sight Distance Analysis AASHTO Criteria

Wendy's Commercial Center at Palmer Park & Powers (LSC #174760)



Approximate Scale
Scale: 1" = 1,200'

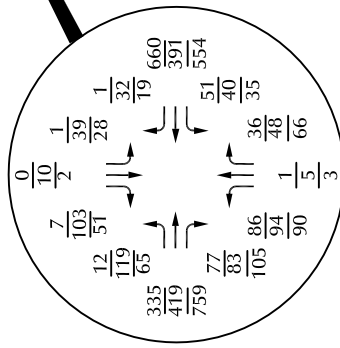
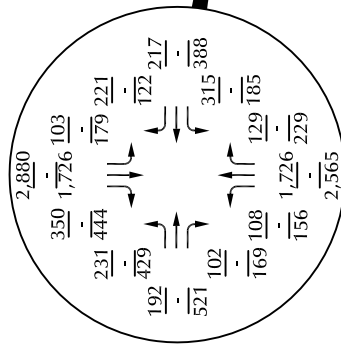
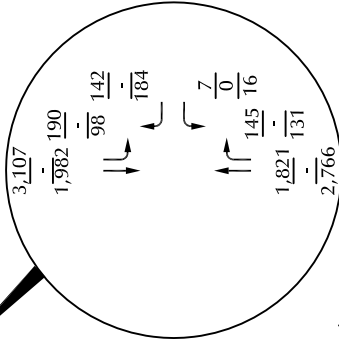
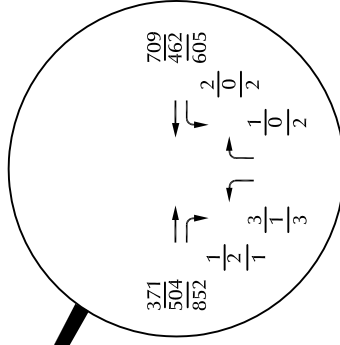
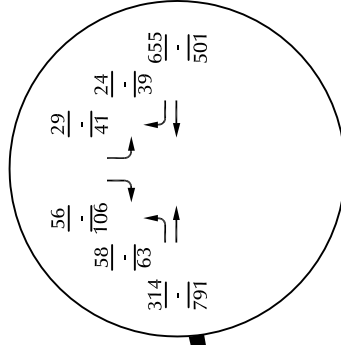
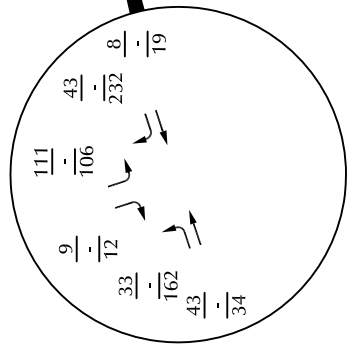
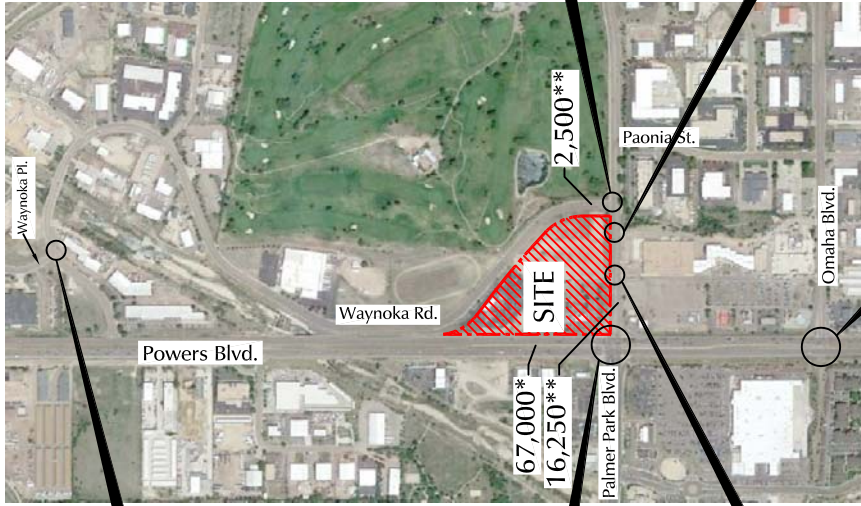


Figure 4a
Existing Traffic

* 2018 CDOT AADT
** Estimate by LSC

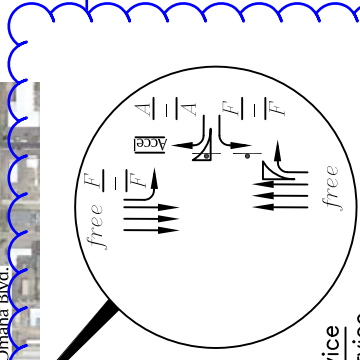
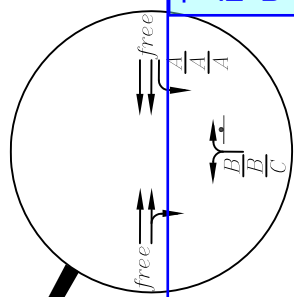
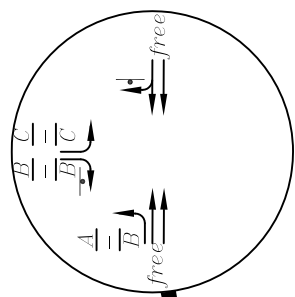
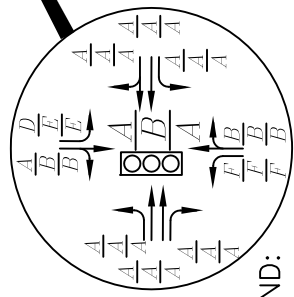
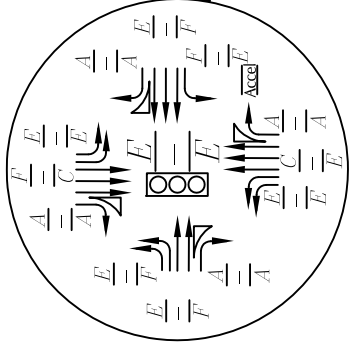
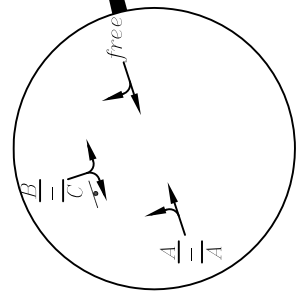
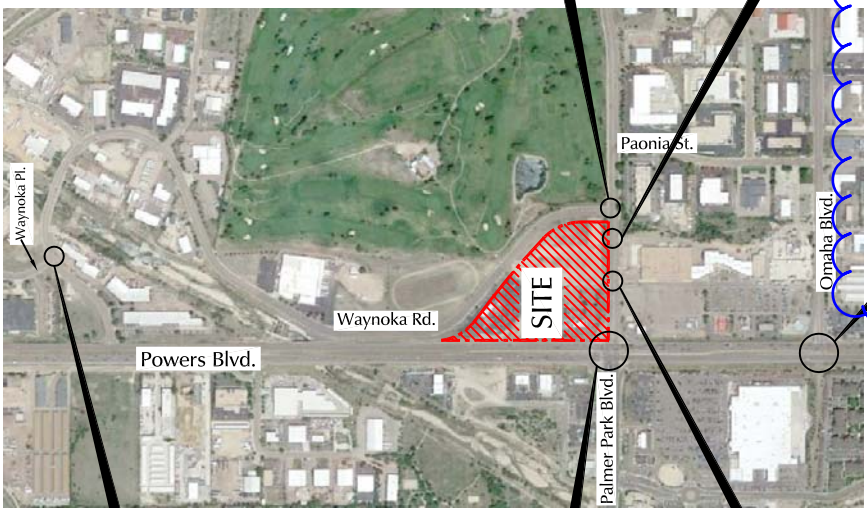
LEGEND:
 XX AM Weekday Peak-Hour Traffic (vehicles per hour)
 XXX Noon Weekday Peak-Hour Traffic (vehicles per hour) Based on Counts
 XXX PM Weekday Peak-Hour Traffic (vehicles per hour) by LSC Oct 2017
 XXX = Average Daily Traffic (vehicles per day)

Wendy's Commercial Center at Palmer Park & Powers (LSC #174760)





Approximate Scale
Scale: 1" = 1,200'



This is a RIRO intersection. Please update the figures and your analysis accordingly.

Figure 4b

Existing Lane Geometry, Traffic Control and Level of Service

Wendy's Commercial Center at Palmer Park & Powers (LSC #174760)

LEGEND:

↑ = Stop Sign

⊞ = Traffic Signal

$\frac{A}{A}$ = AM Individual Movement Peak-Hour Level of Service

$\frac{C}{B}$ = PM Individual Movement Peak-Hour Level of Service

$\frac{C}{C}$ = PM Individual Movement Peak-Hour Level of Service

$\frac{B}{B}$ = AM Entire Intersection Peak-Hour Level of Service

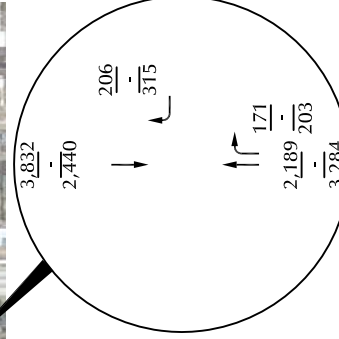
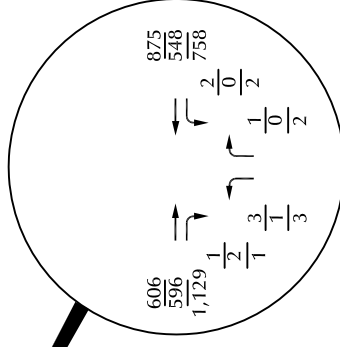
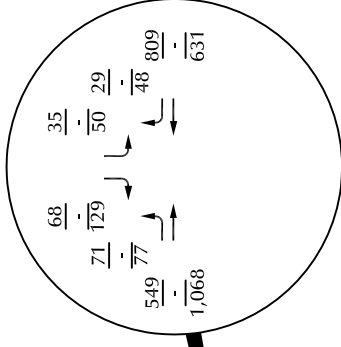
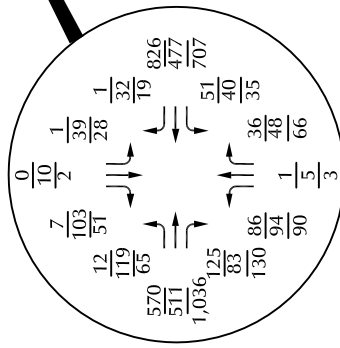
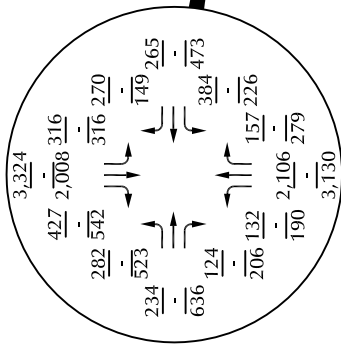
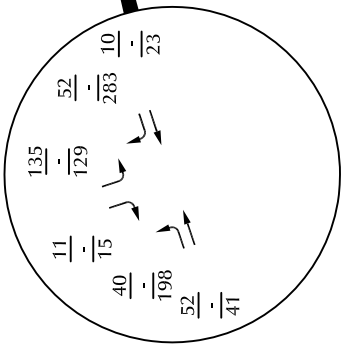
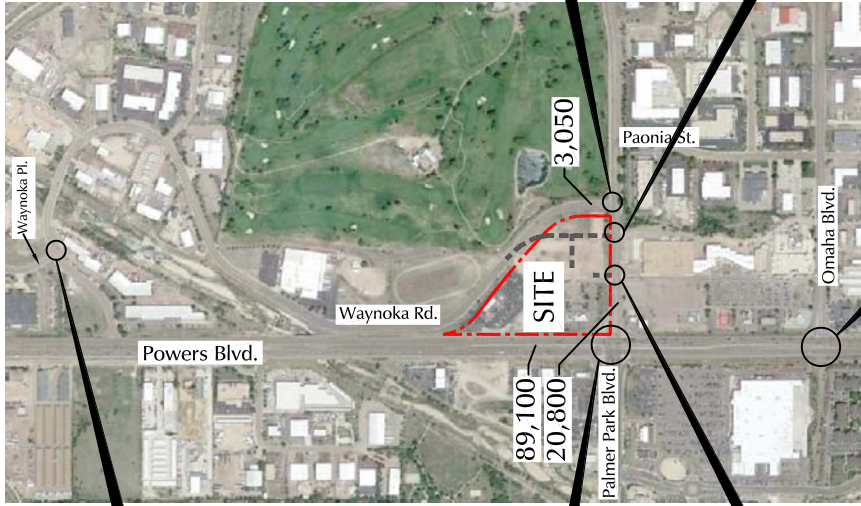
$\frac{A}{A}$ = PM Entire Intersection Peak-Hour Level of Service

$\frac{A}{A}$ = PM Entire Intersection Peak-Hour Level of Service





Approximate Scale
Scale: 1" = 1,200'



LEGEND:

- XX AM Weekday Peak-Hour Traffic (vehicles per hour)
- XX Noon Weekday Peak-Hour Traffic (vehicles per hour)
- XX PM Weekday Peak-Hour Traffic (vehicles per hour)
- XXX = Average Daily Traffic (vehicles per day)



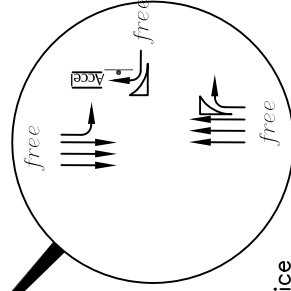
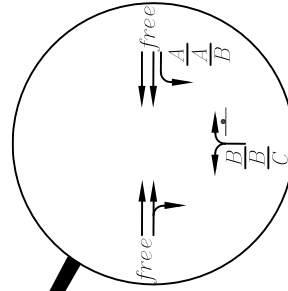
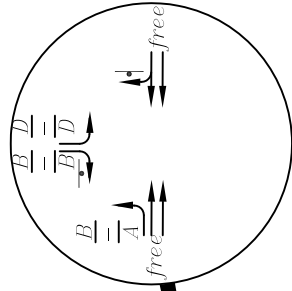
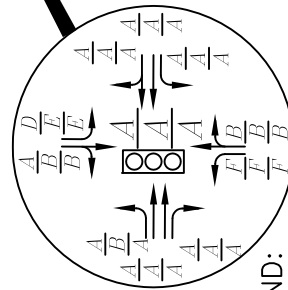
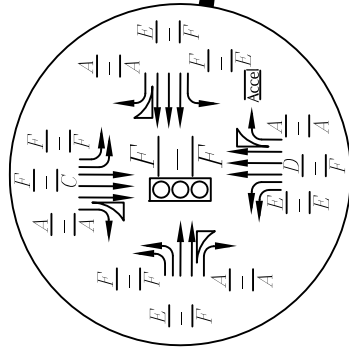
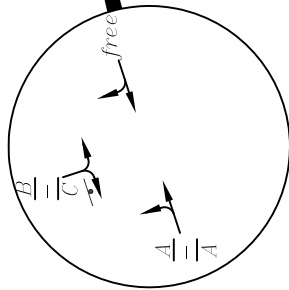
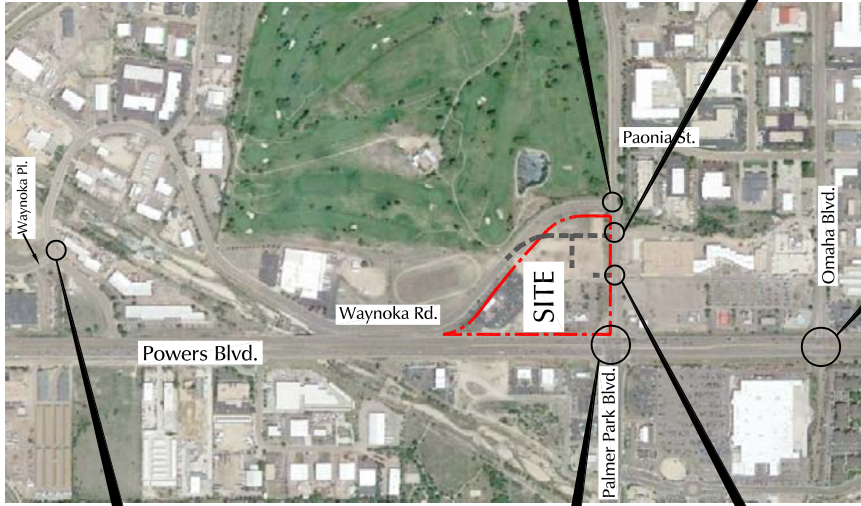
Figure 5a

Year 2040 Background Traffic

Wendy's Commercial Center at Palmer Park & Powers (LSC #174760)



Approximate Scale
Scale: 1" = 1,200'



LEGEND:

↑ = Stop Sign

⊞ = Traffic Signal

- $\frac{A}{A}$ = AM Individual Movement Peak-Hour Level of Service
- $\frac{C}{B}$ = PM Individual Movement Peak-Hour Level of Service
- $\frac{C}{B}$ = AM Entire Intersection Peak-Hour Level of Service
- $\frac{B}{B}$ = Noon Entire Intersection Peak-Hour Level of Service
- $\frac{A}{A}$ = PM Entire Intersection Peak-Hour Level of Service

Figure 5b

Year 2040 Background Lane Geometry, Traffic Control and Level of Service

Wendy's Commercial Center at Palmer Park & Powers (LSC #174760)





Approximate Scale
Scale: 1" = 1,200'



LEGEND:

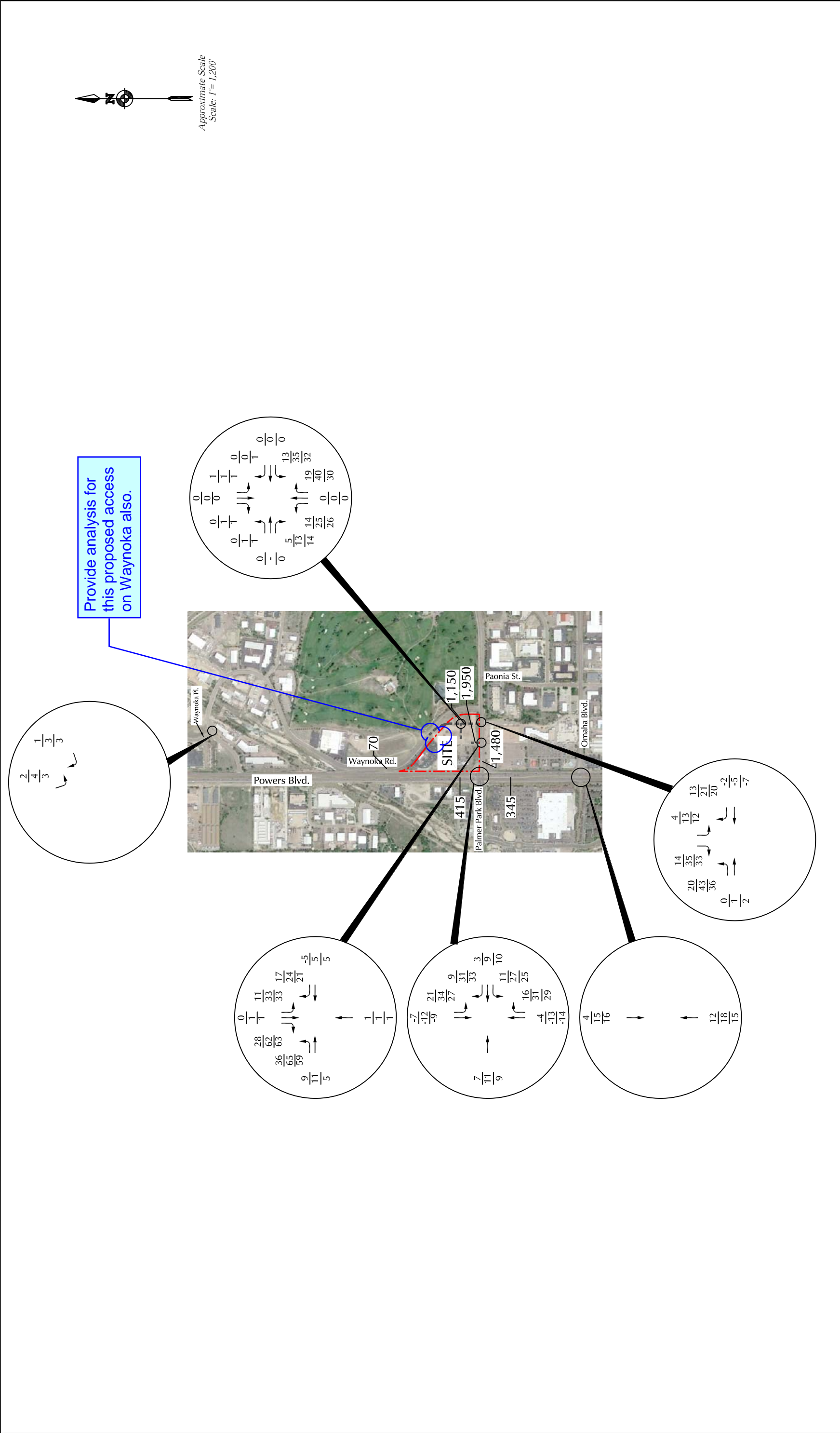
- 10% = Primary Percent Directional Distribution
- 10% = AM Passby Percent Directional Distribution
- 10% = Noon Passby Percent Directional Distribution
- 10% = PM Passby Percent Directional Distribution
- 10% = AM Diverted Percent Directional Distribution
- 10% = Noon Diverted Percent Directional Distribution
- 10% = PM Diverted Percent Directional Distribution

Figure 6

Directional Distribution of Site-Generated Traffic

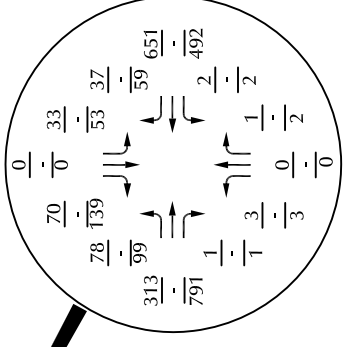
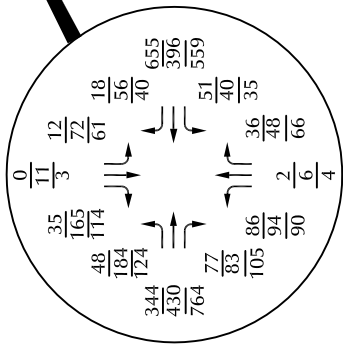
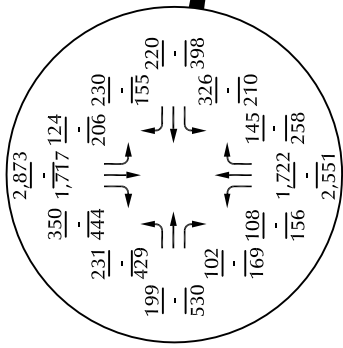
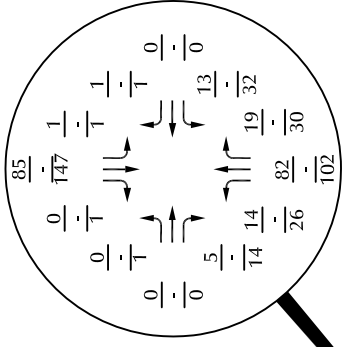
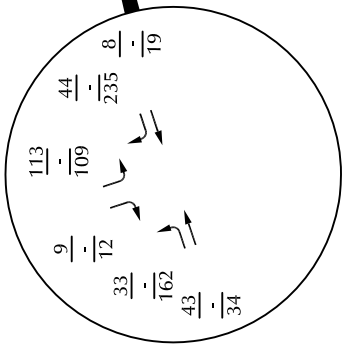
Wendy's Commercial Center at Palmer Park & Powers (LSC #174760)





LEGEND:
 XX AM Weekday Peak-Hour Traffic (vehicles per hour)
 XX Noon Weekday Peak-Hour Traffic (vehicles per hour)
 XX PM Weekday Peak-Hour Traffic (vehicles per hour)
 XXX = Average Daily Traffic (vehicles per day)



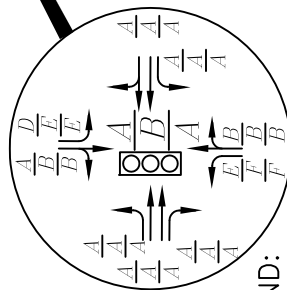
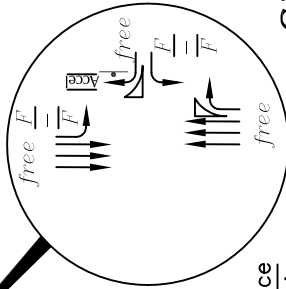
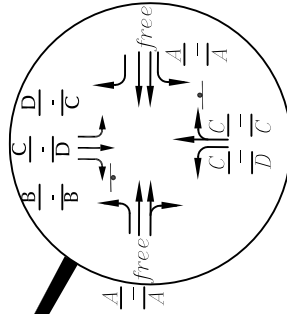
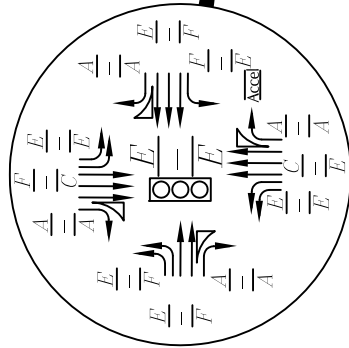
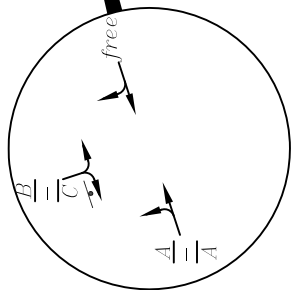
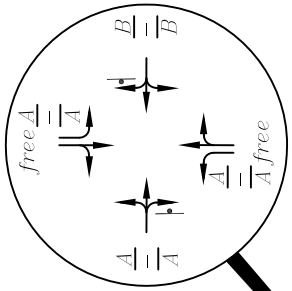
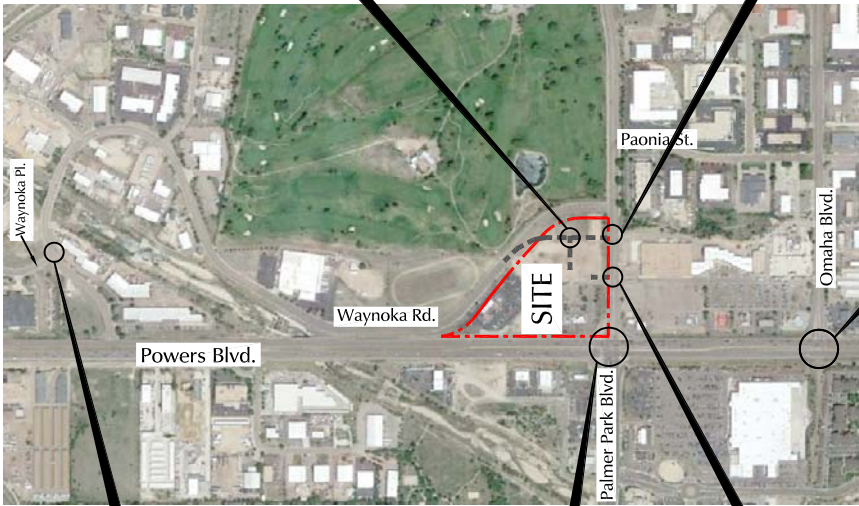


Approximate Scale
Scale: 1" = 1,200'

LEGEND:
 XX AM Weekday Peak-Hour Traffic (vehicles per hour)
 XX Noon Weekday Peak-Hour Traffic (vehicles per hour)
 XX PM Weekday Peak-Hour Traffic (vehicles per hour)
 XXX = Average Daily Traffic (vehicles per day)



Figure 8a
Existing plus Site-Generated Traffic
 Wendy's Commercial Center at Palmer Park & Powers (LSC #174760)



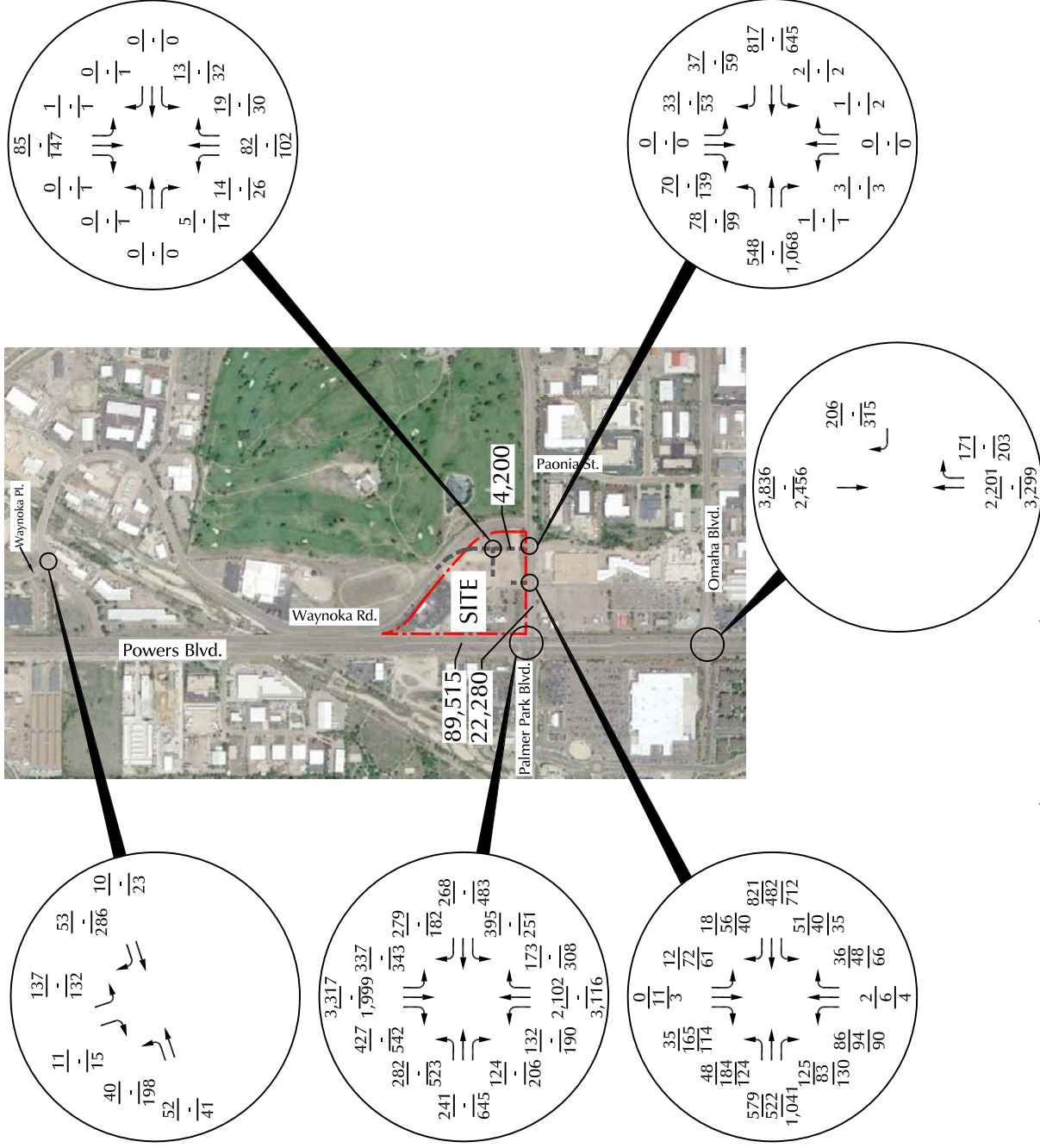
- LEGEND:**
- ↑ = Stop Sign
 - ⊞ = Traffic Signal
 - $\frac{A}{A}$ = AM Individual Movement Peak-Hour Level of Service
 - $\frac{A}{B}$ = PM Individual Movement Peak-Hour Level of Service
 - $\frac{C}{B}$ = AM Entire Intersection Peak-Hour Level of Service
 - $\frac{C}{B}$ = PM Entire Intersection Peak-Hour Level of Service
 - $\frac{A}{A}$ = AM Individual Movement Peak-Hour Level of Service
 - $\frac{A}{B}$ = PM Individual Movement Peak-Hour Level of Service
 - $\frac{C}{B}$ = AM Entire Intersection Peak-Hour Level of Service
 - $\frac{C}{B}$ = PM Entire Intersection Peak-Hour Level of Service

Figure 8b
**Existing plus
 Site-Generated Lane Geometry,
 Traffic Control and Level of Service**
 Wendy's Commercial Center at Palmer Park & Powers (LSC #174760)





Approximate Scale
Scale: 1" = 1,200'



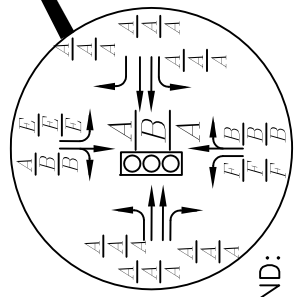
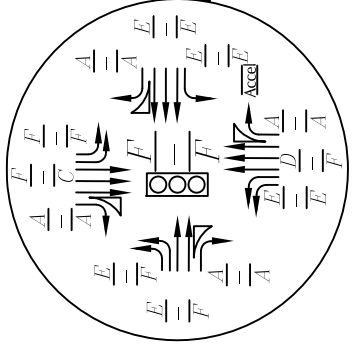
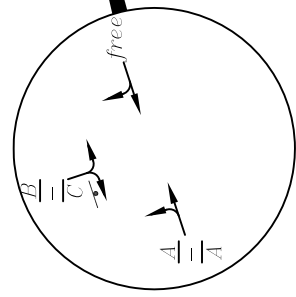
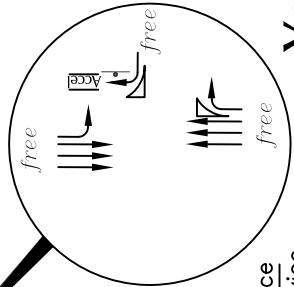
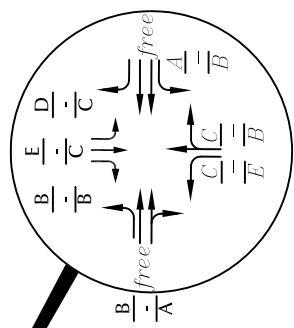
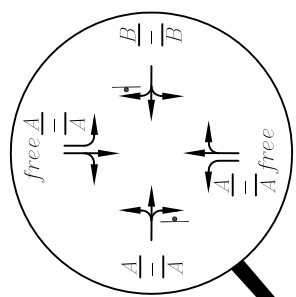
LEGEND:

- XX AM Weekday Peak-Hour Traffic (vehicles per hour)
- XX Noon Weekday Peak-Hour Traffic (vehicles per hour)
- XX PM Weekday Peak-Hour Traffic (vehicles per hour)
- XXX = Average Daily Traffic (vehicles per day)



Figure 9a
**Year 2040
Total Traffic**

Wendy's Commercial Center at Palmer Park & Powers (LSC #174760)



Approximate Scale
Scale: 1" = 1,200'

LEGEND:

- ↑ = Stop Sign
- ⊞ = Traffic Signal
- $\frac{A}{A}$ = AM Individual Movement Peak-Hour Level of Service
- $\frac{C}{B}$ = PM Individual Movement Peak-Hour Level of Service
- $\frac{C}{C}$ = AM Entire Intersection Peak-Hour Level of Service
- $\frac{B}{B}$ = Noon Entire Intersection Peak-Hour Level of Service
- $\frac{A}{A}$ = PM Entire Intersection Peak-Hour Level of Service

Figure 9b

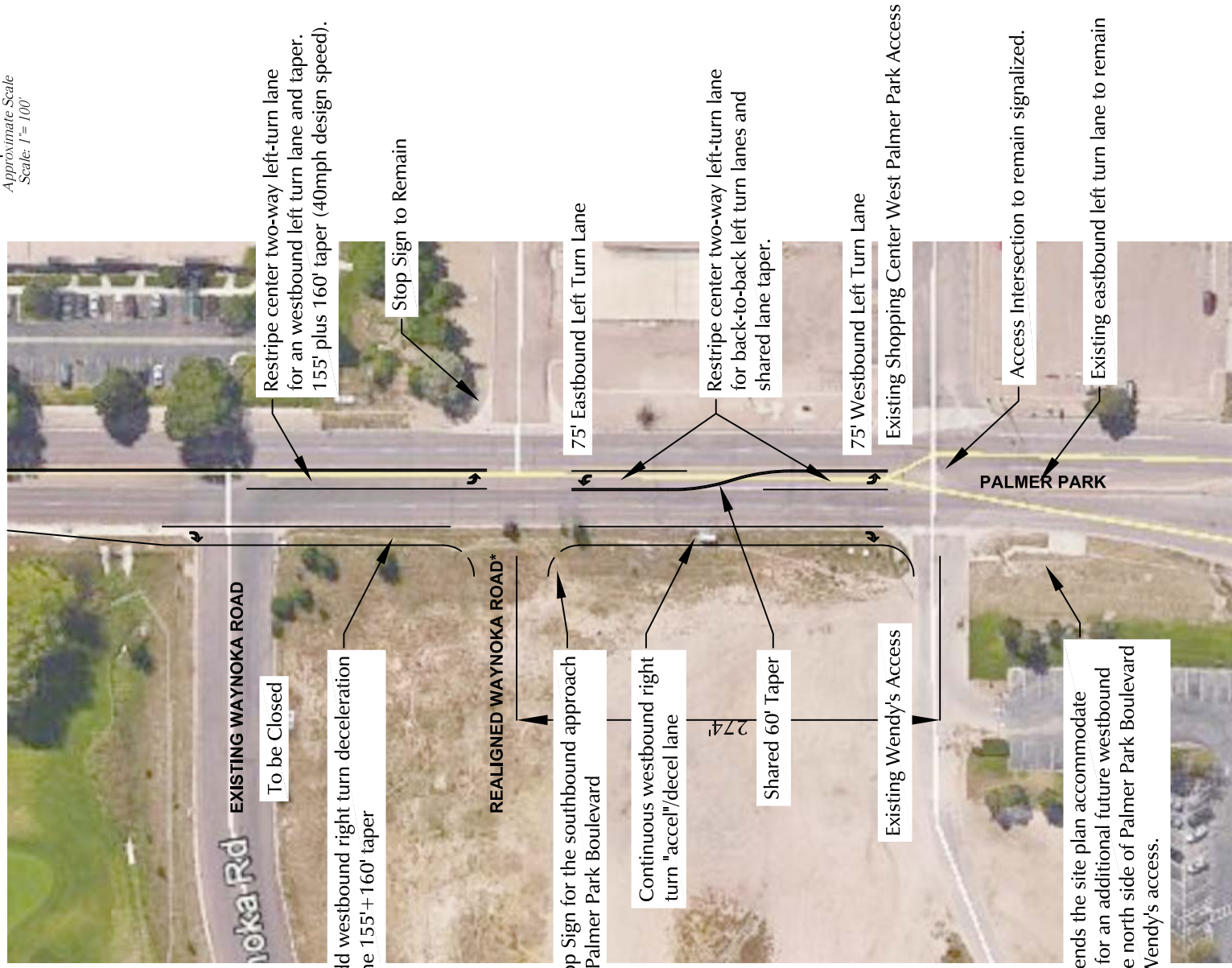
Year 2040 Total Lane Geometry, Traffic Control and Level of Service

Wendy's Commercial Center at Palmer Park & Powers (LSC #174760)





Approximate Scale
Scale: 1" = 100'



LSC recommends the site plan accommodate the potential for an additional future westbound lane along the north side of Palmer Park Boulevard west of the Wendy's access.

*Realign Waynoka Road to align with the east/rear access to the shopping center south of Palmer Park Boulevard.

Figure 10

Recommended Palmer Park Boulevard Improvements

Wendy's Commercial Center at Palmer Park & Powers (LSC #174760)



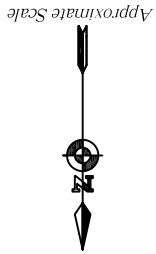
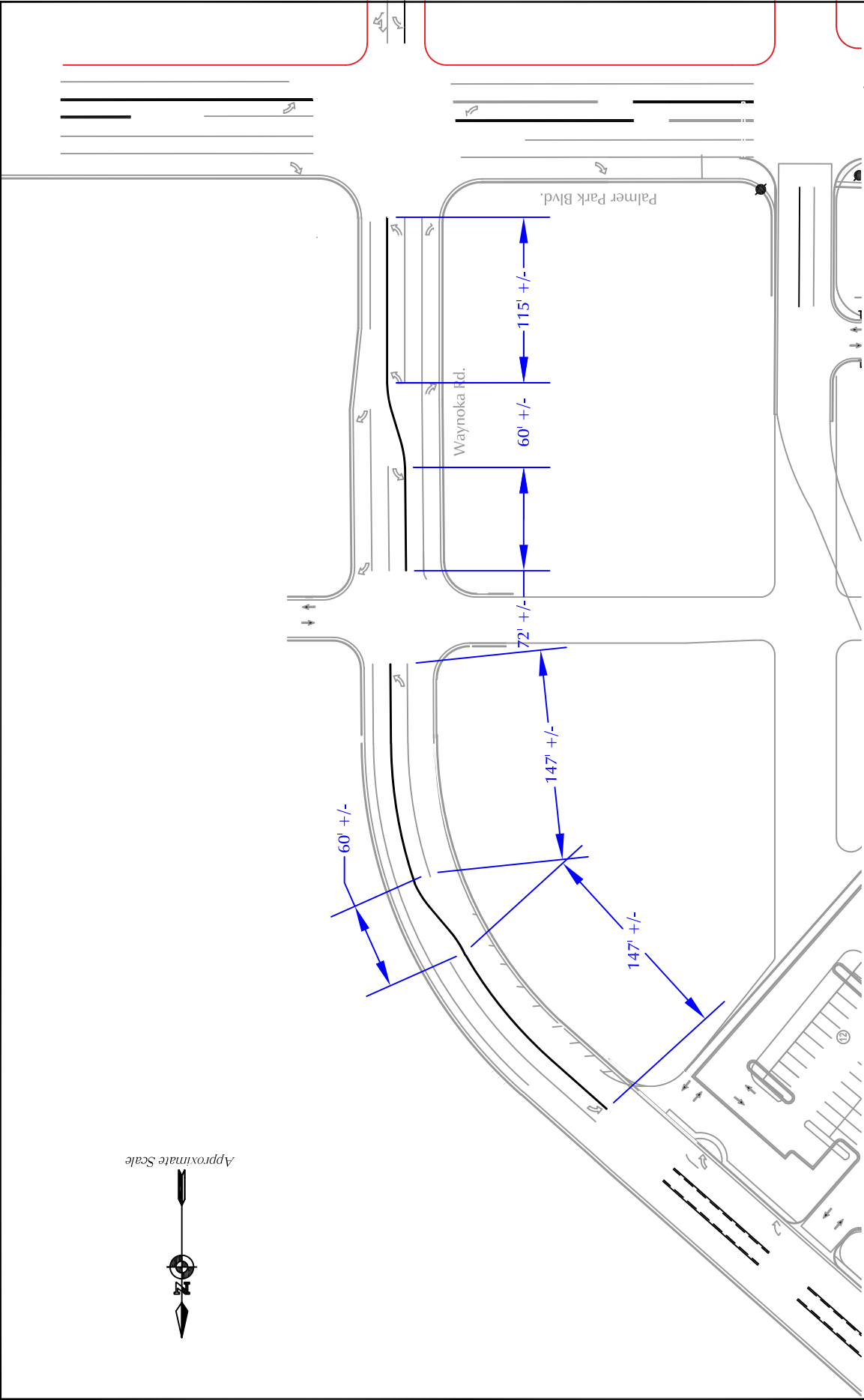


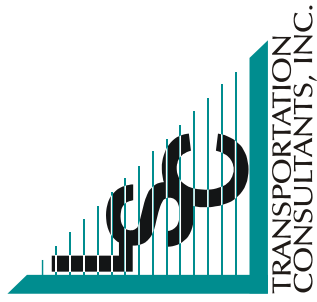
Figure 11

Recommended Waynoka Road (Realigned) Lane Concept

Wendy's Commercial Center at Palmer Park & Powers (LSC #174760)



Traffic Counts



Counts by LSC

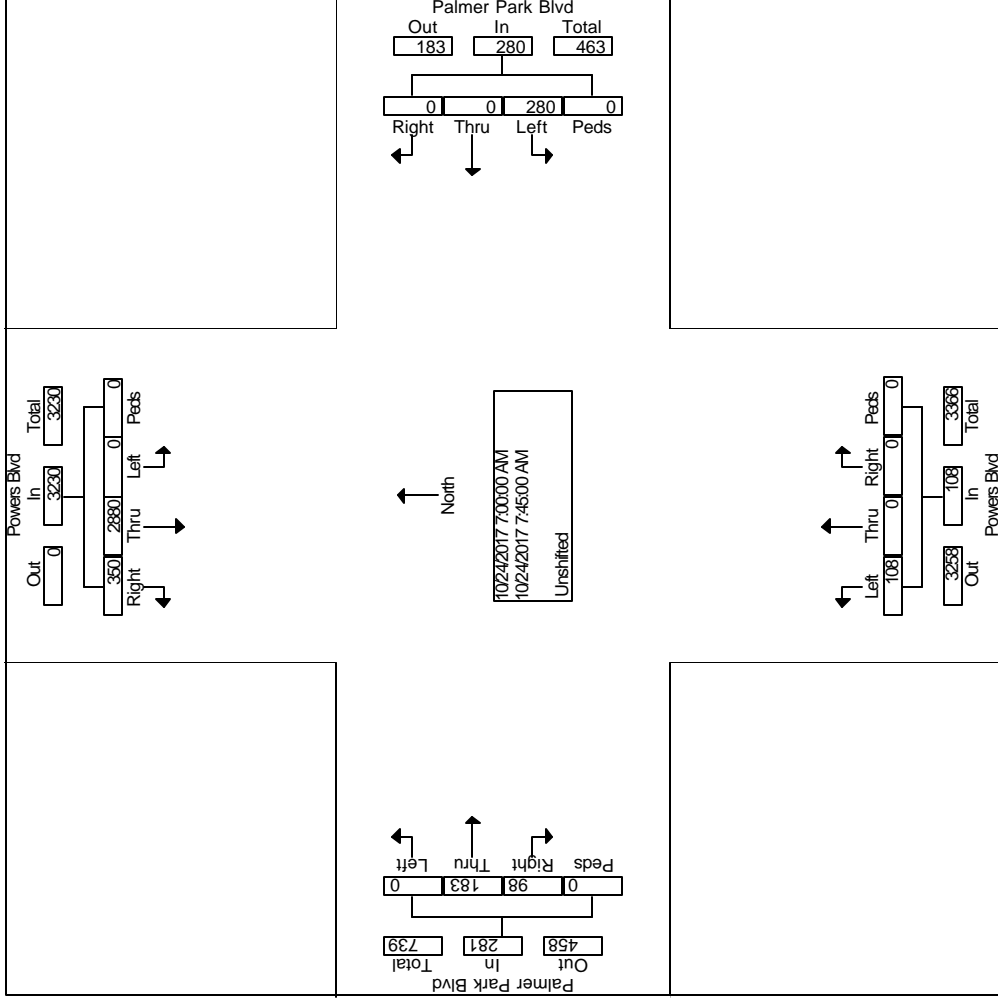
LSC Transportation Consultants, Inc.

File Name : Powers - Palmer Park AM
 Site Code : 00174760
 Start Date : 10/24/2017
 Page No : 1

Groups Printed- Unshifted

Start Time	Powers Blvd From North			Palmer Park Blvd From East			Powers Blvd From South			Palmer Park Blvd From West			Int. Total				
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left		Peds			
	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0			
06:30 AM	28	704	1	0	0	39	0	0	0	0	14	0	26	32	0	0	844
06:45 AM	40	736	1	0	0	49	0	0	0	0	13	0	24	42	0	0	905
Total	68	1440	2	0	0	88	0	0	0	0	27	0	50	74	0	0	1749
07:00 AM	56	719	0	0	0	59	0	0	0	0	23	0	22	40	0	0	919
07:15 AM	85	754	0	0	0	75	0	0	0	0	28	0	32	37	0	0	1011
07:30 AM	113	720	0	0	0	75	0	0	0	0	34	0	24	52	0	0	1018
07:45 AM	96	687	0	0	0	71	0	0	0	0	23	0	20	54	0	0	951
Total	350	2880	0	0	0	280	0	0	0	0	108	0	98	183	0	0	3899
08:00 AM	72	541	0	0	0	51	0	1	0	0	34	0	42	46	0	0	787
08:15 AM	79	557	0	0	0	45	0	0	0	0	38	0	28	29	0	0	776
Grand Total	569	5418	2	0	0	464	0	1	0	0	207	0	218	332	0	0	7211
Apprch %	9.5	90.5	0.0	0.0	0.0	100.	0.0	0.5	0.0	0.0	99.5	0.0	39.6	60.4	0.0	0.0	
Total %	7.9	75.1	0.0	0.0	0.0	6.4	0.0	0.0	0.0	0.0	2.9	0.0	3.0	4.6	0.0	0.0	

Start Time	Powers Blvd From North					Palmer Park Blvd From East					Powers Blvd From South					Palmer Park Blvd From West					
	Rig ht	Thr u	Lef t	Pe ds	App. Total	Rig ht	Thr u	Lef t	Pe ds	App. Total	Rig ht	Thr u	Lef t	Pe ds	App. Total	Rig ht	Thr u	Lef t	Pe ds	App. Total	
Peak Hour	From 06:30 AM to 08:15 AM - Peak 1 of 1																				
Intersection	on 07:00 AM																				
Volume	35	28	0	0	3230	0	0	28	0	280	0	0	10	8	0	108	18	3	0	0	281
Percent	10.	89.	0.0	0.0		0.0	0.0	10	0.0		0.0	0.0	10	0.0		34.	65.	0.0	0.0		
07:30 Volume	11	72	0	0	833	0	0	75	0	75	0	0	34	0	34	24	52	0	0	76	
Peak Factor	0.958																				
High Int.	07:15 AM																				
Volume	85	75	0	0	839	0	0	75	0	75	0	0	34	0	34	24	52	0	0	76	
Peak Factor	0.924																				



Counts by LSC

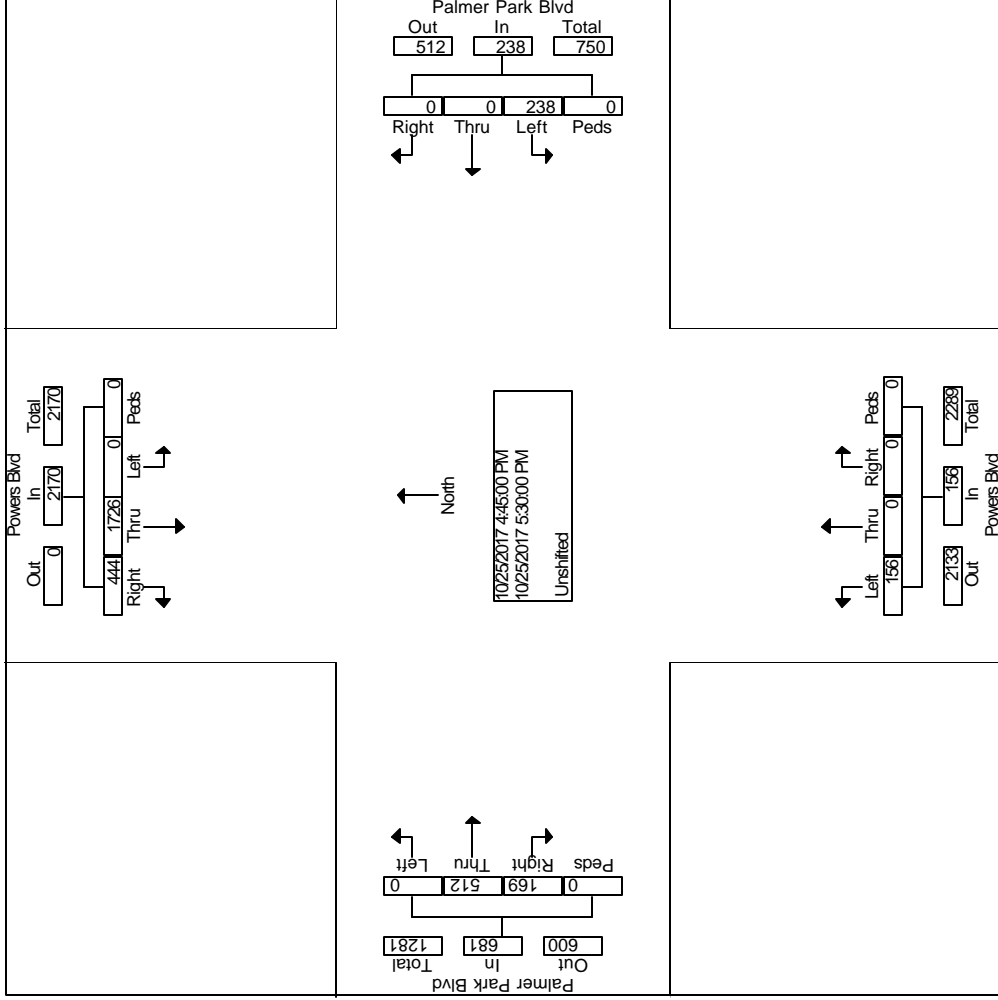
LSC Transportation Consultants, Inc.

File Name : Powers - Palmer Park PM
 Site Code : 00174760
 Start Date : 10/25/2017
 Page No : 1

Groups Printed- Unshifted

Start Time	Powers Blvd From North			Palmer Park Blvd From East			Powers Blvd From South			Palmer Park Blvd From West			Int. Total				
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left		Peds			
	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0			
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			
04:00 PM	117	485	0	0	0	57	0	0	0	0	44	0	40	73	0	0	816
04:15 PM	102	454	0	0	0	64	0	0	0	32	0	48	80	0	0	0	780
04:30 PM	99	414	0	0	0	62	0	0	0	40	0	39	109	0	0	0	763
04:45 PM	106	407	0	0	0	63	0	0	0	26	0	53	115	0	0	0	770
Total	424	1760	0	0	0	246	0	0	0	142	0	180	377	0	0	0	3129
05:00 PM	130	419	0	0	0	59	0	0	0	48	0	34	145	0	0	0	835
05:15 PM	112	460	0	0	0	60	0	0	0	47	0	49	129	0	0	0	857
05:30 PM	96	440	0	0	0	56	0	0	0	35	0	33	123	0	0	0	783
05:45 PM	108	449	0	0	0	56	0	0	0	25	0	35	92	0	0	0	765
Total	446	1768	0	0	0	231	0	0	0	155	0	151	489	0	0	0	3240
Grand Total	870	3528	0	0	0	477	0	0	0	297	0	331	866	0	0	0	6369
Apprch %	19.8	80.2	0.0	0.0	0.0	100.	0.0	0.0	0.0	100.	0.0	27.7	72.3	0.0	0.0	0.0	0.0
Total %	13.7	55.4	0.0	0.0	0.0	7.5	0.0	0.0	0.0	4.7	0.0	5.2	13.6	0.0	0.0	0.0	0.0

Start Time	Powers Blvd From North					Palmer Park Blvd From East					Powers Blvd From South					Palmer Park Blvd From West					
	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	on																				
Volume	44	17	0	0	2170	0	0	23	0	238	0	0	15	0	156	16	51	0	0	681	3245
Percent	20.	79.	0.0	0.0		0.0	0.0	10	0.0		0.0	0.0	0.0	0.0		24.	75.	0.0	0.0		
05:15 Volume	11	46	0	0	572	0	0	60	0	60	0	0	47	0	47	49	12	0	0	178	857
Peak Factor	0.947																				
05:15 PM																					
High Int.	11	46	0	0	572	0	0	63	0	63	0	0	48	0	48	34	14	0	0	179	
Volume	2	0	0	0	0.94	8	0	0.94	4	0.81	3	0.95	1								
Peak Factor																					



Counts by LSC

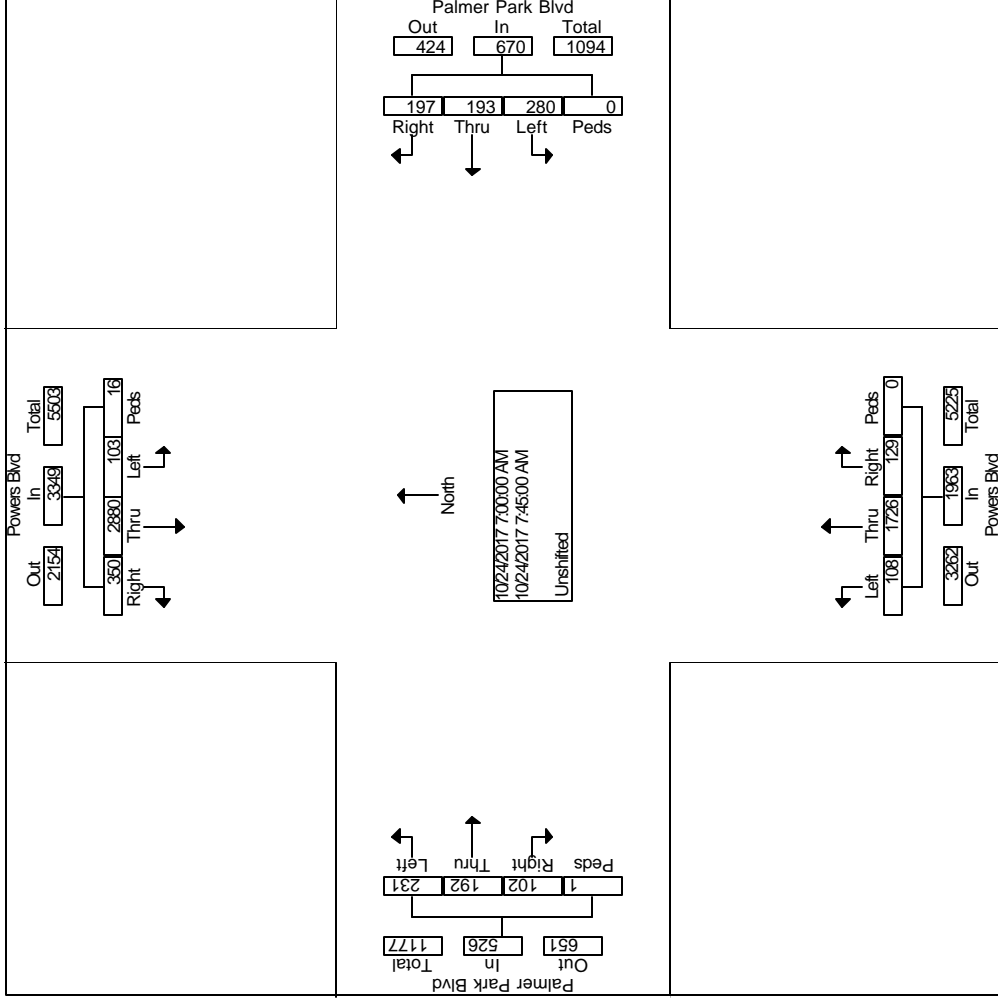
LSC Transportation Consultants, Inc.

File Name : Powers - Palmer Park AM
 Site Code : 00174760
 Start Date : 10/24/2017
 Page No : 1

Groups Printed- Unshifted

Start Time	Powers Blvd From North			Palmer Park Blvd From East			Powers Blvd From South			Palmer Park Blvd From West			Int. Total			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left		Peds		
	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0		
06:30 AM	28	704	10	28	38	39	1	19	373	14	0	28	35	43	1	1361
06:45 AM	40	736	26	33	48	49	0	43	407	13	0	24	46	32	2	1499
Total	68	1440	36	61	86	88	1	62	780	27	0	52	81	75	3	2860
07:00 AM	56	719	14	47	42	59	0	33	418	23	0	22	40	42	0	1517
07:15 AM	85	754	30	48	39	75	0	27	401	28	0	32	38	56	1	1616
07:30 AM	113	720	31	57	55	75	0	28	451	34	0	24	60	64	0	1719
07:45 AM	96	687	28	45	57	71	0	41	456	23	0	24	54	69	0	1656
Total	350	2880	103	197	193	280	0	129	1726	108	0	102	192	231	1	6508
08:00 AM	72	541	19	51	49	51	0	32	365	34	0	42	51	51	0	1367
08:15 AM	79	557	35	42	33	45	0	29	366	38	0	28	29	61	0	1348
Grand Total	569	5418	193	351	361	464	1	252	3237	207	0	224	353	418	4	12083
Apprch %	9.2	87.2	3.1	29.8	30.7	39.4	0.1	6.8	87.6	5.6	0.0	22.4	35.3	41.8	0.4	
Total %	4.7	44.8	1.6	2.9	3.0	3.8	0.0	2.1	26.8	1.7	0.0	1.9	2.9	3.5	0.0	

Start Time	Powers Blvd From North					Palmer Park Blvd From East					Powers Blvd From South					Palmer Park Blvd From West					
	Rig ht	Thr u	Lef t	Pe ds	App. Total	Rig ht	Thr u	Lef t	Pe ds	App. Total	Rig ht	Thr u	Lef t	Pe ds	App. Total	Rig ht	Thr u	Lef t	Pe ds	App. Total	Int. Total
Peak Hour	From 06:30 AM to 08:15 AM - Peak 1 of 1																				
Intersection	07:00 AM																				
Volume	35	28	10	16	3349	19	19	28	0	670	12	17	10	0	1963	10	19	23	1	526	6508
Percent	10.	86.	3.1	0.5		29.	28.	41.	0.0		6.6	9	5.5	0.0		19.	36.	43.	0.2		
07:30 Volume	11	72	31	7	871	57	55	75	0	187	28	45	34	0	513	24	60	64	0	148	1719
Peak Factor	0.946																				
High Int.	07:15 AM																				
Volume	85	75	30	2	871	57	55	75	0	187	41	45	23	0	520	24	60	64	0	148	
Peak Factor	0.94																				
	07:30 AM																				
	0.94																				
	4																				



Counts by LSC

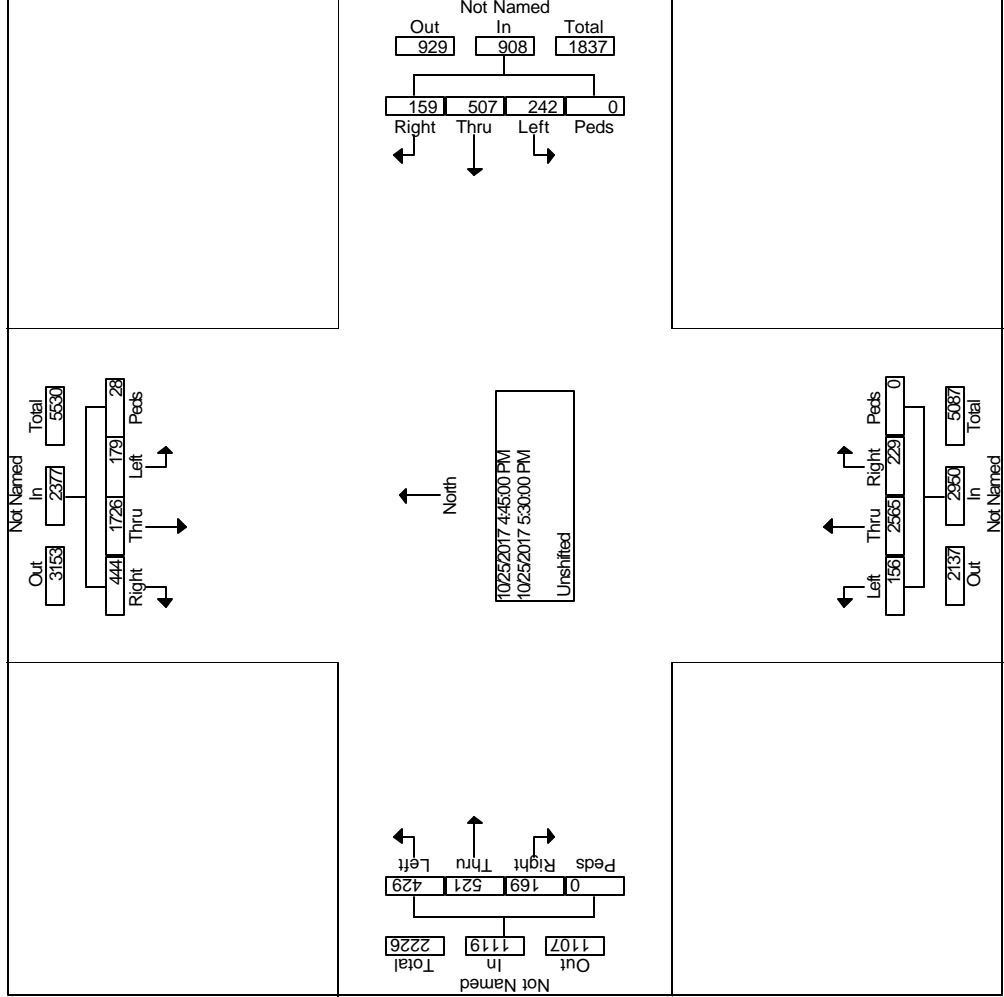
LSC Transportation Consultants, Inc.

File Name : Powers - Palmer Park PM
 Site Code : 00174760
 Start Date : 10/25/2017
 Page No : 1

Groups Printed- Unshifted

Start Time	From North			From East			From South			From West			Int. Total				
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left		Peds			
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			
04:00 PM	117	485	39	8	45	68	57	0	53	680	44	0	40	73	88	1	1798
04:15 PM	102	454	30	12	56	78	64	0	43	652	32	0	48	80	85	1	1737
04:30 PM	99	414	42	15	43	108	62	0	50	681	40	0	39	112	90	1	1796
04:45 PM	106	407	48	12	46	115	63	0	49	673	26	0	53	117	114	0	1829
Total	424	1760	159	47	190	369	246	0	195	2686	142	0	180	382	377	3	7160
05:00 PM	130	419	47	8	46	145	59	0	55	631	48	0	34	148	112	0	1882
05:15 PM	112	460	48	3	37	127	64	0	57	583	47	0	49	129	102	0	1818
05:30 PM	96	440	36	5	30	120	56	0	68	678	35	0	33	127	101	0	1825
05:45 PM	108	449	34	7	30	89	56	0	43	619	25	0	35	92	99	0	1686
Total	446	1768	165	23	143	481	235	0	223	2511	155	0	151	496	414	0	7211
Grand Total	870	3528	324	70	333	850	481	0	418	5197	297	0	331	878	791	3	14371
Apprch %	18.2	73.6	6.8	1.5	20.0	51.1	28.9	0.0	7.1	87.9	5.0	0.0	16.5	43.8	39.5	0.1	
Total %	6.1	24.5	2.3	0.5	2.3	5.9	3.3	0.0	2.9	36.2	2.1	0.0	2.3	6.1	5.5	0.0	

Start Time	From North					From East					From South					From West						
	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Int. Total	
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																						
Intersection	04:45 PM																					
Volume	44	17	17	28	2377	15	50	24	0	908	22	25	15	0	2950	16	52	42	0	1119	7354	
Percent	18.	72.	7.5	1.2		17.	55.	26.	0.0		7.8	86.	5.3	0.0		15.	46.	38.	0.0			
05:00 Volume	7	6	7	8	7	5	8	7			9	63	48	0	734	1	14	11	0	294	1882	
Peak Volume	13	41	47	8	604	14	59	5			55	63	48	0	734	34	8	2			0.977	
Peak Factor	0.90																					
High Int.	05:00 PM																					
Volume	11	46	48	3	623	46	14	59	0	250	68	67	35	0	781	34	14	11	0	294		
Peak Volume	2	0								0.90					0.94							
Peak Factor	4																					



Counts by LSC

LSC Transportation Consultants, Inc.

File Name : K-Mart Rear Access - Palmer Park Blvd AM
 Site Code : 00174760
 Start Date : 10/18/2017
 Page No : 1

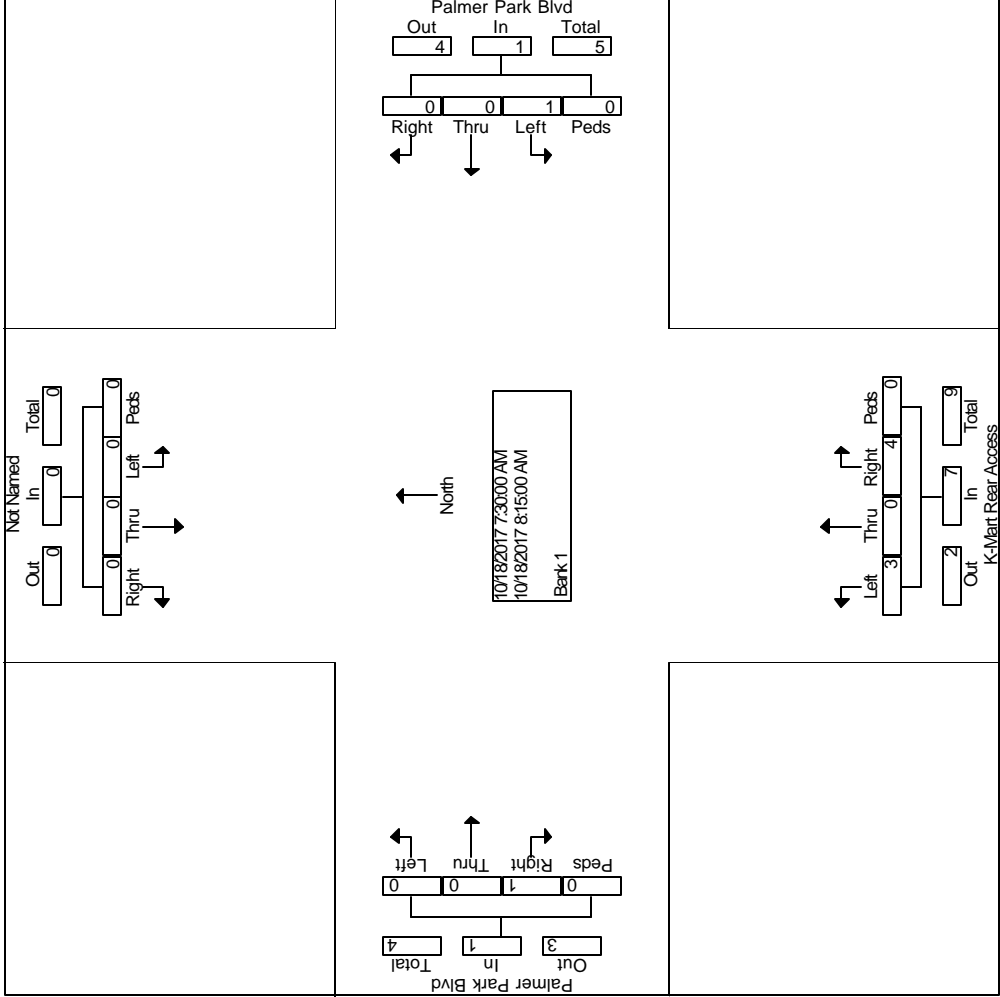
Groups Printed- Bank 1

Start Time	From North			Palmer Park Blvd From East			K-Mart Rear Access From South			Palmer Park Blvd From West			Int. Total		
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left			
	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			
06:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2
Total	0	0	0	0	0	1	0	0	2	0	1	0	0	0	4
08:00 AM	0	0	0	0	0	1	0	1	0	1	0	0	0	0	3
08:15 AM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3
Grand Total	0	0	0	0	0	2	4	0	3	0	3	0	0	0	11
Apprch %	0.0	0.0	0.0	0.0	0.0	100.	57.1	0.0	42.9	0.0	100.	0.0	0.0	0.0	0.0
Total %	0.0	0.0	0.0	0.0	0.0	18.2	36.4	0.0	27.3	0.0	18.2	0.0	0.0	0.0	0.0

Counts by LSC

File Name : K-Mart Rear Access - Palmer Park Blvd AM
 Site Code : 00174760
 Start Date : 10/18/2017
 Page No : 2

Start Time	From North					Palmer Park Blvd From East					K-Mart Rear Access From South					Palmer Park Blvd From West									
	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total					
Peak Hour From 06:30 AM to 08:15 AM - Peak 1 of 1																									
Intersection on 07:30 AM																									
Volume	0	0	0	0	0	0	0	1	0	1	4	0	3	0	7	1	0	0	0	1	9				
Percent	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10	0.0	0.0	57.0	0.0	42.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0				
08:15 Volume	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	3				
Peak Factor																0.750									
High Int. Volume	0	0	0	0	0	0	0	1	0	1	08:00 AM					08:15 AM					07:45 AM				
Peak Factor						0.25					0.25					0.58					0.25				



Counts by LSC

LSC Transportation Consultants, Inc.

File Name : K-Mart Rear Access - Palmer Park Blvd Noon
 Site Code : 00174760
 Start Date : 10/17/2017
 Page No : 1

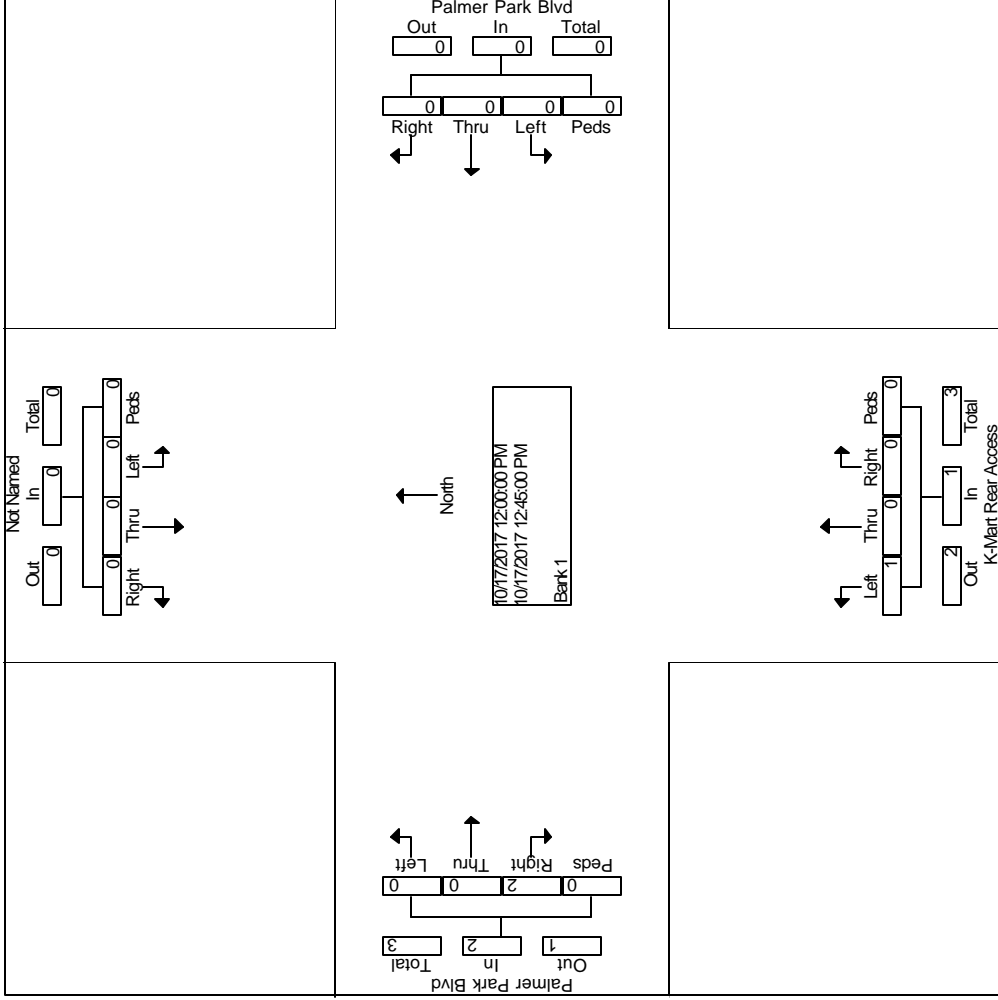
Groups Printed- Bank 1

Start Time	From North			Palmer Park Blvd From East			K-Mart Rear Access From South			Palmer Park Blvd From West			Int. Total				
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left					
	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0					
11:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
Total	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2
Total	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	3
Grand Total	0	0	0	0	0	1	0	0	0	1	0	2	0	0	0	0	4
Approch %	0.0	0.0	0.0	0.0	0.0	100.	0.0	0.0	0.0	100.	0.0	100.	0.0	0.0	0.0	0.0	0.0
Total %	0.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0	25.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0

Counts by LSC

File Name : K-Mart Rear Access - Palmer Park Blvd Noon
 Site Code : 00174760
 Start Date : 10/17/2017
 Page No : 2

Start Time	From North				Palmer Park Blvd From East				K-Mart Rear Access From South				Palmer Park Blvd From West					
	Rig ht	Thru	Lef t	Pe ds	Rig ht	Thru	Lef t	Pe ds	Rig ht	Thru	Lef t	Pe ds	Rig ht	Thru	Lef t	Pe ds		
Peak Hour From 11:30 AM to 01:15 PM - Peak 1 of 1																		
Intersection on 12:00 PM																		
Volume	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0	0	0	0
Percent	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10	0.0	10	0.0	0.0	0.0	0.0	0.0
12:45																		
Volume	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0
Peak Factor																	0.375	
High Int. 11:15:00 AM																		
Volume	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0
Peak Factor																	0.50	



Counts by LSC

LSC Transportation Consultants, Inc.

File Name : K-Mart Rear Access - Palmer Park Blvd PM
 Site Code : 00174760
 Start Date : 10/17/2017
 Page No : 1

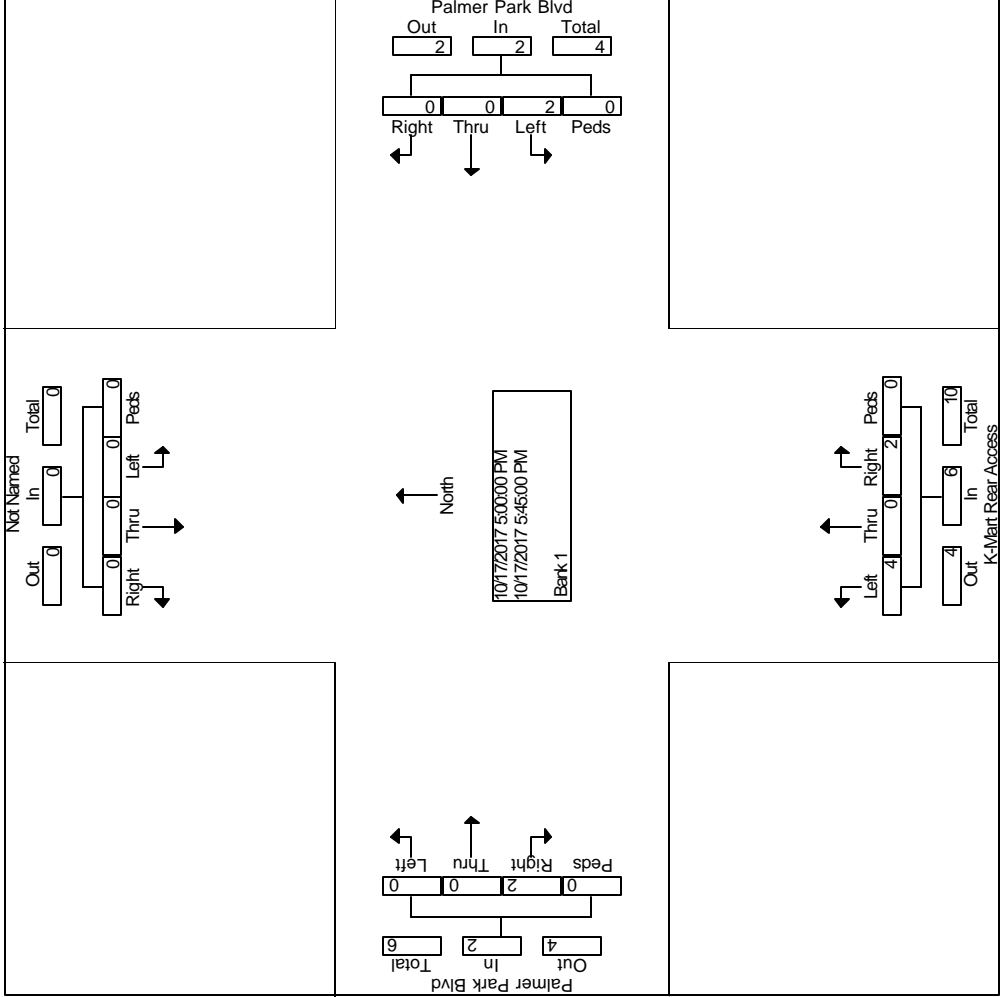
Groups Printed- Bank 1

Start Time	From North			Palmer Park Blvd			K-Mart Rear Access			Palmer Park Blvd			Int. Total
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
04:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	3	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	3	0	0	0	0	0	0	0
Total	0	0	0	0	0	3	5	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	2	0	1	0	0
05:30 PM	0	0	0	0	0	1	2	0	1	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	1	0	1	0	0
Total	0	0	0	0	0	2	2	0	4	0	2	0	0
Grand Total	0	0	0	0	0	5	7	0	4	0	2	0	0
Apprch %	0.0	0.0	0.0	0.0	0.0	100.	63.6	0.0	36.4	0.0	100.	0.0	0.0
Total %	0.0	0.0	0.0	0.0	0.0	27.8	38.9	0.0	22.2	0.0	11.1	0.0	0.0

Counts by LSC

File Name : K-Mart Rear Access - Palmer Park Blvd PM
 Site Code : 00174760
 Start Date : 10/17/2017
 Page No : 2

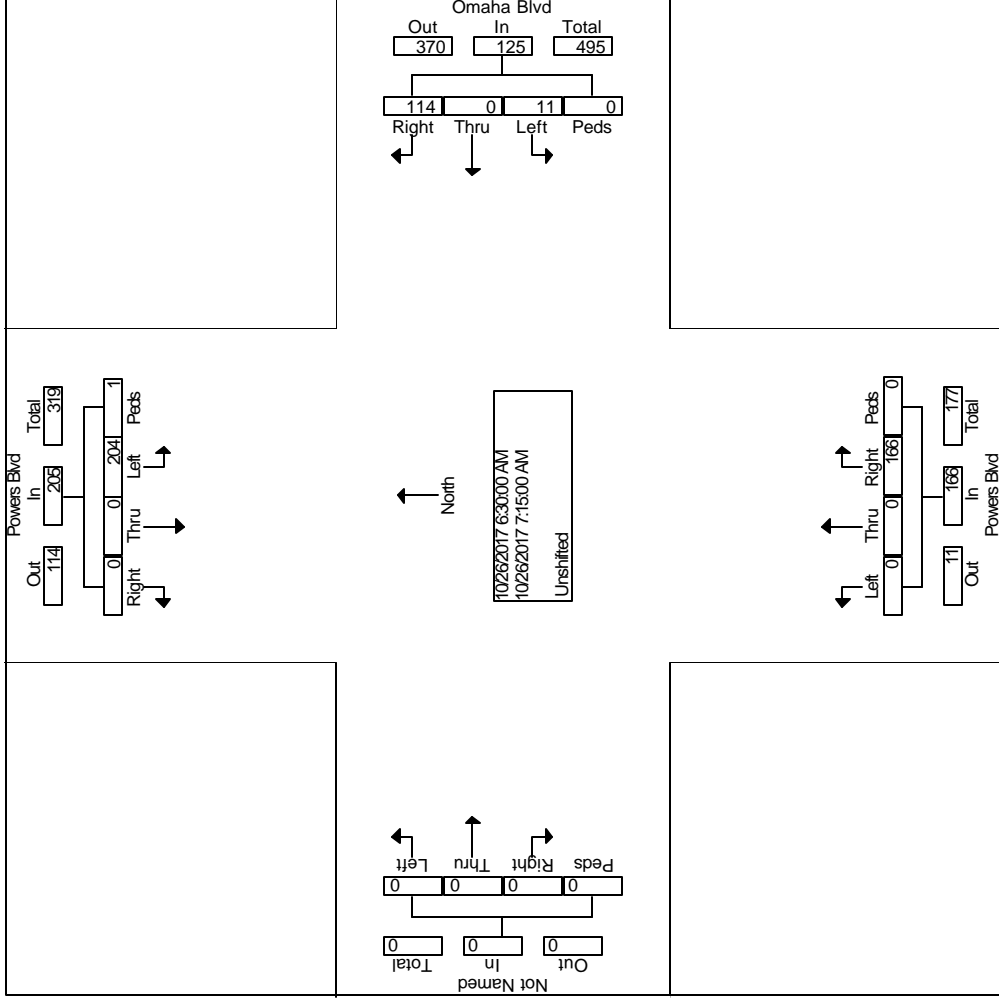
Start Time	From North					Palmer Park Blvd From East					K-Mart Rear Access From South					Palmer Park Blvd From West					
	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection on 05:00 PM																					
Volume	0	0	0	0	0	0	0	2	0	2	2	0	4	0	6	2	0	0	0	2	10
Percent	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10	0.0	0.0	33.0	0.0	66.0	0.0	0.0	10	0.0	0.0	0.0	0.0	0.0
05:30 Volume	0	0	0	0	0	0	0	1	0	1	2	0	1	0	3	0	0	0	0	0	4
Peak Factor	0.625																				
3:45:00 PM High Int.	05:15 PM																				
Volume	0	0	0	0	0	0	0	1	0	1	2	0	1	0	3	1	0	0	0	1	0.50
Peak Factor	0																				



Counts by LSC

File Name : Powers Blvd - Omaha Blvd AM
 Site Code : 00174760
 Start Date : 10/26/2017
 Page No : 2

Start Time	Powers Blvd From North					Omaha Blvd From East					Powers Blvd From South					From West							
	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Int. Total		
Peak Hour	From 06:30 AM to 08:15 AM - Peak 1 of 1																						
Intersection	on 06:30 AM																						
Volume	0	0	20	4	1	205	11	0	11	0	125	16	0	0	0	166	0	0	0	0	0	0	496
Percent	0.0	0.0	99.0	0.5		91.0	0.0	0.0	8.8	0.0		10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
07:15 Volume	0	0	53	0	53	38	0	1	0	39	44	0	0	0	44	0	0	0	0	0	0	136	
Peak Factor	0.912																						
High Int.	06:45 AM																						
Volume	0	0	61	0	61	38	0	1	0	39	52	0	0	0	52	6:15:00 AM							
Peak Factor	0.84																						
	1																						



Counts by LSC

LSC Transportation Consultants, Inc.

File Name : Powers Blvd - Omaha Blvd PM
 Site Code : 00174760
 Start Date : 10/26/2017
 Page No : 1

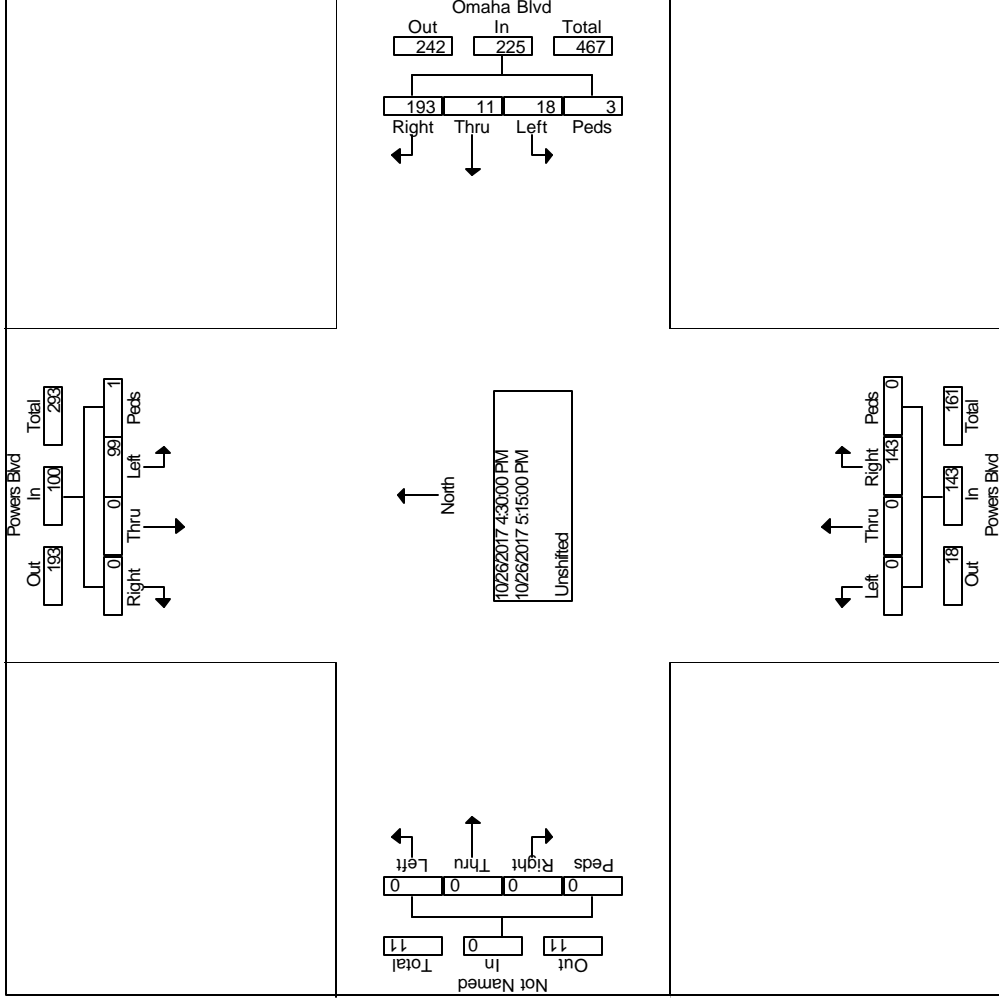
Groups Printed- Unshifted

Start Time	Powers Blvd From North			Omaha Blvd From East			Powers Blvd From South			From West			Int. Total			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left				
	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0				
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			
04:00 PM	0	0	18	1	39	0	2	1	46	0	0	1	0	0	0	108
04:15 PM	0	0	14	0	20	0	2	0	51	0	0	0	0	0	0	87
04:30 PM	0	0	30	0	48	0	4	1	40	0	0	0	0	0	0	128
04:45 PM	0	0	25	0	46	4	4	0	40	0	0	0	0	0	0	119
Total	0	0	87	1	153	9	12	2	177	0	0	1	0	0	0	442
05:00 PM	0	0	18	0	59	1	6	1	33	0	0	0	0	0	0	118
05:15 PM	0	0	26	1	40	1	4	1	30	0	0	0	0	0	0	103
05:30 PM	0	0	29	0	39	2	2	0	28	0	0	0	0	0	0	100
05:45 PM	0	0	35	0	23	0	3	0	22	0	0	0	0	0	0	83
Total	0	0	108	1	161	4	15	2	113	0	0	0	0	0	0	404
Grand Total	0	0	195	2	314	13	27	4	290	0	0	1	0	0	0	846
Approch %	0.0	0.0	99.0	1.0	87.7	3.6	7.5	1.1	99.7	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Total %	0.0	0.0	23.0	0.2	37.1	1.5	3.2	0.5	34.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0

Counts by LSC

File Name : Powers Blvd - Omaha Blvd PM
 Site Code : 00174760
 Start Date : 10/26/2017
 Page No : 2

Start Time	Powers Blvd From North					Omaha Blvd From East					Powers Blvd From South					From West						
	Rig	Thru	Lef	Pe	App. Total	Rig	Thru	Lef	Pe	App. Total	Rig	Thru	Lef	Pe	App. Total	Rig	Thru	Lef	Pe	App. Total	Int. Total	
Peak Hour	From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	on 04:30 PM																					
Volume	0	0	99	1	100	19	11	18	3	225	14	0	0	0	143	0	0	0	0	0	0	468
Percent	0.0	0.0	99.0	1.0		85.8	4.9	8.0	1.3		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
04:30 Volume	0	0	30	0	30	48	5	4	1	58	40	0	0	0	40	0	0	0	0	0	0	128
Peak Factor	0.914																					
High Int.	04:30 PM																					
Volume	0	0	30	0	30	59	1	6	1	67	40	0	0	0	40	3:45:00 PM						
Peak Factor	0.83																					
	3																					
	0.89																					
	4																					



Counts by LSC

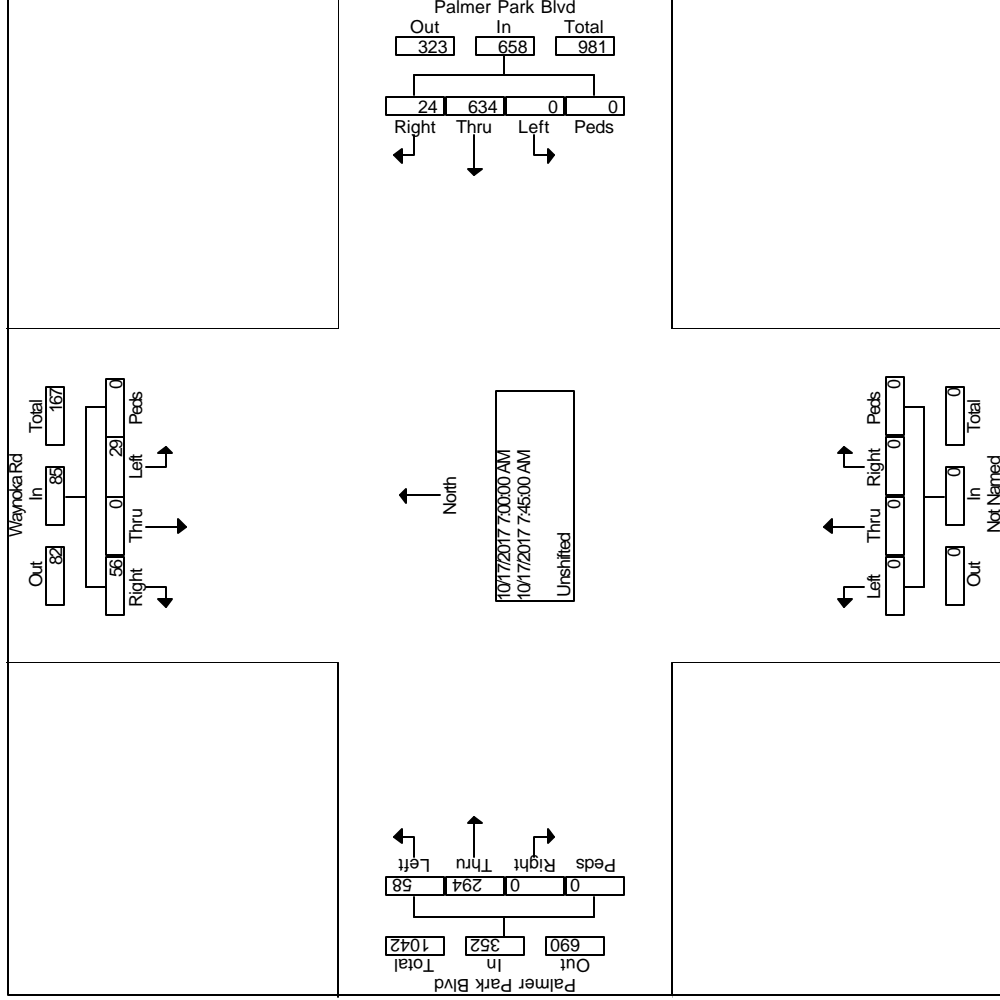
LSC Transportation Consultants, Inc.

File Name : Waynoka Rd - Palmer Park Blvd AM
 Site Code : 00164840
 Start Date : 10/17/2017
 Page No : 1

Groups Printed- Unshifted

Start Time	Waynoka Rd			Palmer Park Blvd			Palmer Park Blvd			Palmer Park Blvd			Int. Total			
	From North			From East			From South			From West						
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left		Peds		
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
06:30 AM	5	0	2	2	89	0	0	0	0	0	0	0	41	21	0	160
06:45 AM	10	0	5	5	113	0	0	0	0	0	0	0	70	20	0	223
Total	15	0	7	7	202	0	0	0	0	0	0	0	111	41	0	383
07:00 AM	12	0	8	9	151	0	0	0	0	0	0	0	60	9	0	249
07:15 AM	21	0	9	5	192	0	0	0	0	0	0	0	72	17	0	316
07:30 AM	15	0	7	5	168	0	0	0	0	0	0	0	84	17	0	296
07:45 AM	8	0	5	5	123	0	0	0	0	0	0	0	78	15	0	234
Total	56	0	29	24	634	0	0	0	0	0	0	0	294	58	0	1095
08:00 AM	16	0	5	5	110	0	0	0	0	0	0	0	89	10	0	235
08:15 AM	15	0	4	4	111	0	0	0	0	0	0	0	49	10	0	193
Grand Total	102	0	45	40	1057	0	0	0	0	0	0	0	543	119	0	1906
Apprch %	69.4	0.0	30.6	3.6	96.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	82.0	18.0	0.0	
Total %	5.4	0.0	2.4	2.1	55.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.5	6.2	0.0	

Start Time	Waynoka Rd From North					Palmer Park Blvd From East					Palmer Park Blvd From South					Palmer Park Blvd From West					
	Rig	Thru	Lef	Pe	App. Total	Rig	Thru	Lef	Pe	App. Total	Rig	Thru	Lef	Pe	App. Total	Rig	Thru	Lef	Pe	App. Total	Int. Total
Peak Hour	From 06:30 AM to 08:15 AM - Peak 1 of 1																				
Intersection	on 07:00 AM																				
Volume	56	0	29	0	85	24	63	4	0	0	658	0	0	0	0	0	29	58	0	352	1095
Percent	65.9	0.0	34.1	0.0	3.6	96.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	83.5	16.5	0.0	0.0	
07:15 Volume	21	0	9	0	30	5	19	2	0	0	197	0	0	0	0	0	72	17	0	89	316
Peak Factor	0.866																				
High Int.	07:15 AM																				
Volume	21	0	9	0	30	5	19	2	0	0	197	0	0	0	0	0	84	17	0	101	
Peak Factor	0.87																				
	1																				



Counts by LSC

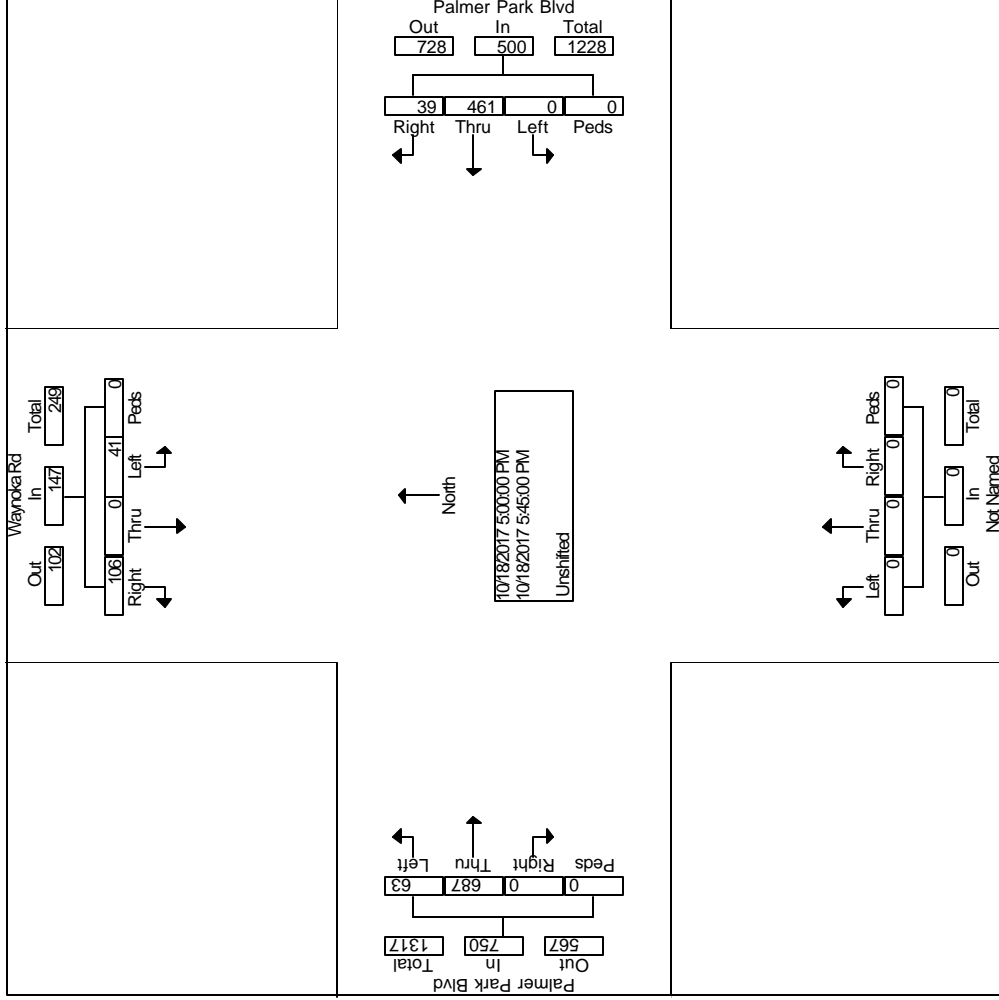
LSC Transportation Consultants, Inc.

File Name : Waynoka Rd - Palmer Park Blvd PM
 Site Code : 00174760
 Start Date : 10/18/2017
 Page No : 1

Groups Printed- Unshifted

Start Time	Waynoka Rd From North			Palmer Park Blvd From East			Palmer Park Blvd From South			Palmer Park Blvd From West			Int. Total		
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left		Peds	
	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
04:00 PM	23	0	8	15	87	0	0	0	0	0	0	161	18	0	312
04:15 PM	27	0	10	10	111	0	0	0	0	0	0	164	26	0	349
04:30 PM	36	0	12	11	130	0	0	0	0	0	0	124	11	0	324
04:45 PM	19	0	14	12	104	0	0	0	0	0	0	163	20	0	332
Total	105	0	44	48	432	0	0	0	0	0	0	612	75	0	1317
05:00 PM	27	0	12	16	130	0	0	0	0	0	0	172	18	0	375
05:15 PM	22	0	11	13	120	0	0	0	0	0	0	178	12	0	356
05:30 PM	29	0	10	7	110	0	0	0	0	0	0	157	13	0	326
05:45 PM	28	0	8	3	101	0	0	0	0	0	0	180	20	0	340
Total	106	0	41	39	461	0	0	0	0	0	0	687	63	0	1397
Grand Total	211	0	85	87	893	0	0	0	0	0	0	1299	138	0	2714
Approach %	71.0	0.0	28.6	8.9	91.1	0.0	0.0	0.0	0.0	0.0	0.0	90.4	9.6	0.0	
Total %	7.8	0.0	3.1	3.2	32.9	0.0	0.0	0.0	0.0	0.0	0.0	47.9	5.1	0.0	

Start Time	Waynoka Rd From North					Palmer Park Blvd From East					Palmer Park Blvd From South					Palmer Park Blvd From West					
	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection on	05:00 PM																				
Volume	10	0	41	0	147	39	46	0	0	500	0	0	0	0	0	0	0	68	63	0	750
Percent	72.	0.0	27.	0.0		7.8	92.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	91.	8.4	0.0		
05:00 Volume	27	0	12	0	39	16	13	0	0	146	0	0	0	0	0	0	17	18	0	190	375
Peak Factor	0.931																				
High Int.	05:00 PM																				
Volume	27	0	12	0	39	16	13	0	0	146	0	0	0	0	0	0	18	20	0	200	
Peak Factor	0.93																				



Counts by LSC

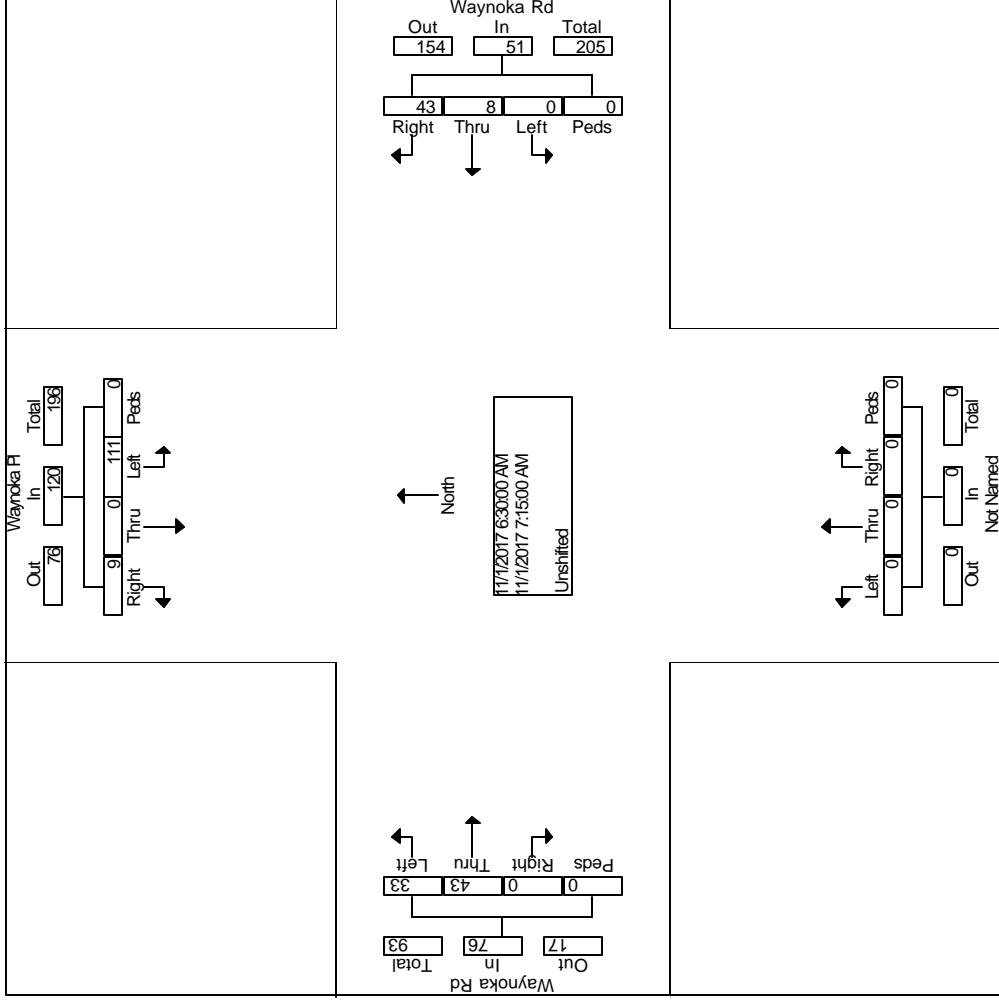
LSC Transportation Consultants, Inc.

File Name : Waynoka Rd -Waynoka PI AM
 Site Code : 00174760
 Start Date : 11/01/2017
 Page No : 1

Groups Printed- Unshifted

Start Time	Waynoka PI			Waynoka Rd			Waynoka Rd			Waynoka Rd			Int. Total			
	From North			From East			From South			From West						
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left		Peds		
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
06:30 AM	2	0	32	10	2	0	0	0	0	0	0	0	14	8	0	68
06:45 AM	4	0	37	11	4	0	0	0	0	0	0	0	18	10	0	84
Total	6	0	69	21	6	0	0	0	0	0	0	0	32	18	0	152
07:00 AM	2	0	20	9	0	0	0	0	0	0	0	0	7	7	0	45
07:15 AM	1	0	22	13	2	0	0	0	0	0	0	0	4	8	0	50
07:30 AM	2	0	35	10	3	0	0	0	0	0	0	0	4	6	0	60
07:45 AM	4	0	38	11	5	0	0	0	0	0	0	0	6	6	0	70
Total	9	0	115	43	10	0	0	0	0	0	0	0	21	27	0	225
08:00 AM	3	0	25	14	2	0	0	0	0	0	0	0	2	6	0	52
08:15 AM	1	0	18	14	10	0	0	0	0	0	0	0	5	8	0	56
Grand Total	19	0	227	92	28	0	0	0	0	0	0	0	60	59	0	485
Apprch %	7.7	0.0	92.3	76.7	23.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.4	49.6	0.0	
Total %	3.9	0.0	46.8	19.0	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.4	12.2	0.0	

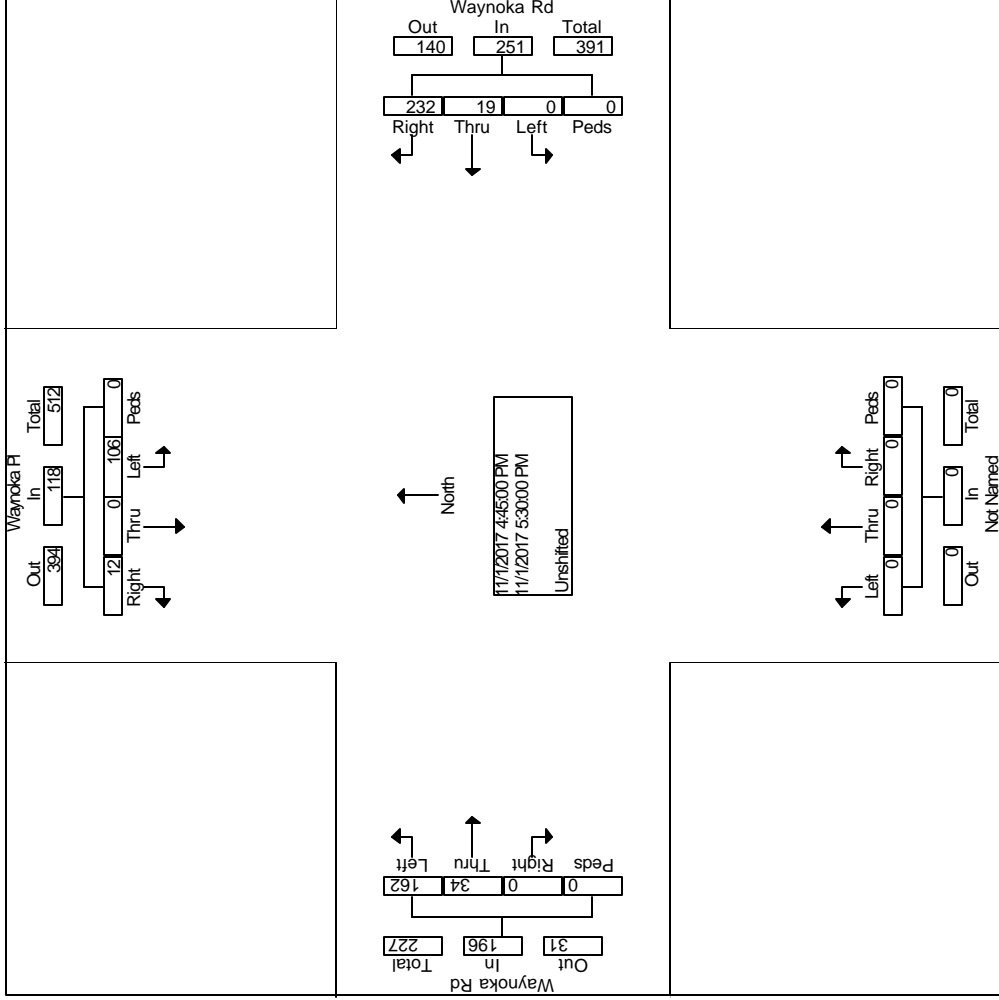
Start Time	Waynoka PI From North					Waynoka Rd From East					Waynoka Rd From South					Waynoka Rd From West					
	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	
Peak Hour	From 06:30 AM to 08:15 AM - Peak 1 of 1																				
Intersection	on 06:30 AM																				
Volume	9	0	11	0	120	43	8	0	0	51	0	0	0	0	0	0	0	43	33	0	76
Percent	7.5	0.0	92.5	0.0		84.3	15.7	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	56.6	43.4	0.0	
06:45 Volume	4	0	37	0	41	11	4	0	0	15	0	0	0	0	0	0	0	18	10	0	28
Peak Factor	0.735																				
High Int.	06:45 AM																				
Volume	4	0	37	0	41	11	4	0	0	15	0	0	0	0	0	0	0	18	10	0	28
Peak Factor	0.679																				



Counts by LSC

File Name : Waynoka Rd -Waynoka PI PM
 Site Code : 00174760
 Start Date : 11/01/2017
 Page No : 2

Start Time	Waynoka PI From North					Waynoka Rd From East					Waynoka Rd From South					Waynoka Rd From West				
	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total
Peak Hour	From 04:00 PM to 05:45 PM - Peak 1 of 1																			
Intersection	04:45 PM																			
Volume	12	0	10	0	118	23	19	0	0	251	0	0	0	0	0	0	34	16	0	196
Percent	10.	0.0	89.	0.0		4	7.6	0.0	0.0		0.0	0.0	0.0	0.0		0.0	17.	82.	0.0	
05:15 Volume	3	0	26	0	29	62	3	0	0	65	0	0	0	0	0	0	11	49	0	60
Peak Factor	0.917																			
High Int.	05:00 PM																			
Volume	2	0	31	0	33	74	5	0	0	79	0	0	0	0	0	0	11	55	0	66
Peak Factor	0.79																			
	4																			
	05:30 PM																			
	0																			
	0.74																			
	2																			



Counts by LSC

LSC Transportation Consultants, Inc.

File Name : Wendy's Access - Palmer Park Blvd AM
 Site Code : 00174760
 Start Date : 10/18/2017
 Page No : 1

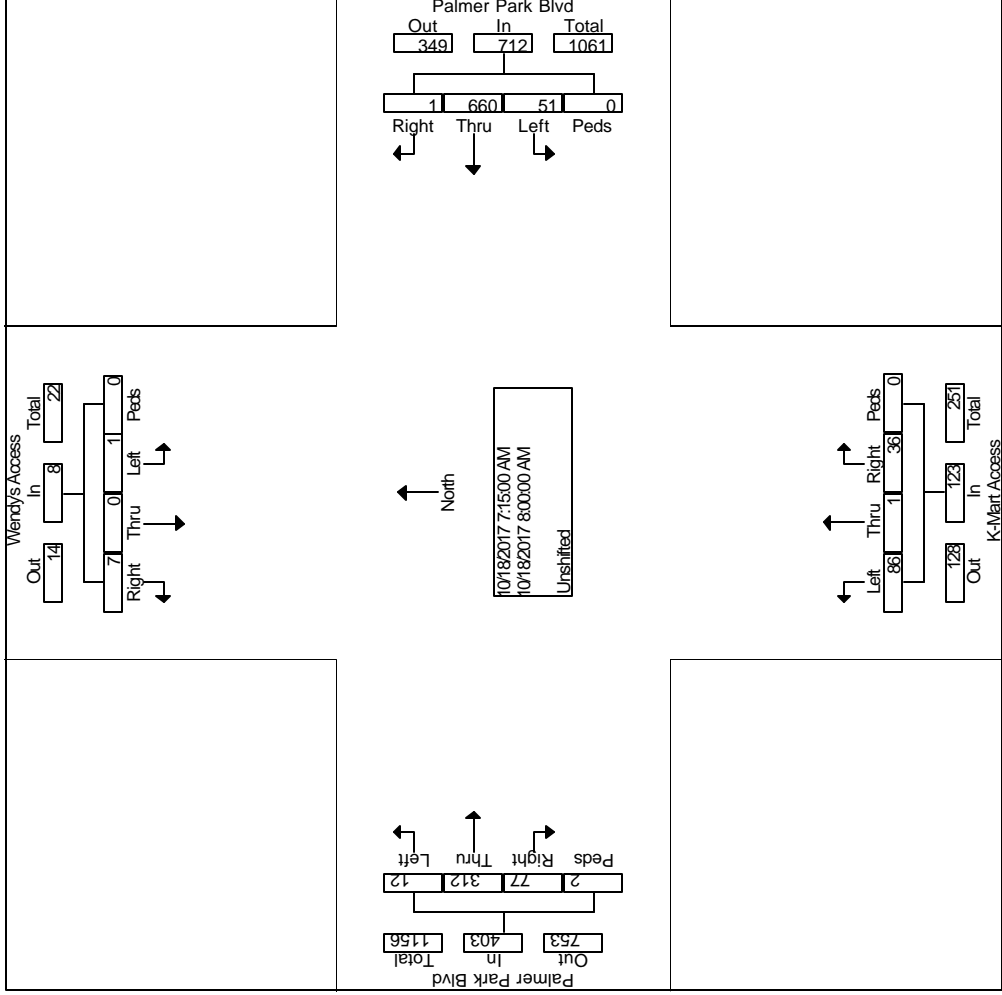
Groups Printed- Unshifted

Start Time	Wendy's Access From North			Palmer Park Blvd From East			K-Mart Access From South			Palmer Park Blvd From West			Int. Total			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left		Peds		
	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0		
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
06:30 AM	1	0	0	0	98	4	0	8	0	18	0	24	68	1	0	222
06:45 AM	0	0	0	0	111	4	0	10	0	21	0	28	86	0	0	260
Total	1	0	0	0	209	8	0	18	0	39	0	52	154	1	0	482
07:00 AM	2	0	0	0	160	7	0	10	0	15	0	15	57	2	0	269
07:15 AM	0	0	0	0	187	9	0	6	0	12	0	16	65	1	0	296
07:30 AM	3	0	0	0	177	22	0	11	0	29	0	17	84	3	1	347
07:45 AM	2	0	1	0	153	14	0	7	1	19	0	24	93	4	1	320
Total	7	0	1	0	677	52	0	34	1	75	0	72	299	10	2	1232
08:00 AM	2	0	0	0	143	6	0	12	0	26	0	20	70	4	0	283
08:15 AM	1	0	0	0	101	1	0	14	0	20	0	16	64	1	0	218
Grand Total	11	0	1	0	21130	67	0	78	1	160	0	160	587	16	2	2215
Apprch %	91.7	0.0	8.3	0.0	94.2	5.6	0.0	32.6	0.4	66.9	0.0	20.9	76.7	2.1	0.3	
Total %	0.5	0.0	0.0	0.0	51.0	3.0	0.0	3.5	0.0	7.2	0.0	7.2	26.5	0.7	0.1	

Counts by LSC

File Name : Wendy's Access - Palmer Park Blvd AM
 Site Code : 00174760
 Start Date : 10/18/2017
 Page No : 2

Start Time	Wendy's Access From North					Palmer Park Blvd From East					K-Mart Access From South					Palmer Park Blvd From West					Int. Total		
	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total			
Peak Hour	From 06:30 AM to 08:15 AM - Peak 1 of 1																						
Intersection	on 07:15 AM																						
Volume	7	0	1	0	8	66	51	0	712	36	1	86	0	123	31	12	2	403					1246
Percent	87.	0.0	12.	0.0		0.1	7.2	0.0		29.	0.8	69.	0.0		19.	77.	3.0	0.5					
07:30 Volume	3	0	0	0	3	17	22	0	199	11	0	29	0	40	17	84	3	105					347
Peak Factor	0.898																						
High Int.	07:30 AM					07:30 AM					07:45 AM												
Volume	3	0	0	0	3	17	22	0	199	11	0	29	0	40	24	93	4	122					
Peak Factor	0.667					0.894					0.769					0.826							



Counts by LSC

LSC Transportation Consultants, Inc.

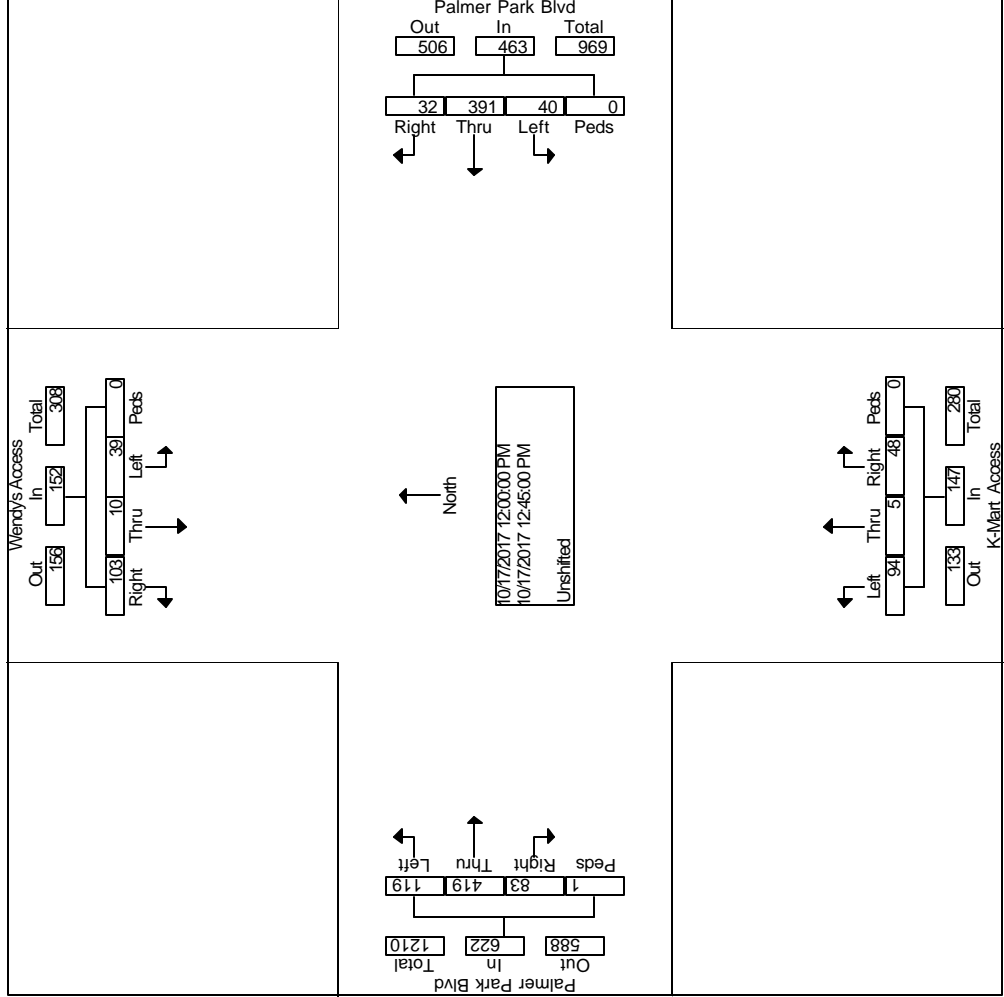
File Name : Wendy's Access - Palmer Park Blvd Noon
 Site Code : 00174760
 Start Date : 10/17/2017
 Page No : 1

Groups Printed- Unshifted

Start Time	Wendy's Access			Palmer Park Blvd			K-Mart Access			Palmer Park Blvd			Int. Total			
	From North			From East			From South			From West						
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left		Peds		
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
11:30 AM	12	3	10	8	82	8	0	10	2	20	0	22	76	29	0	282
11:45 AM	15	4	12	10	88	7	0	12	3	21	0	24	75	37	1	309
Total	27	7	22	18	170	15	0	22	5	41	0	46	151	66	1	591
12:00 PM	28	4	12	10	107	14	0	11	0	23	0	21	93	43	0	366
12:15 PM	23	2	15	5	81	6	0	16	3	23	0	21	116	27	0	338
12:30 PM	27	1	7	8	105	8	0	5	1	25	0	22	109	26	0	344
12:45 PM	25	3	5	9	98	12	0	16	1	23	0	19	101	23	1	336
Total	103	10	39	32	391	40	0	48	5	94	0	83	419	119	1	1384
01:00 PM	28	1	12	5	113	4	0	7	3	20	0	21	93	21	2	330
01:15 PM	17	3	7	8	94	9	0	14	1	25	0	22	112	16	1	329
Grand Total	175	21	80	63	768	68	0	91	14	180	0	172	775	222	5	2634
Apprch %	63.4	7.6	29.0	7.0	85.4	7.6	0.0	31.9	4.9	63.2	0.0	14.7	66.0	18.9	0.4	
Total %	6.6	0.8	3.0	2.4	29.2	2.6	0.0	3.5	0.5	6.8	0.0	6.5	29.4	8.4	0.2	

File Name : Wendy's Access - Palmer Park Blvd Noon
 Site Code : 00174760
 Start Date : 10/17/2017
 Page No : 2

Start Time	Wendy's Access From North					Palmer Park Blvd From East					K-Mart Access From South					Palmer Park Blvd From West					Int. Total
	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	
Peak Hour	From 11:30 AM to 01:15 PM - Peak 1 of 1																				
Intersection	on 12:00 PM																				
Volume	10	10	39	0	152	32	39	40	0	463	48	5	94	0	147	83	41	11	1	622	1384
Percent	67.	6.6	25.	0.0		6.9	84.	8.6	0.0		7	3.4	63.	0.0		13.	67.	19.	0.2		
Volume	28	4	12	0	44	10	10	14	0	131	11	0	23	0	34	21	93	43	0	157	366
Peak Factor	0.945																				
High Int.	12:00 PM																				
Volume	28	4	12	0	44	10	10	14	0	131	16	3	23	0	42	21	11	27	0	164	
Peak Factor	0.86																				
	4																				
	0.87																				
	5																				
	8																				



Counts by LSC

LSC Transportation Consultants, Inc.

File Name : Wendy's Access - Palmer Park Blvd PM
 Site Code : 00174760
 Start Date : 10/17/2017
 Page No : 1

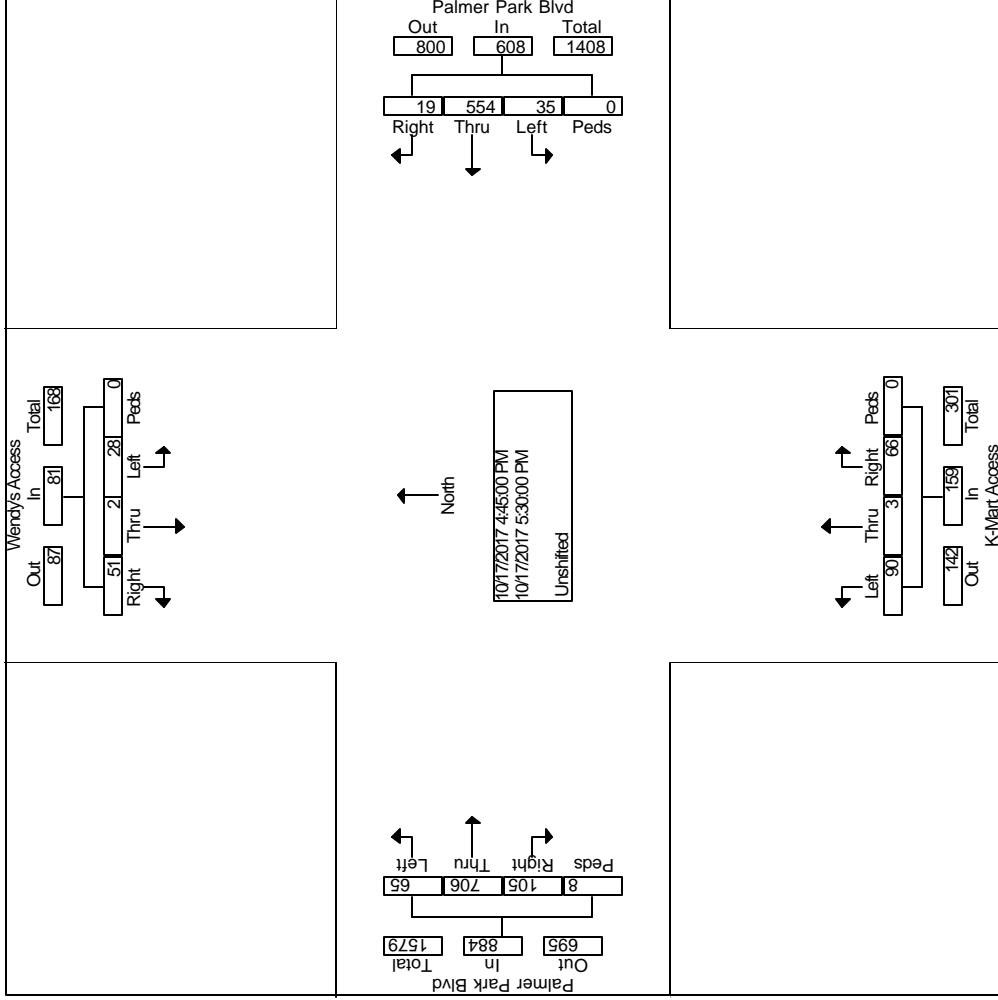
Groups Printed- Unshifted

Start Time	Wendy's Access			Palmer Park Blvd			K-Mart Access			Palmer Park Blvd			Int. Total			
	From North			From East			From South			From West						
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left		Peds		
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
04:00 PM	15	1	4	2	102	5	0	16	2	19	0	20	161	15	2	364
04:15 PM	17	0	5	1	100	6	0	18	3	20	0	23	169	17	3	382
04:30 PM	13	1	6	4	141	11	0	9	0	22	0	21	159	16	1	404
04:45 PM	14	0	8	4	111	11	0	15	0	22	0	24	155	19	2	385
Total	59	2	23	11	454	33	0	58	5	83	0	88	644	67	8	1535
05:00 PM	6	1	6	7	166	12	0	18	0	22	0	32	185	14	2	471
05:15 PM	15	1	10	2	140	5	0	16	2	22	0	25	186	17	2	443
05:30 PM	16	0	4	6	137	7	0	17	1	24	0	24	180	15	2	433
05:45 PM	22	1	5	5	104	7	0	10	3	19	0	24	158	20	0	378
Total	59	3	25	20	547	31	0	61	6	87	0	105	709	66	6	1725
Grand Total	118	5	48	31	1001	64	0	119	11	170	0	193	1353	133	14	3260
Approach %	69.0	2.9	28.1	2.8	91.3	5.8	0.0	39.7	3.7	56.7	0.0	11.4	79.9	7.9	0.8	
Total %	3.6	0.2	1.5	1.0	30.7	2.0	0.0	3.7	0.3	5.2	0.0	5.9	41.5	4.1	0.4	

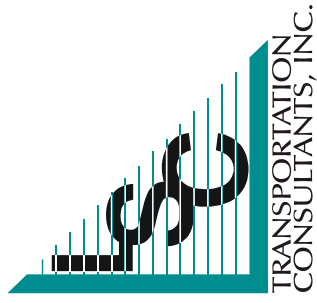
Counts by LSC

File Name : Wendy's Access - Palmer Park Blvd PM
 Site Code : 00174760
 Start Date : 10/17/2017
 Page No : 2

Start Time	Wendy's Access From North					Palmer Park Blvd From East					K-Mart Access From South					Palmer Park Blvd From West					Int. Total
	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	Rig ht	Thru	Lef t	Pe ds	App. Total	
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection on																					
Volume	51	2	28	0	81	19	55	35	0	608	66	3	90	0	159	10	70	65	8	884	1732
Percent	63.0	2.5	34.6	0.0		3.1	91.1	5.8	0.0		41.5	1.9	56.6	0.0		11.9	79.9	7.4	0.9		
05:00 Volume Peak	6	1	6	0	13	7	16	12	0	185	18	0	22	0	40	32	18	14	2	233	471
05:15 PM Volume Peak Factor	15	1	10	0	26	7	16	12	0	185	17	1	24	0	42	32	18	14	2	233	0.919
05:00 PM Volume Peak Factor	0.77				0.82					0.94					0.94						0.94
05:30 PM Volume Peak Factor	2				2					6					6						8



Levels of Service



Timings

1: Powers Blvd & Palmer Park Blvd

Existing Traffic
AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	231	192	102	315	217	221	108	1726	129	103	2880	350
Future Volume (vph)	231	192	102	315	217	221	108	1726	129	103	2880	350
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8	8	5	2	2	1	6	6	
Permitted Phases	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
Detector Phase	7	4	3	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	20.0	4.0	4.0	20.0	
Minimum Split (s)	9.0	10.5	9.0	10.5	10.5	9.0	9.0	27.5	9.0	9.0	27.5	
Total Split (s)	21.0	25.0	21.0	25.0	25.0	21.0	21.0	79.0	21.0	21.0	79.0	
Total Split (%)	14.4%	17.1%	14.4%	17.1%	17.1%	14.4%	14.4%	54.1%	14.4%	14.4%	54.1%	
Yellow Time (s)	3.0	4.5	3.0	4.5	4.5	3.0	3.0	5.5	3.0	3.0	5.5	
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	
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	
Total Lost Time (s)	5.0	6.5	5.0	6.5	6.5	5.0	5.0	7.5	5.0	5.0	7.5	
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	
Act Effct Green (s)	15.6	16.4	146.0	16.0	16.8	146.0	12.1	77.7	146.0	11.9	77.5	146.0
Actuated g/C Ratio	0.11	0.11	1.00	0.11	0.12	1.00	0.08	0.53	1.00	0.08	0.53	1.00
v/c Ratio	0.71	0.54	0.07	0.93	0.59	0.16	0.40	0.66	0.08	0.39	1.12	0.23
Control Delay	74.4	66.3	0.1	90.7	65.1	0.2	67.2	26.8	0.1	67.2	93.7	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	74.4	66.3	0.1	90.7	65.1	0.2	67.2	26.8	0.1	67.2	93.7	0.3
LOS	E	E	A	F	E	A	E	C	A	E	F	A
Approach Delay	57.0			56.7				27.3			83.1	
Approach LOS	E			E				C			F	

Intersection Summary

Cycle Length: 146

Actuated Cycle Length: 146

Offset: 128 (88%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow

Natural Cycle: 120

Control Type: Actuated-Coordinated

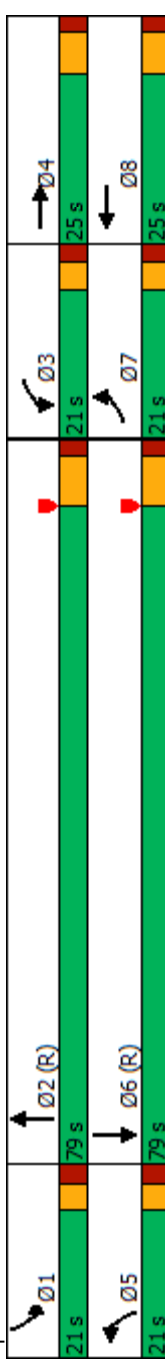
Maximum v/c Ratio: 1.12

Intersection Signal Delay: 61.4

Intersection Capacity Utilization 85.8%

Analysis Period (min) 15

Splits and Phases: 1: Powers Blvd & Palmer Park Blvd



Timings

Existing Traffic
AM Peak Hour

2: Kmart Access/Site Access & Palmer Park Blvd

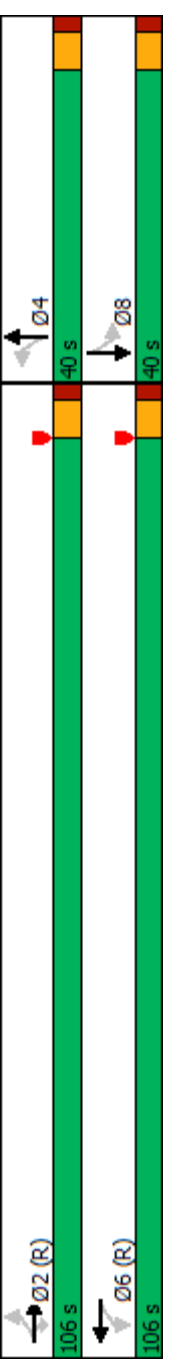


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔
Traffic Volume (vph)	12	335	77	51	660	86	1	1	0
Future Volume (vph)	12	335	77	51	660	86	1	1	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2	2	2	6	6	4	4	8	8
Permitted Phases	2	2	2	6	6	4	4	8	8
Detector Phase	2	2	2	6	6	4	4	8	8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	4.0	4.0	4.0	4.0
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	33.0	33.0	33.0	33.0
Total Split (s)	106.0	106.0	106.0	106.0	106.0	40.0	40.0	40.0	40.0
Total Split (%)	72.6%	72.6%	72.6%	72.6%	72.6%	27.4%	27.4%	27.4%	27.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	117.0	117.0	117.0	117.0	117.0	17.0	17.0	17.0	17.0
Actuated g/C Ratio	0.80	0.80	0.80	0.80	0.80	0.12	0.12	0.12	0.12
v/c Ratio	0.02	0.12	0.06	0.07	0.26	0.69	0.21	0.01	0.02
Control Delay	1.2	1.1	0.1	4.0	4.2	82.3	16.6	53.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.2	1.1	0.1	4.0	4.2	82.3	16.6	53.0	0.1
LOS	A	A	A	A	A	F	B	D	A
Approach Delay	0.9			4.2	4.2	62.6		4.9	
Approach LOS	A			A	A	E		A	

Intersection Summary

Cycle Length: 146
 Actuated Cycle Length: 146
 Offset: 70 (48%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 9.8
 Intersection Capacity Utilization 53.0%
 Analysis Period (min) 15

Splits and Phases: 2: Kmart Access/Site Access & Palmer Park Blvd



HCM 6th TWSC

Existing Traffic

3: Kmart Back Access & Palmer Park Blvd

AM Peak Hour

Intersection									
Int Delay, s/veh	0								
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑		↖	↑↑	↗	↘			
Traffic Vol, veh/h	371	1	2	709	3	1			
Future Vol, veh/h	371	1	2	709	3	1			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Free	Free	Free	Free	Stop	Stop			
RT Channelized	-	None	-	None	-	None			
Storage Length	-	-	50	-	0	-			
Veh in Median Storage, #	0	-	-	0	0	-			
Grade, %	0	-	-	0	0	-			
Peak Hour Factor	92	92	90	90	92	92			
Heavy Vehicles, %	2	2	2	2	2	2			
Mvmt Flow	403	1	2	788	3	1			
Major/Minor	Major1	Major2	Minor1						
Conflicting Flow All	0	0	404	0	802	202			
Stage 1	-	-	-	-	404	-			
Stage 2	-	-	-	-	398	-			
Critical Hdwy	-	-	4.14	-	6.84	6.94			
Critical Hdwy Stg 1	-	-	-	-	5.84	-			
Critical Hdwy Stg 2	-	-	-	-	5.84	-			
Follow-up Hdwy	-	-	2.22	-	3.52	3.32			
Pot Cap-1 Maneuver	-	-	1151	-	322	805			
Stage 1	-	-	-	-	643	-			
Stage 2	-	-	-	-	647	-			
Platoon blocked, %	-	-	-	-	-	-			
Mov Cap-1 Maneuver	-	-	1151	-	321	805			
Mov Cap-2 Maneuver	-	-	-	-	440	-			
Stage 1	-	-	-	-	642	-			
Stage 2	-	-	-	-	647	-			
Approach	EB	WB	NB						
HCM Control Delay, s	0	0	0	12.3					
HCM LOS				B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT				
Capacity (veh/h)	496	-	-	1151	-				
HCM Lane V/C Ratio	0.009	-	-	0.002	-				
HCM Control Delay (s)	12.3	-	-	8.1	-				
HCM Lane LOS	B	-	-	A	-				
HCM 95th %tile Q(veh)	0	-	-	0	-				

HCM 6th TWSC

Existing Traffic

4: Palmer Park Blvd & Waynoka Rd

AM Peak Hour

Intersection										
Int Delay, s/veh	1.8									
Movement	EBL	EBT	WBT	WBR	SBL	SBR				
Lane Configurations	↔	↕↕	↕↕		↕	↕				
Traffic Vol, veh/h	58	314	655	24	29	56				
Future Vol, veh/h	58	314	655	24	29	56				
Conflicting Peds, #/hr	0	0	0	0	0	0				
Sign Control	Free	Free	Free	Free	Stop	Stop				
RT Channelized	-	None	-	None	-	None				
Storage Length	100	-	-	-	0	0				
Veh in Median Storage, #	-	0	0	-	1	-				
Grade, %	-	0	0	-	0	-				
Peak Hour Factor	99	99	84	84	71	71				
Heavy Vehicles, %	2	2	2	2	2	2				
Mvmt Flow	59	317	780	29	41	79				
Major/Minor	Major1	Major2	Minor2							
Conflicting Flow All	809	0	0	1072	405					
Stage 1	-	-	-	795	-					
Stage 2	-	-	-	277	-					
Critical Hdwy	4.14	-	-	6.84	6.94					
Critical Hdwy Stg 1	-	-	-	5.84	-					
Critical Hdwy Stg 2	-	-	-	5.84	-					
Follow-up Hdwy	2.22	-	-	3.52	3.32					
Pot Cap-1 Maneuver	812	-	-	215	595					
Stage 1	-	-	-	405	-					
Stage 2	-	-	-	745	-					
Platoon blocked, %	-	-	-	-	-					
Mov Cap-1 Maneuver	812	-	-	199	595					
Mov Cap-2 Maneuver	-	-	-	300	-					
Stage 1	-	-	-	375	-					
Stage 2	-	-	-	745	-					
Approach	EB	WB	SB							
HCM Control Delay, s	1.5	0	14.4							
HCM LOS	B									
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2				
Capacity (veh/h)	812	-	-	300	595					
HCM Lane V/C Ratio	0.072	-	-	0.136	0.133					
HCM Control Delay (s)	9.8	-	-	18.9	12					
HCM Lane LOS	A	-	-	C	B					
HCM 95th %tile Q(veh)	0.2	-	-	0.5	0.5					

HCM 6th TWSC
8: Waynoka Rd & Waynoka Pl

Existing Traffic
AM Peak Hour

Intersection										
Int Delay, s/veh	6.3									
Movement	EBL	EBT	WBT	WBR	SBL	SBR				
Lane Configurations	4		P		W					
Traffic Vol, veh/h	33	43	8	43	111	9				
Future Vol, veh/h	33	43	8	43	111	9				
Conflicting Peds, #/hr	0	0	0	0	0	0				
Sign Control	Free	Free	Free	Free	Stop	Stop				
RT Channelized	-	None	-	None	-	None				
Storage Length	-	-	-	-	0	-				
Veh in Median Storage, #	-	0	0	-	0	-				
Grade, %	-	0	0	-	0	-				
Peak Hour Factor	68	68	85	85	73	73				
Heavy Vehicles, %	2	2	2	2	2	2				
Mvmt Flow	49	63	9	51	152	12				
Major/Minor	Major1	Major2	Minor2							
Conflicting Flow All	60	0	-	0	196	35				
Stage 1	-	-	-	-	35	-				
Stage 2	-	-	-	-	161	-				
Critical Hdwy	4.12	-	-	-	6.42	6.22				
Critical Hdwy Stg 1	-	-	-	-	5.42	-				
Critical Hdwy Stg 2	-	-	-	-	5.42	-				
Follow-up Hdwy	2.218	-	-	-	3.518	3.318				
Pot Cap-1 Maneuver	1544	-	-	-	793	1038				
Stage 1	-	-	-	-	987	-				
Stage 2	-	-	-	-	868	-				
Platoon blocked, %	-	-	-	-	-	-				
Mov Cap-1 Maneuver	1544	-	-	-	767	1038				
Mov Cap-2 Maneuver	-	-	-	-	767	-				
Stage 1	-	-	-	-	954	-				
Stage 2	-	-	-	-	868	-				
Approach	EB	WB	SB							
HCM Control Delay, s	3.2	0	10.8							
HCM LOS	B									
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1					
Capacity (veh/h)	1544	-	-	-	782					
HCM Lane V/C Ratio	0.031	-	-	-	0.21					
HCM Control Delay (s)	7.4	0	-	-	10.8					
HCM Lane LOS	A	A	-	-	B					
HCM 95th %tile Q(veh)	0.1	-	-	-	0.8					

HCM 6th TWSC
9: Powers Blvd & Omaha Blvd

Existing Traffic
AM Peak Hour

Intersection									
Int Delay, s/veh	7.9								
Movement	WBL	WBR	NBT	NBR	SBL	SBT			
Lane Configurations	↔	↔	↔↔↔	↔	↔	↔↔↔			
Traffic Vol, veh/h	7	142	1821	145	190	3107			
Future Vol, veh/h	7	142	1821	145	190	3107			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Stop	Stop	Free	Free	Free	Free			
RT Channelized	-	Free	-	Free	-	None			
Storage Length	0	0	-	0	400	-			
Veh in Median Storage, #	1	-	0	-	-	0			
Grade, %	0	-	0	-	-	0			
Peak Hour Factor	96	96	100	100	99	99			
Heavy Vehicles, %	2	2	2	2	2	2			
Mvmt Flow	7	148	1821	145	192	3138			

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	3460	- 0	- 1821 0
Stage 1	1821	-	- -
Stage 2	1639	-	- -
Critical Hdwy	5.74	-	- 5.34 -
Critical Hdwy Stg 1	6.64	-	- -
Critical Hdwy Stg 2	6.04	-	- -
Follow-up Hdwy	3.82	-	- 3.12 -
Pot Cap-1 Maneuver	14	0	- 0 ~154 -
Stage 1	74	0	- 0 -
Stage 2	127	0	- 0 -
Platoon blocked, %		-	- -
Mov Cap-1 Maneuver	0	-	- ~154 -
Mov Cap-2 Maneuver	0	-	- -
Stage 1	0	-	- -
Stage 2	127	-	- -

Approach	WB	NB	SB
HCM Control Delay, s	0	0	12.2
HCM LOS	-	-	-

Minor Lane/Major Mvmt	NBTWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	-	- ~154	-
HCM Lane V/C Ratio	-	- 1.246	-
HCM Control Delay (s)	-	0 211	-
HCM Lane LOS	-	- A F	-
HCM 95th %tile Q(veh)	-	- 11.2	-

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings

Existing Traffic
12:00 - 1:00 PM

2: Kmart Access/Site Access & Palmer Park Blvd

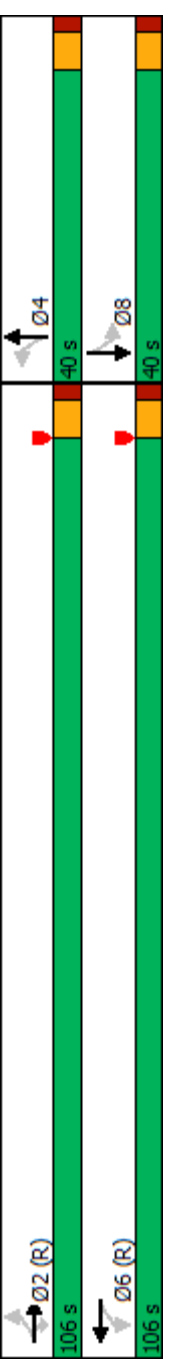


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔
Traffic Volume (vph)	119	419	83	40	391	94	5	39	10
Future Volume (vph)	119	419	83	40	391	94	5	39	10
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2	2	2	6	6	4	4	8	8
Permitted Phases	2	2	2	6	6	4	4	8	8
Detector Phase	2	2	2	6	6	4	4	8	8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	4.0	4.0	4.0	4.0
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	33.0	33.0	33.0	33.0
Total Split (s)	106.0	106.0	106.0	106.0	106.0	40.0	40.0	40.0	40.0
Total Split (%)	72.6%	72.6%	72.6%	72.6%	72.6%	27.4%	27.4%	27.4%	27.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	116.7	116.7	116.7	116.7	116.7	17.3	17.3	17.3	17.3
Actuated g/C Ratio	0.80	0.80	0.80	0.80	0.80	0.12	0.12	0.12	0.12
v/c Ratio	0.17	0.15	0.07	0.06	0.17	0.84	0.23	0.28	0.45
Control Delay	4.7	3.9	1.0	4.2	3.9	111.7	18.3	60.8	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.7	3.9	1.0	4.2	3.9	111.7	18.3	60.8	16.2
LOS	A	A	A	A	A	F	B	E	B
Approach Delay	3.6			3.9		78.0			27.6
Approach LOS	A			A		E			C

Intersection Summary

Cycle Length: 146
 Actuated Cycle Length: 146
 Offset: 70 (48%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 14.0
 Intersection Capacity Utilization 47.0%
 Analysis Period (min) 15

Splits and Phases: 2: Kmart Access/Site Access & Palmer Park Blvd



Intersection									
Int Delay, s/veh	0								
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑		↑	↑↑		↑↑			
Traffic Vol, veh/h	504	2	0	462	1	0			
Future Vol, veh/h	504	2	0	462	1	0			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Free	Free	Free	Free	Stop	Stop			
RT Channelized	-	None	-	None	-	None			
Storage Length	-	-	50	-	0	-			
Veh in Median Storage, #	0	-	-	0	0	-			
Grade, %	0	-	-	0	0	-			
Peak Hour Factor	100	100	88	88	92	92			
Heavy Vehicles, %	2	2	2	2	2	2			
Mvmt Flow	504	2	0	525	1	0			

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	506	0	768	253
Stage 1	-	-	-	-	505	-
Stage 2	-	-	-	-	263	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1055	-	338	746
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	757	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1055	-	338	746
Mov Cap-2 Maneuver	-	-	-	-	445	-
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	757	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	445	-	-	1055	-
HCM Lane V/C Ratio	0.002	-	-	-	-
HCM Control Delay (s)	13.1	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Timings

1: Powers Blvd & Palmer Park Blvd

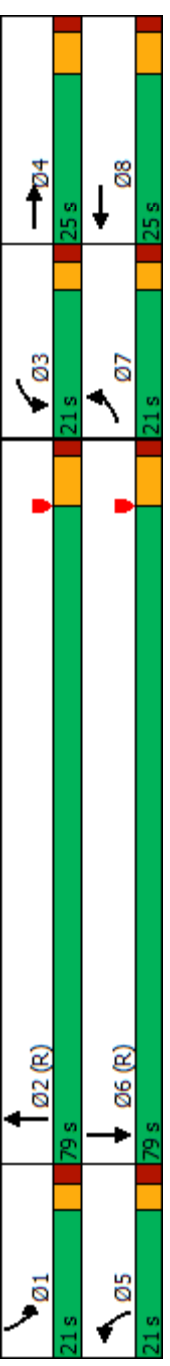
Existing Traffic
PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	↔	→	↘	↙	←	↖	↗	↑	↘	↙	↓	↘
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	429	521	169	185	388	122	156	2565	229	179	1726	444
Future Volume (vph)	429	521	169	185	388	122	156	2565	229	179	1726	444
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8	8	8	5	2	1	6		
Permitted Phases	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
Detector Phase	7	4	3	8	8	8	5	2	1	6		
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	20.0	4.0	20.0		
Minimum Split (s)	9.0	10.5	9.0	10.5	10.5	9.0	9.0	27.5	9.0	27.5		
Total Split (s)	21.0	25.0	21.0	25.0	25.0	21.0	21.0	79.0	21.0	79.0		
Total Split (%)	14.4%	17.1%	14.4%	17.1%	17.1%	14.4%	14.4%	54.1%	14.4%	54.1%		
Yellow Time (s)	3.0	4.5	3.0	4.5	4.5	3.0	3.0	5.5	3.0	5.5		
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	6.5	5.0	6.5	6.5	5.0	5.0	7.5	5.0	7.5		
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lead	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	None	C-Max		
Act Effct Green (s)	16.0	19.7	146.0	14.8	18.5	146.0	13.6	73.1	146.0	14.4	73.9	146.0
Actuated g/C Ratio	0.11	0.13	1.00	0.10	0.13	1.00	0.09	0.50	1.00	0.10	0.51	1.00
v/c Ratio	1.20	1.15	0.11	0.58	0.95	0.08	0.49	1.01	0.14	0.54	0.68	0.28
Control Delay	166.8	143.9	0.1	65.0	93.0	0.1	67.8	55.7	0.2	68.5	29.0	0.4
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	166.8	143.9	0.1	65.0	93.0	0.1	67.8	55.7	0.2	68.5	29.0	0.4
LOS	F	F	A	E	F	A	E	E	A	E	C	A
Approach Delay		131.0			69.2			52.0			26.7	
Approach LOS		F			E			D			C	

Intersection Summary

Cycle Length: 146
Actuated Cycle Length: 146
Offset: 127 (87%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.20
Intersection Signal Delay: 58.3
Intersection Capacity Utilization 97.6%
Analysis Period (min) 15
Intersection LOS: E
ICU Level of Service F

Splits and Phases: 1: Powers Blvd & Palmer Park Blvd



Timings

Existing Traffic
PM Peak Hour

2: Kmart Access/Site Access & Palmer Park Blvd

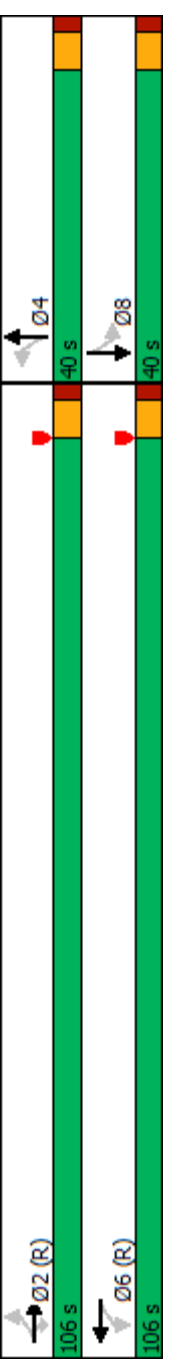


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔
Traffic Volume (vph)	65	759	105	35	554	90	3	28	2
Future Volume (vph)	65	759	105	35	554	90	3	28	2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2	2	2	6	6	4	4	8	8
Permitted Phases	2	2	2	6	6	4	4	8	8
Detector Phase	2	2	2	6	6	4	4	8	8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	4.0	4.0	4.0	4.0
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	33.0	33.0	33.0	33.0
Total Split (s)	106.0	106.0	106.0	106.0	106.0	40.0	40.0	40.0	40.0
Total Split (%)	72.6%	72.6%	72.6%	72.6%	72.6%	27.4%	27.4%	27.4%	27.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode									
C-Max	118.8	118.8	118.8	118.8	118.8	None	None	None	None
Act Effct Green (s)	118.8	118.8	118.8	118.8	118.8	15.2	15.2	15.2	15.2
Actuated g/C Ratio	0.81	0.81	0.81	0.81	0.81	0.10	0.10	0.10	0.10
v/c Ratio	0.12	0.28	0.08	0.08	0.24	0.65	0.31	0.20	0.25
Control Delay	1.1	1.6	0.1	3.8	3.7	82.9	16.9	60.9	17.6
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.1	1.8	0.1	3.8	3.7	82.9	16.9	60.9	17.6
LOS	A	A	A	A	A	F	B	E	B
Approach Delay	1.6			3.7		54.2		32.6	
Approach LOS	A			A		D		C	

Intersection Summary

Cycle Length: 146
 Actuated Cycle Length: 146
 Offset: 70 (48%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.65
 Intersection Signal Delay: 8.0
 Intersection Capacity Utilization 56.0%
 Analysis Period (min) 15

Splits and Phases: 2: Kmart Access/Site Access & Palmer Park Blvd



3: Kmart Back Access & Palmer Park Blvd

Intersection									
Int Delay, s/veh	0.1								
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑		↔	↑↑	↔	↔			
Traffic Vol, veh/h	852	1	2	605	3	2			
Future Vol, veh/h	852	1	2	605	3	2			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Free	Free	Free	Free	Stop	Stop			
RT Channelized	-	None	-	None	-	None			
Storage Length	-	-	50	-	0	-			
Veh in Median Storage, #	0	-	-	0	0	-			
Grade, %	0	-	-	0	0	-			
Peak Hour Factor	96	96	82	82	92	92			
Heavy Vehicles, %	2	2	2	2	2	2			
Mvmt Flow	888	1	2	738	3	2			
Major/Minor	Major1	Major2	Minor1						
Conflicting Flow All	0	0	889	0	1262	445			
Stage 1	-	-	889	-	889	-			
Stage 2	-	-	373	-	373	-			
Critical Hdwy	-	-	4.14	-	6.84	6.94			
Critical Hdwy Stg 1	-	-	-	-	5.84	-			
Critical Hdwy Stg 2	-	-	-	-	5.84	-			
Follow-up Hdwy	-	-	2.22	-	3.52	3.32			
Pot Cap-1 Maneuver	-	-	758	-	162	561			
Stage 1	-	-	-	-	362	-			
Stage 2	-	-	-	-	666	-			
Platoon blocked, %	-	-	-	-	-	-			
Mov Cap-1 Maneuver	-	-	758	-	162	561			
Mov Cap-2 Maneuver	-	-	-	-	278	-			
Stage 1	-	-	-	-	361	-			
Stage 2	-	-	-	-	666	-			
Approach	EB	WB	NB						
HCM Control Delay, s	0	0	0	15.5					
HCM LOS				C					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT				
Capacity (veh/h)	348	-	-	758	-				
HCM Lane V/C Ratio	0.016	-	-	0.003	-				
HCM Control Delay (s)	15.5	-	-	9.8	-				
HCM Lane LOS	C	-	-	A	-				
HCM 95th %tile Q(veh)	0	-	-	0	-				

HCM 6th TWSC

Existing Traffic

4: Palmer Park Blvd & Waynoka Rd

PM Peak Hour

Intersection									
Int Delay, s/veh	1.6								
Movement	EBL	EBT	WBT	WBR	SBL	SBR			
Lane Configurations	↔	↕↕	↕↕		↔	↔			
Traffic Vol, veh/h	63	791	501	39	41	106			
Future Vol, veh/h	63	791	501	39	41	106			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Free	Free	Free	Free	Stop	Stop			
RT Channelized	-	None	-	None	-	None			
Storage Length	100	-	-	-	0	0			
Veh in Median Storage, #	-	0	0	-	1	-			
Grade, %	-	0	0	-	0	-			
Peak Hour Factor	99	99	86	86	94	94			
Heavy Vehicles, %	2	2	2	2	2	2			
Mvmt Flow	64	799	583	45	44	113			
Major/Minor	Major1	Major2	Minor2						
Conflicting Flow All	628	0	-	0	1134	314			
Stage 1	-	-	-	-	606	-			
Stage 2	-	-	-	-	528	-			
Critical Hdwy	4.14	-	-	-	6.84	6.94			
Critical Hdwy Stg 1	-	-	-	-	5.84	-			
Critical Hdwy Stg 2	-	-	-	-	5.84	-			
Follow-up Hdwy	2.22	-	-	-	3.52	3.32			
Pot Cap-1 Maneuver	950	-	-	-	196	682			
Stage 1	-	-	-	-	507	-			
Stage 2	-	-	-	-	556	-			
Platoon blocked, %	-	-	-	-	-	-			
Mov Cap-1 Maneuver	950	-	-	-	183	682			
Mov Cap-2 Maneuver	-	-	-	-	304	-			
Stage 1	-	-	-	-	473	-			
Stage 2	-	-	-	-	556	-			
Approach	EB	WB	SB						
HCM Control Delay, s	0.7	0	13.4						
HCM LOS			B						
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2			
Capacity (veh/h)	950	-	-	-	304	682			
HCM Lane V/C Ratio	0.067	-	-	-	0.143	0.165			
HCM Control Delay (s)	9.1	-	-	-	18.8	11.3			
HCM Lane LOS	A	-	-	-	C	B			
HCM 95th %tile Q(veh)	0.2	-	-	-	0.5	0.6			

HCM 6th TWSC
8: Waynoka Rd & Waynoka Pl

Existing Traffic
PM Peak Hour

Intersection									
Int Delay, s/veh	5.8								
Movement									
	EBL	EBT	WBT	WBR	SBL	SBR			
Lane Configurations		4	1		W				
Traffic Vol, veh/h	162	34	19	232	106	12			
Future Vol, veh/h	162	34	19	232	106	12			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Free	Free	Free	Free	Stop	Stop			
RT Channelized	-	None	-	None	-	None			
Storage Length	-	-	-	-	0	-			
Veh in Median Storage, #	-	0	0	-	0	-			
Grade, %	-	0	0	-	0	-			
Peak Hour Factor	82	82	97	97	100	100			
Heavy Vehicles, %	2	2	2	2	2	2			
Mvmt Flow	198	41	20	239	106	12			

Major/Minor						
	Major1	Major2	Minor2			
Conflicting Flow All	259	0	-	0	577	140
Stage 1	-	-	-	-	140	-
Stage 2	-	-	-	-	437	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1306	-	-	-	478	908
Stage 1	-	-	-	-	887	-
Stage 2	-	-	-	-	651	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1306	-	-	-	404	908
Mov Cap-2 Maneuver	-	-	-	-	404	-
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	651	-

Approach						
	EB	WB	SB			
HCM Control Delay, s	6.8	0	16.6			
HCM LOS			C			

Minor Lane/Major Mvmt						
	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1306	-	-	-	428	
HCM Lane V/C Ratio	0.151	-	-	-	0.276	
HCM Control Delay (s)	8.2	0	-	-	16.6	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.5	-	-	-	1.1	

HCM 6th TWSC
9: Powers Blvd & Omaha Blvd

Existing Traffic
PM Peak Hour

Intersection									
Int Delay, s/veh	12.6								
Movement	WBL	WBR	NBT	NBR	SBL	SBT			
Lane Configurations	↔	↔	↔↔↔	↔	↔	↔↔↔			
Traffic Vol, veh/h	16	184	2766	131	98	1982			
Future Vol, veh/h	16	184	2766	131	98	1982			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Stop	Stop	Free	Free	Free	Free			
RT Channelized	-	Free	-	Free	-	None			
Storage Length	0	0	-	0	400	-			
Veh in Median Storage, #	1	-	0	-	-	0			
Grade, %	0	-	0	-	-	0			
Peak Hour Factor	94	94	100	100	100	100			
Heavy Vehicles, %	2	2	2	2	2	2			
Mvmt Flow	17	196	2766	131	98	1982			

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	3755	- 0	- 2766 0
Stage 1	2766	-	-
Stage 2	989	-	-
Critical Hdwy	5.74	-	- 5.34 -
Critical Hdwy Stg 1	6.64	-	-
Critical Hdwy Stg 2	6.04	-	-
Follow-up Hdwy	3.82	-	- 3.12 -
Pot Cap-1 Maneuver	~10	0	- 0 ~50 -
Stage 1	18	0	- 0 -
Stage 2	290	0	- 0 -
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	0	-	- ~50 -
Mov Cap-2 Maneuver	0	-	-
Stage 1	0	-	-
Stage 2	290	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	29.4
HCM LOS	-	-	-

Minor Lane/Major Mvmt	NBTWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	-	- ~50	-
HCM Lane V/C Ratio	-	- 1.96	-
HCM Control Delay (s)	-	- 624.9	-
HCM Lane LOS	-	- A	-
HCM 95th %tile Q(veh)	-	- 9.8	-

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings

Existing Plus Site-Generated Traffic
AM Peak Hour

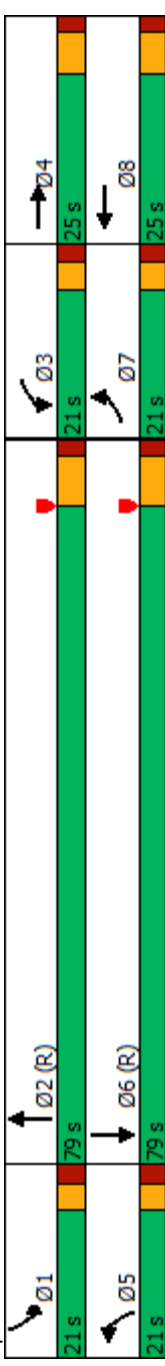
1: Powers Blvd & Palmer Park Blvd

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	↔	→	↘	↘	←	↙	↙	↑	↗	↗	↓	↘
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	231	199	102	326	220	230	108	1722	145	124	2873	350
Future Volume (vph)	231	199	102	326	220	230	108	1722	145	124	2873	350
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8	8	5	5	2	1	6		
Permitted Phases	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
Detector Phase	7	4	3	8	8	5	5	2	1	6		
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	20.0	4.0	20.0		
Minimum Split (s)	9.0	10.5	9.0	10.5	10.5	9.0	9.0	27.5	9.0	27.5		
Total Split (s)	21.0	25.0	21.0	25.0	25.0	21.0	21.0	79.0	21.0	79.0		
Total Split (%)	14.4%	17.1%	14.4%	17.1%	17.1%	14.4%	14.4%	54.1%	14.4%	54.1%		
Yellow Time (s)	3.0	4.5	3.0	4.5	4.5	3.0	3.0	5.5	3.0	5.5		
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	6.5	5.0	6.5	6.5	5.0	5.0	7.5	5.0	7.5		
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lead	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	None	C-Max		
Act Effct Green (s)	15.6	16.5	146.0	16.0	16.9	146.0	12.1	76.7	146.0	12.8	77.5	146.0
Actuated g/C Ratio	0.11	0.11	1.00	0.11	0.12	1.00	0.08	0.53	1.00	0.09	0.53	1.00
v/c Ratio	0.71	0.56	0.07	0.96	0.60	0.16	0.40	0.67	0.10	0.44	1.12	0.23
Control Delay	74.4	66.8	0.1	96.7	65.0	0.2	67.2	27.6	0.1	67.3	93.0	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	74.4	66.8	0.1	96.7	65.0	0.2	67.2	27.6	0.1	67.3	93.0	0.3
LOS	E	E	A	F	E	A	E	C	A	E	F	A
Approach Delay	57.3			59.1				27.7			82.3	
Approach LOS	E			E				C			F	

Intersection Summary

Cycle Length: 146
Actuated Cycle Length: 146
Offset: 128 (88%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.12
Intersection Signal Delay: 61.4
Intersection Capacity Utilization 86.1%
Analysis Period (min) 15
Intersection LOS: E
ICU Level of Service E

Splits and Phases: 1: Powers Blvd & Palmer Park Blvd



Timings

Existing Plus Site-Generated Traffic
AM Peak Hour

2: Kmart Access/Site Access & Palmer Park Blvd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↕
Traffic Volume (vph)	48	344	77	51	655	18	86	2	12	0
Future Volume (vph)	48	344	77	51	655	18	86	2	12	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	2	2	2	6	6	6	4	4	8	8
Permitted Phases	2	2	2	6	6	6	4	4	8	8
Detector Phase	2	2	2	6	6	6	4	4	8	8
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	4.0	4.0	4.0
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	27.0	33.0	33.0	33.0	33.0
Total Split (s)	106.0	106.0	106.0	106.0	106.0	106.0	40.0	40.0	40.0	40.0
Total Split (%)	72.6%	72.6%	72.6%	72.6%	72.6%	72.6%	27.4%	27.4%	27.4%	27.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	115.8	115.8	115.8	115.8	115.8	115.8	18.2	18.2	18.2	18.2
Actuated g/C Ratio	0.79	0.79	0.79	0.79	0.79	0.79	0.12	0.12	0.12	0.12
v/c Ratio	0.09	0.13	0.06	0.07	0.26	0.02	0.66	0.21	0.08	0.09
Control Delay	1.5	1.2	0.1	4.4	4.6	1.6	78.2	17.0	54.1	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.5	1.2	0.1	4.4	4.6	1.6	78.2	17.0	54.1	0.4
LOS	A	A	A	A	A	A	E	B	D	A
Approach Delay	1.0	4.5	4.5	59.3	59.3	14.1				
Approach LOS	A	A	A	E	E	B				

Intersection Summary

Cycle Length: 146

Actuated Cycle Length: 146

Offset: 70 (48%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

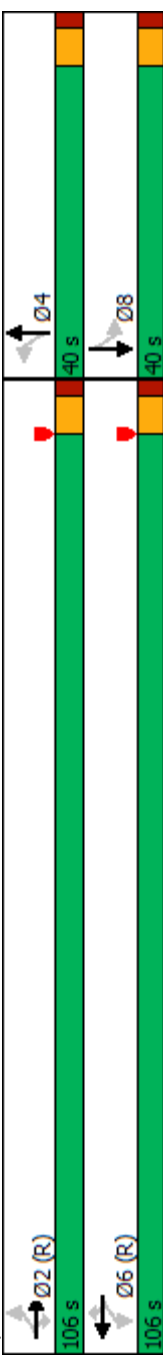
Maximum v/c Ratio: 0.66

Intersection Signal Delay: 9.6

Intersection Capacity Utilization 52.9%

Analysis Period (min) 15

Splits and Phases: 2: Kmart Access/Site Access & Palmer Park Blvd



HCM 6th TWSC

Existing Plus Site-Generated Traffic

3: Kmart Back Access/Waynoka Rd & Palmer Park Blvd

AM Peak Hour

Intersection													
Int Delay, s/veh		2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SBR
Lane Configurations	↔	↕	↕	↔	↕	↕	↔	↕	↕	↔	↕	↕	↕
Traffic Vol, veh/h	78	313	1	2	651	37	3	1	1	33	1	70	70
Future Vol, veh/h	78	313	1	2	651	37	3	1	1	33	1	70	70
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	None	None	-	-	None	-	-	None	None
Storage Length	50	-	-	50	-	150	0	-	-	100	-	0	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	-
Peak Hour Factor	92	92	92	90	90	90	100	100	100	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	85	340	1	2	723	41	3	1	1	36	1	76	76
Major/Minor	Major1	Major2	Major2	Minor1	Minor1	Minor2	Minor2	Minor2	Minor2	Minor2	Minor2	Minor2	Minor2
Conflicting Flow All	764	0	0	341	0	0	877	1279	171	1068	1238	362	362
Stage 1	-	-	-	-	-	-	511	511	-	727	727	-	-
Stage 2	-	-	-	-	-	-	366	768	-	341	511	-	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32	3.32
Pot Cap-1 Maneuver	845	-	-	1410	-	-	326	194	*972	229	206	635	635
Stage 1	-	-	-	-	-	-	677	641	-	381	427	-	-
Stage 2	-	-	-	-	-	-	626	409	-	873	641	-	-
Platoon blocked, %	-	-	-	1	-	-	1	1	1	1	1	1	1
Mov Cap-1 Maneuver	845	-	-	1410	-	-	263	174	*972	210	185	635	635
Mov Cap-2 Maneuver	-	-	-	-	-	-	263	174	-	210	185	-	-
Stage 1	-	-	-	-	-	-	609	576	-	343	427	-	-
Stage 2	-	-	-	-	-	-	549	409	-	783	576	-	-
Approach	EB	WB	WB	NB	NB	SB	SB	SB	SB	SB	SB	SB	SB
HCM Control Delay, s	1.9	0	0	18.2	16	16	16	16	16	16	16	16	16
HCM LOS				C	C	C	C	C	C	C	C	C	C
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3	SBLn3	SBLn3
Capacity (veh/h)	263	295	845	-	-	1410	-	-	210	185	635	635	635
HCM Lane V/C Ratio	0.011	0.007	0.1	-	-	0.002	-	-	0.171	0.006	0.12	0.12	0.12
HCM Control Delay (s)	18.8	17.3	9.7	-	-	7.6	-	-	25.6	24.6	11.4	11.4	11.4
HCM Lane LOS	C	C	A	-	-	A	-	-	D	C	B	B	B
HCM 95th %tile Q(veh)	0	0	0.3	-	-	0	-	-	0.6	0	0.4	0.4	0.4
Notes													
~: Volume exceeds capacity	\$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon												

HCM 6th TWSC

Existing Plus Site-Generated Traffic

5: Waynoka Rd & South Site Access

AM Peak Hour

Intersection													
Int Delay, s/veh 1.3													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔		↔			↔			↔			
Traffic Vol, veh/h	0	0	5	13	0	0	14	82	19	1	85	0	
Future Vol, veh/h	0	0	5	13	0	0	14	82	19	1	85	0	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	0	0	5	14	0	0	15	89	21	1	92	0	
Major/Minor	Minor2	Minor1	Minor1	Minor1	Minor1	Minor1	Major1	Major1	Major2	Major2	Major2	Major2	
Conflicting Flow All	224	234	92	227	224	100	92	0	0	110	0	0	
Stage 1	94	94	-	130	130	-	-	-	-	-	-	-	
Stage 2	130	140	-	97	94	-	-	-	-	-	-	-	
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-	
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-	
Pot Cap-1 Maneuver	732	666	965	728	675	956	1503	-	-	1480	-	-	
Stage 1	913	817	-	874	789	-	-	-	-	-	-	-	
Stage 2	874	781	-	910	817	-	-	-	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	
Mov Cap-1 Maneuver	726	659	965	718	668	956	1503	-	-	1480	-	-	
Mov Cap-2 Maneuver	726	659	-	718	668	-	-	-	-	-	-	-	
Stage 1	904	816	-	865	781	-	-	-	-	-	-	-	
Stage 2	865	773	-	904	816	-	-	-	-	-	-	-	
Approach	EB	WB	WB	NB	NB	SB	SB	SB	SB	SB	SB	SB	
HCM Control Delay, s	8.8	10.1	10.1	0.9	0.9	0.1	0.1						
HCM LOS	A	B	B										
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1503	-	-	965	718	1480	-	-					
HCM Lane V/C Ratio	0.01	-	-	0.006	0.02	0.001	-	-					
HCM Control Delay (s)	7.4	-	-	8.8	10.1	7.4	-	-					
HCM Lane LOS	A	-	-	A	B	A	-	-					
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-					

HCM 6th TWSC

Existing Plus Site-Generated Traffic
AM Peak Hour

8: Waynoka Rd & Waynoka Pl

Intersection									
Int Delay, s/veh	6.4								
Movement	EBL	EBT	WBT	WBR	SBL	SBR			
Lane Configurations		4				W			
Traffic Vol, veh/h	33	43	8	44	113	9			
Future Vol, veh/h	33	43	8	44	113	9			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Free	Free	Free	Free	Stop	Stop			
RT Channelized	-	None	-	None	-	None			
Storage Length	-	-	-	-	0	-			
Veh in Median Storage, #	-	0	0	-	0	-			
Grade, %	-	0	0	-	0	-			
Peak Hour Factor	68	68	85	85	73	73			
Heavy Vehicles, %	2	2	2	2	2	2			
Mvmt Flow	49	63	9	52	155	12			

Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	61	0	-	0	196	35
Stage 1	-	-	-	-	35	-
Stage 2	-	-	-	-	161	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1542	-	-	-	793	1038
Stage 1	-	-	-	-	987	-
Stage 2	-	-	-	-	868	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1542	-	-	-	767	1038
Mov Cap-2 Maneuver	-	-	-	-	767	-
Stage 1	-	-	-	-	954	-
Stage 2	-	-	-	-	868	-

Approach	EB	WB	SB			
HCM Control Delay, s	3.2	0	10.9			
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBRn1
Capacity (veh/h)	1542	-	-	-	782	-
HCM Lane V/C Ratio	0.031	-	-	-	0.214	-
HCM Control Delay (s)	7.4	0	-	-	10.9	-
HCM Lane LOS	A	A	-	-	B	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0.8	-

HCM 6th TWSC

Existing Plus Site-Generated Traffic

9: Powers Blvd & Omaha Blvd

AM Peak Hour

Intersection									
Int Delay, s/veh	8.1								
Movement	WBL	WBR	NBT	NBR	SBL	SBT			
Lane Configurations	↔	↔	↔↔↔	↔	↔	↔↔↔			
Traffic Vol, veh/h	7	142	1833	145	190	3111			
Future Vol, veh/h	7	142	1833	145	190	3111			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Stop	Stop	Free	Free	Free	Free			
RT Channelized	-	Free	-	Free	-	None			
Storage Length	0	0	-	0	400	-			
Veh in Median Storage, #	1	-	0	-	-	0			
Grade, %	0	-	0	-	-	0			
Peak Hour Factor	96	96	100	100	99	99			
Heavy Vehicles, %	2	2	2	2	2	2			
Mvmt Flow	7	148	1833	145	192	3142			
Major/Minor	Minor1	Major1	Major2						
Conflicting Flow All	3474	-	0	-	1833	0			
Stage 1	1833	-	-	-	-	-			
Stage 2	1641	-	-	-	-	-			
Critical Hdwy	5.74	-	-	-	5.34	-			
Critical Hdwy Stg 1	6.64	-	-	-	-	-			
Critical Hdwy Stg 2	6.04	-	-	-	-	-			
Follow-up Hdwy	3.82	-	-	-	3.12	-			
Pot Cap-1 Maneuver	14	0	-	0	~152	-			
Stage 1	73	0	-	0	-	-			
Stage 2	127	0	-	0	-	-			
Platoon blocked, %									
Mov Cap-1 Maneuver	0	-	-	-	~152	-			
Mov Cap-2 Maneuver	0	-	-	-	-	-			
Stage 1	0	-	-	-	-	-			
Stage 2	127	-	-	-	-	-			
Approach	WB	NB	SB						
HCM Control Delay, s	0	0	12.5						
HCM LOS	-	-	-						
Minor Lane/Major Mvmt	NBTWBLn1	WBLn2	SBL	SBT					
Capacity (veh/h)	-	-	~152	-					
HCM Lane V/C Ratio	-	-	1.263	-					
HCM Control Delay (s)	-	-	0	218					
HCM Lane LOS	-	-	A	F					
HCM 95th %tile Q(veh)	-	-	11.3	-					
Notes									
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon									

Timings

Existing Plus Site-Generated Traffic
Noon Hour

2: Kmart Access/Site Access & Palmer Park Blvd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	184	430	83	40	396	56	94	6	72	11
Future Volume (vph)	184	430	83	40	396	56	94	6	72	11
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	4			8				2		6
Permitted Phases	4	4	4	8	8	8	2	2	6	6
Detector Phase	4	4	4	8	8	8	2	2	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	106.0	106.0	106.0	106.0	106.0	106.0	40.0	40.0	40.0	40.0
Total Split (%)	72.6%	72.6%	72.6%	72.6%	72.6%	72.6%	27.4%	27.4%	27.4%	27.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0

Lead/Lag	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Lead-Lag Optimize?										
Recall Mode										
Act Effct Green (s)	113.8	113.8	113.8	113.8	113.8	113.8	20.2	20.2	20.2	20.2
Actuated g/C Ratio	0.78	0.78	0.78	0.78	0.78	0.78	0.14	0.14	0.14	0.14
v/c Ratio	0.26	0.16	0.07	0.06	0.16	0.05	1.03	0.20	0.42	0.51
Control Delay	6.0	4.4	1.0	5.2	4.8	1.4	162.2	17.1	62.3	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.0	4.4	1.0	5.2	4.8	1.4	162.2	17.1	62.3	13.4
LOS	A	A	A	A	A	A	F	B	E	B
Approach Delay	4.4			4.4			109.3			27.6
Approach LOS	A			A			F			C

Intersection Summary

Cycle Length: 146

Actuated Cycle Length: 146

Offset: 70 (48%), Referenced to phase 4:EBTL and 8:WBTL, Start of Yellow

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.03

Intersection Signal Delay: 17.4

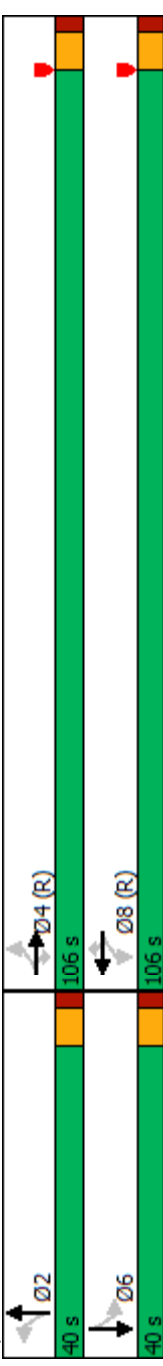
Intersection Capacity Utilization 57.1%

Analysis Period (min) 15

Intersection LOS: B

ICU Level of Service B

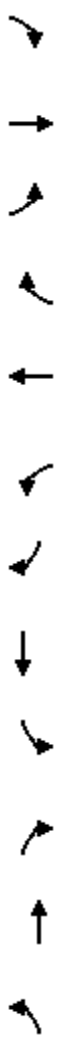
Splits and Phases: 2: Kmart Access/Site Access & Palmer Park Blvd



Timings

Existing Plus Site-Generated Traffic
PM Peak Hour

1: Powers Blvd & Palmer Park Blvd

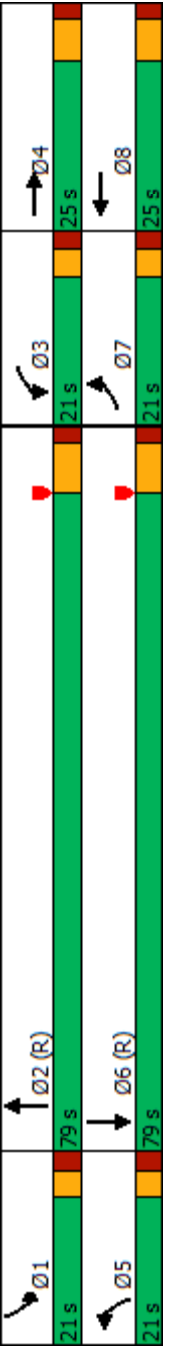


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	429	530	169	210	398	155	156	2551	258	206	1717	444
Future Volume (vph)	429	530	169	210	398	155	156	2551	258	206	1717	444
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8	8	8	5	2	1	6		
Permitted Phases	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
Detector Phase	7	4	3	8	8	8	5	2	1	6		
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	20.0	4.0	20.0		
Minimum Split (s)	9.0	10.5	9.0	10.5	10.5	9.0	9.0	27.5	9.0	27.5		
Total Split (s)	21.0	25.0	21.0	25.0	25.0	21.0	21.0	79.0	21.0	79.0		
Total Split (%)	14.4%	17.1%	14.4%	17.1%	17.1%	14.4%	14.4%	54.1%	14.4%	54.1%		
Yellow Time (s)	3.0	4.5	3.0	4.5	4.5	3.0	3.0	5.5	3.0	5.5		
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	6.5	5.0	6.5	6.5	5.0	5.0	7.5	5.0	7.5		
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lead	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	None	C-Max		
Act Effct Green (s)	16.0	19.2	146.0	15.3	18.5	146.0	13.6	72.6	146.0	14.9	73.9	146.0
Actuated g/C Ratio	0.11	0.13	1.00	0.10	0.13	1.00	0.09	0.50	1.00	0.10	0.51	1.00
v/c Ratio	1.20	1.20	0.11	0.65	0.98	0.11	0.49	1.01	0.16	0.59	0.67	0.28
Control Delay	166.8	160.2	0.1	66.7	97.7	0.1	67.8	56.6	0.2	69.8	28.9	0.4
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	166.8	160.2	0.1	66.7	97.7	0.1	67.8	56.6	0.2	69.8	28.9	0.4
LOS	F	F	A	E	F	A	E	E	A	E	C	A
Approach Delay		138.7			69.4			52.3			27.2	
Approach LOS		F			E			D			C	

Intersection Summary

Cycle Length: 146
Actuated Cycle Length: 146
Offset: 127 (87%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.20
Intersection Signal Delay: 60.0
Intersection Capacity Utilization 98.4%
Analysis Period (min) 15
Intersection LOS: E
ICU Level of Service F

Splits and Phases: 1: Powers Blvd & Palmer Park Blvd



Timings

Existing Plus Site-Generated Traffic
PM Peak Hour

2: Kmart Access/Site Access & Palmer Park Blvd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	124	764	105	35	559	40	90	4	61	3
Future Volume (vph)	124	764	105	35	559	40	90	4	61	3
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	2	2	2	6	6	6	4	4	8	8
Permitted Phases	2	2	2	6	6	6	4	4	8	8
Detector Phase	2	2	2	6	6	6	4	4	8	8
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	4.0	4.0	4.0
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	27.0	33.0	33.0	33.0	33.0
Total Split (s)	106.0	106.0	106.0	106.0	106.0	106.0	40.0	40.0	40.0	40.0
Total Split (%)	72.6%	72.6%	72.6%	72.6%	72.6%	72.6%	27.4%	27.4%	27.4%	27.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	117.5	117.5	117.5	117.5	117.5	117.5	16.5	16.5	16.5	16.5
Actuated g/C Ratio	0.80	0.80	0.80	0.80	0.80	0.80	0.11	0.11	0.11	0.11
v/c Ratio	0.22	0.28	0.09	0.08	0.24	0.04	0.78	0.30	0.41	0.42
Control Delay	1.9	1.5	0.1	4.3	4.0	1.1	101.0	16.5	66.6	14.4
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.9	1.8	0.1	4.3	4.0	1.1	101.0	16.5	66.6	14.4
LOS	A	A	A	A	A	A	F	B	E	B
Approach Delay	1.6			3.9			64.0			32.3
Approach LOS	A			A			E			C

Intersection Summary

Cycle Length: 146

Actuated Cycle Length: 146

Offset: 70 (48%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

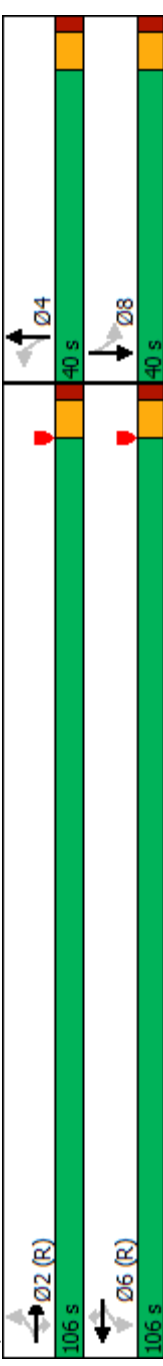
Maximum v/c Ratio: 0.78

Intersection Signal Delay: 9.6

Intersection Capacity Utilization 56.1%

Analysis Period (min) 15

Splits and Phases: 2: Kmart Access/Site Access & Palmer Park Blvd



HCM 6th TWSC

Existing Plus Site-Generated Traffic

3: Kmart Back Access/Waynoka Rd & Palmer Park Blvd

PM Peak Hour

Intersection															
Int Delay, s/veh 2.2															
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Lane Configurations	↔	↕	↕	↔	↕	↕	↔	↕	↕	↔	↕	↕			
Traffic Vol, veh/h	99	791	1	2	492	59	3	1	2	53	1	139			
Future Vol, veh/h	99	791	1	2	492	59	3	1	2	53	1	139			
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0			
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop			
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None			
Storage Length	50	-	-	50	-	150	0	-	-	100	-	0			
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-			
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-			
Peak Hour Factor	96	96	96	82	82	82	95	95	95	92	92	92			
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2			
Mvmt Flow	103	824	1	2	600	72	3	1	2	58	1	151			
Major/Minor	Major1	Major2	Major2	Minor1	Minor1	Minor2	Minor2	Minor2	Minor2	Minor2	Minor2	Minor2			
Conflicting Flow All	672	0	0	825	0	0	1336	1707	413	1223	1635	300			
Stage 1	-	-	-	-	-	-	1031	1031	-	604	604	-			
Stage 2	-	-	-	-	-	-	305	676	-	619	1031	-			
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94			
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-			
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-			
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32			
Pot Cap-1 Maneuver	915	-	-	*1139	-	-	256	136	*762	*333	157	696			
Stage 1	-	-	-	-	-	-	551	516	-	*452	486	-			
Stage 2	-	-	-	-	-	-	680	451	-	*718	516	-			
Platoon blocked, %	-	-	-	1	-	-	1	1	1	1	1	1			
Mov Cap-1 Maneuver	915	-	-	*1139	-	-	182	121	*762	*301	139	696			
Mov Cap-2 Maneuver	-	-	-	-	-	-	182	121	-	*301	139	-			
Stage 1	-	-	-	-	-	-	488	458	-	*401	485	-			
Stage 2	-	-	-	-	-	-	530	450	-	*634	458	-			
Approach	EB	WB	WB	NB	NB	SB	SB	SB	SB	SB	SB	SB			
HCM Control Delay, s	1	0	0	21.7	21.7	14	14	14	14	14	14	14			
HCM LOS				C	C	B	B	B	B	B	B	B			
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3	SBLn3			
Capacity (veh/h)	182	276	915	-	-	*1139	-	-	301	139	696	696			
HCM Lane V/C Ratio	0.017	0.011	0.113	-	-	0.002	-	-	0.191	0.008	0.217	0.217			
HCM Control Delay (s)	25.1	18.2	9.4	-	-	8.2	-	-	19.8	31.1	11.6	11.6			
HCM Lane LOS	D	C	A	-	-	A	-	-	C	D	B	B			
HCM 95th %tile Q(veh)	0.1	0	0.4	-	-	0	-	-	0.7	0	0.8	0.8			
Notes															
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon															

HCM 6th TWSC

Existing Plus Site-Generated Traffic

5: Waynoka Rd & South Site Access

PM Peak Hour

Intersection													
Int Delay, s/veh 2													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SBR
Lane Configurations													
Traffic Vol, veh/h	1	0	14	32	0	1	26	102	30	1	147	1	1
Future Vol, veh/h	1	0	14	32	0	1	26	102	30	1	147	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	15	35	0	1	28	111	33	1	160	1	1
Major/Minor	Minor2	Minor1	Minor1	Minor1	Minor1	Minor1	Major1	Major1	Major2	Major2	Major2	Major2	Major2
Conflicting Flow All	347	363	161	354	347	128	161	0	0	144	0	0	0
Stage 1	163	163	-	184	184	-	-	-	-	-	-	-	-
Stage 2	184	200	-	170	163	-	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-	-
Pot Cap-1 Maneuver	607	565	884	601	576	922	1418	-	-	1438	-	-	-
Stage 1	839	763	-	818	747	-	-	-	-	-	-	-	-
Stage 2	818	736	-	832	763	-	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	597	553	884	581	564	922	1418	-	-	1438	-	-	-
Mov Cap-2 Maneuver	597	553	-	581	564	-	-	-	-	-	-	-	-
Stage 1	822	762	-	802	732	-	-	-	-	-	-	-	-
Stage 2	801	721	-	817	762	-	-	-	-	-	-	-	-
Approach	EB	WB	WB	NB	NB	SB	SB	SB	SB	SB	SB	SB	SB
HCM Control Delay, s	9.3	11.5	11.5	1.2	1.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
HCM LOS	A	B	B	A	A	B	A	A	B	A	A	B	A
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR	SBR	SBR	SBR	SBR	SBR
Capacity (veh/h)	1418	-	-	857	588	1438	-	-	-	-	-	-	-
HCM Lane V/C Ratio	0.02	-	-	0.019	0.061	0.001	-	-	-	-	-	-	-
HCM Control Delay (s)	7.6	-	-	9.3	11.5	7.5	-	-	-	-	-	-	-
HCM Lane LOS	A	-	-	A	B	A	-	-	-	-	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.2	0	-	-	-	-	-	-	-

HCM 6th TWSC

Existing Plus Site-Generated Traffic

8: Waynoka Rd & Waynoka Pl

PM Peak Hour

Intersection									
Int Delay, s/veh	5.9								
Movement	EBL	EBT	WBT	WBR	SBL	SBR			
Lane Configurations		4	1			W			
Traffic Vol, veh/h	162	34	19	235	109	12			
Future Vol, veh/h	162	34	19	235	109	12			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Free	Free	Free	Free	Stop	Stop			
RT Channelized	- None	- None	- None	- None	- None	- None			
Storage Length	-	-	-	-	0	-			
Veh in Median Storage, #	-	0	0	-	0	-			
Grade, %	-	0	0	-	0	-			
Peak Hour Factor	82	82	97	97	100	100			
Heavy Vehicles, %	2	2	2	2	2	2			
Mvmt Flow	198	41	20	242	109	12			
Major/Minor	Major1	Major2	Major2	Minor2					
Conflicting Flow All	262	0	-	0	578	141			
Stage 1	-	-	-	-	141	-			
Stage 2	-	-	-	-	437	-			
Critical Hdwy	4.12	-	-	-	6.42	6.22			
Critical Hdwy Stg 1	-	-	-	-	5.42	-			
Critical Hdwy Stg 2	-	-	-	-	5.42	-			
Follow-up Hdwy	2.218	-	-	-	3.518	3.318			
Pot Cap-1 Maneuver	1302	-	-	-	478	907			
Stage 1	-	-	-	-	886	-			
Stage 2	-	-	-	-	651	-			
Platoon blocked, %	-	-	-	-	-	-			
Mov Cap-1 Maneuver	1302	-	-	-	403	907			
Mov Cap-2 Maneuver	-	-	-	-	403	-			
Stage 1	-	-	-	-	748	-			
Stage 2	-	-	-	-	651	-			
Approach	EB	WB	WB	SB					
HCM Control Delay, s	6.8	0	0	16.7					
HCM LOS				C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1				
Capacity (veh/h)	1302	-	-	-	427				
HCM Lane V/C Ratio	0.152	-	-	-	0.283				
HCM Control Delay (s)	8.3	0	-	-	16.7				
HCM Lane LOS	A	A	-	-	C				
HCM 95th %tile Q(veh)	0.5	-	-	-	1.2				

HCM 6th TWSC

Existing Plus Site-Generated Traffic

9: Powers Blvd & Omaha Blvd

PM Peak Hour

Intersection									
Int Delay, s/veh	12.9								
Movement	WBL	WBR	NBT	NBR	SBL	SBT			
Lane Configurations	↔	↔	↔↔↔	↔	↔	↔↔↔			
Traffic Vol, veh/h	16	184	2781	131	98	1998			
Future Vol, veh/h	16	184	2781	131	98	1998			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Stop	Stop	Free	Free	Free	Free			
RT Channelized	-	Free	-	Free	-	None			
Storage Length	0	0	-	0	400	-			
Veh in Median Storage, #	1	-	0	-	-	0			
Grade, %	0	-	0	-	-	0			
Peak Hour Factor	94	94	100	100	100	100			
Heavy Vehicles, %	2	2	2	2	2	2			
Mvmt Flow	17	196	2781	131	98	1998			
Major/Minor	Minor1	Major1	Major2						
Conflicting Flow All	3776	-	0	-	2781	0			
Stage 1	2781	-	-	-	-	-			
Stage 2	995	-	-	-	-	-			
Critical Hdwy	5.74	-	-	-	5.34	-			
Critical Hdwy Stg 1	6.64	-	-	-	-	-			
Critical Hdwy Stg 2	6.04	-	-	-	-	-			
Follow-up Hdwy	3.82	-	-	-	3.12	-			
Pot Cap-1 Maneuver	~9	0	-	0	~49	-			
Stage 1	~17	0	-	0	-	-			
Stage 2	287	0	-	0	-	-			
Platoon blocked, %									
Mov Cap-1 Maneuver	0	-	-	-	~49	-			
Mov Cap-2 Maneuver	0	-	-	-	-	-			
Stage 1	0	-	-	-	-	-			
Stage 2	287	-	-	-	-	-			
Approach	WB	NB	SB						
HCM Control Delay, s	0	0	30.2						
HCM LOS	-	-	-						
Minor Lane/Major Mvmt	NBTWBLn1WBLn2	SBL	SBT						
Capacity (veh/h)	-	-	~49						
HCM Lane V/C Ratio	-	-	2						
HCM Control Delay (s)	-	-	645.2						
HCM Lane LOS	-	-	A	F					
HCM 95th %tile Q(veh)	-	-	9.9						
Notes									
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon									

Timings

1: Powers Blvd & Palmer Park Blvd

2040 Background Traffic
AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔↔	↔	↔↔	↔↔	↔	↔↔	↔↔	↔	↔↔	↔↔	↔
Traffic Volume (vph)	282	234	124	384	265	270	132	2106	157	316	3324	427
Future Volume (vph)	282	234	124	384	265	270	132	2106	157	316	3324	427
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8	8	5	5	2	1	6		
Permitted Phases	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
Detector Phase	7	4	3	8	8	5	5	2	1	6		
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	20.0	4.0	20.0		
Minimum Split (s)	9.0	10.5	9.0	10.5	10.5	9.0	9.0	27.5	9.0	27.5		
Total Split (s)	21.0	25.0	21.0	25.0	25.0	21.0	21.0	79.0	21.0	79.0		
Total Split (%)	14.4%	17.1%	14.4%	17.1%	17.1%	14.4%	14.4%	54.1%	14.4%	54.1%		
Yellow Time (s)	3.0	4.5	3.0	4.5	4.5	3.0	3.0	5.5	3.0	5.5		
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	6.5	5.0	6.5	6.5	5.0	5.0	7.5	5.0	7.5		
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lead	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	None	C-Max		
Act Effct Green (s)	16.0	17.5	146.0	16.0	17.5	146.0	13.1	71.9	146.0	16.5	75.4	146.0
Actuated g/C Ratio	0.11	0.12	1.00	0.11	0.12	1.00	0.09	0.49	1.00	0.11	0.52	1.00
v/c Ratio	0.84	0.62	0.09	1.14	0.69	0.19	0.45	0.88	0.10	0.86	1.33	0.28
Control Delay	83.7	67.7	0.1	140.5	67.6	0.3	67.3	38.2	0.1	84.5	183.6	0.4
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	83.7	67.7	0.1	140.5	67.6	0.3	67.3	38.2	0.1	84.5	183.6	0.4
LOS	F	E	A	F	E	A	E	D	A	F	F	A
Approach Delay		61.7			78.3			37.3			156.7	
Approach LOS		E			E			D			F	

Intersection Summary

Cycle Length: 146

Actuated Cycle Length: 146

Offset: 128 (88%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow

Natural Cycle: 150

Control Type: Actuated-Coordinated

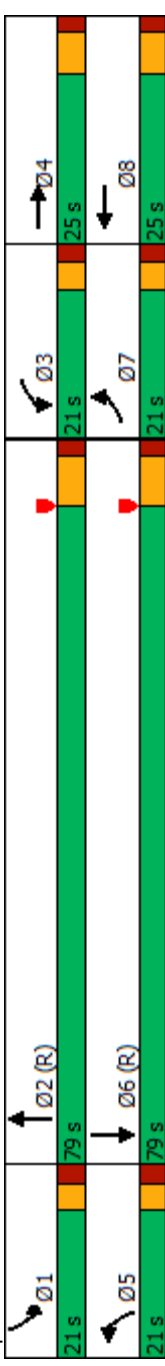
Maximum v/c Ratio: 1.33

Intersection Signal Delay: 104.3

Intersection Capacity Utilization 105.4%

Analysis Period (min) 15

Splits and Phases: 1: Powers Blvd & Palmer Park Blvd



Timings

2040 Background Traffic
AM Peak Hour

2: Kmart Access/Site Access & Palmer Park Blvd

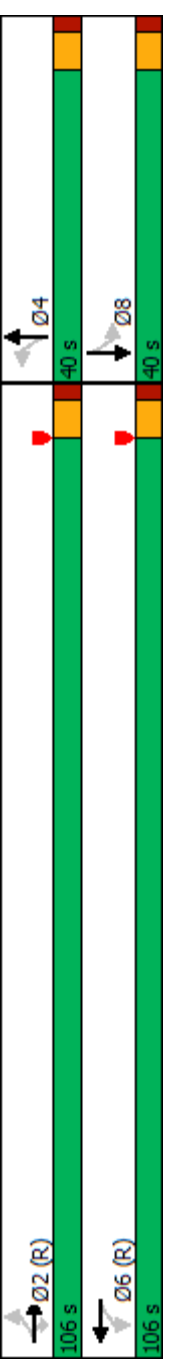


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔
Traffic Volume (vph)	12	570	125	51	826	86	1	1	0
Future Volume (vph)	12	570	125	51	826	86	1	1	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2	2	2	6	6	4	4	8	8
Permitted Phases	2	2	2	6	6	4	4	8	8
Detector Phase	2	2	2	6	6	4	4	8	8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	4.0	4.0	4.0	4.0
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	33.0	33.0	33.0	33.0
Total Split (s)	106.0	106.0	106.0	106.0	106.0	40.0	40.0	40.0	40.0
Total Split (%)	72.6%	72.6%	72.6%	72.6%	72.6%	27.4%	27.4%	27.4%	27.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	117.0	117.0	117.0	117.0	117.0	17.0	17.0	17.0	17.0
Actuated g/C Ratio	0.80	0.80	0.80	0.80	0.80	0.12	0.12	0.12	0.12
v/c Ratio	0.03	0.21	0.10	0.09	0.33	0.69	0.21	0.01	0.03
Control Delay	1.0	0.8	0.1	4.2	4.6	82.3	16.6	53.0	0.1
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.0	1.0	0.1	4.2	4.6	82.3	16.6	53.0	0.1
LOS	A	A	A	A	A	F	B	D	A
Approach Delay	0.9		4.6		62.6			4.9	
Approach LOS	A		A		E			A	

Intersection Summary

Cycle Length: 146
 Actuated Cycle Length: 146
 Offset: 70 (48%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 8.0
 Intersection Capacity Utilization 57.6%
 Analysis Period (min) 15

Splits and Phases: 2: Kmart Access/Site Access & Palmer Park Blvd



3: Kmart Back Access & Palmer Park Blvd

AM Peak Hour

Intersection									
Int Delay, s/veh	0								
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑		↔	↑↑	↔	↔			
Traffic Vol, veh/h	606	1	2	875	3	1			
Future Vol, veh/h	606	1	2	875	3	1			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Free	Free	Free	Free	Stop	Stop			
RT Channelized	-	None	-	None	-	None			
Storage Length	-	-	50	-	0	-			
Veh in Median Storage, #	0	-	-	0	0	-			
Grade, %	0	-	-	0	0	-			
Peak Hour Factor	92	92	90	90	92	92			
Heavy Vehicles, %	2	2	2	2	2	2			
Mvmt Flow	659	1	2	972	3	1			

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	660	0	1150	330
Stage 1	-	-	-	-	660	-
Stage 2	-	-	-	-	490	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	924	-	192	666
Stage 1	-	-	-	-	476	-
Stage 2	-	-	-	-	581	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	924	-	192	666
Mov Cap-2 Maneuver	-	-	-	-	325	-
Stage 1	-	-	-	-	475	-
Stage 2	-	-	-	-	581	-

Approach	EB	WB	NB			
HCM Control Delay, s	0	0	14.8			
HCM LOS			B			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	373	-	-	924	-	
HCM Lane V/C Ratio	0.012	-	-	0.002	-	
HCM Control Delay (s)	14.8	-	-	8.9	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0	-	-	0	-	

4: Palmer Park Blvd & Waynoka Rd

Intersection									
Int Delay, s/veh	1.9								
Movement	EBL	EBT	WBT	WBR	SBL	SBR			
Lane Configurations	↔	↕↕	↕↕	↕↕	↔	↔			
Traffic Vol, veh/h	71	549	809	29	35	68			
Future Vol, veh/h	71	549	809	29	35	68			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Free	Free	Free	Free	Stop	Stop			
RT Channelized	-	None	-	None	-	None			
Storage Length	100	-	-	-	0	0			
Veh in Median Storage, #	-	0	0	-	1	-			
Grade, %	-	0	0	-	0	-			
Peak Hour Factor	99	99	84	84	71	71			
Heavy Vehicles, %	2	2	2	2	2	2			
Mvmt Flow	72	555	963	35	49	96			

Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	998	0	0	1403	499	
Stage 1	-	-	-	981	-	
Stage 2	-	-	-	422	-	
Critical Hdwy	4.14	-	-	6.84	6.94	
Critical Hdwy Stg 1	-	-	-	5.84	-	
Critical Hdwy Stg 2	-	-	-	5.84	-	
Follow-up Hdwy	2.22	-	-	3.52	3.32	
Pot Cap-1 Maneuver	689	-	-	131	517	
Stage 1	-	-	-	324	-	
Stage 2	-	-	-	629	-	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	689	-	-	117	517	
Mov Cap-2 Maneuver	-	-	-	220	-	
Stage 1	-	-	-	290	-	
Stage 2	-	-	-	629	-	

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	17.7
HCM LOS	C		

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	689	-	-	-	220	517
HCM Lane V/C Ratio	0.104	-	-	-	0.224	0.185
HCM Control Delay (s)	10.8	-	-	-	26	13.5
HCM Lane LOS	B	-	-	-	D	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.8	0.7

Intersection									
Int Delay, s/veh	6.8								
Movement	EBL	EBT	WBT	WBR	SBL	SBR			
Lane Configurations		4				W			
Traffic Vol, veh/h	40	52	10	52	135	11			
Future Vol, veh/h	40	52	10	52	135	11			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Free	Free	Free	Free	Stop	Stop			
RT Channelized	-	None	-	None	-	None			
Storage Length	-	-	-	-	0	-			
Veh in Median Storage, #	-	0	0	-	0	-			
Grade, %	-	0	0	-	0	-			
Peak Hour Factor	68	68	85	85	73	73			
Heavy Vehicles, %	2	2	2	2	2	2			
Mvmt Flow	59	76	12	61	185	15			
Major/Minor	Major1	Major2	Major2	Minor2					
Conflicting Flow All	73	0	-	0	237	43			
Stage 1	-	-	-	-	43	-			
Stage 2	-	-	-	-	194	-			
Critical Hdwy	4.12	-	-	-	6.42	6.22			
Critical Hdwy Stg 1	-	-	-	-	5.42	-			
Critical Hdwy Stg 2	-	-	-	-	5.42	-			
Follow-up Hdwy	2.218	-	-	-	3.518	3.318			
Pot Cap-1 Maneuver	1527	-	-	-	751	1027			
Stage 1	-	-	-	-	979	-			
Stage 2	-	-	-	-	839	-			
Platoon blocked, %	-	-	-	-	-	-			
Mov Cap-1 Maneuver	1527	-	-	-	721	1027			
Mov Cap-2 Maneuver	-	-	-	-	721	-			
Stage 1	-	-	-	-	940	-			
Stage 2	-	-	-	-	839	-			
Approach	EB	WB	WB	SB					
HCM Control Delay, s	3.2	0	0	11.7					
HCM LOS					B				
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1				
Capacity (veh/h)	1527	-	-	-	738				
HCM Lane V/C Ratio	0.039	-	-	-	0.271				
HCM Control Delay (s)	7.5	0	-	-	11.7				
HCM Lane LOS	A	A	-	-	B				
HCM 95th %tile Q(veh)	0.1	-	-	-	1.1				

Timings

2040 Background Traffic
Noon Peak Hour

2: Kmart Access/Site Access & Palmer Park Blvd

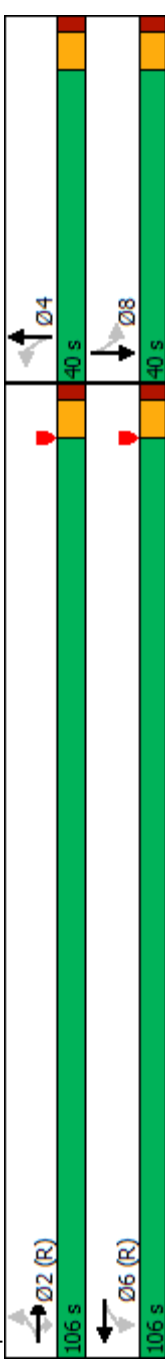


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔
Traffic Volume (vph)	119	511	83	40	477	94	5	39	10
Future Volume (vph)	119	511	83	40	477	94	5	39	10
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2	2	2	6	6	4	4	8	8
Permitted Phases	2	2	2	6	6	4	4	8	8
Detector Phase	2	2	2	6	6	4	4	8	8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	4.0	4.0	4.0	4.0
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	33.0	33.0	33.0	33.0
Total Split (s)	106.0	106.0	106.0	106.0	106.0	40.0	40.0	40.0	40.0
Total Split (%)	72.6%	72.6%	72.6%	72.6%	72.6%	27.4%	27.4%	27.4%	27.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	116.7	116.7	116.7	116.7	116.7	17.3	17.3	17.3	17.3
Actuated g/C Ratio	0.80	0.80	0.80	0.80	0.80	0.12	0.12	0.12	0.12
v/c Ratio	0.19	0.18	0.07	0.07	0.21	0.84	0.23	0.28	0.45
Control Delay	4.9	4.0	1.0	4.2	4.0	111.7	18.3	60.8	16.2
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.9	4.5	1.0	4.2	4.0	111.7	18.3	60.8	16.2
LOS	A	A	A	A	A	F	B	E	B
Approach Delay	4.1			4.0			78.0		27.6
Approach LOS	A			A			E		C

Intersection Summary

Cycle Length: 146
 Actuated Cycle Length: 146
 Offset: 70 (48%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 13.1
 Intersection Capacity Utilization 49.4%
 Analysis Period (min) 15

Splits and Phases: 2: Kmart Access/Site Access & Palmer Park Blvd



Timings

1: Powers Blvd & Palmer Park Blvd

2040 Background Traffic
PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	523	636	206	226	473	149	190	3130	279	316	2008	542
Future Volume (vph)	523	636	206	226	473	149	190	3130	279	316	2008	542
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8	8	5	2	2	1	6		
Permitted Phases	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	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	4.0	20.0	4.0	20.0		
Minimum Split (s)	9.0	10.5	9.0	10.5	10.5	9.0	9.0	27.5	9.0	27.5		
Total Split (s)	21.0	25.0	21.0	25.0	25.0	21.0	21.0	79.0	21.0	79.0		
Total Split (%)	14.4%	17.1%	14.4%	17.1%	17.1%	14.4%	14.4%	54.1%	14.4%	54.1%		
Yellow Time (s)	3.0	4.5	3.0	4.5	4.5	3.0	3.0	5.5	3.0	5.5		
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	6.5	5.0	6.5	6.5	5.0	5.0	7.5	5.0	7.5		
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lead	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	None	C-Max		
Act Effct Green (s)	16.0	19.0	146.0	15.5	18.5	146.0	14.5	71.5	146.0	16.0	73.0	146.0
Actuated g/C Ratio	0.11	0.13	1.00	0.11	0.13	1.00	0.10	0.49	1.00	0.11	0.50	1.00
v/c Ratio	1.47	1.45	0.14	0.68	1.16	0.10	0.56	1.26	0.18	0.85	0.80	0.35
Control Delay	266.8	258.9	0.2	68.2	146.9	0.1	68.9	152.4	0.2	84.3	33.6	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	266.8	258.9	0.2	68.2	146.9	0.1	68.9	152.4	0.2	84.3	33.6	0.6
LOS	F	F	A	E	F	A	E	F	A	F	C	A
Approach Delay		222.9			100.1							33.0
Approach LOS		F			F							C

Intersection Summary

Cycle Length: 146

Actuated Cycle Length: 146

Offset: 127 (87%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow

Natural Cycle: 150

Control Type: Actuated-Coordinated

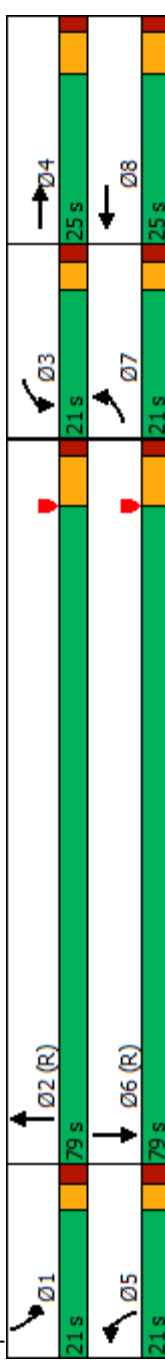
Maximum v/c Ratio: 1.47

Intersection Signal Delay: 112.8

Intersection Capacity Utilization 117.5%

Analysis Period (min) 15

Splits and Phases: 1: Powers Blvd & Palmer Park Blvd



Timings

2040 Background Traffic
PM Peak Hour

2: Kmart Access/Site Access & Palmer Park Blvd



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔
Traffic Volume (vph)	65	1036	130	35	707	90	3	28	2
Future Volume (vph)	65	1036	130	35	707	90	3	28	2
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2	2	2	6	6	4	4	8	8
Permitted Phases	2	2	2	6	6	4	4	8	8
Detector Phase	2	2	2	6	6	4	4	8	8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	4.0	4.0	4.0	4.0
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	33.0	33.0	33.0	33.0
Total Split (s)	106.0	106.0	106.0	106.0	106.0	40.0	40.0	40.0	40.0
Total Split (%)	72.6%	72.6%	72.6%	72.6%	72.6%	27.4%	27.4%	27.4%	27.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode									
C-Max	118.8	118.8	118.8	118.8	118.8	None	None	None	None
Act Effct Green (s)	118.8	118.8	118.8	118.8	118.8	15.2	15.2	15.2	15.2
Actuated g/C Ratio	0.81	0.81	0.81	0.81	0.81	0.10	0.10	0.10	0.10
v/c Ratio	0.14	0.38	0.10	0.11	0.31	0.65	0.31	0.20	0.25
Control Delay	0.9	2.9	0.0	4.3	4.0	82.9	16.9	60.9	17.6
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.9	3.4	0.0	4.3	4.0	82.9	16.9	60.9	17.6
LOS	A	A	A	A	A	F	B	E	B
Approach Delay	2.9			4.0		54.2			32.6
Approach LOS	A			A		D			C

Intersection Summary

Cycle Length: 146

Actuated Cycle Length: 146

Offset: 70 (48%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

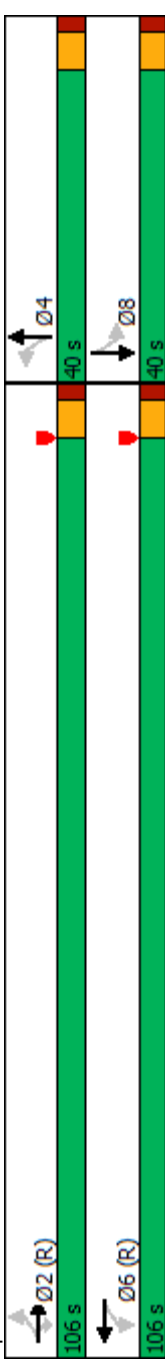
Maximum v/c Ratio: 0.65

Intersection Signal Delay: 7.7

Intersection Capacity Utilization 63.6%

Analysis Period (min) 15

Splits and Phases: 2: Kmart Access/Site Access & Palmer Park Blvd



3: Kmart Back Access & Palmer Park Blvd

Intersection									
Int Delay, s/veh	0.1								
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑		↔	↑↑		↔			
Traffic Vol, veh/h	1129	1	2	758	3	2			
Future Vol, veh/h	1129	1	2	758	3	2			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Free	Free	Free	Free	Stop	Stop			
RT Channelized	-	None	-	None	-	None			
Storage Length	-	-	50	-	0	-			
Veh in Median Storage, #	0	-	-	0	0	-			
Grade, %	0	-	-	0	0	-			
Peak Hour Factor	96	96	82	82	92	92			
Heavy Vehicles, %	2	2	2	2	2	2			
Mvmt Flow	1176	1	2	924	3	2			

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	1177	0	1643	589
Stage 1	-	-	-	-	1177	-
Stage 2	-	-	-	-	466	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	589	-	91	452
Stage 1	-	-	-	-	255	-
Stage 2	-	-	-	-	598	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	589	-	91	452
Mov Cap-2 Maneuver	-	-	-	-	196	-
Stage 1	-	-	-	-	254	-
Stage 2	-	-	-	-	598	-

Approach	EB	WB	NB			
HCM Control Delay, s	0	0	0	19.5		
HCM LOS				C		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	253	-	-	589	-
HCM Lane V/C Ratio	0.021	-	-	0.004	-
HCM Control Delay (s)	19.5	-	-	11.1	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

4: Palmer Park Blvd & Waynoka Rd

Intersection									
Int Delay, s/veh	1.8								
Movement	EBL	EBT	WBT	WBR	SBL	SBR			
Lane Configurations	↔	↕↕	↕↕	↕↕	↔	↔			
Traffic Vol, veh/h	77	1068	631	48	50	129			
Future Vol, veh/h	77	1068	631	48	50	129			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Free	Free	Free	Free	Stop	Stop			
RT Channelized	-	None	-	None	-	None			
Storage Length	100	-	-	-	0	0			
Veh in Median Storage, #	-	0	0	-	1	-			
Grade, %	-	0	0	-	0	-			
Peak Hour Factor	99	99	86	86	94	94			
Heavy Vehicles, %	2	2	2	2	2	2			
Mvmt Flow	78	1079	734	56	53	137			

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	790	0	0
Stage 1	-	-	762
Stage 2	-	-	696
Critical Hdwy	4.14	-	6.84
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	2.22	-	3.52
Pot Cap-1 Maneuver	826	-	120
Stage 1	-	-	421
Stage 2	-	-	456
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	826	-	109
Mov Cap-2 Maneuver	-	-	223
Stage 1	-	-	381
Stage 2	-	-	456

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	16.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	826	-	-	-	223	604
HCM Lane V/C Ratio	0.094	-	-	-	0.239	0.227
HCM Control Delay (s)	9.8	-	-	-	26.1	12.7
HCM Lane LOS	A	-	-	-	D	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.9	0.9

Intersection									
Int Delay, s/veh	7.1								
Movement	EBL	EBT	WBT	WBR	SBL	SBR			
Lane Configurations		4				W			
Traffic Vol, veh/h	198	41	23	283	129	15			
Future Vol, veh/h	198	41	23	283	129	15			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Free	Free	Free	Free	Stop	Stop			
RT Channelized	-	None	-	None	-	None			
Storage Length	-	-	-	-	0	-			
Veh in Median Storage, #	-	0	0	-	0	-			
Grade, %	-	0	0	-	0	-			
Peak Hour Factor	82	82	97	97	100	100			
Heavy Vehicles, %	2	2	2	2	2	2			
Mvmt Flow	241	50	24	292	129	15			
Major/Minor	Major1	Major2	Minor2						
Conflicting Flow All	316	0	-	0	702	170			
Stage 1	-	-	-	-	170	-			
Stage 2	-	-	-	-	532	-			
Critical Hdwy	4.12	-	-	-	6.42	6.22			
Critical Hdwy Stg 1	-	-	-	-	5.42	-			
Critical Hdwy Stg 2	-	-	-	-	5.42	-			
Follow-up Hdwy	2.218	-	-	-	3.518	3.318			
Pot Cap-1 Maneuver	1244	-	-	-	404	874			
Stage 1	-	-	-	-	860	-			
Stage 2	-	-	-	-	589	-			
Platoon blocked, %	-	-	-	-	-	-			
Mov Cap-1 Maneuver	1244	-	-	-	324	874			
Mov Cap-2 Maneuver	-	-	-	-	324	-			
Stage 1	-	-	-	-	689	-			
Stage 2	-	-	-	-	589	-			
Approach	EB	WB	SB						
HCM Control Delay, s	7.1	0	22.5						
HCM LOS			C						
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1				
Capacity (veh/h)	1244	-	-	-	347				
HCM Lane V/C Ratio	0.194	-	-	-	0.415				
HCM Control Delay (s)	8.6	0	-	-	22.5				
HCM Lane LOS	A	A	-	-	C				
HCM 95th %tile Q(veh)	0.7	-	-	-	2				

Timings

2040 Total Traffic
AM Peak Hour

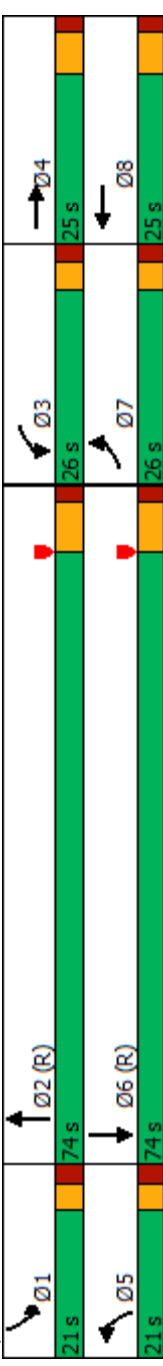
1: Powers Blvd & Palmer Park Blvd

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔↔	↔	↔↔	↔↔	↔	↔↔	↔↔	↔	↔↔	↔↔	↔
Traffic Volume (vph)	282	241	124	395	268	279	132	2102	173	337	3317	427
Future Volume (vph)	282	241	124	395	268	279	132	2102	173	337	3317	427
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8	8	3	5	2	1	6		
Permitted Phases	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
Detector Phase	7	4	3	8	8	3	5	2	1	6		
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	20.0	4.0	20.0		
Minimum Split (s)	9.0	10.5	9.0	10.5	10.5	9.0	9.0	27.5	9.0	27.5		
Total Split (s)	26.0	25.0	26.0	25.0	25.0	21.0	21.0	74.0	21.0	74.0		
Total Split (%)	17.8%	17.1%	17.8%	17.1%	17.1%	14.4%	14.4%	50.7%	14.4%	50.7%		
Yellow Time (s)	3.0	4.5	3.0	4.5	4.5	3.0	3.0	5.5	3.0	5.5		
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	6.5	5.0	6.5	6.5	5.0	5.0	7.5	5.0	7.5		
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lead	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	None	C-Max		
Act Effct Green (s)	18.9	16.8	146.0	20.8	18.6	146.0	13.1	67.1	146.0	17.4	71.3	146.0
Actuated g/C Ratio	0.13	0.12	1.00	0.14	0.13	1.00	0.09	0.46	1.00	0.12	0.49	1.00
v/c Ratio	0.67	0.62	0.08	0.85	0.63	0.19	0.45	0.92	0.11	0.87	1.36	0.28
Control Delay	68.1	68.5	0.1	74.2	65.2	0.3	67.4	44.5	0.2	84.5	197.9	0.4
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	68.1	68.5	0.1	74.2	65.2	0.3	67.4	44.5	0.2	84.5	197.9	0.4
LOS	E	E	A	E	E	A	E	D	A	F	F	A
Approach Delay	55.2			49.7				42.5			167.2	
Approach LOS	E			D				D			F	

Intersection Summary

Cycle Length: 146
 Actuated Cycle Length: 146
 Offset: 128 (88%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.36
 Intersection Signal Delay: 107.1
 Intersection Capacity Utilization 105.8%
 Analysis Period (min) 15

Splits and Phases: 1: Powers Blvd & Palmer Park Blvd



Timings

2040 Total Traffic
AM Peak Hour

2: Kmart Access/Site Access & Palmer Park Blvd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↕
Traffic Volume (vph)	48	579	125	51	821	18	86	2	12	0
Future Volume (vph)	48	579	125	51	821	18	86	2	12	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	2	2	2	6	6	6	4	4	8	8
Permitted Phases	2	2	2	6	6	6	4	4	8	8
Detector Phase	2	2	2	6	6	6	4	4	8	8
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	4.0	4.0	4.0
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	27.0	33.0	33.0	33.0	33.0
Total Split (s)	106.0	106.0	106.0	106.0	106.0	106.0	40.0	40.0	40.0	40.0
Total Split (%)	72.6%	72.6%	72.6%	72.6%	72.6%	72.6%	27.4%	27.4%	27.4%	27.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	118.9	118.9	118.9	118.9	118.9	118.9	15.1	15.1	15.1	15.1
Actuated g/C Ratio	0.81	0.81	0.81	0.81	0.81	0.81	0.10	0.10	0.10	0.10
v/c Ratio	0.11	0.21	0.10	0.08	0.30	0.01	0.65	0.20	0.09	0.11
Control Delay	1.1	0.8	0.1	3.7	3.9	1.2	82.7	19.4	57.8	0.6
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.1	1.0	0.1	3.7	3.9	1.2	82.7	19.4	57.8	0.6
LOS	A	A	A	A	A	A	F	B	E	A
Approach Delay	0.8			3.8			63.4		15.5	
Approach LOS	A			A			E		B	

Intersection Summary

Cycle Length: 146
 Actuated Cycle Length: 146
 Offset: 70 (48%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.65
 Intersection Signal Delay: 7.0
 Intersection Capacity Utilization 57.5%
 Analysis Period (min) 15

Splits and Phases: 2: Kmart Access/Site Access & Palmer Park Blvd



3: Kmart Back Access/Waynoka Rd & Palmer Park Blvd

Intersection													
Int Delay, s/veh 1.8													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SBR
Lane Configurations	↔	↕	↕	↔	↕	↕	↔	↕	↕	↔	↕	↕	↕
Traffic Vol, veh/h	78	548	1	2	817	37	3	1	1	33	1	70	70
Future Vol, veh/h	78	548	1	2	817	37	3	1	1	33	1	70	70
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	None
Storage Length	50	-	-	50	-	150	0	-	-	100	-	0	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	82	577	1	2	860	39	3	1	1	35	1	74	74

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	899	0	0	1177
Stage 1	-	-	-	742
Stage 2	-	-	-	435
Critical Hdwy	4.14	-	4.14	-
Critical Hdwy Stg 1	-	-	-	6.54
Critical Hdwy Stg 2	-	-	-	6.54
Follow-up Hdwy	2.22	-	2.22	-
Pot Cap-1 Maneuver	751	-	*1297	-
Stage 1	-	-	-	644
Stage 2	-	-	-	570
Platoon blocked, %	-	-	1	-
Mov Cap-1 Maneuver	751	-	*1297	-
Mov Cap-2 Maneuver	-	-	-	199
Stage 1	-	-	-	574
Stage 2	-	-	-	495

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.3	0	23.4	18.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	199	198	751	-	-	*1297	-	-	170	120	573
HCM Lane V/C Ratio	0.016	0.011	0.109	-	-	0.002	-	-	0.204	0.009	0.129
HCM Control Delay (s)	23.4	23.4	10.4	-	-	7.8	-	-	31.5	35.3	12.2
HCM Lane LOS	C	C	B	-	-	A	-	-	D	E	B
HCM 95th %tile Q(veh)	0	0	0.4	-	-	0	-	-	0.7	0	0.4

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

5: Waynoka Rd & South Site Access

Intersection													
Int Delay, s/veh 1.3													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔		↔			↔			↔			
Traffic Vol, veh/h	0	0	5	13	0	0	14	82	19	1	85	0	
Future Vol, veh/h	0	0	5	13	0	0	14	82	19	1	85	0	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	0	0	5	14	0	0	15	89	21	1	92	0	
Major/Minor													
	Minor2			Minor1			Major1			Major2			
Conflicting Flow All	224	234	92	227	224	100	92	0	0	110	0	0	
Stage 1	94	94	-	130	130	-	-	-	-	-	-	-	
Stage 2	130	140	-	97	94	-	-	-	-	-	-	-	
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-	
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-	
Pot Cap-1 Maneuver	732	666	965	728	675	956	1503	-	-	1480	-	-	
Stage 1	913	817	-	874	789	-	-	-	-	-	-	-	
Stage 2	874	781	-	910	817	-	-	-	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	
Mov Cap-1 Maneuver	726	659	965	718	668	956	1503	-	-	1480	-	-	
Mov Cap-2 Maneuver	726	659	-	718	668	-	-	-	-	-	-	-	
Stage 1	904	816	-	865	781	-	-	-	-	-	-	-	
Stage 2	865	773	-	904	816	-	-	-	-	-	-	-	
Approach													
	EB	WB	WB	NB	NB	SB	SB						
HCM Control Delay, s	8.8	10.1	10.1	0.9	0.9	0.1	0.1						
HCM LOS	A	B	B										
Minor Lane/Major Mvmt													
	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1503	-	-	965	718	1480	-	-					
HCM Lane V/C Ratio	0.01	-	-	0.006	0.02	0.001	-	-					
HCM Control Delay (s)	7.4	-	-	8.8	10.1	7.4	-	-					
HCM Lane LOS	A	-	-	A	B	A	-	-					
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-					

HCM 6th TWSC
8: Waynoka Rd & Waynoka Pl

2040 Total Traffic
AM Peak Hour

Intersection									
Int Delay, s/veh	6.8								
Movement	EBL	EBT	WBT	WBR	SBL	SBR			
Lane Configurations	4		1		W				
Traffic Vol, veh/h	40	52	10	53	137	11			
Future Vol, veh/h	40	52	10	53	137	11			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Free	Free	Free	Free	Stop	Stop			
RT Channelized	-	None	-	None	-	None			
Storage Length	-	-	-	-	0	-			
Veh in Median Storage, #	-	0	0	-	0	-			
Grade, %	-	0	0	-	0	-			
Peak Hour Factor	68	68	85	85	73	73			
Heavy Vehicles, %	2	2	2	2	2	2			
Mvmt Flow	59	76	12	62	188	15			
Major/Minor	Major1	Major2	Major2	Minor2					
Conflicting Flow All	74	0	-	0	237	43			
Stage 1	-	-	-	-	43	-			
Stage 2	-	-	-	-	194	-			
Critical Hdwy	4.12	-	-	-	6.42	6.22			
Critical Hdwy Stg 1	-	-	-	-	5.42	-			
Critical Hdwy Stg 2	-	-	-	-	5.42	-			
Follow-up Hdwy	2.218	-	-	-	3.518	3.318			
Pot Cap-1 Maneuver	1526	-	-	-	751	1027			
Stage 1	-	-	-	-	979	-			
Stage 2	-	-	-	-	839	-			
Platoon blocked, %	-	-	-	-	-	-			
Mov Cap-1 Maneuver	1526	-	-	-	721	1027			
Mov Cap-2 Maneuver	-	-	-	-	721	-			
Stage 1	-	-	-	-	940	-			
Stage 2	-	-	-	-	839	-			
Approach	EB	WB	WB	SB					
HCM Control Delay, s	3.2	0	0	11.7					
HCM LOS					B				
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1				
Capacity (veh/h)	1526	-	-	-	737				
HCM Lane V/C Ratio	0.039	-	-	-	0.275				
HCM Control Delay (s)	7.5	0	-	-	11.7				
HCM Lane LOS	A	A	-	-	B				
HCM 95th %tile Q(veh)	0.1	-	-	-	1.1				

Timings

2040 Total Traffic
Noon Hour

2: Kmart Access/Site Access & Palmer Park Blvd

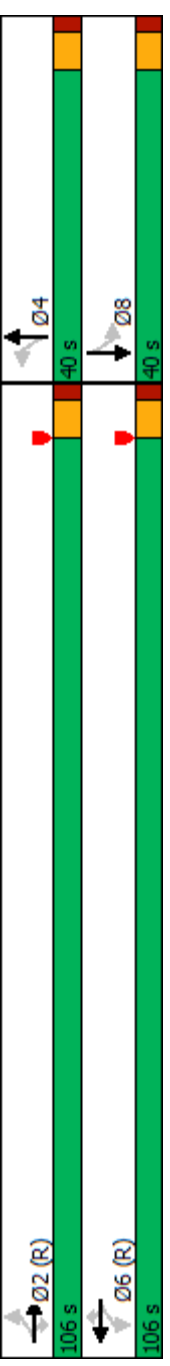


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	184	522	83	40	482	56	94	6	72	11
Future Volume (vph)	184	522	83	40	482	56	94	6	72	11
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	2				6			4		8
Permitted Phases	2	2	2	6	6	6	4	8	8	8
Detector Phase	2	2	2	6	6	6	4	4	8	8
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	4.0	4.0	4.0
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0	27.0	33.0	33.0	33.0	33.0
Total Split (s)	106.0	106.0	106.0	106.0	106.0	106.0	40.0	40.0	40.0	40.0
Total Split (%)	72.6%	72.6%	72.6%	72.6%	72.6%	72.6%	27.4%	27.4%	27.4%	27.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode										
C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	113.4	113.4	113.4	113.4	113.4	113.4	20.6	20.6	20.6	20.6
Actuated g/C Ratio	0.78	0.78	0.78	0.78	0.78	0.78	0.14	0.14	0.14	0.14
v/c Ratio	0.29	0.20	0.07	0.07	0.18	0.05	1.00	0.21	0.40	0.50
Control Delay	6.5	4.7	1.0	5.4	5.0	1.4	152.0	16.6	61.2	13.3
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	5.1	1.0	5.4	5.0	1.4	152.0	16.6	61.2	13.3
LOS	A	A	A	A	A	A	F	B	E	B
Approach Delay	5.0				4.7			102.5		27.2
Approach LOS	A				A			F		C

Intersection Summary

Cycle Length: 146
 Actuated Cycle Length: 146
 Offset: 70 (48%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.00
 Intersection Signal Delay: 16.2
 Intersection Capacity Utilization 59.5%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 2: Kmart Access/Site Access & Palmer Park Blvd



Timings

2040 Total Traffic
PM Peak Hour

1: Powers Blvd & Palmer Park Blvd

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔↔	↔	↔↔	↔↔	↔	↔↔	↔↔	↔	↔↔	↔↔	↔
Traffic Volume (vph)	523	645	206	251	483	182	190	3116	308	343	1999	542
Future Volume (vph)	523	645	206	251	483	182	190	3116	308	343	1999	542
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4	3	8	8	5	2	2	1	6		
Permitted Phases	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free	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	20.0	20.0	4.0	20.0		
Minimum Split (s)	9.0	10.5	9.0	10.5	10.5	9.0	27.5	27.5	9.0	27.5		
Total Split (s)	21.0	35.0	21.0	35.0	35.0	21.0	69.0	69.0	21.0	69.0		
Total Split (%)	14.4%	24.0%	14.4%	24.0%	24.0%	14.4%	47.3%	47.3%	14.4%	47.3%		
Yellow Time (s)	3.0	4.5	3.0	4.5	4.5	3.0	5.5	5.5	3.0	5.5		
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	6.5	5.0	6.5	6.5	5.0	7.5	7.5	5.0	7.5		
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	None	None	None	None		
Act Effct Green (s)	16.0	28.9	146.0	15.6	28.5	146.0	14.8	61.5	146.0	16.0	62.7	146.0
Actuated g/C Ratio	0.11	0.20	1.00	0.11	0.20	1.00	0.10	0.42	1.00	0.11	0.43	1.00
v/c Ratio	1.47	0.97	0.14	0.72	0.74	0.12	0.58	1.49	0.20	0.96	0.93	0.36
Control Delay	266.8	85.3	0.2	69.8	61.4	0.2	69.4	253.3	0.3	101.3	48.9	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	266.8	85.3	0.2	69.8	61.4	0.2	69.4	253.3	0.3	101.3	48.9	0.6
LOS	F	F	A	E	E	A	E	F	A	F	D	A
Approach Delay		141.7		51.5		D		221.2			46.0	
Approach LOS		F		D		D		F			D	

Intersection Summary

Cycle Length: 146

Actuated Cycle Length: 146

Offset: 127 (87%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow

Natural Cycle: 150

Control Type: Actuated-Coordinated

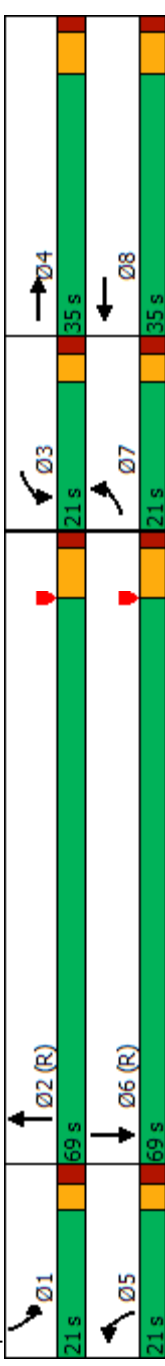
Maximum v/c Ratio: 1.49

Intersection Signal Delay: 133.2

Intersection Capacity Utilization 118.3%

Analysis Period (min) 15

Splits and Phases: 1: Powers Blvd & Palmer Park Blvd



Timings

2040 Total Traffic
PM Peak Hour

2: Kmart Access/Site Access & Palmer Park Blvd



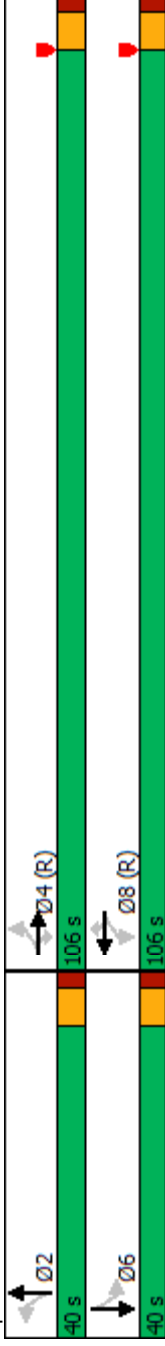
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↕
Traffic Volume (vph)	124	1041	130	35	712	40	90	4	61	3
Future Volume (vph)	124	1041	130	35	712	40	90	4	61	3
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	4			8				2		6
Permitted Phases	4	4	4	8	8	8	2	2	6	6
Detector Phase	4	4	4	8	8	8	2	2	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	4.0	4.0	4.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	106.0	106.0	106.0	106.0	106.0	106.0	40.0	40.0	40.0	40.0
Total Split (%)	72.6%	72.6%	72.6%	72.6%	72.6%	72.6%	27.4%	27.4%	27.4%	27.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0

Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	116.9	116.9	116.9	116.9	116.9	116.9	17.1	17.1	17.1	17.1
Actuated g/C Ratio	0.80	0.80	0.80	0.80	0.80	0.80	0.12	0.12	0.12	0.12
v/c Ratio	0.24	0.39	0.11	0.10	0.26	0.03	0.81	0.29	0.42	0.42
Control Delay	1.5	1.1	0.1	4.9	4.3	1.2	104.8	15.9	66.1	14.0
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.5	1.4	0.1	4.9	4.3	1.2	104.8	15.9	66.1	14.0
LOS	A	A	A	A	A	A	F	B	E	B
Approach Delay	1.3			4.2			66.2			31.8
Approach LOS	A			A			E			C

Intersection Summary

Cycle Length: 146
Actuated Cycle Length: 146
Offset: 70 (48%), Referenced to phase 4:EBTL and 8:WBTL, Start of Yellow
Natural Cycle: 40
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 8.7
Intersection Capacity Utilization 63.8%
Analysis Period (min) 15
Intersection LOS: A
ICU Level of Service B

Splits and Phases: 2: Kmart Access/Site Access & Palmer Park Blvd



3: Kmart Back Access/Waynoka Rd & Palmer Park Blvd

Intersection														
Int Delay, s/veh 1.9														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SBR	
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	
Traffic Vol, veh/h	99	1068	1	2	645	59	3	0	2	53	0	139	139	
Future Vol, veh/h	99	1068	1	2	645	59	3	0	2	53	0	139	139	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	None	
Storage Length	100	-	-	50	-	150	0	-	-	100	-	0	0	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	-	
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	104	1124	1	2	679	62	3	0	2	56	0	146	146	
Major/Minor														
	Major1			Major2			Minor1			Minor2				
Conflicting Flow All	741	0	0	1125	0	0	1677	2078	563	1453	2016	340	340	
Stage 1	-	-	-	-	-	-	1333	1333	-	683	683	-	-	
Stage 2	-	-	-	-	-	-	344	745	-	770	1333	-	-	
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94	6.94	
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-	-	
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32	3.32	
Pot Cap-1 Maneuver	862	-	-	*982	-	-	162	76	*656	*300	87	656	656	
Stage 1	-	-	-	-	-	-	444	424	-	*405	447	-	-	
Stage 2	-	-	-	-	-	-	645	419	-	*619	424	-	-	
Platoon blocked, %	-	-	-	1	-	-	1	1	1	1	1	1	1	
Mov Cap-1 Maneuver	862	-	-	*982	-	-	114	66	*656	*271	77	656	656	
Mov Cap-2 Maneuver	-	-	-	-	-	-	114	66	-	*271	77	-	-	
Stage 1	-	-	-	-	-	-	390	372	-	*356	446	-	-	
Stage 2	-	-	-	-	-	-	500	418	-	*542	372	-	-	
Approach														
EB	WB			NB			SB			SB				
HCM Control Delay, s	0.8	0			26.7			14.8			14.8			
HCM LOS	D			D			B			B				
Minor Lane/Major Mvmt														
	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3	SBLn3	SBLn3	
Capacity (veh/h)	114	656	862	-	-	*982	-	-	271	-	271	-	656	
HCM Lane V/C Ratio	0.028	0.003	0.121	-	-	0.002	-	-	0.206	-	0.206	-	0.223	
HCM Control Delay (s)	37.5	10.5	9.8	-	-	8.7	-	-	21.7	-	21.7	-	12.1	
HCM Lane LOS	E	B	A	-	-	A	-	-	C	-	C	-	B	
HCM 95th %tile Q(veh)	0.1	0	0.4	-	-	0	-	-	0.8	-	0.8	-	0.8	
Notes														
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon														

5: Waynoka Rd & South Site Access

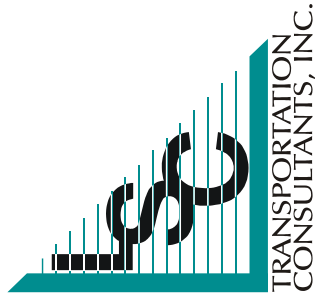
Intersection																
Int Delay, s/veh	2															
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
Lane Configurations		↔		↔			↔			↔			↔	↔		
Traffic Vol, veh/h	1	0	14	32	0	1	26	102	30	1	147	1				
Future Vol, veh/h	1	0	14	32	0	1	26	102	30	1	147	1				
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0				
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	1	0	15	35	0	1	28	111	33	1	160	1				
Major/Minor	Minor2	Minor1					Major1					Major2				
Conflicting Flow All	347	363	161	354	347	128	161	0	0	144	0	0				
Stage 1	163	163	-	184	184	-	-	-	-	-	-	-				
Stage 2	184	200	-	170	163	-	-	-	-	-	-	-				
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-				
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-				
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-				
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-				
Pot Cap-1 Maneuver	607	565	884	601	576	922	1418	-	-	1438	-	-				
Stage 1	839	763	-	818	747	-	-	-	-	-	-	-				
Stage 2	818	736	-	832	763	-	-	-	-	-	-	-				
Platoon blocked, %																
Mov Cap-1 Maneuver	597	553	884	581	564	922	1418	-	-	1438	-	-				
Mov Cap-2 Maneuver	597	553	-	581	564	-	-	-	-	-	-	-				
Stage 1	822	762	-	802	732	-	-	-	-	-	-	-				
Stage 2	801	721	-	817	762	-	-	-	-	-	-	-				
Approach	EB	WB	WB					NB	SB							
HCM Control Delay, s	9.3	11.5	11.5					1.2	0.1							
HCM LOS	A	B	B													
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR								
Capacity (veh/h)	1418	-	-	857	588	1438	-	-								
HCM Lane V/C Ratio	0.02	-	-	0.019	0.061	0.001	-	-								
HCM Control Delay (s)	7.6	-	-	9.3	11.5	7.5	-	-								
HCM Lane LOS	A	-	-	A	B	A	-	-								
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.2	0	-	-								

HCM 6th TWSC
8: Waynoka Rd & Waynoka Pl

2040 Total Traffic
PM Peak Hour

Intersection									
Int Delay, s/veh	7.2								
Movement	EBL	EBT	WBT	WBR	SBL	SBR			
Lane Configurations		4				W			
Traffic Vol, veh/h	198	41	23	286	132	15			
Future Vol, veh/h	198	41	23	286	132	15			
Conflicting Peds, #/hr	0	0	0	0	0	0			
Sign Control	Free	Free	Free	Free	Stop	Stop			
RT Channelized	-	None	-	None	-	None			
Storage Length	-	-	-	-	0	-			
Veh in Median Storage, #	-	0	0	-	0	-			
Grade, %	-	0	0	-	0	-			
Peak Hour Factor	82	82	97	97	100	100			
Heavy Vehicles, %	2	2	2	2	2	2			
Mvmt Flow	241	50	24	295	132	15			
Major/Minor	Major1	Major2	Minor2						
Conflicting Flow All	319	0	-	0	704	172			
Stage 1	-	-	-	-	172	-			
Stage 2	-	-	-	-	532	-			
Critical Hdwy	4.12	-	-	-	6.42	6.22			
Critical Hdwy Stg 1	-	-	-	-	5.42	-			
Critical Hdwy Stg 2	-	-	-	-	5.42	-			
Follow-up Hdwy	2.218	-	-	-	3.518	3.318			
Pot Cap-1 Maneuver	1241	-	-	-	403	872			
Stage 1	-	-	-	-	858	-			
Stage 2	-	-	-	-	589	-			
Platoon blocked, %	-	-	-	-	-	-			
Mov Cap-1 Maneuver	1241	-	-	-	322	872			
Mov Cap-2 Maneuver	-	-	-	-	322	-			
Stage 1	-	-	-	-	686	-			
Stage 2	-	-	-	-	589	-			
Approach	EB	WB	SB						
HCM Control Delay, s	7.1	0	23.1						
HCM LOS			C						
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1				
Capacity (veh/h)	1241	-	-	-	344				
HCM Lane V/C Ratio	0.195	-	-	-	0.427				
HCM Control Delay (s)	8.6	0	-	-	23.1				
HCM Lane LOS	A	A	-	-	C				
HCM 95th %tile Q(veh)	0.7	-	-	-	2.1				

Queuing Reports



Queuing and Blocking Report

Intersection: 2: Kmart Access/Site Access & Palmer Park Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
	L	T	R	T	R	L	T	R	T	R	L	L	TR	L	TR	L	TR	L	TR
Directions Served	49	30	52	31	31	53	124	138	28	28	192	46	46	48	56				
Maximum Queue (ft)	26	8	18	11	11	17	59	36	2	2	77	15	10	19					
Average Queue (ft)	46	29	49	35	35	46	121	92	12	12	142	34	38	47					
95th Queue (ft)	327	327	327	327	327	190	190	190	227	227	227	227	227	180					
Link Distance (ft)																			
Upstream Blk Time (%)																			
Queuing Penalty (veh)																			
Storage Bay Dist (ft)	120					75					150								
Storage Blk Time (%)							3	0											
Queuing Penalty (veh)						1	0												

Intersection: 3: Kmart Back Access/Waynoka Rd & Palmer Park Blvd

Movement	EB	NB	NB	NB	SB	SB	SB	SB
	L	L	TR	L	T	R		
Directions Served	68	31	31	61	25	45		
Maximum Queue (ft)	24	4	2	21	1	24		
Average Queue (ft)	54	22	15	49	8	44		
95th Queue (ft)	244	244	244	188	188	188		
Link Distance (ft)								
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	75			100				
Storage Blk Time (%)	0							
Queuing Penalty (veh)	0							

Intersection: 5: Waynoka Rd & South Site Access

Movement	EB	WB
	LTR	LTR
Directions Served	28	30
Maximum Queue (ft)	4	6
Average Queue (ft)	19	26
95th Queue (ft)	70	96
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 2

Queuing and Blocking Report

Intersection: 2: Kmart Access/Site Access & Palmer Park Blvd

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB	TR	TR
Directions Served	L	T	T	T	R	R	L	T	T	T	R	R	L	L	TR	L	TR	L	L	L	L	L	TR
Maximum Queue (ft)	120	127	79	52	52	72	72	160	52	51	51	192	81	192	81	165	81	165	165	165	165	165	180
Average Queue (ft)	65	52	31	11	11	19	19	65	16	11	11	85	23	85	23	68	23	68	68	68	68	68	68
95th Queue (ft)	109	108	68	36	36	51	51	134	44	37	37	161	57	161	57	136	57	136	136	136	136	136	151
Link Distance (ft)	394	394	394	394	394	394	394	238	238	238	238	227	227	227	227	180	227	180	180	180	180	180	180
Upstream Blk Time (%)												0	0	0	0	0	0	0	0	0	0	0	1
Queuing Penalty (veh)												0	0	0	0	0	0	0	0	0	0	0	0
Storage Bay Dist (ft)	120					75	75		150														
Storage Blk Time (%)	0	0	0	0	0	0	0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Queuing Penalty (veh)	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

Network Summary

Network wide Queuing Penalty: 4

Queuing and Blocking Report

Intersection: 2: Kmart Access/Site Access & Palmer Park Blvd

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
	L	T	T	R	L	L	T	T	R	L	T	L	R	L	T	L	R	L	TR
Directions Served	118	146	174	71	67	150	115	41	168	90	128	118	118	118	118	118	118	118	118
Maximum Queue (ft)	48	33	50	16	21	62	42	6	76	29	45	41	41	41	41	41	41	41	41
Average Queue (ft)	98	84	117	51	56	127	97	26	146	64	98	83	83	83	83	83	83	83	83
95th Queue (ft)	327	327	327	327	190	190	190	0	227	227	227	180	180	180	180	180	180	180	180
Link Distance (ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Upstream Blk Time (%)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Queuing Penalty (veh)	120	75	150	75	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
Storage Bay Dist (ft)	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Storage Blk Time (%)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Queuing Penalty (veh)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

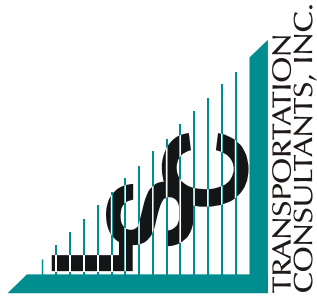
Intersection: 3: Kmart Back Access/Waynoka Rd & Palmer Park Blvd

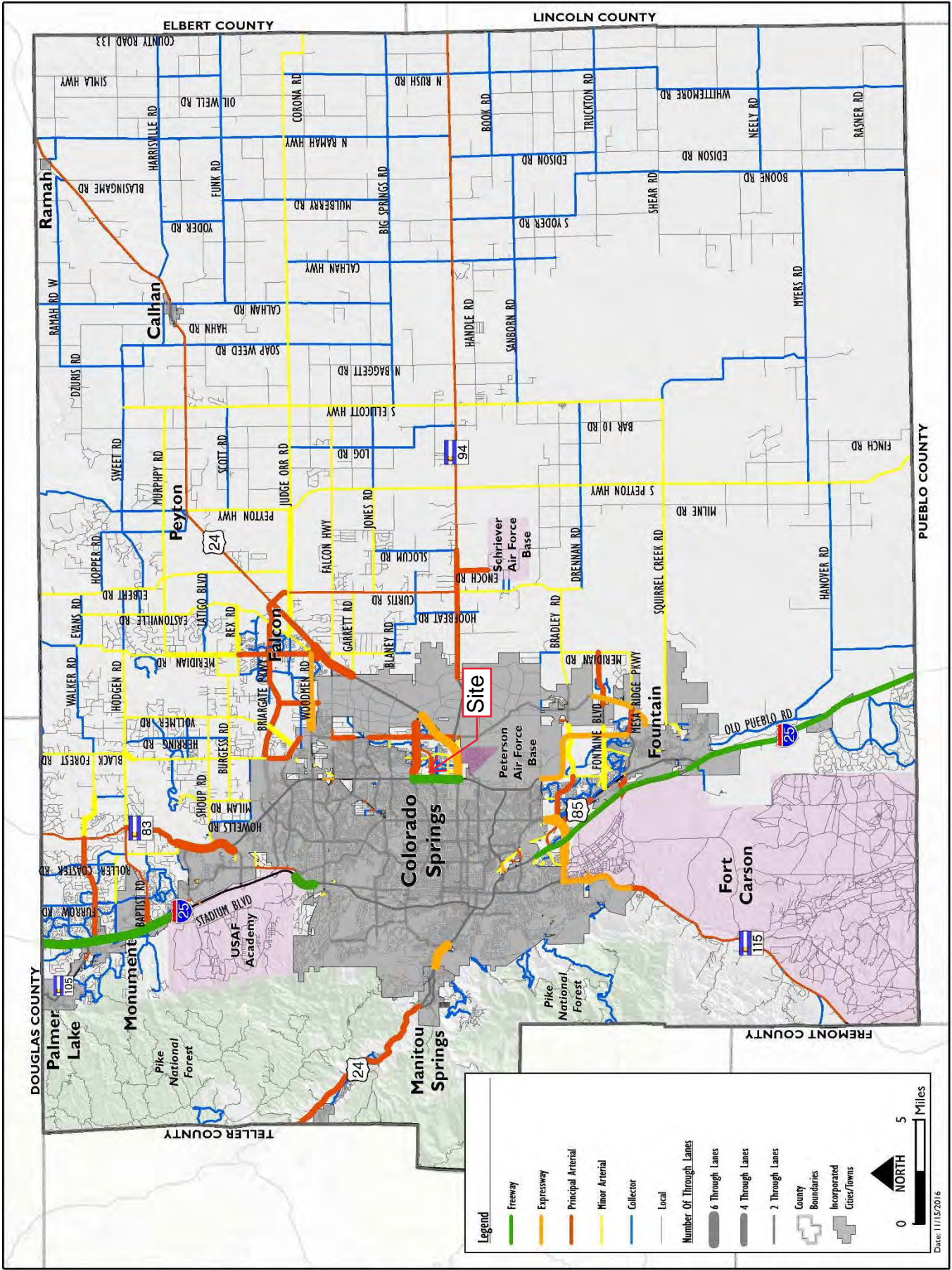
Movement	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
	L	L	T	R	L	L	TR	L	R	L	R	L	R
Directions Served	66	12	4	8	30	18	91	99	99	99	99	99	99
Maximum Queue (ft)	26	1	0	0	2	2	32	35	35	35	35	35	35
Average Queue (ft)	54	8	3	6	13	12	68	66	66	66	66	66	66
95th Queue (ft)	686	244	244	244	244	244	188	188	188	188	188	188	188
Link Distance (ft)	0	0	0	0	0	0	0	0	0	0	0	0	0
Upstream Blk Time (%)	75	50	150	150	100	100	100	100	100	100	100	100	100
Queuing Penalty (veh)	0	0	0	0	1	1	1	1	1	1	1	1	1
Storage Bay Dist (ft)	0	0	0	0	0	0	0	0	0	0	0	0	0
Storage Blk Time (%)	0	0	0	0	0	0	0	0	0	0	0	0	0
Queuing Penalty (veh)	0	0	0	0	0	0	0	0	0	0	0	0	0

Intersection: 5: Waynoka Rd & South Site Access

Movement	EB	WB	NB	SB	SB
	LTR	LTR	L	L	L
Directions Served	28	57	31	6	6
Maximum Queue (ft)	9	23	3	0	0
Average Queue (ft)	30	51	18	4	4
95th Queue (ft)	70	96	100	100	100
Link Distance (ft)	100	100	100	100	100
Upstream Blk Time (%)	100	100	100	100	100
Queuing Penalty (veh)	100	100	100	100	100
Storage Bay Dist (ft)	100	100	100	100	100
Storage Blk Time (%)	100	100	100	100	100
Queuing Penalty (veh)	100	100	100	100	100

MTCP Maps

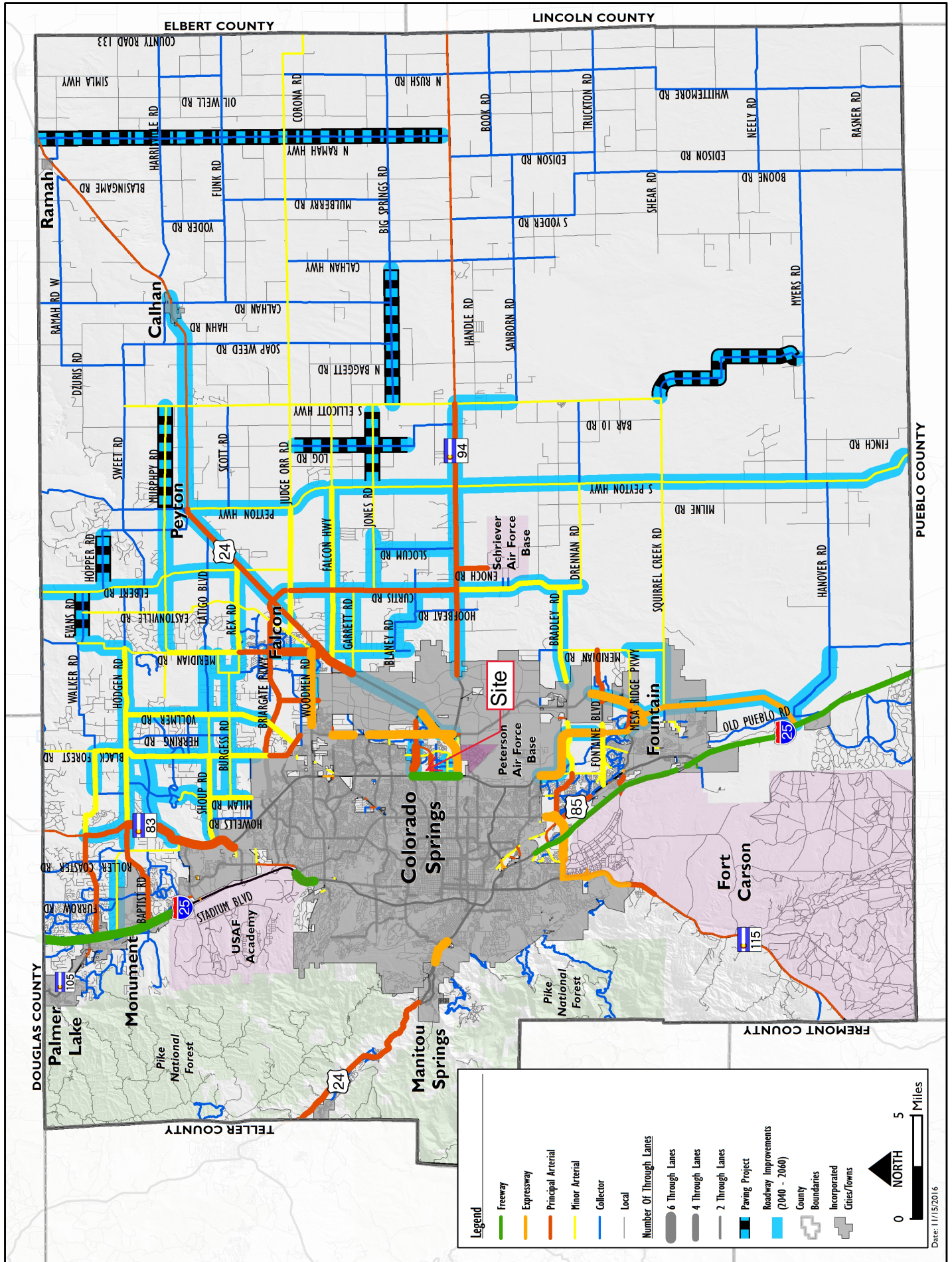




Map 14: 2040 Roadway Plan (Classification and Lanes)

Date: 11/15/2016

Map 17: 2060 Corridor Preservation



Legend

- Freeway
- Expressway
- Principal Arterial
- Minor Arterial
- Collector
- Local
- Number Of Through Lanes
- 6 Through Lanes
- 4 Through Lanes
- 2 Through Lanes
- Paving Project
- Roadway Improvements (2040 - 2060)
- County
- Boundaries
- Incorporated Cities/Towns

0 5 Miles

11/15/2016