LSC TRANSPORTATION CONSULTANTS, INC.
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1. Provide proposed classification of all proposed internal roadways with this preliminary application.
2. Provide trigger points for the construction of all required future improvements including but not limited to turn lanes, signals, widenings, and openings or closings of accesses. Identify the responsible party, cost estimates and escrow amounts.
   - State whether or not any improvements affected by the project are reimbursable under the current MTCP.
   - State whether the MTCP or other approved corridor study call for the construction of improvements in the immediate area.
   - List 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 met state the required modification so that it can be met.
3. State what the current applicable Transportation Impact Fees are and what option the developer will be selecting for payment. If the site is in a special district, so state and summarize the applicable fees.
4. Provide recommendations for the proposed roundabout geometry. (What is the minimum size for the Roundabout center island?)

Traffic Engineer's Statement

This traffic report and supporting information were prepared under my responsible charge and they comport with the standard of care. So far as is consistent with the standard of care, said report was prepared in general conformance with the criteria established by the County for traffic reports.

Jeffrey C. Hodsdon, P.E. #31684

COLORADO LICENSED JEFFREY C. HODSDON 31684 PROFESSIONAL ENGINEER

3-28-17
Date

Developer's Statement

I, the Developer, have read and will comply with all commitments made on my behalf within this report.

_____

_____
Date

Add "PCD File No: SP-17-010"

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March 28, 2017

Mr. Charles Cothern, P.E.
Dakota Springs Engineering
31 North Tejon, Suite 311
Colorado Springs, CO 80903

RE: Waterview Sketch Plan
Updated Master TIS
Springs at Waterview East
Preliminary Plan
El Paso County, Colorado
LSC #164691

Dear Charles:

In response to your request, LSC Transportation Consultants, Inc. has completed this updated master traffic impact study for the Waterview Sketch Plan Amendment and traffic impact study for the Springs at Waterview East Preliminary Plan. The sketch plan location is shown in Figure 1. The sketch plan amendment involves two separate areas of the previous sketch plan. As shown on Figure 1, the western portion of the sketch plan area to be developed is located south of Powers Boulevard west and east of Grinnell Boulevard and the eastern portion to be developed is located north and south of Bradley Road and east of Powers Boulevard. The Bluestem Prairie Open Space and vacant Waterview Sketch Plan land use parcels are located between these two areas. The county *Major Transportation Corridors Plan (MTCP)* shows a future new section of Bradley Road between Goldfield Drive and Powers Boulevard. The Waterview parcel northwest of the Powers/ Bradley intersection is located on the north side of this future Bradley Road alignment.

Site access to the western portion is proposed to Goldfield Drive, to a three-quarter movement (left-in/right-in/right-out-only) access to Grinnell Boulevard, and to a right-in/right-out-only access to Bradley Road. Site access to the eastern portion of the sketch plan is proposed to Bradley Road east and west of Powers.

REPORT CONTENTS

This updated traffic impact report presents the anticipated traffic impacts of the proposed development on the adjacent roadways and the roadway system improvements needed to mitigate the traffic impacts. The report contains the following:

- A determination of the existing traffic and roadway conditions in the vicinity of the site including the lane geometries and traffic controls

- The projected average weekday and peak-hour vehicle-trips to be generated by the two sketch plan areas
- The assignment of the projected trips on the area roadways
- Projections of the future background and resulting total traffic volumes on the area roadways
- Level of service analysis at key intersections adjacent to and in the vicinity of the site
- A traffic signal progression analysis for Bradley Road east of Powers Boulevard
- Recommendations for intersection laneage, traffic control, and street classifications

LAND USE AND ACCESS

Figure 2 shows the Waterview Sketch Plan Amendment areas. The amendment involves west and east areas. The specific areas included in the study are shown in the red border on the figures. These include areas of amendment as well as sketch plan areas not proposed for amendment but not yet developed. Figure 2 also shows the areas of the sketch plan that have changed since completion of the *Waterview Sketch Plan Amendment Updated Master Traffic Impact Study* dated July 28, 2014 and a technical memorandum to accompany two deviation request dated February 6, 2015. This report replaces both prior reports.

West Area

West of Grinnell Boulevard

No changes are proposed to the land use and access shown in the 2014 report and memorandum for the parcels located south of Powers Boulevard, north of Bradley Road, and west of Grinnell Boulevard. These parcels are planned to be developed for multi-family uses. Access to these parcels is proposed via an extension of Goldfield Drive west of Grinnell Boulevard, a potential right-in/right-out-only access to Grinnell Boulevard between Powers Boulevard and Goldfield Drive and a potential right-in/right-out on Bradley Road west of Grinnell. A connection would be provided to the Hassell property to the north.

East of Grinnell Boulevard

Previously planned commercial and multi-family residential development parcels southeast of Grinnell and Goldfield have been replaced with one single-family residential (Springs at Waterviews) site on the current Sketch Plan Amendment. The commercial parcel southeast of Powers/Grinnell will remain as is on the Sketch Plan. Access to these planned developments is proposed from Goldfield Drive. Also, as shown in the 2014 report and approved through a deviation, a three-quarter movement (left-in/right-in/right-out-only) access to Grinnell Boulevard is planned for the commercial parcel located northeast of the intersection of Grinnell Boulevard and Goldfield Drive. The approved access location is 725 feet north of Goldfield Drive (centerline spacing). With this Sketch Plan Amendment, an additional three-quarter movement access is now proposed to Bradley Road.

Parcel 5 was previously planned to contain multi-family housing and Parcel 6 was previously planned to be developed with commercial uses. These two parcels are now planned to be combined and developed with 120 lots for single-family homes. Primary access to these parcels would be to

Escanaba Drive. An additional three-quarter movement access to Bradley Road has been approved about 505 feet east of Grinnell Boulevard. There is an existing access at this location for a pump station. The pump station access would be reconfigured to provide access from a new north/south internal street.

Parcel 7 is planned to be developed with commercial uses. As shown in the 2014 report, Parcel 7 was assumed to contain two restaurants, a gas station with a convenience store, a bank, and about 122,000 square feet of retail floor space. In addition to the proposed three-quarter access to Grinnell, access to this parcel would be via two full-movement access points to Cudahy Drive. The first access is about 400 feet south of Dancing Sun Way and the second access would form the west leg of the intersection of Cudahy/Dancing Sun Way. **Due to intersection spacing limitations, there can be no access to Goldfield.**

Since completion of the 2014 report the residential areas of the Painted Sky at Waterview have been almost entirely built out. At the time the updated traffic counts were conducted there were about 15 lots with homes either under construction (or recently constructed and unoccupied) in the northeast corner of that development.

East Area

West of Powers Boulevard

Parcel 16 is a vacant commercial development parcel of about 30 acres. Access would not be to Powers Boulevard, but rather would need to be to the future Bradley Road connection between Goldfield and Powers. No changes are proposed to Parcel 16.

East of Powers Boulevard

No changes are proposed to general land use for Parcels 14, 15, 17, and 18, which are located east of Powers Boulevard north and south of Bradley Road. Parcel 14 is planned to be developed for industrial/warehouse land uses. Parcels 15 and 17, located north and south of Bradley Road, respectively, and just east of Powers Boulevard, are planned to be developed for commercial uses. Parcel 18 is the site of the proposed Springs at Waterview East Preliminary Plan for single-family residential development. The 2014 study assumed a land use of 785 lots for single-family homes for this parcel based on a density of 4.5 dwellings per acre. Since completion of that report a conceptual site plan has been prepared. The Preliminary Plan application is for 680 single-family homes. The site plan is shown in Figure 3.

The 2014 study showed primary access to these parcels via a full-movement site intersection to Bradley Road about 2,000 feet east of Powers Boulevard and an additional right-in/right-out-only access to Bradley Road about 800 feet east of Powers Boulevard. The 2015 technical memorandum presented a proposed revision to these access points to show the full-movement access 800 feet east of Powers Boulevard and the right-in/right-out switched to the location 2,000 feet east of Powers Boulevard. Based on comments received from the Colorado Department of Transportation (CDOT) and a more recent meeting with CDOT, the proposed location of the full-movement access point is now being proposed at a location about 1,030 feet east of Powers Boulevard. The

right-in/right-out access point is now proposed at a location about 1,300 feet east of the full-movement access.

ROADWAY AND TRAFFIC CONDITIONS

Area Roadways

Figure 1 shows the roadways in the vicinity of the two sites. The major roadways are identified below, followed by a brief description.

- **Powers Boulevard (State Highway 21)** is classified as a Freeway (FW). Powers Boulevard is one of the region's main north/south corridors. Powers Boulevard has a center median and a posted speed limit of 60 miles per hour (mph) north of Crestera Parkway. South of this point the posted speed limit is 65 mph. Powers Boulevard is ultimately planned to be converted to a Freeway with grade-separated intersections.

- **Bradley Road** is shown with a Minor Arterial classification east of Grinnell Boulevard on the 2016 update to the DRAFT 2040 *El Paso County Major Transportation Corridors Plan (MTCP).* East of Grinnell Boulevard to Goldfield Drive, Bradley Road has been upgraded to a two-lane Urban Residential Collector rural cross section. West of Grinnell Boulevard, Bradley Road is a four-lane roadway with a 40-mph posted speed limit and has a raised median, left-turn lanes, and rural paved shoulders.

- **Grinnell Boulevard** is shown as a Minor Arterial on the 2016 DRAFT *2040 El Paso County MTCP Update*. Grinnell Boulevard extends south from Powers Boulevard to Fontaine Boulevard and has a 40-mph posted speed limit (50 mph south of Bradley). The roadway is a median-divided, four-lane facility (plus auxiliary turn lanes) south of Bradley Road. North of Bradley, the roadway transitions to an interim two-lane roadway with auxiliary turn lanes at the Goldfield Drive intersection and the Powers intersection.

- **Goldfield Drive** has been constructed within the Painted Sky at Waterview development between Grinnell Boulevard and Bradley Road. The Grinnell Boulevard/Goldfield Drive intersection is currently unsignalized. Right-turn and left-turn deceleration lanes have been constructed on Grinnell Boulevard at the intersection. Goldfield Drive is classified as a Non-Residential Collector for the first 700 feet east of Grinnell. Between this point and Bradley to the southeast it is classified as a Residential Collector.

Existing Traffic Conditions

Figure 4w shows the existing traffic volumes at the Powers Boulevard/Grinnell Boulevard, Grinnell Boulevard/Goldfield Drive, and Bradley Road/Grinnell Boulevard intersections. The traffic volumes are based on the attached traffic counts conducted by LSC in August and September 2016. Figure 4e shows the existing traffic volumes at the Powers Boulevard/Bradley Road intersection. The traffic volumes are from the attached traffic counts conducted by LSC in October 2016.

Figures 4w and 4e also show the existing lane geometries and traffic controls at the analyzed intersections. The Powers Boulevard/Grinnell Boulevard intersection is traffic signal controlled. The Goldfield Drive/Grinnell Boulevard and Powers Boulevard/Bradley Road intersections are two-way Stop-sign controlled however, based on information provided by the Colorado Department of Transportation, the intersection of Powers Boulevard/Bradley Road is planned to be converted to traffic signal control in the short-term future. The Bradley Road/Grinnell Boulevard intersection is all-way, Stop-sign controlled.

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
	Control Delay (seconds per vehicle)	
A	less than 10 sec	less than 10 sec
B	10-20 sec	10-15 sec
C	20-35 sec	15-25 sec
D	35-55 sec	25-35 sec
E	55-80 sec	35-50 sec
F	greater than 80 sec	greater than 50 sec

The intersections of Powers/Bradley and Goldfield/Grinnell were analyzed to determine the existing levels of service based on the unsignalized method of analysis procedures from the *Highway Capacity Manual (HCM), 2010 Edition* by the Transportation Research Board. As the intersection of Powers/Bradley is planned to be signalized in the short-term future, this intersection was also analyzed using Synchro. The traffic signal-controlled Powers/Grinnell intersection was analyzed using Synchro. The intersection of Bradley Road/Grinnell Boulevard is currently all-way Stop-sign controlled. The HCM 2010 procedure for all-way Stop-sign-controlled intersections is limited to three approach lanes. As the southbound approach at Bradley/Grinnell currently has four approach lanes, it was analyzed using Synchro/SimTraffic. The simulation was run five times and the average stop delay per vehicle for each lane was averaged over the five runs and compared to the control delay listed in Table 1. Figures 4w and 4e show the level of service analysis results. The analyzed intersections are currently operating at satisfactory levels of service. The level of service reports are attached.

SHORT-TERM (2017) BACKGROUND TRAFFIC

Background traffic is the traffic estimated to be on the adjacent roadways without consideration of the proposed development traffic. Background traffic includes the through traffic and the traffic generated by adjacent developments but assumes zero traffic generated by the future sketch plan amendment development areas. Figures 5w and 5e show the estimated 2017 background traffic volumes for the western and eastern portions of the sketch plan area, respectively. These volumes assume buildout of Painted Sky at Waterview Filings No. 1 through Filing No. 7. In August and September 2016 when the traffic counts were conducted at the nearby intersections, there were about 15 lots with homes either under construction (or recently constructed and unoccupied) in the northeast corner of that development. The 2017 background traffic volumes were developed by first applying a three-percent-per-year growth rate to non-Painted Sky at Waterview traffic on the adjacent roadways and intersections. Estimates of traffic to be generated by completion of the Painted Sky at Waterview Filing Nos. 3 through 7 were then added to the baseline non-Waterview traffic on the adjacent street system.

2040 BACKGROUND TRAFFIC

The background traffic volumes for the year 2040 are shown on Figures 6w and 6e for the western and eastern portions of the sketch plan area, respectively. The 2040 background traffic volumes were based in part on the forecasted traffic volumes from the *El Paso County MTCP* 2040 Transportation Model. Recent adjustments to the prior volumes have been made based on 2040 projected volumes for Bradley Road shown in the DRAFT 2016 MTCP Update and volumes estimated as part of the Marksheffel South Corridor Preservation Plan Study. Background traffic volumes also include traffic volumes from properties west of Powers north of the Grinnell intersection including the Hassell property. Appendix Table 1 shows the land uses and trip generation estimate assumed for the Hassell property. It has been assumed that if the level of traffic shown is realized, there would be some level of secondary access connection on the north end of these properties.

TRIP GENERATION

The traffic volumes to be generated by the parcels within the sketch plan amendment areas have been estimated using the nationally published trip generation rates from *Trip Generation, 9th Edition,* by the Institute of Transportation Engineers (ITE). Table 2 shows the average weekday and weekday morning and afternoon peak hour. The results of the weekday trip generation estimate for the sketch plan areas are shown in Table 2.

The 2014 study assumed the traffic to be generated by 54 lots for single-family homes in Filing 7 of Painted Sky at Waterview to be “site-generated traffic.” As these lots have all now been approved and mostly constructed, the additional traffic due to the completion of the remaining 15 homes is included as background traffic in this report.

The total number of vehicle-trips generated by the commercial parcels was reduced to account for the pass-by phenomenon. A pass-by trip is made by a motorist who would already be on the roadway system regardless of the 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. The pass-by percentages for each use were taken from *Trip Generation Handbook, 2nd Edition, June 2004*, by ITE.

TRIP DISTRIBUTION AND ASSIGNMENT

The directional distribution of the site-generated traffic volumes on the adjacent roadway system is one of the most important factors in determining the traffic impacts of the site. Table 3 shows the short-term and long-term directional distributions by parcel. The short-term directional distribution estimates were based on the existing area roadway system and the traffic counts. The long-term directional distribution estimates were based on the anticipated regional development and future roadway networks.

When the distribution percentages (from Table 3) are applied to the trip generation estimates (from Table 2), the resulting site-generated traffic volumes can be determined. Site-generated traffic includes the areas proposed for the sketch plan amendment only. Undeveloped lots previously approved for Painted Sky at Waterview have been included in the background traffic. Figure 7w shows the short-term site-generated traffic volume estimates at the intersections within the western area of the Sketch Plan. Figure 7e shows the short-term site-generated traffic volume at key intersections within the eastern portion of the sketch plan area.

Figure 8w shows the long-term site-generated traffic volume estimates at key intersections within the western area of the sketch plan. Figure 8e shows the long-term site-generated traffic volume estimates at key intersections within the eastern portion of the sketch plan area.

2017 TOTAL TRAFFIC

Figure 9w shows the 2017 total traffic volumes at the key intersections in the western portion of the sketch plan area. These traffic volumes are the sum of the 2017 background traffic volumes (from Figure 5w) plus the short-term site-generated traffic volumes (from Figure 7w). Figure 9e shows the 2017 total traffic volumes at the key intersections in the eastern portion of the sketch plan area. These traffic volumes are the sum of the 2017 background traffic volumes (from Figure 5e) plus the short-term site-generated traffic volumes (from Figure 7e). These volumes have been used in the short-term traffic analysis.

2040 TOTAL TRAFFIC

Figure 10w shows the 2040 total traffic volumes at the key intersections in the western portion of the sketch plan area. These traffic volumes are the sum of the 2040 background traffic volumes (from Figure 6w) plus the long-term site-generated traffic volumes (from Figure 8w). Figure 10e shows the 2040 total traffic volumes at the key intersections in the eastern portion of the sketch plan area. These traffic volumes are the sum of the 2040 background traffic volumes (from Figure 6e) plus the long-term site-generated traffic volumes (from Figure 8e).

PROJECTED LEVELS OF SERVICE

The intersections of Grinnell Boulevard/Powers Boulevard, Bradley Road/Powers Boulevard, Grinnell Boulevard/Goldfield Drive, Goldfield Drive/Cudahy Drive, the proposed three-quarter movement access point to Grinnell Boulevard, and the proposed access points to Bradley Road have been analyzed to determine the projected levels of service for the 2017 background, 2017 total, 2040 background, and 2040 total traffic volumes based on the signalized and unsignalized method of analysis procedures found in Synchro and the *Highway Capacity Manual, 2010 Edition* by the Transportation Research Board, respectively. Figures 4w/e, 5w/e, 6w/e, 9w/e, and 10w/e show the level of service analysis results. The level of service reports are attached.

West Intersections

The intersection of Powers/Grinnell is projected to operate at a satisfactory level of service as a signalized intersection based on projected 2017 and 2040 total traffic volumes.

All movements at the proposed three-quarter-movement access point to Grinnell Boulevard are projected to operate at an acceptable level of service based on projected 2017 and 2040 total traffic volumes.

The westbound left-turn movement at the intersection of Goldfield Drive/Grinnell Boulevard is projected to operate at LOS D during the morning peak hour and LOS E during the afternoon peak hour based on projected 2017 total traffic volumes. This intersection is planned to be signalized once warrants are met. Once signalized, this intersection would operate at an acceptable level of service.

All movements at the intersection of Goldfield/Escanaba are projected to operate at an acceptable level of service based on projected 2017 and 2040 total traffic volumes.

East Intersections

The intersection of Powers/Bradley is currently Stop-sign controlled, however it is planned to be signalized in the near future. Once signalized, this intersection is projected to operate at a satisfactory level of service based on 2017 total traffic volumes. By 2040 some of the minor movements are projected to operate at LOS E during the peak hours. It is common for left-turn and side-street through movements to have projected delays in the LOS E range as signal coordination timing plans generally give priority to moving through traffic. This often results in higher delay for left-turn and side-street movements and can result in movement/approach delays in the E range even though they are projected to have sufficient capacity for the projected traffic volumes. Note: This intersection is planned to be converted to a grade-separated interchange in the future.

The intersection of Marksheffel/Bradley is projected to continue to operate at an overall satisfactory level of service based on projected 2040 total traffic volumes, however some movements at this intersection are projected to operate at LOS E during peak hours.

Clarify. There is no southbound right-turn at the RI/RO.

The proposed ey Road is projected to operate at a satisfactory level of service as a signalized intersection based on projected 2017 and 2040 total traffic volumes. By 2040, some of the movements at this intersection are projected to operate at LOS E during peak hours. A modern roundabout could also be considered for this intersection, although the effect on Bradley Road signal progression would need to be evaluated.

The proposed right-in/right-out-only access to Bradley Road is projected to operate at a satisfactory level of service based on projected 2017 total traffic volumes. By 2040, the southbound right-turn movement at this access is shown by SimTraffic simulation analysis to operate at LOS E during the afternoon peak hour. However, LOS D or better could be achieved by reducing the southbound right-turn volume through site design (shifting traffic demand to the signalized intersection to the east) or using an alternate design for laneage between the access and Powers. This could be addressed at the time of site development.

QUEUING ANALYSIS

A queuing analysis was performed using Synchro/SimTraffic to determine the maximum vehicle queue lengths that can be expected in the vicinity of the site. The 2040 total peak-hour traffic volumes, lane geometry, and signal timings were entered in the model and the simulation was run five times. The queuing reports are attached.

The projected northbound left-turn queue on Grinnell approaching Powers is 289 feet during the morning peak hour and 321 feet during the afternoon peak hour.

The projected southbound left-turn queue on Grinnell approaching the proposed three-quarter movement site access is 105 feet during the morning peak hour and 141 feet during the afternoon peak hour.

TRAFFIC SIGNAL PROGRESSION ANALYSIS

LSC has completed an analysis of the traffic signal progression along Bradley Road assuming the proposed signalized, full-movement access location 1,030 feet east of Powers. This analysis includes the potential extension of Bradley Road to the east, which would introduce east and west straight through movement across Powers. Until such time as Bradley is extended west of Powers (which would be in the future on an as-needed basis) there would be no straight through movements/progression bands across Powers to consider.

Two separate analyses have been completed. The first considers progression of vehicles through the Powers/Bradley and Bradley/site access intersections only. The second analysis presents a Bradley Road arterial progression from Powers through Marksheffel.

First Analysis

The first analysis looks at the potential for good efficiency with the coordination of vehicle movement through the Powers/Bradley and Bradley/site access intersections only. This has been analyzed should the County and CDOT decide to have CDOT coordinate these two signals

together with the City separately operating Bradley signals to the east at Foreign Trade Zone/ Bradley and Marksheffel/Bradley.

The progression bands through these two signals are shown in two related exhibits. The time/space diagram in Exhibit 1A shows the first component—progression bands for through movements east and west across Powers and through the proposed access. As shown by the bands the east/west through green time across Powers would likely be limited even if a future fourth and west leg of the Powers/Bradley intersection is added. The signal green time will likely be more heavily allocated to the priority north/south through movements on Powers and the southbound left turn. Exhibit 1B shows the second component—the "route" progression bands to/from Powers north of Bradley. The diagram shows the "route" band for the heavy southbound left turn from Powers followed by the eastbound movement through the proposed Waterview intersection (at 1,030 feet east of Powers). The westbound band is not restricted by the Powers intersection as in the westbound direction traffic has a free right onto northbound Powers.

As shown, good progression could be achieved east/west straight through both intersections. Good coordination also would be possible for the southbound left followed by the straight through at the Waterview signal. This is a site-specific situation given the significantly lower volumes projected for Bradley (if ever extended) west of Powers (compared to Bradley east of Powers) and the projected heavy southbound left from Powers followed by the eastbound through movement at the proposed Waterview signalized intersection. Effective coordination would be possible due to the relatively close proximity of the two signals.

Second Analysis

The second analysis presents a Bradley Road arterial progression that includes a future signal at the proposed Waterview full-movement access as well as a future signal at the Foreign Trade Zone/ Bradley intersection and the existing signal at the Bradley/Marksheffel intersection. This analysis is shown in Exhibit 2A. This analysis assumes a 50-mile-per-hour (mph) progression speed and a 130-second cycle. Good progression bands are shown. Eastbound would have a progression efficiency of 33 percent. Westbound would have a progression efficiency of 27 percent due to the limited westbound through green at the Marksheffel intersection. The westbound through movement is shown limited because of the combination of projected volumes on "competing" approaches and left turning movements. These include a projected future heavy opposing eastbound left-turn movement volume and north/south through and left volumes on Marksheffel.

Exhibit 2A shows Bradley progression bands without including the Powers Boulevard intersection. The reason is the east/west through green time across Powers would likely be limited even if a future fourth and west leg of the Powers/Bradley intersection is added. The signal green time will likely be heavily allocated to the priority north/south movements on Powers. The southbound left-turn movements especially and the eastbound left-turn movements will also require significant green allocation to serve the projected volumes. Exhibit 2B shows the progression analysis from Exhibit 2A, but with the Powers intersection added. For this analysis, the southbound left turn at the Powers intersection was set to be included as part of the eastbound bands on Bradley Road and the offset was positioned to show how the southbound left turn could be coordinated with the signals to the east along Bradley Road. Alternatively, the analysis showing through bands across Powers are

shown in Exhibit 2C. Powers could be considered a break point in the east/west through progression as achieving a wide through bandwidth across Powers is not realistic or expected by motorists.

CONCEPTUAL LANE EXHIBIT (EAST SIDE)

Figures 11 and 12 present to-scale conceptual lane exhibits. These exhibits have been prepared to depict the recommended short- and long-term auxiliary turn lane and center median configuration at the west Waterview access point and between this intersection and Powers.

Figure 11 shows the short-term recommended laneage. This assumes no fourth leg of the Powers/ Bradley intersection and the Waterview parcel northeast of Bradley and Powers not yet developed. It assumes development southeast of Bradley and Powers and the proposed Waterview access 1,030 feet east of Powers extended south of Bradley (but not yet north of Bradley).

Figure 12 shows the long-term recommended laneage at buildout of the Sketch Plan. Although the lanes on the west side of Powers are not shown on the figure, the lanes on the east leg have been drawn assuming the possible future west leg of Powers/Bradley in place. This has been included so that sufficient width is reserved in case a west leg of Bradley/Powers is ever built. If needed in the future, Bradley Road between Goldfield and Powers is planned to be a two-lane Collector street. Figure 12 shows multiple east/west through lanes on the east leg of the Bradley/Powers intersection in case multiple through lanes on the eastbound and westbound intersection approaches to Powers are needed for signalized intersection capacity. There would be a transition/ reduction to two through lanes on Bradley west of the intersection.

POWERS NORTHBOUND RIGHT-TURN MOVEMENT

The northbound right-turn lane on Powers at Bradley Road is currently a channelized right-turn lane into an acceleration lane on eastbound Bradley Road. Figures 11 and 12 show no changes to this current configuration except the right-turn acceleration lane would end as an eastbound right-turn lane at the proposed site access instead of the current transition taper. Once the Waterview parcel on the north side of Bradley Road begins to develop, the eastbound left-turn lane would be added on Bradley Road to the west of the proposed Waterview intersection in the median section between Powers and this intersection. Motorists traveling to the north-side Waterview development from northbound Powers would turn right onto Bradley Road then left at the Waterview intersection 1,030 feet east of Powers. For the foreseeable future, with Powers/Bradley remaining a T-intersection, except for the period of time during the southbound-to-eastbound left-turn signal phase, there will be no traffic conflicts for motorists wanting to complete this combination of turning movements to enter the Waterview north-side parcel. If such a motorist arrives at the northbound approach to Powers/Bradley during the period of the southbound left-turn green phase, it is more likely that the driver will pause and wait for the left turning traffic to pass and turn into the through lanes of Bradley then the eastbound left-turn lanes rather than attempting a weaving maneuver using the eastbound right-turn acceleration lane. The design details of the northbound right-turn treatment can be evaluated with the development of the north-side Waterview parcel.

SIGHT DISTANCE

Intersection/Access Sight Distance Analysis

Figure 13 shows the sight distance analysis for the Bradley Road access points east of Powers Boulevard.

CONCEPTUAL LANE EXHIBIT (WEST SIDE)

Long-Term Recommendations

Street improvements in the Waterview Sketch Plan area include upgrades of Grinnell Boulevard to a four-lane Minor Arterial with right-turn and left-turn lanes at the intersections. Figure 15 shows the anticipated long-term intersection lane geometry and traffic controls adjacent to the future commercial site. These include the spacing of the approved Grinnell three-quarter movement site access north to Powers Boulevard and south to Goldfield Drive and the recommended lengths for northbound right-turn deceleration lanes and southbound left-turn lanes on Grinnell. These are based on an assumed 40-mph posted speed limit between Bradley and Powers. The analysis assumes Powers Boulevard is widened to three through lanes in each direction.

The spacing of the planned future three-quarter-movement access to the commercial center previously approved by deviation is shown at a location 985 feet south of Powers Boulevard. The exact location and resulting spacing from Powers Boulevard could be adjusted in the future with the Preliminary Plan for this parcel as needed to address CDOT concerns regarding the spacing from the future Powers Grinnell ramp interchange intersection. An adjustment may not be necessary because the conceptual Powers/Grinell interchange southbound (actually eastbound) on-ramp may need to be shifted north as it appears to pass through developed properties.

Regarding the potential future segment of Bradley Road between Powers Boulevard and Goldfield Drive, a BOCC resolution approved a 90-foot right-of-way Collector for this segment. Although the current DRAFT 2016 MTCP Update shows this segment with a classification of "Minor Arterial," it is shown as a two-lane Minor Arterial. Therefore, the street cross section/laneage and right-of-way are likely intended to match the resolution although the MTCP update proposes an arterial classification rather than a collector. LSC would suggest clarification in this Sketch Plan Amendment to the effect that if Bradley is classified as an arterial, that access spacing and type to the Sketch-Plan-designated commercial parcel northwest of Powers/Bradley be consistent with that approved with the BOCC resolution or allowable under the Collector classification designated with the resolution. Note: Two through lanes eastbound/westbound are shown at the intersection with Powers, however the intent is four through lanes at the intersection would transition to two through lanes just west of Powers.

DEVIATION REQUEST FORMS

Two El Paso County deviation request forms for the two Waterview Sketch Plan access points to Bradley Road east of Powers have been prepared to accompany this report. This report supports the currently proposed Sketch Plan Amendment by presenting and analyzing the proposed change

to the access plan shown on the approved 2014 Waterview Sketch Plan Amendment (and the traffic impact analysis by LSC dated July 24, 2014). The two deviation forms are required as the proposed access spacing is shorter than the one-half mile prescribed by the ECM. This 2016 report and accompanying deviation forms supersede the February 6, 2015 Technical Memorandum entitled *Waterview Sketch Plan – Bradley Road Access.*

The number of Waterview planned access points to Bradley Road would remain the same at two, but the full-movement access is now proposed to be located 1,030 feet east of Powers and the right-in/right-out access would be switched to the location 2,350 feet east of Powers (centerline spacing). The deviation forms present the reasons and justification for the access point spacing as currently requested and summarize the technical findings developed in this report.

INTERNAL STREET CLASSIFICATIONS

The street classifications for the Springs at Waterview East streets will be confirmed with the plat submittals, however the main entry drive extending south from the proposed full-movement access to Bradley to the proposed roundabout and southwest along the commercial parcel would be classified as Urban Non-Residential Collector streets. The main street through the project extending southeast from the roundabout to the adjacent property to the east will be an Urban Residential Collector. All other streets are expected to be classified as Urban Local or Urban Local Low Volume. The local-level street classifications will be detailed with the plat submittals.

* * * * *

Please contact me if you have any questions regarding this repo

Submit the recommendations with the TIS associated with the Preliminary Plan.

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.

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

JCH:KDF:bjwb

Enclosures: Tables 2 and 3
Figures 1-15
Appendix Table 1
Exhibits 1A-1B, 2A-2C
Traffic Count Reports
Level of Services Reports

Table 2
Trip Generation Estimate
Waterview East

Parcel	Filing	Land Use Code	Land Use Description	Area (Acres)	F.A.R. or D.U./Acre	Trip Generation Units: Existing	Trip Generation Units: Future	Unit	Trip Generation Rates [1]: Average Weekday Traffic	Morning Peak-Hour: In	Morning Peak-Hour: Out	Afternoon Peak-Hour: In	Afternoon Peak-Hour: Out	Total Future Trips Generated: Average Weekday Traffic	Morning Peak-Hour: In	Morning Peak-Hour: Out	Afternoon Peak-Hour: In	Afternoon Peak-Hour: Out	Pass-by Trip Percent[2]	Total Future "External" Trips Generated Average Weekday
Existing/Approved Land Uses																				
8	Fil. 1	210	Single-Family Detached Housing (Painted Sky)	50.6	- - -	127	0	DU[3]	9.52	0.19	0.56	0.63	0.37	0	0	0	0	0	0%	0
	Fil. 2	210	Single-Family Detached Housing (Painted Sky)		- - -	74	0	DU	9.52	0.19	0.56	0.63	0.37	0	0	0	0	0	0%	0
9		- - -	Park/Drainage	5	- - -	0	5	acres	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
10	Fil. 3	210	Single-Family Detached Housing (Painted Sky)	105.8	- - -	79	0	DU	9.52	0.19	0.56	0.63	0.37	0	0	0	0	0	0%	0
	Fil. 4	210	Single-Family Detached Housing (Painted Sky)		- - -	91	0	DU	9.52	0.19	0.56	0.63	0.37	0	0	0	0	0	0%	0
	Fil. 5	210	Single-Family Detached Housing (Painted Sky)		- - -	93	0	DU	9.52	0.19	0.56	0.63	0.37	0	0	0	0	0	0%	0
	Fil. 6	210	Single-Family Detached Housing (Painted Sky)		- - -	111	0	DU	9.52	0.19	0.56	0.63	0.37	0	0	0	0	0	0%	0
	Fil. 7	210	Single-Family Detached Housing (Painted Sky)		- - -	53	0	DU	9.52	0.19	0.56	0.63	0.37	0	0	0	0	0	0%	0
11	Fil. 7[4]	210	Single-Family Detached Housing	10	5	37	15	DU	9.52	0.19	0.56	0.63	0.37	143	3	8	9	6	0%	143
12		- - -	Open Space/Drainage	5.1	- - -	0	5.1	acres	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
									Total Approved Land Uses Yet to Be Constructed					143	3	8	9	6		143
Trip Generation Estimate Based on The Currently Proposed Sketch Plan Land Uses																				
West of Grinnell St.																				
1		230	Residential Condominium/Townhouse	8.7	12	0	104	DU	5.81	0.07	0.37	0.35	0.17	604	8	38	36	18	0%	604
2		- - -	Open Space/Drainage	22.1	- - -	0	22.1	acres	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
3		230	Residential Condominium/Townhouse	19.8	12	0	238	DU	5.81	0.07	0.37	0.35	0.17	1,383	18	87	83	41	0%	1,383
East of Grinnell St.																				
5		210	Single-Family Detached Housing	15.4	7.8	0	120	DU	9.52	0.19	0.56	0.63	0.37	1,142	23	68	76	44	0%	1,142
6		820	Shopping Center	0	0.23	0	0	KSF[5]	57.36	0.80	0.49	2.45	2.77	0	0	0	0	0	34%	0
7		820	Shopping Center	18.7	- - -	0	122	KSF	57.36	0.80	0.49	2.45	2.77	6,979	97	60	298	337	34%	4,606
		932	High-Turnover (Sit-Down) Restaurant			0	10.4	KSF	127.15	5.95	4.86	5.91	3.94	1,322	51	61	41	41	43%	754
		912	Drive-in Bank			0	3	DIL[6]	139.25	5.57	3.72	16.29	16.95	418	17	11	49	51	47%	221
		945	Gasoline/Service Station with Convenience Market			0	10	VFP[7]	162.78	5.08	5.08	6.76	6.76	1,628	51	51	68	68	56%	716
East of Powers Blvd.																				
14		110	General Light Industrial	81.2	- - -	0	27.1	acres	51.80	6.23	1.28	1.60	5.66	1,404	169	35	43	153	0%	1,404
		120	General Heavy Industrial		- - -	0	27.1	acres	6.75	1.62	0.36	0.45	1.71	183	44	10	12	46	0%	183
		150	Warehousing		- - -	0	27.0	acres	56.86	6.77	2.63	3.00	5.56	1,535	183	71	81	150	0%	1,535
15		820	Shopping Center	34.7	0.16	0	242	KSF	49.84	0.68	0.42	2.15	2.42	12,062	166	102	520	587	34%	7,961
17		820	Shopping Center	21.2	0.16	0	148	KSF	59.20	0.83	0.51	2.53	2.85	8,762	123	75	374	422	34%	5,783
18		210	Single-Family Detached Housing	174.4	4.8	0	840	DU	9.52	0.19	0.56	0.63	0.37	7,997	158	473	529	311	0%	7,997
West of Powers Blvd.																				
13		- - -	Open Space/Drainage	78.3	- - -	0	78.3	acres	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
16		820	Shopping Center	30	0.18	0	235	KSF	50.36	0.69	0.42	2.17	2.45	11,834	163	100	510	575	34%	7,810
									Total Trip Generation Estimate Based on Currently Proposed Sketch Plan Land Uses					57,253	1,268	1,240	2,720	2,843		42,099
Trip Generation Estimate shown in the *Waterveiw Sketch Plan Amendment Updated Master Traffic Impact Study* by LSC dated July 28, 2014																				
West Area																				
West of Grinnell St.																				
1		230	Residential Condominium/Townhouse	8.7	12	0	104	DU	5.81	0.07	0.37	0.35	0.17	604	8	38	36	18	0%	604
2		- - -	Open Space/Drainage	22.1	- - -	0	22.1	acres	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
3		230	Residential Condominium/Townhouse	19.8	12	0	238	DU	5.81	0.07	0.37	0.35	0.17	1,383	18	87	83	41	0%	1,383
East of Grinnell St.																				
5		230	Residential Condominium/Townhouse	11.4	12	0	137	DU	5.81	0.07	0.37	0.35	0.17	796	10	50	48	24	0%	796
6		820	Shopping Center	4	0.23	0	40	KSF	57.36	0.80	0.49	2.45	2.77	2,294	32	20	98	111	34%	1,514
7		820	Shopping Center	18.7	- - -	0	122	KSF	57.36	0.80	0.49	2.45	2.77	6,979	97	60	298	337	34%	4,606
		932	High-Turnover (Sit-Down) Restaurant			0	10.4	KSF	127.15	5.95	4.86	5.91	3.94	1,322	51	61	41	41	43%	754
		912	Drive-in Bank			0	3	DIL	139.25	5.57	3.72	16.29	16.95	418	17	11	49	51	47%	221
		945	Gasoline/Service Station with Convenience Market			0	10	VFP	162.78	5.08	5.08	6.76	6.76	1,628	51	51	68	68	56%	716
12		- - -	Open Space/Drainage	5.1	- - -	0	5.1	acres	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
East Area																				
East of Powers Blvd.																				
14		110	General Light Industrial	81.2	- - -	0	27.1	acres	51.80	6.23	1.28	1.60	5.66	1,404	169	35	43	153	0%	1,404
		120	General Heavy Industrial		- - -	0	27.1	acres	6.75	1.62	0.36	0.45	1.71	183	44	10	12	46	0%	183
		150	Warehousing		- - -	0	27.0	acres	56.86	6.77	2.63	3.00	5.56	1,535	183	71	81	150	0%	1,535
15		820	Shopping Center	34.7	0.16	0	242	KSF	49.84	0.68	0.42	2.15	2.42	12,062	166	102	520	587	34%	7,961
17		820	Shopping Center	21.2	0.16	0	148	KSF	59.20	0.83	0.51	2.53	2.85	8,762	123	75	374	422	34%	5,783
18		210	Single-Family Detached Housing	174.4	4.5	0	785	DU	9.52	0.19	0.56	0.63	0.37	7,473	147	442	495	290	0%	7,473
West of Powers Blvd.																				
13		- - -	Open Space/Drainage	78.3	- - -	0	78.3	acres	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
16		820	Shopping Center	30	0.18	0	235	KSF	50.36	0.69	0.42	2.17	2.45	11,834	163	100	510	575	34%	7,810
									Total Trip Generation Estimate Based on Approved Sketch Plan Land Uses					58,678	1,277	1,211	2,755	2,913		42,743
									Change (Decrease) In Total Sketch Plan Land Uses					**-1,424**	**-9**	**29**	**-36**	**-69**		**-644**

Notes:

(1) Source: based on *Trip Generation* , 9th Edition, 2012 by the Institute of Transportation Engineers (ITE)

(2) Source: "Trip Generation Handbook - An ITE Proposed Recommended Practice 2nd Edition, June 2004" by ITE

(3) DU = dwelling unit

(4) A 10 acre portion of the Painted Sky at Waterview Filing 7 was included as part of the Waterview Sketch Plan Area in the July 28, 2014 *Waterview Sketch Plan Amendment Updated Master Traffic Study* , however, since compeletion of that report Filing 7 has been approved and almost fully built out. As of August 2016 all of the lots in Filing 7 were occupied except for 15 lots which were either under construction or recently constructed but unoccupied.

(5) KSF = 1,000 square feet

(6) DIL = drive-in lane

(7) VFP = vehicle fueling positions

Source: LSC Transportation Consultants, Inc.

Table 3
Trip Distribution
Waterview Sketch Plan Amendment

Parcel	Use	% Directional Distribution											Southeast Retail	Northeast Retail	West Retail	P16 Retail
		North Powers	South Powers	West Bradley	South Grinnell	South Goldfield	West Goldfield	North Marksheffel	East Bradley	South Marksheffel	North Federal Trade Zone	South Bradley Heights				
Short Term																
1-4	W Multi-Family	28	1	37	24	5	0	2	0	0	0	0	1	1	1	0
5	W Multi-Family	28	1	37	24	5	0	2	0	0	0	0	1	1	1	0
6	W Commercial	24	5	29	20	15	0	4	1	0	0	0	0	0	2	0
7	W Commercial	24	5	29	20	15	0	4	1	0	0	0	0	0	2	0
8	W Single-Family	28	1	37	24	5	0	2	0	0	0	0	1	1	1	0
10	W Single-Family	28	1	37	24	5	0	2	0	0	0	0	1	1	1	0
11	W Single-Family	28	1	37	24	5	0	2	0	0	0	0	1	1	1	0
14	E Office/Industrial	27	25	8	4	0	0	28	2	5	1	0	0	0	0	0
15	E Commercial	15	42	10	5	0	0	10	5	10	1	0	0	2	0	0
16	E Commercial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	E Commercial	15	42	10	5	0	0	12	5	10	1	0	0	0	0	0
18	E Single-Family	30	29	10	1	0	0	20	4	4	0	0	1	0	1	0
Long Term																
1-4	W Multi-Family	32.5	1	24	21	8	0	4	3	1	1	1	1	1	1	0.5
5	W Multi-Family	32.5	1	24	21	8	0	4	3	1	1	1	1	1	1	0.5
6	W Commercial	19	6	19	19	15	1	5	5	5	2	2	0	0	2	0
7	W Commercial	19	6	19	19	15	1	5	5	5	2	2	0	0	2	0
8	W Single-Family	32.5	1	24	21	8	0	4	3	1	1	1	1	1	1	0.5
10	W Single-Family	32.5	1	24	21	8	0	4	3	1	1	1	1	1	1	0.5
11	W Single-Family	32.5	1	24	21	8	0	4	3	1	1	1	1	1	1	0.5
14	E Office/Industrial	23	25	6	2	0	0	30	5	4	2	3	0	0	0	0
15	E Commercial	7	26	8	3	0	0	16	15	15	3	5	0	2	0	0
16	E Commercial	7	26	8	3	0	0	16	15	15	3	5	0	0	0	2
17	E Commercial	9	26	8	3	0	0	16	15	15	3	5	0	0	0	0
18	E Single-Family	24.5	26	7	0	0	0	23	8	4	2	2	1	1	1	0.5

Source: LSC Transportation Consultants, Inc.

N

Approximate Scale
Scale: 1"= 3,000'

Figure 1

Vicinity Map

Waterview Sketch Plan Amendment (LSC #164691)

TRANSPORTATION CONSULTANTS, INC.

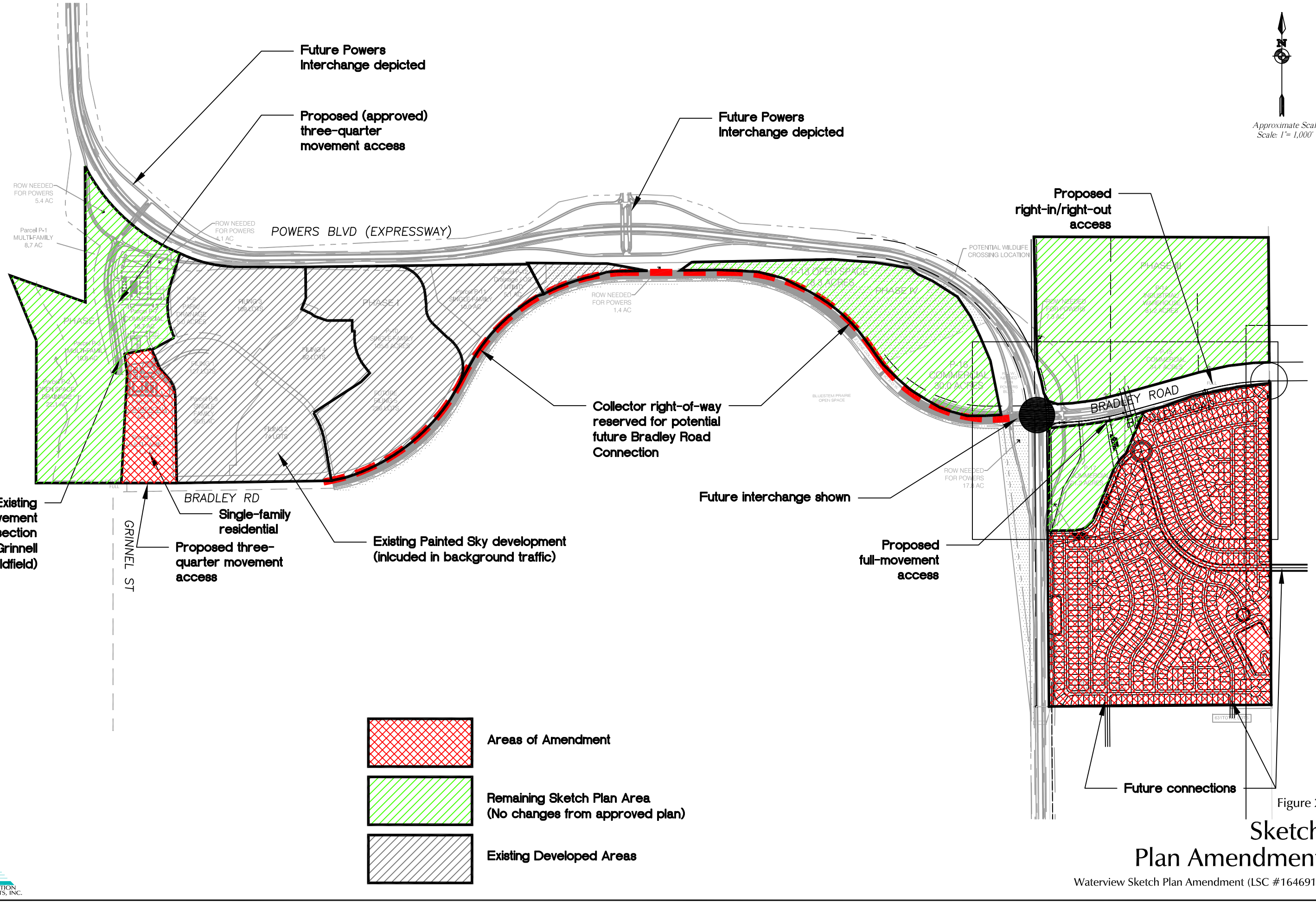

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Figure 2

Sketch Plan Amendment

Waterview Sketch Plan Amendment (LSC #164691)

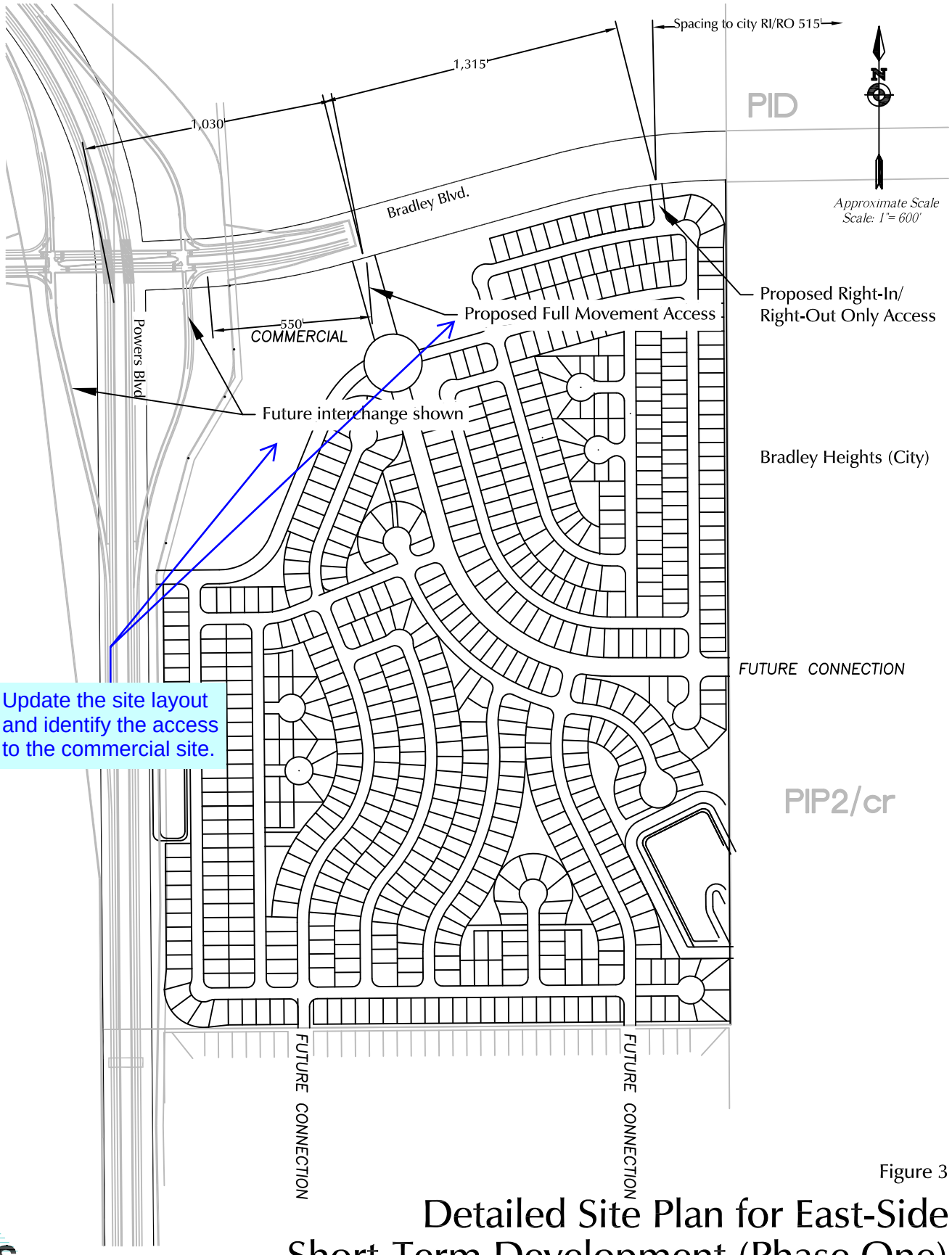
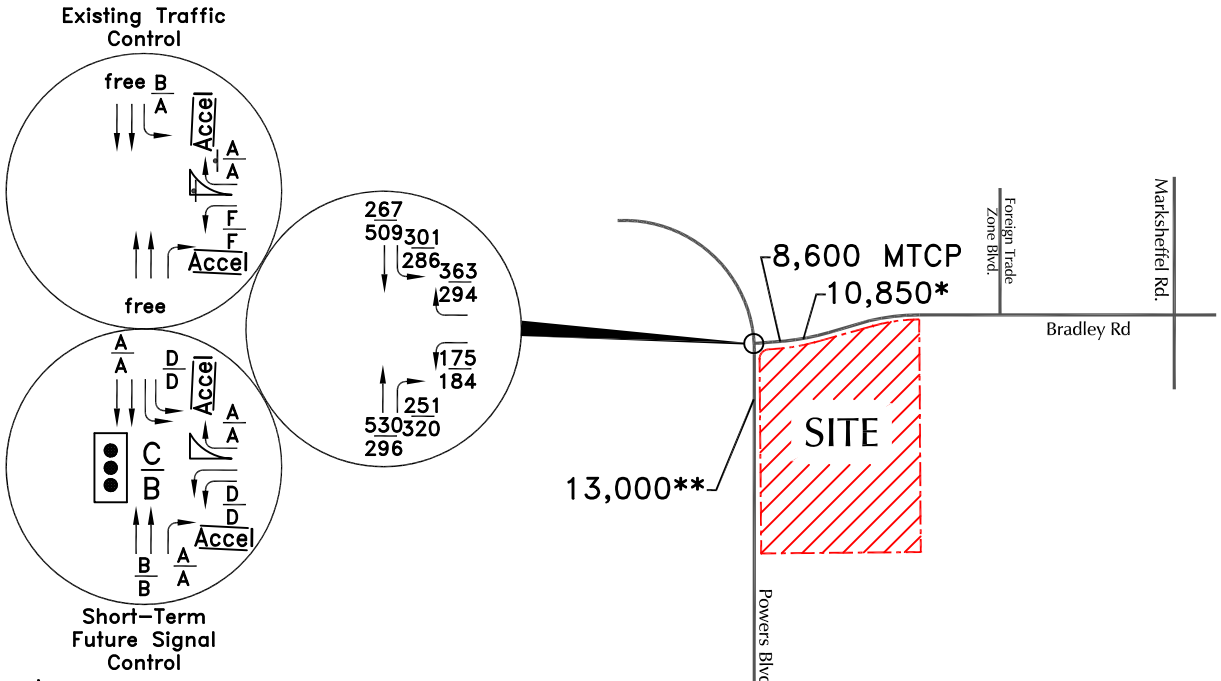


Figure 3

Detailed Site Plan for East-Side Short-Term Development (Phase One)

Waterview Sketch Plan Amendment (LSC #164691)

LSC TRANSPORTATION CONSULTANTS, INC.



Approximate Scale
Scale: 1"= 3,000'

Legend:

–Stop sign

–Traffic Signal

XX/XX –Weekday peak–hour traffic (vehicles per hour) counts by LSC October 2016

X,XXX –Average weekday traffic (vehicles per day) **2015 AADT CDOT

B/C –Individual movement peak–hour Level of Service

B/B –Entire intersection peak–hour Level of Service (weighted average of all movements)

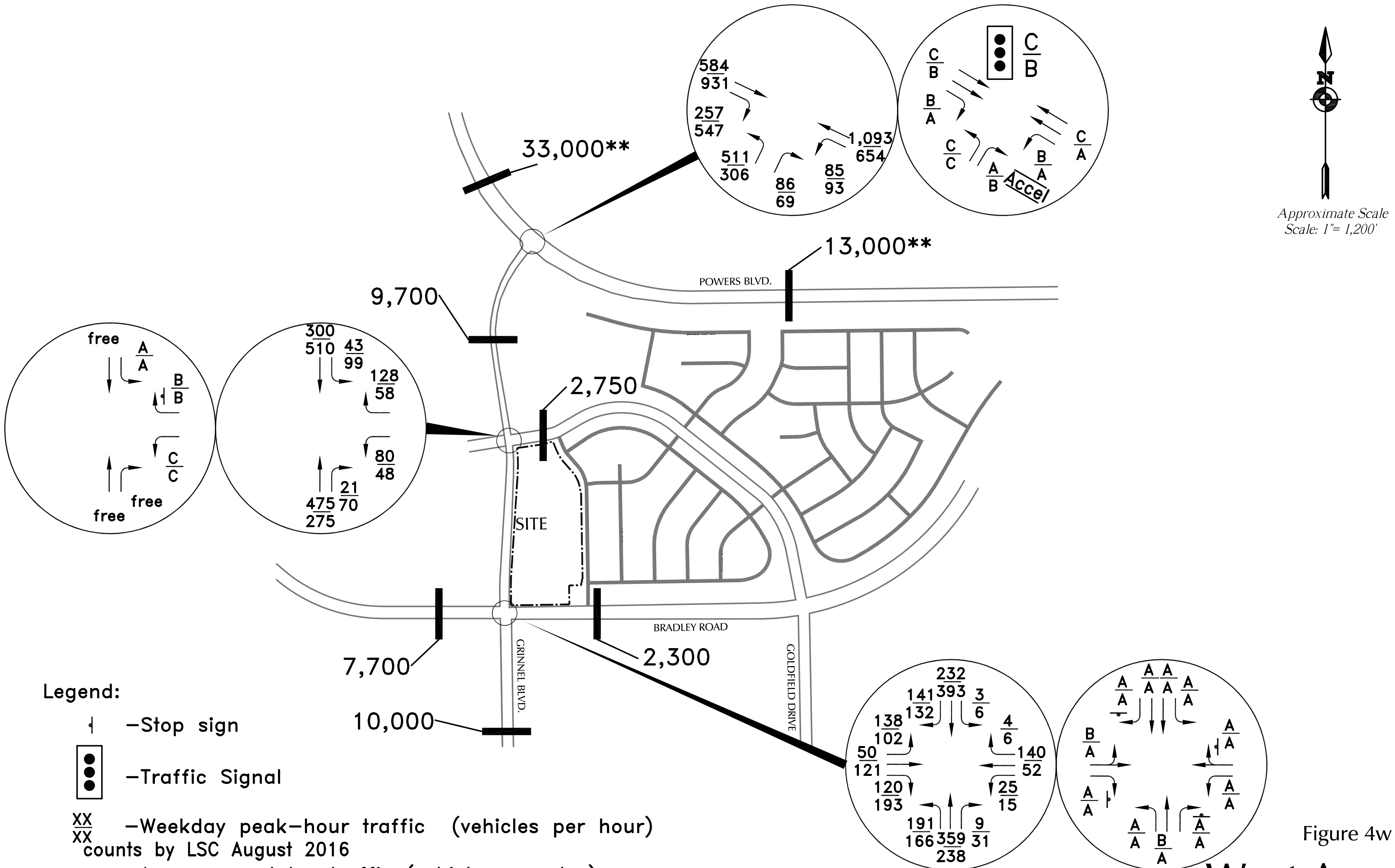
*Estimate by LSC

TRANSPORTATION CONSULTANTS, INC.

Figure 4e

East Area
Existing Traffic, Lane Geometry, Traffic Control and Level of Service

Waterview Sketch Plan Amendment (LSC #164691)



Legend:

- Stop sign
- Traffic Signal

XX/XX – Weekday peak–hour traffic (vehicles per hour) counts by LSC August 2016

X,XXX – Average weekday traffic (vehicles per day)
**2015 AADT CDOT, otherwise estimates by LSC

B/C – Individual movement peak–hour Level of Service

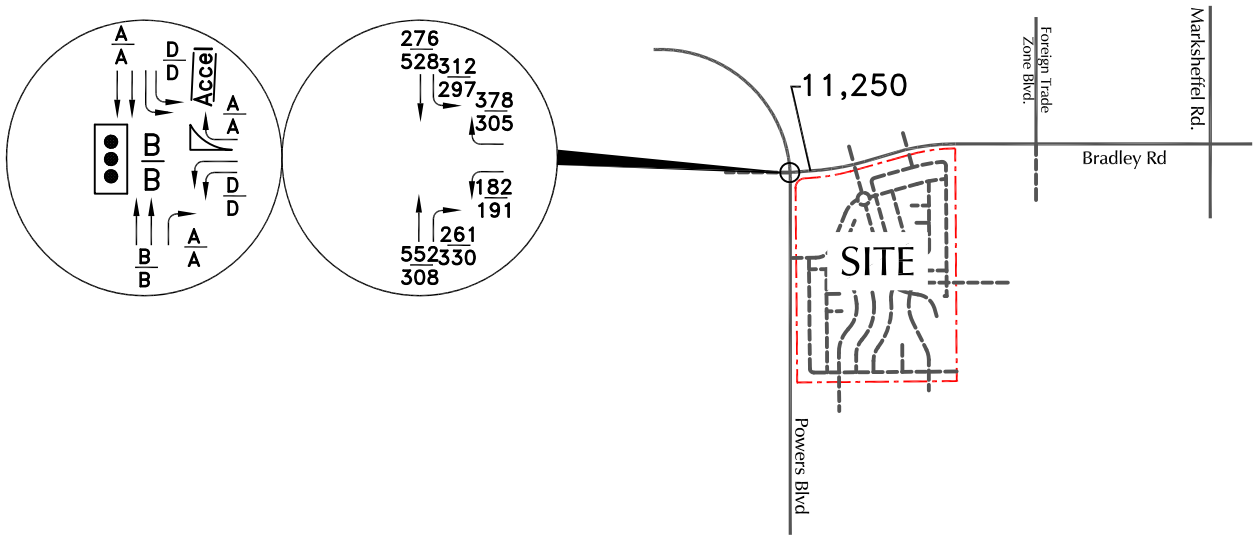
B/B – Entire intersection peak–hour Level of Service (weighted average of all movements)

LSC TRANSPORTATION CONSULTANTS, INC.

Figure 4w

West Area
Existing Traffic, Lane Geometry, Traffic Control and Level of Service

Waterview Sketch Plan Amendment (LSC #164691)



Approximate Scale
Scale: 1"= 3,000'

Legend:

- –Stop sign
- –Traffic Signal
- XX/XX –Weekday peak–hour traffic (vehicles per hour)
- X,XXX –Average weekday traffic (vehicles per day)
- B/C –Individual movement peak–hour Level of Service
- B/B –Entire intersection peak–hour Level of Service (weighted average of all movements)

TRANSPORTATION CONSULTANTS, INC.

Figure 5e

East Area
Year 2017 Background Traffic, Lane Geometry, Traffic Control and Level of Service

Waterview Sketch Plan Amendment (LSC #164691)

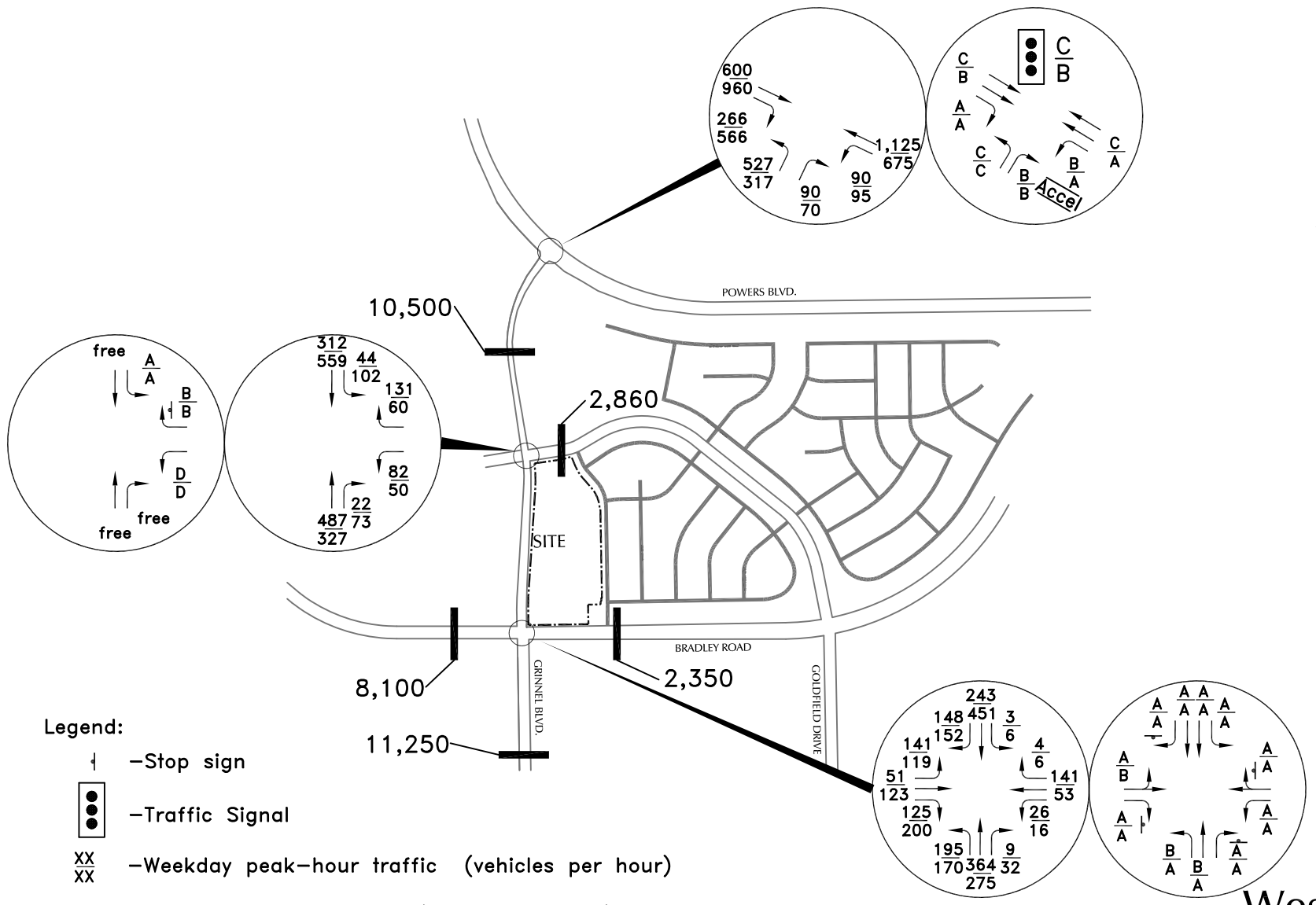


Figure 5w

West Area Year 2017 Background Traffic, Lane Geometry, Traffic Control and Level of Service

Waterview Sketch Plan Amendment (LSC #164691)

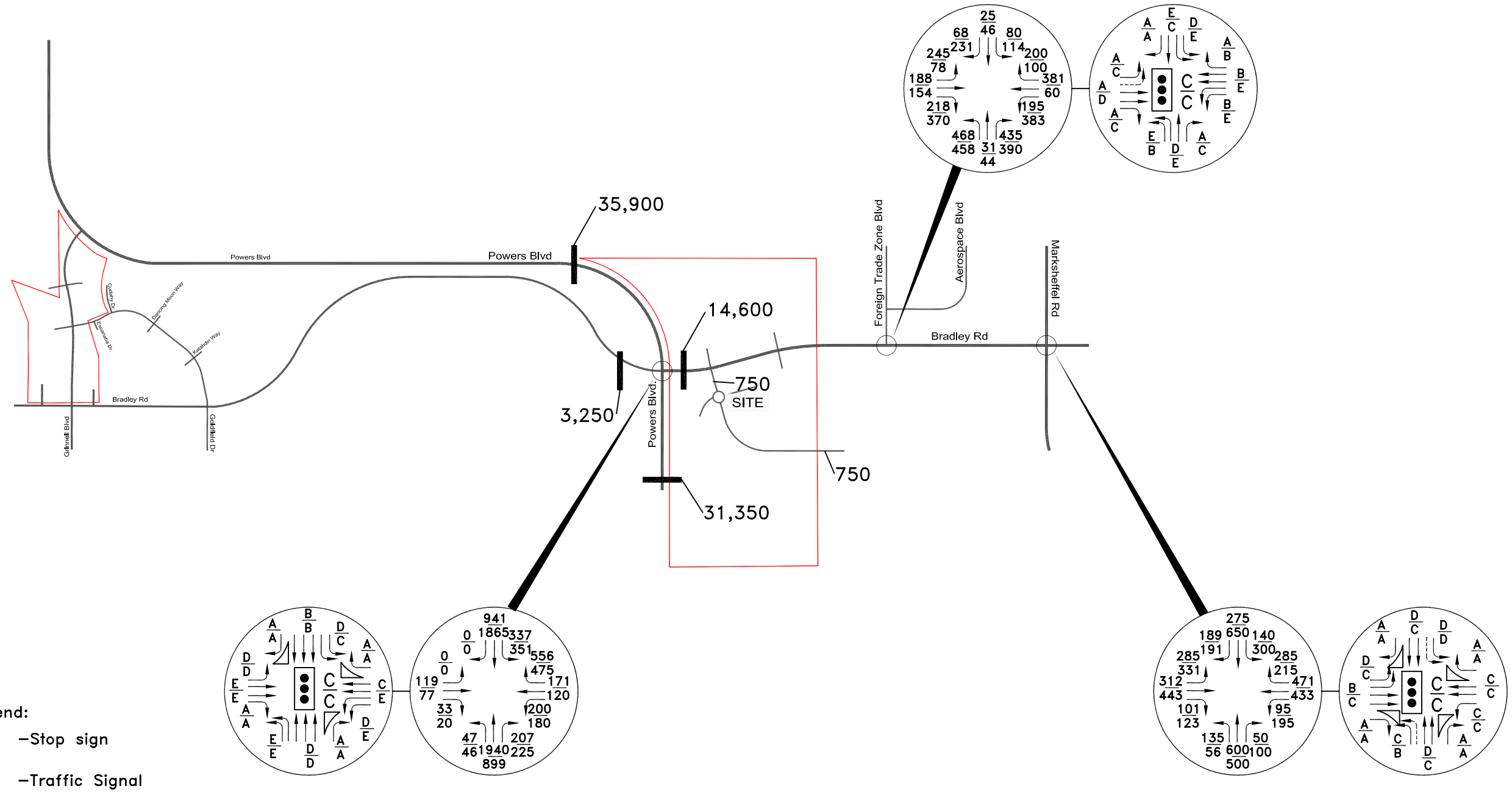
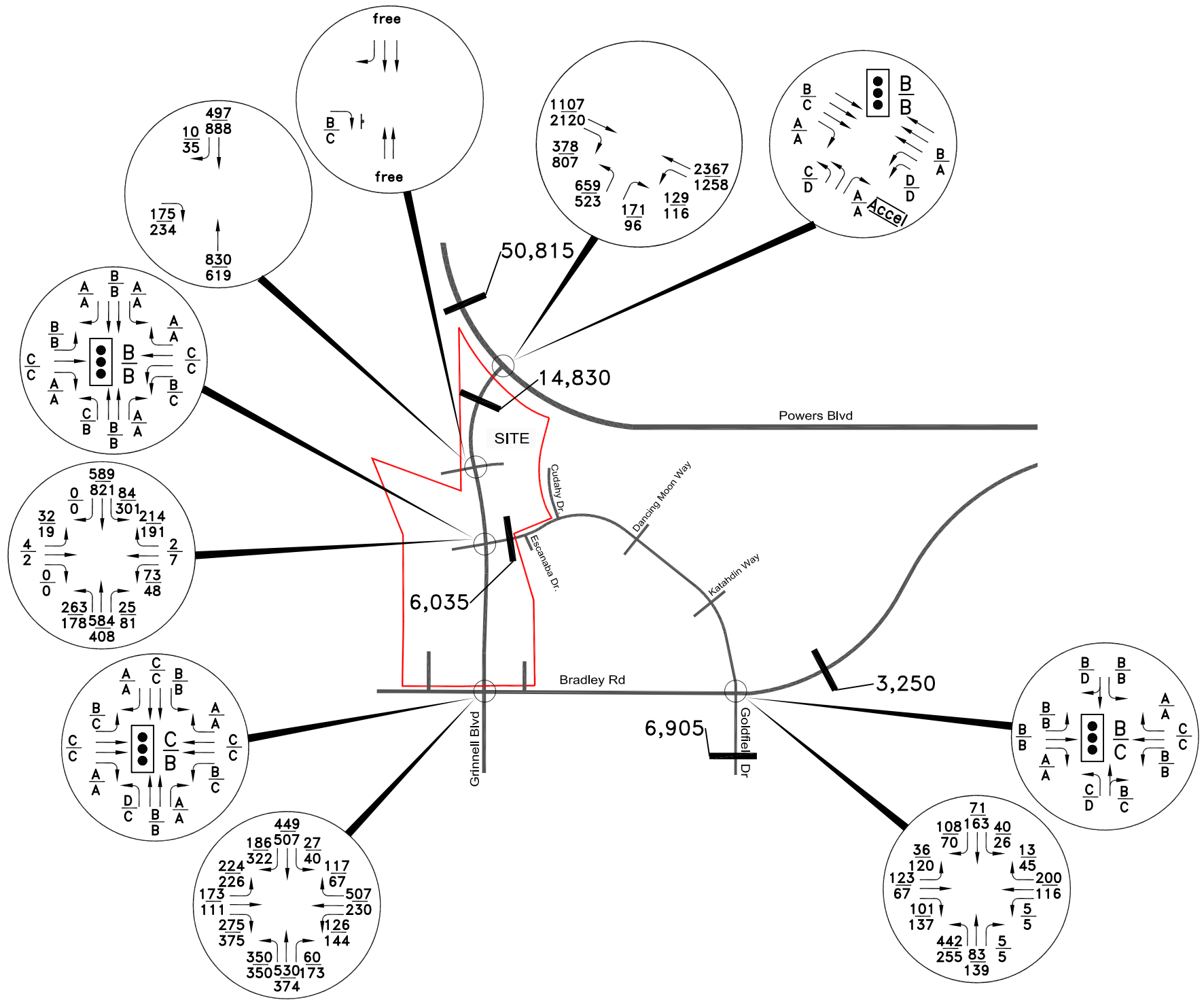


Figure 6e

East Area
East Area 2040 Background Traffic, Lane Geometry, Traffic Control and Level of Service

Waterview Sketch Plan Amendment (LSC #164691)



Approximate Scale
Scale: 1"= 1,200'

Legend:

- —Stop sign
- —Traffic Signal
- XX/XX —Weekday peak-hour traffic (vehicles per hour)
- X,XXX —Average weekday traffic (vehicles per day)
- B/C —Individual movement peak-hour Level of Service
- B/B —Entire intersection peak-hour Level of Service (weighted average of all movements)

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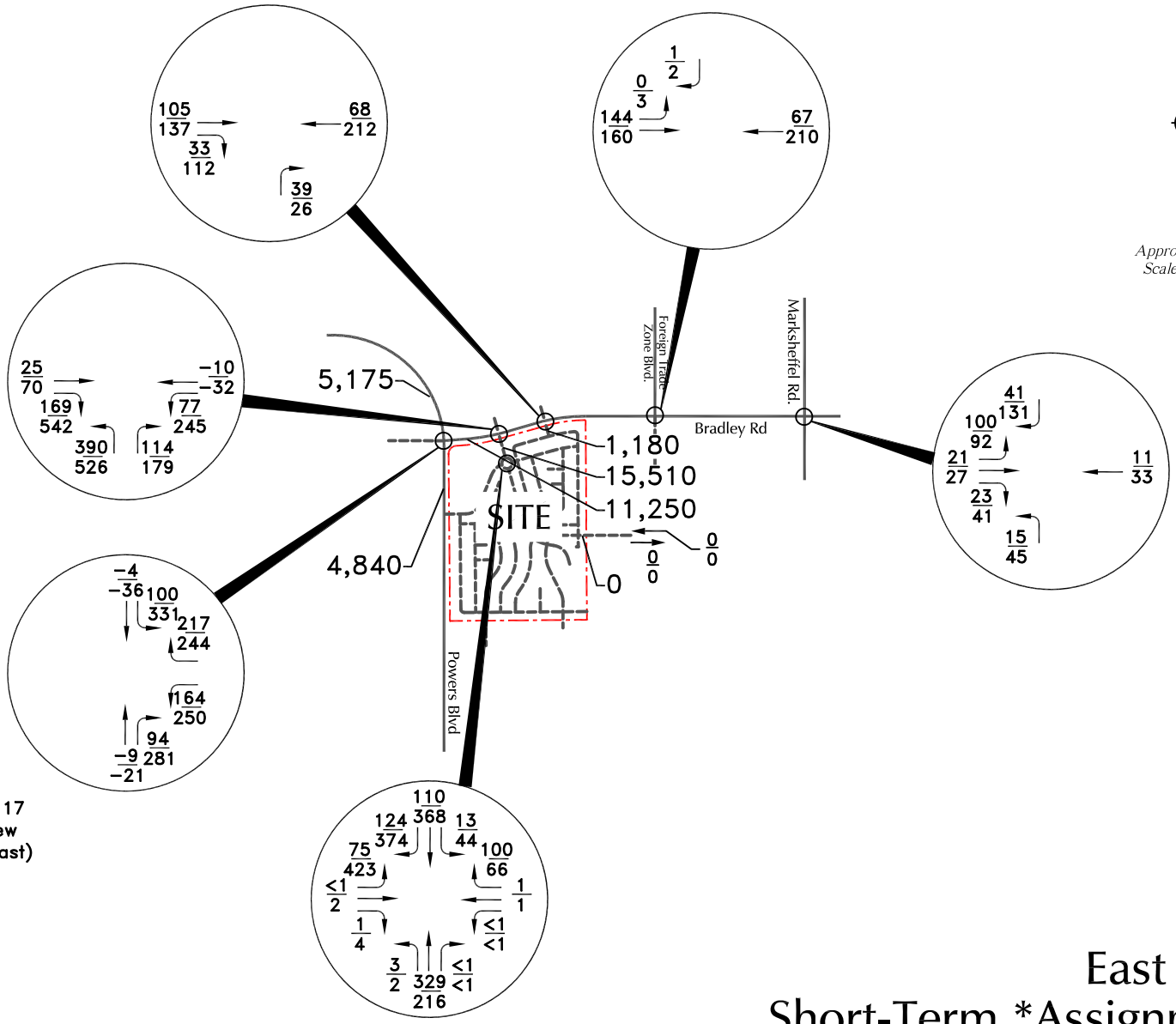
Figure 6w

West Area
West Area 2040 Background Traffic, Lane Geometry, Traffic Control and Level of Service

Waterview Sketch Plan Amendment (LSC #164691)



*Short-Term Development includes only Parcels 5, 6, 17 and 18 (Springs at Waterview and Springs at Waterview East)

Legend:

XX/XX –Weekday peak-hour traffic (vehicles per hour)

X,XXX –Average weekday traffic (vehicles per day)

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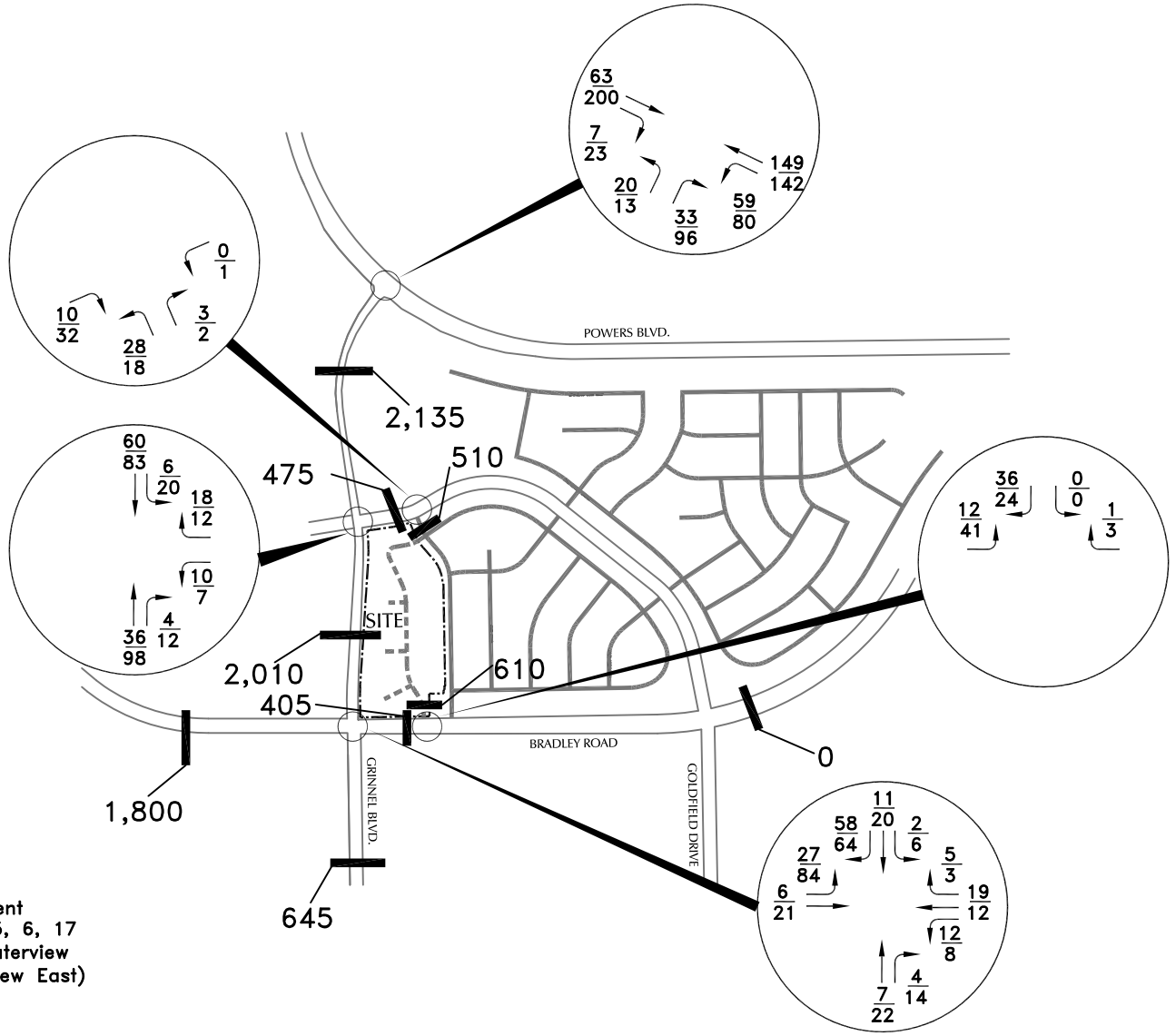
Figure 7e

East Area Short-Term *Assignment of Site-Generated Traffic

Waterview Sketch Plan Amendment (LSC #164691)



*Short-Term Development includes only Parcels 5, 6, 17 and 18 (Springs at Waterview and Springs at Waterview East)

Approximate Scale
Scale: 1"= 1,200'

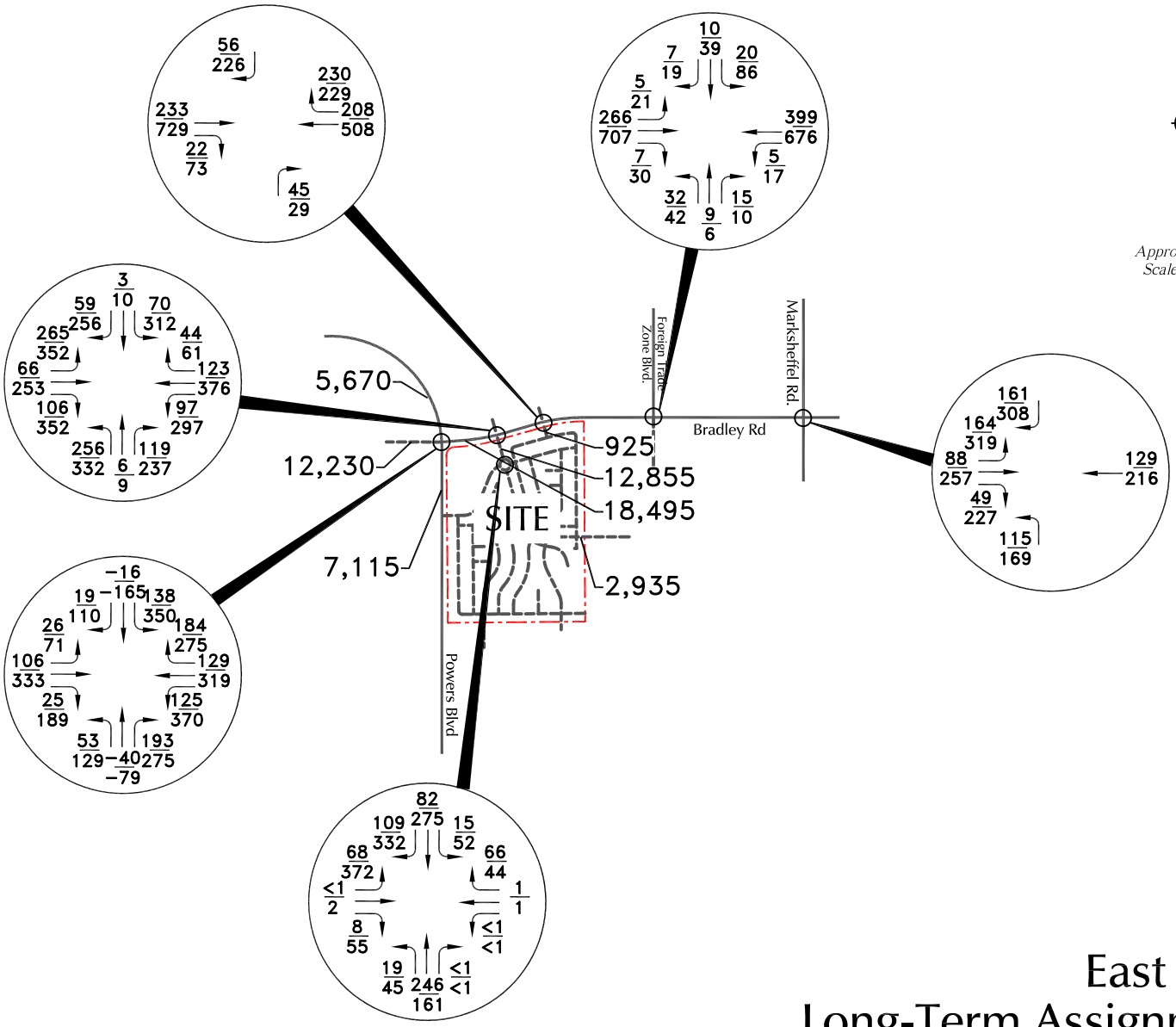
Legend:
XX/XX –Weekday peak-hour traffic (vehicles per hour)
X,XXX –Average weekday traffic (vehicles per day)

TRANSPORTATION CONSULTANTS, INC.

Figure 7w

West Area Short-Term *Assignment of Site-Generated Traffic

Waterview Sketch Plan Amendment (LSC #164691)



Legend:

XX/XX —Weekday peak-hour traffic (vehicles per hour)

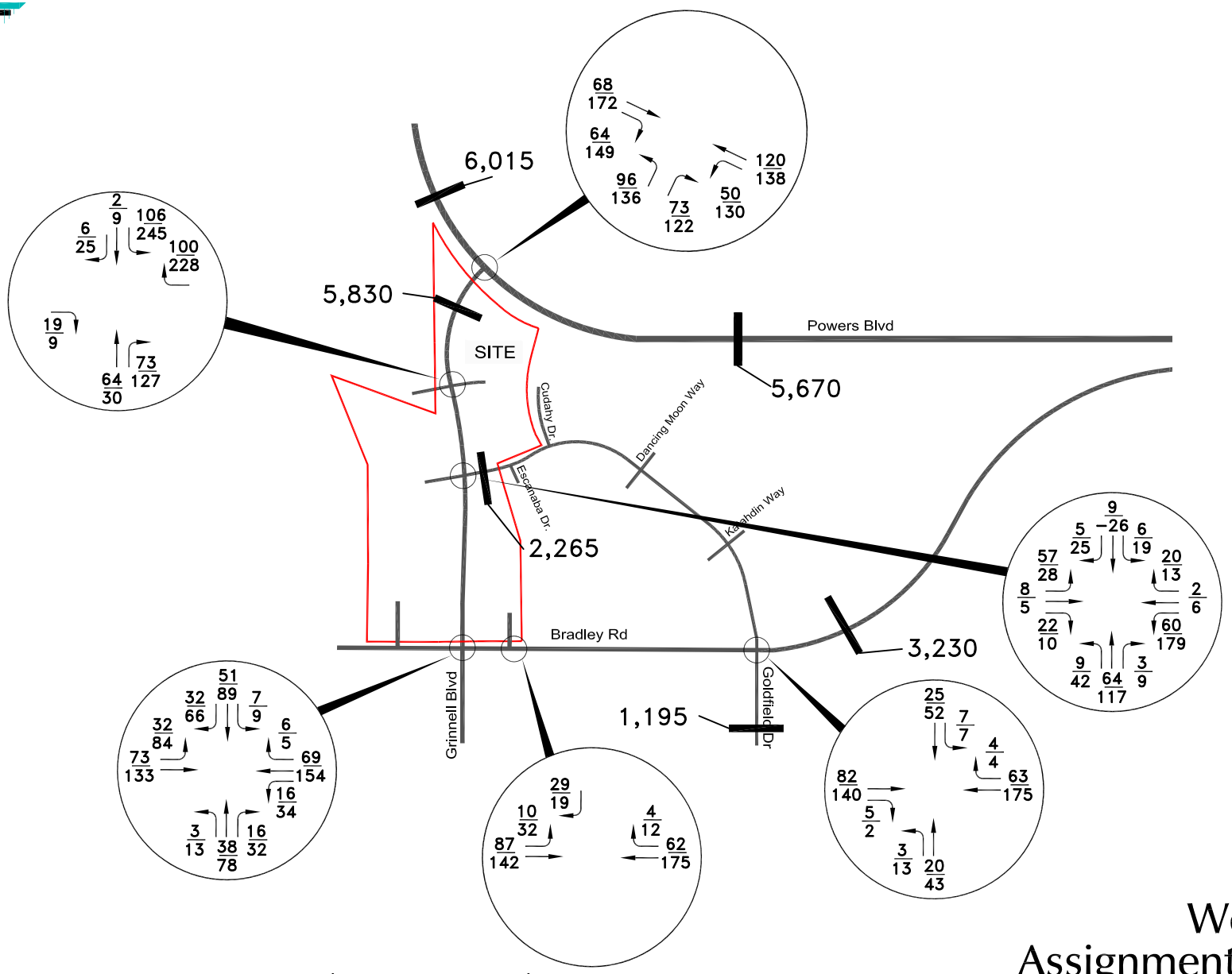
X,XXX —Average weekday traffic (vehicles per day)

TRANSPORTATION CONSULTANTS, INC.

Figure 8e

East Area Long-Term Assignment of Site-Generated Traffic

Waterview Sketch Plan Amendment (LSC #164691)



Approximate Scale
Scale: 1"= 1,200'

Figure 8w

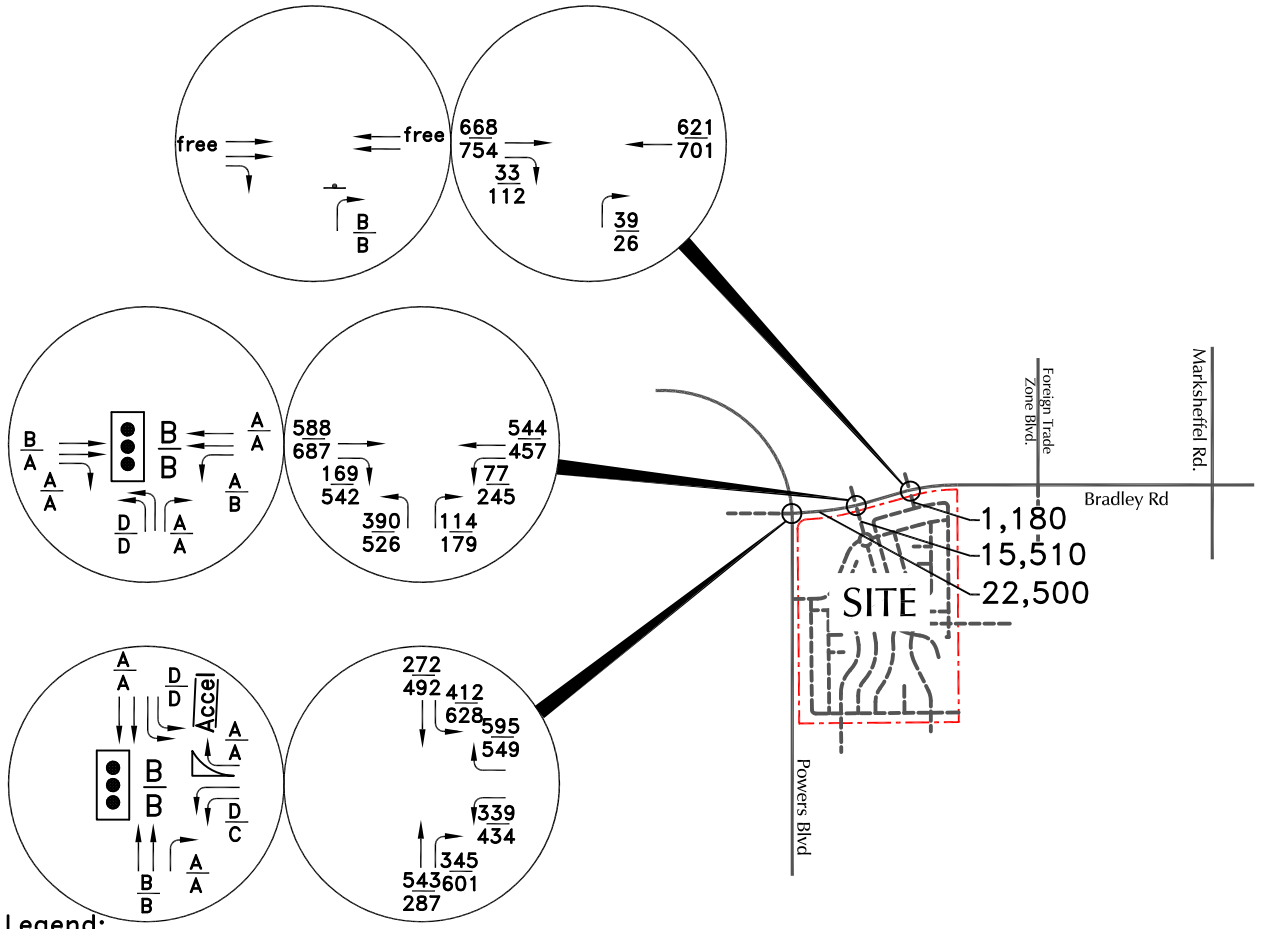
West Area Assignment of Site-Generated Long-Term Traffic

Waterview Sketch Plan Amendment (LSC #164691)

Legend:

XX/XX –Weekday peak-hour traffic (vehicles per hour)

X,XXX –Average weekday traffic (vehicles per day)



Approximate Scale
Scale: 1"= 3,000'

Legend:

–Stop sign

–Traffic Signal

XX/XX –Weekday peak–hour traffic (vehicles per hour)

X,XXX –Average weekday traffic (vehicles per day)

B/C –Individual movement peak–hour Level of Service

B/B –Entire intersection peak–hour Level of Service

*Short–Term Development includes only Parcels 5, 6, 17 and 18 (Springs at Waterview and Springs at Waterview East)

Figure 9e

East Area 2017 Total Traffic*, Lane Geometry, Traffic Control and Level of Service

Waterview Sketch Plan Amendment (LSC #164691)

TRANSPORTATION CONSULTANTS, INC.

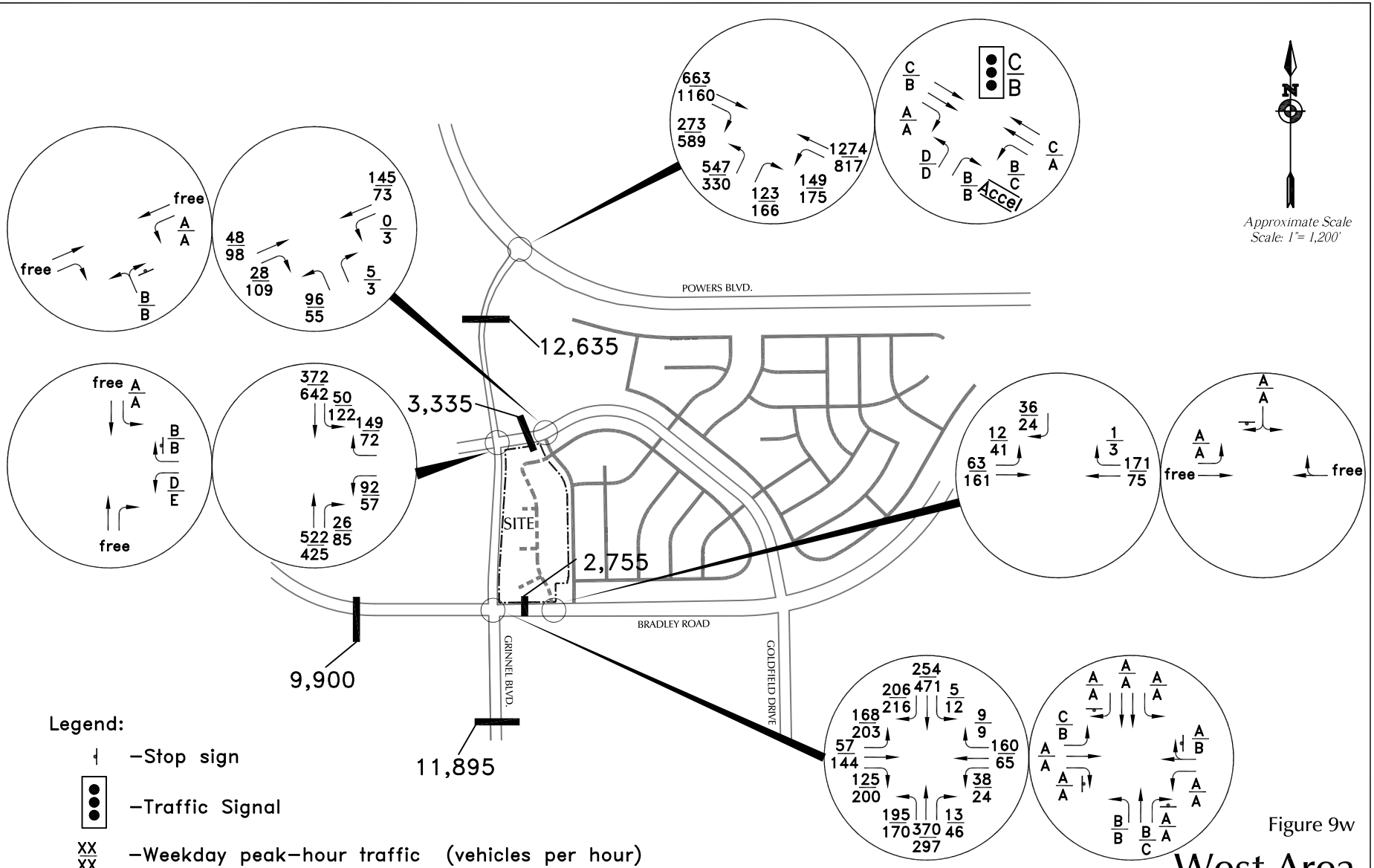


Figure 9w

West Area
2017 Total Traffic, Lane Geometry, Traffic Control and Level of Service

Waterview Sketch Plan Amendment (LSC #164691)

TRANSPORTATION CONSULTANTS, INC.

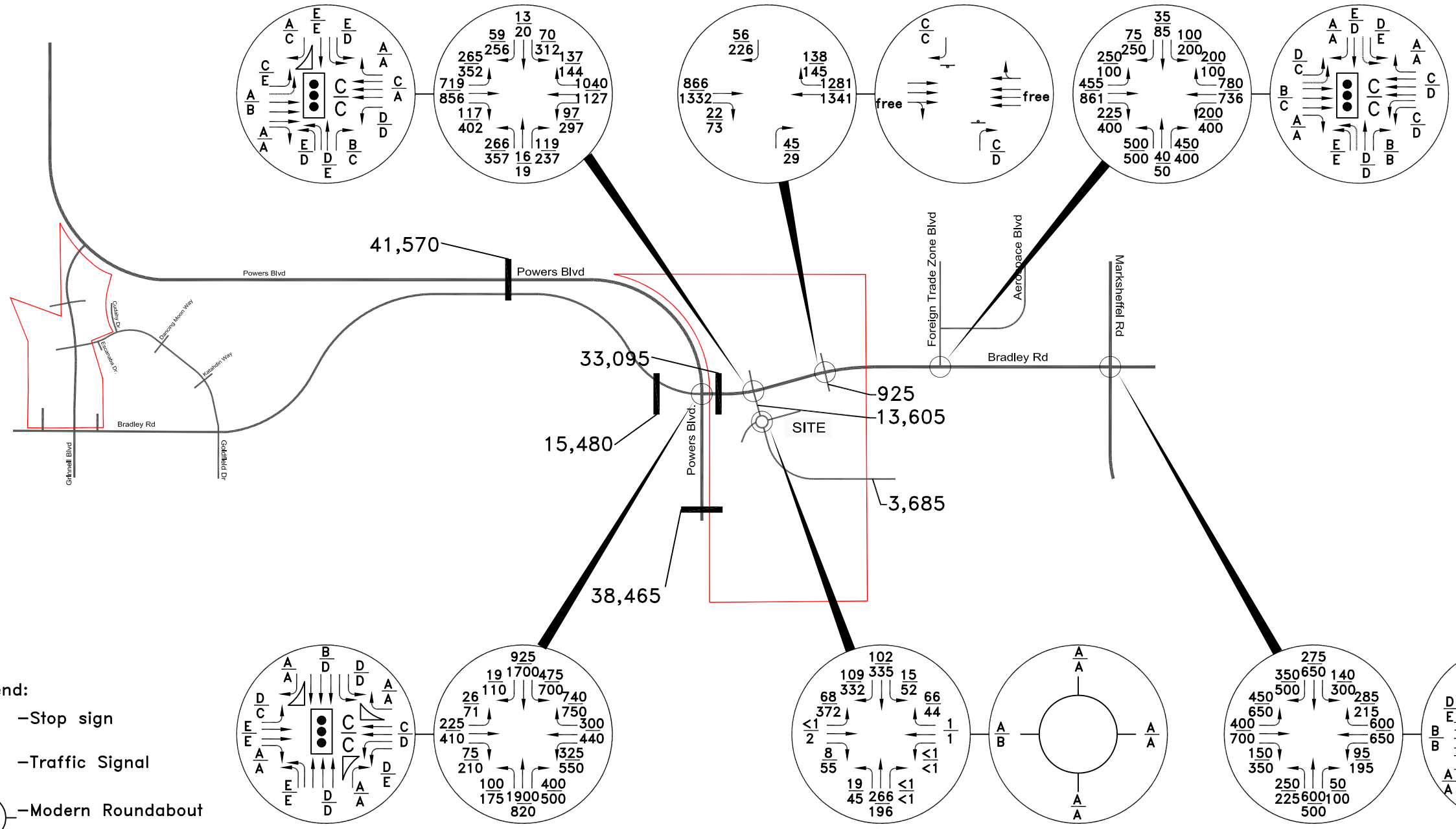


Figure 10e

East Area
East Area 2040 Total Traffic, Lane Geometry, Traffic Control and Level of Service

Waterview Sketch Plan Amendment (LSC #164691)

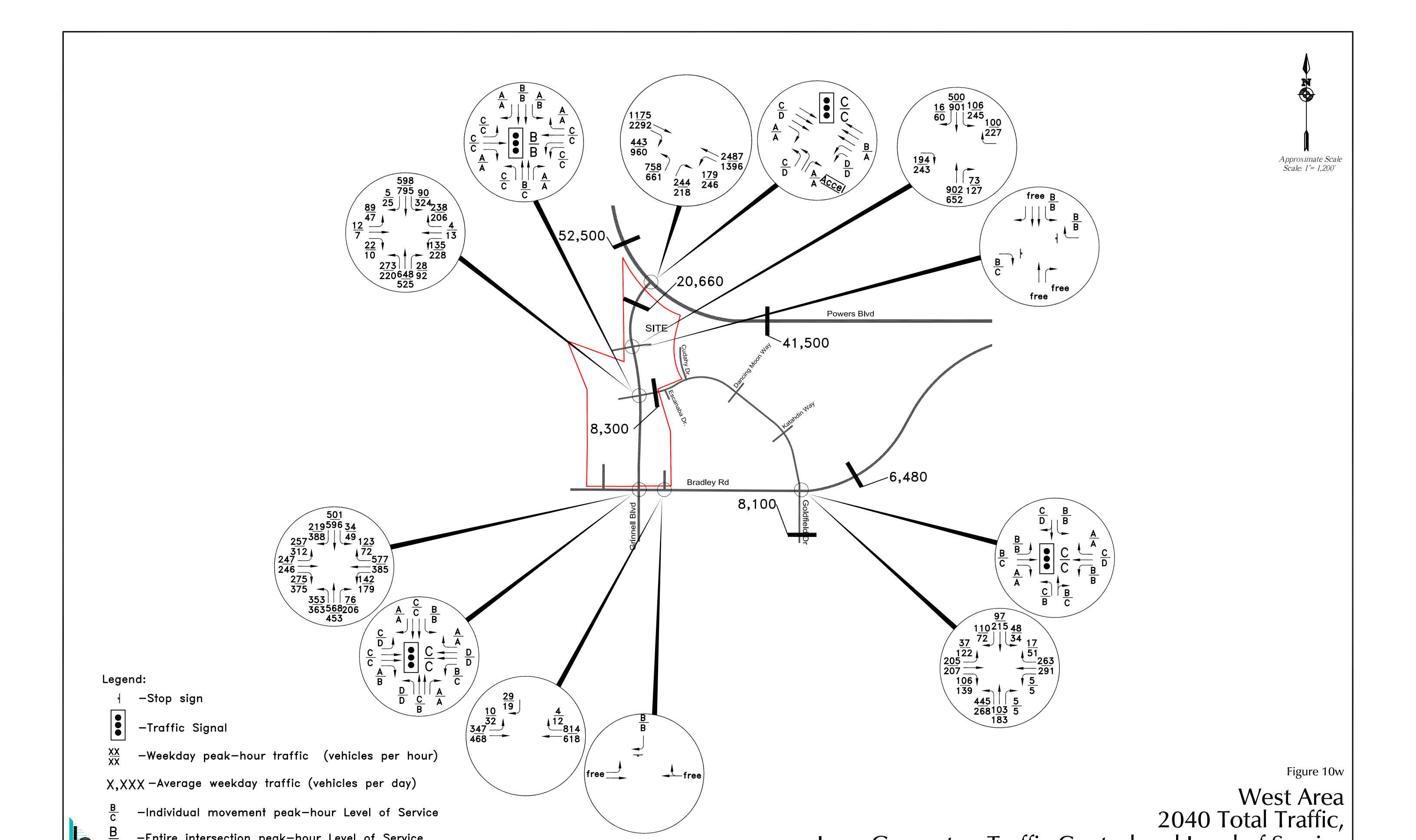
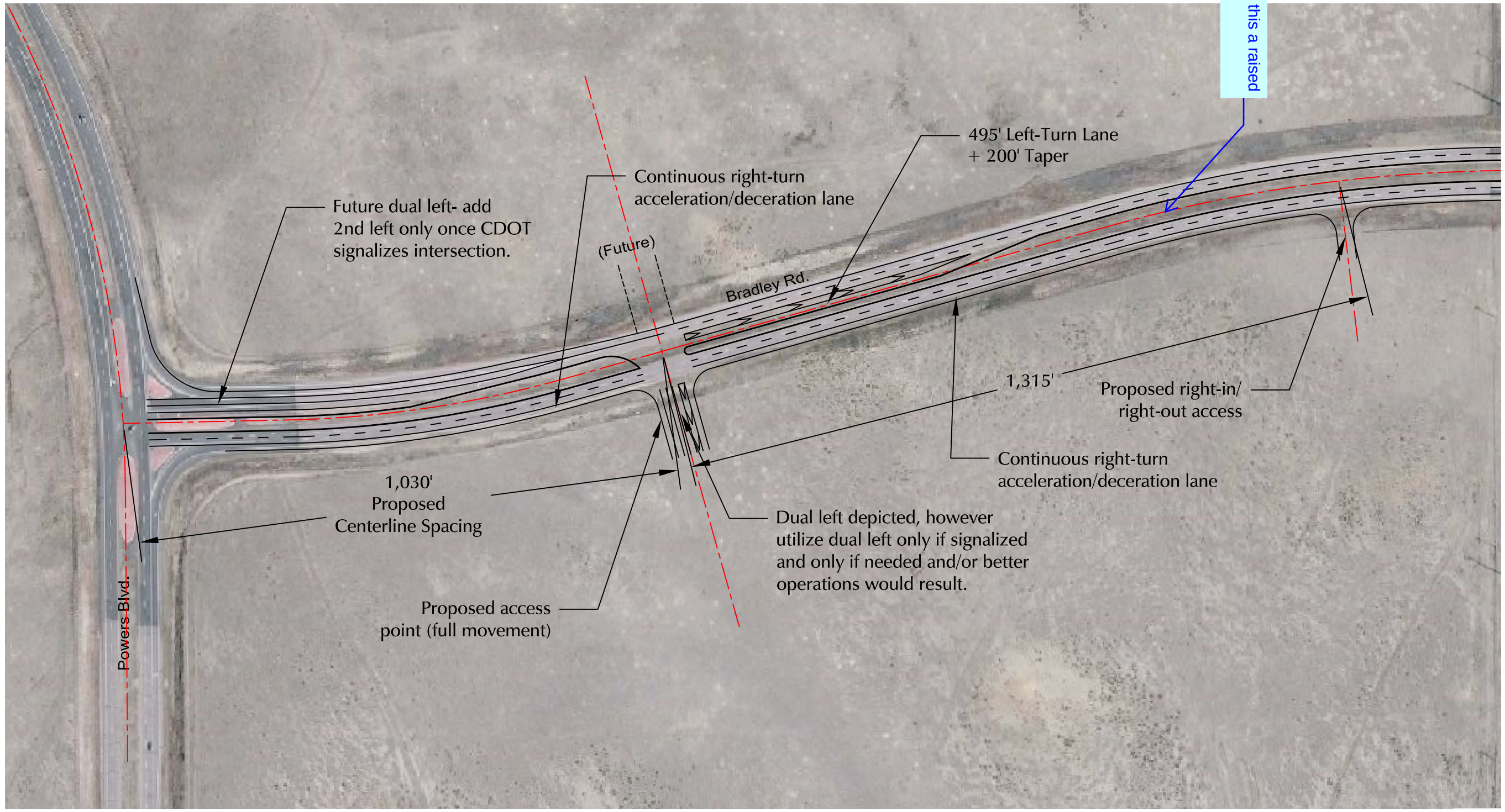


Figure 10w

West Area
2040 Total Traffic, Lane Geometry, Traffic Control and Level of Service

Waterview Sketch Plan Amendment (LSC #164691)



Approximate Scale
Scale: 1"= 200'

Figure 11

Short-Term
Bradley Road Lane Recommendations

Waterview Sketch Plan Amendment (LSC #164691)

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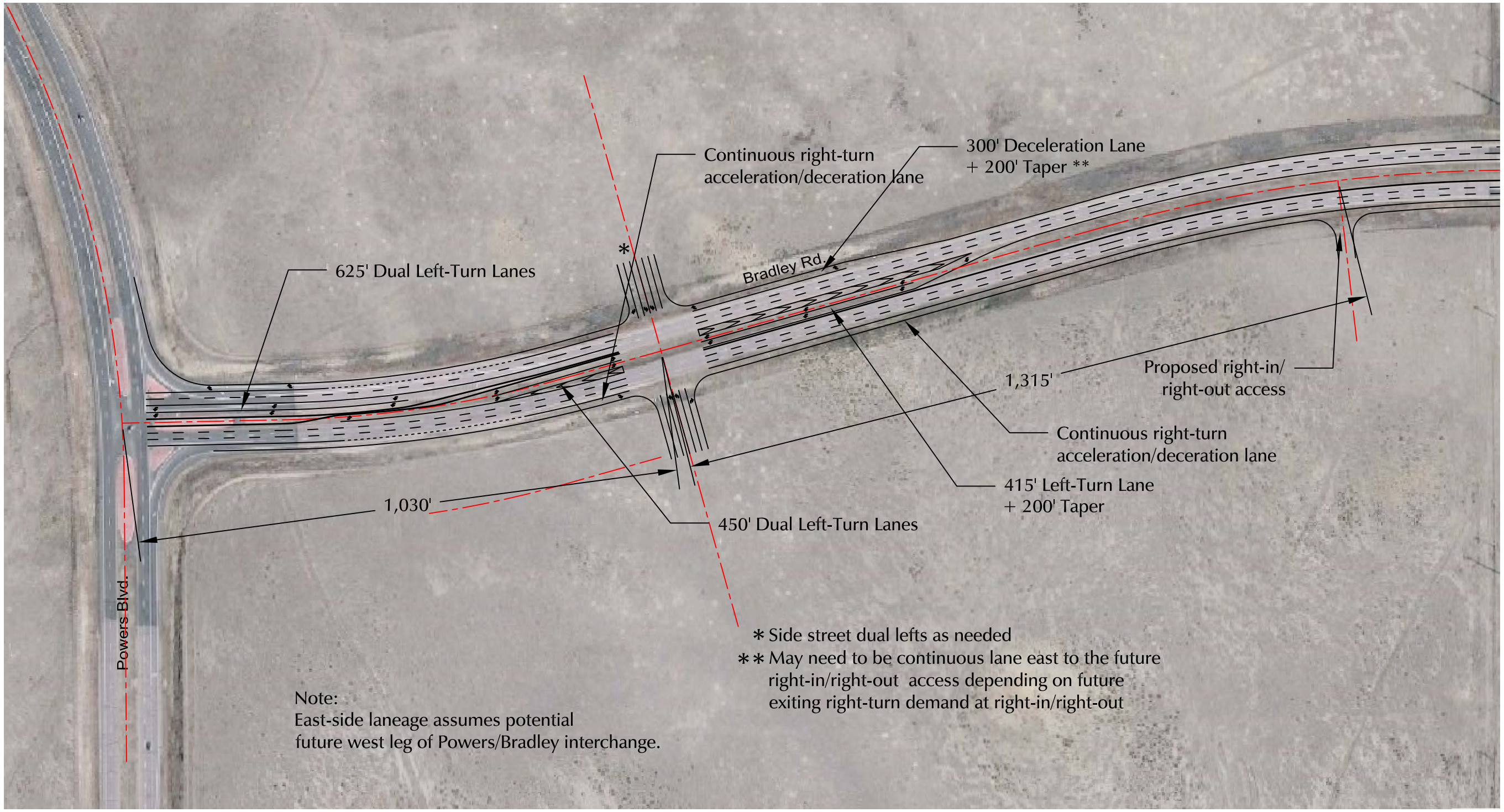

Figure 12

Long-Term
Bradley Road Lane Recommendations

Waterview Sketch Plan Amendment (LSC #164691)

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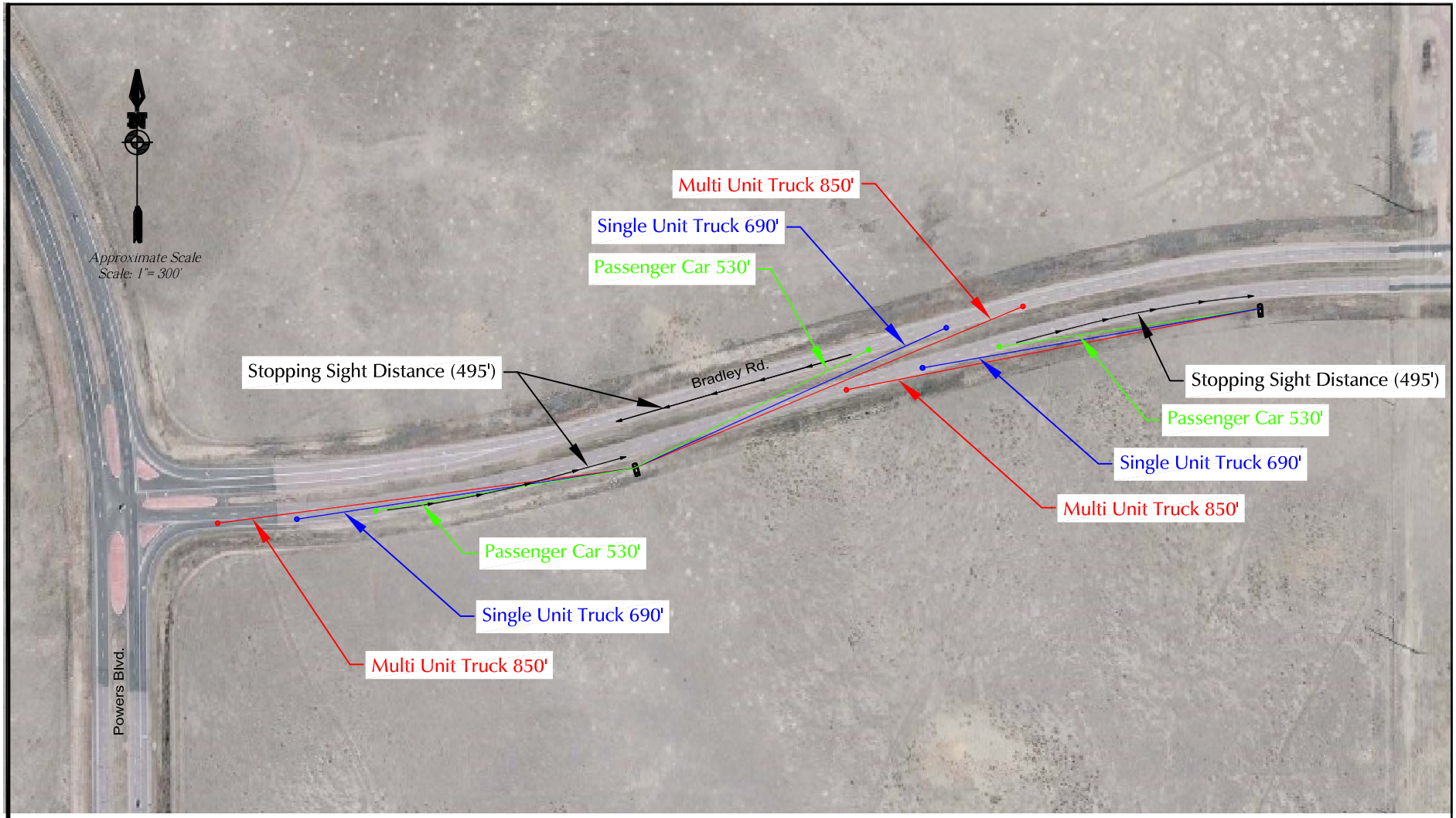

LEGEND:

= Required intersection sight distance for passenger cars

= Required intersection sight distance for single–unit trucks

= Required intersection sight distance for multi–unit trucks

= Required stopping sight distance

Based on a speed limit of 50mph (55mph design speed)

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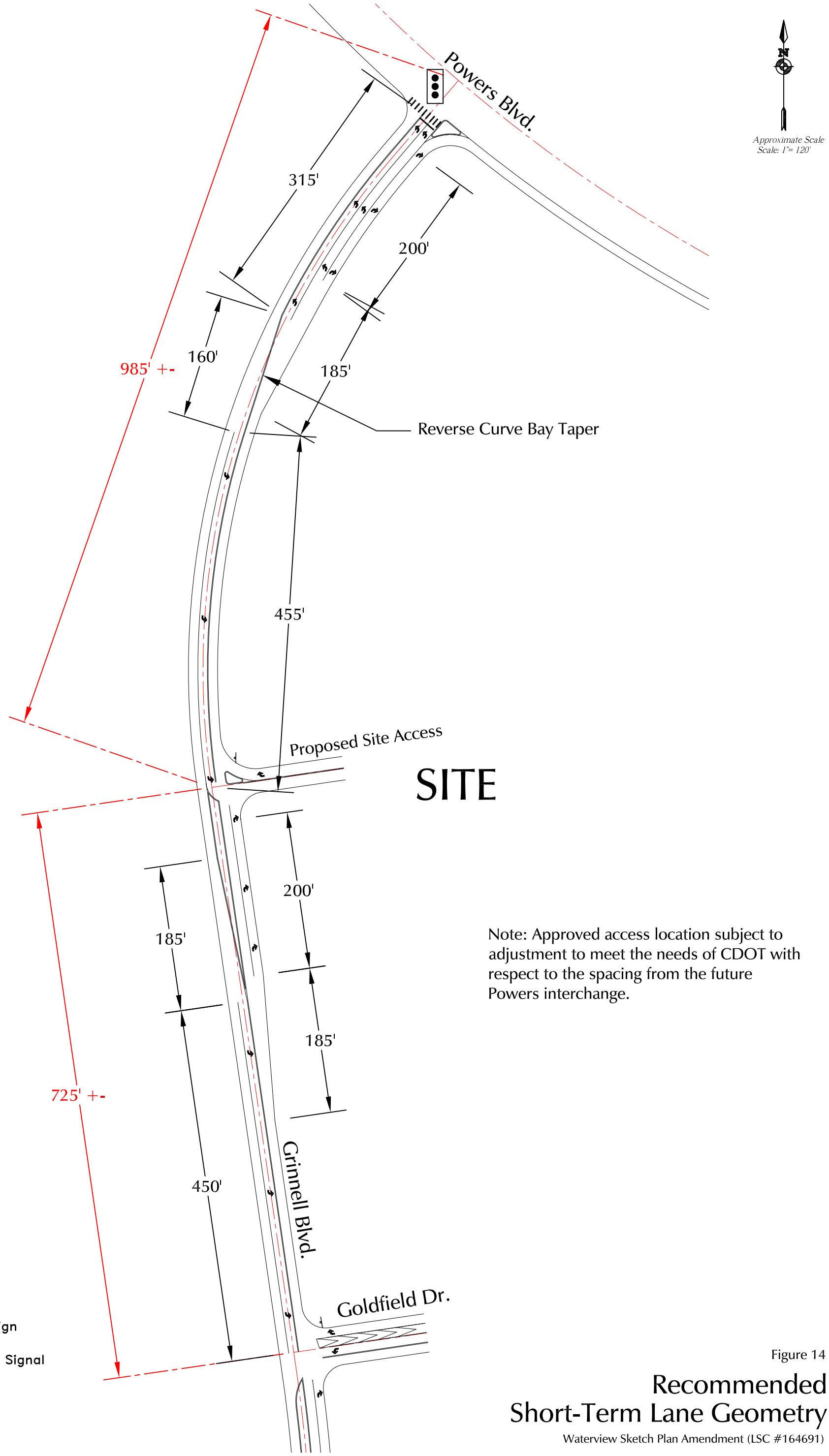
Figure 13

Sight Distance

Waterview Sketch Plan Amendment (LSC #164691)



Note: Approved access location subject to adjustment to meet the needs of CDOT with respect to the spacing from the future Powers interchange.

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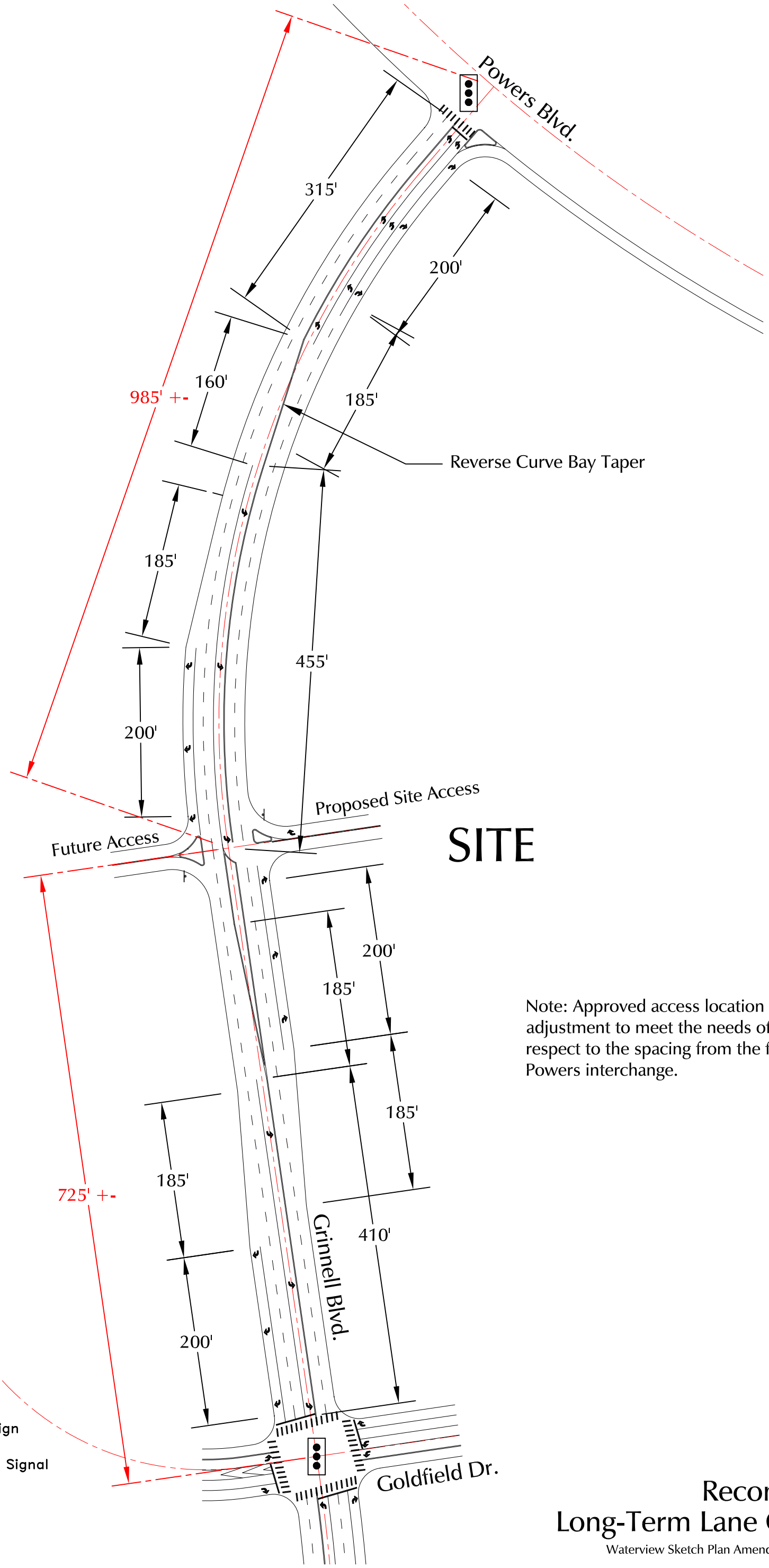
Figure 14

Recommended Short-Term Lane Geometry

Waterview Sketch Plan Amendment (LSC #164691)



Note: Approved access location subject to adjustment to meet the needs of CDOT with respect to the spacing from the future Powers interchange.

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Figure 15

Recommended Long-Term Lane Geometry

Waterview Sketch Plan Amendment (LSC #164691)

Appendix Table 1
Trip Generation Estimate
Hassell Parcel
El Paso County Assessor Schedule Number 6501400009

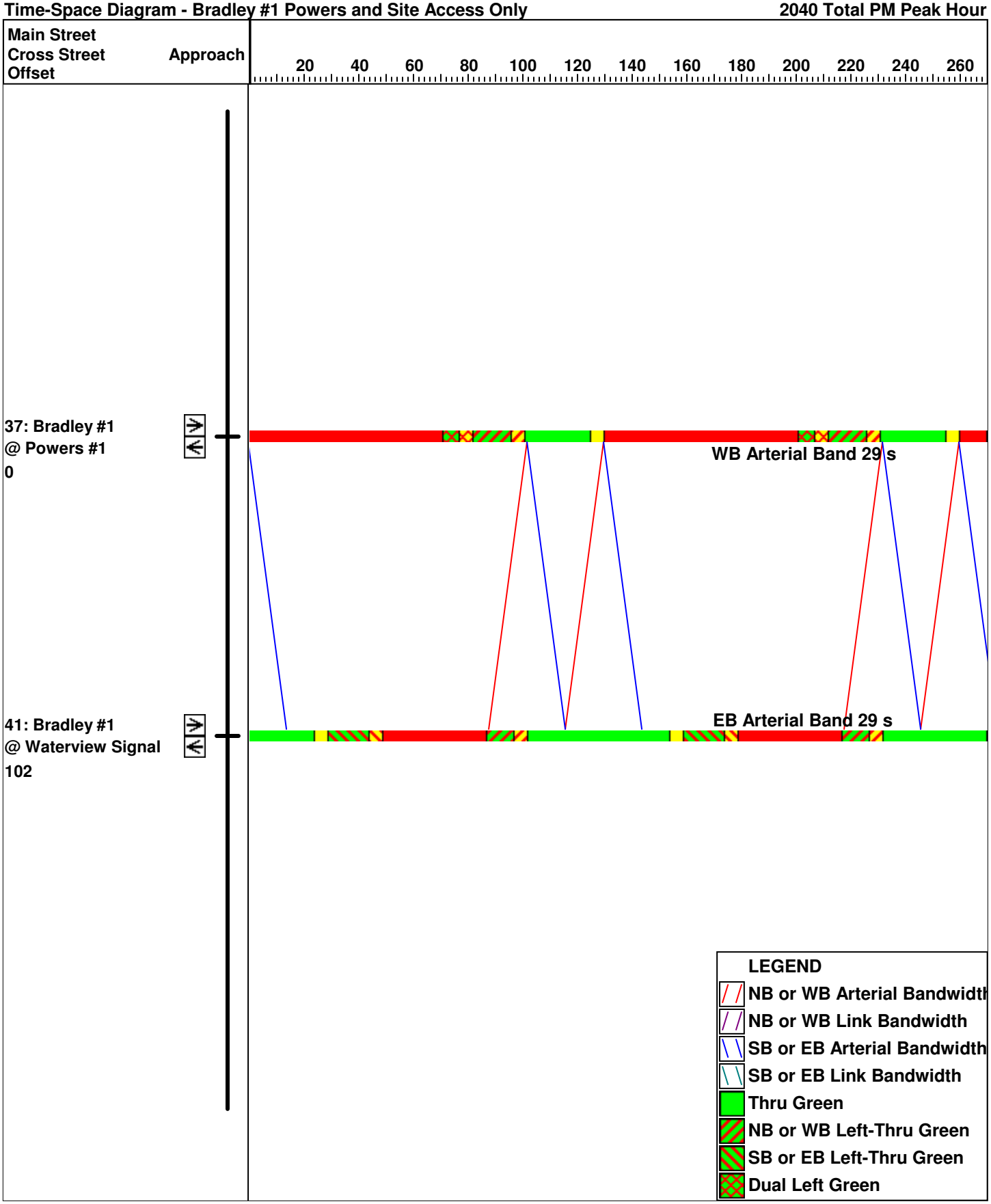
Land Use Code	Land Use Description	Trip Generation Units	Trip Generation Rates [1]					Total Trips Generated				
			Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour		Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour	
				In	Out	In	Out		In	Out	In	Out
210	Single-Family Detached Housing	87 DU[2]	9.52	0.19	0.56	0.63	0.37	828	16	49	55	32
230	Residential Condominium/Townhouse	61 DU	5.81	0.07	0.37	0.35	0.17	354	5	22	21	10
								1,182	**21**	**71**	**76**	**42**

Notes:
(1) Source: "*Trip Generation, 9th Edition, 2012*" by the Institute of Transportation Engineers (ITE)
(2) DU = dwelling unit

Source: LSC Transportation Consultants, Inc.

Exhibit 1A

Time-Space Diagram - Bradley #1 Powers and Site Access Only **2040 Total PM Peak Hour**

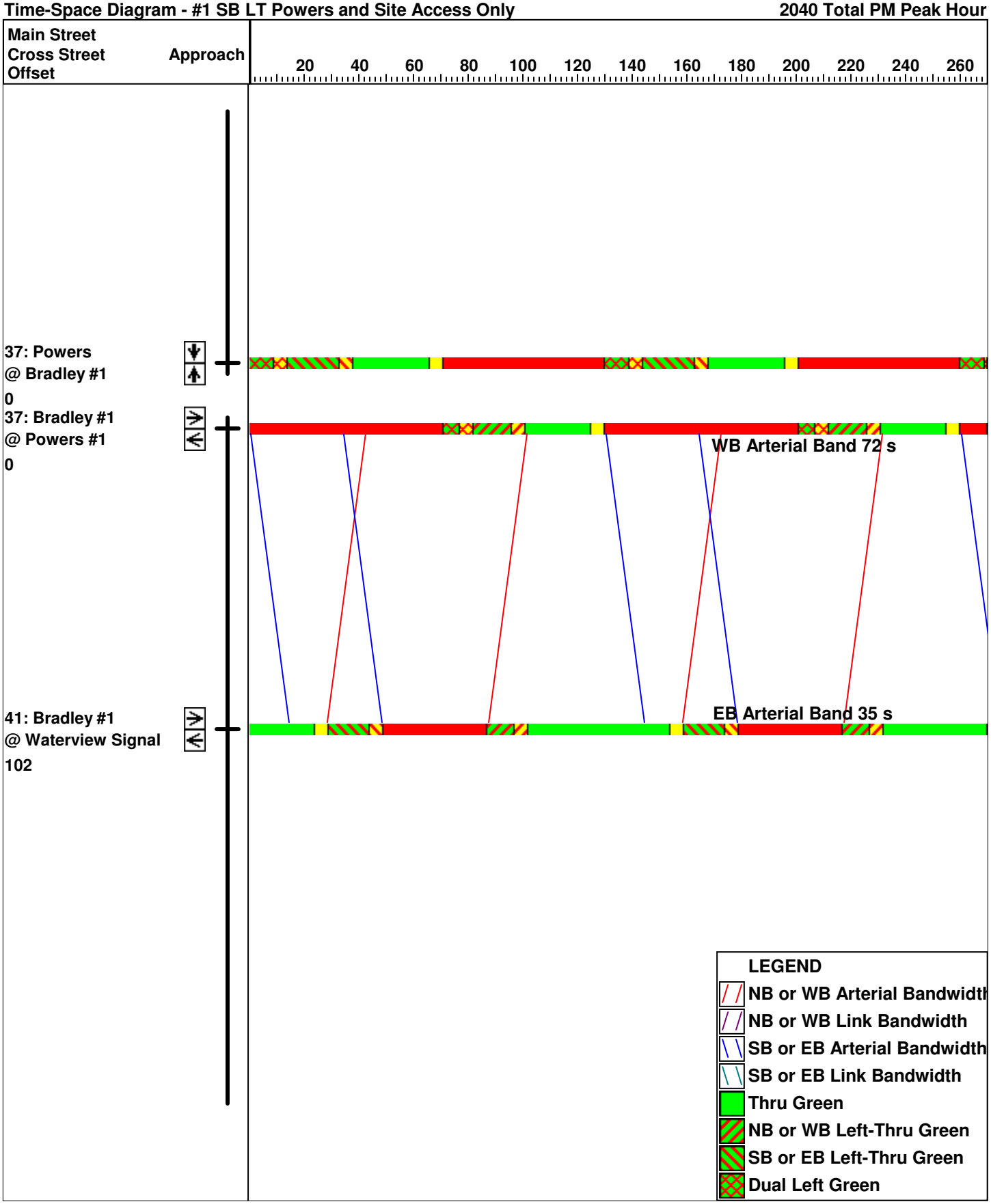


2040 Total PM Peak Hour

Arterial Bandwidths, Maximum Green Times
C = 130 secs, Progression Speed 50 mph

Exhibit 1B

Time-Space Diagram - #1 SB LT Powers and Site Access Only **2040 Total PM Peak Hour**

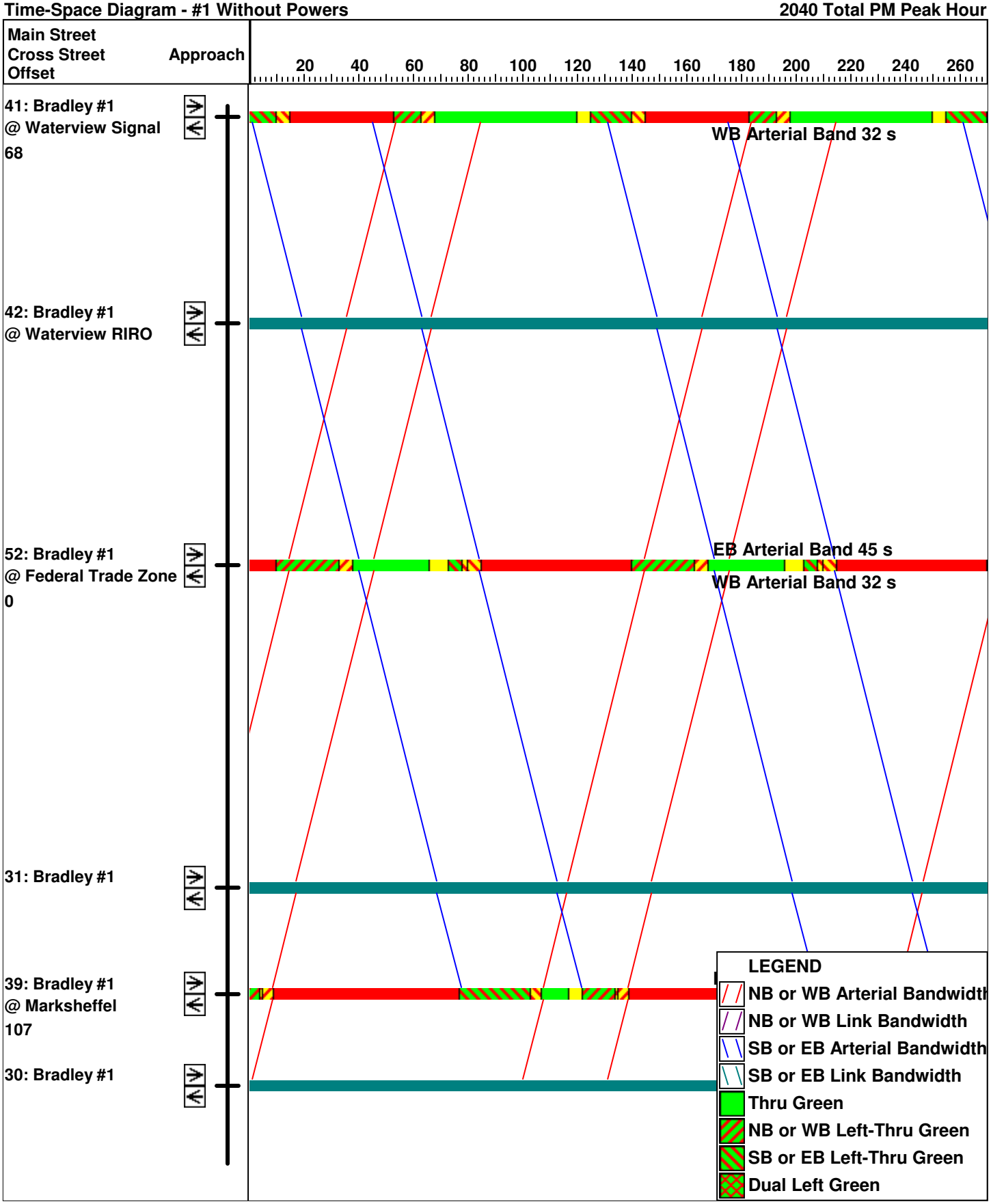


2040 Total PM Peak Hour

Arterial Bandwidths, Maximum Green Times
C = 130 secs, Progression Speed 50 mph

Exhibit 2A

Time-Space Diagram - #1 Without Powers **2040 Total PM Peak Hour**

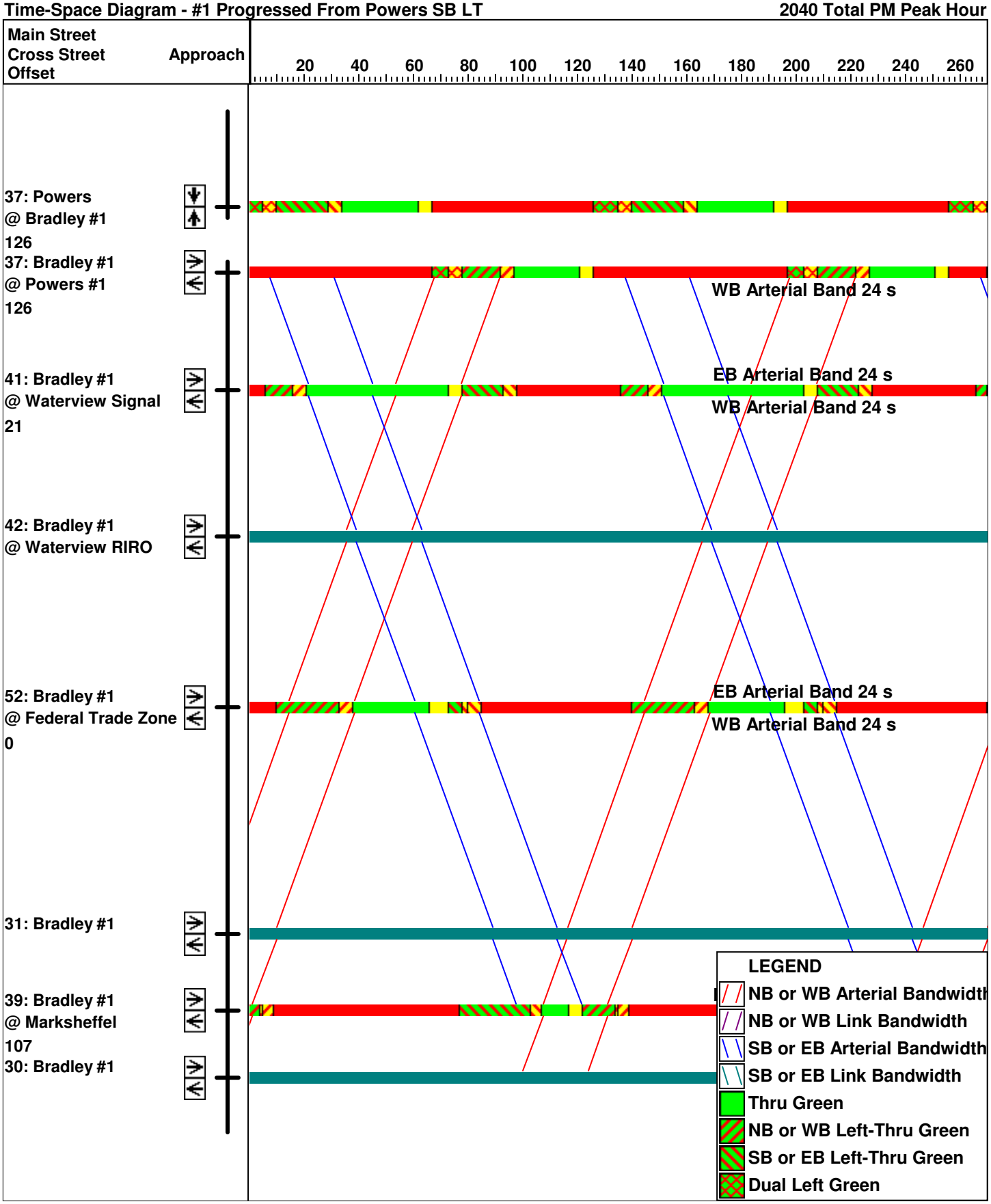


2040 Total PM Peak Hour

Arterial Bandwidths, Maximum Green Times
C = 130 secs, Progression Speed 50 mph

Exhibit 2B

Time-Space Diagram - #1 Progressed From Powers SB LT **2040 Total PM Peak Hour**

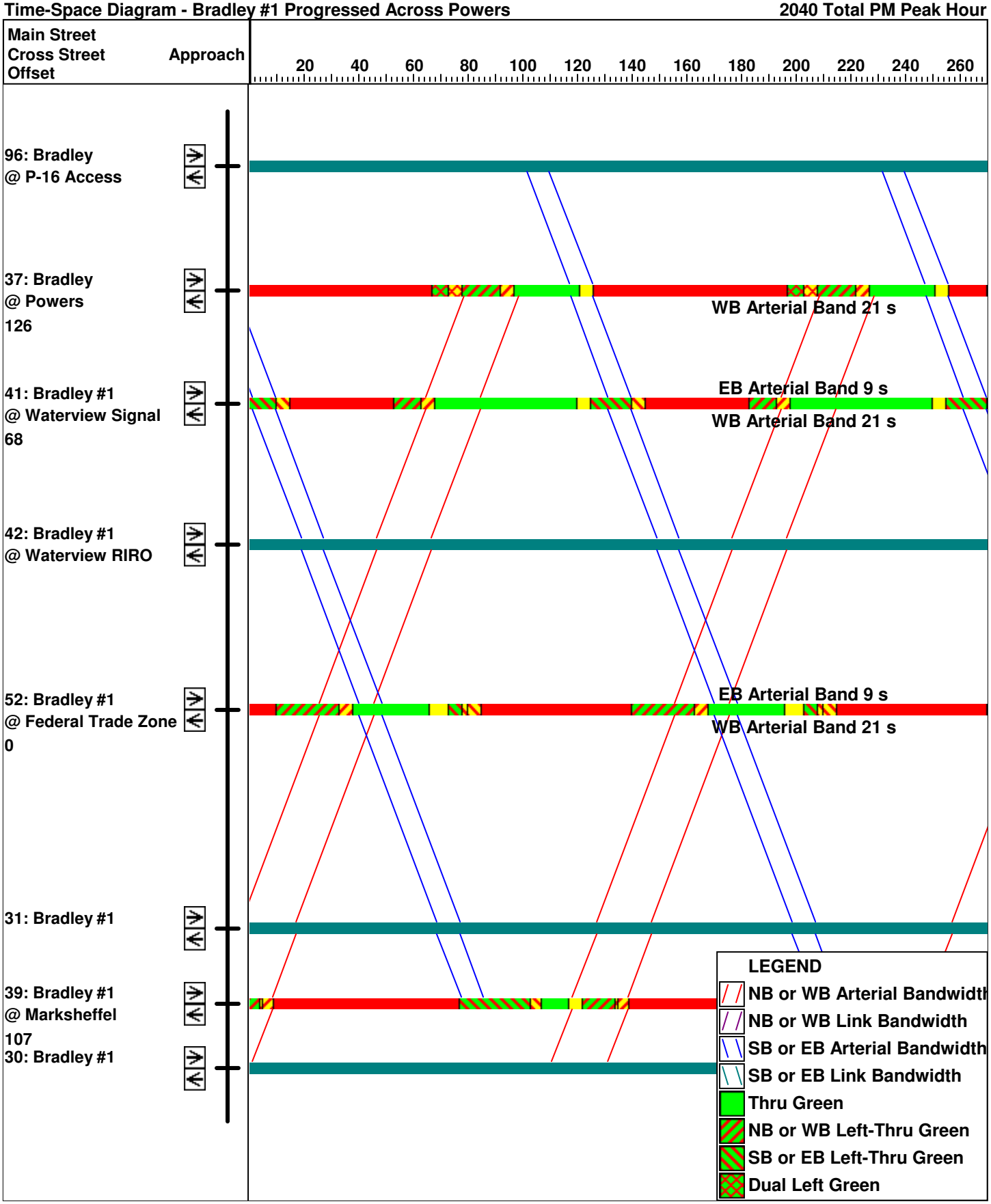


2040 Total PM Peak Hour

Arterial Bandwidths, Maximum Green Times
C = 130 secs, Progression Speed 50 mph

Exhibit 2C

Time-Space Diagram - Bradley #1 Progressed Across Powers — 2040 Total PM Peak Hour



2040 Total PM Peak Hour

Arterial Bandwidths, Maximum Green Times
C = 130 secs, Progression Speed 50 mph

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545 E. Pikes Peak Ave., #210
Colorado Springs, CO 80903
(719) 633-2868

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File Name : Powers - Bradley Rd AM
Site Code : 00164691
Start Date : 10/25/2016
Page No : 1

Groups Printed- Unshifted

	From North				From East				From South				From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
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	1.0	1.0	
06:30 AM	0	60	57	0	77	0	35	0	59	112	0	0	0	0	0	0	400
06:45 AM	0	62	63	0	84	0	49	0	67	120	0	0	0	0	0	0	445
Total	0	122	120	0	161	0	84	0	126	232	0	0	0	0	0	0	845
07:00 AM	0	57	78	0	89	0	44	1	69	132	0	0	0	0	0	0	470
07:15 AM	0	75	82	0	84	0	41	1	67	159	0	0	0	0	0	0	509
07:30 AM	0	73	78	0	106	0	41	0	48	119	0	0	0	0	0	0	465
07:45 AM	0	74	57	0	68	0	55	0	56	86	0	0	0	0	0	0	396
Total	0	279	295	0	347	0	181	2	240	496	0	0	0	0	0	0	1840
08:00 AM	0	58	52	0	56	0	49	0	34	109	0	0	0	0	0	0	358
08:15 AM	0	54	49	0	52	0	43	0	32	101	0	0	0	0	0	0	331
Grand Total	0	513	516	0	616	0	357	2	432	938	0	0	0	0	0	0	3374
Apprch %	0.0	49.9	50.1	0.0	63.2	0.0	36.6	0.2	31.5	68.5	0.0	0.0	0.0	0.0	0.0	0.0	
Total %	0.0	15.2	15.3	0.0	18.3	0.0	10.6	0.1	12.8	27.8	0.0	0.0	0.0	0.0	0.0	0.0	

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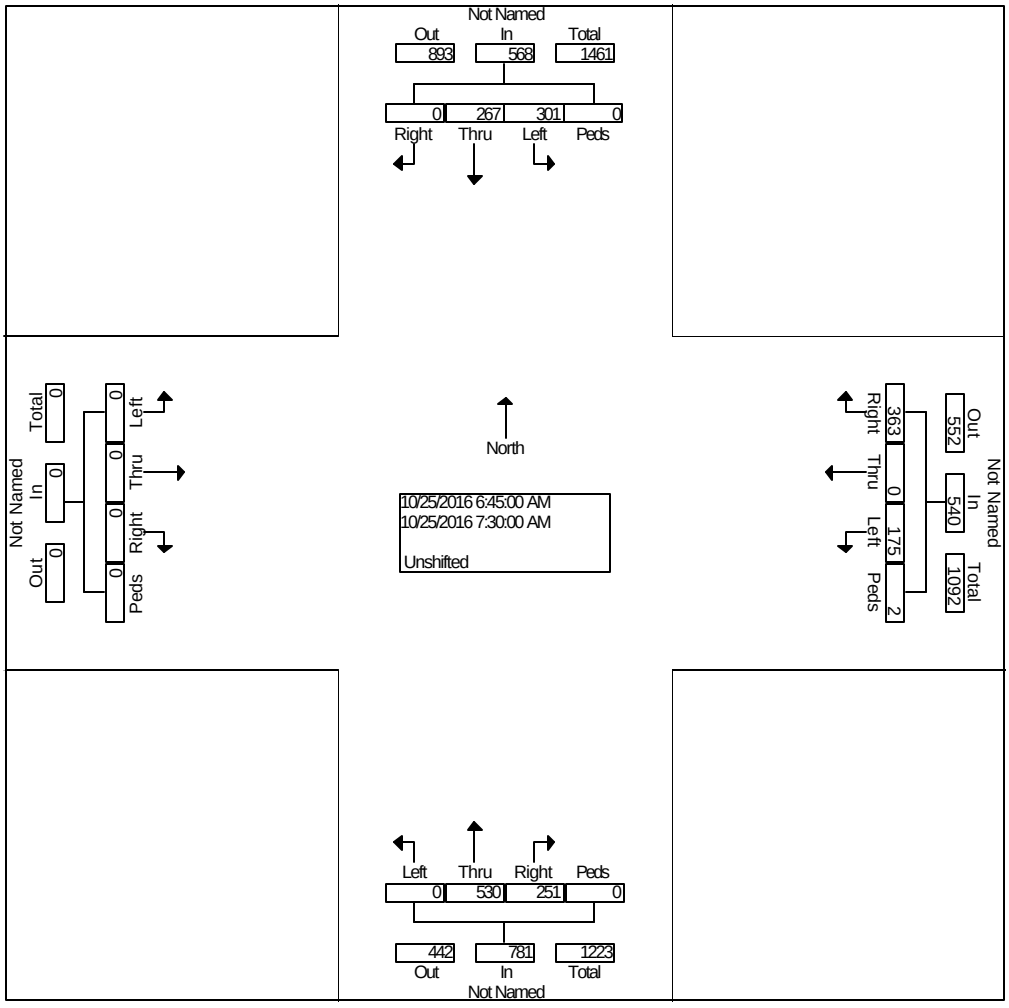
Start Date : 10/25/2016
Page No : 2

	From North					From East					From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Intersection	06:45 AM																				
Volume	0	267	301	0	568	363	0	175	2	540	251	530	0	0	781	0	0	0	0	0	1889
Percent	0.0	47.0	53.0	0.0		67.2	0.0	32.4	0.4		32.1	67.9	0.0	0.0		0.0	0.0	0.0	0.0		
07:15 Volume	0	75	82	0	157	84	0	41	1	126	67	159	0	0	226	0	0	0	0	0	509
Peak Factor																					0.928
High Int.	07:15 AM					07:30 AM					07:15 AM					6:15:00 AM					
Volume	0	75	82	0	157	106	0	41	0	147	67	159	0	0	226						
Peak Factor					0.904					0.918					0.864						



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	Powers Blvd From North				Bradley Rd From East				Powers Blvd From South				From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
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	1.0	1.0	
04:00 PM	0	119	79	0	58	0	45	1	69	60	0	0	0	0	0	0	431
04:15 PM	0	135	71	0	89	0	52	0	68	71	0	0	0	0	0	0	486
04:30 PM	0	129	82	0	65	0	45	0	87	67	0	0	0	0	0	0	475
04:45 PM	0	119	62	0	85	0	56	0	81	71	0	0	0	0	0	0	474
Total	0	502	294	0	297	0	198	1	305	269	0	0	0	0	0	0	1866
05:00 PM	0	119	73	0	70	0	31	0	78	77	0	0	0	0	0	0	448
05:15 PM	0	142	69	0	74	0	52	0	74	81	0	0	0	0	0	0	492
05:30 PM	0	134	70	0	52	0	39	0	90	75	0	0	0	0	0	0	460
05:45 PM	0	129	63	1	45	0	36	0	81	70	0	0	0	0	0	0	425
Total	0	524	275	1	241	0	158	0	323	303	0	0	0	0	0	0	1825
Grand Total	0	1026	569	1	538	0	356	1	628	572	0	0	0	0	0	0	3691
Apprch %	0.0	64.3	35.7	0.1	60.1	0.0	39.8	0.1	52.3	47.7	0.0	0.0	0.0	0.0	0.0	0.0	
Total %	0.0	27.8	15.4	0.0	14.6	0.0	9.6	0.0	17.0	15.5	0.0	0.0	0.0	0.0	0.0	0.0	

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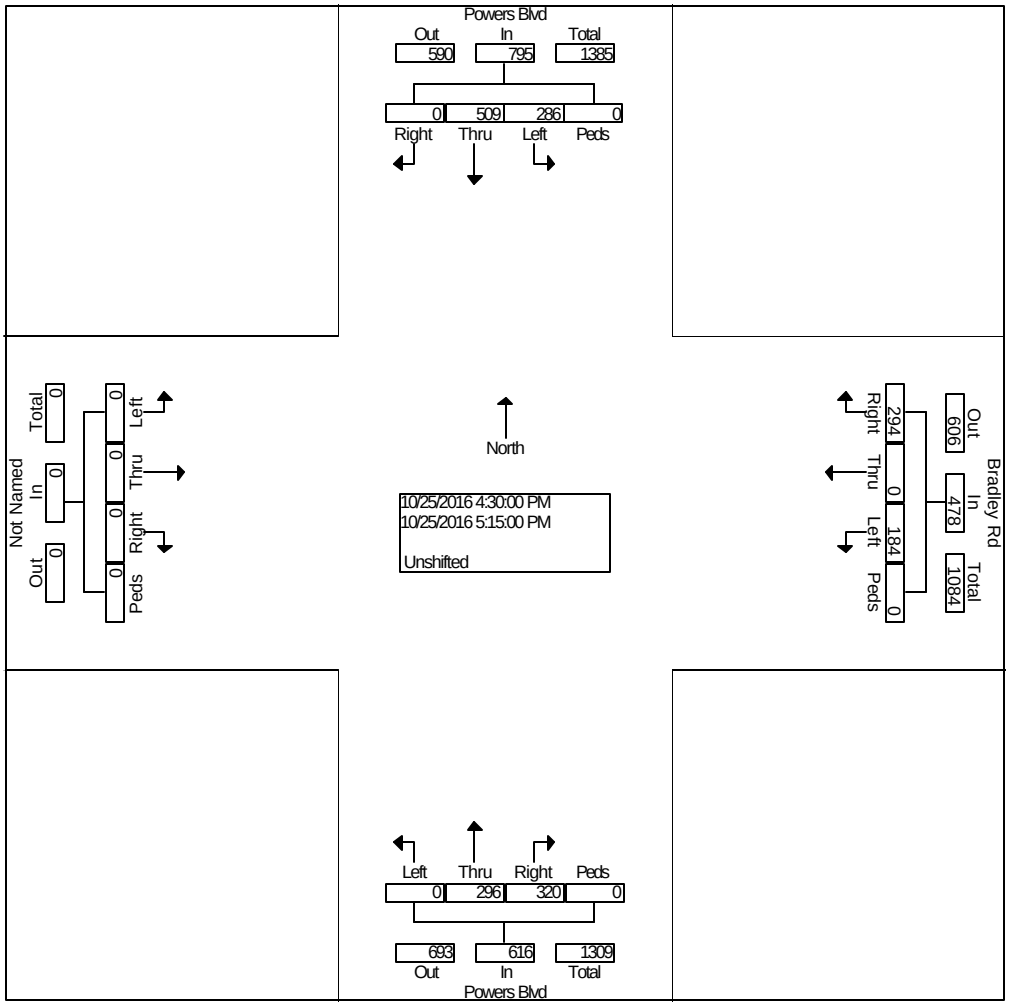
Page No : 2

	Powers Blvd From North					Bradley Rd From East					Powers Blvd From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	04:30 PM																				
Volume	0	509	286	0	795	294	0	184	0	478	320	296	0	0	616	0	0	0	0	0	1889
Percent	0.0	64.0	36.0	0.0		61.5	0.0	38.5	0.0		51.9	48.1	0.0	0.0		0.0	0.0	0.0	0.0		
05:15 Volume	0	142	69	0	211	74	0	52	0	126	74	81	0	0	155	0	0	0	0	0	492
Peak Factor																					0.960
High Int.	04:30 PM					04:45 PM					05:00 PM					3:45:00 PM					
Volume	0	129	82	0	211	85	0	56	0	141	78	77	0	0	155						
Peak Factor					0.942					0.848					0.994						



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Int. Name : Grinnell Blvd - Bradley Rd AM
Site Code : 00164690
Start Date : 08/30/2016
Page No : 1

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	Grinnell Blvd From North				Bradley Rd From East				Grinnell Blvd From South				Bradley Rd From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
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	1.0	1.0	
06:30 AM	38	43	1	0	1	35	5	0	2	77	36	0	29	11	31	0	309
06:45 AM	43	49	1	0	0	39	6	0	3	79	40	0	32	13	35	0	340
Total	81	92	2	0	1	74	11	0	5	156	76	0	61	24	66	0	649
07:00 AM	34	56	0	0	2	30	7	0	2	90	51	0	30	16	50	0	368
07:15 AM	33	54	1	0	0	40	5	0	1	96	58	0	27	10	27	0	352
07:30 AM	31	73	1	0	2	31	7	0	3	94	42	0	31	11	26	0	352
07:45 AM	34	57	0	0	1	25	4	0	3	56	31	1	26	9	21	0	268
Total	132	240	2	0	5	126	23	0	9	336	182	1	114	46	124	0	1340
08:00 AM	29	51	4	0	2	18	7	0	3	56	27	0	29	13	25	0	264
08:15 AM	34	56	2	0	2	31	13	0	2	84	42	0	22	5	18	0	311
Grand Total	276	439	10	0	10	249	54	0	19	632	327	1	226	88	233	0	2564
Apprch %	38.1	60.6	1.4	0.0	3.2	79.6	17.3	0.0	1.9	64.6	33.4	0.1	41.3	16.1	42.6	0.0	
Total %	10.8	17.1	0.4	0.0	0.4	9.7	2.1	0.0	0.7	24.6	12.8	0.0	8.8	3.4	9.1	0.0	

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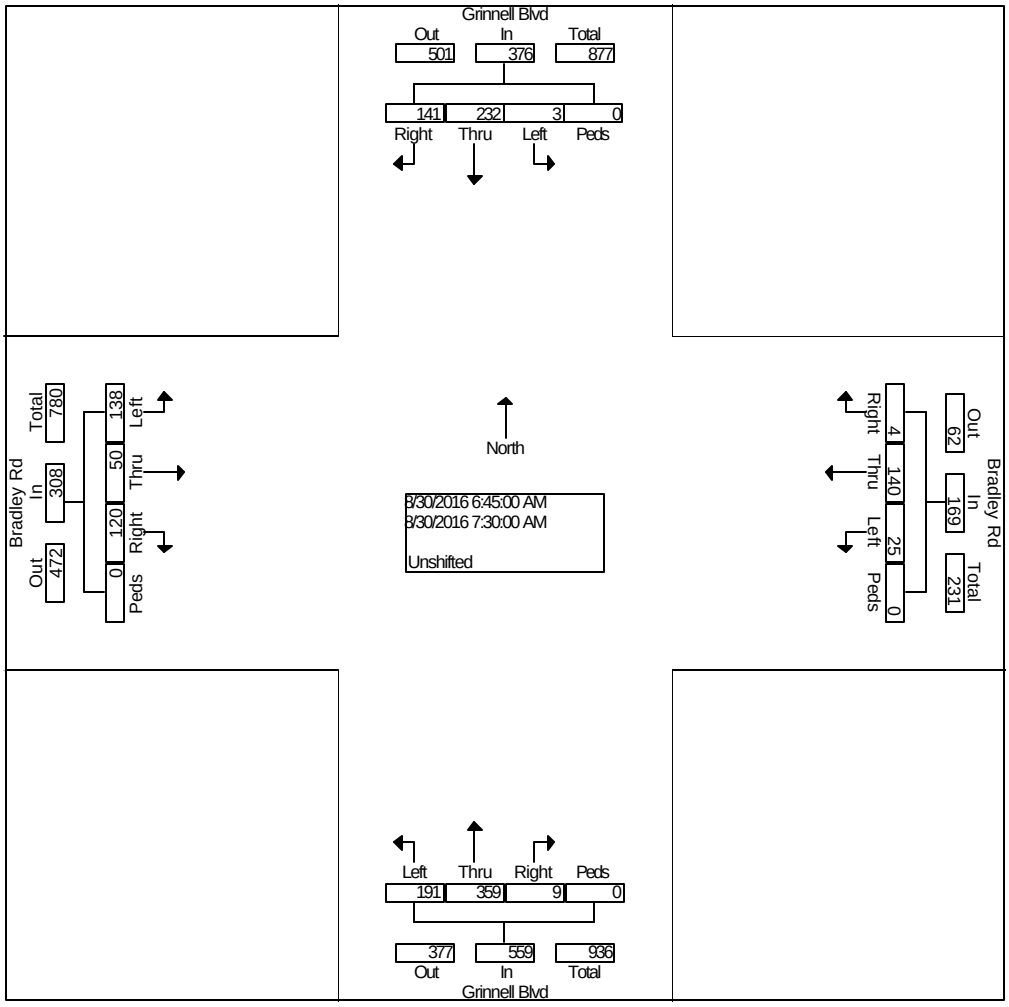
Study Name : Grinnell Blvd - Bradley Rd AM
Site Code : 00164690
Start Date : 08/30/2016

	Grinnell Blvd From North					Bradley Rd From East					Grinnell Blvd From South					Bradley Rd From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Intersection	06:45 AM																				
Volume	141	232	3	0	376	4	140	25	0	169	9	359	191	0	559	120	50	138	0	308	1412
Percent	37.5	61.7	0.8	0.0		2.4	82.8	14.8	0.0		1.6	64.2	34.2	0.0		39.0	16.2	44.8	0.0		
07:00 Volume	34	56	0	0	90	2	30	7	0	39	2	90	51	0	143	30	16	50	0	96	368
Peak Factor																					0.959
High Int.	07:30 AM					06:45 AM					07:15 AM					07:00 AM					
Volume	31	73	1	0	105	0	39	6	0	45	1	96	58	0	155	30	16	50	0	96	
Peak Factor					0.895					0.933					0.902					0.802	



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Site Code : 00164690
Start Date : 08/31/2016
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	Grinnell Blvd From North				Bradley Rd From East				Grinnell Blvd From South				Bradley Rd From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
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	1.0	1.0	
04:00 PM	38	98	2	0	2	11	5	0	5	49	41	0	41	16	19	0	327
04:15 PM	43	111	2	0	4	15	6	0	6	57	43	0	46	14	22	0	369
04:30 PM	41	73	3	0	0	13	6	0	4	70	39	0	62	20	22	0	353
04:45 PM	40	100	3	0	0	14	7	0	7	43	33	0	44	35	19	0	345
Total	162	382	10	0	6	53	24	0	22	219	156	0	193	85	82	0	1394
05:00 PM	38	102	1	1	1	13	2	0	7	59	56	0	43	27	20	0	370
05:15 PM	35	93	0	0	1	12	5	0	6	60	32	0	49	37	29	0	359
05:30 PM	25	106	4	0	1	10	4	0	10	50	39	0	64	31	30	0	374
05:45 PM	34	92	1	0	3	17	4	0	8	69	39	0	37	26	23	0	353
Total	132	393	6	1	6	52	15	0	31	238	166	0	193	121	102	0	1456
Grand Total	294	775	16	1	12	105	39	0	53	457	322	0	386	206	184	0	2850
Apprch %	27.1	71.4	1.5	0.1	7.7	67.3	25.0	0.0	6.4	54.9	38.7	0.0	49.7	26.5	23.7	0.0	
Total %	10.3	27.2	0.6	0.0	0.4	3.7	1.4	0.0	1.9	16.0	11.3	0.0	13.5	7.2	6.5	0.0	

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File Name : Grinnell Blvd - Bradley Rd PM
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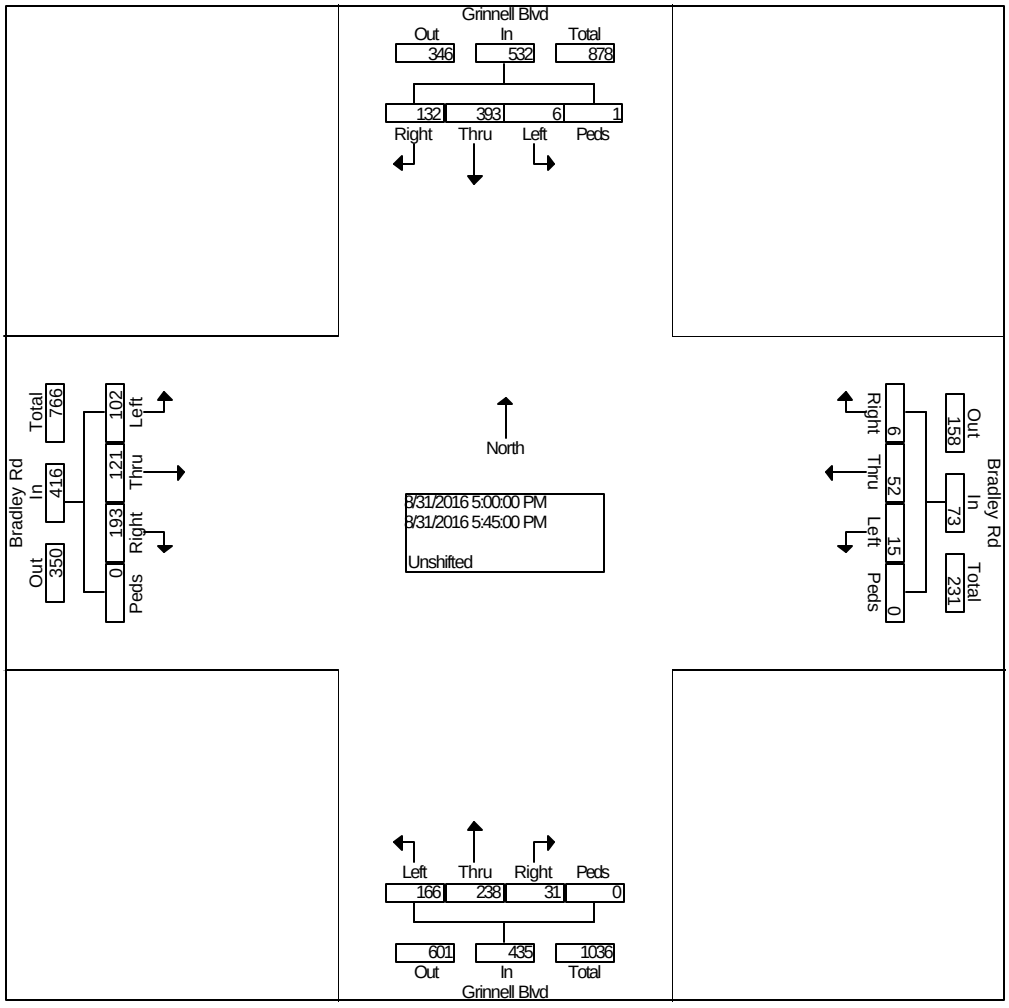
Page No : 2

	Grinnell Blvd From North					Bradley Rd From East					Grinnell Blvd From South					Bradley Rd From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	05:00 PM																				
Volume	132	393	6	1	532	6	52	15	0	73	31	238	166	0	435	193	121	102	0	416	1456
Percent	24.8	73.9	1.1	0.2		8.2	71.2	20.5	0.0		7.1	54.7	38.2	0.0		46.4	29.1	24.5	0.0		
05:30 Volume	25	106	4	0	135	1	10	4	0	15	10	50	39	0	99	64	31	30	0	125	374
Peak Factor																					0.973
High Int.	05:00 PM					05:45 PM					05:00 PM					05:30 PM					
Volume	38	102	1	1	142	3	17	4	0	24	7	59	56	0	122	64	31	30	0	125	
Peak Factor					0.937					0.760					0.891					0.832	



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File Name : Grinnell Blvd - Goldfield Dr AM
Site Code : 00164690
Start Date : 08/25/2016
Page No : 1

Groups Printed- Unshifted

	Grinnell Blvd From North				Goldfield Dr From East				Grinnell Blvd From South				From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
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	1.0	1.0	
06:30 AM	0	57	6	0	30	0	12	0	5	117	0	0	0	0	0	0	227
06:45 AM	0	88	12	0	25	0	21	1	7	91	0	0	0	0	0	0	245
Total	0	145	18	0	55	0	33	1	12	208	0	0	0	0	0	0	472
07:00 AM	0	58	4	0	29	0	27	0	7	123	0	0	0	0	0	0	248
07:15 AM	0	86	13	0	41	0	15	1	5	119	0	0	0	0	0	0	280
07:30 AM	0	72	14	0	33	0	17	0	2	107	0	0	0	0	0	0	245
07:45 AM	0	87	19	0	17	0	20	0	8	72	0	0	0	0	0	0	223
Total	0	303	50	0	120	0	79	1	22	421	0	0	0	0	0	0	996
08:00 AM	0	82	8	0	27	0	17	0	6	65	0	0	0	0	0	0	205
08:15 AM	0	82	15	0	20	0	21	0	7	65	0	0	0	0	0	0	210
Grand Total	0	612	91	0	222	0	150	2	47	759	0	0	0	0	0	0	1883
Apprch %	0.0	87.1	12.9	0.0	59.4	0.0	40.1	0.5	5.8	94.2	0.0	0.0	0.0	0.0	0.0	0.0	
Total %	0.0	32.5	4.8	0.0	11.8	0.0	8.0	0.1	2.5	40.3	0.0	0.0	0.0	0.0	0.0	0.0	

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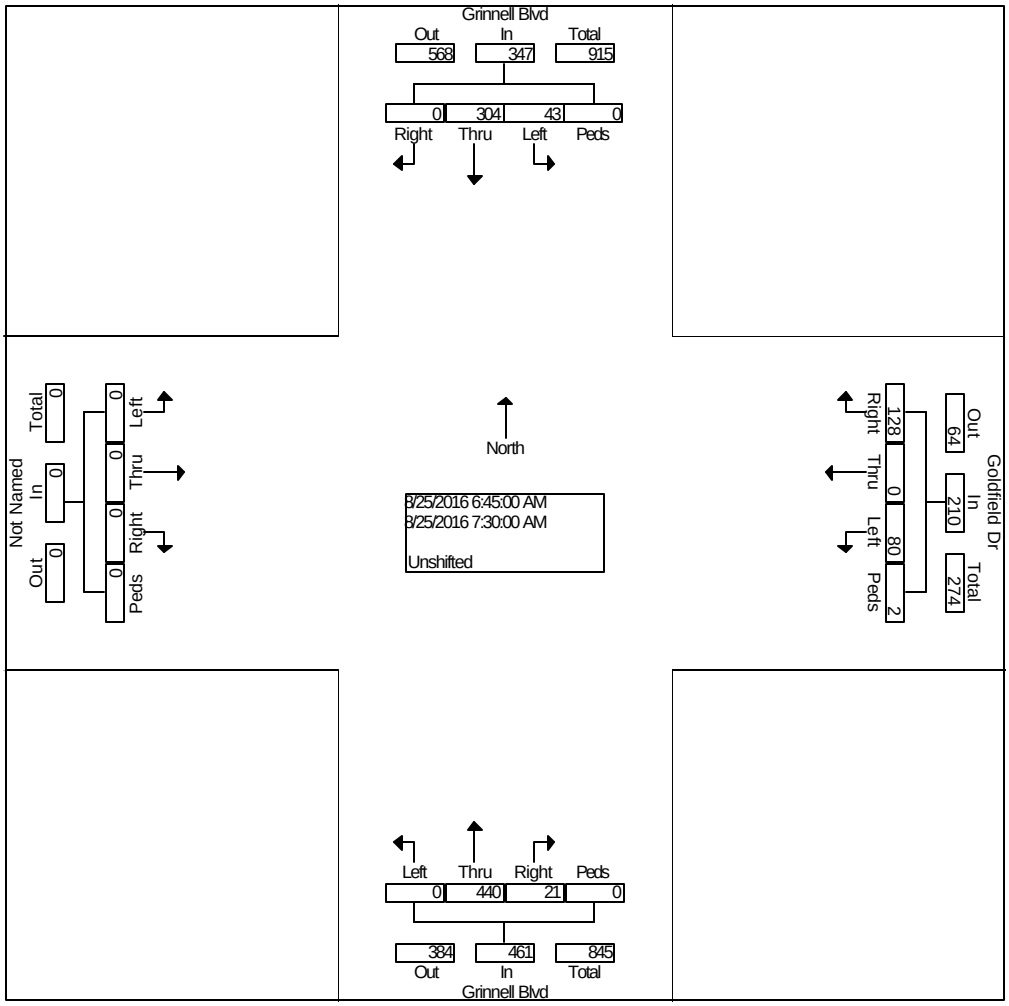
Intersection : Grinnell Blvd - Goldfield Dr AM
Site Code : 00164690
Start Date : 08/25/2016

	Grinnell Blvd From North					Goldfield Dr From East					Grinnell Blvd From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Intersection	06:45 AM																				
Volume	0	304	43	0	347	128	0	80	2	210	21	440	0	0	461	0	0	0	0	0	1018
Percent	0.0	87.6	12.4	0.0		61.0	0.0	38.1	1.0		4.6	95.4	0.0	0.0		0.0	0.0	0.0	0.0		
07:15 Volume	0	86	13	0	99	41	0	15	1	57	5	119	0	0	124	0	0	0	0	0	280
Peak Factor																					0.909
High Int.	06:45 AM					07:15 AM					07:00 AM					6:15:00 AM					
Volume	0	88	12	0	100	41	0	15	1	57	7	123	0	0	130						
Peak Factor					0.868					0.921					0.887						



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LSC Transportation Consultants, Inc.

Int Name : Grinnell Blvd - Goldfield Dr PM
Site Code : 00164690
Start Date : 08/24/2016
Page No : 1

Groups Printed- Unshifted

	From North				From East				From South				From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
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	1.0	1.0	
04:00 PM	0	133	27	0	14	0	8	0	13	79	0	0	0	0	0	0	274
04:15 PM	0	135	26	0	17	0	15	0	18	64	0	0	0	0	0	0	275
04:30 PM	0	114	20	0	16	0	11	0	19	60	0	0	0	0	0	0	240
04:45 PM	0	128	26	0	11	0	14	0	20	67	0	0	0	0	0	0	266
Total	0	510	99	0	58	0	48	0	70	270	0	0	0	0	0	0	1055
05:00 PM	0	110	33	0	29	0	10	0	31	58	0	0	0	0	0	0	271
05:15 PM	0	141	26	0	10	0	4	0	18	54	0	0	0	0	0	0	253
05:30 PM	0	112	36	0	15	0	9	0	20	61	0	0	0	0	0	0	253
05:45 PM	0	109	32	0	13	0	7	0	18	59	0	0	0	0	0	0	238
Total	0	472	127	0	67	0	30	0	87	232	0	0	0	0	0	0	1015
Grand Total	0	982	226	0	125	0	78	0	157	502	0	0	0	0	0	0	2070
Apprch %	0.0	81.3	18.7	0.0	61.6	0.0	38.4	0.0	23.8	76.2	0.0	0.0	0.0	0.0	0.0	0.0	
Total %	0.0	47.4	10.9	0.0	6.0	0.0	3.8	0.0	7.6	24.3	0.0	0.0	0.0	0.0	0.0	0.0	

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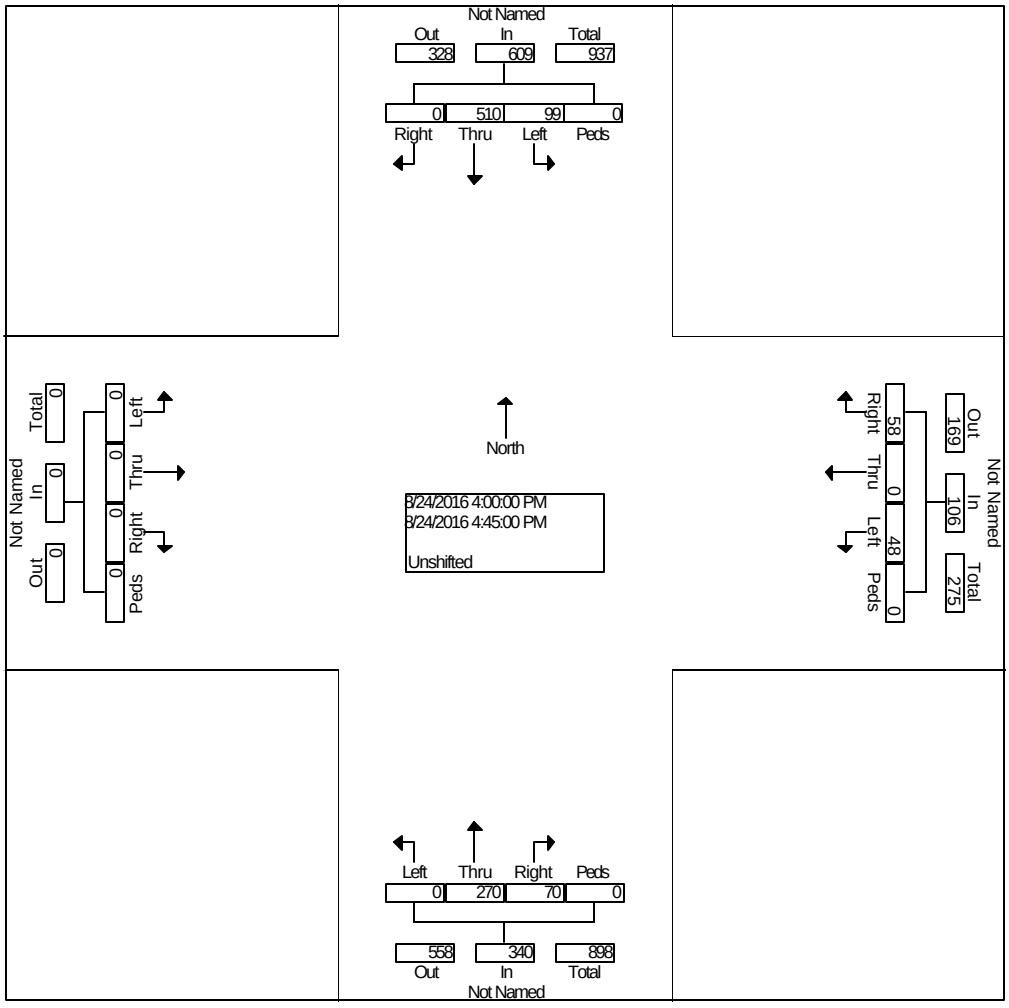
Int Name : Grinnell Blvd - Goldfield Dr PM
Site Code : 00164690
Start Date : 08/24/2016

	From North					From East					From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	04:00 PM																				
Volume	0	510	99	0	609	58	0	48	0	106	70	270	0	0	340	0	0	0	0	0	1055
Percent	0.0	83.7	16.3	0.0		54.7	0.0	45.3	0.0		20.6	79.4	0.0	0.0		0.0	0.0	0.0	0.0		
04:15 Volume	0	135	26	0	161	17	0	15	0	32	18	64	0	0	82	0	0	0	0	0	275
Peak Factor																					0.959
High Int.	04:15 PM					04:15 PM					04:00 PM					3:45:00 PM					
Volume	0	135	26	0	161	17	0	15	0	32	13	79	0	0	92						
Peak Factor					0.946					0.828					0.924						



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File Name : Powers Blvd - Grinnell Blvd AM
Site Code : 00164690
Start Date : 08/31/2016
Page No : 1

Groups Printed- Unshifted

	Powers Blvd From North				From East				Powers Blvd From South				Grinnell Blvd From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
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	1.0	1.0	
06:30 AM	33	73	0	0	0	0	0	0	0	148	15	0	14	0	89	0	372
06:45 AM	67	150	0	0	0	0	0	0	0	240	30	0	23	0	108	0	618
Total	100	223	0	0	0	0	0	0	0	388	45	0	37	0	197	0	990
07:00 AM	54	150	0	0	0	0	0	0	0	291	16	0	26	0	128	0	665
07:15 AM	68	137	0	0	0	0	0	0	0	297	18	1	19	0	147	0	687
07:30 AM	68	147	0	0	0	0	0	0	0	265	21	0	18	0	128	0	647
07:45 AM	70	121	0	0	0	0	0	0	0	202	19	1	9	0	83	0	505
Total	260	555	0	0	0	0	0	0	0	1055	74	2	72	0	486	0	2504
08:00 AM	72	115	0	0	0	0	0	0	0	166	18	0	5	0	87	0	463
08:15 AM	61	129	0	0	0	0	0	0	0	165	21	0	16	0	79	0	471
Grand Total	493	1022	0	0	0	0	0	0	0	1774	158	2	130	0	849	0	4428
Apprch %	32.5	67.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	91.7	8.2	0.1	13.3	0.0	86.7	0.0	
Total %	11.1	23.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.1	3.6	0.0	2.9	0.0	19.2	0.0	

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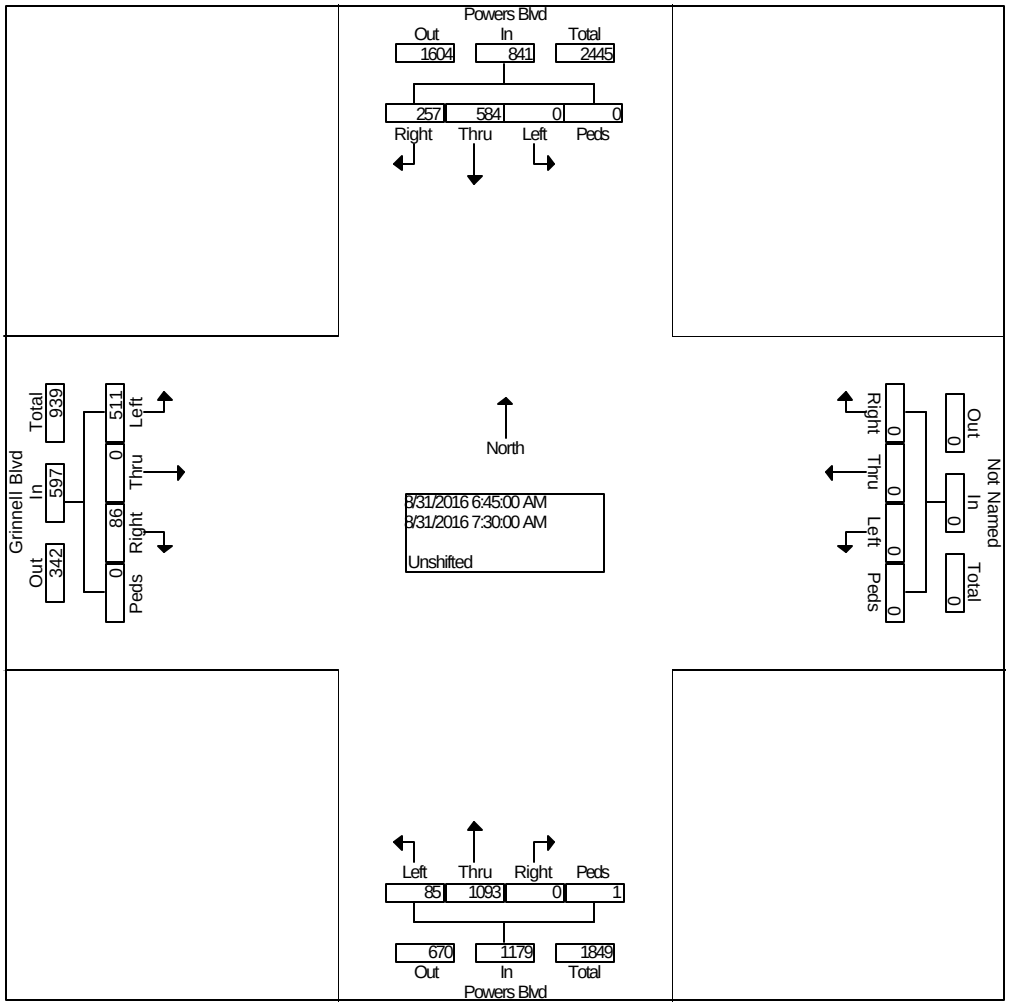
File Name : Powers Blvd - Grinnell Blvd AM
Site Code : 00164690
Start Date : 08/31/2016

	Powers Blvd From North					From East					Powers Blvd From South					Grinnell Blvd From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 08:15 AM - Peak 1 of 1																					
Intersection	06:45 AM																				
Volume	257	584	0	0	841	0	0	0	0	0	0	1093	85	1	1179	86	0	511	0	597	2617
Percent	30.6	69.4	0.0	0.0		0.0	0.0	0.0	0.0		0.0	92.7	7.2	0.1		14.4	0.0	85.6	0.0		
07:15 Volume	68	137	0	0	205	0	0	0	0	0	0	297	18	1	316	19	0	147	0	166	687
Peak Factor																					0.952
High Int.	06:45 AM					6:15:00 AM					07:15 AM					07:15 AM					
Volume	67	150	0	0	217	0	0	0	0	0	0	297	18	1	316	19	0	147	0	166	
Peak Factor					0.969										0.933					0.899	



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File Name : Powers Blvd - Grinnell Blvd PM
Site Code : 00164690
Start Date : 09/01/2016
Page No : 1

Groups Printed- Unshifted

	Powers Blvd From North				From East				Powers Blvd From South				Grinnell Blvd From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
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	1.0	1.0	
04:00 PM	138	210	0	0	0	0	0	0	0	157	25	0	30	0	81	0	641
04:15 PM	146	237	0	0	0	0	0	0	0	182	24	1	16	0	73	0	679
04:30 PM	123	195	0	0	0	0	0	0	0	161	25	0	12	0	88	0	604
04:45 PM	140	289	0	0	0	0	0	0	0	154	19	1	11	0	64	0	678
Total	547	931	0	0	0	0	0	0	0	654	93	2	69	0	306	0	2602
05:00 PM	117	248	0	0	0	0	0	0	0	152	27	0	19	0	71	0	634
05:15 PM	138	205	0	0	0	0	0	0	0	177	11	0	12	0	43	0	586
05:30 PM	138	231	0	0	0	0	0	0	0	141	11	0	6	0	47	0	574
05:45 PM	122	195	0	1	0	0	0	0	0	154	14	0	12	0	74	0	572
Total	515	879	0	1	0	0	0	0	0	624	63	0	49	0	235	0	2366
Grand Total	1062	1810	0	1	0	0	0	0	0	1278	156	2	118	0	541	0	4968
Apprch %	37.0	63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	89.0	10.9	0.1	17.9	0.0	82.1	0.0	
Total %	21.4	36.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.7	3.1	0.0	2.4	0.0	10.9	0.0	

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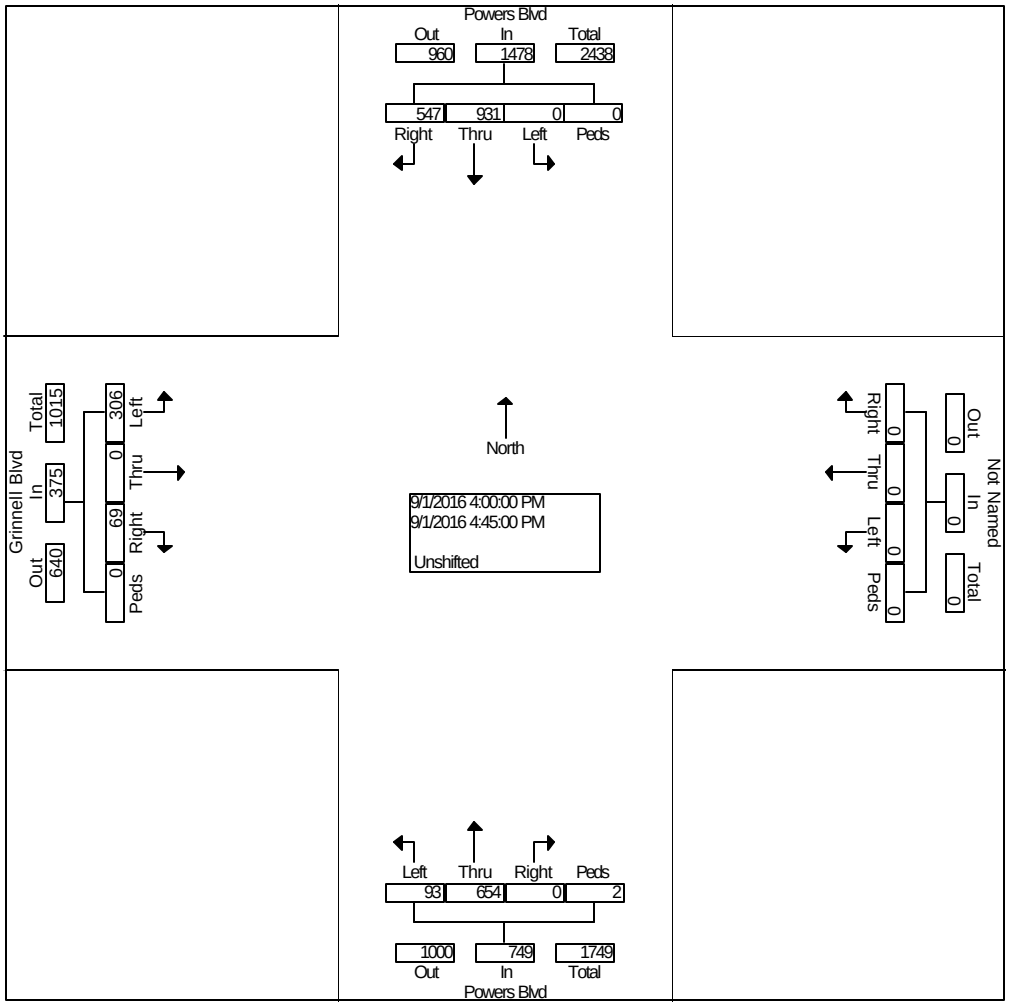
File Name : Powers Blvd - Grinnell Blvd PM
Site Code : 00164690
Start Date : 09/01/2016

	Powers Blvd From North					From East					Powers Blvd From South					Grinnell Blvd From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	04:00 PM																				
Volume	547	931	0	0	1478	0	0	0	0	0	0	654	93	2	749	69	0	306	0	375	2602
Percent	37.0	63.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	87.3	12.4	0.3		18.4	0.0	81.6	0.0		
04:15 Volume	146	237	0	0	383	0	0	0	0	0	0	182	24	1	207	16	0	73	0	89	679
Peak Factor																					0.958
High Int.	04:45 PM					3:45:00 PM					04:15 PM					04:00 PM					
Volume	140	289	0	0	429	0	0	0	0	0	0	182	24	1	207	30	0	81	0	111	
Peak Factor					0.861										0.905					0.845	



Intersection	
Int Delay, s/veh	14.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	175	363	530	251	301	267
Future Vol, veh/h	175	363	530	251	301	267
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	-	500	670	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	86	86	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	175	363	616	292	334	297

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1433	-	0	-	616	0
Stage 1	616	-	-	-	-	-
Stage 2	817	-	-	-	-	-
Critical Hdwy	6.84	-	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	-	-	-	2.22	-
Pot Cap-1 Maneuver	~ 125	0	-	0	960	-
Stage 1	501	0	-	0	-	-
Stage 2	395	0	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	~ 82	-	-	-	960	-
Mov Cap-2 Maneuver	188	-	-	-	-	-
Stage 1	501	-	-	-	-	-
Stage 2	258	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	99.5	0	5.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	188	-	960	-
HCM Lane V/C Ratio	-	0.931	-	0.348	-
HCM Control Delay (s)	-	99.5	0	10.7	-
HCM Lane LOS	-	F	A	B	-
HCM 95th %tile Q(veh)	-	7.3	-	1.6	-

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

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	175	363	530	251	301	267
Future Volume (vph)	175	363	530	251	301	267
Turn Type	Prot	Free	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		Free		2		
Detector Phase	8		2	2	1	6
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	9.0		9.0	9.0	9.0	9.0
Total Split (s)	30.0		50.0	50.0	20.0	70.0
Total Split (%)	30.0%		50.0%	50.0%	20.0%	70.0%
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None		C-Max	C-Max	None	C-Max
Act Effct Green (s)	15.2	100.0	45.0	45.0	24.8	74.8
Actuated g/C Ratio	0.15	1.00	0.45	0.45	0.25	0.75
v/c Ratio	0.65	0.23	0.39	0.33	0.76	0.11
Control Delay	50.9	0.3	19.2	3.1	49.2	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.9	0.3	19.2	3.1	49.2	4.0
LOS	D	A	B	A	D	A
Approach Delay	16.8		14.0			27.9
Approach LOS	B		B			C

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 19.0	Intersection LOS: B
Intersection Capacity Utilization 53.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 37: Powers & Bradley Rd.

Intersection	
Int Delay, s/veh	3.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	80	128	475	21	43	300
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	300	0	-	380	295	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	88	88
Heavy Vehicles, %	1	1	2	1	1	2
Mvmt Flow	86	138	511	23	49	341

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	950	511	0	0	511	0
Stage 1	511	-	-	-	-	-
Stage 2	439	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	290	565	-	-	1059	-
Stage 1	604	-	-	-	-	-
Stage 2	652	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	277	565	-	-	1059	-
Mov Cap-2 Maneuver	277	-	-	-	-	-
Stage 1	604	-	-	-	-	-
Stage 2	622	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.4	0	1.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	277	565	1059	-
HCM Lane V/C Ratio	-	-	0.311	0.244	0.046	-
HCM Control Delay (s)	-	-	23.7	13.4	8.6	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	1.3	0.9	0.1	-

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #1 6:45

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	11.2	3.4	4.5	7.7	8.3	13.0	3.0		5.5	6.8	6.4	9.0

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #2 7:00

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	11.9	4.1	5.6	8.1	9.2	14.0	3.0	4.9	4.5	6.7	6.8	9.2

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #3 7:15

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	9.1	3.9	4.6	7.9	9.4	8.8	2.9		6.0	6.3	5.4	7.5

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #4 7:30

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	7.1	3.4	6.2	8.5	7.3	9.2	2.5		5.2	6.7	6.6	7.3

4: Grinnell Blvd. & Bradley Rd. Performance by lane Entire Run

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	10.3	3.8	5.2	8.2	8.8	11.7	2.9	6.1	5.4	6.8	6.4	8.5

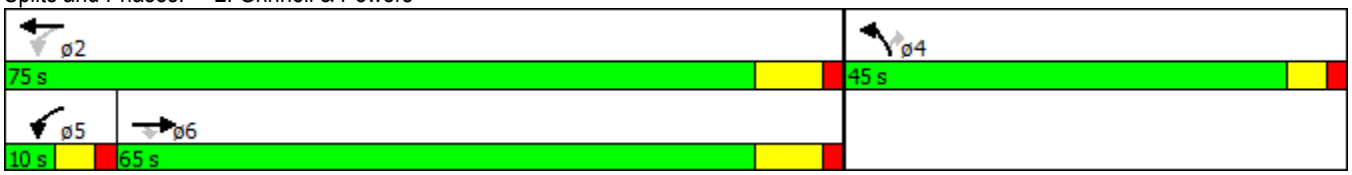
Total Zone Performance By Interval

Interval Start	6:45	7:00	7:15	7:30	All
Stop Del/Veh (s)	228.5	116.7	282.5	293.2	427.6

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	584	257	85	1093	511	86
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	4	4
Switch Phase						
Minimum Initial (s)	30.0	30.0	4.0	30.0	8.0	8.0
Minimum Split (s)	38.0	38.0	10.0	38.0	22.0	22.0
Total Split (s)	65.0	65.0	10.0	75.0	45.0	45.0
Total Split (%)	54.2%	54.2%	8.3%	62.5%	37.5%	37.5%
Yellow Time (s)	6.0	6.0	3.5	6.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-4.0	-4.0	-1.5	-4.0	-1.5	-1.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Min	Min	None	Min	None	None
Act Effct Green (s)	36.2	36.2	43.8	43.8	37.2	37.2
Actuated g/C Ratio	0.41	0.41	0.49	0.49	0.42	0.42
v/c Ratio	0.42	0.32	0.25	0.70	0.77	0.14
Control Delay	21.2	3.7	14.6	20.4	31.5	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.2	3.7	14.6	20.4	31.5	11.7
LOS	C	A	B	C	C	B
Approach Delay	15.9			20.0	28.6	
Approach LOS	B			C	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 89.1	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 20.8	Intersection LOS: C
Intersection Capacity Utilization 68.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Grinnell & Powers



Intersection	
Int Delay, s/veh	12.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	184	294	296	320	286	509
Future Vol, veh/h	184	294	296	320	286	509
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	-	500	670	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	99	99	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	194	309	299	323	304	541

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1178	-	0	-	299	0
Stage 1	299	-	-	-	-	-
Stage 2	879	-	-	-	-	-
Critical Hdwy	6.84	-	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	-	-	-	2.22	-
Pot Cap-1 Maneuver	~ 184	0	-	0	1259	-
Stage 1	726	0	-	0	-	-
Stage 2	366	0	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	~ 140	-	-	-	1259	-
Mov Cap-2 Maneuver	230	-	-	-	-	-
Stage 1	726	-	-	-	-	-
Stage 2	278	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	69.9	0	3.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	230	-	1259	-
HCM Lane V/C Ratio	-	0.842	-	0.242	-
HCM Control Delay (s)	-	69.9	0	8.8	-
HCM Lane LOS	-	F	A	A	-
HCM 95th %tile Q(veh)	-	6.5	-	0.9	-

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

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	184	294	296	320	286	509
Future Volume (vph)	184	294	296	320	286	509
Turn Type	Prot	Free	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		Free		2		
Detector Phase	8		2	2	1	6
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	9.0		9.0	9.0	9.0	9.0
Total Split (s)	30.0		55.0	55.0	15.0	70.0
Total Split (%)	30.0%		55.0%	55.0%	15.0%	70.0%
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None		C-Max	C-Max	None	C-Max
Act Effct Green (s)	11.0	100.0	50.0	50.0	24.0	79.0
Actuated g/C Ratio	0.11	1.00	0.50	0.50	0.24	0.79
v/c Ratio	0.51	0.20	0.17	0.34	0.72	0.19
Control Delay	46.5	0.3	14.0	2.6	46.7	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.5	0.3	14.0	2.6	46.7	2.9
LOS	D	A	B	A	D	A
Approach Delay	18.1		8.1			18.7
Approach LOS	B		A			B

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 15.2	Intersection LOS: B
Intersection Capacity Utilization 44.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 37: Powers & Bradley Rd.

Intersection	
Int Delay, s/veh	2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	48	58	275	70	99	510
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	300	0	-	380	295	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	83	83	100	100	95	95
Heavy Vehicles, %	1	1	2	1	1	2
Mvmt Flow	58	70	275	70	104	537

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1020	275	0	0	275	0
Stage 1	275	-	-	-	-	-
Stage 2	745	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	263	766	-	-	1294	-
Stage 1	774	-	-	-	-	-
Stage 2	471	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	242	766	-	-	1294	-
Mov Cap-2 Maneuver	242	-	-	-	-	-
Stage 1	774	-	-	-	-	-
Stage 2	433	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.7	0	1.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	242	766	1294	-
HCM Lane V/C Ratio	-	-	0.239	0.091	0.081	-
HCM Control Delay (s)	-	-	24.5	10.2	8	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.9	0.3	0.3	-

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #1 5:00

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	6.6	4.6	4.1	5.2	6.7	5.7	3.1	3.4	4.8	6.0	5.9	5.6

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #2 5:15

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	9.3	5.1	6.7	5.9	7.7	6.5	3.2	3.1	5.2	7.5	5.1	6.6

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #3 5:30

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	7.2	4.5	5.7	5.9	6.3	5.4	3.2	3.6	4.9	6.6	4.4	5.7

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #4 5:45

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	6.8	3.7	4.2	5.3	6.4	5.3	3.0	2.6	4.6	5.6	4.1	5.2

4: Grinnell Blvd. & Bradley Rd. Performance by lane Entire Run

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	7.8	4.5	5.0	5.7	6.9	5.9	3.1	3.7	5.0	6.6	4.9	5.9

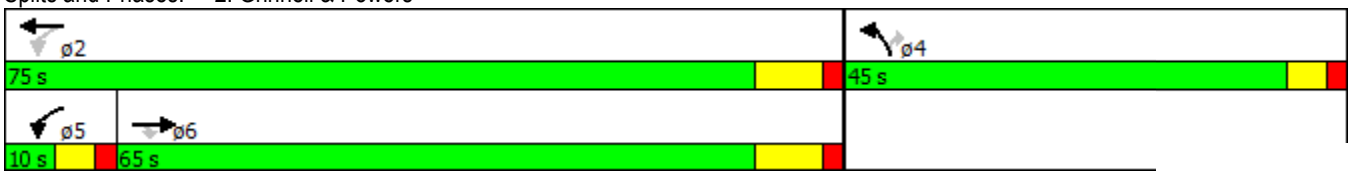
Total Zone Performance By Interval

Interval Start	5:00	5:15	5:30	5:45	All
Stop Del/Veh (s)	123.4	106.7	131.8	175.9	231.8

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	931	547	93	654	306	69
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	4	4
Switch Phase						
Minimum Initial (s)	30.0	30.0	4.0	30.0	8.0	8.0
Minimum Split (s)	38.0	38.0	10.0	38.0	22.0	22.0
Total Split (s)	65.0	65.0	10.0	75.0	45.0	45.0
Total Split (%)	54.2%	54.2%	8.3%	62.5%	37.5%	37.5%
Yellow Time (s)	6.0	6.0	3.5	6.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-4.0	-4.0	-1.5	-4.0	-1.5	-1.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Min	Min	None	Min	None	None
Act Effct Green (s)	38.2	38.2	45.9	45.9	20.5	20.5
Actuated g/C Ratio	0.51	0.51	0.61	0.61	0.27	0.27
v/c Ratio	0.55	0.52	0.31	0.34	0.63	0.15
Control Delay	15.3	3.2	9.4	8.1	31.1	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.3	3.2	9.4	8.1	31.1	10.4
LOS	B	A	A	A	C	B
Approach Delay	10.8			8.2	27.3	
Approach LOS	B			A	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 74.7	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 12.3	Intersection LOS: B
Intersection Capacity Utilization 57.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: Grinnell & Powers



4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #1 7:00

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	9.0	3.8	5.7	8.8	10.9	10.5	2.7		6.8	7.7	6.0	8.6

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #2 7:15

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	8.6	3.5	4.8	7.8	7.1	8.7	1.7		4.3	5.9	5.5	6.8

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #3 7:30

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	9.1	3.8	4.9	9.6	11.0	13.2	2.5		6.5	7.6	7.5	9.4

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #4 7:45

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	7.8	3.5	5.1	6.8	8.9	9.1	2.0		4.7	6.0	4.5	7.0

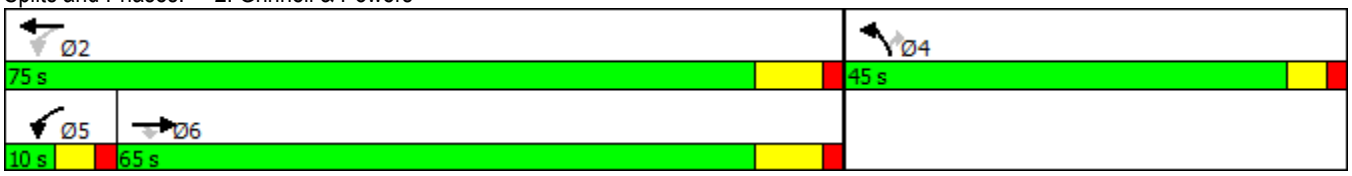
4: Grinnell Blvd. & Bradley Rd. Performance by lane Entire Run

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	9.0	3.7	5.1	8.5	9.8	10.7	2.2	10.0	5.6	7.1	6.0	8.1

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	600	266	90	1125	527	90
Future Volume (vph)	600	266	90	1125	527	90
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	4	4
Switch Phase						
Minimum Initial (s)	30.0	30.0	4.0	30.0	8.0	8.0
Minimum Split (s)	38.0	38.0	10.0	38.0	22.0	22.0
Total Split (s)	65.0	65.0	10.0	75.0	45.0	45.0
Total Split (%)	54.2%	54.2%	8.3%	62.5%	37.5%	37.5%
Yellow Time (s)	6.0	6.0	3.5	6.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-4.0	-4.0	-1.5	-4.0	-1.5	-1.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Min	Min	None	Min	None	None
Act Effct Green (s)	36.5	36.5	46.5	46.5	38.9	38.9
Actuated g/C Ratio	0.39	0.39	0.50	0.50	0.42	0.42
v/c Ratio	0.45	0.34	0.28	0.71	0.80	0.15
Control Delay	22.5	3.7	15.1	21.2	33.9	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.5	3.7	15.1	21.2	33.9	12.1
LOS	C	A	B	C	C	B
Approach Delay	16.7			20.8	30.7	
Approach LOS	B			C	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 93.5	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 21.9	Intersection LOS: C
Intersection Capacity Utilization 69.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Grinnell & Powers



Intersection	
Int Delay, s/veh	3.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	82	131	487	22	44	312
Future Vol, veh/h	82	131	487	22	44	312
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	300	0	-	380	295	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	88	88
Heavy Vehicles, %	1	1	2	1	1	2
Mvmt Flow	88	141	524	24	50	355

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	979	524	0	0	524	0
Stage 1	524	-	-	-	-	-
Stage 2	455	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	279	555	-	-	1048	-
Stage 1	596	-	-	-	-	-
Stage 2	641	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	266	555	-	-	1048	-
Mov Cap-2 Maneuver	266	-	-	-	-	-
Stage 1	596	-	-	-	-	-
Stage 2	610	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.1	0	1.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	266	555	1048	-
HCM Lane V/C Ratio	-	-	0.331	0.254	0.048	-
HCM Control Delay (s)	-	-	25.1	13.7	8.6	-
HCM Lane LOS	-	-	D	B	A	-
HCM 95th %tile Q(veh)	-	-	1.4	1	0.1	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	182	378	552	261	312	276
Future Volume (vph)	182	378	552	261	312	276
Turn Type	Prot	Free	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		Free		2		
Detector Phase	8		2	2	1	6
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	9.0		9.0	9.0	9.0	9.0
Total Split (s)	30.0		50.0	50.0	20.0	70.0
Total Split (%)	30.0%		50.0%	50.0%	20.0%	70.0%
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None		C-Max	C-Max	None	C-Max
Act Effct Green (s)	10.6	100.0	59.1	59.1	15.2	79.4
Actuated g/C Ratio	0.11	1.00	0.59	0.59	0.15	0.79
v/c Ratio	0.50	0.24	0.31	0.29	0.66	0.11
Control Delay	46.6	0.4	11.4	2.2	46.1	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	0.4	11.4	2.2	46.1	2.6
LOS	D	A	B	A	D	A
Approach Delay	15.4		8.5			25.7
Approach LOS	B		A			C

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 64 (64%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 15.5	Intersection LOS: B
Intersection Capacity Utilization 41.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 37: Powers & Bradley Rd.

SimTraffic Performance Report

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #1 5:00

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	7.8	5.2	5.8	6.3	8.1	5.4	3.7	7.1	6.2	7.0	5.2	6.4

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #2 5:15

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	12.1	6.2	7.4	6.8	8.4	7.9	3.7	7.2	5.4	7.0	4.8	7.6

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #3 5:30

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	10.0	4.9	5.7	6.2	7.2	5.7	2.8	2.9	5.7	7.2	4.6	6.4

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #4 5:45

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	8.5	4.4	6.5	6.6	7.6	7.4	2.6	5.4	6.0	8.1	4.6	6.8

4: Grinnell Blvd. & Bradley Rd. Performance by lane Entire Run

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	10.2	5.3	6.4	6.6	7.8	6.9	3.2	6.2	5.9	7.6	4.9	7.0

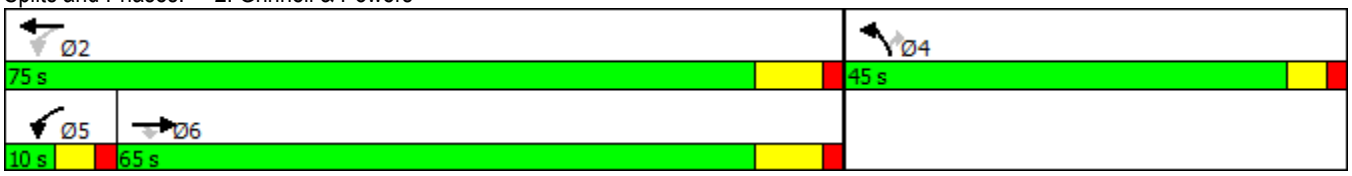
Total Zone Performance By Interval

Interval Start	5:00	5:15	5:30	5:45	All
Stop Del/Veh (s)	211.5	113.9	201.3	275.0	467.0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	960	566	95	675	317	70
Future Volume (vph)	960	566	95	675	317	70
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	4	4
Switch Phase						
Minimum Initial (s)	30.0	30.0	4.0	30.0	8.0	8.0
Minimum Split (s)	38.0	38.0	10.0	38.0	22.0	22.0
Total Split (s)	65.0	65.0	10.0	75.0	45.0	45.0
Total Split (%)	54.2%	54.2%	8.3%	62.5%	37.5%	37.5%
Yellow Time (s)	6.0	6.0	3.5	6.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-4.0	-4.0	-1.5	-4.0	-1.5	-1.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Min	Min	None	Min	None	None
Act Effct Green (s)	39.1	39.1	46.7	46.7	21.4	21.4
Actuated g/C Ratio	0.51	0.51	0.61	0.61	0.28	0.28
v/c Ratio	0.57	0.54	0.33	0.35	0.64	0.15
Control Delay	15.8	3.2	10.0	8.4	31.8	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.8	3.2	10.0	8.4	31.8	10.8
LOS	B	A	A	A	C	B
Approach Delay	11.2			8.6	28.0	
Approach LOS	B			A	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 76.4	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 12.7	Intersection LOS: B
Intersection Capacity Utilization 59.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: Grinnell & Powers



Intersection	
Int Delay, s/veh	3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	50	60	327	73	102	559
Future Vol, veh/h	50	60	327	73	102	559
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	300	0	-	380	295	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	2	1	1	2
Mvmt Flow	54	65	355	79	111	608

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1184	355	0	0	355	0
Stage 1	355	-	-	-	-	-
Stage 2	829	-	-	-	-	-
Critical Hdwy	7.11	6.21	-	-	4.11	-
Critical Hdwy Stg 1	6.11	-	-	-	-	-
Critical Hdwy Stg 2	6.11	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	167	691	-	-	1209	-
Stage 1	664	-	-	-	-	-
Stage 2	366	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	155	691	-	-	1209	-
Mov Cap-2 Maneuver	155	-	-	-	-	-
Stage 1	664	-	-	-	-	-
Stage 2	332	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24.2	0	1.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	155	691	1209	-
HCM Lane V/C Ratio	-	-	0.351	0.094	0.092	-
HCM Control Delay (s)	-	-	40.3	10.8	8.3	-
HCM Lane LOS	-	-	E	B	A	-
HCM 95th %tile Q(veh)	-	-	1.5	0.3	0.3	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	191	305	308	330	297	528
Future Volume (vph)	191	305	308	330	297	528
Turn Type	Prot	Free	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		Free		2		
Detector Phase	8		2	2	1	6
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	9.0		9.0	9.0	9.0	9.0
Total Split (s)	30.0		50.0	50.0	20.0	70.0
Total Split (%)	30.0%		50.0%	50.0%	20.0%	70.0%
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None		C-Max	C-Max	None	C-Max
Act Effct Green (s)	11.2	100.0	59.4	59.4	14.4	78.8
Actuated g/C Ratio	0.11	1.00	0.59	0.59	0.14	0.79
v/c Ratio	0.52	0.20	0.15	0.31	0.64	0.20
Control Delay	46.5	0.3	10.1	2.2	46.2	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.5	0.3	10.1	2.2	46.2	3.0
LOS	D	A	B	A	D	A
Approach Delay	18.1		6.0			18.6
Approach LOS	B		A			B

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 14.5	Intersection LOS: B
Intersection Capacity Utilization 37.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 37: Powers & Bradley Rd.

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #1 7:00

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	12.0	4.0	6.7	11.2	12.1	16.6	2.8	9.0	7.9	9.1	8.0	11.3

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #2 7:15

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	20.5	4.2	6.1	9.2	10.9	15.7	2.1		5.2	8.1	7.9	11.5

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #3 7:30

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	11.7	3.8	5.8	10.1	9.3	10.3	3.2	6.1	5.7	7.4	9.2	9.0

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #4 7:45

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	8.7	3.6	5.6	8.9	7.0	11.0	2.4	3.4	5.4	6.8	5.7	7.8

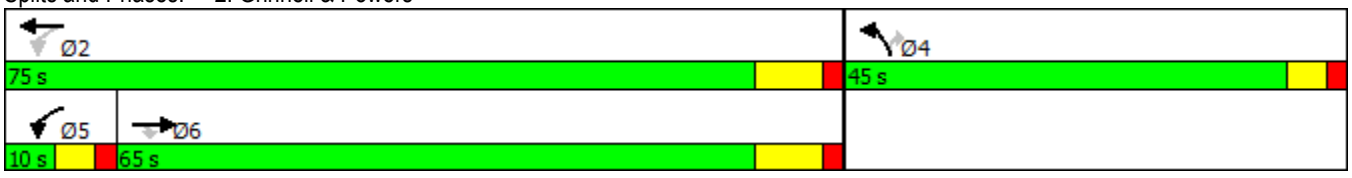
4: Grinnell Blvd. & Bradley Rd. Performance by lane Entire Run

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	14.4	4.0	6.0	10.2	10.1	13.9	2.6	6.2	6.1	8.2	7.9	10.2

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	663	273	149	1274	547	123
Future Volume (vph)	663	273	149	1274	547	123
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	4	4
Switch Phase						
Minimum Initial (s)	30.0	30.0	4.0	30.0	8.0	8.0
Minimum Split (s)	38.0	38.0	10.0	38.0	22.0	22.0
Total Split (s)	65.0	65.0	10.0	75.0	45.0	45.0
Total Split (%)	54.2%	54.2%	8.3%	62.5%	37.5%	37.5%
Yellow Time (s)	6.0	6.0	3.5	6.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-4.0	-4.0	-1.5	-4.0	-1.5	-1.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Min	Min	None	Min	None	None
Act Effct Green (s)	41.4	41.4	51.4	51.4	41.2	41.2
Actuated g/C Ratio	0.41	0.41	0.51	0.51	0.41	0.41
v/c Ratio	0.47	0.34	0.48	0.78	0.84	0.20
Control Delay	22.5	3.3	18.2	23.5	40.5	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.5	3.3	18.2	23.5	40.5	14.4
LOS	C	A	B	C	D	B
Approach Delay	16.9			22.9	35.7	
Approach LOS	B			C	D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.7	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 24.1	Intersection LOS: C
Intersection Capacity Utilization 73.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2: Grinnell & Powers



Intersection	
Int Delay, s/veh	4.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	92	149	522	26	50	372
Future Vol, veh/h	92	149	522	26	50	372
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	300	0	-	380	295	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	88	88
Heavy Vehicles, %	1	1	2	1	1	2
Mvmt Flow	99	160	561	28	57	423

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1097	561	0	0	561	0
Stage 1	561	-	-	-	-	-
Stage 2	536	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	237	529	-	-	1015	-
Stage 1	573	-	-	-	-	-
Stage 2	589	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	224	529	-	-	1015	-
Mov Cap-2 Maneuver	224	-	-	-	-	-
Stage 1	573	-	-	-	-	-
Stage 2	556	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.8	0	1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	224	529	1015	-
HCM Lane V/C Ratio	-	-	0.442	0.303	0.056	-
HCM Control Delay (s)	-	-	33.2	14.7	8.8	-
HCM Lane LOS	-	-	D	B	A	-
HCM 95th %tile Q(veh)	-	-	2.1	1.3	0.2	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	48	28	0	145	96	5
Future Vol, veh/h	48	28	0	145	96	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	155	175	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	52	30	0	156	103	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	52	0	208	52
Stage 1	-	-	-	-	52	-
Stage 2	-	-	-	-	156	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1567	-	785	1021
Stage 1	-	-	-	-	976	-
Stage 2	-	-	-	-	877	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1567	-	785	1021
Mov Cap-2 Maneuver	-	-	-	-	785	-
Stage 1	-	-	-	-	976	-
Stage 2	-	-	-	-	877	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	794	-	-	1567	-
HCM Lane V/C Ratio	0.137	-	-	-	-
HCM Control Delay (s)	10.3	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	339	595	543	345	412	272
Future Volume (vph)	339	595	543	345	412	272
Turn Type	Prot	Free	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		Free		2		
Detector Phase	8		2	2	1	6
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	9.0		9.0	9.0	9.0	9.0
Total Split (s)	30.0		50.0	50.0	20.0	70.0
Total Split (%)	30.0%		50.0%	50.0%	20.0%	70.0%
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None		C-Max	C-Max	None	C-Max
Act Effct Green (s)	15.2	100.0	51.1	51.1	18.7	74.8
Actuated g/C Ratio	0.15	1.00	0.51	0.51	0.19	0.75
v/c Ratio	0.65	0.38	0.35	0.40	0.71	0.11
Control Delay	53.4	1.5	16.1	3.0	44.6	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.4	1.5	16.1	3.0	44.6	3.9
LOS	D	A	B	A	D	A
Approach Delay	20.4		11.0			28.4
Approach LOS	C		B			C

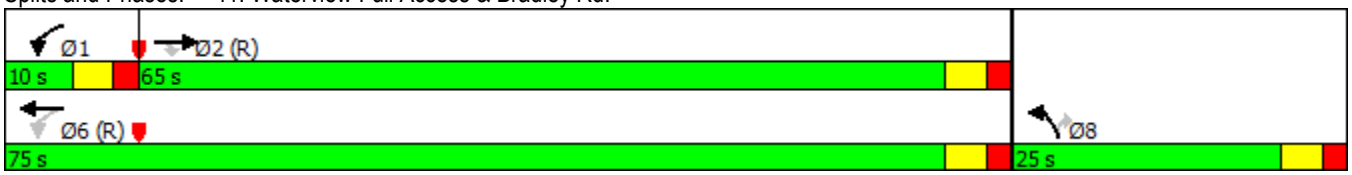
Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 64 (64%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 19.1	Intersection LOS: B
Intersection Capacity Utilization 48.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 37: Powers & Bradley Rd.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	588	169	77	544	390	114
Future Volume (vph)	588	169	77	544	390	114
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	21.0	21.0
Total Split (s)	65.0	65.0	10.0	75.0	25.0	25.0
Total Split (%)	65.0%	65.0%	10.0%	75.0%	25.0%	25.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	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
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Act Effct Green (s)	64.1	64.1	72.9	72.9	17.1	17.1
Actuated g/C Ratio	0.64	0.64	0.73	0.73	0.17	0.17
v/c Ratio	0.28	0.17	0.15	0.23	0.72	0.33
Control Delay	11.7	5.0	4.9	4.9	46.5	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.7	5.0	4.9	4.9	46.5	9.0
LOS	B	A	A	A	D	A
Approach Delay	10.2			4.9	38.0	
Approach LOS	B			A	D	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 67 (67%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 15.9	Intersection LOS: B
Intersection Capacity Utilization 44.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 41: Waterview Full Access & Bradley Rd.



Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	668	33	0	621	0	39
Future Vol, veh/h	668	33	0	621	0	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	500	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	726	36	0	675	0	42

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	363
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	634
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	634
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	634	-	-	-
HCM Lane V/C Ratio	0.067	-	-	-
HCM Control Delay (s)	11.1	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	63	171	1	0	36
Future Vol, veh/h	12	63	171	1	0	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	225	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	68	186	1	0	39

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	187	0	-	0	-	186
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.12	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.218	-	-	-	-	3.318
Pot Cap-1 Maneuver	1387	-	-	-	0	856
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1387	-	-	-	-	856
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	9.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1387	-	-	-	856
HCM Lane V/C Ratio	0.009	-	-	-	0.046
HCM Control Delay (s)	7.6	-	-	-	9.4
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #1 7:00

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	13.1	3.7	5.3	10.5	10.7	13.9	2.6		6.4	7.7	7.8	10.2

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #2 7:15

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	13.5	4.5	5.4	9.2	10.5	12.7	3.1		4.6	7.0	7.9	9.5

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #3 7:30

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	13.3	3.9	4.4	9.0	8.6	8.8	3.0	5.0	5.7	6.7	8.3	8.4

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #4 7:45

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	14.1	4.0	6.0	10.6	13.2	12.8	3.1	6.4	7.8	9.4	7.3	10.4

4: Grinnell Blvd. & Bradley Rd. Performance by lane Entire Run

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	14.1	4.1	5.3	10.1	11.1	12.4	3.3	5.0	6.2	8.0	7.9	9.9

SimTraffic Performance Report

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #1 5:00

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	19.4	6.7	10.1	8.6	17.8	10.0	6.3	4.3	8.7	11.0	6.3	11.6

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #2 5:15

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	22.7	6.9	6.5	6.3	8.4	11.4	3.4	5.7	6.6	8.3	5.9	10.7

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #3 5:30

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	12.3	5.0	6.6	6.8	6.9	8.1	3.8	8.0	6.3	7.7	5.2	7.6

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #4 5:45

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	47.4	6.7	6.4	9.7	11.1	12.5	3.0	4.5	12.2	16.5	6.0	17.3

4: Grinnell Blvd. & Bradley Rd. Performance by lane Entire Run

Lane	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	All
Movements Served	LT	R	L	TR	L	T	R	L	T	T	R	
Stop Del/Veh (s)	26.9	6.5	7.3	7.9	11.5	11.0	3.8	5.4	8.8	11.4	5.9	12.3

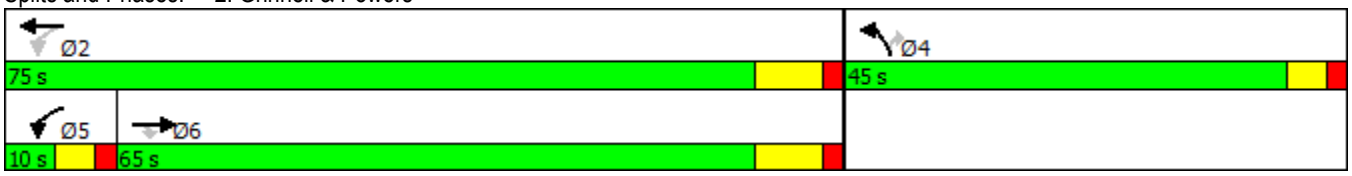
Total Zone Performance By Interval

Interval Start	5:00	5:15	5:30	5:45	All
Stop Del/Veh (s)	403.1	171.2	181.2	571.9	829.6

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1160	589	175	817	330	166
Future Volume (vph)	1160	589	175	817	330	166
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	4	4
Switch Phase						
Minimum Initial (s)	30.0	30.0	4.0	30.0	8.0	8.0
Minimum Split (s)	38.0	38.0	10.0	38.0	22.0	22.0
Total Split (s)	65.0	65.0	10.0	75.0	45.0	45.0
Total Split (%)	54.2%	54.2%	8.3%	62.5%	37.5%	37.5%
Yellow Time (s)	6.0	6.0	3.5	6.0	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-4.0	-4.0	-1.5	-4.0	-1.5	-1.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Min	Min	None	Min	None	None
Act Effct Green (s)	45.1	45.1	55.5	55.5	24.3	24.3
Actuated g/C Ratio	0.51	0.51	0.63	0.63	0.28	0.28
v/c Ratio	0.69	0.55	0.78	0.41	0.68	0.32
Control Delay	19.1	3.2	34.0	9.5	37.1	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	3.2	34.0	9.5	37.1	11.6
LOS	B	A	C	A	D	B
Approach Delay	13.7			13.8	28.6	
Approach LOS	B			B	C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 88.1	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 15.9	Intersection LOS: B
Intersection Capacity Utilization 70.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Grinnell & Powers



Intersection	
Int Delay, s/veh	3.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	57	72	425	85	122	642
Future Vol, veh/h	57	72	425	85	122	642
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	300	0	-	380	295	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	1	1	2	1	1	2
Mvmt Flow	61	77	452	90	130	683

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1395	452	0	0	452	0
Stage 1	452	-	-	-	-	-
Stage 2	943	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	157	610	-	-	1114	-
Stage 1	643	-	-	-	-	-
Stage 2	380	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	139	610	-	-	1114	-
Mov Cap-2 Maneuver	139	-	-	-	-	-
Stage 1	643	-	-	-	-	-
Stage 2	336	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	28.4	0	1.4
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	139	610	1114	-
HCM Lane V/C Ratio	-	-	0.436	0.126	0.117	-
HCM Control Delay (s)	-	-	49.6	11.7	8.7	-
HCM Lane LOS	-	-	E	B	A	-
HCM 95th %tile Q(veh)	-	-	1.9	0.4	0.4	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	98	109	3	73	55	3
Future Vol, veh/h	98	109	3	73	55	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	155	175	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	105	117	3	78	59	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	105	0	190	105
Stage 1	-	-	-	-	105	-
Stage 2	-	-	-	-	85	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1499	-	804	955
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	943	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1499	-	802	955
Mov Cap-2 Maneuver	-	-	-	-	802	-
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	941	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	809	-	-	1499	-
HCM Lane V/C Ratio	0.077	-	-	0.002	-
HCM Control Delay (s)	9.8	-	-	7.4	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	434	549	287	601	628	492
Future Volume (vph)	434	549	287	601	628	492
Turn Type	Prot	Free	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		Free		2		
Detector Phase	8		2	2	1	6
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	9.0		9.0	9.0	9.0	9.0
Total Split (s)	30.0		49.0	49.0	21.0	70.0
Total Split (%)	30.0%		49.0%	49.0%	21.0%	70.0%
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None		C-Max	C-Max	None	C-Max
Act Effct Green (s)	18.5	100.0	44.0	44.0	22.5	71.5
Actuated g/C Ratio	0.18	1.00	0.44	0.44	0.22	0.72
v/c Ratio	0.72	0.37	0.19	0.59	0.86	0.21
Control Delay	33.6	1.6	17.5	4.1	51.4	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.6	1.6	17.5	4.1	51.4	5.3
LOS	C	A	B	A	D	A
Approach Delay	15.8		8.4			31.2
Approach LOS	B		A			C

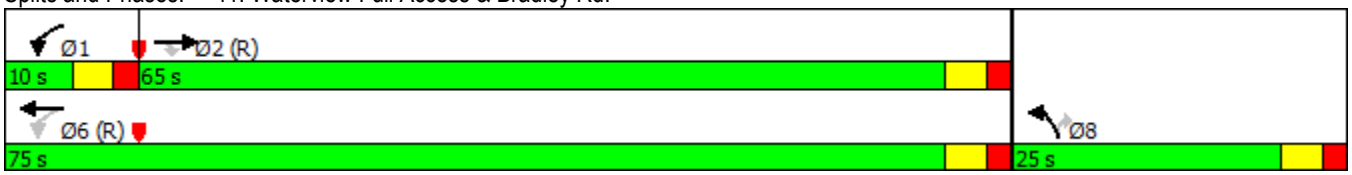
Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 19.5	Intersection LOS: B
Intersection Capacity Utilization 63.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 37: Powers & Bradley Rd.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	687	542	245	457	526	179
Future Volume (vph)	687	542	245	457	526	179
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	21.0	21.0
Total Split (s)	65.0	65.0	10.0	75.0	25.0	25.0
Total Split (%)	65.0%	65.0%	10.0%	75.0%	25.0%	25.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	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
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Act Effct Green (s)	60.0	60.0	70.6	70.6	19.4	19.4
Actuated g/C Ratio	0.60	0.60	0.71	0.71	0.19	0.19
v/c Ratio	0.35	0.50	0.57	0.20	0.86	0.42
Control Delay	4.9	2.5	10.8	5.3	53.0	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.9	2.5	10.8	5.3	53.0	8.1
LOS	A	A	B	A	D	A
Approach Delay	3.8			7.2	41.6	
Approach LOS	A			A	D	

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 67 (67%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 14.8	Intersection LOS: B
Intersection Capacity Utilization 60.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 41: Waterview Full Access & Bradley Rd.



Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱		↑↑		↱
Traffic Vol, veh/h	754	112	0	701	0	26
Future Vol, veh/h	754	112	0	701	0	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	500	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	820	122	0	762	0	28

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	410
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	591
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	591
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	591	-	-	-
HCM Lane V/C Ratio	0.048	-	-	-
HCM Control Delay (s)	11.4	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	41	161	75	3	0	24
Future Vol, veh/h	41	161	75	3	0	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	225	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	45	175	82	3	0	26

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	85	0	-	0	-	83
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.12	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.218	-	-	-	-	3.318
Pot Cap-1 Maneuver	1512	-	-	-	0	976
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1512	-	-	-	-	976
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1512	-	-	-	976
HCM Lane V/C Ratio	0.029	-	-	-	0.027
HCM Control Delay (s)	7.5	-	-	-	8.8
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #1 5:00

Lane	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Movements Served	L	T	R	L	TR	L	T	R	L	T	T	R
Stop Del/Veh (s)	10.6	7.2	5.4	7.3	7.8	9.5	9.8	3.3	4.6	7.4	9.3	7.0

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #1 5:00

Lane	All
Movements Served	
Stop Del/Veh (s)	8.3

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #2 5:15

Lane	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Movements Served	L	T	R	L	TR	L	T	R	L	T	T	R
Stop Del/Veh (s)	17.9	9.4	5.8	7.4	9.7	12.8	9.0	3.8	6.0	9.4	12.1	8.2

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #2 5:15

Lane	All
Movements Served	
Stop Del/Veh (s)	10.2

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #3 5:30

Lane	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Movements Served	L	T	R	L	TR	L	T	R	L	T	T	R
Stop Del/Veh (s)	13.4	7.3	5.9	6.2	9.5	12.4	9.5	3.3	4.7	8.1	10.9	6.4

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #3 5:30

Lane	All
Movements Served	
Stop Del/Veh (s)	9.2

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #4 5:45

Lane	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Movements Served	L	T	R	L	TR	L	T	R	L	T	T	R
Stop Del/Veh (s)	9.0	6.5	5.0	4.8	8.0	8.5	8.8	3.1	6.5	6.8	8.7	5.8

4: Grinnell Blvd. & Bradley Rd. Performance by lane Interval #4 5:45

Lane	All
Movements Served	
Stop Del/Veh (s)	7.3

SimTraffic Performance Report

4: Grinnell Blvd. & Bradley Rd. Performance by lane Entire Run

Lane	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Movements Served	L	T	R	L	TR	L	T	R	L	T	T	R
Stop Del/Veh (s)	13.2	8.0	5.6	6.4	8.9	11.2	9.6	3.4	5.6	8.2	10.7	6.9

4: Grinnell Blvd. & Bradley Rd. Performance by lane Entire Run

Lane	All
Movements Served	
Stop Del/Veh (s)	9.0

Total Zone Performance By Interval

Interval Start	5:00	5:15	5:30	5:45	All
Stop Del/Veh (s)	227.2	249.2	270.1	227.6	841.6

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1107	378	129	2367	659	171
Future Volume (vph)	1107	378	129	2367	659	171
Turn Type	NA	Free	Prot	NA	Prot	Free
Protected Phases	6		5	2	4	
Permitted Phases		Free				Free
Detector Phase	6		5	2	4	
Switch Phase						
Minimum Initial (s)	30.0		4.0	30.0	8.0	
Minimum Split (s)	38.0		9.5	38.0	21.5	
Total Split (s)	42.0		20.0	62.0	36.0	
Total Split (%)	42.9%		20.4%	63.3%	36.7%	
Yellow Time (s)	6.0		3.5	6.0	3.5	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-4.0		-1.5	-4.0	-1.5	
Total Lost Time (s)	4.0		4.0	4.0	4.0	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	Min		None	Min	None	
Act Effct Green (s)	40.2	87.3	10.4	54.7	24.5	87.3
Actuated g/C Ratio	0.46	1.00	0.12	0.63	0.28	1.00
v/c Ratio	0.50	0.25	0.33	0.79	0.70	0.11
Control Delay	18.3	0.4	39.3	15.2	32.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.3	0.4	39.3	15.2	32.8	0.1
LOS	B	A	D	B	C	A
Approach Delay	13.7			16.4	26.0	
Approach LOS	B			B	C	

Intersection Summary	
Cycle Length: 98	
Actuated Cycle Length: 87.3	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 17.2	Intersection LOS: B
Intersection Capacity Utilization 71.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Grinnell & Powers

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	32	4	73	2	214	263	584	25	84	589
Future Volume (vph)	32	4	73	2	214	263	584	25	84	589
Turn Type	pm+pt	NA	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases	4				8	2		2	6	
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	4.0	4.0	4.0
Minimum Split (s)	9.0	21.0	9.0	21.0	21.0	9.0	21.0	21.0	9.0	21.0
Total Split (s)	10.0	21.0	10.0	21.0	21.0	10.0	50.0	50.0	10.0	50.0
Total Split (%)	11.0%	23.1%	11.0%	23.1%	23.1%	11.0%	54.9%	54.9%	11.0%	54.9%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
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	Min	Min	None	Min
Act Effct Green (s)	7.1	6.6	7.5	6.9	6.9	22.0	19.3	19.3	19.5	14.2
Actuated g/C Ratio	0.16	0.15	0.17	0.15	0.15	0.49	0.43	0.43	0.43	0.31
v/c Ratio	0.12	0.01	0.13	0.01	0.52	0.67	0.41	0.03	0.19	0.56
Control Delay	18.2	21.0	19.9	20.5	8.9	21.1	12.8	0.1	7.9	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.2	21.0	19.9	20.5	8.9	21.1	12.8	0.1	7.9	15.9
LOS	B	C	B	C	A	C	B	A	A	B
Approach Delay		18.5		11.7			15.0			14.9
Approach LOS		B		B			B			B

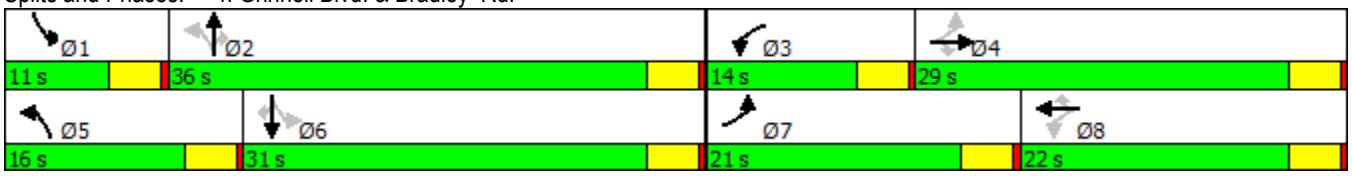
Intersection Summary	
Cycle Length: 91	
Actuated Cycle Length: 45.3	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 14.5	Intersection LOS: B
Intersection Capacity Utilization 52.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Grinnell Blvd. & Goldfield Drive

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	224	173	275	126	507	117	350	530	60	27	449	186
Future Volume (vph)	224	173	275	126	507	117	350	530	60	27	449	186
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	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	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	21.0	29.0	29.0	14.0	22.0	22.0	16.0	36.0	36.0	11.0	31.0	31.0
Total Split (%)	23.3%	32.2%	32.2%	15.6%	24.4%	24.4%	17.8%	40.0%	40.0%	12.2%	34.4%	34.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	32.7	22.8	22.8	23.8	15.4	15.4	31.8	28.0	28.0	21.7	15.5	15.5
Actuated g/C Ratio	0.45	0.31	0.31	0.33	0.21	0.21	0.44	0.39	0.39	0.30	0.21	0.21
v/c Ratio	0.55	0.16	0.42	0.29	0.71	0.25	0.84	0.41	0.09	0.09	0.63	0.39
Control Delay	18.4	20.7	5.1	14.9	33.4	1.6	36.7	19.7	0.2	14.3	30.6	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.4	20.7	5.1	14.9	33.4	1.6	36.7	19.7	0.2	14.3	30.6	6.2
LOS	B	C	A	B	C	A	D	B	A	B	C	A
Approach Delay		13.6			25.3			24.8			23.0	
Approach LOS		B			C			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 72.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 22.0	Intersection LOS: C
Intersection Capacity Utilization 71.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 4: Grinnell Blvd. & Bradley Rd.



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	175	0	0	0	0	830	0	0	498	10
Future Vol, veh/h	0	0	175	0	0	0	0	830	0	0	498	10
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	-	-	0	-	-	0	-	-	200	455	-	200
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	184	0	0	0	0	874	0	0	524	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	262	-	-	437	-	0	0	874	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.94	-	-	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.32	-	-	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	0	0	737	0	0	567	0	-	-	768	-	-
Stage 1	0	0	-	0	0	-	0	-	-	-	-	-
Stage 2	0	0	-	0	0	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	737	-	-	567	-	-	-	768	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.5	0	0	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	-	-	737	-	768	-	-
HCM Lane V/C Ratio	-	-	0.25	-	-	-	-
HCM Control Delay (s)	-	-	11.5	0	0	-	-
HCM Lane LOS	-	-	B	A	A	-	-
HCM 95th %tile Q(veh)	-	-	1	-	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	1	119	49	200	171	556	47	1940	207	337	941
Future Volume (vph)	1	119	49	200	171	556	47	1940	207	337	941
Turn Type	pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA
Protected Phases	7	4		3	8		5	2		1	6
Permitted Phases	4		Free			Free			Free		
Detector Phase	7	4		3	8		5	2		1	6
Switch Phase											
Minimum Initial (s)	4.0	10.0		4.0	4.0		4.0	4.0		4.0	4.0
Minimum Split (s)	9.0	15.0		9.0	9.0		9.0	9.0		9.0	9.0
Total Split (s)	10.0	20.0		22.0	32.0		10.0	59.0		29.0	78.0
Total Split (%)	7.7%	15.4%		16.9%	24.6%		7.7%	45.4%		22.3%	60.0%
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes
Recall Mode	None	None		None	None		None	None		C-Max	None
Act Effct Green (s)	15.8	10.7	130.0	13.1	26.8	130.0	7.0	53.9	130.0	32.2	81.3
Actuated g/C Ratio	0.12	0.08	1.00	0.10	0.21	1.00	0.05	0.41	1.00	0.25	0.63
v/c Ratio	0.01	0.43	0.03	0.60	0.24	0.36	0.26	0.95	0.13	0.41	0.31
Control Delay	38.0	61.2	0.0	45.1	33.9	4.5	62.3	47.6	0.2	43.5	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	61.2	0.0	45.1	33.9	4.5	62.3	47.6	0.2	43.5	12.4
LOS	D	E	A	D	C	A	E	D	A	D	B
Approach Delay		43.2			18.7			43.4			20.6
Approach LOS		D			B			D			C

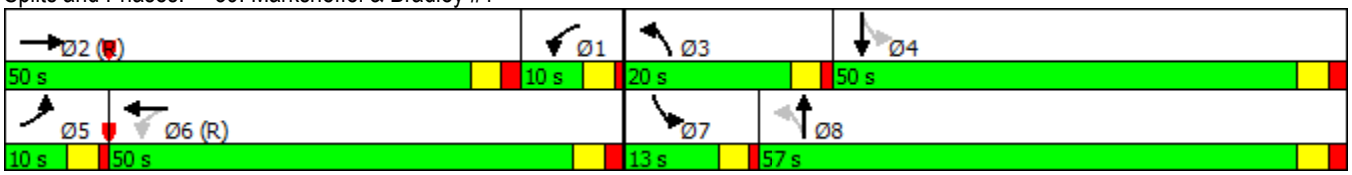
Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 125 (96%), Referenced to phase 1:SBL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 32.0	Intersection LOS: C
Intersection Capacity Utilization 72.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 37: Powers & Bradley #2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	285	312	101	95	471	285	135	600	50	140	275	189
Future Volume (vph)	285	312	101	95	471	285	135	600	50	140	275	189
Turn Type	Prot	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free	6		Free	8		Free	4		Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	9.0	10.0		9.0	10.0		9.0	10.0		9.0	10.0	
Total Split (s)	10.0	50.0		10.0	50.0		20.0	57.0		13.0	50.0	
Total Split (%)	7.7%	38.5%		7.7%	38.5%		15.4%	43.8%		10.0%	38.5%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	24.5	68.2	130.0	50.7	49.7	130.0	41.7	28.8	130.0	34.8	24.8	130.0
Actuated g/C Ratio	0.19	0.52	1.00	0.39	0.38	1.00	0.32	0.22	1.00	0.27	0.19	1.00
v/c Ratio	0.45	0.12	0.07	0.22	0.25	0.18	0.40	0.78	0.03	0.73	0.42	0.12
Control Delay	46.1	17.7	0.1	28.5	27.8	0.3	34.2	54.8	0.0	54.4	47.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	17.7	0.1	28.5	27.8	0.3	34.2	54.8	0.0	54.4	47.9	0.2
LOS	D	B	A	C	C	A	C	D	A	D	D	A
Approach Delay		26.8			18.7			47.7			34.5	
Approach LOS		C			B			D			C	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 97 (75%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 31.6	Intersection LOS: C
Intersection Capacity Utilization 56.6%	ICU Level of Service B
Analysis Period (min) 15	

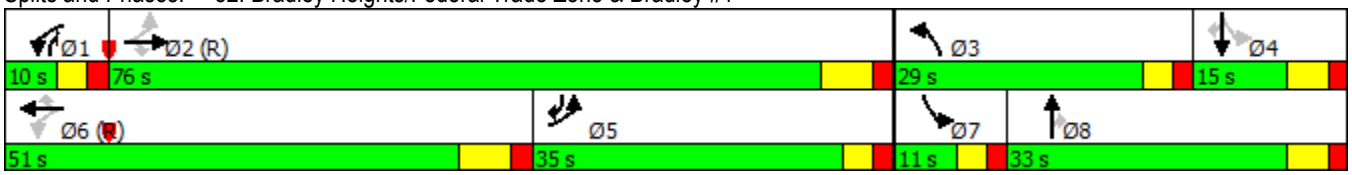
Splits and Phases: 39: Marksheffel & Bradley #1



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	245	188	218	195	381	200	468	31	435	80	25	68
Future Volume (vph)	245	188	218	195	381	200	468	31	435	80	25	68
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	5	2		1	6		3	8	1	7	4	5
Permitted Phases	2		2	6		6			8	4		4
Detector Phase	5	2	2	1	6	6	3	8	1	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0
Minimum Split (s)	10.0	12.0	12.0	10.0	12.0	12.0	10.0	11.0	10.0	10.0	8.0	10.0
Total Split (s)	35.0	76.0	76.0	10.0	51.0	51.0	29.0	33.0	10.0	11.0	15.0	35.0
Total Split (%)	26.9%	58.5%	58.5%	7.7%	39.2%	39.2%	22.3%	25.4%	7.7%	8.5%	11.5%	26.9%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	3.0	3.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	6.0	5.0	5.0	6.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	77.4	75.4	75.4	54.2	52.2	52.2	22.3	20.4	30.7	14.6	7.2	35.5
Actuated g/C Ratio	0.60	0.58	0.58	0.42	0.40	0.40	0.17	0.16	0.24	0.11	0.06	0.27
v/c Ratio	0.34	0.07	0.23	0.23	0.20	0.28	0.84	0.11	0.63	0.23	0.25	0.13
Control Delay	8.6	4.4	0.7	15.3	16.2	5.7	65.3	45.0	7.4	39.8	64.2	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.6	4.4	0.7	15.3	16.2	5.7	65.3	45.0	7.4	39.8	64.2	0.5
LOS	A	A	A	B	B	A	E	D	A	D	E	A
Approach Delay		4.7			13.3			37.7			27.7	
Approach LOS		A			B			D			C	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 28 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 21.1	Intersection LOS: C
Intersection Capacity Utilization 56.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 52: Bradley Heights/Federal Trade Zone & Bradley #1



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2120	807	116	1258	523	96
Future Volume (vph)	2120	807	116	1258	523	96
Turn Type	NA	Free	Prot	NA	Prot	Free
Protected Phases	6		5	2	4	
Permitted Phases		Free				Free
Detector Phase	6		5	2	4	
Switch Phase						
Minimum Initial (s)	30.0		4.0	30.0	8.0	
Minimum Split (s)	38.0		9.5	38.0	21.5	
Total Split (s)	62.0		23.0	85.0	45.0	
Total Split (%)	47.7%		17.7%	65.4%	34.6%	
Yellow Time (s)	6.0		3.5	6.0	3.5	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-4.0		-1.5	-4.0	-1.5	
Total Lost Time (s)	4.0		4.0	4.0	4.0	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	Min		None	Min	None	
Act Effct Green (s)	57.5	103.1	10.5	72.0	23.0	103.1
Actuated g/C Ratio	0.56	1.00	0.10	0.70	0.22	1.00
v/c Ratio	0.79	0.53	0.34	0.38	0.70	0.06
Control Delay	21.8	1.3	47.0	7.1	42.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	1.3	47.0	7.1	42.5	0.1
LOS	C	A	D	A	D	A
Approach Delay	16.1			10.5	35.9	
Approach LOS	B			B	D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 103.1	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 17.0	Intersection LOS: B
Intersection Capacity Utilization 69.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Grinnell & Powers

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	19	2	48	7	191	178	408	81	301	821
Future Volume (vph)	19	2	48	7	191	178	408	81	301	821
Turn Type	pm+pt	NA	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases	4				8	2		2	6	
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	4.0	4.0	4.0
Minimum Split (s)	9.0	21.0	9.0	21.0	21.0	9.0	21.0	21.0	9.0	21.0
Total Split (s)	10.0	21.0	16.0	27.0	27.0	10.0	36.0	36.0	18.0	44.0
Total Split (%)	11.0%	23.1%	17.6%	29.7%	29.7%	11.0%	39.6%	39.6%	19.8%	48.4%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
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	Min	Min	None	Min
Act Effct Green (s)	6.8	6.2	6.7	6.9	6.9	18.6	13.3	13.3	27.3	18.2
Actuated g/C Ratio	0.14	0.13	0.14	0.15	0.15	0.39	0.28	0.28	0.57	0.38
v/c Ratio	0.08	0.01	0.10	0.03	0.49	0.53	0.43	0.13	0.51	0.64
Control Delay	19.1	24.0	22.5	21.7	9.0	15.0	16.5	0.4	8.5	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	24.0	22.5	21.7	9.0	15.0	16.5	0.4	8.5	14.7
LOS	B	C	C	C	A	B	B	A	A	B
Approach Delay		19.6		12.0			14.2			13.0
Approach LOS		B		B			B			B

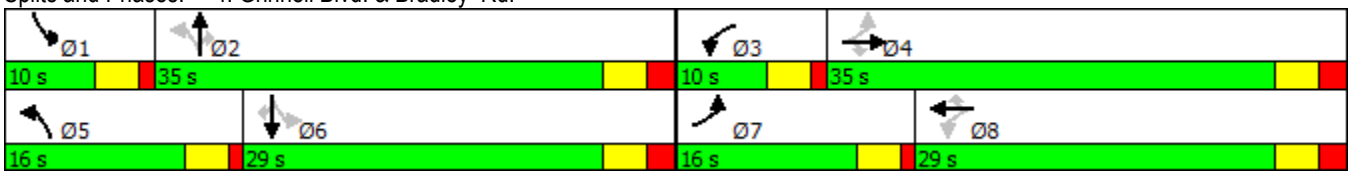
Intersection Summary	
Cycle Length: 91	
Actuated Cycle Length: 47.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 53.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Grinnell Blvd. & Goldfield Drive

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	226	111	375	144	230	67	350	374	173	40	507	322
Future Volume (vph)	226	111	375	144	230	67	350	374	173	40	507	322
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	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	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Total Split (s)	16.0	35.0	35.0	10.0	29.0	29.0	16.0	35.0	35.0	10.0	29.0	29.0
Total Split (%)	17.8%	38.9%	38.9%	11.1%	32.2%	32.2%	17.8%	38.9%	38.9%	11.1%	32.2%	32.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	26.7	15.8	15.8	17.5	10.5	10.5	41.0	34.2	34.2	30.9	24.0	24.0
Actuated g/C Ratio	0.35	0.21	0.21	0.23	0.14	0.14	0.54	0.45	0.45	0.41	0.32	0.32
v/c Ratio	0.56	0.16	0.64	0.46	0.50	0.17	0.72	0.25	0.22	0.09	0.48	0.46
Control Delay	23.7	24.7	9.8	23.5	34.0	0.9	21.0	15.1	3.6	10.2	23.1	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	24.7	9.8	23.5	34.0	0.9	21.0	15.1	3.6	10.2	23.1	5.0
LOS	C	C	A	C	C	A	C	B	A	B	C	A
Approach Delay		16.5			25.5			15.2			15.8	
Approach LOS		B			C			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 75.9	
Natural Cycle: 60	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 17.3	Intersection LOS: B
Intersection Capacity Utilization 67.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 4: Grinnell Blvd. & Bradley Rd.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	1	77	21	180	120	475	46	899	225	351	1865
Future Volume (vph)	1	77	21	180	120	475	46	899	225	351	1865
Turn Type	pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA
Protected Phases	7	4		3	8		5	2		1	6
Permitted Phases	4		Free			Free			Free		
Detector Phase	7	4		3	8		5	2		1	6
Switch Phase											
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0
Minimum Split (s)	9.0	9.0		9.0	9.0		9.0	9.0		9.0	9.0
Total Split (s)	10.0	32.0		27.0	49.0		15.0	34.0		37.0	56.0
Total Split (%)	7.7%	24.6%		20.8%	37.7%		11.5%	26.2%		28.5%	43.1%
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes
Recall Mode	None	None		None	None		None	Max		C-Max	Max
Act Effct Green (s)	13.4	8.4	130.0	12.4	23.8	130.0	7.2	29.0	130.0	60.2	84.1
Actuated g/C Ratio	0.10	0.06	1.00	0.10	0.18	1.00	0.06	0.22	1.00	0.46	0.65
v/c Ratio	0.01	0.36	0.01	0.57	0.19	0.31	0.25	0.82	0.15	0.23	0.58
Control Delay	40.0	62.1	0.0	66.7	57.4	4.0	61.5	54.8	0.2	22.1	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.0	62.1	0.0	66.7	57.4	4.0	61.5	54.8	0.2	22.1	15.1
LOS	D	E	A	E	E	A	E	D	A	C	B
Approach Delay		48.7			26.9			44.6			16.2
Approach LOS		D			C			D			B

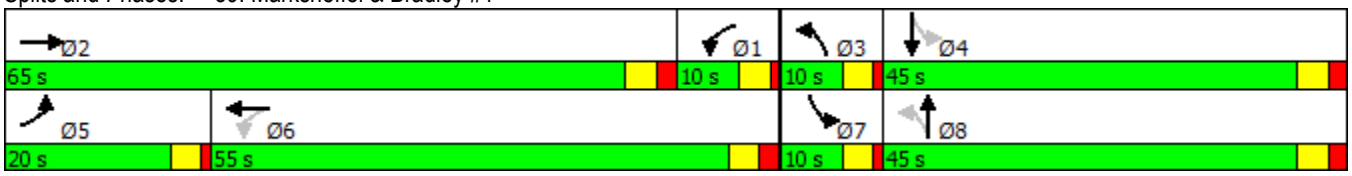
Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 1 (1%), Referenced to phase 1:SBL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 26.7	Intersection LOS: C
Intersection Capacity Utilization 63.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 37: Powers & Bradley #2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	331	443	123	195	433	215	56	500	100	300	650	191
Future Volume (vph)	331	443	123	195	433	215	56	500	100	300	650	191
Turn Type	Prot	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free	6		Free	8		Free	4		Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	9.0	10.0		9.0	10.0		9.0	30.0		9.0	30.0	
Total Split (s)	20.0	65.0		10.0	55.0		10.0	45.0		10.0	45.0	
Total Split (%)	15.4%	50.0%		7.7%	42.3%		7.7%	34.6%		7.7%	34.6%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	None		None	None	
Act Effct Green (s)	13.0	12.4	67.8	13.2	12.1	67.8	25.3	18.3	67.8	26.4	20.8	67.8
Actuated g/C Ratio	0.19	0.18	1.00	0.19	0.18	1.00	0.37	0.27	1.00	0.39	0.31	1.00
v/c Ratio	0.52	0.49	0.08	0.55	0.49	0.14	0.18	0.54	0.06	0.86	0.61	0.12
Control Delay	28.8	27.8	0.1	32.6	28.0	0.2	13.6	23.7	0.1	43.4	24.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.8	27.8	0.1	32.6	28.0	0.2	13.6	23.7	0.1	43.4	24.3	0.2
LOS	C	C	A	C	C	A	B	C	A	D	C	A
Approach Delay		24.3			22.0			19.2			25.3	
Approach LOS		C			C			B			C	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 67.8	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 23.1	Intersection LOS: C
Intersection Capacity Utilization 64.8%	ICU Level of Service C
Analysis Period (min) 15	

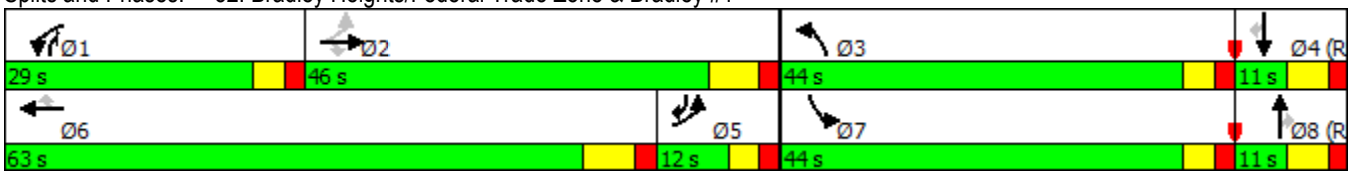
Splits and Phases: 39: Marksheffel & Bradley #1



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	154	370	383	60	100	458	44	390	114	46	231
Future Volume (vph)	78	154	370	383	60	100	458	44	390	114	46	231
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8	1	7	4	5
Permitted Phases	2		2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	1	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0
Minimum Split (s)	10.0	12.0	12.0	10.0	12.0	12.0	10.0	11.0	10.0	10.0	8.0	10.0
Total Split (s)	12.0	46.0	46.0	29.0	63.0	63.0	44.0	11.0	29.0	44.0	11.0	12.0
Total Split (%)	9.2%	35.4%	35.4%	22.3%	48.5%	48.5%	33.8%	8.5%	22.3%	33.8%	8.5%	9.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	3.0	3.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	6.0	5.0	5.0	6.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	24.9	11.7	11.7	20.5	7.3	7.3	23.7	64.9	91.4	9.9	51.1	77.0
Actuated g/C Ratio	0.19	0.09	0.09	0.16	0.06	0.06	0.18	0.50	0.70	0.08	0.39	0.59
v/c Ratio	0.24	0.35	0.78	0.75	0.22	0.51	0.77	0.05	0.33	0.46	0.07	0.23
Control Delay	28.0	37.3	25.2	61.0	59.9	14.6	59.1	20.8	1.6	62.7	30.5	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.0	37.3	25.2	61.0	59.9	14.6	59.1	20.8	1.6	62.7	30.5	1.5
LOS	C	D	C	E	E	B	E	C	A	E	C	A
Approach Delay		28.7			52.4			32.1			22.7	
Approach LOS		C			D			C			C	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 3 (2%), Referenced to phase 4:SBT and 8:NBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 34.3	Intersection LOS: C
Intersection Capacity Utilization 52.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 52: Bradley Heights/Federal Trade Zone & Bradley #1



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1175	443	179	2487	758	244
Future Volume (vph)	1175	443	179	2487	758	244
Turn Type	NA	Free	Prot	NA	Prot	Free
Protected Phases	6		5	2	4	
Permitted Phases		Free				Free
Detector Phase	6		5	2	4	
Switch Phase						
Minimum Initial (s)	30.0		4.0	30.0	8.0	
Minimum Split (s)	38.0		9.5	38.0	21.5	
Total Split (s)	42.0		20.0	62.0	36.0	
Total Split (%)	42.9%		20.4%	63.3%	36.7%	
Yellow Time (s)	6.0		3.5	6.0	3.5	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-4.0		-1.5	-4.0	-1.5	
Total Lost Time (s)	4.0		4.0	4.0	4.0	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	Min		None	Min	None	
Act Effct Green (s)	40.3	91.8	11.9	56.2	27.6	91.8
Actuated g/C Ratio	0.44	1.00	0.13	0.61	0.30	1.00
v/c Ratio	0.56	0.29	0.42	0.85	0.76	0.16
Control Delay	21.2	0.5	40.7	18.5	34.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.2	0.5	40.7	18.5	34.7	0.2
LOS	C	A	D	B	C	A
Approach Delay	15.5			20.0	26.3	
Approach LOS	B			B	C	

Intersection Summary	
Cycle Length: 98	
Actuated Cycle Length: 91.8	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 19.8	Intersection LOS: B
Intersection Capacity Utilization 76.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2: Grinnell & Powers

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	12	22	135	4	238	272	648	28	90	598	5
Future Volume (vph)	89	12	22	135	4	238	272	648	28	90	598	5
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			8	2		2	6		6
Detector Phase	7	4	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	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	21.0	21.0	9.0	21.0	21.0	9.0	21.0	21.0	9.0	21.0	21.0
Total Split (s)	10.0	21.0	21.0	10.0	21.0	21.0	10.0	50.0	50.0	10.0	50.0	50.0
Total Split (%)	11.0%	23.1%	23.1%	11.0%	23.1%	23.1%	11.0%	54.9%	54.9%	11.0%	54.9%	54.9%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	8.4	7.1	7.1	9.7	7.1	7.1	22.1	18.4	18.4	20.7	15.5	15.5
Actuated g/C Ratio	0.17	0.14	0.14	0.19	0.14	0.14	0.43	0.36	0.36	0.41	0.30	0.30
v/c Ratio	0.32	0.05	0.07	0.22	0.02	0.57	0.78	0.53	0.04	0.26	0.59	0.01
Control Delay	20.0	22.0	0.4	23.0	21.5	9.7	29.9	16.7	0.1	9.6	17.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	22.0	0.4	23.0	21.5	9.7	29.9	16.7	0.1	9.6	17.9	0.0
LOS	C	C	A	C	C	A	C	B	A	A	B	A
Approach Delay		16.7			14.5			20.0			16.7	
Approach LOS		B			B			B			B	

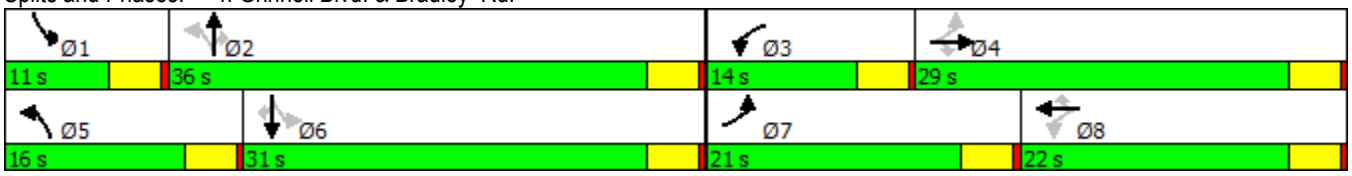
Intersection Summary	
Cycle Length: 91	
Actuated Cycle Length: 50.9	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 17.8	Intersection LOS: B
Intersection Capacity Utilization 55.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Grinnell Blvd. & Goldfield Drive

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	257	247	275	142	577	123	353	568	76	34	501	219
Future Volume (vph)	257	247	275	142	577	123	353	568	76	34	501	219
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	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	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	21.0	29.0	29.0	14.0	22.0	22.0	16.0	36.0	36.0	11.0	31.0	31.0
Total Split (%)	23.3%	32.2%	32.2%	15.6%	24.4%	24.4%	17.8%	40.0%	40.0%	12.2%	34.4%	34.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	34.5	22.0	22.0	25.3	16.6	16.6	33.4	27.5	27.5	23.6	17.2	17.2
Actuated g/C Ratio	0.45	0.29	0.29	0.33	0.22	0.22	0.44	0.36	0.36	0.31	0.23	0.23
v/c Ratio	0.64	0.25	0.44	0.34	0.79	0.26	0.91	0.47	0.12	0.11	0.66	0.43
Control Delay	22.2	22.4	5.4	16.2	38.1	2.0	47.1	22.2	0.4	14.5	31.6	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.2	22.4	5.4	16.2	38.1	2.0	47.1	22.2	0.4	14.5	31.6	6.5
LOS	C	C	A	B	D	A	D	C	A	B	C	A
Approach Delay		16.4			29.1			29.4			23.5	
Approach LOS		B			C			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 76.3	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 25.0	Intersection LOS: C
Intersection Capacity Utilization 76.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 4: Grinnell Blvd. & Bradley Rd.



Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	175	0	0	100	0	902	73	106	506	10
Future Vol, veh/h	0	0	175	0	0	100	0	902	73	106	506	10
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	-	-	0	-	-	0	-	-	200	455	-	200
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	184	0	0	105	0	949	77	112	533	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	266	-	-	475	-	0	0	949	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.94	-	-	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.32	-	-	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	0	0	732	0	0	536	0	-	-	719	-	-
Stage 1	0	0	-	0	0	-	0	-	-	-	-	-
Stage 2	0	0	-	0	0	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	732	-	-	536	-	-	-	719	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.6	13.4	0	1.9
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	-	-	732	536	719	-	-
HCM Lane V/C Ratio	-	-	0.252	0.196	0.155	-	-
HCM Control Delay (s)	-	-	11.6	13.4	10.9	-	-
HCM Lane LOS	-	-	B	B	B	-	-
HCM 95th %tile Q(veh)	-	-	1	0.7	0.5	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	225	75	325	300	740	100	1900	400	475	925	19
Future Volume (vph)	26	225	75	325	300	740	100	1900	400	475	925	19
Turn Type	pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free			Free			Free			6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	4.0	10.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.0	15.0		9.0	9.0		9.0	9.0		9.0	9.0	9.0
Total Split (s)	10.0	20.0		22.0	32.0		10.0	59.0		29.0	78.0	78.0
Total Split (%)	7.7%	15.4%		16.9%	24.6%		7.7%	45.4%		22.3%	60.0%	60.0%
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
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)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None		None	None		C-Max	None	None
Act Effct Green (s)	18.4	13.3	130.0	16.1	28.4	130.0	6.3	53.7	130.0	26.9	74.2	74.2
Actuated g/C Ratio	0.14	0.10	1.00	0.12	0.22	1.00	0.05	0.41	1.00	0.21	0.57	0.57
v/c Ratio	0.15	0.65	0.05	0.79	0.40	0.48	0.62	0.93	0.26	0.69	0.33	0.02
Control Delay	37.5	64.9	0.1	44.9	21.5	8.1	76.9	45.8	0.4	54.3	15.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.5	64.9	0.1	44.9	21.5	8.1	76.9	45.8	0.4	54.3	15.3	0.1
LOS	D	E	A	D	C	A	E	D	A	D	B	A
Approach Delay		47.8			19.8			39.5			28.1	
Approach LOS		D			B			D			C	

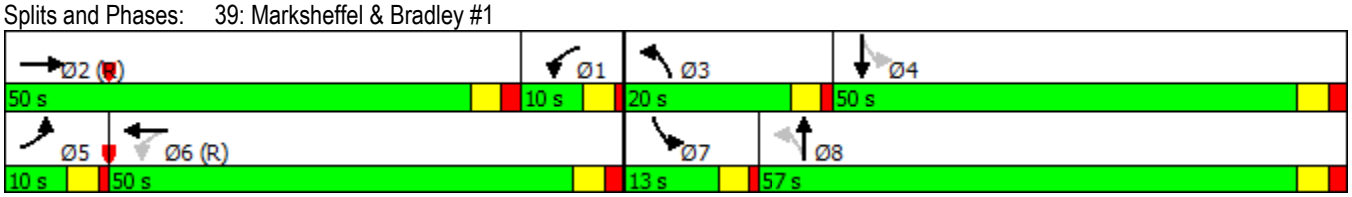
Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 125 (96%), Referenced to phase 1:SBL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 32.2	Intersection LOS: C
Intersection Capacity Utilization 84.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 37: Powers & Bradley #2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	450	400	150	95	600	285	250	600	50	140	275	350
Future Volume (vph)	450	400	150	95	600	285	250	600	50	140	275	350
Turn Type	Prot	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free	6		Free	8		Free	4		Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	9.0	10.0		9.0	10.0		9.0	10.0		9.0	10.0	
Total Split (s)	10.0	50.0		10.0	50.0		20.0	57.0		13.0	50.0	
Total Split (%)	7.7%	38.5%		7.7%	38.5%		15.4%	43.8%		10.0%	38.5%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	29.2	68.2	130.0	46.0	45.0	130.0	42.8	28.8	130.0	32.1	22.1	130.0
Actuated g/C Ratio	0.22	0.52	1.00	0.35	0.35	1.00	0.33	0.22	1.00	0.25	0.17	1.00
v/c Ratio	0.60	0.15	0.10	0.26	0.35	0.18	0.70	0.78	0.03	0.73	0.47	0.23
Control Delay	41.0	15.8	0.1	32.8	32.3	0.3	44.6	54.8	0.0	54.3	50.5	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	15.8	0.1	32.8	32.3	0.3	44.6	54.8	0.0	54.3	50.5	0.3
LOS	D	B	A	C	C	A	D	D	A	D	D	A
Approach Delay		24.8			23.0			48.9			28.3	
Approach LOS		C			C			D			C	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 97 (75%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 31.0	Intersection LOS: C
Intersection Capacity Utilization 63.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 39: Marksheffel & Bradley #1



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	265	719	117	97	1040	137	266	16	119	70	13	59
Future Volume (vph)	265	719	117	97	1040	137	266	16	119	70	13	59
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	10.0	85.0	85.0	10.0	85.0	85.0	25.0	10.0	10.0	25.0	10.0	10.0
Total Split (%)	7.7%	65.4%	65.4%	7.7%	65.4%	65.4%	19.2%	7.7%	7.7%	19.2%	7.7%	7.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	84.0	84.0	84.0	85.3	85.3	85.3	15.8	13.7	13.7	8.2	5.9	5.9
Actuated g/C Ratio	0.65	0.65	0.65	0.66	0.66	0.66	0.12	0.11	0.11	0.06	0.05	0.05
v/c Ratio	0.80	0.23	0.12	0.23	0.33	0.13	0.67	0.09	0.43	0.34	0.17	0.30
Control Delay	33.9	7.9	2.2	17.5	21.7	6.8	62.5	52.9	10.4	62.2	64.3	3.6
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	33.9	7.9	2.2	17.5	21.7	6.8	62.5	52.9	10.4	62.2	64.3	3.6
LOS	C	A	A	B	C	A	E	D	B	E	E	A
Approach Delay		13.5			19.8			46.7			38.2	
Approach LOS		B			B			D			D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 74 (57%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 22.0	Intersection LOS: C
Intersection Capacity Utilization 61.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 41: Waterview Signal & Bradley #2

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	886	22	0	1218	138	0	0	45	0	0	56
Future Vol, veh/h	0	886	22	0	1218	138	0	0	45	0	0	56
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	-	-	Yield
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	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
Mvmt Flow	0	933	23	0	1282	145	0	0	47	0	0	59

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	478	-	-	714
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	7.14	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.92	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	456	0	0	321
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	456	-	-	321
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

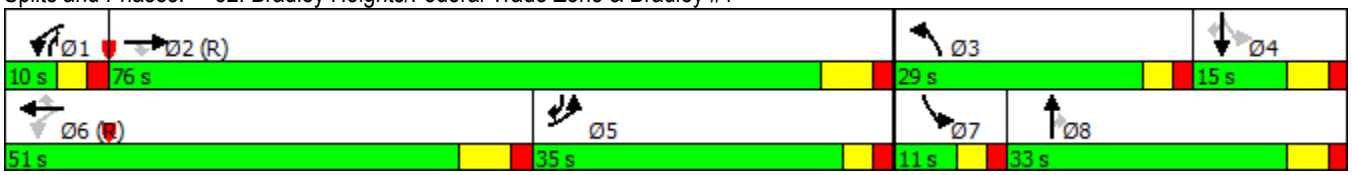
Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	13.8	18.7
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	456	-	-	-	-	321
HCM Lane V/C Ratio	0.104	-	-	-	-	0.184
HCM Control Delay (s)	13.8	-	-	-	-	18.7
HCM Lane LOS	B	-	-	-	-	C
HCM 95th %tile Q(veh)	0.3	-	-	-	-	0.7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	455	225	200	780	200	500	40	450	100	35	75
Future Volume (vph)	250	455	225	200	780	200	500	40	450	100	35	75
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	5	2		1	6		3	8	1	7	4	5
Permitted Phases			2	6		6			8	4		4
Detector Phase	5	2	2	1	6	6	3	8	1	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0
Minimum Split (s)	10.0	12.0	12.0	10.0	12.0	12.0	10.0	11.0	10.0	10.0	8.0	10.0
Total Split (s)	35.0	76.0	76.0	10.0	51.0	51.0	29.0	33.0	10.0	11.0	15.0	35.0
Total Split (%)	26.9%	58.5%	58.5%	7.7%	39.2%	39.2%	22.3%	25.4%	7.7%	8.5%	11.5%	26.9%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	3.0	3.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	6.0	5.0	5.0	6.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	30.0	72.3	72.3	50.7	48.7	48.7	23.0	21.9	31.9	16.1	7.7	37.4
Actuated g/C Ratio	0.23	0.56	0.56	0.39	0.37	0.37	0.18	0.17	0.25	0.12	0.06	0.29
v/c Ratio	0.64	0.17	0.24	0.31	0.43	0.29	0.87	0.13	0.74	0.28	0.34	0.14
Control Delay	54.5	12.3	4.6	20.7	24.6	4.5	67.6	43.5	19.2	38.3	66.7	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	12.3	4.6	20.7	24.6	4.5	67.6	43.5	19.2	38.3	66.7	0.5
LOS	D	B	A	C	C	A	E	D	B	D	E	A
Approach Delay		21.8			20.5			44.6			29.6	
Approach LOS		C			C			D			C	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 28 (22%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 28.6	Intersection LOS: C
Intersection Capacity Utilization 64.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 52: Bradley Heights/Federal Trade Zone & Bradley #1



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2292	960	246	1396	661	218
Future Volume (vph)	2292	960	246	1396	661	218
Turn Type	NA	Free	Prot	NA	Prot	Free
Protected Phases	6		5	2	4	
Permitted Phases		Free				Free
Detector Phase	6		5	2	4	
Switch Phase						
Minimum Initial (s)	30.0		4.0	30.0	8.0	
Minimum Split (s)	38.0		9.5	38.0	21.5	
Total Split (s)	62.0		23.0	85.0	45.0	
Total Split (%)	47.7%		17.7%	65.4%	34.6%	
Yellow Time (s)	6.0		3.5	6.0	3.5	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-4.0		-1.5	-4.0	-1.5	
Total Lost Time (s)	4.0		4.0	4.0	4.0	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	Min		None	Min	None	
Act Effct Green (s)	58.3	115.4	15.1	77.5	29.9	115.4
Actuated g/C Ratio	0.51	1.00	0.13	0.67	0.26	1.00
v/c Ratio	0.95	0.63	0.56	0.43	0.77	0.14
Control Delay	37.7	1.9	53.0	9.8	45.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.7	1.9	53.0	9.8	45.9	0.2
LOS	D	A	D	A	D	A
Approach Delay	27.1			16.3	34.5	
Approach LOS	C			B	C	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 115.4	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 25.2	Intersection LOS: C
Intersection Capacity Utilization 80.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2: Grinnell & Powers

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	7	10	228	13	206	220	525	92	324	795	25
Future Volume (vph)	47	7	10	228	13	206	220	525	92	324	795	25
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4			8	2		2	6		6
Detector Phase	7	4	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	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	21.0	21.0	9.0	21.0	21.0	9.0	21.0	21.0	9.0	21.0	21.0
Total Split (s)	10.0	21.0	21.0	16.0	27.0	27.0	10.0	36.0	36.0	18.0	44.0	44.0
Total Split (%)	11.0%	23.1%	23.1%	17.6%	29.7%	29.7%	11.0%	39.6%	39.6%	19.8%	48.4%	48.4%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	7.3	6.1	6.1	10.7	9.1	9.1	20.3	15.0	15.0	30.7	20.9	20.9
Actuated g/C Ratio	0.13	0.11	0.11	0.19	0.16	0.16	0.36	0.27	0.27	0.55	0.37	0.37
v/c Ratio	0.21	0.03	0.03	0.37	0.05	0.49	0.73	0.59	0.16	0.66	0.64	0.04
Control Delay	21.6	29.3	0.1	24.5	24.7	8.8	28.8	21.9	0.5	14.9	17.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	29.3	0.1	24.5	24.7	8.8	28.8	21.9	0.5	14.9	17.6	0.1
LOS	C	C	A	C	C	A	C	C	A	B	B	A
Approach Delay		18.9			17.2			21.3			16.5	
Approach LOS		B			B			C			B	

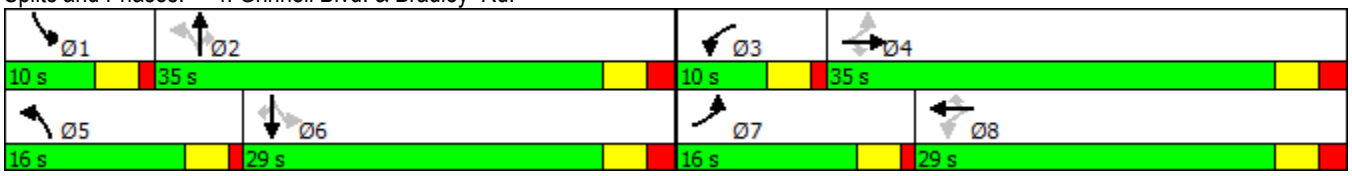
Intersection Summary	
Cycle Length: 91	
Actuated Cycle Length: 56.3	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 18.3	Intersection LOS: B
Intersection Capacity Utilization 59.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Grinnell Blvd. & Goldfield Drive

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	312	246	375	179	385	72	363	453	206	49	596	388
Future Volume (vph)	312	246	375	179	385	72	363	453	206	49	596	388
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	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	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Total Split (s)	16.0	35.0	35.0	10.0	29.0	29.0	16.0	35.0	35.0	10.0	29.0	29.0
Total Split (%)	17.8%	38.9%	38.9%	11.1%	32.2%	32.2%	17.8%	38.9%	38.9%	11.1%	32.2%	32.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effct Green (s)	31.5	20.5	20.5	21.5	14.5	14.5	41.1	34.2	34.2	30.9	24.0	24.0
Actuated g/C Ratio	0.39	0.25	0.25	0.27	0.18	0.18	0.51	0.42	0.42	0.38	0.30	0.30
v/c Ratio	0.83	0.29	0.62	0.55	0.64	0.16	0.88	0.32	0.27	0.13	0.59	0.58
Control Delay	39.0	24.8	10.3	25.3	35.4	0.8	39.2	17.8	3.9	12.4	27.4	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	24.8	10.3	25.3	35.4	0.8	39.2	17.8	3.9	12.4	27.4	9.5
LOS	D	C	B	C	D	A	D	B	A	B	C	A
Approach Delay		23.7			28.6			22.6			20.0	
Approach LOS		C			C			C			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 80.6	
Natural Cycle: 60	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 23.2	Intersection LOS: C
Intersection Capacity Utilization 79.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 4: Grinnell Blvd. & Bradley Rd.



Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	234	0	0	228	0	651	127	245	926	35
Future Vol, veh/h	0	0	234	0	0	228	0	651	127	245	926	35
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	-	-	0	-	-	0	-	-	200	455	-	200
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	246	0	0	240	0	685	134	258	975	37

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	487	-	-	343	-	0	0	685	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.94	-	-	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.32	-	-	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	0	0	526	0	0	653	0	-	-	904	-	-
Stage 1	0	0	-	0	0	-	0	-	-	-	-	-
Stage 2	0	0	-	0	0	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	526	-	-	653	-	-	-	904	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.7	13.7	0	2.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	-	-	526	653	904	-	-
HCM Lane V/C Ratio	-	-	0.468	0.368	0.285	-	-
HCM Control Delay (s)	-	-	17.7	13.7	10.6	-	-
HCM Lane LOS	-	-	C	B	B	-	-
HCM 95th %tile Q(veh)	-	-	2.5	1.7	1.2	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	410	210	550	440	750	175	820	500	700	1700	110
Future Volume (vph)	71	410	210	550	440	750	175	820	500	700	1700	110
Turn Type	pm+pt	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		Free			Free			Free			6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.0	9.0		9.0	9.0		9.0	9.0		9.0	9.0	9.0
Total Split (s)	10.0	32.0		27.0	49.0		15.0	33.0		38.0	56.0	56.0
Total Split (%)	7.7%	24.6%		20.8%	37.7%		11.5%	25.4%		29.2%	43.1%	43.1%
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
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)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None		None	Max		C-Max	Max	Max
Act Effct Green (s)	26.2	21.2	130.0	22.0	40.2	130.0	11.1	28.0	130.0	38.8	55.7	55.7
Actuated g/C Ratio	0.20	0.16	1.00	0.17	0.31	1.00	0.09	0.22	1.00	0.30	0.43	0.43
v/c Ratio	0.35	0.75	0.14	0.98	0.41	0.49	0.61	0.77	0.33	0.71	0.80	0.15
Control Delay	33.4	60.1	0.2	69.1	36.4	3.8	66.8	53.5	0.5	45.7	36.7	2.3
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	33.4	60.1	0.2	69.1	36.4	3.8	66.8	53.5	0.5	45.7	36.7	2.3
LOS	C	E	A	E	D	A	E	D	A	D	D	A
Approach Delay		39.2			32.7			37.4			37.7	
Approach LOS		D			C			D			D	

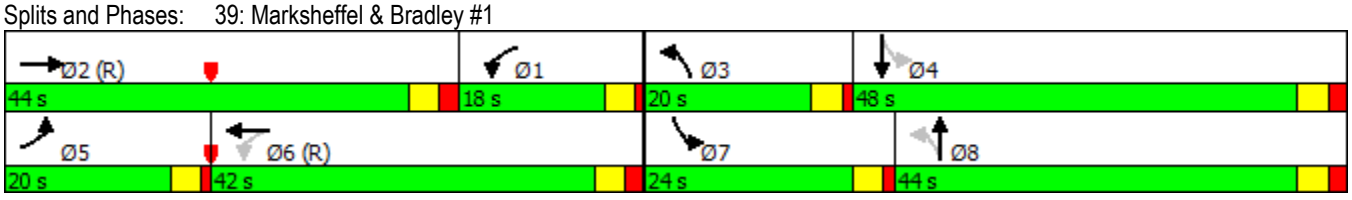
Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 1 (1%), Referenced to phase 1:SBL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 36.4	Intersection LOS: D
Intersection Capacity Utilization 81.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 37: Powers & Bradley #2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	650	700	350	195	650	215	225	500	100	300	650	500
Future Volume (vph)	650	700	350	195	650	215	225	500	100	300	650	500
Turn Type	Prot	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free	pm+pt	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free	6		Free	8		Free	4		Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	9.0	10.0		9.0	10.0		9.0	10.0		9.0	10.0	
Total Split (s)	20.0	44.0		18.0	42.0		20.0	44.0		24.0	48.0	
Total Split (%)	15.4%	33.8%		13.8%	32.3%		15.4%	33.8%		18.5%	36.9%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	5.0		4.0	5.0		4.0	5.0		4.0	5.0	
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	29.3	52.3	130.0	38.0	37.0	130.0	43.0	26.6	130.0	50.4	30.4	130.0
Actuated g/C Ratio	0.23	0.40	1.00	0.29	0.28	1.00	0.33	0.20	1.00	0.39	0.23	1.00
v/c Ratio	0.86	0.35	0.23	0.63	0.46	0.14	0.83	0.70	0.06	0.87	0.80	0.32
Control Delay	56.7	17.4	0.3	54.6	39.5	0.2	54.9	53.2	0.1	53.4	54.7	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.7	17.4	0.3	54.6	39.5	0.2	54.9	53.2	0.1	53.4	54.7	0.5
LOS	E	B	A	D	D	A	D	D	A	D	D	A
Approach Delay		28.9			34.3			47.2			35.7	
Approach LOS		C			C			D			D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 100 (77%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 35.0	Intersection LOS: D
Intersection Capacity Utilization 76.5%	ICU Level of Service D
Analysis Period (min) 15	

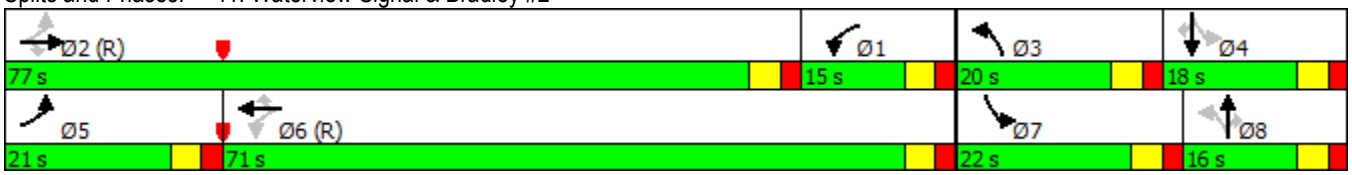
Splits and Phases: 39: Marksheffel & Bradley #1



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	352	856	402	297	1127	144	357	19	237	312	20	256
Future Volume (vph)	352	856	402	297	1127	144	357	19	237	312	20	256
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	21.0	77.0	77.0	15.0	71.0	71.0	20.0	16.0	16.0	22.0	18.0	18.0
Total Split (%)	16.2%	59.2%	59.2%	11.5%	54.6%	54.6%	15.4%	12.3%	12.3%	16.9%	13.8%	13.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	75.9	75.9	75.9	66.0	66.0	66.0	23.4	8.7	8.7	24.8	9.4	9.4
Actuated g/C Ratio	0.58	0.58	0.58	0.51	0.51	0.51	0.18	0.07	0.07	0.19	0.07	0.07
v/c Ratio	0.96	0.30	0.38	0.83	0.46	0.17	0.66	0.16	0.77	0.56	0.16	0.82
Control Delay	56.2	14.3	5.2	52.4	19.0	4.6	49.9	59.1	25.8	46.8	57.3	31.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.2	14.3	5.2	52.4	19.0	4.6	49.9	59.1	25.8	46.8	57.3	31.2
LOS	E	B	A	D	B	A	D	E	C	D	E	C
Approach Delay		21.2			24.0			40.9			40.3	
Approach LOS		C			C			D			D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 39 (30%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 27.5	Intersection LOS: C
Intersection Capacity Utilization 70.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 41: Waterview Signal & Bradley #2



Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1332	73	0	1341	145	0	0	29	0	0	226
Future Vol, veh/h	0	1332	73	0	1341	145	0	0	29	0	0	226
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	Yield	Yield	Yield
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	98	95	95	98	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1359	77	0	1368	153	0	0	31	0	0	238

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	-	0	0	-	-	0	-	-	718
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	319
Stage 1	0	-	-	0	-	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	0	319
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	0	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	0	-

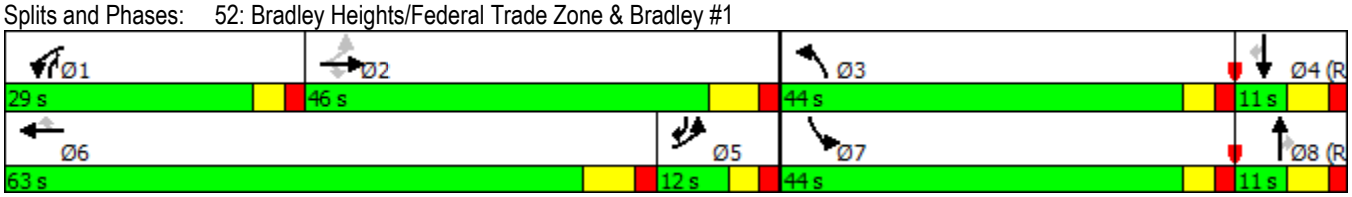
Approach	EB	WB	NB
HCM Control Delay, s	0	0	17.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR
Capacity (veh/h)	319	-	-	-	-
HCM Lane V/C Ratio	0.096	-	-	-	-
HCM Control Delay (s)	17.5	-	-	-	-
HCM Lane LOS	C	-	-	-	-
HCM 95th %tile Q(veh)	0.3	-	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	861	400	400	736	100	500	50	400	200	85	250
Future Volume (vph)	100	861	400	400	736	100	500	50	400	200	85	250
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8	1	7	4	5
Permitted Phases	2		2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	1	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0
Minimum Split (s)	10.0	12.0	12.0	10.0	12.0	12.0	10.0	11.0	10.0	10.0	8.0	10.0
Total Split (s)	12.0	46.0	46.0	29.0	63.0	63.0	44.0	11.0	29.0	44.0	11.0	12.0
Total Split (%)	9.2%	35.4%	35.4%	22.3%	48.5%	48.5%	33.8%	8.5%	22.3%	33.8%	8.5%	9.2%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	3.0	3.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	6.0	5.0	5.0	6.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	34.6	32.6	32.6	21.2	27.8	27.8	25.4	39.8	67.0	13.4	27.8	54.9
Actuated g/C Ratio	0.27	0.25	0.25	0.16	0.21	0.21	0.20	0.31	0.52	0.10	0.21	0.42
v/c Ratio	0.26	0.71	0.59	0.75	0.71	0.24	0.79	0.09	0.45	0.60	0.22	0.36
Control Delay	20.8	25.3	5.2	47.9	40.1	2.7	58.3	37.9	10.2	62.5	49.3	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.8	25.3	5.2	47.9	40.1	2.7	58.3	37.9	10.2	62.5	49.3	9.2
LOS	C	C	A	D	D	A	E	D	B	E	D	A
Approach Delay		19.0			39.6			37.0			35.5	
Approach LOS		B			D			D			D	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 3 (2%), Referenced to phase 4:SBT and 8:NBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 31.6	Intersection LOS: C
Intersection Capacity Utilization 64.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 52: Bradley Heights/Federal Trade Zone & Bradley #1



Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	32	468	618	12	0	19
Future Vol, veh/h	32	468	618	12	0	19
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	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	509	672	13	0	21

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	685	0	-	0	1002	342
Stage 1	-	-	-	-	678	-
Stage 2	-	-	-	-	324	-
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	904	-	-	-	239	654
Stage 1	-	-	-	-	466	-
Stage 2	-	-	-	-	705	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	904	-	-	-	230	654
Mov Cap-2 Maneuver	-	-	-	-	230	-
Stage 1	-	-	-	-	466	-
Stage 2	-	-	-	-	678	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	904	-	-	-	654
HCM Lane V/C Ratio	0.038	-	-	-	0.032
HCM Control Delay (s)	9.1	-	-	-	10.7
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Intersection: 2: Grinnell & Powers

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	R	L	L	T	T	T	L	L	R
Maximum Queue (ft)	322	323	287	76	137	188	447	454	432	268	289	70
Average Queue (ft)	228	211	164	15	64	85	290	294	274	171	201	11
95th Queue (ft)	301	295	255	50	123	151	419	425	412	244	272	51
Link Distance (ft)	1989	1989	1989	1989			2283	2283	2283		883	883
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)					475	475				315		
Storage Blk Time (%)							0			0	0	
Queuing Penalty (veh)							0			0	0	

Intersection: 22: Grinnell Blvd. & Three-Quarter Site Access

Movement	EB	WB	NB	SB
Directions Served	R	R	R	L
Maximum Queue (ft)	100	59	12	105
Average Queue (ft)	44	26	1	36
95th Queue (ft)	73	47	7	74
Link Distance (ft)	379	406		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			200	455
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Intersection: 2: Grinnell & Powers

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	R	L	L	T	T	T	L	L	R
Maximum Queue (ft)	1970	1941	1891	1715	274	279	241	246	218	304	321	166
Average Queue (ft)	1184	1159	1099	345	175	185	155	154	124	193	223	55
95th Queue (ft)	1967	1926	1841	1345	290	296	233	227	208	277	306	140
Link Distance (ft)	1989	1989	1989	1989			2283	2283	2283		883	883
Upstream Blk Time (%)	5	3	3	2								
Queuing Penalty (veh)	0	0	0	0								
Storage Bay Dist (ft)					475	475				315		
Storage Blk Time (%)										0	0	
Queuing Penalty (veh)										0	1	

Intersection: 22: Grinnell Blvd. & Three-Quarter Site Access

Movement	EB	WB	NB	SB
Directions Served	R	R	R	L
Maximum Queue (ft)	155	127	30	141
Average Queue (ft)	71	48	4	60
95th Queue (ft)	128	94	18	110
Link Distance (ft)	379	406		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			200	455
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 1

Markup Summary

dsdlaforce (6)

Subject: Text Box
Page Label: 1
Lock: Unlocked
Author: dsdlaforce

1. Provide proposed classification of all proposed internal roadways with this preliminary application.
2. Provide trigger points for the construction of all required future improvements including but not limited to turn lanes, signals, widenings, and openings or closings of accesses. Identify the responsible party, cost estimates and escrow amounts.
- State whether or not any improvements affected by the project are reimbursable under the current MTCP.
- State whether the MTCP or other approved corridor study call for the construction of improvements in the immediate area.
- List 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 met state the required modification so that it can be met.
3. State what the current applicable Transportation Impact Fees are and what option the developer will be selecting for payment. If the site is in a special district, so state and summarize the applicable fees.
4. Provide recommendations for the proposed roundabout geometry. (What is the minimum size for the Roundabout center island?)

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Page Label: 1
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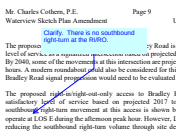
Author: dsdlaforce

Add "PCD File No: SP-17-010"



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Page Label: 10
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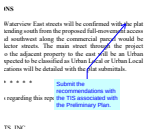
Author: dsdlaforce

Clarify. There is no southbound right-turn at the RI/RO.



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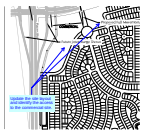
Author: dsdlaforce

Submit the recommendations with the TIS associated with the Preliminary Plan.



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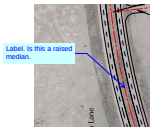
Update the site layout and identify the access to the commercial site.



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Page Label: 34
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Author: dsdlaforce

Label. Is this a raised median.