TRAFFIC ANALYSIS REPORT

FOR

CEDAR HILLS PARK

SW CEDAR HILLS BLVD

WASHINGTON COUNTY

SUBMITTED BY

CHARBONNEAU ENGINEERING LLC

February 2014

Project 13-28

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FOR

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SW CEDAR HILLS BLVD

WASHINGTON COUNTY

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Project 13-28

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INTRODUCTION

This traffic study has been prepared to document and evaluate the traffic operation and safety conditions at the Cedar Hills Park site in the City of Beaverton & Washington County. The park is under the ownership of Tualatin Hills Park & Recreation District (THPRD) and will be upgraded to provide expanded parking, synthetic turf multi-use sports fields, splash pad, restrooms, picnic shelter, play equipment, and other amenities.

The study area was defined as the surrounding neighborhood including Cedar Hills Blvd and SW Walker Road and the intersections located at Cedar Hills Blvd/Huntington Avenue, Cedar Hills Blvd at Walker Road, and Walker Road at Lynnfield Lane. Additionally, future access will be permitted from the park to Lynnfield Lane through William Walker Elementary School based upon an Intergovernmental Agreement implemented between the Beaverton School District and THPRD in May 2013.

The site location is highlighted on the vicinity map (Figure 'a') in the appendix. Figure 'b' in the appendix serves as the conceptual site plan illustrating the park's proposed uses and traffic access.

TRAFFIC ANALYSIS CONSIDERATIONS

The project scoping was established for the initial traffic study completed in 2011 based on discussions with THPRD and Washington County. As before a number of important elements were identified and considered in the traffic study.

- Inventory and record pertinent information such as traffic control devices, circulation patterns, lane configuration, pedestrian & bicycle facilities, parking conditions, and street characteristics.
- Collect updated data on typical weekdays during the PM peak traffic hour and on Saturday during the mid-day peak hour.
- Consideration of alternative site access scenarios.
- Conduct traffic counts on Cedar Hills Blvd at Huntington Avenue and on Walker Road at Cedar Hills Blvd and at Lynnfield Lane.
- Application of a 1% per year growth rate for five years to establish the background traffic volumes.
- Review the peak hour signal warrant for the intersection of Cedar Hills Blvd at Huntington Avenue to verify if signalization criteria is met.
- Review of the left turn warrants for Cedar Hills Blvd at Huntington Avenue.
- Level of service (LOS) analysis of the study intersections to measure the vehicular delays.
- Verification of intersection sight distance at the park's access locations.
- Review of traffic accident data furnished by ODOT and determination of the intersection crash rates at the study intersections.

SITE DESCRIPTION, STREETS, AND CRITICAL INTERSECTIONS

The park is located at 2300 SW Cedar Hills Blvd in the City of Beaverton. The park's area measures 11.87 acres (including the additional property being purchased from the school district) and has 30 existing parking spaces. Existing park amenities include two small parking lots, an ADA accessible trail/path, picnic tables and grills, playground equipment, decommissioned restroom shelter, tennis courts, sand volleyball courts, bocce courts, combined baseball and soccer field, community garden, and tree grove. The main traffic access to the park is located on Cedar Hills Blvd opposite Huntington Avenue. A secondary access exists on Cedar Hills Blvd near the park's northwesterly property boundary adjacent to the tennis courts. Limited parking for approximately five vehicles is available on the dirt-surfaced lot from the secondary access.

The surrounding area is developed as a mixture of retail establishments and businesses (Pet Smart store, Circle K store & Union-76 gas station, Border's Books store, Rite Aid), residential neighborhood, West Hills Racquet & Fitness Club, and William Walker Elementary School. The park property is situated on the southeast side of Cedar Hills Blvd between the West Hills Racquet Club and Pet Smart properties. The elementary school is located adjacent to the park immediately to the east. Currently there is no access connection for traffic between the park and school properties.

The park's access and the Huntington Avenue approach to Cedar Hills Blvd are controlled with stop signing. The intersections on Walker Road at Cedar Hills Blvd and at Lynnfield Lane are controlled by signalization. The existing lane configuration and traffic control are illustrated on Figure 'c'.

Walker Road is a two lane arterial east of 123rd Avenue that widens to five lanes with bike lanes and sidewalk in advance of the Cedar Hills Blvd intersection. East of 123rd Avenue there are no bike lanes with the shoulder width varying from one to four feet wide. The posted travel speed is 35 MPH.

Cedar Hills Blvd between Walker Road and Huntington Avenue is a five lane road (center left turn lane) with sidewalk and bike lanes. Northeast of Huntington Avenue the road is four lanes without a center left turn lane. The posted travel speed is 35 MPH.

Cedar Hills Blvd at Huntington Avenue and the Cedar Hills Park driveway is a four-way intersection with stop-control on the side approaches (Huntington Avenue and park access). There are no separate turn lanes at the intersection. There is a Tri-Met bus stop (Line #20) adjacent to the parks access. Parking is not permitted on Cedar Hills Blvd.

Cedar Hills Blvd at Walker Road is a four-way intersection controlled by signalization. The signal operates with eight phases and provides protected left turn phasing on each approach. There are crosswalks on all intersection sides with pedestrian signals and pushbuttons. The Cedar Hills Blvd approaches contain separate left turn lanes, two through lanes, and separate right turn lanes. The Walker Road approaches consist of separate left turn lanes with one through and one combination through/right lane on each approach.

Walker Road at Lynnfield Lane is configured as a tee-shaped intersection controlled by signalization. The signal operates with two phases and provides a pedestrian crossing on Walker Road activated by pushbuttons. There are no separate turn lanes at the intersection and each approach lane is a single lane. Lynnfield Lane provides access to William Walker Elementary School and residences in the area.

ACCESS PLAN

Currently the Cedar Hills Park site is served by a main access on Cedar Hills Blvd located across from Huntington Avenue. A second access on Cedar Hills Blvd located near the site's northwesterly boundary serves a small unimproved parking area near the tennis courts. Under THPRD's IGA with the Beaverton School District the park will also have access to Lynnfield Lane at the north corner of the school property. The new access connection to Lynnfield Lane will enhance traffic circulation and has been incorporated into traffic flow analysis. Figure 'd' illustrates the access conditions and recommendations.

Three alternative access options were considered for the park's main access at Cedar Hills Blvd. For each scenario an alternative trip distribution and assignment plan was developed to illustrate the peak hour volumes on flow maps. The alternatives are as follows.

Option 1
Park access at Cedar Hills Blvd provides full park access with no restricted traffic movements

Option 2
Park access at Cedar Hills Blvd restricted to right turn ingress & and right turn egress

Option 3
Park access at Cedar Hills Blvd restricted to right turn ingress, right turn egress, & left turn ingress (no left turn egress movement)

Access to Walker Road via the proposed internal connection to Lynnfield Lane is included in all of the options.

TRAFFIC OPERATIONAL ANALYSIS

In order to evaluate traffic flow and delay in the area several intersections were analyzed for level of service (LOS) conditions including vehicular delay, queuing, and safety. The intersections analyzed included Cedar Hills Blvd at Huntington Avenue & the park's access, Cedar Hills Blvd at Walker Road, and Walker Road at Lynnfield Lane. Volume to Capacity (v/c) and level of service (LOS) analyses were completed in the weekday PM peak hour and Saturday mid-day periods for the following scenarios:

- Year 2013 Existing Traffic
- 2018 Background Traffic
- 2018 Total Traffic

In order to perform the LOS analysis at the study intersections manual traffic counts were conducted during the weekday PM peak (4:00-6:00 PM) traffic hours and Saturday mid-day peak (12 noon - 2:00 PM) hours. The traffic count data is included in the report's appendix. The turning movement flow maps for the existing traffic is illustrated on Figure 1.

Background growth is comprised of the existing traffic factored with a traffic growth rate. For this project a traffic growth rate of 1.0% per year over a five-year buildout scenario was applied. Background traffic volumes (the sum of existing and growth traffic) are illustrated in Figure 2.

The year 2018 total traffic is the summation of background traffic volumes and site generated traffic. The peak total traffic is presented on Figures 4, 7, & 10 for the respective scenarios analyzed.

VEHICULAR TRIP GENERATION

Trip generation for the existing park was obtained from traffic counts conducted at the park access in September 2009, December 2010, & December 2013. The following table is based on averages of the historical data and documents the existing number of vehicles accessing the 30-car parking lot access on Cedar Hills Blvd.

Existing Park Trip Generation

Peak Hour Period	Enter	Exit	Total
Weekday AM Peak Hour	2	2	4
Weekday PM Peak Hour	5	4	9
Saturday Mid-Day Peak Hour	4	4	8

For the redeveloped park that will provide upgraded amenities and the lighted sports fields the trip generation was established based on discussions with THPRD staff and consideration of the programs planned at the site. The new ancillary uses including the splash pad, picnic shelter, and play equipment are anticipated to draw an increased number of trips in the weekday and Saturday peak hours. The multi-purpose sports field with turf surfacing will host team practices and games and will also generate additional traffic.

In establishing the number of trips associated with the sports fields, picnic area, and splash pad the following factors were considered.

- The fields will accommodate either two youth soccer fields or one baseball diamond at one time as the two uses cannot be combined at the same time.
- Since soccer teams have more players than baseball the trip generation for soccer was used in establishing the number of trips generated by the sports fields.
- For two soccer events staged at the same time a total of 15 players per team was considered. With two players per team carpooling there will be 13 entering and 13 exiting trips per team per field. Practices on weekdays in the PM peak hour will produce 26 entering and 26 exiting trips. With games on Saturdays the number of peak hour trips double during the peak hour and equate to 52 entering and 52 exiting trips.

- The sheltered picnic area may be reserved for groups up to 60 people with parking for approximately 20 to 25 cars. On weekdays in the summer months the PM peak hour from 5-6PM is likely to generate a fairly even mix of exit and entry trips. The trip generation was based on 50% of the total number of cars that park for the picnic shelter or 13 trip ends (six enter & seven exit trips for the weekday PM peak hour). On Saturdays there will be high use of the picnic area and the hour between 1-2PM will likely generate a high number of trips as the early reservation time ends at 2PM. Therefore, 75% of the parked capacity for the shelter area was used yielding 19 trip ends. Of this total 15 exit trips and four entering trips were estimated.
- Based on discussions with THPRD the splash pad will typically generate from 60 to 120 trip ends with the visitors staying anywhere from one to four hours. It is anticipated that only a portion of these trips will occur in any single hour. As there are no specific records available for the peak hour trip rates it was assumed that for the weekday PM peak hour 30% of the median number of trip ends occur or 0.30 x 90 trip ends = 27 trip ends. The split will be nearly even and 14 entering and 13 exiting trips were used. On Saturdays it was assumed that 50% of the median number of trip ends occur or 0.50 x 90 trip ends = 45 trip ends. A split of 23 entering trips and 22 exit trips was applied.

Table 1 summarizes the trip generation for the improved Cedar Hills Park.

Table 1 Trip Generation Summary

Park Facility	Peak Hour					
	Weekday AM		Weekday PM		Saturday Afternoon	
	Enter	Exit	Enter	Exit	Enter	Exit
ADA Accessible Trail	1	1	0	1	1	1
Bocce Ball Courts			1	1	2	2
Picnic Tables			6	7	4	15
Playground			0	2	4	4
Tennis Courts	2	2	8	0	8	8
Splash Pad			14	13	23	22
Soccer/Sports Field[1]			26	26	52	52
Community Garden			1	0	3	2
Total Trips Generated	Weekday AM		Weekday PM		Saturday Afternoon	
	3	3	56	50	97	106

[1] Soccer use trips includes reduction of 2 trips entering & exiting per team to account for carpooling.

As a result the redeveloped park will generate 106 trips during the weekday PM peak hour and 203 trips during the Saturday mid-day peak hour. A total of six trips will occur during the weekday AM peak hour.

Trip rates presented in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 8th Edition were reviewed and were determined to be insufficient for application in the study.

Trip distribution used in the analysis was based on existing traffic patterns, traffic counts at the existing site access, engineering judgment, and the applicable access considerations. Figures 3a, 5a, & 8a illustrate the trip distribution pattern for each scenario. Figures 3b, 5b, & 8b illustrate the trip assignments for the weekday PM and Saturday mid-day peak hours.

CAPACITY ANALYSIS

Capacity analyses were performed to determine the levels of service for the Saturday and weekday peak hours. Highway Capacity Software (HCS) was used to determine the level of service. The program is based on the Highway Capacity Manual methodology.

Table 2a summarizes the year 2013 existing traffic and year 2018 background traffic. Table 2b presents the results for the year 2018 total traffic and Options 1-3. Copies of the capacity analysis calculations are included in the appendix.

Through the year 2018 background traffic conditions the study intersections will operate at acceptable level of service conditions (LOS 'D' or better). For the year 2018 total traffic conditions the intersections on Walker Road at Cedar Hills Blvd and at Lynnfield Lane will experience acceptable LOS 'C' or better conditions.

The stop-controlled intersection of Cedar Hills Blvd at Huntington Avenue and the park access will experience LOS 'F' (failure) in the weekday PM peak hour and the Saturday mid-day peak hour in the year 2018 total traffic scenario. Several alternative mitigation measures that improve the operational standards to meet the agency standards have been identified.

- Install traffic signal & retain the existing lane configuration (Option 1), no street widening, resulting LOS 'A'
- Retain stop sign control on Huntington Avenue and the park's access and restrict the park's access to right turn ingress & egress movements (Option 2), resulting LOS 'C'
- Retain stop sign control on Huntington Avenue and the park's access and restrict the park's access to right & left turn ingress & right turn egress (Option 3), resulting LOS 'C'

The alternatives described above are subject to agency review and approval of the traffic control measures and lane configuration described.

Table 2a. Capacity Analysis Summary

Intersection	Type of Control	Peak Hour	Traffic Scenario							
			2013 Existing				2018 Background			
			Crit. Mov't	LOS	Delay	v/c	Crit. Mov't	LOS	Delay	v/c
Walker Road and Cedar Hills Boulevard	Signal	Weekday PM	-	C	29.7	0.75	-	C	31.8	0.79
		Midday Saturday	-	C	26.9	0.76	-	C	29.1	0.80
Park Access/ Huntington Avenue and Cedar Hills Boulevard	Two-way Stop	Weekday PM	EB	C	15.0	-	EB	C	15.8	-
		Midday Saturday	WB	D	29.0	-	WB	D	32.9	-
Lynnfield Lane and Walker Road	Signal	Weekday PM	-	A	5.2	0.74	-	A	6.1	0.77
		Midday Saturday	-	A	3.0	0.55	-	A	3.2	0.58

Notes: *Highway Capacity Manual* methodology used in analysis. EB - Eastbound, WB - Westbound, Crit. Mov't - Critical movement or critical approach.

Table 2b. Capacity Analysis Summary

Intersection	Type of Control	Peak Hour	Traffic Scenario											
			2018 Total - Option 1 -				2018 Total - Option 2 -				2018 Total - Option 3 -			
			Crit. Mov't	LOS	Delay	v/c	Crit. Mov't	LOS	Delay	v/c	Crit. Mov't	LOS	Delay	v/c
Walker Road and Cedar Hills Boulevard	Signal	Weekday PM	-	C	32.5	0.79	-	C	32.5	0.80	-	C	32.7	0.80
		Midday Saturday	-	C	30.8	0.81	-	C	30.1	0.82	-	C	30.3	0.81
Park Access/ Huntington Avenue and Cedar Hills Boulevard	Two-way Stop	Weekday PM	WB	F[1]	230.6	-	EB	C	15.8	-	EB	C	16.0	-
		Midday Saturday	WB	F[1]	344.0	-	EB	C	18.0	-	EB	C	18.8	-
Lynnfield Lane and Walker Road	Signal	Weekday PM	-	A	6.3	0.78	-	A	7.3	0.82	-	A	6.8	0.80
		Midday Saturday	-	A	3.8	0.61	-	A	6.0	0.69	-	A	5.4	0.65

Notes: *Highway Capacity Manual* methodology used in analysis. EB - Eastbound, WB - Westbound, Crit. Mov't - Critical movement or critical approach.

[1] Signalization of this intersection would improve the Weekday PM and Midday Saturday peak hour intersection operation to LOS 'A'.

Generally, LOS ‘A’, ‘B’, ‘C’, and ‘D’ are desirable service levels ranging from no vehicle delays to average or longer than average delays in the peak hours. Level ‘E’ represents long delays indicating signalization warrants need to be reviewed and signals considered only if warrants are met. Level ‘F’ indicates that intersection improvements, such as widening and signalization, may be considered. According to the Highway Capacity Manual (HCM), the following delay times are associated with the LOS at stop controlled unsignalized and signalized intersections.

Level of Service criteria defined in the Highway Capacity Manual

Level of Service (LOS)	Unsignalized Control Stopped Delay (sec/veh)	Signalized Control Stopped Delay (sec/veh)
A	≤ 10	≤ 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	> 50	> 80

QUEUING ANALYSIS

Queue lengths at the study intersections were derived from the HCS & Synchro analysis reports. The results are based on values representing the 95th percentile queuing conditions. Copies of the reports are included in the appendix.

At the intersection of Cedar Hills Blvd at Huntington Avenue and the park access the stop controlled approaches currently experience queues of one vehicle during the peak hours on the weekday and Saturday. In the year 2018 background conditions the queues will remain about the same. The same queue lengths are projected to occur if the park access is converted to a right turn in/out (Option 2) or right & left ingress and right egress (Option 3) design when the site is redeveloped.

If the park access on Cedar Hills Blvd remains as a full access with stop sign control when the park site redevelops the queue lengths will increase to two vehicles on Huntington Avenue and one to eight vehicles on the park's approach (Option 1).

SIGHT DISTANCE

Intersection sight distance at the site access point were reviewed in the field in accordance with Washington County standards. Based on the posted speed on Cedar Hills Blvd and on Walker Road (35 MPH) the County requires a minimum sight distance of 350 feet be available from the driveways in each direction.

At the existing site access on Cedar Hills Blvd the available intersection sight distance is over 1,000 feet to the northeast and 500 feet to the southwest. Therefore, this location currently meets the County's standard for sight distance.

TURN LANE WARRANTS

The need for left turn lanes were evaluated for the intersection on Cedar Hills Blvd at Huntington Avenue and the park access using the peak hour warrant analysis procedure (Highway Research Record #211) method. The analysis revealed that a separate northbound left turn lane on Cedar

Hills Blvd is presently warranted for traffic turning left onto Huntington Avenue. The warrant carries through under all access scenarios studied. The storage length needed is 200 feet.

For the southbound direction on Cedar Hills Blvd the analysis documents that a separate turn lane is necessary when the park is redeveloped for Options 1 & 3. When installed the southbound left turn lane storage length should provide a minimum length of 150 feet for safety purposes.

A copy of the left turn warrant sheet is included in the appendix.

TRAFFIC SIGNAL WARRANTS

The peak hour signal warrant described in the Manual on Uniform Traffic Control Devices (MUTCD) was reviewed in order to document the signal warrant status on Cedar Hills Blvd at Huntington Avenue and the site access. The results indicated the signal warrant is not met for existing, background, or total traffic conditions. The minimum side street approach volume needed to meet the warrant is 100 vehicles and this threshold is not met.

ACCIDENT HISTORY

Accident data for the study intersections was requested from Oregon Department of Transportation staff and has been summarized using the available historical data. Listed in the following table are the crash rate averages for the study intersections.

Table 4 Accident Rate Results

Intersection	Accident History (Years)	Number of Accidents	Accidents per year	Annual Traffic Entering (veh/yr)	Accident rate per M.E.V.*
Huntington Avenue and Cedar Hills Boulevard	5	5	1.0	8221552	**0.122**
Lynnfield Lane and Walker Road	5	5	1.0	7648126	**0.131**
Walker Road at Cedar Hills Blvd	5	26	5.2	16264137	**0.320**

* M.E.V. - million entering vehicles.

A five-year history within the period of January 2008 through December 2012 was researched. The results indicate that there were five reported crashes at the Lynnfield Lane and Huntington Avenue intersections and 26 reported crashes at the Walker Road at Cedar Hills Blvd location.

The crash rates are well below the critical rate of 1.0 M.E.V. which is typically considered the threshold rate for considering safety improvements.

PEDESTRIANS, BICYCLES, & BUSES

Continuous sidewalks and bike lanes are provided along both sides of Cedar Hills Blvd and on Walker Road from 123rd Avenue to the west. East of 123rd Avenue Walker Road transitions into a two-lane road (without curbs and sidewalks) with narrow one to three-foot wide shoulders.

From approximately 100 feet west of Lynnfield Lane to the east there is a three-foot wide separated paved sidewalk on the south side of Walker Road adjoining with the pedestrian crossing provided at the signalized intersection with Lynnfield Lane.

Transit service is provided by Tri-Met (line #20 - Cedar Hills) in the vicinity. There are bus stops located on both sides of Cedar Hills Blvd at the intersection with Huntington Avenue and the park access. Walker Road does not have a Tri-Met route available in the area.

SUMMARY AND RECOMMENDATIONS

The traffic study for the Cedar Hills Park improvement project has been prepared to determine the potential impacts to Cedar Hills Blvd and several study intersections. Redevelopment of the park is expected to generate 106 trips in the weekday PM peak hour and 203 trips during the Saturday peak hour.

The park will be upgraded to provide expanded parking, lighted turf multi-use sports field, splash pad, restrooms, picnic shelter, play equipment, and other amenities. The existing playground area and community garden (garden to be relocated, final size to be determined) that are currently available will be retained and the Walker Elementary School playground will be upgraded and park visitors will be allowed shared use per the IGA. The conceptual site plan is shown on Figure 'b'.

The study area was defined as the surrounding neighborhood including Cedar Hills Blvd and SW Walker Road and the intersections located at Cedar Hills Blvd/Huntington Avenue, Cedar Hills Blvd at Walker Road, and Walker Road at Lynnfield Lane.

Vehicular access to the site will be maintained at the existing driveway on Cedar Hills Blvd at Huntington Avenue. Additionally, future access will be provided to Lynnfield Lane through William Walker Elementary School based upon the IGA between the Beaverton School District and THPRD.

Intersection sight distance at the access point was reviewed in the field in accordance with the Washington County road standards. At the existing site access on Cedar Hills Blvd the available intersection sight distance is over 1,000 feet to the northeast and 500 feet to the southwest. Therefore, this location currently exceeds the County's standard for sight distance (minimum of 350 feet based on 35 MPH posted speed). As the park is redeveloped it is important that any improvements created in the general access area such as landscaping, signing, parking, fencing, structures, or other features will not result in obstructions to sight distance.

The left turn lane warrants were evaluated for the intersection on Cedar Hills Blvd at Huntington Avenue and the park access. The analysis revealed that a separate northbound left turn lane on Cedar Hills Blvd is presently warranted for traffic turning left onto Huntington Avenue. A vehicle storage length of 200 feet should be installed when the lane is constructed. For the southbound direction on Cedar Hills Blvd the analysis documents that a separate turn lane is warranted when the park is redeveloped under the Option 1 and Option 3 scenarios. When

installed the southbound left turn lane storage length should provide for 150 feet for safety purposes.

The peak hour signal warrant described in the Manual on Uniform Traffic Control Devices (MUTCD) was reviewed in order to document the signal warrant status on Cedar Hills Blvd at Huntington Avenue and the site access. The results indicated the signal warrant is not met for existing, background, or total traffic conditions. The minimum side street approach volume needed to meet the warrant is 100 vehicles and this threshold is not met.

Capacity analyses were performed to determine the levels of service for the Saturday and weekday peak hours. The results were established for year 2013 existing traffic, year 2018 background traffic, and the year 2018 total traffic conditions.

Through the year 2018 background traffic conditions the study intersections will operate at acceptable level of service conditions (LOS 'D' or better). For the year 2018 total traffic conditions the intersections on Walker Road at Cedar Hills Blvd and at Lynnfield Lane will experience acceptable LOS 'C' or better conditions.

The stop-controlled intersection of Cedar Hills Blvd at Huntington Avenue and the park access will experience LOS 'F' (failure) in the weekday PM peak hour and Saturday mid-day peak hour in the year 2018 total traffic scenario. Several alternative mitigation measures were identified that will improve the intersection's operation to meet the agency standards.

- Install traffic signal & retain the existing lane configuration (Option 1). It should be noted that the signal warrant is not met. No street widening or lane improvements on Cedar Hills Blvd are necessary to mitigate to LOS 'A' operation.
- Retain stop sign control on Huntington Avenue and the park's access and restrict the park's access to right turn ingress & egress movements (Option 2). No street widening or lane improvements on Cedar Hills Blvd are necessary to mitigate to LOS 'C' operation.
- Retain stop sign control on Huntington Avenue and the park's access and restrict the park's access to right & left turn ingress & right turn egress (Option 3). No street widening or lane improvements on Cedar Hills Blvd are necessary to mitigate to resulting LOS 'C' operation.

The analysis has determined that no mitigation is necessary at the intersection of Walker Road at Cedar Hills Blvd and the intersection of Walker Road at Lynnfield Road through the year 2018 total traffic scenario.

APPENDIX

- Vicinity Map Figure 'a'
- Site Plan Figure 'b'
- Existing Lane Configurations and Control Figure 'c'
- Proposed Lane Configurations and Control Figure 'd'
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- Cedar Hills Park Programming (compiled by THPRD, November 2013)
- Traffic Count Data
- Left Turn Lane Warrant Worksheets
- Peak Hour Signal Warrant
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- Highway Capacity Software (HCS) Analysis Worksheets

FILE NAME: 1328flow.dwg

PLOT DATE: 01.12.14

CHARBONNEAU ENGINEERING LLC

PROJECT: 13-28

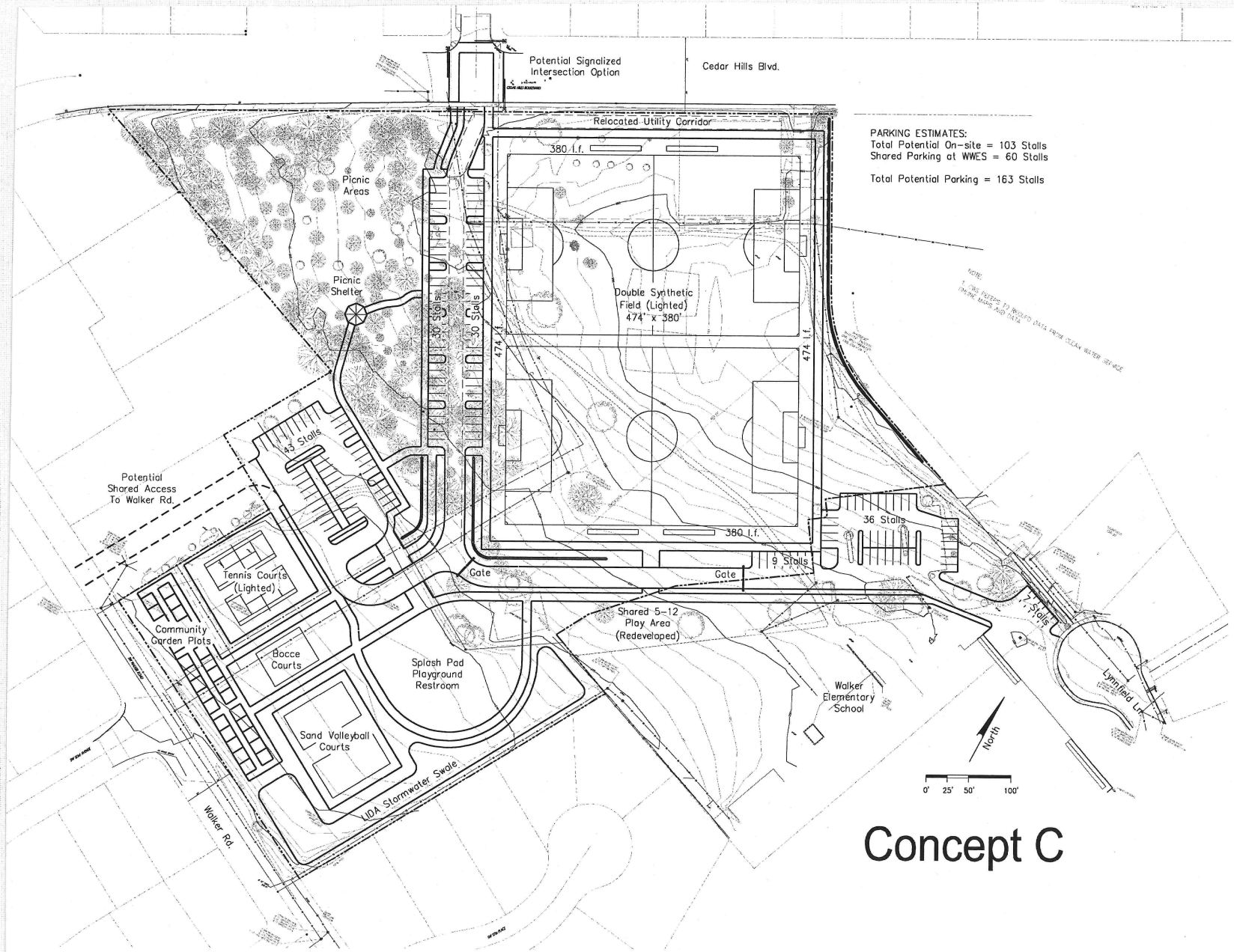
NOTES:
NO SCALE

N

VICINITY MAP
CEDAR HILLS COMMUNITY PARK

FIGURE
a

FILE NAME: 1328flow.dwg



PARKING ESTIMATES:
Total Potential On-site = 103 Stalls
Shared Parking at WWES = 60 Stalls

Total Potential Parking = 163 Stalls

Concept C

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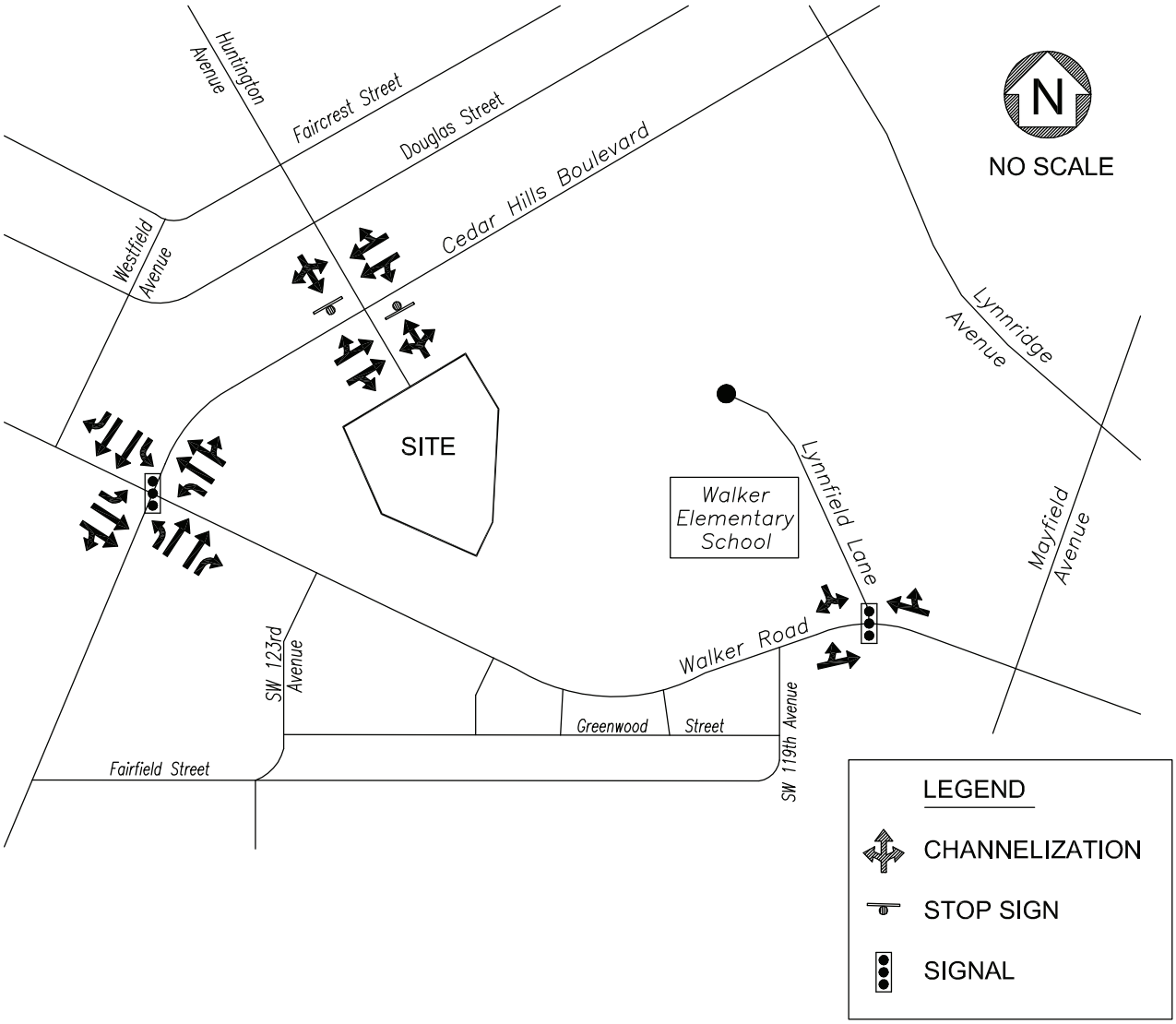
NOTES: NO SCALE

SITE PLAN

CEDAR HILLS COMMUNITY PARK

FIGURE b



FILE NAME: 1328flow.dwg

PLOT DATE: 01.07.14

CHARBONNEAU ENGINEERING LLC

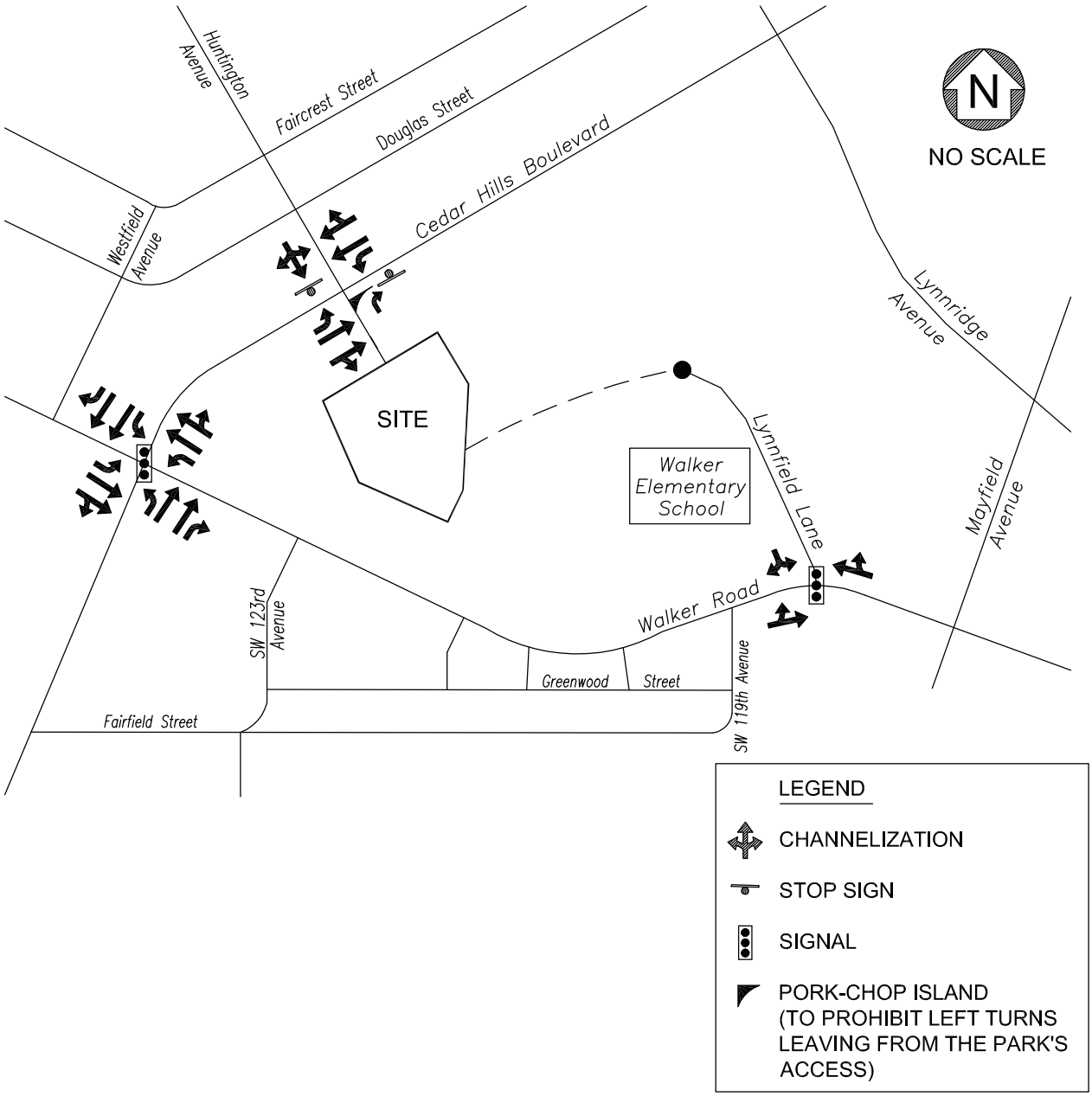
PROJECT: 13-28

NOTES:

EXISTING TRAFFIC CONTROL AND LANE CONFIGURATIONS
CEDAR HILLS COMMUNITY PARK

FIGURE

C



FILE NAME: 1328flow2.dwg

PLOT DATE: 01.29.14

CHARBONNEAU ENGINEERING LLC

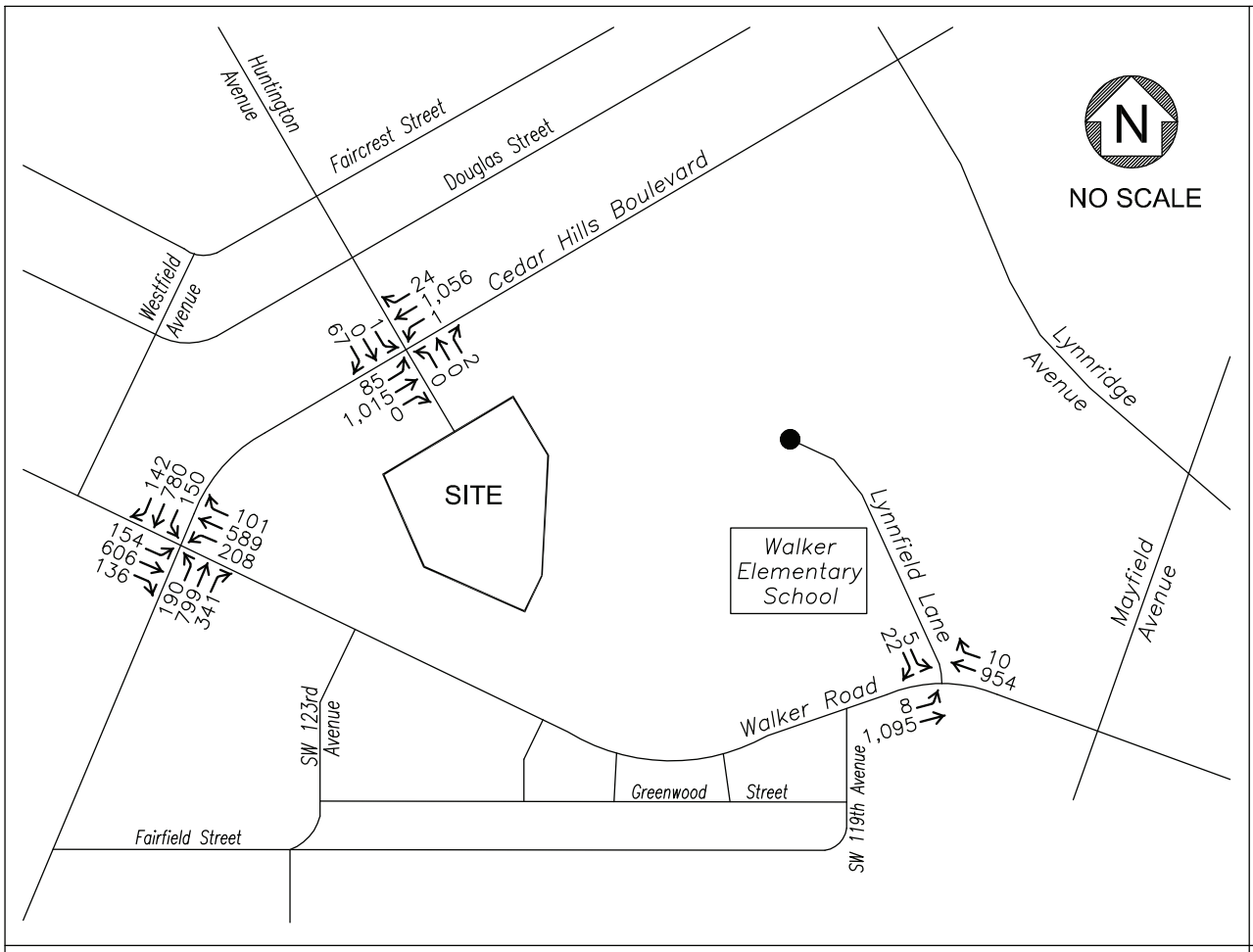
PROJECT: 13-28

NOTES:

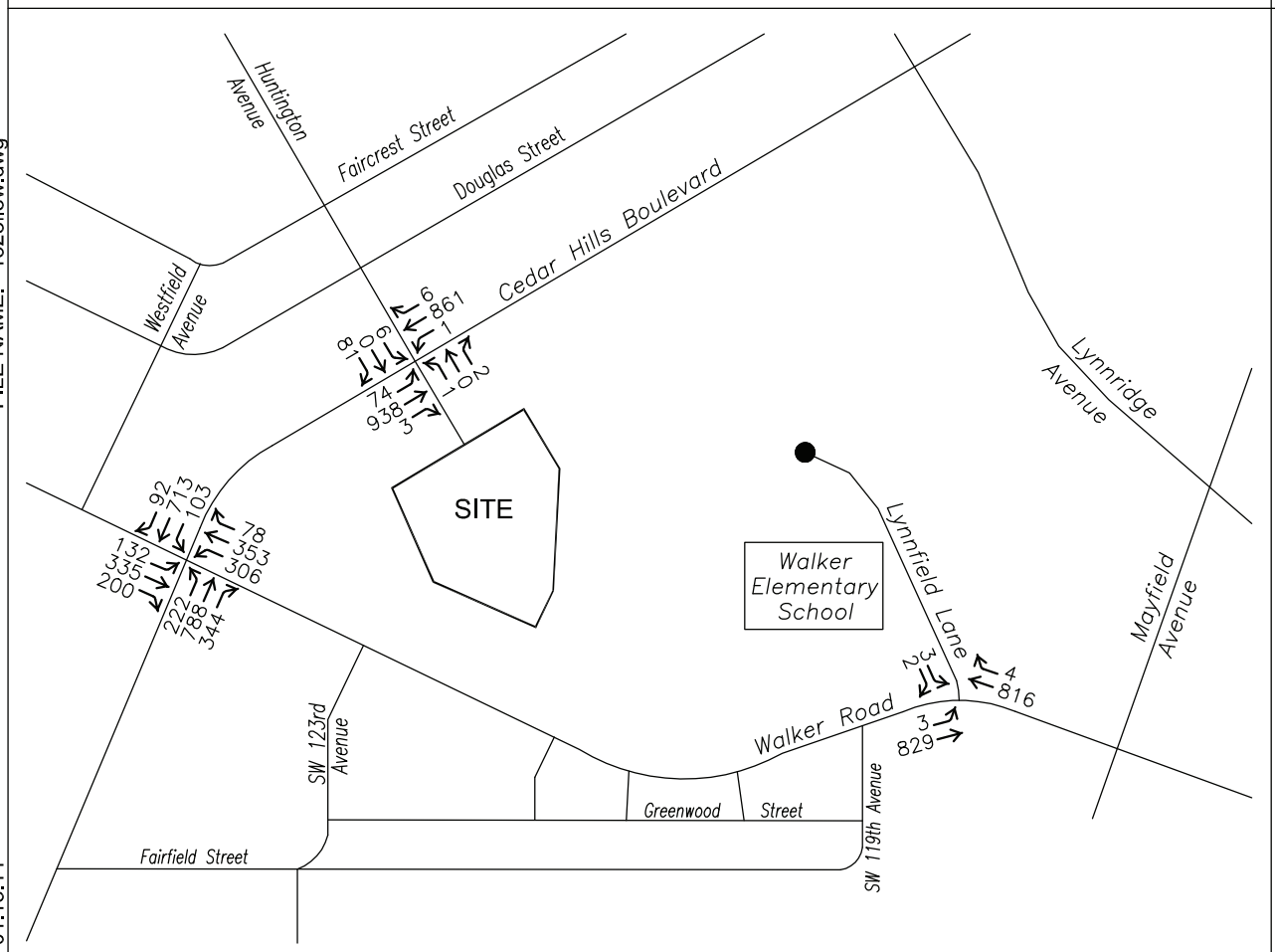
PROPOSED TRAFFIC CONTROL AND LANE CONFIGURATIONS CEDAR HILLS COMMUNITY PARK

FIGURE

d



WEEKDAY PM PEAK HOUR



SATURDAY MIDDAY PEAK HOUR

FILE NAME: 1328flow.dwg

PLOT DATE: 01.15.14

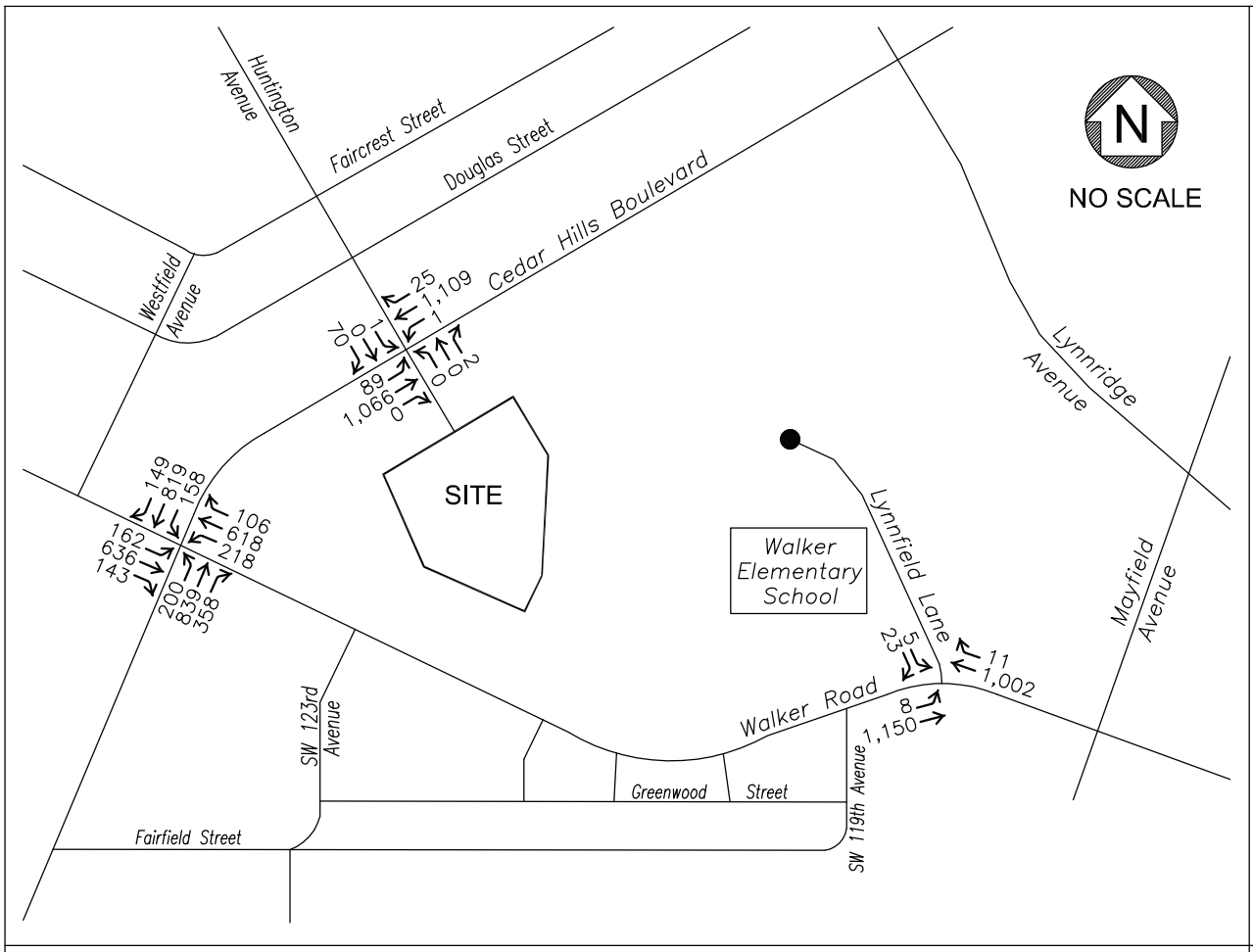
CHARBONNEAU ENGINEERING LLC

PROJECT: 13-28

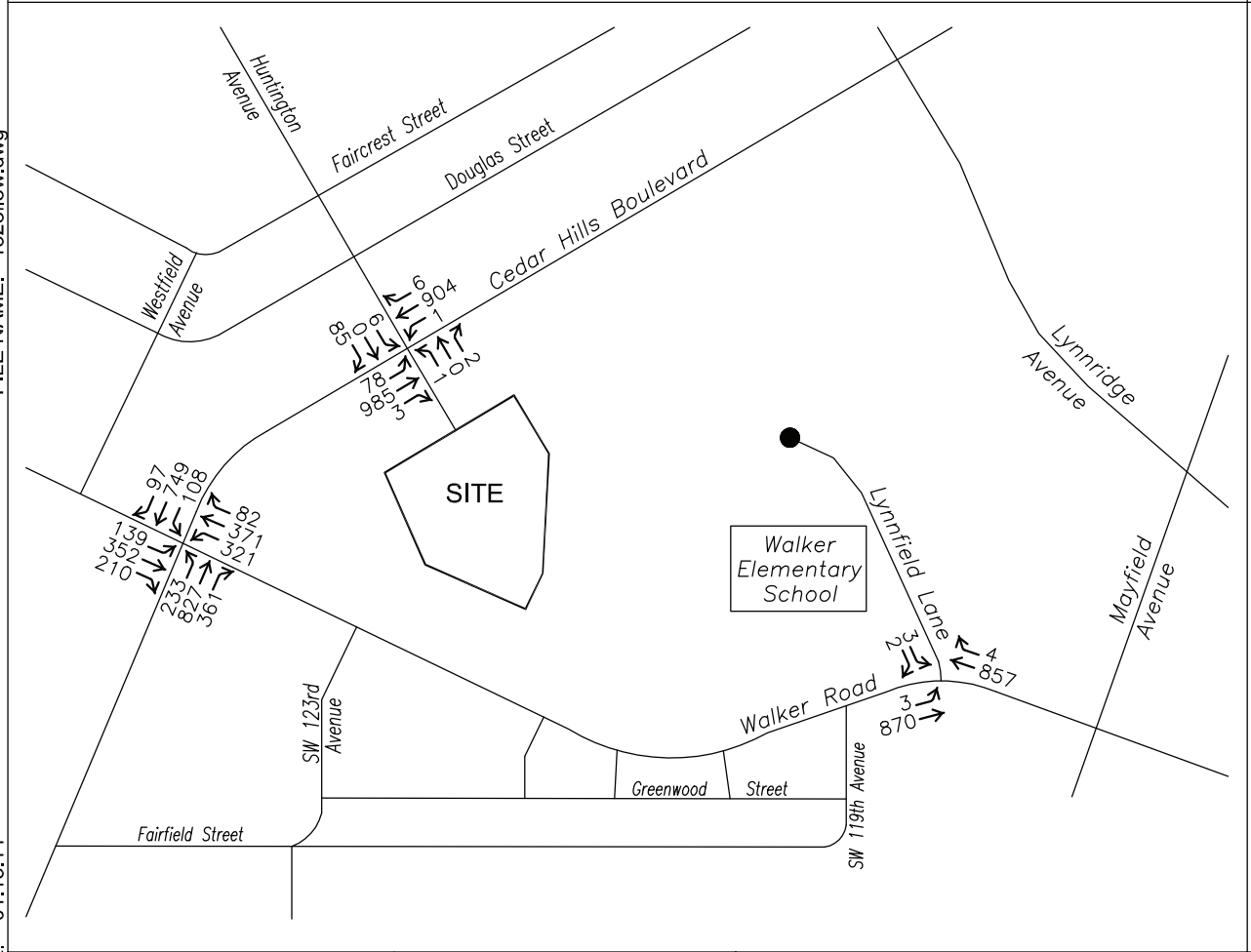
NOTES:

2013 EXISTING TRAFFIC
CEDAR HILLS COMMUNITY PARK

FIGURE 1



WEEKDAY PM PEAK HOUR



SATURDAY MIDDAY PEAK HOUR

FILE NAME: 1328flow.dwg

PLOT DATE: 01.15.14

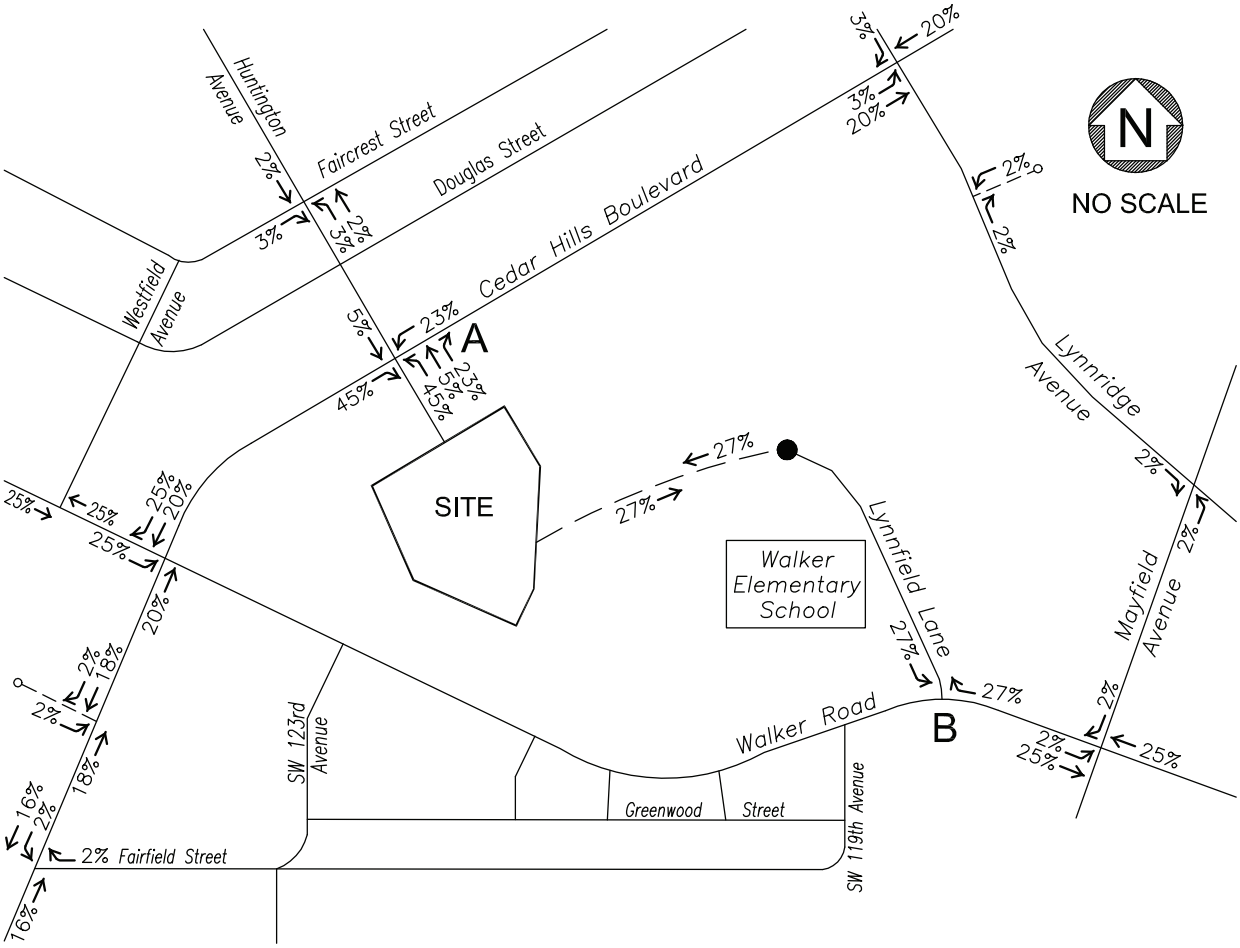
CHARBONNEAU ENGINEERING LLC

PROJECT: 13-28

NOTES: 2018 Background Traffic = 2013 Existing Traffic + growth (1% per year for five (5) years).

2018 BACKGROUND TRAFFIC
CEDAR HILLS COMMUNITY PARK

FIGURE 2



WEEKDAY PM PEAK HOUR AND SATURDAY MIDDAY PEAK HOUR

OPTION 1

ACCESS 'A' = Full-movement
ACCESS 'B' = Full-movement

FILE NAME: 1328flow.dwg

PLOT DATE: 01.15.14

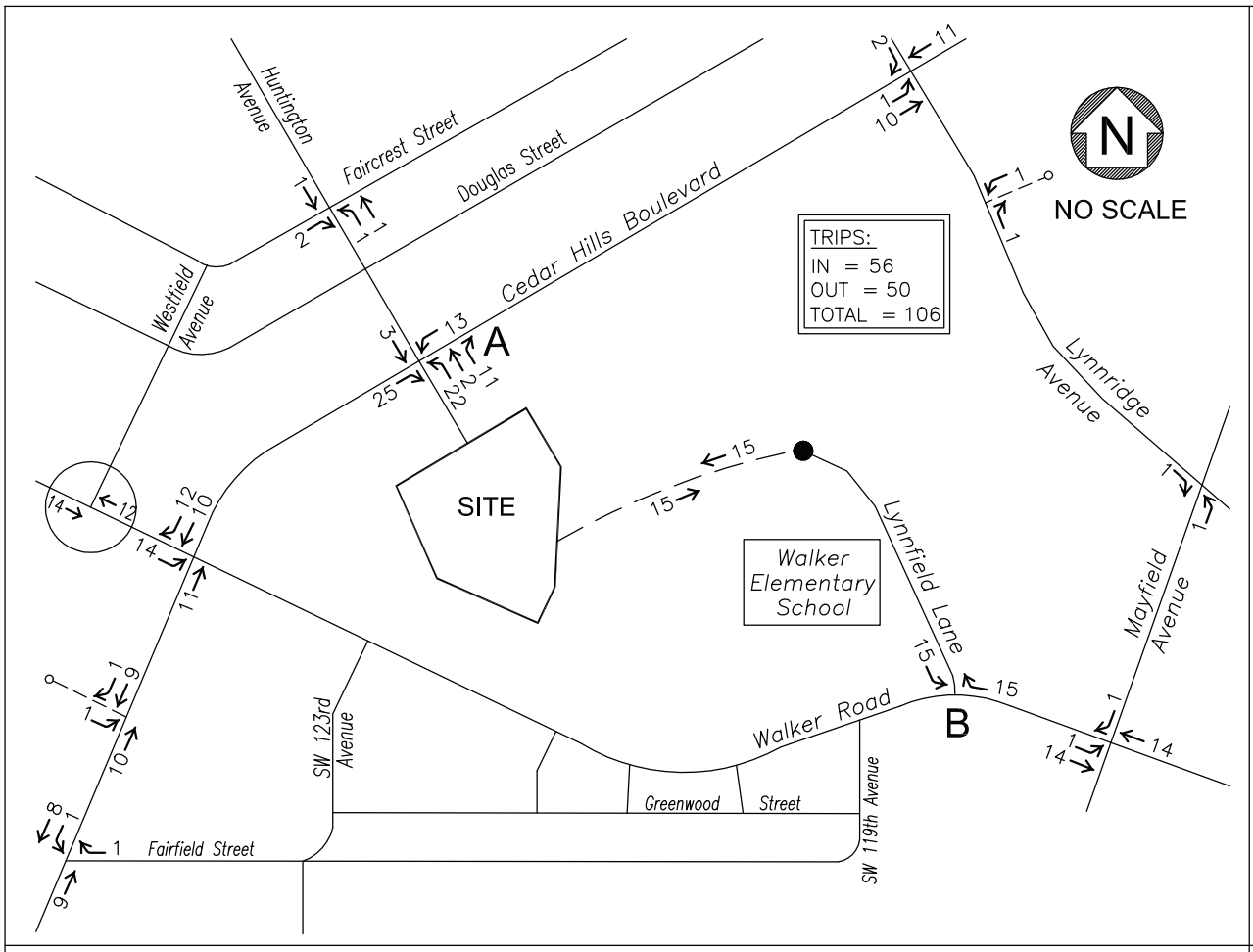
CHARBONNEAU ENGINEERING LLC

PROJECT: 13-28

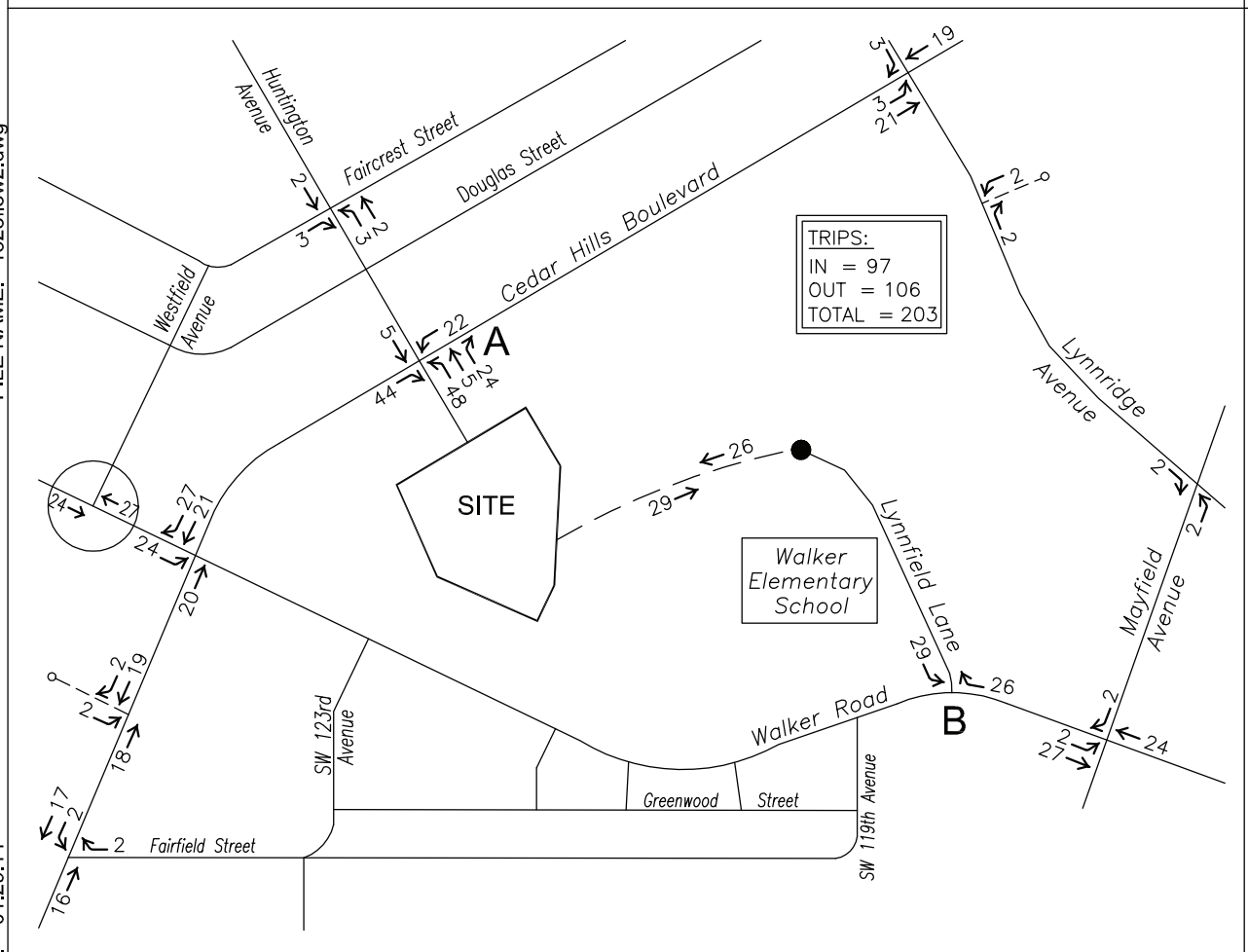
NOTES: Trip distribution based on access configurations and engineering judgement.

TRIP DISTRIBUTION
OPTION 1
CEDAR HILLS COMMUNITY PARK

FIGURE 3a



WEEKDAY PM PEAK HOUR



SATURDAY MIDDAY PEAK HOUR

FILE NAME: 1328flow2.dwg

PLOT DATE: 01.29.14

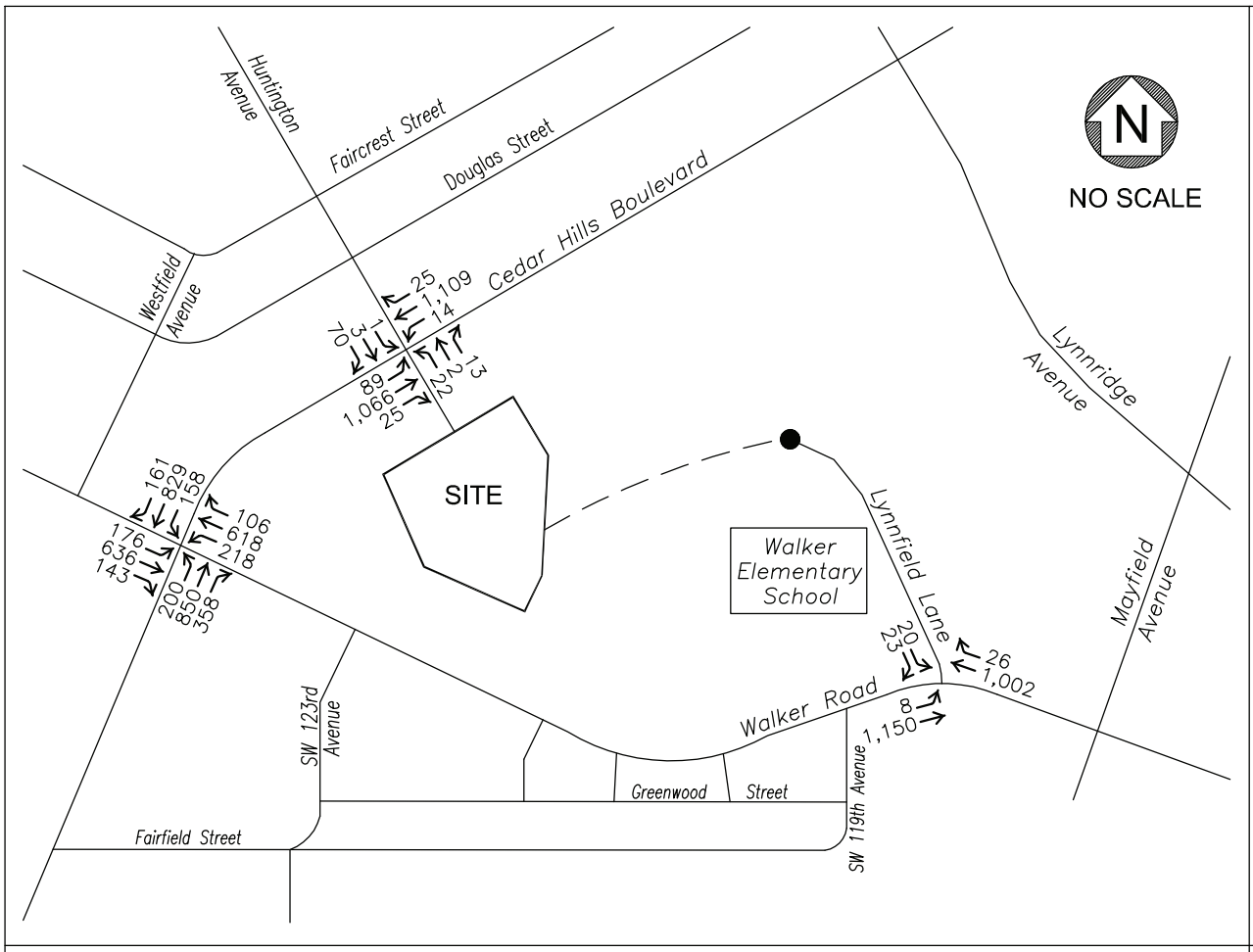
CHARBONNEAU ENGINEERING LLC

PROJECT: 13-28

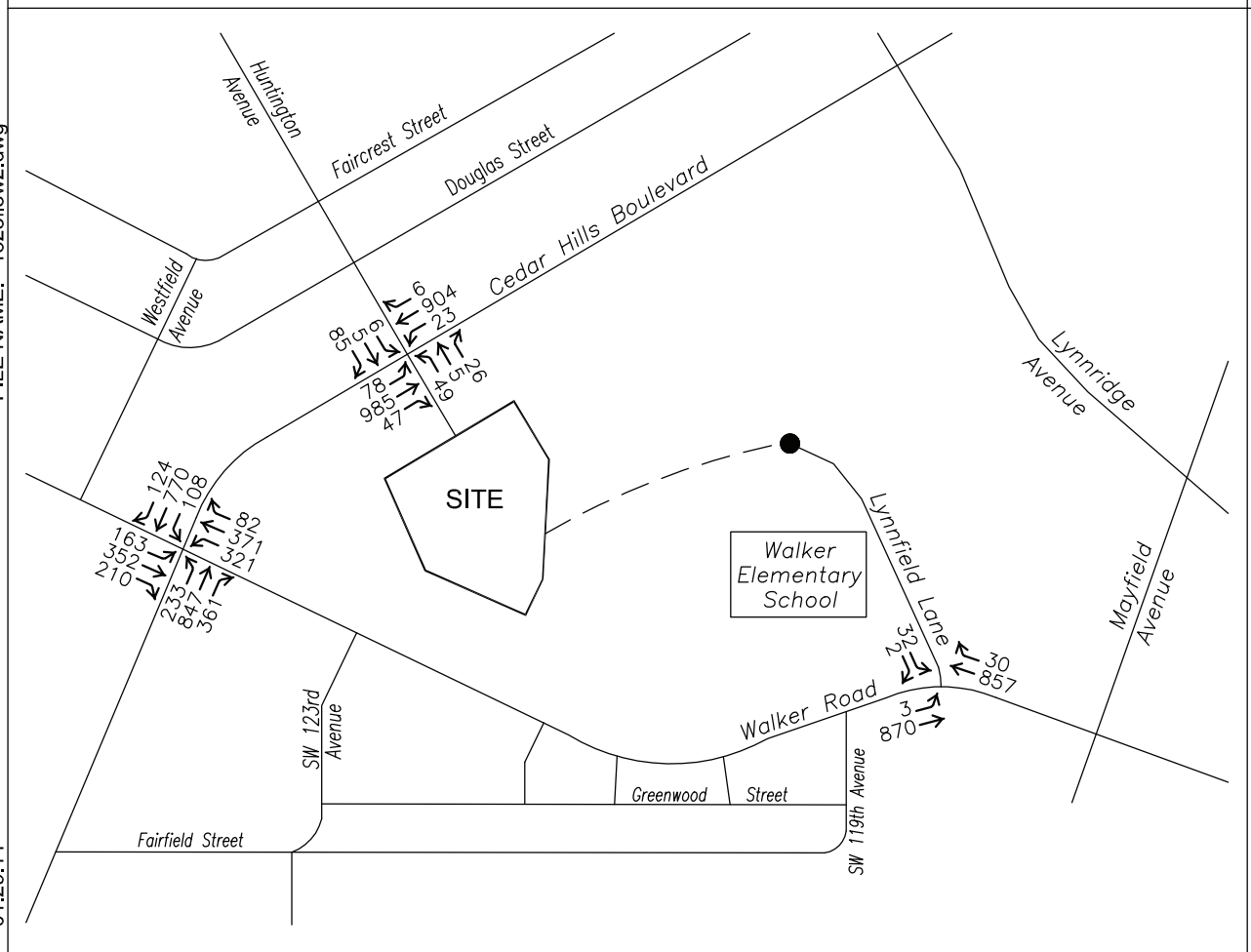
NOTES: Trip generation based on site-specific information.

TRIP ASSIGNMENT
OPTION 1
CEDAR HILLS COMMUNITY PARK

FIGURE 3b



WEEKDAY PM PEAK HOUR



SATURDAY MIDDAY PEAK HOUR

FILE NAME: 1328flow2.dwg

PLOT DATE: 01.29.14

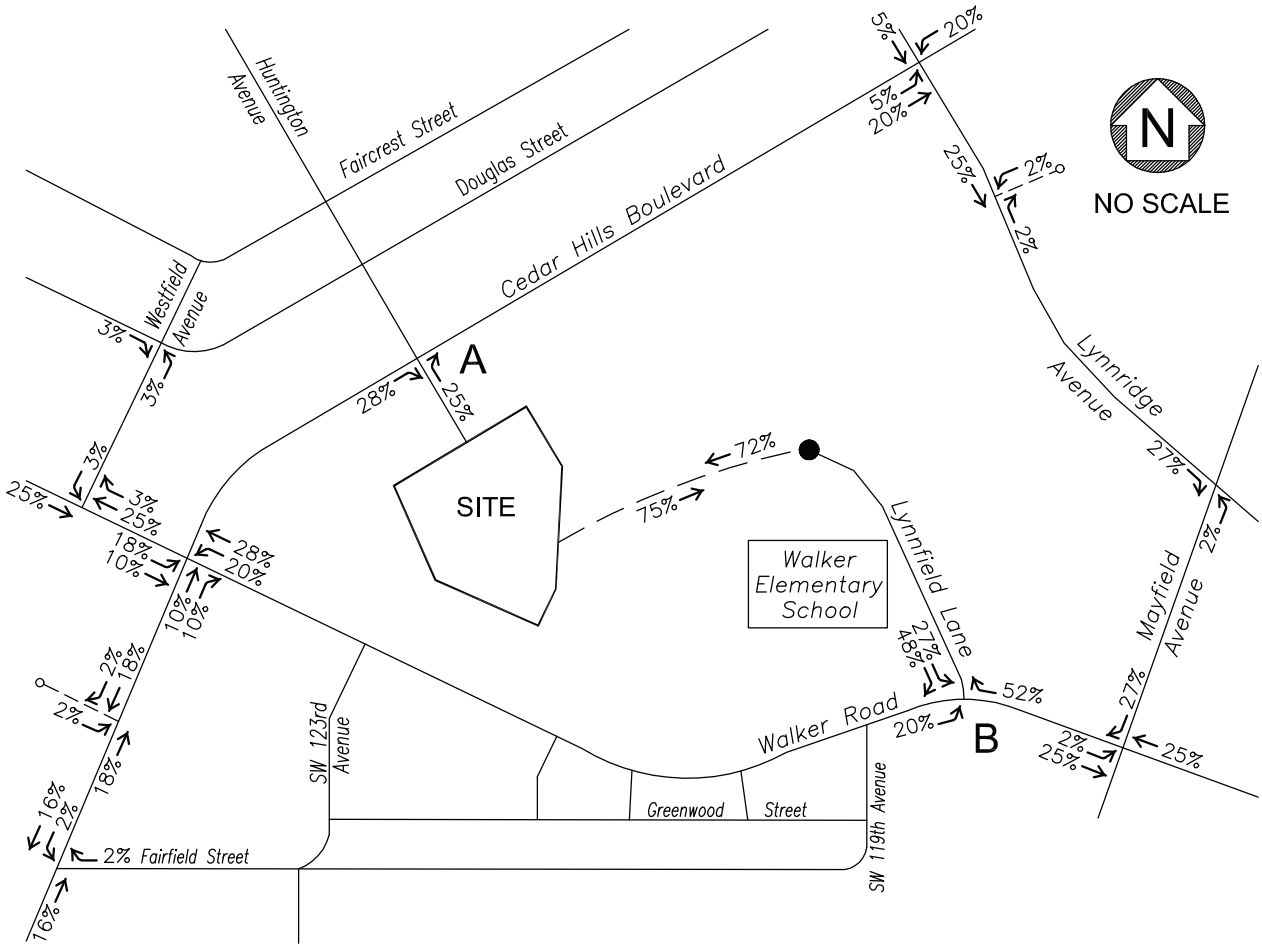
CHARBONNEAU ENGINEERING LLC

PROJECT: 13-28

NOTES:
2018 Total Traffic (Option 1) = 2018 Background Traffic + Option 1 Trip Assignment.

2018 TOTAL TRAFFIC
OPTION 1
CEDAR HILLS COMMUNITY PARK

FIGURE
4



WEEKDAY PM PEAK HOUR AND SATURDAY MIDDAY PEAK HOUR

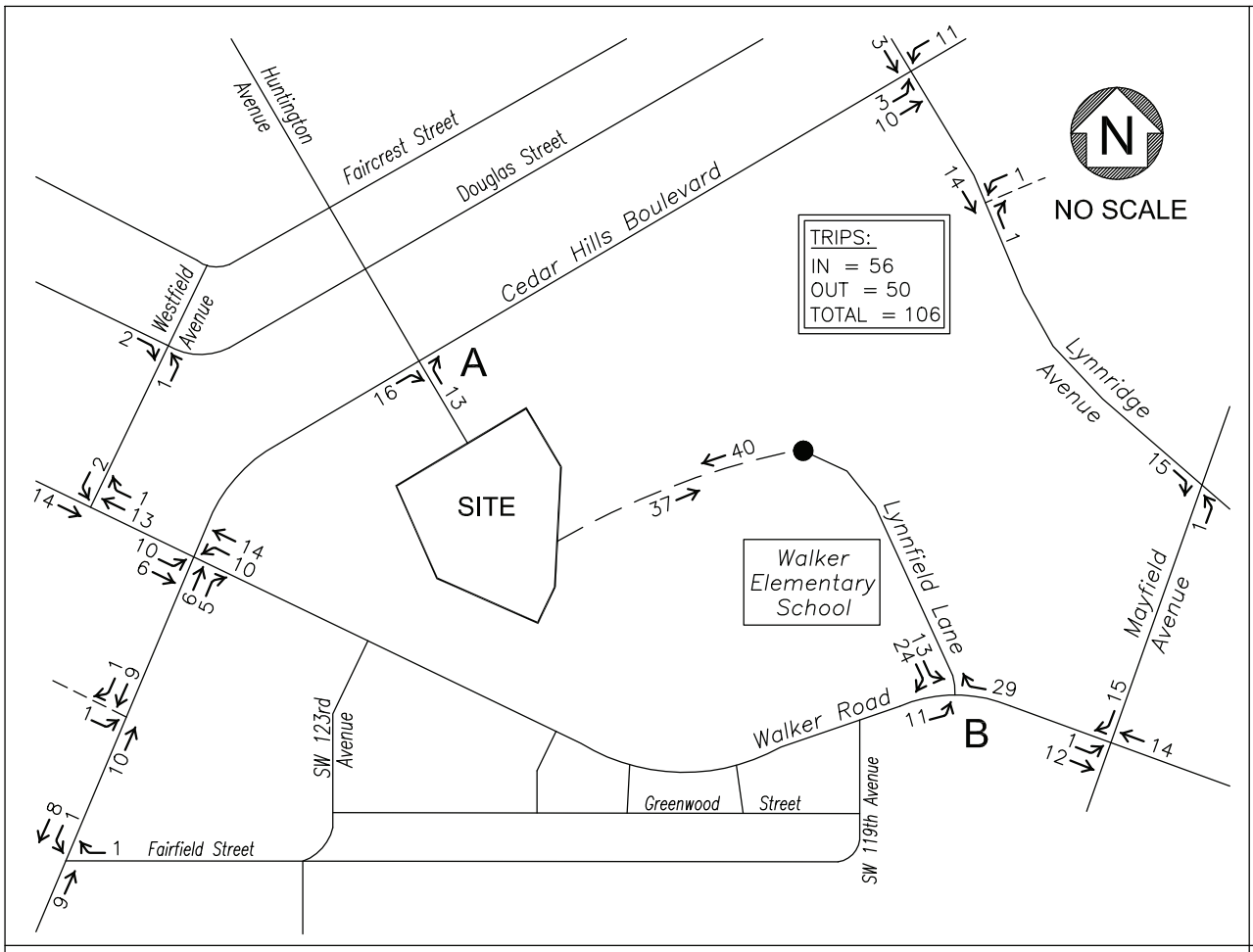
OPTION 2

ACCESS 'A' = Right In-Right Out
ACCESS 'B' = Full-movement

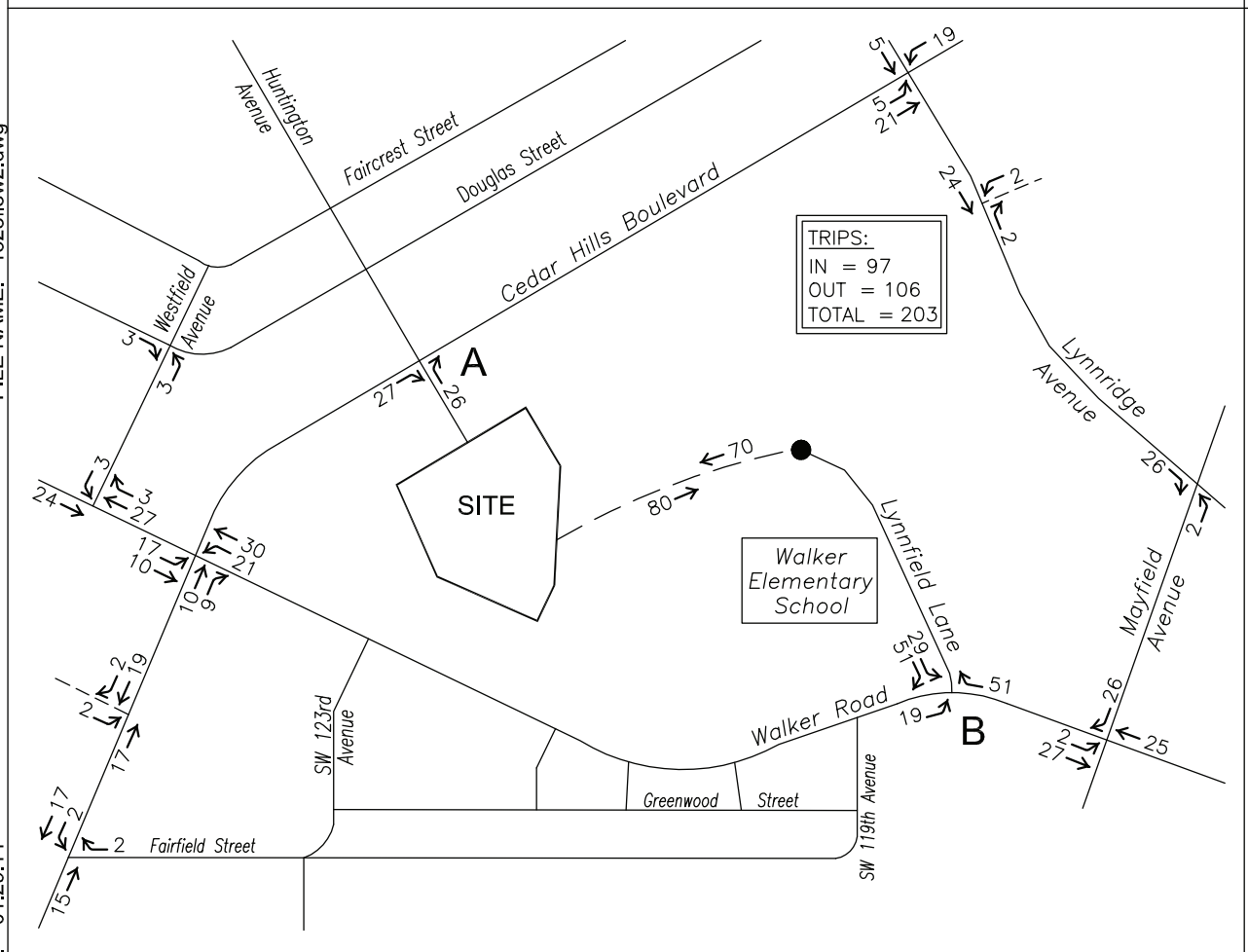
FILE NAME: 1328flow.dwg

PLOT DATE: 01.15.14

CHARBONNEAU ENGINEERING LLC PROJECT: 13-28	NOTES: Trip distribution based on access configurations and engineering judgement.	TRIP DISTRIBUTION OPTION 2 CEDAR HILLS COMMUNITY PARK	FIGURE 5a



WEEKDAY PM PEAK HOUR



SATURDAY MIDDAY PEAK HOUR

FILE NAME: 1328flow2.dwg

PLOT DATE: 01.29.14

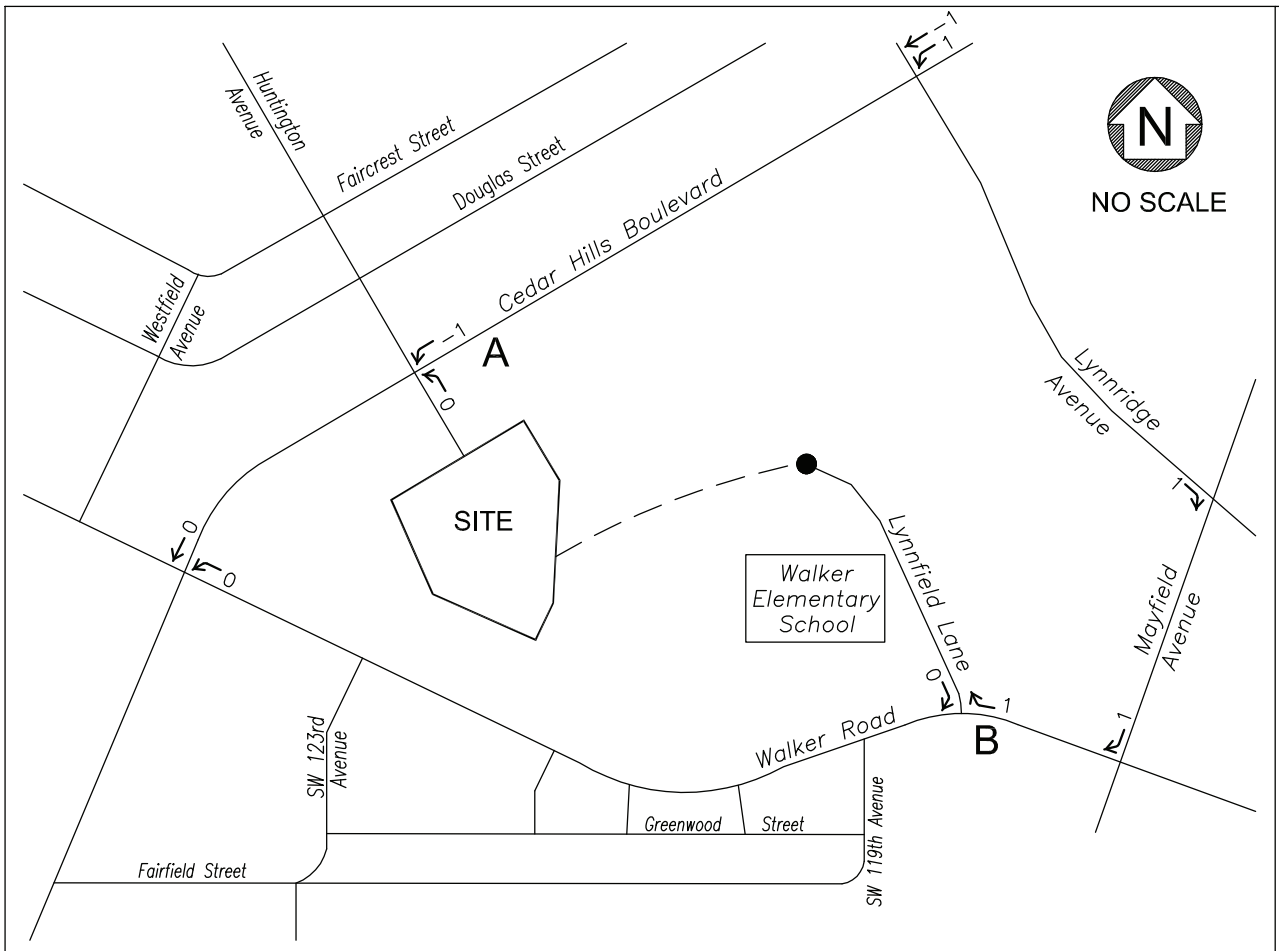
CHARBONNEAU ENGINEERING LLC

PROJECT: 13-28

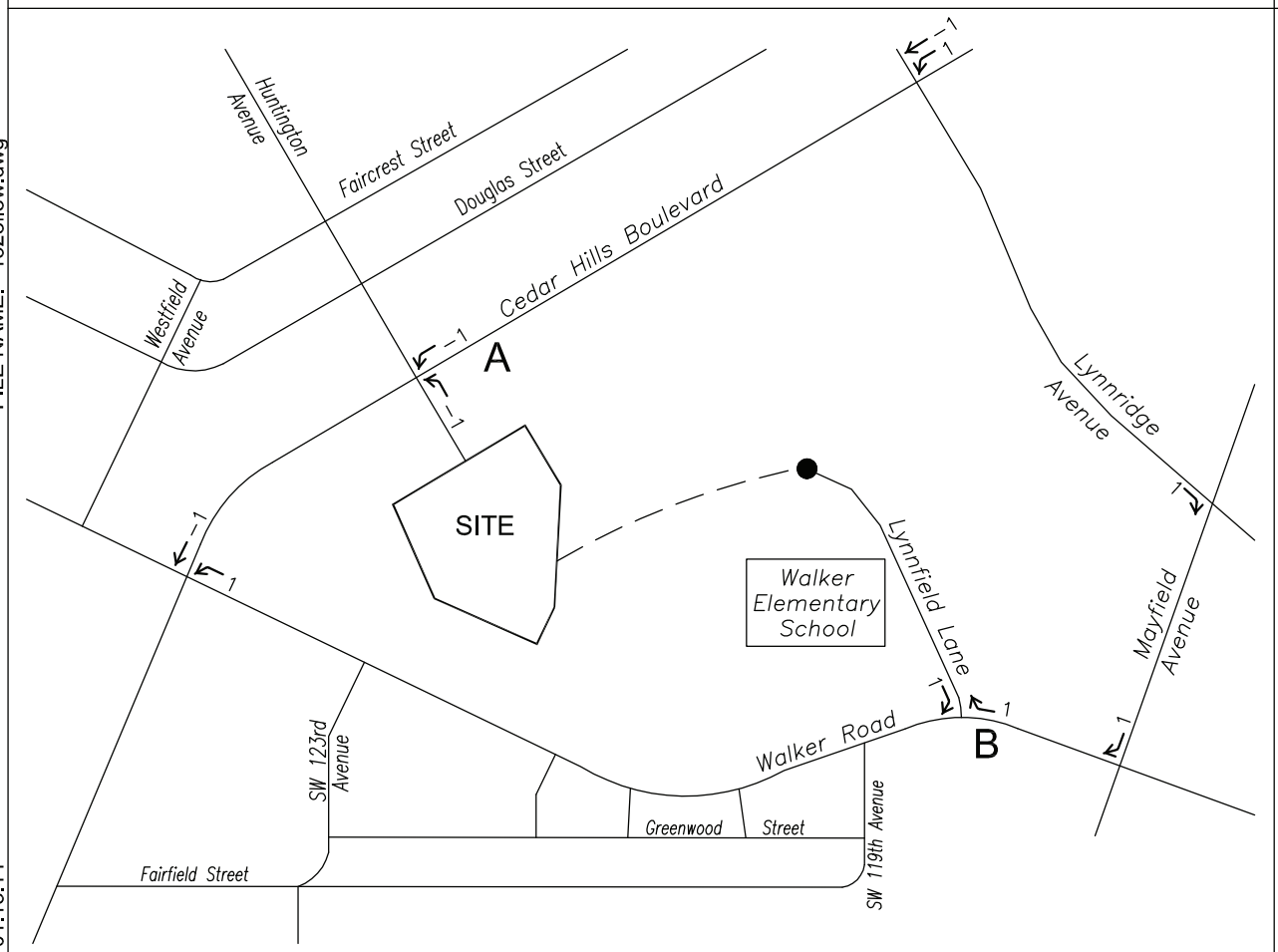
NOTES: Trip generation based on site-specific information.

TRIP ASSIGNMENT
OPTION 2
CEDAR HILLS COMMUNITY PARK

FIGURE 5b



WEEKDAY PM PEAK HOUR



SATURDAY MIDDAY PEAK HOUR

FILE NAME: 1328flow.dwg

PLOT DATE: 01.15.14

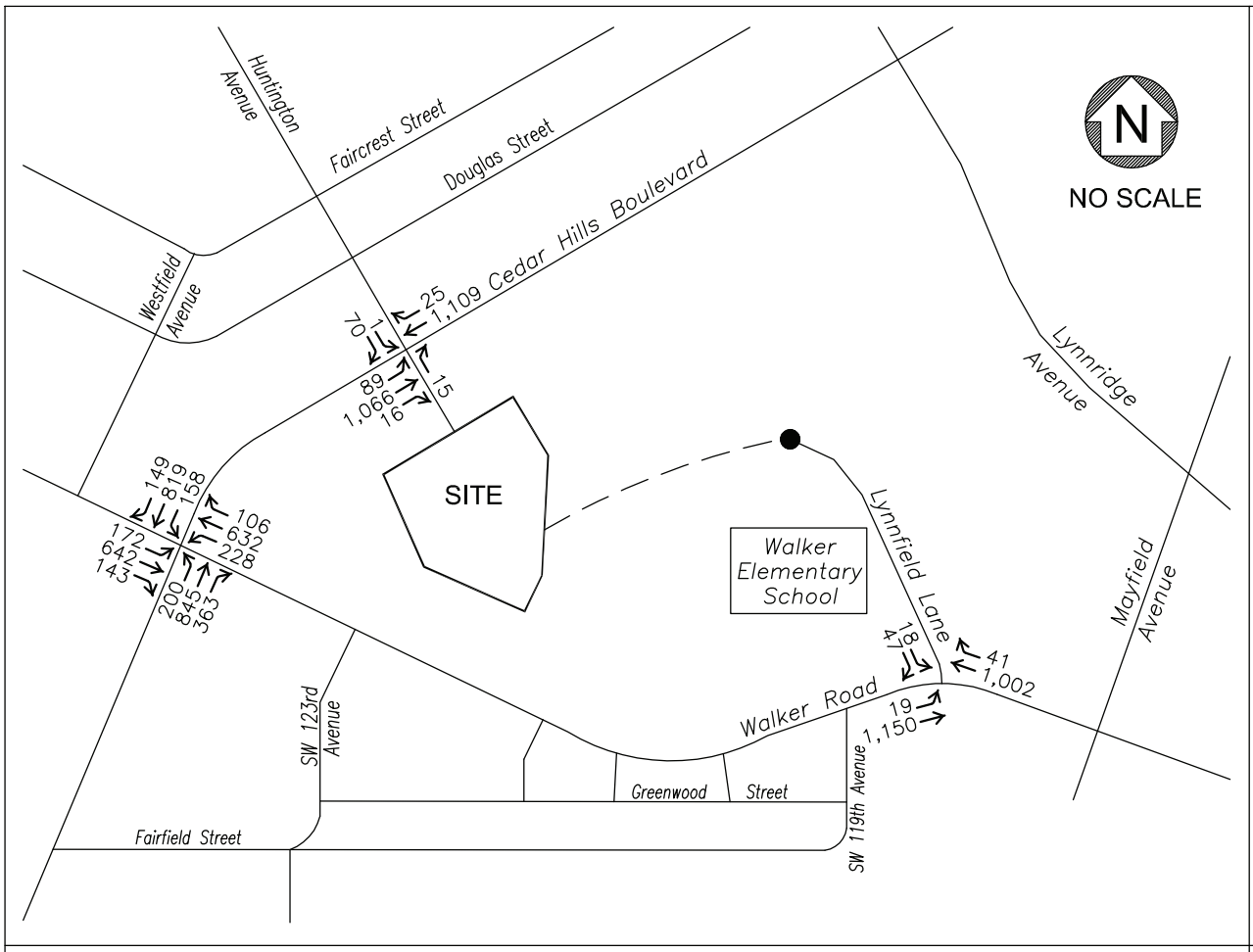
CHARBONNEAU ENGINEERING LLC

PROJECT: 13-28

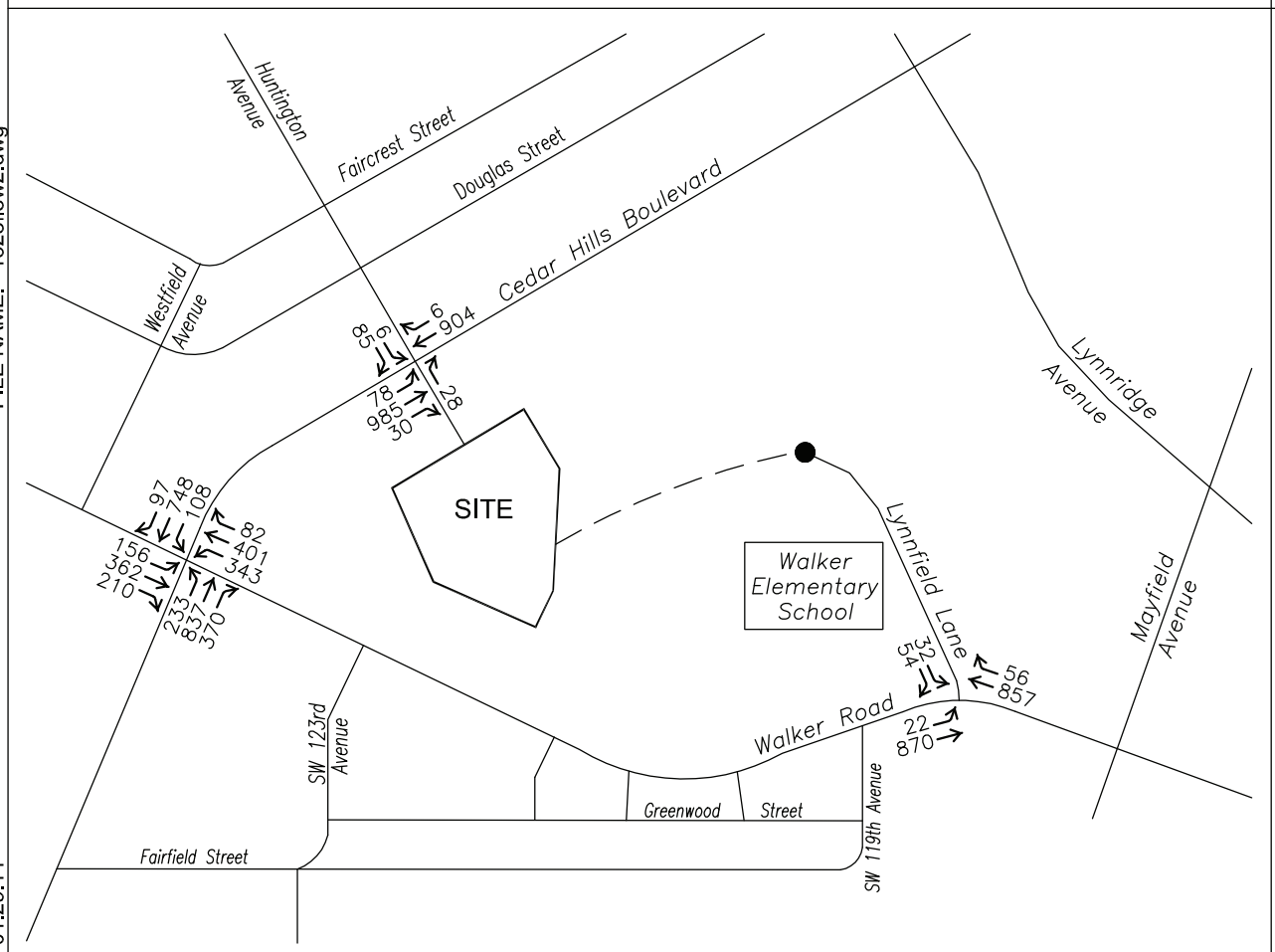
NOTES: Option 2 reroute based on the Right In-Right Out configuration at Access 'A' (the park's access to Cedar Hills Blvd).

TRAFFIC REROUTE
OPTION 2
CEDAR HILLS COMMUNITY PARK

FIGURE 6



WEEKDAY PM PEAK HOUR



SATURDAY MIDDAY PEAK HOUR

FILE NAME: 1328flow2.dwg

PLOT DATE: 01.29.14

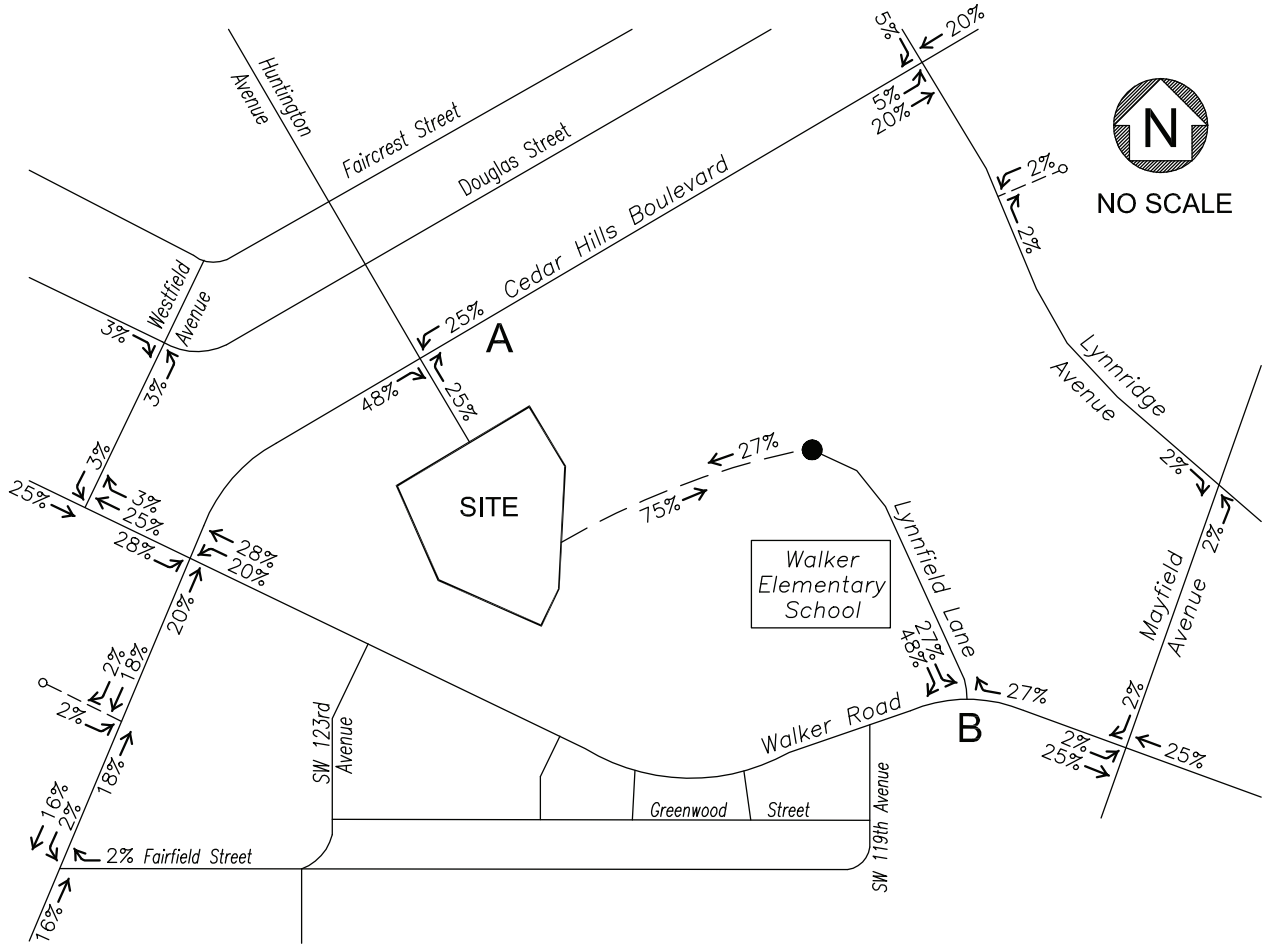
CHARBONNEAU ENGINEERING LLC

PROJECT: 13-28

NOTES: 2018 Total Traffic (Option 2) = 2018 Background Traffic + Option 2 Reroute + Option 2 Trip Assignment.

2018 TOTAL TRAFFIC
OPTION 2
CEDAR HILLS COMMUNITY PARK

FIGURE 7



WEEKDAY PM PEAK HOUR AND SATURDAY MIDDAY PEAK HOUR

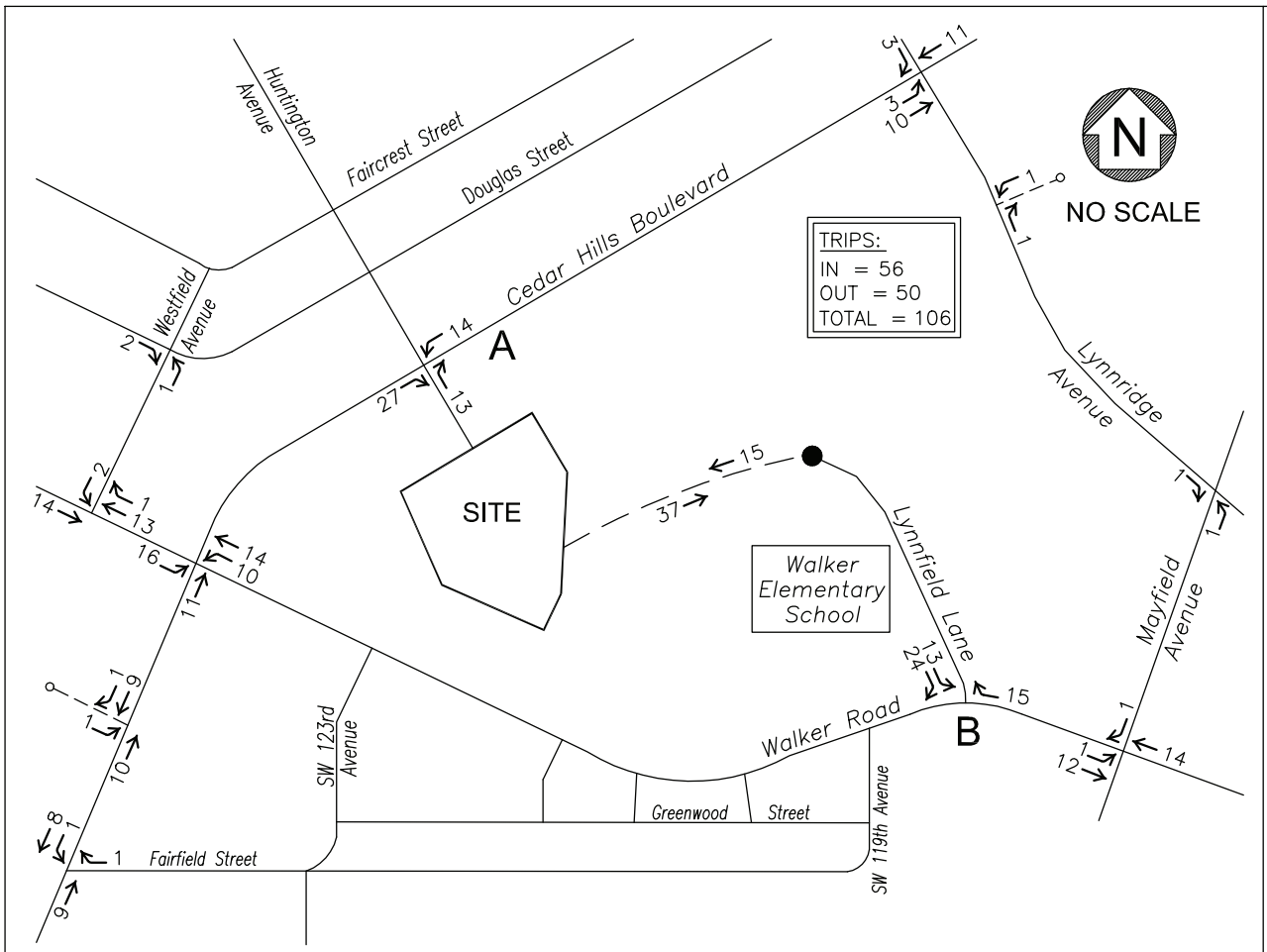
OPTION 3

ACCESS 'A' = Right In-Right Out-Left In
ACCESS 'B' = Full-movement

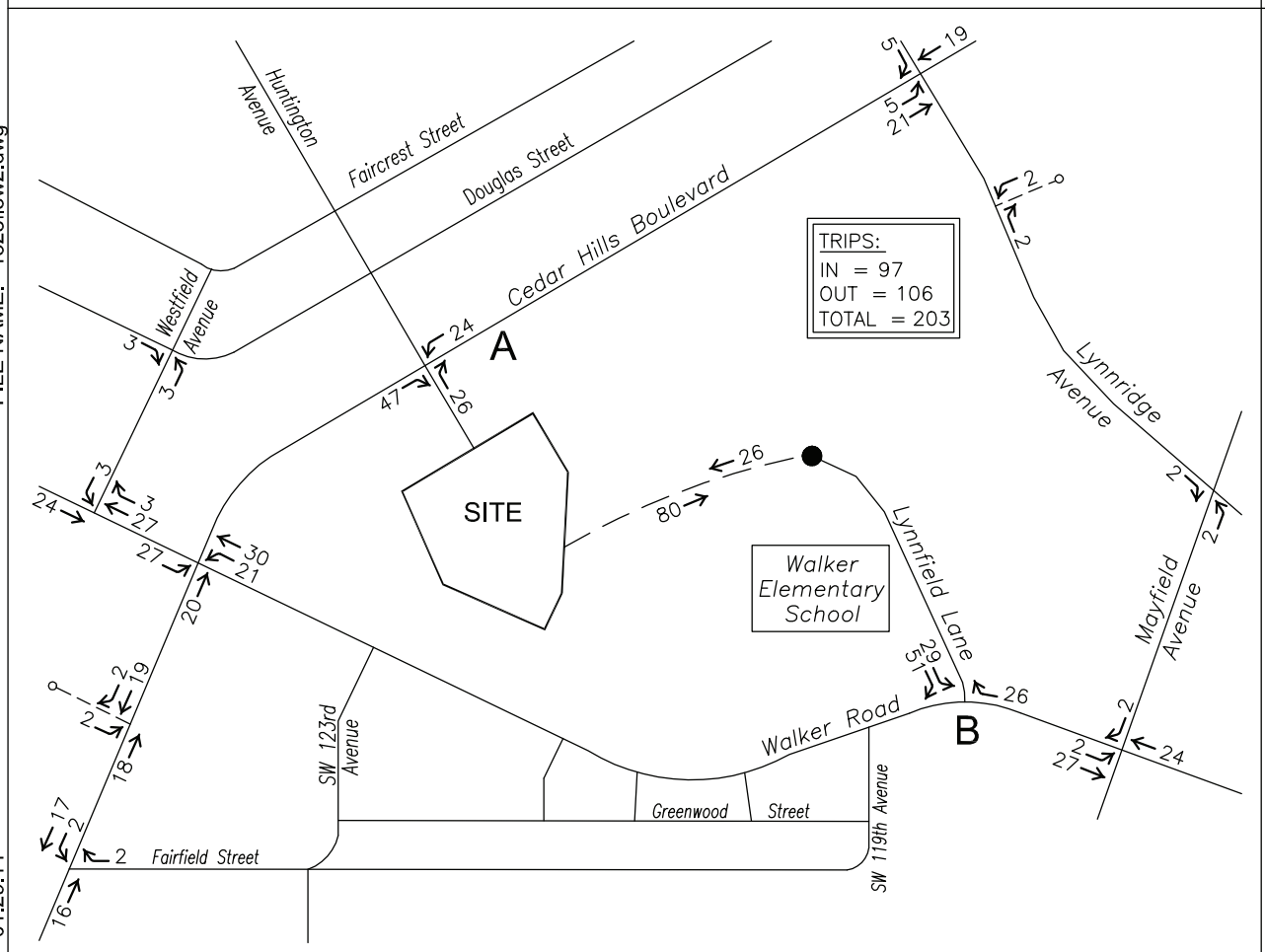
FILE NAME: 1328flow.dwg

PLOT DATE: 01.15.14

CHARBONNEAU ENGINEERING LLC PROJECT: 13-28	NOTES: Trip distribution based on access configurations and engineering judgement.	TRIP DISTRIBUTION OPTION 3 CEDAR HILLS COMMUNITY PARK	FIGURE 8a



WEEKDAY PM PEAK HOUR



SATURDAY MIDDAY PEAK HOUR

FILE NAME: 1328flow2.dwg

PLOT DATE: 01.29.14

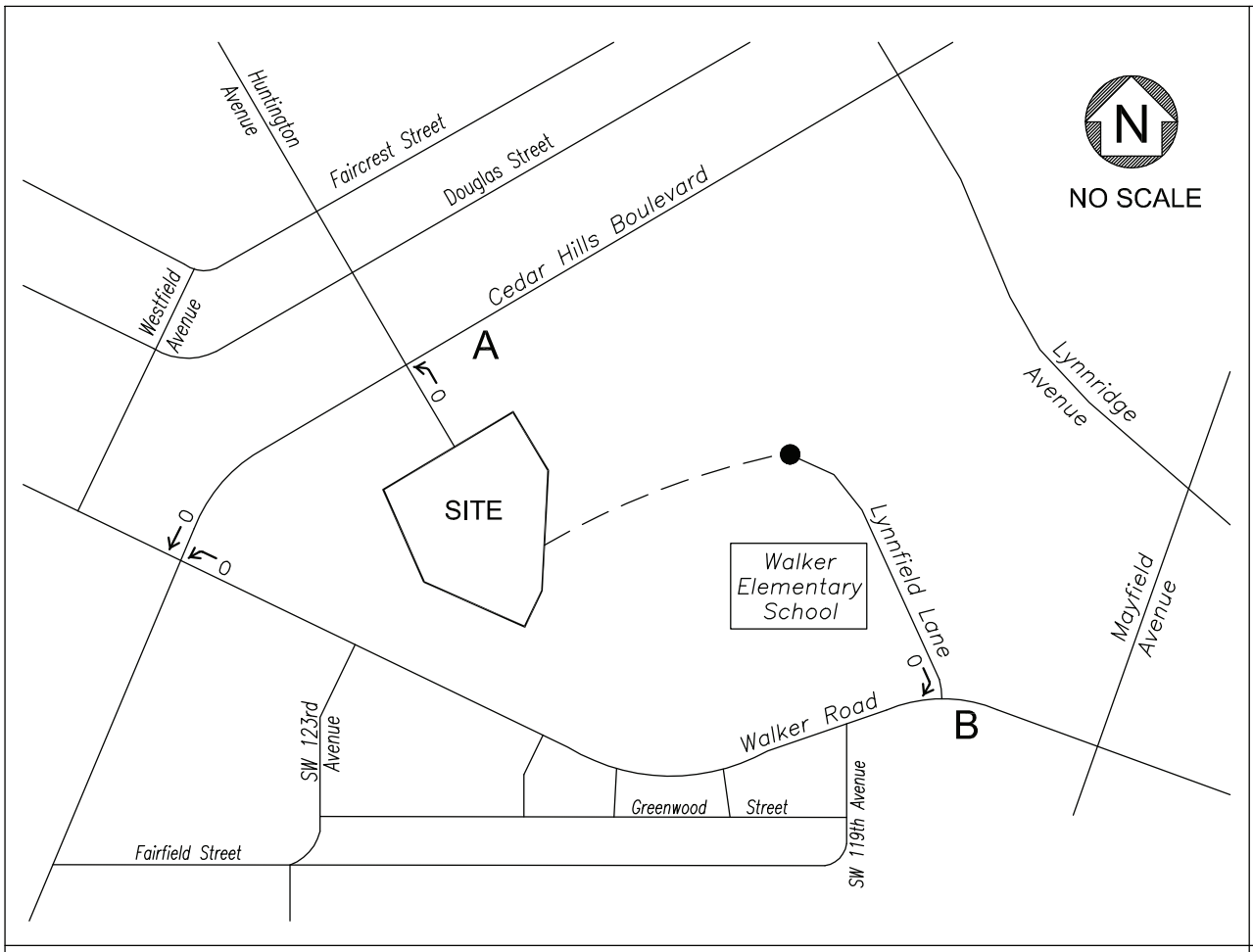
CHARBONNEAU ENGINEERING LLC

PROJECT: 13-28

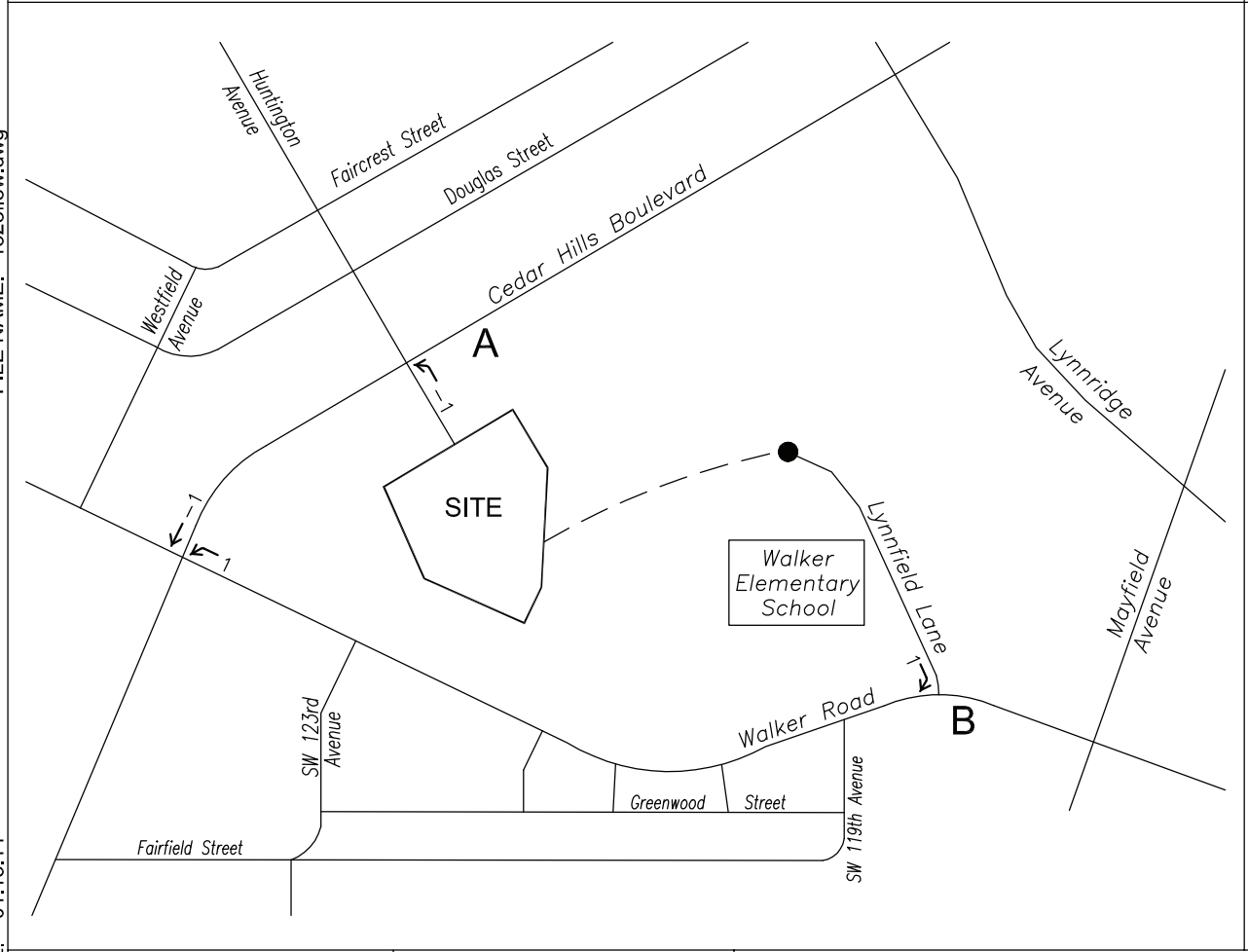
NOTES: Trip generation based on site-specific information.

TRIP ASSIGNMENT
OPTION 3
CEDAR HILLS COMMUNITY PARK

FIGURE 8b



WEEKDAY PM PEAK HOUR



SATURDAY MIDDAY PEAK HOUR

FILE NAME: 1328flow.dwg

PLOT DATE: 01.15.14

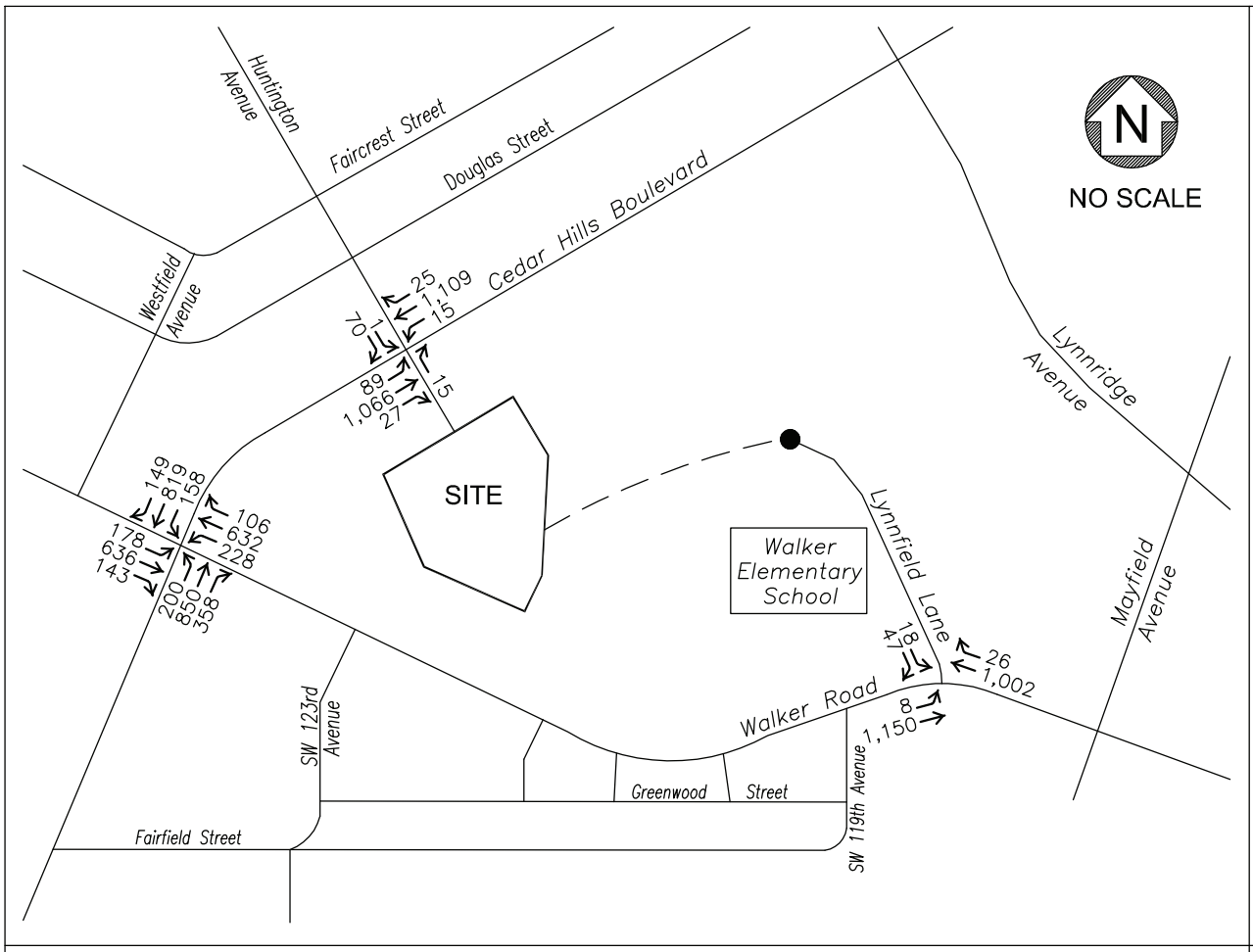
CHARBONNEAU ENGINEERING LLC

PROJECT: 13-28

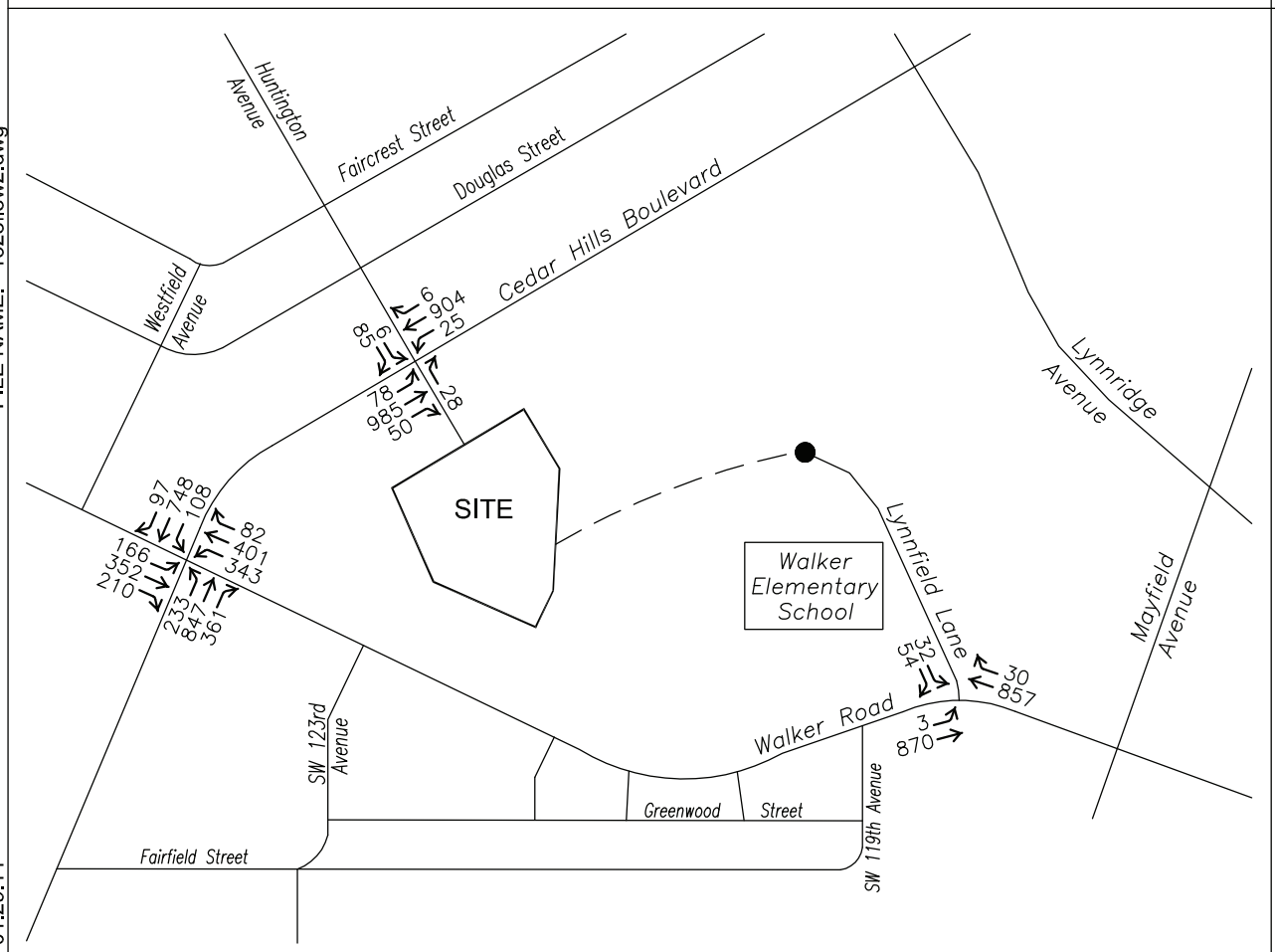
NOTES: Option 3 reroute based on the Right In-Right Out-Left In configuration at Access 'A' (the park's access to Cedar Hills Blvd).

TRAFFIC REROUTE
OPTION 3
CEDAR HILLS COMMUNITY PARK

FIGURE 9



WEEKDAY PM PEAK HOUR



SATURDAY MIDDAY PEAK HOUR

FILE NAME: 1328flow2.dwg

PLOT DATE: 01.29.14

CHARBONNEAU ENGINEERING LLC

PROJECT: 13-28

NOTES: 2018 Total Traffic (Option 3) = 2018 Background Traffic + Option 3 Reroute + Option 3 Trip Assignment.

2018 TOTAL TRAFFIC
OPTION 3
CEDAR HILLS COMMUNITY PARK

FIGURE

10

Cedar Hills Park Redevelopment Project

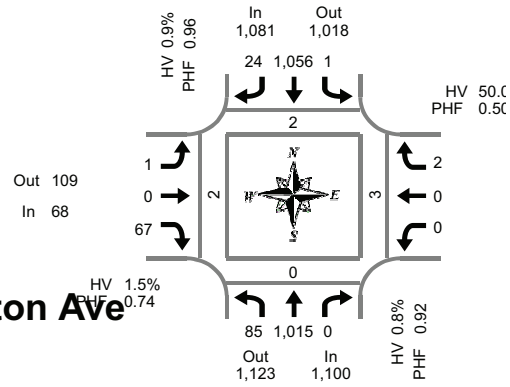
Proposed Programming / Amenities

Updated 11/15/13

1. Lighted synthetic turf multi-purpose sports field
   - Backstop fencing at all 4 corners
     i. 30'-40' high and extending 60'-80' from corners of field
     ii. Without chamfer behind home plate
     iii. Without hood, but with rolled top
   - Optimal double field size: 474' wide x 380' long incl'd sidelines/runouts; or,
   - Minimum 1½ field size: 384' wide x 350' long incl'd sidelines/runouts.
2. Splash pad
   - Vortex equipment; interactive play components
   - approx. 3,000 sf w/ concrete paving
   - possible drain to storage for irrigation or recirculating - *TBD*
3. Community garden
   - approx. (44) 15' x 15' plots – *need to confirm # and size of plots?*
4. Playground (2-5 age equipment)
5. Playground (5-12 age equipment)
   - replaced Walker ES equip and surfacing; shared use per IGA
6. (2) Sand volleyball courts
7. Lighted tennis court(s) – 1 court minimum, 2 optimum as space allows
8. Bocce courts – *THPRD needs to confirm w/ user group(s)*
9. Picnic shelter / pavilion
   - approx. 25' x 25'; pre-fabricated
10. Restroom building
    - pre-fabricated; *size TBD*
    - possibly w/ basic concession hook-ups and overhang shelter – *THPRD needs to confirm hook-ups vs concession room*
    - storage for splash pad equipment – *size TBD*
    - storage for Cedar Hills Rec Center equipment – *size TBD*
    - storage for field maintenance supplies – *size TBD*
11. Multi-purpose open lawn areas – *as space allows*
12. Picnic areas
13. Parking (110 to 160 stalls – *need to confirm*);
    - possibly incl'd 54+ shared parking stalls at Walker ES; shared parking per IGA – *BSD has agreed to offer additional shared parking at school; THPRD to confirm # w/ BSD*
14. Vehicular connectivity between CH Park and Walker ES per IGA
15. Pedestrian connectivity between CH Park and Walker ES for shared-use of sports fields
    - w/ <u>no</u> ped/traffic conflicts during school hours per IGA
16. Pathways / pedestrian circulation
17. Signage (traffic, regulatory, park ID and rules, wayfinding, etc.)
18. Artistic element(s)
19. Public Right-of-Way improvements, as required – *amount currently unknown*
20. Protect significant tree grove to extent possible
21. Low Impact Development strategies for storm water runoff and treatment

Total Vehicle Summary

Clay Carney
(503) 833-2740



SE Cedar Hills Blvd & SE Huntington Ave

Thursday, December 05, 2013
4:00 PM to 6:00 PM

Peak Hour Summary
4:30 PM to 5:30 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Cedar Hills Blvd			Southbound SE Cedar Hills Blvd			Eastbound SE Huntington Ave			Westbound SE Huntington Ave			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
4:00 PM	22	224	0	0	214	7	0	0	11	1	0	0	479	1	0	3	0
4:15 PM	21	215	2	0	269	3	0	0	14	0	0	0	524	0	0	0	0
4:30 PM	26	250	0	0	278	4	0	0	12	0	0	1	571	0	0	0	1
4:45 PM	26	236	0	0	266	8	1	0	22	0	0	0	559	0	0	0	1
5:00 PM	16	283	0	0	255	4	0	0	18	0	0	0	576	1	0	2	0
5:15 PM	17	246	0	1	257	8	0	0	15	0	0	1	545	1	0	1	0
5:30 PM	15	248	0	0	252	6	1	0	14	0	0	0	536	0	0	1	0
5:45 PM	19	212	0	0	224	2	2	0	16	0	0	0	475	0	0	0	1
Total Survey	162	1,914	2	1	2,015	42	4	0	122	1	0	2	4,265	3	0	7	3

Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound SE Cedar Hills Blvd			Southbound SE Cedar Hills Blvd			Eastbound SE Huntington Ave			Westbound SE Huntington Ave			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	1,100	1,123	2,223	1,081	1,018	2,099	68	109	177	2	1	3	2,251
%HV	0.8%			0.9%			1.5%			50.0%			0.9%
PHF	0.92			0.96			0.74			0.50			0.98

Pedestrians Crosswalk			
North	South	East	West
2	0	3	2

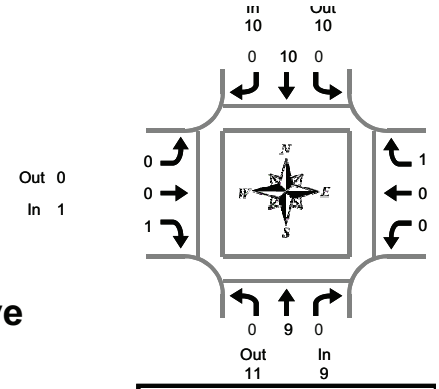
By Movement	Northbound SE Cedar Hills Blvd			Southbound SE Cedar Hills Blvd			Eastbound SE Huntington Ave			Westbound SE Huntington Ave			Total
	L	T	R	L	T	R	L	T	R	L	T	R	
Volume	85	1,015	0	1	1,056	24	1	0	67	0	0	2	2,251
%HV	0.0%	0.9%	0.0%	0.0%	0.9%	0.0%	0.0%	0.0%	1.5%	0.0%	0.0%	50.0%	0.9%
PHF	0.82	0.90	0.00	0.25	0.95	0.75	0.25	0.00	0.76	0.00	0.00	0.50	0.98

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Cedar Hills Blvd			Southbound SE Cedar Hills Blvd			Eastbound SE Huntington Ave			Westbound SE Huntington Ave			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
4:00 PM	95	925	2	0	1,027	22	1	0	59	1	0	1	2,133	1	0	3	2
4:15 PM	89	984	2	0	1,068	19	1	0	66	0	0	1	2,230	1	0	2	2
4:30 PM	85	1,015	0	1	1,056	24	1	0	67	0	0	2	2,251	2	0	3	2
4:45 PM	74	1,013	0	1	1,030	26	2	0	69	0	0	1	2,216	2	0	4	1
5:00 PM	67	989	0	1	988	20	3	0	63	0	0	1	2,132	2	0	4	1

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
4:30 PM to 5:30 PM

SE Cedar Hills Blvd & SE Huntington Ave

Thursday, December 05, 2013
4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Cedar Hills Blvd				Southbound SE Cedar Hills Blvd				Eastbound SE Huntington Ave				Westbound SE Huntington Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
4:15 PM	0	3	1	4	0	2	0	2	0	0	1	1	0	0	0	0	7
4:30 PM	0	4	0	4	0	2	0	2	0	0	0	0	0	0	1	1	7
4:45 PM	0	2	0	2	0	5	0	5	0	0	0	0	0	0	0	0	7
5:00 PM	0	2	0	2	0	2	0	2	0	0	1	1	0	0	0	0	5
5:15 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
5:30 PM	0	2	0	2	0	2	0	2	0	0	0	0	0	0	0	0	4
5:45 PM	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	3
Total Survey	0	18	1	19	0	16	0	16	0	0	2	2	0	0	1	1	38

Heavy Vehicle Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound SE Cedar Hills Blvd			Southbound SE Cedar Hills Blvd			Eastbound SE Huntington Ave			Westbound SE Huntington Ave			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	9	11	20	10	10	20	1	0	1	1	0	1	21
PHF	0.20			0.28			0.25			0.25			0.25

By Movement	Northbound SE Cedar Hills Blvd				Southbound SE Cedar Hills Blvd				Eastbound SE Huntington Ave				Westbound SE Huntington Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	9	0	9	0	10	0	10	0	0	1	1	0	0	1	1	21
PHF	0.00	0.23	0.00	0.20	0.00	0.28	0.00	0.28	0.00	0.00	0.25	0.25	0.00	0.00	0.25	0.25	0.25

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

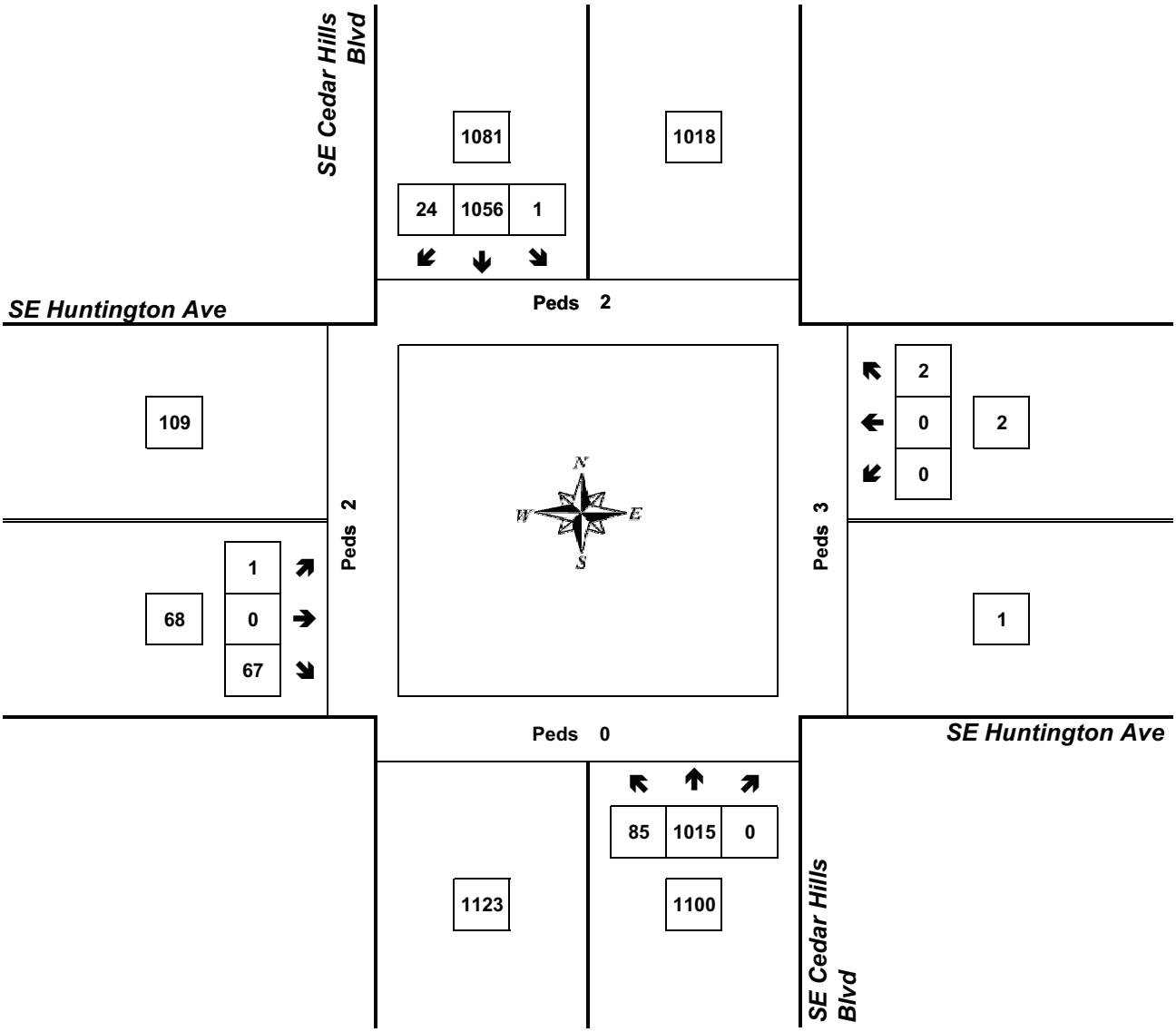
Interval Start Time	Northbound SE Cedar Hills Blvd				Southbound SE Cedar Hills Blvd				Eastbound SE Huntington Ave				Westbound SE Huntington Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	12	1	13	0	9	0	9	0	0	1	1	0	0	1	1	24
4:15 PM	0	11	1	12	0	11	0	11	0	0	2	2	0	0	1	1	26
4:30 PM	0	9	0	9	0	10	0	10	0	0	1	1	0	0	1	1	21
4:45 PM	0	7	0	7	0	10	0	10	0	0	1	1	0	0	0	0	18
5:00 PM	0	6	0	6	0	7	0	7	0	0	1	1	0	0	0	0	14

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

SE Cedar Hills Blvd & SE Huntington Ave

4:30 PM to 5:30 PM
Thursday, December 05, 2013

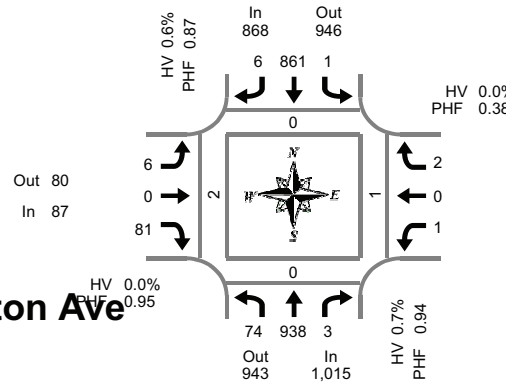


Approach	PHF	HV%	Volume
EB	0.74	1.5%	68
WB	0.50	50.0%	2
NB	0.92	0.8%	1,100
SB	0.96	0.9%	1,081
Intersection	0.98	0.9%	2,251

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
1:00 PM to 2:00 PM

SE Cedar Hills Blvd & SE Huntington Ave

Saturday, December 07, 2013
12:00 PM to 2:00 PM

15-Minute Interval Summary
12:00 PM to 2:00 PM

Interval Start Time	Northbound SE Cedar Hills Blvd			Southbound SE Cedar Hills Blvd			Eastbound SE Huntington Ave			Westbound SE Huntington Ave			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
12:00 PM	22	211	0	0	266	2	1	0	16	0	0	0	518	0	0	0	0
12:15 PM	21	200	0	0	206	4	4	0	24	0	0	0	459	2	0	1	2
12:30 PM	20	213	0	0	221	1	1	0	34	0	0	0	490	1	0	1	2
12:45 PM	11	198	0	0	206	1	0	0	21	0	0	0	437	0	0	1	0
1:00 PM	18	240	0	0	203	2	1	0	21	0	0	0	485	0	0	0	0
1:15 PM	22	205	2	0	250	0	2	0	21	1	0	0	503	0	0	1	0
1:30 PM	11	246	0	1	201	2	2	0	19	0	0	2	484	0	0	0	2
1:45 PM	23	247	1	0	207	2	1	0	20	0	0	0	501	0	0	0	0
Total Survey	148	1,760	3	1	1,760	14	12	0	176	1	0	2	3,877	3	0	4	6

Peak Hour Summary
1:00 PM to 2:00 PM

By Approach	Northbound SE Cedar Hills Blvd			Southbound SE Cedar Hills Blvd			Eastbound SE Huntington Ave			Westbound SE Huntington Ave			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	1,015	943	1,958	868	946	1,814	87	80	167	3	4	7	1,973
%HV	0.7%			0.6%			0.0%			0.0%			0.6%
PHF	0.94			0.87			0.95			0.38			0.98

Pedestrians Crosswalk			
North	South	East	West
0	0	1	2

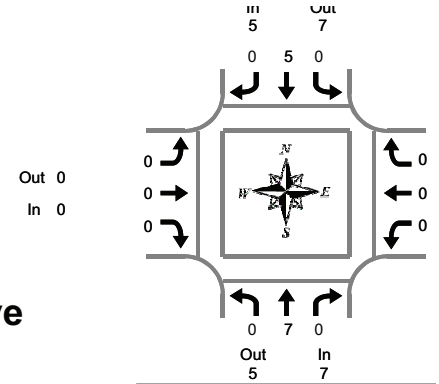
By Movement	Northbound SE Cedar Hills Blvd			Southbound SE Cedar Hills Blvd			Eastbound SE Huntington Ave			Westbound SE Huntington Ave			Total
	L	T	R	L	T	R	L	T	R	L	T	R	
Volume	74	938	3	1	861	6	6	0	81	1	0	2	1,973
%HV	0.0%	0.7%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%
PHF	0.80	0.95	0.38	0.25	0.86	0.75	0.75	0.00	0.96	0.25	0.00	0.25	0.98

Rolling Hour Summary
12:00 PM to 2:00 PM

Interval Start Time	Northbound SE Cedar Hills Blvd			Southbound SE Cedar Hills Blvd			Eastbound SE Huntington Ave			Westbound SE Huntington Ave			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
12:00 PM	74	822	0	0	899	8	6	0	95	0	0	0	1,904	3	0	3	4
12:15 PM	70	851	0	0	836	8	6	0	100	0	0	0	1,871	3	0	3	4
12:30 PM	71	856	2	0	880	4	4	0	97	1	0	0	1,915	1	0	3	2
12:45 PM	62	889	2	1	860	5	5	0	82	1	0	2	1,909	0	0	2	2
1:00 PM	74	938	3	1	861	6	6	0	81	1	0	2	1,973	0	0	1	2

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



SE Cedar Hills Blvd & SE Huntington Ave

Saturday, December 07, 2013
12:00 PM to 2:00 PM

Peak Hour Summary
1:00 PM to 2:00 PM

Heavy Vehicle 15-Minute Interval Summary
12:00 PM to 2:00 PM

Interval Start Time	Northbound SE Cedar Hills Blvd				Southbound SE Cedar Hills Blvd				Eastbound SE Huntington Ave				Westbound SE Huntington Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
12:00 PM	0	4	0	4	0	2	0	2	0	0	0	0	0	0	0	0	6
12:15 PM	1	4	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5
12:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
12:45 PM	0	2	0	2	0	1	0	1	0	0	0	0	0	0	0	0	3
1:00 PM	0	2	0	2	0	2	0	2	0	0	0	0	0	0	0	0	4
1:15 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
1:30 PM	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	3
1:45 PM	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
Total Survey	1	17	0	18	0	9	0	9	0	0	0	0	0	0	0	0	27

Heavy Vehicle Peak Hour Summary
1:00 PM to 2:00 PM

By Approach	Northbound SE Cedar Hills Blvd			Southbound SE Cedar Hills Blvd			Eastbound SE Huntington Ave			Westbound SE Huntington Ave			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	7	5	12	5	7	12	0	0	0	0	0	0	12
PHF	0.19			0.25			0.00			0.00			0.25

By Movement	Northbound SE Cedar Hills Blvd				Southbound SE Cedar Hills Blvd				Eastbound SE Huntington Ave				Westbound SE Huntington Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	7	0	7	0	5	0	5	0	0	0	0	0	0	0	0	12
PHF	0.00	0.22	0.00	0.19	0.00	0.25	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25

Heavy Vehicle Rolling Hour Summary
12:00 PM to 2:00 PM

Interval Start Time	Northbound SE Cedar Hills Blvd				Southbound SE Cedar Hills Blvd				Eastbound SE Huntington Ave				Westbound SE Huntington Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
12:00 PM	1	10	0	11	0	4	0	4	0	0	0	0	0	0	0	0	15
12:15 PM	1	8	0	9	0	4	0	4	0	0	0	0	0	0	0	0	13
12:30 PM	0	5	0	5	0	5	0	5	0	0	0	0	0	0	0	0	10
12:45 PM	0	6	0	6	0	6	0	6	0	0	0	0	0	0	0	0	12
1:00 PM	0	7	0	7	0	5	0	5	0	0	0	0	0	0	0	0	12

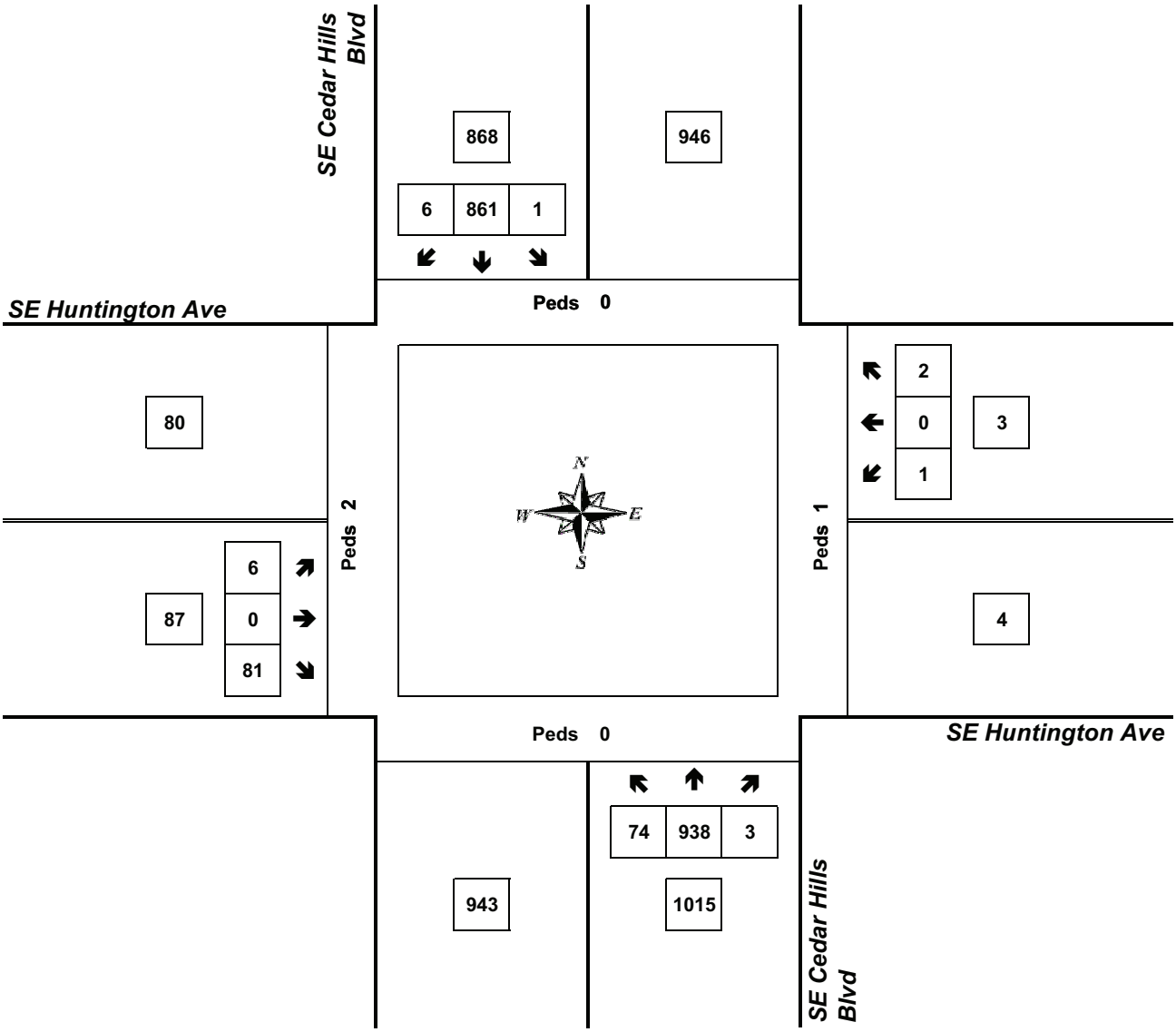
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

SE Cedar Hills Blvd & SE Huntington Ave

1:00 PM to 2:00 PM
Saturday, December 07, 2013

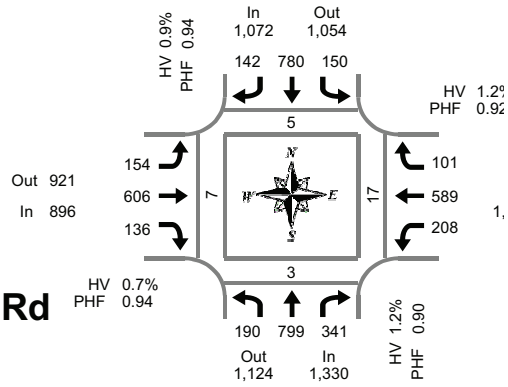


Approach	PHF	HV%	Volume
EB	0.95	0.0%	87
WB	0.38	0.0%	3
NB	0.94	0.7%	1,015
SB	0.87	0.6%	868
Intersection	0.98	0.6%	1,973

Count Period: 12:00 PM to 2:00 PM

Total Vehicle Summary

Clay Carney
(503) 833-2740



SW Cedar Hills Blvd & SW Walker Rd

Thursday, December 05, 2013
4:00 PM to 6:00 PM

Peak Hour Summary
4:15 PM to 5:15 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Cedar Hills Blvd			Southbound SW Cedar Hills Blvd			Eastbound SW Walker Rd			Westbound SW Walker Rd			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
4:00 PM	60	193	87	26	179	29	30	140	31	64	144	13	996	1	0	3	3
4:15 PM	46	179	78	42	210	32	32	141	39	54	148	24	1,025	1	1	13	1
4:30 PM	46	198	100	34	190	42	38	158	36	60	160	24	1,086	3	0	1	2
4:45 PM	41	195	76	42	206	35	37	147	29	55	150	33	1,046	0	1	2	3
5:00 PM	57	227	87	32	174	33	47	160	32	39	131	20	1,039	1	1	1	1
5:15 PM	64	198	91	37	181	29	33	158	26	55	130	22	1,024	5	1	2	2
5:30 PM	42	193	81	35	213	35	30	147	37	62	97	14	986	1	1	2	3
5:45 PM	30	183	91	31	192	44	33	160	26	61	120	13	984	0	0	1	4
Total Survey	386	1,566	691	279	1,545	279	280	1,211	256	450	1,080	163	8,186	12	5	25	19

Peak Hour Summary
4:15 PM to 5:15 PM

By Approach	Northbound SW Cedar Hills Blvd			Southbound SW Cedar Hills Blvd			Eastbound SW Walker Rd			Westbound SW Walker Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	1,330	1,124	2,454	1,072	1,054	2,126	896	921	1,817	898	1,097	1,995	4,196
%HV	1.2%			0.9%			0.7%			1.2%			1.0%
PHF	0.90			0.94			0.94			0.92			0.97

Pedestrians Crosswalk			
North	South	East	West
5	3	17	7

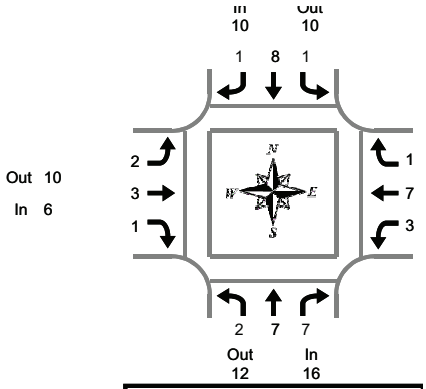
By Movement	Northbound SW Cedar Hills Blvd			Southbound SW Cedar Hills Blvd			Eastbound SW Walker Rd			Westbound SW Walker Rd			Total
	L	T	R	L	T	R	L	T	R	L	T	R	
Volume	190	799	341	150	780	142	154	606	136	208	589	101	4,196
%HV	1.1%	0.9%	2.1%	0.7%	1.0%	0.7%	1.3%	0.5%	0.7%	1.4%	1.2%	1.0%	1.0%
PHF	0.83	0.88	0.85	0.89	0.93	0.85	0.82	0.95	0.87	0.87	0.92	0.77	0.97

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Cedar Hills Blvd			Southbound SW Cedar Hills Blvd			Eastbound SW Walker Rd			Westbound SW Walker Rd			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
4:00 PM	193	765	341	144	785	138	137	586	135	233	602	94	4,153	5	2	19	9
4:15 PM	190	799	341	150	780	142	154	606	136	208	589	101	4,196	5	3	17	7
4:30 PM	208	818	354	145	751	139	155	623	123	209	571	99	4,195	9	3	6	8
4:45 PM	204	813	335	146	774	132	147	612	124	211	508	89	4,095	7	4	7	9
5:00 PM	193	801	350	135	760	141	143	625	121	217	478	69	4,033	7	3	6	10

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
4:15 PM to 5:15 PM

SW Cedar Hills Blvd & SW Walker Rd

Thursday, December 05, 2013
4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Cedar Hills Blvd				Southbound SW Cedar Hills Blvd				Eastbound SW Walker Rd				Westbound SW Walker Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	1	2	2	5	0	0	0	0	0	3	0	3	0	2	1	3	11
4:15 PM	0	1	4	5	0	2	0	2	1	0	0	1	2	3	1	6	14
4:30 PM	1	4	2	7	0	3	0	3	0	2	0	2	0	0	0	0	12
4:45 PM	1	1	1	3	1	2	0	3	0	0	1	1	1	2	0	3	10
5:00 PM	0	1	0	1	0	1	1	2	1	1	0	2	0	2	0	2	7
5:15 PM	1	1	0	2	0	1	0	1	0	0	0	0	1	2	0	3	6
5:30 PM	0	1	0	1	0	1	0	1	0	1	0	1	0	0	0	0	3
5:45 PM	0	1	0	1	1	0	0	1	0	0	0	0	0	1	0	1	3
Total Survey	4	12	9	25	2	10	1	13	2	7	1	10	4	12	2	18	66

Heavy Vehicle Peak Hour Summary
4:15 PM to 5:15 PM

By Approach	Northbound SW Cedar Hills Blvd			Southbound SW Cedar Hills Blvd			Eastbound SW Walker Rd			Westbound SW Walker Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	16	12	28	10	10	20	6	10	16	11	11	22	43
PHF	0.24			0.31			0.25			0.31			0.29

By Movement	Northbound SW Cedar Hills Blvd				Southbound SW Cedar Hills Blvd				Eastbound SW Walker Rd				Westbound SW Walker Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	2	7	7	16	1	8	1	10	2	3	1	6	3	7	1	11	43
PHF	0.25	0.25	0.22	0.24	0.25	0.29	0.25	0.31	0.50	0.15	0.25	0.25	0.25	0.29	0.13	0.31	0.29

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Cedar Hills Blvd				Southbound SW Cedar Hills Blvd				Eastbound SW Walker Rd				Westbound SW Walker Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	3	8	9	20	1	7	0	8	1	5	1	7	3	7	2	12	47
4:15 PM	2	7	7	16	1	8	1	10	2	3	1	6	3	7	1	11	43
4:30 PM	3	7	3	13	1	7	1	9	1	3	1	5	2	6	0	8	35
4:45 PM	2	4	1	7	1	5	1	7	1	2	1	4	2	6	0	8	26
5:00 PM	1	4	0	5	1	3	1	5	1	2	0	3	1	5	0	6	19

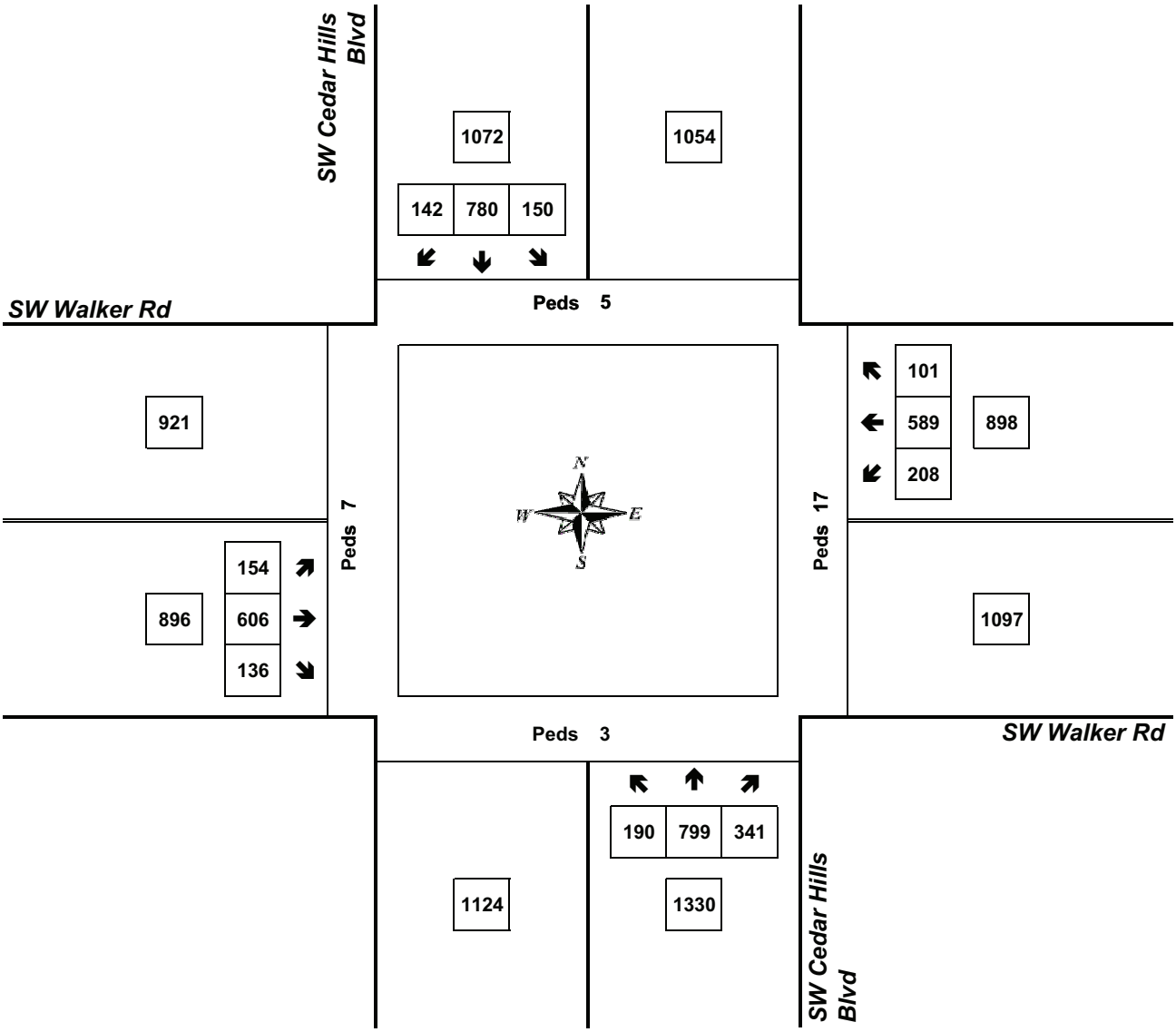
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

SW Cedar Hills Blvd & SW Walker Rd

4:15 PM to 5:15 PM
Thursday, December 05, 2013

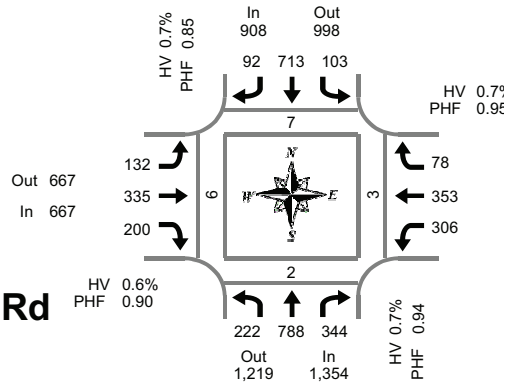


Approach	PHF	HV%	Volume
EB	0.94	0.7%	896
WB	0.92	1.2%	898
NB	0.90	1.2%	1,330
SB	0.94	0.9%	1,072
Intersection	0.97	1.0%	4,196

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
1:00 PM to 2:00 PM

SW Cedar Hills Blvd & SW Walker Rd

Saturday, December 07, 2013
12:00 PM to 2:00 PM

15-Minute Interval Summary
12:00 PM to 2:00 PM

Interval Start Time	Northbound SW Cedar Hills Blvd			Southbound SW Cedar Hills Blvd			Eastbound SW Walker Rd			Westbound SW Walker Rd			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
12:00 PM	53	178	75	30	214	38	24	76	49	61	72	17	887	1	0	3	1
12:15 PM	43	173	87	33	172	24	24	89	40	73	87	19	864	2	0	1	0
12:30 PM	56	200	74	28	188	25	19	80	45	91	79	19	904	1	1	4	1
12:45 PM	53	157	79	29	171	26	17	98	39	92	98	19	878	0	0	0	1
1:00 PM	57	207	84	19	176	25	31	93	56	72	92	17	929	1	2	0	0
1:15 PM	52	184	93	35	203	30	22	84	51	77	88	16	935	3	0	3	1
1:30 PM	59	185	72	29	147	20	49	80	56	80	79	22	878	1	0	0	5
1:45 PM	54	212	95	20	187	17	30	78	37	77	94	23	924	2	0	0	0
Total Survey	427	1,496	659	223	1,458	205	216	678	373	623	689	152	7,199	11	3	11	9

Peak Hour Summary
1:00 PM to 2:00 PM

By Approach	Northbound SW Cedar Hills Blvd			Southbound SW Cedar Hills Blvd			Eastbound SW Walker Rd			Westbound SW Walker Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	1,354	1,219	2,573	908	998	1,906	667	667	1,334	737	782	1,519	3,666
%HV	0.7%			0.7%			0.6%			0.7%			0.7%
PHF	0.94			0.85			0.90			0.95			0.98

Pedestrians Crosswalk			
North	South	East	West
7	2	3	6

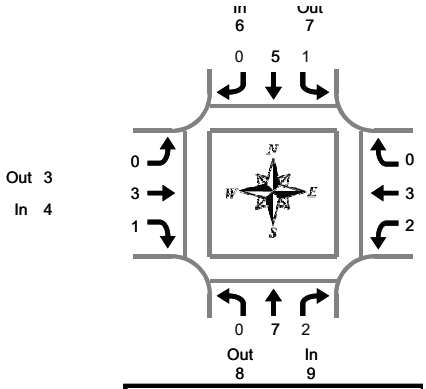
By Movement	Northbound SW Cedar Hills Blvd			Southbound SW Cedar Hills Blvd			Eastbound SW Walker Rd			Westbound SW Walker Rd			Total
	L	T	R	L	T	R	L	T	R	L	T	R	
Volume	222	788	344	103	713	92	132	335	200	306	353	78	3,666
%HV	0.0%	0.9%	0.6%	1.0%	0.7%	0.0%	0.0%	0.9%	0.5%	0.7%	0.8%	0.0%	0.7%
PHF	0.94	0.93	0.91	0.74	0.88	0.77	0.67	0.90	0.89	0.96	0.94	0.85	0.98

Rolling Hour Summary
12:00 PM to 2:00 PM

Interval Start Time	Northbound SW Cedar Hills Blvd			Southbound SW Cedar Hills Blvd			Eastbound SW Walker Rd			Westbound SW Walker Rd			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
12:00 PM	205	708	315	120	745	113	84	343	173	317	336	74	3,533	4	1	8	3
12:15 PM	209	737	324	109	707	100	91	360	180	328	356	74	3,575	4	3	5	2
12:30 PM	218	748	330	111	738	106	89	355	191	332	357	71	3,646	5	3	7	3
12:45 PM	221	733	328	112	697	101	119	355	202	321	357	74	3,620	5	2	3	7
1:00 PM	222	788	344	103	713	92	132	335	200	306	353	78	3,666	7	2	3	6

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



SW Cedar Hills Blvd & SW Walker Rd

Saturday, December 07, 2013
12:00 PM to 2:00 PM

Peak Hour Summary
1:00 PM to 2:00 PM

Heavy Vehicle 15-Minute Interval Summary
12:00 PM to 2:00 PM

Interval Start Time	Northbound SW Cedar Hills Blvd				Southbound SW Cedar Hills Blvd				Eastbound SW Walker Rd				Westbound SW Walker Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
12:00 PM	3	2	0	5	0	1	0	1	0	0	0	0	1	0	0	1	7
12:15 PM	0	2	0	2	0	1	0	1	1	0	0	1	1	0	0	1	5
12:30 PM	0	0	2	2	0	1	0	1	0	0	0	0	1	2	0	3	6
12:45 PM	1	1	1	3	0	1	0	1	0	1	0	1	0	1	0	1	6
1:00 PM	0	4	1	5	0	2	0	2	0	0	0	0	0	1	0	1	8
1:15 PM	0	1	0	1	0	2	0	2	0	2	1	3	0	0	0	0	6
1:30 PM	0	1	1	2	1	1	0	2	0	0	0	0	1	0	0	1	5
1:45 PM	0	1	0	1	0	0	0	0	0	1	0	1	1	2	0	3	5
Total Survey	4	12	5	21	1	9	0	10	1	4	1	6	5	6	0	11	48

Heavy Vehicle Peak Hour Summary
1:00 PM to 2:00 PM

By Approach	Northbound SW Cedar Hills Blvd			Southbound SW Cedar Hills Blvd			Eastbound SW Walker Rd			Westbound SW Walker Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	9	8	17	6	7	13	4	3	7	5	6	11	24
PHF	0.23			0.25			0.25			0.25			0.30

By Movement	Northbound SW Cedar Hills Blvd				Southbound SW Cedar Hills Blvd				Eastbound SW Walker Rd				Westbound SW Walker Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	7	2	9	1	5	0	6	0	3	1	4	2	3	0	5	24
PHF	0.00	0.29	0.13	0.23	0.25	0.25	0.00	0.25	0.00	0.25	0.25	0.25	0.17	0.19	0.00	0.25	0.30

Heavy Vehicle Rolling Hour Summary
12:00 PM to 2:00 PM

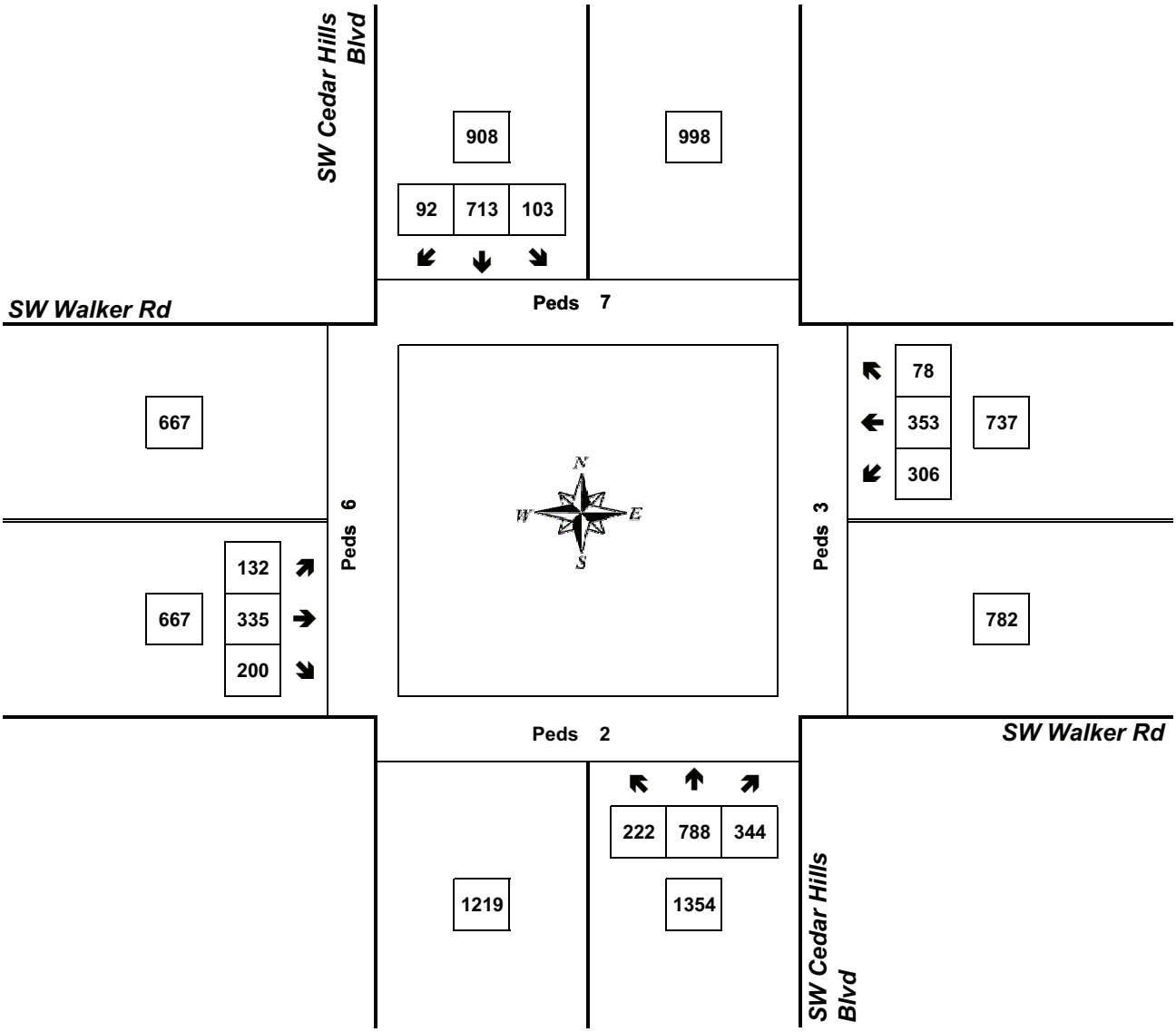
Interval Start Time	Northbound SW Cedar Hills Blvd				Southbound SW Cedar Hills Blvd				Eastbound SW Walker Rd				Westbound SW Walker Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
12:00 PM	4	5	3	12	0	4	0	4	1	1	0	2	3	3	0	6	24
12:15 PM	1	7	4	12	0	5	0	5	1	1	0	2	2	4	0	6	25
12:30 PM	1	6	4	11	0	6	0	6	0	3	1	4	1	4	0	5	26
12:45 PM	1	7	3	11	1	6	0	7	0	3	1	4	1	2	0	3	25
1:00 PM	0	7	2	9	1	5	0	6	0	3	1	4	2	3	0	5	24

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

SW Cedar Hills Blvd & SW Walker Rd

1:00 PM to 2:00 PM
Saturday, December 07, 2013

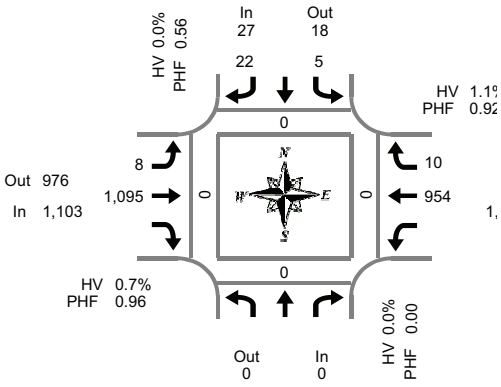


Approach	PHF	HV%	Volume
EB	0.90	0.6%	667
WB	0.95	0.7%	737
NB	0.94	0.7%	1,354
SB	0.85	0.7%	908
Intersection	0.98	0.7%	3,666

Count Period: 12:00 PM to 2:00 PM

Total Vehicle Summary

Clay Carney
(503) 833-2740



SW Lynnfield Ln & SW Walker Rd

Thursday, December 05, 2013
4:00 PM to 6:00 PM

Peak Hour Summary
4:30 PM to 5:30 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Lynnfield Ln			Southbound SW Lynnfield Ln			Eastbound SW Walker Rd			Westbound SW Walker Rd			Interval Total	Pedestrians Crosswalk			
				L		R	L	T			T	R		North	South	East	West
4:00 PM				11		2	1	241			249	2	506	0	0	0	0
4:15 PM				1		4	4	230			248	0	487	0	0	0	0
4:30 PM				1		11	3	280			261	2	558	0	0	0	0
4:45 PM				0		4	0	266			235	3	508	0	0	0	0
5:00 PM				1		3	1	267			246	3	521	0	0	0	0
5:15 PM				3		4	4	282			212	2	507	0	0	0	0
5:30 PM				3		9	5	235			188	1	441	0	0	0	1
5:45 PM				3		5	3	307			177	2	497	0	0	0	0
Total Survey				23		42	21	2,108			1,816	15	4,025	0	0	0	1

Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound SW Lynnfield Ln			Southbound SW Lynnfield Ln			Eastbound SW Walker Rd			Westbound SW Walker Rd			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	0	0	0	27	18	45	1,103	976	2,079	964	1,100	2,064	2,094	0	0	0	0
%HV	0.0%			0.0%			0.7%			1.1%			0.9%				
PHF	0.00			0.56			0.96			0.92			0.94				

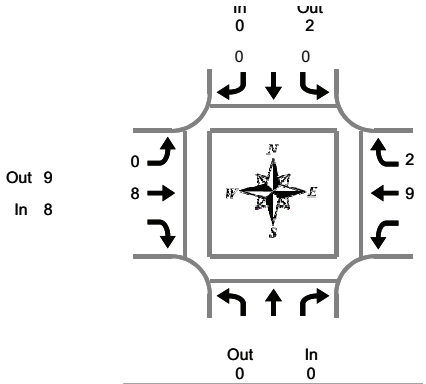
By Movement	Northbound SW Lynnfield Ln			Southbound SW Lynnfield Ln			Eastbound SW Walker Rd			Westbound SW Walker Rd			Total
				L		R	L	T			T	R	
Volume				5		22	8	1,095			954	10	2,094
%HV	NA	NA	NA	0.0%	NA	0.0%	0.0%	0.7%	NA	NA	0.9%	20.0%	0.9%
PHF				0.42		0.50	0.50	0.97			0.91	0.83	0.94

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Lynnfield Ln			Southbound SW Lynnfield Ln			Eastbound SW Walker Rd			Westbound SW Walker Rd			Interval Total	Pedestrians Crosswalk			
				L		R	L	T			T	R		North	South	East	West
4:00 PM				13		21	8	1,017			993	7	2,059	0	0	0	0
4:15 PM				3		22	8	1,043			990	8	2,074	0	0	0	0
4:30 PM				5		22	8	1,095			954	10	2,094	0	0	0	0
4:45 PM				7		20	10	1,050			881	9	1,977	0	0	0	1
5:00 PM				10		21	13	1,091			823	8	1,966	0	0	0	1

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



SW Lynnfield Ln & SW Walker Rd

Thursday, December 05, 2013
4:00 PM to 6:00 PM

Peak Hour Summary
4:30 PM to 5:30 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SW Lynnfield Ln				Southbound SW Lynnfield Ln				Eastbound SW Walker Rd				Westbound SW Walker Rd				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
4:00 PM				0	0		0	0	0	5		5		3	0	3	8
4:15 PM				0	0		0	0	0	4		4		5	0	5	9
4:30 PM				0	0		0	0	0	4		4		1	0	1	5
4:45 PM				0	0		0	0	0	3		3		4	1	5	8
5:00 PM				0	0		0	0	0	1		1		3	1	4	5
5:15 PM				0	0		0	0	0	0		0		1	0	1	1
5:30 PM				0	0		2	2	0	1		1		0	0	0	3
5:45 PM				0	0		0	0	0	0		0		2	0	2	2
Total Survey				0	0		2	2	0	18		18		19	2	21	41

Heavy Vehicle Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound SW Lynnfield Ln			Southbound SW Lynnfield Ln			Eastbound SW Walker Rd			Westbound SW Walker Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	2	2	8	9	17	11	8	19	19
PHF	0.00			0.00			0.15			0.25			0.22

By Movement	Northbound SW Lynnfield Ln				Southbound SW Lynnfield Ln				Eastbound SW Walker Rd				Westbound SW Walker Rd				Total
				Total	L		R	Total	L	T		Total		T	R	Total	
Volume				0	0		0	0	0	8		8		9	2	11	19
PHF				0.00	0.00		0.00	0.00	0.00	0.15		0.15		0.23	0.25	0.25	0.22

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

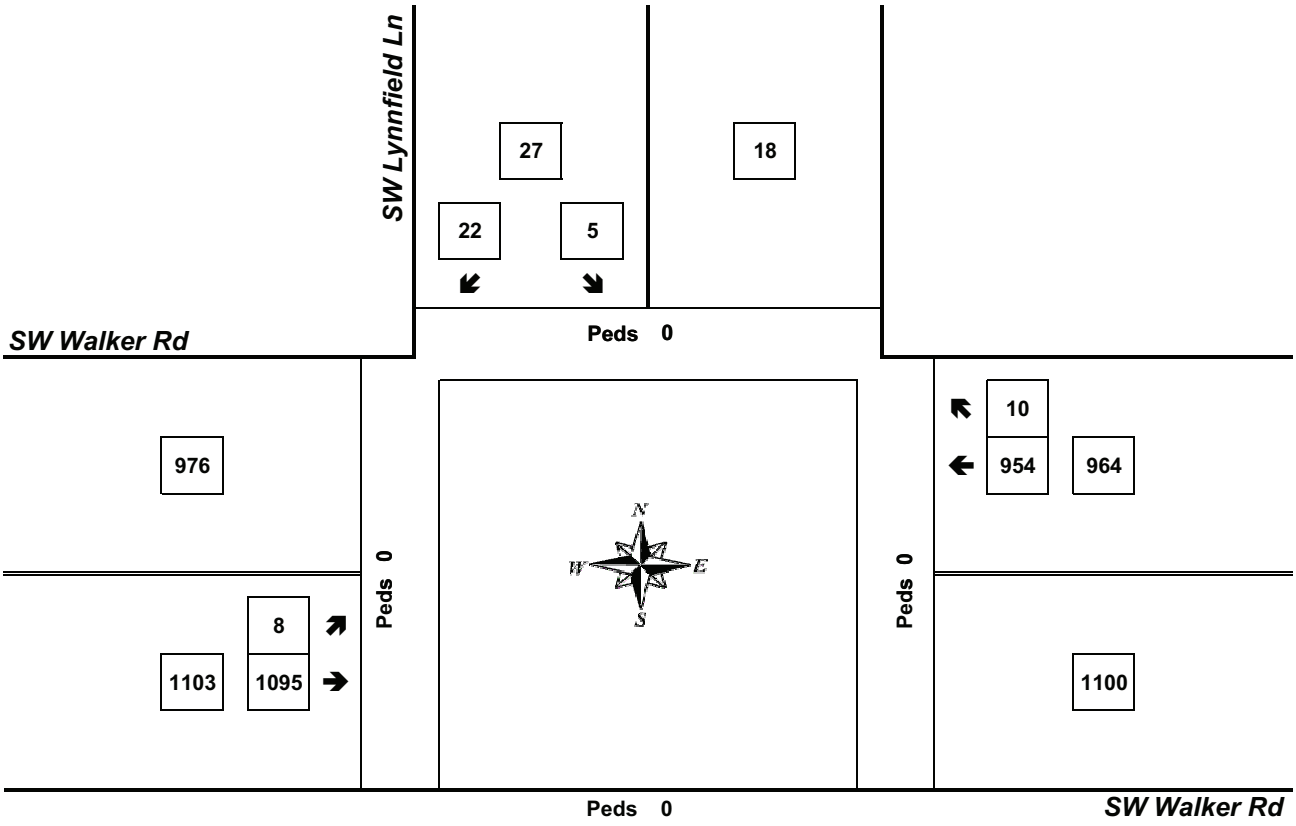
Interval Start Time	Northbound SW Lynnfield Ln				Southbound SW Lynnfield Ln				Eastbound SW Walker Rd				Westbound SW Walker Rd				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
4:00 PM				0	0		0	0	0	16		16		13	1	14	30
4:15 PM				0	0		0	0	0	12		12		13	2	15	27
4:30 PM				0	0		0	0	0	8		8		9	2	11	19
4:45 PM				0	0		2	2	0	5		5		8	2	10	17
5:00 PM				0	0		2	2	0	2		2		6	1	7	11

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

SW Lynnfield Ln & SW Walker Rd

4:30 PM to 5:30 PM
Thursday, December 05, 2013

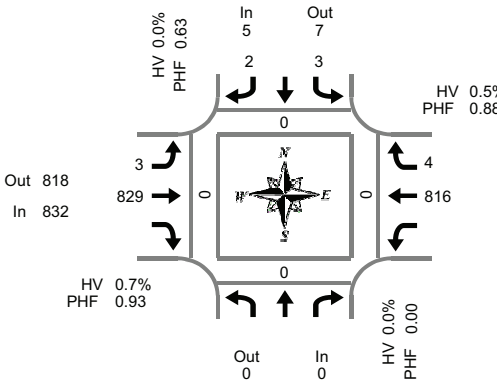


Approach	PHF	HV%	Volume
EB	0.96	0.7%	1,103
WB	0.92	1.1%	964
NB	0.00	0.0%	0
SB	0.56	0.0%	27
Intersection	0.94	0.9%	2,094

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
12:45 PM to 1:45 PM

SW Lynnfield Ln & SW Walker Rd

Saturday, December 07, 2013
12:00 PM to 2:00 PM

15-Minute Interval Summary
12:00 PM to 2:00 PM

Interval Start Time	Northbound SW Lynnfield Ln			Southbound SW Lynnfield Ln			Eastbound SW Walker Rd			Westbound SW Walker Rd			Interval Total	Pedestrians Crosswalk			
				L		R	L	T			T	R		North	South	East	West
12:00 PM				4		0	0	184			170	1	359	0	0	0	0
12:15 PM				0		0	0	202			187	0	389	0	0	0	0
12:30 PM				1		0	0	180			205	0	386	0	0	0	0
12:45 PM				2		0	1	214			231	1	449	0	0	0	0
1:00 PM				0		1	0	195			181	2	379	0	0	0	0
1:15 PM				1		1	2	221			198	1	424	0	0	0	0
1:30 PM				0		0	0	199			206	0	405	0	0	0	0
1:45 PM				0		1	0	199			200	0	400	0	0	0	0
Total Survey				8		3	3	1,594			1,578	5	3,191	0	0	0	0

Peak Hour Summary
12:45 PM to 1:45 PM

By Approach	Northbound SW Lynnfield Ln			Southbound SW Lynnfield Ln			Eastbound SW Walker Rd			Westbound SW Walker Rd			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	0	0	0	5	7	12	832	818	1,650	820	832	1,652	1,657	0	0	0	0
%HV	0.0%			0.0%			0.7%			0.5%			0.6%				
PHF	0.00			0.63			0.93			0.88			0.92				

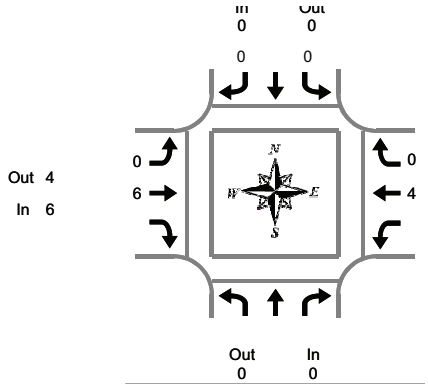
By Movement	Northbound SW Lynnfield Ln			Southbound SW Lynnfield Ln			Eastbound SW Walker Rd			Westbound SW Walker Rd			Total
				L		R	L	T			T	R	
Volume				3		2	3	829			816	4	1,657
%HV	NA	NA	NA	0.0%	NA	0.0%	0.0%	0.7%	NA	NA	0.5%	0.0%	0.6%
PHF				0.38		0.50	0.38	0.94			0.88	0.50	0.92

Rolling Hour Summary
12:00 PM to 2:00 PM

Interval Start Time	Northbound SW Lynnfield Ln			Southbound SW Lynnfield Ln			Eastbound SW Walker Rd			Westbound SW Walker Rd			Interval Total	Pedestrians Crosswalk			
				L		R	L	T			T	R		North	South	East	West
12:00 PM				7		0	1	780			793	2	1,583	0	0	0	0
12:15 PM				3		1	1	791			804	3	1,603	0	0	0	0
12:30 PM				4		2	3	810			815	4	1,638	0	0	0	0
12:45 PM				3		2	3	829			816	4	1,657	0	0	0	0
1:00 PM				1		3	2	814			785	3	1,608	0	0	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



SW Lynnfield Ln & SW Walker Rd

Saturday, December 07, 2013
12:00 PM to 2:00 PM

Peak Hour Summary
12:45 PM to 1:45 PM

Heavy Vehicle 15-Minute Interval Summary
12:00 PM to 2:00 PM

Interval Start Time	Northbound SW Lynnfield Ln				Southbound SW Lynnfield Ln				Eastbound SW Walker Rd				Westbound SW Walker Rd				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
12:00 PM				0	0		0	0	0	2		2		2	0	2	4
12:15 PM				0	0		0	0	0	1		1		1	0	1	2
12:30 PM				0	0		0	0	0	2		2		2	0	2	4
12:45 PM				0	0		0	0	0	2		2		0	0	0	2
1:00 PM				0	0		0	0	0	1		1		1	0	1	2
1:15 PM				0	0		0	0	0	2		2		0	0	0	2
1:30 PM				0	0		0	0	0	1		1		3	0	3	4
1:45 PM				0	0		0	0	0	1		1		2	0	2	3
Total Survey				0	0		0	0	0	12		12		11	0	11	23

Heavy Vehicle Peak Hour Summary
12:45 PM to 1:45 PM

By Approach	Northbound SW Lynnfield Ln			Southbound SW Lynnfield Ln			Eastbound SW Walker Rd			Westbound SW Walker Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	6	4	10	4	6	10	10
PHF	0.00			0.00			0.30			0.20			0.25

By Movement	Northbound SW Lynnfield Ln				Southbound SW Lynnfield Ln				Eastbound SW Walker Rd				Westbound SW Walker Rd				Total
				Total	L		R	Total	L	T		Total		T	R	Total	
Volume				0	0		0	0	0	6		6		4	0	4	10
PHF				0.00	0.00		0.00	0.00	0.00	0.30		0.30		0.20	0.00	0.20	0.25

Heavy Vehicle Rolling Hour Summary
12:00 PM to 2:00 PM

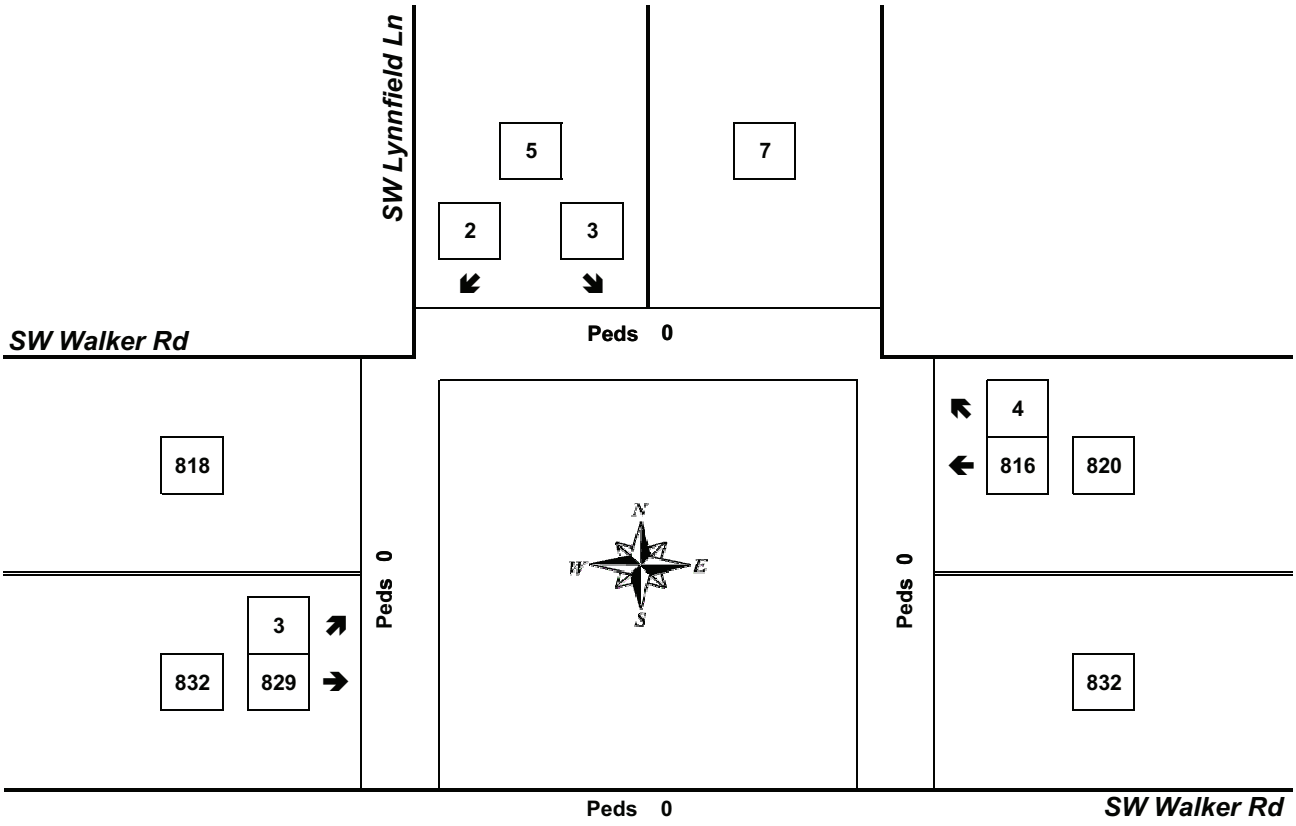
Interval Start Time	Northbound SW Lynnfield Ln				Southbound SW Lynnfield Ln				Eastbound SW Walker Rd				Westbound SW Walker Rd				Interval Total
				Total	L		R	Total	L	T		Total		T	R	Total	
12:00 PM				0	0		0	0	0	7		7		5	0	5	12
12:15 PM				0	0		0	0	0	6		6		4	0	4	10
12:30 PM				0	0		0	0	0	7		7		3	0	3	10
12:45 PM				0	0		0	0	0	6		6		4	0	4	10
1:00 PM				0	0		0	0	0	5		5		6	0	6	11

Peak Hour Summary

Clay Carney
(503) 833-2740

SW Lynnfield Ln & SW Walker Rd

12:45 PM to 1:45 PM
Saturday, December 07, 2013



Approach	PHF	HV%	Volume
EB	0.93	0.7%	832
WB	0.88	0.5%	820
NB	0.00	0.0%	0
SB	0.63	0.0%	5
Intersection	0.92	0.6%	1,657

Count Period: 12:00 PM to 2:00 PM

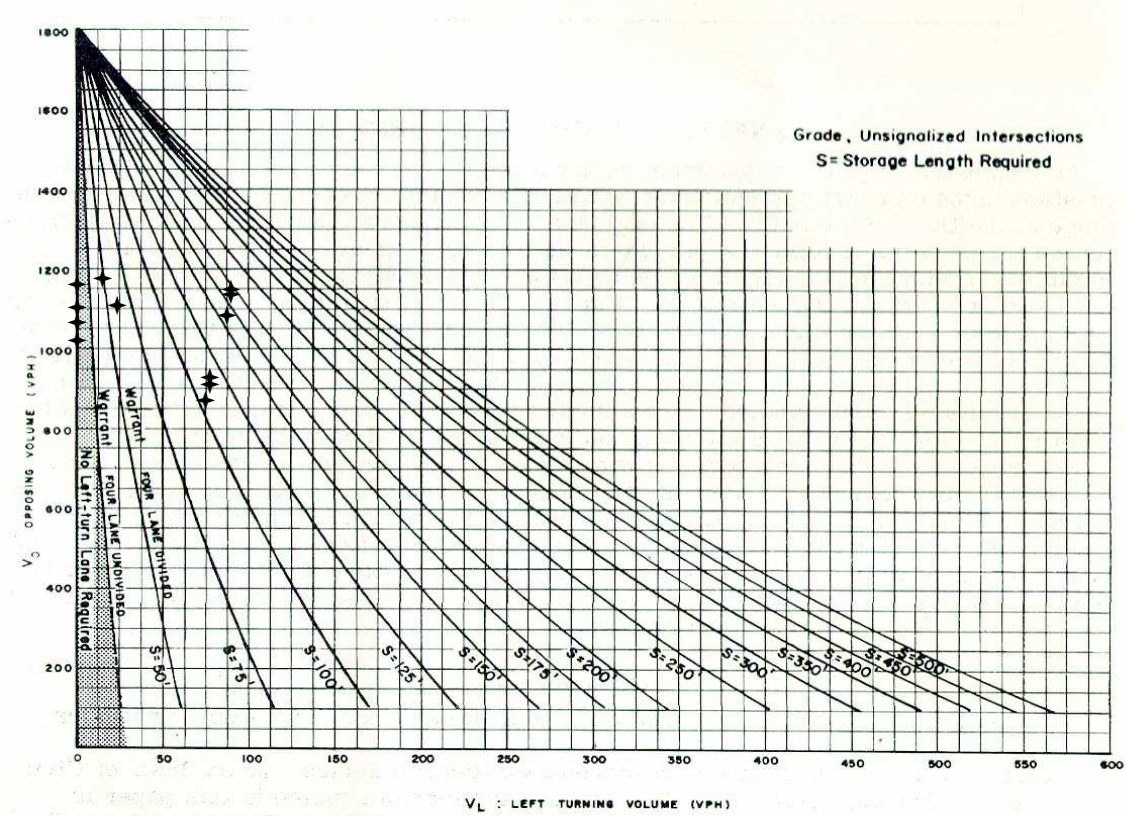


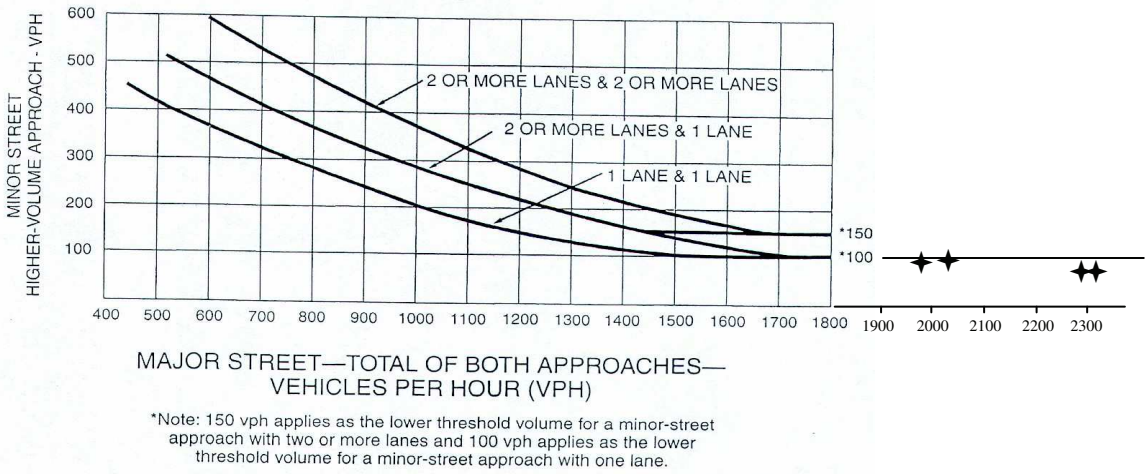
Figure 1. Warrant for left-turn storage lanes on four-lane highways.

Left-turn storage requirements at unsignalized intersections on 4-Lane roadways.

Intersection	Movement	Analysis Period	Opposing Vol. V_O (vph)	Left Turning Vol. V_L (vph)	Storage Req'd (ft)
Huntington Avenue/ Access 'A' and Cedar Hills Boulevard	SB LT	2013 Existing - Weekday PM	1,100	1	None
		2013 Existing - Saturday Midday	1,015	1	None
		2018 Background - Weekday PM	1,155	1	None
		2018 Background - Saturday Midday	1,066	1	None
		2018 Total - Weekday PM, Option 1	1,180	14	50'
		2018 Total - Saturday Midday, Option 1	1,110	23	75'
	NB LT	2013 Existing - Weekday PM	1,081	85	175'
		2013 Existing - Saturday Midday	868	74	125'
		2018 Background - Weekday PM	1,135	89	200'
		2018 Background - Saturday Midday	911	78	125'
		2018 Total - Weekday PM, Option 1	1,148	89	200'
		2018 Total - Saturday Midday, Option 1	933	78	125'

Source: *Highway Research Record* #211, Harmelink, M. D.

Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Peak hour volume warrant for signalization data.

Intersection	Analysis Period	Major Street Speed (mph)	Major Street		Minor Street High Volume Approach		Signal Warranted?
			Volume (vph)	Lanes (#)	Volume (vph)	Lanes (#)	
Huntington Avenue and Cedar Hills Boulevard	2018 Background - PM Peak	35	2,290	2	71	1	No
	2018 Background - Sat. Peak		1,977		91		No
	2018 Total - Option 1 PM Peak		2,328		74		No
	2018 Total - Option 1 Sat. Peak		2,043		95		No

Source: *Manual on Uniform Traffic Control Devices (MUTCD)*, 2003 Edition.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SW Cedar Hills Boulevard @ SW Huntington Avenue
January 1, 2008 through December 31, 2012

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2012														
TURNING MOVEMENTS	0	1	0	1	0	2	0	0	1	0	1	1	0	0
2012 TOTAL	0	1	0	1	0	2	0	0	1	0	1	1	0	0
YEAR: 2011														
REAR-END	0	1	0	1	0	2	0	1	0	1	0	1	0	0
2011 TOTAL	0	1	0	1	0	2	0	1	0	1	0	1	0	0
YEAR: 2010														
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2010 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR: 2008														
REAR-END	0	0	1	1	0	0	0	1	0	0	1	1	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	0	1	1	0	0
2008 TOTAL	0	0	2	2	0	0	0	2	0	0	2	2	0	0
FINAL TOTAL	0	3	2	5	0	5	0	4	1	2	3	5	0	0

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SW Cedar Hills Boulevard @ SW Walker Road
January 1, 2008 through December 31, 2012

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2012														
REAR-END	0	1	4	5	0	1	0	2	2	4	1	5	0	0
TURNING MOVEMENTS	0	0	2	2	0	0	0	0	2	0	2	2	0	0
2012 TOTAL	0	1	6	7	0	1	0	2	4	4	3	7	0	0
YEAR: 2011														
REAR-END	0	2	0	2	0	2	0	1	1	2	0	2	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	0	1	1	0	0
2011 TOTAL	0	2	1	3	0	2	0	1	2	2	1	3	0	0
YEAR: 2010														
ANGLE	0	1	0	1	0	1	0	1	0	1	0	1	0	0
BACKING	0	0	1	1	0	0	0	1	0	1	0	1	0	0
REAR-END	0	2	3	5	0	2	0	1	3	3	2	5	0	0
2010 TOTAL	0	3	4	7	0	3	0	3	3	5	2	7	0	0
YEAR: 2009														
ANGLE	0	0	1	1	0	0	0	1	0	1	0	1	0	0
REAR-END	0	2	2	4	0	2	0	3	1	3	1	4	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	0	1	1	0	0
2009 TOTAL	0	2	4	6	0	2	0	4	2	4	2	6	0	0
YEAR: 2008														
REAR-END	0	1	2	3	0	1	0	2	1	1	2	3	0	0
2008 TOTAL	0	1	2	3	0	1	0	2	1	1	2	3	0	0
FINAL TOTAL	0	9	17	26	0	9	0	12	12	16	10	26	0	0

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SW Walker Road @ SW Lynnfield Lane
January 1, 2008 through December 31, 2012

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2012														
REAR-END	0	0	2	2	0	0	0	1	1	2	0	2	0	0
2012 TOTAL	0	0	2	2	0	0	0	1	1	2	0	2	0	0
YEAR: 2011														
FIXED / OTHER OBJECT	0	0	1	1	0	0	0	1	0	1	0	1	0	1
2011 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	1
YEAR: 2010														
REAR-END	0	0	1	1	0	0	0	0	1	1	0	1	0	0
2010 TOTAL	0	0	1	1	0	0	0	0	1	1	0	1	0	0
YEAR: 2008														
REAR-END	0	0	1	1	0	0	0	0	1	1	0	1	0	0
2008 TOTAL	0	0	1	1	0	0	0	0	1	1	0	1	0	0
FINAL TOTAL	0	0	5	5	0	0	0	2	3	5	0	5	0	1

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	*MEO*	Intersection	*Walker Road & Cedar Hills Blvd*
Agency or Co.	*Charbonneau Engineering LLC*	Area Type	*All other areas*
Date Performed	*01/09/2014*	Jurisdiction	*Washington County*
Time Period	*Weekday PM Peak Hour*	Analysis Year	*2013 Existing Traffic*
		Project ID	*#13-28 Cedar Hills Community Park*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	1	2	0	1	2	0	1	2	1	1	2	1
Lane group	L	TR		L	TR		L	T	R	L	T	R
Volume, V (vph)	154	606	136	208	589	101	190	799	341	150	780	142
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Extension of effective green, e	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Arrival type, AT	3	3		3	3		3	3	3	3	3	3
Unit extension, UE	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Filtering/metering, I	1.000	1.000		1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000
Initial unmet demand, Q_b	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0	0		0	0		0	0	0	0	0	0
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EB Only	Thru & RT	WB Only	04	SB Only	Thru & RT	NB Only	08
Timing	G = 8.0	G = 7.0	G = 11.0	G =	G = 8.0	G = 8.5	G = 11.5	G =
	Y = 4	Y = 0	Y = 4	Y =	Y = 4	Y = 0	Y = 4	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	159	765		214	711		196	824	352	155	804	146
Lane group capacity, c	206	955		284	910		297	1034	461	206	1060	473
v/c ratio, X	0.77	0.80		0.75	0.78		0.66	0.80	0.76	0.75	0.76	0.31
Total green ratio, g/C	0.11	0.27		0.16	0.26		0.16	0.29	0.29	0.11	0.29	0.29
Uniform delay, d_1	30.1	23.7		28.2	24.2		27.4	23.1	22.8	30.0	22.5	19.2
Progression factor, PF	1.000	1.000		1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000
Delay calibration, k	0.32	0.34		0.31	0.33		0.23	0.34	0.32	0.31	0.31	0.11
Incremental delay, d_2	16.4	5.0		10.9	4.5		5.3	4.4	7.4	14.4	3.2	0.4
Initial queue delay, d_3												
Control delay	46.5	28.7		39.1	28.6		32.8	27.6	30.3	44.5	25.7	19.6
Lane group LOS	D	C		D	C		C	C	C	D	C	B
Approach delay	31.8			31.0			29.0			27.5		
Approach LOS	C			C			C			C		
Intersection delay	29.7			X_C = 0.75			Intersection LOS			C		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	*MEO*	Intersection	*Walker Road & Cedar Hills Blvd*
Agency or Co.	*Charbonneau Engineering LLC*	Area Type	*All other areas*
Date Performed	*01/09/2014*	Jurisdiction	*Washington County*
Time Period	*Saturday Midday Peak Hour*	Analysis Year	*2013 Existing Traffic*
		Project ID	*#13-28 Cedar Hills Community Park*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	1	2	0	1	2	0	1	2	1	1	2	1
Lane group	L	TR		L	TR		L	T	R	L	T	R
Volume, V (vph)	132	335	200	306	353	78	222	788	344	103	713	92
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Extension of effective green, e	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Arrival type, AT	3	3		3	3		3	3	3	3	3	3
Unit extension, UE	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Filtering/metering, I	1.000	1.000		1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000
Initial unmet demand, Q_b	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0	0		0	0		0	0	0	0	0	0
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EB Only	Thru & RT	WB Only	04	SB Only	Thru & RT	NB Only	08
Timing	G = 6.0	G = 2.0	G = 14.0	G =	G = 5.5	G = 5.5	G = 11.0	G =
	Y = 4	Y = 0	Y = 4	Y =	Y = 4	Y = 0	Y = 4	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	135	546		312	440		227	804	351	105	728	94
Lane group capacity, c	181	683		421	938		331	995	444	165	905	404
v/c ratio, X	0.75	0.80		0.74	0.47		0.69	0.81	0.79	0.64	0.80	0.23
Total green ratio, g/C	0.10	0.20		0.23	0.27		0.18	0.28	0.28	0.09	0.25	0.25
Uniform delay, d_1	26.3	22.9		21.3	18.4		22.9	20.3	20.1	26.3	21.1	17.9
Progression factor, PF	1.000	1.000		1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000
Delay calibration, k	0.30	0.34		0.30	0.11		0.25	0.35	0.34	0.22	0.35	0.11
Incremental delay, d_2	15.5	6.7		6.9	0.4		5.8	5.0	9.4	7.9	5.4	0.3
Initial queue delay, d_3												
Control delay	41.8	29.6		28.2	18.8		28.7	25.3	29.5	34.2	26.5	18.2
Lane group LOS	D	C		C	B		C	C	C	C	C	B
Approach delay	32.0			22.7			26.9			26.5		
Approach LOS	C			C			C			C		
Intersection delay	26.9			X_C = 0.76			Intersection LOS			C		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*MEO*	Intersection	*Cedar Hills Bl & Huntington Av*
Agency/Co.	*Charbonneau Engineering LLC*	Jurisdiction	*Washington County*
Date Performed	*01/10/2014*	Analysis Year	*2013 Existing Traffic*
Analysis Time Period	*Weekday PM Peak Hour*		

Project Description *#13-85 Cedar Hills Community Park*

East/West Street: *Huntington Avenue* | North/South Street: *Cedar Hills Blvd*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*85*	*1015*	*0*	*1*	*1056*	*24*
Peak-Hour Factor, PHF	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*
Hourly Flow Rate, HFR	*86*	*1035*	*0*	*1*	*1077*	*24*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration	*LT*		*TR*	*LT*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*2*	*1*	*0*	*67*
Peak-Hour Factor, PHF	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*
Hourly Flow Rate, HFR	*0*	*0*	*2*	*1*	*0*	*68*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*		*LTR*			*LTR*	
v (vph)	*86*	*1*		*2*			*69*	
C (m) (vph)	*642*	*679*		*508*			*427*	
v/c	*0.13*	*0.00*		*0.00*			*0.16*	
95% queue length	*0.46*	*0.00*		*0.01*			*0.57*	
Control Delay	*11.5*	*10.3*		*12.1*			*15.0*	
LOS	*B*	*B*		*B*			*C*	
Approach Delay	--	--	*12.1*			*15.0*		
Approach LOS	--	--	*B*			*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*MEO*	Intersection	*Cedar Hills Bl & Huntington Av*
Agency/Co.	*Charbonneau Engineering LLC*	Jurisdiction	*Washington County*
Date Performed	*01/10/2014*	Analysis Year	*2013 Existing Traffic*
Analysis Time Period	*Saturday Midday Peak Hour*		

Project Description	*#13-85 Cedar Hills Community Park*
East/West Street: *Huntington Avenue*	North/South Street: *Cedar Hills Blvd*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*74*	*938*	*3*	*1*	*861*	*6*
Peak-Hour Factor, PHF	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*
Hourly Flow Rate, HFR	*75*	*957*	*3*	*1*	*878*	*6*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration	*LT*		*TR*	*LT*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*1*	*0*	*2*	*6*	*0*	*81*
Peak-Hour Factor, PHF	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*
Hourly Flow Rate, HFR	*1*	*0*	*2*	*6*	*0*	*82*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*		*LTR*			*LTR*	
v (vph)	*75*	*1*		*3*			*88*	
C (m) (vph)	*774*	*725*		*153*			*396*	
v/c	*0.10*	*0.00*		*0.02*			*0.22*	
95% queue length	*0.32*	*0.00*		*0.06*			*0.84*	
Control Delay	*10.1*	*10.0*		*29.0*			*16.7*	
LOS	*B*	*A*		*D*			*C*	
Approach Delay	--	--	*29.0*			*16.7*		
Approach LOS	--	--	*D*			*C*		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	*MEO*	Intersection	*Walker Road and Lynnfield Lane*
Agency or Co.	*Charbonneau Engineering LLC*	Area Type	*All other areas*
Date Performed	*01/09/2014*	Jurisdiction	*Washington County*
Time Period	*Weekday PM Peak Hour*	Analysis Year	*2013 Existing Traffic*
		Project ID	*#13-28 Cedar Hills Community Park*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	0	0	0	0	0
Lane group		LT			TR						LR	
Volume, V (vph)	8	1095			954	10				5		22
% Heavy vehicles, %HV	0	0			0	0				0		0
Peak-hour factor, PHF	0.94	0.94			0.94	0.94				0.94		0.94
Pretimed (P) or actuated (A)	P	A			A	A				A		A
Start-up lost time, l_1		2.0			2.0						2.0	
Extension of effective green, e		2.0			2.0						2.0	
Arrival type, AT		3			3						3	
Unit extension, UE		3.0			3.0						3.0	
Filtering/metering, I		1.000			1.000						1.000	
Initial unmet demand, Q_b		0.0			0.0						0.0	
Ped / Bike / RTOR volumes				0		0	0			0	0	0
Lane width		12.0			12.0						12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N		N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0						0	
Min. time for pedestrians, G_p				3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	SB Only	06	07	08
Timing	G = 48.0	G =	G =	G =	G = 4.0	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		1174			1026						28	
Lane group capacity, c		1510			1518						112	
v/c ratio, X		0.78			0.68						0.25	
Total green ratio, g/C		0.80			0.80						0.07	
Uniform delay, d_1		3.2			2.6						26.6	
Progression factor, PF		1.000			1.000						1.000	
Delay calibration, k		0.33			0.25						0.11	
Incremental delay, d_2		2.6			1.2						1.2	
Initial queue delay, d_3												
Control delay		5.8			3.8						27.8	
Lane group LOS		A			A						C	
Approach delay	5.8			3.8						27.8		
Approach LOS	A			A						C		
Intersection delay	5.2			X_C = 0.74			Intersection LOS			A		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	*MEO*	Intersection	*Walker Road and Lynnfield Lane*
Agency or Co.	*Charbonneau Engineering LLC*	Area Type	*All other areas*
Date Performed	*01/09/2014*	Jurisdiction	*Washington County*
Time Period	*Saturday Midday Peak Hour*	Analysis Year	*2013 Existing Traffic*
		Project ID	*#13-28 Cedar Hills Community Park*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	0	0	0	0	0
Lane group		LT			TR						LR	
Volume, V (vph)	3	829			816	4				3		2
% Heavy vehicles, %HV	0	0			0	0				0		0
Peak-hour factor, PHF	0.92	0.92			0.92	0.92				0.92		0.92
Pretimed (P) or actuated (A)	P	A			A	A				A		A
Start-up lost time, l_1		2.0			2.0						2.0	
Extension of effective green, e		2.0			2.0						2.0	
Arrival type, AT		3			3						3	
Unit extension, UE		3.0			3.0						3.0	
Filtering/metering, I		1.000			1.000						1.000	
Initial unmet demand, Q_b		0.0			0.0						0.0	
Ped / Bike / RTOR volumes				0		0	0			0		0
Lane width		12.0			12.0						12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N		N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0						0	
Min. time for pedestrians, G_p					3.2			3.2			3.2	

Phasing	EW Perm	02	03	04	SB Only	06	07	08
Timing	G = 48.0	G =	G =	G =	G = 4.0	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		904			891						5	
Lane group capacity, c		1518			1519						116	
v/c ratio, X		0.60			0.59						0.04	
Total green ratio, g/C		0.80			0.80						0.07	
Uniform delay, d_1		2.3			2.3						26.2	
Progression factor, PF		1.000			1.000						1.000	
Delay calibration, k		0.18			0.18						0.11	
Incremental delay, d_2		0.6			0.6						0.2	
Initial queue delay, d_3												
Control delay		2.9			2.9						26.4	
Lane group LOS		A			A						C	
Approach delay	2.9			2.9						26.4		
Approach LOS	A			A						C		
Intersection delay	3.0			X_C = 0.55			Intersection LOS			A		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	*MEO*	Intersection	*Walker Road & Cedar Hills Blvd*
Agency or Co.	*Charbonneau Engineering LLC*	Area Type	*All other areas*
Date Performed	*01/09/2014*	Jurisdiction	*Washington County*
Time Period	*Weekday PM Peak Hour*	Analysis Year	*2018 Background Traffic*
		Project ID	*#13-28 Cedar Hills Community Park*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	1	2	0	1	2	0	1	2	1	1	2	1
Lane group	L	TR		L	TR		L	T	R	L	T	R
Volume, V (vph)	162	636	143	218	618	106	200	839	358	158	819	149
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Extension of effective green, e	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Arrival type, AT	3	3		3	3		3	3	3	3	3	3
Unit extension, UE	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Filtering/metering, I	1.000	1.000		1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000
Initial unmet demand, Q_b	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0	0		0	0		0	0	0	0	0	0
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EB Only	Thru & RT	WB Only	04	SB Only	Thru & RT	NB Only	08
Timing	G = 8.0	G = 7.0	G = 11.0	G =	G = 8.0	G = 8.5	G = 11.5	G =
	Y = 4	Y = 0	Y = 4	Y =	Y = 4	Y = 0	Y = 4	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	167	803		225	746		206	865	369	163	844	154
Lane group capacity, c	206	955		284	910		297	1034	461	206	1060	473
v/c ratio, X	0.81	0.84		0.79	0.82		0.69	0.84	0.80	0.79	0.80	0.33
Total green ratio, g/C	0.11	0.27		0.16	0.26		0.16	0.29	0.29	0.11	0.29	0.29
Uniform delay, d_1	30.3	24.1		28.4	24.5		27.6	23.5	23.2	30.2	22.8	19.3
Progression factor, PF	1.000	1.000		1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000
Delay calibration, k	0.35	0.38		0.34	0.36		0.26	0.37	0.34	0.34	0.34	0.11
Incremental delay, d_2	21.1	6.8		14.2	6.0		6.8	6.1	9.7	18.6	4.3	0.4
Initial queue delay, d_3												
Control delay	51.4	30.9		42.6	30.5		34.4	29.6	32.9	48.8	27.1	19.8
Lane group LOS	D	C		D	C		C	C	C	D	C	B
Approach delay	34.4			33.3			31.1			29.2		
Approach LOS	C			C			C			C		
Intersection delay	31.8			X_C = 0.79			Intersection LOS			C		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	*MEO*	Intersection	*Walker Road & Cedar Hills Blvd*
Agency or Co.	*Charbonneau Engineering LLC*	Area Type	*All other areas*
Date Performed	*01/09/2014*	Jurisdiction	*Washington County*
Time Period	*Midday Saturday Peak Hour*	Analysis Year	*2018 Background Traffic*
		Project ID	*#13-28 Cedar Hills Community Park*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	1	2	0	1	2	0	1	2	1	1	2	1
Lane group	L	TR		L	TR		L	T	R	L	T	R
Volume, V (vph)	139	352	210	321	371	82	233	827	361	108	749	97
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Extension of effective green, e	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Arrival type, AT	3	3		3	3		3	3	3	3	3	3
Unit extension, UE	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Filtering/metering, I	1.000	1.000		1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000
Initial unmet demand, Q_b	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0	0		0	0		0	0	0	0	0	0
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EB Only	Thru & RT	WB Only	04	SB Only	Thru & RT	NB Only	08
Timing	G = 6.0	G = 2.0	G = 14.0	G =	G = 5.5	G = 5.5	G = 11.0	G =
	Y = 4	Y = 0	Y = 4	Y =	Y = 4	Y = 0	Y = 4	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	142	573		328	463		238	844	368	110	764	99
Lane group capacity, c	181	683		421	938		331	995	444	165	905	404
v/c ratio, X	0.78	0.84		0.78	0.49		0.72	0.85	0.83	0.67	0.84	0.25
Total green ratio, g/C	0.10	0.20		0.23	0.27		0.18	0.28	0.28	0.09	0.25	0.25
Uniform delay, d_1	26.4	23.1		21.6	18.6		23.0	20.6	20.4	26.4	21.4	18.0
Progression factor, PF	1.000	1.000		1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000
Delay calibration, k	0.33	0.37		0.33	0.11		0.28	0.38	0.37	0.24	0.38	0.11
Incremental delay, d_2	19.9	9.1		9.1	0.4		7.4	7.0	12.4	9.8	7.4	0.3
Initial queue delay, d_3												
Control delay	46.3	32.2		30.6	19.0		30.4	27.6	32.8	36.2	28.8	18.3
Lane group LOS	D	C		C	B		C	C	C	D	C	B
Approach delay	35.0			23.8			29.4			28.5		
Approach LOS	D			C			C			C		
Intersection delay	29.1			X_C = 0.80			Intersection LOS			C		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*MEO*	Intersection	*Cedar Hills Bl & Huntington Av*
Agency/Co.	*Charbonneau Engineering LLC*	Jurisdiction	*Washington County*
Date Performed	*01/10/2014*	Analysis Year	*2018 Background Traffic*
Analysis Time Period	*Weekday PM Peak Hour*		

Project Description *#13-85 Cedar Hills Community Park*

East/West Street: *Huntington Avenue*	North/South Street: *Cedar Hills Blvd*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*89*	*1066*	*0*	*1*	*1109*	*25*
Peak-Hour Factor, PHF	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*
Hourly Flow Rate, HFR	*90*	*1087*	*0*	*1*	*1131*	*25*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration	*LT*		*TR*	*LT*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*2*	*1*	*0*	*70*
Peak-Hour Factor, PHF	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*
Hourly Flow Rate, HFR	*0*	*0*	*2*	*1*	*0*	*71*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*		*LTR*			*LTR*	
v (vph)	*90*	*1*		*2*			*72*	
C (m) (vph)	*612*	*649*		*488*			*404*	
v/c	*0.15*	*0.00*		*0.00*			*0.18*	
95% queue length	*0.51*	*0.00*		*0.01*			*0.64*	
Control Delay	*11.9*	*10.6*		*12.4*			*15.8*	
LOS	*B*	*B*		*B*			*C*	
Approach Delay	--	--	*12.4*			*15.8*		
Approach LOS	--	--	*B*			*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*MEO*	Intersection	*Cedar Hills Bl & Huntington Av*
Agency/Co.	*Charbonneau Engineering LLC*	Jurisdiction	*Washington County*
Date Performed	*01/10/2014*	Analysis Year	*2018 Background Traffic*
Analysis Time Period	*Saturday Midday Peak Hour*		

Project Description *#13-85 Cedar Hills Community Park*

East/West Street: *Huntington Avenue* | North/South Street: *Cedar Hills Blvd*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*78*	*985*	*3*	*1*	*904*	*6*
Peak-Hour Factor, PHF	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*
Hourly Flow Rate, HFR	*79*	*1005*	*3*	*1*	*922*	*6*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration	*LT*		*TR*	*LT*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*1*	*0*	*2*	*6*	*0*	*85*
Peak-Hour Factor, PHF	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*
Hourly Flow Rate, HFR	*1*	*0*	*2*	*6*	*0*	*86*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*		*LTR*			*LTR*	
v (vph)	*79*	*1*		*3*			*92*	
C (m) (vph)	*745*	*695*		*132*			*376*	
v/c	*0.11*	*0.00*		*0.02*			*0.24*	
95% queue length	*0.35*	*0.00*		*0.07*			*0.95*	
Control Delay	*10.4*	*10.2*		*32.9*			*17.6*	
LOS	*B*	*B*		*D*			*C*	
Approach Delay	--	--	*32.9*			*17.6*		
Approach LOS	--	--	*D*			*C*		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	*MEO*	Intersection	*Walker Road and Lynnfield Lane*
Agency or Co.	*Charbonneau Engineering LLC*	Area Type	*All other areas*
Date Performed	*01/10/2014*	Jurisdiction	*Washington County*
Time Period	*Weekday PM Peak Hour*	Analysis Year	*2018 Background Traffic*
		Project ID	*#13-28 Cedar Hills Community Park*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	0	0	0	0	0
Lane group		LT			TR						LR	
Volume, V (vph)	8	1150			1002	11				5		23
% Heavy vehicles, %HV	0	0			0	0				0		0
Peak-hour factor, PHF	0.94	0.94			0.94	0.94				0.94		0.94
Pretimed (P) or actuated (A)	P	A			A	A				A		A
Start-up lost time, l_1		2.0			2.0						2.0	
Extension of effective green, e		2.0			2.0						2.0	
Arrival type, AT		3			3						3	
Unit extension, UE		3.0			3.0						3.0	
Filtering/metering, I		1.000			1.000						1.000	
Initial unmet demand, Q_b		0.0			0.0						0.0	
Ped / Bike / RTOR volumes				0		0	0			0	0	0
Lane width		12.0			12.0						12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N		N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0						0	
Min. time for pedestrians, G_p				3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	SB Only	06	07	08
Timing	G = 48.0	G =	G =	G =	G = 4.0	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		1232			1078						29	
Lane group capacity, c		1510			1518						112	
v/c ratio, X		0.82			0.71						0.26	
Total green ratio, g/C		0.80			0.80						0.07	
Uniform delay, d_1		3.5			2.8						26.6	
Progression factor, PF		1.000			1.000						1.000	
Delay calibration, k		0.36			0.27						0.11	
Incremental delay, d_2		3.6			1.6						1.2	
Initial queue delay, d_3												
Control delay		7.1			4.4						27.8	
Lane group LOS		A			A						C	
Approach delay	7.1			4.4						27.8		
Approach LOS	A			A						C		
Intersection delay	6.1			X_C = 0.77			Intersection LOS			A		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	*MEO*	Intersection	*Walker Road and Lynnfield Lane*
Agency or Co.	*Charbonneau Engineering LLC*	Area Type	*All other areas*
Date Performed	*1/9/2014*	Jurisdiction	*Washington County*
Time Period	*Saturday Midday Peak Hour*	Analysis Year	*2018 Background Traffic*
		Project ID	*#13-28 Cedar Hills Community Park*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	0	0	0	0	0
Lane group		LT			TR						LR	
Volume, V (vph)	3	870			857	4				3		2
% Heavy vehicles, %HV	0	0			0	0				0		0
Peak-hour factor, PHF	0.92	0.92			0.92	0.92				0.92		0.92
Pretimed (P) or actuated (A)	P	A			A	A				A		A
Start-up lost time, l_1		2.0			2.0						2.0	
Extension of effective green, e		2.0			2.0						2.0	
Arrival type, AT		3			3						3	
Unit extension, UE		3.0			3.0						3.0	
Filtering/metering, I		1.000			1.000						1.000	
Initial unmet demand, Q_b		0.0			0.0						0.0	
Ped / Bike / RTOR volumes				0		0	0			0		0
Lane width		12.0			12.0						12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N		N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0						0	
Min. time for pedestrians, G_p				3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	SB Only	06	07	08
Timing	G = 48.0	G =	G =	G =	G = 4.0	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		949			936						5	
Lane group capacity, c		1518			1519						116	
v/c ratio, X		0.63			0.62						0.04	
Total green ratio, g/C		0.80			0.80						0.07	
Uniform delay, d_1		2.4			2.4						26.2	
Progression factor, PF		1.000			1.000						1.000	
Delay calibration, k		0.21			0.20						0.11	
Incremental delay, d_2		0.8			0.8						0.2	
Initial queue delay, d_3												
Control delay		3.2			3.1						26.4	
Lane group LOS		A			A						C	
Approach delay	3.2			3.1						26.4		
Approach LOS	A			A						C		
Intersection delay	3.2			X_C = 0.58			Intersection LOS			A		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	*MEO*	Intersection	*Walker Road & Cedar Hills Blvd*
Agency or Co.	*Charbonneau Engineering LLC*	Area Type	*All other areas*
Date Performed	*01/29/2014*	Jurisdiction	*Washington County*
Time Period	*Weekday PM Peak Hour*	Analysis Year	*2018 Total - Opt. 1*
		Project ID	*#13-28 Cedar Hills Community Park*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	1	2	0	1	2	0	1	2	1	1	2	1
Lane group	L	TR		L	TR		L	T	R	L	T	R
Volume, V (vph)	176	636	143	218	618	106	200	850	358	158	829	161
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Extension of effective green, e	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Arrival type, AT	3	3		3	3		3	3	3	3	3	3
Unit extension, UE	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Filtering/metering, I	1.000	1.000		1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000
Initial unmet demand, Q_b	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0	0		0	0		0	0	0	0	0	0
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EB Only	Thru & RT	WB Only	04	SB Only	Thru & RT	NB Only	08
Timing	G = 8.0	G = 7.0	G = 11.0	G =	G = 8.0	G = 8.5	G = 11.5	G =
	Y = 4	Y = 0	Y = 4	Y =	Y = 4	Y = 0	Y = 4	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	181	803		225	746		206	876	369	163	855	166
Lane group capacity, c	206	955		284	910		297	1034	461	206	1060	473
v/c ratio, X	0.88	0.84		0.79	0.82		0.69	0.85	0.80	0.79	0.81	0.35
Total green ratio, g/C	0.11	0.27		0.16	0.26		0.16	0.29	0.29	0.11	0.29	0.29
Uniform delay, d_1	30.5	24.1		28.4	24.5		27.6	23.6	23.2	30.2	22.9	19.5
Progression factor, PF	1.000	1.000		1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000
Delay calibration, k	0.41	0.38		0.34	0.36		0.26	0.38	0.34	0.34	0.35	0.11
Incremental delay, d_2	32.2	6.8		14.2	6.0		6.8	6.7	9.7	18.6	4.7	0.5
Initial queue delay, d_3												
Control delay	62.8	30.9		42.6	30.5		34.4	30.3	32.9	48.8	27.6	20.0
Lane group LOS	E	C		D	C		C	C	C	D	C	B
Approach delay	36.8			33.3			31.5			29.5		
Approach LOS	D			C			C			C		
Intersection delay	32.5			X_C = 0.79			Intersection LOS			C		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	*MEO*	Intersection	*Walker Road & Cedar Hills Blvd*
Agency or Co.	*Charbonneau Engineering LLC*	Area Type	*All other areas*
Date Performed	*01/29/2014*	Jurisdiction	*Washington County*
Time Period	*Midday Saturday Peak Hour*	Analysis Year	*2018 Total - Opt. 1*
		Project ID	*#13-28 Cedar Hills Community Park*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	1	2	0	1	2	0	1	2	1	1	2	1
Lane group	L	TR		L	TR		L	T	R	L	T	R
Volume, V (vph)	163	352	210	321	371	82	233	847	361	108	770	124
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Extension of effective green, e	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Arrival type, AT	3	3		3	3		3	3	3	3	3	3
Unit extension, UE	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Filtering/metering, I	1.000	1.000		1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000
Initial unmet demand, Q_b	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0	0		0	0		0	0	0	0	0	0
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EB Only	Thru & RT	WB Only	04	SB Only	Thru & RT	NB Only	08
Timing	G = 6.0	G = 2.0	G = 14.0	G =	G = 5.5	G = 5.5	G = 11.0	G =
	Y = 4	Y = 0	Y = 4	Y =	Y = 4	Y = 0	Y = 4	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	166	573		328	463		238	864	368	110	786	127
Lane group capacity, c	181	683		421	938		331	995	444	165	905	404
v/c ratio, X	0.92	0.84		0.78	0.49		0.72	0.87	0.83	0.67	0.87	0.31
Total green ratio, g/C	0.10	0.20		0.23	0.27		0.18	0.28	0.28	0.09	0.25	0.25
Uniform delay, d_1	26.8	23.1		21.6	18.6		23.0	20.7	20.4	26.4	21.6	18.3
Progression factor, PF	1.000	1.000		1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000
Delay calibration, k	0.44	0.37		0.33	0.11		0.28	0.40	0.37	0.24	0.40	0.11
Incremental delay, d_2	44.0	9.1		9.1	0.4		7.4	8.3	12.4	9.8	9.1	0.4
Initial queue delay, d_3												
Control delay	70.7	32.2		30.6	19.0		30.4	29.0	32.8	36.2	30.6	18.8
Lane group LOS	E	C		C	B		C	C	C	D	C	B
Approach delay	40.9			23.8			30.2			29.7		
Approach LOS	D			C			C			C		
Intersection delay	30.8			X_C = 0.81			Intersection LOS			C		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*MEO*	Intersection	*Cedar Hills Bl & Huntington Av*
Agency/Co.	*Charbonneau Engineering LLC*	Jurisdiction	*Washington County*
Date Performed	*01/29/2014*	Analysis Year	*2018 Total - Opt. 1*
Analysis Time Period	*Weekday PM Peak Hour*		

Project Description *#13-85 Cedar Hills Community Park*

East/West Street: *Huntington Avenue* | North/South Street: *Cedar Hills Blvd*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*89*	*1066*	*25*	*14*	*1109*	*25*
Peak-Hour Factor, PHF	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*
Hourly Flow Rate, HFR	*90*	*1087*	*25*	*14*	*1131*	*25*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration	*LT*		*TR*	*LT*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*22*	*2*	*13*	*1*	*3*	*70*
Peak-Hour Factor, PHF	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*
Hourly Flow Rate, HFR	*22*	*2*	*13*	*1*	*3*	*71*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*		*LTR*			*LTR*	
v (vph)	*90*	*14*		*37*			*75*	
C (m) (vph)	*612*	*635*		*44*			*252*	
v/c	*0.15*	*0.02*		*0.84*			*0.30*	
95% queue length	*0.51*	*0.07*		*3.31*			*1.21*	
Control Delay	*11.9*	*10.8*		*230.6*			*25.2*	
LOS	*B*	*B*		*F*			*D*	
Approach Delay	--	--	*230.6*			*25.2*		
Approach LOS	--	--	*F*			*D*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*MEO*	Intersection	*Cedar Hills Bl & Huntington Av*
Agency/Co.	*Charbonneau Engineering LLC*	Jurisdiction	*Washington County*
Date Performed	*01/29/2014*	Analysis Year	*2018 Total - Opt. 1*
Analysis Time Period	*Saturday Midday Peak Hour*		

Project Description	*#13-85 Cedar Hills Community Park*
East/West Street: *Huntington Avenue*	North/South Street: *Cedar Hills Blvd*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*78*	*985*	*47*	*23*	*904*	*6*
Peak-Hour Factor, PHF	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*
Hourly Flow Rate, HFR	*79*	*1005*	*47*	*23*	*922*	*6*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration	*LT*		*TR*	*LT*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*49*	*5*	*26*	*6*	*5*	*85*
Peak-Hour Factor, PHF	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*
Hourly Flow Rate, HFR	*49*	*5*	*26*	*6*	*5*	*86*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*		*LTR*			*LTR*	
v (vph)	*79*	*23*		*80*			*97*	
C (m) (vph)	*745*	*669*		*60*			*246*	
v/c	*0.11*	*0.03*		*1.33*			*0.39*	
95% queue length	*0.35*	*0.11*		*6.87*			*1.78*	
Control Delay	*10.4*	*10.6*		*344.0*			*28.8*	
LOS	*B*	*B*		*F*			*D*	
Approach Delay	--	--	*344.0*			*28.8*		
Approach LOS	--	--	*F*			*D*		

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HCS2000™ DETAILED REPORT

General Information		***Site Information***	
Analyst	*MEO*	Intersection	*Walker Road and Lynnfield Lane*
Agency or Co.	*Charbonneau Engineering LLC*	Area Type	*All other areas*
Date Performed	*01/29/2014*	Jurisdiction	*Washington County*
Time Period	*Weekday PM Peak Hour*	Analysis Year	*2018 Total - Opt. 1*
		Project ID	*#13-28 Cedar Hills Community Park*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	0	0	0	0	0
Lane group		LT			TR						LR	
Volume, V (vph)	8	1150			1002	26				20		23
% Heavy vehicles, %HV	0	0			0	0				0		0
Peak-hour factor, PHF	0.94	0.94			0.94	0.94				0.94		0.94
Pretimed (P) or actuated (A)	P	A			A	A				A		A
Start-up lost time, l_1		2.0			2.0						2.0	
Extension of effective green, e		2.0			2.0						2.0	
Arrival type, AT		3			3						3	
Unit extension, UE		3.0			3.0						3.0	
Filtering/metering, I		1.000			1.000						1.000	
Initial unmet demand, Q_b		0.0			0.0						0.0	
Ped / Bike / RTOR volumes				0		0	0			0	0	0
Lane width		12.0			12.0						12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N		N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0						0	
Min. time for pedestrians, G_p				3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	SB Only	06	07	08
Timing	G = 48.0	G =	G =	G =	G = 4.0	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		1232			1094						45	
Lane group capacity, c		1510			1514						115	
v/c ratio, X		0.82			0.72						0.39	
Total green ratio, g/C		0.80			0.80						0.07	
Uniform delay, d_1		3.5			2.8						26.8	
Progression factor, PF		1.000			1.000						1.000	
Delay calibration, k		0.36			0.28						0.11	
Incremental delay, d_2		3.6			1.7						2.2	
Initial queue delay, d_3												
Control delay		7.1			4.6						29.0	
Lane group LOS		A			A						C	
Approach delay	7.1			4.6						29.0		
Approach LOS	A			A						C		
Intersection delay	6.3			X_C = 0.78			Intersection LOS			A		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	*MEO*	Intersection	*Walker Road and Lynnfield Lane*
Agency or Co.	*Charbonneau Engineering LLC*	Area Type	*All other areas*
Date Performed	*01/29/2014*	Jurisdiction	*Washington County*
Time Period	*Saturday Midday Peak Hour*	Analysis Year	*2018 Total - Opt. 1*
		Project ID	*#13-28 Cedar Hills Community Park*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	0	0	0	0	0
Lane group		LT			TR						LR	
Volume, V (vph)	3	870			857	30				32		2
% Heavy vehicles, %HV	0	0			0	0				0		0
Peak-hour factor, PHF	0.92	0.92			0.92	0.92				0.92		0.92
Pretimed (P) or actuated (A)	P	A			A	A				A		A
Start-up lost time, l_1		2.0			2.0						2.0	
Extension of effective green, e		2.0			2.0						2.0	
Arrival type, AT		3			3						3	
Unit extension, UE		3.0			3.0						3.0	
Filtering/metering, I		1.000			1.000						1.000	
Initial unmet demand, Q_b		0.0			0.0						0.0	
Ped / Bike / RTOR volumes				0		0	0			0		0
Lane width		12.0			12.0						12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N		N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0						0	
Min. time for pedestrians, G_p					3.2			3.2			3.2	

Phasing	EW Perm	02	03	04	SB Only	06	07	08
Timing	G = 48.0	G =	G =	G =	G = 4.0	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		949			965						37	
Lane group capacity, c		1518			1513						120	
v/c ratio, X		0.63			0.64						0.31	
Total green ratio, g/C		0.80			0.80						0.07	
Uniform delay, d_1		2.4			2.5						26.7	
Progression factor, PF		1.000			1.000						1.000	
Delay calibration, k		0.21			0.22						0.11	
Incremental delay, d_2		0.8			0.9						1.5	
Initial queue delay, d_3												
Control delay		3.2			3.4						28.1	
Lane group LOS		A			A						C	
Approach delay	3.2			3.4						28.1		
Approach LOS	A			A						C		
Intersection delay	3.8			X_C = 0.61			Intersection LOS			A		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	*MEO*	Intersection	*Walker Road & Cedar Hills Blvd*
Agency or Co.	*Charbonneau Engineering LLC*	Area Type	*All other areas*
Date Performed	*01/29/2014*	Jurisdiction	*Washington County*
Time Period	*Weekday PM Peak Hour*	Analysis Year	*2015 Total - Opt. 2*
		Project ID	*#13-28 Cedar Hills Community Park*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	1	2	0	1	2	0	1	2	1	1	2	1
Lane group	L	TR		L	TR		L	T	R	L	T	R
Volume, V (vph)	172	642	143	228	632	106	200	845	363	158	819	149
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Extension of effective green, e	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Arrival type, AT	3	3		3	3		3	3	3	3	3	3
Unit extension, UE	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Filtering/metering, I	1.000	1.000		1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000
Initial unmet demand, Q_b	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0	0		0	0		0	0	0	0	0	0
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EB Only	Thru & RT	WB Only	04	SB Only	Thru & RT	NB Only	08
Timing	G = 8.5	G = 7.0	G = 11.0	G =	G = 7.5	G = 9.0	G = 11.0	G =
	Y = 4	Y = 0	Y = 4	Y =	Y = 4	Y = 0	Y = 4	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	177	809		235	761		206	871	374	163	844	154
Lane group capacity, c	219	980		284	910		284	1034	461	193	1060	473
v/c ratio, X	0.81	0.83		0.83	0.84		0.73	0.84	0.81	0.84	0.80	0.33
Total green ratio, g/C	0.12	0.28		0.16	0.26		0.16	0.29	0.29	0.11	0.29	0.29
Uniform delay, d_1	30.0	23.7		28.6	24.6		28.1	23.5	23.2	30.7	22.8	19.3
Progression factor, PF	1.000	1.000		1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000
Delay calibration, k	0.35	0.36		0.37	0.37		0.29	0.38	0.35	0.38	0.34	0.11
Incremental delay, d_2	19.8	5.9		18.0	6.9		8.9	6.4	10.5	27.5	4.3	0.4
Initial queue delay, d_3												
Control delay	49.7	29.5		46.6	31.5		37.0	29.9	33.8	58.2	27.1	19.8
Lane group LOS	D	C		D	C		D	C	C	E	C	B
Approach delay	33.2			35.1			31.9			30.5		
Approach LOS	C			D			C			C		
Intersection delay	32.5			X_C = 0.80			Intersection LOS			C		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	*MEO*	Intersection	*Walker Road & Cedar Hills Blvd*
Agency or Co.	*Charbonneau Engineering LLC*	Area Type	*All other areas*
Date Performed	*01/29/2014*	Jurisdiction	*Washington County*
Time Period	*Midday Saturday Peak Hour*	Analysis Year	*2018 Total - Opt. 2*
		Project ID	*#13-28 Cedar Hills Community Park*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	1	2	0	1	2	0	1	2	1	1	2	1
Lane group	L	TR		L	TR		L	T	R	L	T	R
Volume, V (vph)	156	362	210	343	401	82	233	837	370	108	748	97
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Extension of effective green, e	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Arrival type, AT	3	3		3	3		3	3	3	3	3	3
Unit extension, UE	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Filtering/metering, I	1.000	1.000		1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000
Initial unmet demand, Q_b	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0	0		0	0		0	0	0	0	0	0
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EB Only	Thru & RT	WB Only	04	SB Only	Thru & RT	NB Only	08
Timing	G = 6.5	G = 2.0	G = 13.5	G =	G = 5.5	G = 5.5	G = 11.0	G =
	Y = 4	Y = 0	Y = 4	Y =	Y = 4	Y = 0	Y = 4	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	159	583		350	493		238	854	378	110	763	99
Lane group capacity, c	196	712		406	911		331	995	444	165	905	404
v/c ratio, X	0.81	0.82		0.86	0.54		0.72	0.86	0.85	0.67	0.84	0.25
Total green ratio, g/C	0.11	0.21		0.22	0.26		0.18	0.28	0.28	0.09	0.25	0.25
Uniform delay, d_1	26.2	22.7		22.4	19.2		23.0	20.6	20.6	26.4	21.4	18.0
Progression factor, PF	1.000	1.000		1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000
Delay calibration, k	0.35	0.36		0.39	0.14		0.28	0.39	0.38	0.24	0.38	0.11
Incremental delay, d_2	22.1	7.5		17.1	0.7		7.4	7.6	14.6	9.8	7.3	0.3
Initial queue delay, d_3												
Control delay	48.2	30.2		39.4	19.8		30.4	28.3	35.2	36.2	28.7	18.3
Lane group LOS	D	C		D	B		C	C	D	D	C	B
Approach delay	34.0			28.0			30.4			28.5		
Approach LOS	C			C			C			C		
Intersection delay	30.1			X_C = 0.82			Intersection LOS			C		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*MEO*	Intersection	*Cedar Hills Bl & Huntington Av*
Agency/Co.	*Charbonneau Engineering LLC*	Jurisdiction	*Washington County*
Date Performed	*01/29/2014*	Analysis Year	*2018 Total - Opt. 2*
Analysis Time Period	*Weekday PM Peak Hour*		

Project Description *#13-85 Cedar Hills Community Park*

East/West Street: *Huntington Avenue* | North/South Street: *Cedar Hills Blvd*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*89*	*1066*	*16*	*0*	*1109*	*25*
Peak-Hour Factor, PHF	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*
Hourly Flow Rate, HFR	*90*	*1087*	*16*	*0*	*1131*	*25*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration	*LT*		*TR*		*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*10*	*1*	*0*	*70*
Peak-Hour Factor, PHF	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*
Hourly Flow Rate, HFR	*0*	*0*	*10*	*1*	*0*	*71*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*1*	*0*	*0*	*0*
Configuration			*R*		*LR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*				*R*		*LR*	
v (vph)	*90*				*10*		*72*	
C (m) (vph)	*612*				*483*		*404*	
v/c	*0.15*				*0.02*		*0.18*	
95% queue length	*0.51*				*0.06*		*0.64*	
Control Delay	*11.9*				*12.6*		*15.8*	
LOS	*B*				*B*		*C*	
Approach Delay	--	--	*12.6*			*15.8*		
Approach LOS	--	--	*B*			*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*MEO*	Intersection	*Cedar Hills Bl & Huntington Av*
Agency/Co.	*Charbonneau Engineering LLC*	Jurisdiction	*Washington County*
Date Performed	*01/29/2014*	Analysis Year	*2018 Total - Opt. 2*
Analysis Time Period	*Saturday Midday Peak Hour*		

Project Description *#13-85 Cedar Hills Community Park*

East/West Street: *Huntington Avenue* | North/South Street: *Cedar Hills Blvd*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*78*	*985*	*30*	*0*	*904*	*6*
Peak-Hour Factor, PHF	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*
Hourly Flow Rate, HFR	*79*	*1005*	*30*	*0*	*922*	*6*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration	*LT*		*TR*		*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*28*	*6*	*0*	*85*
Peak-Hour Factor, PHF	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*
Hourly Flow Rate, HFR	*0*	*0*	*28*	*6*	*0*	*86*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*1*	*0*	*0*	*0*
Configuration			*R*		*LR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*				*R*		*LR*	
v (vph)	*79*				*28*		*92*	
C (m) (vph)	*745*				*508*		*368*	
v/c	*0.11*				*0.06*		*0.25*	
95% queue length	*0.35*				*0.17*		*0.97*	
Control Delay	*10.4*				*12.5*		*18.0*	
LOS	*B*				*B*		*C*	
Approach Delay	--	--	*12.5*			*18.0*		
Approach LOS	--	--	*B*			*C*		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	*MEO*	Intersection	*Walker Road and Lynnfield Lane*
Agency or Co.	*Charbonneau Engineering LLC*	Area Type	*All other areas*
Date Performed	*01/29/2014*	Jurisdiction	*Washington County*
Time Period	*Weekday PM Peak Hour*	Analysis Year	*2018 Total - Opt. 2*
		Project ID	*#13-28 Cedar Hills Community Park*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	0	0	0	0	0
Lane group		LT			TR						LR	
Volume, V (vph)	19	1150			1002	41				18		47
% Heavy vehicles, %HV	0	0			0	0				0		0
Peak-hour factor, PHF	0.94	0.94			0.94	0.94				0.94		0.94
Pretimed (P) or actuated (A)	P	A			A	A				A		A
Start-up lost time, l_1		2.0			2.0						2.0	
Extension of effective green, e		2.0			2.0						2.0	
Arrival type, AT		3			3						3	
Unit extension, UE		3.0			3.0						3.0	
Filtering/metering, I		1.000			1.000						1.000	
Initial unmet demand, Q_b		0.0			0.0						0.0	
Ped / Bike / RTOR volumes				0		0	0			0	0	0
Lane width		12.0			12.0						12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N		N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0						0	
Min. time for pedestrians, G_p				3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	SB Only	06	07	08
Timing	G = 48.0	G =	G =	G =	G = 4.0	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		1243			1110						69	
Lane group capacity, c		1488			1512						113	
v/c ratio, X		0.84			0.73						0.61	
Total green ratio, g/C		0.80			0.80						0.07	
Uniform delay, d_1		3.6			2.9						27.2	
Progression factor, PF		1.000			1.000						1.000	
Delay calibration, k		0.37			0.29						0.20	
Incremental delay, d_2		4.3			1.9						9.3	
Initial queue delay, d_3												
Control delay		7.9			4.8						36.6	
Lane group LOS		A			A						D	
Approach delay	7.9			4.8						36.6		
Approach LOS	A			A						D		
Intersection delay	7.3			X_C = 0.82			Intersection LOS			A		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	*MEO*	Intersection	*Walker Road and Lynnfield Lane*
Agency or Co.	*Charbonneau Engineering LLC*	Area Type	*All other areas*
Date Performed	*01/29/2014*	Jurisdiction	*Washington County*
Time Period	*Saturday Midday Peak Hour*	Analysis Year	*2018 Total - Opt. 2*
		Project ID	*#13-28 Cedar Hills Community Park*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	0	0	0	0	0
Lane group		LT			TR						LR	
Volume, V (vph)	22	870			857	56				32		54
% Heavy vehicles, %HV	0	0			0	0				0		0
Peak-hour factor, PHF	0.90	0.90			0.90	0.90				0.90		0.90
Pretimed (P) or actuated (A)	P	A			A	A				A		A
Start-up lost time, l_1		2.0			2.0						2.0	
Extension of effective green, e		2.0			2.0						2.0	
Arrival type, AT		3			3						3	
Unit extension, UE		3.0			3.0						3.0	
Filtering/metering, I		1.000			1.000						1.000	
Initial unmet demand, Q_b		0.0			0.0						0.0	
Ped / Bike / RTOR volumes				0		0	0			0		0
Lane width		12.0			12.0						12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N		N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0						0	
Min. time for pedestrians, G_p				3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	SB Only	06	07	08
Timing	G = 47.0	G =	G =	G =	G = 5.0	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		991			1014						96	
Lane group capacity, c		1444			1476						142	
v/c ratio, X		0.69			0.69						0.68	
Total green ratio, g/C		0.78			0.78						0.08	
Uniform delay, d_1		3.0			3.0						26.7	
Progression factor, PF		1.000			1.000						1.000	
Delay calibration, k		0.26			0.26						0.25	
Incremental delay, d_2		1.4			1.4						12.1	
Initial queue delay, d_3												
Control delay		4.4			4.4						38.8	
Lane group LOS		A			A						D	
Approach delay	4.4			4.4						38.8		
Approach LOS	A			A						D		
Intersection delay	6.0			X_C = 0.69			Intersection LOS			A		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	*MEO*	Intersection	*Walker Road & Cedar Hills Blvd*
Agency or Co.	*Charbonneau Engineering LLC*	Area Type	*All other areas*
Date Performed	*01/29/2014*	Jurisdiction	*Washington County*
Time Period	*Weekday PM Peak Hour*	Analysis Year	*2018 Total - Opt. 3*
		Project ID	*#13-28 Cedar Hills Community Park*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	1	2	0	1	2	0	1	2	1	1	2	1
Lane group	L	TR		L	TR		L	T	R	L	T	R
Volume, V (vph)	178	636	143	228	632	106	200	850	358	158	819	149
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Extension of effective green, e	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Arrival type, AT	3	3		3	3		3	3	3	3	3	3
Unit extension, UE	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Filtering/metering, I	1.000	1.000		1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000
Initial unmet demand, Q_b	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0	0		0	0		0	0	0	0	0	0
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EB Only	Thru & RT	WB Only	04	SB Only	Thru & RT	NB Only	08
Timing	G = 8.5	G = 7.0	G = 11.0	G =	G = 7.5	G = 9.0	G = 11.0	G =
	Y = 4	Y = 0	Y = 4	Y =	Y = 4	Y = 0	Y = 4	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	184	803		235	761		206	876	369	163	844	154
Lane group capacity, c	219	980		284	910		284	1034	461	193	1060	473
v/c ratio, X	0.84	0.82		0.83	0.84		0.73	0.85	0.80	0.84	0.80	0.33
Total green ratio, g/C	0.12	0.28		0.16	0.26		0.16	0.29	0.29	0.11	0.29	0.29
Uniform delay, d_1	30.1	23.6		28.6	24.6		28.1	23.6	23.2	30.7	22.8	19.3
Progression factor, PF	1.000	1.000		1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000
Delay calibration, k	0.38	0.36		0.37	0.37		0.29	0.38	0.34	0.38	0.34	0.11
Incremental delay, d_2	24.3	5.6		18.0	6.9		8.9	6.7	9.7	27.5	4.3	0.4
Initial queue delay, d_3												
Control delay	54.3	29.2		46.6	31.5		37.0	30.3	32.9	58.2	27.1	19.8
Lane group LOS	D	C		D	C		D	C	C	E	C	B
Approach delay	33.9			35.1			31.9			30.5		
Approach LOS	C			D			C			C		
Intersection delay	32.7			X_C = 0.80			Intersection LOS			C		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	MEO	Intersection	Walker Road & Cedar Hills Blvd
Agency or Co.	Charbonneau Engineering LLC	Area Type	All other areas
Date Performed	01/29/2014	Jurisdiction	Washington County
Time Period	Midday Saturday Peak Hour	Analysis Year	2018 Total - Opt. 3
		Project ID	#13-28 Cedar Hills Community Park

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	1	2	0	1	2	0	1	2	1	1	2	1
Lane group	L	TR		L	TR		L	T	R	L	T	R
Volume, V (vph)	166	352	210	343	401	82	233	847	361	108	748	97
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Extension of effective green, e	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Arrival type, AT	3	3		3	3		3	3	3	3	3	3
Unit extension, UE	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Filtering/metering, I	1.000	1.000		1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000
Initial unmet demand, Q_b	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width	12.0	12.0		12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0	0		0	0		0	0	0	0	0	0
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EB Only	Thru & RT	WB Only	04	SB Only	Thru & RT	NB Only	08
Timing	G = 6.5	G = 2.0	G = 13.5	G =	G = 5.5	G = 5.5	G = 11.0	G =
	Y = 4	Y = 0	Y = 4	Y =	Y = 4	Y = 0	Y = 4	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	169	573		350	493		238	864	368	110	763	99
Lane group capacity, c	196	711		406	911		331	995	444	165	905	404
v/c ratio, X	0.86	0.81		0.86	0.54		0.72	0.87	0.83	0.67	0.84	0.25
Total green ratio, g/C	0.11	0.21		0.22	0.26		0.18	0.28	0.28	0.09	0.25	0.25
Uniform delay, d_1	26.3	22.6		22.4	19.2		23.0	20.7	20.4	26.4	21.4	18.0
Progression factor, PF	1.000	1.000		1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000
Delay calibration, k	0.39	0.35		0.39	0.14		0.28	0.40	0.37	0.24	0.38	0.11
Incremental delay, d_2	30.3	6.8		17.1	0.7		7.4	8.3	12.4	9.8	7.3	0.3
Initial queue delay, d_3												
Control delay	56.6	29.4		39.4	19.8		30.4	29.0	32.8	36.2	28.7	18.3
Lane group LOS	E	C		D	B		C	C	C	D	C	B
Approach delay	35.6			28.0			30.2			28.5		
Approach LOS	D			C			C			C		
Intersection delay	30.3			X_C = 0.81			Intersection LOS			C		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*MEO*	Intersection	*Cedar Hills Bl & Huntington Av*
Agency/Co.	*Charbonneau Engineering LLC*	Jurisdiction	*Washington County*
Date Performed	*01/29/2014*	Analysis Year	*2018 Total - Opt. 3*
Analysis Time Period	*Weekday PM Peak Hour*		

Project Description *#13-85 Cedar Hills Community Park*

East/West Street: *Huntington Avenue* | North/South Street: *Cedar Hills Blvd*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*89*	*1066*	*27*	*15*	*1109*	*25*
Peak-Hour Factor, PHF	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*
Hourly Flow Rate, HFR	*90*	*1087*	*27*	*15*	*1131*	*25*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration	*LT*		*TR*	*LT*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*15*	*1*	*0*	*70*
Peak-Hour Factor, PHF	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*
Hourly Flow Rate, HFR	*0*	*0*	*15*	*1*	*0*	*71*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*1*	*0*	*0*	*0*
Configuration			*R*		*LR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*			*R*		*LR*	
v (vph)	*90*	*15*			*15*		*72*	
C (m) (vph)	*612*	*634*			*479*		*398*	
v/c	*0.15*	*0.02*			*0.03*		*0.18*	
95% queue length	*0.51*	*0.07*			*0.10*		*0.65*	
Control Delay	*11.9*	*10.8*			*12.8*		*16.0*	
LOS	*B*	*B*			*B*		*C*	
Approach Delay	--	--	*12.8*			*16.0*		
Approach LOS	--	--	*B*			*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*MEO*	Intersection	*Cedar Hills Bl & Huntington Av*
Agency/Co.	*Charbonneau Engineering LLC*	Jurisdiction	*Washington County*
Date Performed	*01/29/2014*	Analysis Year	*2018 Total - Opt. 3*
Analysis Time Period	*Saturday Midday Peak Hour*		

Project Description *#13-85 Cedar Hills Community Park*

East/West Street: *Huntington Avenue* | North/South Street: *Cedar Hills Blvd*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*78*	*985*	*50*	*25*	*904*	*6*
Peak-Hour Factor, PHF	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*
Hourly Flow Rate, HFR	*79*	*1005*	*51*	*25*	*922*	*6*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration	*LT*		*TR*	*LT*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*28*	*6*	*0*	*85*
Peak-Hour Factor, PHF	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*	*0.98*
Hourly Flow Rate, HFR	*0*	*0*	*28*	*6*	*0*	*86*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*1*	*0*	*0*	*0*
Configuration			*R*		*LR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*			*R*		*LR*	
v (vph)	*79*	*25*			*28*		*92*	
C (m) (vph)	*745*	*667*			*500*		*352*	
v/c	*0.11*	*0.04*			*0.06*		*0.26*	
95% queue length	*0.35*	*0.12*			*0.18*		*1.03*	
Control Delay	*10.4*	*10.6*			*12.6*		*18.8*	
LOS	*B*	*B*			*B*		*C*	
Approach Delay	--	--	*12.6*			*18.8*		
Approach LOS	--	--	*B*			*C*		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	*MEO*	Intersection	*Walker Road and Lynnfield Lane*
Agency or Co.	*Charbonneau Engineering LLC*	Area Type	*All other areas*
Date Performed	*01/29/2014*	Jurisdiction	*Washington County*
Time Period	*Weekday PM Peak Hour*	Analysis Year	*2018 Total - Opt. 3*
		Project ID	*#13-28 Cedar Hills Community Park*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	0	0	0	0	0
Lane group		LT			TR						LR	
Volume, V (vph)	8	1150			1002	26				18		47
% Heavy vehicles, %HV	0	0			0	0				0		0
Peak-hour factor, PHF	0.94	0.94			0.94	0.94				0.94		0.94
Pretimed (P) or actuated (A)	P	A			A	A				A		A
Start-up lost time, l_1		2.0			2.0						2.0	
Extension of effective green, e		2.0			2.0						2.0	
Arrival type, AT		3			3						3	
Unit extension, UE		3.0			3.0						3.0	
Filtering/metering, I		1.000			1.000						1.000	
Initial unmet demand, Q_b		0.0			0.0						0.0	
Ped / Bike / RTOR volumes				0		0	0			0	0	0
Lane width		12.0			12.0						12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N		N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0						0	
Min. time for pedestrians, G_p				3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	SB Only	06	07	08
Timing	G = 48.0	G =	G =	G =	G = 4.0	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		1232			1094						69	
Lane group capacity, c		1510			1514						113	
v/c ratio, X		0.82			0.72						0.61	
Total green ratio, g/C		0.80			0.80						0.07	
Uniform delay, d_1		3.5			2.8						27.2	
Progression factor, PF		1.000			1.000						1.000	
Delay calibration, k		0.36			0.28						0.20	
Incremental delay, d_2		3.6			1.7						9.3	
Initial queue delay, d_3												
Control delay		7.1			4.6						36.6	
Lane group LOS		A			A						D	
Approach delay	7.1			4.6						36.6		
Approach LOS	A			A						D		
Intersection delay	6.8			X_C = 0.80			Intersection LOS			A		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	*MEO*	Intersection	*Walker Road and Lynnfield Lane*
Agency or Co.	*Charbonneau Engineering LLC*	Area Type	*All other areas*
Date Performed	*01/29/2014*	Jurisdiction	*Washington County*
Time Period	*Saturday Midday Peak Hour*	Analysis Year	*2018 Total - Opt. 3*
		Project ID	*#13-85 Cedar Hills Community Park*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	0	0	0	0	0
Lane group		LT			TR						LR	
Volume, V (vph)	3	870			857	30				32		54
% Heavy vehicles, %HV	0	0			0	0				0		0
Peak-hour factor, PHF	0.92	0.92			0.92	0.92				0.92		0.92
Pretimed (P) or actuated (A)	P	A			A	A				A		A
Start-up lost time, l_1		2.0			2.0						2.0	
Extension of effective green, e		2.0			2.0						2.0	
Arrival type, AT		3			3						3	
Unit extension, UE		3.0			3.0						3.0	
Filtering/metering, I		1.000			1.000						1.000	
Initial unmet demand, Q_b		0.0			0.0						0.0	
Ped / Bike / RTOR volumes				0		0	0			0		0
Lane width		12.0			12.0						12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N		N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0						0	
Min. time for pedestrians, G_p					3.2			3.2			3.2	

Phasing	EW Perm	02	03	04	SB Only	06	07	08
Timing	G = 47.0	G =	G =	G =	G = 5.0	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		949			965						94	
Lane group capacity, c		1486			1481						142	
v/c ratio, X		0.64			0.65						0.66	
Total green ratio, g/C		0.78			0.78						0.08	
Uniform delay, d_1		2.8			2.9						26.7	
Progression factor, PF		1.000			1.000						1.000	
Delay calibration, k		0.22			0.23						0.24	
Incremental delay, d_2		0.9			1.0						10.9	
Initial queue delay, d_3												
Control delay		3.7			3.9						37.6	
Lane group LOS		A			A						D	
Approach delay	3.7			3.9						37.6		
Approach LOS	A			A						D		
Intersection delay	5.4			X_C = 0.65			Intersection LOS			A		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	MEO	Intersection	Huntington Av & Cedar Hills Bl
Agency or Co.	Charbonneau Engineering LLC	Area Type	All other areas
Date Performed	1/29/2014	Jurisdiction	Washington County
Time Period	Weekday PM Peak - Mitigated	Analysis Year	2015 Total - Opt. 1
		Project ID	#13-28 Cedar Hills Community Park

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	1	2	0	1	2	0
Lane group		LTR			LTR		L	TR		L	TR	
Volume, V (vph)	1	3	70	22	2	13	89	1066	25	14	1109	25
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1		2.0			2.0		2.0	2.0		2.0	2.0	
Extension of effective green, e		2.0			2.0		2.0	2.0		2.0	2.0	
Arrival type, AT		3			3		3	3		3	3	
Unit extension, UE		3.0			3.0		3.0	3.0		3.0	3.0	
Filtering/metering, I		1.000			1.000		1.000	1.000		1.000	1.000	
Initial unmet demand, Q_b		0.0			0.0		0.0	0.0		0.0	0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0			12.0		12.0	12.0		12.0	12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0		0	0		0	0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	Excl. Left	Thru & RT	07	08
Timing	G = 5.5	G =	G =	G =	G = 6.0	G = 36.5	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y = 4	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		75			37		91	1114		14	1158	
Lane group capacity, c		151			137		181	2193		181	2193	
v/c ratio, X		0.50			0.27		0.50	0.51		0.08	0.53	
Total green ratio, g/C		0.09			0.09		0.10	0.61		0.10	0.61	
Uniform delay, d_1		25.9			25.4		25.6	6.7		24.5	6.8	
Progression factor, PF		1.000			1.000		1.000	1.000		1.000	1.000	
Delay calibration, k		0.11			0.11		0.11	0.12		0.11	0.13	
Incremental delay, d_2		2.6			1.1		2.2	0.2		0.2	0.2	
Initial queue delay, d_3												
Control delay		28.5			26.4		27.8	6.9		24.7	7.0	
Lane group LOS		C			C		C	A		C	A	
Approach delay	28.5			26.4			8.4			7.2		
Approach LOS	C			C			A			A		
Intersection delay	8.7			X_C = 0.52			Intersection LOS			A		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	*MEO*	Intersection	*Huntington Av & Cedar Hills Bl*
Agency or Co.	*Charbonneau Engineering LLC*	Area Type	*All other areas*
Date Performed	*1/29/2014*	Jurisdiction	*Washington County*
Time Period	*Saturday Midday Pk - Mitigated*	Analysis Year	*2015 Total - Opt. 1*
		Project ID	*#09-32 Cedar Hills Community Park*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	1	2	0	1	2	0
Lane group		LTR			LTR		L	TR		L	TR	
Volume, V (vph)	6	5	85	49	5	26	78	985	47	23	904	6
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1		2.0			2.0		2.0	2.0		2.0	2.0	
Extension of effective green, e		2.0			2.0		2.0	2.0		2.0	2.0	
Arrival type, AT		3			3		3	3		3	3	
Unit extension, UE		3.0			3.0		3.0	3.0		3.0	3.0	
Filtering/metering, I		1.000			1.000		1.000	1.000		1.000	1.000	
Initial unmet demand, Q_b		0.0			0.0		0.0	0.0		0.0	0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0			12.0		12.0	12.0		12.0	12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0		0	0		0	0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	Excl. Left	Thru & RT	07	08
Timing	G = 7.5	G =	G =	G =	G = 5.5	G = 35.0	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y = 4	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		98			82		80	1053		23	928	
Lane group capacity, c		205			184		165	2096		165	2108	
v/c ratio, X		0.48			0.45		0.48	0.50		0.14	0.44	
Total green ratio, g/C		0.13			0.13		0.09	0.58		0.09	0.58	
Uniform delay, d_1		24.4			24.3		25.9	7.4		25.1	7.0	
Progression factor, PF		1.000			1.000		1.000	1.000		1.000	1.000	
Delay calibration, k		0.11			0.11		0.11	0.11		0.11	0.11	
Incremental delay, d_2		1.8			1.7		2.2	0.2		0.4	0.1	
Initial queue delay, d_3												
Control delay		26.2			26.0		28.1	7.6		25.5	7.2	
Lane group LOS		C			C		C	A		C	A	
Approach delay	26.2			26.0			9.0			7.6		
Approach LOS	C			C			A			A		
Intersection delay	9.8			X_C = 0.50			Intersection LOS			A		

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HCM Unsignalized Intersection Capacity Analysis
1: Huntington Ave & Cedar Hills Blvd

1/17/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	0	67	0	0	2	85	1015	0	1	1056	24
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.99	0.99	0.99	0.99	0.92	0.99	0.92	0.99	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	68	0	0	2	86	1103	0	1	1148	26
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1889	2438	587	1919	2451	552	1174			1103		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1889	2438	587	1919	2451	552	1174			1103		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	85	100	100	100	85			100		
cM capacity (veh/h)	38	27	453	31	26	478	591			629		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	69	2	637	552	575	600
Volume Left	1	0	86	0	1	0
Volume Right	68	2	0	0	0	26
cSH	386	478	591	1700	629	1700
Volume to Capacity	0.18	0.00	0.15	0.32	0.00	0.35
Queue Length 95th (ft)	16	0	13	0	0	0
Control Delay (s)	16.3	12.6	3.9	0.0	0.0	0.0
Lane LOS	C	B	A		A	
Approach Delay (s)	16.3	12.6	2.1		0.0	
Approach LOS	C	B				

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1: Huntington Ave & Cedar Hills Blvd

1/17/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	0	81	1	0	2	74	938	3	1	861	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.99	0.99	0.99	0.99	0.92	0.99	0.92	0.99	0.92	0.92	0.92
Hourly flow rate (vph)	7	0	82	1	0	2	75	1020	3	1	936	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1603	2113	471	1723	2115	511	942			1023		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1603	2113	471	1723	2115	511	942			1023		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	90	100	85	98	100	100	90			100		
cM capacity (veh/h)	65	45	539	45	45	508	723			675		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	88	3	585	513	469	474
Volume Left	7	1	75	0	1	0
Volume Right	82	2	0	3	0	7
cSH	350	119	723	1700	675	1700
Volume to Capacity	0.25	0.03	0.10	0.30	0.00	0.28
Queue Length 95th (ft)	25	2	9	0	0	0
Control Delay (s)	18.7	36.2	2.7	0.0	0.0	0.0
Lane LOS	C	E	A		A	
Approach Delay (s)	18.7	36.2	1.4		0.0	
Approach LOS	C	E				

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1: Huntington Ave & Cedar Hills Blvd

1/17/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	0	70	0	0	2	89	1066	0	1	1109	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.99	0.99	0.99	0.99	0.92	0.99	0.92	0.99	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	71	0	0	2	90	1159	0	1	1205	27
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1983	2560	616	2014	2573	579	1233			1159		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1983	2560	616	2014	2573	579	1233			1159		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	84	100	100	100	84			100		
cM capacity (veh/h)	32	22	433	25	21	458	561			599		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	72	2	669	579	604	630
Volume Left	1	0	90	0	1	0
Volume Right	71	2	0	0	0	27
cSH	364	458	561	1700	599	1700
Volume to Capacity	0.20	0.00	0.16	0.34	0.00	0.37
Queue Length 95th (ft)	18	0	14	0	0	0
Control Delay (s)	17.3	12.9	4.4	0.0	0.1	0.0
Lane LOS	C	B	A		A	
Approach Delay (s)	17.3	12.9	2.3		0.0	
Approach LOS	C	B				

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1: Huntington Ave & Cedar Hills Blvd

1/17/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	0	70	0	0	2	89	1066	0	1	1109	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.99	0.99	0.99	0.99	0.92	0.99	0.92	0.99	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	71	0	0	2	90	1159	0	1	1205	27
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1983	2560	616	2014	2573	579	1233			1159		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1983	2560	616	2014	2573	579	1233			1159		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	84	100	100	100	84			100		
cM capacity (veh/h)	32	22	433	25	21	458	561			599		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	72	2	669	579	604	630
Volume Left	1	0	90	0	1	0
Volume Right	71	2	0	0	0	27
cSH	364	458	561	1700	599	1700
Volume to Capacity	0.20	0.00	0.16	0.34	0.00	0.37
Queue Length 95th (ft)	18	0	14	0	0	0
Control Delay (s)	17.3	12.9	4.4	0.0	0.1	0.0
Lane LOS	C	B	A		A	
Approach Delay (s)	17.3	12.9	2.3		0.0	
Approach LOS	C	B				

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1: Huntington Ave & Cedar Hills Blvd

1/17/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	0	85	1	0	2	78	985	3	1	904	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.99	0.99	0.99	0.99	0.92	0.99	0.92	0.99	0.92	0.92	0.92
Hourly flow rate (vph)	7	0	86	1	0	2	79	1071	3	1	983	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1683	2219	495	1809	2221	537	989			1074		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1683	2219	495	1809	2221	537	989			1074		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	88	100	84	97	100	100	89			100		
cM capacity (veh/h)	56	38	520	38	38	488	695			645		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	92	3	614	538	492	498
Volume Left	7	1	79	0	1	0
Volume Right	86	2	0	3	0	7
cSH	328	102	695	1700	645	1700
Volume to Capacity	0.28	0.03	0.11	0.32	0.00	0.29
Queue Length 95th (ft)	28	2	10	0	0	0
Control Delay (s)	20.2	41.6	3.0	0.0	0.0	0.0
Lane LOS	C	E	A		A	
Approach Delay (s)	20.2	41.6	1.6		0.0	
Approach LOS	C	E				

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1: Huntington Ave & Cedar Hills Blvd

2/3/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	3	70	22	2	13	89	1066	25	14	1109	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.99	0.99	0.99	0.99	0.92	0.99	0.92	0.99	0.92	0.92	0.92
Hourly flow rate (vph)	1	3	71	22	2	14	90	1159	25	15	1205	27
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2024	2613	616	2056	2614	592	1233			1184		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2024	2613	616	2056	2614	592	1233			1184		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	85	84	0	90	97	84			97		
cM capacity (veh/h)	26	20	433	20	20	449	561			586		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	75	38	669	605	618	630
Volume Left	1	22	90	0	15	0
Volume Right	71	14	0	25	0	27
cSH	208	31	561	1700	586	1700
Volume to Capacity	0.36	1.23	0.16	0.36	0.03	0.37
Queue Length 95th (ft)	39	107	14	0	2	0
Control Delay (s)	31.7	427.6	4.4	0.0	0.7	0.0
Lane LOS	D	F	A		A	
Approach Delay (s)	31.7	427.6	2.3		0.4	
Approach LOS	D	F				

Intersection Summary				
Average Delay	8.4			
Intersection Capacity Utilization	83.5%	ICU Level of Service	E	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1: Huntington Ave & Cedar Hills Blvd

2/3/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	5	85	49	5	26	78	985	47	23	904	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.99	0.99	0.99	0.99	0.92	0.99	0.92	0.99	0.92	0.92	0.92
Hourly flow rate (vph)	7	5	86	49	5	28	79	1071	47	25	983	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1760	2312	495	1882	2291	559	989			1118		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1760	2312	495	1882	2291	559	989			1118		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	84	84	84	0	85	94	89			96		
cM capacity (veh/h)	40	32	520	28	33	472	695			620		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	97	83	614	583	516	498
Volume Left	7	49	79	0	25	0
Volume Right	86	28	0	47	0	7
cSH	200	42	695	1700	620	1700
Volume to Capacity	0.49	1.96	0.11	0.34	0.04	0.29
Queue Length 95th (ft)	60	216	10	0	3	0
Control Delay (s)	39.1	655.4	3.0	0.0	1.1	0.0
Lane LOS	E	F	A		A	
Approach Delay (s)	39.1	655.4	1.5		0.6	
Approach LOS	E	F				

Intersection Summary			
Average Delay	25.3		
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1: Huntington Ave & Cedar Hills Blvd

2/3/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	0	70	0	0	15	89	1066	16	0	1109	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.99	0.99	0.99	0.99	0.92	0.99	0.92	0.99	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	71	0	0	16	90	1159	16	0	1205	27
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1994	2574	616	2020	2579	587	1233			1175		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1994	2574	616	2020	2579	587	1233			1175		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	100	84	100	100	96	84			100		
cM capacity (veh/h)	30	21	433	25	21	453	561			590		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	72	16	669	596	804	429
Volume Left	1	0	90	0	0	0
Volume Right	71	16	0	16	0	27
cSH	360	453	561	1700	1700	1700
Volume to Capacity	0.20	0.04	0.16	0.35	0.47	0.25
Queue Length 95th (ft)	18	3	14	0	0	0
Control Delay (s)	17.5	13.3	4.4	0.0	0.0	0.0
Lane LOS	C	B	A			
Approach Delay (s)	17.5	13.3	2.3		0.0	
Approach LOS	C	B				

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1: Huntington Ave & Cedar Hills Blvd

2/3/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	0	85	0	0	28	78	985	30	0	904	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.99	0.99	0.99	0.99	0.92	0.99	0.92	0.99	0.92	0.92	0.92
Hourly flow rate (vph)	7	0	86	0	0	30	79	1071	30	0	983	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1709	2244	495	1821	2233	550	989			1101		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1709	2244	495	1821	2233	550	989			1101		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	87	100	84	100	100	94	89			100		
cM capacity (veh/h)	50	37	520	37	37	478	695			630		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	92	30	614	566	491	498
Volume Left	7	0	79	0	0	0
Volume Right	86	30	0	30	0	7
cSH	313	478	695	1700	630	1700
Volume to Capacity	0.29	0.06	0.11	0.33	0.00	0.29
Queue Length 95th (ft)	30	5	10	0	0	0
Control Delay (s)	21.2	13.0	3.0	0.0	0.0	0.0
Lane LOS	C	B	A			
Approach Delay (s)	21.2	13.0	1.5		0.0	
Approach LOS	C	B				

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1: Huntington Ave & Cedar Hills Blvd

2/3/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	0	70	0	0	15	89	1066	27	15	1109	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.99	0.99	0.99	0.99	0.92	0.99	0.92	0.99	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	71	0	0	16	90	1159	27	16	1205	27
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2027	2617	616	2058	2617	593	1233			1186		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2027	2617	616	2058	2617	593	1233			1186		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	100	84	100	100	96	84			97		
cM capacity (veh/h)	28	19	433	23	19	449	561			585		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	72	16	669	607	619	630
Volume Left	1	0	90	0	16	0
Volume Right	71	16	0	27	0	27
cSH	355	449	561	1700	585	1700
Volume to Capacity	0.20	0.04	0.16	0.36	0.03	0.37
Queue Length 95th (ft)	19	3	14	0	2	0
Control Delay (s)	17.7	13.3	4.4	0.0	0.8	0.0
Lane LOS	C	B	A		A	
Approach Delay (s)	17.7	13.3	2.3		0.4	
Approach LOS	C	B				

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1: Huntington Ave & Cedar Hills Blvd

2/3/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	0	85	0	0	28	78	985	50	25	904	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.99	0.99	0.99	0.99	0.92	0.99	0.92	0.99	0.92	0.92	0.92
Hourly flow rate (vph)	7	0	86	0	0	30	79	1071	51	27	983	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1764	2319	495	1885	2297	561	989			1121		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1764	2319	495	1885	2297	561	989			1121		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	85	100	84	100	100	94	89			96		
cM capacity (veh/h)	44	31	520	32	33	471	695			619		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	92	30	614	586	518	498
Volume Left	7	0	79	0	27	0
Volume Right	86	30	0	51	0	7
cSH	295	471	695	1700	619	1700
Volume to Capacity	0.31	0.06	0.11	0.34	0.04	0.29
Queue Length 95th (ft)	32	5	10	0	3	0
Control Delay (s)	22.6	13.2	3.0	0.0	1.2	0.0
Lane LOS	C	B	A		A	
Approach Delay (s)	22.6	13.2	1.5		0.6	
Approach LOS	C	B				

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		