LSC TRANSPORTATION CONSULTANTS, INC.
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May 14, 2026

John Litchenberg
COO
Fountain Valley Schools
6155 Fountain Valley School Rd
Colorado Springs, CO 80911

RE: Fountain Valley School
Academic Center
El Paso County, CO
Trip Generation/Traffic Technical Memorandum
EPC PCD File No. PPR2610

Dear Mr. Litchenberg:

In response to your request LSC Transportation Consultants, Inc., has prepared this *Trip Generation/Traffic Technical Memorandum* for the proposed Fountain Valley School Academic Center project in El Paso County Colorado. The school campus is located north of Fontaine Blvd. and east of Grinnell Blvd.

REPORT CONTENTS

A general overview of planned school improvements and details regarding the vehicular access to the school campus (no changes to the vehicular access are proposed with this project).
The projected increase in the number of enrolled students, change in the number of faculty/ staff, and information/details regarding the number of students and faculty currently residing on-campus and the anticipated residency on-campus following the project completion.
Assessment of the anticipated change in trip generation compared to the previous traffic study considering the school-specific demographics related to vehicular travel demand.
Current information/data regarding the existing area roadways, available traffic volume data and comparison to traffic volumes documented in the 2011 traffic study.

PRIOR TRAFFIC REPORT (TIS)

A previous traffic impact study was completed for school expansion. The previous report was prepared by LSC - dated April 20, 2011. That report anticipated growth in the school enrollment

from 250 students to 425 students with an estimate of daily traffic increase from 683 to 1161 vehicle trips per day. A copy of the 2011 TIS report is attached for reference.

LAND USE

General project information

Summary of Fountain Valley School Academic Center project:

- Project scope: two new campus buildings
- Anticipated impacts: The goal is to increase annual enrollment from 200 to 300 students

The proposed development project consists of the following: demolition of the existing administrative and classroom Buildings; demolition of existing site utilities; construction of a proposed 24,600 gsf humanities building; construction of a proposed 20,800 gsf STEM (Science, Technology, Engineering, and Math) building; construction of vehicular and pedestrian access within the existing campus core area; construction of utility infrastructure to support the proposed buildings and site improvements.

School Demographic Information Relative to Travel Demand

The school operations, enrollment, transportation services, employment, hours of operation and on campus residency information have been considered in this analysis. Table 1 presents the current and planned enrollment, faculty/staff, and campus residency information (IE boarding students vs. “day students” and faculty residing on campus vs. off campus and commuting.

Some notes/details:

- The school operates three bus routes.
- For day/commuter students **not** riding the bus, about 15-20 are student drivers. The remainder are dropped off and picked up by parents.
- For faculty/staff members living **on** campus, currently about 15 reside with someone. Nine of these 15 commute to work off campus and the remainder work from home.
- Currently, eleven students are also children of faculty members, and walk to school on campus.

Vehicular Access

Access to the school campus is on Grinnell Boulevard (primary access) and Goldfield Drive (secondary, gated/restricted access). No change to the campus access is proposed.

All employees and families have access to and use the "back gate". It automatically locks so the public, vendors, students, parents all use the front gate. Automated gate actuation data indicates an average of 72 per day using Goldfield access.

AREA ROADWAYS AND TRAFFIC VOLUMES

Area Roadways

Goldfield Drive is a paved, two-lane, "unimproved" roadway. It is classified as Rural Major Collector by the current MTCP.

Grinnell Boulevard is a four-lane, Urban Minor Arterial. This is a change from the 2011 TIS report. The adopted version of the MTCP at that time showed Grinnell Boulevard as a Principal Arterial.

Traffic Volumes

Grinnell Boulevard

Current Estimates Based on 2024 CDOT/MS2 Traffic Data:

The following current estimates of traffic volumes on Grinnell Boulevard north of Fontaine Boulevard are based on 2024 CDOT/MS2 Traffic Data.

- Weekday volume: 14,100 vehicles per day
- Peak hour volume count in vehicles per hour (vph) - northbound
    - AM Peak Hour: 485 vph
    - Mid-Afternoon School peak hour: 550 vph
    - PM Peak Hour: 550 vph
- Peak hour volume count in vehicles per hour (vph) - southbound
    - AM Peak Hour: 435 vph
    - Mid-Afternoon School peak hour: 450 vph
    - PM Peak Hour: 525 vph

*Volumes From the **2011 TIS Report:***

The following 2011 traffic volumes on Grinnell Boulevard north of Fontaine Boulevard have been included for comparison:

- Estimated weekday volume of 9,750 vehicles per day.
- Peak hour volume count in vehicles per hour (vph) - northbound
    - AM Peak Hour: 500 vph
    - Mid-Afternoon School peak hour: 400 vph
    - PM Peak Hour: 400 vph
- Peak hour volume count in vehicles per hour (vph) - southbound
    - AM Peak Hour: 355 vph
    - Mid-Afternoon School peak hour: 475 vph
    - PM Peak Hour: 525 vph

VEHICLE TRIP GENERATION

Table 2 shows the Trip Generation Estimate from the 2011 TIS.

Based on the information in Table 1, a reduction in trip generation is anticipated when compared to the base estimates and projections in the 2011 TIS. While the enrollment is projected to increase to 300, reductions in the numbers of day students and commuting faculty traveling to/from the school by private vehicle are shown. The currently proposed increase to 300 students would result in significantly fewer trips than the previously anticipated enrollment increase to 425 students. This is reflected in Table 1 in a qualitative summary of anticipated vehicular travel demand changes. The following two comparisons are presented:

- Currently Proposed Compared to Baseline/Existing Conditions in 2011 (from the 2011 TIS Report) (reflected in the 2011 counts and 2011 baseline trip generation in the TIS).
- Currently Proposed Compared to Proposed Future Scenario in 2011 TIS Report (basis for 2011 TIS future traffic impacts).

COUNTY ROAD IMPROVEMENT FEE PROGRAM

This project will be subject to El Paso County Roadway Improvement Impact Fees subject to the requirements of the program. As indicated in the EA meeting minutes, credit will be given for demo/removal existing buildings – IE fee calculation will be based on net new square footage of this "Institutional" land use.

* * * * *

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

Respectfully Submitted,

LSC TRANSPORTATION CONSULTANTS, INC.

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

JCH

Enclosures: Tables 1 and 2
2011 TIS Report

Table 1

School Demographics for Estimating Trip Generation

Fountain Valley School

	2011 TIS							2026 Currently Anticipated/Proposed							
								Current (2025/2026 School Yr.)				Anticipated Future (Post Expansion)			
	Total	Living on Site	Commuters: Driving	Commuters: Riding the school bus	Total Future Anticipated	Future Anticipted to Live on Site	Commuters	Current Totals	Living on Campus	Commuters: Driving	Commuters: Riding the school bus	Total Anticipated Future Number	Future Anticipted to Live on Campus	Commuters: Driving	Commuters: Riding the school bus
High School Students	250	165	26	60	335	235	100	200	140	15	45	300	210	20	70
Middle School Students	0	0	0	0	90	0	90	0	0	0	0	0	0	0	0
Faculty/Staff	103	47	56	N/A	122	68	54	100	55	45	N/A	115	55	50	N/A

2026 Additional Notes:

Average daily attendance on a typical weekday

--------> About 2-4 kids absent on average daily (per the deans office)

Estimated number of campus visitors (admissions tours, deliveries, vendors, etc.)

-------> 468 people over 7 days = 67 people per day (per visitor aware, our visitor tracking software) I ran this on data from September of 2025. Recent but not since construction stuff started.

Special Events (for reference only, not relevant to average school-day impacts): Attendance for larger events (e.g., graduation or other major gatherings) These do not need to be exact—reasonable estimates are sufficient at this stage.

-------> We have two. Graduation and Reunion. Probably about 400/500 visitors the last two weeks of May. Graduation one Saturday and Reunion the next Saturday.

Table 2
Trip Generation
Fountain Valley School

Phase/Year	Land Use Description	Value	Units [1]	Trip Generation Rates [2] Average Weekday	A.M. Peak Hour In	A.M. Peak Hour Out	School P.M. Peak Hour In	School P.M. Peak Hour Out	P.M. Peak Hour		Total Trips Generated Average Weekday [3]	A.M. Peak Hour [4] In	A.M. Peak Hour [4] Out	School P.M. Peak Hour [4] In	School P.M. Peak Hour [4] Out	P.M. Peak Hour [4] In	P.M. Peak Hour [4] Out
For Reference: Trip Generation Estimate from 2011 TIS																	
Existing 2011	Fountain Valley School	**250**	Students	2.73	0.20	0.06	0.10	0.18	0.10	0.15	683	49	16	25	45	24	38
Proposed in 2011	Fountain Valley School	**425**	Students	2.73	0.20	0.06	0.10	0.18	0.10	0.15	1,161	83	27	43	77	41	55

Summary of Anticipated Vehicular Travel Demand Changes (based on Table 1)

Current - 2026	Fountain Valley School	**200**	Students
Currently Proposed	Fountain Valley School	**300**	Students

Currently Proposed Compared to Baseline/Existing Conditions in 2011 (from the 2011 TIS Report) (reflected in the 2011 counts and 2011 baseline trip generation in the TIS)

School travel-demand/ "demographic" change	Anticipated Vehicular Trip Generation Change
Change in number of students driving to Campus - day students/commuters	Decrease
Change in number of faculty/staff driving to Campus - commuting vs. living on campus	Decrease
Change in number of bus trips (resulting from change in the number of day students riding the bus)	Likely no change, but possiby an increase by 1-2 bus trips.
Change in the number of other trips by spouses and family members of Faculty	Minor Increase
Change in the number of other trips to/from the school as a function of change in the enrollment and faculty staff (general school size) (campus visitors such as admissions tours, deliveries, vendors, etc.)	Potential Minor Increase
Overall	**Decrease**

Currently Proposed Compared to Proposed Future Scenario in 2011 TIS Report (basis for 2011 TIS future traffic impacts)

School travel-demand/"demographic" change	Anticipated Vehicular Trip Generation Difference
Change in number of students driving to Campus - day students/commuters	Decrease
Change in number of faculty/staff driving to Campus - commuting vs. living on campus	Decrease
Change in number of Middle School Trips Generated	Decrease to zero - No Middle school currently proposed
Change in number of bus trips (resulting from change in the number of day students riding the bus)	Likely no change, but possiby an increase by 1-2 bus trips.
Change in the number of other trips by spouses and family members of Faculty	Minor decrease
Change in the number of other trips to/from the school as a function of change in the enrollment and faculty staff (general school size) (campus visitors such as admissions tours, deliveries, vendors, etc.)	Minor decrease
Overall	**Decrease**

May 14, 2026

April 20, 2011

Mr. Wayne M. Timura, P.E.
Next Level Development, Inc.
118 North Tejon Street, Suite 205
Colorado Springs, Colorado 80903

RE: Fountain Valley School
Traffic Impact Analysis
LSC #104330

Dear Mr. Timura:

In response to your request, LSC Transportation Consultants, Inc. (LSC) has prepared this traffic impact analysis for the proposed expansion of the Fountain Valley School. As shown on Figure 1, the school campus is located north of Fontaine Boulevard and east of Grinnell Boulevard in El Paso County, Colorado.

REPORT CONTENTS

This report is being prepared for submittal to El Paso County. The report includes: the existing street and traffic conditions in the vicinity of the site, the proposed expansion plan, the projected increase in trip generation, and level of service analyses for the short term and long term at the site access on Grinnell Boulevard for typical weekday school operation. An appendix figure has been included to show that the expansion of the site will have less than a ten percent impact at the nearest major off-site intersections to the north and south along Grinnell Boulevard.

SITE DEVELOPMENT AND LAND USE

The Fountain Valley School currently consists of 250 high school students (165 of whom live on-site) and 103 faculty/staff (47 of whom live on-site). The proposed expansion of the school would allow for up to 335 high school students (235 living on-site), 90 middle school students (none living on-site and 90 day students), and 122 faculty/staff (68 living on-site). The expansion would include the addition of classroom space, a fitness center, athletic facilities (including a possible ice arena), a performing arts center, administration space, student dormitories, and faculty housing. Currently, the school provides bus service for the 85 day students. About 70 percent of day students utilize the bus service. The bus service would be expanded to serve, as much as possible, the planned new middle school day students.

The school has an existing access on Grinnell Boulevard located approximately 3,000 feet north of Fontaine Boulevard that aligns with Crandall Drive. There is also an emergency-only access on Goldfield Drive. No additional access points are proposed as part of the expansion plan.

STREET AND TRAFFIC CONDITIONS

Area Streets

The key streets in the vicinity of the site are shown on Figure 1 and are described below.

- **Grinnell Boulevard** is shown on the *El Paso County 2030 Major Transportation Corridors Plan* and the *Preserved Corridor Network* as a four-lane Principal Arterial extending south from Powers Boulevard to Fontaine Boulevard. In the vicinity of Fountain Valley School Road, Grinnell Boulevard is a four-lane median-divided street with a posted speed limit of 50 miles per hour (mph).

- **Fountain Valley School Road** is a 26- to 30-foot-wide roadway extending east from Grinnell Boulevard and serving as the access for Fountain Valley School. The posted speed limit is 25 mph. It aligns with Crandall Drive at Grinnell Boulevard, creating a four-leg, two-way stop-sign-controlled intersection.

- **Crandall Drive** is a 36-foot-wide residential street extending west from Grinnell Boulevard to Crawford Avenue. It has a posted speed limit of 30 mph.

Existing Traffic Conditions

Figure 2 shows the existing peak-hour traffic volumes at the Grinnell Boulevard/Fountain Valley School Road intersection and the average daily traffic volume on Fountain Valley School Road. The traffic volumes are from traffic counts conducted by LSC in May 2010. The traffic count reports are attached. Figure 2 also shows estimates of the current average weekday traffic based on the peak-hour counts as well as a 2007 count on Grinnell by El Paso County.

Existing Levels of Service

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection. Level of service is indicated on a scale from "A" to "F." LOS A is indicative of very little congestion or delay. LOS F is indicative of a high level of congestion or delay. Attached is a more detailed description of levels of service.

The Grinnell Boulevard/Fountain Valley School Road intersection was analyzed to determine the existing levels of service based on the unsignalized method of analysis procedures found in the *Highway Capacity Manual, 2000 Edition* by the Transportation Research Board. Figure 3 shows the level of service analysis results. The level of service reports are attached

TRIP GENERATION

The estimated traffic volumes expected to be generated by the site after the proposed expansion were based on the existing trip generation and the anticipated/planned potential growth in the student population. Table 1 shows the existing trip generation of the school based on the traffic counts at the site access. The table also shows the estimated future trip generation of the school assuming the student enrollment reaches the new capacity of 425 students. The future trip generation was calculated by increasing the existing trip generation by the ratio at which the student population is expected to increase, or 70 percent. Although the percentage of students living off-site will increase from 34 percent to 45 percent, the percentage of faculty/staff living off-site will decrease from 54 percent to 44 percent and the total percentage of students bussed to school is expected to increase in the future, as most of the new middle school students will potentially be bussed, whereas some of the high school students drive themselves to school. Also, with additional grade levels being offered, it is more likely that for those families driving day students, there will be some level of increased trip reduction associated with siblings attending Fountain Valley School—for example, a middle school student and a high school student from the same family.

After expansion, the school is projected to generate about 1,160 vehicle-trips on the average weekday, with about half of the vehicles entering and half of the vehicles exiting the site during a 24-hour period. During the morning peak hour, which typically occurs for one hour between 6:30 and 8:30 a.m., about 85 vehicles would enter and 25 vehicles would exit the site. During the mid-afternoon peak hour, which was shown to occur between about 3:00 and 4:00 p.m., about 45 vehicles would enter and 75 vehicles would exit the site. During the afternoon peak hour, which typically occurs for one hour between 4:15 and 6:15 p.m., about 40 vehicles would enter and 65 vehicles would exit the site.

2018 TOTAL TRAFFIC

Figure 3 shows the projected 2018 total traffic volumes assuming full enrollment of 425 students. Although the full increase in student enrollment is unlikely to occur in only eight years, the year 2018 was chosen as the short-term horizon in order to analyze the impacts of the proposed expansion in the short term. The full growth in student enrollment could take as long as 20 to 25 years. The 2018 total traffic volumes at Grinnell/Fountain Valley School were developed by increasing the existing traffic volumes on the east leg of the intersection by 70 percent and increasing the existing through traffic (background traffic) on Grinnell Boulevard by two percent per year.

2035 TOTAL TRAFFIC

Figure 4 shows the total traffic volumes for the year 2035. The 2035 total traffic volumes at Grinnell/ Fountain Valley School were developed by increasing the existing traffic volumes on the east leg of the intersection by 70 percent and increasing the existing through traffic on Grinnell Boulevard by two percent per year.

PROJECTED LEVELS OF SERVICE

The Grinnell Boulevard/Fountain Valley School Road intersection was analyzed to determine the projected levels of service for the 2018 and 2035 total traffic volumes based on the unsignalized method of analysis procedures found in the *Highway Capacity Manual, 2000 Edition* by the Transportation Research Board. Figures 3 and 4 show the level of service analysis results. The level of service reports are attached.

SIGNAL WARRANT ANALYSIS

A four-hour traffic signal warrant analysis was completed for the Grinnell Boulevard/Fountain Valley School Road intersection using the existing traffic volumes and the projected 2018 and 2035 total traffic volumes. The 70-percent factor was used because Grinnell Boulevard's 50 mph posted speed limit is above 40 mph.

Figure 5 shows the four-hour warrant chart. As shown in the figure, the four-hour traffic signal warrant is not currently met and is not projected to be met based on the 2018 and 2035 traffic volumes. Based on the traffic projections in this report, the expansion of the Fountain Valley School will not trigger the need for a signal at Grinnell Boulevard/Fountain Valley School Road.

CONCLUSIONS

Trip Generation

1. After expansion, the school is projected to generate about 1,160 vehicle-trips on the average weekday, with about half of the vehicles entering and half of the vehicles exiting the site during a 24-hour period. During the morning peak hour, about 85 vehicles would enter and 25 vehicles would exit the site. During the mid-afternoon peak hour, about 45 vehicles would enter and 75 vehicles would exit the site. During the afternoon peak hour, about 40 vehicles would enter and 65 vehicles would exit the site.

Projected Levels of Service

2. The Grinnell Boulevard/Fountain Valley School Road intersection is projected to operate at acceptable levels of service during the peak hours through the year 2035.

Auxiliary Turn Lanes

3. Based on the *El Paso County Engineering Criteria Manual*, the required length of the southbound left-turn lane on Grinnell Boulevard approaching Fountain Valley School Road is 290 feet plus a 200-foot taper. The existing left-turn lane is 320 feet plus a 180-foot taper, which is adequate.

4. Based on the *El Paso County Engineering Criteria Manual* and the projected post-expansion site-generated traffic volumes, a northbound right-turn deceleration lane on Grinnell Boulevard approaching Fountain Valley School Road would be required by code. Although current traffic volumes do not meet the 25-vehicles-per-hour threshold for a right-turn deceleration lane, the ten-foot paved shoulder has been striped for a right-turn lane and the paved shoulder continues south of the striped turn-lane taper.

5. Based on the projected post-expansion site-generated westbound right-turning traffic volumes, the criteria contained in the *El Paso County Engineering Criteria Manual* indicate that a northbound right-turn acceleration lane would be required (in the future, once the peak-hour exiting right-turning traffic volume exceeds 50 vehicles per hour). Existing constraints on the east side of Grinnell Boulevard could make it difficult, if not infeasible, to widen Grinnell to accommodate a standard 12-foot northbound right-turn acceleration lane. There is a County storm water channel along the east side of Grinnell Boulevard. In my judgement, given the site-specific conditions, this acceleration lane would not be necessary and LSC would submit a County deviation request form to request the acceleration lane requirement be waived. It is our understanding that the submittal of this deviation request can be deferred until a later stage in the process.

* * * * *

We trust this traffic impact analysis will assist you in gaining approval of the proposed expansion of the Fountain Valley School. Please contact me if you have any questions or need further assistance.

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.

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

COLORADO REGISTERED
JEFFREY C HODSDON
31684
4-20-11
PROFESSIONAL ENGINEER

JCH:EJL:bjwb

Enclosures: Table 1
Figures 1-5
Appendix Figure
Level of Service Definitions
Traffic Count Reports
Level of Service Reports

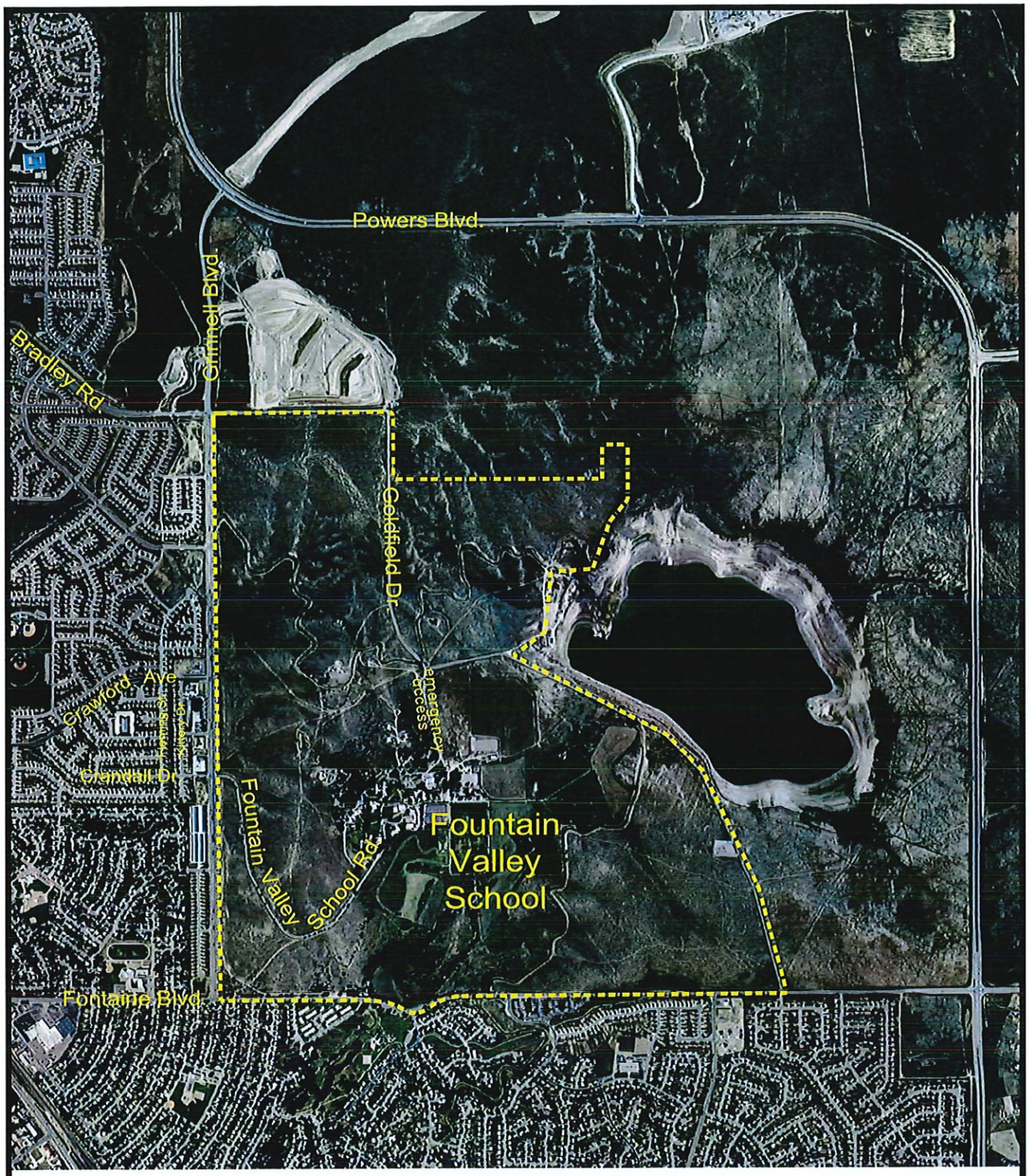
Table 1
Fountain Valley School
Trip Generation Estimates

Land Use Description	Trip Generation Units	Trip Generation Rates [1]							Total Trips Generated						
		Average Weekday Traffic	Morning Peak Hour		Mid-Afternoon Peak Hour		Afternoon Peak Hour		Average Weekday Traffic	Morning Peak Hour		Mid-Afternoon Peak Hour		Afternoon Peak Hour	
			In	Out	In	Out	In	Out		In	Out	In	Out	In	Out
Current Enrollment															
Fountain Valley School	250 Students	2.73	0.20	0.06	0.10	0.18	0.10	0.15	683	49	16	25	45	24	38
Post-Expansion Enrollment															
Fountain Valley School	425 Students	2.73	0.20	0.06	0.10	0.18	0.10	0.15	1,161	83	27	43	77	41	65

Notes:

(1) Trip generation rate source: traffic counts conducted by LSC at the Fountain Valley School access in May, 2010

Source: LSC Transportation Consultants, Inc.



N

Not to Scale

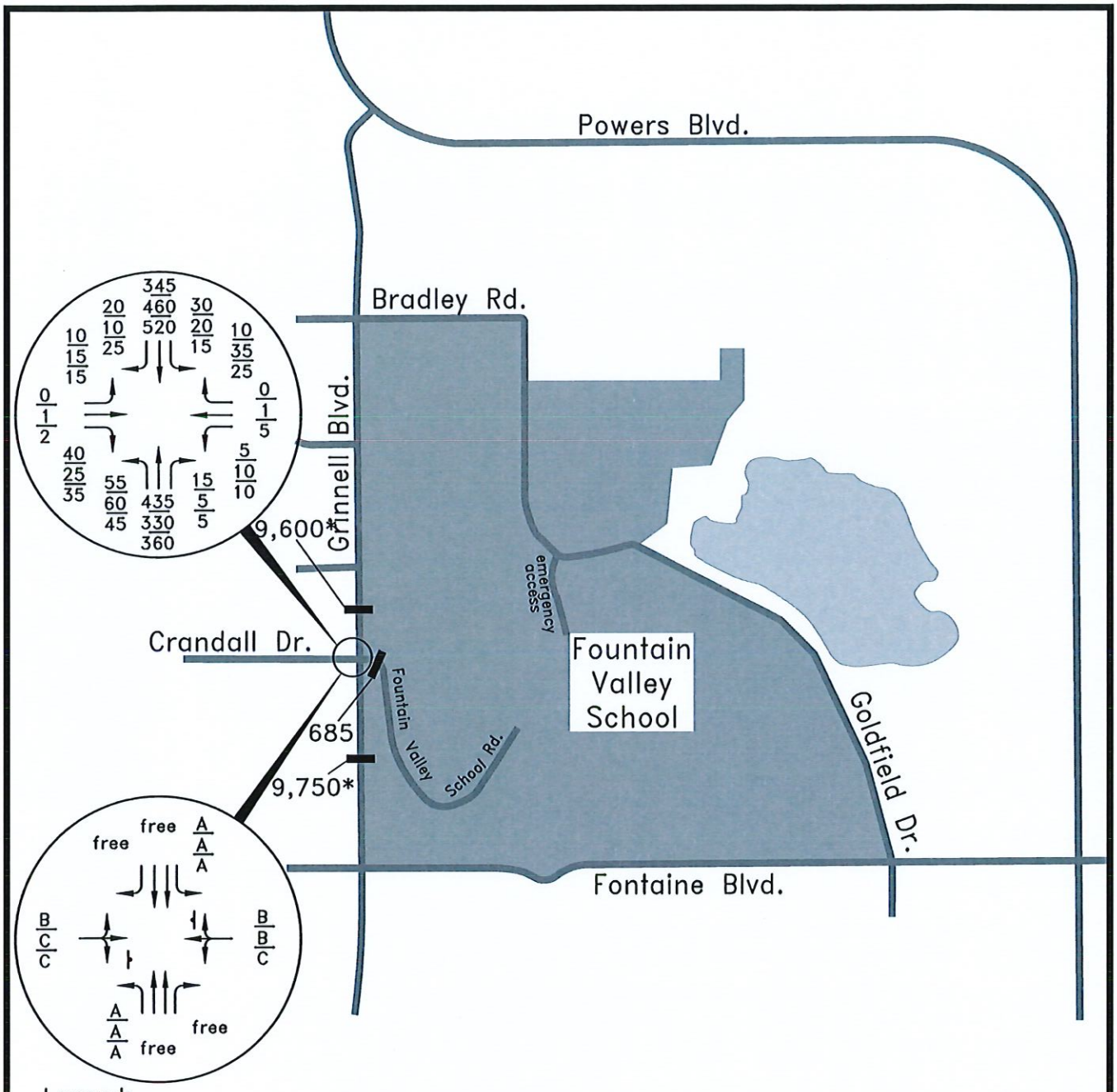
LSC TRANSPORTATION CONSULTANTS, INC.

Vicinity Map

Fountain Valley School

Figure 1

LSC # 104330



Legend:

xxx am / xxx school / xxx pm —Weekday peak-hour traffic (vehicles per hour)

X,XXX —Average weekday traffic (vehicles per day) (counts by LSC 5/10) (*estimates by LSC)

xxx am / xxx school / xxx pm —Individual movement peak-hour Level of Service

—Stop sign

N

Not to Scale

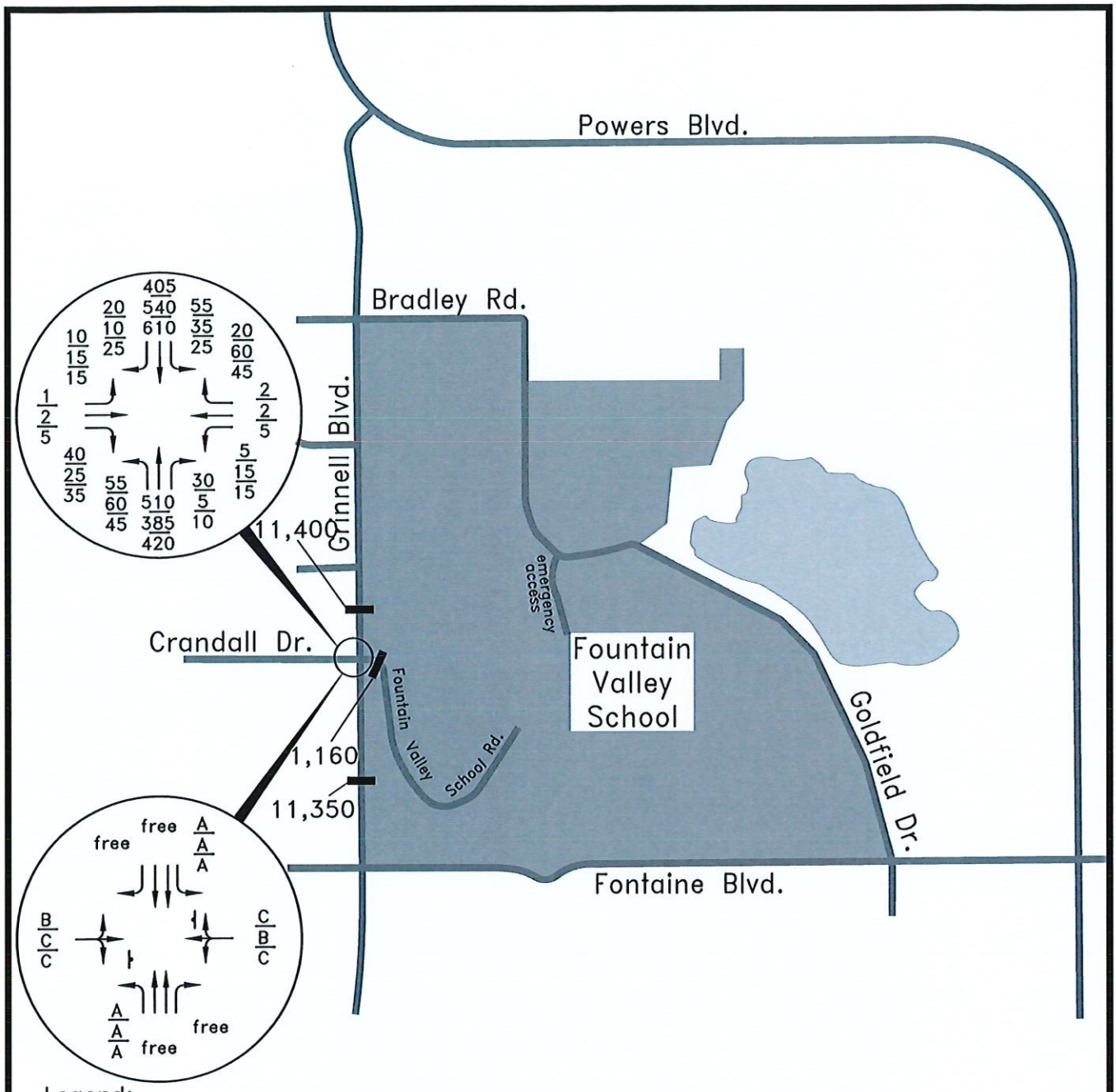
Existing Traffic, Lane Geometry, Traffic Control and Level of Service

Fountain Valley School

Figure 2

LSC # 104330

LSC TRANSPORTATION CONSULTANTS, INC.



Legend:

xxx am
xxx school –Weekday peak–hour traffic (vehicles per hour)
xxx pm

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

xxx am
xxx school –Individual movement peak–hour Level of Service
xxx pm

–Stop sign

Not to Scale

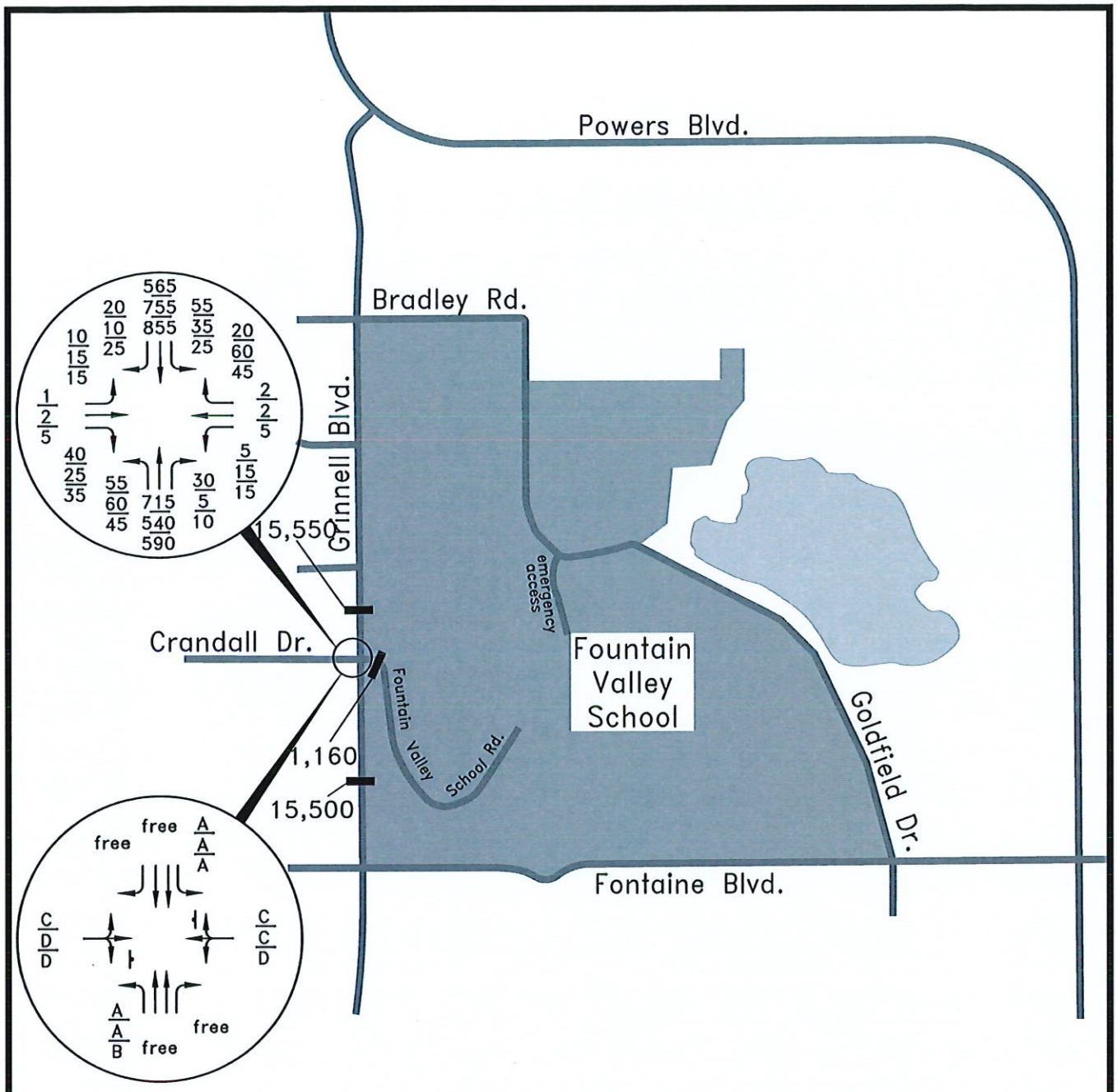
2018 Total Traffic, Lane Geometry, Traffic Control and Level of Service

Fountain Valley School

Figure 3

LSC # 104330

TRANSPORTATION CONSULTANTS, INC.



Legend:

xxx am / xxx school / xxx pm –Weekday peak-hour traffic (vehicles per hour)

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

xxx am / xxx school / xxx pm –Individual movement peak-hour Level of Service

–Stop sign

N

Not to Scale

2035 Total Traffic, Lane Geometry, Traffic Control and Level of Service

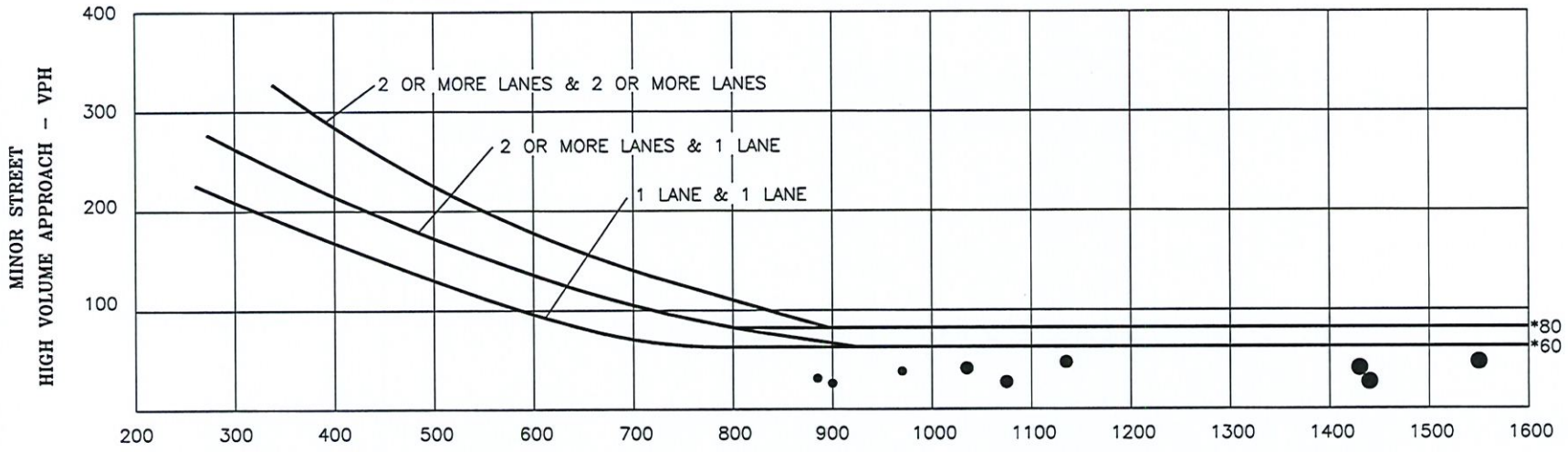
Fountain Valley School

Figure 4

LSC # 104330

TRANSPORTATION CONSULTANTS, INC.

Figure 4C–2 Warrant 2, Four–Hour Vehicular Volume (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h (40mph) ON MAJOR STREET)



* Note: 80 vph applies as the lower threshold volumes for a minor–street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor–street approach with one lane.

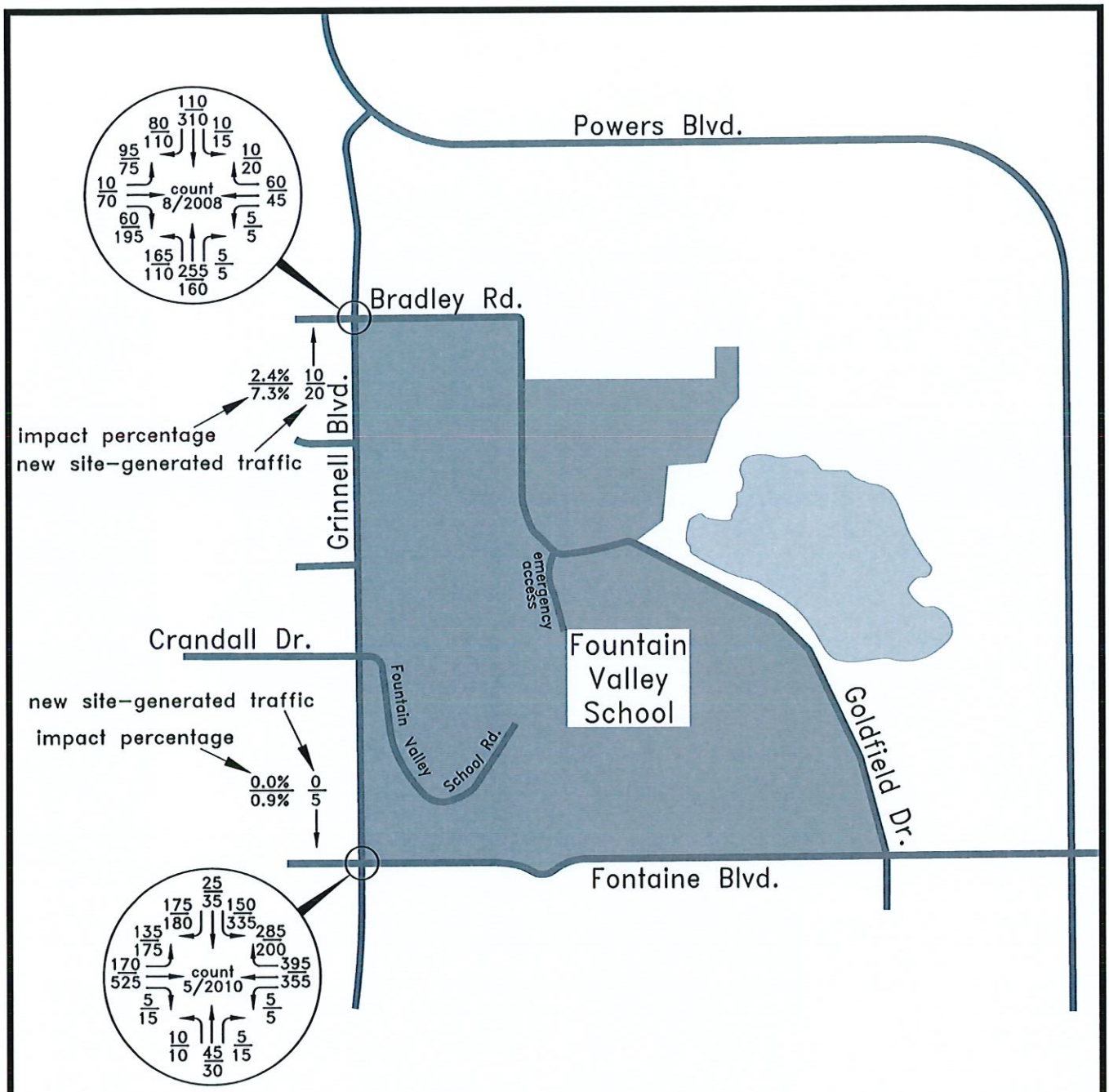
• –Existing traffic
● –2018 traffic
● –2035 traffic

TRANSPORTATION CONSULTANTS, INC.

Grinnell Boulevard/Fountain Valley School Road
Four-Hour Signal Warrant Chart

Fountain Valley School

Figure 5
LSC # 104330



LSC TRANSPORTATION CONSULTANTS, INC.

Off-Site Impact Percentages

Fountain Valley School

Appendix

LSC # 104330

Level of Service Definitions

The following descriptions have been adopted directly from the Transportation Research Board's *Highway Capacity Manual (HCM 2000), Fourth Edition.* The methodologies used in the preceding report are consistent with the descriptions listed herein and within the original text.

Quality of service requires quantitative measures to characterize operational conditions within a traffic stream. Level of service (LOS) is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience.

Six levels of service are defined for each type of facility that has analysis procedures available. Letters designate each level, from A to F, with LOS A representing the best operating conditions and LOS F the worst. Each level of service represents a range of operating conditions and the driver's perception of those conditions. Safety is not included in the measures that establish service levels.

SERVICE FLOW RATES

The analytical methods in the HCM 2000 attempt to establish or predict the maximum flow rate for various facilities at each level of service—except for LOS F, for which the flows are unstable or the vehicle delay is high. Thus, each facility has five service flow rates, one for each level of service (A through E). For LOS F, it is difficult to predict flow due to stop-and-start conditions.

The service flow rate is the maximum hourly rate at which persons or vehicles reasonably can be expected to traverse a point or uniform segment of a lane or roadway during a given period under prevailing roadway, traffic, and control conditions while maintaining a designated level of service. The service flow rates generally are based on a 15-minute period. Typically, the hourly service flow rate is defined as four times the peak 15-minute volume.

Note that service flow rates are discrete values, whereas levels of service represent a range of conditions. Because the service flow rates are the maximums for each level of service, they effectively define the flow boundaries between levels of service.

Most design or planning efforts typically use service flow rates at LOS C or D, to ensure an acceptable operating service for facility users.

SIGNALIZED INTERSECTIONS LEVEL OF SERVICE

The average control delay per vehicle is estimated for each lane group and aggregated for each approach and for the intersection as a whole. LOS is directly related to the control delay value. The criteria are listed in the following table.

Level of Service Criteria for Signalized Intersections	
Level of Service	**Control Delay per Vehicle (Sec/Veh)**
A	≤10
B	>10 - 20
C	>20 - 35
D	>35 - 55
E	>55 - 80
F	>80
Source: Highway Capacity Manual 2000, Exhibit 16-2.	

UNSIGNALIZED INTERSECTIONS LEVEL OF SERVICE

Level of service (LOS) for a TWSC intersection is determined by the computed or measure control delay and is defined for each minor movement. LOS is not defined for the intersection as a whole. LOS criteria are shown in the following table.

Level of Service Criteria for TWSC* Intersections	
Level of Service	**Average Control Delay (Sec/Veh)**
A	0 - 10
B	>10 - 15
C	>15 - 25
D	>25 - 35
E	>35 - 50
F	>50
*TWSC - Two-Way Stop Controlled	
Source: Highway Capacity Manual 2000, Exhibit 17-2.	

LSC Transportation Consultants, Inc.
516 N. Tejon St.
Colorado Springs, CO
(719) 633-2868

LSC Transportation Consultants, Inc.

File Name : Grinnell - Fontaine AM
Site Code : 00000000
Start Date : 05/13/2010
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Groups Printed- Unshifted

	Grinnell From North				Fontaine From East				Grinnell From South				Fontaine From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:45 AM	50	2	23	0	48	102	1	0	0	8	1	0	0	27	16	0	278
Total	50	2	23	0	48	102	1	0	0	8	1	0	0	27	16	0	278
07:00 AM	46	9	55	0	64	84	0	0	2	11	3	0	2	48	29	0	353
07:15 AM	46	7	26	0	71	114	2	0	1	20	2	0	1	48	42	0	380
07:30 AM	52	4	43	0	83	103	1	0	0	11	3	0	2	33	34	0	369
07:45 AM	29	5	26	0	68	94	0	0	0	4	2	0	2	40	28	0	298
Total	173	25	150	0	286	395	3	0	3	46	10	0	7	169	133	0	1400
08:00 AM	31	7	37	0	55	76	0	0	0	9	2	0	0	47	23	0	287
Grand Total	254	34	210	0	389	573	4	0	3	63	13	0	7	243	172	0	1965
Apprch %	51.0	6.8	42.2	0.0	40.3	59.3	0.4	0.0	3.8	79.7	16.5	0.0	1.7	57.6	40.8	0.0	
Total %	12.9	1.7	10.7	0.0	19.8	29.2	0.2	0.0	0.2	3.2	0.7	0.0	0.4	12.4	8.8	0.0	

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File Name : Grinnell - Fontaine PM
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Start Date : 05/12/2010
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Groups Printed- Unshifted

	Grinnell From North				Fontaine From East				Grinnell From South				Fontaine From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
03:00 PM	21	6	76	0	46	81	0	0	1	10	2	0	2	112	33	0	390
03:15 PM	43	9	81	0	60	74	0	0	2	12	5	0	5	123	28	0	442
03:30 PM	27	5	72	0	52	68	6	0	5	14	3	0	3	101	41	0	397
03:45 PM	32	5	84	0	46	85	1	0	1	8	3	0	1	120	29	0	415
Total	123	25	313	0	204	308	7	0	9	44	13	0	11	456	131	0	1644
04:00 PM	37	5	77	0	54	69	1	0	2	4	1	0	1	114	40	0	405
04:15 PM	31	6	70	0	35	85	1	0	2	9	3	0	6	147	35	0	430
04:30 PM	37	6	84	0	36	77	2	0	5	9	1	0	3	132	34	0	426
04:45 PM	36	10	87	0	52	109	1	0	2	5	4	0	3	139	43	0	491
Total	141	27	318	0	177	340	5	0	11	27	9	0	13	532	152	0	1752
05:00 PM	52	7	74	0	59	95	0	0	4	8	3	0	3	120	49	0	474
05:15 PM	54	11	88	0	53	76	2	1	3	7	1	0	4	133	47	0	480
Grand Total	370	70	793	0	493	819	14	1	27	86	26	0	31	1241	379	0	4350
Apprch %	30.0	5.7	64.3	0.0	37.2	61.7	1.1	0.1	19.4	61.9	18.7	0.0	1.9	75.2	23.0	0.0	
Total %	8.5	1.6	18.2	0.0	11.3	18.8	0.3	0.0	0.6	2.0	0.6	0.0	0.7	28.5	8.7	0.0	

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Groups Printed- Unshifted

	Grinnell From North				Fountain Valley School From East				Grinnell From South				Crandall From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:45 AM	0	13	2	0	0	0	0	0	1	17	0	0	3	0	1	0	37
06:50 AM	0	26	3	0	0	0	0	0	1	28	1	0	6	0	0	0	65
06:55 AM	0	23	2	0	0	0	0	0	0	19	1	0	1	0	0	0	46
Total	0	62	7	0	0	0	0	0	2	64	2	0	10	0	1	0	148
07:00 AM	1	27	1	0	1	0	0	0	0	24	1	0	3	0	0	0	58
07:05 AM	0	42	1	0	0	0	1	0	1	40	4	0	3	0	1	0	93
07:10 AM	0	32	0	0	1	0	0	0	0	33	6	0	3	0	2	0	77
07:15 AM	0	33	3	0	0	0	1	0	0	45	2	0	11	0	1	0	96
07:20 AM	1	33	2	0	2	0	0	0	1	38	9	0	6	0	1	0	93
07:25 AM	2	31	1	0	1	0	0	0	1	46	4	0	1	0	2	0	89
07:30 AM	0	22	2	0	2	0	0	0	4	37	5	0	3	0	1	0	76
07:35 AM	1	41	9	0	2	0	1	0	3	43	3	0	3	0	0	0	106
07:40 AM	5	27	1	0	0	0	0	0	2	33	6	0	1	0	0	0	75
07:45 AM	2	19	1	0	1	0	1	0	1	32	5	0	3	0	0	0	65
07:50 AM	5	11	5	0	0	0	0	0	2	34	7	0	2	0	0	0	66
07:55 AM	3	27	6	0	2	0	0	0	2	29	3	0	0	0	0	0	72
Total	20	345	32	0	12	0	4	0	17	434	55	0	39	0	8	0	966
08:00 AM	2	16	3	1	2	0	0	0	2	19	5	0	1	1	2	0	54
08:05 AM	3	29	1	0	0	0	1	0	1	19	5	0	0	0	2	0	61
08:10 AM	1	21	1	0	2	0	1	0	0	36	4	0	3	0	3	0	72
Grand Total	26	473	44	1	16	0	6	0	22	572	71	0	53	1	16	0	1301
Apprch %	4.8	86.9	8.1	0.2	72.7	0.0	27.3	0.0	3.3	86.0	10.7	0.0	75.7	1.4	22.9	0.0	
Total %	2.0	36.4	3.4	0.1	1.2	0.0	0.5	0.0	1.7	44.0	5.5	0.0	4.1	0.1	1.2	0.0	

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File Name : Grinnell - Fountain Valley School PM
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Groups Printed- Unshifted

	Grinnell From North				Fountain Valley School From East				Grinnell From South				Crandall From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
03:00 PM	0	31	0	0	2	0	0	0	0	19	7	0	4	1	0	0	64
03:05 PM	3	36	0	0	3	0	1	0	0	29	9	0	1	0	1	0	83
03:10 PM	0	28	2	0	4	0	4	0	0	25	6	0	3	0	3	0	75
03:15 PM	2	47	3	0	0	0	0	0	0	29	3	0	4	0	2	0	90
03:20 PM	0	52	5	0	0	0	0	0	0	32	3	0	0	0	1	0	93
03:25 PM	0	38	0	0	2	0	0	0	1	23	5	0	1	0	2	0	72
03:30 PM	0	36	2	0	5	0	2	0	0	36	4	0	0	0	0	0	85
03:35 PM	3	31	1	0	7	0	0	0	1	29	4	0	3	0	2	0	81
03:40 PM	0	34	4	0	5	0	2	0	0	33	7	0	2	0	0	0	87
03:45 PM	1	29	1	0	4	0	0	0	0	28	5	0	4	0	1	0	73
03:50 PM	2	53	0	0	2	1	0	0	0	26	3	0	1	0	0	0	88
03:55 PM	1	43	2	0	1	0	0	0	2	23	2	0	2	0	2	0	78
Total	12	458	20	0	35	1	9	0	4	332	58	0	25	1	14	0	969
04:00 PM	2	34	4	0	0	0	0	0	0	33	4	0	2	0	1	0	80
04:05 PM	1	39	1	0	1	0	0	0	0	32	3	0	3	0	2	0	82
04:10 PM	3	40	0	0	2	0	0	0	0	23	4	0	4	0	2	0	78
04:15 PM	3	39	1	0	1	1	0	0	0	25	2	0	2	1	2	0	77
04:20 PM	1	41	2	0	1	0	0	0	1	23	2	0	1	0	1	0	73
04:25 PM	2	33	1	0	2	1	0	0	0	32	4	0	4	0	0	0	79
04:30 PM	1	40	4	0	1	0	1	0	0	30	5	0	1	0	0	0	83
04:35 PM	5	34	1	0	2	0	2	0	0	23	3	0	3	1	1	0	75
04:40 PM	5	47	1	0	0	0	1	0	1	14	3	0	2	0	1	0	75
04:45 PM	5	46	2	0	1	0	1	0	0	23	5	0	2	0	2	0	87
04:50 PM	1	41	0	0	0	0	1	0	0	36	6	0	1	0	2	0	88
04:55 PM	0	36	2	0	1	0	0	0	1	31	4	0	4	0	2	0	81
Total	29	470	19	0	12	2	6	0	3	325	45	0	29	2	16	0	958
05:00 PM	1	42	1	1	3	0	0	0	2	30	2	0	1	0	1	0	84
05:05 PM	4	40	3	0	6	1	0	0	1	34	4	0	7	0	1	0	101
05:10 PM	0	49	1	0	3	2	1	0	0	41	4	0	4	0	4	0	109
05:15 PM	0	49	0	0	3	0	1	0	0	33	2	0	2	1	1	0	92
05:20 PM	2	47	0	0	2	0	1	0	0	34	3	0	5	0	0	0	94
05:25 PM	1	50	1	0	3	0	1	0	1	30	6	0	3	0	1	0	97
Grand Total	49	1205	45	1	67	6	19	0	11	859	124	0	76	4	38	0	2504
Apprch %	3.8	92.7	3.5	0.1	72.8	6.5	20.7	0.0	1.1	86.4	12.5	0.0	64.4	3.4	32.2	0.0	
Total %	2.0	48.1	1.8	0.0	2.7	0.2	0.8	0.0	0.4	34.3	5.0	0.0	3.0	0.2	1.5	0.0	

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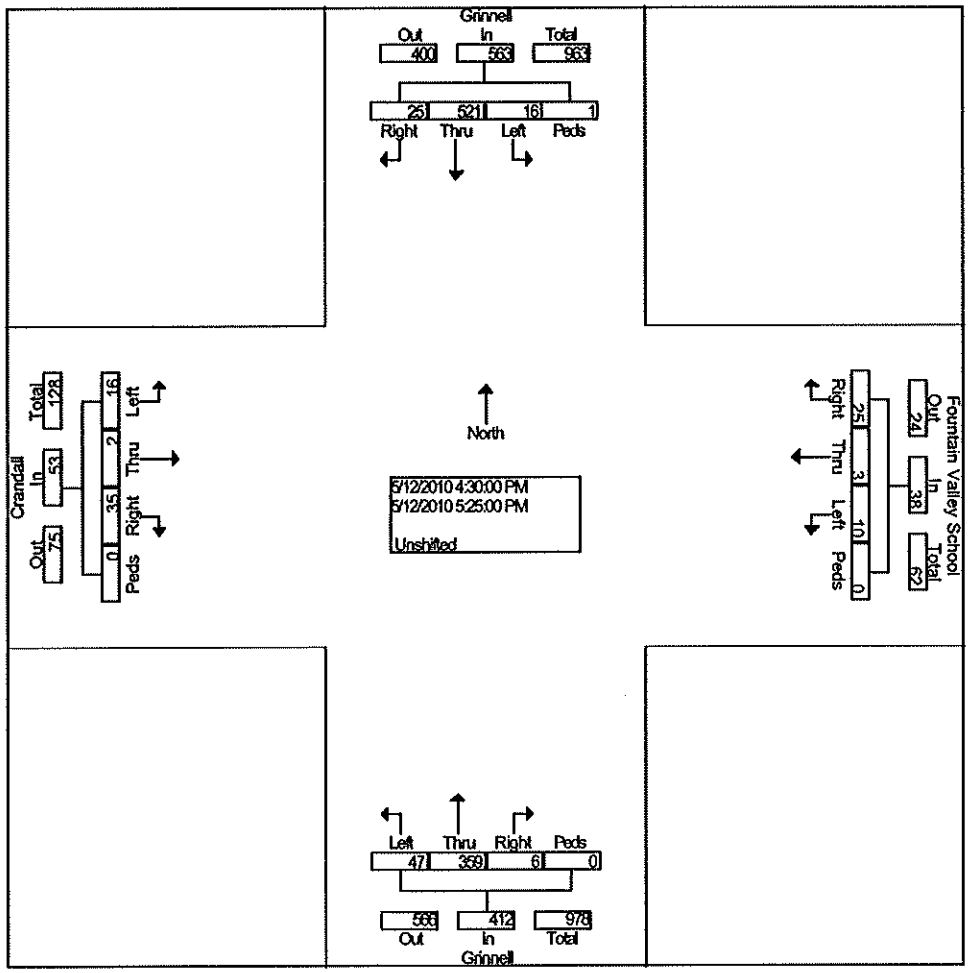
	Grinnell From North					Fountain Valley School From East					Grinnell From South					Crandall From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 03:00 PM to 05:25 PM - Peak 1 of 1																					
Intersection	04:30 PM																				
Volume	25	521	16	1	563	25	3	10	0	38	6	359	47	0	412	35	2	16	0	53	1066
Percent	4.4	92.5	2.8	0.2		65.8	7.9	26.3	0.0		1.5	87.1	11.4	0.0		66.0	3.8	30.2	0.0		
05:10 Volume	0	49	1	0	50	3	2	1	0	6	0	41	4	0	45	4	0	4	0	8	109
Peak Factor																					0.815
High Int.	04:40 PM					05:05 PM					05:10 PM					05:05 PM					
Volume	5	47	1	0	53	6	1	0	0	7	0	41	4	0	45	7	0	1	0	8	
Peak Factor					0.885					0.452					0.763					0.552	



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File Name : Grinnell - Fountain Valley School AM
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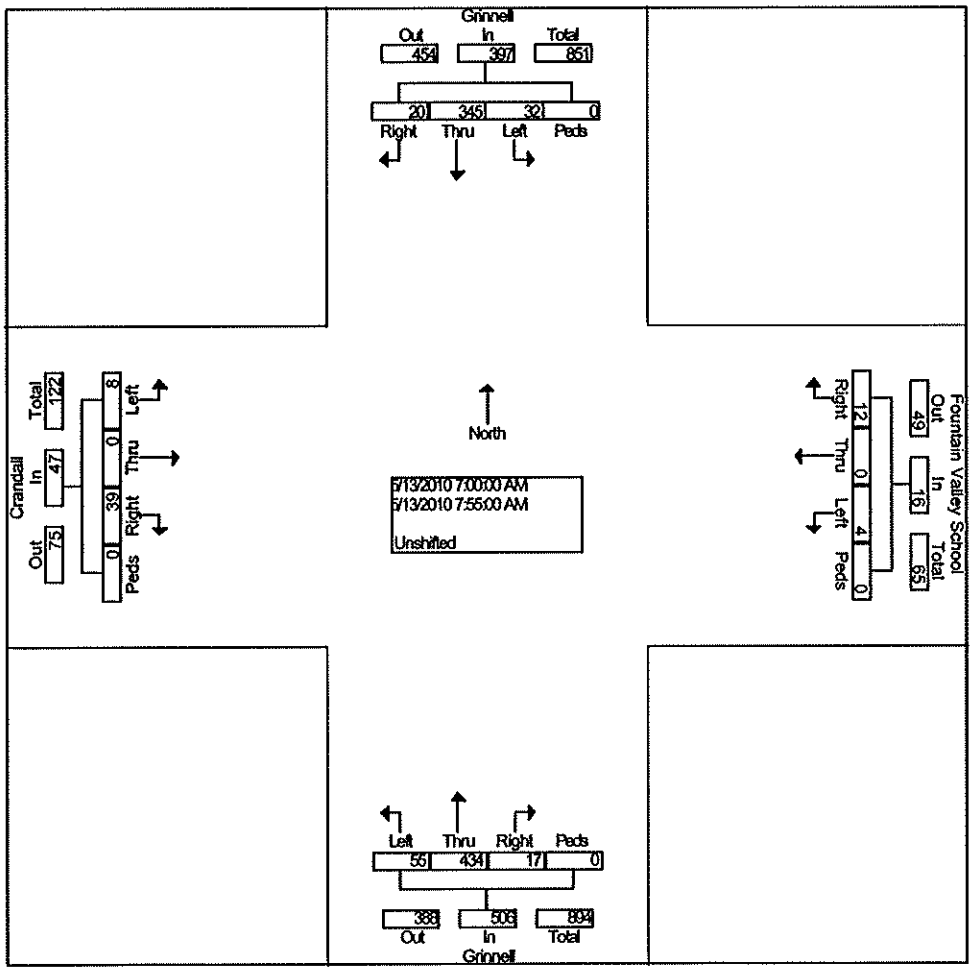
	Grinnell From North					Fountain Valley School From East					Grinnell From South					Crandall From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 06:45 AM to 08:10 AM - Peak 1 of 1																					
Intersection	07:00 AM																				
Volume	20	345	32	0	397	12	0	4	0	16	17	434	55	0	506	39	0	8	0	47	966
Percent	5.0	86.9	8.1	0.0		75.0	0.0	25.0	0.0		3.4	85.8	10.9	0.0		83.0	0.0	17.0	0.0		
07:35 Volume	1	41	9	0	51	2	0	1	0	3	3	43	3	0	49	3	0	0	0	3	106
Peak Factor																					0.759
High Int.	07:35 AM					07:35 AM					07:25 AM					07:15 AM					
Volume	1	41	9	0	51	2	0	1	0	3	1	46	4	0	51	11	0	1	0	12	
Peak Factor					0.649					0.444					0.827					0.326	



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File Name : Grinnell - Fontaine PM
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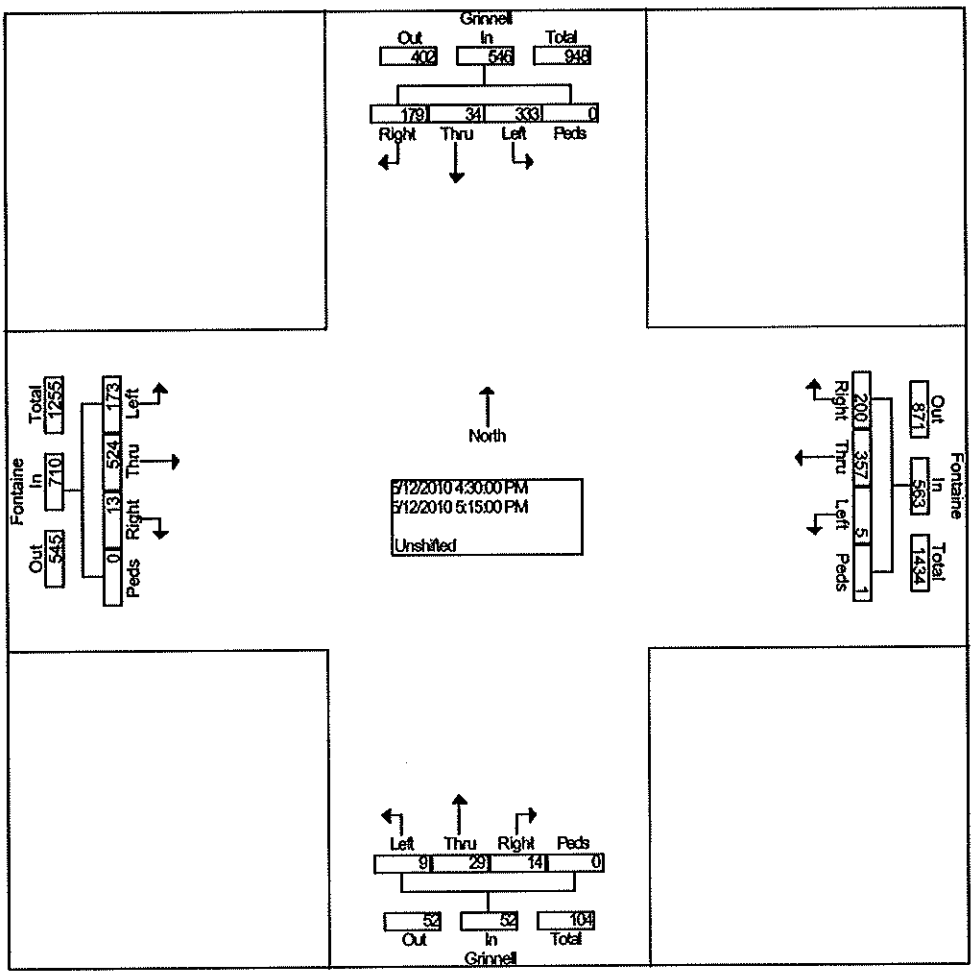
	Grinnell From North					Fontaine From East					Grinnell From South					Fontaine From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 03:00 PM to 05:15 PM - Peak 1 of 1																					
Intersection	04:30 PM																				
Volume	179	34	333	0	546	200	357	5	1	563	14	29	9	0	52	13	524	173	0	710	1871
Percent	32.8	6.2	61.0	0.0		35.5	63.4	0.9	0.2		26.9	55.8	17.3	0.0		1.8	73.8	24.4	0.0		
04:45 Volume	36	10	87	0	133	52	109	1	0	162	2	5	4	0	11	3	139	43	0	185	491
Peak Factor																					0.953
High Int.	05:15 PM					04:45 PM					04:30 PM					04:45 PM					
Volume	54	11	88	0	153	52	109	1	0	162	5	9	1	0	15	3	139	43	0	185	
Peak Factor					0.892					0.869					0.867					0.959	



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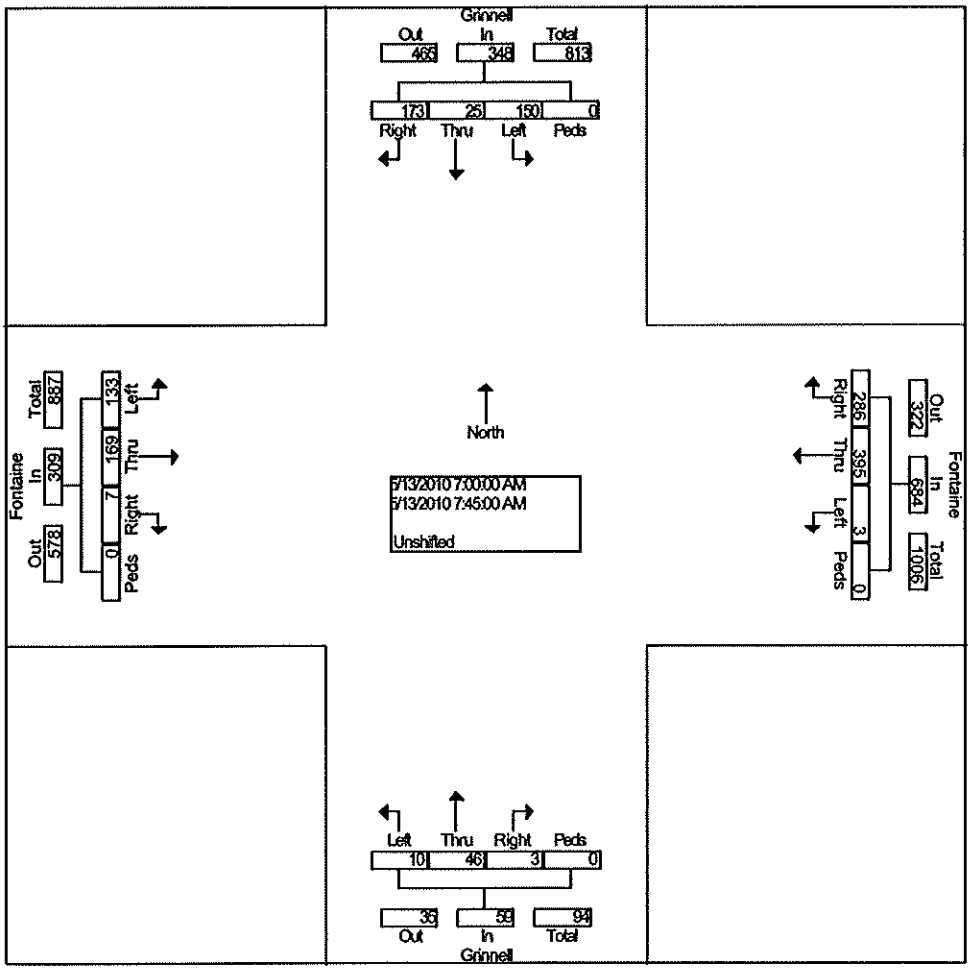
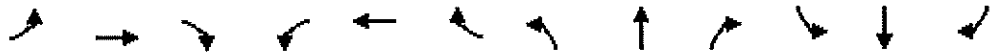
	Grinnell From North					Fontaine From East					Grinnell From South					Fontaine From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour From 06:45 AM to 08:00 AM - Peak 1 of 1																					
Intersection	07:00 AM																				
Volume	173	25	150	0	348	286	395	3	0	684	3	46	10	0	59	7	169	133	0	309	1400
Percent	49.7	7.2	43.1	0.0		41.8	57.7	0.4	0.0		5.1	78.0	16.9	0.0		2.3	54.7	43.0	0.0		
07:15 Volume	46	7	26	0	79	71	114	2	0	187	1	20	2	0	23	1	48	42	0	91	380
Peak Factor																					0.921
High Int.	07:00 AM					07:15 AM					07:15 AM					07:15 AM					
Volume	46	9	55	0	110	71	114	2	0	187	1	20	2	0	23	1	48	42	0	91	
Peak Factor					0.791					0.914					0.641					0.849	





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	15	1	25	10	1	35	60	330	5	20	460	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	1	26	11	1	37	63	347	5	21	484	11
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	864	1005	242	785	1011	174	495			353		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	864	1005	242	785	1011	174	495			353		
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 %	93	100	97	96	100	96	94			98		
cM capacity (veh/h)	223	222	759	257	220	840	1065			1203		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	43	48	63	174	174	5	21	242	242	11
Volume Left	16	11	63	0	0	0	21	0	0	0
Volume Right	26	37	0	0	0	5	0	0	0	11
cSH	391	540	1065	1700	1700	1700	1203	1700	1700	1700
Volume to Capacity	0.11	0.09	0.06	0.10	0.10	0.00	0.02	0.14	0.14	0.01
Queue Length 95th (ft)	9	7	5	0	0	0	1	0	0	0
Control Delay (s)	15.3	12.3	8.6	0.0	0.0	0.0	8.0	0.0	0.0	0.0
Lane LOS	C	B	A				A			
Approach Delay (s)	15.3	12.3	1.3				0.3			
Approach LOS	C	B								

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	30.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	0	40	5	0	10	55	435	15	30	345	20
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	11	0	46	6	0	11	63	500	17	34	397	23
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	853	1109	198	940	1115	250	420			517		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	853	1109	198	940	1115	250	420			517		
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 %	95	100	94	97	100	98	94			97		
cM capacity (veh/h)	232	190	810	192	189	750	1136			1045		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	57	17	63	250	250	17	34	198	198	23
Volume Left	11	6	63	0	0	0	34	0	0	0
Volume Right	46	11	0	0	0	17	0	0	0	23
cSH	541	381	1136	1700	1700	1700	1045	1700	1700	1700
Volume to Capacity	0.11	0.05	0.06	0.15	0.15	0.01	0.03	0.12	0.12	0.01
Queue Length 95th (ft)	9	4	4	0	0	0	3	0	0	0
Control Delay (s)	12.5	14.9	8.4	0.0	0.0	0.0	8.6	0.0	0.0	0.0
Lane LOS	B	B	A				A			
Approach Delay (s)	12.5	14.9	0.9				0.7			
Approach LOS	B	B								

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	28.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↑↑	↱	↰	↑↑	↱
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	15	2	35	10	5	25	45	360	5	15	520	25
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	16	2	38	11	5	27	49	396	5	16	571	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	931	1104	286	853	1126	198	599			401		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	931	1104	286	853	1126	198	599			401		
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 %	92	99	95	95	97	97	95			99		
cM capacity (veh/h)	199	196	711	225	190	810	974			1154		

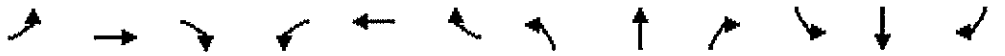
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	57	44	49	198	198	5	16	286	286	27
Volume Left	16	11	49	0	0	0	16	0	0	0
Volume Right	38	27	0	0	0	5	0	0	0	27
cSH	386	394	974	1700	1700	1700	1154	1700	1700	1700
Volume to Capacity	0.15	0.11	0.05	0.12	0.12	0.00	0.01	0.17	0.17	0.02
Queue Length 95th (ft)	13	9	4	0	0	0	1	0	0	0
Control Delay (s)	15.9	15.3	8.9	0.0	0.0	0.0	8.2	0.0	0.0	0.0
Lane LOS	C	C	A				A			
Approach Delay (s)	15.9	15.3	1.0				0.2			
Approach LOS	C	C								

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	32.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↑↑	↱	↰	↑↑	↱
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	1	40	5	2	20	55	510	30	55	405	20
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	11	1	46	6	2	23	63	586	34	63	466	23
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	1036	1339	233	1118	1328	293	489			621		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1036	1339	233	1118	1328	293	489			621		
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 %	93	99	94	96	98	97	94			93		
cM capacity (veh/h)	161	133	769	137	135	703	1071			956		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	59	31	63	293	293	34	63	233	233	23
Volume Left	11	6	63	0	0	0	63	0	0	0
Volume Right	46	23	0	0	0	34	0	0	0	23
cSH	419	339	1071	1700	1700	1700	956	1700	1700	1700
Volume to Capacity	0.14	0.09	0.06	0.17	0.17	0.02	0.07	0.14	0.14	0.01
Queue Length 95th (ft)	12	8	5	0	0	0	5	0	0	0
Control Delay (s)	15.0	16.7	8.6	0.0	0.0	0.0	9.0	0.0	0.0	0.0
Lane LOS	B	C	A				A			
Approach Delay (s)	15.0	16.7	0.8				1.0			
Approach LOS	B	C								

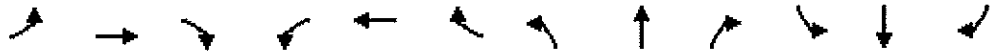
Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	31.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	15	5	35	15	5	45	45	420	10	25	610	25
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	16	5	38	16	5	49	49	462	11	27	670	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	1107	1297	335	992	1313	231	698			473		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1107	1297	335	992	1313	231	698			473		
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	96	94	90	96	94	94			97		
cM capacity (veh/h)	141	148	661	172	145	772	894			1086		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	60	71	49	231	231	11	27	335	335	27
Volume Left	16	16	49	0	0	0	27	0	0	0
Volume Right	38	49	0	0	0	11	0	0	0	27
cSH	284	361	894	1700	1700	1700	1086	1700	1700	1700
Volume to Capacity	0.21	0.20	0.06	0.14	0.14	0.01	0.03	0.20	0.20	0.02
Queue Length 95th (ft)	20	18	4	0	0	0	2	0	0	0
Control Delay (s)	21.0	17.4	9.3	0.0	0.0	0.0	8.4	0.0	0.0	0.0
Lane LOS	C	C	A				A			
Approach Delay (s)	21.0	17.4	0.9				0.3			
Approach LOS	C	C								

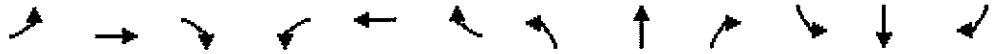
Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	35.1%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑↑	↱	↰	↑↑	↱
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	15	2	25	15	2	60	60	385	5	35	540	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	2	26	16	2	63	63	405	5	37	568	11
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	1035	1179	284	917	1184	203	579			411		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1035	1179	284	917	1184	203	579			411		
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	99	96	92	99	92	94			97		
cM capacity (veh/h)	158	171	713	201	170	804	991			1145		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	44	81	63	203	203	5	37	284	284	11
Volume Left	16	16	63	0	0	0	37	0	0	0
Volume Right	26	63	0	0	0	5	0	0	0	11
cSH	296	478	991	1700	1700	1700	1145	1700	1700	1700
Volume to Capacity	0.15	0.17	0.06	0.12	0.12	0.00	0.03	0.17	0.17	0.01
Queue Length 95th (ft)	13	15	5	0	0	0	2	0	0	0
Control Delay (s)	19.3	14.1	8.9	0.0	0.0	0.0	8.2	0.0	0.0	0.0
Lane LOS	C	B	A				A			
Approach Delay (s)	19.3	14.1	1.2				0.5			
Approach LOS	C	B								

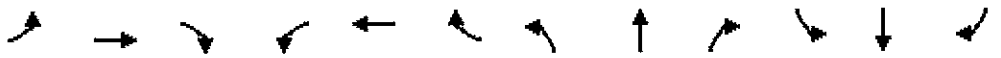
Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	33.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	1	40	5	2	20	55	715	30	55	565	20
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.95	0.87	0.87	0.95	0.87
Hourly flow rate (vph)	11	1	46	6	2	23	63	753	34	63	595	23
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	1248	1635	297	1349	1623	376	618			787		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1248	1635	297	1349	1623	376	618			787		
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	99	93	94	97	96	93			92		
cM capacity (veh/h)	110	86	699	90	88	621	958			828		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	59	31	63	376	376	34	63	297	297	23
Volume Left	11	6	63	0	0	0	63	0	0	0
Volume Right	46	23	0	0	0	34	0	0	0	23
cSH	319	245	958	1700	1700	1700	828	1700	1700	1700
Volume to Capacity	0.18	0.13	0.07	0.22	0.22	0.02	0.08	0.17	0.17	0.01
Queue Length 95th (ft)	17	11	5	0	0	0	6	0	0	0
Control Delay (s)	18.8	21.8	9.0	0.0	0.0	0.0	9.7	0.0	0.0	0.0
Lane LOS	C	C	A				A			
Approach Delay (s)	18.8	21.8	0.7				0.9			
Approach LOS	C	C								

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	37.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	15	5	35	15	5	45	45	590	10	25	855	25
Peak Hour Factor	0.95	0.91	0.95	0.91	0.91	0.91	0.95	0.95	0.91	0.91	0.95	0.95
Hourly flow rate (vph)	16	5	37	16	5	49	47	621	11	27	900	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	1412	1682	450	1260	1697	311	926			632		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1412	1682	450	1260	1697	311	926			632		
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 %	80	94	93	84	93	93	94			97		
cM capacity (veh/h)	80	85	556	105	83	685	734			947		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	58	71	47	311	311	11	27	450	450	26
Volume Left	16	16	47	0	0	0	27	0	0	0
Volume Right	37	49	0	0	0	11	0	0	0	26
cSH	177	242	734	1700	1700	1700	947	1700	1700	1700
Volume to Capacity	0.33	0.30	0.06	0.18	0.18	0.01	0.03	0.26	0.26	0.02
Queue Length 95th (ft)	34	30	5	0	0	0	2	0	0	0
Control Delay (s)	34.9	26.0	10.2	0.0	0.0	0.0	8.9	0.0	0.0	0.0
Lane LOS	D	D	B				A			
Approach Delay (s)	34.9	26.0	0.7				0.3			
Approach LOS	D	D								

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	41.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	15	2	25	15	2	60	60	540	5	35	755	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	2	26	16	2	63	63	568	5	37	795	11
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	1343	1568	397	1193	1574	284	805			574		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1343	1568	397	1193	1574	284	805			574		
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 %	83	98	96	87	98	91	92			96		
cM capacity (veh/h)	90	98	602	122	97	713	815			995		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	44	81	63	284	284	5	37	397	397	11
Volume Left	16	16	63	0	0	0	37	0	0	0
Volume Right	26	63	0	0	0	5	0	0	0	11
cSH	184	339	815	1700	1700	1700	995	1700	1700	1700
Volume to Capacity	0.24	0.24	0.08	0.17	0.17	0.00	0.04	0.23	0.23	0.01
Queue Length 95th (ft)	23	23	6	0	0	0	3	0	0	0
Control Delay (s)	30.6	18.9	9.8	0.0	0.0	0.0	8.8	0.0	0.0	0.0
Lane LOS	D	C	A				A			
Approach Delay (s)	30.6	18.9	1.0				0.4			
Approach LOS	D	C								

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	39.4%	ICU Level of Service	A
Analysis Period (min)	15		