Appendix G

Traffic Impact Analysis (Kd Anderson)

TRAFFIC IMPACT ANALYSIS

FOR

RECOLOGY HAY ROAD LANDFILL EXPANSION PROJECT

Solano County, CA

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0563-002

Hay Rd Landfill.rpt

RECOLOGY HAY ROAD LANDFILL EXPANSION PROJECT
TRAFFIC IMPACT ANALYSIS

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RECOLOGY HAY ROAD LANDFILL EXPANSION PROJECT
TRAFFIC IMPACT ANALYSIS

EXECUTIVE SUMMARY

Project Description. This study evaluates the traffic impacts associated with amending the existing Conditional Use Permit (CUP) to reflect changes requested for the Recology Hay Road Landfill site in Solano County. The Recology Hay Road Landfill is located in the southwest quadrant of the SR 113 / Hay Road intersection in Solano County. Access to the site is from Hay Road just west of SR 113. The project will revise the existing daily tonnage limit and establish a new peak limit as well as an average daily limit. The existing CUP allows for 2,400 tons per day (tpd) of landfill disposal. Occasionally, the site has received more than 2,400 tpd requiring the site to turn away vehicles so as to not exceed the existing peak limit. The project would amend the CUP to allow a peak day limit of 3,400 tpd with a 7-day average limit of 3,200 tpd. This will allow the site to not have to turn away haulers.

Existing Setting. Levels of Service were evaluated for eight intersections and six roadway segments to provide a baseline analysis to meet CEQA criteria. The intersection locations included intersections between the I-80 / Midway Road interchange, and along Midway Road and SR 113. The analysis included a.m. and p.m. peak hours at all intersections and included a Saturday peak hour analysis at four intersections closest to the site. Sunday traffic was reviewed at the project site and was consistently lower than Saturday traffic; therefore, the weekend analysis included only Saturday.

The six roadway segments considered included three along SR 113, two along Midway Road and one along Hay Road. County Level of Service policy considers LOS C as the acceptable threshold while Caltrans policy considers LOS D as the acceptable threshold.

The SR 12 / SR 113 intersection currently operates at LOS E in the a.m. peak hour and LOS F in the p.m. peak hour. Caltrans has an identified safety project that would construct a single lane roundabout at this intersection. Construction is slated to be completed Fall 2019. Under the roundabout condition the intersection will operate at LOS A in the a.m. peak period (7.0 spv) and LOS C in the p.m. peak hour (18.8 spv). The remaining intersections and roadway segments operate within the Caltrans and County LOS thresholds.

No additional recommendations are noted.

Existing Plus Project Specific Impacts. Under Existing plus Project conditions, all intersections except the SR 12 / SR 113 intersection will operate within acceptable County and Caltrans LOS thresholds. The SR 12 / SR 113 intersection will continue to operate at LOS E in the a.m. peak hour and LOS F in the p.m. peak hour. As identified under Existing Conditions

Caltrans has an identified safety project that would construct a single lane roundabout at this intersection. With this project completed the intersection will operate at LOS A in the a.m. peak hour (7.1 spv) and LOS C in the p.m. peak hour (19.1 spv). All roadways will continue to operate within the Caltrans and County LOS thresholds.

No additional mitigations are necessary.

2030 Conditions. Under 2030 conditions, the SR 113 / Midway Road intersection will decline to an LOS E condition in the a.m. peak hour (45.7 spv) and LOS F condition in the p.m. peak hour (53.6 spv). The intersection will not meet the peak hour traffic signal warrant. The SR 12 / SR 113 intersection will decline to LOS F in the p.m. peak hour (124.4 spv). One roadway segment, Midway Road between the I-80 Eastbound Ramps intersection and Porter Road will decline to LOS D in both directions. The remaining intersections and roadway segments will operate within County and Caltrans LOS thresholds.

The following recommendations are made:

Recommendations:

- SR 113 / Midway Road: Installation of all-way stop control will improve the level of service to LOS B in both a.m. (13.3 spv) and p.m. (13.7 spv) peak hours. Caltrans has identified a conceptual project to widen shoulders, construct a median and install a traffic signal at the SR 113 / Midway Road intersection to enhance safety; however, this project is not yet included in a planning or programming document.

- SR 12 / SR 113: Installation of a second eastbound lane through the roundabout will improve the level of service to a LOS C (21.5 spv) condition in the p.m. peak hour. No agencies with jurisdiction currently have plans for any improvements at this intersection.

- Midway Road - I-80 Eastbound Ramps to Porter Road (both directions): A 0.30 mile long passing lane in both eastbound and westbound directions would be needed to improve the roadway segment to an acceptable level of service, LOS C (EB ATS – 45.1 / PTSF – 52.8; WB ATS – 45.3 / PTSF – 43.0). No agencies with jurisdiction currently have plans for any improvements at this intersection.

No additional recommendations are noted.

2030 Plus Project Conditions. The SR 113 / Midway Road intersection and the SR 12 / SR 113 intersection will continue to operate below the Caltrans LOS D threshold. Additionally, both directions of Midway Road, between the I-80 Eastbound Ramps intersection and Porter Road will operate at LOS D. The remaining intersections and all roadway segments will operate within County and Caltrans LOS thresholds. The following mitigations are made:

Mitigations:

- SR 113 / Midway Road: As identified in the 2030 No Project Recommendations installation of all-way stop control will improve the level of service to LOS B in both a.m. (13.7 spv) and p.m. (13.8 spv) peak hours. This intersection is under the jurisdiction of Caltrans, and Caltrans has identified a conceptual project to widen shoulders, construct a median and install a traffic signal at the SR 113 / Midway Road intersection to enhance safety. However, this project is not yet included in a planning or programming document. Any improvement of the intersection would require Caltrans concurrence and approval. The project applicant and Solano County shall coordinate with Caltrans on implementation of this improvement. However, because the final approval of the proposed improvement is outside the jurisdiction and control of the Applicant and County, there is no guarantee that this mitigation measure would be implemented prior to project-related trips occurring at this intersection. Therefore, this is considered a significant and unavoidable impact.

- SR 12 / SR 113: As identified in the 2030 No Project Recommendations installation of a second eastbound lane through the roundabout will improve the level of service to a LOS C (21.7 spv) condition in the p.m. peak hour. This improvement is under the jurisdiction of Caltrans. Any improvement of the intersection would require Caltrans concurrence and approval. The project applicant and Solano County shall coordinate with Caltrans on implementation of this improvement. However, because the final approval of the proposed improvement is outside the jurisdiction and control of the Applicant and County, there is no guarantee that this mitigation measure would be implemented prior to project-related trips occurring at this intersection. Additionally, Caltrans does not currently have plans for any improvements at this intersection. Therefore, this is considered a significant and unavoidable impact.

- Midway Road - I-80 Eastbound Ramps to Porter Road (both directions): As identified in the 2030 No Project Recommendations a 0.30 mile long passing lane in both eastbound and westbound directions would be needed to improve the roadway segment LOS to an acceptable level of LOS C (EB ATS – 45.0 / PTSF – 53.2; WB ATS – 45.2 / PTSF – 43.7). This improvement is under the jurisdiction of Solano County. The project applicant shall coordinate with Solano County and shall fund the improvement of this segment to be constructed prior to vehicle trips to the landfill exceeding 2,400 per day. Therefore, with mitigation, this is considered a less-than-significant impact.

No additional mitigations are identified.

RECOLOGY HAY ROAD LANDFILL EXPANSION PROJECT
TRAFFIC IMPACT ANALYSIS

INTRODUCTION

Study Purpose and Objectives

This study evaluates the traffic impacts associated with amending the existing Conditional Use Permit (CUP) to reflect changes requested for the Recology Hay Road Landfill site. Regarding traffic related issues the project proposed to revise the existing daily tonnage limit and establish a new peak limit as well as an average daily limit. The existing CUP allows for 2,400 tons per day (tpd) of landfill disposal. Occasionally, the site has received more than 2,400 tpd requiring the site to turn away vehicles so as to not exceed the existing peak limit. The project would amend the CUP to allow a peak day limit of 3,400 tpd with a 7-day average limit of 3,200 tpd. This will allow the site to not have to turn away haulers.

The study parameters are consistent with Solano County guidelines. The study addresses the following traffic scenarios:

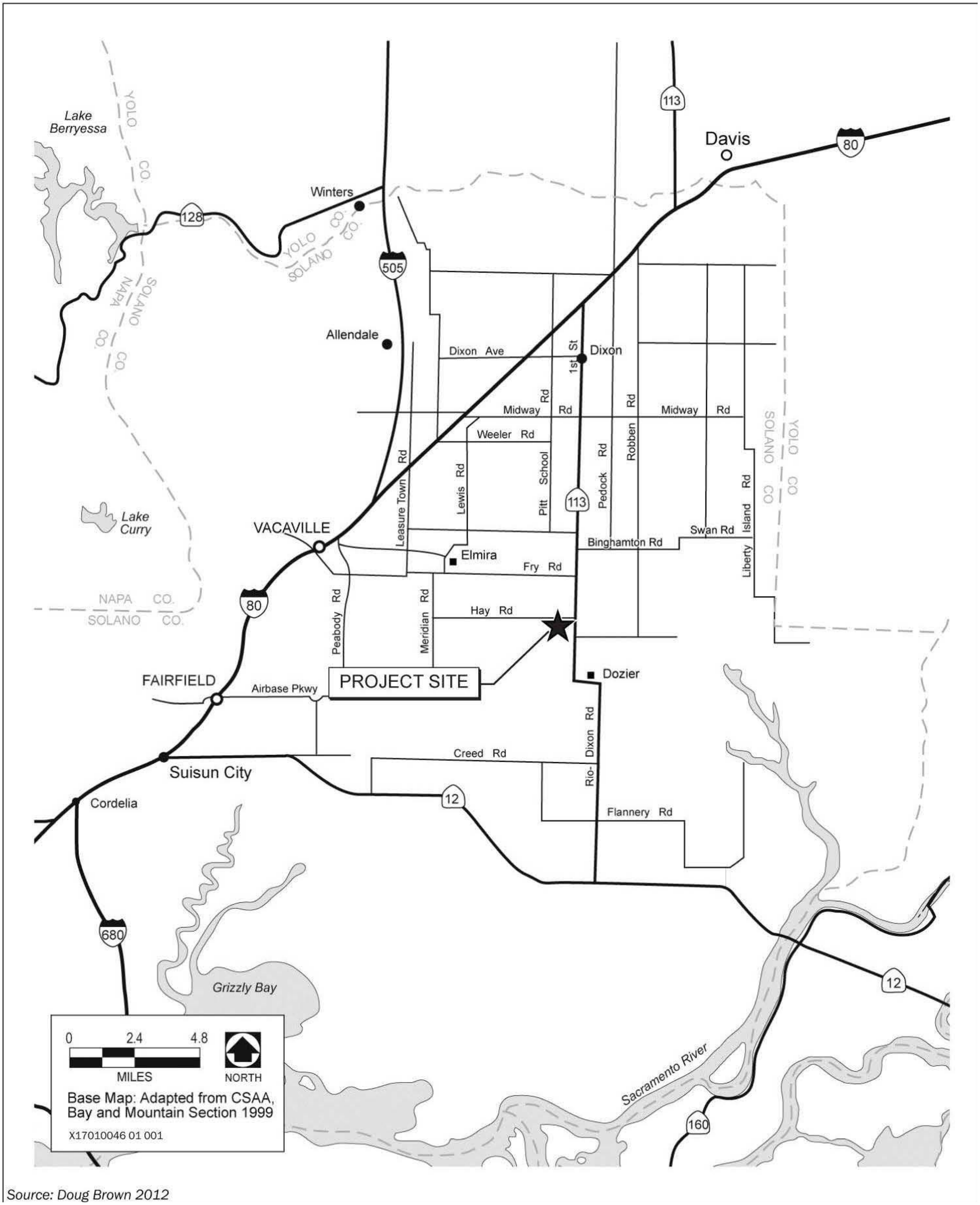
1. Existing (2018) Peak Hour Traffic Conditions;
2. Existing plus Project Peak Hour Traffic Conditions;
3. Year 2030 Peak Hour Traffic Conditions;
4. Year 2030 plus Project Peak Hour Traffic Conditions;

The focus of this study is to identify project-related impacts under long-term conditions as a result of accepting an additional 1,718 tpd at the site, which is the difference between existing tonnage received at the landfill and allowable tonnage to be received under the proposed CUP amendments. Analysis of an Existing condition is required to address the requirements of Sections 15125 of the State CEQA Guidelines, "an EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, from both a local and regional perspective."

Project Description

The Hay Road Landfill is located east of the City of Vacaville in Solano County. The site is located in the southwest quadrant of the SR 113 (Rio Dixon Road) / Hay Road intersection. The project will modify the previously approved Hay Road Landfill Expansion project. From a transportation perspective the proposed project will modify the existing daily limit to accept up to 3,400 tpd with an average of 3,200 tpd over a 7-day period.

Access to the site facility will remain unchanged, via its access along Hay Road. Figure 1 illustrates the location of the site relative to the surrounding areas of Solano County.



Source: Doug Brown 2012

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SITE PLAN

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figure 1

EXISTING SETTING

Study Area

This study addresses traffic conditions in the vicinity of the Hay Road Landfill project site, including the project routes from the Interstate 80 (I-80) / Midway Road interchange to the north and from the SR 113 / SR 12 intersection to the south. Six roadway segments were analyzed along with eight intersections along the routes providing access to the landfill site. The text that follows describes the facilities included in this analysis.

Study Area Roadways

State Route 113. State Route (SR) is a two-lane road between in Solano County beginning at SR 12 in the south and heads north past I-80, continuing through Davis and Woodland to its terminus in Sutter County. Between SR 12 and Midway Road, the road has varying shoulder widths, ranging from about 10' at intersections to 0' within the segments. The speed limit is 55 miles per hour (mph). SR 113 is identified in Solano County as a major arterial.

Midway Road. Midway Road is a two-lane road providing east-west access west of I-80 and east beyond the SR 113 intersection. The road has varying shoulder widths, ranging between 0 and 8 feet. The speed limit is 55 miles per hour (mph). Midway Road is identified in Solano County as a County Route of Regional Significance.

Hay Road. Hay Road is a two-lane local road running east-west between Meridian Road and SR 113. The road has minimal shoulder widths, ranging between 0 and 2 feet. The speed limit is 55 miles per hour (mph). Hay Road is identified in Solano County as a collector road.

Study Area Intersections

The quality of traffic flow is typically governed by the operation of major intersections. Eight intersections serving this site were identified for evaluation. These include:

1) I-80 Westbound Ramps / Oday Road
2) Midway Road / Oday Road
3) I-80 Eastbound Ramps / Midway Road
4) Midway Road / Porter Road
5) SR 113 / Midway Road
6) SR 113 / Hay Road
7) SR 113 / SR 12
8) Hay Road / Project Entrance

A.m. and p.m. mid-week peak hour counts were conducted at each of these intersections in late January and early February 2018. Traffic counts were also conducted at intersections 5 through 8 for the Saturday mid-day peak period in late January 2018. New counts were also conducted at intersections 1 through 3 in early October 2018; the I-80/Midway Road interchange has been reopened since July 2018 after being replaced. The Midway Road interchange is the designated truck route for the site.

Each study intersection is described below:

I-80 Westbound Ramps / Oday Road is a tee intersection with a hook on/off ramp. The intersection is stop controlled along the I-80 off-ramp approach. The Oday Road approaches consist of single lanes providing shared through and left or right turn right turn movements. The westbound off-ramp includes a left turn lane under stop control and a short right turn lane under yield control.

Midway Road / Oday Road is an unsignalized tee intersection. Stop control is provided along Oday Road. Westbound Midway Road includes a through lane with a free right turn lane onto Oday Road. Eastbound Midway Road includes a shared through-left lane while Oday Road consists of a single lane approach.

The **Midway Road / I-80 Eastbound Ramps intersection** is an unsignalized diamond configuration (L-1). Both directions of Midway Road consist of a single lane with the eastbound approach providing a shared through left lane and the westbound approach providing a shared through-right lane. Stop control exists along the I-80 off-ramp for through and left turn movements while the right turn movement merges onto eastbound Midway Road.

The **Midway Road / Porter intersection** is an unsignalized tee intersection. Eastbound Midway Road bypasses the Porter Road intersection while westbound Midway Road tees into Porter Road. The westbound left turn is stop controlled while the right turn is yield controlled. The northbound and southbound approaches along Porter Road allow only through movements.

The **SR 113 / Midway Road intersection** is an unsignalized four-way intersection with stop control along Midway Road. The SR 113 approaches include left turn lanes and a shared through-right lane while Midway Road consists of a single lane.

The **SR 113 / Hay Road intersection** is an unsignalized tee intersection with stop control along Hay Road. All approaches are single lanes.

The **SR 12 / SR 113 – Birds Landing Road intersection** is an unsignalized four-way intersection with stop control along SR 113. The SR 12 approaches include a left turn lane, a through lane and a right turn lane. Both the northbound Birds Landing Road approach and the SR 113 approach include a shared through-left lane and a right turn lane. Caltrans has an identified safety project that would construct a single lane roundabout at this intersection. Construction is slated to be completed Fall 2019.

The **Hay Road / Project Access intersection** is an unsignalized tee intersection with stop control along the project access. Westbound Hay Road includes a through lane and a left turn lane while the eastbound approach includes a shared through-right lane. The project entrance is unstriped but wide enough to allow both right and left turning vehicles to queue.

Level of Service

To assess the quality of existing traffic conditions and provide a basis for analyzing project impacts, Levels of Service were calculated at study area intersections and project driveways. "Level of Service" is a qualitative measure of traffic operating conditions whereby a letter grade "A" through "F", corresponding to progressively worsening operating conditions, is assigned to an intersection or roadway segment.

The Level of Service policies of Solano County and Caltrans govern this analysis. The Solano County Road Standards documents the County's policies for Level of Service in rural and urban areas. The document notes that LOS C is the design standard for the County.

Caltrans has set a minimum Level of Service standard of LOS D in rural areas, populations less than 2,500 and LOS E in urban clusters (populations 2,500 to 49,999) and LOS E in urbanized areas (populations over 50,000) for state highways. These standards may vary depending on the corridor conditions. For this project LOS D is considered the significance threshold.

Various methodologies exist to determine operating Levels of Service at signalized intersections. The available techniques vary with regard to factors such as traffic signal timing, interaction between adjoining signals, etc. The procedures contained in the *2010 Highway Capacity Manual* have been used for determining operating Level of Service at signalized intersections.

At unsignalized intersections the number of gaps in through traffic, gap acceptance time and corresponding delays for motorists waiting to turn are used for Level of Service analysis. Procedures used for calculating unsignalized intersection Level of Service are as presented in the *Highway Capacity Manual, 2010 Edition.*

Table 1 presents general characteristics associated with each Level of Service grade.

TABLE 1
LEVEL OF SERVICE DEFINITIONS

Level of Service	Signalized Intersection	Unsignalized Intersection	Roadway (Daily)
"A"	Uncongested operations, all queues clear in a single-signal cycle. Ave Delay ≤ 10 seconds per vehicle	Little or no delay. Ave Delay ≤ 10 sec/veh	Completely free flow.
"B"	Uncongested operations, all queues clear in a single cycle. Delay > 10 sec/veh and ≤ 20 sec/veh	Short traffic delays. Delay > 10 sec/veh and ≤ 15 sec/veh	Free flow, presence of other vehicles noticeable.
"C"	Light congestion, occasional backups on critical approaches. Delay >20 sec/veh and <35 sec/veh	Average traffic delays. Delay > 15 sec/veh and ≤ 25 sec/veh	Ability to maneuver and select operating speed affected.
"D"	Significant congestions of critical approaches but intersection functional. Cars required to wait through more than one cycle during short peaks. No long queues formed. Delay > 35 sec/veh and < 55 sec/veh	Long traffic delays. Delay > 25 sec/veh and ≤ 35 sec/veh	Unstable flow, speeds and ability to maneuver restricted.
"E"	Severe congestion with some long standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersection(s) upstream of critical approach(es). Delay >55 sec and ≤ 80 sec/veh	Very long traffic delays, failure, extreme congestion. Delay > 35 sec/veh and ≤ 50 sec/veh	At or near capacity, flow quite unstable.
"F"	Total breakdown, stop-and-go operation. Delay > 80 sec/veh	Intersection often blocked by external causes. Delay > 50 sec/veh	Forced flow, breakdown.
Sources: 2010 Highway Capacity Manual,			

Roadway Segment Level of Service

Two-Lane Highway Roadway Segments. Roadway segments were analyzed using methods presented in the *Highway Capacity Manual 2010 (HCM).* A two-lane highway is an undivided roadway with one lane in each direction. Passing a slower vehicle requires use of the opposing lane as sight distance and gaps in the opposing traffic stream permit. As volumes and geometric restrictions increase, the ability to pass decreases and platoons form. Motorists in platoons are subject to delay because they are unable to pass. The HCM divides these roadways into three types: Class I, Class II and Class III. They are defined as follows:

- *Class I two-lane highways* are highways where motorists expect to travel at relatively high speeds. Two-lane highways that are major intercity routes, primary connectors of major traffic generators, daily commuter routes, or major links in state or national highway networks are generally assigned to Class I. These facilities serve mostly long-distance trips or provide the connections between facilities that serve long-distance trips.

- *Class II two-lane highways* are highways where motorists do not necessarily expect to travel at high speeds. Two-lane highways functioning as access routes to Class I facilities, serving as scenic or recreational routes (and not as primary arterials), or passing through rugged terrain (where high-speed operation would be impossible) are assigned to Class II. Class II facilities most often serve relatively short trips, the beginning or ending portions of longer trips, or trips for which sightseeing plays a significant role.

- *Class III two-lane highways* are highways serving moderately developed areas. They may be portions of a Class I or Class II highway that pass through small towns or developed recreational areas. On such segments, local traffic often mixes with through traffic, and the density of unsignalized roadside access points is noticeably higher than in a purely rural area. Class III highways may also be longer segments passing through more spread-out recreational areas, also with increased roadside densities. Such segments are often accompanied by reduced speed limits that reflect the higher activity level.

Levels of Service. Three measures of effectiveness are incorporated into the methodology to determine automobile LOS:

1. Average Travel Speed (ATS) reflects mobility on a two-lane highway. It is defined as the highway segment length divided by the average travel time taken by vehicles to traverse it during a designated time interval.

2. Percent Time Spent Following (PTSF) represents the freedom to maneuver and the comfort and convenience of travel. It is the average percentage of time that vehicles must travel in platoons behind slower vehicles due to the inability to pass. Because this characteristic is difficult to measure in the field, a surrogate measure is the percentage of vehicles traveling at headways of less than 3.0 at a representative location within the highway segment. PTSF also represents the approximate percentage of vehicles traveling in platoons.

3. Percent of free-flow speed (PFFS) represents the ability of vehicles to travel at or near the posted speed limit.

Speed and delay due to passing restrictions are both important to motorists on Class I two-lane highways; therefore, LOS is defined in terms of both ATS and PTSF. Travel speed is not a significant issue on Class II highways; therefore, LOS is defined in only terms of PTSF. High speeds are not expected on Class III highways and since the length of the Class III segments may be generally limited, passing restrictions are also not a major concern. In Class III segments drivers are expected to want to travel at or near the speed limit. Therefore, PFFS is used to define LOS. The LOS criteria for two-lane highways are shown in Table 2.

TABLE 2
AUTOMOBILE LOS FOR TWO-LANE HIGHWAYS†

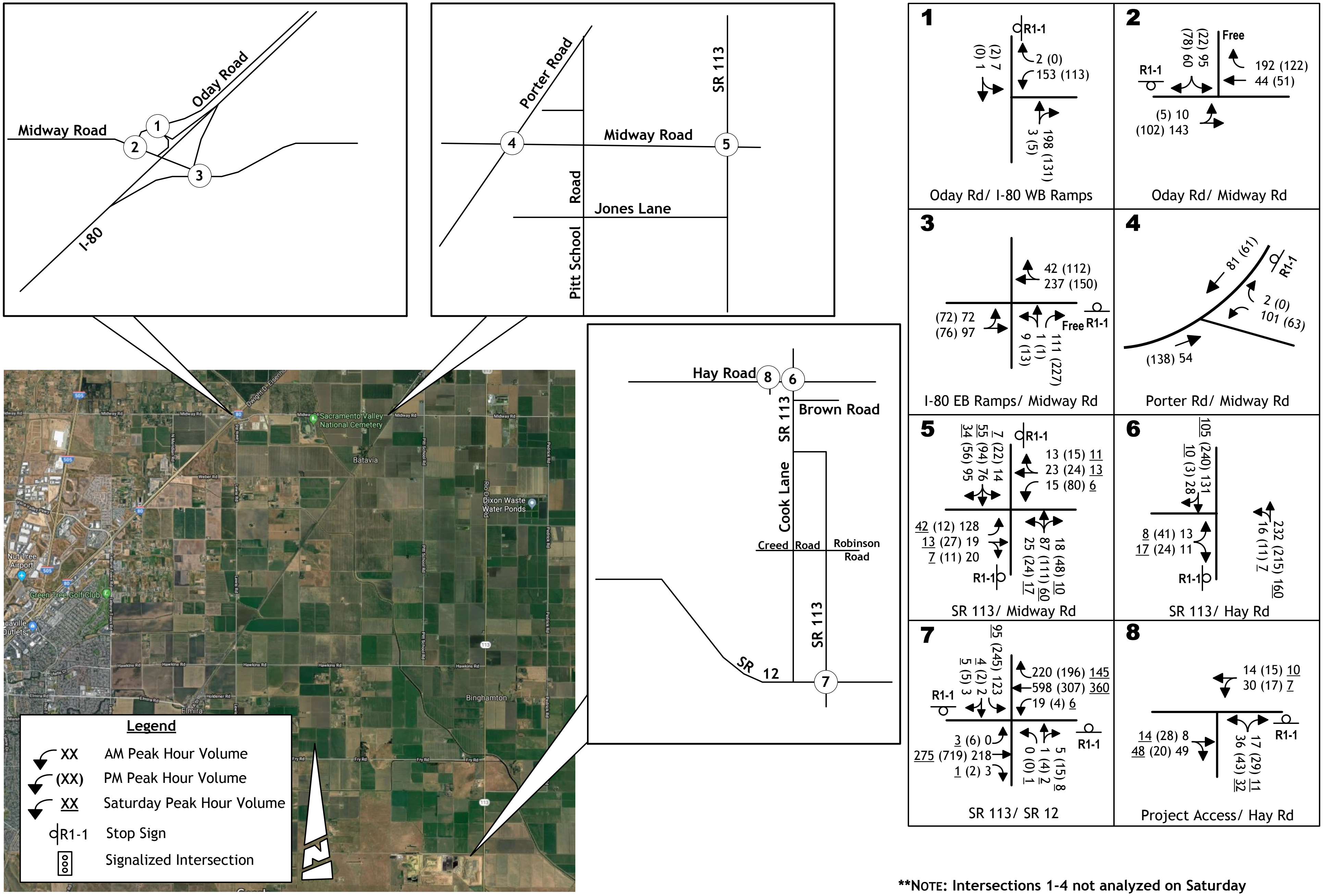
LOS	Class I Highways		Class II Highways	Class III Highways
	ATS (mi / hr)	PTSF (%)	PTSF (%)	PFFS (%)
A	>55	≤35	≤40	>91.7
B	>50-55	>35-50	>40-55	>83.3 – 91.7
C	>45-50	>50-65	>55-70	>75.0 – 83.3
D	>40-45	>65-80	>70-85	>66.7 – 75.0
E	≤40	>80	>85	≤66.7

† HCM 2010, Chapter 15, December 2010

Existing Traffic Conditions

Intersection Levels of Service. Level of Service is based on and measured in terms of delay (seconds) per vehicle for the peak fifteen-minute analysis period. For unsignalized minor leg stop controlled intersections the movement with the worst delay approach movement is considered the critical Level of Service for the intersection. For multiway stop-controlled intersections the Level of Service is determined based on the overall average delay in the intersection.

Figure 2 presents the intersection turning movements for each intersection. Table 3 summarizes current Levels of Service at the study area intersections during the a.m. and p.m. peak hour. Saturday peak hour level of service was also calculated along the SR 113 intersections and at the Hay Road / Project Entrance intersection. Sunday traffic was reviewed at the project site and was consistently lower than Saturday traffic; therefore, the weekend analysis included only Saturday. All intersections except the SR 12 / SR 113 intersection currently operate at LOS C or better. The SR 12/ SR 113 intersection operates at LOS E in the a.m. peak hour with a delay of 38.8 seconds per vehicle (spv) and LOS F in the p.m. with a delay of 373.3 spv. This intersection meets the peak hour signal warrant in the p.m. peak hour. Caltrans has an identified safety improvement at this intersection which will construct a single lane roundabout. This project is identified for completion in the Fall 2019.



**NOTE: Intersections 1-4 not analyzed on Saturday

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EXISTING TRAFFIC VOLUMES AND LANE CONFIGURATIONS

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figure 2

TABLE 3
EXISTING PEAK HOUR LEVELS OF SERVICE AT INTERSECTIONS

Location	Control	Existing AM Peak Hour LOS	Existing AM Peak Hour Average Delay (secs)	Existing PM Peak Hour LOS	Existing PM Peak Hour Average Delay (secs)	Existing Saturday Peak Hour LOS	Existing Saturday Peak Hour Average Delay (secs)	Peak Hour Warrant Met?
1. I-80 Westbound Ramps / Oday Rd	WB Stop							No
SB Left		A	6.7	A	7.5	---	---	
WB		B	10.3	A	9.6	---	---	
2. Midway Road/ Oday Rd	SB Stop							No
SB		B	11.0	A	9.8	---	---	
EB Left		A	7.8	A	7.6	---	---	
3. I-80 Eastbound Ramps / Midway Rd	NB Stop							No
NB		B	13.0	B	12.2	---	---	
EB Left		A	8.1	A	8.1	---	---	
4. Midway Rd / Porter Rd	WB Stop							No
WB		A	9.0	A	8.8	---	---	
5. SR 113 / Midway Rd	EB/EB Stop							No
NB Left		A	7.7	A	7.6	A	7.5	
SB Left		A	7.5	A	7.6	A	7.4	
EB		B	13.7	B	12.0	B	10.5	
WB		B	11.4	B	13.7	A	9.9	
6. SR 113 / Hay Rd	EB Stop							No
NB Left		A	7.6	A	7.8	A	7.5	
EB		B	10.6	B	12.1	A	9.5	
7. SR 113 / SR 12	NB / SB Stop							Yes
NB		C	24.1	C	17.8	B	12.0	
SB		E	38.8	F	373.3	C	20.5	
EB Left		A	0.0	A	8.6	A	8.6	
WB Left		A	7.8	A	9.3	A	7.9	
8. Hay Rd / Project Entrance	NB Stop							No
NB		A	9.2	A	9.1	A	9.0	
WB Left		A	7.4	A	7.3	A	7.4	

AWS – multi-way stop

Existing Roadway Segment Levels of Service. Table 4 summarizes the Levels of Service based on the current traffic volumes on study area roads with the existing roadway configuration. Applicable Level of Service thresholds and roadway classifications are presented. The Levels of Service along Midway Road, SR 113 and Hay Road were computed using the HCS two-lane roadway methodology. Both County roadways will operate at LOS C or better while the segments along SR 113 operate at LOS D or better. These are within the acceptable thresholds.

TABLE 4
EXISTING ROADWAY SEGMENT LEVELS OF SERVICE

Roadway	Location	Facility Classification	ATS/PTSF/LOS Existing AM	ATS/PTSF/LOS Existing PM
Midway Rd	I-80 to Porter Rd	Class I Highway		
	EB		46.6 / 42.8 / C	45.9 / 55.0 / C
	WB		46.5 / 53.3 / C	46.0 / 49.8 / C
	Porter Rd to SR 113	Class I Highway		
	EB		48.2 / 35.3 / C	50.0 / 13.9 / B
	WB		48.0 / 30.5 / C	50.2 / 28.1 / B
SR 113	Midway Rd to Fry Rd	Class I Highway		
	NB		47.7 / 29.1 / C	45.9 / 36.8 / C
	SB		47.5 / 25.0 / C	45.9 / 37.3 / C
	Fry Rd to Hay Rd	Class I Highway		
	NB		45.8 / 44.2 / C	44.8 / 46.1 / D
	SB		45.6 / 31.7 / C	44.8 / 43.8 / D
	Hay Rd to SR 12	Class I Highway		
	NB		46.1 / 48.2 / C	44.9 / 45.3 / D
	SB		45.7 / 30.5 / C	44.9 / 50.4 / D
Hay Rd	SR 113 to Daily Rd	Class I Highway		
	EB		49.7 / 24.9 / C	49.5 / 26.4 / C
	WB		49.7 / 24.9 / C	49.4 / 15.1 / C

ATS – average travel speed
PTSF – percent time spent following

Non-Automobile Transportation

Public Transit. Various bus services are provided within Solano County. These include the Fairfield and Suisun Transit System (FAST), Rio Vista Delta Breeze, Solano Express and Vacaville City Coach. These services provide local and intercity routes along the I-80 corridor; however, there are no routes along Midway Road or SR 113.

Bicycle and Pedestrian Facilities. Due to the rural nature of the project location there are no bike facilities or pedestrian facilities present.

Existing Plus Project Conditions

Under Section 15126.2 of the CEQA guidelines, a project must be evaluated individually and cumulatively to determine whether the project causes a significant effect on the environment. Individually, the project is evaluated under Existing conditions, i.e., Existing plus Project conditions while cumulatively, it is analyzed under future conditions which may include either a list of past, present and probably future projects producing related or cumulative impacts or a summary of projections contained in an adopted local, regional or statewide plan or related planning document.

This project is intended to amend the existing Conditional Use Permit by allowing up to 3,400 tons of refuse to be delivered to the site, while maintaining an average 7-day average of 3,200 tons per day.

The 2016 data (tonnage received and vehicle trips) is an appropriate baseline against which to assess the potential net growth in vehicles travelling to and from the landfill as a result of the project. During 2017 and 2018, the landfill assisted in the disposal of fire debris from wildfires in Northern California, which resulted in the accommodation of additional tonnage within the disposal area and additional vehicles travelling to and from the landfill. Table 5 identifies the annual tonnage received, with and without the fire debris and the number of vehicles travelling to and from the landfill during those periods. Because the acceptance of fire debris was in response to an emergency condition, the additional tonnage received and trips conducted were not subject to the established limits within the CUP for the landfill. As a result, use of either 2017 or 2018 tonnage data as part of the baseline against which the potential impacts of an amended CUP would be assessed is considered inappropriate and potentially misleading because it does not represent the landfill's typical operating condition.

TABLE 5
HISTORICAL ANNUAL TONNAGE 2016 – 2018

Year	Baseline Tonnage	Baseline Vehicles
2016	*1,682*	*425*
2017 (with fire debris)	1,947	471
2018 (with fire debris)	2,083	465

Italics: Baseline

Trip Generation. The 2016 7-day tonnage averaged about 1,682 per day. Recology Hay Road projects that most new municipal solid waste (MSW) associated with the proposed project will arrive from outside the local area using semitrailer. MSW tonnage arriving to the site is projected as follows:

- 90% 20-ton transfer trucks
- 8% 7-ton packer trucks
- 2% ½-ton self-haul vehicles

Table 6 presents the projected additional trips, broken down by vehicle type, based on the proposed expansion of the site. Both average daily and peak day MSW tonnage to the site were considered. Peak tonnage was based on the difference between the maximum proposed peak tonnage per day (maximum 3,400 tons per day) and the average 2016 weekday tonnage 1,682 tons per day). The project will generate an additional 1,718 tons of MSW under a peak day while the additional average daily MSW will be 1,518 tons per day.

Based on the projected additional daily tonnage and the various vehicles bringing MSW to the site it is projected that 195 new inbound and 195 new outbound trips will be generated daily by the project. This is shown in Table 6. Of these trips, 91 new semi-trailer trips will be generated, with 23 additional packer trucks and 81 new self-haul vehicles.

TABLE 6
PROJECTED DAILY TRIPS*

Average MSW Tons		Average Daily Tonnage per Week (Proposed)	Maximum Daily Tonnage (Proposed)	Net New Tonnage	
(a)	(b)	(c)	(d)	(e)	(f)
Weekday	Weekend			Weekday	**Maximum**
1,682	924	3,200	3,400	1,518[1]	**1,768[2]**

PEAK TONNAGE VEHICLES

Maximum Daily Tonnage	Transfer Trucks 90% of entering vehicles (20 tons / vehicle)		Packer Trucks 8% of entering vehicles (7 tons / vehicle)		Self-Haul vehicles 2% of entering vehicles (0.5 tons / vehicle)		Total Vehicles
(g)	In	Out	In	Out	In	Out	
1,718 (Inbound)	91[3]		23[4]		81[5]		**195**
Empty (Outbound)		91		23		81	**195**

* Based on 2016 traffic at Recology Hay Road site
MSW – municipal solid waste
[1] (c) – (a)
[2] (d) – (a)
[3] [(g)*0.90] / 20
[4] [(g)*0.08] / 7
[5] [(g)*0.02] / 0.5

The projected peak hour traffic was estimated based on current traffic into the site compared to historical daily traffic and proportioned based on the existing conditions. On a peak day the project is expected to generate 46 additional a.m. peak hour trips and 27 additional p.m. peak hour trips. Table 7 presents the projected a.m. and p.m. peak hour trips including a breakdown by trip type.

TABLE 7
PROJECTED PEAK HOUR TRIPS

Existing Conditions				
Avg Total Daily Vehicles	**AM**		**PM**	
	In	**Out**	**In**	**Out**
526 vehicles*	69†	53†	3‡	53‡
Percent Traffic◊	13.1%	10.1%	0.6%	13.1%
Project Traffic				
New Daily Vehicles	**AM**		**PM**	
	In	**Out**	**In**	**Out**
195 vehicles				
Peak Hour Traffic	**26♦**	**20**	**1**	**26**
Transfer Truck	**12ϕ**	**9**	**1**	**12**
Packer	**3μ**	**2**	**0**	**3**
Self-Haul	**11β**	**8**	**0**	**11**

* average entering midweek vehicles
† existing a.m. peak hour traffic
‡ existing p.m. peak hour traffic
◊ directional peak hour traffic / ADT
♦ (195 daily vehicles* 13.1%) typ.
ϕ 26*(91/195) typ.
μ 26*(23/195) typ.
β 26*(81/195) typ.

Recology is projecting that Saturday traffic volumes will be similar to mid-week volumes. Weekend traffic generates about 459 vehicles to the site on a typical Saturday. Table 8 presents the projected Saturday peak hour trips based on current inbound and outbound peak hour Saturday trips relative to the total daily Saturday trips. Eleven inbound and nine outbound transfer trucks are projected during the peak hour with three inbound and two outbound packer trucks and ten inbound and eight outbound additional self-haul vehicles are projected with the increase in daily tonnage.

TABLE 8
PROJECTED SATURDAY DAILY TRIPS

Existing Conditions						
Avg Total Daily Vehicles				**In**	**Out**	
459 vehicles				55†	43‡	
Percent Traffic				**12.0%**	**9.4%**	
Project Traffic						
Transfer Trucks		**Packer Trucks**		**Self-Haul Vehicles**		**Total Vehicles**
In	**Out**	**In**	**Out**	**In**	**Out**	
11[1]	9[2]	3[3]	2[4]	10[5]	8[6]	**43**

† entering Saturday vehicles
‡ exiting Saturday vehicles
[1] (91 weekday transfer trucks)*12.0%
[2] (91 weekday transfer trucks)*9.4%
[3] (23 weekday packer trucks)*12.0%
[4] (23 weekday packer trucks)*9.4%
[5] (81 weekday self-haul)*12.0%
[6] (81 weekday self-haul)*9.4%

Vehicle Trip Distribution. The distribution of project vehicular traffic was determined based on the haul routes for semi-trailer and packer vehicles and a review of existing traffic counts at the surrounding intersections. Table 9 displays the trip distribution assumptions used for the proposed projects.

TABLE 9
TRIP DISTRIBUTION

Route	**% of Total Trips**		
	AM	**PM**	**Saturday**
To / From I-80 west of Midway Rd	62%	46%	48%
West on Hay Road	20%	30%	30%
To / From SR 12 east of SR 113	9%	8%	10%
To / From SR 12 west of SR 113	0%	8%	6%
North on SR 113	9%	8%	6%
Total	100%	100%	100%

Vehicle Trip Assignment. Traffic generated by the project was assigned to the study roadway system based on the projected distribution percentages. Figure 3 displays the project generated traffic. Figure 4 displays the resulting sum of existing a.m., p.m. and Saturday peak hour volumes and project trips at the study intersections for the Existing plus Project condition.

PROJECT ONLY TRAFFIC VOLUMES AND LANE CONFIGURATIONS

**NOTE: Intersections 1-4 not analyzed on Saturday

EXISTING PLUS PROJECT
TRAFFIC VOLUMES AND LANE CONFIGURATIONS

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Existing Plus Project Level of Service Impacts

Intersection Levels of Service. Table 10 displays the a.m., p.m. and Saturday peak period levels of service at each study intersection under Existing plus Project conditions. All intersections except the SR 12/ SR 113 intersection will continue to operate at or above the level of service thresholds, at LOS C or better. The SR 12 / SR 113 intersection will continue to operate at LOS E in the a.m. peak hour and LOS F in the p.m. peak hour. As identified in the Existing Conditions the intersection is scheduled to have a roundabout installed and completed by Fall 2019. No mitigations are necessary.

Roadway Levels of Service. Table 11 presents the peak hour roadway segment traffic volumes along the five study segments. All roadway segments along County roads will operate at LOS C or better while all roadway segments along SR 113 will operate at LOS D or better. These are within the acceptable thresholds.

TABLE 10
EXISTING PLUS PEAK HOUR LEVELS OF SERVICE AT INTERSECTIONS

Location	Control	Existing plus Project AM Peak Hour		Existing plus Project PM Peak Hour		Existing plus Project Saturday Peak Hour		Peak Hour Warrant Met?
		LOS	Average Delay (secs)	LOS	Average Delay (secs)	LOS	Average Delay (secs)	
1. I-80 Westbound Ramps / Oday Rd	WB Stop							No
SB Left		A	7.7	A	7.5	---	---	
WB		B	10.3	A	9.6	---	---	
2. Midway Road / Oday Rd	SB Stop							No
SB		B	11.1	A	9.8	---	---	
EB Left		A	7.8	A	7.6	---	---	
3. I-80 Eastbound Ramps / Midway Rd	NB Stop							No
NB		B	13.2	B	12.4	---	---	
EB Left		A	8.2	A	8.1	---	---	
4. Midway Rd / Porter Rd	WB Stop							No
WB		A	9.1	A	8.9	---	---	
5. SR 113 / Midway Rd	EB/EB							No
NB Left	Stop	A	7.7	A	7.7	A	7.5	
SB Left		A	7.5	A	7.6	A	7.4	
EB		B	14.3	B	12.3	B	10.5	
WB		B	11.8	B	14.2	B	10.0	
6. SR 113 / Hay Rd	EB Stop							No
NB Left		A	7.6	A	7.8	A	7.5	
EB		B	11.2	B	12.5	A	9.9	
7. SR 113 / SR 12	NB / SB							Yes
NB	Stop	B	11.9	C	17.8	B	12.0	
SB		E	39.4	F	376.1	C	20.6	
EB Left		A	0.0	A	8.6	A	8.6	
WB Left		A	7.8	A	9.3	A	7.9	
8. Hay Rd / Project Entrance	NB Stop							No
NB		A	9.5	A	9.3	A	9.2	
WB Left		A	7.4	A	7.3	A	7.4	

AWS – multi-way stop

TABLE 11
EXISTING PLUS PROJECT ROADWAY SEGMENT LEVELS OF SERVICE

Roadway	Location	Facility Classification	ATS/PTSF/LOS Existing plus Project AM	ATS/PTSF/LOS Existing plus Project PM
Midway Rd	I-80 to Porter Rd	Class I Highway		
	EB		46.4 / 45.4 / C	45.8 / 55.6 / C
	WB		46.3 / 55.3 / C	45.9 / 51.3 / C
	Porter Rd to SR 113	Class I Highway		
	EB		47.9 / 37.5 / C	49.8 / 13.3 / C
	WB		47.6 / 32.3 / C	50.1 / 29.6 / B
SR 113	Midway Rd to Fry Rd	Class I Highway		
	NB		47.2 / 31.0 / C	45.7 / 38.5 / C
	SB		47.0 / 28.1 / C	45.7 / 37.7 / C
	Fry Rd to Hay Rd	Class I Highway		
	NB		45.3 / 45.3 / C	44.7 / 47.8 / D
	SB		45.3 / 34.0 / C	44.7 / 44.1 / D
	Hay Rd to SR 12	Class I Highway		
	NB		46.0 / 48.5 / C	44.8 / 45.0 / D
	SB		45.7 / 30.9 / C	44.8 / 50.7 / D
Hay Rd	SR 113 to Daily Rd	Class I Highway		
	EB		49.0 / 27.2 / C	49.3 / 29.3 / C
	WB		49.0 / 21.8 / C	49.2 / 13.1 / C

ATS – average travel speed
PTSF – percent time spent following

CUMULATIVE IMPACTS

The analysis of Cumulative impacts was considered when accommodating the peak tonnage increase for the site.

Year 2030 Traffic Forecasts and Lane Configurations

The traffic impacts associated with revising the allowable daily tonnage increase at the Hay Road Landfill site was evaluated within the context of future traffic conditions occurring in this area of Solano County. The most recent Napa-Solano regional travel demand model was used to estimate cumulative traffic in the project's vicinity.

Year 2030 daily traffic volume forecasts generated by the traffic model was the basis for future background traffic conditions. Cumulative volumes along the roadway links were developed using the difference method, i.e., using the projected model growth (i.e. 2010 to 2030) and adding this to existing traffic counts.

The "balancing" of future year intersection turning movement traffic volumes was conducted using methods described in the Transportation Research Board's (TRB's) National Cooperative Highway Research Program (NCHRP) Report 255, *Highway Traffic Data for Urbanized Area Project Planning and Design*. The NCHRP 255 method applies the desired peak hour directional volumes to the intersection turning movement volumes, using an iterative process to balance and adjust the resulting forecasts to match the desired peak hour directional volumes. The development of future year intersection turning movement traffic volumes requires that the turning movements at each intersection "balance". To achieve the balance, inbound traffic volumes must equal the outbound traffic volumes, and the volumes must be distributed among the various left-turn, through, and right-turn movements at each intersection. Figure 5 presents the projected turning movements at the study intersections.

A single lane roundabout at the SR 12 / SR 113 intersection is the only road improvement identified within the project limits.

2030 Conditions

Intersection Levels of Service. Table 12 displays the a.m. peak hour Levels of Service at each study intersection in the Cumulative 2030 condition. Two intersections will operate below County and Caltrans LOS thresholds in the 2030 No Project condition. The SR 113 / Midway Road intersection will decline to a LOS E condition in the a.m. peak hour (38.5 spv) and p.m. peak hour (46.0 spv). The SR 12/ SR 113 intersection is projected to operate at a LOS F condition in the p.m. peak hour (124.4 spv). The SR 113 / Midway Road intersection will meet the peak hour signal warrant in the a.m. and p.m. peak hours. The SR 113 / Hay Road intersection will also meet the peak hour signal warrant in the p.m. peak hour; however, the intersection operates at LOS C or better.

TABLE 12
2030 PEAK HOUR LEVELS OF SERVICE AT INTERSECTIONS

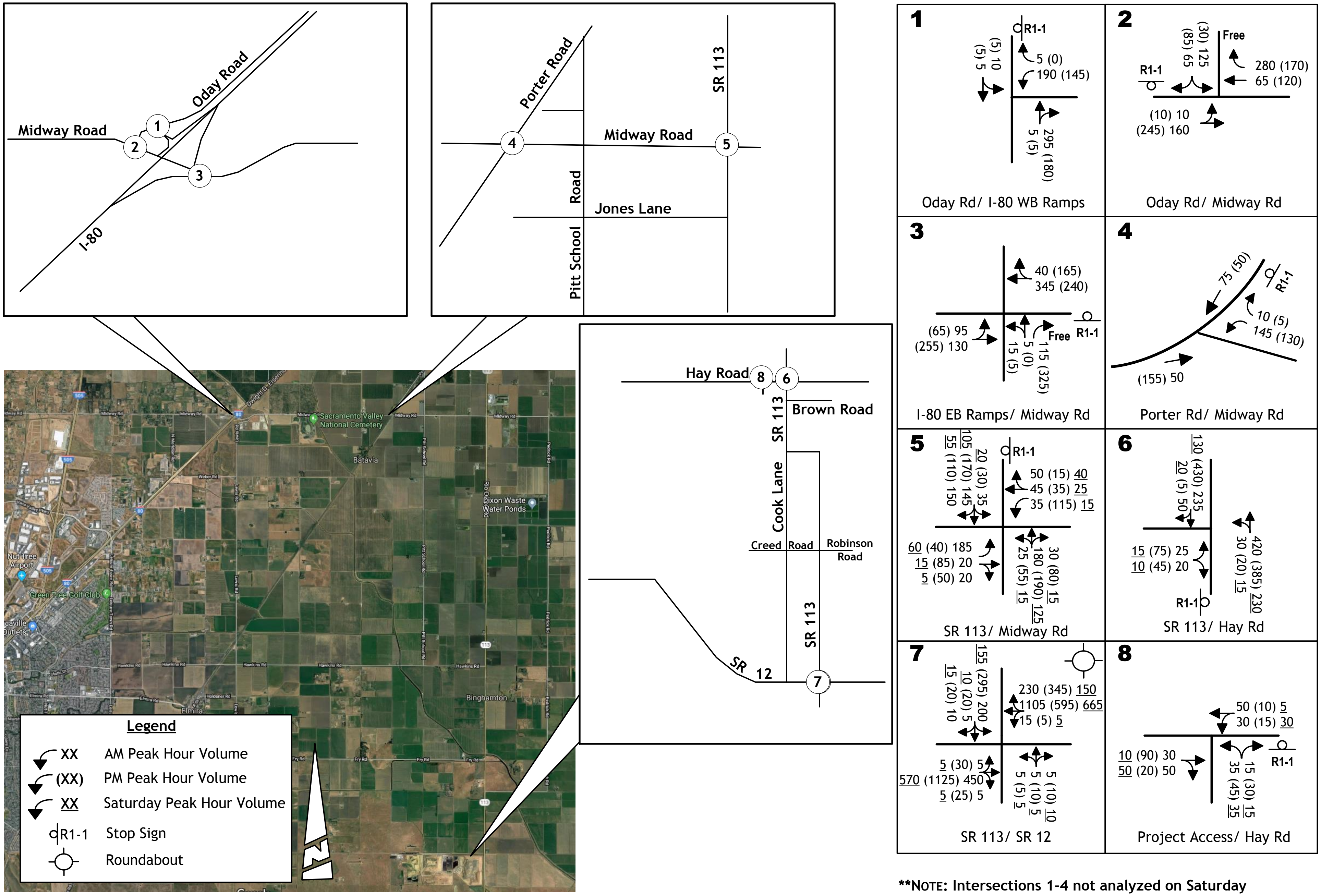
Location	Control	2030 AM Peak Hour LOS	2030 AM Peak Hour Average Delay (secs)	2030 PM Peak Hour LOS	2030 PM Peak Hour Average Delay (secs)	2030 Saturday Peak Hour LOS	2030 Saturday Peak Hour Average Delay (secs)	Peak Hour Warrant Met?
1. I-80 Westbound Ramps / Oday Rd	WB Stop							No
SB Left		A	7.9	A	7.6	---	---	
WB		B	11.2	B	10.1	---	---	
2. Midway Road / Oday Rd	SB Stop							No
SB		B	13.3	B	11.2	---	---	
EB Left		A	8.1	A	7.9	---	---	
3. I-80 Eastbound Ramps / Midway Rd	NB Stop							No
NB		C	16.4	C	16.0	---	---	
EB Left		A	8.6	A	8.5	---	---	
4. Midway Rd / Porter Rd	WB Stop							No
WB		A	9.2	A	9.1	---	---	
5. SR 113 / Midway Rd	EB/EB Stop							Yes[1]
NB Left		A	8.0	A	8.1	A	7.7	
SB Left		A	7.8	A	7.9	A	7.6	
EB		E	38.5	C	23.6	B	13.2	
WB		C	16.1	E	46.0	B	11.1	
6. SR 113 / Hay Rd	EB Stop							Yes[2]
NB Left		A	8.0	A	8.4	A	7.6	
EB		B	14.1	C	21.2	B	10.7	
7. SR 113 / SR 12	Roundabout	C	20.8	F	124.4	B	10.4	N/A
8. Hay Rd / Project Entrance	NB Stop							No
NB		A	9.6	A	9.5	A	9.2	
WB Left		A	7.4	A	7.5	A	7.4	

AWS – multi-way stop

N/A – not applicable

[1]meets peak hour traffic signal warrant (a.m. and p.m.)

[2]meets peak hour traffic signal warrant (p.m.)



**NOTE: Intersections 1-4 not analyzed on Saturday

2030 TRAFFIC VOLUMES AND LANE CONFIGURATIONS

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figure 5

2030 Roadway Segment Levels of Service. Table 13 summarizes the Levels of Service based on the projected 2030 traffic volumes on study area roads with the existing two-lane roadway configuration. All roadway segments except the Midway Road segment between I-80 and Porter Road are projected to operate acceptably, at LOS C along County roads and at LOS D or better along SR 113. The Level of Service along Midway Road between I-80 and Porter Road is projected to decline to LOS D in the p.m. peak hour in both eastbound and westbound directions.

TABLE 13
2030 ROADWAY SEGMENT LEVELS OF SERVICE

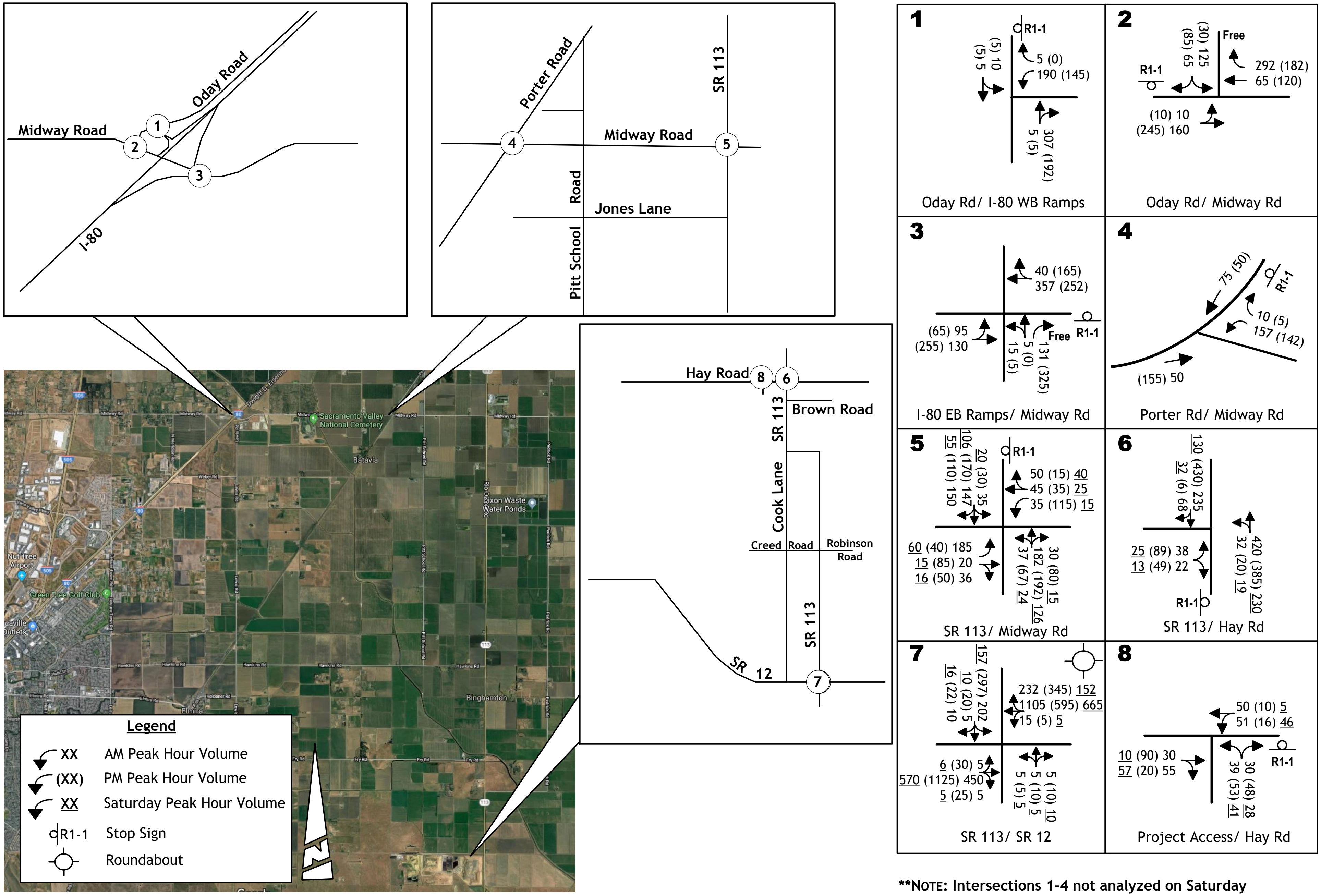
Roadway	Location	Facility Classification	ATS/PTSF/LOS 2030 AM	ATS/PTSF/LOS 2030 PM
Midway Rd	I-80 to Porter Rd	Class I Highway		
	EB		45.5 / 45.3 / C	42.6 / 72.3 / D
	WB		45.4 / 62.2 / C	43.0 / 59.2 / D
	Porter Rd to SR 113	Class I Highway		
	EB		46.5 / 44.5 / C	47.3 / 36.1 / C
	WB		46.7 / 42.3 / C	47.3 / 39.8 / C
SR 113	Midway Rd to Fry Rd	Class I Highway		
	NB		44.3 / 41.4 / D	43.5 / 52.8 / D
	SB		43.7 / 53.6 / D	43.5 / 53.1 / D
	Fry Rd to Hay Rd	Class I Highway		
	NB		42.9 / 59.6 / D	41.7 / 63.1 / D
	SB		43.1 / 46.6 / D	41.8 / 60.4 / D
	Hay Rd to SR 12	Class I Highway		
	NB		43.1 / 63.0 / D	41.9 / 59.6 / D
	SB		43.4 / 44.2 / D	41.8 / 65.7 / D
Hay Rd	SR 113 to Daily Rd	Class I Highway		
	EB		49.2 / 16.6 / C	49.0 / 36.7 / C
	WB		49.2 / 29.3 / C	48.6 / 7.9 / C

ATS – average travel speed
PTSF – percent time spent following

2030 Plus Project Level of Service Impacts

Intersection Levels of Service. Figure 6 presents the projected turning movements at the study intersections under 2030 plus Project conditions. Table 14 displays the a.m. peak hour Levels of Service at each study intersection in the 2030 plus Project condition. Two intersections will operate below County and Caltrans LOS thresholds. The SR 113 / Midway Road intersection will operate at a LOS E condition in the a.m. peak hour (45.7 spv) and LOS F condition in the p.m. peak hour (53.6 spv). This intersection will meet the peak hour signal warrant in the a.m. and p.m. peak hour. The SR 12/ SR 113 intersection is projected to operate at a LOS F condition in the p.m. peak hour (125.3 spv). The SR 113 / Hay Road intersection will also meet the peak hour signal warrant in the p.m. peak hour; however, the intersection operates at LOS C or better.

Roadway Levels of Service. Table 15 summarizes the Levels of Service based on the projected 2030 plus Project traffic volumes on study area roads. All roadway segments except the Midway Road segment between I-80 and Porter Road are projected to operate acceptably, at LOS C along County roads and at LOS D or better along SR 113. The Level of Service along Midway Road between I-80 and Porter Road is projected to decline to LOS D in the p.m. peak hour in both eastbound and westbound directions.



**NOTE: Intersections 1-4 not analyzed on Saturday

2030 PLUS PROJECT TRAFFIC VOLUMES AND LANE CONFIGURATIONS

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figure 6

TABLE 14
2030 PLUS PEAK HOUR LEVELS OF SERVICE AT INTERSECTIONS

Location	Control	2030 plus Project AM Peak Hour		2030 plus Project PM Peak Hour		2030 plus Project Saturday Peak Hour		Peak Hour Warrant Met?
		LOS	Average Delay (secs)	LOS	Average Delay (secs)	LOS	Average Delay (secs)	
1. I-80 Westbound Ramps / Oday Rd	WB Stop							No
SB Left		A	8.0	A	7.7	---	---	
WB		B	11.3	B	10.2	---	---	
2. Midway Road / Oday Rd	SB Stop							No
SB		B	13.4	B	11.3	---	---	
EB Left		A	8.1	A	7.9	---	---	
3. I-80 Eastbound Ramps / Midway Rd	NB Stop							No
NB		C	16.6	C	16.2	---	---	
EB Left		A	8.6	A	8.6	---	---	
4. Midway Rd / Porter Rd	WB Stop							No
WB		A	9.3	A	9.2	---	---	
5. SR 113 / Midway Rd	EB/EB Stop							Yes[1]
NB Left		A	8.1	A	8.1	A	7.7	
SB Left		A	7.8	A	7.9	A	7.6	
EB		E	45.7	D	25.3	B	13.3	
WB		C	17.0	F	53.6	B	11.3	
6. SR 113 / Hay Rd	EB Stop							Yes[2]
NB Left		A	8.0	A	8.4	A	7.6	
EB		C	15.4	C	23.1	B	11.1	
7. SR 113 / SR 12	Roundabout	C	21.0	F	125.3	B	10.5	N/A
8. Hay Rd / Project Entrance	NB Stop							No
NB		A	9.8	A	9.7	A	9.4	
WB Left		A	7.5	A	7.5	A	7.4	

AWS – multi-way stop

N/A – not applicable

[1]meets peak hour traffic signal warrant (a.m. and p.m.)

[2]meets peak hour traffic signal warrant (p.m.)

TABLE 15
2030 PLUS PROJECT ROADWAY SEGMENT LEVELS OF SERVICE

Roadway	Location	Facility Classification	ATS/PTSF/LOS 2030 plus Project AM	ATS/PTSF/LOS 2030 plus Project PM
Midway Rd	I-80 to Porter Rd	Class I Highway		
	EB		45.3 / 47.4 / C	42.6 / 72.9 / D
	WB		45.1 / 61.4 / C	42.9 / 60.2 / D
	Porter Rd to SR 113	Class I Highway		
	EB		46.5 / 44.5 / C	47.2 / 35.1 / C
	WB		46.5 / 44.0 / C	47.2 / 41.1 / C
SR 113	Midway Rd to Fry Rd	Class I Highway		
	NB		44.0 / 42.8 / D	43.4 / 54.1 / D
	SB		42.9 / 47.7 / D	43.4 / 53.6 / D
	Fry Rd to Hay Rd	Class I Highway		
	NB		42.6 / 61.1 / D	41.6 / 63.7 / D
	SB		42.8 / 49.2/ D	41.7 / 60.7 / D
	Hay Rd to SR 12	Class I Highway		
	NB		43.0 / 63.0 / D	41.9 / 60.5 / D
	SB		43.3 / 44.4 / D	41.7 / 66.0 / D
Hay Rd	SR 113 to Daily Rd	Class I Highway		
	EB		48.7 / 19.0 / C	48.9 / 38.7 / C
	WB		48.9 / 31.6 / C	48.3 / 7.6 / C

ATS – average travel speed
PTSF – percent time spent following

TEMPORARY BALE STORAGE OF RECYCLABLE MATERIALS

Due to recent import restrictions imposed by China on recyclable materials, baled, single-stream recyclable materials are planned to be temporarily stored at the Hay Road landfill site until the restrictions are lifted and/or new markets are developed to accept the material. The landfill site is proposing to store up to 3,680 bales for up to six months before being transported to off-site processing facilities. Each truck delivering bales would contain approximately 50 bales. The project applicant proposes to deliver on average five trucks per day and up to twenty trucks on a given day of baled recyclable materials. If deliveries were to occur daily the landfill would reach its storage limit in 4 to 15 days. It is assumed that similar shipments outbound would be made to the processing facilities or buyer, however, the potential destination of the material is not able to be determined. Trucks could return to the San Francisco Bay Area along westbound I-80, could head east toward Sacramento along eastbound I-80 or east toward Stockton via SR 12.

Because a reasonable projection of the number of vehicles (591) traveling to the landfill with implementation of the proposed project are not anticipated to exceed the daily vehicle limit (620) evaluated in this analysis, the potential additional truck trips associated with the delivery of bales to the landfill is within the modeling results identified above. A further qualitative assessment was conducted to determine what impacts the addition of five trucks per day would have on the local road system. As noted above the site could be filled in 15 days with no additional storage available until on-site material is shipped off-site. It is expected that the maximum of 20 truck shipments could occur on a rare basis, with the five-truck average being more likely, given the amount of storage space available and the expected storage time. With five trucks delivering recyclables and five trucks hauling recyclables to a processing facility this would add 10 round trip truck trips per day to the roadway network. While delivery and shipping times are unknown Recology has stated in their Bale Storage Management Plan that they would attempt to avoid peak hours to the extent possible. All bales would be shipped along I-80 with 75% of the baled material west of the Midway Road interchange and 25% of the baled material east of the interchange. Since Recology aims to avoid the peak hours these vehicles would not be part of the intersection or roadway analyses. The additional trips would not occur every day and would be part of the daily fluctuation in traffic. Based on this information the quantitative analysis did not include these recyclable material trips. Under Existing plus Project conditions all study intersections between the I-80 / Midway Road interchange and the site have adequate capacity to accommodate additional peak hour round trips. All roadway segments will have capacity to accommodate the additional peak hour truck traffic.

If the import restriction continues through 2030 the two intersections identified under 2030 Cumulative plus Project conditions, SR 113 at Midway Road and SR 12 at SR 113, will continue to operate at LOS E or F, below Caltrans' LOS D threshold. The Midway Road segment between I-80 and Porter Road will also continue to operate below the County's LOS C threshold.

MITIGATION MEASURES

The preceding analysis has identified project-specific and cumulative (2030) impacts that may occur without mitigation. The following discussion identifies a strategy for mitigating the impacts and contribution to impacts of the proposed project. Recommendations are identified for facilities that require improvement but the need for improvement is not a result of the proposed project. If the project causes or contributes to a significant impact, mitigations are identified for the facility.

Existing Conditions

The SR 12 / SR 113 intersection currently operates at LOS E in the a.m. peak hour and LOS F in the p.m. peak hour. Caltrans has an identified safety project that would construct a single lane roundabout at this intersection. Construction is slated to be completed Fall 2019. Under the roundabout condition the intersection will operate at LOS A in the a.m. peak period (7.0 spv) and LOS C in the p.m. peak hour (18.8 spv). The remaining intersections and roadway segments operate within the Caltrans and County LOS thresholds.

Existing Plus Project Conditions

Under Existing plus Project conditions, all intersections except the SR 12 / SR 113 intersection will operate within acceptable County and Caltrans LOS thresholds. The SR 12 / SR 113 intersection will continue to operate at LOS E in the a.m. peak hour and LOS F in the p.m. peak hour. As identified under Existing Conditions Caltrans has an identified safety project that would construct a single lane roundabout at this intersection. With this project completed the intersection will operate at LOS A in the a.m. peak hour (7.1 spv) and LOS C in the p.m. peak hour (19.1 spv). All roadways will continue to operate within the Caltrans and County LOS thresholds.

No additional mitigations are necessary.

2030 Conditions

Under 2030 conditions the SR 113 / Midway Road intersection will decline to an LOS E condition in the a.m. peak hour (45.7 spv) and LOS F condition in the p.m. peak hour (53.6 spv). The intersection will not meet the peak hour traffic signal warrant. The SR 12 / SR 113 intersection will decline to LOS F in the p.m. peak hour (124.4 spv). One roadway segment, Midway Road between the I-80 Eastbound Ramps intersection and Porter Road will decline to LOS D in both directions. The remaining intersections and roadway segments will operate within County and Caltrans LOS thresholds.

The following recommendations are made:

Recommendations:

- SR 113 / Midway Road: Installation of all-way stop control will improve the level of service to LOS B in both a.m. (13.3 spv) and p.m. (13.7 spv) peak hours. Caltrans has identified a conceptual project to widen shoulders, construct a median and install a traffic signal at the SR 113 / Midway Road intersection to enhance safety; however, this project is not yet included in a planning or programming document.

- SR 12 / SR 113: Installation of a second eastbound lane through the roundabout will improve the level of service to a LOS C (21.5 spv) condition in the p.m. peak hour. Caltrans would have jurisdiction over this improvement. Additionally, there is no funding mechanism for this improvement, and no agencies with jurisdiction currently have plans for any improvements at this intersection.

- Midway Road - I-80 Eastbound Ramps to Porter Road (both directions): A 0.30 mile long passing lane in both eastbound and westbound directions would be needed to improve the roadway segment to an acceptable level of service, LOS C (EB ATS – 45.1 / PTSF – 52.8; WB ATS – 45.3 / PTSF – 43.0). However, Caltrans would have jurisdiction over these improvements. Additionally, there is no funding mechanism for this improvement, and no agencies with jurisdiction currently have plans for any improvements at this intersection.

No additional recommendations are noted.

2030 Plus Project Conditions

The SR 113 / Midway Road intersection and the SR 12 / SR 113 intersection will continue to operate below the Caltrans LOS D threshold with implementation of the project. Additionally, both directions of Midway Road, between the I-80 Eastbound Ramps intersection and Porter Road will operate at LOS D with implementation of the project. The remaining intersections and all roadway segments will operate within County and Caltrans LOS thresholds. The following mitigation measures have been identified for the aforementioned facilities to which the project would contribute to unacceptable LOS:

Mitigations:

- SR 113 / Midway Road: As identified in the 2030 No Project Recommendations installation of all-way stop control will improve the level of service to LOS B in both a.m. (13.7 spv) and p.m. (13.8 spv) peak hours. This intersection is under the jurisdiction of Caltrans, and Caltrans has identified a conceptual project to widen shoulders, construct a median and install a traffic signal at the SR 113 / Midway Road intersection to enhance safety. However, this project is not yet included in a planning or programming document. Any improvement of the intersection would require Caltrans concurrence and approval. The project applicant and Solano County shall coordinate with Caltrans on implementation of this improvement. However, because the final approval of the proposed improvement is outside the jurisdiction and control of the Applicant and County, there is no guarantee that this mitigation measure would be implemented prior to project-related trips occurring at this intersection. Therefore, this is considered a significant and unavoidable impact.

- SR 12 / SR 113: As identified in the 2030 No Project Recommendations installation of a second eastbound lane through the roundabout will improve the level of service to a LOS C (21.7 spv) condition in the p.m. peak hour. This improvement is under the jurisdiction of Caltrans. Any improvement of the intersection would require Caltrans concurrence and approval. The project applicant and Solano County shall coordinate with Caltrans on implementation of this improvement. However, because the final approval of the proposed improvement is outside the jurisdiction and control of the Applicant and County, there is no guarantee that this mitigation measure would be implemented prior to project-related trips occurring at this intersection. Additionally, Caltrans does not currently have plans for any improvements at this intersection. Therefore, this is considered a significant and unavoidable impact.

- Midway Road - I-80 Eastbound Ramps to Porter Road (both directions): As identified in the 2030 No Project Recommendations a 0.30 mile long passing lane in both eastbound and westbound directions would be needed to improve the roadway segment LOS to an acceptable level of LOS C (EB ATS – 45.0 / PTSF – 53.2; WB ATS – 45.2 / PTSF – 43.7). This improvement is under the jurisdiction of Solano County. The project applicant shall coordinate with Solano County and shall fund the improvement of this segment to be constructed prior to vehicle trips to the landfill exceeding 2,400 per day. Therefore, with mitigation, this is considered a less-than-significant impact.

No additional mitigations are identified.

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APPENDIX

(under separate cover)

TECHNICAL APPENDIX

FOR

RECOLOGY HAY ROAD LANDFILL EXPANSION PROJECT
TRAFFIC IMPACT ANALYSIS
Solano County, CA

Prepared For:

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December 5, 2018

0563-002

Intersection						
Int Delay, s/veh	4.5					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	153	2	3	198	7	1
Future Vol, veh/h	153	2	3	198	7	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	7	2	2
Mvmt Flow	166	2	3	215	8	1

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	128	111	0	0	218	0
Stage 1	111	-	-	-	-	-
Stage 2	17	-	-	-	-	-
Critical Hdwy	6.47	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	855	942	-	-	1352	-
Stage 1	901	-	-	-	-	-
Stage 2	993	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	850	942	-	-	1352	-
Mov Cap-2 Maneuver	850	-	-	-	-	-
Stage 1	896	-	-	-	-	-
Stage 2	993	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.3	0	6.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	850	942	1352	-
HCM Lane V/C Ratio	-	-	0.196	0.002	0.006	-
HCM Control Delay (s)	-	-	10.3	8.8	7.7	0
HCM Lane LOS	-	-	B	A	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0	0	-

Intersection						
Int Delay, s/veh	3.5					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	102	44	192	95	60
Future Vol, veh/h	5	102	44	192	95	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	7	7	2
Mvmt Flow	5	111	48	209	103	65

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	257	0	-	0	274	153
Stage 1	-	-	-	-	153	-
Stage 2	-	-	-	-	121	-
Critical Hdwy	4.12	-	-	-	6.47	6.22
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	2.218	-	-	-	3.563	3.318
Pot Cap-1 Maneuver	1308	-	-	-	705	893
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	892	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1308	-	-	-	702	893
Mov Cap-2 Maneuver	-	-	-	-	702	-
Stage 1	-	-	-	-	860	-
Stage 2	-	-	-	-	892	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1308	-	-	-	765
HCM Lane V/C Ratio	0.004	-	-	-	0.22
HCM Control Delay (s)	7.8	0	-	-	11
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.8

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	72	97	0	0	237	42	9	1	111	0	0	0
Future Vol, veh/h	72	97	0	0	237	42	9	1	111	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	50	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	7	2	2	7	7	7	2	7	2	2	2
Mvmt Flow	78	105	0	0	258	46	10	1	121	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	304	0	-	-	-	0	542	565	-
Stage 1	-	-	-	-	-	-	261	261	-
Stage 2	-	-	-	-	-	-	281	304	-
Critical Hdwy	4.17	-	-	-	-	-	6.47	6.52	-
Critical Hdwy Stg 1	-	-	-	-	-	-	5.47	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.47	5.52	-
Follow-up Hdwy	2.263	-	-	-	-	-	3.563	4.018	-
Pot Cap-1 Maneuver	1229	-	0	0	-	-	493	434	0
Stage 1	-	-	0	0	-	-	771	692	0
Stage 2	-	-	0	0	-	-	755	663	0
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1229	-	-	-	-	-	460	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	460	0	-
Stage 1	-	-	-	-	-	-	719	0	-
Stage 2	-	-	-	-	-	-	755	0	-

Approach	EB	WB	NB
HCM Control Delay, s	3.5	0	13
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	460	-	1229	-	-	-
HCM Lane V/C Ratio	0.024	-	0.064	-	-	-
HCM Control Delay (s)	13	0	8.1	0	-	-
HCM Lane LOS	B	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-	-

Intersection						
Int Delay, s/veh	0					

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	101	2	0	0	0	0
Future Vol, veh/h	101	2	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	2	2	2
Mvmt Flow	110	2	0	0	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1	0	0	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.47	6.22	-	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	-	-	-	-
Pot Cap-1 Maneuver	1009	-	-	0	0	-
Stage 1	-	-	-	0	0	-
Stage 2	1009	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	1009	-	-	-	-	-
Mov Cap-2 Maneuver	1009	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1009	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s		0	0
HCM LOS	-		

Minor Lane/Major Mvmt	NET	NBLn1	NBLn2	SWT
Capacity (veh/h)	-	1009	-	-
HCM Lane V/C Ratio	-	0.109	-	-
HCM Control Delay (s)	-	9	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.4	-	-

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	128	19	20	15	23	13	25	87	18	14	76	95
Future Vol, veh/h	128	19	20	15	23	13	25	87	18	14	76	95
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	120	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	7	2	2	2	7	7	2	2	7	2
Mvmt Flow	139	21	22	16	25	14	27	95	20	15	83	103

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	344	334	135	345	375	105	186	0	0	115	0	0
Stage 1	165	165	-	159	159	-	-	-	-	-	-	-
Stage 2	179	169	-	186	216	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.27	7.12	6.52	6.22	4.17	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.363	3.518	4.018	3.318	2.263	-	-	2.218	-	-
Pot Cap-1 Maneuver	610	586	901	609	556	949	1359	-	-	1474	-	-
Stage 1	837	762	-	843	766	-	-	-	-	-	-	-
Stage 2	823	759	-	816	724	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	567	568	901	565	539	949	1359	-	-	1474	-	-
Mov Cap-2 Maneuver	567	568	-	565	539	-	-	-	-	-	-	-
Stage 1	820	754	-	826	751	-	-	-	-	-	-	-
Stage 2	768	744	-	767	717	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.7	11.4	1.5	0.6
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1359	-	-	593	615	1474	-	-
HCM Lane V/C Ratio	0.02	-	-	0.306	0.09	0.01	-	-
HCM Control Delay (s)	7.7	-	-	13.7	11.4	7.5	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.3	0.3	0	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	13	11	16	232	131	28
Future Vol, veh/h	13	11	16	232	131	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	7	7	7
Mvmt Flow	14	12	17	252	142	30

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	443	157	172	0	-	0
Stage 1	157	-	-	-	-	-
Stage 2	286	-	-	-	-	-
Critical Hdwy	6.47	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	563	889	1405	-	-	-
Stage 1	859	-	-	-	-	-
Stage 2	751	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	555	889	1405	-	-	-
Mov Cap-2 Maneuver	555	-	-	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	751	-	-	-	-	-

Approach	EB		NB		SB	
HCM Control Delay, s	10.6		0.5		0	
HCM LOS	B					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1405	-	670	-	-
HCM Lane V/C Ratio	0.012	-	0.039	-	-
HCM Control Delay (s)	7.6	0	10.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	218	3	19	598	220	0	1	5	123	2	3
Future Vol, veh/h	0	218	3	19	598	220	0	1	5	123	2	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	305	-	120	290	-	520	-	-	35	560	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	10	2	2	10	7	2	2	2	7	2	7
Mvmt Flow	0	237	3	21	650	239	0	1	5	134	2	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	889	0	0	240	0	0	1051	1168	237	934	932	650
Stage 1	-	-	-	-	-	-	237	237	-	692	692	-
Stage 2	-	-	-	-	-	-	814	931	-	242	240	-
Critical Hdwy	4.17	-	-	4.12	-	-	7.12	6.52	6.22	7.17	6.52	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.17	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.17	5.52	-
Follow-up Hdwy	2.263	-	-	2.218	-	-	3.518	4.018	3.318	3.563	4.018	3.363
Pot Cap-1 Maneuver	742	-	-	1327	-	-	205	193	802	241	266	460
Stage 1	-	-	-	-	-	-	766	709	-	426	445	-
Stage 2	-	-	-	-	-	-	372	346	-	750	707	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	742	-	-	1327	-	-	200	190	802	235	262	460
Mov Cap-2 Maneuver	-	-	-	-	-	-	200	190	-	235	262	-
Stage 1	-	-	-	-	-	-	766	709	-	426	438	-
Stage 2	-	-	-	-	-	-	362	340	-	744	707	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	11.9	38.8
HCM LOS			B	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	190	802	742	-	-	1327	-	-	235	460
HCM Lane V/C Ratio	0.006	0.007	-	-	-	0.016	-	-	0.578	0.007
HCM Control Delay (s)	24.1	9.5	0	-	-	7.8	-	-	39.4	12.9
HCM Lane LOS	C	A	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	0	0	0	-	-	0	-	-	3.3	0

Intersection	
Int Delay, s/veh	4.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	8	49	30	14	36	17
Future Vol, veh/h	8	49	30	14	36	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	53	33	15	39	18

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	62	0	117	36
Stage 1	-	-	-	-	36	-
Stage 2	-	-	-	-	81	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1541	-	879	1037
Stage 1	-	-	-	-	986	-
Stage 2	-	-	-	-	942	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1541	-	860	1037
Mov Cap-2 Maneuver	-	-	-	-	860	-
Stage 1	-	-	-	-	964	-
Stage 2	-	-	-	-	942	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	910	-	-	1541	-
HCM Lane V/C Ratio	0.063	-	-	0.021	-
HCM Control Delay (s)	9.2	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	4.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	113	0	5	131	2	0
Future Vol, veh/h	113	0	5	131	2	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	7	2	2
Mvmt Flow	123	0	5	142	2	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	80	76	0	0	147	0
Stage 1	76	-	-	-	-	-
Stage 2	4	-	-	-	-	-
Critical Hdwy	6.47	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	910	985	-	-	1435	-
Stage 1	934	-	-	-	-	-
Stage 2	1006	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	909	985	-	-	1435	-
Mov Cap-2 Maneuver	909	-	-	-	-	-
Stage 1	933	-	-	-	-	-
Stage 2	1006	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	7.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	909	-	1435	-
HCM Lane V/C Ratio	-	-	0.135	-	0.002	-
HCM Control Delay (s)	-	-	9.6	0	7.5	0
HCM Lane LOS	-	-	A	A	A	A
HCM 95th %tile Q(veh)	-	-	0.5	-	0	-

Intersection						
Int Delay, s/veh	2.5					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	143	51	122	22	78
Future Vol, veh/h	10	143	51	122	22	78
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	7	7	2
Mvmt Flow	11	155	55	133	24	85

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	188	0	-	0	299	122
Stage 1	-	-	-	-	122	-
Stage 2	-	-	-	-	177	-
Critical Hdwy	4.12	-	-	-	6.47	6.22
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	2.218	-	-	-	3.563	3.318
Pot Cap-1 Maneuver	1386	-	-	-	682	929
Stage 1	-	-	-	-	891	-
Stage 2	-	-	-	-	842	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1386	-	-	-	676	929
Mov Cap-2 Maneuver	-	-	-	-	676	-
Stage 1	-	-	-	-	883	-
Stage 2	-	-	-	-	842	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1386	-	-	-	858
HCM Lane V/C Ratio	0.008	-	-	-	0.127
HCM Control Delay (s)	7.6	0	-	-	9.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.4

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	72	76	0	0	150	112	13	1	227	0	0	0
Future Vol, veh/h	72	76	0	0	150	112	13	1	227	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	50	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	7	2	2	7	7	7	2	7	2	2	2
Mvmt Flow	78	83	0	0	163	122	14	1	247	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	285	0	-	-	-	0	463	524	-
Stage 1	-	-	-	-	-	-	239	239	-
Stage 2	-	-	-	-	-	-	224	285	-
Critical Hdwy	4.17	-	-	-	-	-	6.47	6.52	-
Critical Hdwy Stg 1	-	-	-	-	-	-	5.47	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.47	5.52	-
Follow-up Hdwy	2.263	-	-	-	-	-	3.563	4.018	-
Pot Cap-1 Maneuver	1249	-	0	0	-	-	548	458	0
Stage 1	-	-	0	0	-	-	789	708	0
Stage 2	-	-	0	0	-	-	802	676	0
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1249	-	-	-	-	-	512	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	512	0	-
Stage 1	-	-	-	-	-	-	738	0	-
Stage 2	-	-	-	-	-	-	802	0	-

Approach	EB	WB	NB
HCM Control Delay, s	3.9	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	512	-	1249	-	-	-
HCM Lane V/C Ratio	0.03	-	0.063	-	-	-
HCM Control Delay (s)	12.2	0	8.1	0	-	-
HCM Lane LOS	B	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-	-

Intersection						
Int Delay, s/veh	8.7					

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	63	0	0	0	0	0
Future Vol, veh/h	63	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	2	2	2
Mvmt Flow	68	0	0	0	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1	0	0	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.47	6.22	-	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	-	-	-	-
Pot Cap-1 Maneuver	1009	-	-	0	0	-
Stage 1	-	-	-	0	0	-
Stage 2	1009	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	1009	-	-	-	-	-
Mov Cap-2 Maneuver	1009	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1009	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NBLn1	NBLn2	SWT
Capacity (veh/h)	-	1009	-	-
HCM Lane V/C Ratio	-	0.068	-	-
HCM Control Delay (s)	-	8.8	0	-
HCM Lane LOS	-	A	A	-
HCM 95th %tile Q(veh)	-	0.2	-	-

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	27	11	80	24	15	24	111	48	22	94	56
Future Vol, veh/h	12	27	11	80	24	15	24	111	48	22	94	56
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	120	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	7	2	2	2	7	7	2	2	7	2
Mvmt Flow	13	29	12	87	26	16	26	121	52	24	102	61

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	401	406	133	400	410	147	163	0	0	173	0	0
Stage 1	181	181	-	199	199	-	-	-	-	-	-	-
Stage 2	220	225	-	201	211	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.27	7.12	6.52	6.22	4.17	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.363	3.518	4.018	3.318	2.263	-	-	2.218	-	-
Pot Cap-1 Maneuver	560	534	903	560	531	900	1386	-	-	1404	-	-
Stage 1	821	750	-	803	736	-	-	-	-	-	-	-
Stage 2	782	718	-	801	728	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	514	515	903	514	512	900	1386	-	-	1404	-	-
Mov Cap-2 Maneuver	514	515	-	514	512	-	-	-	-	-	-	-
Stage 1	805	737	-	788	722	-	-	-	-	-	-	-
Stage 2	726	704	-	746	716	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12	13.7	1	1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1386	-	-	568	543	1404	-	-
HCM Lane V/C Ratio	0.019	-	-	0.096	0.238	0.017	-	-
HCM Control Delay (s)	7.6	-	-	12	13.7	7.6	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.9	0.1	-	-

Intersection						
Int Delay, s/veh	1.6					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	41	24	11	215	240	3
Future Vol, veh/h	41	24	11	215	240	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	7	7	7
Mvmt Flow	45	26	12	234	261	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	521	263	264	0	-	0
Stage 1	263	-	-	-	-	-
Stage 2	258	-	-	-	-	-
Critical Hdwy	6.47	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	507	776	1300	-	-	-
Stage 1	770	-	-	-	-	-
Stage 2	774	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	501	776	1300	-	-	-
Mov Cap-2 Maneuver	501	-	-	-	-	-
Stage 1	762	-	-	-	-	-
Stage 2	774	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.1	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1300	-	576	-	-
HCM Lane V/C Ratio	0.009	-	0.123	-	-
HCM Control Delay (s)	7.8	0	12.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Intersection	
Int Delay, s/veh	62.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	719	2	4	307	196	0	4	15	245	2	5
Future Vol, veh/h	6	719	2	4	307	196	0	4	15	245	2	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	305	-	120	290	-	520	-	-	35	560	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	10	2	2	10	7	2	2	2	7	2	7
Mvmt Flow	7	782	2	4	334	213	0	4	16	266	2	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	547	0	0	784	0	0	1248	1351	782	1149	1140	334
Stage 1	-	-	-	-	-	-	796	796	-	342	342	-
Stage 2	-	-	-	-	-	-	452	555	-	807	798	-
Critical Hdwy	4.17	-	-	4.12	-	-	7.12	6.52	6.22	7.17	6.52	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.17	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.17	5.52	-
Follow-up Hdwy	2.263	-	-	2.218	-	-	3.518	4.018	3.318	3.563	4.018	3.363
Pot Cap-1 Maneuver	998	-	-	834	-	-	150	150	394	~ 172	201	697
Stage 1	-	-	-	-	-	-	380	399	-	663	638	-
Stage 2	-	-	-	-	-	-	587	513	-	368	398	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	998	-	-	834	-	-	146	148	394	~ 160	199	697
Mov Cap-2 Maneuver	-	-	-	-	-	-	146	148	-	~ 160	199	-
Stage 1	-	-	-	-	-	-	377	396	-	658	635	-
Stage 2	-	-	-	-	-	-	578	510	-	346	395	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	17.8	$ 373.3
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	148	394	998	-	-	834	-	-	160	697
HCM Lane V/C Ratio	0.029	0.041	0.007	-	-	0.005	-	-	1.678	0.008
HCM Control Delay (s)	30.1	14.5	8.6	-	-	9.3	-	-	$ 380.7	10.2
HCM Lane LOS	D	B	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	0.1	0.1	0	-	-	0	-	-	18.9	0

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

Intersection	
Int Delay, s/veh	5.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	28	20	17	15	43	29
Future Vol, veh/h	28	20	17	15	43	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	22	18	16	47	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	52	0	93	41
Stage 1	-	-	-	-	41	-
Stage 2	-	-	-	-	52	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1554	-	907	1030
Stage 1	-	-	-	-	981	-
Stage 2	-	-	-	-	970	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1554	-	896	1030
Mov Cap-2 Maneuver	-	-	-	-	896	-
Stage 1	-	-	-	-	969	-
Stage 2	-	-	-	-	970	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.9	9.1
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	946	-	-	1554	-
HCM Lane V/C Ratio	0.083	-	-	0.012	-
HCM Control Delay (s)	9.1	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection												
Int Delay, s/veh	4.1											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	42	13	7	6	13	11	17	60	10	7	55	34
Future Vol, veh/h	42	13	7	6	13	11	17	60	10	7	55	34
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	120	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	7	2	2	2	7	7	2	2	7	2
Mvmt Flow	46	14	8	7	14	12	18	65	11	8	60	37

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	215	207	79	213	220	71	97	0	0	76	0	0
Stage 1	95	95	-	107	107	-	-	-	-	-	-	-
Stage 2	120	112	-	106	113	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.27	7.12	6.52	6.22	4.17	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.363	3.518	4.018	3.318	2.263	-	-	2.218	-	-
Pot Cap-1 Maneuver	742	690	968	744	678	991	1466	-	-	1523	-	-
Stage 1	912	816	-	898	807	-	-	-	-	-	-	-
Stage 2	884	803	-	900	802	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	712	678	968	716	666	991	1466	-	-	1523	-	-
Mov Cap-2 Maneuver	712	678	-	716	666	-	-	-	-	-	-	-
Stage 1	901	812	-	887	797	-	-	-	-	-	-	-
Stage 2	847	793	-	873	798	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.5	9.9	1.5	0.5
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1466	-	-	726	769	1523	-	-
HCM Lane V/C Ratio	0.013	-	-	0.093	0.042	0.005	-	-
HCM Control Delay (s)	7.5	-	-	10.5	9.9	7.4	-	-
HCM Lane LOS	A	-	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.1	0	-	-

Intersection						
Int Delay, s/veh	0.9					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	17	7	160	105	10
Future Vol, veh/h	8	17	7	160	105	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	7	7	7
Mvmt Flow	9	18	8	174	114	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	310	120	125	0	-	0
Stage 1	120	-	-	-	-	-
Stage 2	190	-	-	-	-	-
Critical Hdwy	6.47	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	672	931	1462	-	-	-
Stage 1	893	-	-	-	-	-
Stage 2	830	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	668	931	1462	-	-	-
Mov Cap-2 Maneuver	668	-	-	-	-	-
Stage 1	888	-	-	-	-	-
Stage 2	830	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1462	-	827	-	-
HCM Lane V/C Ratio	0.005	-	0.033	-	-
HCM Control Delay (s)	7.5	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	275	1	6	360	145	1	2	8	95	4	5
Future Vol, veh/h	3	275	1	6	360	145	1	2	8	95	4	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	305	-	120	290	-	520	-	-	35	560	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	10	2	2	10	7	2	2	2	7	2	7
Mvmt Flow	3	299	1	7	391	158	1	2	9	103	4	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	549	0	0	300	0	0	794	868	299	716	711	391
Stage 1	-	-	-	-	-	-	305	305	-	405	405	-
Stage 2	-	-	-	-	-	-	489	563	-	311	306	-
Critical Hdwy	4.17	-	-	4.12	-	-	7.12	6.52	6.22	7.17	6.52	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.17	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.17	5.52	-
Follow-up Hdwy	2.263	-	-	2.218	-	-	3.518	4.018	3.318	3.563	4.018	3.363
Pot Cap-1 Maneuver	996	-	-	1261	-	-	306	290	741	339	358	647
Stage 1	-	-	-	-	-	-	705	662	-	613	598	-
Stage 2	-	-	-	-	-	-	561	509	-	689	662	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	996	-	-	1261	-	-	299	287	741	331	355	647
Mov Cap-2 Maneuver	-	-	-	-	-	-	299	287	-	331	355	-
Stage 1	-	-	-	-	-	-	703	660	-	611	594	-
Stage 2	-	-	-	-	-	-	549	506	-	677	660	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	12	20.5
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	291	741	996	-	-	1261	-	-	332	647
HCM Lane V/C Ratio	0.011	0.012	0.003	-	-	0.005	-	-	0.324	0.008
HCM Control Delay (s)	17.5	9.9	8.6	-	-	7.9	-	-	21	10.6
HCM Lane LOS	C	A	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0	0	0	-	-	0	-	-	1.4	0

Intersection	
Int Delay, s/veh	3.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	14	48	7	10	32	11
Future Vol, veh/h	14	48	7	10	32	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	52	8	11	35	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	67	0	68	41
Stage 1	-	-	-	-	41	-
Stage 2	-	-	-	-	27	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1535	-	937	1030
Stage 1	-	-	-	-	981	-
Stage 2	-	-	-	-	996	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1535	-	932	1030
Mov Cap-2 Maneuver	-	-	-	-	932	-
Stage 1	-	-	-	-	976	-
Stage 2	-	-	-	-	996	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	955	-	-	1535	-
HCM Lane V/C Ratio	0.049	-	-	0.005	-
HCM Control Delay (s)	9	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	4.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	153	2	3	210	7	1
Future Vol, veh/h	153	2	3	210	7	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	7	2	2
Mvmt Flow	166	2	3	228	8	1

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	134	117	0	0	231	0
Stage 1	117	-	-	-	-	-
Stage 2	17	-	-	-	-	-
Critical Hdwy	6.47	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	848	935	-	-	1337	-
Stage 1	896	-	-	-	-	-
Stage 2	993	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	843	935	-	-	1337	-
Mov Cap-2 Maneuver	843	-	-	-	-	-
Stage 1	891	-	-	-	-	-
Stage 2	993	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.3	0	6.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	843	935	1337	-
HCM Lane V/C Ratio	-	-	0.197	0.002	0.006	-
HCM Control Delay (s)	-	-	10.3	8.9	7.7	0
HCM Lane LOS	-	-	B	A	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0	0	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	102	44	204	95	60
Future Vol, veh/h	5	102	44	204	95	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	7	7	2
Mvmt Flow	5	111	48	222	103	65

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	270	0	-	0	280	159
Stage 1	-	-	-	-	159	-
Stage 2	-	-	-	-	121	-
Critical Hdwy	4.12	-	-	-	6.47	6.22
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	2.218	-	-	-	3.563	3.318
Pot Cap-1 Maneuver	1293	-	-	-	699	886
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	892	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1293	-	-	-	696	886
Mov Cap-2 Maneuver	-	-	-	-	696	-
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	892	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1293	-	-	-	759
HCM Lane V/C Ratio	0.004	-	-	-	0.222
HCM Control Delay (s)	7.8	0	-	-	11.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.8

Intersection												
Int Delay, s/veh	1.5											
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Lane Configurations												
Traffic Vol, veh/h	72	97	0	0	249	42	9	1	127	0	0	0
Future Vol, veh/h	72	97	0	0	249	42	9	1	127	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	50	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	7	2	2	7	7	7	2	7	2	2	2
Mvmt Flow	78	105	0	0	271	46	10	1	138	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	317	0	-	-	-	0	555	578	-
Stage 1	-	-	-	-	-	-	261	261	-
Stage 2	-	-	-	-	-	-	294	317	-
Critical Hdwy	4.17	-	-	-	-	-	6.47	6.52	-
Critical Hdwy Stg 1	-	-	-	-	-	-	5.47	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.47	5.52	-
Follow-up Hdwy	2.263	-	-	-	-	-	3.563	4.018	-
Pot Cap-1 Maneuver	1215	-	0	0	-	-	484	427	0
Stage 1	-	-	0	0	-	-	771	692	0
Stage 2	-	-	0	0	-	-	745	654	0
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1215	-	-	-	-	-	451	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	451	0	-
Stage 1	-	-	-	-	-	-	719	0	-
Stage 2	-	-	-	-	-	-	745	0	-
Approach	**EB**			**WB**			**NB**		
HCM Control Delay, s	3.5			0			13.2		
HCM LOS							B		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	451	-	1215	-	-	-
HCM Lane V/C Ratio	0.024	-	0.064	-	-	-
HCM Control Delay (s)	13.2	0	8.2	0	-	-
HCM Lane LOS	B	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-	-

Intersection						
Int Delay, s/veh	0					

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	113	2	0	0	0	0
Future Vol, veh/h	113	2	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	2	2	2
Mvmt Flow	123	2	0	0	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1	0	0	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.47	6.22	-	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	-	-	-	-
Pot Cap-1 Maneuver	1009	-	-	0	0	-
Stage 1	-	-	-	0	0	-
Stage 2	1009	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	1009	-	-	-	-	-
Mov Cap-2 Maneuver	1009	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1009	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s		0	0
HCM LOS	-		

Minor Lane/Major Mvmt	NET	NBLn1	NBLn2	SWT
Capacity (veh/h)	-	1009	-	-
HCM Lane V/C Ratio	-	0.122	-	-
HCM Control Delay (s)	-	9.1	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.4	-	-

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	128	19	36	15	23	13	37	89	18	14	78	95
Future Vol, veh/h	128	19	36	15	23	13	37	89	18	14	78	95
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	120	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	7	2	2	2	7	7	2	2	7	2
Mvmt Flow	139	21	39	16	25	14	40	97	20	15	85	103

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	374	364	137	384	405	107	188	0	0	117	0	0
Stage 1	167	167	-	187	187	-	-	-	-	-	-	-
Stage 2	207	197	-	197	218	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.27	7.12	6.52	6.22	4.17	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.363	3.518	4.018	3.318	2.263	-	-	2.218	-	-
Pot Cap-1 Maneuver	583	564	898	574	535	947	1357	-	-	1471	-	-
Stage 1	835	760	-	815	745	-	-	-	-	-	-	-
Stage 2	795	738	-	805	723	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	536	542	898	517	514	947	1357	-	-	1471	-	-
Mov Cap-2 Maneuver	536	542	-	517	514	-	-	-	-	-	-	-
Stage 1	811	752	-	791	723	-	-	-	-	-	-	-
Stage 2	734	717	-	741	716	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.3	11.8	2	0.6
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1357	-	-	583	583	1471	-	-
HCM Lane V/C Ratio	0.03	-	-	0.341	0.095	0.01	-	-
HCM Control Delay (s)	7.7	-	-	14.3	11.8	7.5	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.5	0.3	0	-	-

Intersection						
Int Delay, s/veh	1.3					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	26	13	18	232	131	46
Future Vol, veh/h	26	13	18	232	131	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	7	7	7
Mvmt Flow	28	14	20	252	142	50

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	459	167	192	0	-	0
Stage 1	167	-	-	-	-	-
Stage 2	292	-	-	-	-	-
Critical Hdwy	6.47	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	551	877	1381	-	-	-
Stage 1	851	-	-	-	-	-
Stage 2	747	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	542	877	1381	-	-	-
Mov Cap-2 Maneuver	542	-	-	-	-	-
Stage 1	837	-	-	-	-	-
Stage 2	747	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.2	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1381	-	621	-	-
HCM Lane V/C Ratio	0.014	-	0.068	-	-
HCM Control Delay (s)	7.6	0	11.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	218	3	19	598	222	0	1	5	125	2	3
Future Vol, veh/h	0	218	3	19	598	222	0	1	5	125	2	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	305	-	120	290	-	520	-	-	35	560	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	10	2	2	10	7	2	2	2	7	2	7
Mvmt Flow	0	237	3	21	650	241	0	1	5	136	2	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	891	0	0	240	0	0	1052	1170	237	934	932	650
Stage 1	-	-	-	-	-	-	237	237	-	692	692	-
Stage 2	-	-	-	-	-	-	815	933	-	242	240	-
Critical Hdwy	4.17	-	-	4.12	-	-	7.12	6.52	6.22	7.17	6.52	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.17	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.17	5.52	-
Follow-up Hdwy	2.263	-	-	2.218	-	-	3.518	4.018	3.318	3.563	4.018	3.363
Pot Cap-1 Maneuver	740	-	-	1327	-	-	204	193	802	241	266	460
Stage 1	-	-	-	-	-	-	766	709	-	426	445	-
Stage 2	-	-	-	-	-	-	371	345	-	750	707	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	740	-	-	1327	-	-	199	190	802	235	262	460
Mov Cap-2 Maneuver	-	-	-	-	-	-	199	190	-	235	262	-
Stage 1	-	-	-	-	-	-	766	709	-	426	438	-
Stage 2	-	-	-	-	-	-	361	339	-	744	707	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	11.9	39.4
HCM LOS			B	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	190	802	740	-	-	1327	-	-	235	460
HCM Lane V/C Ratio	0.006	0.007	-	-	-	0.016	-	-	0.587	0.007
HCM Control Delay (s)	24.1	9.5	0	-	-	7.8	-	-	40	12.9
HCM Lane LOS	C	A	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	0	0	0	-	-	0	-	-	3.3	0

Intersection	
Int Delay, s/veh	5.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	8	54	51	14	40	32
Future Vol, veh/h	8	54	51	14	40	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	59	55	15	43	35

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	68	0	164	39
Stage 1	-	-	-	-	39	-
Stage 2	-	-	-	-	125	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1533	-	827	1033
Stage 1	-	-	-	-	983	-
Stage 2	-	-	-	-	901	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1533	-	797	1033
Mov Cap-2 Maneuver	-	-	-	-	797	-
Stage 1	-	-	-	-	948	-
Stage 2	-	-	-	-	901	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.8	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	887	-	-	1533	-
HCM Lane V/C Ratio	0.088	-	-	0.036	-
HCM Control Delay (s)	9.5	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Intersection						
Int Delay, s/veh	4.2					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	113	0	5	143	2	0
Future Vol, veh/h	113	0	5	143	2	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	7	2	2
Mvmt Flow	123	0	5	155	2	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	87	83	0	0	160	0
Stage 1	83	-	-	-	-	-
Stage 2	4	-	-	-	-	-
Critical Hdwy	6.47	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	902	976	-	-	1419	-
Stage 1	928	-	-	-	-	-
Stage 2	1006	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	901	976	-	-	1419	-
Mov Cap-2 Maneuver	901	-	-	-	-	-
Stage 1	927	-	-	-	-	-
Stage 2	1006	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	7.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	901	-	1419	-
HCM Lane V/C Ratio	-	-	0.136	-	0.002	-
HCM Control Delay (s)	-	-	9.6	0	7.5	0
HCM Lane LOS	-	-	A	A	A	A
HCM 95th %tile Q(veh)	-	-	0.5	-	0	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	143	51	134	22	78
Future Vol, veh/h	10	143	51	134	22	78
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	7	7	2
Mvmt Flow	11	155	55	146	24	85

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	201	0	-	0	305	128
Stage 1	-	-	-	-	128	-
Stage 2	-	-	-	-	177	-
Critical Hdwy	4.12	-	-	-	6.47	6.22
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	2.218	-	-	-	3.563	3.318
Pot Cap-1 Maneuver	1371	-	-	-	677	922
Stage 1	-	-	-	-	886	-
Stage 2	-	-	-	-	842	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1371	-	-	-	671	922
Mov Cap-2 Maneuver	-	-	-	-	671	-
Stage 1	-	-	-	-	878	-
Stage 2	-	-	-	-	842	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1371	-	-	-	852
HCM Lane V/C Ratio	0.008	-	-	-	0.128
HCM Control Delay (s)	7.6	0	-	-	9.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.4

Intersection												
Int Delay, s/veh	1.7											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	72	76	0	0	162	112	13	1	227	0	0	0
Future Vol, veh/h	72	76	0	0	162	112	13	1	227	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	50	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	7	2	2	7	7	7	2	7	2	2	2
Mvmt Flow	78	83	0	0	176	122	14	1	247	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	298	0	-	-	-	0	476	537	-
Stage 1	-	-	-	-	-	-	239	239	-
Stage 2	-	-	-	-	-	-	237	298	-
Critical Hdwy	4.17	-	-	-	-	-	6.47	6.52	-
Critical Hdwy Stg 1	-	-	-	-	-	-	5.47	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.47	5.52	-
Follow-up Hdwy	2.263	-	-	-	-	-	3.563	4.018	-
Pot Cap-1 Maneuver	1235	-	0	0	-	-	539	450	0
Stage 1	-	-	0	0	-	-	789	708	0
Stage 2	-	-	0	0	-	-	791	667	0
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1235	-	-	-	-	-	503	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	503	0	-
Stage 1	-	-	-	-	-	-	737	0	-
Stage 2	-	-	-	-	-	-	791	0	-

Approach	EB	WB	NB
HCM Control Delay, s	3.9	0	12.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	503	-	1235	-	-	-
HCM Lane V/C Ratio	0.03	-	0.063	-	-	-
HCM Control Delay (s)	12.4	0	8.1	0	-	-
HCM Lane LOS	B	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-	-

Intersection	
Int Delay, s/veh	8.8

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	75	0	0	0	0	0
Future Vol, veh/h	75	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	2	2	2
Mvmt Flow	82	0	0	0	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1	0	0	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.47	6.22	-	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	-	-	-	-
Pot Cap-1 Maneuver	1009	-	-	0	0	-
Stage 1	-	-	-	0	0	-
Stage 2	1009	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	1009	-	-	-	-	-
Mov Cap-2 Maneuver	1009	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1009	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NBLn1	NBLn2	SWT
Capacity (veh/h)	-	1009	-	-
HCM Lane V/C Ratio	-	0.081	-	-
HCM Control Delay (s)	-	8.9	0	-
HCM Lane LOS	-	A	A	-
HCM 95th %tile Q(veh)	-	0.3	-	-

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	27	11	80	24	15	36	113	48	22	94	56
Future Vol, veh/h	12	27	11	80	24	15	36	113	48	22	94	56
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	120	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	7	2	2	2	7	7	2	2	7	2
Mvmt Flow	13	29	12	87	26	16	39	123	52	24	102	61

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	429	434	133	428	438	149	163	0	0	175	0	0
Stage 1	181	181	-	227	227	-	-	-	-	-	-	-
Stage 2	248	253	-	201	211	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.27	7.12	6.52	6.22	4.17	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.363	3.518	4.018	3.318	2.263	-	-	2.218	-	-
Pot Cap-1 Maneuver	536	515	903	537	512	898	1386	-	-	1401	-	-
Stage 1	821	750	-	776	716	-	-	-	-	-	-	-
Stage 2	756	698	-	801	728	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	488	492	903	489	489	898	1386	-	-	1401	-	-
Mov Cap-2 Maneuver	488	492	-	489	489	-	-	-	-	-	-	-
Stage 1	798	737	-	754	696	-	-	-	-	-	-	-
Stage 2	694	678	-	746	716	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.3	14.2	1.4	1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1386	-	-	546	519	1401	-	-
HCM Lane V/C Ratio	0.028	-	-	0.1	0.249	0.017	-	-
HCM Control Delay (s)	7.7	-	-	12.3	14.2	7.6	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	1	0.1	-	-

Intersection						
Int Delay, s/veh	2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	55	28	11	215	240	4
Future Vol, veh/h	55	28	11	215	240	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	7	7	7
Mvmt Flow	60	30	12	234	261	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	521	263	265	0	-	0
Stage 1	263	-	-	-	-	-
Stage 2	258	-	-	-	-	-
Critical Hdwy	6.47	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	507	776	1299	-	-	-
Stage 1	770	-	-	-	-	-
Stage 2	774	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	501	776	1299	-	-	-
Mov Cap-2 Maneuver	501	-	-	-	-	-
Stage 1	762	-	-	-	-	-
Stage 2	774	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.5	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1299	-	569	-	-
HCM Lane V/C Ratio	0.009	-	0.159	-	-
HCM Control Delay (s)	7.8	0	12.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

Intersection	
Int Delay, s/veh	64.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	719	2	4	307	196	0	4	15	247	2	7
Future Vol, veh/h	6	719	2	4	307	196	0	4	15	247	2	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	305	-	120	290	-	520	-	-	35	560	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	10	2	2	10	7	2	2	2	7	2	7
Mvmt Flow	7	782	2	4	334	213	0	4	16	268	2	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	547	0	0	784	0	0	1250	1351	782	1149	1140	334
Stage 1	-	-	-	-	-	-	796	796	-	342	342	-
Stage 2	-	-	-	-	-	-	454	555	-	807	798	-
Critical Hdwy	4.17	-	-	4.12	-	-	7.12	6.52	6.22	7.17	6.52	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.17	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.17	5.52	-
Follow-up Hdwy	2.263	-	-	2.218	-	-	3.518	4.018	3.318	3.563	4.018	3.363
Pot Cap-1 Maneuver	998	-	-	834	-	-	150	150	394	~ 172	201	697
Stage 1	-	-	-	-	-	-	380	399	-	663	638	-
Stage 2	-	-	-	-	-	-	586	513	-	368	398	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	998	-	-	834	-	-	146	148	394	~ 160	199	697
Mov Cap-2 Maneuver	-	-	-	-	-	-	146	148	-	~ 160	199	-
Stage 1	-	-	-	-	-	-	377	396	-	658	635	-
Stage 2	-	-	-	-	-	-	575	510	-	346	395	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	17.8	$ 376.1
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	148	394	998	-	-	834	-	-	160	697
HCM Lane V/C Ratio	0.029	0.041	0.007	-	-	0.005	-	-	1.692	0.011
HCM Control Delay (s)	30.1	14.5	8.6	-	-	9.3	-	-	$ 386.4	10.2
HCM Lane LOS	D	B	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	0.1	0.1	0	-	-	0	-	-	19.1	0

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

Intersection	
Int Delay, s/veh	5.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	28	20	18	15	51	47
Future Vol, veh/h	28	20	18	15	51	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	22	20	16	55	51

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	52	0	97	41
Stage 1	-	-	-	-	41	-
Stage 2	-	-	-	-	56	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1554	-	902	1030
Stage 1	-	-	-	-	981	-
Stage 2	-	-	-	-	967	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1554	-	890	1030
Mov Cap-2 Maneuver	-	-	-	-	890	-
Stage 1	-	-	-	-	968	-
Stage 2	-	-	-	-	967	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4	9.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	952	-	-	1554	-
HCM Lane V/C Ratio	0.112	-	-	0.013	-
HCM Control Delay (s)	9.3	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	42	13	18	6	13	11	26	61	10	7	56	34
Future Vol, veh/h	42	13	18	6	13	11	26	61	10	7	56	34
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	120	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	7	2	2	2	7	7	2	2	7	2
Mvmt Flow	46	14	20	7	14	12	28	66	11	8	61	37

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	237	229	80	241	242	72	98	0	0	77	0	0
Stage 1	96	96	-	128	128	-	-	-	-	-	-	-
Stage 2	141	133	-	113	114	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.27	7.12	6.52	6.22	4.17	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.363	3.518	4.018	3.318	2.263	-	-	2.218	-	-
Pot Cap-1 Maneuver	717	671	966	713	660	990	1464	-	-	1522	-	-
Stage 1	911	815	-	876	790	-	-	-	-	-	-	-
Stage 2	862	786	-	892	801	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	683	655	966	674	644	990	1464	-	-	1522	-	-
Mov Cap-2 Maneuver	683	655	-	674	644	-	-	-	-	-	-	-
Stage 1	894	811	-	859	775	-	-	-	-	-	-	-
Stage 2	820	771	-	854	797	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.5	10	2	0.5
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1464	-	-	730	746	1522	-	-
HCM Lane V/C Ratio	0.019	-	-	0.109	0.044	0.005	-	-
HCM Control Delay (s)	7.5	-	-	10.5	10	7.4	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.1	0	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	18	20	11	160	105	22
Future Vol, veh/h	18	20	11	160	105	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	7	7	7
Mvmt Flow	20	22	12	174	114	24

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	324	126	138	0	-	0
Stage 1	126	-	-	-	-	-
Stage 2	198	-	-	-	-	-
Critical Hdwy	6.47	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	660	924	1446	-	-	-
Stage 1	887	-	-	-	-	-
Stage 2	824	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	654	924	1446	-	-	-
Mov Cap-2 Maneuver	654	-	-	-	-	-
Stage 1	879	-	-	-	-	-
Stage 2	824	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1446	-	773	-	-
HCM Lane V/C Ratio	0.008	-	0.053	-	-
HCM Control Delay (s)	7.5	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	275	1	6	360	147	1	2	8	97	4	6
Future Vol, veh/h	4	275	1	6	360	147	1	2	8	97	4	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	305	-	120	290	-	520	-	-	35	560	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	10	2	2	10	7	2	2	2	7	2	7
Mvmt Flow	4	299	1	7	391	160	1	2	9	105	4	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	551	0	0	300	0	0	798	872	299	718	713	391
Stage 1	-	-	-	-	-	-	307	307	-	405	405	-
Stage 2	-	-	-	-	-	-	491	565	-	313	308	-
Critical Hdwy	4.17	-	-	4.12	-	-	7.12	6.52	6.22	7.17	6.52	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.17	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.17	5.52	-
Follow-up Hdwy	2.263	-	-	2.218	-	-	3.518	4.018	3.318	3.563	4.018	3.363
Pot Cap-1 Maneuver	994	-	-	1261	-	-	304	289	741	338	357	647
Stage 1	-	-	-	-	-	-	703	661	-	613	598	-
Stage 2	-	-	-	-	-	-	559	508	-	687	660	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	994	-	-	1261	-	-	296	286	741	330	353	647
Mov Cap-2 Maneuver	-	-	-	-	-	-	296	286	-	330	353	-
Stage 1	-	-	-	-	-	-	700	658	-	611	594	-
Stage 2	-	-	-	-	-	-	546	505	-	674	657	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	12	20.6
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	289	741	994	-	-	1261	-	-	331	647
HCM Lane V/C Ratio	0.011	0.012	0.004	-	-	0.005	-	-	0.332	0.01
HCM Control Delay (s)	17.6	9.9	8.6	-	-	7.9	-	-	21.2	10.6
HCM Lane LOS	C	A	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0	0	0	-	-	0	-	-	1.4	0

Intersection	
Int Delay, s/veh	4.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	14	55	23	10	38	24
Future Vol, veh/h	14	55	23	10	38	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	60	25	11	41	26

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	75	0	106	45
Stage 1	-	-	-	-	45	-
Stage 2	-	-	-	-	61	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1524	-	892	1025
Stage 1	-	-	-	-	977	-
Stage 2	-	-	-	-	962	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1524	-	877	1025
Mov Cap-2 Maneuver	-	-	-	-	877	-
Stage 1	-	-	-	-	960	-
Stage 2	-	-	-	-	962	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.2	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	929	-	-	1524	-
HCM Lane V/C Ratio	0.073	-	-	0.016	-
HCM Control Delay (s)	9.2	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

MOVEMENT SUMMARY

Site: 7 [SR 12 / SR 113]

Cumulative AM
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Birds Landing Rd												
3	L2	5	3.0	0.032	7.5	LOS A	0.1	2.6	0.56	0.52	0.56	33.0
8	T1	5	3.0	0.032	7.5	LOS A	0.1	2.6	0.56	0.52	0.56	33.0
18	R2	5	3.0	0.032	7.5	LOS A	0.1	2.6	0.56	0.52	0.56	32.0
Approach		16	3.0	0.032	7.5	LOS A	0.1	2.6	0.56	0.52	0.56	32.7
East: SR 12												
1	L2	16	3.0	0.858	17.2	LOS C	11.8	317.6	0.23	0.06	0.23	29.6
6	T1	1201	10.0	0.858	17.3	LOS C	11.8	317.6	0.23	0.06	0.23	29.5
16	R2	250	7.0	0.858	17.2	LOS C	11.8	317.6	0.23	0.06	0.23	28.7
Approach		1467	9.4	0.858	17.3	LOS C	11.8	317.6	0.23	0.06	0.23	29.3
North: SR 113												
7	L2	217	7.0	0.847	61.4	LOS F	5.7	150.1	0.93	1.36	2.57	18.2
4	T1	5	3.0	0.847	60.9	LOS F	5.7	150.1	0.93	1.36	2.57	18.2
14	R2	11	7.0	0.847	61.4	LOS F	5.7	150.1	0.93	1.36	2.57	17.9
Approach		234	6.9	0.847	61.4	LOS F	5.7	150.1	0.93	1.36	2.57	18.2
West: SR 12												
5	L2	5	7.0	0.574	12.3	LOS B	4.4	117.8	0.54	0.55	0.74	31.5
2	T1	489	10.0	0.574	12.4	LOS B	4.4	117.8	0.54	0.55	0.74	31.5
12	R2	5	3.0	0.574	12.1	LOS B	4.4	117.8	0.54	0.55	0.74	30.8
Approach		500	9.9	0.574	12.4	LOS B	4.4	117.8	0.54	0.55	0.74	31.5
All Vehicles		2217	9.2	0.858	20.8	LOS C	11.8	317.6	0.38	0.31	0.60	27.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Int Delay, s/veh	4.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	190	5	5	295	10	5
Future Vol, veh/h	190	5	5	295	10	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	7	2	2
Mvmt Flow	207	5	5	321	11	5

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	193	166	0	0	326	0
Stage 1	166	-	-	-	-	-
Stage 2	27	-	-	-	-	-
Critical Hdwy	6.47	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	785	878	-	-	1234	-
Stage 1	851	-	-	-	-	-
Stage 2	983	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	778	878	-	-	1234	-
Mov Cap-2 Maneuver	778	-	-	-	-	-
Stage 1	843	-	-	-	-	-
Stage 2	983	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.2	0	5.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	778	878	1234	-
HCM Lane V/C Ratio	-	-	0.265	0.006	0.009	-
HCM Control Delay (s)	-	-	11.3	9.1	7.9	0
HCM Lane LOS	-	-	B	A	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0	0	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	160	65	280	125	65
Future Vol, veh/h	10	160	65	280	125	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	7	7	2
Mvmt Flow	11	174	71	304	136	71

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	375	0	-	0	419	223
Stage 1	-	-	-	-	223	-
Stage 2	-	-	-	-	196	-
Critical Hdwy	4.12	-	-	-	6.47	6.22
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	2.218	-	-	-	3.563	3.318
Pot Cap-1 Maneuver	1183	-	-	-	581	817
Stage 1	-	-	-	-	802	-
Stage 2	-	-	-	-	825	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1183	-	-	-	575	817
Mov Cap-2 Maneuver	-	-	-	-	575	-
Stage 1	-	-	-	-	794	-
Stage 2	-	-	-	-	825	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	13.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1183	-	-	-	640
HCM Lane V/C Ratio	0.009	-	-	-	0.323
HCM Control Delay (s)	8.1	0	-	-	13.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	1.4

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	95	130	0	0	345	40	15	5	115	0	0	0
Future Vol, veh/h	95	130	0	0	345	40	15	5	115	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	50	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	7	2	2	7	7	7	2	7	2	2	2
Mvmt Flow	103	141	0	0	375	43	16	5	125	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	418	0	-	-	-	0	744	765	-
Stage 1	-	-	-	-	-	-	347	347	-
Stage 2	-	-	-	-	-	-	397	418	-
Critical Hdwy	4.17	-	-	-	-	-	6.47	6.52	-
Critical Hdwy Stg 1	-	-	-	-	-	-	5.47	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.47	5.52	-
Follow-up Hdwy	2.263	-	-	-	-	-	3.563	4.018	-
Pot Cap-1 Maneuver	1115	-	0	0	-	-	375	333	0
Stage 1	-	-	0	0	-	-	705	635	0
Stage 2	-	-	0	0	-	-	668	591	0
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1115	-	-	-	-	-	338	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	338	0	-
Stage 1	-	-	-	-	-	-	635	0	-
Stage 2	-	-	-	-	-	-	668	0	-

Approach	EB	WB	NB
HCM Control Delay, s	3.6	0	16.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	338	-	1115	-	-	-
HCM Lane V/C Ratio	0.064	-	0.093	-	-	-
HCM Control Delay (s)	16.4	0	8.6	0	-	-
HCM Lane LOS	C	A	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.3	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	145	10	0	0	0	0
Future Vol, veh/h	145	10	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	2	2	2
Mvmt Flow	158	11	0	0	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1	0	0	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.47	6.22	-	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	-	-	-	-
Pot Cap-1 Maneuver	1009	-	-	0	0	-
Stage 1	-	-	-	0	0	-
Stage 2	1009	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	1009	-	-	-	-	-
Mov Cap-2 Maneuver	1009	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1009	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s		0	0
HCM LOS	-		

Minor Lane/Major Mvmt	NET	NBLn1	NBLn2	SWT
Capacity (veh/h)	-	1009	-	-
HCM Lane V/C Ratio	-	0.156	-	-
HCM Control Delay (s)	-	9.2	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.6	-	-

Intersection	
Int Delay, s/veh	12.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	185	20	20	35	45	50	25	180	30	35	145	150
Future Vol, veh/h	185	20	20	35	45	50	25	180	30	35	145	150
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	120	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	7	2	2	2	7	7	2	2	7	2
Mvmt Flow	201	22	22	38	49	54	27	196	33	38	158	163

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	634	599	240	605	664	213	321	0	0	229	0	0
Stage 1	316	316	-	267	267	-	-	-	-	-	-	-
Stage 2	318	283	-	338	397	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.27	7.12	6.52	6.22	4.17	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.363	3.518	4.018	3.318	2.263	-	-	2.218	-	-
Pot Cap-1 Maneuver	392	415	787	410	381	827	1211	-	-	1339	-	-
Stage 1	695	655	-	738	688	-	-	-	-	-	-	-
Stage 2	693	677	-	676	603	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	316	395	787	367	362	827	1211	-	-	1339	-	-
Mov Cap-2 Maneuver	316	395	-	367	362	-	-	-	-	-	-	-
Stage 1	680	637	-	722	673	-	-	-	-	-	-	-
Stage 2	587	662	-	617	586	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	38.5	16.1	0.9	0.8
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1211	-	-	340	464	1339	-	-
HCM Lane V/C Ratio	0.022	-	-	0.719	0.305	0.028	-	-
HCM Control Delay (s)	8	-	-	38.5	16.1	7.8	-	-
HCM Lane LOS	A	-	-	E	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	5.3	1.3	0.1	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	20	30	420	235	50
Future Vol, veh/h	25	20	30	420	235	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	7	7	7
Mvmt Flow	27	22	33	457	255	54

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	805	282	309	0	-	0
Stage 1	282	-	-	-	-	-
Stage 2	523	-	-	-	-	-
Critical Hdwy	6.47	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	345	757	1252	-	-	-
Stage 1	754	-	-	-	-	-
Stage 2	585	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	333	757	1252	-	-	-
Mov Cap-2 Maneuver	333	-	-	-	-	-
Stage 1	728	-	-	-	-	-
Stage 2	585	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.1	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1252	-	443	-	-
HCM Lane V/C Ratio	0.026	-	0.11	-	-
HCM Control Delay (s)	8	0	14.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	30	50	30	50	35	15
Future Vol, veh/h	30	50	30	50	35	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	54	33	54	38	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	87	0	180	60
Stage 1	-	-	-	-	60	-
Stage 2	-	-	-	-	120	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1509	-	810	1005
Stage 1	-	-	-	-	963	-
Stage 2	-	-	-	-	905	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1509	-	791	1005
Mov Cap-2 Maneuver	-	-	-	-	791	-
Stage 1	-	-	-	-	941	-
Stage 2	-	-	-	-	905	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.8	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	845	-	-	1509	-
HCM Lane V/C Ratio	0.064	-	-	0.022	-
HCM Control Delay (s)	9.6	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

MOVEMENT SUMMARY

Site: 7 [SR 12 / SR 113]

Cumulative PM
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Birds Landing Rd												
3	L2	5	3.0	0.088	13.2	LOS B	0.3	6.7	0.74	0.74	0.74	30.8
8	T1	11	3.0	0.088	13.2	LOS B	0.3	6.7	0.74	0.74	0.74	30.8
18	R2	11	3.0	0.088	13.2	LOS B	0.3	6.7	0.74	0.74	0.74	30.0
Approach		27	3.0	0.088	13.2	LOS B	0.3	6.7	0.74	0.74	0.74	30.4
East: SR 12												
1	L2	5	3.0	0.685	10.7	LOS B	5.4	145.8	0.24	0.09	0.24	32.3
6	T1	647	10.0	0.685	10.9	LOS B	5.4	145.8	0.24	0.09	0.24	32.1
16	R2	375	7.0	0.685	10.8	LOS B	5.4	145.8	0.24	0.09	0.24	31.3
Approach		1027	8.9	0.685	10.9	LOS B	5.4	145.8	0.24	0.09	0.24	31.8
North: SR 113												
7	L2	321	7.0	0.709	25.8	LOS D	5.5	146.2	0.79	1.08	1.72	25.3
4	T1	22	3.0	0.709	25.6	LOS D	5.5	146.2	0.79	1.08	1.72	25.3
14	R2	22	7.0	0.709	25.8	LOS D	5.5	146.2	0.79	1.08	1.72	24.7
Approach		364	6.8	0.709	25.8	LOS D	5.5	146.2	0.79	1.08	1.72	25.3
West: SR 12												
5	L2	33	7.0	1.499	245.7	LOS F	162.5	4380.5	1.00	5.40	11.51	7.4
2	T1	1223	10.0	1.499	245.8	LOS F	162.5	4380.5	1.00	5.40	11.51	7.4
12	R2	27	3.0	1.499	245.5	LOS F	162.5	4380.5	1.00	5.40	11.51	7.4
Approach		1283	9.8	1.499	245.8	LOS F	162.5	4380.5	1.00	5.40	11.51	7.4
All Vehicles		2701	9.0	1.499	124.4	LOS F	162.5	4380.5	0.68	2.75	5.80	12.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Int Delay, s/veh	4.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	145	0	5	180	5	5
Future Vol, veh/h	145	0	5	180	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	7	2	2
Mvmt Flow	158	0	5	196	5	5

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	118	103	0	0	201	0
Stage 1	103	-	-	-	-	-
Stage 2	15	-	-	-	-	-
Critical Hdwy	6.47	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	866	952	-	-	1371	-
Stage 1	909	-	-	-	-	-
Stage 2	995	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	863	952	-	-	1371	-
Mov Cap-2 Maneuver	863	-	-	-	-	-
Stage 1	905	-	-	-	-	-
Stage 2	995	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.1	0	3.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	863	-	1371	-
HCM Lane V/C Ratio	-	-	0.183	-	0.004	-
HCM Control Delay (s)	-	-	10.1	0	7.6	0
HCM Lane LOS	-	-	B	A	A	A
HCM 95th %tile Q(veh)	-	-	0.7	-	0	-

Intersection						
Int Delay, s/veh	2.1					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	245	120	170	30	85
Future Vol, veh/h	10	245	120	170	30	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	7	7	2
Mvmt Flow	11	266	130	185	33	92

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	315	0	-	0	511	223
Stage 1	-	-	-	-	223	-
Stage 2	-	-	-	-	288	-
Critical Hdwy	4.12	-	-	-	6.47	6.22
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	2.218	-	-	-	3.563	3.318
Pot Cap-1 Maneuver	1245	-	-	-	514	817
Stage 1	-	-	-	-	802	-
Stage 2	-	-	-	-	750	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1245	-	-	-	509	817
Mov Cap-2 Maneuver	-	-	-	-	509	-
Stage 1	-	-	-	-	794	-
Stage 2	-	-	-	-	750	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1245	-	-	-	706
HCM Lane V/C Ratio	0.009	-	-	-	0.177
HCM Control Delay (s)	7.9	0	-	-	11.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.6

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	65	255	0	0	240	165	5	0	325	0	0	0
Future Vol, veh/h	65	255	0	0	240	165	5	0	325	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	50	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	7	2	2	7	7	7	2	7	2	2	2
Mvmt Flow	71	277	0	0	261	179	5	0	353	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	440	0	-	-	-	0	770	859	-
Stage 1	-	-	-	-	-	-	419	419	-
Stage 2	-	-	-	-	-	-	351	440	-
Critical Hdwy	4.17	-	-	-	-	-	6.47	6.52	-
Critical Hdwy Stg 1	-	-	-	-	-	-	5.47	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.47	5.52	-
Follow-up Hdwy	2.263	-	-	-	-	-	3.563	4.018	-
Pot Cap-1 Maneuver	1094	-	0	0	-	-	362	294	0
Stage 1	-	-	0	0	-	-	653	590	0
Stage 2	-	-	0	0	-	-	702	578	0
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1094	-	-	-	-	-	334	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	334	0	-
Stage 1	-	-	-	-	-	-	603	0	-
Stage 2	-	-	-	-	-	-	702	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.7	0	16
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	334	-	1094	-	-	-
HCM Lane V/C Ratio	0.016	-	0.065	-	-	-
HCM Control Delay (s)	16	0	8.5	0	-	-
HCM Lane LOS	C	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-	-

Intersection						
Int Delay, s/veh	0					

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	130	5	0	0	0	0
Future Vol, veh/h	130	5	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	2	2	2
Mvmt Flow	141	5	0	0	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1	0	0	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.47	6.22	-	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	-	-	-	-
Pot Cap-1 Maneuver	1009	-	-	0	0	-
Stage 1	-	-	-	0	0	-
Stage 2	1009	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	1009	-	-	-	-	-
Mov Cap-2 Maneuver	1009	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1009	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s		0	0
HCM LOS	-		

Minor Lane/Major Mvmt	NET	NBLn1	NBLn2	SWT
Capacity (veh/h)	-	1009	-	-
HCM Lane V/C Ratio	-	0.14	-	-
HCM Control Delay (s)	-	9.1	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.5	-	-

Intersection	
Int Delay, s/veh	12.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	85	50	115	35	15	55	190	80	30	170	110
Future Vol, veh/h	40	85	50	115	35	15	55	190	80	30	170	110
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	120	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	7	2	2	2	7	7	2	2	7	2
Mvmt Flow	43	92	54	125	38	16	60	207	87	33	185	120

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	709	725	245	755	742	251	305	0	0	294	0	0
Stage 1	311	311	-	371	371	-	-	-	-	-	-	-
Stage 2	398	414	-	384	371	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.27	7.12	6.52	6.22	4.17	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.363	3.518	4.018	3.318	2.263	-	-	2.218	-	-
Pot Cap-1 Maneuver	349	352	782	325	344	788	1228	-	-	1268	-	-
Stage 1	699	658	-	649	620	-	-	-	-	-	-	-
Stage 2	628	593	-	639	620	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	294	326	782	224	319	788	1228	-	-	1268	-	-
Mov Cap-2 Maneuver	294	326	-	224	319	-	-	-	-	-	-	-
Stage 1	665	641	-	617	590	-	-	-	-	-	-	-
Stage 2	547	564	-	496	604	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.6	46	1.4	0.8
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1228	-	-	380	257	1268	-	-
HCM Lane V/C Ratio	0.049	-	-	0.501	0.698	0.026	-	-
HCM Control Delay (s)	8.1	-	-	23.6	46	7.9	-	-
HCM Lane LOS	A	-	-	C	E	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	2.7	4.7	0.1	-	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	75	45	20	385	430	5
Future Vol, veh/h	75	45	20	385	430	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	7	7	7
Mvmt Flow	82	49	22	418	467	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	932	470	472	0	-	0
Stage 1	470	-	-	-	-	-
Stage 2	462	-	-	-	-	-
Critical Hdwy	6.47	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	290	594	1090	-	-	-
Stage 1	619	-	-	-	-	-
Stage 2	624	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	282	594	1090	-	-	-
Mov Cap-2 Maneuver	282	-	-	-	-	-
Stage 1	603	-	-	-	-	-
Stage 2	624	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.2	0.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1090	-	351	-	-
HCM Lane V/C Ratio	0.02	-	0.372	-	-
HCM Control Delay (s)	8.4	0	21.2	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	1.7	-	-

Intersection						
Int Delay, s/veh	3.9					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	90	20	15	10	45	30
Future Vol, veh/h	90	20	15	10	45	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	98	22	16	11	49	33

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	120	0	152	109
Stage 1	-	-	-	-	109	-
Stage 2	-	-	-	-	43	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1468	-	840	945
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	979	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1468	-	831	945
Mov Cap-2 Maneuver	-	-	-	-	831	-
Stage 1	-	-	-	-	906	-
Stage 2	-	-	-	-	979	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.5	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	873	-	-	1468	-
HCM Lane V/C Ratio	0.093	-	-	0.011	-
HCM Control Delay (s)	9.5	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

MOVEMENT SUMMARY

Site: 7 [SR 12 / SR 113]

Cumulative Saturday
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Birds Landing Rd												
3	L2	5	3.0	0.047	8.4	LOS A	0.1	3.7	0.59	0.59	0.59	32.8
8	T1	5	3.0	0.047	8.4	LOS A	0.1	3.7	0.59	0.59	0.59	32.7
18	R2	11	3.0	0.047	8.4	LOS A	0.1	3.7	0.59	0.59	0.59	31.8
Approach		22	3.0	0.047	8.4	LOS A	0.1	3.7	0.59	0.59	0.59	32.3
East: SR 12												
1	L2	5	3.0	0.543	7.3	LOS A	3.3	88.2	0.10	0.03	0.10	34.0
6	T1	723	10.0	0.543	7.5	LOS A	3.3	88.2	0.10	0.03	0.10	33.8
16	R2	163	7.0	0.543	7.4	LOS A	3.3	88.2	0.10	0.03	0.10	32.8
Approach		891	9.4	0.543	7.5	LOS A	3.3	88.2	0.10	0.03	0.10	33.6
North: SR 113												
7	L2	168	7.0	0.414	15.0	LOS B	1.8	46.9	0.68	0.76	0.96	28.7
4	T1	11	3.0	0.414	14.7	LOS B	1.8	46.9	0.68	0.76	0.96	28.8
14	R2	16	7.0	0.414	15.0	LOS B	1.8	46.9	0.68	0.76	0.96	28.0
Approach		196	6.8	0.414	15.0	LOS B	1.8	46.9	0.68	0.76	0.96	28.6
West: SR 12												
5	L2	5	7.0	0.641	13.0	LOS B	5.7	154.4	0.53	0.48	0.68	31.2
2	T1	620	10.0	0.641	13.1	LOS B	5.7	154.4	0.53	0.48	0.68	31.2
12	R2	5	3.0	0.641	12.9	LOS B	5.7	154.4	0.53	0.48	0.68	30.5
Approach		630	9.9	0.641	13.1	LOS B	5.7	154.4	0.53	0.48	0.68	31.2
All Vehicles		1739	9.2	0.641	10.4	LOS B	5.7	154.4	0.33	0.28	0.42	32.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	60	15	5	15	25	40	15	125	15	20	105	55
Future Vol, veh/h	60	15	5	15	25	40	15	125	15	20	105	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	120	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	7	2	2	2	7	7	2	2	7	2
Mvmt Flow	65	16	5	16	27	43	16	136	16	22	114	60

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	399	372	144	375	394	144	174	0	0	152	0	0
Stage 1	188	188	-	176	176	-	-	-	-	-	-	-
Stage 2	211	184	-	199	218	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.27	7.12	6.52	6.22	4.17	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.363	3.518	4.018	3.318	2.263	-	-	2.218	-	-
Pot Cap-1 Maneuver	561	558	890	582	542	903	1373	-	-	1429	-	-
Stage 1	814	745	-	826	753	-	-	-	-	-	-	-
Stage 2	791	747	-	803	723	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	503	543	890	553	527	903	1373	-	-	1429	-	-
Mov Cap-2 Maneuver	503	543	-	553	527	-	-	-	-	-	-	-
Stage 1	804	734	-	816	744	-	-	-	-	-	-	-
Stage 2	717	738	-	768	712	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.2	11.1	0.7	0.8
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1373	-	-	524	673	1429	-	-
HCM Lane V/C Ratio	0.012	-	-	0.166	0.129	0.015	-	-
HCM Control Delay (s)	7.7	-	-	13.2	11.1	7.6	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.4	0	-	-

Intersection						
Int Delay, s/veh	0.9					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	10	15	230	130	20
Future Vol, veh/h	15	10	15	230	130	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	7	7	7
Mvmt Flow	16	11	16	250	141	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	434	152	163	0	-	0
Stage 1	152	-	-	-	-	-
Stage 2	282	-	-	-	-	-
Critical Hdwy	6.47	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	570	894	1416	-	-	-
Stage 1	864	-	-	-	-	-
Stage 2	754	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	563	894	1416	-	-	-
Mov Cap-2 Maneuver	563	-	-	-	-	-
Stage 1	853	-	-	-	-	-
Stage 2	754	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1416	-	661	-	-
HCM Lane V/C Ratio	0.012	-	0.041	-	-
HCM Control Delay (s)	7.6	0	10.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection						
Int Delay, s/veh	4.7					
Movement	**EBT**	**EBR**	**WBL**	**WBT**	**NBL**	**NBR**
Lane Configurations						
Traffic Vol, veh/h	10	50	30	5	35	15
Future Vol, veh/h	10	50	30	5	35	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	54	33	5	38	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	65	0	109	38
Stage 1	-	-	-	-	38	-
Stage 2	-	-	-	-	71	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1537	-	888	1034
Stage 1	-	-	-	-	984	-
Stage 2	-	-	-	-	952	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1537	-	868	1034
Mov Cap-2 Maneuver	-	-	-	-	868	-
Stage 1	-	-	-	-	962	-
Stage 2	-	-	-	-	952	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.3	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	912	-	-	1537	-
HCM Lane V/C Ratio	0.06	-	-	0.021	-
HCM Control Delay (s)	9.2	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

MOVEMENT SUMMARY

Site: 7 [SR 12 / SR 113]

Cumulative plus Project AM
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Birds Landing Rd												
3	L2	5	3.0	0.032	7.6	LOS A	0.1	2.6	0.56	0.52	0.56	33.0
8	T1	5	3.0	0.032	7.6	LOS A	0.1	2.6	0.56	0.52	0.56	32.9
18	R2	5	3.0	0.032	7.6	LOS A	0.1	2.6	0.56	0.52	0.56	32.0
Approach		16	3.0	0.032	7.6	LOS A	0.1	2.6	0.56	0.52	0.56	32.7
East: SR 12												
1	L2	16	3.0	0.859	17.2	LOS C	11.9	319.5	0.23	0.06	0.23	29.6
6	T1	1201	10.0	0.859	17.4	LOS C	11.9	319.5	0.23	0.06	0.23	29.4
16	R2	252	7.0	0.859	17.3	LOS C	11.9	319.5	0.23	0.06	0.23	28.7
Approach		1470	9.4	0.859	17.4	LOS C	11.9	319.5	0.23	0.06	0.23	29.3
North: SR 113												
7	L2	220	7.0	0.855	62.8	LOS F	5.9	154.8	0.93	1.37	2.63	18.0
4	T1	5	3.0	0.855	62.3	LOS F	5.9	154.8	0.93	1.37	2.63	18.0
14	R2	11	7.0	0.855	62.8	LOS F	5.9	154.8	0.93	1.37	2.63	17.7
Approach		236	6.9	0.855	62.8	LOS F	5.9	154.8	0.93	1.37	2.63	18.0
West: SR 12												
5	L2	5	7.0	0.576	12.4	LOS B	4.4	119.9	0.55	0.56	0.75	31.5
2	T1	489	10.0	0.576	12.5	LOS B	4.4	119.9	0.55	0.56	0.75	31.5
12	R2	5	3.0	0.576	12.2	LOS B	4.4	119.9	0.55	0.56	0.75	30.7
Approach		500	9.9	0.576	12.5	LOS B	4.4	119.9	0.55	0.56	0.75	31.4
All Vehicles		2222	9.2	0.859	21.0	LOS C	11.9	319.5	0.38	0.31	0.61	27.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Int Delay, s/veh	4.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	190	5	5	307	10	5
Future Vol, veh/h	190	5	5	307	10	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	7	2	2
Mvmt Flow	207	5	5	334	11	5

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	199	172	0	0	339	0
Stage 1	172	-	-	-	-	-
Stage 2	27	-	-	-	-	-
Critical Hdwy	6.47	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	778	872	-	-	1220	-
Stage 1	846	-	-	-	-	-
Stage 2	983	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	771	872	-	-	1220	-
Mov Cap-2 Maneuver	771	-	-	-	-	-
Stage 1	838	-	-	-	-	-
Stage 2	983	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.3	0	5.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	771	872	1220	-
HCM Lane V/C Ratio	-	-	0.268	0.006	0.009	-
HCM Control Delay (s)	-	-	11.4	9.2	8	0
HCM Lane LOS	-	-	B	A	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0	0	-

Intersection						
Int Delay, s/veh	3.7					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	160	65	292	125	65
Future Vol, veh/h	10	160	65	292	125	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	7	7	2
Mvmt Flow	11	174	71	317	136	71

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	388	0	-	0	426	230
Stage 1	-	-	-	-	230	-
Stage 2	-	-	-	-	196	-
Critical Hdwy	4.12	-	-	-	6.47	6.22
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	2.218	-	-	-	3.563	3.318
Pot Cap-1 Maneuver	1170	-	-	-	576	809
Stage 1	-	-	-	-	797	-
Stage 2	-	-	-	-	825	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1170	-	-	-	570	809
Mov Cap-2 Maneuver	-	-	-	-	570	-
Stage 1	-	-	-	-	789	-
Stage 2	-	-	-	-	825	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	13.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1170	-	-	-	634
HCM Lane V/C Ratio	0.009	-	-	-	0.326
HCM Control Delay (s)	8.1	0	-	-	13.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	1.4

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	95	130	0	0	357	40	15	5	131	0	0	0
Future Vol, veh/h	95	130	0	0	357	40	15	5	131	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	50	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	7	2	2	7	7	7	2	7	2	2	2
Mvmt Flow	103	141	0	0	388	43	16	5	142	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	431	0	-	-	-	0	757	778	-
Stage 1	-	-	-	-	-	-	347	347	-
Stage 2	-	-	-	-	-	-	410	431	-
Critical Hdwy	4.17	-	-	-	-	-	6.47	6.52	-
Critical Hdwy Stg 1	-	-	-	-	-	-	5.47	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.47	5.52	-
Follow-up Hdwy	2.263	-	-	-	-	-	3.563	4.018	-
Pot Cap-1 Maneuver	1102	-	0	0	-	-	368	328	0
Stage 1	-	-	0	0	-	-	705	635	0
Stage 2	-	-	0	0	-	-	659	583	0
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1102	-	-	-	-	-	331	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	331	0	-
Stage 1	-	-	-	-	-	-	634	0	-
Stage 2	-	-	-	-	-	-	659	0	-

Approach	EB	WB	NB
HCM Control Delay, s	3.6	0	16.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	331	-	1102	-	-	-
HCM Lane V/C Ratio	0.066	-	0.094	-	-	-
HCM Control Delay (s)	16.6	0	8.6	0	-	-
HCM Lane LOS	C	A	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.3	-	-	-

Intersection						
Int Delay, s/veh	0					

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	157	10	0	0	0	0
Future Vol, veh/h	157	10	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	2	2	2
Mvmt Flow	171	11	0	0	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1	0	0	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.47	6.22	-	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	-	-	-	-
Pot Cap-1 Maneuver	1009	-	-	0	0	-
Stage 1	-	-	-	0	0	-
Stage 2	1009	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	1009	-	-	-	-	-
Mov Cap-2 Maneuver	1009	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1009	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s		0	0
HCM LOS	-		

Minor Lane/Major Mvmt	NET	NBLn1	NBLn2	SWT
Capacity (veh/h)	-	1009	-	-
HCM Lane V/C Ratio	-	0.169	-	-
HCM Control Delay (s)	-	9.3	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.6	-	-

Intersection	
Int Delay, s/veh	14.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	185	20	36	35	45	50	37	182	30	35	147	150
Future Vol, veh/h	185	20	36	35	45	50	37	182	30	35	147	150
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	120	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	7	2	2	2	7	7	2	2	7	2
Mvmt Flow	201	22	39	38	49	54	40	198	33	38	160	163

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	664	629	242	643	694	215	323	0	0	231	0	0
Stage 1	318	318	-	295	295	-	-	-	-	-	-	-
Stage 2	346	311	-	348	399	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.27	7.12	6.52	6.22	4.17	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.363	3.518	4.018	3.318	2.263	-	-	2.218	-	-
Pot Cap-1 Maneuver	374	399	785	386	366	825	1209	-	-	1337	-	-
Stage 1	693	654	-	713	669	-	-	-	-	-	-	-
Stage 2	670	658	-	668	602	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	297	375	785	334	344	825	1209	-	-	1337	-	-
Mov Cap-2 Maneuver	297	375	-	334	344	-	-	-	-	-	-	-
Stage 1	670	636	-	689	647	-	-	-	-	-	-	-
Stage 2	559	636	-	596	585	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	45.7	17	1.2	0.8
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1209	-	-	334	439	1337	-	-
HCM Lane V/C Ratio	0.033	-	-	0.784	0.322	0.028	-	-
HCM Control Delay (s)	8.1	-	-	45.7	17	7.8	-	-
HCM Lane LOS	A	-	-	E	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	6.4	1.4	0.1	-	-

Intersection						
Int Delay, s/veh	1.5					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	38	22	32	420	235	68
Future Vol, veh/h	38	22	32	420	235	68
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	7	7	7
Mvmt Flow	41	24	35	457	255	74

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	819	292	329	0	-	0
Stage 1	292	-	-	-	-	-
Stage 2	527	-	-	-	-	-
Critical Hdwy	6.47	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	338	747	1231	-	-	-
Stage 1	747	-	-	-	-	-
Stage 2	582	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	325	747	1231	-	-	-
Mov Cap-2 Maneuver	325	-	-	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	582	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.4	0.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1231	-	410	-	-
HCM Lane V/C Ratio	0.028	-	0.159	-	-
HCM Control Delay (s)	8	0	15.4	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	30	55	51	50	39	30
Future Vol, veh/h	30	55	51	50	39	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	60	55	54	42	33

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	93	0	227	63
Stage 1	-	-	-	-	63	-
Stage 2	-	-	-	-	164	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1501	-	761	1002
Stage 1	-	-	-	-	960	-
Stage 2	-	-	-	-	865	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1501	-	732	1002
Mov Cap-2 Maneuver	-	-	-	-	732	-
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	865	-

Approach	EB		WB		NB	
HCM Control Delay, s	0		3.8		9.8	
HCM LOS					A	

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	829	-	-	1501	-
HCM Lane V/C Ratio	0.09	-	-	0.037	-
HCM Control Delay (s)	9.8	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

MOVEMENT SUMMARY

Site: 7 [SR 12 / SR 113]

Cumulative plus Project PM
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Birds Landing Rd												
3	L2	5	3.0	0.088	13.2	LOS B	0.3	6.7	0.73	0.73	0.73	30.8
8	T1	11	3.0	0.088	13.2	LOS B	0.3	6.7	0.73	0.73	0.73	30.8
18	R2	11	3.0	0.088	13.2	LOS B	0.3	6.7	0.73	0.73	0.73	30.0
Approach		27	3.0	0.088	13.2	LOS B	0.3	6.7	0.73	0.73	0.73	30.4
East: SR 12												
1	L2	5	3.0	0.684	10.7	LOS B	5.4	145.7	0.24	0.09	0.24	32.3
6	T1	647	10.0	0.684	10.9	LOS B	5.4	145.7	0.24	0.09	0.24	32.1
16	R2	375	7.0	0.684	10.8	LOS B	5.4	145.7	0.24	0.09	0.24	31.3
Approach		1027	8.9	0.684	10.8	LOS B	5.4	145.7	0.24	0.09	0.24	31.8
North: SR 113												
7	L2	323	7.0	0.717	26.4	LOS D	5.7	150.9	0.80	1.10	1.76	25.1
4	T1	22	3.0	0.717	26.1	LOS D	5.7	150.9	0.80	1.10	1.76	25.2
14	R2	24	7.0	0.717	26.4	LOS D	5.7	150.9	0.80	1.10	1.76	24.6
Approach		368	6.8	0.717	26.4	LOS D	5.7	150.9	0.80	1.10	1.76	25.1
West: SR 12												
5	L2	33	7.0	1.504	247.7	LOS F	163.1	4397.0	1.00	5.43	11.59	7.4
2	T1	1223	10.0	1.504	247.8	LOS F	163.1	4397.0	1.00	5.43	11.59	7.4
12	R2	27	3.0	1.504	247.5	LOS F	163.1	4397.0	1.00	5.43	11.59	7.3
Approach		1283	9.8	1.504	247.8	LOS F	163.1	4397.0	1.00	5.43	11.59	7.4
All Vehicles		2705	9.0	1.504	125.3	LOS F	163.1	4397.0	0.68	2.76	5.83	12.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Int Delay, s/veh	4.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	145	0	5	192	5	5
Future Vol, veh/h	145	0	5	192	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	7	2	2
Mvmt Flow	158	0	5	209	5	5

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	125	110	0	0	214	0
Stage 1	110	-	-	-	-	-
Stage 2	15	-	-	-	-	-
Critical Hdwy	6.47	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	858	943	-	-	1356	-
Stage 1	902	-	-	-	-	-
Stage 2	995	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	855	943	-	-	1356	-
Mov Cap-2 Maneuver	855	-	-	-	-	-
Stage 1	898	-	-	-	-	-
Stage 2	995	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.2	0	3.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	855	-	1356	-
HCM Lane V/C Ratio	-	-	0.184	-	0.004	-
HCM Control Delay (s)	-	-	10.2	0	7.7	0
HCM Lane LOS	-	-	B	A	A	A
HCM 95th %tile Q(veh)	-	-	0.7	-	0	-

Intersection						
Int Delay, s/veh	2					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	245	120	182	30	85
Future Vol, veh/h	10	245	120	182	30	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	7	7	2
Mvmt Flow	11	266	130	198	33	92

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	328	0	-	0	517	229
Stage 1	-	-	-	-	229	-
Stage 2	-	-	-	-	288	-
Critical Hdwy	4.12	-	-	-	6.47	6.22
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	2.218	-	-	-	3.563	3.318
Pot Cap-1 Maneuver	1232	-	-	-	510	810
Stage 1	-	-	-	-	797	-
Stage 2	-	-	-	-	750	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1232	-	-	-	505	810
Mov Cap-2 Maneuver	-	-	-	-	505	-
Stage 1	-	-	-	-	789	-
Stage 2	-	-	-	-	750	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1232	-	-	-	700
HCM Lane V/C Ratio	0.009	-	-	-	0.179
HCM Control Delay (s)	7.9	0	-	-	11.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.6

Intersection												
Int Delay, s/veh	0.8											
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Lane Configurations												
Traffic Vol, veh/h	65	255	0	0	252	165	5	0	325	0	0	0
Future Vol, veh/h	65	255	0	0	252	165	5	0	325	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	50	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	7	2	2	7	7	7	2	7	2	2	2
Mvmt Flow	71	277	0	0	274	179	5	0	353	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	453	0	-	-	-	0	783	872	-
Stage 1	-	-	-	-	-	-	419	419	-
Stage 2	-	-	-	-	-	-	364	453	-
Critical Hdwy	4.17	-	-	-	-	-	6.47	6.52	-
Critical Hdwy Stg 1	-	-	-	-	-	-	5.47	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.47	5.52	-
Follow-up Hdwy	2.263	-	-	-	-	-	3.563	4.018	-
Pot Cap-1 Maneuver	1082	-	0	0	-	-	355	289	0
Stage 1	-	-	0	0	-	-	653	590	0
Stage 2	-	-	0	0	-	-	692	570	0
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1082	-	-	-	-	-	327	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	327	0	-
Stage 1	-	-	-	-	-	-	602	0	-
Stage 2	-	-	-	-	-	-	692	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.7	0	16.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	327	-	1082	-	-	-
HCM Lane V/C Ratio	0.017	-	0.065	-	-	-
HCM Control Delay (s)	16.2	0	8.6	0	-	-
HCM Lane LOS	C	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-	-

Intersection						
Int Delay, s/veh	0					

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	142	5	0	0	0	0
Future Vol, veh/h	142	5	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	2	2	2
Mvmt Flow	154	5	0	0	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1	0	0	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.47	6.22	-	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	-	-	-	-
Pot Cap-1 Maneuver	1009	-	-	0	0	-
Stage 1	-	-	-	0	0	-
Stage 2	1009	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	1009	-	-	-	-	-
Mov Cap-2 Maneuver	1009	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1009	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s		0	0
HCM LOS	-		

Minor Lane/Major Mvmt	NET	NBLn1	NBLn2	SWT
Capacity (veh/h)	-	1009	-	-
HCM Lane V/C Ratio	-	0.153	-	-
HCM Control Delay (s)	-	9.2	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.5	-	-

Intersection	
Int Delay, s/veh	14.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	85	50	115	35	15	67	192	80	30	170	110
Future Vol, veh/h	40	85	50	115	35	15	67	192	80	30	170	110
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	120	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	7	2	2	2	7	7	2	2	7	2
Mvmt Flow	43	92	54	125	38	16	73	209	87	33	185	120

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	737	753	245	783	770	253	305	0	0	296	0	0
Stage 1	311	311	-	399	399	-	-	-	-	-	-	-
Stage 2	426	442	-	384	371	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.27	7.12	6.52	6.22	4.17	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.363	3.518	4.018	3.318	2.263	-	-	2.218	-	-
Pot Cap-1 Maneuver	334	339	782	311	331	786	1228	-	-	1265	-	-
Stage 1	699	658	-	627	602	-	-	-	-	-	-	-
Stage 2	606	576	-	639	620	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	277	311	782	209	304	786	1228	-	-	1265	-	-
Mov Cap-2 Maneuver	277	311	-	209	304	-	-	-	-	-	-	-
Stage 1	658	641	-	590	566	-	-	-	-	-	-	-
Stage 2	521	542	-	496	604	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	25.3	53.6	1.6	0.8
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1228	-	-	363	241	1265	-	-
HCM Lane V/C Ratio	0.059	-	-	0.524	0.744	0.026	-	-
HCM Control Delay (s)	8.1	-	-	25.3	53.6	7.9	-	-
HCM Lane LOS	A	-	-	D	F	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	2.9	5.2	0.1	-	-

Intersection						
Int Delay, s/veh	3.4					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	89	49	20	385	430	6
Future Vol, veh/h	89	49	20	385	430	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	7	7	7
Mvmt Flow	97	53	22	418	467	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	933	471	474	0	-	0
Stage 1	471	-	-	-	-	-
Stage 2	462	-	-	-	-	-
Critical Hdwy	6.47	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	289	593	1088	-	-	-
Stage 1	618	-	-	-	-	-
Stage 2	624	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	281	593	1088	-	-	-
Mov Cap-2 Maneuver	281	-	-	-	-	-
Stage 1	602	-	-	-	-	-
Stage 2	624	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.1	0.4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1088	-	346	-	-
HCM Lane V/C Ratio	0.02	-	0.434	-	-
HCM Control Delay (s)	8.4	0	23.1	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	2.1	-	-

Intersection						
Int Delay, s/veh	4.6					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	90	20	16	10	53	48
Future Vol, veh/h	90	20	16	10	53	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	98	22	17	11	58	52

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	120	0	154	109
Stage 1	-	-	-	-	109	-
Stage 2	-	-	-	-	45	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1468	-	838	945
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	977	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1468	-	828	945
Mov Cap-2 Maneuver	-	-	-	-	828	-
Stage 1	-	-	-	-	905	-
Stage 2	-	-	-	-	977	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.6	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	880	-	-	1468	-
HCM Lane V/C Ratio	0.125	-	-	0.012	-
HCM Control Delay (s)	9.7	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

MOVEMENT SUMMARY

Site: 7 [SR 12 / SR 113]

Cumulative plus Project Saturday
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Birds Landing Rd												
3	L2	5	3.0	0.047	8.5	LOS A	0.1	3.7	0.59	0.59	0.59	32.8
8	T1	5	3.0	0.047	8.5	LOS A	0.1	3.7	0.59	0.59	0.59	32.7
18	R2	11	3.0	0.047	8.5	LOS A	0.1	3.7	0.59	0.59	0.59	31.8
Approach		22	3.0	0.047	8.5	LOS A	0.1	3.7	0.59	0.59	0.59	32.3
East: SR 12												
1	L2	5	3.0	0.548	7.5	LOS A	3.3	89.8	0.11	0.03	0.11	33.9
6	T1	723	10.0	0.548	7.6	LOS A	3.3	89.8	0.11	0.03	0.11	33.7
16	R2	165	7.0	0.548	7.5	LOS A	3.3	89.8	0.11	0.03	0.11	32.8
Approach		893	9.4	0.548	7.6	LOS A	3.3	89.8	0.11	0.03	0.11	33.6
North: SR 113												
7	L2	171	7.0	0.421	15.2	LOS C	1.8	48.2	0.68	0.77	0.98	28.6
4	T1	11	3.0	0.421	14.9	LOS B	1.8	48.2	0.68	0.77	0.98	28.7
14	R2	17	7.0	0.421	15.2	LOS C	1.8	48.2	0.68	0.77	0.98	27.9
Approach		199	6.8	0.421	15.2	LOS C	1.8	48.2	0.68	0.77	0.98	28.6
West: SR 12												
5	L2	7	7.0	0.644	13.2	LOS B	6.0	161.0	0.54	0.50	0.71	31.2
2	T1	620	10.0	0.644	13.3	LOS B	6.0	161.0	0.54	0.50	0.71	31.1
12	R2	5	3.0	0.644	13.1	LOS B	6.0	161.0	0.54	0.50	0.71	30.4
Approach		632	9.9	0.644	13.3	LOS B	6.0	161.0	0.54	0.50	0.71	31.1
All Vehicles		1746	9.2	0.644	10.5	LOS B	6.0	161.0	0.33	0.29	0.43	32.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	60	15	16	15	25	40	24	126	15	20	106	55
Future Vol, veh/h	60	15	16	15	25	40	24	126	15	20	106	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	120	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	7	2	2	2	7	7	2	2	7	2
Mvmt Flow	65	16	17	16	27	43	26	137	16	22	115	60

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	421	394	145	403	416	145	175	0	0	153	0	0
Stage 1	189	189	-	197	197	-	-	-	-	-	-	-
Stage 2	232	205	-	206	219	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.27	7.12	6.52	6.22	4.17	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.363	3.518	4.018	3.318	2.263	-	-	2.218	-	-
Pot Cap-1 Maneuver	543	542	889	558	527	902	1372	-	-	1428	-	-
Stage 1	813	744	-	805	738	-	-	-	-	-	-	-
Stage 2	771	732	-	796	722	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	483	524	889	520	509	902	1372	-	-	1428	-	-
Mov Cap-2 Maneuver	483	524	-	520	509	-	-	-	-	-	-	-
Stage 1	798	733	-	790	724	-	-	-	-	-	-	-
Stage 2	693	718	-	751	711	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.3	11.3	1.1	0.8
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1372	-	-	533	654	1428	-	-
HCM Lane V/C Ratio	0.019	-	-	0.186	0.133	0.015	-	-
HCM Control Delay (s)	7.7	-	-	13.3	11.3	7.6	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.7	0.5	0	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	13	19	230	130	32
Future Vol, veh/h	25	13	19	230	130	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	2	2	7	7	7
Mvmt Flow	27	14	21	250	141	35

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	451	159	176	0	-	0
Stage 1	159	-	-	-	-	-
Stage 2	292	-	-	-	-	-
Critical Hdwy	6.47	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	557	886	1400	-	-	-
Stage 1	858	-	-	-	-	-
Stage 2	747	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	548	886	1400	-	-	-
Mov Cap-2 Maneuver	548	-	-	-	-	-
Stage 1	843	-	-	-	-	-
Stage 2	747	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1400	-	630	-	-
HCM Lane V/C Ratio	0.015	-	0.066	-	-
HCM Control Delay (s)	7.6	0	11.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	5.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	10	57	46	5	41	28
Future Vol, veh/h	10	57	46	5	41	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	62	50	5	45	30

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	73	0	147	42
Stage 1	-	-	-	-	42	-
Stage 2	-	-	-	-	105	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1527	-	845	1029
Stage 1	-	-	-	-	980	-
Stage 2	-	-	-	-	919	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1527	-	817	1029
Mov Cap-2 Maneuver	-	-	-	-	817	-
Stage 1	-	-	-	-	948	-
Stage 2	-	-	-	-	919	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.7	9.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	892	-	-	1527	-
HCM Lane V/C Ratio	0.084	-	-	0.033	-
HCM Control Delay (s)	9.4	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

MOVEMENT SUMMARY

Site: 7 [SR 12 / SR 113]

MITIG8 Existing AM
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Birds Landing Rd												
3	L2	1	3.0	0.010	5.0	LOS A	0.0	0.9	0.42	0.28	0.42	34.8
8	T1	1	3.0	0.010	5.0	LOS A	0.0	0.9	0.42	0.28	0.42	34.7
18	R2	5	3.0	0.010	5.0	LOS A	0.0	0.9	0.42	0.28	0.42	33.7
Approach		8	3.0	0.010	5.0	LOS A	0.0	0.9	0.42	0.28	0.42	34.0
East: SR 12												
1	L2	21	3.0	0.502	6.4	LOS A	2.9	76.9	0.04	0.00	0.04	34.4
6	T1	650	10.0	0.502	6.5	LOS A	2.9	76.9	0.04	0.00	0.04	34.2
16	R2	239	7.0	0.502	6.4	LOS A	2.9	76.9	0.04	0.00	0.04	33.3
Approach		910	9.1	0.502	6.5	LOS A	2.9	76.9	0.04	0.00	0.04	34.0
North: SR 113												
7	L2	134	7.0	0.275	11.2	LOS B	0.9	24.5	0.62	0.62	0.62	29.9
4	T1	2	3.0	0.275	10.9	LOS B	0.9	24.5	0.62	0.62	0.62	30.0
14	R2	3	7.0	0.275	11.2	LOS B	0.9	24.5	0.62	0.62	0.62	29.2
Approach		139	6.9	0.275	11.2	LOS B	0.9	24.5	0.62	0.62	0.62	29.9
West: SR 12												
5	L2	1	7.0	0.266	6.6	LOS A	1.0	27.4	0.33	0.22	0.33	34.2
2	T1	237	10.0	0.266	6.7	LOS A	1.0	27.4	0.33	0.22	0.33	34.2
12	R2	3	3.0	0.266	6.5	LOS A	1.0	27.4	0.33	0.22	0.33	33.3
Approach		241	9.9	0.266	6.7	LOS A	1.0	27.4	0.33	0.22	0.33	34.2
All Vehicles		1298	8.9	0.502	7.0	LOS A	2.9	76.9	0.15	0.11	0.15	33.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 7 [SR 12 / SR 113]

mitig8 Existing PM
Site Category: (None)
Roundabout

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Birds Landing Rd												
3	L2	1	3.0	0.063	11.4	LOS B	0.2	4.8	0.70	0.70	0.70	31.9
8	T1	4	3.0	0.063	11.4	LOS B	0.2	4.8	0.70	0.70	0.70	31.8
18	R2	16	3.0	0.063	11.4	LOS B	0.2	4.8	0.70	0.70	0.70	31.0
Approach		22	3.0	0.063	11.4	LOS B	0.2	4.8	0.70	0.70	0.70	31.2
East: SR 12												
1	L2	4	3.0	0.339	4.9	LOS A	1.5	40.6	0.07	0.01	0.07	35.2
6	T1	334	10.0	0.339	5.1	LOS A	1.5	40.6	0.07	0.01	0.07	35.0
16	R2	213	7.0	0.339	5.0	LOS A	1.5	40.6	0.07	0.01	0.07	34.0
Approach		551	8.8	0.339	5.0	LOS A	1.5	40.6	0.07	0.01	0.07	34.6
North: SR 113												
7	L2	266	7.0	0.376	9.8	LOS A	1.5	40.2	0.53	0.50	0.53	30.4
4	T1	2	3.0	0.376	9.6	LOS A	1.5	40.2	0.53	0.50	0.53	30.5
14	R2	5	7.0	0.376	9.8	LOS A	1.5	40.2	0.53	0.50	0.53	29.7
Approach		274	7.0	0.376	9.8	LOS A	1.5	40.2	0.53	0.50	0.53	30.4
West: SR 12												
5	L2	7	7.0	0.895	31.7	LOS D	25.8	697.7	0.90	1.56	2.55	24.9
2	T1	782	10.0	0.895	31.8	LOS D	25.8	697.7	0.90	1.56	2.55	24.8
12	R2	2	3.0	0.895	31.6	LOS D	25.8	697.7	0.90	1.56	2.55	24.4
Approach		790	10.0	0.895	31.8	LOS D	25.8	697.7	0.90	1.56	2.55	24.8
All Vehicles		1637	9.0	0.895	18.8	LOS C	25.8	697.7	0.56	0.85	1.35	28.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 7 [SR 12 / SR 113]

MITIG8 Existing plus Project AM
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Birds Landing Rd												
3	L2	1	3.0	0.010	5.0	LOS A	0.0	0.9	0.42	0.29	0.42	34.8
8	T1	1	3.0	0.010	5.0	LOS A	0.0	0.9	0.42	0.29	0.42	34.7
18	R2	5	3.0	0.010	5.0	LOS A	0.0	0.9	0.42	0.29	0.42	33.7
Approach		8	3.0	0.010	5.0	LOS A	0.0	0.9	0.42	0.29	0.42	34.0
East: SR 12												
1	L2	21	3.0	0.503	6.4	LOS A	2.9	77.3	0.04	0.00	0.04	34.4
6	T1	650	10.0	0.503	6.5	LOS A	2.9	77.3	0.04	0.00	0.04	34.2
16	R2	241	7.0	0.503	6.5	LOS A	2.9	77.3	0.04	0.00	0.04	33.3
Approach		912	9.0	0.503	6.5	LOS A	2.9	77.3	0.04	0.00	0.04	34.0
North: SR 113												
7	L2	136	7.0	0.280	11.3	LOS B	1.0	25.1	0.62	0.62	0.63	29.9
4	T1	2	3.0	0.280	11.0	LOS B	1.0	25.1	0.62	0.62	0.63	29.9
14	R2	3	7.0	0.280	11.3	LOS B	1.0	25.1	0.62	0.62	0.63	29.1
Approach		141	6.9	0.280	11.3	LOS B	1.0	25.1	0.62	0.62	0.63	29.9
West: SR 12												
5	L2	1	7.0	0.267	6.7	LOS A	1.0	27.5	0.33	0.22	0.33	34.2
2	T1	237	10.0	0.267	6.8	LOS A	1.0	27.5	0.33	0.22	0.33	34.2
12	R2	3	3.0	0.267	6.5	LOS A	1.0	27.5	0.33	0.22	0.33	33.3
Approach		241	9.9	0.267	6.8	LOS A	1.0	27.5	0.33	0.22	0.33	34.2
All Vehicles		1302	8.9	0.503	7.1	LOS A	2.9	77.3	0.16	0.11	0.16	33.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 7 [SR 12 / SR 113]

MITIG8 Existing plus Project PM
Site Category: (None)
Roundabout

Movement Performance - Vehicles													
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Birds Landing Rd												
3	L2	1	3.0	0.063	11.4	LOS B	0.2	4.8	0.70	0.70	0.70	31.9
8	T1	4	3.0	0.063	11.4	LOS B	0.2	4.8	0.70	0.70	0.70	31.8
18	R2	16	3.0	0.063	11.4	LOS B	0.2	4.8	0.70	0.70	0.70	30.9
Approach		22	3.0	0.063	11.4	LOS B	0.2	4.8	0.70	0.70	0.70	31.2
East: SR 12												
1	L2	4	3.0	0.339	4.9	LOS A	1.5	40.6	0.07	0.01	0.07	35.2
6	T1	334	10.0	0.339	5.1	LOS A	1.5	40.6	0.07	0.01	0.07	35.0
16	R2	213	7.0	0.339	5.0	LOS A	1.5	40.6	0.07	0.01	0.07	34.0
Approach		551	8.8	0.339	5.0	LOS A	1.5	40.6	0.07	0.01	0.07	34.6
North: SR 113												
7	L2	268	7.0	0.382	9.9	LOS A	1.6	41.0	0.53	0.50	0.53	30.4
4	T1	2	3.0	0.382	9.7	LOS A	1.6	41.0	0.53	0.50	0.53	30.5
14	R2	8	7.0	0.382	9.9	LOS A	1.6	41.0	0.53	0.50	0.53	29.6
Approach		278	7.0	0.382	9.9	LOS A	1.6	41.0	0.53	0.50	0.53	30.4
West: SR 12												
5	L2	7	7.0	0.898	32.2	LOS D	26.1	704.6	0.91	1.58	2.58	24.7
2	T1	782	10.0	0.898	32.3	LOS D	26.1	704.6	0.91	1.58	2.58	24.7
12	R2	2	3.0	0.898	32.0	LOS D	26.1	704.6	0.91	1.58	2.58	24.2
Approach		790	10.0	0.898	32.3	LOS D	26.1	704.6	0.91	1.58	2.58	24.7
All Vehicles		1641	9.0	0.898	19.1	LOS C	26.1	704.6	0.56	0.86	1.36	28.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Intersection Delay, s/veh	13.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	185	20	20	35	45	50	25	180	30	35	145	150
Future Vol, veh/h	185	20	20	35	45	50	25	180	30	35	145	150
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	7	2	2	2	7	7	2	2	7	2
Mvmt Flow	201	22	22	38	49	54	27	196	33	38	158	163
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	13.4	11	12.8	14.5
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	82%	27%	100%	0%
Vol Thru, %	0%	86%	9%	35%	0%	49%
Vol Right, %	0%	14%	9%	38%	0%	51%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	25	210	225	130	35	295
LT Vol	25	0	185	35	35	0
Through Vol	0	180	20	45	0	145
RT Vol	0	30	20	50	0	150
Lane Flow Rate	27	228	245	141	38	321
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.052	0.397	0.412	0.237	0.07	0.523
Departure Headway (Hd)	6.874	6.263	6.067	6.028	6.652	5.867
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	519	571	589	591	536	612
Service Time	4.647	4.036	4.143	4.115	4.418	3.633
HCM Lane V/C Ratio	0.052	0.399	0.416	0.239	0.071	0.525
HCM Control Delay	10	13.1	13.4	11	9.9	15
HCM Lane LOS	A	B	B	B	A	B
HCM 95th-tile Q	0.2	1.9	2	0.9	0.2	3

Intersection	
Intersection Delay, s/veh	13.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	85	50	115	35	15	55	190	80	30	170	110
Future Vol, veh/h	40	85	50	115	35	15	55	190	80	30	170	110
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	7	2	2	2	7	7	2	2	7	2
Mvmt Flow	43	92	54	125	38	16	60	207	87	33	185	120
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	12.2	12.4	14.2	14.6
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	23%	70%	100%	0%
Vol Thru, %	0%	70%	49%	21%	0%	61%
Vol Right, %	0%	30%	29%	9%	0%	39%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	55	270	175	165	30	280
LT Vol	55	0	40	115	30	0
Through Vol	0	190	85	35	0	170
RT Vol	0	80	50	15	0	110
Lane Flow Rate	60	293	190	179	33	304
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.113	0.498	0.325	0.317	0.061	0.513
Departure Headway (Hd)	6.829	6.109	6.142	6.368	6.772	6.069
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	522	587	580	560	526	590
Service Time	4.61	3.889	4.235	4.463	4.552	3.849
HCM Lane V/C Ratio	0.115	0.499	0.328	0.32	0.063	0.515
HCM Control Delay	10.5	14.9	12.2	12.4	10	15.1
HCM Lane LOS	B	B	B	B	A	C
HCM 95th-tile Q	0.4	2.8	1.4	1.4	0.2	2.9

MOVEMENT SUMMARY

Site: 7 [SR 12 / SR 113]

MITIG8 Cumulative PM
Add 2nd EB Lane
Site Category: (None)
Roundabout

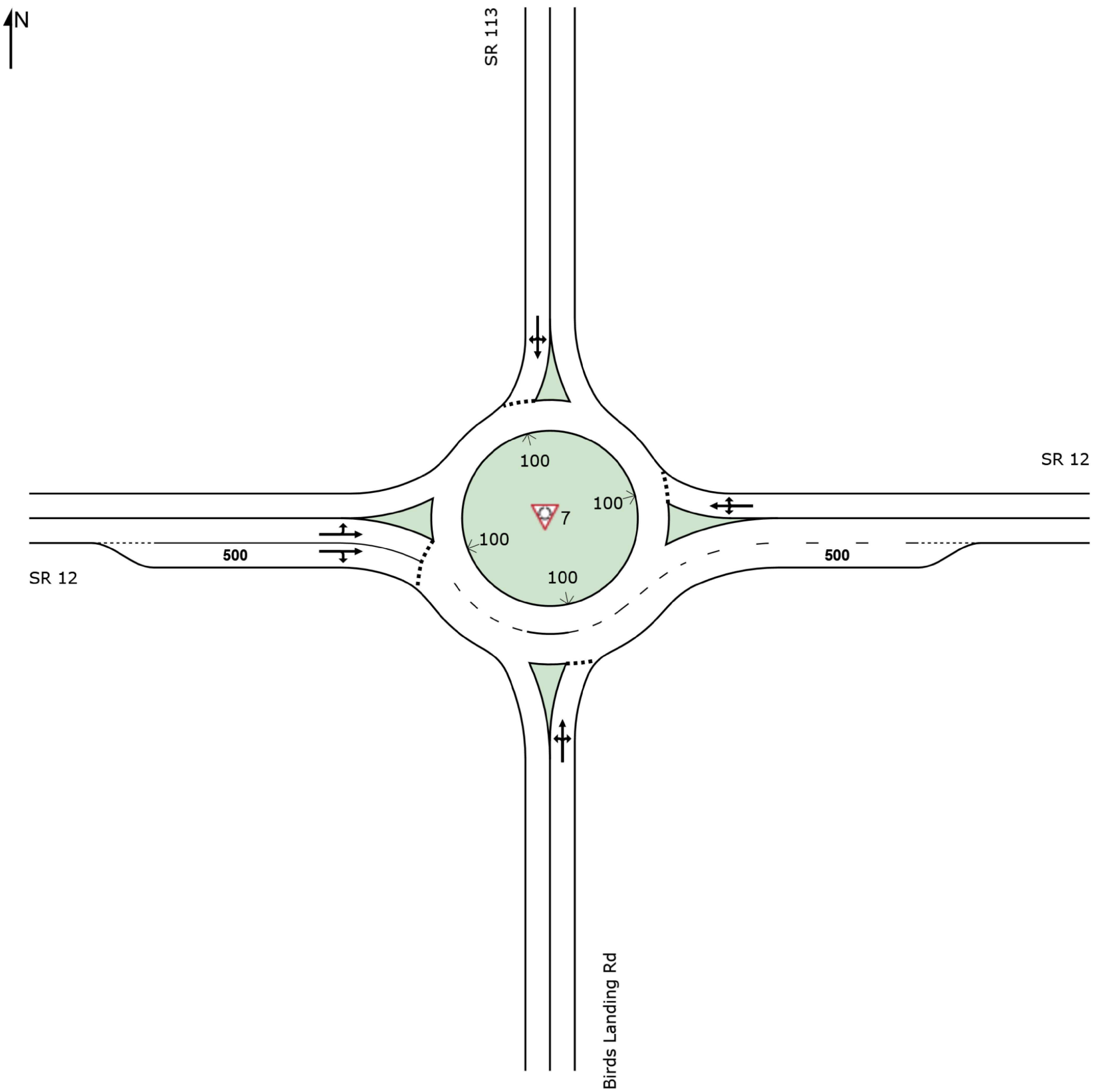
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Birds Landing Rd												
3	L2	5	3.0	0.083	12.4	LOS B	0.2	5.1	0.72	0.72	0.72	31.1
8	T1	11	3.0	0.083	12.4	LOS B	0.2	5.1	0.72	0.72	0.72	31.1
18	R2	11	3.0	0.083	12.4	LOS B	0.2	5.1	0.72	0.72	0.72	30.3
Approach		27	3.0	0.083	12.4	LOS B	0.2	5.1	0.72	0.72	0.72	30.8
East: SR 12												
1	L2	5	3.0	0.713	11.8	LOS B	6.0	159.9	0.30	0.12	0.30	31.8
6	T1	647	10.0	0.713	12.0	LOS B	6.0	159.9	0.30	0.12	0.30	31.6
16	R2	375	7.0	0.713	11.9	LOS B	6.0	159.9	0.30	0.12	0.30	30.8
Approach		1027	8.9	0.713	12.0	LOS B	6.0	159.9	0.30	0.12	0.30	31.3
North: SR 113												
7	L2	321	7.0	0.709	25.8	LOS D	5.5	146.2	0.79	1.08	1.72	25.3
4	T1	22	3.0	0.709	25.6	LOS D	5.5	146.2	0.79	1.08	1.72	25.3
14	R2	22	7.0	0.709	25.8	LOS D	5.5	146.2	0.79	1.08	1.72	24.7
Approach		364	6.8	0.709	25.8	LOS D	5.5	146.2	0.79	1.08	1.72	25.3
West: SR 12												
5	L2	33	7.0	0.855	29.7	LOS D	17.3	466.8	0.86	1.47	2.37	25.3
2	T1	1223	10.0	0.855	28.0	LOS D	17.3	466.8	0.84	1.40	2.23	25.9
12	R2	27	3.0	0.817	25.9	LOS D	14.3	385.7	0.82	1.33	2.08	25.9
Approach		1283	9.8	0.855	28.0	LOS D	17.3	466.8	0.84	1.40	2.23	25.9
All Vehicles		2701	9.0	0.855	21.5	LOS C	17.3	466.8	0.63	0.87	1.41	27.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 7 [SR 12 / SR 113]

MITIG8 Cumulative PM
Add 2nd EB Lane
Site Category: (None)
Roundabout



Organisation: KD ANDERSON & ASSOCIATES INC. | Created: Thursday, May 17, 2018 10:19:14 AM
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Intersection	
Intersection Delay, s/veh	13.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	185	20	36	35	45	50	37	182	30	35	147	150
Future Vol, veh/h	185	20	36	35	45	50	37	182	30	35	147	150
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	7	2	2	2	7	7	2	2	7	2
Mvmt Flow	201	22	39	38	49	54	40	198	33	38	160	163
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	14	11.2	13	14.9
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	77%	27%	100%	0%
Vol Thru, %	0%	86%	8%	35%	0%	49%
Vol Right, %	0%	14%	15%	38%	0%	51%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	37	212	241	130	35	297
LT Vol	37	0	185	35	35	0
Through Vol	0	182	20	45	0	147
RT Vol	0	30	36	50	0	150
Lane Flow Rate	40	230	262	141	38	323
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.078	0.406	0.443	0.241	0.071	0.535
Departure Headway (Hd)	6.957	6.347	6.084	6.138	6.75	5.968
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	512	565	587	579	528	600
Service Time	4.739	4.128	4.166	4.233	4.525	3.742
HCM Lane V/C Ratio	0.078	0.407	0.446	0.244	0.072	0.538
HCM Control Delay	10.3	13.5	14	11.2	10	15.5
HCM Lane LOS	B	B	B	B	A	C
HCM 95th-tile Q	0.3	2	2.3	0.9	0.2	3.2

Intersection	
Intersection Delay, s/veh	13.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	85	50	115	35	15	67	192	80	30	170	110
Future Vol, veh/h	40	85	50	115	35	15	67	192	80	30	170	110
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	7	2	2	2	7	7	2	2	7	2
Mvmt Flow	43	92	54	125	38	16	73	209	87	33	185	120
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	12.3	12.5	14.2	14.8
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	23%	70%	100%	0%
Vol Thru, %	0%	71%	49%	21%	0%	61%
Vol Right, %	0%	29%	29%	9%	0%	39%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	67	272	175	165	30	280
LT Vol	67	0	40	115	30	0
Through Vol	0	192	85	35	0	170
RT Vol	0	80	50	15	0	110
Lane Flow Rate	73	296	190	179	33	304
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.138	0.503	0.326	0.319	0.062	0.516
Departure Headway (Hd)	6.84	6.121	6.179	6.405	6.805	6.102
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	521	585	576	556	523	587
Service Time	4.62	3.901	4.276	4.503	4.584	3.881
HCM Lane V/C Ratio	0.14	0.506	0.33	0.322	0.063	0.518
HCM Control Delay	10.7	15	12.3	12.5	10	15.3
HCM Lane LOS	B	B	B	B	A	C
HCM 95th-tile Q	0.5	2.8	1.4	1.4	0.2	3

MOVEMENT SUMMARY

Site: 7 [SR 12 / SR 113]

MITIG8 Cumulative plus Project PM
Add 2nd EB Lane
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Birds Landing Rd												
3	L2	5	3.0	0.083	12.4	LOS B	0.2	5.1	0.72	0.72	0.72	31.1
8	T1	11	3.0	0.083	12.4	LOS B	0.2	5.1	0.72	0.72	0.72	31.1
18	R2	11	3.0	0.083	12.4	LOS B	0.2	5.1	0.72	0.72	0.72	30.3
Approach		27	3.0	0.083	12.4	LOS B	0.2	5.1	0.72	0.72	0.72	30.8
East: SR 12												
1	L2	5	3.0	0.713	11.8	LOS B	6.0	159.9	0.30	0.12	0.30	31.8
6	T1	647	10.0	0.713	12.0	LOS B	6.0	159.9	0.30	0.12	0.30	31.6
16	R2	375	7.0	0.713	11.9	LOS B	6.0	159.9	0.30	0.12	0.30	30.8
Approach		1027	8.9	0.713	12.0	LOS B	6.0	159.9	0.30	0.12	0.30	31.3
North: SR 113												
7	L2	323	7.0	0.717	26.4	LOS D	5.7	150.9	0.80	1.10	1.76	25.1
4	T1	22	3.0	0.717	26.1	LOS D	5.7	150.9	0.80	1.10	1.76	25.2
14	R2	24	7.0	0.717	26.4	LOS D	5.7	150.9	0.80	1.10	1.76	24.6
Approach		368	6.8	0.717	26.4	LOS D	5.7	150.9	0.80	1.10	1.76	25.1
West: SR 12												
5	L2	33	7.0	0.857	30.1	LOS D	17.5	471.0	0.87	1.49	2.39	25.2
2	T1	1223	10.0	0.857	28.4	LOS D	17.5	471.0	0.85	1.42	2.25	25.8
12	R2	27	3.0	0.820	26.2	LOS D	14.4	388.9	0.83	1.34	2.10	25.8
Approach		1283	9.8	0.857	28.4	LOS D	17.5	471.0	0.85	1.42	2.25	25.8
All Vehicles		2705	9.0	0.857	21.7	LOS C	17.5	471.0	0.63	0.87	1.43	27.5

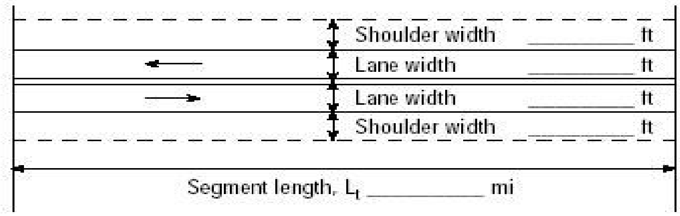
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of Porter Rd EB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*Exist AM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*208*veh/h
Opposing direction vol., V_o	*279*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*22%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.5*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.966*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS} * f_{HV,ATS})$	*234*	*312*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*52.2 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*46.6 mi/h*
		Percent free flow speed, PFFS	*89.4 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}^* f_{g,PTSF})$	*228*	*305*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*26.5*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*38.2*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*42.8*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.14*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*89.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*226.1*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.32*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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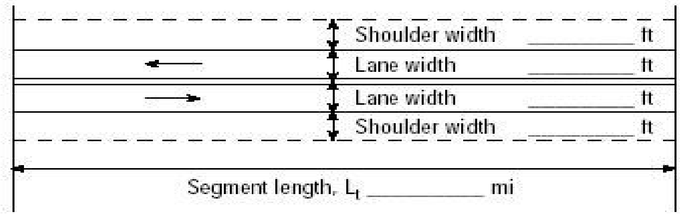
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of Porter Rd WB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*Exist AM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*279*veh/h
Opposing direction vol., V_o	*208*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*22%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.973*	*0.966*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*312*	*234*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(v/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.4 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*52.2 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*46.5 mi/h*
		Percent free flow speed, PFFS	*89.2 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*305*	*228*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*31.4*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*38.2*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*53.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.18*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1642*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*89.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*303.3*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.47*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If $v_i(v_d$ or $v_o)$ >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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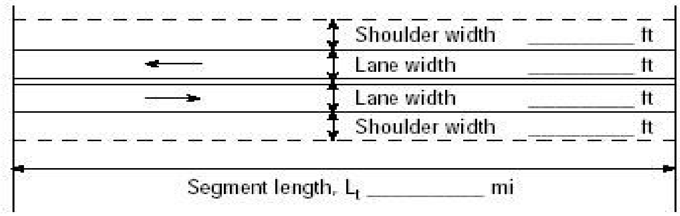
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		*Site Information*	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of Porter Rd EB*
Date Performed	*10/8/19*	Jurisdiction	*Solano County*
Analysis Time Period	*Exist PM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*22%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1*/mi

Analysis direction vol., V_d	*303*veh/h
Opposing direction vol., V_o	*262*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.973*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*338*	*293*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Total demand flow rate, both directions, *v*		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*52.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*45.9 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Percent free flow speed, PFFS	*88.1 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*332*	*287*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*34.6*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*38.0*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*55.0*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.20*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*88.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*329.3*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.51*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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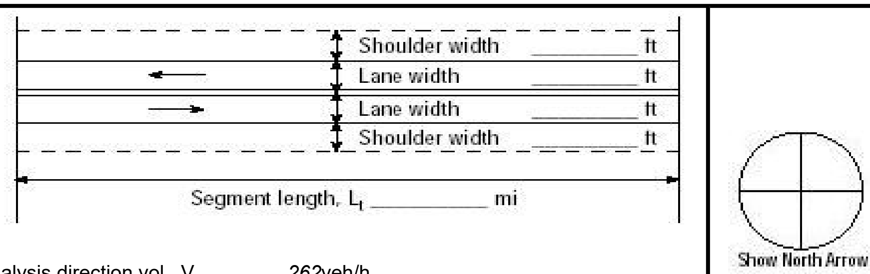
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of Porter Rd WB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*Exist PM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*262*veh/h
Opposing direction vol., V_o	*303*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*22%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.973*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS} * f_{HV,ATS})$	*293*	*338*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0* *mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6* *mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3* *mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3* *mi/h*	Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*52.2* *mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*46.0* *mi/h*
		Percent free flow speed, PFFS	*88.1* *%*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}{}^* f_{g,PTSF})$	*287*	*332*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*32.2*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*38.0*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF} * (v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*49.8*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.17*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*88.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*284.8*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.44*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

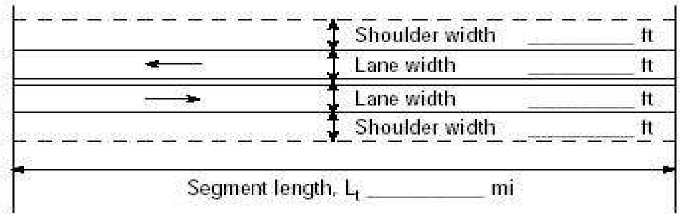
1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

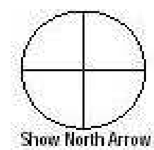
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of SR 113 EB*
Date Performed	*4/13/2018*	Jurisdiction	*Solano County*
Analysis Time Period	*Exist AM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*167*veh/h
Opposing direction vol., V_o	*143*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*13%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.6*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.953*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*189*	*163*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Total demand flow rate, both directions, *v*		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*51.9 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.9 mi/h*	Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*48.2 mi/h*
		Percent free flow speed, PFFS	*92.9 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*183*	*157*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*20.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*28.4*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*35.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.11*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1620*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*92.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*181.5*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.21*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

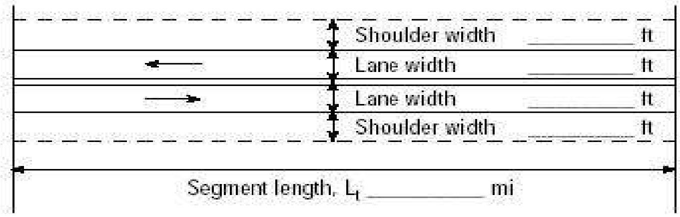
1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

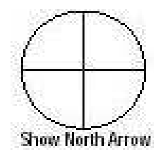
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	
Date Performed	*4/13/2018*	Jurisdiction	*Solano County*
Analysis Time Period	*Exist AM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.92*

No-passing zone *13%*

% Trucks and Buses, P_T *7* %

% Recreational vehicles, P_R *0%*

Access points *mi* 2/mi

Analysis direction vol., V_d *143*veh/h

Opposing direction vol., V_o *167*veh/h

Shoulder width ft *3.0*

Lane Width ft *12.0*

Segment Length mi *2.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.7	1.6
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.953	0.960
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	163	189

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	55.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	2.6 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.5 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.2 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	51.9 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	48.0 mi/h
		Percent free flow speed, PFFS	92.4 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.1	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.993	0.993
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	157	183
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	17.4	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	28.4	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	30.5	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, v/c	0.10

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1632*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*92.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*155.4*
Effective width, Wv (Eq. 15-29) ft	*19.27*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*4.40*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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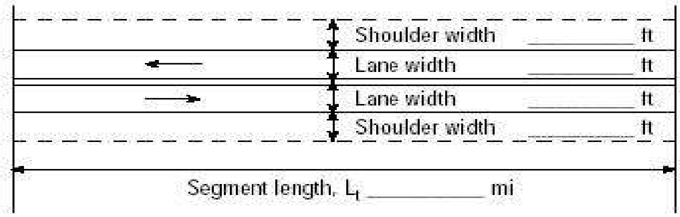
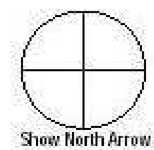
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of SR 113 EB*
Date Performed	*4/13/2018*	Jurisdiction	*Solano County*
Analysis Time Period	*Exist PM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*13%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi
Analysis direction vol., V_d	*50*veh/h
Opposing direction vol., V_o	*104*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.941*	*0.947*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*58*	*119*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.5 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*51.9 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*50.0 mi/h*
		Percent free flow speed, PFFS	*96.4 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*55*	*114*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*6.7*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*22.2*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*13.9*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*B*
Volume to capacity ratio, *v/c*	*0.03*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1610*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*96.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*54.3*
Effective width, Wv (Eq. 15-29) ft	*26.25*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.27*
Bicycle level of service (Exhibit 15-4)	*B*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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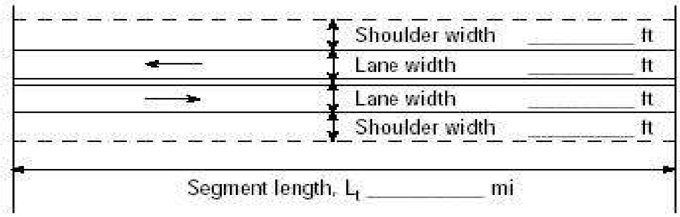
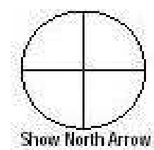
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of SR 113 WB*
Date Performed	*4/13/2018*	Jurisdiction	*Solano County*
Analysis Time Period	*Exist PM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*13%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Analysis direction vol., V_d	*104*veh/h
Opposing direction vol., V_o	*50*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.8*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.947*	*0.941*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS} * f_{HV,ATS})$	*119*	*58*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Total demand flow rate, both directions, *v*		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*51.9 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*50.2 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.3 mi/h*	Percent free flow speed, PFFS	*96.7 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}{}^* f_{g,PTSF})$	*114*	*55*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*13.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*22.2*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF} / v_{d,PTSF} + v_{o,PTSF})$	*28.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*B*
Volume to capacity ratio, *v/c*	*0.07*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1600*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*96.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*113.0*
Effective width, Wv (Eq. 15-29) ft	*22.20*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.63*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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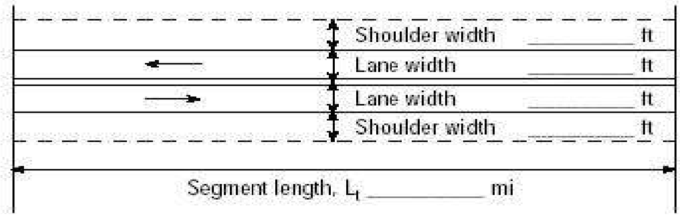
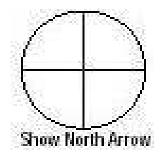
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Midway Rd NB*
Date Performed	*4/13/2018*	Jurisdiction	*Caltrans*
Analysis Time Period	*Exist AM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*130*veh/h
Opposing direction vol., V_o	*111*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*12%*
% Trucks and Buses , P_T	*7 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.7*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.953*	*0.947*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*148*	*127*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(v/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.5 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*47.7 mi/h*
		Percent free flow speed, PFFS	*94.8 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*142*	*121*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*16.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*24.3*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*29.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.09*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1610*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*94.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*141.3*
Effective width, Wv (Eq. 15-29) ft	*16.88*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*4.78*
Bicycle level of service (Exhibit 15-4)	*E*
Notes	

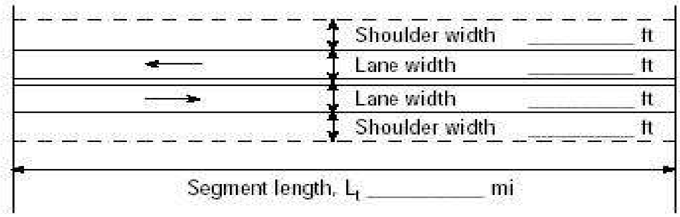
1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

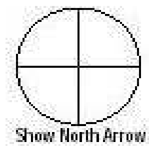
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		**Site Information**	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Midway Rd SB*
Date Performed	*4/13/2018*	Jurisdiction	*Caltrans*
Analysis Time Period	*Exist AM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.92*

No-passing zone *12%*

% Trucks and Buses , P_T *7 %*

% Recreational vehicles, P_R *0%*

Access points *mi* 2/mi

Analysis direction vol., V_d *111*veh/h

Opposing direction vol., V_o *130*veh/h

Shoulder width ft *0.5*

Lane Width ft *12.0*

Segment Length mi *3.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.8*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.947*	*0.953*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*127*	*148*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.7 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*47.5 mi/h*
		Percent free flow speed, PFFS	*94.4 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*121*	*142*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*13.8*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*24.3*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*25.0*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.07*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1620*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*94.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*120.7*
Effective width, Wv (Eq. 15-29) ft	*18.06*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*4.50*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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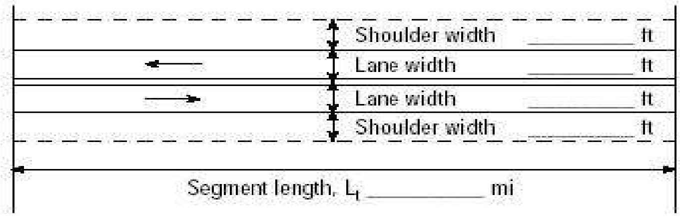
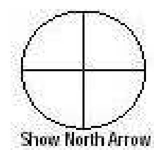
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		**Site Information**	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Midway Rd NB*
Date Performed	*4/13/2018*	Jurisdiction	*Caltrans*
Analysis Time Period	*Exist PM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*183*veh/h
Opposing direction vol., V_o	*185*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*12%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.5*	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.966*	*0.966*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*206*	*208*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Total demand flow rate, both directions, *v*		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(v/ $f_{HV,ATS}$)		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*45.9 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.2 mi/h*	Percent free flow speed, PFFS	*91.2 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*200*	*202*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*21.4*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*31.0*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*36.8*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.12*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1642*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*91.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*198.9*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.60*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

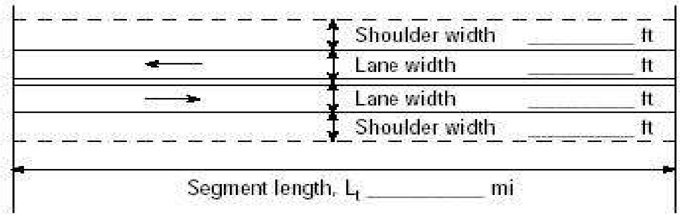
1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Midway Rd SB*
Date Performed	*4/13/2018*	Jurisdiction	*Caltrans*
Analysis Time Period	*Exist PM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*185*veh/h
Opposing direction vol., V_o	*183*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*12%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.5*	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.966*	*0.966*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*208*	*206*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed[4], BFFS	*55.0* mi/h
Mean speed of sample[3], S_{FM}		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2* mi/h
Total demand flow rate, both directions, *v*		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5* mi/h
Free-flow speed, FFS=S_{FM}+0.00776(v/ $f_{HV,ATS}$)		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3* mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.2* mi/h	Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*45.9* mi/h
		Percent free flow speed, PFFS	*91.2* %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*202*	*200*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*21.7*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*31.0*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*37.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.12*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1642*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*91.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*201.1*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.61*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

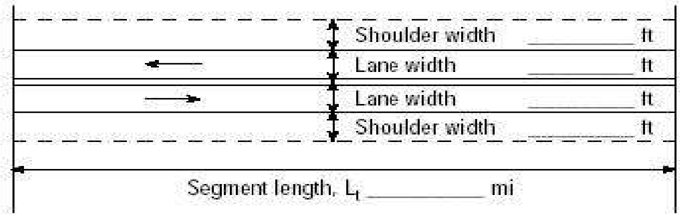
 HCS 2010™ Version 6.65 Generated: 4/16/2018 10:11 AM

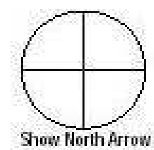
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*north of Hay Rd NB*
Date Performed	*4/13/2018*	Jurisdiction	*Caltrans*
Analysis Time Period	*Exist AM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*245*veh/h
Opposing direction vol., V_o	*159*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*12%*
% Trucks and Buses , P_T	*7 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.973*	*0.960*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*274*	*180*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.0 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*45.8 mi/h*
		Percent free flow speed, PFFS	*91.0 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*268*	*174*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*27.6*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*27.3*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*44.2*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.16*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1632*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*91.0*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*266.3*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.75*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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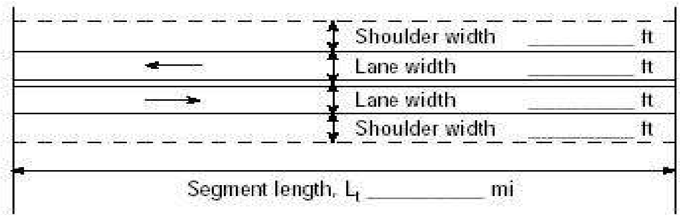
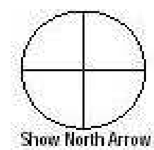
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*north of Hay Rd SB*
Date Performed	*4/13/2018*	Jurisdiction	*Caltrans*
Analysis Time Period	*Exist AM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.92*

No-passing zone *12%*

% Trucks and Buses , P_T *7* %

% Recreational vehicles, P_R *0%*

Access points *mi* *2*/mi

Analysis direction vol., V_d *159*veh/h

Opposing direction vol., V_o *245*veh/h

Shoulder width ft *0.5*

Lane Width ft *12.0*

Segment Length mi *3.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.6*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS} * f_{HV,ATS})$	*180*	*274*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Total demand flow rate, both directions, *v*		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776($v/f_{HV,ATS}$)		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*45.6 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.2 mi/h*	Percent free flow speed, PFFS	*90.7 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}{}^* f_{g,PTSF})$	*174*	*268*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*21.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*27.3*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}{}^*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*31.7*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.11*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*90.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*172.8*
Effective width, Wv (Eq. 15-29) ft	*15.06*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.18*
Bicycle level of service (Exhibit 15-4)	*E*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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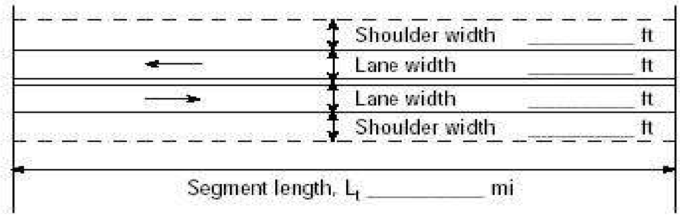
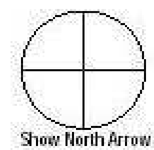
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*north of Hay Rd NB*
Date Performed	*4/13/2018*	Jurisdiction	*Caltrans*
Analysis Time Period	*Exist PM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down	
Peak-hour factor, PHF		*0.92*
No-passing zone		*12%*
% Trucks and Buses , P_T		*7 %*
% Recreational vehicles, P_R		*0%*
Access points *mi*		*2/mi*

Analysis direction vol., V_d	*256*veh/h
Opposing direction vol., V_o	*243*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.973*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*286*	*271*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Total demand flow rate, both directions, *v*		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*44.8 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.2 mi/h*	Percent free flow speed, PFFS	*89.1 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*280*	*266*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*31.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*29.5*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*46.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.17*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*89.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*278.3*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.77*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If $v_i(v_d$ or $v_o)$ >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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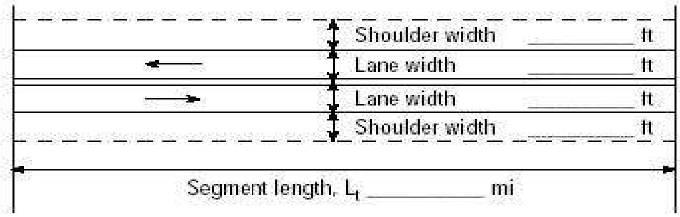
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*north of Hay Rd SB*
Date Performed	*4/13/2018*	Jurisdiction	*Caltrans*
Analysis Time Period	*Exist PM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*243*veh/h
Opposing direction vol., V_o	*256*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*
Grade Length mi Up/down	
Peak-hour factor, PHF	*0.92*
No-passing zone	*12%*
% Trucks and Buses, P_T	*7 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.973*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS} * f_{HV,ATS})$	*271*	*286*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*44.8 mi/h*
		Percent free flow speed, PFFS	*89.1 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}{}^* f_{g,PTSF})$	*266*	*280*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*29.4*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*29.5*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*43.8*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.16*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*89.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*264.1*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.74*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

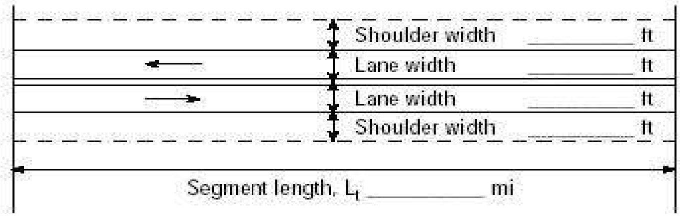
 HCS 2010™ Version 6.65 Generated: 4/16/2018 10:29 AM

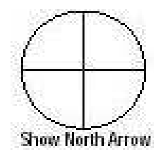
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Hay Rd NB*
Date Performed	*4/13/2018*	Jurisdiction	*Caltrans*
Analysis Time Period	*Exist AM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*18%*
% Trucks and Buses , P_T	*7 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2/mi*

Analysis direction vol., V_d	*248*veh/h
Opposing direction vol., V_o	*142*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*8.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.973*	*0.953*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*277*	*162*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.8 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*46.1 mi/h*
		Percent free flow speed, PFFS	*91.6 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*271*	*155*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*27.8*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*32.0*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*48.2*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.16*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1620*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*91.6*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*269.6*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.75*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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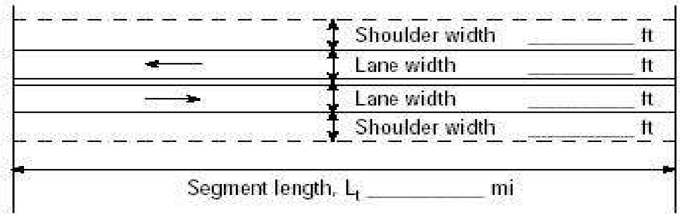
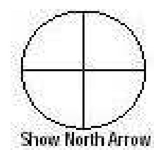
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Hay Rd SB*
Date Performed	*4/13/2018*	Jurisdiction	*Caltrans*
Analysis Time Period	*Exist AM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*142*veh/h
Opposing direction vol., V_o	*248*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*8.5*
Grade Length mi Up/down	
Peak-hour factor, PHF	*0.92*
No-passing zone	*18%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.7*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.953*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*162*	*277*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*45.7 mi/h*
		Percent free flow speed, PFFS	*90.9 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*155*	*271*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*18.9*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*32.0*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*30.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.10*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*90.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*154.3*
Effective width, Wv (Eq. 15-29) ft	*16.13*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*4.95*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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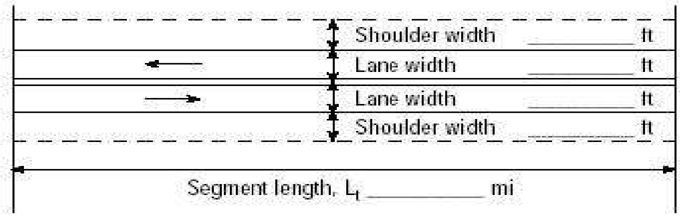
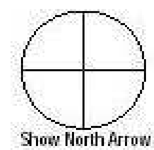
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	JF	Highway / Direction of Travel	SR 113
Agency or Company		From/To	south of Hay Rd NB
Date Performed	4/13/2018	Jurisdiction	Caltrans
Analysis Time Period	Exist PM	Analysis Year	2018

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	226veh/h
Opposing direction vol., V_o	264veh/h
Shoulder width ft	0.5
Lane Width ft	12.0
Segment Length mi	8.5
Grade Length mi	Up/down
Peak-hour factor, PHF	0.92
No-passing zone	18%
% Trucks and Buses , P_T	7 %
% Recreational vehicles, P_R	0%
Access points *mi*	2/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.5	1.4
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.966	0.973
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS} * f_{HV,ATS})$	254	295

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed[4], BFFS	55.0 mi/h
Mean speed of sample[3], S_{FM}		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	4.2 mi/h
Total demand flow rate, both directions, *v*		Adj. for access points[4], f_A (Exhibit 15-8)	0.5 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	50.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.2 mi/h	Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	44.9 mi/h
		Percent free flow speed, PFFS	89.2 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.1	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.993	0.993
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}{}^* f_{g,PTSF})$	247	289
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	28.8	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	35.9	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	45.3	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	D
Volume to capacity ratio, *v/c*	0.15

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*89.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*245.7*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.71*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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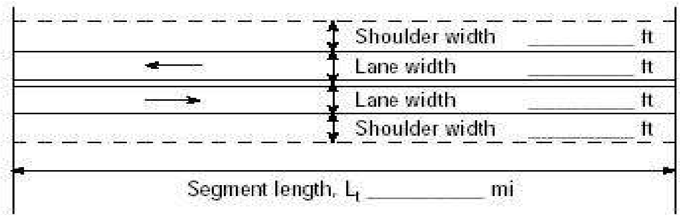
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	JF	Highway / Direction of Travel	SR 113
Agency or Company		From/To	south of Hay Rd SB
Date Performed	4/13/2018	Jurisdiction	Caltrans
Analysis Time Period	Exist PM	Analysis Year	2018

Project Description: *Recology Hay Rd Landfill*

Input Data



Analysis direction vol., V_d	264veh/h
Opposing direction vol., V_o	226veh/h
Shoulder width ft	0.5
Lane Width ft	12.0
Segment Length mi	8.5

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	0.92
No-passing zone	18%
% Trucks and Buses , P_T	7 %
% Recreational vehicles, P_R	0%
Access points *mi*	2/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.4	1.5
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.973	0.966
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS} * f_{HV,ATS})$	295	254

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	55.0 mi/h
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	4.2 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.5 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.2 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	50.3 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	44.9 mi/h
		Percent free flow speed, PFFS	89.2 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.1	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.993	0.993
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}{}^* f_{g,PTSF})$	289	247
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	31.0	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	35.9	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	50.4	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	D
Volume to capacity ratio, *v/c*	0.17

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1642*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*89.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*287.0*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.79*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If $v_i(v_d$ or $v_o)$ >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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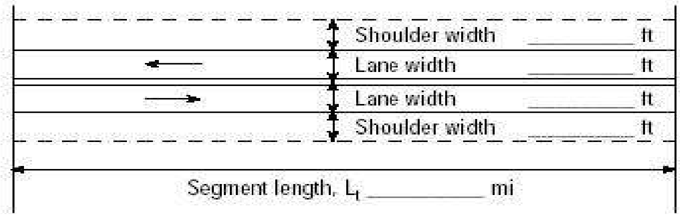
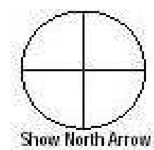
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway / Direction of Travel	*Hay Rd*
Agency or Company		From/To	*west of SR 113 EB*
Date Performed	*4/13/2018*	Jurisdiction	*Solano County*
Analysis Time Period	*Exist AM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*44*veh/h
Opposing direction vol., V_o	*25*veh/h
Shoulder width ft	*1.0*
Lane Width ft	*12.0*
Segment Length mi	*0.7*
Grade Length mi Up/down	
Peak-hour factor, PHF	*0.92*
No-passing zone	*20%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.941*	*0.941*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*51*	*29*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.5 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*49.7 mi/h*
		Percent free flow speed, PFFS	*98.3 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*48*	*27*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*5.9*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*29.7*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*24.9*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.03*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1600*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*98.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*47.8*
Effective width, Wv (Eq. 15-29) ft	*23.14*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.98*
Bicycle level of service (Exhibit 15-4)	*C*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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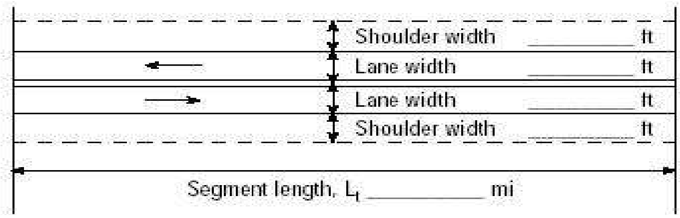
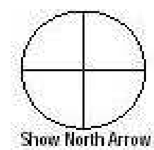
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Hay Rd*
Agency or Company		From/To	*west of SR 113 WB*
Date Performed	*4/13/2018*	Jurisdiction	*Solano County*
Analysis Time Period	*Exist AM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*44veh/h*
Opposing direction vol., V_o	*25veh/h*
Shoulder width ft	*1.0*
Lane Width ft	*12.0*
Segment Length mi	*0.7*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*20%*
% Trucks and Buses , P_T	*7 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.941*	*0.941*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*51*	*29*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.5 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*49.7 mi/h*
		Percent free flow speed, PFFS	*98.3 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*48*	*27*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*5.9*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*29.7*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*24.9*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.03*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1600*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*98.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*47.8*
Effective width, Wv (Eq. 15-29) ft	*23.14*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.98*
Bicycle level of service (Exhibit 15-4)	*C*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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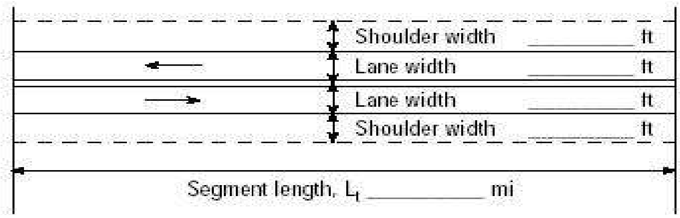
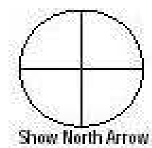
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Hay Rd*
Agency or Company		From/To	*west of SR 113 EB*
Date Performed	*4/13/2018*	Jurisdiction	*Solano County*
Analysis Time Period	*Exist PM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Analysis direction vol., V_d	*57veh/h*
Opposing direction vol., V_o	*32veh/h*
Shoulder width ft	*1.0*
Lane Width ft	*12.0*
Segment Length mi	*0.7*
Peak-hour factor, PHF	*0.92*
No-passing zone	*20%*
% Trucks and Buses , P_T	*7 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))$	*0.941*	*0.941*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*66*	*37*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.5 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*49.5 mi/h*
		Percent free flow speed, PFFS	*98.0 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*62*	*35*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*7.5*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*29.6*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF} / v_{d,PTSF} + v_{o,PTSF})$	*26.4*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.04*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1600*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*98.0*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*62.0*
Effective width, Wv (Eq. 15-29) ft	*22.30*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.30*
Bicycle level of service (Exhibit 15-4)	*C*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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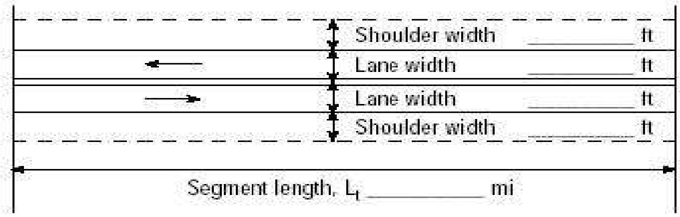
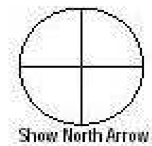
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway / Direction of Travel	*Hay Rd*
Agency or Company		From/To	*west of SR 113 WB*
Date Performed	*4/13/2018*	Jurisdiction	*Solano County*
Analysis Time Period	*Exist PM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☐ Rolling

Analysis direction vol., V_d	*32veh/h*
Opposing direction vol., V_o	*57veh/h*
Shoulder width ft	*1.0*
Lane Width ft	*12.0*
Segment Length mi	*0.7*
Grade Length	*0.25* mi
Up/down	*3.0*
Peak-hour factor, PHF	*0.92*
No-passing zone	*20%*
% Trucks and Buses , P_T	*7 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.6*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.899*	*0.941*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.78*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*50*	*66*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Total demand flow rate, both directions, *v*		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.5 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*49.4 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.2 mi/h*	Percent free flow speed, PFFS	*97.8 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*35*	*62*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*4.4*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*29.6*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*15.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.03*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1192*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*97.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*34.8*
Effective width, Wv (Eq. 15-29) ft	*23.92*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.64*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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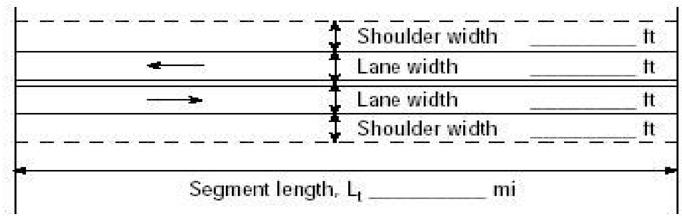
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of Porter Rd EB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*Exist + Project AM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*224*veh/h
Opposing direction vol., V_o	*291*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*22%*
% Trucks and Buses, P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.5*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.966*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*252*	*325*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*52.2 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*46.4 mi/h*
		Percent free flow speed, PFFS	*88.9 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*245*	*319*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*28.8*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*38.3*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*45.4*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.15*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*88.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*243.5*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.36*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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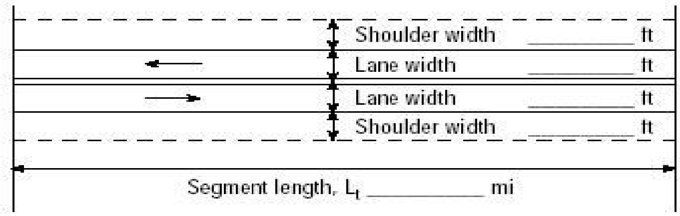
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	JF	Highway / Direction of Travel	Midway Rd
Agency or Company		From/To	west of Porter Rd WB
Date Performed	10/8/18	Jurisdiction	Solano County
Analysis Time Period	Exist AM	Analysis Year	2018

Project Description: *Recology Hay Rd Landfill*

Input Data



Analysis direction vol., V_d 291veh/h

Opposing direction vol., V_o 224veh/h

Shoulder width ft 3.0

Lane Width ft 12.0

Segment Length mi 2.0

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF 0.92

No-passing zone 22%

% Trucks and Buses , P_T 7 %

% Recreational vehicles, P_R 0%

Access points *mi* 1/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.4	1.5
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.973	0.966
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	325	252

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed[4], BFFS	55.0 mi/h
Mean speed of sample[3], S_{FM}		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	2.6 mi/h
Total demand flow rate, both directions, v		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	52.2 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.4 mi/h	Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	46.3 mi/h
		Percent free flow speed, PFFS	88.8 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.1	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.993	0.993
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	319	245
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	33.6	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	38.3	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	55.3	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, v/c	0.19

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1642*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*88.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*316.3*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.49*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

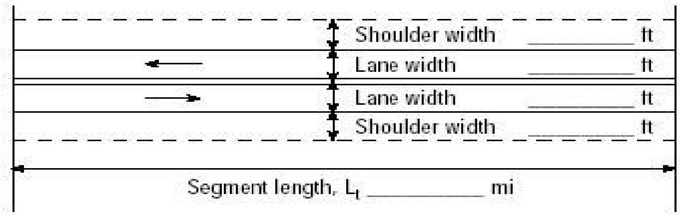
1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of Porter Rd EB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*Exist plus Project PM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*303*veh/h
Opposing direction vol., V_o	*274*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*22%*
% Trucks and Buses , P_T	*7 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/\ (1+ P_T(E_T-1)+P_R(E_R-1))$	*0.973*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*338*	*306*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(v/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*52.2 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*45.8 mi/h*
		Percent free flow speed, PFFS	*87.9 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*332*	*300*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*35.7*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*37.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF} / v_{d,PTSF} + v_{o,PTSF})$	*55.6*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.20*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*87.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*329.3*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.51*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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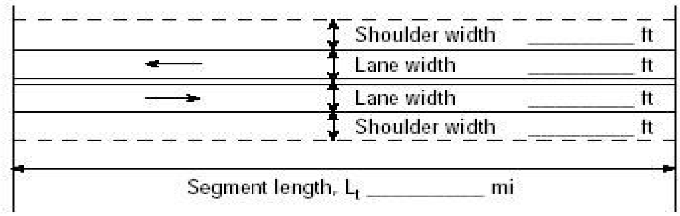
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of Porter Rd WB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*Exist plus Project PM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*274*veh/h
Opposing direction vol., V_o	*303*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*22%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.973*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*306*	*338*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*52.2 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*45.9 mi/h*
		Percent free flow speed, PFFS	*87.9 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*300*	*332*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*33.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*37.9*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*51.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.18*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*87.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*297.8*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.46*
Bicycle level of service (Exhibit 15-4)	*E*
Notes	
1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain. 2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F. 3. For the analysis direction only and for v>200 veh/h. 4. For the analysis direction only 5. Exhibit 15-20 provides coefficients a and b for Equation 15-10. 6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.	

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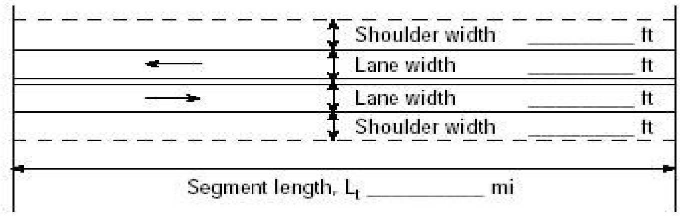
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of SR 113 EB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*Exist + Project AM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.92*

No-passing zone *13%*

% Trucks and Buses , P_T *7 %*

% Recreational vehicles, P_R *0%*

Access points *mi* *2/mi*

Analysis direction vol., V_d *183*veh/h

Opposing direction vol., V_o *155*veh/h

Shoulder width ft *3.0*

Lane Width ft *12.0*

Segment Length mi *2.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.5*	*1.6*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.966*	*0.960*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*206*	*175*

Free-Flow Speed from Field Measurement	Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}	Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, v	Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(v/ $f_{HV,ATS}$)	Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15) *1.1 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*51.9 mi/h*
	Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*47.9 mi/h*
	Percent free flow speed, PFFS	*92.3 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*200*	*170*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*21.5*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*29.6*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*37.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, v/c	*0.12*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1632*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*92.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*198.9*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.26*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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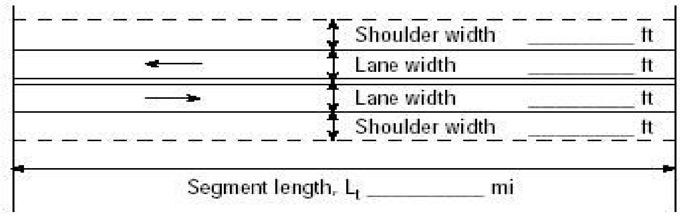
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of SR 113 WB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*Exist + Project AM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*13%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi
Analysis direction vol., V_d	*155*veh/h
Opposing direction vol., V_o	*183*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.6*	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.960*	*0.966*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*175*	*206*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*51.9 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*47.6 mi/h*
		Percent free flow speed, PFFS	*91.8 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*170*	*200*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*18.7*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*29.6*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*32.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.10*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1642*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*91.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*168.5*
Effective width, Wv (Eq. 15-29) ft	*18.38*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*4.61*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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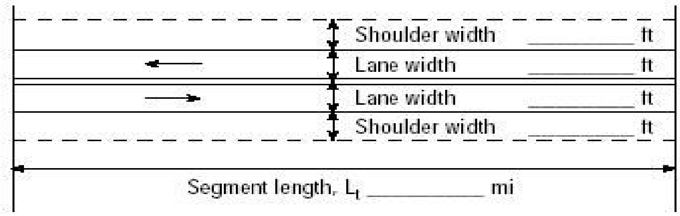
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of SR 113 EB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*Exist plus Projcet PM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*50*veh/h
Opposing direction vol., V_o	*116*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*13%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/\ (1+ P_T(E_T-1)+P_R(E_R-1))$	*0.941*	*0.947*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*58*	*133*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(v/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.6 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*51.9 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*49.8 mi/h*
		Percent free flow speed, PFFS	*95.9 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/\ (1+ P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*55*	*127*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*6.7*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*21.8*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF} / v_{d,PTSF} + v_{o,PTSF})$	*13.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.03*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1610*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*95.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*54.3*
Effective width, Wv (Eq. 15-29) ft	*26.25*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.27*
Bicycle level of service (Exhibit 15-4)	*B*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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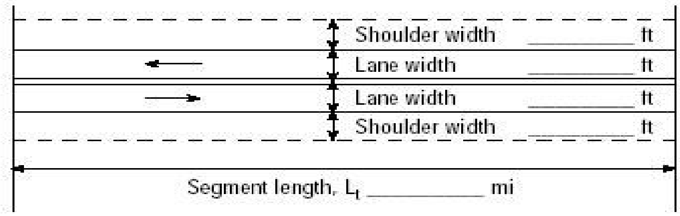
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		**Site Information**	
Analyst	JF	Highway / Direction of Travel	Midway Rd
Agency or Company		From/To	west of SR 113 WB
Date Performed	10/8/18	Jurisdiction	Solano County
Analysis Time Period	Exist plus Project PM	Analysis Year	2018

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	0.92
No-passing zone	13%
% Trucks and Buses , P_T	7 %
% Recreational vehicles, P_R	0%
Access points *mi*	2/mi

Analysis direction vol., V_d	116veh/h
Opposing direction vol., V_o	50veh/h
Shoulder width ft	3.0
Lane Width ft	12.0
Segment Length mi	2.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.8	1.9
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	0.947	0.941
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	133	58

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
		Base free-flow speed[4], BFFS	55.0 mi/h
Mean speed of sample[3], S_{FM}		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	2.6 mi/h
Total demand flow rate, both directions, *v*		Adj. for access points[4], f_A (Exhibit 15-8)	0.5 mi/h
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	51.9 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	0.3 mi/h	Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	50.1 mi/h
		Percent free flow speed, PFFS	96.5 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.1	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	0.993	0.993
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	127	55
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	14.4	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	21.8	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	29.6	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	B
Volume to capacity ratio, *v/c*	0.08

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1600*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*96.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*126.1*
Effective width, Wv (Eq. 15-29) ft	*21.30*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.88*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

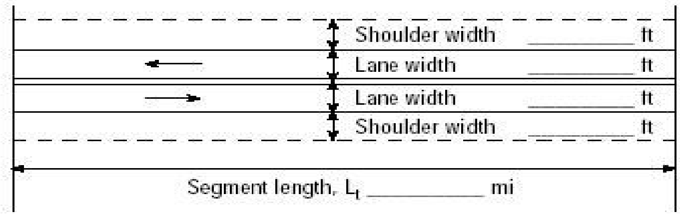
1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Midway Rd NB*
Date Performed	*10/8/18*	Jurisdiction	*Caltrans*
Analysis Time Period	*Exist + Project AM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*12%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi
Analysis direction vol., V_d	*143*veh/h
Opposing direction vol., V_o	*129*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.7*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.953*	*0.953*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*163*	*147*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.7 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*50.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*47.2 mi/h*
		Percent free flow speed, PFFS	*93.8 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*157*	*141*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*17.4*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*25.8*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*31.0*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.10*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1620*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*93.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*155.4*
Effective width, Wv (Eq. 15-29) ft	*16.06*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*4.96*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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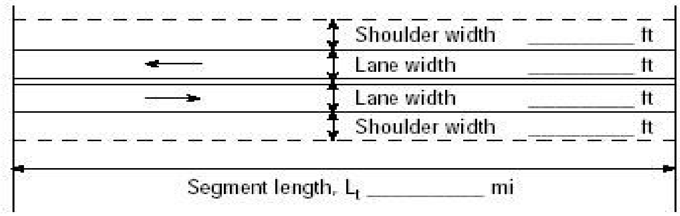
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Midway Rd SB*
Date Performed	*10/8/18*	Jurisdiction	*Caltrans*
Analysis Time Period	*Exist + Project AM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*129*veh/h
Opposing direction vol., V_o	*143*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*12%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.7*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.953*	*0.953*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*147*	*163*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0* mi/h
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2* mi/h
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5* mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.8* mi/h	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3* mi/h
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*47.0* mi/h
		Percent free flow speed, PFFS	*93.5* %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*141*	*157*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*15.9*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*25.8*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*28.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.09*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1620*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*93.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*140.2*
Effective width, Wv (Eq. 15-29) ft	*16.94*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*4.77*
Bicycle level of service (Exhibit 15-4)	*E*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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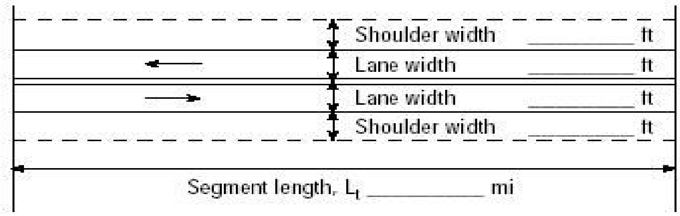
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Midway Rd NB*
Date Performed	*10/8/18*	Jurisdiction	*Caltrans*
Analysis Time Period	*Exist plus Project PM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



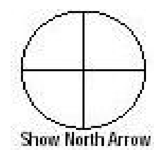
Analysis direction vol., V_d *197*veh/h

Opposing direction vol., V_o *186*veh/h

Shoulder width ft *0.5*

Lane Width ft *12.0*

Segment Length mi *3.5*



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.92*

No-passing zone *12%*

% Trucks and Buses , P_T *7* %

% Recreational vehicles, P_R *0%*

Access points *mi* *2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.5*	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.966*	*0.966*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*222*	*209*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(v/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*45.7 mi/h*
		Percent free flow speed, PFFS	*90.9 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*216*	*204*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*22.9*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*30.4*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*38.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.13*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1642*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*90.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*214.1*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.64*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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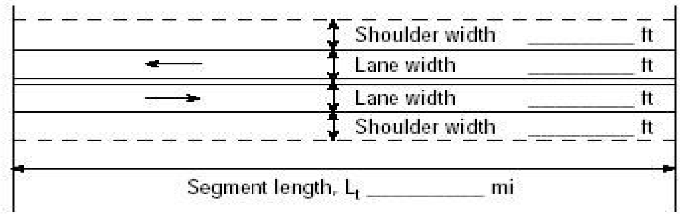
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	JF	Highway / Direction of Travel	SR 113
Agency or Company		From/To	south of Midway Rd SB
Date Performed	10/8/18	Jurisdiction	Caltrans
Analysis Time Period	Exist plus Projcet PM	Analysis Year	2018

Project Description: Recology Hay Rd Landfill

Input Data



Analysis direction vol., V_d 186veh/h

Opposing direction vol., V_o 197veh/h

Shoulder width ft 0.5

Lane Width ft 12.0

Segment Length mi 3.5

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF 0.92

No-passing zone 12%

% Trucks and Buses , P_T 7 %

% Recreational vehicles, P_R 0%

Access points *mi* 2/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.5	1.5
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	0.966	0.966
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	209	222

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed[4], BFFS	55.0 mi/h
		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	4.2 mi/h
Mean speed of sample[3], S_{FM}		Adj. for access points[4], f_A (Exhibit 15-8)	0.5 mi/h
Total demand flow rate, both directions, *v*		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	50.3 mi/h
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	45.7 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.2 mi/h	Percent free flow speed, PFFS	91.0 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.1	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	0.993	0.993
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	204	216
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	22.9	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	30.4	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	37.7	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, *v/c*	0.12

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1642*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*91.0*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*202.2*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.61*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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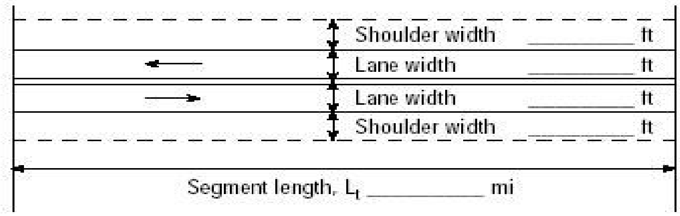
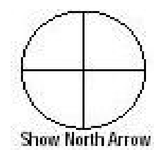
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*north of Hay Rd NB*
Date Performed	*10/8/18*	Jurisdiction	*Caltrans*
Analysis Time Period	*Exist + Project AM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data





Analysis direction vol., V_d	*258*veh/h
Opposing direction vol., V_o	*177*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*12%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.973*	*0.966*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS} * f_{HV,ATS})$	*288*	*199*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.2 mi/h*	Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*50.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*45.3 mi/h*
		Percent free flow speed, PFFS	*90.1 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}^* f_{g,PTSF})$	*282*	*194*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*28.8*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*27.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*45.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.17*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1642*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*90.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*280.4*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.77*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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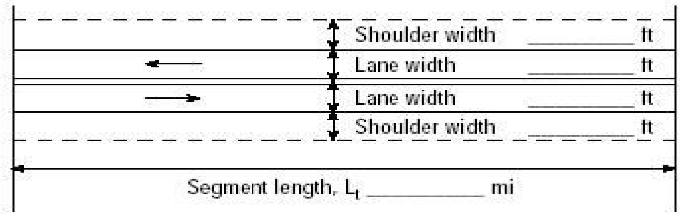
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	JF	Highway / Direction of Travel	SR 113
Agency or Company		From/To	north of Hay Rd SB
Date Performed	10/8/18	Jurisdiction	Caltrans
Analysis Time Period	Exist + Project AM	Analysis Year	2018

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF 0.92

No-passing zone 12%

% Trucks and Buses , P_T 7 %

% Recreational vehicles, P_R 0%

Access points *mi* 2/mi

Analysis direction vol., V_d 177veh/h

Opposing direction vol., V_o 258veh/h

Shoulder width ft 0.5

Lane Width ft 12.0

Segment Length mi 3.5

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.5	1.4
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.966	0.973
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	199	288

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	55.0 mi/h
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	4.2 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.5 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.2 mi/h	Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	50.3 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	45.3 mi/h
		Percent free flow speed, PFFS	90.2 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.1	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.993	0.993
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	194	282
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	22.6	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	27.9	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	34.0	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, *v/c*	0.12

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*90.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*192.4*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.58*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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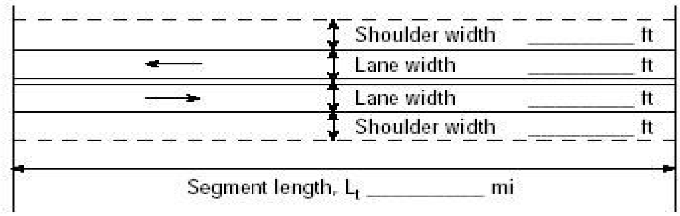
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*north of Hay Rd NB*
Date Performed	*10/8/18*	Jurisdiction	*Caltrans*
Analysis Time Period	*Exist plus Project PM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*12%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Analysis direction vol., V_d	*270*veh/h
Opposing direction vol., V_o	*244*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.973*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*302*	*273*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*44.7 mi/h*
		Percent free flow speed, PFFS	*88.8 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*296*	*267*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*32.4*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*29.2*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*47.8*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.18*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*88.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*293.5*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.80*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

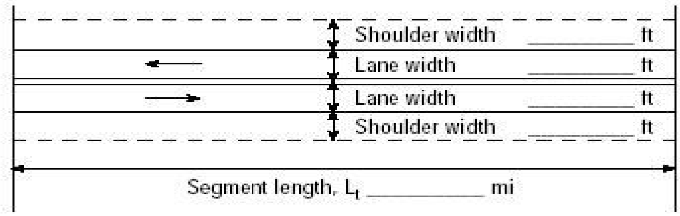
1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*north of Hay Rd SB*
Date Performed	*10/8/18*	Jurisdiction	*Caltrans*
Analysis Time Period	*Exist plus Project PM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



Analysis direction vol., V_d	*244*veh/h	☑ Class I highway ☐ Class II highway ☐ Class III highway	
Opposing direction vol., V_o	*270*veh/h	Terrain ☑ Level ☐ Rolling	
Shoulder width ft	*0.5*	Grade Length mi	Up/down
Lane Width ft	*12.0*	Peak-hour factor, PHF	*0.92*
Segment Length mi	*3.5*	No-passing zone	*12%*
		% Trucks and Buses , P_T	*7* %
		% Recreational vehicles, P_R	*0%*
		Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.973*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*273*	*302*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*44.7 mi/h*
		Percent free flow speed, PFFS	*88.8 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*267*	*296*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*30.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*29.2*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*44.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.16*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*88.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*265.2*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.75*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If $v_i(v_d$ or $v_o)$ >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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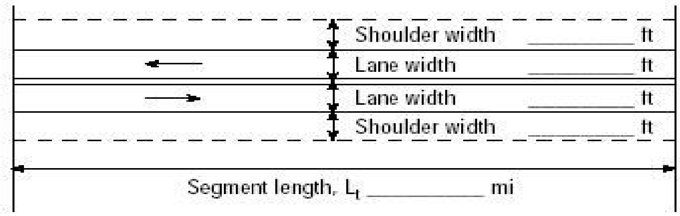
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Hay Rd NB*
Date Performed	*10/8/18*	Jurisdiction	*Caltrans*
Analysis Time Period	*Exist + Project AM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*250*veh/h
Opposing direction vol., V_o	*144*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*8.5*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*18%*
% Trucks and Buses , P_T	*7 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.973*	*0.953*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*279*	*164*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.9 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*46.0 mi/h*
		Percent free flow speed, PFFS	*91.5 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*274*	*158*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*28.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*32.1*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*48.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.16*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1620*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*91.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*271.7*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.76*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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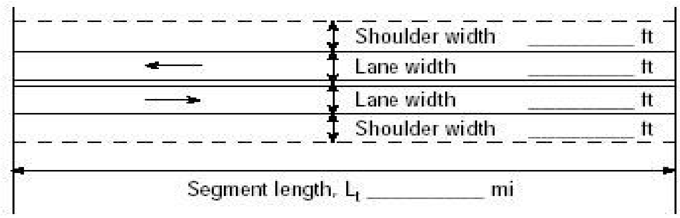
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Hay Rd SB*
Date Performed	*10/8/18*	Jurisdiction	*Caltrans*
Analysis Time Period	*Exist + Project AM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Analysis direction vol., V_d	*144*veh/h
Opposing direction vol., V_o	*250*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*8.5*
Peak-hour factor, PHF	*0.92*
No-passing zone	*18%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.7*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.953*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS} * f_{HV,ATS})$	*164*	*279*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*45.7 mi/h*
		Percent free flow speed, PFFS	*90.8 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}*f_{g,PTSF})$	*158*	*274*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*19.2*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*32.1*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*30.9*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.10*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*90.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*156.5*
Effective width, Wv (Eq. 15-29) ft	*16.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*4.98*
Bicycle level of service (Exhibit 15-4)	*E*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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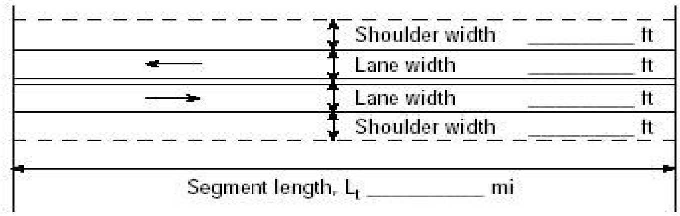
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Hay Rd NB*
Date Performed	*10/8/18*	Jurisdiction	*Caltrans*
Analysis Time Period	*Exist plus Project PM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*226*veh/h	
Opposing direction vol., V_o	*268*veh/h	
Shoulder width ft	*0.5*	
Lane Width ft	*12.0*	
Segment Length mi	*8.5*	
Grade Length mi		Up/down
Peak-hour factor, PHF	*0.92*	
No-passing zone	*18%*	
% Trucks and Buses , P_T	*7 %*	
% Recreational vehicles, P_R	*0%*	
Access points *mi*	*2/mi*	

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.5*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/ (1+ P_T (E_T -1)+P_R (E_R -1))$	*0.966*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*254*	*299*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Total demand flow rate, both directions, *v*		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(v/ $f_{HV,ATS}$)		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*44.8 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.2 mi/h*	Percent free flow speed, PFFS	*89.2 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}* f_{g,PTSF})$	*247*	*293*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*28.6*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*35.8*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF} *(v_{d,PTSF} / v_{d,PTSF} + v_{o,PTSF})$	*45.0*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.15*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*89.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*245.7*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.71*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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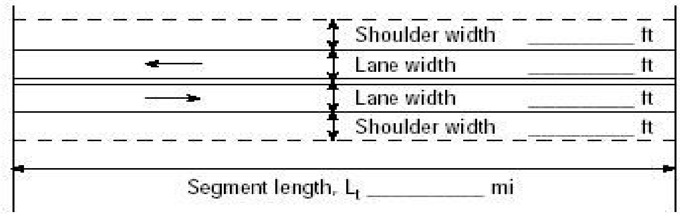
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Hay Rd SB*
Date Performed	*10/8/18*	Jurisdiction	*Caltrans*
Analysis Time Period	*Exist plus Project PM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.92*

No-passing zone *18%*

% Trucks and Buses , P_T *7 %*

% Recreational vehicles, P_R *0%*

Access points *mi* 2/mi

Analysis direction vol., V_d *268*veh/h

Opposing direction vol., V_o *226*veh/h

Shoulder width ft *0.5*

Lane Width ft *12.0*

Segment Length mi *8.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.973*	*0.966*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*299*	*254*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*44.8 mi/h*
		Percent free flow speed, PFFS	*89.1 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*293*	*247*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*31.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*35.8*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*50.7*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.18*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1642*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*89.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*291.3*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.79*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

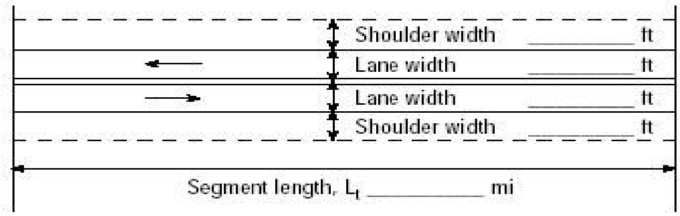
1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Hay Rd*
Agency or Company		From/To	*west of SR 113 EB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*Exist + Project AM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*81*veh/h
Opposing direction vol., V_o	*65*veh/h
Shoulder width ft	*1.0*
Lane Width ft	*12.0*
Segment Length mi	*0.7*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*20%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.941*	*0.941*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*94*	*75*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0* mi/h
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2* mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3* mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.2* mi/h	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.5* mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*49.0* mi/h
		Percent free flow speed, PFFS	*96.9* %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*89*	*71*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*10.5*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*30.0*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*27.2*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.05*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1600*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*96.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*88.0*
Effective width, Wv (Eq. 15-29) ft	*20.74*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.82*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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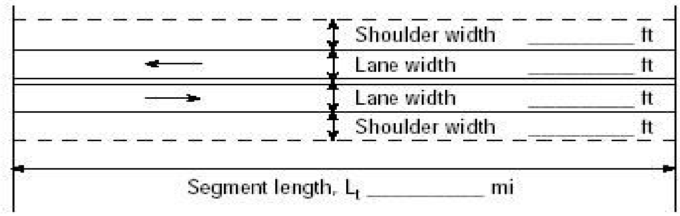
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Hay Rd*
Agency or Company		From/To	*west of SR 113 WB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*Exist AM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*20%*
% Trucks and Buses , P_T	*7 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1/mi*

Analysis direction vol., V_d	*65*veh/h
Opposing direction vol., V_o	*81*veh/h
Shoulder width ft	*1.0*
Lane Width ft	*12.0*
Segment Length mi	*0.7*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.941*	*0.941*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS} * f_{HV,ATS})$	*75*	*94*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Total demand flow rate, both directions, *v*			
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.2 mi/h*	Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*49.0 mi/h*
		Percent free flow speed, PFFS	*96.9 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}{}^* f_{g,PTSF})$	*71*	*89*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*8.5*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*30.0*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*21.8*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.04*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1600*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*96.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*70.7*
Effective width, Wv (Eq. 15-29) ft	*21.77*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.49*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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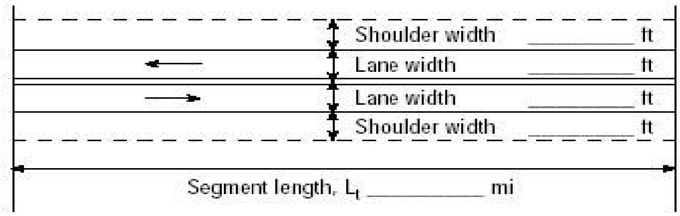
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway / Direction of Travel	*Hay Rd*
Agency or Company		From/To	*west of SR 113 EB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*Exist plus Project PM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*75veh/h*
Opposing direction vol., V_o	*33veh/h*
Shoulder width ft	*1.0*
Lane Width ft	*12.0*
Segment Length mi	*0.7*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*20%*
% Trucks and Buses , P_T	*7 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.941*	*0.941*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*87*	*38*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.5 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*49.3 mi/h*
		Percent free flow speed, PFFS	*97.6 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*82*	*36*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*9.7*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*28.2*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF} / v_{d,PTSF} + v_{o,PTSF})$	*29.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.05*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1600*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*97.6*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*81.5*
Effective width, Wv (Eq. 15-29) ft	*21.13*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.70*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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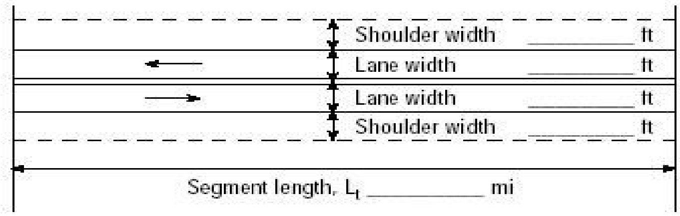
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Hay Rd*
Agency or Company		From/To	*west of SR 113 WB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*Exist plus Project PM*	Analysis Year	*2018*

Project Description: *Recology Hay Rd Landfill*

Input Data



Analysis direction vol., V_d	*33veh/h*
Opposing direction vol., V_o	*75veh/h*
Shoulder width ft	*1.0*
Lane Width ft	*12.0*
Segment Length mi	*0.7*

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☐ Rolling

Grade Length	*0.25* mi
Up/down	*3.0*
Peak-hour factor, PHF	*0.92*
No-passing zone	*20%*
% Trucks and Buses , P_T	*7 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.6*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.899*	*0.941*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.78*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*51*	*87*

Free-Flow Speed from Field Measurement

Mean speed of sample[3], S_{FM}	
Total demand flow rate, both directions, *v*	
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)	
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.2 mi/h*

Estimated Free-Flow Speed

Base free-flow speed[4], BFFS	*55.0 mi/h*
Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.5 mi/h*
Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*49.2 mi/h*
Percent free flow speed, PFFS	*97.4 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*1.000*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*36*	*82*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*4.5*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*28.2*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*13.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.03*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1192*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*97.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*35.9*
Effective width, Wv (Eq. 15-29) ft	*23.85*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.67*
Bicycle level of service (Exhibit 15-4)	*C*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If $v_i(v_d$ or $v_o)$ >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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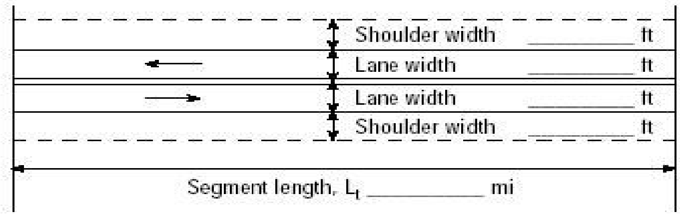
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	JF	Highway / Direction of Travel	Midway Rd
Agency or Company		From/To	west of Porter Rd EB
Date Performed	10/8/18	Jurisdiction	Solano County
Analysis Time Period	AM	Analysis Year	Cumulative

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	245veh/h
Opposing direction vol., V_o	385veh/h
Shoulder width ft	3.0
Lane Width ft	12.0
Segment Length mi	2.0
Grade Length mi	Up/down
Peak-hour factor, PHF	0.92
No-passing zone	22%
% Trucks and Buses , P_T	7 %
% Recreational vehicles, P_R	0%
Access points *mi*	1/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.4	1.3
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.973	0.979
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	274	427

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	55.0 mi/h
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	2.6 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.2 mi/h	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	52.2 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	45.5 mi/h
		Percent free flow speed, PFFS	87.3 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.1	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.993	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	268	418
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	32.3	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	33.2	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	45.3	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, *v/c*	0.16

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1548*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*87.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*266.3*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.40*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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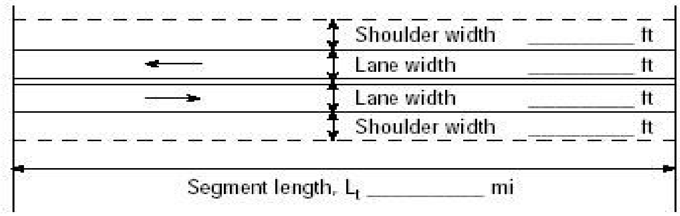
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of Porter Rd WB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*AM*	Analysis Year	*Cumulative*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*22%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1*/mi

Analysis direction vol., V_d	*385*veh/h
Opposing direction vol., V_o	*245*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.3*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T-1)+P_R (E_R-1))	*0.979*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*427*	*274*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*52.2 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*45.4 mi/h*
		Percent free flow speed, PFFS	*87.0 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*1.000*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*418*	*268*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*42.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*33.2*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*62.2*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.25*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*87.0*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*418.5*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.63*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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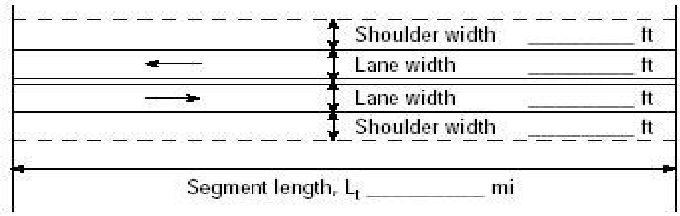
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of Porter Rd EB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*PM*	Analysis Year	*Cumulative*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Analysis direction vol., V_d	*580*veh/h
Opposing direction vol., V_o	*405*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*
Peak-hour factor, PHF	*0.92*
No-passing zone	*22%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.1*	*1.3*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.979*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*635*	*450*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.1 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*52.2 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*42.6 mi/h*
		Percent free flow speed, PFFS	*81.7 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*630*	*440*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*57.6*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*24.9*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*72.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.37*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1664*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*81.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*630.4*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.84*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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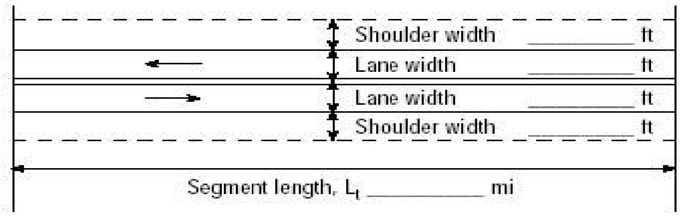
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of Porter Rd WB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*PM*	Analysis Year	*Cumulative*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*22%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1*/mi
Analysis direction vol., V_d	*405*veh/h
Opposing direction vol., V_o	*580*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.3*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.979*	*0.993*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*450*	*635*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0* *mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6* *mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3* *mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.7* *mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*52.2* *mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*43.0* *mi/h*
		Percent free flow speed, PFFS	*82.5* *%*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*440*	*630*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*49.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*24.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*59.2*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.26*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1688*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*440.2*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.66*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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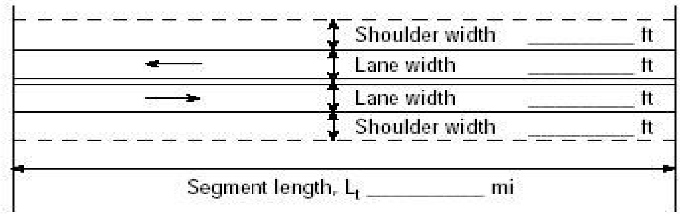
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of SR 113 EB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*AM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Analysis direction vol., V_d	*241*veh/h
Opposing direction vol., V_o	*232*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*
Peak-hour factor, PHF	*0.92*
No-passing zone	*13%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.973*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*269*	*259*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0* mi/h
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6* mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5* mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3* mi/h	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*51.9* mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*46.5* mi/h
		Percent free flow speed, PFFS	*89.7* %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*264*	*254*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*28.7*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*31.0*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*44.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.16*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*89.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*262.0*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.40*
Bicycle level of service (Exhibit 15-4)	*E*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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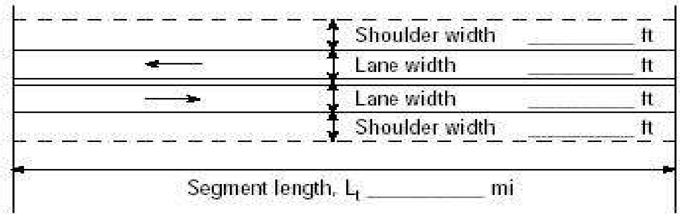
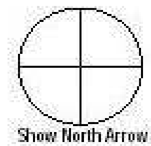
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of SR 113 WB*
Date Performed	*4/13/2018*	Jurisdiction	*Solano County*
Analysis Time Period	*AM*	Analysis Year	*Cumulative*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*220*veh/h
Opposing direction vol., V_o	*225*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*13%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.5*	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.966*	*0.966*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF* f_{g,ATS} * f_{HV,ATS})$	*248*	*253*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*51.9 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*46.7 mi/h*
		Percent free flow speed, PFFS	*90.0 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*241*	*246*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*26.8*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*31.3*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*42.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.15*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1642*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*90.0*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*239.1*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.35*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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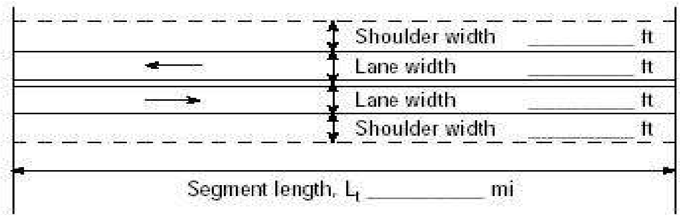
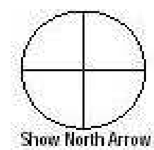
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		*Site Information*	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of SR 113 EB*
Date Performed	*4/13/2018*	Jurisdiction	*Solano County*
Analysis Time Period	*PM*	Analysis Year	*Cumulative*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*13%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Analysis direction vol., V_d	*175*veh/h
Opposing direction vol., V_o	*200*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.5*	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.966*	*0.966*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*197*	*225*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Total demand flow rate, both directions, *v*		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*51.9 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*47.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Percent free flow speed, PFFS	*91.2 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*192*	*219*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*21.6*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*31.0*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*36.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.12*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1642*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*91.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*190.2*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.23*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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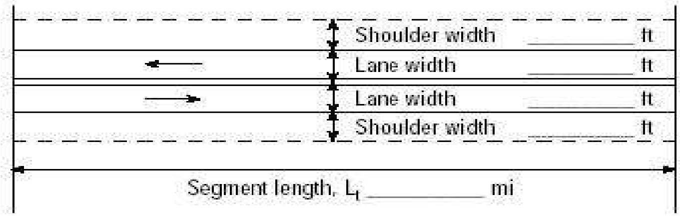
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	JF	Highway / Direction of Travel	Midway Rd
Agency or Company		From/To	west of SR 113 WB
Date Performed	4/13/2018	Jurisdiction	Solano County
Analysis Time Period	PM	Analysis Year	Cumulative

Project Description: *Recology Hay Rd Landfill*

Input Data



Analysis direction vol., V_d	200veh/h
Opposing direction vol., V_o	175veh/h
Shoulder width ft	3.0
Lane Width ft	12.0
Segment Length mi	2.0

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	0.92
No-passing zone	13%
% Trucks and Buses , P_T	7 %
% Recreational vehicles, P_R	0%
Access points *mi*	2/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.5	1.5
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.966	0.966
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	225	197

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	55.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	2.6 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.5 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.3 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	51.9 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	47.3 mi/h
		Percent free flow speed, PFFS	91.2 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.1	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.993	0.993
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	219	192
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	23.3	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	31.0	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	39.8	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, *v/c*	0.13

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1642*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*91.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*217.4*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.30*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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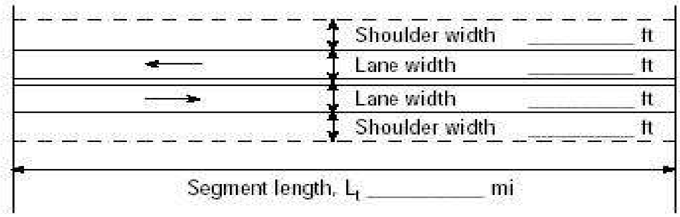
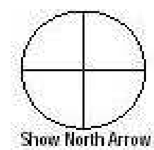
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		**Site Information**	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Midway Rd NB*
Date Performed	*4/13/2018*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM*	Analysis Year	*Cumulative*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*235*veh/h
Opposing direction vol., V_o	*330*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*12%*
% Trucks and Buses , P_T	*7 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.3*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.973*	*0.979*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*263*	*366*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.1 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*44.3 mi/h*
		Percent free flow speed, PFFS	*88.0 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*257*	*361*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*29.8*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*27.8*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*41.4*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.15*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1664*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*88.0*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*255.4*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.73*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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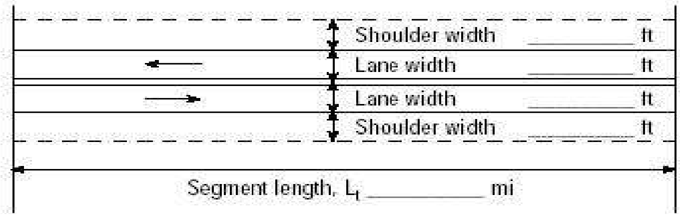
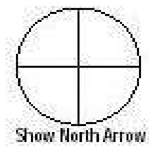
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		*Site Information*	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Midway Rd SB*
Date Performed	*4/13/2018*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM*	Analysis Year	*Cumulative*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Analysis direction vol., V_d	*330*veh/h
Opposing direction vol., V_o	*235*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*

Terrain	☐ Level ☐ Rolling
Grade Length	*0.25* mi
Up/down	*3.0*
Peak-hour factor, PHF	*0.92*
No-passing zone	*12%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.2*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.920*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.89*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*438*	*263*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(v/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*43.7 mi/h*
		Percent free flow speed, PFFS	*86.8 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.96*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*372*	*257*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*37.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*27.5*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*53.6*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.26*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1336*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1664*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*86.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*358.7*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.90*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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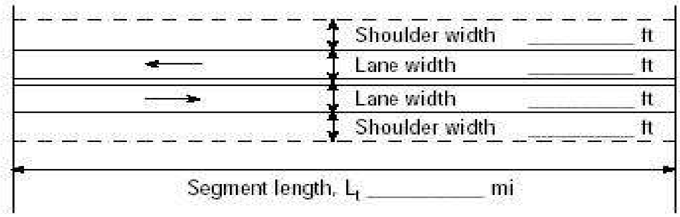
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

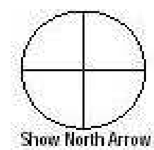
General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Midway Rd NB*
Date Performed	*4/13/2018*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM*	Analysis Year	*Cumulative*

Project Description: *Recology Hay Rd Landfill*

Input Data



Analysis direction vol., V_d *325*veh/h
Opposing direction vol., V_o *335*veh/h
Shoulder width ft *0.5*
Lane Width ft *12.0*
Segment Length mi *3.5*



☑ Class I highway ☐ Class II highway ☐ Class III highway
Terrain ☑ Level ☐ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF *0.92*
No-passing zone *12%*
% Trucks and Buses , P_T *7* %
% Recreational vehicles, P_R *0%*
Access points *mi* *2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.3*	*1.3*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.979*	*0.979*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*361*	*372*

Free-Flow Speed from Field Measurement	Estimated Free-Flow Speed	
	Base free-flow speed[4], BFFS	*55.0 mi/h*
	Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Mean speed of sample[3], S_{FM}	Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Total demand flow rate, both directions, *v*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)	Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*43.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15) *1.1 mi/h*	Percent free flow speed, PFFS	*86.5 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*356*	*367*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*39.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*27.4*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*52.8*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.21*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1664*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*86.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*353.3*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.89*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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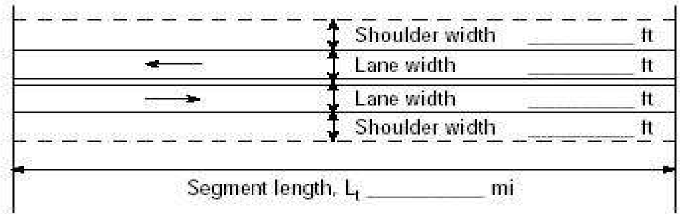
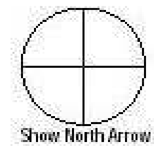
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Midway Rd SB*
Date Performed	*4/13/2018*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM*	Analysis Year	*Cumulative*

Project Description: *Recology Hay Rd Landfill*

Input Data





Analysis direction vol., V_d	*335*veh/h
Opposing direction vol., V_o	*325*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length	mi	Up/down
Peak-hour factor, PHF		*0.92*
No-passing zone		*12%*
% Trucks and Buses , P_T		*7 %*
% Recreational vehicles, P_R		*0%*
Access points *mi*		*2/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.3*	*1.3*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.979*	*0.979*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS} * f_{HV,ATS})$	*372*	*361*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.1 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*43.5 mi/h*
		Percent free flow speed, PFFS	*86.4 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}{}^* f_{g,PTSF})$	*367*	*356*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*39.2*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*27.4*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*53.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.22*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1664*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*86.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*364.1*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.91*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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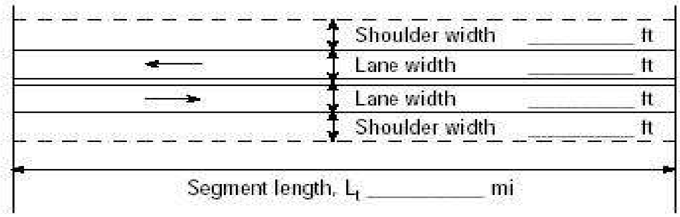
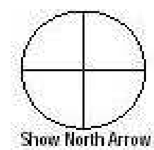
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*north of Hay Rd NB*
Date Performed	*4/13/2018*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM*	Analysis Year	*Cumulative*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*445*veh/h
Opposing direction vol., V_o	*285*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*12%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.2*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.986*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*491*	*318*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Total demand flow rate, both directions, *v*		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(v/ $f_{HV,ATS}$)		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*42.9 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.2 mi/h*	Percent free flow speed, PFFS	*85.2 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*484*	*312*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*46.2*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*22.1*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*59.6*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.29*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*85.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*483.7*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*6.05*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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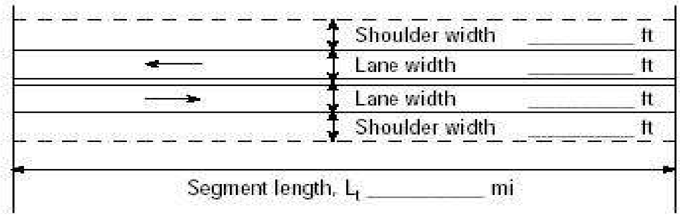
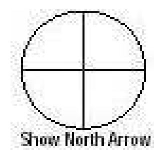
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*north of Hay Rd SB*
Date Performed	*4/13/2018*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM*	Analysis Year	*Cumulative*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*285*veh/h
Opposing direction vol., V_o	*445*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*12%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))$	*0.973*	*0.986*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*318*	*491*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.9 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*43.1 mi/h*
		Percent free flow speed, PFFS	*85.8 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*312*	*484*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*37.9*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*22.1*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF} / v_{d,PTSF} + v_{o,PTSF})$	*46.6*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.19*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1676*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*85.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*309.8*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.82*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

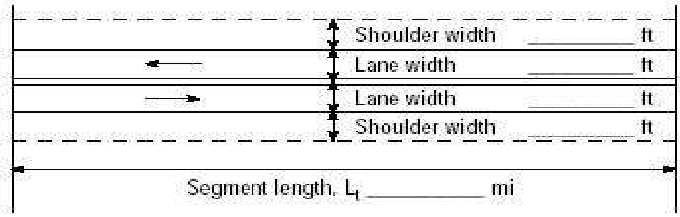
 HCS 2010™ Version 6.65 Generated: 4/16/2018 11:07 AM

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	JF	Highway / Direction of Travel	SR 113
Agency or Company		From/To	north of Hay Rd NB
Date Performed	4/13/2018	Jurisdiction	Caltrans
Analysis Time Period	PM	Analysis Year	Cumulative

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	460veh/h
Opposing direction vol., V_o	435veh/h
Shoulder width ft	0.5
Lane Width ft	12.0
Segment Length mi	3.5
Grade Length mi	Up/down
Peak-hour factor, PHF	0.92
No-passing zone	12%
% Trucks and Buses , P_T	7 %
% Recreational vehicles, P_R	0%
Access points *mi*	2/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.2	1.2
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))$	0.986	0.986
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i / (PHF^* f_{g,ATS} * f_{HV,ATS})$	507	480

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	55.0 mi/h
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	4.2 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/ f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.5 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	0.9 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	50.3 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS} + v_{o,ATS}) - f_{np,ATS}$	41.7 mi/h
		Percent free flow speed, PFFS	83.0 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}* f_{g,PTSF})$	500	473
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	51.1	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	23.4	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF} *(v_{d,PTSF} / v_{d,PTSF} + v_{o,PTSF})$	63.1	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	D
Volume to capacity ratio, *v/c*	0.30

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1676*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*83.0*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*500.0*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*6.07*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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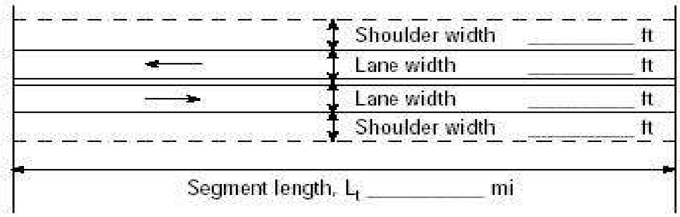
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*north of Hay Rd SB*
Date Performed	*4/13/2018*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM*	Analysis Year	*Cumulative*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*435*veh/h
Opposing direction vol., V_o	*460*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*12%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.2*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.986*	*0.986*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*480*	*507*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.8 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*41.8 mi/h*
		Percent free flow speed, PFFS	*83.1 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*473*	*500*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*49.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*23.4*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*60.4*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.28*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1676*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*83.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*472.8*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*6.04*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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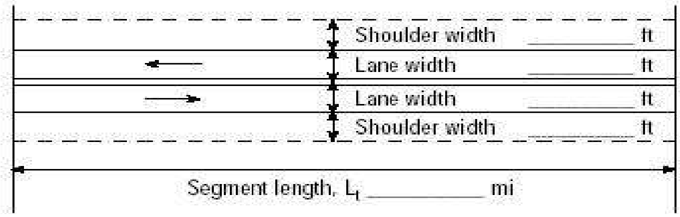
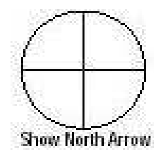
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Hay Rd NB*
Date Performed	*4/13/2018*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM*	Analysis Year	*Cumulative*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*450*veh/h
Opposing direction vol., V_o	*255*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*8.5*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*18%*
% Trucks and Buses , P_T	*7 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.2*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.986*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*496*	*285*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Total demand flow rate, both directions, *v*		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*43.1 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.2 mi/h*	Percent free flow speed, PFFS	*85.6 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*1.000*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*489*	*279*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*46.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.2*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*63.0*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.29*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*85.6*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*489.1*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*6.06*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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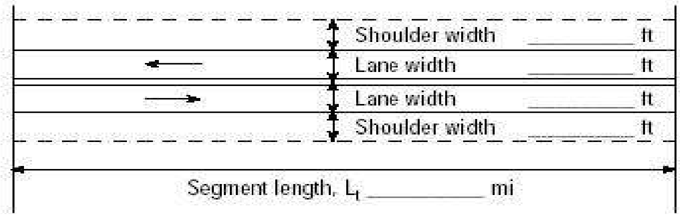
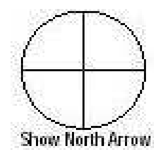
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Hay Rd SB*
Date Performed	*4/13/2018*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM*	Analysis Year	*Cumulative*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF	*0.92*
No-passing zone	*18%*
% Trucks and Buses , P_T	*7 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2/mi*
Analysis direction vol., V_d	*255*veh/h
Opposing direction vol., V_o	*450*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*8.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/\ (1+P_T(E_T-1)+P_R(E_R-1))$	*0.973*	*0.986*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i\ /\ (PHF^*\ f_{g,ATS}\ ^*\ f_{HV,ATS})$	*285*	*496*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/\ f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.9 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*43.4 mi/h*
		Percent free flow speed, PFFS	*86.2 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/\ (1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}{}^*\ f_{g,PTSF})$	*279*	*489*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*34.7*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.2*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}{}^*(v_{d,PTSF}\ /\ v_{d,PTSF}+v_{o,PTSF})$	*44.2*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.17*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1676*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*86.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*277.2*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.77*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

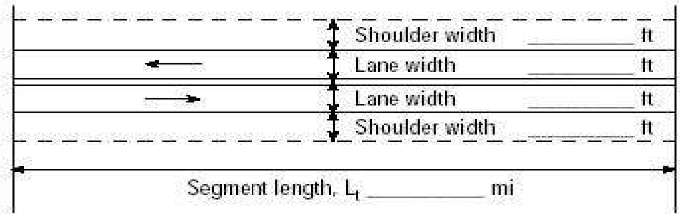
1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

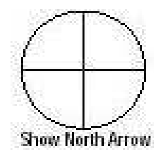
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Hay Rd NB*
Date Performed	*4/13/2018*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM*	Analysis Year	*Cumulative*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*18%*
% Trucks and Buses , P_T	*7 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2/mi*

Analysis direction vol., V_d	*405*veh/h
Opposing direction vol., V_o	*475*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*8.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.3*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.979*	*0.986*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS} * f_{HV,ATS})$	*450*	*524*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/ f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.8 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*41.9 mi/h*
		Percent free flow speed, PFFS	*83.4 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}{}^* f_{g,PTSF})$	*440*	*516*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*47.2*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*27.0*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}{}^*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*59.6*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.26*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1676*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*83.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*440.2*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*6.00*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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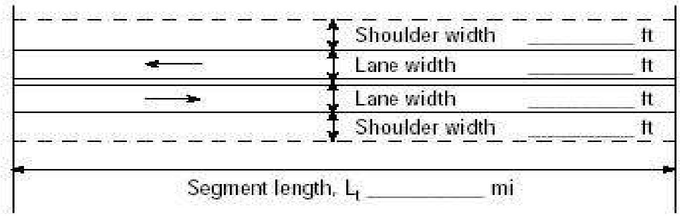
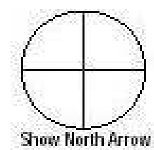
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Hay Rd SB*
Date Performed	*4/13/2018*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM*	Analysis Year	*Cumulative*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*475*veh/h
Opposing direction vol., V_o	*405*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*8.5*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*18%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.2*	*1.3*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.986*	*0.979*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*524*	*450*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Total demand flow rate, both directions, *v*		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*41.8 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.0 mi/h*	Percent free flow speed, PFFS	*83.0 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*516*	*440*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*51.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*27.0*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*65.7*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.31*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1664*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*83.0*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*516.3*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*6.08*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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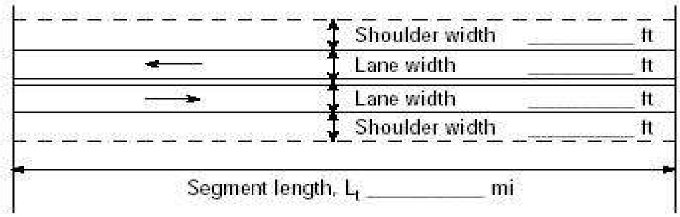
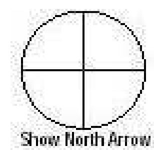
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Hay Rd*
Agency or Company		From/To	*west of SR 113 EB*
Date Performed	*4/13/2018*	Jurisdiction	*Solano County*
Analysis Time Period	*AM*	Analysis Year	*Cumulative*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*45*veh/h
Opposing direction vol., V_o	*80*veh/h
Shoulder width ft	*1.0*
Lane Width ft	*12.0*
Segment Length mi	*0.7*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*20%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.941*	*0.941*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*52*	*92*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.2 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*50.5 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*49.2 mi/h*
		Percent free flow speed, PFFS	*97.3 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*49*	*88*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*6.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*29.6*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*16.6*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.03*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1600*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*97.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*48.9*
Effective width, Wv (Eq. 15-29) ft	*23.08*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.01*
Bicycle level of service (Exhibit 15-4)	*C*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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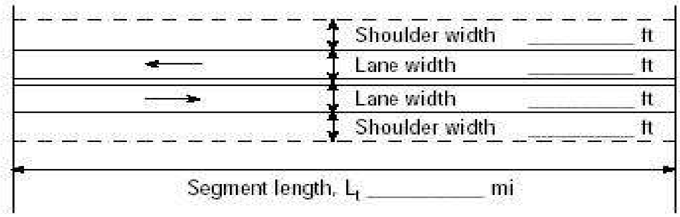
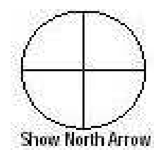
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Hay Rd*
Agency or Company		From/To	*west of SR 113 WB*
Date Performed	*4/13/2018*	Jurisdiction	*Solano County*
Analysis Time Period	*AM*	Analysis Year	*Cumulative*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*80*veh/h
Opposing direction vol., V_o	*45*veh/h
Shoulder width ft	*1.0*
Lane Width ft	*12.0*
Segment Length mi	*0.7*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*20%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.941*	*0.941*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*92*	*52*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.5 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*49.2 mi/h*
		Percent free flow speed, PFFS	*97.3 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*88*	*49*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*10.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*29.6*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*29.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.05*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1600*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*97.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*87.0*
Effective width, Wv (Eq. 15-29) ft	*20.80*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.80*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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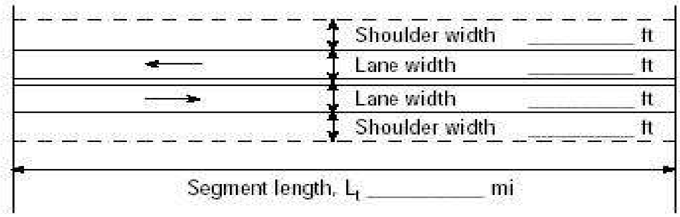
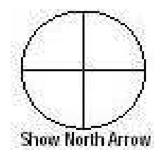
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	JF	Highway / Direction of Travel	Hay Rd
Agency or Company		From/To	west of SR 113 EB
Date Performed	4/13/2018	Jurisdiction	Solano County
Analysis Time Period	PM	Analysis Year	Cumulative

Project Description: Recology Hay Rd Landfill

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	120veh/h
Opposing direction vol., V_o	25veh/h
Shoulder width ft	1.0
Lane Width ft	12.0
Segment Length mi	0.7
Grade Length mi	Up/down
Peak-hour factor, PHF	0.92
No-passing zone	20%
% Trucks and Buses , P_T	7 %
% Recreational vehicles, P_R	0%
Access points *mi*	1/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.8	1.9
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.947	0.941
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS} * f_{HV,ATS})$	138	29

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	55.0 mi/h
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	4.2 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	0.2 mi/h	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	50.5 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	49.0 mi/h
		Percent free flow speed, PFFS	97.0 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.1	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.993	0.993
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}^* f_{g,PTSF})$	131	27
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	14.9	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	26.3	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	36.7	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, *v/c*	0.08

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1600*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*97.0*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*130.4*
Effective width, Wv (Eq. 15-29) ft	*18.20*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*4.51*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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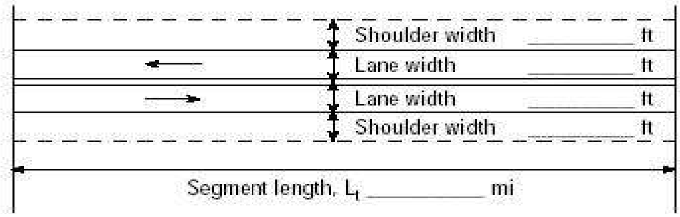
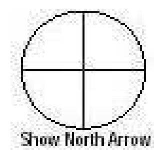
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Hay Rd*
Agency or Company		From/To	*west of SR 113 WB*
Date Performed	*4/13/2018*	Jurisdiction	*Solano County*
Analysis Time Period	*PM*	Analysis Year	*Cumulative*

Project Description: *Recology Hay Rd Landfill*

Input Data





☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☐ Rolling

Analysis direction vol., V_d	*25*veh/h
Opposing direction vol., V_o	*120*veh/h
Shoulder width ft	*1.0*
Lane Width ft	*12.0*
Segment Length mi	*0.7*
Grade Length	*0.25* mi
Up/down	*3.0*
Peak-hour factor, PHF	*0.92*
No-passing zone	*20%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.6*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.899*	*0.947*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.78*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*39*	*138*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.6 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.5 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*48.6 mi/h*
		Percent free flow speed, PFFS	*96.1 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*1.000*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*27*	*131*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*3.4*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.3*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*7.9*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.02*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1228*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1695*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*96.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*27.2*
Effective width, Wv (Eq. 15-29) ft	*24.38*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.40*
Bicycle level of service (Exhibit 15-4)	*B*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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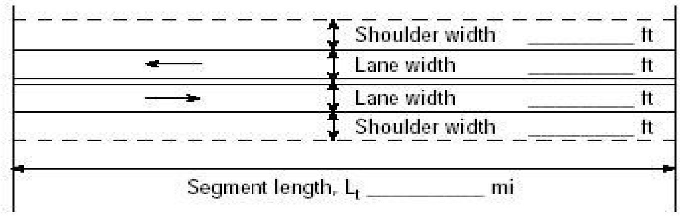
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of Porter Rd EB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*AM*	Analysis Year	*Cumulative + Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Analysis direction vol., V_d	*261*veh/h
Opposing direction vol., V_o	*397*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*
Peak-hour factor, PHF	*0.92*
No-passing zone	*22%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.3*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.973*	*0.979*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS} * f_{HV,ATS})$	*292*	*441*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0* *mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6* *mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3* *mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.1* *mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*52.2* *mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*45.3* *mi/h*
		Percent free flow speed, PFFS	*86.9* *%*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}{}^* f_{g,PTSF})$	*286*	*432*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*34.6*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*32.2*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}{}^*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*47.4*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.17*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1664*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*86.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*283.7*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.44*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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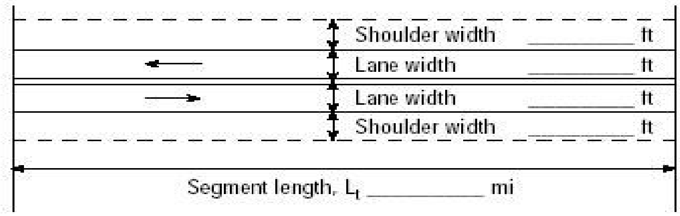
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of Porter Rd WB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*AM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



Analysis direction vol., V_d	*397*veh/h
Opposing direction vol., V_o	*261*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*22%*
% Trucks and Buses , P_T	*7 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.3*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.979*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*441*	*292*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(v/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*52.2 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*45.1 mi/h*
		Percent free flow speed, PFFS	*86.5 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*432*	*286*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*42.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*32.2*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF} / v_{d,PTSF} + v_{o,PTSF})$	*61.4*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.26*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1439*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*86.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*431.5*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.65*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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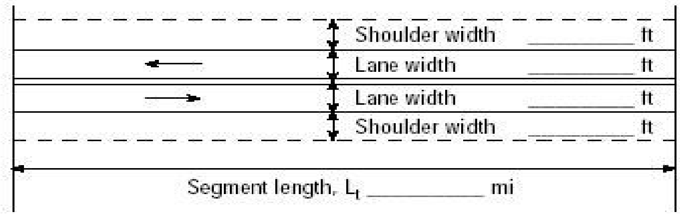
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of Porter Rd EB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*PM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*580*veh/h
Opposing direction vol., V_o	*417*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*22%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.1*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.986*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*635*	*460*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0* *mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6* *mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(v/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3* *mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.1* *mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*52.2* *mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*42.6* *mi/h*
		Percent free flow speed, PFFS	*81.6* *%*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*630*	*453*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*58.4*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*24.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*72.9*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.37*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1676*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*81.6*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*630.4*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.84*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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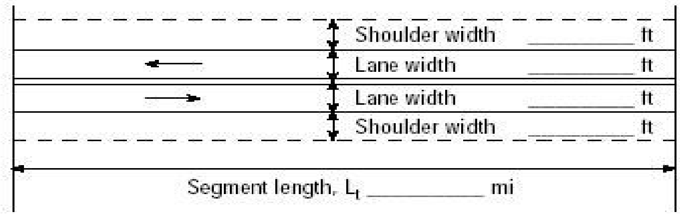
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of Porter Rd WB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*PM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



Analysis direction vol., V_d	*417*veh/h
Opposing direction vol., V_o	*580*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*22%*
% Trucks and Buses , P_T	*7 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.2*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.986*	*0.993*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*460*	*635*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(v/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.7 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*52.2 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*42.9 mi/h*
		Percent free flow speed, PFFS	*82.4 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*453*	*630*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*49.8*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*24.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF} / v_{d,PTSF} + v_{o,PTSF})$	*60.2*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.27*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1688*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*453.3*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.67*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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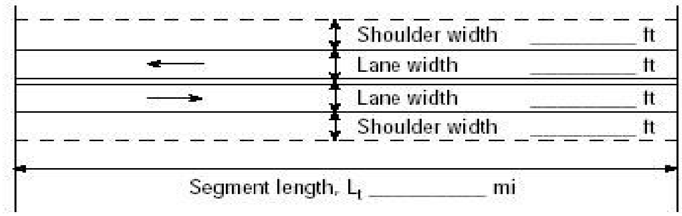
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of SR 113 EB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*AM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



Analysis direction vol., V_d	*241*veh/h
Opposing direction vol., V_o	*232*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*13%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.973*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*269*	*259*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0* *mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6* *mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5* *mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3* *mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*51.9* *mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*46.5* *mi/h*
		Percent free flow speed, PFFS	*89.7* *%*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*264*	*254*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*28.7*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*31.0*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*44.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.16*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*89.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*262.0*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.40*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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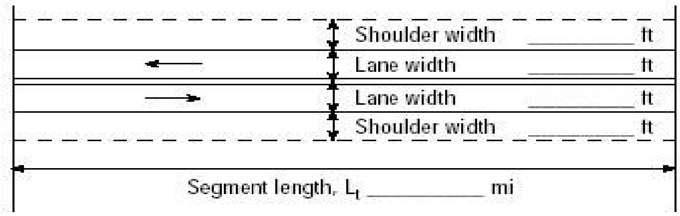
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of SR 113 WB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*AM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



Analysis direction vol., V_d	*232*veh/h	☑ Class I highway ☐ Class II highway ☐ Class III highway	
Opposing direction vol., V_o	*241*veh/h	Terrain ☑ Level ☐ Rolling	
Shoulder width ft	*3.0*	Grade Length mi	Up/down
Lane Width ft	*12.0*	Peak-hour factor, PHF	*0.92*
Segment Length mi	*2.0*	No-passing zone	*13%*
		% Trucks and Buses , P_T	*7* %
		% Recreational vehicles, P_R	*0%*
		Access points *mi*	*2/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.973*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*259*	*269*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*51.9 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*46.5 mi/h*
		Percent free flow speed, PFFS	*89.7 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*254*	*264*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*28.8*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*31.0*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*44.0*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.15*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*89.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*252.2*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.38*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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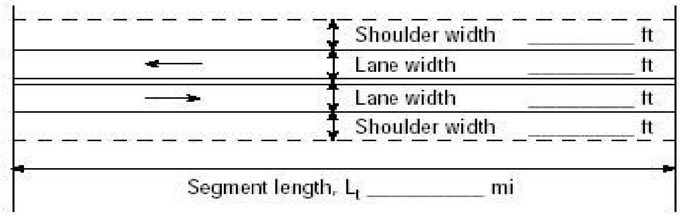
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of SR 113 EB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*PM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*175*veh/h
Opposing direction vol., V_o	*212*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*13%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.5*	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.966*	*0.966*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*197*	*239*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0* mi/h
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6* mi/h
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5* mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3* mi/h	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*51.9* mi/h
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*47.2* mi/h
		Percent free flow speed, PFFS	*91.0* %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*192*	*232*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*21.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*30.4*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF} / v_{d,PTSF} + v_{o,PTSF})$	*35.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.12*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1642*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*91.0*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*190.2*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.23*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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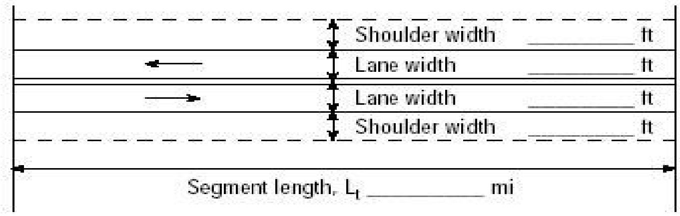
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway / Direction of Travel	*Midway Rd*
Agency or Company		From/To	*west of SR 113 WB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*PM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*212*veh/h
Opposing direction vol., V_o	*175*veh/h
Shoulder width ft	*3.0*
Lane Width ft	*12.0*
Segment Length mi	*2.0*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*13%*
% Trucks and Buses, P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.5*	*1.5*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.966*	*0.966*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS} * f_{HV,ATS})$	*239*	*197*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*51.9 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*47.2 mi/h*
		Percent free flow speed, PFFS	*91.0 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}{}^* f_{g,PTSF})$	*232*	*192*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*24.5*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*30.4*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF} * (v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*41.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.14*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1642*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*91.0*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*230.4*
Effective width, Wv (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.33*
Bicycle level of service (Exhibit 15-4)	*E*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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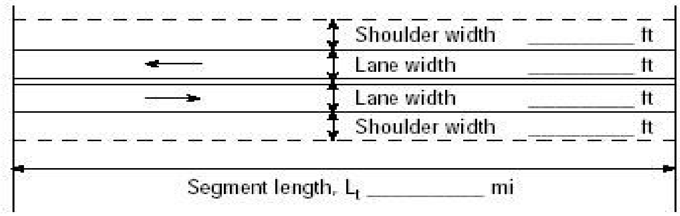
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Midway Rd NB*
Date Performed	*10/8/18*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*248*veh/h
Opposing direction vol., V_o	*348*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*12%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.3*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/\ (1+ P_T (E_T -1)+P_R (E_R -1))$	*0.973*	*0.979*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*277*	*386*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.1 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*44.0 mi/h*
		Percent free flow speed, PFFS	*87.5 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/\ (1+ P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*271*	*381*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*31.6*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF} / v_{d,PTSF} + v_{o,PTSF})$	*42.8*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.16*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1664*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*87.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*269.6*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.75*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If $v_i(v_d$ or $v_o)$ >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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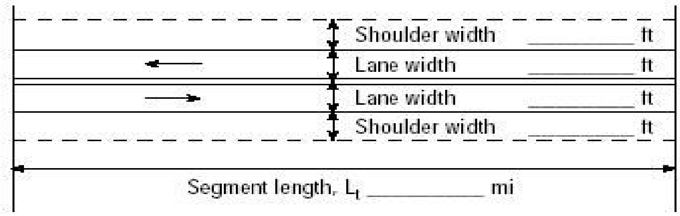
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Midway Rd SB*
Date Performed	*10/8/18*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*348*veh/h	
Opposing direction vol., V_o	*248*veh/h	
Shoulder width ft	*0.5*	
Lane Width ft	*12.0*	
Segment Length mi	*3.5*	
Grade Length mi	Up/down	
Peak-hour factor, PHF	*0.92*	
No-passing zone	*12%*	
% Trucks and Buses , P_T	*7* %	
% Recreational vehicles, P_R	*0%*	
Access points *mi*	*2*/mi	

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.3*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.979*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS} * f_{HV,ATS})$	*386*	*277*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*44.0 mi/h*
		Percent free flow speed, PFFS	*87.4 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}^* f_{g,PTSF})$	*381*	*271*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*39.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*54.8*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.23*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*87.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*378.3*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.93*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If $v_i(v_d$ or $v_o)$ >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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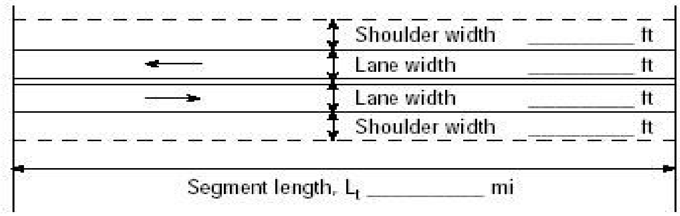
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Midway Rd NB*
Date Performed	*10/8/18*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*339*veh/h
Opposing direction vol., V_o	*336*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*12%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.3*	*1.3*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.979*	*0.979*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*376*	*373*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.1 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*43.4 mi/h*
		Percent free flow speed, PFFS	*86.2 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*371*	*368*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*40.4*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*27.3*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*54.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.22*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1664*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*86.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*368.5*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.91*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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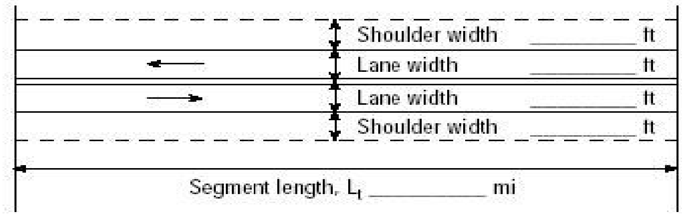
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Midway Rd SB*
Date Performed	*10/8/18*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*12%*
% Trucks and Buses , P_T	*7 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Analysis direction vol., V_d	*336*veh/h
Opposing direction vol., V_o	*339*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.3*	*1.3*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.979*	*0.979*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*373*	*376*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.1 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*43.4 mi/h*
		Percent free flow speed, PFFS	*86.2 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*368*	*371*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*40.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*27.3*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*53.6*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.22*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1664*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*86.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*365.2*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.91*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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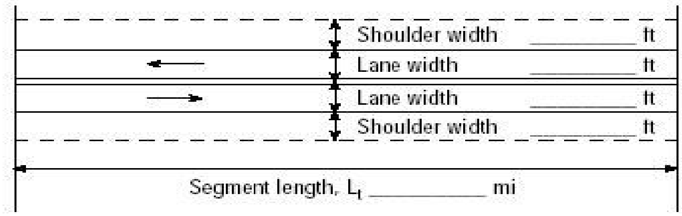
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*north of Hay Rd NB*
Date Performed	*10/8/18*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*458*veh/h
Opposing direction vol., V_o	*303*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*12%*
% Trucks and Buses , P_T	*7 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.2*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.986*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^*\ f_{g,ATS}\ ^*\ f_{HV,ATS})$	*505*	*338*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.1 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*50.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*42.6 mi/h*
		Percent free flow speed, PFFS	*84.7 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}\ ^*\ f_{g,PTSF})$	*498*	*332*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*47.9*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*22.0*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}\ ^*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*61.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.30*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*84.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*497.8*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*6.07*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	
1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain. 2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F. 3. For the analysis direction only and for v>200 veh/h. 4. For the analysis direction only 5. Exhibit 15-20 provides coefficients a and b for Equation 15-10. 6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.	

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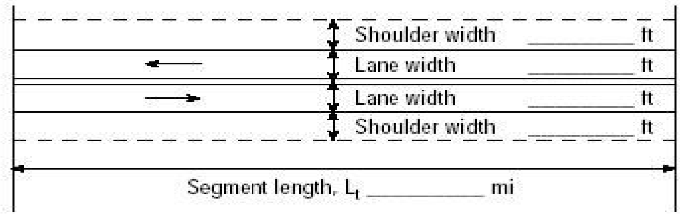
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*north of Hay Rd SB*
Date Performed	*10/8/18*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*12%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Analysis direction vol., V_d	*303*veh/h
Opposing direction vol., V_o	*458*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.973*	*0.986*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*338*	*505*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
		Base free-flow speed[4], BFFS	*55.0* mi/h
		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2* mi/h
Mean speed of sample[3], S_{FM}		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5* mi/h
Total demand flow rate, both directions, *v*		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3* mi/h
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*42.9* mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.9* mi/h	Percent free flow speed, PFFS	*85.3* %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*332*	*498*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*38.9*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*22.0*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*47.7*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.20*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1676*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*85.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*329.3*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.86*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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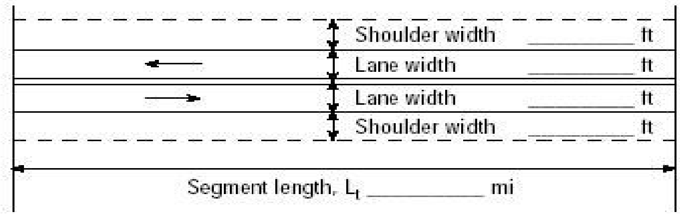
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		**Site Information**	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*north of Hay Rd NB*
Date Performed	*10/8/18*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*12%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Analysis direction vol., V_d	*474*veh/h
Opposing direction vol., V_o	*436*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.2*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T-1)+P_R (E_R -1))	*0.986*	*0.986*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*523*	*481*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0* *mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2* *mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5* *mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.9* *mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3* *mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*41.6* *mi/h*
		Percent free flow speed, PFFS	*82.7* *%*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*515*	*474*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*51.8*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*22.9*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*63.7*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.31*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1676*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*515.2*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*6.08*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

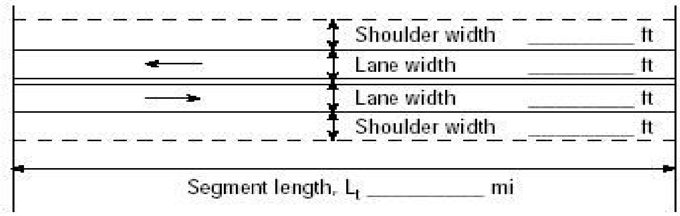
1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*north of Hay Rd SB*
Date Performed	*10/8/18*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*436*veh/h
Opposing direction vol., V_o	*474*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*3.5*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*12%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.2*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.986*	*0.986*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*481*	*523*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.8 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*50.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*41.7 mi/h*
		Percent free flow speed, PFFS	*82.9 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*474*	*515*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*49.7*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*22.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*60.7*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.28*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1676*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*473.9*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*6.04*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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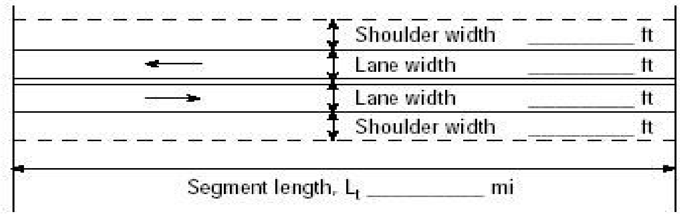
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Hay Rd NB*
Date Performed	*10/8/18*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*18%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Analysis direction vol., V_d	*452*veh/h
Opposing direction vol., V_o	*257*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*8.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.2*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.986*	*0.973*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*498*	*287*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(v/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*43.0 mi/h*
		Percent free flow speed, PFFS	*85.6 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*491*	*281*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*46.4*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.1*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*63.0*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.29*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1654*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*85.6*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*491.3*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*6.06*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

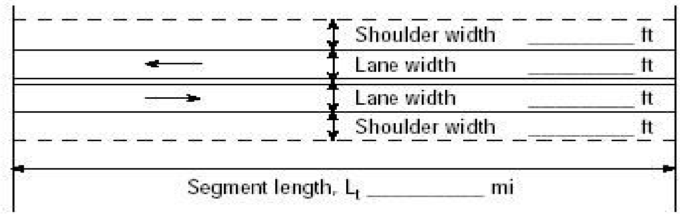
1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Hay Rd SB*
Date Performed	*10/8/18*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*257*veh/h
Opposing direction vol., V_o	*452*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*8.5*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*18%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T -1)+P_R (E_R -1))	*0.973*	*0.986*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*287*	*498*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Total demand flow rate, both directions, *v*		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(v/ $f_{HV,ATS}$)		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*43.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.9 mi/h*	Percent free flow speed, PFFS	*86.2 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*281*	*491*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*34.9*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.1*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*44.4*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.17*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1676*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*86.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*279.3*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.77*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	

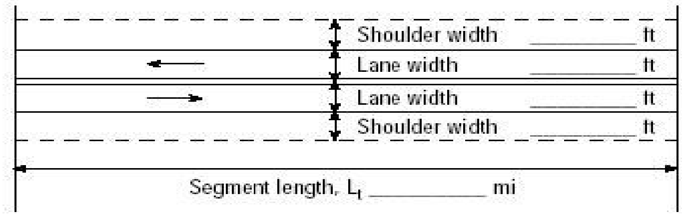
1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If $v_i(v_d$ or $v_o)$ >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Hay Rd NB*
Date Performed	*10/8/18*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*18%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*2*/mi

Analysis direction vol., V_d	*405*veh/h
Opposing direction vol., V_o	*479*veh/h
Shoulder width ft	*0.5*
Lane Width ft	*12.0*
Segment Length mi	*8.5*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.3*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.979*	*0.986*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS} * f_{HV,ATS})$	*450*	*528*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0* mi/h
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2* mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5* mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.8* mi/h	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3* mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*41.9* mi/h
		Percent free flow speed, PFFS	*83.3* %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}{}^* f_{g,PTSF})$	*440*	*521*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*48.2*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}{}^*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*60.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.26*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1676*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*83.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*440.2*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*6.00*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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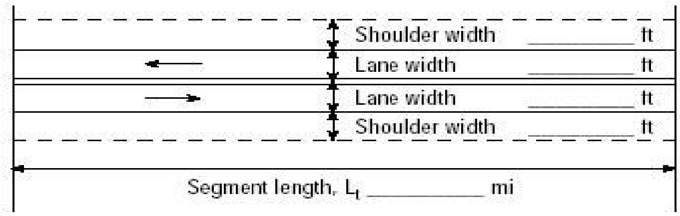
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway / Direction of Travel	*SR 113*
Agency or Company		From/To	*south of Hay Rd SB*
Date Performed	*10/8/18*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*479*veh/h	
Opposing direction vol., V_o	*405*veh/h	
Shoulder width ft	*0.5*	
Lane Width ft	*12.0*	
Segment Length mi	*8.5*	
Grade Length mi	Up/down	
Peak-hour factor, PHF	*0.92*	
No-passing zone	*18%*	
% Trucks and Buses , P_T	*7* %	
% Recreational vehicles, P_R	*0%*	
Access points *mi*	*2*/mi	

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.2*	*1.3*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.986*	*0.979*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i / (PHF^* f_{g,ATS} * f_{HV,ATS})$	*528*	*450*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*55.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/ f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*0.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.0 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS} + v_{o,ATS}) - f_{np,ATS}$	*41.7 mi/h*
		Percent free flow speed, PFFS	*82.9 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}* f_{g,PTSF})$	*521*	*440*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*51.4*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*26.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF} *(v_{d,PTSF} / v_{d,PTSF} + v_{o,PTSF})$	*66.0*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.31*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1664*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*520.7*
Effective width, Wv (Eq. 15-29) ft	*12.50*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*6.09*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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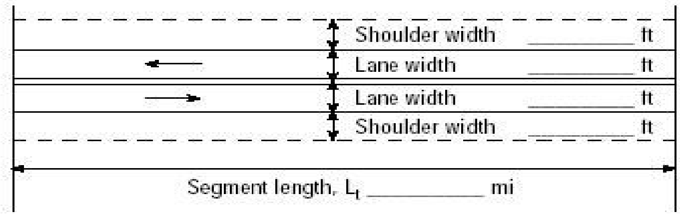
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway / Direction of Travel	*Hay Rd*
Agency or Company		From/To	*west of SR 113 EB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*AM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*20%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1*/mi

Analysis direction vol., V_d	*60*veh/h
Opposing direction vol., V_o	*101*veh/h
Shoulder width ft	*1.0*
Lane Width ft	*12.0*
Segment Length mi	*0.7*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}$=1/ (1+ P_T (E_T-1)+P_R (E_R-1))	*0.941*	*0.941*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) v_i=V_i / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*69*	*117*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Total demand flow rate, both directions, *v*		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.5 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*48.7 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.4 mi/h*	Percent free flow speed, PFFS	*96.3 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) v_i=V_i/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*66*	*111*
Base percent time-spent-following[4], $BPTSF_d$(%)=100(1-$e^{av_d^b}$)	*7.9*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*29.9*	
Percent time-spent-following, $PTSF_d$(%)=$BPTSF_d$+$f_{np,PTSF}$ *($v_{d,PTSF}$ / $v_{d,PTSF}$ + $v_{o,PTSF}$)	*19.0*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.04*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1600*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*96.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*65.2*
Effective width, Wv (Eq. 15-29) ft	*22.10*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.37*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

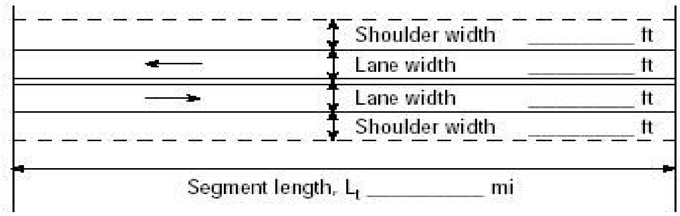
1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If $v_i(v_d$ or $v_o)$ >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Hay Rd*
Agency or Company		From/To	*west of SR 113 WB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*AM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*20%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1*/mi
Analysis direction vol., V_d	*101*veh/h
Opposing direction vol., V_o	*60*veh/h
Shoulder width ft	*1.0*
Lane Width ft	*12.0*
Segment Length mi	*0.7*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.941*	*0.941*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS} * f_{HV,ATS})$	*117*	*69*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Total demand flow rate, both directions, *v*		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.5 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(v/ $f_{HV,ATS}$)		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*48.9 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.2 mi/h*	Percent free flow speed, PFFS	*96.7 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}{}^* f_{g,PTSF})$	*111*	*66*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*12.8*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*29.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF} *(v_{d,PTSF} / v_{d,PTSF} + v_{o,PTSF})$	*31.6*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.07*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1600*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*96.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*109.8*
Effective width, Wv (Eq. 15-29) ft	*19.43*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*4.19*
Bicycle level of service (Exhibit 15-4)	*D*
Notes	
1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain. 2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F. 3. For the analysis direction only and for v>200 veh/h. 4. For the analysis direction only 5. Exhibit 15-20 provides coefficients a and b for Equation 15-10. 6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.	

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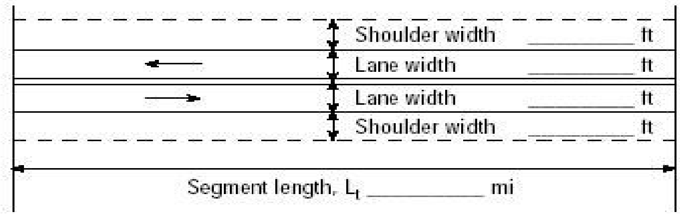
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway / Direction of Travel	*Hay Rd*
Agency or Company		From/To	*west of SR 113 EB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*PM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*138*veh/h
Opposing direction vol., V_o	*26*veh/h
Shoulder width ft	*1.0*
Lane Width ft	*12.0*
Segment Length mi	*0.7*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*20%*
% Trucks and Buses , P_T	*7* %
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.7*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.953*	*0.941*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF^* f_{g,ATS} * f_{HV,ATS})$	*157*	*30*

Free-Flow Speed from Field Measurement

Mean speed of sample[3], S_{FM}	
Total demand flow rate, both directions, *v*	
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$	
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.2 mi/h*

Estimated Free-Flow Speed

Base free-flow speed[4], BFFS	*55.0 mi/h*
Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.5 mi/h*
Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*48.9 mi/h*
Percent free flow speed, PFFS	*96.7 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF^*f_{HV,PTSF}{}^* f_{g,PTSF})$	*151*	*28*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*16.9*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*25.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}{}^*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*38.7*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.09*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1600*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*96.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*150.0*
Effective width, Wv (Eq. 15-29) ft	*17.03*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*4.79*
Bicycle level of service (Exhibit 15-4)	*E*

Notes

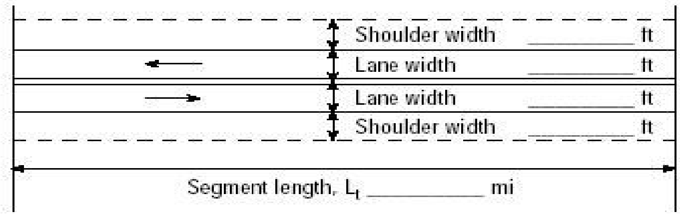
1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway / Direction of Travel	*Hay Rd*
Agency or Company		From/To	*west of SR 113 WB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*PM*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Analysis direction vol., V_d	*26*veh/h
Opposing direction vol., V_o	*138*veh/h
Shoulder width ft	*1.0*
Lane Width ft	*12.0*
Segment Length mi	*0.7*
Grade Length mi	Up/down
Peak-hour factor, PHF	*0.92*
No-passing zone	*20%*
% Trucks and Buses , P_T	*7 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*1/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.941*	*0.953*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i$ / (PHF* $f_{g,ATS}$ * $f_{HV,ATS}$)	*30*	*157*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
		Base free-flow speed[4], BFFS	*55.0 mi/h*
		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*4.2 mi/h*
Mean speed of sample[3], S_{FM}		Adj. for access points[4], f_A (Exhibit 15-8)	*0.3 mi/h*
Total demand flow rate, both directions, *v*		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*50.5 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*48.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.8 mi/h*	Percent free flow speed, PFFS	*95.5 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.993*	*0.993*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i$/(PHF*$f_{HV,PTSF}$* $f_{g,PTSF}$)	*28*	*151*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*3.5*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*25.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*7.6*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.02*

Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1620*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1688*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*95.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*28.3*
Effective width, Wv (Eq. 15-29) ft	*24.31*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.43*
Bicycle level of service (Exhibit 15-4)	*B*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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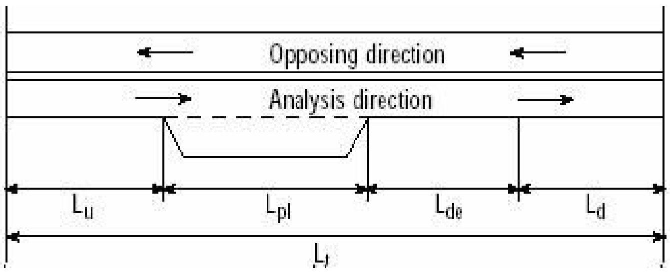
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET WITH PASSING LANE WORKSHEET

General Information		Site Information	
Analyst	*JF*	Highway of Travel	*Midway Rd*
Agency or Company		From/To	*west of Porter Rd EB*
Date Performed	*4/13/2018*	Jurisdiction	*Solano County*
Analysis Time Period	*PM - MITIG8 - ADD PASSING LANE*	Analysis Year	*Cumulative*

Project Description: *Recology Hay Rd Landfill*

Input Data

☑ Class I highway ☐ Class II highway ☐ Class III highway



Shoulder width (ft)	3.0
Lane Width (ft)	12.0
Segment Length (mi)	2.0
Total length of analysis segment, L_t	2.0
Length of two-lane highway upstream of the passing lane, L_u	0.5
Length of passing lane including tapers , L_{pl}	0.3
Average travel speed, ATS_d (from Directional Two-Lane Highway Segment Worksheet)	42.6
Percent time-spent-following, $PTSF_d$ (from Directional Two-Lane Highway Segment Worksheet)	72.3
Level of service[1], LOS_d (from Directional Two-Lane Highway Segment Worksheet)	D
Average Travel Speed	
Length of the downstream highway segment within the effective length of passing lane for average travel speed, L_{de} (Exhibit 15-23)	1.70
Length of two-lane highway downstream of effective length of the passing lane for avg travel speed, L_d $L_d=L_t-(L_u+L_{pl}+L_{de})$	-0.50
Adj. factor for the effect of passing lane on average speed, f_{pl} (Exhibit 15-28)	1.11
Average travel speed including passing lane[2], $ATS_{pl} = (ATS_d * L_t) / (L_u+L_d+(L_{pl}/f_{pl})+ (2L_{de}/(1+f_{pl,ATS})))$	45.1
Percent free flow speed including passing lane, $PFFS_{pl} = (ATS_{pl}/ FFS)$	86.4
Percent Time-Spent-Following	
Length of the downstream highway segment within the effective length of passing lane for percent time-spent-following, L_{de} (Exhibit 15-23)	6.26
Length of two-lane highway downstream of effective length of the passing lane for percent-time-following, $L_d =L_t-(L_u+ L_{pl}+ L_{de})$	-5.06
Adj. factor for the effect of passing lane on percent time-spent-following, $f_{pl,PTSF}$(Exhibit 15-26)	0.61

Percent time-spent-following including passing lane[3], $PTSF_{pl}$(%) $PTSF_{pl} = PTSF_d[L_u + L_d + f_{pl,PTSF} L_{pl} + ((1+f_{pl,PTSF})/2) L_{de}]/L_t$	*52.8*
Level of Service and Other Performance Measures[4]	
Level of service including passing lane LOS_{pl} (Exhibit 15-3)	*C*
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15} = VMT_{15}/ATS_{pl}$	*7.0*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*630.4*
Effective width, W_v (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.84*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	
1. If LOS_d=F, passing lane analysis cannot be performed. 2. If L_d <0, use alternative Equation 15-18. 3. If L_d<0, use alternative Equation 15-16. 4. v/c, VMT_{15} and VMT_{60} are calculated on Directional Two-Lane Highway Segment Worksheet.	

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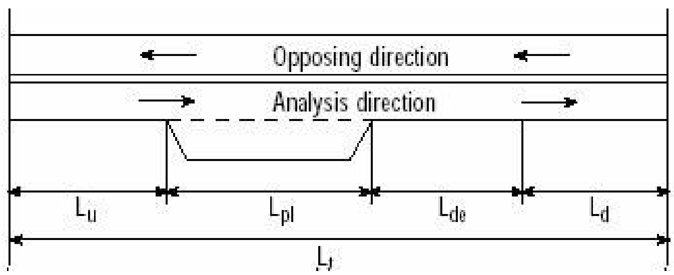
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET WITH PASSING LANE WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway of Travel	*Midway Rd*
Agency or Company		From/To	*west of Porter Rd WB*
Date Performed	*10/8/18*	Jurisdiction	*Solano County*
Analysis Time Period	*PM - MITIG8*	Analysis Year	*Cumulative*

Project Description: *Recology Hay Rd Landfill*

Input Data

☑ Class I highway ☐ Class II highway ☐ Class III highway



Shoulder width (ft)	*3.0*
Lane Width (ft)	*12.0*
Segment Length (mi)	*2.0*
Total length of analysis segment, L_t	*2.0*
Length of two-lane highway upstream of the passing lane, L_u	*0.5*
Length of passing lane including tapers , L_{pl}	*0.3*
Average travel speed, ATS_d (from Directional Two-Lane Highway Segment Worksheet)	*43.0*
Percent time-spent-following, $PTSF_d$ (from Directional Two-Lane Highway Segment Worksheet)	*59.2*
Level of service[1], LOS_d (from Directional Two-Lane Highway Segment Worksheet)	*D*
Average Travel Speed	
Length of the downstream highway segment within the effective length of passing lane for average travel speed, L_{de} (Exhibit 15-23)	*1.70*
Length of two-lane highway downstream of effective length of the passing lane for avg travel speed, L_d $L_d=L_t-(L_u+L_{pl}+L_{de})$	*-0.50*
Adj. factor for the effect of passing lane on average speed, f_{pl} (Exhibit 15-28)	*1.10*
Average travel speed including passing lane[2], $ATS_{pl} = (ATS_d * L_t) / (L_u+L_d+(L_{pl}/f_{pl}) + (2L_{de}/(1+f_{pl,ATS})))$	*45.3*
Percent free flow speed including passing lane, $PFFS_{pl} = (ATS_{pl}/ FFS)$	*86.9*
Percent Time-Spent-Following	
Length of the downstream highway segment within the effective length of passing lane for percent time-spent-following, L_{de} (Exhibit 15-23)	*7.78*
Length of two-lane highway downstream of effective length of the passing lane for percent-time-following, $L_d = L_t-(L_u+L_{pl}+L_{de})$	*-6.58*
Adj. factor for the effect of passing lane on percent time-spent-following, $f_{pl,PTSF}$(Exhibit 15-26)	*0.61*

Percent time-spent-following including passing lane[3], $PTSF_{pl}$(%) $PTSF_{pl}= PTSF_d[L_u+L_d+f_{pl,PTSF}L_{pl}+((1+f_{pl,PTSF})/2)L_{de}]/L_t$	*43.0*
Level of Service and Other Performance Measures[4]	
Level of service including passing lane LOS_{pl} (Exhibit 15-3)	*C*
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}= VMT_{15}/ATS_{pl}$	*4.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*440.2*
Effective width, W_v (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.66*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	
1. If LOS_d=F, passing lane analysis cannot be performed. 2. If L_d <0, use alternative Equation 15-18. 3. If L_d<0, use alternative Equation 15-16. 4. v/c, VMT_{15} and VMT_{60} are calculated on Directional Two-Lane Highway Segment Worksheet.	

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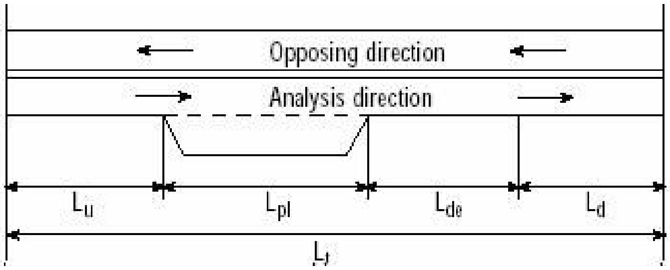
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET WITH PASSING LANE WORKSHEET

General Information		***Site Information***	
Analyst	*JF*	Highway of Travel	*Midway Rd*
Agency or Company		From/To	*west of Porter Rd EB*
Date Performed	*4/13/2018*	Jurisdiction	*Solano County*
Analysis Time Period	*PM - MITIG8*	Analysis Year	*Cumulative plus Project*

Project Description: *Recology Hay Rd Landfill*

Input Data

☑ Class I highway ☐ Class II highway ☐ Class III highway



Shoulder width (ft)	*3.0*
Lane Width (ft)	*12.0*
Segment Length (mi)	*2.0*
Total length of analysis segment, L_t	*2.0*
Length of two-lane highway upstream of the passing lane, L_u	*0.5*
Length of passing lane including tapers , L_{pl}	*0.3*
Average travel speed, ATS_d (from Directional Two-Lane Highway Segment Worksheet)	*42.6*
Percent time-spent-following, $PTSF_d$ (from Directional Two-Lane Highway Segment Worksheet)	*72.9*
Level of service[1], LOS_d (from Directional Two-Lane Highway Segment Worksheet)	*D*
Average Travel Speed	
Length of the downstream highway segment within the effective length of passing lane for average travel speed, L_{de} (Exhibit 15-23)	*1.70*
Length of two-lane highway downstream of effective length of the passing lane for avg travel speed, L_d $L_d=L_t-(L_u+L_{pl}+L_{de})$	*-0.50*
Adj. factor for the effect of passing lane on average speed, f_{pl} (Exhibit 15-28)	*1.11*
Average travel speed including passing lane[2], $ATS_{pl} = (ATS_d * L_t) / (L_u+L_d+(L_{pl}/f_{pl}) + (2L_{de}/(1+f_{pl,ATS})))$	*45.0*
Percent free flow speed including passing lane, $PFFS_{pl} = (ATS_{pl}/ FFS)$	*86.3*
Percent Time-Spent-Following	
Length of the downstream highway segment within the effective length of passing lane for percent time-spent-following, L_{de} (Exhibit 15-23)	*6.26*
Length of two-lane highway downstream of effective length of the passing lane for percent-time-following, $L_d=L_t-(L_u+L_{pl}+L_{de})$	*-5.06*
Adj. factor for the effect of passing lane on percent time-spent-following, $f_{pl,PTSF}$(Exhibit 15-26)	*0.61*

Percent time-spent-following including passing lane[3], $PTSF_{pl}$(%) $PTSF_{pl} = PTSF_d[L_u + L_d + f_{pl,PTSF} L_{pl} + ((1+f_{pl,PTSF})/2) L_{de}]/L_t$	*53.2*
Level of Service and Other Performance Measures[4]	
Level of service including passing lane LOS_{pl} (Exhibit 15-3)	*C*
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15} = VMT_{15}/ATS_{pl}$	*7.0*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*630.4*
Effective width, W_v (Eq. 15-29) ft	*15.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.84*
Bicycle level of service (Exhibit 15-4)	*F*
Notes	
1. If LOS_d=F, passing lane analysis cannot be performed. 2. If L_d <0, use alternative Equation 15-18. 3. If L_d<0, use alternative Equation 15-16. 4. v/c, VMT_{15} and VMT_{60} are calculated on Directional Two-Lane Highway Segment Worksheet.	

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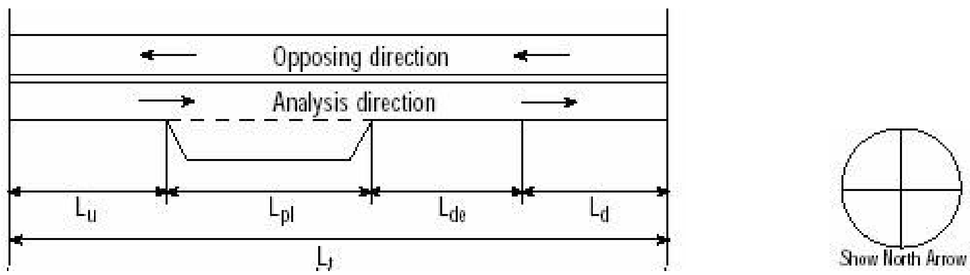
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET WITH PASSING LANE WORKSHEET

General Information		Site Information	
Analyst	JF	Highway of Travel	Midway Rd
Agency or Company		From/To	west of Porter Rd WB
Date Performed	10/8/18	Jurisdiction	Solano County
Analysis Time Period	PM - MITIG8	Analysis Year	Cumulative plus Project

Project Description: *Recology Hay Rd Landfill*

Input Data

☑ Class I highway ☐ Class II highway ☐ Class III highway



Shoulder width (ft)	3.0
Lane Width (ft)	12.0
Segment Length (mi)	2.0
Total length of analysis segment, L_t	2.0
Length of two-lane highway upstream of the passing lane, L_u	0.5
Length of passing lane including tapers , L_{pl}	0.3
Average travel speed, ATS_d (from Directional Two-Lane Highway Segment Worksheet)	42.9
Percent time-spent-following, $PTSF_d$ (from Directional Two-Lane Highway Segment Worksheet)	60.2
Level of service[1], LOS_d (from Directional Two-Lane Highway Segment Worksheet)	D
Average Travel Speed	
Length of the downstream highway segment within the effective length of passing lane for average travel speed, L_{de} (Exhibit 15-23)	1.70
Length of two-lane highway downstream of effective length of the passing lane for avg travel speed, L_d $L_d=L_t-(L_u+L_{pl}+L_{de})$	-0.50
Adj. factor for the effect of passing lane on average speed, f_{pl} (Exhibit 15-28)	1.10
Average travel speed including passing lane[2], $ATS_{pl} = (ATS_d * L_t) / (L_u+L_d+(L_{pl}/f_{pl})+ (2L_{de}/(1+f_{pl,ATS})))$	45.2
Percent free flow speed including passing lane, $PFFS_{pl} = (ATS_{pl}/ FFS)$	86.7
Percent Time-Spent-Following	
Length of the downstream highway segment within the effective length of passing lane for percent time-spent-following, L_{de} (Exhibit 15-23)	7.68
Length of two-lane highway downstream of effective length of the passing lane for percent-time-following, $L_d=L_t-(L_u+L_{pl}+L_{de})$	-6.48
Adj. factor for the effect of passing lane on percent time-spent-following, $f_{pl,PTSF}$(Exhibit 15-26)	0.61

Percent time-spent-following including passing lane[3], $PTSF_{pl}$(%) $PTSF_{pl} = PTSF_d[L_u+L_d+f_{pl,PTSF}L_{pl}+((1+f_{pl,PTSF})/2)L_{de}]/L_t$	43.7
Level of Service and Other Performance Measures[4]	
Level of service including passing lane LOS_{pl} (Exhibit 15-3)	C
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15} = VMT_{15}/ATS_{pl}$	5.0
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	453.3
Effective width, W_v (Eq. 15-29) ft	15.00
Effective speed factor, S_t (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	5.67
Bicycle level of service (Exhibit 15-4)	F
Notes	
1. If LOS_d=F, passing lane analysis cannot be performed. 2. If L_d <0, use alternative Equation 15-18. 3. If L_d<0, use alternative Equation 15-16. 4. v/c, VMT_{15} and VMT_{60} are calculated on Directional Two-Lane Highway Segment Worksheet.	

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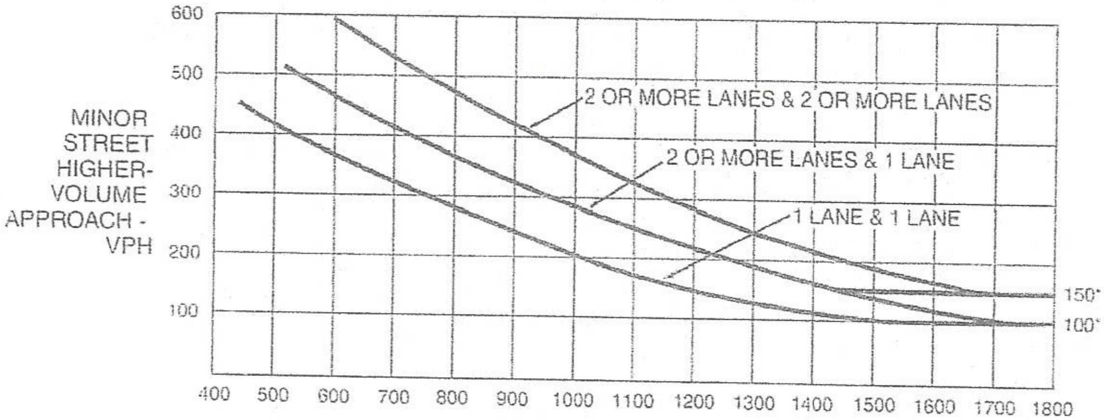
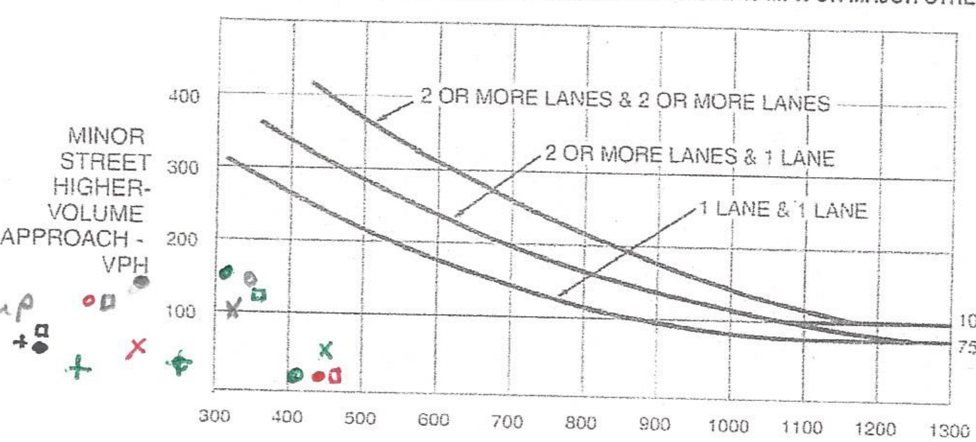
Figure 4C-3. Warrant 3, Peak Hour



*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.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

O DAY / I-80 WB RAMP
● AM
□ PM

O DAY / MIDWAY
O AM
X PM

MIDWAY / I-80 EB RAMP
● AM
□ PM

PORTER / MIDWAY
O AM
X PM

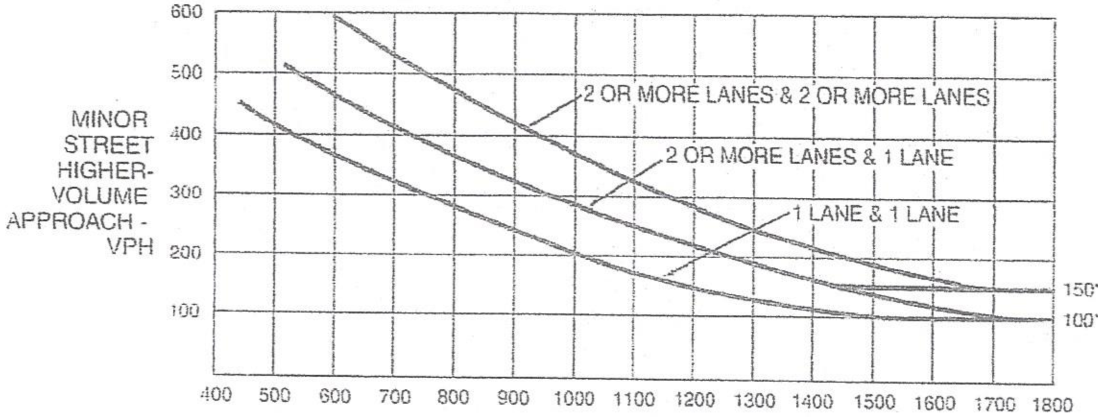
SR 113 / MIDWAY
● AM
□ PM
+ SAT

SR 113 / HAY RD
O AM
X PM
⊕ SAT

HAY RD / ACCESS
● AM
□ PM
+ SAT

EXISTING

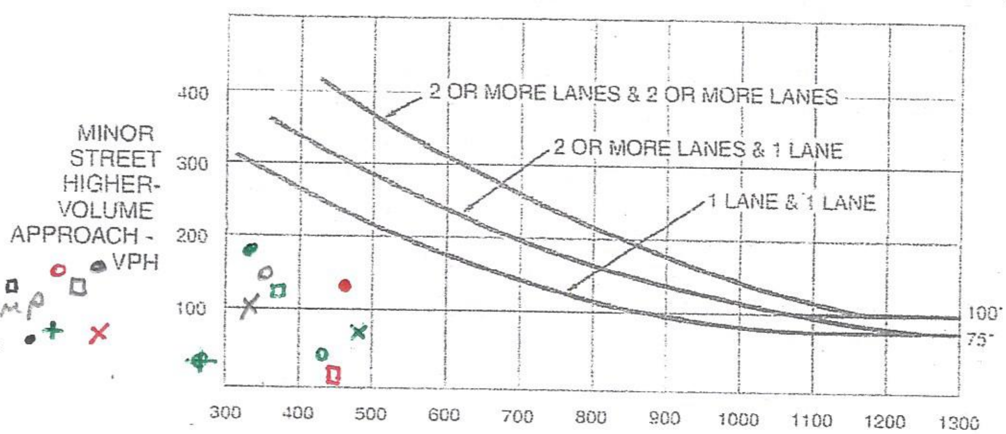
Figure 4C-3. Warrant 3, Peak Hour



*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.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

O DAY / I-80 WB RAMP
• AM
□ PM

O DAY / MIDWAY
O AM
X PM

MIDWAY / I-80 EB RAMP
• AM
□ PM

PORTER / MIDWAY
O AM
X PM

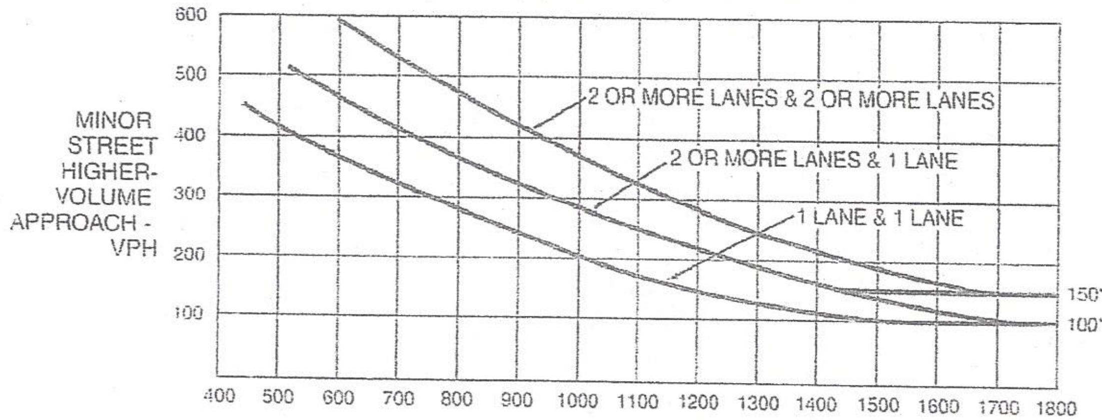
SR 113 / MIDWAY
• AM
□ PM
+ SAT

SR 113 / HAY RD
O AM
X PM
+ SAT

HAY RD / ACCESS
• AM
□ PM
+ SAT

EXISTING + PROJECT

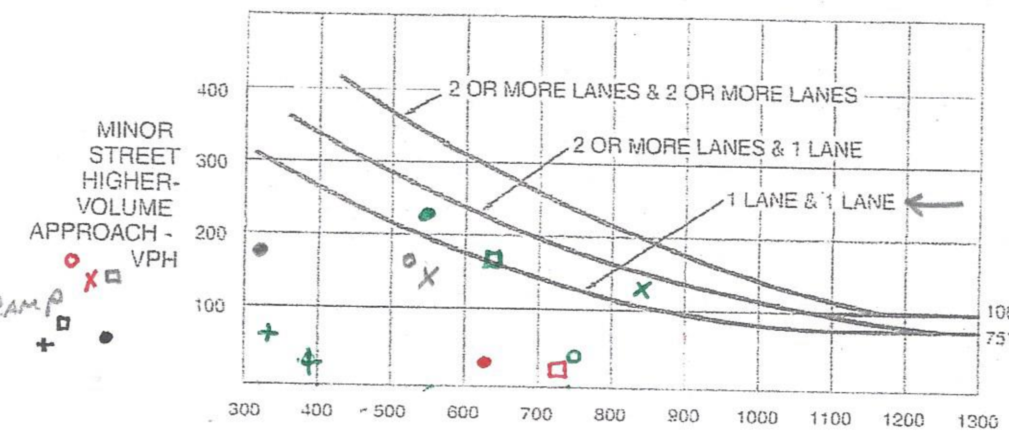
Figure 4C-3. Warrant 3, Peak Hour



*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.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

ODAY / I-80 WB RAMP
• AM
□ PM

O DAY / MIDWAY
O AM
X PM

MIDWAY / I-80 EB RAMP
• AM
□ PM

PORTER / MIDWAY
O AM
X PM

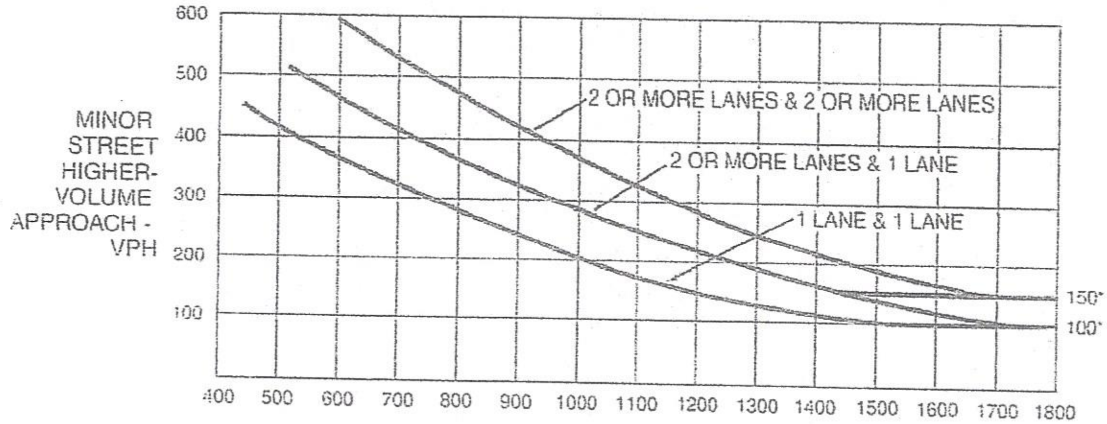
SR 113 / MIDWAY
• AM
□ PM
+ SAT

SR 113 / HAY RD
O AM
X PM
+ SAT

HAY RD / ACCESS
• AM
□ PM
+ SAT

CUMULATIVE

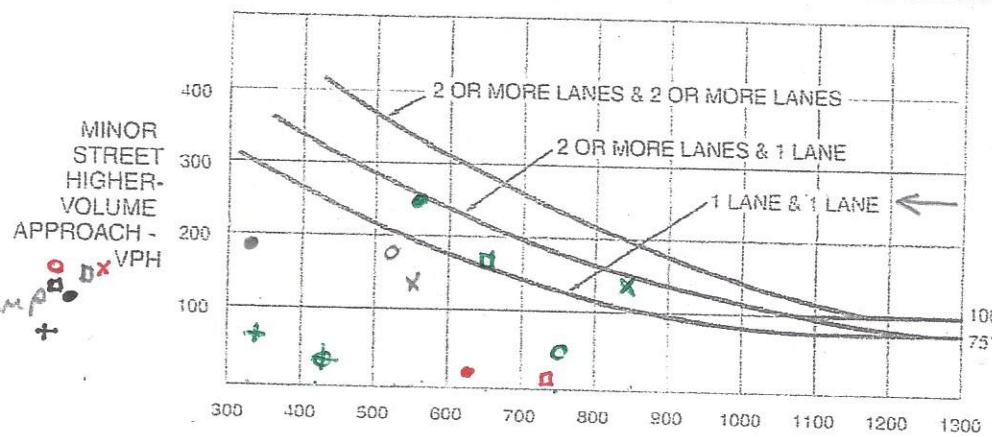
Figure 4C-3. Warrant 3, Peak Hour



*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.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

O DAY / I-80 WB RAMP
• AM
□ PM

O DAY / MIDWAY
O AM
X PM

MIDWAY / I-80 EB RAMP
• AM
□ PM

PORTER / MIDWAY
O AM
X PM

SR 113 / MIDWAY
• AM
□ PM
+ SAT

SR 113 / HAY RD
O AM
X PM
⊕ SAT

HAY RD / ACCESS
• AM
□ PM
+ SAT

CUMULATIVE + PROJECT