

TRANSPORTATION NEEDS REPORT

William Preston Lane Jr. Memorial (Bay) Bridge



December 2004

Volume I of II

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EXECUTIVE SUMMARY

Background

The existing Bay Bridge is the only roadway crossing of the Chesapeake Bay in Maryland. Trips across the Bay Bridge consist of two types of travel: local trips (such as work related and discretionary trips) with origins and destinations relatively close to the shores, and regional travel (such as commerce and beach traffic) with origins and destinations elsewhere in Maryland and beyond. Traffic associated with all types of trips across the Bay has been steadily increasing since the parallel spans were constructed; the original two-lane bridge was constructed in 1952 and the second three-lane bridge was constructed in 1973.

The location for the existing Bay Bridge was selected in the 1930's based on a number of factors, including the growing state highway network, ship navigation, and access to the lower Eastern Shore. Since 1952, population and job growth on both sides of the Bay have increased significantly, resulting in an increase in the volumes of local and regional trips, and increased congestion and it's associated effects (e.g., accidents, increased truck traffic, delays, environmental concerns, and others). For example, between 1970 and 2000, the population of Anne Arundel County increased from 299,825 to 491,383. The Maryland Department of Planning (MDP) projects the Anne Arundel County population to increase to 541,250 by 2015. For Queen Anne's County, between 1970 and 2000, the population increased from 18,506 to 41,456. MDP projects the population in Queen Anne's County to increase to 53,550 by 2015.

The US50/301 corridor is experiencing congestion today, and is projected to experience even higher levels of congestion in the future. Most significant are the constraints that cause eastbound delays between the Parole area in Anne Arundel County and the Bay Bridge. The Bay Bridge is a critical portion of the US 50/301 corridor that is the most susceptible to factors that can cause or exacerbate congestion. For example, because it is a bridge with no shoulders, reconstruction and rehabilitation work takes longer and creates difficulties with maintaining traffic flow.

Further, based on the current condition of the eastbound bridge deck and the projected increases in traffic volumes, it is anticipated that the deck will require rehabilitation between 2015 and 2020. Depending on the type and method of construction, the rehabilitation could require long-term single lane closures or complete nighttime bridge closures of the eastbound bridge. Because the bridge is projected to carry significantly higher traffic volumes by 2015-2020, the rehabilitation would likely result in substantial travel time delays. For example the current Average Daily Traffic (ADT) during an average weekday is 61,000 and is projected to be 86,000 by 2025, an increase of 41 percent. The ADT for a Saturday in the summer is 95,000 and is projected to grow to 135,000 by 2025, an increase of 42 percent.

Recognizing these facts, the Authority has begun studies to formulate a long-term improvement plan for the William Preston Lane Jr. Memorial (Bay) Bridge Transportation Facility Project.

Bay Bridge Needs Report

a. Initiation of the Needs Report

The Bay Bridge is owned and operated by the Authority, while the approach roadway system is predominantly owned and operated by the State Highway Administration. Portions of the approach roadways are also maintained by the local county and municipal jurisdictions. The Authority – with the cooperation of various regional planning partners, including staff from a number of metropolitan planning organizations, Maryland Department of Transportation (MDOT), Virginia Department of Transportation (VDOT) and Delaware Department of Transportation (DelDOT) – initiated a study of the Bay Bridge, to begin the process of identifying the transportation and safety needs associated with the crossing. This study resulted in the Needs Report, which is now being released.

b. Purpose and Methodology of the Needs Report

The overall purpose of the Authority's initial Needs Report was to identify the long-range improvement needs of its transportation facility project through preliminary identification of issues such as transportation demand and safety. This process has ultimately led to the conclusion that addressing the transportation and safety needs at the Bay Bridge requires consideration of other corridor and, ultimately, statewide issues. The Needs Report addresses one part of the problem: What are the needs associated with the Bay Bridge?

The first step in the Authority's Needs Report was to identify a study area. The transportation needs associated with the Bay Bridge can be separated into two major areas:

- Capacity, safety, operations, and maintenance of the bridge and toll plaza.
- Capacity, safety, operations, and maintenance of the system of roadways leading to and from the Bay Bridge.

Because the transportation needs associated with the Bay Bridge extend beyond the bridge itself, the Bay Bridge study area was defined as an area extending a distance of 5.8 miles along U.S. Route 50/301, between the Oceanic Drive overpass in Anne Arundel County and the MD 8 overpass in Queen Anne's County. Within the study limits, U.S. Route 50/301 includes the Bay Bridge, the two parallel steel bridge structures that span 4.3 miles from shore to shore across the Chesapeake Bay.

In undertaking the Needs Report, the following factors were evaluated:

- Travel Patterns
- Geometric Conditions
- Travel Demand and Traffic Operations
- Maintenance and Rehabilitation Needs
- Safety

c. Key Findings

To understand the physical limitations of the bridge, an assessment of its geometric condition in light of the latest engineering standards was conducted. An assessment of the maintenance and rehabilitation needs of the bridge, based on the Authority's Long Range Plan, was also performed. Travel demand and traffic operational analyses of the bridge and the toll plazas were also conducted. And finally, a safety analysis was conducted to understand the types and locations of accidents in the study area and their possible causes.

In general, the bridge meets current geometric design standards with the exception of the offsets between travel lanes and the bridge rails. The lack of roadside shoulders or buffer areas results in the loss of a lane or roadway closures during incident management activities including clearance of disabled vehicles. This has an impact on the vehicular capacity of the bridge.

To understand the travel patterns in the study area, an origin-destination survey was conducted for eastbound traffic traveling over the Bay Bridge on both an average weekday and an average summer weekend day. This study also revealed the percentage of truck traffic using the bridge. The origin-destination studies indicate that most of the typical summer weekend eastbound bridge traffic is traveling between the Baltimore-Washington metropolitan area and the lower Eastern Shore and between the Baltimore region and both the lower

Eastern Shore and Queen Anne's County on an average weekday. In general, the Bay Bridge carries approximately 53 percent more traffic on an average summer weekend day (95,000 vehicles) than on an average weekday (61,000 vehicles) and by 2025, the daily volumes are expected to increase to approximately 135,000 vehicles on an average summer weekend day and 86,000 vehicles on an average weekday. Trucks account for approximately five percent of total traffic on an average summer weekend day and 14 percent on an average weekday.

During a three-year study period, a total of 402 accidents occurred in the study area. Although there are no similar bridges or toll plazas to make an exact comparison, the accident statistics suggest that the study area experienced a volume of rear-end collisions significantly higher than the statewide rate for similar, rural, four-lane divided highways.

Additional Needs Data

Recognizing that the congestion issues in the US 50/301 corridor are not only related to the Bay Bridge. The Authority looked at a travel time speed study for the US 50/301 corridor in the eastbound direction conducted in May and June of 2003 as part the evaluation of a Toll Sponsorship Pilot Program. The study measured travel speeds, queues, and delays. Two distinct eastbound areas of congestion were observed.

- The first area of congestion was between the Parole area and the Severn River Bridge, with queue lengths on the order of two miles. In this section, I-97 intersects US 50/301 and the number US 50/301 eastbound lanes is reduced from four to three as the roadway approaches the Severn River Bridge. Free flowing speeds were again observed from the Severn River Bridge to two miles prior to the Bay Bridge.
- The second area of congestion, beginning at the Bay Bridge, is due to reduced lane capacity on the Bay Bridge relative to the approach lanes, and weave/merge movements associated with the toll plaza.

These two queues are often perceived as one continuous delay. It is anticipated that future traffic volumes could increase to the point where the queues begin to encroach upon one another. On a typical summer Friday or Saturday, traffic delays exist over a six-hour period and travel times associated with these delays are increasing. These undesirable operating conditions are expected to worsen significantly, upwards of 12 hours per summer weekend day by 2025. Likewise, travel time delays in this 16-mile segment of approach roadway will deteriorate in much the same fashion in the coming years. By 2025, these types of delays will begin to occur during peak weekday periods, as well. This level of congestion is difficult for bridge drivers, causes increased accidents, and can severely impact access to nearby communities.

Beyond the Transportation Needs Reports: Ongoing and Next Steps in the Process

To begin to understand the diverse and complex issues associated with addressing the transportation needs, the Authority is collecting data and information about the environment and transportation system in the corridor. This information will serve as a starting point for more detailed future engineering and environmental studies of a Bay crossing. As part of this data collection effort, the Authority:

- has reviewed several historic Bay Bridge documents to learn about what crossings have been studied in the past and to determine if any are still applicable today;
- is compiling an inventory of roadway planning, design, and construction projects as well as a review of area comprehensive plans, to understand and document the features of the existing and future transportation system; and
- is identifying and documenting resources in the Study area by inventorying socioeconomic, cultural, and natural environmental features in the study area.

The Authority is also evaluating the legal and process issues that could affect the direction, scope, and constraints of a study of feasible solutions.

In addition, to complete the assessment, an understanding of the needs in the US 50/301 corridor, of which the bridge is an integral part, is also required. Assessments of other systems affected by crossings of the Chesapeake Bay could be or have been undertaken by MDOT, the Maryland Department of Planning (MDP), Maryland Department of the Environment (MDE) and other agencies over the course of several years. These additional studies should contribute to an understanding of the needs across the corridor in the context of congestion statewide and regional plans, such as management recommendations; transit opportunities; development and growth control measures; impacts to natural, cultural, and socio-economic resources; and opportunities for economic growth. Once identified, the needs of the entire system could be addressed in concert, through a statewide effort.

The Bay Bridge Transportation Needs Report represents the first step in identifying the needs, understanding the feasibility of addressing the needs, and developing feasible solutions for a unique and complicated project within the framework of the regulatory and legislative process. The Authority will begin to address these needs through a Feasibility Review. The Feasibility Review will include a Task Force on Traffic Capacity Across the Chesapeake Bay, consisting of representatives from the Chesapeake Bay region and other parts of the State. The purpose of the Task Force is to assist the Authority in evaluating the need for additional capacity, and identifying issues to be considered in addressing those needs. The Feasibility Review will serve as a transition between the Needs Report and future project planning studies.

The Feasibility Review will be a significant undertaking for the State of Maryland. A study of this magnitude and complexity requires a partnership between elected officials, state and federal agencies, and the public within Maryland and beyond state lines. Therefore, the Authority is presenting and will continue to present a variety of future action proposals to the Maryland Department of Transportation for consideration and action.

PURPOSE OF STUDY

There are several areas of recurring congestion along US 50 including portions of the roadway near Annapolis, the Severn River, the Chesapeake Bay, and the Eastern Shore. The William Preston Lane Jr. Memorial (Bay) Bridge represents an integral part of the US 50 corridor.

The Maryland Transportation Authority (Authority) is responsible for constructing, managing, operating, and improving the State's toll facilities including the Bay Bridge. As part of the ongoing mission to provide Maryland's citizens and visitors with safe and convenient transportation facilities, the Authority conducted an assessment of the existing and future transportation needs at the Bay Bridge.

To assess the future transportation needs, a full understanding of travel patterns, existing geometric features, and operating conditions was required. Therefore, this study included extensive data collection and analysis. This report documents the results of the data collection effort and analysis of existing (2001) conditions and future transportation needs at the Bay Bridge.

The needs assessment included in this report focuses on one part of the problem: what are the needs associated with the Bay Bridge. However, to fully understand the overall transportation needs in the corridor, a broader analysis of the approach roadways should be conducted. Therefore this transportation needs study represents the first step in a much larger process: identifying the needs, understanding the feasibility of addressing the needs, and developing feasible solutions for a much larger transportation corridor. The needs and recommendations identified in this report will serve as the basis for future studies of the Bay Bridge and the overall US 50 corridor.

The study was completed under the sponsorship of the Authority. At key milestones representatives from the Maryland Department of Transportation (MDOT), Maryland State Highway Administration (MSHA), Baltimore Metropolitan Council (BMC), Delaware Department of Transportation (DelDOT), Washington Metropolitan Council of Governments (MWCOG), and the Authority reviewed and approved the travel demand process and projections. Each of these agencies proved to be valuable resources of information and provided input and review of the traffic and socio-economic information. The responsive participation was appreciated and team members are acknowledged in **Appendix A**.

Figure 1 shows the location of the Bay Bridge; along with the area included in the travel demand model developed for the study. The remainder of this report includes discussions on the existing conditions, future conditions, and conclusions.

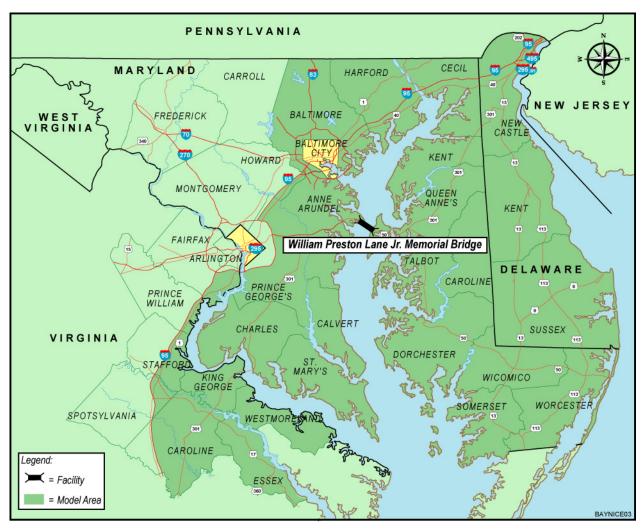


Figure 1. Study Area

EXISTING CONDITIONS

2.1 Study Area

The study area extends a distance of 5.8 miles along U.S. Route 50/301, between the Oceanic Drive overpass in Anne Arundel County and the MD 8 overpass in Queen Anne's County. Within the study limits, U.S. Route 50/301 includes two parallel steel bridge structures, collectively known as the Bay Bridge, that span 4.3 miles, from shore to shore, across the Chesapeake Bay. The Bay Bridge provides a direct travel link between the metropolitan areas of Baltimore, Washington D.C., and Annapolis and Maryland's Eastern Shore communities. It is the only roadway crossing of the Chesapeake Bay in Maryland. The only surface transportation options to this crossing are to travel around the Bay to the north, through Delaware, or to travel south through Virginia's tidewater area via the Chesapeake Bay Bridge-Tunnel.

2.1.1 History

Prior to construction of the Bay Bridge, the primary method of automobile travel across the Chesapeake Bay was by ferry service, which took approximately two hours. In 1938, legislation authorizing the crossing came from mounting pressure for a bridge, but the effort was postponed due to the onset of World War II. Under the leadership of Governor William Preston Lane, Jr., and the 1947 General Assembly, the Maryland State Roads Commission was directed to proceed with building the Bay Bridge. A growing State highway network, the need to provide safe navigation for ships, and the need to provide improved access to the lower Eastern Shore made a bridge location in the Sandy Point-Matapeake area (near Stevensville) the most desirable, as opposed to earlier efforts that planned for a bridge crossing in the Bay Shore-Tolchester area.

Construction of the world's longest continuous over-water steel bridge at that time began in January 1949, and it was opened to traffic on July 30, 1952. The bridge was designed as a two-lane structure originally meant to carry one lane of traffic in each direction. By the early 1960's, the traffic volume on the bridge had reached its capacity. Consequently, in May 1968, a permit was granted for construction of a new parallel structure located 450 feet north of the existing bridge. Construction on the second bridge began in May 1969, and it was opened to traffic on June 28, 1973. The second

bridge, a three-lane structure, is open to westbound travel while the original two-lane bridge carries eastbound traffic, except during contra-flow operations.

The annual traffic on the Bay Bridge in 1952 (when the first bridge was originally opened to traffic) was 1.1 million vehicles. In 2001, the annual number of vehicles crossing the Chesapeake Bay on the Bay Bridge was documented at over 23.9 million vehicles.

2.1.2 Demographics of Areas Near the Bridge

Information presented on population and income is derived from 2000 US Census data, historical census data, and Maryland Department of Planning (MDP) projections.

The City of Baltimore, the largest city in the State of Maryland with a total population of 651,154 in 2000, is located approximately 23 miles northwest of the study area. Washington D.C. is located 28 miles west of the study area along U.S. Route 50/301, with a total population of 525,059 in 2000.

The population in Anne Arundel County grew 14.6 percent from 427,239 people in 1990 to 491,383 people in 2000. This is slightly higher than the growth rate for the Washington region and significantly higher than the growth rate for the Baltimore region for the same period. However, growth rates have declined consistently over the past three decades from 24.4 percent in the 1970s. Maryland's State capital is located in Annapolis, which is the largest city in Anne Arundel County. Annapolis had a recorded population of 35,838 in 2000.

The population in Queen Anne's County grew 19.5 percent from 33,953 people in 1990 to 41,456 people in 2000. While still significant, the population growth rate for Queen Anne's County has also declined consistently from a high of 38.5 percent in the 1970s.

The Eastern Shore community of Stevensville is located within the study area just east of the Bay Bridge in Queen Anne's County. It recorded a total population of 5,880 in year 2000. Several retail outlets located in Stevensville contributed the highest amount in total sales, reported at over \$321 million, for Queens Anne's County in 1997.

Population in the upper Eastern Shore counties of Caroline, Cecil, Kent, Queen Anne's and Talbot grew 15.8 percent from 180,726 people in 1990 to 209,295 people in 2000. Similarly, population in the lower Eastern Shore counties of Dorchester, Somerset, Wicomico, and Worcester grew 14.5 percent from 163,043 people in 1990 to 186,608 people in 2000.

In 2000, there were approximately 297,000 jobs in Anne Arundel County. This was an 18.0 percent increase over the 251,600 jobs in 1990. Queen Anne's County job growth peaked in the 1980s with 52.4 percent growth and although it is on a downward trend, job growth rates remain high. In 2000, there were approximately 17,300 jobs in Queen Anne's County. This represents a 34.17 percent increase over the 12,900 jobs in 1990.

Similar job growth occurred in the 1980s in the upper Eastern Shore and lower Eastern Shore counties. Job growth between 1990 and 2000 was 23.5 percent (from 81,200 jobs to 100,300 jobs) for the upper Eastern Shore and 13.4 percent (from 97,600 jobs to 110,700 jobs) for the lower Eastern Shore.

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A contraflow lane is a lane operating in a direction opposite to the normal flow of traffic.

2.1.3 Parallel Routes

The Bay Bridge crosses the Chesapeake Bay linking Central Maryland to the Eastern Shore. It also provides an alternative north-south route for traffic traveling along the east coast. I-95 is located approximately 30 miles west of the Bay Bridge and U.S. Route 13 is located approximately 50 miles to the east. In Maryland, I-95 extends through Central Maryland to the northeastern border of Maryland continuing into Delaware. U.S. Route 13 links the eastern peninsula of Maryland and Virginia at the mouth of the Chesapeake Bay and continues north through Maryland's Eastern Shore into Delaware. Long distance motorists use U.S. Route 50/301 as an alternative to these north-south routes.

2.1.4 Priority Funding Areas

The Maryland Economic Growth, Resource Protection and Planning Act of 1992 (the Planning Act) and the subsequent Smart Growth Priority Funding Areas Act of 1997 direct State and local governments to target their infrastructure investments to designated priority funding areas (PFAs). PFAs are existing communities and places designated by local governments and certified by the Maryland Department of Planning (MDP) as future growth areas where State infrastructure investments should be focused. **Appendix B** includes mapping of the PFAs for the two counties adjacent to the Bay Bridge, Anne Arundel and Queen Anne's counties. On the west side of the Bay Bridge, in Anne Arundel County, the City of Annapolis and the community of Arnold are designated as PFAs. The PFA designations for Queen Anne's County include portions of Kent Island, Stevensville, and Grasonville. The Bay Bridge serves as a critical link in connecting these PFAs on either side of the Chesapeake Bay.

In October 2003, the Priority Places Strategy Executive Order was established. The Priority Places Strategy builds on three decades of State and local land use policy promoting sustainable development and maintaining Maryland's high quality of life. It directs every State agency to work within a deliberate strategy to implement PFAs and planned growth in order to develop long-term solutions to the complicated issues of economic growth, community revitalization, and resource conservation to achieve the best "public return" on State investments.

2.2 Roadway Geometry

The Bay Bridge study area is divided into three distinct segments known as the (1) west approach, (2) bridge structure, and (3) east approach. The following describes the geometric configuration of each segment. Additional geometric elements are recorded in **Table 1** and aerial views of the approach sections are included in **Appendix C**.

2.2.1 West Approach Roadway

The limits of the west approach roadway segment begin at the Oceanic Drive overpass and terminate at the west abutment of the bridge for a total distance of 0.7 mile. U.S. Route 50/301 is a six-lane divided highway as it approaches the Bay Bridge. It is classified as an Urban Principal Arterial and has a posted speed of 50 mph. The three eastbound and westbound through-lanes are 12 feet wide with ten-foot outside shoulders. The inside shoulder varies in width from four to ten feet. There is a 70-foot

Table 1. Roadway Geometry

SEGMENTS	West A	pproach	Bridge	Structure	East Approach		
LIMITS	Oceanic Drive Overpass to West Abutment			utment to butment	East Abutment to MD 8 Overpass		
DIRECTION	ON Eastbound Westbound		Eastbound	Westbound	Eastbound	Westbound	
Roadway Classification	Urban Principal Arterial			al Arterial (AA) al Arterial (QA)	Rural Principal Arterial		
Posted Speed	Speed 50 mph		50	mph		eastbound) westbound)	
Number of Lanes	3	3	*2 *3		3	3	
Number of Toll Lanes	11	None	None	None	None	None	
Lane Width	12'	12'	12' 5"	12'	12'	12'	
Shoulder Width/ Offset	10' - outside 4 - 10' - inside (varies)	10' - outside 4 - 10' - inside (varies)	1' 7"	1'	10' - outside 4 - 8' – inside (varies)	10' - outside 4 - 8' – inside (varies)	
Median Width	2' - 70'	(varies)	None		47' (varies)		
Maximum Vertical Grade	+1.0%	-1.0%	+/- 3.0% +/- 3.0%		-0.3%	+0.3%	
Reversible Lanes	None		1 1		None		
Transition Length (Leaving Plaza)	600'	None		one	None		

Measurements were taken from existing roadway plans, aerial surveys and drawings provided by the Authority.

grass median near Oceanic Drive that narrows to a two-foot concrete median barrier approaching the toll plaza.

The eastbound travel way widens from three lanes to an eleven-lane, 192-foot wide toll plaza. East of the plaza, a 600-foot long transition area is provided for traffic to merge back together as it approaches the two-lane eastbound bridge. A wide transition area between the toll plaza and the westbound bridge allows flexibility for contraflow lane operations. The transition area allows for two-way traffic on either bridge. This is primarily used to accommodate bridge maintenance operations and ease congestion in the eastbound direction during peak periods. The transition and lane shift designs meet minimum AASHTO 50 mph design speed standards and allow for a smooth transition of traffic to/from either bridge. **Figure 2** shows a schematic of the west approach roadway geometry in the transition area surrounding the toll plaza. The vertical grade is relatively flat at the toll plaza and increases to one percent at the Bridge.

^{*} Standard Lane Configuration, AA – Anne Arundel County, QA – Queen Anne's County

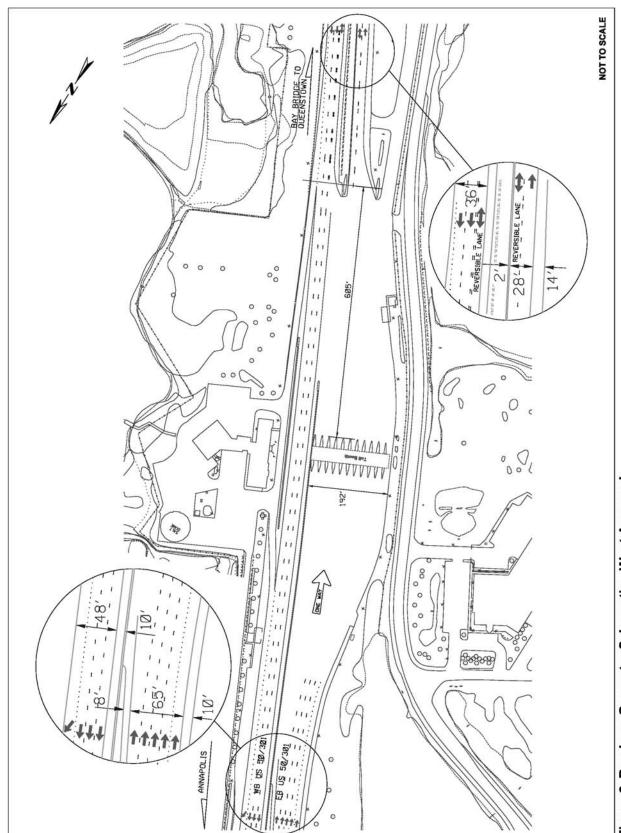


Figure 2. Roadway Geometry Schematic - West Approach

The Authority is currently designing and implementing improvements on the west approach roadway. An extended dedicated travel lane for EZPass vehicles is being added to the median side of the roadway and the overall approach roadway is being widened to provide additional space for vehicles entering the toll plaza. A second project is scheduled to be complete by Summer 2005, which will make similar improvements between the toll plaza and the bridge. Improvements include widening the roadway to allow more space for merging traffic prior to the bridge, and relocating the truck inspection area,

2.2.2 Bridge Structure

A distance of 450 feet separates the eastbound and westbound bridges. Each bridge consists of a partially suspended structure above the Chesapeake Bay, rising to a total height of 354 feet in the eastbound direction and 379 feet in the westbound direction. The roadway height reaches approximately 198 feet above the water. Each bridge measures 4.3 miles shore-to-shore and 4.0 miles abutment-to-abutment. Through this segment the roadway classification changes from an Urban Principal Arterial in Anne Arundel County to a Rural Principal Arterial in Queen Anne's County.

The eastbound bridge carries two lanes of traffic and the westbound bridge carries three lanes of traffic. The eastbound bridge consists of two 12'5" lanes with 1'7" offsets to the bridge rail. The westbound bridge consists of three 12-foot lanes with one-foot offsets to the bridge rails. Both the westbound and eastbound bridges include flexible lane control markings to allow for contraflow operations during maintenance, incident management or periods of congestion. While the bridge lanes are full-width, motorists traveling over bridges often perceive the lanes to be narrower due to the lack of shoulders and presence of railings. This perceived constraint on the roadway can result in lower operational capacity for the lanes on the bridge in comparison to the lanes on the approach roadways. **Figure 3** shows a schematic of the eastbound and westbound bridge lane configurations.

The eastbound bridge follows a southeasterly alignment going on a tangent, or straight line, for a distance of approximately 3,000 feet. It then curves to the east with a 1.67-degree curve and continues straight for approximately 15,800 feet. Along the eastbound bridge, the vertical grades vary in the order of 0.5 to 3.0 percent on the uphill portion to -1.9 to -3.0 percent on the downhill portion. The westbound bridge follows a parallel alignment to the eastbound bridge and has similar vertical grades.

Bridge and roadway plans were reviewed and analyzed to determine if the existing horizontal alignments and vertical grades were appropriate based on current traffic volumes, speed, and design standards. The three percent grade on the eastbound and westbound bridges is within desirable American Association of State Highway and Transportation Officials (AASHTO) guidelines for urban and rural arterials. The steepness of the grade in combination with a stop condition for traffic passing through the eastbound toll plaza, however, results in heavy vehicles traveling below the posted speed on the upgrade causing some delay for all vehicles using the eastbound bridge. The lack of a climbing lane for trucks, which make up more of the vehicle composition than on similar types of facilities, reduces the vehicular capacity of the bridge.

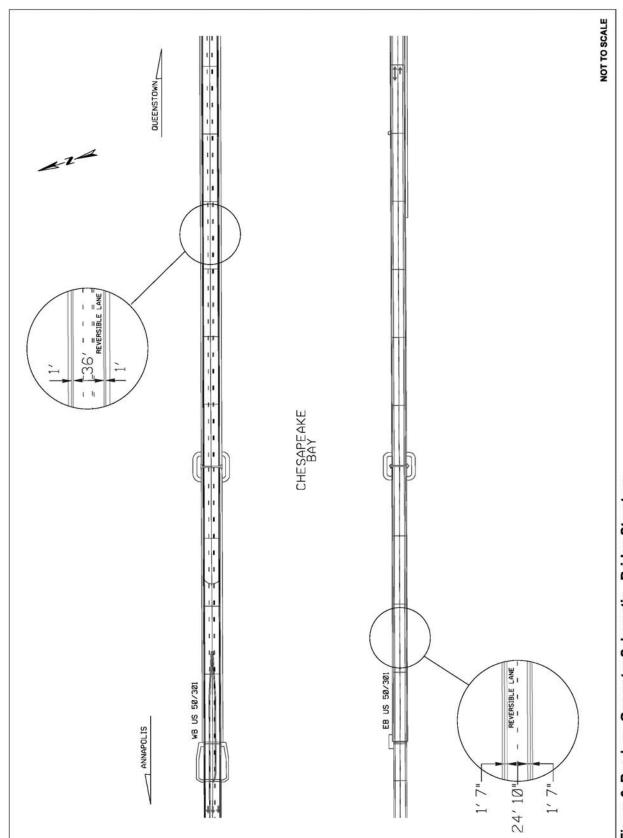


Figure 3. Roadway Geometry Schematic - Bridge Structure

AASHTO recognizes that long span bridges are expensive to construct and maintain, guidelines therefore allow minimal one to two-foot offsets to the bridge railings. Both bridges have minimal offsets; leaving no space for disabled vehicles to safely pull off the traveled lanes. Disabled vehicles subsequently block traffic until towed from the Bridge. The loss of a lane for a disabled vehicle or other incident management activities can have a significant impact on the vehicular capacity of the bridges.

An analysis was conducted to determine if there was sufficient sight distance for drivers to view obstacles or stopped vehicles in the travel lanes. The analysis focused on the crest profile along the top of the bridge and the bridge's vertical geometry was determined to be sufficient. A second review of the horizontal stopping sight distance for the curved sections along each bridge was conducted. The sight lines for bridges on a curve can be limiting when minimal shoulder widths result in the inside rail blocking the drivers ability to see an object or slowing vehicle in the travel lane ahead. For 50 mph (the posted speed on the bridge), AASHTO criteria calls for a minimum stopping sight distance of 400 feet. The existing stopping sight distance on the bridge was computed at 520 feet, exceeding the criteria for 50 mph. In fact, it exceeds the criteria of 495 feet for a design speed of 55 mph.

2.2.3 East Approach Roadway

The east approach measures 1.1 miles between the east abutment and the MD 8 overpass. It includes a six-lane divided highway consisting of three 12-foot lanes in the eastbound and westbound directions separated by a variable-width median, typically approximately 47 feet. It is classified as a Rural Principal Arterial and the posted speed is 55 mph in the eastbound direction and 50 mph in the westbound direction approaching the bridge. The eastbound and westbound roadways include ten-foot outside shoulders. The inside shoulders vary from four to eight feet. The vertical grade approaching the bridge is relatively flat and allows for a smooth multi-directional crossover between the eastbound and westbound roadways.

Figure 4 shows a schematic of the east approach roadway segment in the area adjacent to the bridge. The median crossover is approximately 0.41 miles east of the bridge to accommodate the reversible lanes on both bridges. The crossovers consist of a 26-foot lane in each direction for high-speed transition of vehicles between the bridges and approach roadways. At the times when one lane of the westbound bridge is used for eastbound traffic, westbound traffic approaching the bridge must merge from the three approach lanes to the two lanes in operation on the bridge. Eastbound traffic using the westbound bridge reversible lane has a smooth transition into the third inside lane of eastbound U.S. Route 50/301. From a traffic operations standpoint the eastbound median crossover functions very effectively.

2.3 Travel Patterns

An origin-destination (O-D) survey was conducted in 2001 to determine travel patterns across the Bay Bridge. Separate surveys were conducted in the eastbound direction on a summer weekend day (Saturday in August) and an "average" weekday (Wednesday in October) to capture seasonal variations in traffic crossing the Bridge. The summary of findings of the O-D study is documented in a separate report entitled "Origin-Destination Survey Report, Bay & Nice Bridge Study, June 5, 2002." The Origin-Destination travel patterns, trip purpose, vehicle occupancy, vehicle type and willingness of drivers to

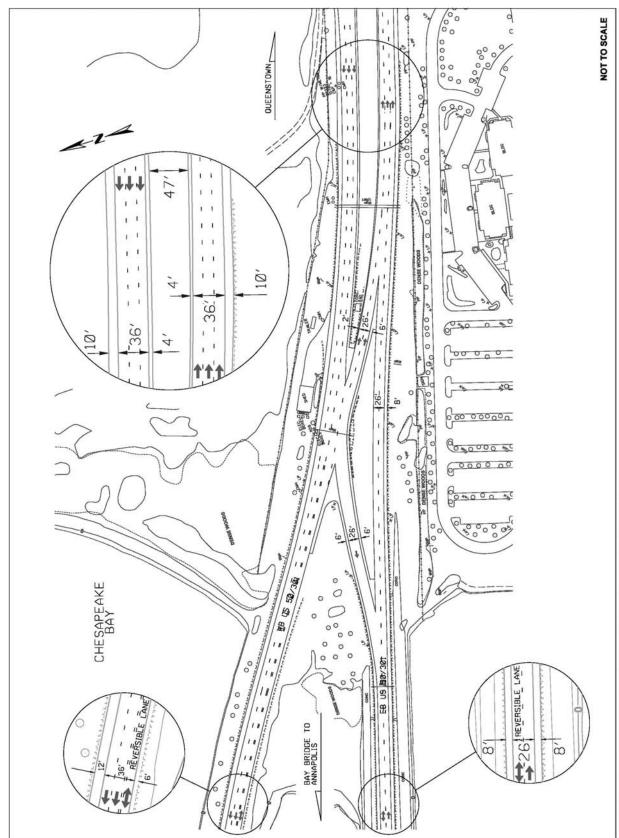


Figure 4. Roadway Geometry Schematic - East Approach

change travel times are summarized in **Figures 5 and 6** for a Saturday during the summer and average weekday, respectively. Of the 53,628 surveys distributed at the Bay Bridge, 18 and 26 percent of the forms were returned for the summer Saturday and average weekday, respectively. This represents valid return rates that provided sufficient data, adequate sample size, and information on both summer weekend and average weekday travel.

As shown on **Figure 5**, on an average Saturday in the summer, 82 percent of the eastbound traffic using the Bay Bridge comes from the Baltimore-Washington metropolitan area. Twenty-four percent of the traffic is destined to Queen Anne's and Kent counties with another 24 percent destined to other locations on Maryland's Eastern Shore, excluding Ocean City. Ocean City and the Delaware Beach resorts attract 23 percent and 20 percent of the traffic, respectively. During the summer Saturday, 83 percent of the trips begin at home and 37 percent are destined to recreation or tourism activities.

On an average weekday (See **Figure 6**), 93 percent of eastbound traffic is from the Baltimore-Washington metropolitan area. Fifty-two percent of the traffic is destined to Queen Anne's and Kent counties with another 35 percent destined to Maryland's Eastern Shore, including Ocean City. On an average weekday, 85 percent of the trips began at work or home and 77 percent end at work or home.

2.4 Traffic

Automatic Traffic Recorders (ATR) were placed on the east side of the Bay Bridge on all travel lanes. Traffic counts were conducted over the August 17-19, 2001 weekend, representative of a summer weekend, and October 16-17, 2001, representative of average weekdays.

For the purpose of assuring the quality of the machine counts, two other data sets were compared to the output of the counting equipment, including toll plaza axle counts and two-hour manual classification counts. The machine counts and toll counts deviated by less than four percent. The percentage difference between the manual and machine count results was less than three percent. **Appendix D (Volume II)** includes classified counts and detailed hourly summaries for both the summer weekend day and average weekday.

2.4.1 Vehicle Classification

The vehicle classifications recorded on Saturday, August 18, and Wednesday, October 17, are illustrated as percentages in **Table 2**. Heavy vehicles, defined as Single-Unit Trucks and larger, accounted for five percent of total traffic on the August Saturday observation period and 14 percent on the October weekday observation period. The truck percentage of 14 percent for an average weekday significantly exceeds the statewide average of four percent for urban arterials.

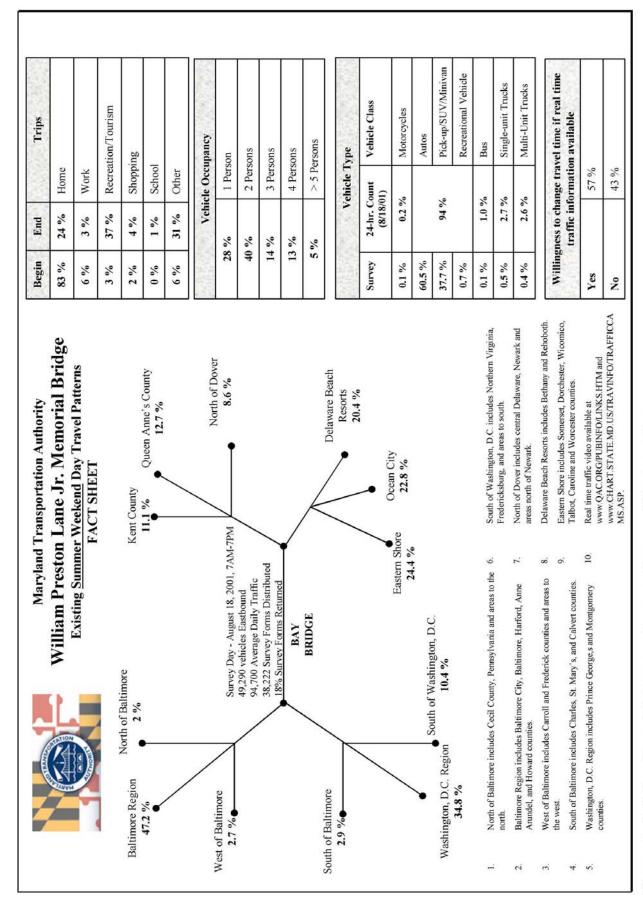


Figure 5. Existing Travel Patterns – Average <u>Summer Weekend</u> Day

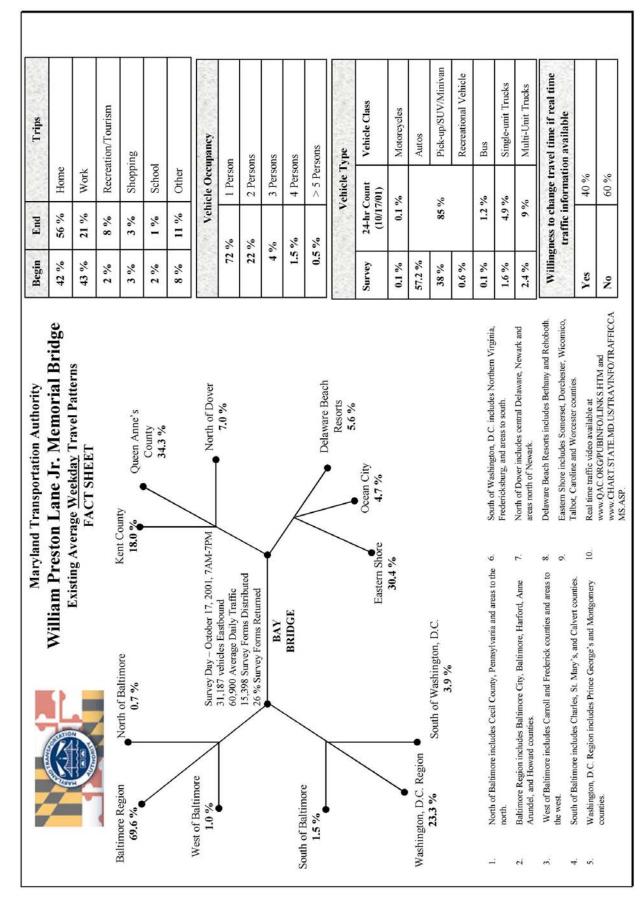


Figure 6. Existing Travel Patterns - Average Weekday

Table 2. Vehicle Classifications (Percent)

	Ĕ				Heavy Vehicles					
Date	Direction	MC Ca	Cars	s Buses	SU	WB40	WB50	WB60	>66'	Total
August 18, 2001	EB	0.2	93.6	1.0	2.7	0.7	1.3	0.4	0.1	5.2
Saturday	WB	0.1	93.4	1.3	2.7	0.8	1.1	0.5	0.1	5.2
October 17, 2001	EB	0.1	84.7	1.2	4.9	1.6	5.0	2.3	0.2	14.0
Wednesday	WB	0.1	85.7	0.9	4.1	1.6	5.6	1.8	0.2	13.3

MC – Motorcycles, SU – Single Unit Trucks, WB – Wheel Base (in feet) EB – Eastbound, WB – Westbound

2.4.2 Average Daily Traffic

Table 3 summarizes the total daily volumes recorded for the summer weekend. Traffic flow is heaviest on Friday in the eastbound direction (52,594 vehicles) and on Sunday in the westbound direction (53,572 vehicles). This is indicative of the summer weekend travel pattern to destinations along the Eastern Shore of Maryland and Delaware. Table 4 summarizes total daily traffic volumes recorded for the average weekdays.

Table 3. 2001 Total Daily Traffic Volume

SUMMER WEEKEND								
DATE	EASTBOUND	WESTBOUND	TOTAL					
August 17, 2001 Friday	52,594	41,577	94,171					
August 18, 2001 Saturday	49,290	45,396	94,686					
August 19, 2001 Sunday	33,652	53,572	87,224					
Average Annual Daily Traffic	1	1	65,000					

Table 4. 2001 Total Daily Traffic Volume

AVERAGE WEEKDAY								
DATE	EASTBOUND	WESTBOUND	TOTAL					
October 16, 2001 Tuesday	28,741	29,731	58,472					
October 17, 2001 Wednesday	31,187	29,714	60,901					
Average Annual Daily Traffic	Average Annual Daily Traffic							

Detailed hourly summaries are shown in **Appendix D** (**Volume II**). Figures D-1 and D-2, in the appendix show 24-hour volumes for both directions over the entire data collection period, including the number of heavy vehicles.

2.4.3 Peak Hour Traffic

Table 5 summarizes peak hour volumes, by direction, for the two observation periods. The highest hourly volume of vehicles for both directions occurred on Friday, between 3:00 PM and 4:00 PM, when a total of 7,055 vehicles were counted.

Table 5. 2001 Directional Peak Hour Summary*

DATE	DIRECTION	PEAK HOUR	PEAK HOUR VOLUME
August 18, 2001 Saturday	Eastbound	9:00 – 10:00 AM 3:00 – 4:00 PM	3,653 3,604
	Westbound	11:00 – 12:00 PM 1:00 – 2:00 PM	2,978 3,585
October 17, 2001	Eastbound	11:00- 12:00 AM 6:00 – 7:00 PM	1,596 3,181
Wednesday	Westbound	7:00 – 8:00 AM 3:00 – 4:00 PM	2,891 1,761

^{*}The combined highest hourly volume of vehicles for both directions occurred on Friday, between 3:00 and 4:00 PM.

2.4.4 Capacity Analysis

The mathematical relationships presented in this section are based on the procedures contained within the 2000 Edition of the *Highway Capacity Manual* (Transportation Research Board, 2000), in particular "Chapter 13 – Freeway Concepts." The actual calculations were performed using the input and output mechanisms contained in the latest version of HCS-2000 Highway Capacity Software, Version 4.1b.

The Highway Capacity Manual defines Level of Service (LOS) as "a qualitative measure describing operational conditions within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience." Six LOS are defined for each type of facility and are designated from A to F, with LOS "A" representing the best operating conditions with free traffic flow and low volumes and LOS "F" representing the worst conditions with low speeds and frequent delays. LOS "F" is considered undesirable. LOS D is approaching unstable traffic conditions with heavy volumes and decreasing speeds. LOS E has high volumes approaching the capacity of the roadway and is characterized with low speeds and delays. Table 6 summarizes the Bay Bridge LOS results for an average Saturday in summer between 7 AM and 7 PM, under normal operating conditions (two lanes eastbound, three lanes westbound). This analysis was performed for comparison purposes. However, during periods of peak hour congestion, the Authority would move to contraflow operations to address capacity constraints. It is important to note that contraflow operations are a *normal* operating procedure at the Bay Bridge, however, for the purpose of this study normal operating conditions refer to two eastbound lanes and three westbound lanes and contraflow operations refer to three eastbound lanes and two westbound lanes. Capacity analysis worksheets are included in Appendix E (Volume II).

Table 6. 2001 Hourly Level of Service (LOS) - Saturday

	SUMMER WEEKEND DAY* - SATURDAY									
START TIME	2001 EB TOTAL	LOS	2001 WB TOTAL	LOS						
7:00 AM	2,935	D	1,019	Α						
8:00	3,572	E	1,445	Α						
9:00	3,653	E	1,887	В						
10:00	3,524	D	2,439	В						
11:00	3,443	D	2,978	С						
12:00 PM	3,508	D	2,695	В						
1:00	3,010	D	3,585	С						
2:00	3,083	D	3,333	С						
3:00	3,604	Е	2,565	В						
4:00	3,467	D	2,327	В						
5:00	1,985	С	3,488	С						
6:00	2,201	С	2,931	С						

^{*} Hourly volumes from data collected on Saturday, August 18, 2001.

The heaviest observed total traffic volume occurred on Friday, August 17, 2001 between 3 PM and 4 PM. Therefore, a LOS analysis was also conducted for the midday period for Friday and the results are shown in **Table 7**.

Table 7. 2001 Hourly Level of Service (LOS) - Friday

SUMMER WEEKEND DAY** - FRIDAY									
START TIME 2001 LOS 2001 WB TOTAL LO									
12:00 PM	3,332	D	2434	В					
1:00	3,440	D	2,652	В					
2:00	3,804	E	2,627	В					
3:00	4,013	F	3,042	С					
4:00	3,972	E	2,878	С					
5:00	4,011	F	2,563	В					
6:00	3,146	D	2,435	В					

^{**} Hourly volumes from data collected on Friday, August 17, 2001.

Table 8 summarizes the Bay Bridge Level of Service (LOS) results between 7 AM and 7 PM for an average weekday under normal operating conditions (two lanes eastbound, three lanes westbound).

Table 8. 2001 Level of Service (LOS) - Average Weekday

	AVERAGE WEEKDAY*									
START TIME	2001 EB TOTAL	LOS	2001 WB TOTAL	LOS						
7:00 AM	1,221	В	2,891	С						
8:00	1,405	В	2,505	В						
9:00	1,282	В	1,781	В						
10:00	1,370	В	1,571	Α						
11:00	1,596	В	1,505	Α						
12:00 PM	1,544	В	1,449	Α						
1:00	1,752	В	1,613	Α						
2:00	1,792	В	1,716	Α						
3:00	2,185	С	1,761	Α						
4:00	2,599	С	1,698	Α						
5:00	3,082	D	1,576	Α						
6:00	3,181	D	1,329	Α						

^{*} Hourly volumes from data collected on Wednesday, October 17, 2001.

Contraflow Operation. Contraflow lane operations typically occur during periods of peak traffic volumes or during maintenance, construction or incident management activities. The configuration of contraflow lanes may vary. However, during typical contraflow lane operations the lane usage of one of the lanes on the westbound bridge is reversed to provide a third eastbound lane (See **Figure 7**).

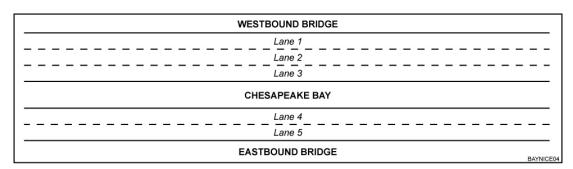


Figure 7. Contraflow Lane Operations

The Highway Capacity Manual does not have a set of procedures to evaluate this type of reversible lane operation. Therefore, to calculate LOS for multi-lane traffic with adjacent opposing traffic, the LOS for westbound traffic was estimated by analyzing the traffic as a two-lane, two-way highway (for the middle lane on the westbound bridge) and a multi-lane highway (for the outside westbound lane). Actual percentage volumes per lane were used for this analysis. Similarly, the eastbound traffic was analyzed as a two-lane, two-way highway for the traffic on the westbound bridge and a two-lane freeway for traffic on the eastbound bridge.

The following analysis focuses on the peak periods identified for the eastbound direction of travel for Saturday in summer. **Table 9** shows the LOS under the contraflow lane operation (three lanes eastbound, two lanes westbound), for the peak flow in the eastbound direction and the corresponding LOS in the westbound direction. For comparison purposes, the table also shows the LOS in each direction under normal (two lanes eastbound, three lanes westbound) operating conditions. The portion of the table highlighted in the boxes indicates the hours when the contraflow operation is likely to be in effect. As shown in the table, westbound congestion occurs as a result of contraflow operation.

Toll Operations. The increased volumes of traffic on summer weekend days cause the section of U.S. Route 50/301 approaching the toll plaza to experience significant congestion queuing. The queues usually start to build on Friday around midday and last into the evening (approximately 6 – 7 PM). Queues during average summer Saturday travel have been measured between two to almost five miles approaching the toll plaza. The queues tend to be longer during summer holiday weekends such as Memorial Day and Independence Day. Motorists are also informed by variable message signs (VMS), traffic advisory radio (TAR), the Authority's website, web cameras, recorded telephone messages and media reports about traffic conditions at the Bay Bridge. During the peak period of eastbound travel, the two-way reversible lane is placed in effect (third eastbound lane on the westbound bridge) and all eleven-toll lanes are opened.

Table 9. 2001 Hourly Level of Service- Contraflow Lane Operations

	SUMMER SATURDAY										
		EASTBO	UND		WESTBOUND						
	2001	Level	of Service	е	2001	Lev	el of Serv	ice			
START TIME	EB TOTAL TRAFFIC	Normal Operations		Contraflow Operations		Normal Operations		raflow ations			
TIME	VOLUME	(Lanes 4 & 5)	Lanes 4 & 5	Lane 3	TRAFFIC VOLUME	INAFFIC	INAFFIC	INAFFIC	(Lanes 1, 2, & 3)	Lane 1	Lane 2
7:00 AM	2,935	D	С	Е	1,019	Α	Α	Е			
8:00	3,572	E	D	Е	1,445	Α	В	Е			
9:00	3,653	E	D	Е	1,887	В	С	Е			
10:00	3,524	D	D	Е	2,439	В	С	E E			
11:00	3,443	D	D	Е	2,978	С	D	E			
12:00 PM	3,508	D	D	Е	2,695	В	D	E			
1:00	3,010	D	С	F	3,585	С	E	F			
2:00	3,083	D	D	F	3,333	С	D	F			
3:00	3,604	E	D	Е	2,565	В	С	E			
4:00	3,467	D	D	Е	2,327	В	С	Е			
5:00	1,985	С	В	F	3,488	С	D	F			
6:00	2,201	С	С	Е	2,931	С	D	E			

Lane numbers correspond to lanes shown in Figure 7.

Note: Areas highlighted by double-lined box indicate hours of likely reversible lane operation.

During the non-summer months, when there are no incidents, maintenance, or construction activities, traffic operates reasonably well at the toll plaza with maximum queues not extending beyond the Oceanic Drive overpass (approximately 1500 feet).

2.5 Accident History

The Maryland State Highway Administration's (SHA) Office of Traffic and Safety (OOTS) provided accident data for the period between January 1999 and October 2002. Data from OOTS included yearly and combined summaries indicating the location (log mile), type and severity of accidents; number and types of vehicles involved in the accident; weather and surface conditions; time of day; and a comparison of study area rates to Statewide average rates for similarly classified State maintained highways or composite sections. For the analysis of accidents on the Bay Bridge, accident rates in Anne Arundel County were compared to other Urban Principal Arterials and accident rates in Queen Anne's County were compared to Rural Principal Arterials to be consistent with the classification of the roadway in each segment. The State Highway Location Reference Manual was used to categorize accidents into roadway segments by matching mile point descriptions with the appropriate log mile. Accident statistics were quantified and summarized by the five principal elements on the following list.

- Accident Occurrence (total number, collision type and rate)
- Accident Severity (number of deaths and/or injuries occurring)
- Accident Involvements (categories of vehicles involved)
- Accident Location (roadway and bridge segments)
- Time of day and year

Accident statistics were analyzed for the overall study area as well as the individual segments to determine any relevant trends. It should be noted that accident locations on police reports are sometimes listed by the nearest land mark which may result in the "clumping" of accident locations by mile point. Detailed accident summaries are included in **Appendix F** (Volume II).

2.5.1 Overall Study Area

Accident data provided by OOTS showed a total of 402 accidents on U.S. Route 50/301 between the Oceanic Drive overpass in Anne Arundel County and the MD 8 overpass in Queen Anne's County (total length of 5.78 miles). This includes 94 accidents in 1999, 92 in 2000, 105 in 2001, and 111 in the first ten months of 2002.

There were 291 accidents in Anne Arundel County and 111 accidents in Queen Anne's County. This results in accident rates of 102.6 and 37.6 accidents per 100 million vehicles miles of travel (VMT) for Anne Arundel and Queen Anne's counties, respectively. The rate in Anne Arundel County is significantly higher than the statewide average rate of 54.7 for similarly classified State maintained highways or composite sections, in this case other urban principal arterials. It should be noted, however, that most other urban principal arterials in Maryland do not contain toll plazas. The rate in Queen Anne's County is below the statewide rate of 38.5 for similar rural principal arterials.

The total accidents, by severity, are shown in **Table 10**. For the analysis period, three accidents (less than one percent) involved fatalities. The corresponding fatal accident rates equal/just exceed the corresponding statewide rates for similarly classified urban and rural facilities. The total number of accidents involving injury and property damage result in corresponding accident rates in Queen Anne's County that are below the statewide rates for similar rural facilities. However, the accident rates for injury and property damage accidents, as well as the total number of accidents, in Anne Arundel County significantly exceed the statewide rates for similarly classified urban facilities. As stated previously, most other urban principal arterials in Maryland do not contain toll plazas with the associated merging. In addition, traffic through the toll plaza tends travel at slower speeds lowering the severity of the accidents. This results in more property damage accidents and fewer personal injury accidents.

Table 10. Overall Study Area Accidents by Severity

Accident Severity	Number of Accidents		Study Rate*		Statewide Rate*		
Accident Seventy	AA	QA	Total	AA	QA	Urban	Rural
Fatal Accidents	1	2	3	0.4	0.7	0.4	0.5
Injury Accidents	101	44	145	35.6	14.9	21.5	15.2
Property Damage Accidents	189	65	254	66.6	22.0	32.8	22.7
Total Accidents	291	111	402	102.6	37.6	54.7	38.5

^{*} Accident rates are calculated as the number of accidents per 100 million vehicle miles of travel.

As shown in **Table 11**, the most prevalent accident type was identified as rear-end collisions which are frequently associated with traffic congestion. Rear-end collisions account for 60 percent, or a total of 242 accidents, during the analysis period. This results in a rear-end accident rate that is significantly higher than the Statewide rates for

similarly classified urban and rural facilities. In Anne Arundel County other types of accidents significantly exceeding statewide rates for similarly classified urban facilities include fixed object, opposite direction, and other collisions. In Queen Anne's County other types of accidents significantly exceeding statewide rates for similar rural facilities include accidents involving parked vehicles and "other" collisions.

Table 11. Overall Study Area Accidents by Type

Accident Type	Number of Accidents		Study Rate*		Statewide Rate*		
	AA	QA	Total	AA	QA	Urban	Rural
Opposite Direction	2	1	3	0.7	0.0	0.3	0.3
Rear End	172	70	242	60.6	23.7	21.5	8.9
Sideswipe	11	8	19	3.9	2.7	7.2	3.6
Angle Collision	2	0	2	0.7	0.0	0.3	0.3
Parked Vehicles	3	4	7	1.0	1.4	1.3	0.7
Fixed Object	58	12	70	20.4	4.0	14.2	14.1
Other	43	16	59	15.2	5.4	4.9	2.2
Total Accidents	291	111	402	102.6	37.6	54.7	38.5
Truck Related	84	24	108	28.4	7.2	9.2	6.7

^{*} Accident rates are calculated as the number of accidents per 100 million vehicle miles of travel.

The majority of accidents occurred in dry weather and in daylight conditions. Fifty-one percent occurred on a Friday, Saturday, or Sunday with 45 percent of them occurring on Fridays. The total daily traffic volume on an average Friday in the summer is approximately 40 percent higher than the average annual daily traffic. Thirty-nine percent of the accidents occurred in the summer months of June, July, or August, which account for approximately 35 percent of the annual Vehicle Miles of Travel (VMT). Of these summer accidents, 60 percent occurred on Friday, Saturday, or Sunday.

Of the total number of accidents, 27 percent (108 accidents) were truck-related accidents. The resulting truck accident rate for the Anne Arundel County portion of the study area is significantly higher than the Statewide rate for truck-related accidents on similarly classified urban facilities. This correlates with a higher than average percent of trucks in the study area (five percent for average summer Saturdays and 14 percent for average weekdays).

There were a total of 885 vehicles involved in accidents during the analysis period (many accidents involve more than one vehicle). Trucks accounted for 12 percent of the vehicles involved in accidents. Traffic counts collected in August and October of 2001 show truck percentages of five percent for average summer Saturday and 14 percent for average weekday. This is higher than the statewide average of four percent for other urban principal arterials and may account, in part, for the higher than average truck accident rate.

The primary cause listed on police reports for 53 percent of the total accidents was failure to give full time/attention which may be a result of drivers being distracted by the volume of traffic, geometric conditions, other vehicle occupants, in-vehicle electronic devices, scenery and/or unfamiliar roadways. In addition, eastbound drivers traveling through the toll plaza can be distracted while trying to find money for the toll or putting away change and/or receipts. Other major causes include driving too fast for

conditions, following too closely, under the influence of drugs or alcohol, vehicle defects, and unknown or other causes.

2.5.2 Segment Summary

An analysis of the total number of accidents recorded during the analysis period shows 139 accidents (35 percent) occurring along the west approach, 53 accidents (13 percent) occurring along the east approach, and 210 accidents (52 percent) occurring along the bridge structure (See **Table 12**). The number of accidents per mile was computed based on the total number of accidents for each segment divided by the length recorded in miles of the segment. While the majority of accidents occurred along the bridge structure, the highest concentration of accidents occurred at locations along the west approach roadway, primarily in the eastbound direction.

Table 12. Accident Summary by Segment

Segment	Number of Accidents	Percent of Total Accidents	Accidents/Mile
West Approach Roadway	139	35	210.6
Bridge	210	52	51.7
East Approach Roadway	53	13	50.0
Total	402	100	69.6

Accident records indicate that there were a total of 139 accidents on the west approach roadway segment for the analysis period. Thirty-five percent, 48 accidents were listed as occurring at log mile 17.34, the location of the tollbooths. Experience shows that accidents are often reported at the nearest "landmark" and these accidents most likely occurred at and in the general vicinity of the tollbooths. Of the accidents listed at this location, 69 percent (33 accidents) were fixed object collisions which most likely include lane control markers such as traffic cones, variable message signs, the truck inspection area, dividers between the toll lanes, and the tollbooths themselves. The probable cause listed on police reports for 73 percent of these accidents was failure to give full time/attention.

The second highest occurrence of accidents is at log mile 17.71, which represents the beginning of the bridge. Fourteen, 10 percent, of the total accidents on this segment occurred at this location. Of the 14 total accidents at this location, 11 accidents (79 percent) were rear end collisions. The primary causes listed on police reports were failure to give full time/attention, following too closely, and too fast for conditions. There are many factors that could lead to this including differing driver behavior (some drivers may slow when entering the bridge while others speed up), the change in pavement material, and the change in roadway characteristics (entering a constrained segment without shoulders).

Of the 139 total accidents occurring on the west approach roadway, 37 percent were rear end collision, 35 percent were fixed object collisions, and 19 percent were other types of collisions (See **Table 13**). Of the fixed object collisions, 65 percent involved objects identified as "other". Other fixed object accidents involved guardrail/barrier, light poles, buildings, curb, and crash attenuators. The remaining accident types included sideswipe, parked, and angle collisions. Seventy-three of the total accidents on this segment, 53 percent, were due to the driver's failure to give full time/attention. Other

causes for accidents included driving too fast for conditions, following too closely, improper lane change, passing, turning, or backing, vehicle defects, under the influence of alcohol, failure to yield the right-of-way, physical/mental difficulty, fell asleep/fainted, animal, icy or snow covered road, and unknown or other causes.

Table 13. Accident Types Occurring on the West Approach Roadway

Accident Type	Number of Accidents	Percent of Total Accidents
Opposite Direction	0	0
Rear End	52	37
Sideswipe	9	7
Angle Collision	1	1
Parked Vehicles	2	1
Fixed Object	48	35
Other	27	19
Total	139	100

The majority of accidents occurred in dry weather and during daylight conditions. Approximately 45 percent occurred on Friday, Saturday, or Sunday. The remaining 55 percent occurred Monday through Thursday. Forty-eight accidents, 35 percent, occurred during the summer months of June, July, and August, which represent 25 percent of the year. Of these summer accidents, 20 accidents, 42 percent, occurred on a Friday, Saturday, or Sunday. This is consistent with the weekend rates seen for the entire year.

As shown in **Table 14**, there were 53 accidents for the analysis period on the east approach roadway. Twenty-one percent, 11 accidents, occurred at log mile 2.95, the end of the study area near the MD 8 overpass and ramps. Twenty-six of the total accidents, 49 percent, were rear end collisions. Other accident types include fixed object, sideswipe, opposite direction, and other accidents. The primary cause listed on police reports for 43 percent of the accidents was failure to give full time/attention. Other causes include following too closely, driving too fast for conditions, driving under the influence of alcohol, animal, wet/icy/snow covered roadways, and unknown or other causes. There were also two instances of improper lane changes and one instance each of a driver falling asleep or fainting, an inoperable traffic control device, and a vehicle defect. Information was not available to determine the number of accidents on the east approach roadway that occurred during contraflow operations when westbound traffic has to merge from three lanes on the approach roadway to two lanes on the bridge.

Table 14. Accident Types Occurring on the East Approach Roadway

Accident Type	Number of Accidents	Percent of Total Accidents
Opposite Direction	1	2
Rear End	26	49
Sideswipe	6	11
Angle Collision	0	0
Parked Vehicles	0	0
Fixed Object	8	15
Other	12	23
Total	53	100

The majority of accidents occurred in dry weather and in daylight conditions. Approximately 58 percent occurred on a Friday, Saturday, or Sunday. The remaining 42 percent occurred Monday through Thursday. Twenty-four accidents, 45 percent, occurred during the summer months of June, July, and August, which represents 25 percent of the year. Of these summer accidents, 71 percent occurred on a Friday, Saturday, or Sunday. This is higher than the weekend rates seen for the rest of the year.

There were a total of 210 accidents on the bridge structure for the analysis period (See **Table 15**). The majority, 78 percent, were rear end collisions. The remaining accidents were fixed object, parked, sideswipe, opposite direction, angle, and other. The primary cause listed on police reports was failure to give full time/attention. Other causes included traveling too fast for conditions and following too closely.

Table 15. Accident Types Occurring on the Bridge Structure

Accident Type	Number of Accidents	Percent of Total Accidents
Opposite Direction	2	1
Rear End	164	78
Sideswipe	4	2
Angle Collision	1	1
Parked Vehicles	5	2
Fixed Object	13	6
Other	21	10
Total	210	100

The majority of accidents occurred in dry weather and during daylight conditions. Approximately 52 percent occurred on Friday, Saturday, or Sunday. The remaining 48 percent occurred on Monday through Thursday. Forty percent occurred during the summer months of June, July, and August. Of these summer accidents, 57 accidents (68 percent) occurred on a Friday, Saturday, or Sunday. The high level of weekend and summer accidents may be a result of vacation and recreational drivers who are less familiar with the bridge and it's setting. These drivers are more likely distracted by the views from the bridge and lack of shoulders.

FUTURE CONDITIONS

3.1 Demographics of Areas Near the Bridge

Demographic projections presented in this section are from the Maryland Department of Planning (MDP). These projections are consistent with projections from the Baltimore Metropolitan Council and Metropolitan Washington Council of Governments.

MDP projects that the population of Anne Arundel County will increase 8.7 percent between 2000 and 2010 to approximately 532,200. This is lower than the 11.4 percent growth rate MDP projects for the Washington region but higher than the 5.5 percent growth rate they expect for the Baltimore region. The population of Queen Anne's County is projected to increase 19.6 percent by 2010 to approximately 48,500. This is higher than the projected growth rates for the Baltimore and Washington regions and is the highest of the upper Eastern Shore counties (Caroline, Cecil, Kent, Queen Anne's and Talbot). Population in the upper Eastern Shore counties is projected to grow another 10.8 percent by 2010 to approximately 231,800 people. Similarly, population in the lower Eastern Shore counties (Dorchester, Somerset, Wicomico, and Worcester) is projected to grow an additional 8.2 percent by 2010 to approximately 202,000 people.

Similarly, MDP projects the number of jobs in Anne Arundel County to increase by 11.4 percent between 2000 and 2010 to an approximate 330,900 jobs. This represents a downward trend from the high level of job growth in the 1970s (35.4 percent) and 1980s (43.0 percent). The number of jobs in Queen Anne's County is projected to increase by 20.0 percent by 2010 to an approximate 21,000 jobs. Job growth is projected to continue by 13.4 and 12.2 percent by 2010 for the upper and lower Eastern Shore counties, respectively.

3.2 Bridge Structure

The westbound bridge deck has been undergoing rehabilitation since January 2002. The completion of the work should meet all major reconstruction and maintenance needs on the westbound structure in the foreseeable future.

In general, the deck of the eastbound bridge is in good condition. The concrete deck panels and cast-in-place concrete deck spans exhibit minor cracking. Considering the current condition of the deck and the projected increases in traffic volumes, it is anticipated that the deck will require rehabilitation around 2018. Depending on the type

and method of construction, the rehabilitation could require either long-term single lane closures or complete night time bridge closures. Because the bridge is projected to carry significant traffic volumes by 2018, the rehabilitation would likely result in substantial travel time delays.

3.3 Traffic

Unconstrained Average Daily Traffic (ADT) volume projections for 2025 were developed for a Saturday in summer and an average weekday as described in the *Travel Demand Model Technical Memorandum*, 2003. The projections represent unconstrained demand that does not account for congestion on the local roadway network or the maximum allowable throughput of the bridges or tollbooths. The unconstrained ADT forecasts were converted to unconstrained hourly volumes using hourly distribution K-factors² developed from existing (2001) count data. A capacity analysis was then performed based on the hourly volumes. This sketch level traffic analysis was deemed most appropriate for a quick assessment of the future transportation needs at the Bay Bridge and is based on the eastbound origin-destination survey and seasonal count data as well as regional transportation and land use models.

3.3.1 Average Daily Traffic

Consistent with the downward demographic trends, growth in Annual Average Daily Traffic (AADT) has declined over the last two decades from 5.4 percent per year between 1980 and 1985 to 3.2 percent per year from 1995 to 2000³. Historical traffic data provided by the Authority also indicates an annual increase in summer daily traffic of approximately one percent per year. While the rate of overall annual traffic growth is expected to continue to decrease, summer Average Daily Traffic volumes are forecasted to increase at a slightly higher rate of approximately two percent per year.

Summer Saturday. The projected two-direction unconstrained daily traffic on the Bay Bridge for year 2025 on a Saturday in summer is 135,000 vehicles. This is a 42 percent increase in traffic from year 2001⁴ (95,000 vehicles on a Saturday in August). The daily directional split in traffic based on existing count data for a Saturday in summer is 55 percent eastbound and 45 percent westbound.

Average Weekday. The projected two-direction unconstrained daily traffic on the Bay Bridge for year 2025 on an average weekday is 86,000 vehicles. This is a 41 percent increase in traffic from year 2001⁵ (61,000 vehicles). The daily directional split in traffic based on existing count data for an average weekday is 50 percent eastbound and 50 percent westbound.

⁴ Traffic counts conducted in August 2001 were used for comparison purposes. Base year for modeling purposes is 2000.

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² K-Factor – The proportion of Average Daily Traffic (ADT) occurring in the analysis hour. Source: 2000 Highway Capacity Manual, Transportation Research Board.

³ Data on AADT provided by the Authority.

⁵ Traffic counts collected in October 2001 used for comparison purposes. Base year for modeling is 2000.

3.3.2 Peak Hour Traffic

Summer Saturday. Hourly distribution of directional traffic for year 2025 was developed based on K-factors derived from 24-hour counts conducted on Saturday, August 18, 2001. The directional K-factors and hourly distribution for 2025 are shown in **Table 16**. This results in unconstrained hourly volumes that are in excess of the capacity of the toll plaza and the bridges. A separate study conducted for the Authority determined the maximum volumes that can be serviced under LOS E conditions for the toll plaza and bridge. Based on that study, the maximum LOS E volume for eastbound traffic on the Bay Bridge, under contraflow conditions, was calculated to be 5,175 vehicles. Volumes exceeding this limit would result in LOS F conditions.

Table 16. 2025 Unconstrained Hourly Volumes

		SUMMI	ER SATURDAY		
START TIME	WEEKEND EB K-FACTOR	2025 EB TOTAL	WEEKEND WB K-FACTOR	2025 WB TOTAL	TOTAL
12:00 AM	1.02%	770	0.92%	544	1,313
1:00	0.74%	556	0.75%	444	999
2:00	0.50%	379	0.59%	348	727
3:00	0.62%	468	0.82%	489	958
4:00	0.69%	523	1.25%	741	1,263
5:00	1.26%	955	2.74%	1627	2,582
6:00	2.34%	1,769	4.95%	2940	4,709
7:00	3.10%	2,343	6.15%	3652	5,995
8:00	3.57%	2,696	5.02%	2977	5,673
9:00	4.06%	3,065	4.57%	2709	5,774
10:00	5.34%	4,029	4.58%	2717	6,746
11:00	5.99%	4,521	5.33%	3160	7,681
12:00 PM	6.34%	4,784	5.85%	3474	8,258
1:00	6.54%	4,939	6.38%	3785	8,724
2:00	7.23%	5,462	6.32%	3749	9,211
3:00	7.63%	5,762	7.32%	4341	10,103
4:00	7.55%	5,703	6.92%	4107	9,810
5:00	7.63%	5,759	6.16%	3658	9,417
6:00	5.98%	4,517	5.86%	3475	7,992
7:00	5.49%	4,147	5.04%	2988	7,135
8:00	5.27%	3,983	4.25%	2520	6,503
9:00	5.36%	4,048	3.55%	2104	6,151
10:00	3.36%	2,540	2.88%	1708	4,248
11:00	2.38%	1,798	1.82%	1079	2,877
TOTAL	100.0%	75,516	100.0%	59,334	134,850

K-Factor is the proportion of Average Daily Traffic (ADT) occurring in the analysis hour.

The future constrained traffic can be expected to result in longer queues and increased travel times in the vicinity of the Bay Bridge. These longer queues will be compounded by the other existing and growing queues along the US 50 corridor. In addition, it is expected that some drivers would choose alternate departure times (peak spreading),

find alternate routes to their ultimate destination (diversion), or not make certain types of trips.

Average Weekday. Hourly distribution of directional traffic for year 2025 was developed based on K-factors derived from the 24-hour counts conducted on Wednesday, October 17, 2001. The directional K-factors and hourly distribution for 2025 are shown in **Table 17**.

Table 17. 2025 Unconstrained Hourly Volumes

1 4510 171 2020	Table 17. 2025 Officonstrained Hourly Volumes								
	AVERAGE WEEKDAY								
START TIME	Weekday EB K-FACTOR	2025 EB TOTAL	Weekday WB K-FACTOR	2025 WB TOTAL	Total				
12:00 AM	1.09%	468	0.82%	351	819				
1:00	0.77%	330	0.66%	285	615				
2:00	0.78%	336	0.54%	234	570				
3:00	0.71%	306	0.99%	425	731				
4:00	0.86%	368	1.87%	804	1,172				
5:00	1.51%	650	4.66%	1,999	2,649				
6:00	2.86%	1,227	8.26%	3,547	4,774				
7:00	4.02%	1,727	10.12%	4,344	6,071				
8:00	4.40%	1,891	8.33%	3,576	5,467				
9:00	4.78%	2,054	6.18%	2,653	4,707				
10:00	4.98%	2,136	5.16%	2,216	4,352				
11:00	5.03%	2,159	5.12%	2,200	4,359				
12:00 PM	5.27%	2,263	5.13%	2,201	4,464				
1:00	5.15%	2,210	5.05%	2,166	4,376				
2:00	6.01%	2,580	5.52%	2,370	4,950				
3:00	7.92%	3,402	5.79%	2,484	5,886				
4:00	9.71%	4,170	5.75%	2,471	6,641				
5:00	9.76%	4,189	5.57%	2,393	6,582				
6:00	8.20%	3,520	4.48%	1,925	5,445				
7:00	4.96%	2,130	3.30%	1,418	3,548				
8:00	3.68%	1,579	2.50%	1,073	2,652				
9:00	3.35%	1,437	2.03%	872	2,309				
10:00	2.44%	1,049	1.30%	559	1,608				
11:00	1.76%	757	0.87%	373	1,130				
TOTAL	100.0%	42,938	100.0%	42,939	85,877				

3.3.3 Capacity Analysis

Summer Saturday. Future hourly volumes were analyzed for both normal operating conditions as well as contraflow operations.

<u>Capacity Analysis – Normal Operations</u> Eastbound traffic flows across the Bay Bridge were analyzed as a two-lane freeway segment and westbound flows were analyzed as a three-lane freeway segment. The resulting unconstrained levels of service for several of the heaviest volume hours of the day are shown in **Table 18** and on **Figure 8** using LOS threshold volumes. Based on the projected unconstrained hourly distribution, the eastbound bridge will operate at LOS "F" between the hours of 10 AM and 10 PM when

the bridges are operating under normal conditions (two eastbound lanes). The westbound bridge operates at LOS "D" or better for most of the day under normal conditions (three westbound lanes). Capacity analysis worksheets are included in **Appendix G (Volume II)**.

Table 18. 2025 Unconstrained Hourly Level of Service (LOS) - Normal Operations

	SUMMER SATURDAY								
START TIME	2025 EB TOTAL	LOS	2025 WB TOTAL	LOS					
10:00 AM	4,029	F	2,717	В					
11:00	4,521	F	3,160	С					
12:00 PM	4,784	F	3,474	С					
1:00	4,939	F	3,785	С					
2:00	5,462	F	3,749	С					
3:00	5,762	F	4,341	D					
4:00	5,703	F	4,107	С					
5:00	5,759	F	3,658	С					
6:00	4,517	F	3,475	С					
7:00	4,147	F	2,988	С					
8:00	3,983	E	2,520	В					
9:00	4,048	F	2,104	В					

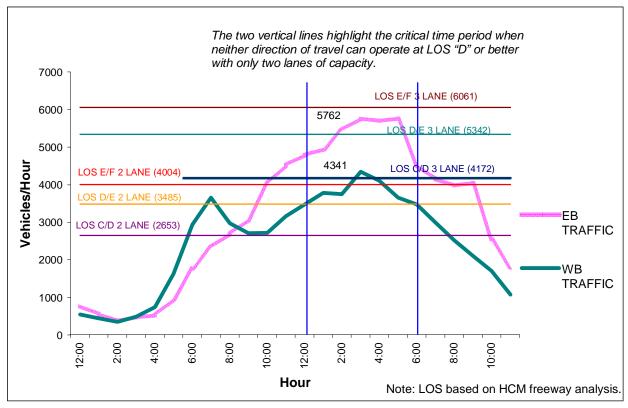


Figure 8. 2025 Unconstrained Hourly Volume Distribution Summer Saturday – Normal Operations

Capacity Analysis – Reversible Lane Operations For contraflow lane operations during times of peak directional flow, two of the lanes on the three-lane westbound bridge remain open for westbound traffic and the third lane is opened to eastbound traffic. The Highway Capacity Manual does not have a set of procedures to evaluate this type of reversible lane operation. Therefore, to calculate LOS for multi-lane traffic with adjacent opposing traffic, the LOS for westbound traffic was estimated by analyzing the traffic as a two-lane, two-way highway (for the middle lane on the westbound bridge) and a multi-lane highway (for the outside westbound lane). Actual percentage volumes per lane were used for this analysis. Similarly, the eastbound traffic was analyzed as a two-lane, two-way highway for the traffic on the westbound bridge and a two-lane freeway for traffic on the eastbound bridge. **Figure 7**, shown on page 2-18, shows typical reversible lane usage on the Bridge.

Table 19 for both contraflow lane operations and normal operations. As seen from this table, during periods of peak flow in both directions, contraflow operations only slightly improve the LOS for four of the 12 hours (6 PM to 10 PM) in the eastbound direction and a majority of the hours remain at undesirable levels of service. In the westbound direction the LOS deteriorates to undesirable levels for seven hours in the westbound direction due to the contraflow lane operations. On **Figure 8**, the two vertical lines highlight the critical time period when neither direction of travel can operate at LOS "D" or better with only two lanes of capacity. Therefore, during this time contraflow operations would fail to meet the capacity needs. As with the existing conditions, westbound congestion on a typical Saturday in the summer would occur as the result of contraflow operations.

Table 19. 2025 Unconstrained Hourly Level of Service- Contraflow Operations

	SUMMER SATURDAY									
		EASTBOU	IND			WESTBO	UND			
	2025	Level	of Servic	е	2025	Leve	I of Service	e		
START TIME	EB TOTAL TRAFFIC	Normal Operations	Contr Opera		WB TOTAL TRAFFIC	Normal Operations	Contr Opera	aflow ations		
····- <u>-</u>	VOLUME	(Lanes 4, 5)	Lane 4, 5 ¹	Lane 3 ²	VOLUME	(Lanes 1,2,3)	Lane 1 ³	Lane 2 ⁴		
10:00 AM	4,029	F	Е	Е	2,717	В	D	Е		
11:00	4,521	F	Е	Е	3,160	С	D	Е		
12:00 PM	4,784	F	F	F	3,474	С	Е	F		
1:00	4,939	F	F	F	3,785	С	Е	F		
2:00	5,462	F	F	F	3,749	С	Е	F		
3:00	5,762	F	F	F	4,341	D	F	F		
4:00	5,703	F	F	F	4,107	С	F	F		
5:00	5,759	F	F	F	3,658	С	Ε	F		
6:00	4,517	F	Ε	F	3,475	С	Ε	F		
7:00	4,147	F	Е	Е	2,988	С	D	Е		
8:00	3,983	E	D	Е	2,520	В	С	Е		
9:00	4,048	F	Е	Е	2,104	В	С	Е		

Lane numbers correspond to lanes shown in Figure 7.

Average Weekday. Future hourly volumes were analyzed for both normal operating conditions as well as contraflow operations.

<u>Capacity Analysis – Normal Operations</u> Eastbound traffic flows across the Bay Bridge were analyzed as a two-lane freeway segment and westbound flows were analyzed as a three-lane freeway segment. The resulting unconstrained levels of service for several of the heaviest volume hours of the day are shown in **Table 20** and on **Figure 9** using LOS threshold volumes.

The eastbound bridge would experience queuing and delays operating at LOS "F" between 4 PM and 6 PM and at LOS "E" from 6 PM to 7 PM. The westbound bridge operates at satisfactory levels of service during most of the day. Capacity analysis worksheets are included in **Appendix G (Volume II)**.

Table 20. 2025 Unconstrained Hourly Level of Service (LOS) – Normal Operations

AVERAGE WEEKDAY								
START TIME	2025 EB TOTAL	LOS	2025 WB TOTAL	LOS				
6:00 AM	1,227	В	3,547	С				
7:00	1,727	В	4,344	D				
8:00	1,891	С	3,576	С				
9:00	2,054	С	2,653	В				
10:00	2,136	С	2,216	В				
11:00	2,159	С	2,200	В				
12:00 PM	2,263	С	2,201	В				
1:00	2,210	С	2,166	В				
2:00	2,580	С	2,370	В				
3:00	3,402	D	2,484	В				
4:00	4,170	F	2,471	В				
5:00	4,189	F	2,393	В				
6:00	3,520	Е	1,925	В				
7:00	2,130	С	1,418	Α				
8:00	1,579	В	1,073	Α				
9:00	1,437	В	872	Α				

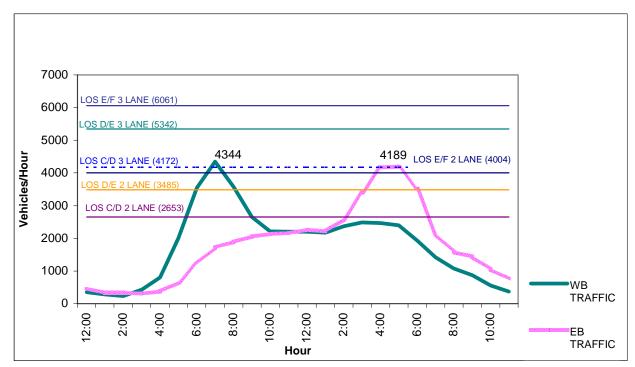


Figure 9. 2025 Unconstrained Hourly Volume Distribution Average Weekday – Normal Operations

<u>Capacity Analysis - Reversible Lane Operations</u> The reversible lane operation is currently utilized for normal weekday operation only on an "as-needed" basis. The same methodology that was used for the existing analysis was applied for the future analysis and only the peak periods where the volumes were at or beyond capacity for normal operation were analyzed.

The unconstrained levels of service for the period from 4 PM to 7 PM are shown in **Table 21** and compared to LOS for normal operations. As seen from this table, during periods of peak flow in both directions, contraflow lane operations improve the LOS for two of the three hours in the eastbound direction but the westbound direction LOS deteriorates to near capacity for the same two hours for the inner lane of travel.

Table 21. 2025 Unconstrained Hourly Level of Service (LOS) - Contraflow Operations

	AVERAGE WEEKDAY								
		EASTBO	DUND		WESTBOUND				
	2025	Leve	l of Service	е	2025	Leve	l of Service	е	
START TIME	EB Total Traffic	Normal Operations	Reversible Operations		WB Total Traffic	Normal Operations		rsible ations	
Time	Volume	(Lanes 4, 5)	Lanes 4 & 5 ¹	Lane 3 ²	Volume	(Lanes 1, 2 & 3)	Lane 1 ³	Lane 2 ⁴	
4:00 PM	4,170	F	D	D	2,471	В	С	E	
5:00	4,189	F	D	D	2,393	В	С	Е	
6:00	3,520	E	Е	D	1,925	В	С	D	

Lane numbers correspond to lanes shown in Figure 7.

180 Percent of Eastbound Traffic on Eastbound Bridge (Lanes 1 & 2).

200 Percent of Eastbound Traffic on Westbound Bridge (Lane 3).

355 Percent of Westbound Traffic in Outer Lane (Lane 1).

445 Percent of Westbound Traffic in Inner Lane (Lane 2).



SUMMARY AND CONCLUSIONS

4.1 Study Area

The Bay Bridge study area extends a distance of 5.8 miles along U.S. Route 50/301, between the Oceanic Drive overpass in Anne Arundel County and the MD 8 overpass in Queen Anne's County. Within the study limits, U.S. Route 50/301 includes two parallel steel bridge structures, collectively known as the Bay Bridge, that span 4.3 miles, from shore to shore, across the Chesapeake Bay. It is the only roadway crossing of the Chesapeake Bay in Maryland.

The areas in the vicinity of the Bay Bridge have seen high levels of population and employment growth for the past several decades. This growth is projected to increase for the next ten years at a pace greater than the rest of the Baltimore-Washington region.

The Bay Bridge serves as a critical link in connecting several priority funding areas (PFA) on either side of the Chesapeake Bay. These PFAs, targeted for future economic development and growth, include the City of Annapolis and the community of Arnold, in Anne Arundel County on the west side of the Bridge and portions of Kent Island, Stevensville, and Grasonville, in Queen Anne's County on the east side of the bridge.

4.2 Roadway Geometry

The eastbound bridge was opened over 50 years ago and originally served traffic in both the eastbound and westbound directions. It now carries two lanes of eastbound traffic. The second bridge opened 30 years ago and carries three lanes of westbound traffic. This lane configuration represents normal operating conditions. Contraflow lane operation is used during periods of peak congestion, incident response, or construction and maintenance activities.

U.S. 50/301 is a six-lane divided highway on both approaches to the Bay Bridge. There is an 11-lane toll plaza west of the Bridge that provides one-way toll collection for eastbound vehicles. There are also transition areas on each side of the bridge to allow for contraflow operations. The transition and lane shift designs meet current minimum American Association of State Highway and Transportation Officials (AASHTO) standards and allow for a smooth transition of traffic to/from either bridge.

From a geometric review standpoint, the three percent grade on the eastbound and westbound bridges is within desirable AASHTO guidelines for urban arterials. However, the steepness of the grade in combination with a stop condition for traffic passing through the eastbound toll plaza, results in heavy vehicles traveling below the posted speed causing some delay for all vehicles using the eastbound bridge. AASHTO guidelines recommend minimal safety offsets on long span bridges. Both bridges have approximately one-foot offsets between travel lanes and the bridge rails leaving no room for disabled vehicles to pull out of the traveled lanes. Disabled vehicles routinely block traffic. The loss of a lane due to a disabled vehicle or other incident management activities can have a significant impact on the vehicular capacity of the bridges.

4.3 Travel Patterns

On an average summer Saturday, 82 percent of the eastbound traffic using the Bay Bridge comes from the Baltimore-Washington metropolitan area. Twenty-four percent of the traffic is destined to Queen Anne's and Kent counties with another 24 percent destined to other locations on Maryland's Eastern Shore, excluding Ocean City. Ocean City and the Delaware Beach resorts attract 23 percent and 20 percent of the traffic, respectively. During the summer Saturday, 83 percent of the trips begin at home and 37 percent are destined to recreation or tourism activities.

On an average weekday 93 percent of eastbound traffic using the Bay Bridge comes from the Baltimore-Washington metropolitan area. Fifty-two percent of the traffic is destined to Queen Anne's and Kent counties with another 35 percent destined to Maryland's Eastern Shore, including Ocean City. On an average weekday, 85 percent of the trips began at work or home and 77 percent end at work or home.

4.4 Travel Demand and Traffic Operations

The Bay Bridge carries approximately 53 percent more traffic on an average Saturday in summer (92,000 vehicles) than on an average weekday (60,000 vehicles). By 2025, the daily volumes are expected to increase to approximately 135,000 vehicles on an average Saturday in summer and 86,000 vehicles on an average weekday.

Trucks account for approximately five percent of total traffic on an average summer Saturday and approximately 14 percent on an average weekday. The trucks travel predominantly in the non-peak periods; however, the truck percentage of 14 percent for an average weekday significantly exceeds the Statewide average of four percent on other urban arterials.

The increased volumes of traffic on summer weekends cause the section of U.S. Route 50/301 approaching the toll plaza to experience significant congestion queuing. The queues usually start to build on Friday around midday and last into the evening (approximately 6 to 7 PM). The queues tend to be longer during summer holiday weekends such as Memorial Day and Independence Day. These queues occur even when all eleven-toll lanes are open and contraflow operations are used to maximize the Bridge's vehicular capacity in the peak direction of travel.

By the year 2025, the eastbound bridge is expected to operate at level of service (LOS) "E" or "F" for several hours during the PM peak period for an average weekday. On an average Saturday in summer, the eastbound bridge is expected to operate at LOS "F"

between the hours of 10 AM and 10 PM when the bridges are operated under normal conditions. The westbound bridge is expected to operate at LOS "D" or better for most of the day, under normal conditions.

During periods of peak flow in both directions, it is anticipated that contraflow operations will slightly improve the LOS for four of the 12 hours (6 PM to 10 PM) in the eastbound direction and a majority of the hours remain at undesirable levels of service. In the westbound direction the LOS deteriorates to undesirable levels for seven hours of the summer Saturday due to the contraflow operations on the bridge. Westbound congestion is a result of the contraflow operations due to the reduction from three to two westbound lanes.

These levels of service are based on an unconstrained hourly volume assignment that does not take into account congestion on the adjacent street network, at the toll plaza or on the Bridge. Under constrained traffic conditions, it is expected that the hours of congestion will increase due to peak spreading (drivers selecting alternative travel times to avoid peak congestion). In addition, it is anticipated that some drivers would select alternative routes or cancel certain types of discretionary trips. The future constrained traffic can be expected to result in longer queues and increased travel times in the vicinity of the Bay Bridge. These longer queues will be compounded by the other existing and growing queues along the US 50 corridor.

4.5 Maintenance

Based on the current condition of the eastbound bridge deck and the projected increases in traffic volumes, it is anticipated that the deck will require rehabilitation by 2018. Depending on the type and method of construction, the rehabilitation could require long-term single lane closures or complete nighttime bridge closures of the eastbound bridge. Because the bridge is projected to carry significant traffic volumes by 2018, the rehabilitation would likely result in substantial travel time delays.

4.6 Safety

Accident data analyzed for the period from January 1999 to October 2002 show a total of 402 accidents in the study area. Approximately 60 percent of the collisions are rearend accidents which are frequently associated with traffic congestion. The study area's rate for rear-end collisions is significantly higher than the Statewide rates for both urban and rural arterials.

Approximately 39 percent of the accidents occur in the summer months of June, July, and August, which account for approximately 35 percent of the annual Vehicle Miles of Travel (VMT). Of these summer accidents, 60 percent occurred on a Friday, Saturday, or Sunday. Approximately half of the total accidents occur on weekends (Friday, Saturday, Sunday) with 45 percent of them occurring on Fridays. The total daily traffic volume on an average Friday in the summer is approximately 40 percent higher than the average annual daily traffic.

Approximately 27 percent of accidents involve trucks resulting in a truck accident rate that is significantly higher than the statewide rate for the urban portion of the study area and slightly over the statewide rate for the rural portion of the study area. This

correlates with a higher than average percent of trucks in the study area (five percent for average Saturday in summer and 14 percent for average weekday).

Almost 90 percent of the accidents occur under dry weather conditions and 85 percent occur during the day indicating that neither wet pavement nor lighting is a major contributor to accidents in the study area.

While the largest number of accidents occurs on the bridge structure, the largest occurrence of accidents in proportion to the length of the segment occurs on the west approach roadway. Thirty-five percent of the accidents on the west approach roadway occurred in the immediate vicinity of the tollbooths and were mostly fixed object collisions. Another concentration of accidents occurred at the beginning of the bridge.

Finally, the probable cause listed on the police reports for 53 percent of the accidents was "failure to give full attention" which may be a result of drivers being distracted by the volume of traffic, geometric conditions, other vehicle occupants, in-vehicle electronic devices, scenery and/or unfamiliar roadways. In addition, eastbound drivers traveling through the toll plaza can be distracted while trying to find money for the toll or putting away change and/or receipts.

4.7 Conclusion

The transportation needs identified in this study primarily relate to capacity, safety, and maintenance requirements. The existing needs are projected to continue and worsen into the future.

The Bay Bridge currently experiences LOS "E/F" in the eastbound direction for several hours during the summer weekend peak periods. By 2025, it is anticipated to operate at LOS "E/F" for an extended period of time (12 hours a day) on summer Saturdays and for several hours during average weekday PM peak periods. The westbound bridge is expected to operate at LOS "D" or better for most of the day, under normal conditions.

The current contraflow lane operation that is used to increase peak direction capacity is not expected to mitigate the LOS. During periods of peak flow in both directions, it is anticipated that contraflow operations would improve the LOS for four of the 12 hours in the eastbound direction and in the westbound direction the LOS is anticipated to deteriorate to LOS "F" for seven hours on summer Saturdays. Westbound congestion is a result of the contraflow operations when westbound traffic is restricted to two rather than three travel lanes on the bridge.

The future constrained traffic can be expected to result in longer queues and increased travel times in the vicinity of the Bay Bridge. These longer queues will be compounded by the other existing and growing queues along the US 50 corridor.

The bridge capacity is reduced by the lack of a climbing lane for trucks, which make up more of the vehicle composition than on similar types of facilities. In addition, the bridge's lack of shoulders to accommodate disabled vehicles outside the travel lanes further reduces capacity.

Approximately 60 percent of the collisions in the study area are rear-end accidents which are frequently associated with traffic congestion. The study area's rate for rear-

end collisions is significantly higher than the Statewide rates for both urban and rural arterials.

Finally, planned future maintenance and rehabilitation of the eastbound Bay Bridge could require long-term single lane closures or complete nighttime bridge closures of the eastbound bridge which would likely result in substantial travel time delays.

The transportation needs for the Bay Bridge outlined in this report should be looked at in the context of the larger transportation facility along the US 50 corridor.



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Mr. Charles Ray, Facility Manager, Francis Scott Key Bridge

Metropolitan Washington Council of Governments

Mr. Michael Clifford, Systems Planning Application Director

Mr. J.C. Park, Transportation Engineer

Rappahannock Area Development Commission

Mr. Stephen Manster, Executive Director

Johnson, Mirmiran & Thompson

Mr. Matt Wolniak, Vice President

Parsons

Mr. Bala Akundi, Senior Transportation Engineer

Ms. Maureen Decker, Senior Transportation Engineer

Mr. Joseph Springer, Senior Transportation Planner

Ms. Harriet K. Levine, Senior Transportation Engineer

Mr. Stephen C. Walter, Vice President

KCI Technologies, Inc.

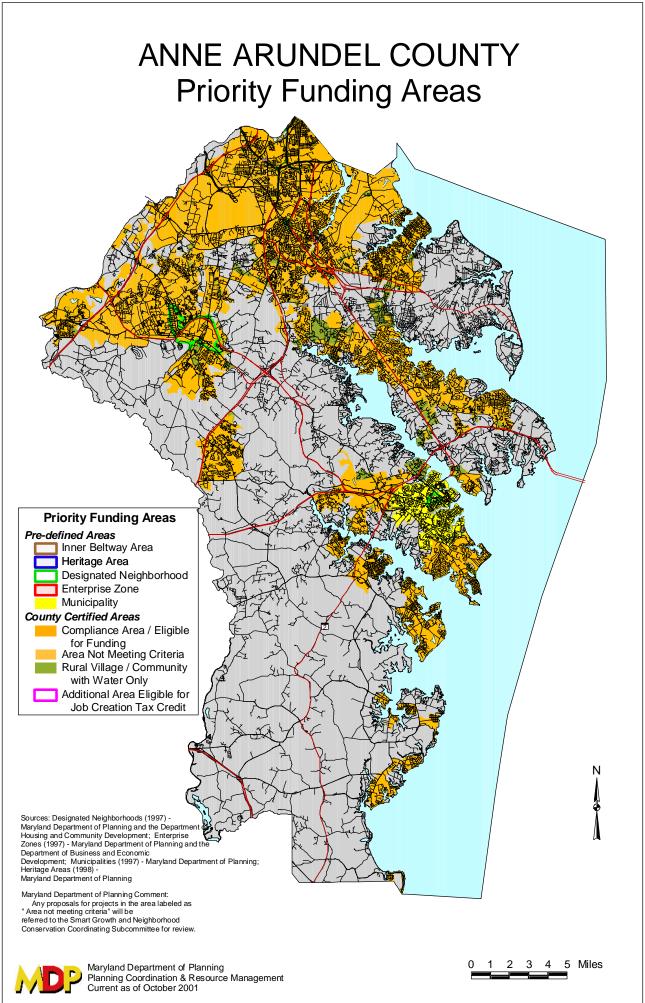
Mr. Harvey Floyd, Principal-in-Charge

Mr. Steve Drumm, Senior Highway Engineer

Ms. Angela Jones, Planner



PRIORITY FUNDING AREA MAPS



Sources: Designated Neighborhoods (1997) Naryland Department of Plann ing and the Department of Housing and Community Development: Enterprise Zones (1997) - Maryland Department of Planning and the Department of Business and Economic Development, Municipalities (1997) - Maryland Department of Planning: Heritage Areas (1998) Maryland Department of Planning Any proposals for projects in the area labeled as "Manyland Department of Planning Comment Area" will be referred to the Smart Growth and Neighborhood Conservation Coordinating Subcommittee for review Maryland Department of Planning Comment: QUEEN ANNE'S COUNTY Priority Funding Areas Maryland Department of Planning Planning Coordination & Resource Management Current as of March 4, 2002 Compliance Area / Eligible Additional Area Eligible for Designated Neighborhood for Funding Area Not Meeting Criteria Rural Village / Community Job Creation Tax Credit **Priority Funding Areas** Inner Beltway Area with Water Only County Certified Areas **Enterprise Zone** Heritage Area Municipality Pre-defined Areas

AERIAL FIGURES



FIGURE C-1
BAY BRIDGE (WEST APPROACH)

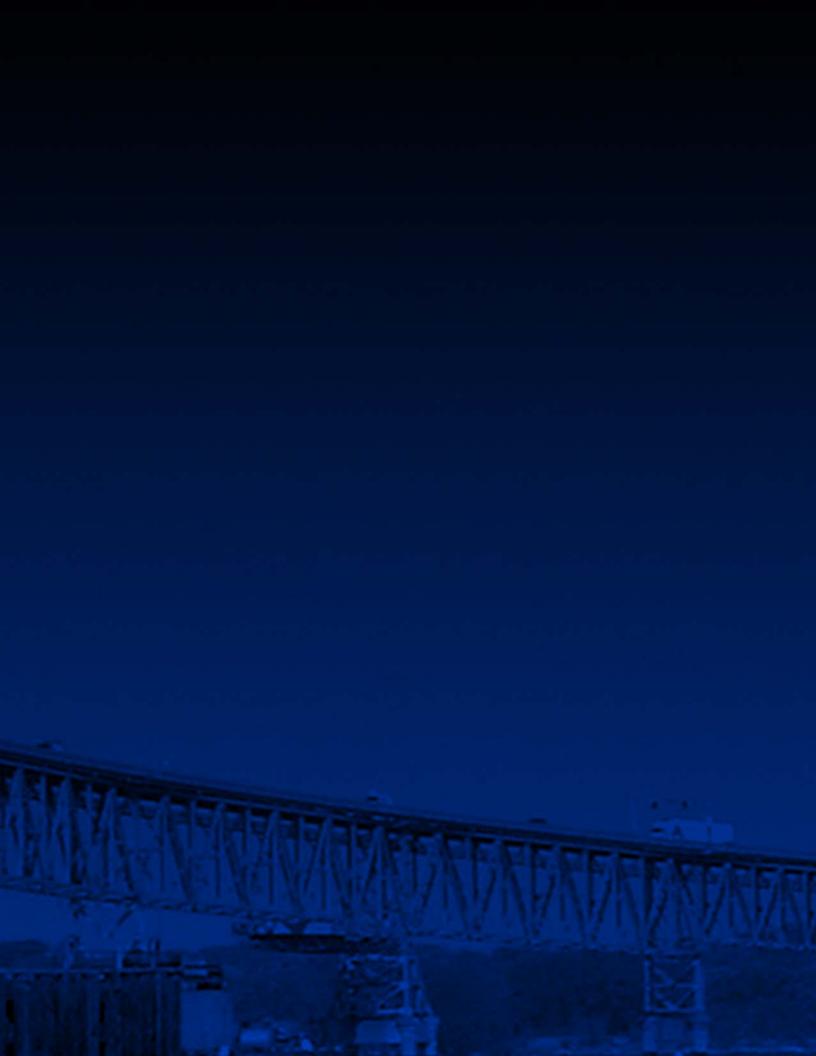
SCALE 1:200
FEET
50 0 100 200



BAY BRIDGE (EAST APPROACH)

SCALE 1:200

FEET
50 0 100 200





TRANSPORTATION NEEDS REPORT

William Preston Lane Jr. Memorial (Bay) Bridge



December 2004

Volume II of II



EXISTING TRAFFIC SUMMARIES

Location: William Preston Lane Bridge (Bay Bridge)

Direction: Eastbound

Date: Saturday, August 18, 2001

						Heavy Vehicles	s			
Beginning		Passenger		Single Unit					Total Heavy	
Hour	Motorcycles	Cars	Buses	Trucks	WB40	WB50	WB60	Length > 66'	Vehicles	Total
0:00	0	766	6	34	9	27	8	1	79	851
01:00	0	405	12	14	6	32	5	1	58	475
02:00	0	340	7	20	7	23	3	1	54	401
03:00	0	277	20	26	11	26	7	2	72	369
04:00	2	303	22	35	14	38	7	1	95	422
05:00	1	626	30	63	13	29	11	2	118	775
06:00	3	1500	28	61	14	47	8	5	135	1666
07:00	3	2751	25	90	23	21	18	4	156	2935
08:00	6	3364	29	96	22	40	13	2	173	3572
09:00	5	3466	37	67	23	33	19	3	145	3653
10:00	8	3354	28	71	17	30	14	2	134	3524
11:00	11	3285	32	57	22	28	7	1	115	3443
12:00	6	3336	30	80	21	20	13	2	136	3508
13:00	5	2882	25	46	12	23	16	1	98	3010
14:00	6	2956	11	68	20	14	6	2	110	3083
15:00	9	3421	25	79	19	37	10	4	149	3604
16:00	14	3272	29	85	16	37	9	5	152	3467
17:00	6	1843	17	70	17	21	9	2	119	1985
18:00	3	2071	14	74	11	23	4	1	113	2201
19:00	2	1646	17	67	12	28	4	1	112	1777
20:00	1	1369	15	45	13	23	9	4	94	1479
21:00	0	1218	8	42	6	24	9	2	83	1309
22:00	1	981	3	23	5	15	3	1	47	1032
23:00	0	687	2	33	4	19	3	1	60	749
Total:	92	46119	472	1346	337	658	215	51	2607	49290
Percentage:	0.20%	93.57%	0.96%	2.73%	0.68%	1.33%	0.44%	0.10%	5.29%	

Total Motorcycles, Cars and Buses:	46683
Percentage Motorcycles, Cars and Buses:	94.71%

Total Heavy Vehicles:	2607
Percentage Heavy Vehicles:	5.29%

Location: William Preston Lane Bridge (Bay Bridge)

Direction: Westbound

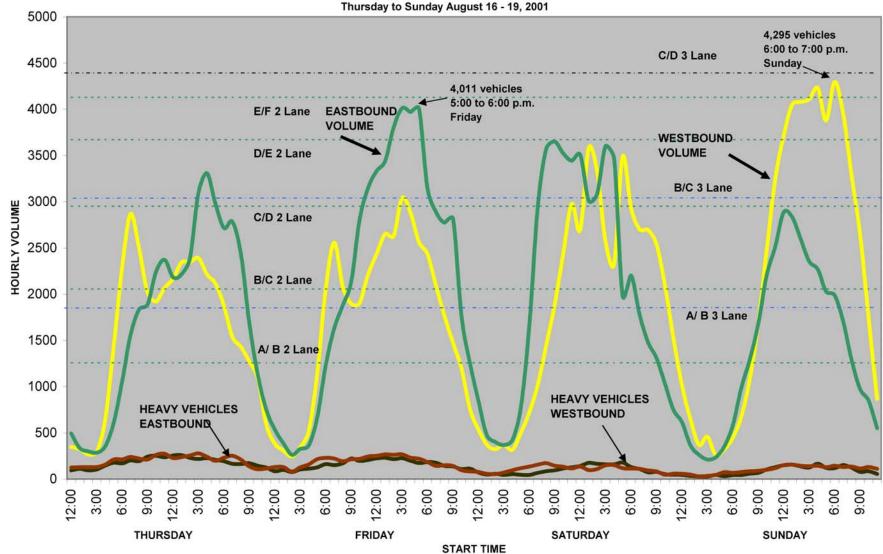
Date: Saturday, August 18, 2001

\neg			3	Heavy Vehicles	ı					
vy	Total Heavy					Single Unit		Passenger		Beginning
s Tota	Vehicles	Length > 66'	WB60	WB50	WB40	Trucks	Buses	Cars	Motorcycles	Hour
539	71	0	11	31	11	18	6	462	0	0:00
372	49	0	10	20	9	10	4	319	0	01:00
324	57	1	8	27	11	10	10	256	1	02:00
372	46	1	10	19	6	10	7	319	0	03:00
31	54	2	5	31	10	6	2	260	1	04:00
50 ⁻	47	2	5	18	5	17	4	450	0	05:00
72	46	2	3	13	8	20	6	669	1	06:00
101	67	2	17	19	14	15	9	942	1	07:00
144	86	4	9	32	13	28	17	1340	2	08:00
188	96	4	18	28	16	30	26	1765	0	09:00
243	114	3	15	31	24	41	24	2297	4	10:00
297	127	2	7	24	35	59	47	2803	1	11:00
269	142	1	2	8	17	114	37	2511	5	12:00
358	176	1	6	5	26	138	51	3355	3	13:00
333	165	4	11	20	36	94	40	3124	4	14:00
256	160	1	4	7	21	127	44	2352	9	15:00
232	160	4	7	6	20	123	37	2124	6	16:00
348	180	1	11	19	32	117	65	3238	5	17:00
293	130	4	18	31	16	61	54	2743	4	18:00
270	110	1	15	31	13	50	42	2546	5	19:00
269	73	1	8	14	13	37	22	2597	2	20:00
254	78	1	3	23	10	41	17	2446	0	21:00
209	54	2	3	11	11	27	10	2031	2	22:00
152	47	1	5	15	6	20	9	1462	4	23:00
4539	2335	45	211	483	383	1213	590	42411	60	Total:
	5.14%	0.10%	0.46%	1.06%	0.84%	2.67%	1.30%	93.42%	0.13%	Percentage:

Total Motorcycles, Cars and Buses:	43061
Percentage Motorcycles, Cars and Buses:	94.86%

Total Heavy Vehicles:	2335
Percentage Heavy Vehicles:	5.14%

FIGURE E-1
HOURLY VOLUME COMPOSITE CHART - BAY BRIDGE
Thursday to Sunday August 16 - 19, 2001



Location: William Preston Lane Bridge (Bay Bridge)

Direction: Eastbound

Date: Wednesday, October 17, 2001

				Heavy Vehicles						
Beginning		Passenger		Single Unit					Total Heavy	
Hour	Motorcycles	Cars	Buses	Trucks	WB40	WB50	WB60	Length > 66'	Vehicles	Total
0:00	0	240	4	17	17	66	30	0	130	374
01:00	0	96	2	15	7	46	27	0	95	193
02:00	2	67	4	11	11	47	31	0	100	173
03:00	2	69	2	18	15	56	28	2	119	192
04:00	0	107	4	18	18	82	27	2	147	258
05:00	1	248	12	39	21	83	28	2	173	434
06:00	2	651	21	62	30	58	23	3	176	850
07:00	0	1010	24	83	20	67	13	4	187	1221
08:00	2	1183	31	85	21	62	21	0	189	1405
09:00	0	1070	16	73	25	68	29	1	196	1282
10:00	0	1124	25	78	34	81	25	3	221	1370
11:00	0	1343	27	84	25	75	38	4	226	1596
12:00	1	1310	12	82	31	62	39	7	221	1544
13:00	3	1495	22	99	23	71	36	3	232	1752
14:00	2	1556	23	75	28	73	29	6	211	1792
15:00	3	1940	19	92	26	65	37	3	223	2185
16:00	3	2350	24	99	19	78	24	2	222	2599
17:00	0	2836	15	102	27	72	29	1	231	3082
18:00	3	2864	23	125	30	81	54	1	291	3181
19:00	2	1603	17	66	25	54	35	0	180	1802
20:00	2	1247	17	66	20	70	34	2	192	1458
21:00	1	938	9	38	8	53	29	2	130	1078
22:00	2	672	10	45	6	52	23	5	131	815
23:00	0	410	11	41	7	43	35	4	130	551
Total:	31	26429	374	1513	494	1565	724	57	4353	31187
Percentage:	0.10%	84.74%	1.20%	4.85%	1.58%	5.02%	2.32%	0.18%	13.96%	

Total Motorcycles, Cars and Buses:	26834
Percentage Motorcycles, Cars and Buses:	86.04%

Total Heavy Vehicles:	4353
Percentage Heavy Vehicles:	13.96%

Location: William Preston Lane Bridge (Bay Bridge)

Direction: Westbound

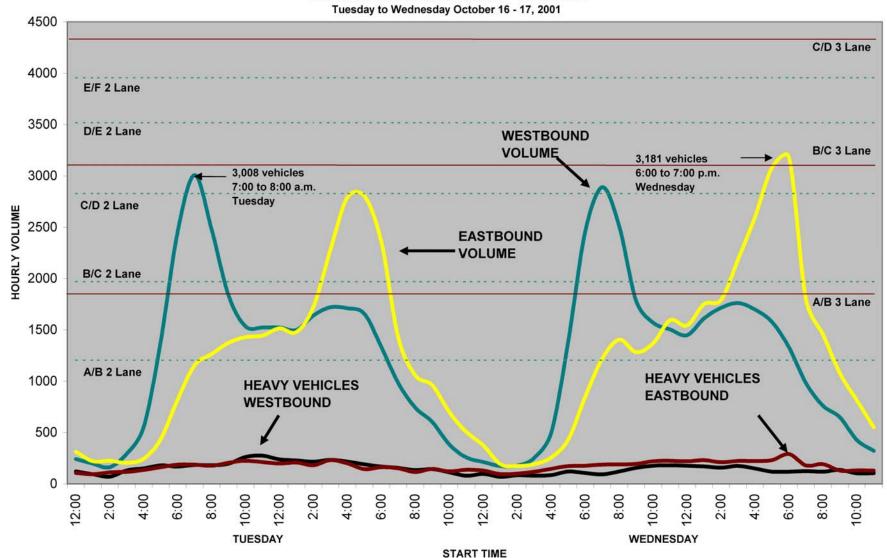
Date: Wednesday, October 17, 2001

				Heavy Vehicles						
Beginning		Passenger		Single Unit					Total Heavy	
Hour	Motorcycles	Cars	Buses	Trucks	WB40	WB50	WB60	Length > 66'	Vehicles	Total
0:00	0	106	4	9	11	57	24	1	102	212
01:00	1	96	3	8	6	47	12	1	74	174
02:00	0	85	5	8	15	56	8	1	88	178
03:00	2	149	3	25	16	47	10	3	101	255
04:00	1	382	3	36	13	52	14	4	119	505
05:00	4	1207	22	59	17	58	16	7	157	1390
06:00	1	2267	14	86	26	45	15	6	178	2460
07:00	1	2727	9	70	24	41	14	5	154	2891
08:00	0	2290	18	93	30	59	12	3	197	2505
09:00	4	1535	9	86	29	87	29	2	233	1781
10:00	1	1332	19	61	33	90	35	0	219	1571
11:00	2	1249	17	72	29	107	28	1	237	1505
12:00	2	1211	6	60	34	102	32	2	230	1449
13:00	5	1365	18	73	21	95	31	5	225	1613
14:00	1	1484	23	73	28	80	23	4	208	1716
15:00	0	1517	23	69	30	90	29	3	221	1761
16:00	0	1485	19	63	26	74	29	2	194	1698
17:00	2	1395	19	60	18	55	20	7	160	1576
18:00	1	1146	11	63	14	74	19	1	171	1329
19:00	2	818	11	39	12	69	31	2	153	984
20:00	0	613	6	29	10	74	24	5	142	761
21:00	1	483	5	29	14	72	41	4	160	649
22:00	0	314	1	12	8	59	32	3	114	429
23:00	0	198	5	19	12	68	20	0	119	322
Total:	31	25454	273	1202	476	1658	548	72	3956	29714
Percentage:	0.10%	85.66%	0.92%	4.05%	1.60%	5.58%	1.84%	0.24%	13.31%	

Total Motorcycles, Cars and Buses:	25758
Percentage Motorcycles, Cars and Buses:	86.69%

Total Heavy Vehicles:	3956
Percentage Heavy Vehicles:	13.31%

FIGURE E-2
HOURLY VOLUME COMPOSITE CHART - BAY BRIDGE
Tuesday to Wednesday October 16 - 17, 2001





2001 CAPACITY ANALYSIS WORKSHEETS

Bay Bridge 2001 Summer Weekend Day Westbound Analysis

HCS2000: Basic Freeway Segments Release 4.1a

_____Operational Analysis_____

	Operacional Ana	<u></u>					
7 7	D 1 21 1'						
Analyst:	Bala Akundi						
Agency or Company:	Parsons						
	8/13/02						
Analysis Time Period:							
	BAY BRIDGE WESTE	BOUND SPAN					
From/To:							
Jurisdiction:							
Analysis Year:		END					
Description: 3 WB LANE	S						
	Flow Inputs and	l Adjustments	-				
17.2 3		1010	h /h				
Volume, V		1019	veh/h				
Peak-hour factor, PHF		0.90					
Peak 15-min volume, v15		283	V				
Trucks and buses		6	%				
Recreational vehicles		0	%				
Terrain type:		Grade					
Grade		3.50	%				
Segment length		0.60	mi				
Trucks and buses PCE, E	T	2.0					
Recreational vehicle PC	E, ER	3.0					
Heavy vehicle adjustmen	t, fHV	0.943					
Driver population facto	r, vp	1.00					
Flow rate, vp		400	pc/h/ln				
	Speed Inputs an	d Adjustments					
Lane width		12.0	ft				
Right-shoulder lateral	clearance	2.0	ft				
Interchange density		0.50	interchange/mi				
Number of lanes, N		3					
Free-flow speed:		Ideal					
FFS or BFFS		65.0	mi/h				
Lane width adjustment,	fLW	0.0	mi/h				
Lateral clearance adjus	tment, fLC	1.6	mi/h				
Interchange density adj		0.0	mi/h				
Number of lanes adjustm		3.0	mi/h				
Free-flow speed, FFS	•	60.4	mi/h				
<u>.</u>		Urban Freeway					
LOS and Performance Measures							
	105 and refroin	arroc ricabar cb					
Flow rate, vp		400	pc/h/ln				
Free-flow speed, FFS		60.4	mi/h				
Average passenger-car s	peed, S	60.4	mi/h				
Number of lanes, N		3					
Density, D		6.6	pc/mi/ln				
Level of service, LOS		A					

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1a

_____Operational Analysis_____

	Operational And	117515					
Analyst:	Bala Akundi						
Agency or Company:	Parsons						
Date Performed:	8/13/02						
Analysis Time Period:							
	BAY BRIDGE WESTE	OUND SDAN					
From/To:	DAI DRIDGE WESTI	DOUND SPAN					
Jurisdiction:							
Analysis Year:	2001 STIMMER WEEK	END					
Description: 3 WB LANE							
	Flow Inputs and	l Adjustments					
1		1.4.45	1. /1.				
Volume, V		1445	veh/h				
Peak-hour factor, PHF	-	0.90					
Peak 15-min volume, v15)	401	V o.				
Trucks and buses		6	8				
Recreational vehicles		0	%				
Terrain type: Grade		Grade 3.50	8				
		0.60					
Segment length	200	2.0	mi				
Trucks and buses PCE, Recreational vehicle PC		3.0					
Heavy vehicle adjustmen		0.943					
Driver population factor		1.00					
Flow rate, vp	DI, VP	567	pc/h/ln				
riow lace, vp		307	pc/11/111				
	Speed Inputs ar	nd Adjustments					
Lane width		12.0	ft				
Right-shoulder lateral	clearance	2.0	ft				
Interchange density		0.50	interchange/mi				
Number of lanes, N		3					
Free-flow speed:		Ideal					
FFS or BFFS		65.0	mi/h				
Lane width adjustment,	fLW	0.0	mi/h				
Lateral clearance adjus	stment, fLC	1.6	mi/h				
Interchange density ad	justment, fID	0.0	mi/h				
Number of lanes adjustr	ment, fN	3.0	mi/h				
Free-flow speed, FFS		60.4	mi/h				
		Urban Freeway	7				
	LOS and Perform	nance Measures					
Flow rate, vp		567	pc/h/ln				
Free-flow speed, FFS		60.4	mi/h				
Average passenger-car s	speed. S	60.4	mi/h				
Number of lanes, N	peca, b	3					
Density, D		9.4	pc/mi/ln				
Level of service, LOS		A. 1	F 3 / 111				
LOUGH OF DOLVICO, HOD		**					

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1a

_____Operational Analysis_____

	Operacional Ana	11,212					
7	D-1- 311-						
Analyst:	Bala Akundi						
Agency or Company:	Parsons						
	8/13/02						
Analysis Time Period:		ACTURE CENT					
	BAY BRIDGE WESTE	SOUND SPAN					
From/To:							
Jurisdiction:							
Analysis Year:		END					
Description: 3 WB LANE	S						
	Flow Inputs and	l Adjustments					
Volume, V		1887	veh/h				
Peak-hour factor, PHF		0.90	VeII/II				
Peak 15-min volume, v15		524	***				
Trucks and buses		6	V %				
Recreational vehicles		0					
		•	00				
Terrain type:		Grade	0				
Grade		3.50	%				
Segment length		0.60	mi				
Trucks and buses PCE, E		2.0					
Recreational vehicle PC		3.0					
Heavy vehicle adjustmen		0.943					
Driver population facto	r, vp	1.00	/1- /1				
Flow rate, vp		741	pc/h/ln				
	Speed Inputs ar	d Adjustments					
Tana wideh		10 0	£ L				
Lane width	1	12.0	ft				
Right-shoulder lateral	clearance	2.0	ft				
Interchange density		0.50	interchange/mi				
Number of lanes, N		3					
Free-flow speed:		Ideal	1.73				
FFS or BFFS	5	65.0	mi/h				
Lane width adjustment,		0.0	mi/h				
Lateral clearance adjus		1.6	mi/h				
Interchange density adj		0.0	mi/h				
Number of lanes adjustm	ent, iN	3.0	mi/h				
Free-flow speed, FFS		60.4	mi/h				
		Urban Freeway					
LOS and Performance Measures							
Flow rate an		741	ng/h/ln				
Flow rate, vp			pc/h/ln mi/h				
Free-flow speed, FFS	nood C	60.4					
Average passenger-car s	peea, s	60.4	mi/h				
Number of lanes, N		3					
Density, D		12.3	pc/mi/ln				
Level of service, LOS B							

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1a

	OPELACIONAL AND	117515			
Anolitat.	Bala Akundi				
Analyst: Agency or Company:					
Date Performed:	Parsons				
Analysis Time Period:	8/13/02				
		COIND CDAN			
<pre>Freeway/Direction: From/To:</pre>	BAY BRIDGE WESTE	SOUND SPAN			
Jurisdiction:					
Analysis Year:	2001 SUMMER WEEK	rent)			
Description: 3 WB LANK		CEND			
Descripcion 5 WD Emi					
	Flow Inputs and	a Adjustments			
Volume, V		2439	veh/h		
Peak-hour factor, PHF		0.90			
Peak 15-min volume, v15	5	678	V		
Trucks and buses		6	%		
Recreational vehicles		0	96		
Terrain type:		Grade			
Grade		3.50	96		
Segment length		0.60	mi		
Trucks and buses PCE, I	ET	2.0			
Recreational vehicle Po		3.0			
Heavy vehicle adjustmen	nt, fHV	0.943			
Driver population factor		1.00			
Flow rate, vp		958	pc/h/ln		
	Speed Inputs ar	nd Adiustments			
	Speed inpues ar	ia riajasemerres			
Lane width		12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		3			
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,	fLW	0.0	mi/h		
Lateral clearance adjus	stment, fLC	1.6	mi/h		
Interchange density ad:		0.0	mi/h		
Number of lanes adjustr	ment, fN	3.0	mi/h		
Free-flow speed, FFS		60.4	mi/h		
		Urban Freeway	7		
	LOS and Perform	nance Measures			
Eleva mete		0.50	ng/h/ln		
Flow rate, vp		958	pc/h/ln mi/h		
Free-flow speed, FFS	n been	60.4			
Average passenger-car s	speed, S	60.4	mi/h		
Number of lanes, N		3	ng/mi/ln		
Density, D		15.9	pc/mi/ln		
Level of service, LOS		В			

HCS2000: Basic Freeway Segments Release 4.1a

_____Operational Analysis______ Analyst: Bala Akundi Data Akting or Company: Parsons Date Performed: 8/12/00 Analysis Time Analysis Time Period: 11 AM Freeway/Direction: BAY BRIDGE WESTBOUND SPAN From/To: Jurisdiction: Analysis Year: 2001 SUMMER WEEKEND Description: 3 WB LANES _____Flow Inputs and Adjustments___ Volume, V 2978 veh/h Peak-hour factor, PHF 0.90 Peak 15-min volume, v15 827 V Trucks and buses Recreational vehicles Terrain type: Grade 3.50 용 Grade Segment length 0.60 Trucks and buses PCE, ET 2.0 Recreational vehicle PCE, ER 3.0 Heavy vehicle adjustment, fHV 0.943 Driver population factor, vp 1.00 Flow rate, vp 1169 pc/h/ln _____Speed Inputs and Adjustments____ Lane width 12.0 £t. Right-shoulder lateral clearance 2.0 ft Interchange density 0.50 interchange/mi Number of lanes, N 3 Free-flow speed: Ideal FFS or BFFS 65.0 mi/h Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC 1.6 mi/h Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 3.0 mi/h Free-flow speed, FFS 60.4 mi/h Urban Freeway _____LOS and Performance Measures_____ pc/h/ln Flow rate, vp 1169 Free-flow speed, FFS 60.4 mi/h Average passenger-car speed, S 60.4 mi/h Number of lanes, N 3 Density, D 19.4 pc/mi/ln

Overall results are not computed when free-flow speed is less than 55 mph.

Level of service, LOS

HCS2000: Basic Freeway Segments Release 4.1a

	Operacional Ana	11,212			
71	Dele Menedi				
Analyst:	Bala Akundi				
Agency or Company:	Parsons	8/13/02			
Analysis Time Period:					
	BAY BRIDGE WESTE	BOUND SPAN			
From/To:					
Jurisdiction:					
Analysis Year:		END - FRIDAY			
Description: 3 WB LANE	S				
	Flow Inputs and	l Adjustments			
77-1		2424	1- /1-		
Volume, V		2434	veh/h		
Peak-hour factor, PHF		0.90			
Peak 15-min volume, v15		676	V		
Trucks and buses		6	%		
Recreational vehicles		0	%		
Terrain type:		Grade			
Grade		3.50	%		
Segment length		0.60	mi		
Trucks and buses PCE, E	T	2.0			
Recreational vehicle PC	E, ER	3.0			
Heavy vehicle adjustmen	t, fHV	0.943			
Driver population facto	r, vp	1.00			
Flow rate, vp		956	pc/h/ln		
	Speed Inputs an	d Adjustments			
Lane width		12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		3			
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,	fLW	0.0	mi/h		
Lateral clearance adjus	tment, fLC	1.6	mi/h		
Interchange density adj	ustment, fID	0.0	mi/h		
Number of lanes adjustm	ent, fN	3.0	mi/h		
Free-flow speed, FFS		60.4	mi/h		
-		Urban Freeway			
	LOS and Perform	nance Measures			
Flow rate, vp		956	pc/h/ln		
Free-flow speed, FFS		60.4	mi/h		
Average passenger-car s	peed, S	60.4	mi/h		
Number of lanes, N		3			
Density, D		15.8	pc/mi/ln		
Level of service, LOS		В	_		
•					

HCS2000: Basic Freeway Segments Release 4.1a

	Operacional Ana				
71	Dala Marradi				
Analyst:	Bala Akundi Parsons				
Agency or Company:					
	8/13/02				
Analysis Time Period:					
	BAY BRIDGE WESTE	BOUND SPAN			
From/To:					
Jurisdiction:					
Analysis Year:		END - FRIDAY			
Description: 3 WB LANE	S				
	Flow Inputs and	l Adjustments			
Molumo M		2652	veh/h		
Volume, V Peak-hour factor, PHF		0.90	VeII/II		
Peak 15-min volume, v15		737	77		
Trucks and buses		6	V %		
Recreational vehicles		0			
		*	00		
Terrain type:		Grade	0		
Grade		3.50	%		
Segment length	-	0.60	mi		
Trucks and buses PCE, E		2.0			
Recreational vehicle PC	•	3.0			
Heavy vehicle adjustmen		0.943			
Driver population facto	r, vp	1.00	(3. (3.		
Flow rate, vp		1041	pc/h/ln		
-	Speed Inputs an	nd Adjustments			
		10.0	5.		
Lane width	-	12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		3			
Free-flow speed:		Ideal			
FFS or BFFS	_	65.0	mi/h		
Lane width adjustment,		0.0	mi/h		
Lateral clearance adjus		1.6	mi/h		
Interchange density adj		0.0	mi/h		
Number of lanes adjustm	ent, fN	3.0	mi/h		
Free-flow speed, FFS		60.4	mi/h		
		Urban Freeway			
LOS and Performance Measures					
Elevanote		1041	ng/h/ln		
Flow rate, vp		1041	pc/h/ln		
Free-flow speed, FFS	J	60.4	mi/h		
Average passenger-car s	peea, S	60.4	mi/h		
Number of lanes, N		3	/ . / .		
Density, D		17.2	pc/mi/ln		
Level of service, LOS		В			

HCS2000: Basic Freeway Segments Release 4.1a

		1			
Analyst:	Bala Akundi				
Agency or Company:	Parsons				
	8/13/02				
Analysis Time Period:					
Freeway/Direction:	RAV RRIDGE WESTE	ROLIND SDAM			
From/To:	DAI DRIDGE WEGIL	SCOND STAN			
Jurisdiction:					
Analysis Year:	2001 STIMMED WEEK	TEND - EPIDAY			
Description: 3 WB LANE		TRIDAT			
Descripcion: 5 WE HAVE	D				
	Flow Inputs and	d Adjustments			
Volume, V		2627	veh/h		
Peak-hour factor, PHF		0.90			
Peak 15-min volume, v15		730	V		
Trucks and buses		6	%		
Recreational vehicles		0	%		
Terrain type:		Grade			
Grade		3.50	%		
Segment length		0.60	mi		
Trucks and buses PCE, E	T	2.0			
Recreational vehicle PC		3.0			
Heavy vehicle adjustmen		0.943			
Driver population facto		1.00			
Flow rate, vp	•	1031	pc/h/ln		
	Speed Inputs ar	nd Adjustments			
Lane width		12.0	ft		
Right-shoulder lateral clearance		2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		3			
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,	fLW	0.0	mi/h		
Lateral clearance adjus	tment, fLC	1.6	mi/h		
Interchange density adj	ustment, fID	0.0	mi/h		
Number of lanes adjustm	ent, fN	3.0	mi/h		
Free-flow speed, FFS		60.4	mi/h		
		Urban Freeway			
	LOS and Perform	nance Measures			
Elev mate		1021	ng/h/1n		
Flow rate, vp		1031	pc/h/ln		
Free-flow speed, FFS	nood C	60.4	mi/h		
Average passenger-car s	peea, S	60.4	mi/h		
Number of lanes, N		3	ng/mi/ln		
Density, D		17.1	pc/mi/ln		
Level of service, LOS		В			

HCS2000: Basic Freeway Segments Release 4.1a

	Operacional Ana	117515			
7	D-1- 3114				
Analyst:	Bala Akundi				
Agency or Company:	Parsons				
	8/13/02				
Analysis Time Period:					
	BAY BRIDGE WESTE	BOUND SPAN			
From/To:					
Jurisdiction:					
Analysis Year:		CEND			
Description: 3 WB LANE	S				
	Flow Inputs and	d Adjustments			
Volume, V		2565	veh/h		
Peak-hour factor, PHF		0.90	V E11/ 11		
Peak 15-min volume, v15		713	V		
Trucks and buses		6	v %		
Recreational vehicles		0	6 %		
Terrain type:		u Grade	6		
Grade		3.50	90		
		0.60	· .		
Segment length Trucks and buses PCE, E	т	2.0	mi		
Recreational vehicle PC		3.0			
Heavy vehicle adjustmen		0.943			
Driver population facto	r, vp	1.00	/b /l		
Flow rate, vp		1007	pc/h/ln		
	Speed Inputs ar	nd Adjustments			
Lane width		12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density	Clearance	0.50	interchange/mi		
Number of lanes, N		3	incci change/ mi		
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,	ft.W	0.0	mi/h		
Lateral clearance adjus		1.6	mi/h		
Interchange density adj		0.0	mi/h		
Number of lanes adjustm		3.0	mi/h		
Free-flow speed, FFS	lenc, in	60.4	mi/h		
riee ilow speed, rrs		Urban Freeway	1111/11		
		Olban Fleeway			
	LOS and Perform	nance Measures			
Flow rate, vp		1007	pc/h/ln		
Free-flow speed, FFS		60.4	mi/h		
Average passenger-car s	peed, S	60.4	mi/h		
Number of lanes, N	1	3	,		
Density, D		16.7	pc/mi/ln		
Level of service, LOS		В	<u> </u>		

HCS2000: Basic Freeway Segments Release 4.1a

	OPELACIONAL AND	117515			
Analyst:	Bala Akundi				
Agency or Company:	Parsons				
	8/13/02				
Analysis Time Period:					
-	BAY BRIDGE WESTE	ROIND SDAN			
From/To:	DAI DRIDGE WESTI	SCOND STAN			
Jurisdiction:					
Analysis Year:	2001 SUMMER WEEK	CEND			
Description: 3 WB LANK					
	Flow Inputs and	d Adjustments			
1		0205	1. /1.		
Volume, V		2327	veh/h		
Peak-hour factor, PHF	_	0.90			
Peak 15-min volume, v15)	646	V •.		
Trucks and buses		6	%		
Recreational vehicles		0	%		
Terrain type:		Grade	0,		
Grade		3.50 0.60	% 		
Segment length Trucks and buses PCE, I	200		mi		
		2.0			
Recreational vehicle PO		0.943			
Heavy vehicle adjustment Driver population factor		1.00			
	or, vp	914	pc/h/ln		
Flow rate, vp		914	pc/11/111		
	Speed Inputs ar	nd Adjustments			
Lane width		12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		3			
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,	fLW	0.0	mi/h		
Lateral clearance adjus	stment, fLC	1.6	mi/h		
Interchange density ad:	justment, fID	0.0	mi/h		
Number of lanes adjustr	ment, fN	3.0	mi/h		
Free-flow speed, FFS		60.4	mi/h		
		Urban Freeway	•		
	LOS and Perform	nance Measures			
Flow rate, vp		914	pc/h/ln		
Free-flow speed, FFS		60.4	mi/h		
Average passenger-car s	sneed S	60.4	mi/h		
Number of lanes, N	predu, b	3	111±/11		
Density, D		15.1	pc/mi/ln		
Level of service, LOS		В	PO/1111		
LOVEL OF DELVICE, HOD		<u> </u>			

HCS2000: Basic Freeway Segments Release 4.1a

	Operacional And	X1 Y D 1 D			
7 7	D 1 11 1'				
Analyst:	Bala Akundi				
Agency or Company:	Parsons				
	8/13/02				
Analysis Time Period:					
	BAY BRIDGE WESTE	BOUND SPAN			
From/To:					
Jurisdiction:					
Analysis Year:		KEND			
Description: 3 WB LANE	S				
	Flow Inputs and	d Adjustments			
Volume, V		3488	veh/h		
Peak-hour factor, PHF		0.90	V CII/ II		
Peak 15-min volume, v15		969	V		
Trucks and buses		6	ତ ଚ		
Recreational vehicles		0	90		
Terrain type:		Grade	0		
Grade		3.50	%		
Segment length		0.60	mi		
Trucks and buses PCE, E	т	2.0	шт		
Recreational vehicle PC		3.0			
Heavy vehicle adjustmen		0.943			
Driver population facto		1.00			
Flow rate, vp		1369	pc/h/ln		
riow race, vp		1309	PC/11/111		
	Speed Inputs ar	nd Adjustments			
Lane width		12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		3			
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,	fLW	0.0	mi/h		
Lateral clearance adjus		1.6	mi/h		
Interchange density adj		0.0	mi/h		
Number of lanes adjustm		3.0	mi/h		
Free-flow speed, FFS		60.4	mi/h		
		Urban Freeway			
	LOS and Perform	mance Measures			
Flow rate, vp		1369	pc/h/ln		
Free-flow speed, FFS		60.4	mi/h		
Average passenger-car s	peed, S	60.4	mi/h		
Number of lanes, N		3			
Density, D		22.7	pc/mi/ln		
Level of service, LOS		C			

HCS2000: Basic Freeway Segments Release 4.1a

	Operacional And	117515			
7	D-1- 31				
Analyst:	Bala Akundi				
Agency or Company:	Parsons				
	8/13/02				
Analysis Time Period:					
	BAY BRIDGE WESTE	BOUND SPAN			
From/To:					
Jurisdiction:					
Analysis Year:		KEND			
Description: 3 WB LANE	S				
	Flow Inputs and	d Adjustments			
Volume, V		2931	veh/h		
Peak-hour factor, PHF		0.90	V (11 / 11		
Peak 15-min volume, v15		814	V		
Trucks and buses		6	v %		
Recreational vehicles		0	, 0		
Terrain type:		•	6		
Grade		Grade 3.50	90		
		0.60	· .		
Segment length	ш		mi		
Trucks and buses PCE, E		2.0			
Recreational vehicle PC		3.0			
Heavy vehicle adjustmen		0.943			
Driver population facto	r, vp	1.00	/b /l		
Flow rate, vp		1151	pc/h/ln		
Speed Inputs and Adjustments					
Lane width		12.0	ft		
Right-shoulder lateral	clearance	4.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		3	3		
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,	fT.W	0.0	mi/h		
Lateral clearance adjus		0.8	mi/h		
Interchange density adj		0.0	mi/h		
Number of lanes adjustm		3.0	mi/h		
Free-flow speed, FFS	.0110 / 111	61.2	mi/h		
rice rich speed, ric		Urban Freeway	,		
	LOS and Perform	nance Measures			
Flow rate, vp		1151	pc/h/ln		
Free-flow speed, FFS		61.2	mi/h		
Average passenger-car s	peed, S	61.2	mi/h		
Number of lanes, N		3			
Density, D		18.8	pc/mi/ln		
Level of service, LOS		C			

Bay Bridge 2001 Summer Weekend Day Eastbound Analysis

HCS2000: Basic Freeway Segments Release 4.1a

Analyst:	Bala Akundi				
Agency or Company:	Parsons				
	8/13/02				
Analysis Time Period:					
Freeway/Direction:	BAY BRIDGE EASTE	SOUND SPAN			
From/To:	5111 51115 62 511612				
Jurisdiction:					
Analysis Year:	2001 SUMMER WEEK	END			
Description: 2 EB LANE					
	Flow Inputs and	l Adjustments			
	<u> </u>	<u> </u>			
Volume, V		2935	veh/h		
Peak-hour factor, PHF		0.90			
Peak 15-min volume, v15	5	815	V		
Trucks and buses		6	%		
Recreational vehicles		0	%		
Terrain type:		Grade			
Grade		3.00	%		
Segment length		0.70	mi		
Trucks and buses PCE, I	CT	1.5			
Recreational vehicle PO	CE, ER	3.0			
Heavy vehicle adjustmer	nt, fHV	0.971			
Driver population factor	or, vp	1.00			
Flow rate, vp		1679	pc/h/ln		
	Speed Inputs an	d Adjustments			
Lane width		12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		2			
Free-flow speed:		Ideal			
FFS or BFFS	G-1	65.0	mi/h		
Lane width adjustment,		0.0	mi/h		
Lateral clearance adjus		2.4	mi/h		
Interchange density ad		0.0	mi/h		
Number of lanes adjustr		4.5	mi/h		
Free-flow speed, FFS		58.1	mi/h		
		Urban Freeway			
	LOS and Perform	nance Measures			
Flow rate, vp		1679	pc/h/ln		
Free-flow speed, FFS		58.1	mi/h		
Average passenger-car s	speed. S	58.1	mi/h		
Number of lanes, N		2	/ 11		
Density, D		28.9	pc/mi/ln		
Level of service, LOS		D	F 0 / 1111		
LEVEL OF SCHVICE, HOD		_			

HCS2000: Basic Freeway Segments Release 4.1a

Analyst:	Bala Akundi				
Agency or Company:	Parsons				
	8/13/02				
Analysis Time Period: Freeway/Direction:	BAY BRIDGE EASTE	OUIND CDAN			
From/To:	DAI DRIDGE EASII	SCOND SPAN			
Jurisdiction:					
	2001 CHMMED MEEK	TEND			
Analysis Year:		CEND			
Description: 2 EB LANE	5				
	Flow Inputs and	d Adjustments			
Volume, V		3572	veh/h		
Peak-hour factor, PHF		0.90	VE11/11		
Peak 15-min volume, v15		992	77		
Trucks and buses		6	V %		
Recreational vehicles		0	6 %		
		Grade	6		
Terrain type: Grade		3.00	00		
		0.70			
Segment length Trucks and buses PCE, E	т	1.5	mi		
Recreational vehicle PC		3.0			
		0.971			
Heavy vehicle adjustmen		1.00			
Driver population facto	r, vp		ng/h/ln		
Flow rate, vp		2044	pc/h/ln		
	Speed Inputs ar	nd Adjustments			
T		10 0	£L		
Lane width	7	12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		2			
Free-flow speed:		Ideal	. (1)		
FFS or BFFS	CT	65.0	mi/h		
Lane width adjustment,		0.0	mi/h		
Lateral clearance adjus		2.4	mi/h		
Interchange density adj		0.0	mi/h		
Number of lanes adjustm	ent, in	4.5	mi/h		
Free-flow speed, FFS		58.1	mi/h		
		Urban Freeway			
LOS and Performance Measures					
Flow rate		2044	ng/h/ln		
Flow rate, vp		2044	pc/h/ln mi/h		
Free-flow speed, FFS	nood C	58.1	mi/h		
Average passenger-car s	peea, s	56.0	mi/h		
Number of lanes, N		2	ng/m;/ln		
Density, D		36.5	pc/mi/ln		
Level of service, LOS		E			

HCS2000: Basic Freeway Segments Release 4.1a

		_			
Analyst:	Bala Akundi				
Agency or Company:	Parsons				
Date Performed:	8/13/02				
Analysis Time Period:					
Freeway/Direction:	BAY BRIDGE EASTE	NOTIND SDAN			
From/To:	DAI DRIDGE EASII	SCOND STAN			
Jurisdiction:					
	2001 стимер меет	ZENID			
Analysis Year: Description: 2 EB LANE		KEND			
Description: 2 EB LANG	15				
	Flow Inputs and	d Adjustments			
77-1		2652	b /b		
Volume, V		3653	veh/h		
Peak-hour factor, PHF		0.90			
Peak 15-min volume, v15)	1015	V		
Trucks and buses		6	%		
Recreational vehicles		0	8		
Terrain type:		Grade	•		
Grade		3.00	8		
Segment length		0.70	mi		
Trucks and buses PCE, E		1.5			
Recreational vehicle PC		3.0			
Heavy vehicle adjustmer		0.971			
Driver population factor	or, vp	1.00	(2. (2.		
Flow rate, vp		2090	pc/h/ln		
	Speed Inputs ar	nd Adjustments			
Lane width		12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		2			
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,	fLW	0.0	mi/h		
Lateral clearance adjus	stment, fLC	2.4	mi/h		
Interchange density adj	justment, fID	0.0	mi/h		
Number of lanes adjustm	nent, fN	4.5	mi/h		
Free-flow speed, FFS		58.1	mi/h		
		Urban Freeway			
	LOS and Perform	nance Measures			
Flow rate, vp		2090	pc/h/ln		
Free-flow speed, FFS		58.1	mi/h		
Average passenger-car s	speed, S	55.2	mi/h		
Number of lanes, N		2			
Density, D		37.8	pc/mi/ln		
Level of service, LOS		E			

HCS2000: Basic Freeway Segments Release 4.1a

	Operational Ana	alysis	
Analyst:	Bala Akundi		
Agency or Company:	Parsons		
Date Performed:	8/13/02		
Analysis Time Period:			
Freeway/Direction:	BAY BRIDGE EAST	BOUND SPAN	
From/To:	BIT BRIDGE BIST	BOOND BITH	
Jurisdiction:	0001 GERMER HER		
Analysis Year: Description: 2 EB LANK	2001 SUMMER WEED	KEND	
	Flow Inputs and	d Adjustments	
Volume, V		3524	veh/h
Peak-hour factor, PHF		0.90	V E11/ 11
Peak 15-min volume, v1	;	979	77
Trucks and buses)	6	V %
Recreational vehicles			8
		0	6
Terrain type:		Grade	0
Grade		3.00	%
Segment length		0.70	mi
Trucks and buses PCE, I		1.5	
Recreational vehicle Po		3.0	
Heavy vehicle adjustmen		0.971	
Driver population factor	or, vp	1.00	
Flow rate, vp		2017	pc/h/ln
	Speed Inputs a	nd Adjustments_	
Lane width		12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		2	
Free-flow speed:		Ideal	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	fLW	0.0	mi/h
Lateral clearance adjus		2.4	mi/h
Interchange density ad		0.0	mi/h
Number of lanes adjustr		4.5	mi/h
Free-flow speed, FFS		58.1	mi/h
and and appear, and		Urban Free	
	LOS and Perfor	mance Measures_	
T1		2015	/1- /1
Flow rate, vp		2017	pc/h/ln
Free-flow speed, FFS	1 0	58.1	mi/h
Average passenger-car s	speed, S	56.3	mi/h
Number of lanes, N		2	
Density, D		35.8	pc/mi/ln
Level of service, LOS		E	

HCS2000: Basic Freeway Segments Release 4.1a

	_				
Analyst:	Bala Akundi				
Agency or Company:	Parsons				
Date Performed:	8/13/02				
Analysis Time Period:	11 AM				
Freeway/Direction:	BAY BRIDGE EASTE	BOUND SPAN			
From/To:					
Jurisdiction:					
Analysis Year:	2001 SUMMER WEER	KEND			
Description: 2 EB LANE	S				
	Flow Inputs and	d Adjustments			
	1 10 ** 111p 405 4116				
Volume, V		3443	veh/h		
Peak-hour factor, PHF		0.90			
Peak 15-min volume, v15		956	V		
Trucks and buses		6	8		
Recreational vehicles		0	8		
Terrain type:		Grade			
Grade		3.00	%		
Segment length		0.70	mi		
Trucks and buses PCE, E	Т	1.5			
Recreational vehicle PC	E, ER	3.0			
Heavy vehicle adjustmen	t, fHV	0.971			
Driver population facto	r, vp	1.00			
Flow rate, vp		1970	pc/h/ln		
	Speed Inputs ar	nd Adjustments			
Lane width		12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		2			
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,		0.0	mi/h		
Lateral clearance adjus		2.4	mi/h		
Interchange density adj		0.0	mi/h		
Number of lanes adjustm	ent, fN	4.5	mi/h		
Free-flow speed, FFS		58.1	mi/h		
		Urban Freeway			
	LOS and Perform	mance Measures			
		1000	(3. (3.		
Flow rate, vp		1970	pc/h/ln		
Free-flow speed, FFS	1 0	58.1	mi/h		
Average passenger-car s	peed, S	56.9	mi/h		
Number of lanes, N		2	4 4 4 7		
Density, D		34.6	pc/mi/ln		
Level of service, LOS		D			

HCS2000: Basic Freeway Segments Release 4.1a

Analyst:	Bala Akundi				
Agency or Company:	Parsons				
	8/13/02				
Analysis Time Period:					
	BAY BRIDGE EASTE	ROLIND SDAM			
From/To:	DAI DRIDGE EASIL	SCOND STAN			
Jurisdiction:					
Analysis Year:	2001 CIIMMED WEEK	FND			
Description: 2 EB LANE		CEND			
Description: 2 EB DANE	D .				
	Flow Inputs and	d Adjustments			
Volume, V		3508	veh/h		
Peak-hour factor, PHF		0.90	,		
Peak 15-min volume, v15		974	V		
Trucks and buses		6	8		
Recreational vehicles		0	%		
Terrain type:		Grade			
Grade		3.00	%		
Segment length		0.70	mi		
Trucks and buses PCE, E	Т	1.5			
Recreational vehicle PC		3.0			
Heavy vehicle adjustmen	t, fHV	0.971			
Driver population facto		1.00			
Flow rate, vp		2007	pc/h/ln		
	Speed Inputs ar	nd Adjustments			
Lane width		12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		2			
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,	fLW	0.0	mi/h		
Lateral clearance adjus	tment, fLC	2.4	mi/h		
Interchange density adj	ustment, fID	0.0	mi/h		
Number of lanes adjustm	ent, fN	4.5	mi/h		
Free-flow speed, FFS		58.1	mi/h		
		Urban Freeway			
LOS and Performance Measures					
Tile		2007	/b /l		
Flow rate, vp		2007	pc/h/ln		
Free-flow speed, FFS	nood C	58.1	mi/h		
Average passenger-car s	peea, S	56.5	mi/h		
Number of lanes, N		2	ng/mi/ln		
Density, D		35.6	pc/mi/ln		
Level of service, LOS		E			

HCS2000: Basic Freeway Segments Release 4.1a

Analyst:	Bala Akundi				
Agency or Company:	Parsons				
	8/13/02				
Analysis Time Period:					
Freeway/Direction:		OLIND CDAN			
From/To:	BAI BRIDGE EASIL	SOUND SPAN			
Jurisdiction:					
	2001 CHMMED MEEK	TEND			
Analysis Year:		LEND			
Description: 2 EB LANE	5				
	Flow Inputs and	l Adjustments			
Volume, V		3010	veh/h		
Peak-hour factor, PHF		0.90	VE11/11		
Peak 15-min volume, v15		836	V		
Trucks and buses		6	%		
Recreational vehicles		0	00		
Terrain type:		Grade	70		
Grade		3.00	00		
Segment length		0.70	mi		
Trucks and buses PCE, E	т	1.5	шт		
Recreational vehicle PC		3.0			
Heavy vehicle adjustmen		0.971			
-		1.00			
Driver population factor, vp Flow rate, vp		1722	pc/h/ln		
riow lace, vp		1/22	pc/11/111		
	Speed Inputs ar	nd Adjustments			
Lane width		12.0	ft		
Right-shoulder lateral	alaamanaa	2.0	ft		
Interchange density	Clearance	0.50			
Number of lanes, N		2	interchange/mi		
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
	£T W		•		
Lane width adjustment,		0.0	mi/h		
Lateral clearance adjus		2.4	mi/h		
Interchange density adj		0.0	mi/h		
Number of lanes adjustm	ent, in	4.5	mi/h		
Free-flow speed, FFS		58.1	mi/h		
		Urban Freeway			
LOS and Performance Measures					
Flow rate, vp		1722	ng/h/ln		
· -		58.1	pc/h/ln mi/h		
Free-flow speed, FFS Average passenger-car s	need C	58.1	mi/h		
	peeu, s	2	шт/П		
Number of lanes, N Density, D		29.6	ng/mi/ln		
Level of service, LOS			pc/mi/ln		
HEAGT OF SELATCE, HOS		D			

HCS2000: Basic Freeway Segments Release 4.1a

Analyst:	Bala Akundi				
Agency or Company:	Parsons				
	8/13/02				
Analysis Time Period:					
Freeway/Direction:	RAV RRIDGE FASTE	ROLIND SDAM			
From/To:	DAI DRIDGE EASIL	SCOND STAN			
Jurisdiction:					
Analysis Year:	2001 CIIMMED WEEK	FND			
Description: 2 EB LANE		CEND			
Descripcion: 2 ED DAME	D .				
	Flow Inputs and	d Adjustments			
Volume, V		3083	veh/h		
Peak-hour factor, PHF		0.90			
Peak 15-min volume, v15		856	V		
Trucks and buses		6	8		
Recreational vehicles		0	96		
Terrain type:		Grade			
Grade		3.00	%		
Segment length		0.70	mi		
Trucks and buses PCE, E	Т	1.5			
Recreational vehicle PC		3.0			
Heavy vehicle adjustmen	t, fHV	0.971			
Driver population facto		1.00			
Flow rate, vp		1764	pc/h/ln		
	Speed Inputs ar	nd Adiustments			
	bpeed liiputs ai	id Adjustillerits			
Lane width		12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		2			
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,	fLW	0.0	mi/h		
Lateral clearance adjus	tment, fLC	2.4	mi/h		
Interchange density adj	ustment, fID	0.0	mi/h		
Number of lanes adjustm	ent, fN	4.5	mi/h		
Free-flow speed, FFS		58.1	mi/h		
		Urban Freeway			
	LOS and Perform	nance Measures			
-1		1004	(1, (7,		
Flow rate, vp		1764	pc/h/ln		
Free-flow speed, FFS	1 0	58.1	mi/h		
Average passenger-car s	peed, S	58.0	mi/h		
Number of lanes, N		2	, , , ,		
Density, D		30.4	pc/mi/ln		
Level of service, LOS		D			

HCS2000: Basic Freeway Segments Release 4.1a

		-			
Analyst:	Bala Akundi				
Agency or Company:	Parsons				
Date Performed:	8/13/02				
Analysis Time Period:					
Freeway/Direction:	BAY BRIDGE EASTE	BOUND SPAN			
From/To:					
Jurisdiction:					
Analysis Year:	2001 SUMMER WEER	KEND			
Description: 2 EB LANE					
1					
	Flow Inputs and	d Adjustments			
Volume, V		3604	veh/h		
Peak-hour factor, PHF		0.90	V C11/ 11		
Peak 15-min volume, v15		1001	v		
Trucks and buses		6	000		
Recreational vehicles		0	000		
Terrain type:		Grade	· ·		
Grade		3.00	%		
Segment length		0.70	mi		
Trucks and buses PCE, E	Т	1.5			
Recreational vehicle PC		3.0			
Heavy vehicle adjustmen		0.971			
Driver population factor		1.00			
Flow rate, vp		2062	pc/h/ln		
	Speed Inputs ar	nd Adjustments			
Lane width		12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		2			
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,	fLW	0.0	mi/h		
Lateral clearance adjus	tment, fLC	2.4	mi/h		
Interchange density adj	ustment, fID	0.0	mi/h		
Number of lanes adjustm	ent, fN	4.5	mi/h		
Free-flow speed, FFS		58.1	mi/h		
		Urban Freeway	7		
	LOS and Perform	mance Measures			
		2252	(2. (2.		
Flow rate, vp		2062	pc/h/ln		
Free-flow speed, FFS		58.1	mi/h		
Average passenger-car s	peed, S	55.7	mi/h		
Number of lanes, N		2			
Density, D		37.0	pc/mi/ln		
Level of service, LOS		E			

HCS2000: Basic Freeway Segments Release 4.1a

	Operational Ana	lysis			
Analyst:	Bala Akundi				
Agency or Company:	Parsons				
Date Performed:	8/13/02				
Analysis Time Period:					
Freeway/Direction: From/To:	BAY BRIDGE EASTE	OUND SPAN			
Jurisdiction:					
Analysis Year: Description: 2 EB LANE	2001 SUMMER WEEK	END			
	Flow Inputs and	Adjustments			
Volume, V		3467	veh/h		
Peak-hour factor, PHF		0.90	V E11/ 11		
Peak 15-min volume, v15		963	V		
Trucks and buses)	6	90		
Recreational vehicles		0	000		
Terrain type:		Grade	· ·		
Grade		3.00	%		
Segment length		0.70	mi		
Trucks and buses PCE, E	lT	1.5			
Recreational vehicle PC		3.0			
Heavy vehicle adjustmen		0.971			
Driver population factor		1.00			
Flow rate, vp		1984	pc/h/ln		
	Speed Inputs an	d Adjustments			
Lane width		12.0	ft		
Right-shoulder lateral	aloarango	2.0	ft		
Interchange density	Clearance	0.50	interchange/mi		
Number of lanes, N		2	interchange/ mi		
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,	fT.W	0.0	mi/h		
Lateral clearance adjus		2.4	mi/h		
Interchange density ad		0.0	mi/h		
Number of lanes adjustm		4.5	mi/h		
Free-flow speed, FFS		58.1	mi/h		
		Urban Freeway			
LOS and Performance Measures					
Flow rate am		1984	ng/h/ln		
Flow rate, vp Free-flow speed, FFS		58.1	pc/h/ln mi/h		
Average passenger-car s	rneed S	56.7	mi/h		
Number of lanes, N	ישרפת, ה	2	111111111111111111111111111111111111111		
Density, D		35.0-	pc/mi/ln		
Level of service, LOS		D	L 0 / 1111 / TIT		
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		_			

HCS2000: Basic Freeway Segments Release 4.1a

_____Operational Analysis______ Analyst: Bala Akundi Data Akt Parsons Date Performed: 8/12/00 Analysis Time Analysis Time Period: 5 PM Freeway/Direction: BAY BRIDGE EASTBOUND SPAN From/To: Jurisdiction: Analysis Year: 2001 SUMMER WEEKEND Description: 2 EB LANES _____Flow Inputs and Adjustments___ Volume, V 1985 veh/h Peak-hour factor, PHF 0.90 Peak 15-min volume, v15 551 V Trucks and buses Recreational vehicles Terrain type: Grade 3.00 용 Grade Segment length 0.70 Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 3.0 Heavy vehicle adjustment, fHV 0.971 Driver population factor, vp 1.00 Flow rate, vp 1136 pc/h/ln _____Speed Inputs and Adjustments____ Lane width 12.0 £t. Right-shoulder lateral clearance 2.0 ft Interchange density 0.50 interchange/mi Number of lanes, N 2 Free-flow speed: Ideal FFS or BFFS 65.0 mi/h Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC 2.4 mi/h Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 4.5 mi/h Free-flow speed, FFS 58.1 mi/h Urban Freeway _____LOS and Performance Measures_____ pc/h/ln Flow rate, vp 1136 Free-flow speed, FFS 58.1 mi/h Average passenger-car speed, S 58.1 mi/h Number of lanes, N 2 Density, D 19.6 pc/mi/ln Level of service, LOS

HCS2000: Basic Freeway Segments Release 4.1a

	Operational An	alysis	
Analyst:	Bala Akundi		
Agency or Company:	Parsons		
Date Performed:	8/13/02		
Analysis Time Period:			
Freeway/Direction:	BAY BRIDGE EAST	BUIND CDIN	
From/To:	DAI DKIDGE EASI	DOUND SPAN	
Jurisdiction:			
Analysis Year:	2001 SUMMER WEE	KEND	
Description: 2 EB LANE		KEND	
-		d Adjustments	
	110W 111pacb air	a najasemenes	
Volume, V		2201	veh/h
Peak-hour factor, PHF		0.90	
Peak 15-min volume, v15		611	V
Trucks and buses		6	%
Recreational vehicles		0	%
Terrain type:		Grade	
Grade		3.00	%
Segment length		0.70	mi
Trucks and buses PCE, E	Т	1.5	
Recreational vehicle PC		3.0	
Heavy vehicle adjustmen		0.971	
Driver population facto		1.00	
Flow rate, vp	,	1259	pc/h/ln
	Speed Inputs a	nd Adjustments_	
Tama wideb		10.0	£ L
Lane width		12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		2 Ideal	
Free-flow speed:			mi/h
FFS or BFFS	£T T.T	65.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adjus		2.4	mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjustm	ent, in	4.5	mi/h
Free-flow speed, FFS		58.1 Urban Free	mi/h
		orban Fice	way
	LOS and Perfor	mance Measures_	
Flow rate, vp		1259	pc/h/ln
Free-flow speed, FFS		58.1	mi/h
Average passenger-car s	peed, S	58.1	mi/h
Number of lanes, N	<u>.</u>	2	•
Density, D		21.7	pc/mi/ln
Level of service, LOS		C	<u> </u>

Bay Bridge 2001 Summer Weekend – Friday Westbound Analysis

HCS2000: Basic Freeway Segments Release 4.1a

	Operacional Ana	11,212			
71	Dele Menedi				
Analyst:	Bala Akundi				
Agency or Company:	Parsons				
	8/13/02				
Analysis Time Period:					
	BAY BRIDGE WESTE	BOUND SPAN			
From/To:					
Jurisdiction:					
Analysis Year:		END - FRIDAY			
Description: 3 WB LANE	S				
	Flow Inputs and	l Adjustments			
77-1		2424	1- /1-		
Volume, V		2434	veh/h		
Peak-hour factor, PHF		0.90			
Peak 15-min volume, v15		676	V		
Trucks and buses		6	%		
Recreational vehicles		0	%		
Terrain type:		Grade			
Grade		3.50	%		
Segment length		0.60	mi		
Trucks and buses PCE, E	T	2.0			
Recreational vehicle PC	E, ER	3.0			
Heavy vehicle adjustmen	t, fHV	0.943			
Driver population facto	r, vp	1.00			
Flow rate, vp		956	pc/h/ln		
	Speed Inputs an	d Adjustments			
Lane width		12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		3			
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,	fLW	0.0	mi/h		
Lateral clearance adjus	tment, fLC	1.6	mi/h		
Interchange density adj	ustment, fID	0.0	mi/h		
Number of lanes adjustm	ent, fN	3.0	mi/h		
Free-flow speed, FFS		60.4	mi/h		
-		Urban Freeway			
	LOS and Perform	nance Measures			
Flow rate, vp		956	pc/h/ln		
Free-flow speed, FFS		60.4	mi/h		
Average passenger-car s	peed, S	60.4	mi/h		
Number of lanes, N		3			
Density, D		15.8	pc/mi/ln		
Level of service, LOS		В	_		
•					

HCS2000: Basic Freeway Segments Release 4.1a

		,			
Analyst:	Bala Akundi				
Agency or Company:	Parsons				
	8/13/02				
Analysis Time Period:					
Freeway/Direction:		ROLIND SDAM			
From/To:	DAI DRIDGE WEGIL	SCOND STAN			
Jurisdiction:					
Analysis Year:	2001 CIIMMED WEEK	TEND - EPIDAY			
Description: 3 WB LANE		TRIDAT			
Descripcion: 5 WD DANE	Б				
	Flow Inputs and	d Adjustments			
Volume, V		2652	veh/h		
Peak-hour factor, PHF		0.90	·		
Peak 15-min volume, v15		737	V		
Trucks and buses		6	%		
Recreational vehicles		0	96		
Terrain type:		Grade			
Grade		3.50	%		
Segment length		0.60	mi		
Trucks and buses PCE, E	Т	2.0			
Recreational vehicle PC		3.0			
Heavy vehicle adjustmen		0.943			
Driver population facto		1.00			
Flow rate, vp		1041	pc/h/ln		
	Speed Inputs ar	nd Adjustments			
Lane width		12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		3			
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,	fLW	0.0	mi/h		
Lateral clearance adjus	tment, fLC	1.6	mi/h		
Interchange density adj	ustment, fID	0.0	mi/h		
Number of lanes adjustm	ent, fN	3.0	mi/h		
Free-flow speed, FFS		60.4	mi/h		
		Urban Freeway			
LOS and Performance Measures					
-		1041			
Flow rate, vp		1041	pc/h/ln		
Free-flow speed, FFS	1 0	60.4	mi/h		
Average passenger-car s	peed, S	60.4	mi/h		
Number of lanes, N		3	, , , ,		
Density, D		17.2	pc/mi/ln		
Level of service, LOS		В			

HCS2000: Basic Freeway Segments Release 4.1a

Analyst: Agency or Company: Date Performed: Analysis Time Period: Freeway/Direction: From/To: Jurisdiction: Analysis Year: Description: 3 WB LANE	BAY BRIDGE WESTBO 2001 SUMMER WEEKE			
	Flow Inputs and	Adjustments		
Volume, V		2627	veh/h	
Peak-hour factor, PHF		0.90		
Peak 15-min volume, v15		730	V	
Trucks and buses		6	%	
Recreational vehicles		0	%	
Terrain type:		Grade		
Grade		3.50	8	
Segment length	_	0.60	mi	
Trucks and buses PCE, E		2.0		
Recreational vehicle PC		3.0		
Heavy vehicle adjustmen		0.943		
Driver population facto	r, vp	1.00	(1. /7	
Flow rate, vp		1031	pc/h/ln	
	Speed Inputs and	Adjustments		
			_	
Lane width	_	12.0	ft	
Right-shoulder lateral	clearance	2.0	ft	
Interchange density		0.50	interchange/mi	
Number of lanes, N		3		
Free-flow speed:		Ideal		
FFS or BFFS		65.0	mi/h	
Lane width adjustment,		0.0	mi/h	
Lateral clearance adjus		1.6	mi/h	
Interchange density adj		0.0	mi/h	
Number of lanes adjustm	ent, fN	3.0	mi/h	
Free-flow speed, FFS		60.4	mi/h	
		Urban Freeway		
LOS and Performance Measures				
			(2. (2.	
Flow rate, vp		1031	pc/h/ln	
Free-flow speed, FFS	1 0	60.4	mi/h	
Average passenger-car s	peed, S	60.4	mi/h	
Number of lanes, N		3	/ 1/3	
Density, D		17.1	pc/mi/ln	
Level of service, LOS		В		

HCS2000: Basic Freeway Segments Release 4.1a

	Operacional Ana	11,212		
7	Dele Menedi			
Analyst:	Bala Akundi			
Agency or Company:	Parsons			
	8/13/02			
Analysis Time Period:		ACTURE CENT		
	BAY BRIDGE WESTE	BOUND SPAN		
From/To:				
Jurisdiction:	0001 0			
Analysis Year:		END - FRIDAY		
Description: 3 WB LANE	S			
	Flow Inputs and	l Adjustments		
Volume, V		3042	veh/h	
Peak-hour factor, PHF		0.90	V C11/ 11	
Peak 15-min volume, v15		845	v	
Trucks and buses		6	> &	
Recreational vehicles		0	%	
Terrain type:		Grade	0	
Grade		3.50	%	
Segment length		0.60	mi	
Trucks and buses PCE, E	т	2.0	ш	
Recreational vehicle PC		3.0		
Heavy vehicle adjustmen	•	0.943		
Driver population factor		1.00		
Flow rate, vp		1194	pc/h/ln	
riow race, vp		1101	pc/11/111	
	Speed Inputs an	d Adjustments		
Lane width		12.0	ft	
Right-shoulder lateral	clearance	2.0	ft	
Interchange density	crearance	0.50	interchange/mi	
Number of lanes, N		3	incer enange/ mi	
Free-flow speed:		Ideal		
FFS or BFFS		65.0	mi/h	
Lane width adjustment,	fT.W	0.0	mi/h	
Lateral clearance adjus		1.6	mi/h	
Interchange density adj		0.0	mi/h	
Number of lanes adjustm		3.0	mi/h	
Free-flow speed, FFS	CIIC, III	60.4	mi/h	
rice from speca, rrb		Urban Freeway	1117 11	
		Olban Fleeway		
	LOS and Perform	nance Measures		
Flow rate, vp		1194	pc/h/ln	
Free-flow speed, FFS		60.4	mi/h	
Average passenger-car s	peed, S	60.4	mi/h	
Number of lanes, N	<u>-</u> ,	3	•	
Density, D		19.8	pc/mi/ln	
Level of service, LOS		С	-	
·				

HCS2000: Basic Freeway Segments Release 4.1a

_____Operational Analysis_____

Analyst: Bala Akundi Data Aki Parsons Date Performed: 8/12/00 Analysis Time Analysis Time Period: 4 PM Freeway/Direction: BAY BRIDGE WESTBOUND SPAN From/To: Jurisdiction: Analysis Year: 2001 SUMMER WEEKEND - FRIDAY Description: 3 WB LANES _____Flow Inputs and Adjustments__ Volume, V 2878 veh/h Peak-hour factor, PHF 0.90 Peak 15-min volume, v15 799 V Trucks and buses 0 Recreational vehicles Terrain type: Grade 3.50 용 Grade Segment length 0.60 Trucks and buses PCE, ET 2.0 Recreational vehicle PCE, ER 3.0 Heavy vehicle adjustment, fHV 0.943 Driver population factor, vp 1.00 Flow rate, vp 1130 pc/h/ln _____Speed Inputs and Adjustments____ Lane width 12.0 £t. Right-shoulder lateral clearance 2.0 ft Interchange density 0.50 interchange/mi Number of lanes, N 3 Free-flow speed: Ideal FFS or BFFS 65.0 mi/h Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC 1.6 mi/h Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 3.0 mi/h Free-flow speed, FFS 60.4 mi/h Urban Freeway LOS and Performance Measures_____ pc/h/ln Flow rate, vp 1130 Free-flow speed, FFS 60.4 mi/h Average passenger-car speed, S 60.4 mi/h Number of lanes, N 3 Density, D 18.7 pc/mi/ln Level of service, LOS

HCS2000: Basic Freeway Segments Release 4.1a

Analyst:	Bala Akundi				
Agency or Company:	Parsons				
	8/13/02				
Analysis Time Period: Freeway/Direction:	DAY DDIDCE MECTE	OUIND CDAN			
From/To:	DAI BRIDGE WESTI	SCOND SPAN			
Jurisdiction:					
Analysis Year:	2001 СІІММЕР МЕСК	TEND - FRIDAY			
Description: 3 WB LANE		CEND - FRIDAI			
Description: 5 WB DAME	D .				
	Flow Inputs and	d Adjustments			
Volume, V		2563	veh/h		
Peak-hour factor, PHF		0.90	,		
Peak 15-min volume, v15		712	V		
Trucks and buses		6	8		
Recreational vehicles		0	%		
Terrain type:		Grade			
Grade		3.50	%		
Segment length		0.60	mi		
Trucks and buses PCE, E	Т	2.0			
Recreational vehicle PC		3.0			
Heavy vehicle adjustmen		0.943			
Driver population facto		1.00			
Flow rate, vp		1006	pc/h/ln		
	One and Transit a sec	. J. 7 J			
	Speed Inputs ar	a Adjustments			
Lane width		12.0	ft		
Right-shoulder lateral	clearance	4.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		3			
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,	fLW	0.0	mi/h		
Lateral clearance adjus	tment, fLC	0.8	mi/h		
Interchange density adj	ustment, fID	0.0	mi/h		
Number of lanes adjustm	ent, fN	3.0	mi/h		
Free-flow speed, FFS		61.2	mi/h		
		Urban Freeway			
LOS and Performance Measures					
71 t.		1006	(]- (]		
Flow rate, vp		1006	pc/h/ln		
Free-flow speed, FFS		61.2	mi/h		
Average passenger-car s	peea, S	61.2	mi/h		
Number of lanes, N		3	(
Density, D		16.4	pc/mi/ln		
Level of service, LOS		В			

HCS2000: Basic Freeway Segments Release 4.1a

	Operational A	nalysis					
Analyst:	Bala Akundi						
Agency or Company:	Parsons						
Date Performed:	8/13/02						
Analysis Time Period:	6 PM						
Freeway/Direction:							
From/To:							
Jurisdiction:							
Analysis Year:	2001 SUMMER WE	EKEND - FRIDAY					
Description: 3 WB LANES							
Flow Inputs and Adjustments							
Volume, V		2435	veh/h				
Peak-hour factor, PHF		0.90	•				
Peak 15-min volume, v15		676	V				
Trucks and buses		6	%				
Recreational vehicles		0	%				
Terrain type:		Grade					
Grade		3.50	%				
Segment length		0.60	mi				
Trucks and buses PCE, E	T	2.0					
Recreational vehicle PC		3.0					
Heavy vehicle adjustmen		0.943					
Driver population facto	r, vp	1.00					
Flow rate, vp		956	pc/h/ln				
	Speed Inputs	and Adjustments					
Lane width		12.0	ft				
Right-shoulder lateral	clearance	2.0	ft				
Interchange density		0.50	interchange/mi				
Number of lanes, N		3					
Free-flow speed:		Ideal					
FFS or BFFS		65.0	mi/h				
Lane width adjustment,		0.0	mi/h				
Lateral clearance adjus		1.6	mi/h				
Interchange density adj		0.0	mi/h				
Number of lanes adjustm	ent, fN	3.0	mi/h				
Free-flow speed, FFS		60.4	mi/h				
		Urban Freeway					
LOS and Performance Measures							
Flow rate, vp		956	pc/h/ln				
Free-flow speed, FFS		60.4	mi/h				
Average passenger-car speed, S		60.4	mi/h				
Number of lanes, N		3					
Density, D		15.8	pc/mi/ln				
Level of service, LOS		В					

Bay Bridge 2001 Summer Weekend – Friday Eastbound Analysis

HCS2000: Basic Freeway Segments Release 4.1a

	Operational Ana	alysis					
Analyst:	Bala Akundi						
Agency or Company:	Parsons						
Date Performed:	8/13/02						
Analysis Time Period:							
Freeway/Direction:		DUIND GDYN					
From/To:	BAY BRIDGE EASTBOUND SPAN						
Jurisdiction:							
Analysis Year:	2001 SIMMED WEEK	YFND - FRIDAY					
-	Analysis Year: 2001 SUMMER WEEKEND - FRIDAY Description: 2 EB LANES						
Flow Inputs and Adjustments							
Molumo M		2221	veh/h				
Volume, V		3332	ven/n				
Peak-hour factor, PHF		0.90					
Peak 15-min volume, v15		926	V				
Trucks and buses		6	%				
Recreational vehicles		0	%				
Terrain type:		Grade	_				
Grade		3.00	%				
Segment length		0.70	mi				
Trucks and buses PCE, E		1.5					
Recreational vehicle PC	•	3.0					
Heavy vehicle adjustmen		0.971					
Driver population facto	r, vp	1.00					
Flow rate, vp		1907	pc/h/ln				
	Speed Inputs ar	nd Adjustments					
Lane width		12.0	ft				
Right-shoulder lateral	clearance	2.0	ft				
Interchange density		0.50	interchange/mi				
Number of lanes, N		2					
Free-flow speed:		Ideal					
FFS or BFFS		65.0	mi/h				
Lane width adjustment, fLW		0.0	mi/h				
Lateral clearance adjus		2.4	mi/h				
Interchange density adj		0.0	mi/h				
Number of lanes adjustm		4.5	mi/h				
Free-flow speed, FFS		58.1	mi/h				
rice riow speca, ris		Urban Freewa					
	LOS and Performance Measures						
DOS and Ferrormance measures							
Flow rate, vp		1907	pc/h/ln				
Free-flow speed, FFS		58.1	mi/h				
Average passenger-car speed, S		57.4	mi/h				
Number of lanes, N		2					
Density, D		33.2	pc/mi/ln				
Level of service, LOS							

HCS2000: Basic Freeway Segments Release 4.1a

_____Operational Analysis______ Analyst: Bala Akundi Data Akting or Company: Parsons Date Performed: 8/12/00 Analysis Time Analysis Time Period: 1 PM Freeway/Direction: BAY BRIDGE EASTBOUND SPAN From/To: Jurisdiction: Analysis Year: 2001 SUMMER WEEKEND - FRIDAY Description: 2 EB LANES _____Flow Inputs and Adjustments__ Volume, V 3440 veh/h Peak-hour factor, PHF 0.90 Peak 15-min volume, v15 956 V Trucks and buses 0 Recreational vehicles Terrain type: Grade 3.00 용 Grade Segment length 0.70 Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 3.0 Heavy vehicle adjustment, fHV 0.971 Driver population factor, vp 1.00 Flow rate, vp 1968 pc/h/ln _____Speed Inputs and Adjustments____ Lane width 12.0 £t. Right-shoulder lateral clearance 2.0 ft Interchange density 0.50 interchange/mi Number of lanes, N 2 Free-flow speed: Ideal FFS or BFFS 65.0 mi/h Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC 2.4 mi/h Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 4.5 mi/h Free-flow speed, FFS 58.1 mi/h Urban Freeway _____LOS and Performance Measures_____ pc/h/ln Flow rate, vp 1968 Free-flow speed, FFS 58.1 mi/h Average passenger-car speed, S 56.9 mi/h Number of lanes, N 2 Density, D 34.6 pc/mi/ln Level of service, LOS

HCS2000: Basic Freeway Segments Release 4.1a

Analyst: Bala Akundi Agency or Company: Parsons Date Performed: 8/13/02 Analysis Time Period: 2 PM Freeway/Direction: BAY BRIDGE EASTBOUND SPAN From/To: Jurisdiction: Analysis Year: 2001 SUMMER WEEKEND - FRIDAY Description: 2 EB LANES							
Flow Inputs and Adjustments							
Volume, V Peak-hour factor, PHF		3804 0.90	veh/h				
Peak 15-min volume, v15		1057	V				
Trucks and buses		6	%				
Recreational vehicles		0	000				
Terrain type:		Grade	0				
Grade		3.00	%				
Segment length		0.70	mi				
Trucks and buses PCE, E	т	1.5					
Recreational vehicle PC		3.0					
Heavy vehicle adjustmen		0.971					
Driver population facto		1.00					
Flow rate, vp	-, · . F	2177	pc/h/ln				
Tion Idde, ip			F 0 / 11 / 111				
-	Speed Inputs and	Adjustments					
T		10.0	£L.				
Lane width	-1	12.0	ft ft				
Right-shoulder lateral	clearance	2.0					
Interchange density		0.50 2	interchange/mi				
Number of lanes, N		z Ideal					
Free-flow speed:							
FFS or BFFS	£T W	65.0 0.0	mi/h				
Lane width adjustment, fLW Lateral clearance adjustment, fLC		2.4	mi/h mi/h				
Interchange density adj		0.0	mi/h				
		4.5	mi/h				
Number of lanes adjustm Free-flow speed, FFS	ent, in	58.1	mi/h				
riee-liow speed, rrs			1111/11				
		Urban Freeway					
LOS and Performance Measures							
Flow rate, vp		2177	pc/h/ln				
Free-flow speed, FFS		58.1	mi/h				
Average passenger-car speed, S		53.5	mi/h				
Number of lanes, N	- '	2	·				
Density, D		40.7	pc/mi/ln				
Level of service, LOS		E	_				
•							

HCS2000: Basic Freeway Segments Release 4.1a

Analyst:	Bala Akundi					
Agency or Company:	Parsons					
	8/13/02					
Analysis Time Period:						
Freeway/Direction:	BAY BRIDGE EASTE	ROLIND SPAN				
From/To:	DIII DICIDOL LINGIL					
Jurisdiction:						
Analysis Year:	2001 SUMMER WEEK	END - FRIDAY				
Description: 2 EB LANE						
	Flow Inputs and	l Adjustments				
Volume, V		4013	veh/h			
Peak-hour factor, PHF		0.90	V 322, 22			
Peak 15-min volume, v15		1115	V			
Trucks and buses		6	%			
Recreational vehicles		0	00			
Terrain type:		Grade	•			
Grade		3.00	90			
Segment length		0.70	mi			
Trucks and buses PCE, E	Т	1.5				
Recreational vehicle PC		3.0				
Heavy vehicle adjustmen		0.971				
Driver population factor		1.00				
Flow rate, vp	-, · · ·	2296	pc/h/ln			
			1 - /			
	Speed Inputs an	d Adjustments				
Lane width		12.0	ft			
Right-shoulder lateral	clearance	2.0	ft			
Interchange density	010010100	0.50	interchange/mi			
Number of lanes, N		2				
Free-flow speed:		Ideal				
FFS or BFFS		65.0	mi/h			
Lane width adjustment, fLW		0.0	mi/h			
Lateral clearance adjustment, fLC		2.4	mi/h			
Interchange density adj		0.0	mi/h			
Number of lanes adjustm		4.5	mi/h			
Free-flow speed, FFS	·	58.1	mi/h			
-		Urban Freeway				
		_				
LOS and Performance Measures						
Flow rate, vp		2296	pc/h/ln			
Free-flow speed, FFS		58.1	mi/h			
Average passenger-car s	peed, S		mi/h			
Number of lanes, N		2				
Density, D			pc/mi/ln			
Level of service, LOS		F				

HCS2000: Basic Freeway Segments Release 4.1a

_____Operational Analysis_____ Analyst: Bala Akundi Data Akı Parsons Date Performed: 8/12/00 Analysis Tim Freeway/Direction: BAY BRIDGE EASTBOUND SPAN From/To: Jurisdiction: Analysis Year: 2001 SUMMER WEEKEND - FRIDAY Description: 2 EB LANES _____Flow Inputs and Adjustments__ Volume, V 3972 veh/h Peak-hour factor, PHF 0.90 Peak 15-min volume, v15 1103 V Trucks and buses Recreational vehicles 0 Terrain type: Grade 3.00 % Grade Segment length 0.70 Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 3.0 Heavy vehicle adjustment, fHV 0.971 Driver population factor, vp 1.00 Flow rate, vp 2273 pc/h/ln _____Speed Inputs and Adjustments____ Lane width 12.0 £t. Right-shoulder lateral clearance 2.0 ft Interchange density 0.50 interchange/mi Number of lanes, N 2 Free-flow speed: Ideal FFS or BFFS 65.0 mi/h Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC 2.4 mi/h Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 4.5 mi/h Free-flow speed, FFS 58.1 mi/h Urban Freeway LOS and Performance Measures_____ pc/h/ln Flow rate, vp 2273 Free-flow speed, FFS 58.1 mi/h Average passenger-car speed, S 50.9 mi/h Number of lanes, N 2 Density, D 44.6 pc/mi/ln Level of service, LOS \mathbf{E}

HCS2000: Basic Freeway Segments Release 4.1a

	Operational Anai	.ysis		
7	Dala Marradi			
Analyst:	Bala Akundi			
Agency or Company:				
	8/13/02			
Analysis Time Period:				
	BAY BRIDGE EASTBO	DUND SPAN		
From/To:				
Jurisdiction:				
Analysis Year:		ND - FRIDAY		
Description: 2 EB LANE	S			
	Flow Inputs and	Adjustments		
Volumo V		4011	veh/h	
Volume, V			VeII/II	
Peak-hour factor, PHF		0.90		
Peak 15-min volume, v15		1114	V o.	
Trucks and buses		5	%	
Recreational vehicles		0	%	
Terrain type:		Grade	2	
Grade		3.00	%	
Segment length		0.70	mi	
Trucks and buses PCE, E		1.5		
Recreational vehicle PC		3.0		
Heavy vehicle adjustmen		0.976		
Driver population facto	r, vp	1.00		
Flow rate, vp		2284	pc/h/ln	
	Speed Inputs and	l Adjustments		
T		10.0	£ .	
Lane width	-1	12.0	ft	
Right-shoulder lateral	clearance	2.0	ft	
Interchange density		0.50	interchange/mi	
Number of lanes, N		2		
Free-flow speed:		Ideal	1.73	
FFS or BFFS	C	65.0	mi/h	
Lane width adjustment,		0.0	mi/h	
Lateral clearance adjus		2.4	mi/h	
Interchange density adj		0.0	mi/h	
Number of lanes adjustm	ent, fN	4.5	mi/h	
Free-flow speed, FFS		58.1	mi/h	
		Urban Freeway		
	LOS and Performa	nce Measures		
Flow rate, vp		2284	pc/h/ln	
Free-flow speed, FFS		58.1	mi/h	
	nood C	20.1		
Average passenger-car s	peea, s	2	mi/h	
Number of lanes, N		2		
Density, D		T-1	pc/mi/ln	
Level of service, LOS		F		

HCS2000: Basic Freeway Segments Release 4.1a

	Operational An	alysis			
Analyst:	Bala Akundi				
Agency or Company:	Parsons				
Date Performed:	8/13/02				
Analysis Time Period:	6 PM				
Freeway/Direction:	BAY BRIDGE EAST	BOUND SPAN			
From/To:					
Jurisdiction:					
Analysis Year:	2001 SUMMER WEE	KEND - FRIDAY			
Description: 2 EB LANE	S				
	Flow Inputs and	d Adjustments			
Volume, V		3146	veh/h		
Peak-hour factor, PHF		0.90			
Peak 15-min volume, v15		874	v		
Trucks and buses		5	%		
Recreational vehicles		0	%		
Terrain type:		Grade			
Grade		3.00	9		
Segment length		0.70	mi		
Trucks and buses PCE, E		1.5			
Recreational vehicle PC	•	3.0			
Heavy vehicle adjustmen		0.976			
Driver population facto	r, vp	1.00	(1. / 7		
Flow rate, vp		1791	pc/h/ln		
	Speed Inputs a	nd Adjustments			
Lane width		12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		2			
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,		0.0	mi/h		
Lateral clearance adjus		2.4	mi/h		
Interchange density adj		0.0	mi/h		
Number of lanes adjustm	ent, iN	4.5	mi/h		
Free-flow speed, FFS		58.1	mi/h		
		Urban Freeway			
	LOS and Perfor	mance Measures			
Flow rate, vp		1791	pc/h/ln		
Free-flow speed, FFS		58.1	mi/h		
Average passenger-car s	peed, S	58.0	mi/h		
Number of lanes, N		2			
Density, D		30.9	pc/mi/ln		
Level of service, LOS		D			

Bay Bridge 2001 Average Weekday Westbound Analysis

HCS2000: Basic Freeway Segments Release 4.1a

		_			
Analyst:	BKA				
Agency or Company:	Parsons				
Date Performed:	8/13/02				
Analysis Time Period:	7 AM				
Freeway/Direction:	BAY BRIDGE WESTE	BOUND SPAN			
From/To:					
Jurisdiction:					
Analysis Year:	2001 WEEKDAY				
Description: 3 WB LANE	S				
	Flow Inputs and	d Adjustments			
Volume, V		2891	veh/h		
Peak-hour factor, PHF		0.90			
Peak 15-min volume, v15		803	v		
Trucks and buses		6	%		
Recreational vehicles		0	%		
Terrain type:		Grade			
Grade		3.50	%		
Segment length		0.60	mi		
Trucks and buses PCE, E	Т	2.0			
Recreational vehicle PC	E, ER	3.0			
Heavy vehicle adjustmen	t, fHV	0.943			
Driver population facto	r, vp	1.00			
Flow rate, vp		1135	pc/h/ln		
	Speed Inputs ar	nd Adjustments			
Lane width		12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		3			
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,	fLW	0.0	mi/h		
Lateral clearance adjus	tment, fLC	1.6	mi/h		
Interchange density adj		0.0	mi/h		
Number of lanes adjustm	ent, fN	3.0	mi/h		
Free-flow speed, FFS		60.4	mi/h		
		Urban Freeway			
	LOS and Perform	nance Measures			
_					
Flow rate, vp		1135	pc/h/ln		
Free-flow speed, FFS		60.4	mi/h		
Average passenger-car s	peed, S	60.4	mi/h		
Number of lanes, N		3			
Density, D		18.8	pc/mi/ln		
Level of service, LOS		С			

HCS2000: Basic Freeway Segments Release 4.1a

	Operational Anal	ysis	
Analyst:	BKA		
Agency or Company:	Parsons		
Date Performed:	8/13/02		
Analysis Time Period:			
Freeway/Direction:		MADS CIMII	
From/To:	BIII BRIDGE WEBIBO	OND BITH	
Jurisdiction:			
Analysis Year:	2001 WEEKDAY		
Description: 3 WB LANE			
	Flow Inputs and	Adjustments	
77. 1 77		25.05	1- /1-
Volume, V		2505	veh/h
Peak-hour factor, PHF		0.90	
Peak 15-min volume, v15		696	V
Trucks and buses		6	8
Recreational vehicles		0	%
Terrain type:		Grade	0
Grade		3.50	%
Segment length	ım	0.60	mi
Trucks and buses PCE, E		2.0	
Recreational vehicle PC Heavy vehicle adjustmen		0.943	
_		1.00	
Driver population factor, vp		983	pc/h/ln
Flow rate, vp		903	pc/11/111
	Speed Inputs and	Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		3	
Free-flow speed:		Ideal	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	fLW	0.0	mi/h
Lateral clearance adjus	tment, fLC	1.6	mi/h
Interchange density adj	ustment, fID	0.0	mi/h
Number of lanes adjustm	ent, fN	3.0	mi/h
Free-flow speed, FFS		60.4	mi/h
		Urban Freeway	
	LOS and Performa	nce Measures	
Flow rate, vp		983	pc/h/ln
Free-flow speed, FFS		60.4	mi/h
Average passenger-car s	meed S	60.4	mi/h
Number of lanes, N	peca, b	3	
Density, D		16.3	pc/mi/ln
Level of service, LOS		В	pc/ m1/ 111

HCS2000: Basic Freeway Segments Release 4.1a

Analyst:	BKA				
Agency or Company:	Parsons				
	8/13/02				
Analysis Time Period:					
Freeway/Direction:	BAY BRIDGE WESTE	ROUND SPAN			
From/To:	BIII BRIDGE WEGIL				
Jurisdiction:					
Analysis Year:	2001 WEEKDAY				
Description: 3 WB LANE					
Deberration 5 ND Entre					
	Flow Inputs and	d Adjustments			
Volume, V		1781	veh/h		
Peak-hour factor, PHF		0.90	V 311, 11		
Peak 15-min volume, v15		495	V		
Trucks and buses		6	%		
Recreational vehicles		0	90		
Terrain type:		Grade			
Grade		3.50	%		
Segment length		0.60	mi		
Trucks and buses PCE, E	Т	2.0			
Recreational vehicle PC		3.0			
Heavy vehicle adjustmen		0.971			
Driver population facto		1.00			
Flow rate, vp		679	pc/h/ln		
	Speed Inputs ar	nd Adjustments			
Lane width		12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		3			
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,	fLW	0.0	mi/h		
Lateral clearance adjus	tment, fLC	1.6	mi/h		
Interchange density adj	ustment, fID	0.0	mi/h		
Number of lanes adjustm	ent, fN	3.0	mi/h		
Free-flow speed, FFS		60.4	mi/h		
		Urban Freeway			
	LOS and Perform	mance Measures			
-1		600	(1. (2.		
Flow rate, vp		679	pc/h/ln		
Free-flow speed, FFS	1 0	60.4	mi/h		
Average passenger-car s	peed, S	60.4	mi/h		
Number of lanes, N		3	(1 / 3		
Density, D		11.2	pc/mi/ln		
Level of service, LOS		В			

HCS2000: Basic Freeway Segments Release 4.1a

Analyst:	BKA				
Agency or Company:	Parsons				
	8/13/02				
Analysis Time Period:					
Freeway/Direction:	BAY BRIDGE WESTE	ROUND SPAN			
From/To:	DITI DRIDGE WEGIT				
Jurisdiction:					
Analysis Year:	2001 WEEKDAY				
Description: 3 WB LANE					
Joseph S WE Ellis	~				
	Flow Inputs and	d Adjustments			
Volume, V		1571	veh/h		
Peak-hour factor, PHF		0.90	,		
Peak 15-min volume, v15		436	V		
Trucks and buses		6	%		
Recreational vehicles		0	%		
Terrain type:		Grade			
Grade		3.50	%		
Segment length		0.60	mi		
Trucks and buses PCE, E	Т	2.0			
Recreational vehicle PC	E, ER	3.0			
Heavy vehicle adjustmen	t, fHV	0.943			
Driver population facto	r, vp	1.00			
Flow rate, vp		617	pc/h/ln		
	Speed Inputs ar	nd Adiustments			
	ppeca inpacb ai	ia hajabemeneb			
Lane width		12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		3			
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,	fLW	0.0	mi/h		
Lateral clearance adjus	tment, fLC	1.6	mi/h		
Interchange density adj	ustment, fID	0.0	mi/h		
Number of lanes adjustm	ent, fN	3.0	mi/h		
Free-flow speed, FFS		60.4	mi/h		
		Urban Freeway			
	LOS and Perform	nance Measures			
Tile		C17	/b /l		
Flow rate, vp		617	pc/h/ln		
Free-flow speed, FFS	a	60.4	mi/h		
Average passenger-car s	peea, S	60.4	mi/h		
Number of lanes, N		3	(
Density, D		10.2	pc/mi/ln		
Level of service, LOS		A			

HCS2000: Basic Freeway Segments Release 4.1a

	Operational Ana	llysis		
Analyst:	BKA			
Agency or Company:	Parsons			
Date Performed:	8/13/02			
Analysis Time Period:				
Freeway/Direction:	BAY BRIDGE WESTE	SOUND SPAN		
From/To:				
Jurisdiction:				
Analysis Year:	2001 WEEKDAY			
Description: 3 WB LANE	S			
	Flow Inputs and	l Adjustments		
Volume, V		1505	veh/h	
Peak-hour factor, PHF		0.90	veii/ii	
Peak 15-min volume, v15		418	77	
Trucks and buses		6	V %	
Recreational vehicles		0	% %	
Terrain type:		Grade	.0	
Grade		3.50	%	
Segment length		0.60	mi	
Trucks and buses PCE, E	т	2.0		
Recreational vehicle PC		3.0		
Heavy vehicle adjustmen	•	0.943		
Driver population factor		1.00		
Flow rate, vp		591	pc/h/ln	
	Speed Inputs an	nd Adjustments		
Lane width		12.0	ft	
	Right-shoulder lateral clearance		C.	
Interchange density		2.0	ft	
	clearance	0.50	interchange/mi	
Number of lanes, N	clearance	0.50		
Number of lanes, N Free-flow speed:	clearance	0.50 3 Ideal	interchange/mi	
Number of lanes, N Free-flow speed: FFS or BFFS		0.50 3 Ideal 65.0	interchange/mi	
Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment,	fLW	0.50 3 Ideal 65.0 0.0	interchange/mi mi/h mi/h	
Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus	fLW tment, fLC	0.50 3 Ideal 65.0 0.0 1.6	<pre>interchange/mi mi/h mi/h mi/h</pre>	
Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjustment adjustment, Interchange density adj	fLW tment, fLC ustment, fID	0.50 3 Ideal 65.0 0.0 1.6 0.0	<pre>interchange/mi mi/h mi/h mi/h mi/h mi/h</pre>	
Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjustment adjustment, Interchange density adjustment adjustment of lanes adjustment.	fLW tment, fLC ustment, fID	0.50 3 Ideal 65.0 0.0 1.6 0.0 3.0	<pre>interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h</pre>	
Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjustment adjustment, Interchange density adj	fLW tment, fLC ustment, fID	0.50 3 Ideal 65.0 0.0 1.6 0.0 3.0 60.4	<pre>interchange/mi mi/h mi/h mi/h mi/h mi/h</pre>	
Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjustment adjustment, Interchange density adjustment adjustment of lanes adjustment.	fLW tment, fLC ustment, fID	0.50 3 Ideal 65.0 0.0 1.6 0.0 3.0	<pre>interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h</pre>	
Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjustment adjustment, Interchange density adjustment adjustment of lanes adjustment.	fLW tment, fLC ustment, fID	0.50 3 Ideal 65.0 0.0 1.6 0.0 3.0 60.4 Urban Freeway	<pre>interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h</pre>	
Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjust Interchange density adj Number of lanes adjustment Free-flow speed, FFS	fLW tment, fLC ustment, fID ent, fN	0.50 3 Ideal 65.0 0.0 1.6 0.0 3.0 60.4 Urban Freeway	<pre>interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h</pre>	
Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjust Interchange density adj Number of lanes adjustment Free-flow speed, FFS Flow rate, vp	fLW tment, fLC ustment, fID ent, fN	0.50 3 Ideal 65.0 0.0 1.6 0.0 3.0 60.4 Urban Freeway	interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h	
Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjust Interchange density adj Number of lanes adjustment Free-flow speed, FFS	fLW tment, fLC ustment, fID ent, fNLOS and Perform	0.50 3 Ideal 65.0 0.0 1.6 0.0 3.0 60.4 Urban Freeway mance Measures	interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h	
Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjust Interchange density adj Number of lanes adjustment Free-flow speed, FFS Flow rate, vp Free-flow speed, FFS	fLW tment, fLC ustment, fID ent, fNLOS and Perform	0.50 3 Ideal 65.0 0.0 1.6 0.0 3.0 60.4 Urban Freeway mance Measures	interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h	
Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjust Interchange density adj Number of lanes adjustment Free-flow speed, FFS Flow rate, vp Free-flow speed, FFS Average passenger-car se	fLW tment, fLC ustment, fID ent, fNLOS and Perform	0.50 3 Ideal 65.0 0.0 1.6 0.0 3.0 60.4 Urban Freeway mance Measures 591 60.4 60.4	interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h	

HCS2000: Basic Freeway Segments Release 4.1a

Analyst:	BKA				
Agency or Company:	Parsons				
	8/13/02				
Analysis Time Period:					
Freeway/Direction:	BAY BRIDGE WESTE	BOUND SPAN			
From/To:	BIII BRIDGE WEGIL				
Jurisdiction:					
Analysis Year:	2001 WEEKDAY				
Description: 3 WB LANE					
1					
	Flow Inputs and	d Adjustments			
Volume, V		1449	veh/h		
Peak-hour factor, PHF		0.90			
Peak 15-min volume, v15		403	V		
Trucks and buses		6	%		
Recreational vehicles		0	%		
Terrain type:		Grade			
Grade		3.50	%		
Segment length		0.60	mi		
Trucks and buses PCE, E	T	2.0			
Recreational vehicle PC	E, ER	3.0			
Heavy vehicle adjustmen	t, fHV	0.943			
Driver population factor	r, vp	1.00			
Flow rate, vp		569	pc/h/ln		
	Speed Inputs ar	nd Adjustments			
Lane width		12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		3			
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,		0.0	mi/h		
Lateral clearance adjus		1.6	mi/h		
Interchange density adj	ustment, fID	0.0	mi/h		
Number of lanes adjustm	ent, fN	3.0	mi/h		
Free-flow speed, FFS		60.4	mi/h		
		Urban Freeway			
LOS and Performance Measures					
Flow rate, vp		569	pc/h/ln		
Free-flow speed, FFS		60.4	mi/h		
Average passenger-car s	peed. S	60.4	mi/h		
Number of lanes, N	F 5 5 6 7 5	3	/ 11		
Density, D		9.4	pc/mi/ln		
Level of service, LOS		A.	F - / /		
		==			

HCS2000: Basic Freeway Segments Release 4.1a

	-	_			
Analyst:	BKA				
Agency or Company:	Parsons				
Date Performed:	8/13/02				
Freeway/Direction:	BAY BRIDGE WEST	ROIMD SDAN			
From/To:	DAI DRIDGE WEGII	BOOND BLAN			
Jurisdiction:					
Analysis Year:	2001 WEEKDAY				
Description: 3 WB LANE					
Description: 3 WB LANE	۵				
	Flow Inputs and	d Adjustments			
Molumo M		1612	rrah /h		
Volume, V		1613	veh/h		
Peak-hour factor, PHF		0.90			
Peak 15-min volume, v15		448	V •		
Trucks and buses		6	%		
Recreational vehicles		0	8		
Terrain type:		Grade	0		
Grade		3.50 0.60	% 		
Segment length	m		mi		
Trucks and buses PCE, E		2.0			
Recreational vehicle PC	•	3.0			
Heavy vehicle adjustmen		0.943			
Driver population facto	r, vp	1.00	/1- / 7		
Flow rate, vp		633	pc/h/ln		
	Speed Inputs a	nd Adjustments			
		10.0	6.		
Lane width	-	12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		3			
Free-flow speed:		Ideal	1.0		
FFS or BFFS	5	65.0	mi/h		
Lane width adjustment,		0.0	mi/h		
Lateral clearance adjus		1.6	mi/h		
Interchange density adj		0.0	mi/h		
Number of lanes adjustm	ent, fN	3.0	mi/h		
Free-flow speed, FFS		60.4	mi/h		
		Urban Freeway	7		
	LOS and Perform	mance Measures			
71 t.		(22	/1- /1		
Flow rate, vp		633	pc/h/ln		
Free-flow speed, FFS	1 0	60.4	mi/h		
Average passenger-car s	peea, S	60.4	mi/h		
Number of lanes, N		3	(' ' / 3		
Density, D		10.5	pc/mi/ln		
Level of service, LOS		A			

HCS2000: Basic Freeway Segments Release 4.1a

Analyst:	BKA		
Agency or Company:	Parsons		
Date Performed:	8/13/02		
Analysis Time Period:			
Freeway/Direction:		SOUND SPAN	
From/To:			
Jurisdiction:			
Analysis Year:	2001 WEEKDAY		
Description: 3 WB LANI			
	Flow Inputs and	l Adjustments	
Volume, V		1716	veh/h
Peak-hour factor, PHF		0.90	
Peak 15-min volume, v1	5	477	V
Trucks and buses		6	%
Recreational vehicles		0	%
Terrain type:		Grade	
Grade		3.50	8
Segment length		0.60	mi
Trucks and buses PCE, I		2.0	
Recreational vehicle Po		3.0	
Heavy vehicle adjustmen		0.943	
Driver population factor	or, vp	1.00	43. 43
Flow rate, vp		674	pc/h/ln
	Speed Inputs an	d Adjustments	
Lane width		12.0	ft
	alcarango		ft
Right-shoulder lateral	Clearance	2.0 0.50	
Interchange density Number of lanes, N		3	interchange/mi
Free-flow speed:		Ideal	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	ft W	0.0	mi/h
Lateral clearance adjust		1.6	mi/h
Interchange density ad		0.0	mi/h
Number of lanes adjustr		3.0	mi/h
Free-flow speed, FFS		60.4	mi/h
rice riow speed, ris		Urban Freeway	
		,,	
	LOS and Perform	nance Measures	
Flow rate, vp		674	pc/h/ln
Free-flow speed, FFS		60.4	mi/h
Average passenger-car	speed, S	60.4	mi/h
Number of lanes, N		3	
Density, D		11.2	pc/mi/ln
Level of service, LOS		В	

HCS2000: Basic Freeway Segments Release 4.1a

	Operacional Ana	<u></u>			
7 7	DILA				
Analyst:	BKA				
Agency or Company:	Parsons				
	8/13/02				
Analysis Time Period:					
	BAY BRIDGE WESTE	BOUND SPAN			
From/To:					
Jurisdiction:					
Analysis Year:	2001 WEEKDAY				
Description: 3 WB LANE	S				
	Flow Inputs and	l Adjustments			
Volume, V		1761	veh/h		
Peak-hour factor, PHF		0.90	Ve11/11		
Peak 15-min volume, v15		489	**		
Trucks and buses		6	V %		
Recreational vehicles		0			
		•	%		
Terrain type:		Grade	0		
Grade		3.50	%		
Segment length	m	0.60	mi		
Trucks and buses PCE, E		2.0			
Recreational vehicle PC		3.0			
Heavy vehicle adjustmen		0.943			
Driver population facto	r, vp	1.00	(1- / 1		
Flow rate, vp		691	pc/h/ln		
	Speed Inputs an	d Adjustments			
T		10 0	£ L		
Lane width	-1	12.0	ft ft		
Right-shoulder lateral	clearance	2.0			
Interchange density		0.50	interchange/mi		
Number of lanes, N		3			
Free-flow speed:		Ideal	/ 1-		
FFS or BFFS	CTTT	65.0	mi/h		
Lane width adjustment,		0.0	mi/h		
Lateral clearance adjus		1.6	mi/h		
Interchange density adj		0.0	mi/h		
Number of lanes adjustm	ent, in	3.0	mi/h		
Free-flow speed, FFS		60.4	mi/h		
		Urban Freeway			
	LOS and Perform	nance Measures			
Flow rate, vp		691	pc/h/ln		
Free-flow speed, FFS		60.4	mi/h		
Average passenger-car s	need S	60.4	mi/h		
Number of lanes, N	peca, b	3	m±/11		
Density, D		11.4	pc/mi/ln		
Level of service, LOS		В	PC/1111		
TOVEL OF BUTAICE, HOD		ם			

HCS2000: Basic Freeway Segments Release 4.1a

_____Operational Analysis_____ Analyst: BKA Parsons Agency or Company: Date Performed: Analysis Time Period: 4 PM Freeway/Direction: BAY BRIDGE WESTBOUND SPAN From/To: Jurisdiction: Analysis Year: 2001 WEEKDAY Description: 3 WB LANES _____Flow Inputs and Adjustments___ Volume, V 1698 veh/h Peak-hour factor, PHF 0.90 Peak 15-min volume, v15 472 V Trucks and buses Recreational vehicles 0 Terrain type: Grade 3.50 응 Grade Segment length 0.60 Trucks and buses PCE, ET 2.0 Recreational vehicle PCE, ER 3.0 Heavy vehicle adjustment, fHV 0.943 Driver population factor, vp 1.00 Flow rate, vp 667 pc/h/ln _____Speed Inputs and Adjustments____ Lane width 12.0 £t. Right-shoulder lateral clearance 2.0 ft Interchange density 0.50 interchange/mi Number of lanes, N 3 Free-flow speed: Ideal FFS or BFFS 65.0 mi/h Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC 1.6 mi/h Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 3.0 mi/h Free-flow speed, FFS 60.4 mi/h Urban Freeway LOS and Performance Measures_____ pc/h/ln Flow rate, vp 667 Free-flow speed, FFS 60.4 mi/h Average passenger-car speed, S 60.4 mi/h Number of lanes, N 3 Density, D 11.0+ pc/mi/ln Level of service, LOS

HCS2000: Basic Freeway Segments Release 4.1a

Analyst:	BKA				
Agency or Company:	Parsons				
	8/13/02				
Analysis Time Period:					
Freeway/Direction:	BAY BRIDGE WESTE	ROUND SPAN			
From/To:	BIII BRIDGE WEGIL				
Jurisdiction:					
Analysis Year:	2001 WEEKDAY				
Description: 3 WB LANE					
Joseph S WE Ellis	~				
	Flow Inputs and	d Adjustments			
Volume, V		1576	veh/h		
Peak-hour factor, PHF		0.90	,		
Peak 15-min volume, v15		438	V		
Trucks and buses		6	8		
Recreational vehicles		0	%		
Terrain type:		Grade			
Grade		3.50	%		
Segment length		0.60	mi		
Trucks and buses PCE, E	Т	2.0			
Recreational vehicle PC		3.0			
Heavy vehicle adjustmen	t, fHV	0.943			
Driver population facto		1.00			
Flow rate, vp		619	pc/h/ln		
	Oracod Transita and	. J. 7 J			
	Speed Inputs ar	ia Aajustments			
Lane width		12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		3			
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,	fLW	0.0	mi/h		
Lateral clearance adjus	tment, fLC	1.6	mi/h		
Interchange density adj	ustment, fID	0.0	mi/h		
Number of lanes adjustm	ent, fN	3.0	mi/h		
Free-flow speed, FFS		60.4	mi/h		
		Urban Freeway			
	LOS and Perform	mance Measures			
-1			(1, 7,		
Flow rate, vp		619	pc/h/ln		
Free-flow speed, FFS		60.4	mi/h		
Average passenger-car s	peed, S	60.4	mi/h		
Number of lanes, N		3	4 1 45		
Density, D		10.2	pc/mi/ln		
Level of service, LOS		A			

HCS2000: Basic Freeway Segments Release 4.1a

Analyst:	BKA		
Agency or Company:	Parsons		
Date Performed:	8/13/02		
Analysis Time Period:	6 PM		
Freeway/Direction:	BAY BRIDGE WEST	SUIND SDAN	
From/To:	DAI DRIDGE WEGII	BOOND BIAN	
Jurisdiction:			
	2001 WEEKDAY		
Analysis Year: Description: 3 WB LANE	2001 WEEKDAY		
Description: 3 WB LANE	ت		
	Flow Inputs and	d Adjustments	
Molumo M		1329	veh/h
Volume, V		0.90	veii/ii
Peak-hour factor, PHF		369	
Peak 15-min volume, v15			V •.
Trucks and buses		6	%
Recreational vehicles		0	8
Terrain type:		Grade	0
Grade		3.50	% !
Segment length		0.60	mi
Trucks and buses PCE, E		2.0	
Recreational vehicle PC	•	3.0	
Heavy vehicle adjustmen		0.943	
Driver population facto	r, vp	1.00	(1 ()
Flow rate, vp		522	pc/h/ln
	Speed Inputs ar	nd Adjustments	
			_
Lane width	_	12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		3	
Free-flow speed:		Ideal	
FFS or BFFS		65.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adjus		1.6	mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjustm	ent, fN	3.0	mi/h
Free-flow speed, FFS		60.4	mi/h
		Urban Freeway	•
	LOS and Perform	mance Measures	
Flow rate, vp		522	pc/h/ln
Free-flow speed, FFS		60.4	mi/h
Average passenger-car s	peed, S	60.4	mi/h
Number of lanes, N		3	
Density, D		8.6	pc/mi/ln
Level of service, LOS		A	

Bay Bridge 2001 Average Weekday Eastbound Analysis

HCS2000: Basic Freeway Segments Release 4.1a

	-	_	
Analyst:	Bala Akundi		
Agency or Company:	Parsons		
Date Performed:	8/13/02		
	7 AM		
_		COIND CDAN	
Freeway/Direction:	BAY BRIDGE EASTE	SOUND SPAN	
From/To:			
Jurisdiction:	0001		
Analysis Year:	2001 WEEKDAY		
Description: 2 EB LANE	IS		
	Flow Inputs and	d Adjustments	·
_			
Volume, V		1221	veh/h
Peak-hour factor, PHF		0.90	
Peak 15-min volume, v15		339	V
Trucks and buses		6	%
Recreational vehicles		0	%
Terrain type:		Grade	
Grade		3.00	%
Segment length		0.70	mi
Trucks and buses PCE, E	'T	1.5	
Recreational vehicle PC	E, ER	3.0	
Heavy vehicle adjustmen	t, fHV	0.971	
Driver population factor	er, vp	1.00	
Flow rate, vp		699	pc/h/ln
	Speed Inputs ar	nd Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		2	3-7
Free-flow speed:		Ideal	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	fT.W	0.0	mi/h
Lateral clearance adjus		2.4	mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjustm		4.5	mi/h
Free-flow speed, FFS	iciic, iii	58.1	mi/h
rice from speca, ris		Urban Freeway	
		orban rreeway	
	LOS and Perform	nance Measures	
Flow rate, vp		699	pc/h/ln
Free-flow speed, FFS		58.1	mi/h
Average passenger-car s	need S	58.1	mi/h
Number of lanes, N	peca, b	2	
Density, D		12.0	pc/mi/ln
Level of service, LOS		12.0 B	PC/ IIIT/ TII
Tever or service, TOS		D	

HCS2000: Basic Freeway Segments Release 4.1a

	Operacional Ana	11,212	
7 7	D 1 21 1'		
Analyst:	Bala Akundi		
Agency or Company:	Parsons		
	8/13/02		
Analysis Time Period:			
	BAY BRIDGE EASTE	BOUND SPAN	
From/To:			
Jurisdiction:			
Analysis Year:			
Description: 2 EB LANE	S		
	Flow Inputs and	l Adjustments	
Volume, V		1405	veh/h
Peak-hour factor, PHF		0.90	V E11/ 11
Peak 15-min volume, v15		390	77
Trucks and buses		6	V %
Recreational vehicles		0	
		•	%
Terrain type:		Grade	0
Grade		3.00	8
Segment length	_	0.70	mi
Trucks and buses PCE, E		1.5	
Recreational vehicle PC	· ·	3.0	
Heavy vehicle adjustmen		0.971	
Driver population facto	r, vp	1.00	
Flow rate, vp		804	pc/h/ln
	Speed Inputs an	d Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	aloarango	2.0	ft
Interchange density	Clearance	0.50	interchange/mi
Number of lanes, N		2	incerchange/mi
Free-flow speed:		Ideal	
FFS or BFFS		65.0	mi/h
	£T W	0.0	mi/h
Lane width adjustment,			
Lateral clearance adjus		2.4	mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjustm	ent, in	4.5	mi/h
Free-flow speed, FFS		58.1	mi/h
		Urban Freeway	
	LOS and Perform	nance Measures	
Flow rate, vp		804	pc/h/ln
Free-flow speed, FFS		58.1	mi/h
Average passenger-car s	peed. S	58.1	mi/h
Number of lanes, N	peca, b	2	
Density, D		13.8	pc/mi/ln
Level of service, LOS		В	PC/ III./ 111
TOVET OF BETATOE, TOP		ם	

HCS2000: Basic Freeway Segments Release 4.1a

Analyst:	Bala Akundi		
Agency or Company:	Parsons		
Date Performed:	8/13/02		
Analysis Time Period:			
Freeway/Direction:	BAY BRIDGE EASTE	SOUND SPAN	
From/To:			
Jurisdiction:			
Analysis Year:	2001 WEEKDAY		
Description: 2 EB LANK			
	Flow Inputs and	l Adjustments	
Volume, V		1282	veh/h
Peak-hour factor, PHF		0.90	
Peak 15-min volume, v15	5	356	V
Trucks and buses		6	%
Recreational vehicles		0	%
Terrain type:		Grade	
Grade		3.00	8
Segment length		0.70	mi
Trucks and buses PCE, I		1.5	
Recreational vehicle Po	•	3.0	
Heavy vehicle adjustmen		0.971	
Driver population factor	or, vp	1.00	
Flow rate, vp		734	pc/h/ln
	Speed Inputs an	nd Adjustments	
Tana wideb		10 0	£ L
Lane width		12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density		0.50 2	interchange/mi
Number of lanes, N			
Free-flow speed: FFS or BFFS		Ideal 65.0	mi/h
Lane width adjustment,	ft W	0.0	mi/h
Lateral clearance adjust		2.4	mi/h
Interchange density ad		0.0	mi/h
Number of lanes adjustr		4.5	mi/h
Free-flow speed, FFS		58.1	mi/h
riee liow speed, rrs		Urban Freeway	1117 11
		orban Freeway	
	LOS and Perform	nance Measures	
Flow rate, vp		734	pc/h/ln
Free-flow speed, FFS		58.1	mi/h
Average passenger-car	speed, S	58.1	mi/h
Number of lanes, N		2	
Density, D		12.6	pc/mi/ln
Level of service, LOS		В	

HCS2000: Basic Freeway Segments Release 4.1a

Analyst:	Bala Akundi		
Agency or Company:	Parsons		
Date Performed:	8/13/02		
Analysis Time Period:			
Freeway/Direction:	BAY BRIDGE EASTE	SOUND SPAN	
From/To:			
Jurisdiction:			
Analysis Year:	2001 WEEKDAY		
Description: 2 EB LANE			
	Flow Inputs and	l Adjustments	
Volume, V		1370	veh/h
Peak-hour factor, PHF		0.90	
Peak 15-min volume, v15	5	381	V
Trucks and buses		6	%
Recreational vehicles		0	%
Terrain type:		Grade	
Grade		3.00	8
Segment length		0.70	mi
Trucks and buses PCE, I		1.5	
Recreational vehicle Po		3.0	
Heavy vehicle adjustmen		0.971	
Driver population factor	or, vp	1.00	
Flow rate, vp		784	pc/h/ln
	Speed Inputs an	nd Adjustments	
T		10.0	£ L
Lane width		12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		2	
Free-flow speed:		Ideal	
FFS or BFFS	£ 7 7.7	65.0	mi/h
Lane width adjustment,		0.0	mi/h mi/h
Lateral clearance adjus		2.4	
Interchange density adj		0.0 4.5	mi/h mi/h
Number of lanes adjustr Free-flow speed, FFS		58.1	mi/h
riee-liow speed, rrs		Urban Freeway	1111/11
		Ofball Freeway	
	LOS and Perform	nance Measures	
Flow rate, vp		784	pc/h/ln
Free-flow speed, FFS		58.1	mi/h
Average passenger-car s	speed, S	58.1	mi/h
Number of lanes, N	- <u>-</u>	2	,
Density, D		13.5	pc/mi/ln
Level of service, LOS		В	E = / /
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		-	

HCS2000: Basic Freeway Segments Release 4.1a

Analyst:	Bala Akundi		
Agency or Company:	Parsons		
Date Performed:	8/13/02		
Analysis Time Period:			
Freeway/Direction:		SOUND SPAN	
From/To:			
Jurisdiction:			
Analysis Year:	2001 WEEKDAY		
Description: 2 EB LANE			
	Flow Inputs and	l Adjustments	
Volume, V		1596	veh/h
Peak-hour factor, PHF		0.90	
Peak 15-min volume, v15	5	443	V
Trucks and buses		6	%
Recreational vehicles		0	%
Terrain type:		Grade	
Grade		3.00	%
Segment length		0.70	mi
Trucks and buses PCE, I		1.5	
Recreational vehicle Po		3.0	
Heavy vehicle adjustmen		0.971	
Driver population factor	or, vp	1.00	
Flow rate, vp		913	pc/h/ln
	Speed Inputs an	nd Adjustments	
T		10.0	£L
Lane width		12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		2	
Free-flow speed: FFS or BFFS		Ideal 65.0	mi/h
	ft W	0.0	mi/h
Lane width adjustment,			mi/h
Lateral clearance adjust Interchange density adj		2.4	mi/h
Number of lanes adjustr		4.5	mi/h
Free-flow speed, FFS		58.1	mi/h
riee-liow speed, rrs		Urban Freeway	1111/11
		Olban Fleeway	
	LOS and Perform	ance Measures	
Flow rate, vp		913	pc/h/ln
Free-flow speed, FFS		58.1	mi/h
Average passenger-car s	speed, S	58.1	mi/h
Number of lanes, N	,	2	·
Density, D		15.7	pc/mi/ln
Level of service, LOS		В	<u> </u>
,			

HCS2000: Basic Freeway Segments Release 4.1a

Analyst:	Bala Akundi		
Agency or Company:	Parsons		
Date Performed:	8/13/02		
Analysis Time Period:			
Freeway/Direction:		BOUND SPAN	
From/To:			
Jurisdiction:			
Analysis Year:	2001 WEEKDAY		
Description: 2 EB LANE			
	Flow Inputs and	l Adjustments	
Volume, V		1544	veh/h
Peak-hour factor, PHF		0.90	
Peak 15-min volume, v15	5	429	V
Trucks and buses		6	%
Recreational vehicles		0	%
Terrain type:		Grade	
Grade		3.00	% .
Segment length		0.70	mi
Trucks and buses PCE, I		1.5	
Recreational vehicle Po		3.0	
Heavy vehicle adjustmen		0.971	
Driver population factor	or, vp	1.00	4343
Flow rate, vp		884	pc/h/ln
	Speed Inputs ar	nd Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	aloarango	2.0	ft
Interchange density	Clearance	0.50	interchange/mi
Number of lanes, N		2	Interchange/mi
Free-flow speed:		Ideal	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	fT.W	0.0	mi/h
Lateral clearance adjust		2.4	mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjustr		4.5	mi/h
Free-flow speed, FFS		58.1	mi/h
rice riow speed, ris		Urban Freeway	
	LOS and Perform	nance Measures	
Flow rate, vp		884	pc/h/ln
Free-flow speed, FFS		58.1	mi/h
Average passenger-car s	speed, S	58.1	mi/h
Number of lanes, N		2	
Density, D		15.2	pc/mi/ln
Level of service, LOS		В	

HCS2000: Basic Freeway Segments Release 4.1a

	_		
Analyst:	Bala Akundi		
Agency or Company:	Parsons		
Date Performed:	8/13/02		
Analysis Time Period:			
Freeway/Direction:	BAY BRIDGE EAST	DOLLND CDAN	
From/To:	BAI BRIDGE EASII	BOUND SPAN	
Jurisdiction:			
	2001 MEEKDAY		
Analysis Year:			
Description: 2 EB LANE	رار		
	Flow Inputs and	d Adjustments	
77-1		1750	lo /lo
Volume, V		1752	veh/h
Peak-hour factor, PHF		0.90	
Peak 15-min volume, v15)	487	V
Trucks and buses		6	%
Recreational vehicles		0	8
Terrain type:		Grade	
Grade		3.00	8
Segment length		0.70	mi
Trucks and buses PCE, F		1.5	
Recreational vehicle PO		3.0	
Heavy vehicle adjustmer		0.971	
Driver population factor, vp		1.00	
Flow rate, vp		1003	pc/h/ln
	Speed Inputs ar	nd Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		2	
Free-flow speed:		Ideal	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	fLW	0.0	mi/h
Lateral clearance adjus	stment, fLC	2.4	mi/h
Interchange density adj	justment, fID	0.0	mi/h
Number of lanes adjustm	nent, fN	4.5	mi/h
Free-flow speed, FFS		58.1	mi/h
		Urban Freeway	•
	LOS and Perform	mance Measures	
Flow rate, vp		1003	pc/h/ln
Free-flow speed, FFS		58.1	mi/h
Average passenger-car s	speed, S	58.1	mi/h
Number of lanes, N		2	
Density, D		17.3	pc/mi/ln
Level of service, LOS		В	

HCS2000: Basic Freeway Segments Release 4.1a

	_		
Analyst:	Bala Akundi		
Agency or Company:	Parsons		
Date Performed:	8/13/02		
Analysis Time Period:			
Freeway/Direction:	BAY BRIDGE EAST	DOLLND CDAN	
From/To:	BAI BRIDGE EASII	SOUND SPAN	
Jurisdiction:			
	2001 MEEKDAY		
Analysis Year:			
Description: 2 EB LANE	72		
	Flow Inputs and	d Adjustments	
77-1		1700	la /la
Volume, V		1792	veh/h
Peak-hour factor, PHF	_	0.90	
Peak 15-min volume, v15		498	V
Trucks and buses		6	%
Recreational vehicles		0	8
Terrain type:		Grade	
Grade		3.00	8
Segment length		0.70	mi
Trucks and buses PCE, F		1.5	
Recreational vehicle PO		3.0	
Heavy vehicle adjustmer		0.971	
Driver population factor, vp		1.00	
Flow rate, vp		1025	pc/h/ln
	Speed Inputs ar	nd Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		2	
Free-flow speed:		Ideal	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	fLW	0.0	mi/h
Lateral clearance adjus	stment, fLC	2.4	mi/h
Interchange density adj	justment, fID	0.0	mi/h
Number of lanes adjustm	ment, fN	4.5	mi/h
Free-flow speed, FFS		58.1	mi/h
		Urban Freeway	У
	LOS and Perform	mance Measures	
Flow rate, vp		1025	pc/h/ln
Free-flow speed, FFS		58.1	mi/h
Average passenger-car s	speed, S	58.1	mi/h
Number of lanes, N		2	
Density, D		17.6	pc/mi/ln
Level of service, LOS		В	

HCS2000: Basic Freeway Segments Release 4.1a

	_		
Analyst:	Bala Akundi		
Agency or Company:	Parsons		
Date Performed:	8/13/02		
Analysis Time Period:			
Freeway/Direction:	BAY BRIDGE EASTE	OUIND SDAN	
From/To:	DAI DRIDGE EASII	SCOND STAN	
Jurisdiction:			
Analysis Year:	2001 WEEKDAY		
Description: 2 EB LANE			
Description: 2 LB LANG	10		
	Flow Inputs and	d Adjustments	
Molumo M		2105	rroh /h
Volume, V		2185	veh/h
Peak-hour factor, PHF		0.90	
Peak 15-min volume, v15		607	V
Trucks and buses		6	00
Recreational vehicles		0	%
Terrain type:		Grade	2
Grade		3.00	8
Segment length		0.70	mi
Trucks and buses PCE, F		1.5	
Recreational vehicle PO		3.0	
Heavy vehicle adjustmer		0.971	
Driver population factor, vp		1.00	
Flow rate, vp		1250	pc/h/ln
	Speed Inputs ar	nd Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		2	
Free-flow speed:		Ideal	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	fLW	0.0	mi/h
Lateral clearance adjus	stment, fLC	2.4	mi/h
Interchange density adj	justment, fID	0.0	mi/h
Number of lanes adjustm	nent, fN	4.5	mi/h
Free-flow speed, FFS		58.1	mi/h
		Urban Freeway	
	LOS and Perform	nance Measures	
		marioc ricabat cb	
Flow rate, vp		1250	pc/h/ln
Free-flow speed, FFS		58.1	mi/h
Average passenger-car s	speed, S	58.1	mi/h
Number of lanes, N		2	
Density, D		21.5	pc/mi/ln
Level of service, LOS		C	

HCS2000: Basic Freeway Segments Release 4.1a

Analyst:	Bala Akundi					
Agency or Company:	Parsons					
Date Performed:	8/13/02					
Analysis Time Period:						
Freeway/Direction:	BAY BRIDGE EASTE	ROUND SPAN				
From/To:	Biii Biiibon Biibii	SCOND BITH				
Jurisdiction:						
Analysis Year:	2001 WEEKDAY					
Description: 2 EB LANE						
	Flow Inputs and	d Adjustments				
Volume, V		2599	veh/h			
Peak-hour factor, PHF		0.90	·			
Peak 15-min volume, v15		722	V			
Trucks and buses		6	%			
Recreational vehicles		0	%			
Terrain type:		Grade				
Grade		3.00	%			
Segment length		0.70	mi			
Trucks and buses PCE, E	Т	1.5				
Recreational vehicle PC	E, ER	3.0				
Heavy vehicle adjustmen	t, fHV	0.971				
Driver population facto	r, vp	1.00				
Flow rate, vp		1487	pc/h/ln			
	Speed Inputs ar	nd Adiustments				
Lane width		12.0	ft			
Right-shoulder lateral	clearance	2.0	ft			
Interchange density		0.50	interchange/mi			
Number of lanes, N		2				
Free-flow speed:		Ideal				
FFS or BFFS		65.0	mi/h			
Lane width adjustment,	fLW	0.0	mi/h			
Lateral clearance adjus	tment, fLC	2.4	mi/h			
Interchange density adj	ustment, fID	0.0	mi/h			
Number of lanes adjustm	ent, fN	4.5	mi/h			
Free-flow speed, FFS		58.1	mi/h			
		Urban Freeway				
	LOS and Performance Measures					
Elev mete		1 4 0 7	ng/h/ln			
Flow rate, vp		1487	pc/h/ln			
Free-flow speed, FFS	nood C	58.1	mi/h			
Average passenger-car s	peea, S	58.1	mi/h			
Number of lanes, N		2	ng/mi/ln			
Density, D		25.6	pc/mi/ln			
Level of service, LOS		С				

HCS2000: Basic Freeway Segments Release 4.1a

Analyst:	Bala Akundi			
Agency or Company:	Parsons			
	8/13/02			
Analysis Time Period: Freeway/Direction:	BAY BRIDGE EASTE	POLIND CDAN		
From/To:	DAI DRIDGE EASIE	SOUND SPAN		
Jurisdiction:				
	2001 MERICAN			
Analysis Year:				
Description: 2 EB LANE	15			
	Flow Inputs and	d Adjustments		
Wolumo W		3082	veh/h	
Volume, V Peak-hour factor, PHF		0.90	VeII/II	
Peak 15-min volume, v15		856	**	
Trucks and buses		6	V %	
Recreational vehicles		0		
		•	%	
Terrain type:		Grade	96	
Grade		3.00 0.70		
Segment length	m	1.5	mi	
Trucks and buses PCE, E Recreational vehicle PC		3.0		
Heavy vehicle adjustmen	•	0.971		
_		1.00		
Driver population factor, vp		1764	ng/h/ln	
Flow rate, vp		1/04	pc/h/ln	
	Speed Inputs ar	nd Adjustments		
Lane width		12.0	ft	
Right-shoulder lateral	alaamanaa	2.0	ft	
Interchange density	Clearance	0.50		
Number of lanes, N		2	interchange/mi	
Free-flow speed:		Ideal		
FFS or BFFS			mi/h	
	£T W	65.0 0.0	mi/h	
Lane width adjustment, Lateral clearance adjus				
_		2.4	mi/h	
Interchange density adj Number of lanes adjustm		0.0 4.5	mi/h mi/h	
Free-flow speed, FFS	lent, in	58.1	mi/h	
riee-llow speed, Frs			1111/11	
		Urban Freeway		
	LOS and Perform	nance Measures		
Flow rate, vp		1764	pc/h/ln	
Free-flow speed, FFS		58.1	mi/h	
Average passenger-car s	peed. S	58.0	mi/h	
Number of lanes, N	F 5 5 6 7 5	2	/ 11	
Density, D		30.4	pc/mi/ln	
Level of service, LOS		D	F = / 1111	
		_		

HCS2000: Basic Freeway Segments Release 4.1a

Analyst: Agency or Company: Date Performed: Analysis Time Period: Freeway/Direction: From/To: Jurisdiction: Analysis Year: Description: 2 EB LANE	BAY BRIDGE EASTB	OUND SPAN	
	Flow Inputs and	Adjustments	
Volume, V Peak-hour factor, PHF		3181 0.90	veh/h
Peak 15-min volume, v15		884	V
Trucks and buses		6	%
Recreational vehicles		0	%
Terrain type: Grade		Grade 3.00	%
Segment length		0.70	mi
Trucks and buses PCE, E	!T	1.5	шт
Recreational vehicle PC		3.0	
Heavy vehicle adjustmen		0.971	
Driver population factor		1.00	
Flow rate, vp	,	1820	pc/h/ln
	Speed Inputs and	d Adiustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		2	
Free-flow speed:		Ideal	
FFS or BFFS	_	65.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adjus		2.4	mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjustm	ent, IN	4.5	mi/h
Free-flow speed, FFS		58.1	mi/h
		Urban Freeway	
	LOS and Perform	ance Measures	
Flow rate, vp		1820	pc/h/ln
Free-flow speed, FFS		58.1	mi/h
Average passenger-car s	peed, S	57.9	mi/h
Number of lanes, N	_	2	
Density, D		31.4	pc/mi/ln
Level of service, LOS		D	

Bay Bridge 2001 Summer Weekend Day Reversible Lane Operation Westbound Analysis

___OPERATIONAL ANALYSIS___

Analyst: BA

Agency/Co:

Date: 8/18/02 Analsis Period: 7 AM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2001 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION

FREE	-FLOW SPEED)				
Direction	1		2			
Lane width	12.0	ft	12.0	ft		
Lateral clearance:						
Right edge	2.0	ft	6.0	ft		
Left edge	6.0	ft	6.0	ft		
Total lateral clearance	8.0	ft	12.0	ft		
Access points per mile	0		0			
Median type	Undivided	L				
Free-flow speed:	Base		Measured			
FFS or BFFS	60.0	mph	60.0	mph		
Lane width adjustment, FLW	0.0	mph	0.0	mph		
Lateral clearance adjustment, FLC	0.9	mph	0.0	mph		
Median type adjustment, FM	1.6	mph	0.0	mph		
Access points adjustment, FA	0.0	mph	0.0	mph		
Free-flow speed	57.5	mph	60.0	mph		
-		-		-		
	_VOLUME					
Direction	1		2			
Volume, V	1019	vph	0	vph		
Peak-hour factor, PHF	0.90		0.90			
Peak 15-minute volume, v15	283		0			
Trucks and buses	6	%	0	%		
Recreational vehicles	0	%	0	8		
Terrain type	Grade		Level			
Grade	3.50	%	0.00	%		
Segment length	0.60	mi	0.00	mi		
Number of lanes	2		2			
Driver population adjustment, fP	1.00		1.00			
Trucks and buses PCE, ET	2.0		1.5			
Recreational vehicles PCE, ER	3.0		1.2			
Heavy vehicle adjustment, fHV	0.943		1.000			
Flow rate, vp	600	pcphpl	0	pcphpl		
RESULTS						
Direction	1		2			
Flow rate, vp	600	pcphpl	0	pcphpl		
Free-flow speed, FFS	57.5	mph	60.0	mph		
Avg. passenger-car travel speed, S	57.5	mph	60.0	mph		
Level of service, LOS	A	T	A	<u> </u>		
Density, D	10.4	pc/mi/ln	==	pc/mi/ln		
· 4 /	-	,,		, , —		

___OPERATIONAL ANALYSIS___

Analyst: BA

Agency/Co:

Date: 8/18/02 Analsis Period: 8 AM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2001 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION

FREE	-FLOW SPEEI)				
Direction	1		2			
Lane width	12.0	ft	12.0	ft		
Lateral clearance:						
Right edge	2.0	ft	6.0	ft		
Left edge	6.0	ft	6.0	ft		
Total lateral clearance	8.0	ft	12.0	ft		
Access points per mile	0		0			
Median type	Undivided	i.				
Free-flow speed:	Base		Measured			
FFS or BFFS	60.0	mph	60.0	mph		
Lane width adjustment, FLW	0.0	mph	0.0	mph		
Lateral clearance adjustment, FLC	0.9	mph	0.0	mph		
Median type adjustment, FM	1.6	mph	0.0	mph		
Access points adjustment, FA	0.0	mph	0.0	mph		
Free-flow speed	57.5	mph	60.0	mph		
Tice flow byced	37.3	mp11	00.0	mpii		
	_VOLUME					
Direction	1		2			
Volume, V	1445	vph	0	vph		
Peak-hour factor, PHF	0.90		0.90			
Peak 15-minute volume, v15	401		0			
Trucks and buses	5	%	0	%		
Recreational vehicles	0	%	0	%		
Terrain type	Grade		Level			
Grade	3.50	용	0.00	%		
Segment length	0.60	mi	0.00	mi		
Number of lanes	2		2			
Driver population adjustment, fP	1.00		1.00			
Trucks and buses PCE, ET	2.0		1.5			
Recreational vehicles PCE, ER	3.0		1.2			
Heavy vehicle adjustment, fHV	0.952		1.000			
Flow rate, vp	842	pcphpl	0	pcphpl		
RESULTS						
Direction	1		2			
Flow rate, vp	842	pcphpl	0	pcphpl		
Free-flow speed, FFS	57.5	mph	60.0	mph		
Avg. passenger-car travel speed, S	57.5	mph	60.0	mph		
Level of service, LOS	В	P11	A			
Density, D	14.6	pc/mi/ln	==	pc/mi/ln		
201122011 2		PC// III		F 0 / 1111		

___OPERATIONAL ANALYSIS___

Analyst: BA

Agency/Co:

Date: 8/18/02 Analsis Period: 9 AM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2001 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION

FREE	-FLOW SPEED					
Direction	1		2			
Lane width	12.0	ft	12.0	ft		
Lateral clearance:						
Right edge	2.0	ft	6.0	ft		
Left edge	6.0	ft	6.0	ft		
Total lateral clearance	8.0	ft	12.0	ft		
Access points per mile	0		0			
Median type	Undivided					
Free-flow speed:	Base		Measured			
FFS or BFFS	60.0	mph	60.0	mph		
Lane width adjustment, FLW	0.0	mph	0.0	mph		
Lateral clearance adjustment, FLC	0.9	mph	0.0	mph		
Median type adjustment, FM	1.6	mph	0.0	mph		
Access points adjustment, FA	0.0	mph	0.0	mph		
Free-flow speed	57.5	mph	60.0	mph		
-		-		-		
	_VOLUME					
Direction	1		2			
Volume, V	1887	vph	0	vph		
Peak-hour factor, PHF	0.90		0.90			
Peak 15-minute volume, v15	524		0			
Trucks and buses	5	૪	0	%		
Recreational vehicles	0	૪	0	%		
Terrain type	Grade		Level			
Grade	3.50	용	0.00	용		
Segment length	0.60	mi	0.00	mi		
Number of lanes	2		2			
Driver population adjustment, fP	1.00		1.00			
Trucks and buses PCE, ET	2.0		1.5			
Recreational vehicles PCE, ER	3.0		1.2			
Heavy vehicle adjustment, fHV	0.952		1.000			
Flow rate, vp	1100	pcphpl	0	pcphpl		
RESULTS						
Direction	1		2			
Flow rate, vp	1100	pcphpl	0	pcphpl		
Free-flow speed, FFS	57.5	mph	60.0	mph		
Avg. passenger-car travel speed, S	57.5	mph	60.0	mph		
Level of service, LOS	C C	mp11	A	m511		
Density, D	19.1	pc/mi/ln	==	pc/mi/ln		
	± / • ±	PC/ III / TII	J. 0	PC/ III./ TII		

___OPERATIONAL ANALYSIS___

Analyst: BA

Agency/Co:

Date: 8/18/02 Analsis Period: 10 AM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2001 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION

		_				
FREE	-FLOW SPEE	D				
Direction	1		2			
Lane width	12.0	ft	12.0	ft		
Lateral clearance:						
Right edge	2.0	ft	6.0	ft		
Left edge	6.0	ft	6.0	ft		
Total lateral clearance	8.0	ft	12.0	ft		
Access points per mile	0		0			
Median type	Undivide	d				
Free-flow speed:	Base		Measured			
FFS or BFFS	60.0	mph	60.0	mph		
Lane width adjustment, FLW	0.0	mph	0.0	mph		
Lateral clearance adjustment, FLC	0.9	mph	0.0	mph		
Median type adjustment, FM	1.6	mph	0.0	mph		
Access points adjustment, FA	0.0	mph	0.0	mph		
Free-flow speed	57.5	mph	60.0	mph		
-		-		-		
	_VOLUME					
	_					
Direction	1	_	2			
Volume, V	2439	vph	0	vph		
Peak-hour factor, PHF	0.90		0.90			
Peak 15-minute volume, v15	678		0			
Trucks and buses	5	8	0	8		
Recreational vehicles	0	%	0	%		
Terrain type	Grade		Level			
Grade	3.50	8	0.00	%		
Segment length	0.60	mi	0.00	mi		
Number of lanes	2		2			
Driver population adjustment, fP	1.00		1.00			
Trucks and buses PCE, ET	2.0		1.5			
Recreational vehicles PCE, ER	3.0		1.2			
Heavy vehicle adjustment, fHV	0.952		1.000			
Flow rate, vp	1422	pcphpl	0	pcphpl		
RESULTS						
Direction	1		2			
DITECTION	Τ.		۷			
Flow rate, vp	1422	pcphpl	0	pcphpl		
Free-flow speed, FFS	57.5	mph	60.0	mph		
Avg. passenger-car travel speed, S	57.5	mph	60.0	mph		
Level of service, LOS	C		Α	T		
Density, D	24.7	pc/mi/ln		pc/mi/ln		
± *		<u>.</u>				

___OPERATIONAL ANALYSIS___

Analyst: BA

Agency/Co:

Date: 8/18/02 Analsis Period: 11 AM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2001 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION

FREE	-FLOW SPEED					
Direction	1		2			
Lane width	12.0	ft	12.0	ft		
Lateral clearance:				20		
Right edge	2.0	ft	6.0	ft.		
Left edge	6.0	ft	6.0	ft		
Total lateral clearance	8.0	ft	12.0	ft		
Access points per mile	0		0	20		
Median type	Undivided					
Free-flow speed:	Base		Measured			
FFS or BFFS	60.0	mph	60.0	mph		
Lane width adjustment, FLW	0.0	mph	0.0	mph		
Lateral clearance adjustment, FLC	0.9	mph	0.0	mph		
Median type adjustment, FM	1.6	mph	0.0	mph		
Access points adjustment, FA	0.0	mph	0.0	mph		
Free-flow speed	57.5	mph	60.0	mph		
riee-liow speed	57.5	шрп	00.0	шрп		
	VOLUME					
Direction	1		2			
Volume, V	2978	vph	0	vph		
Peak-hour factor, PHF	0.90		0.90			
Peak 15-minute volume, v15	827		0			
Trucks and buses	5	%	0	%		
Recreational vehicles	0	%	0	%		
Terrain type	Grade		Level			
Grade	3.50	%	0.00	%		
Segment length	0.60	mi	0.00	mi		
Number of lanes	2		2			
Driver population adjustment, fP	1.00		1.00			
Trucks and buses PCE, ET	2.0		1.5			
Recreational vehicles PCE, ER	3.0		1.2			
Heavy vehicle adjustment, fHV	0.952		1.000			
Flow rate, vp	1737	pcphpl	0	pcphpl		
, -		1 1 1		1 1 1		
RESULTS						
Direction	1		2			
Elev rate un	1727	nanhn]	0	nanhnl		
Flow rate, vp	1737	pcphpl	0	pcphpl		
Free-flow speed, FFS	57.5	mph	60.0	mph		
Avg. passenger-car travel speed, S	56.1	mph	60.0	mph		
Level of service, LOS	D 31 0		A	m a /m + /1		
Density, D	31.0	pc/mi/ln	0.0	pc/mi/ln		

___OPERATIONAL ANALYSIS___

Analyst: BA

Agency/Co:

Date: 8/18/02 Analsis Period: 12 PM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2001 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION

FREE-FLOW SPEED						
Direction	1		2			
Lane width	12.0	ft	12.0	ft		
Lateral clearance:						
Right edge	2.0	ft	6.0	ft		
Left edge	6.0	ft	6.0	ft		
Total lateral clearance	8.0	ft	12.0	ft		
Access points per mile	0		0			
Median type	Undivide	d				
Free-flow speed:	Base		Measured			
FFS or BFFS	60.0	mph	60.0	mph		
Lane width adjustment, FLW	0.0	mph	0.0	mph		
Lateral clearance adjustment, FLC	0.9	mph	0.0	mph		
Median type adjustment, FM	1.6	mph	0.0	mph		
Access points adjustment, FA	0.0	mph	0.0	mph		
Free-flow speed	57.5	mph	60.0	mph		
	_VOLUME					
Direction	1		2			
Volume, V	2695	vph	0	vph		
Peak-hour factor, PHF	0.90		0.90			
Peak 15-minute volume, v15	749		0			
Trucks and buses	5	%	0	%		
Recreational vehicles	0	%	0	%		
Terrain type	Grade		Level			
Grade	3.50	%	0.00	%		
Segment length	0.60	mi	0.00	mi		
Number of lanes	2		2			
Driver population adjustment, fP	1.00		1.00			
Trucks and buses PCE, ET	2.0		1.5			
Recreational vehicles PCE, ER	3.0		1.2			
Heavy vehicle adjustment, fHV	0.952		1.000			
Flow rate, vp	1572	pcphpl	0	pcphpl		
RESULTS						
Direction	1		2			
Direction	1		۷			
Flow rate, vp	1572	pcphpl	0	pcphpl		
Free-flow speed, FFS	57.5	mph	60.0	mph		
Avg. passenger-car travel speed, S	56.9	mph	60.0	mph		
Level of service, LOS	D	-	A	-		
Density, D	27.6	pc/mi/ln	0.0	pc/mi/ln		

___OPERATIONAL ANALYSIS___

Analyst: BA

Agency/Co:

Date: 8/18/02 Analsis Period: 1 PM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2001 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION

	-					
FREE	-FLOW SPEEI)				
Direction	1		2			
Lane width	12.0	ft	12.0	ft		
Lateral clearance:						
Right edge	2.0	ft	6.0	ft		
Left edge	6.0	ft	6.0	ft		
Total lateral clearance	8.0	ft	12.0	ft.		
Access points per mile	0		0			
Median type	Undivided	l				
Free-flow speed:	Base		Measured			
FFS or BFFS	60.0	mph	60.0	mph		
Lane width adjustment, FLW	0.0	mph	0.0	mph		
Lateral clearance adjustment, FLC	0.9	mph	0.0	mph		
Median type adjustment, FM	1.6	mph	0.0	mph		
Access points adjustment, FA	0.0	mph	0.0	mph		
Free-flow speed	57.5	mph	60.0	mph		
riee-liow speed	37.3	шрп	00.0	шрп		
	VOLUME					
Direction	1		2			
Volume, V	3585	vph	0	vph		
Peak-hour factor, PHF	0.90		0.90			
Peak 15-minute volume, v15	996		0			
Trucks and buses	5	%	0	%		
Recreational vehicles	0	용	0	%		
Terrain type	Grade		Level			
Grade	3.50	%	0.00	%		
Segment length	0.60	mi	0.00	mi		
Number of lanes	2		2			
Driver population adjustment, fP	1.00		1.00			
Trucks and buses PCE, ET	2.0		1.5			
Recreational vehicles PCE, ER	3.0		1.2			
Heavy vehicle adjustment, fHV	0.952		1.000			
Flow rate, vp	2091	pcphpl	0	pcphpl		
, -						
RESULTS						
Direction	1		2			
Flow rate, vp	2091	pcphpl	0	pcphpl		
Free-flow speed, FFS	57.5	mph	60.0	mph		
Avg. passenger-car travel speed, S	54.0	mph	60.0	mph		
Level of service, LOS	54.0 E	mp11	A	mP11		
Density, D	38.8	pc/mi/ln	==	pc/mi/ln		
Demotor, D	50.0	PC/ III / III	0.0	P = / 1111		

___OPERATIONAL ANALYSIS___

Analyst: BA

Agency/Co:

Date: 8/18/02 Analsis Period: 2 PM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2001 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION

FREE	-FLOW SPEED			
Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:	12.0	10	12.0	10
Right edge	2.0	ft	6.0	ft.
Left edge	6.0	ft	6.0	ft
Total lateral clearance	8.0	ft	12.0	ft
Access points per mile	0	10	0	
Median type	Undivided		Ü	
Free-flow speed:	Base		Measured	
FFS or BFFS	60.0	mph	60.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	-	0.0	mph
Median type adjustment, FM	1.6	mph mph	0.0	=
Access points adjustment, FA	0.0	mph mph	0.0	mph mph
		-		-
Free-flow speed	57.5	mph	60.0	mph
	VOLUME			
Direction	1		2	
Volume, V	3333	vph	0	vph
Peak-hour factor, PHF	0.90		0.90	
Peak 15-minute volume, v15	926		0	
Trucks and buses	5	%	0	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Level	
Grade	3.50	%	0.00	%
Segment length	0.60	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	2.0		1.5	
Recreational vehicles PCE, ER	3.0		1.2	
Heavy vehicle adjustment, fHV	0.952		1.000	
Flow rate, vp	1944	pcphpl	0	pcphpl
, _				1 1 1
	_RESULTS			
Direction	1		2	
Flow rate up	1944	nanhnl	0	nanhnl
Flow rate, vp		pcphpl	0	pcphpl
Free-flow speed, FFS	57.5	mph	60.0	mph
Avg. passenger-car travel speed, S	54.9	mph	60.0	mph
Level of service, LOS	E 35.4	ng/mi/1=	A	ng/mi/ln
Density, D	33.4	pc/mi/ln	0.0	pc/mi/ln

___OPERATIONAL ANALYSIS___

Analyst: BA

Agency/Co:

Date: 8/18/02 Analsis Period: 3 PM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2001 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION

FREE-FLOW SPEED					
Direction	1		2		
Lane width	12.0	ft	12.0	ft	
Lateral clearance:					
Right edge	2.0	ft	6.0	ft	
Left edge	6.0	ft	6.0	ft	
Total lateral clearance	8.0	ft	12.0	ft	
Access points per mile	0		0		
Median type	Undivide	d			
Free-flow speed:	Base		Measured		
FFS or BFFS	60.0	mph	60.0	mph	
Lane width adjustment, FLW	0.0	mph	0.0	mph	
Lateral clearance adjustment, FLC	0.9	mph	0.0	mph	
Median type adjustment, FM	1.6	mph	0.0	mph	
Access points adjustment, FA	0.0	mph	0.0	mph	
Free-flow speed	57.5	mph	60.0	mph	
-		-		-	
	VOLUME				
Direction	1		2		
Volume, V	2565	vph	0	vph	
Peak-hour factor, PHF	0.90		0.90		
Peak 15-minute volume, v15	713		0		
Trucks and buses	5	%	0	%	
Recreational vehicles	0	%	0	%	
Terrain type	Grade		Level		
Grade	3.50	%	0.00	%	
Segment length	0.60	mi	0.00	mi	
Number of lanes	2		2		
Driver population adjustment, fP	1.00		1.00		
Trucks and buses PCE, ET	2.0		1.5		
Recreational vehicles PCE, ER	3.0		1.2		
Heavy vehicle adjustment, fHV	0.952		1.000		
Flow rate, vp	1496	pcphpl	0	pcphpl	
	RESULTS				
Direction	1		2		
Flow rate, vp	1496	pcphpl	0	pcphpl	
Free-flow speed, FFS	57.5	mph	60.0	mph	
Avg. passenger-car travel speed, S	57.2	mph	60.0	mph	
Level of service, LOS	D	"FII	Α	L.11	
Density, D	26.1	pc/mi/ln		pc/mi/ln	
2011220112	20.1	PC/1/111		F 0 / 1111	

___OPERATIONAL ANALYSIS___

Analyst: BA

Agency/Co:

Date: 8/18/02 Analsis Period: 4 PM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2001 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION

FREE-FLOW SPEED					
Direction	1		2		
Lane width	12.0	ft	12.0	ft	
Lateral clearance:					
Right edge	2.0	ft	6.0	ft	
Left edge	6.0	ft	6.0	ft	
Total lateral clearance	8.0	ft	12.0	ft	
Access points per mile	0		0		
Median type	Undivide	d			
Free-flow speed:	Base		Measured		
FFS or BFFS	60.0	mph	60.0	mph	
Lane width adjustment, FLW	0.0	mph	0.0	mph	
Lateral clearance adjustment, FLC	0.9	mph	0.0	mph	
Median type adjustment, FM	1.6	mph	0.0	mph	
Access points adjustment, FA	0.0	mph	0.0	mph	
Free-flow speed	57.5	mph	60.0	mph	
Tide tid. Speed	37.5	[-11		[-11	
	_VOLUME				
Direction	1		2		
Volume, V	2327	vph	0	vph	
Peak-hour factor, PHF	0.90		0.90		
Peak 15-minute volume, v15	646		0		
Trucks and buses	5	%	0	%	
Recreational vehicles	0	%	0	%	
Terrain type	Grade		Level		
Grade	3.50	%	0.00	%	
Segment length	0.60	mi	0.00	mi	
Number of lanes	2		2		
Driver population adjustment, fP	1.00		1.00		
Trucks and buses PCE, ET	2.0		1.5		
Recreational vehicles PCE, ER	3.0		1.2		
Heavy vehicle adjustment, fHV	0.952		1.000		
Flow rate, vp	1357	pcphpl	0	pcphpl	
· -	D D GIII MG				
	_RESULTS				
Direction	1		2		
Flow rate, vp	1357	pcphpl	0	pcphpl	
Free-flow speed, FFS	57.5	mph	60.0	mph	
Avg. passenger-car travel speed, S	57.5	mph	60.0	mph	
Level of service, LOS	37.3 C	шрш	A	mP11	
Density, D	23.6	pc/mi/ln	==	pc/mi/ln	

___OPERATIONAL ANALYSIS___

Analyst: BA

Agency/Co:

Date: 8/18/02 Analsis Period: 5 PM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2001 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION

FREE	-FLOW SPEEI)				
Direction	1		2			
Lane width	12.0	ft	12.0	ft		
Lateral clearance:						
Right edge	2.0	ft	6.0	ft		
Left edge	6.0	ft	6.0	ft		
Total lateral clearance	8.0	ft	12.0	ft		
Access points per mile	0		0			
Median type	Undivided	1				
Free-flow speed:	Base		Measured			
FFS or BFFS	60.0	mph	60.0	mph		
Lane width adjustment, FLW	0.0	mph	0.0	mph		
Lateral clearance adjustment, FLC	0.9	mph	0.0	mph		
Median type adjustment, FM	1.6	mph	0.0	mph		
Access points adjustment, FA	0.0	mph	0.0	mph		
Free-flow speed	57.5	mph	60.0	mph		
riee-liow speed	37.3	шрп	00.0	шрп		
	_VOLUME					
21	-		0			
Direction	1	1	2	1		
Volume, V	3488	vph	0	vph		
Peak-hour factor, PHF	0.90		0.90			
Peak 15-minute volume, v15	969		0	_		
Trucks and buses	5	%	0	%		
Recreational vehicles	0	%	0	ે		
Terrain type	Grade		Level			
Grade	3.50	8	0.00	8		
Segment length	0.60	mi	0.00	mi		
Number of lanes	2		2			
Driver population adjustment, fP	1.00		1.00			
Trucks and buses PCE, ET	2.0		1.5			
Recreational vehicles PCE, ER	3.0		1.2			
Heavy vehicle adjustment, fHV	0.952		1.000			
Flow rate, vp	2034	pcphpl	0	pcphpl		
RESULTS						
Direction	1		2			
Flow rate, vp	2034	pcphpl	0	pcphpl		
Free-flow speed, FFS	57.5	mph	60.0	mph		
Avg. passenger-car travel speed, S	54.3	mph	60.0	mph		
Level of service, LOS	E .		Α			
Density, D	37.4	pc/mi/ln		pc/mi/ln		

___OPERATIONAL ANALYSIS___

Analyst: BA

Agency/Co:

Date: 8/18/02 Analsis Period: 6 PM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2001 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION

FREE-FLOW SPEED						
Direction	1		2			
Lane width	12.0	ft	12.0	ft		
Lateral clearance:						
Right edge	2.0	ft	6.0	ft		
Left edge	6.0	ft	6.0	ft		
Total lateral clearance	8.0	ft	12.0	ft		
Access points per mile	0		0			
Median type	Undivide	ed				
Free-flow speed:	Base		Measure	d		
FFS or BFFS	60.0	mph	60.0	mph		
Lane width adjustment, FLW	0.0	mph	0.0	mph		
Lateral clearance adjustment, FLC	0.9	mph	0.0	mph		
Median type adjustment, FM	1.6	mph	0.0	mph		
Access points adjustment, FA	0.0	mph	0.0	mph		
Free-flow speed	57.5	mph	60.0	mph		
Tice flow bpeed	37.3	mpii	00.0	mp11		
	_VOLUME					
Direction	1		2			
Volume, V	2931	vph	0	vph		
Peak-hour factor, PHF	0.90	VPII	0.90	v PII		
Peak 15-minute volume, v15	814		0.50			
Trucks and buses	5	8	0	8		
Recreational vehicles	0	96	0	%		
Terrain type	Grade	0	Level	0		
Grade	3.50	8	0.00	%		
Segment length	0.60	mi	0.00	mi		
Number of lanes	2	шт	2	шт		
Driver population adjustment, fP	1.00		1.00			
	2.0		1.5			
Trucks and buses PCE, ET Recreational vehicles PCE, ER	3.0		1.2			
Heavy vehicle adjustment, fHV	0.952		1.000	la 1		
Flow rate, vp	1709	pcphpl	0	pcphpl		
RESULTS						
Direction	1		2			
Flow rate, vp	1709	pcphpl	0	pcphpl		
Free-flow speed, FFS	57.5	mph	60.0	mph		
Avg. passenger-car travel speed, S	56.3	mph	60.0	mph		
Level of service, LOS	D	-	A	-		
Density, D	30.4	pc/mi/ln	0.0	pc/mi/ln		
-		-		=		

Bay Bridge 2001 Summer Weekend Day Reversible Lane Operation Eastbound Analysis (2 Lanes, 80 Percent Traffic)

HCS2000: Basic Freeway Segments Release 4.1a

	Operational An	alysis	
Analyst:	BKA		
Agency or Company:	Parsons		
Date Performed:	8/13/02		
Analysis Time Period:			
Freeway/Direction:	BAY BRIDGE EAST	ROUND	
From/To:			
Jurisdiction:	Anne Arundel Co	unty	
Analysis Year:	2001		
Description: REVERSIBL	E OPERATION 2 LA	NES 80% EB TRAFFIC	
	Flow Inputs an	d Adjustments	
Volume, V		2348	veh/h
Peak-hour factor, PHF		0.90	V 311, 11
Peak 15-min volume, v15		652	V
Trucks and buses		6	00
Recreational vehicles		0	٥
Terrain type:		Grade	
Grade		3.00	ଚ୍ଚ
Segment length		0.70	mi
Trucks and buses PCE, E	т	1.5	
Recreational vehicle PC		3.0	
Heavy vehicle adjustmen		0.971	
Driver population factor		1.00	
Flow rate, vp	-, vp	1344	pc/h/ln
III III III III		1011	F 0, 11, 111
	Speed Inputs a	nd Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density		0.50	
Number of lanes, N		0.30	interchange/mi
		2	interchange/mi
Free-flow speed:			interchange/mi
		2	<pre>interchange/mi mi/h</pre>
Free-flow speed:	fLW	2 Ideal	
Free-flow speed: FFS or BFFS		2 Ideal 65.0	mi/h
Free-flow speed: FFS or BFFS Lane width adjustment,	tment, fLC	2 Ideal 65.0 0.0	mi/h mi/h
Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus	tment, fLC ustment, fID	2 Ideal 65.0 0.0 2.4	mi/h mi/h mi/h
Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus Interchange density adj	tment, fLC ustment, fID	2 Ideal 65.0 0.0 2.4 0.0	mi/h mi/h mi/h mi/h
Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjustment Interchange density adjustment Number of lanes adjustment	tment, fLC ustment, fID	2 Ideal 65.0 0.0 2.4 0.0 4.5	mi/h mi/h mi/h mi/h mi/h
Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjustment Interchange density adjustment Number of lanes adjustment	tment, fLC ustment, fID ent, fN	2 Ideal 65.0 0.0 2.4 0.0 4.5 58.1	mi/h mi/h mi/h mi/h mi/h
Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustment Free-flow speed, FFS	tment, fLC ustment, fID ent, fN	2 Ideal 65.0 0.0 2.4 0.0 4.5 58.1 Urban Freeway	mi/h mi/h mi/h mi/h mi/h mi/h mi/h
Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjust Interchange density adj Number of lanes adjustm Free-flow speed, FFS Flow rate, vp	tment, fLC ustment, fID ent, fN	2 Ideal 65.0 0.0 2.4 0.0 4.5 58.1 Urban Freeway mance Measures	mi/h mi/h mi/h mi/h mi/h mi/h mi/h pc/h/ln
Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjust Interchange density adj Number of lanes adjustment Free-flow speed, FFS Flow rate, vp Free-flow speed, FFS	tment, fLC ustment, fID ent, fNLOS and Perfor	2 Ideal 65.0 0.0 2.4 0.0 4.5 58.1 Urban Freeway mance Measures	mi/h mi/h mi/h mi/h mi/h mi/h mi/h mi/h
Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjust Interchange density adj Number of lanes adjustment Free-flow speed, FFS Flow rate, vp Free-flow speed, FFS Average passenger-car se	tment, fLC ustment, fID ent, fNLOS and Perfor	2 Ideal 65.0 0.0 2.4 0.0 4.5 58.1 Urban Freeway mance Measures 1344 58.1 58.1	mi/h mi/h mi/h mi/h mi/h mi/h mi/h pc/h/ln
Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjust Interchange density adj Number of lanes adjustment Free-flow speed, FFS Flow rate, vp Free-flow speed, FFS Average passenger-car se Number of lanes, N	tment, fLC ustment, fID ent, fNLOS and Perfor	2 Ideal 65.0 0.0 2.4 0.0 4.5 58.1 Urban Freeway mance Measures 1344 58.1 58.1 2	mi/h mi/h mi/h mi/h mi/h mi/h mi/h mi/h
Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjust Interchange density adj Number of lanes adjustment Free-flow speed, FFS Flow rate, vp Free-flow speed, FFS Average passenger-car se	tment, fLC ustment, fID ent, fNLOS and Perfor	2 Ideal 65.0 0.0 2.4 0.0 4.5 58.1 Urban Freeway mance Measures 1344 58.1 58.1	mi/h mi/h mi/h mi/h mi/h mi/h mi/h mi/h

HCS2000: Basic Freeway Segments Release 4.1a

	Operational Ana	alysis				
Analyst:	BKA					
Agency or Company:	Parsons					
	8/13/02					
Analysis Time Period:	-, -, -					
Freeway/Direction:	BAY BRIDGE EAST	BOUND				
From/To:	rom/To:					
Jurisdiction: Anne Arundel County						
Analysis Year: 2001						
Description: REVERSIBL	E OPERATION 2 LAI	NES 80% EB TRAFFIC				
	Flow Inputs and	d Adjustments				
Volume, V		2858	veh/h			
Peak-hour factor, PHF		0.90				
Peak 15-min volume, v15		794	V			
Trucks and buses		6	%			
Recreational vehicles		0	%			
Terrain type:		Grade				
Grade		3.00	%			
Segment length		0.70	mi			
Trucks and buses PCE, E	Т	1.5				
Recreational vehicle PC		3.0				
Heavy vehicle adjustmen		0.971				
Driver population facto		1.00				
Flow rate, vp	,	1635	pc/h/ln			
	Speed Inputs an	nd Adjustments				
- 122		10.0	5.			
Lane width	-	12.0	ft			
Right-shoulder lateral	clearance	2.0	ft			
Interchange density		0.50	interchange/mi			
Number of lanes, N		2				
Free-flow speed:		Ideal	1.73			
FFS or BFFS	5	65.0	mi/h			
Lane width adjustment,		0.0	mi/h			
Lateral clearance adjus		2.4	mi/h			
Interchange density adj		0.0	mi/h			
Number of lanes adjustm	ent, iN	4.5	mi/h			
Free-flow speed, FFS		58.1	mi/h			
		Urban Freeway				
	LOS and Perform	mance Measures				
Flow rate, vp		1635	pc/h/ln			
Free-flow speed, FFS		58.1	mi/h			
Average passenger-car s	peed, S	58.1	mi/h			
Number of lanes, N		2				
Density, D		28.1	pc/mi/ln			
Level of service, LOS		D				
Hever or service, Hos						

HCS2000: Basic Freeway Segments Release 4.1a

	Operational Ar	nalysis				
Analyst:	BKA					
Agency or Company:	Parsons					
	8/13/02					
Analysis Time Period:						
Freeway/Direction:		TROUND				
From/To:						
Jurisdiction:	Anne Arundel County					
Analysis Year:						
Description: REVERSIBI	E OPERATION 2 LA	ANES 80% EB TRAFFIC				
	Flow Inputs ar	nd Adjustments				
Volume, V		2922	veh/h			
Peak-hour factor, PHF		0.90				
Peak 15-min volume, v15		812	V			
Trucks and buses		6	90			
Recreational vehicles		0	%			
Terrain type:		Grade	·			
Grade		3.00	%			
Segment length		0.70	mi			
Trucks and buses PCE, E	!Т	1.5				
Recreational vehicle PC		3.0				
Heavy vehicle adjustmen		0.971				
Driver population factor		1.00				
Flow rate, vp	- / · F	1672	pc/h/ln			
	Speed Inputs a	and Adjustments				
Lane width		12.0	ft			
Right-shoulder lateral	clearance	2.0	ft			
Interchange density		0.50	interchange/mi			
Number of lanes, N		2				
Free-flow speed:		Ideal				
FFS or BFFS		65.0	mi/h			
Lane width adjustment,	fLW	0.0	mi/h			
Lateral clearance adjus	tment, fLC	2.4	mi/h			
Interchange density adj	ustment, fID	0.0	mi/h			
Number of lanes adjustm	ent, fN	4.5	mi/h			
Free-flow speed, FFS		58.1	mi/h			
		Urban Freeway				
	LOS and Perfor	rmance Measures				
Flow rate, vp		1672	pc/h/ln			
Free-flow speed, FFS		58.1	mi/h			
Average passenger-car s	peed, S	58.1	mi/h			
Number of lanes, N	/	2	,			
Density, D		28.8	pc/mi/ln			
Level of service, LOS		D	<u>-</u> · · · · ·			

HCS2000: Basic Freeway Segments Release 4.1a

	Operational A	nalysis					
Analyst:	BKA						
Agency or Company:	Parsons						
	8/13/02						
Analysis Time Period:	-, -, -						
Freeway/Direction:		TBOUND					
From/To:							
	Jurisdiction: Anne Arundel County						
-	Analysis Year: 2001						
Description: REVERSIBI	E OPERATION 2 L	ANES 80% EB TRAFFIC					
	Flow Inputs a	nd Adjustments					
Volume, V		2819	veh/h				
Peak-hour factor, PHF		0.90	,				
Peak 15-min volume, v15		783	V				
Trucks and buses		6	%				
Recreational vehicles		0	%				
Terrain type:		Grade					
Grade		3.00	%				
Segment length		0.70	mi				
Trucks and buses PCE, E	Т	1.5					
Recreational vehicle PC	E, ER	3.0					
Heavy vehicle adjustmen	t, fHV	0.971					
Driver population facto	r, vp	1.00					
Flow rate, vp		1613	pc/h/ln				
	Speed Inputs	and Adjustments					
Lane width		12.0	ft				
Right-shoulder lateral	alearange	2.0	ft				
Interchange density	Clearance	0.50	interchange/mi				
Number of lanes, N		2	incerenange, mi				
Free-flow speed:		Ideal					
FFS or BFFS		65.0	mi/h				
Lane width adjustment,	ftw	0.0	mi/h				
Lateral clearance adjus		2.4	mi/h				
Interchange density adj		0.0	mi/h				
Number of lanes adjustm		4.5	mi/h				
Free-flow speed, FFS	•	58.1	mi/h				
-		Urban Freeway					
LOS and Performance Measures							
Elevanote		1612					
Flow rate, vp		1613	pc/h/ln				
Free-flow speed, FFS	nood C	58.1 50 1	mi/h				
Average passenger-car s	peea, s	58.1 2	mi/h				
Number of lanes, N		27.8	ng/mi/ln				
Density, D Level of service, LOS		27.8 D	pc/mi/ln				
TOACT OF BETATOE' TOB		D					

HCS2000: Basic Freeway Segments Release 4.1a

	Operational Ana	alysis				
Analyst:	BKA					
Agency or Company:	Parsons					
Date Performed:	8/13/02					
Analysis Time Period:						
Freeway/Direction:	BAY BRIDGE EAST	BOUND				
From/To:						
Jurisdiction:	Anne Arundel Co	unty				
Analysis Year: 2001 Description: REVERSIBLE OPERATION 2 LANES 80% EB TRAFFIC						
Description: REVERSIBL	E OPERATION 2 LAI	NES 80% EB TRAFFIC				
	Flow Inputs and	d Adjustments				
Volume, V		2754	veh/h			
Peak-hour factor, PHF		0.90	V 311, 11			
Peak 15-min volume, v15		765	V			
Trucks and buses		6	8			
Recreational vehicles		0	%			
Terrain type:		Grade				
Grade		3.00	%			
Segment length		0.70	mi			
Trucks and buses PCE, E	Т	1.5				
Recreational vehicle PC	E, ER	3.0				
Heavy vehicle adjustmen	t, fHV	0.971				
Driver population facto	r, vp	1.00				
Flow rate, vp		1576	pc/h/ln			
	Speed Inputs a	nd Adjustments				
Lane width		12.0	ft			
Right-shoulder lateral	clearance	2.0	ft			
Interchange density	CICALANCC	0.50	interchange/mi			
Number of lanes, N		2	inecremanye, mi			
Free-flow speed:						
FFS or BFFS		Ideal				
LLO OT DLLO		Ideal 65.0	mi/h			
	fLW	65.0 0.0	mi/h mi/h			
Lane width adjustment,		65.0	·			
Lane width adjustment, Lateral clearance adjus	tment, fLC	65.0 0.0	mi/h			
Lane width adjustment,	tment, fLC ustment, fID	65.0 0.0 2.4	mi/h mi/h			
Lane width adjustment, Lateral clearance adjus Interchange density adj	tment, fLC ustment, fID	65.0 0.0 2.4 0.0	mi/h mi/h mi/h			
Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustm	tment, fLC ustment, fID	65.0 0.0 2.4 0.0 4.5	mi/h mi/h mi/h mi/h			
Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustm	tment, fLC ustment, fID	65.0 0.0 2.4 0.0 4.5 58.1 Urban Freeway	mi/h mi/h mi/h mi/h			
Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustm Free-flow speed, FFS	tment, fLC ustment, fID ent, fN	65.0 0.0 2.4 0.0 4.5 58.1 Urban Freeway	mi/h mi/h mi/h mi/h mi/h mi/h			
Lane width adjustment, Lateral clearance adjust Interchange density adj Number of lanes adjustm Free-flow speed, FFS Flow rate, vp	tment, fLC ustment, fID ent, fN	65.0 0.0 2.4 0.0 4.5 58.1 Urban Freeway mance Measures	mi/h mi/h mi/h mi/h mi/h mi/h pc/h/ln			
Lane width adjustment, Lateral clearance adjust Interchange density adj Number of lanes adjustm Free-flow speed, FFS Flow rate, vp Free-flow speed, FFS	tment, fLC ustment, fID ent, fNLOS and Perform	65.0 0.0 2.4 0.0 4.5 58.1 Urban Freeway mance Measures	mi/h mi/h mi/h mi/h mi/h mi/h pc/h/ln mi/h			
Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustm Free-flow speed, FFS Flow rate, vp Free-flow speed, FFS Average passenger-car s	tment, fLC ustment, fID ent, fNLOS and Perform	65.0 0.0 2.4 0.0 4.5 58.1 Urban Freeway mance Measures 1576 58.1 58.1	mi/h mi/h mi/h mi/h mi/h mi/h pc/h/ln			
Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustm Free-flow speed, FFS Flow rate, vp Free-flow speed, FFS Average passenger-car s Number of lanes, N	tment, fLC ustment, fID ent, fNLOS and Perform	65.0 0.0 2.4 0.0 4.5 58.1 Urban Freeway mance Measures 1576 58.1 58.1 2	mi/h mi/h mi/h mi/h mi/h mi/h mi/h mi/h			
Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustm Free-flow speed, FFS Flow rate, vp Free-flow speed, FFS Average passenger-car s	tment, fLC ustment, fID ent, fNLOS and Perform	65.0 0.0 2.4 0.0 4.5 58.1 Urban Freeway mance Measures 1576 58.1 58.1	mi/h mi/h mi/h mi/h mi/h mi/h pc/h/ln mi/h			

HCS2000: Basic Freeway Segments Release 4.1a

	Operational	Analysis				
Analyst:	BKA					
Agency or Company:	Parsons					
	8/13/02					
Analysis Time Period:						
Freeway/Direction:	BAY BRIDGE EA	A STROLIND				
From/To:						
Jurisdiction:	Anne Arundel County					
Analysis Year:	lysis Year: 2001					
Description: REVERSIBL	E OPERATION 2	LANES 80% EB TRAFFIC				
	Flow Inputs	and Adjustments				
Volume, V		2806	veh/h			
Peak-hour factor, PHF		0.90	,			
Peak 15-min volume, v15		779	V			
Trucks and buses		6	000			
Recreational vehicles		0	00			
Terrain type:		Grade	·			
Grade		3.00	90			
Segment length		0.70	mi			
Trucks and buses PCE, E	Т	1.5				
Recreational vehicle PC		3.0				
Heavy vehicle adjustmen		0.971				
Driver population facto		1.00				
Flow rate, vp	, 1	1606	pc/h/ln			
·	Speed Inputs	s and Adjustments				
Lane width		12.0	ft			
Right-shoulder lateral	aloarango	2.0	ft			
Interchange density	Clearance	0.50	interchange/mi			
Number of lanes, N		2	incerchange/ mi			
Free-flow speed:		Ideal				
FFS or BFFS		65.0	mi/h			
Lane width adjustment,	ft.w	0.0	mi/h			
Lateral clearance adjus		2.4	mi/h			
Interchange density adj		0.0	mi/h			
Number of lanes adjustm		4.5	mi/h			
Free-flow speed, FFS		58.1	mi/h			
II de II du Speca, II d		Urban Freeway				
	LOS and Perf	Formance Measures				
Flow rate, vp		1606	pc/h/ln			
Free-flow speed, FFS		58.1	mi/h			
Average passenger-car s	peed, S	58.1	mi/h			
Number of lanes, N		2				
Density, D		27.6	pc/mi/ln			
Level of service, LOS		D				

HCS2000: Basic Freeway Segments Release 4.1a

	Operational Ana	lysis					
Analyst:	BKA						
Agency or Company:	Parsons						
	8/13/02						
Analysis Time Period:							
Freeway/Direction:		SOUND					
From/To:							
	Jurisdiction: Anne Arundel County						
Analysis Year:	2001	TEC 000 ED EDJEETO					
Description: REVERSIBL	E OPERATION 2 LAN	ES 80% EB TRAFFIC					
	Flow Inputs and	Adjustments					
Volume, V		2408	veh/h				
Peak-hour factor, PHF		0.90					
Peak 15-min volume, v15		669	V				
Trucks and buses		6	%				
Recreational vehicles		0	%				
Terrain type:		Grade					
Grade		3.00	%				
Segment length		0.70	mi				
Trucks and buses PCE, E	Т	1.5					
Recreational vehicle PC	E, ER	3.0					
Heavy vehicle adjustmen	t, fHV	0.971					
Driver population factor	r, vp	1.00					
Flow rate, vp		1378	pc/h/ln				
	Speed Inputs an	d Adjustments					
Lane width		12.0	ft				
Right-shoulder lateral	clearance	2.0	ft				
Interchange density	010010100	0.50	interchange/mi				
Number of lanes, N		2	3 - ,				
Free-flow speed:		Ideal					
FFS or BFFS		65.0	mi/h				
Lane width adjustment,	fLW	0.0	mi/h				
Lateral clearance adjus		2.4	mi/h				
Interchange density adj		0.0	mi/h				
Number of lanes adjustm	ent, fN	4.5	mi/h				
Free-flow speed, FFS		58.1	mi/h				
		Urban Freeway					
	LOS and Perform	ance Measures					
Flow rate, vp		1378	pc/h/ln				
Free-flow speed, FFS		58.1	mi/h				
Average passenger-car s	need. S	58.1	mi/h				
Number of lanes, N	peca, b	2	/ 11				
Density, D		23.7	pc/mi/ln				
Level of service, LOS		C C	,, -				

HCS2000: Basic Freeway Segments Release 4.1a

	Operational Ana	alysis							
Analyst:	BKA								
Agency or Company:	Parsons								
Date Performed:	8/13/02								
Analysis Time Period:									
Freeway/Direction:	BAY BRIDGE EASTE	ROLIND							
From/To:									
Jurisdiction:	Anne Arundel Cou	inty							
Analysis Year:	2001								
Description: REVERSIBE	E OPERATION 2 LAN	IES 80% EB TRAFFIC							
	Flow Inputs and	l Adjustments							
Volume, V		2466	veh/h						
Peak-hour factor, PHF		0.90	VeII/II						
Peak 15-min volume, v15		685	V						
Trucks and buses		6	v %						
Recreational vehicles		0	%						
Terrain type:		Grade	6						
Grade		3.00	%						
Segment length		0.70	mi						
Trucks and buses PCE, E	lT	1.5							
Recreational vehicle PC		3.0							
Heavy vehicle adjustmen									
Driver population factor		•							
Flow rate, vp		1411	pc/h/ln						
	Speed Inputs an	nd Adiustmonts							
	speed inputs an	a Adjustments							
Lane width		12.0	ft						
Right-shoulder lateral	clearance	2.0	ft						
Interchange density		0.50	interchange/mi						
Number of lanes, N		2							
Free-flow speed:		Ideal							
FFS or BFFS		65.0	mi/h						
Lane width adjustment,		0.0	mi/h						
Lateral clearance adjus		2.4	mi/h						
Interchange density adj		0.0	mi/h						
Number of lanes adjustm	ent, fN	4.5	mi/h						
Free-flow speed, FFS		58.1	mi/h						
		Urban Freeway							
	LOS and Perform	nance Measures							
Flow rate, vp		1411	pc/h/ln						
		58.1	mi/h						
Free-flow speed, FFS			1 /1.						
Average passenger-car s	peed, S	58.1	mi/h						
-	peed, S	58.1 2	mi/n						
Average passenger-car s Number of lanes, N Density, D	peed, S		mi/n pc/mi/ln						
Average passenger-car s Number of lanes, N	peed, S	2							

HCS2000: Basic Freeway Segments Release 4.1a

	Operational Ar	alysis	
Analyst:	BKA		
Agency or Company:	Parsons		
	8/13/02		
Analysis Time Period:			
Freeway/Direction:	BAY BRIDGE EAST	'BOUND	
From/To:			
Jurisdiction:	Anne Arundel Co	ounty	
Analysis Year:	2001		
Description: REVERSIBL	E OPERATION 2 LA	NES 80% EB TRAFFIC	
	Flow Inputs an	d Adjustments	
Volume, V		2883	veh/h
Peak-hour factor, PHF		0.90	, 5,
Peak 15-min volume, v15		801	V
Trucks and buses		6	%
Recreational vehicles		0	olo
Terrain type:		Grade	·
Grade		3.00	olo
Segment length		0.70	mi
Trucks and buses PCE, E	Т	1.5	-
Recreational vehicle PC		3.0	
Heavy vehicle adjustmen		0.971	
Driver population factor		1.00	
Flow rate, vp	, 1	1650	pc/h/ln
	Speed Inputs a	nd Adjustments	
- 111			5.
Lane width	-	12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		2	
Free-flow speed:		Ideal	
FFS or BFFS	£TIJ	65.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adjus		2.4	mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjustm	ent, in	4.5	mi/h
Free-flow speed, FFS		58.1	mi/h
		Urban Freeway	
	LOS and Perfor	mance Measures	
Flow rate, vp		1650	pc/h/ln
Free-flow speed, FFS		58.1	mi/h
Average passenger-car s	peed, S	58.1	mi/h
Number of lanes, N		2	
Density, D		28.4	pc/mi/ln
Level of service, LOS		D	

HCS2000: Basic Freeway Segments Release 4.1a

	Operational Ana	alysis						
Analyst:	BKA							
Agency or Company:	Parsons							
Date Performed:	8/13/02							
Analysis Time Period:								
Freeway/Direction:	BAY BRIDGE EASTE	BOUND						
From/To:								
Jurisdiction:	Anne Arundel Cou	unty						
Analysis Year:	2001							
Description: REVERSIBI	E OPERATION 2 LAN	NES 80% EB TRAFFIC						
	Flow Inputs and	d Adjustments						
Volume, V		2774	veh/h					
Peak-hour factor, PHF		0.90	Ve11/11					
Peak 15-min volume, v15		771	V					
Trucks and buses	,	6	00					
Recreational vehicles		0	0/0					
Terrain type:		Grade	0					
Grade		3.00	ે જ					
Segment length		0.70	mi					
Trucks and buses PCE, E	lT	1.5						
Recreational vehicle PC		3.0						
Heavy vehicle adjustmen								
Driver population factor								
Flow rate, vp		1.00 1587	pc/h/ln					
	Speed Inputs ar	nd Adjustments						
Lane width		12.0	ft					
Right-shoulder lateral	clearance	2.0	ft					
Interchange density		0.50	interchange/mi					
Number of lanes, N		2						
Free-flow speed:		Ideal						
FFS or BFFS	C=	65.0	mi/h					
Lane width adjustment,		0.0	mi/h					
Lateral clearance adjus		2.4	mi/h					
Interchange density add		0.0	mi/h					
Number of lanes adjustm	ient, in	4.5	mi/h					
Free-flow speed, FFS		58.1	mi/h					
		Urban Freeway						
	LOS and Perform	mance Measures						
Flow rate, vp		1587	pc/h/ln					
Free-flow speed, FFS		58.1	mi/h					
Average passenger-car s	speed, S	58.1	mi/h					
Number of lanes, N		2						
Density, D		27.3	pc/mi/ln					
Level of service, LOS		D						

HCS2000: Basic Freeway Segments Release 4.1a

	Operational Ar	alysis	
Analyst:	BKA		
Agency or Company:	Parsons		
Date Performed:	8/13/02		
Analysis Time Period:			
Freeway/Direction:	BAY BRIDGE EAST	'B∩UND	
From/To:			
Jurisdiction:	Anne Arundel Co	ounty	
Analysis Year:	2001		
Description: REVERSIBL	E OPERATION 2 LA	NES 80% EB TRAFFIC	
	Flow Inputs an	d Adjustments	
Volume, V		1588	veh/h
Peak-hour factor, PHF		0.90	V G11/ 11
Peak 15-min volume, v15		441	V
Trucks and buses		6	%
Recreational vehicles		0	000
Terrain type:		Grade	
Grade		3.00	%
Segment length		0.70	mi
Trucks and buses PCE, E	т	1.5	
Recreational vehicle PC		3.0	
Heavy vehicle adjustmen		0.971	
Driver population factor		1.00	
Flow rate, vp	-, vp	909	pc/h/ln
			F - 7 7
	Speed Inputs a	nd Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density			
		0.50	interchange/mi
Number of lanes, N		0.50 2	interchange/mi
Number of lanes, N Free-flow speed:			interchange/mi
		2	interchange/mi mi/h
Free-flow speed:	fLW	2 Ideal	
Free-flow speed: FFS or BFFS		2 Ideal 65.0	mi/h
Free-flow speed: FFS or BFFS Lane width adjustment,	tment, fLC	2 Ideal 65.0 0.0	mi/h mi/h
Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus	tment, fLC ustment, fID	2 Ideal 65.0 0.0 2.4	mi/h mi/h mi/h
Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus Interchange density adj	tment, fLC ustment, fID	2 Ideal 65.0 0.0 2.4 0.0	mi/h mi/h mi/h mi/h
Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustm	tment, fLC ustment, fID	2 Ideal 65.0 0.0 2.4 0.0 4.5	mi/h mi/h mi/h mi/h mi/h
Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustm	tment, fLC ustment, fID ent, fN	2 Ideal 65.0 0.0 2.4 0.0 4.5 58.1	mi/h mi/h mi/h mi/h mi/h
Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustm Free-flow speed, FFS	tment, fLC ustment, fID ent, fN	2 Ideal 65.0 0.0 2.4 0.0 4.5 58.1 Urban Freeway	mi/h mi/h mi/h mi/h mi/h mi/h mi/h
Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustm Free-flow speed, FFS Flow rate, vp	tment, fLC ustment, fID ent, fN	2 Ideal 65.0 0.0 2.4 0.0 4.5 58.1 Urban Freeway mance Measures	mi/h mi/h mi/h mi/h mi/h mi/h mi/h pc/h/ln
Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustm Free-flow speed, FFS Flow rate, vp Free-flow speed, FFS	tment, fLC ustment, fID ent, fNLOS and Perfor	2 Ideal 65.0 0.0 2.4 0.0 4.5 58.1 Urban Freeway mance Measures 909 58.1	mi/h mi/h mi/h mi/h mi/h mi/h mi/h mi/h
Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustm Free-flow speed, FFS Flow rate, vp Free-flow speed, FFS Average passenger-car s	tment, fLC ustment, fID ent, fNLOS and Perfor	2 Ideal 65.0 0.0 2.4 0.0 4.5 58.1 Urban Freeway mance Measures 909 58.1 58.1	mi/h mi/h mi/h mi/h mi/h mi/h mi/h pc/h/ln
Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjust Interchange density adj Number of lanes adjustment Free-flow speed, FFS Flow rate, vp Free-flow speed, FFS Average passenger-car se Number of lanes, N	tment, fLC ustment, fID ent, fNLOS and Perfor	2 Ideal 65.0 0.0 2.4 0.0 4.5 58.1 Urban Freeway mance Measures 909 58.1 58.1 2	mi/h mi/h mi/h mi/h mi/h mi/h mi/h mi/h
Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustm Free-flow speed, FFS Flow rate, vp Free-flow speed, FFS Average passenger-car s	tment, fLC ustment, fID ent, fNLOS and Perfor	2 Ideal 65.0 0.0 2.4 0.0 4.5 58.1 Urban Freeway mance Measures 909 58.1 58.1	mi/h mi/h mi/h mi/h mi/h mi/h mi/h mi/h

HCS2000: Basic Freeway Segments Release 4.1a

	Operational Ar	nalysis	
Analyst:	BKA		
Agency or Company:	Parsons		
	8/13/02		
Analysis Time Period:			
Freeway/Direction:		PROLIND.	
From/To:			
Jurisdiction:	Anne Arundel Co	ounty	
Analysis Year:	2001		
Description: REVERSIBI	E OPERATION 2 LA	ANES 80% EB TRAFFIC	
·	Flow Inputs ar	nd Adjustments	
Volume, V		1761	veh/h
Peak-hour factor, PHF		0.90	,
Peak 15-min volume, v15		489	V
Trucks and buses		6	90
Recreational vehicles		0	90
Terrain type:		Grade	·
Grade		3.00	%
Segment length		0.70	mi
Trucks and buses PCE, E	!T	1.5	
Recreational vehicle PC		3.0	
Heavy vehicle adjustmer		0.971	
Driver population factor		1.00	
Flow rate, vp	,	1008	pc/h/ln
	Chood Inputs		1 - 7
	speed inputs a	and Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		2	
Free-flow speed:		Ideal	
FFS or BFFS		65.0	mi/h
Lane width adjustment,		0.0	mi/h
Lateral clearance adjus		2.4	mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjustm	nent, fN	4.5	mi/h
Free-flow speed, FFS		58.1	mi/h
		Urban Freeway	
	LOS and Perfor	rmance Measures	
Flow rate, vp		1008	pc/h/ln
Free-flow speed, FFS		58.1	mi/h
Average passenger-car s	speed, S	58.1	mi/h
Number of lanes, N	,	2	•
Density, D		17.3	pc/mi/ln
Level of service, LOS		В	<u>-</u> · · · · · ·
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Maryland State Highway Administration Office of Traffic and Cafety - Traffic Sefety Analysis Division SMA 52.1 ADC Study Worksheet Output rev. 12/99-3 Name: TRRAKTON Date: 04/29/2003

Longth: USSO Oceanic Brive to MON Overpass Longth: 5.78

County: Cross County Period: Jan. 1, 1999 to approx. Oct. 31, 2002 Type Controls: 1R-1004 . Bignificantly Higher than Statewide STUDYBATE STWORATE 2001 2002 TOTAL YRAR . 2333 2000 FRIAL 1 1 1 3 0.5 0.5 Ma KILLED IMJURY 26 10 37 145 25.0 -16.2 ŢP. 59 270 _ NO. INJUNED 67_ 64 22.7 254 43.6 . 402 69.3 * 38.5 TOTAL ACC .54 105 88.1 58.7 75.6 RATE 79400 74100 65800 65500 ADT 167-5 136.8 117.0 509.1 VNT (millions) 156.8 Q.B OPPOSITE OIR 1 1 0.3 41.7 HEAR THE _ 54 ... 242 0.9 BIDESWIPE 19 3.3 3.6 FRAL LABOT AUCHE 0:3 8.3 PROSECULIAS2 1.2 -8.7 SINK OBTROL ... 16 11-TURNS PACKING ANIPAL HALLROAD EXPL /PIRE OVERTURA OTHER/UNK TROK BALL ACC 31 100 10.6 * 25 28 24 6.7 14 % 32 % MICHTS INC. 11 19 13 15 G S HET SURFACE 38 _ 9 9 _ _ 20 _* ALCOHOL REL 19 INTERSEC REL 1 1 3 20+ 227 237 885 TOTAL TRUCKS 25 28 24 168 PERCENT TRAS 12.2 11.5 15.2 10.1

Note: Statewide Accident Rates shown in this table are for similar urban facilities. For the analysis of accidents on the Bay Bridge, accident rates in Anne Arundel County were compared to similar Urban Principal Arterials and accident rates in Queen Anne's County were compared to similar Rural Principal Arterials to be consistent with the classification of the roadway in each segment.

Maryland State Highway Administration Office of Traffic and Safety - Traffic Safety Analysis Division SHA 52.1 ADC Summary Output rev. 12/98-1 Hame: TERAXION Date: 04/29/2003

Note (s):

Location: UESO Oceanic Drive to MDS Overpase

County: Cross County Period: January 1, 1999 To December 11, 1999

Length: 5.78

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Maryland State Highway Administration Office of Traffic and Safety - Traffic Safety Analysis Division SHA 52.1 ADC Summary Output rev. 12/98-1. Name: TRRAKTOM: Date: 04/29/2003

Location: USSO Oceanic brive to HDM Overpass County: Cross County Period: January

Period: January 1, 2000 To December 31, 2006 Note (e):

Longth: 5.78

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Maryland State Highway Administration Office of Traffic and Satety - Traffic Malety Analysis Division SHA 52.1 ADC Susmary Output rev- 12/98-1

Name: TURALTON Date: 04/29/2003

Hote(s):

Location: USSO Oceanic Drive to MD8 Overpass Period: January 1, 2001 To December 31, 2001

County: Cross County

Longth: 5.78

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Haryland State Highway Administration Office of Traffic and Safety - Traffic Sefety Analysis Division SNA 52:1 ADC Summary Cutput rev. 12/98-1 Name: TBRAXTON Dato: 04/29/2003

Location: USSO Oceanic Drive to MDS Overpass
County: Cross County Period: Jan. 1, 2002 to approx. Oct. 31, 2002 Stote(s):

Length: 5.78

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Maryland State Highway Administration Office of Traffic and Safety - Traffic Safety Analysis Division mma 52:1 ADC Combined Susmary Output rev. 12/98-1 Name: TRUNKTON Date: 04/29/2003

Location: USSO Oceanic Drive to NOE Overpass County: Cross County Period: Jan. 1, 1998 to approx. Oct. 31, 2002 Hote(s): Length: 5.78

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Maryland State Righmay Administration
Office of Traffic and Safety - Traffic Safety Analysis Division
SNA 52.1 ADC Commind Logalle Mistory Output rev. 12/98-1

Name: TURATION Date: 04/30/2003

Length: 5.78

Location: USBG Occanic Drive to MDS Overpass

County: Gross County Period: Jan. 1, 1999 to approx. Occ. 31, 2002 Hote(s):

LOGHILE	ir: Date	SEVERITE	TIME	LIONT	SUR PACE	ALC	OG	TANK CT2M	AT AS MOAE	PRODABLE CAUSE
JS0050				*******						
Anne Ar	undel	2								
17.05	060299	1 Inj.	SP	DAY	DILY			KREND	RS ES	PAIL TO GIVE FULL TIME/ATTENT
17.05	110299	ı ınj.	9 A	DAY	DAY		05	PROBJ	WE na	PAIL TO CIVE FULL TIME/ATTENT
37.05	632999	1 Inj	129	DAY	DRY			PERMIT	EI ES	PAIL TO GIVE PULL TIME/ATTENT
17.95	670100	PROPERTY	112	DAT	DRY			MEND	ES 55	PAIL TO GIVE PULL TIME/ATTENT
17.05	040900	ı ınj.	EA	NIGHT	day			REEMD	NS MS	PAIL TO GIVE FULL TIME/ATTERT
17.05	090700	l Inj.	9A	DAY	DRY			edswp	M3 M9	IMPROPER TURK
17.05	101101	PROPERTY	-6₽	DAY	DRY			OTHER	es es	ANIMAL
17.05	112501	1 Inj.	86	HIGHT	WEI			RREND	es rs	PAIL TO GIVE FULL TIME/ATTENT
17.05	612403	PROPERTY	35.	NIGHT	WET			PARKD	AG GE	CHRESONN OR OTHER CAUSE
17.05	110602	PROPERTY	48	DAY	DXY			TREED	es es	POLICHED TOO CLOUBLY
17.06	072301	PROPERTY	3P	DAT	DAX		05	PADDJ	WS BA	ARHICTE DEAUCL
17.07	061999	PROPERTY	118	DAY	DRY			RREND	eg es	FAIL TO GIVE FULL TIMES/ATTENT
17.07	041201	PROPERTY	11F	MIGHT	DRY			SDSWP	WE WS	FAIL TO GIVE PULL TIME/ATTENT
17.07	041403	1 Inj.	38	DAY	DRY		95	FROM	MS nu	PAIL TO GIVE FULL TIME/ATTENT
17.09	052899	PROPERTY	116	MIGHT	DRY			REPRESE	rs es	DEMONSHION OF OTHER CAUSE
17.11	062500	PROPERTY	511	DAY	DRY	₹.,		OTHER	uu es	UNDER IMPLUENCE OF ALCOHOL
17.14	052000	PROPERTY	12P	DAY	WRT			OTHER	ES na	TOO FAST FOR CONDITIONS
17.14	081500	1 Inj	111	DAY	DKY			RREDED	us es	FAIL TO GIVE FULL TIME/ATTENT
17.14	092802	1 Inj.	1 2 P	DAY	DRY			other	KE DA	UNICHONN OR OTHER CAUSE
17.14	072902	PROPURTY	12r	DAY	DRY			OTHER	94 UU	CHINOCOL CR OTHER CAUSE
17.14	062901	PROPERTY	27	DAY	DRY			RREED	es es	PAIL TO GIVE FULL TIME/ATTENT
17.15	111199	i Inj.	GA	DAY	DHI			REEND	MS NG	FAIL TO GIVE PULL TIME/ATTENT
17.16	070299	i inj.	129	DAY	DRY			RRRIP	NS NS	INTERIORIS OR OTHER CAUSE
17.15	061302	2K 01	5A.	DAY	DRY			PARKD	WE UP	PAIL TO GIVE PULL TIME/ATTENT
17.15	031602	2 Inj.	111	DAY	WET			BREND		PAIL TO GIVE PULL TIME/ATTENT
17.21	050799	3 [8]	.4P.	DAY.	DRY			OTHER	WS WS ES E9	PAIL TO GIVE FULL TIME/ATTENT
17.21	032599	PROPERTY	41	DAY	DRY			RREERD	ES ES	TOO PAST FOR CONDITIONS
17.21	070201	PROPERTY	5P		DAY		OR	PXOBJ	RS na	TAIL TO GIVE PULL TIME/ATTENT
37.24	000700	PROPERTY	JIV JIV	DAY	DRY		yn.	PARMO	ES 110	PAIL TO GIVE FULL TIME/ATTENT
17.24	062303	PROPERTY	11A	DAY	DRY		08	PXOB3	EC na	IMPROPER PASSING
17.26	110299	PROPERTY	47	DAY	WET		05	PKOBJ	MS na	PAIL TO GIVE FULL TIME/ATTENT
17.25 17.25	083001	1 inj.	108	DAY	WET			CTREE	WS UU	TOO PAST FOR COMDITIONS
17.29	051502	l Inj.	12P	DAT	DRY			RABER	RS BS	POLLOWED TOO CLOSELY
17.31	051701	PROPERTY	102	nicht	DAY			OTHER	KO KO	UNICHONN OR OTHER CAUSE
17.51	081702	PROPERTY	102	HIGHT	DRY	1		9DSWP	ES RE	UNDER INFLUENCE OF ALCOHOL
17.32	061999	PROPERTY	11A	DAY	DRY	·*:		REEMO	UD ES	PAIL TO GIVE FULL TIME/ATTEMY
17.32	061999 041900	PROPERTY	114	DAY	DRY	1		RREND	ES ES	UNDER IMPLUENCE OF ALCOHOL
17.33	090682	PROPERTY	42	DAY	DRY	₹.		OTHER	UU ES	PAIL TO YIELD RIGHT OF MAY
17.33	062102	PROPERTY	10P	NIGHT	WET			OTHER	OU ES	PAIL TO TIELD RIGHT OF MAY
17.34	012299	PROPERTY	23A	DAY	WET		00	PXORJ	ES Da	IMPOONE OR OTHER CAUSE
+(+4*	014499		yA.	'rwr.	into \$		40	: United	10-	
KOB (01) =8c1	oge (02)-Bui	lding (01)	-Culve	r/Ditch	(D4) i	Carb	(0:) =Gened:	mail/Burn	rier (06)-Embankment (07)-Pe

Continues ...

ADC Combined Logaile History Output Continued ...

Licipitle	IR	DATE	SEVERITY	TIME	LIGHT	SUR FACE	ALC	DE DE	CLEN	MDAE	PRODABLE CAUSE
LEASTILLE	**	UM.15		4 5 (14)							
.17,-34		021699	PROPERTY	47	DAT	DRY			OTHER	BS DB	UNKNOWN OR CTHER CADER
27.34		050899	PROPERTY	114	DAY	DRY		65 .	PECEJ	85 na	PAIL TO GIVE FULL TIME/ATTENT
17.34		060699	PROPERTY	101	MICHT	DRY		ÖR	PECINI	E9 ne	PAIL TO GIVE PULL TIME/ATTENT
17.34		061799	PROPERTY	37	DAY	HET		88	LXOB1	ES DA	PAIL TO GIVE PULL TIME/ATTENT
17.34		080999	PROPERTY	73	DAY	DOX		02	PROBJ	ES GA	PAIL TO GIVE PULL TIME/ATTENT
17.34		052499	PROPERTY	127	DAY	DOLY		86.	PKOLJ	ES no	FAIL TO GIVE FULL TIME/ATTENT
27.34		082699	PROPERTY	93.	DAY	DRY			REESTO	88 E2	FULLOWED TOO CLOSELY
17.34		112400	PROPERTY	107	THOU	DRY		46	PXC93	es na	PAIL TO GIVE YOLK TIME/ATTEMP
17.34		062900	1 Inj.	#P	DAY	DRY			RREND	es es	PAIL TO GIVE FULL TIME/ATTENT
17.14		033000	l Ioj.	TOP	nicht	WHT			rrend	es es	PAIL TO GIVE PULL TIME/ATTEME
17.34		010100	l Inj.	6A	DAY	HEI		85	FECRI	BS na	TOO PAST FOR COMDITIONS
17.34		100300	PROPERTY	72	MICHT	DRY		99	FEORJ	ES na	PAIL TO GIVE FULL TIME/ATTENT
17.34		061400	PROPERTY	77	DAY	DILY		40	PKORJ	25 na	ENTL TO GIVE PULL TIME/ATTENT
17:34		081600	PROPERTY	105	DAY	PRY		**	FRODJ	55 ta	FAIL TO GIVE FULL TIME/ATTENT
17.34		120900	PROPERTY	3P.	DAY	DRY		90	LECORA	B9 na	PAIL TO GIVE FULL TIME/ATTENT
17.34		102200	PROPURTY	10P	MIGHT	DRY		86	PXOBJ	RS na	ASHICLE DEAECL
17.34		070600	PROPERTY	10F	MICHT	DRY			CTHEE	uu es	FAIL TO GIVE FULL TIME/ATTENT
17.34		111301	PROPERTY	TH	DAY	DRY			OTHER	MA EE	FAIL TO GIVE FULL TIME/ATTENT
17.34		012501	PROPERTY	72	DAY	ENCY		0.0	PEORI	68 na	PAIL TO GIVE FULL TIME/ATTENT
17.34		100801	PROPERTY	121	MICHIT	DRY		9.0	PEOBL	RS na	PAIL TO GIVE PULL TIME/ATTENT
17.34		111201	PROPERTY	10A	DAY	DRY			OTHER	uu es	LIBITIONN OR OTHER CAUSE
17.34		102601	PROPERTY	10F	THOIM	DRY	1		rkend	es es	UNDER INPLUENCE OF ALCOHOL.
17.34		041701	PROPERTY	111	DAY	DRY		48	PXOBJ	ES na	PAIL TO GIVE FULL TIME/ATTENT
17.34		081401	Phoperty	1P	DAY	dry		88	FECGJ	es un	PAIL TO GIVE FULL TIME/ATTENT
17,34		111001	PROPRIET	18	NIGHT	WILL		QŹ	LHOX	RE na	PAIL TO GIVE FULL TIME/ATTENT
17.34		112201	PROPERTY	72	NICHT	DRY			CTHEA	UU ES	PAIL TO GIVE FULL TIME/ATTENT
17.14		841601	PROPERTY	121	MIGHT	4/57		68	PECIES	ES na	PAIL TO GIVE FULL TIME/ATTEMT
17.34		071301	6 inj	10A	DAY	DEX			RRENTO	es Rg	FAIL TO GIVE FULL TIME/ATTENT
17.34		062501	PROPERTY	:76	DAY	DRY		20	LECKY	an as	PAIL TO GIVE FULL TIME/ATTENT
17.34		120301	PROPERTY	4P	DAY	WET		03	PEOSJ	es na	PAIL TO GIVE PULL TIME/ATTENT
17.34		121101	PROPERTY	104	DAY	WILL		08	LYOP	RS 114	PAIL TO GIVE FULL TIME/ATTENT
17.34		121301	PROPERTY	7Þ	HIGHT	DRY		8.5	FXOBJ	R6 de	FAIL TO GIVE FULL TIME/ATTENT
17.34		121101	PROPERTY	114	DAY	DRY		99	PKOBJ	B6 n≠	PAIL TO GIVE PULL TIME/ATTENT
17.34		042901	PROPERTY	41	DAY	DRY		88:	FECD3	es na	INDOORN OR CITEER CAUSE
17.34		010501	PROPERTY	aa	DAY	DRY		99	PECRI	RG na	PAIL TO GIVE FULL TIME/ATTENT
17.34		072781	PROTEKTY	LOA	DAY	DAX		42	Leoka	RS DA	PAIL TO CIVE FULL TIME/ATTENT
17.34		111501	PROPERTY	50	DAY	DRY		80	PXOOJ	E9 na	PAIL TO GIVE PULL TIME/ATTENT
17.34		062501	PROPERTY	114	DAY	DRY		8.4	ECCORA	E2 D3	VEHICLE DEFECT
17.34		101002	PROPERTY	47	NIGHT	DHY		80	FXCUJ	W na	PAIL TO GIVE PULL TIME/ATTENT
17.34		092702	PROPERTY	6A	DAY	DOX			OTHER	K3 na	VEHICLE DEFECT
17:34		090702	PHOPERTY	6A	DAY	DICY		86	PXONJ	KS na	UTICIONE OR OTHER CAUSE
17.34		081602	PROPERTY	10P	MIGHT	HEL			OTHER	nn Ra	IMPROPER LANE CHARGE
17.34		061702	PROPERTY	72	DAY	HET			OTHER	w es	IMPROPER LANE CHANCE
17,34		051802	PROPERTY	δÝ	DAY	DRY		66.	PROBJ	RG na	PAIL TO GIVE FULL TIME/ATTENT
17.34		042702	Indierty	114	DAY	DRY			OTHER	טט טט	PAIL TO GIVE FULL TIME/AFTERT
37.34	-	033502	PROPERTY	6P	DAY	DAY			RRIEN	es es	PAIL TO GIVE FULL TIME/ATTENT
17.34		110902	PROPERTY	BA	DAY	DRY		数据	PKODJ	ES na	FAIL TO CIVE FULL TIME/ATTENT
17.35		111700	PROPERTY	127	DAY	DRY		02	Probj	E5 na	PAIL TO GIVE FULL TIME/ATTENT
17.36		063301	PROPERTY	42	DAY	DRY			OTHER	on es	UNICHONN OR OTHER CAUGH
						· · · · · · · · · · · · · · · · · · ·					
(01)-Bri	dge	(82) -Bu17	lding (D3)	-Culve	r/Ditch	(D4)#	Curb	(05)-Cuard	cail/Bar:	rier (06)=Embankment (07)=Pt

Págé: 2

ADC Combined Logalie History Output Continued.

LOGMILE	1k	DATE	SEARSTA	TIME	LIGHT	BUR FACE	ALC	en Cu	TYPE	AT A3 MOAE	PROBABLE CAUSE
27.36	سحد	650701	l Inj.	111	DAY	DRY		13	PXOBJ	WS na	PELL AGLEEP, PAINTED, STC.
17.36		051401	PROPERTY	21	DAY	DRY			SDSWP	re re	IMPROPER LANE CHARGE
17.37		077800	PROPERTY	114	DAY	DRY			RREITO	es es	POLLOWED TOO CLOSELY
17.37		110402	l Inj.	ЭP	TUAY	DRY		05:	PROBJ	W6 05	PHYSICAL/MENTAL DIFFICULTY
17.38		032091	PROPERTY	10A	DAY	DILY			SDSWP	es ar	UNEMONE OR OTHER CAUSE
17.38		053902	з inj.	6.5	DAY	DRY			OTHER	RS UU	TOO PAST FOR CONDITIONS
17.41		080702	PROPERTY	12P	DAY	DRY			RREND	E5 E5	POLICHED TOO CLOSELY
17.41		081802	PROPERTY	4P	DAY	DRY			RHIMD	rs ko	TOO PAST FOR COMDITIONS
17,44		112999	l Inj.	82	DAY	DRY		0.4	FEORJ	MS Da	TOO PAST FOR COMDITIONS
17.44		062390	PROPERTY	38	MICHT	DRY		80	PXCILI	25 na	FAIL TO GIVE FULL TIME/ATTEMY
17.44		030381	2 inj.	3P	DAY	DRT			RREND	115 89	PAIL TO GIVE FULL TIME/ATTENT
17.44		081001	PROPERTY	47	DAY	DRY			OTHER	00 KS	UNENOWN OR OTHER CAUSE
17.44		072202	PROPERTY	61	DAY	DRY		9.6	PXODJ	BB na	UNICHOWN ON OTHER CADEE
17.45		041499	1 Inj.	12	DAY	DRY			RREMU	RS 53	PAIL TO GIVE PULL TIME/ATTENT
17.47		050401	PROPERTY	32	DAY	DAY			RREND	20 ES	FAIL TO GIVE FULL TIME/ATTENT
37.47		092802	FROPERTY	1P	DAY	DRY			rrend	es es	UNICHONN OR OTHER CAUSE
17.47		092802	PROPERTY	37	TMY	DAY			RREND	eg eg	DENOMIN OR OTHER CAUSE
17.49		080299	PROPRICTY	BA	DAY	DRY		8.6	FXONJ	UU na	FAIL TO GIVE FULL TIME/ATTENT
17.49		060999	PROPERTY	7 0	NIGHT	DRY		86:	PEONJ	MU na	PAIL TO GIVE FULL TIME/ATTENT
17.51		031402	PROPERTY	19	DAY	DRY			SDSWP	es es	PAIL TO DIVE FULL TIME/ATTEMT
17.56		072002	PROPERTY	5A	DAY	DIT			REMAIN	E9 SS	TOO PAST FOR CONDITIONS
17.57		121500	PROPERTY	ðP	MIGHT	DRY			SDOWP	MG M9	UNDER IMPLIENCE OF ALCOHOL
17.57		022801	PROPERTY	48	DAY	DRY			SDSWP	25 ES	UNIXIONN OR OTHER CAUSE
37-57		082102	PROPERTY	47	DAY	DRY			OTHER	UU F5	TOO FAST FOR COMDITIONS
17.59		112700	PROPERTY	6P	NIGHT	DAY			OTHER	EU 29	IMPROPER BACKING
17.61		041299	PROPERTY	121	DAY	DET			READID	RS RS	FOLLOWED TOO CLOSKLY
17.61		030802	2 Inj.	5P	DAY	DRY			KREND	RE RE	PAIL TO GIVE PULL TIME/ATTENT
17.61		090402	PROPERTY	78	DAY	DRY			RREND	NS WS	POLLOWED TOO CLOSELY
17.62		040299	2 Inj.	49	DAY	Day			RRESTO	ES ES	TOO PAST FOR COMDITIONS
17.62		031301	PROPERTY	3P	DAY	WEI			BDSWP	ES ES	UNKNOWN OR OTHER CAUSE
17.67		970900	ı raj	41	DAY	DRY			AREND	23 23	FAIL TO GIVE FULL TIME/ATTENT
17.67		092201	PROPERTY	118	DAY	DAY			RREND	ES ES	FAIL TO GIVE FULL TIME/ATTENT
17.67		041701	PROPERTY	SP.	DAY	DRY			AIRTLE	26 RG	PAIL TO GIVE PULL TIME/ATTEMT
17.67		010101	PROPERTY	102	NIGHT	DRY			OTHER	WE OR	UNICHONN OR OTHER CAURE
17.67		092201	PROPERTY	11A	DAY	DRY			RECEIP	ES ES	FAIL TO GIVE FULL TIME/ATTENT
17.71		#52099	1 Inj.	38	DAY	DAY			RREND	12 R9	TOO FAST FOR CONDITIONS
17.71		050199	1 Ind.	36	DAY	DRY			BURNO	us es	PAIL TO GIVE FULL TIME/ATTENT
17.71		051599	YTRETORY	2P	DAY	DRY			RREND	EC 22	POLLOWED TOO CLOURLY
17-71		051699	PROPERTY	Ä.	DAY	WEIT			OTHER	UU WG	ICY DR SHOW COVERUED
17.71		051999	PROPERTY	104	DAY	DRY		05	FXODJ	ws no	PAIL TO GIVE PULL TIME/ATTENT
17.71		091499	PROPERTY	5A	DAY	DRY			CHEEKE	25 53	PAIL TO GIVE FULL TIME/ATTEMT
17×71		101499	PROPERTY	42	DAY	DRY			RHEND	RG RE	PAIL TO GIVE FULL TIME/ATTENT
17.71		061599	PROPERTY	5A	DAY	DAY			OTHER.	NS. na	VEHICLE DEFECT
17.71		052099	1 Imj	ar	MICHT	DAY			RREND	ES ES	POLLOWED TOO CLOSELY
17.71		162901	1 Inj.	1.GA	DAY	DRY			HARND	es es	TOO FAST FOR CONDITIONS
17.71		062481	1 Ini	10	DAY	DRY			REEMD	es es	POLLOWED TOO CLOSELY
17.71		061001	1 Inj.	113	DAY	DRY			RREND	ES ES	PAIL TO GIVE PULL TIME/ATTENT
17.71		060302	PROPERTY	118	DAY	DRY			HREED	es Rs	TOO FAST FOR CONDITIONS
17.71		090602	PROPERTY	10A	DAY	DRY			RREND	ED BS	PAIL TO GIVE FULL TIME/ATTENT
ا افائیات کی اور اور اور		(65)	المراقد المراقد	مساورة	e Zni bab	jnásti.	Chieb.		1 -174	211/22-	ier (06)=Embankment (07)-Fer
8 (G1) = HT1	uga .	(02) =Bull	ատց (63)	- CHIAC	r/Ditch	(04)	LUXD	(05	************	ail/Borr	The fact the second of the sec

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ADC Combined Logalle History Output Continued ...

ALL INDO	IR.	DATE	BEVERITY	TIME	LIGHT	BUR PACE	ALC	DB DB	CLSM TYPE	MOVE V1 V2	PROBRELE CAUSE
										7 11 3	
17.73		061299	PROPERTY	127	DAY	DRY			RREMO	eg re	PAIL TO GIVE FULL TIME/ATTENT
17.77		090399	PROPERTY	10	DAY	DRA			RREID	E3 68	PAIL TO GIVE FULL TIME/ATTENT
17.77		060199	PROPERTY	ЯŘ	DAY	DRY			OTHER	WS WS	VEHICLE DEFECT
37.77		000500	PROPERTY	31	DAY	DRY			reend	es es	TOO PAST FOR COMDITIONS
17.77		100600	PROPERTY	52	DAY	MAL			PREND	25 E9	PAIL TO GIVE FULL TIME/ATTENT
17.77		051101	2 mj.	2 P	DAY	DRY			RENT	ZS TC	FAIL TO GIVE PULL TIME/ATTENT
17.77		051101	3 Inj	22	DAY	DRY			RREND	es es	PAIL TO GIVE FULL TIME/ATTENT
17.77		051101	l Inj.	2 P	DAT	DKY:			OTHER	שם טע	PAIL TO GIVE FULL TIME/ATTENT
17.78		033199	a Inj.	47	DAY	DRY		05	TEODJ	美性 智能	PAIL TO GIVE FULL TIME/ATTENT
17.79		110100	PROPERTY	7 7	NIORT	DRY			OTHER	NS DO	ANIMAL
17.81		061299	2 inj.	67	DAY	DRT			PREND	ns re	FAIL TO GIVE FULL TIME/ATTEMY
17.81		061401	PROFESTY	7P	DAY	DRY			RREND	ES BS	PAIL TO GIVE PULL TIME/ATTENT
17.67		035588	l Inj.	11A	DAT	DRY			RREND	es es	PAIL TO GIVE FULL TIME/ATTENT
17.67		080799	PROPERTY	37	DAY	DRY			RRINO	es es	PAIL TO GIVE FOLL TIME/ATTENT
17.67		080799	PROPERTY	50	DAY	DRY			DISRR	rs rs	PAIL TO GIVE PULL TIME/ATTENT
17,67		081599	A Ini-	22	DAY	DRY			RHEND	B6 122	FAIL TO GIVE FULL TIME/ATTEME
17.87		082199	i inj.	JP.	DAY	DRY			RPERID	ks as	PAIL TO GIVE FULL TIME/ATTENT
17/47		091200	2 Inj.	ЯÈ	DAY	DRY			RREDED	es es	PAIL TO GIVE FULL TIME/ATTEMY
17.47		802201	PROPERTY	88	DAY	DRY			MARNO	ec es	UNKNOWN OR OTHER CAUSE
77.87		071101	D Ing.	42	DAY	DRY			Brend	ES ES	FAIL TO GIVE FULL TIMB/ATTENT
17.87		090501	2 Inj.	12P	DAY	DRY			RIGHT	es es	FAIL TO GIVE FULL TIME/AITEMT
17.67		031491	2 inj	1P	DAT	DRIT			REEND	es es	PAIL TO GIVE FULL TIME/ATTENT
17.47		971191	2 Inj.	49	DAY	DRY			RREND	ee es	TAIL TO GIVE FULL TIME/ATTENT
17.17		061001	1 Inj.	118	DAY	DRY			RREND	es es	POLLOWED TOO CLOSELY
17.87		060502	PROPERTY	4.2	DAY	DRY			RREND	es by	PAIL TO GIVE FULL TIME/ATTENT
17.89		101901	PHOPERTY	29	DAT	DRY			20000	ES ES	PAIL TO GIVE VULL TIME/ATTENT
17.90		041699	PROPERTY	40	DAY	DRY			RREND	EC ES	PAIL TO GIVE PULL TIME/ATTENT
17,91		002799	PROPERTY	32	DAY	DRY			RUBBID	es Bs	FAIL TO GIVE FULL TIME/ATTENT
17.91		870200	PROPERTY	111	DAY	DRY			RESIDE	ES ES	PAIL TO GIVE FULL TIME/AITHERT
17.91		081200	inj.	10A	DAY	DKX			rrend	eg eg	PAIL TO GIVE PULL TIME/ATTENT
37.91		121800	l Inj.	113	DAY	DBA			RABBE	29 28 28	PAIL TO GIVE PULL TIME/ATTENT
17.91		060300	1 Inj.	13P	DAY	DHY			rrein	ns ns	PAIL TO DIVE PULL THRE/ATTENT
17.91		062500	tai t	2P	DAY	DRY			REEND	129 163	FAIL TO DIVE PULL TIME/ATTENT
17.91		078800	PROPERTY	78	DAY	DRY			RRELIO	20 ES	TAIL TO GIVE YULL TIME/ATTENT
17.51		111701	PROPERTY	98	DAY	DRY			rrand Rreed	RG ES	TOO PAST FOR CONDITIONS
17.51		111901	PROPERTY	9A	DAY	DRY			HERMAN	es es	TOO PAST FOR CONDITIONS
17.91		092101		1P 2P	DAY	DRY			RREND	ES ES	TOO PAST FOR COMPITIONS
17.91		101901	2 Inj	2P	DAY	DRY			HABNO	28 25	TOO FAST FOR CONDITIONS
17.91		101901	2 lnj.	31	DAY	WET			ilizind Chanus	29 ES	PAIL TO GIVE FULL TIME/ATTENT
17.91		052302	1 Inj.	32	DAY	WET			RREERO	es es	FAIL TO GIVE PULL TIME/ATTENT
17.91		062302	i ini. i ini	3F 12P	DAY	DRY			RREWO	es es	PAIL TO GIVE FULL TIME/ATTENT
17.95			PROPERTY	1.2	25-27	DRY					TOO PAST FOR COMDITIONS
17.97		032699		4P	DAY	DRY			rrend Rrend	es es	POLLOWED TOO CLOSELY
17-97		110199	5 Inj.	9A	DAY	DRY			BREND	es es	PAIL TO GIVE FULL TIME/ATTENT
17.97		030900	2 Inj.	11X 10X	DAY	DRY			OTHER	URI MS	CHEROCHE OR OTHER CAUSE
17.97		091200		10A	DAY	DRY			BREND	N9 W6	PAIL TO GIVE FULL TIME/ATTEMT
17.97		091200 091200	2 inj.	10A	DAY	DRY			RRIEND	WS WS	PAIL TO GIVE FULL TIME/ATTENT
17.97 17.97		031300	PROPERTY PROPERTY	10%	DAY	DRY			CTHER	2H RH	DEBRIS OR OBSTRUCTION
		.032300	**************************************	77/	4474				71095		
(01) #Brl		(02) -Bull	(03)		r/Ditch	(0.4)	COLP	, ai	فحجيته الأ	rail/Bar	rier (06)-Embankment (07)-Fe

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ADC Combined Logaila Mistory Output Continued...

LOGHILE	18	DATE	CHARLITA	Time	LIGHT	FACE	ALC	PX 08	TYPE	AT AS	PROBABLE CAUSE
17.97		092801	PROPERTY	:2P	EAY	DRY			AZAZILE!	98 28	PAIL TO GIVE PULL TIME/ATTENT
17.97		051702	PROPERTY	1P	DAY	DRY			PREMO	ES ES	POLLOWED TOO CLOSELY
17.97		042002	PROPERTY	22	DAY	DRY			MEND	24 24 24	PAIL TO GIVE PULL TIME/ATTENT
18.01		050299	PROPERTY	77	DAY	DRY			RREMO	as Re	PAIL TO GIVE FULL TIME/ATTENT
18.01		061299	PROPERTY	118	DAY	DRY			DE RIND	1213 R.S	PAIL TO GIVE FULL TIME/ATTENT
18.01		070601	2 Inj.	114	DAY	DRY			RANGARD	es es	TOO FAST FOR CONDITIONS
18.06		051502	i Inj.	128	MICHT	DRY	₹	05	PERMIT	Sin UU	WALL TO GIVE PULL TIME/ATTEMT
18.07		042799	2 Inj.	ЭĖ	DAY	DRY			SCHOOL STATE	B8 88	PAIL TO GIVE FULL TIME/ATTENT
18.07		072999	PROPERTY	38	DAY	DRY			RESERVE	E9 B6	VEHICLE DEFECT
18.07		112499	PROPERTY	10	DAY	DRY			RESERVE	us es	PAIL TO GIVE FULL TIME/ATTENT
18.07		031700	PROPERTY	6P	HIGHT	DITY			REED CO	BS MS	PAIL TO GIVE FULL TIME/ATTENT
18.67		062000	PROPERTY	111	DAY	DAY			RENDE	M8 88	VALL TO GIVE PULL TIME/ATTENT
16.07		083200	PHOPERTY	118	DAT	DRY			RRYDE	RS RD	PAIL TO GIVE PULL TIME/ATTENT
16.07		970200	PROPERTY	118	DAY	DRY			RRAND	RC BC	FAIL TO GIVE PULL TIME/ATTENT
18.67		102700	PROPURTY	4P	DAY	DAY.			MARIND	es ps	TOO PAST FOR COMPITIONS
10.07		091200	S Inj.	98	DAY	DRY			RREND	es es	PAIL TO GIVE FULL TIME/ATTENT
18.07		101901	PROPERTY	2P	DAY	DRY			PREMI)	88 BB	FAIL TO GIVE FULL TIME/AITENT
19.07		041301	PROPERTY	2P	DAY	DRY			PLEASE	rs es	ANIT TO GIAS ANIT TIME/SLIESL
18.07		061701	2 Inj.	128	DAY	DRY			REEND	ES 85	TOO FAST FOR CONDITIONS
18.07		091402	PROPERTY	9A.	DAY	PRY			RREND	re or	PAIL TO GIVE FULL TIME/ATTEMT
18.10		071699	1 Inj.	12P	DAY	DRY			RABNO	us R9	PAIL TO GIVE FULL TIME/ATTENT
10.11		001399	1 Inj.	130	DAY	DRY			PREND	es es	FOLLOWED TOO CLORELY
10.16		011302	PROPERTY	87	MIGHT	DRY			OTHER	A0 168	LERECTORN OR OTHER CAUSE
18.16		061402	PROPERTY	22	DAY	WET			RREPER	es es	TOO FAST FOR COMMUTICARS
18.16		062602	PROPERTY	2P	DAY	WET			OTHER	uu es	TOO PAST FOR COMMITTONS
10.16		071802	PROPERTY	10r	NIOHT	DRY			MULEND	RC RC	FOLLOWED TOO CLOSELY
18.17		080799	YTR29081	78	DAT	DRY			RRSED	ES ES	FAIL TO GIVE FULL TIME/ATTENT
18.17		110199	4 Inj.	114	DAY	DRY			RAUGHED	RS ES	FAIL TO GIVE FULL TIME/ATTRIFT
18.17		111099	PROPERTY	10A	DAY	DRY			FREND	TE DE	TOO FAST FOR CONDITIONS
18.17		030900	PROPERTY	15	DAY	DRY			MEXIM	ES BC	FAIL TO GIVE PULL TIME/ATTEMP
18.17		041000	PROPERTY	1.7	DAY	DRY		05	PEDOJ	28 na	PAIL TO GIVE PULL TIME/ATTENT
18.17		062100	PROPERTY	78	DAY	DRY			RREND	ES 31	PAIL TO GIVE FULL TIME/ATTENT
19.19		082761	5 lnj.	11A	DAY	DRT			RREND	es us	PAIL TO GIVE FULL TIME/ATTENT
18.21		072100	PROPERTY	NA.	DAY	DHY			RILEND	es es	PAIL TO GIVE FULL TIME/ATTEMT
10.21		081102	PROPERTY	12P	DAY	DRY			DREND	es rs	PAIL TO GIVE PULL TIME/ATTENT
18.27		031600	PROPERTY	37	DAY	DRY			RREND	86 BE	PAIL TO GIVE FULL TIME/ATTENT
16.27		103000	5 Inj.	10A	DAY	DRY			rrend	119 RS	EXCREDED SPEED LIMIT
18.27		000501	PROPERTY	121	DAY	DRY			RILEND	88 88	PAIL TO GIVE FULL TIME/ATTEM
15.31		040G99	2 Inj.	11P	MIGHT	net	. ₹		PARKD	ER 05	PAIL TO GIVE FULL TIME/ATTEMT
18.31		072186	PROPERTY	ea:	DAY	DRY			RREND	es es	FAIL TO GIVE FULL TIME/ATTENT
10.34		070300	2 Inj.	42	DAY	Dex			RREND	rs rs	PAIL TO GIVE PULL TIME/ATTENT
10.36		072702	PHOPHITY	2₽	DAY	DRY			RREND	RC ES	POLLOWED TOO CLOSELY
\$8.37		070900	13 laj.	18	DAY	DBA			RKEND	ES BS	FAIL TO GIVE FULL TIME/ATTENT
18,41		071700	Property	2P	DAY	DRY			REMID	ns vš	UNICHONN OR CTHER CAUSE
18.46		122600	1 Inj.	113	DAY	DRY			FREND	RE EE	POLLONED TOO CLOSELY
18.46		050101	PROPERTY	22	DAY	DRY			OTIER	ยย บร	INPROPER LANE CRAIRIE
18.46		060802	PROPERTY	4P	CKY	DRY			RRENT	us es	TOO FAST FOR CONDITIONS
18.46		032702	PROPERTY	72	DAY	DRX			RIGHT	WE WE	(MICHOINI OR OTHER CAUSE
10.47		052877	1 inj.	96	MIGHT	DRY			DENED.	ES ES	PAIL TO GIVE PULL TIME/ATTENT
B (01) -Bri	dge	(02) =8u1)	ding (03)	-Culva	r/Ditch	(04)=	Curp	(09)-Guardi	all/Barr	ter (06)=Hmbankment (07)=Fe
-Light F	17.	(09)=31gs	7 1 7								ic. Barrier (13)-Crash Attenua

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ADC Combined Logaile History Output Continued ...

LOGHILE III	717	DATE	SEVERITY	TIME	LIGHT	FACE	ALC	(N)	CLS# TYPE	AT A3 MCAE	PROBABLE CAUSE
LANCE LINE	244	u-+=									
18.50		061002	PROPERTY	40	DAY	DRY		05	FXCOJ	WS DA	VEHICLE DRUNCT
18 56		071502	2 inj.	1.2 <i>p</i>	DAY	DRY			REIDIO	26 WG	POLLONED TOO CLOSELT
18.57		052001	PROPERTY	12P	DAY	DRT			OTHER	פב טט	TRECKING OR OTHER CAUSE
10.62		010499	1 Inj.	11.	DAY	DRY			SDSWP	WE MS	IMPROPER LANG CHANGE
10.62		031401	L'HOPERTY	3P	DAY	DEX	_		RREND	es es	PAIL TO GIVE FULL TIME/ATTENT
10.71		080800	2 Inj.	41	MICHE	DRY	ŧ		RREND	TC 58	IMPER INFLUENCE OF ALCOROL
16.71		022602	PROPERTY	164	DAY	DRY		13	Prouj	MS na	PAIL TO GIVE FULL TIME/ATTEMT
18.76		122600	i inj.	114	DAY	DKY			PHEND	IIS RS	FOLLOWED TOO CLOSELY
18.76		122690	1 Ing.	118	DAY	DRY			RREHO	ES ES	POLLOWED TOO CLOSELY
18.76		060901	PROPERTY	2P	DAY	DRY			OPDIR	W5 25	PELL ASLEEP, PAINTED, STC.
18.75		101702	2 Inj.	28	DAY	DRY			OTHER	WE WE	SKCSSOED SPEED LIMIT
16.46		091202	PROPERTY	47	DAY	DRY			RESID	es es	FAIL TO GIVE FULL TIME/ATTENT
18.87		062599	PROPERTY	6P	DAY	DRY				26 PS	PAIL TO GIVE FULL TIME/ATTEMI
18.91		101300	PROPERTY	32	DAY	DRY			RREID	E9 E8	TOO PAST FOR CONDITIONS
18.37		062100	PROPERTY	11P	MICHT	WET		05	PKODJ	WS ma	TOO PAST FOR COMMITTIONS
26.97		030202	PROPERTY	2P	DAY	DRY		12	PKONJ	WS DA	VEHICLE DEFECT
19.06		102702	PROPERTY	J.P.	DAY	DKY			RESID	KO RE	FAIL TO GIVE FULL TIME/ATTEM?
19.07		062799	PROPERTY	2F	DAY	DRY			RRIGHD	ne es	FAIL TO GIVE FULL TIME/ATTENT
19.17		033505	PROPERTY	3 P	DAY	DRY			RREND	RS RS	POLLOWED TOO CLOSELY
19.17		102302	PROPERTY	ÐΛ	DAY	DRY			Chesins	#6 #9	A CONTRACTOR OF THE STATE OF TH
19.17		033303	PROPERTY	37	£	DRY			REFERENCE	29 59	PAIL TO GIVE FULL TIME/ATTENT
19.17		032202	l Inj.	35	DAY	DRY			RRENTO	25 25	FOLLOWED TOO CLOSELY
19.18		070200	llaj.	114	DAY	DRY			PRIMO	rs es es es	PAIL TO GIVE FULL TIME/ATTENT
19:10		030200	PROPERTY	12P	DAY	DRY			RREED	E9 88	TOO PAST FOR COMMITTIONS
13.10		083192	l inj.	2P	DAY	DRY			RREND	ES 89	TOO PAST FOR CONDITIONS
19.16		093102	PROPERTY	:2P :38	MICHT	DRY		12	PAGBJ	NG DA	PAIL TO GIVE FULL TIME/ATTENT
19.16		021902 052799	PROPERTY	7P	DAY	PRY	1		EREND	119 BS	PAIL TO DIVE FULL TIME/ATTENT
19.27		032199	2 Inj.	5A	BIGHT	WET	•	85	PEODJ	w9 ma	WRT
19.28		091900	i inj.	73	DAY	WET		85	PXODJ	WS na	TOO FAST FOR CONDITIONS
19.25		012000	PROPERTY	98	DAY	SMOW			RHEND	es es	PAIL TO GIVE FULL TIME/ATTENT
19.17		032202	1 Inj.	2D 2P	DAY	DXY			RRESID	25 E8	UNDER INFLUENCE OF DRUGS
19.47		051501	PROPERTY	5P	DAY	WET			RREMO	ES 123	UNDER INFLUENCE OF ALCOHOL
19.47		090702	PROPERTY	12A	MIGHT	DRY	1		OTHER	45 HE	THE BER INFLUENCE OF ALCOPOL
15.47		081102	PROPERTY	1.5	DAY	DRY			RREED	E8 E9	POLICHED TOO CLOSELY
19.47		062502	2 Inj.	32	DAY	DRY			RREWD	NS HB	UNICHONN OR OTHER CAUSE
19.40		050201	1 Inj	101	DAY	DRY			CTUER	es no	PHYSICAL/MENTAL DIFFICULTY
19.40		060801	1 inj.	2P	DAY	DRY			PREMIO	es es	PAIL TO GIVE PULL TIME/ATTENT
19.50		113099	PROPERTY	5P	DAY	DAX			CTHER	WS ma	UNIXECUST OF CAMER CAUSE
19.52		022300	i Inj.	34	MIGHT	DRY			OTHER	UU MB	UNKNOWN OR OTHER CAUSE
19.57		071902	m Yaj	17	DAY	DRY			CFDIR	25 W9	VEHICLE DEPECT
19.50		061900	1 Inj.	#A	DAT	DAT			HREND	ng ps	PAIL TO GIVE FULL TIME/ATTENT
19.50		082302	PROPERTY	2P	DAY	DRY			OTHER	UU ES	UNICHONN OR OTHER CAUCE
19.60		022802	1 Inj.	ÄE	DAY	DRY			RREIM	WS WS	FAIL TO GIVE FULL TIME/ATTENT
19:68		022602	1 In1	9A	DAT	DICY			PREND	WS WS	FAIL TO GIVE FULL TIME/ATTEMY
19.65		022502	2 Inj.	91	DAY	DRY			arrnd	WS WS	PAIL TO GIVE FULL TIME/ATTENT
19.60		022502	2 laj.	91	DAY	DRY			RURNO	WS WB	PAIL TO GIVE PULL TIME/ATTENT
19.68		080202	PROPERTY	138	DAY	DRY			RREND	es es	TOO FART FOR CONDITIONS
19.68		082302	PROPERTY	2P	DAY	DILA			OTHER	es uu	TOO PAST FOR COMDITIONS
						· · · · · · · · · · · · · · · · · · ·					
i (O1) «Bri	dge	(02) -Bull	ding (03)	-Culve	r/Ditch	(04)=	Curb	(05) =Guazdi	ail/barr	ier (06)-Embankment (07)-Fe

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ADC Combined Logalle History Output Continued ...

POCHLER	IR	DATE	SEVENITY	TIME	FTGHL	SUR FACE	ALC	(FZ (OB	TYPE	V1 V2	PROBABLE CAUSE
19.12		011499	PROPERTY	11A	DAY	ICE			205VP	NU MI	THEOLOGIA OR OTHER CAUSE
15.00		090299	ı inj.	4P	DAT	DRY			RREAD	RS #9	PAIL TO GIVE PULL TIME/ATTENT
19.68		031601	1 Inj	12P	DAY	DRY			rrend	es ed	FOLLOWED TOO CLUCKLY
19.10		070201	1 Inj.	:6P	DAY	DEX			REED	28 2 6	TOO PAST FOR COMPITIONS
19.10		111601	ı inj.	73.	DAY	DRY			rrewd	NC WS	FAIL TO GIVE FULL TIME/ATTENT
ieen A	nne '	. . .									
0.00		052899	a inj.	12A	HIGHT	dry	1		Parkb	WS UP	UNDER INPLUENCE OF ALCOHOL
0.00		192401	PROPERTY	71	DAY	Dax			RITEND	WS WO	PAIL TO GIVE FULL TIME/ATTENT PAIL TO GIVE FULL TIME/ATTENT
0.00		102401	PROPERTY	7A	DAY	DRY			ARRIND	NO NO	
0,00		102401	PHOPERTY	78.	DAY	DRY			PREND	WE WIT	FAIL TO GIVE FULL TIME/ATTENT
6.00		052202	Z Inj.	€K.	DVA	DAY			REND	2M 2M	
6.09		011902	PROPERTY	.2F	DAY	SROW		05	PROBJ	AS DA	BAIL TO GIVE FULL TIME/ATTENT
0.10		041595	PROPERTY	32	DAY	DRY			CHRAC	WS WS	PAIL TO GIVE FULL TIME/ATTEMT
0.10		033302	1 laj.	107	DAY	WET			OTHER RECENT	ng na Ra ka	PAIL TO GIVE FULL TIME/ATTENT
0.10		041202	l Inj.)P	DAY	DUA			PREMO	NS MS	TOG FAST FOR COUDITIONS
0.20		112601	2 Inj.	1P	DAY	DEX			RREMD	WE WE	TOO PAST FOR COMPITIONS
0.20		030603	PROPERTY	7A	DAY	DRY	ı.		PREMO	NG NG	UNDER INPLUENCE OF ALCOHOL
0.30		101900	i Knj	11F	MICHT	DRY	₩:		RREND	ME ME	PAIL TO GIVE PULL TIME/ATTENT
0.30		030102	PROPERTY	7A 7P	DAY	DRY			RREND	MS WS	PAIL TO GIVE FULL TIME/ATTENT
0.40		080301	PROPERTY	11A	DVA	DRX			OTTIER	UU WS	PAIL TO GIVE POLL TIME/ATTENT
0.40		061602	l Inj.	12P	DAY	DRY			RREND	eg es	POLICHED TOO CLOSELY
0.40		032699	2 Inj.	42	DAY	DRY			RREND	ES ES	PAIL TO GIVE FULL TIME/ATTENT
40.00		072700	PROPERTY	12P	DAY	DRY			FARKD	ינו טע	INCHOMO CH OTHER CAUSE
0.50 0.50		072700	PROPERTY	127	DAY	DRY			PARKO	UKI 002	UNIONAL OR OTHER CAUSE
a .sc		041900	l Inj.	5P	DAY	DHA			RREND	82 83	PAIL TO GIVE FULL TIME/ATTENT
0.50		010701	2 Inj.	4.1	MIGHT	DRY		05	PXOBJ	ES na	PAIL TO GIVE FULL TIME/ATTERT
6.50		101002	3 Inj.	3F	DAY	WILT			RREND		PAIL TO GIVE FULL TIME/ATTENT
0.55		080699	PROPERTY	21	DAY	DEX			BD8wt	ME MS	IMPROPER PASSING
B.60		060999	PROPERTY	21	DAY	DRY	1		RICEND	KB ES	IMMER IMPLIMINER OF ALCOHOL
B . 60		092200	1 Toj.	8.P	DAY	DRY			REFERENCE	EU 59	FAIL TO GIVE FULL TIME/AFTERT
0.60		041202	2 701	CP	DAY	DET			RREND	RS RC	FAIL TO GIVE FULL TIME/ATTENT
0.70		100195	YTRRIORS	98	DAY	DRY			RREND	WS WE	FOLLOWED TOO CLOSELY
0.70		090402	PROPERTY	72	DAY	DRY			OTHER	UU WS	FAIL TO GIVE PULL TIME/ATTEMY
0.50		073099	PROPERTY	27	CAY	DICT			EREND	136 MO	PAIL TO GIVE FULL TIME/ATTENT
0.09		051999	PROPERTY	ėΛ	DAY	DET			SDEWP	99 WE	THPROPER LANE CHANGE
1.00		041600	PROPERTY	7P	DAY	DRY			KREND	WB WS	PAIL TO GIVE FULL TIME/ATTENT
1.09		110302	5 Inj.	1 r	DAY	DRY			BREED	WE CH	POLLOWED TOO CLOSELY
1.09		119302	1 Inj.	17	DAY	DRY			PREND	MS MS	POLILOWED TOO CLOSELY
1.10		022199	1 781.	117	NIGHT	DRY			OTKER	WS na	FAIL TO DIVE FULL TIME/ATTENT
1.10		960901	1 Inj.	93.	UAY	DRY			HEND	WG WE	PAIL TO GIVE FULL TIME/ATTENT
1.19		022601	PROPERTY	7A	DAY	DRY			AREND	WE WE	PAIL TO GIVE FULL TIME/ATTEMT
1.19		022601	PROPERTY	·7A:	DAY	DRY			RUELID	MS WS	PAIL TO GIVE FULL TIME/ATTEMT
1.20		090601	PROPERTY	79	DAY	DRY		0.5	PXOBJ	MS sa	PAIL TO GIVE PULL TIME/ATTENT
1.26		060901	J Inj.	6/	DAY	DKY			RREIT	es es	FAIL TO GIVE FULL THE ATTEST
2.20		061001	PHOI-ERTY	100	MICHT	DEY			REGIO	20 25	FOLLOWED TOO CLOSELY
1.29		041900	PROPERTY	SP	DAY	DRY			RREND	RC RS	PAIL TO GIVE FULL TIME/ATTENT
1.35		072180	I Inj.	82	DAY	DRY			RREND	ne ne	PAIL TO GIVE PULL TIME/ATTENT
0 (01) #8ri		(02) «Buil)	Alma (63)	- Anlara	r/Ditch	(04)-	Curh	/ne)-Guardi	11/Barri	ler (06)=Embankment (07)=Pe

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and Combined Localle History Output Continued ...

DOMITE.	IR	DATE	SEVERITE	TIME	LIGHT	PACR PACR	NIC .	CB CB	TYPE TYPE	MOVE V1 V2	PROBABLE CAUSE
		040402	1 Inj.	118	NIGHT	DRY	1		RAENO	We WE	TOO PAST FOR COMPITIONS
1.40		092200	PROPERTY	Sr	DAT	DRY			RRENO	WS NS	PAIL TO GIVE FULL TIME/ATTEMT
1.49		111000	1K 61	-12	DAY	DRX			RREND	NS NS	TOO PAST FOR COMDITIONS
1.49		D81399	1 inj.	19	DAY	DRY			RREED	KS BR	FULLOWED TOO CLUSTELY
1.59		021400	1 Inj.	104	DAY	DRY			PREMID	ES 59	TOO FAST FOR COMDITIONS
1.59		021402	a Inj	7A	DAY	DRY			RINBMD	HE WE	PAIL TO GIVE FULL TIME/ATTENT
1.60		102602	PROPERTY	11P	MICHT	DRY			BRIDED	ES 66	EXCEPDED SPESD LINIT
1.69		060102	PROPERTY	1P	DAY	DAY			UTHER	uu ws	PAIL TO YIELD RIGHT OF MAY
1.79		090200	PROPERTY	29	DAY	DRY			RREDED	22 EE	FAIL TO GIVE FULL TIME/ATTENT
1.79		061602	PROPERTY	ÍXA	DAY	DRY			RECORD	25 49	POLICHED TOO CLOSELY
1.00		111501	i inj.	401	DAT	URY			MUEND	ME WS	TOO PAST FOR COMPUTIONS
1.65		110302	ı Inj.	32	DAY	CRY			RREHD	MS WS	POLIONED TOO CLUSELY
1.89		021499	PROPERTY	3 P.	DAY	DRY			AREAR	WS WS	UNIXABANI OR CTHER CAUSE
1.89		071901	PROPERTY	SP.	DAY	DRY			RPEND	WS WS	PAIL TO GIVE PULL TIME/ATTENT
1.89		072401	l Inj.	6P	DAY	DRY			RREND	WS. WE	PAIL TO GIVE FULL TIME/ATTENT
1.09		000102	PROPERTY	BA	DYA	DRY			RREED	es es	UNKNOWN OR OTHER CAUGE
1.91		052199	2 Tpj.	5A	DAY	DRY			RESID	29 BB	PAIL TO GIVE WILL TIME/ATTENT
2.95		072399.	PROPERTY	11A	DAY	DRY			PDEMP	UD WS	UNICHONET CR. CTITIKE CAUSE
2.05		042100	PROPERTY	10A	DAY	DEX			RRESED	MC MB	FAIL TO GIVE FOIL TIME/ATTENT
2.09		110502	PROPERTY	12P	DAY	DRY		05	Probj	WE DA	TOO PAST FOR COMDITIONS
2.12		100501	PROPERTY	5P	DVA	Decy			REEND	es es	PAIL TO GIVE PULL TIME/ATTENT
2.19		070501	PROPERTY	42	DAY	WET			KHRMO	#S #3	PAIL TO GIVE FULL TIME/ATTEMT
2.22		041302	PROPERTY	10P	nicht	DRY			MEDIO	WE WE	PAIL TO GIVE FULL TIME/ATTENT
2.23		112191	1 Inj.	73.	DAY	DRY			rrend	WE WE	PAIL TO GIVE PULL TIME/ATTENT
2.23		112151	PROPERTY	78	DAY	DAY			RREND	W5 WS	PAIL TO GIVE FULL TIME/ATTENT PAIL TO GIVE FULL TIME/ATTENT
2.39		122399	PROPERTY	37	DAY	DRY			RHEND	NS NS	PAIL TO GIVE FULL TIME/ATTENT
2.29		030302	2 Inj.	ĮΑλ	DAY	bay			RRITED	WS WE	PAIL TO GIVE PULL TIME/ATTENT
\$.33		061601	l Inj.	2P	DXY	WEI			PREND	WS NO	POLLOWED TOO CLOBELY
2.32		061001	PROPERTY	2r	DAY	DAY		05	PHOBI	WS na	PAIL TO GIVE FULL TIME/ATTENT
2.32		110901	PROPERTY	4.0	DAY	DRY		93	OTHER	WE DA	PAIL TO GIVE FULL TIME/ATTENT
2.32		062402	PROPERTY	64	DAY	DRY	1		RUEND	WS WS	UNDER IMPLURNCE OF ALCOHOL
2.33		062699	1 Ing.	11P 1P	DAY	DRY	:* T :		REEDED	NE NS	FOLLOWED TOO CLOSBLY
3.33		081602	l inj.	117	DAY	DRY			SDSWP	IN RE	IMPROPER LANE CHANGE
2.39		061799 110902	PROPERTY	12A	NIGHT	DAT			OTHER	85 na	MIMAL
2.42		080202	PROPERTY	1.F	DAY	DAY			OTHER	UU W5	INIXIONN OR CIVER CAUSE
2.42		070502	f inj.	12A	MIGHT	DRY		05	PXONJ	WE DA	VEHICLE DEFECT
2.42		000502	PROPERTY	111	DAY	DAY		- -	RIZEND	NS NS	TOO PAST FOR COMULTIONS
2.43		022301	1 Inj.	45	DAY	BHON		05	PXODJ	WB na	gleet, hall, preezing rain
2.44		090801	1K 11	78	DAY	DRY			SDEWP	MS WE	PAIL TO GIVE FULL TIME/ATTENT
2.49		061695	PROPERTY	68	DAY	DAY			RREND	28 28	TOO PAST FOR CONDITIONS
2.53		070300	PROPERTY	3P	DAY	DRY			OTTIME	WS no	PAIL TO GIVE FULL TIME/ATTENT
2.56		030501	ı inj.	9A	DAY	WET			OTHER	HS UU	TOO FAST FOR COMDITIONS
2.61		110999	l Inj	57	NIGHT	DRY			RREND	NB NB	PAIL TO GIVE FULL TIME/ATTENT
2.63		071199	2 Inj	12P	DAY	DAT			RRETED	WS WL	POLLOWED TOO CLOSELY
2.63		010700	1 inj	98	DAY	DRY			ADSWP	es es	THE CAUSE
2.67	1	050899	PROPERTY	SP	DAY	WET		10	PRODJ	ES BA	BAIN, SHOW
2.70	-	071301	1 Inj.	121	MIGHT	DRY	. ↓		OTHER	WS na	UNDER INPLUENCE OF ALCOHOL
2.71		000799	PROPERTY	4P	DAY	DRY			RREMD	Ma M8	PAIL TO GIVE PULL TIME/ATTENT
				-							and the second s
8 (Q1) -Bric	ige	(02)=Bui	lding (03	-Citte	r/Ditch	(04)	-Curb	(0:)-Guard	rail/Box	rier (06)=Embesikment (07)=7

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ADC Combined Logarie Distory Output Continued...

LOGHT LE	7R	DATE	SEVERITY	TIME	LIGHT	Sur Pace	ALC	PX DG	TASE CFBH	HOVE V1 V2	PROBABLE CAUCE
2.71		659800	PROPERTY	99	MIGHT	DRY			OTHER	E9 na	ARINAT
2.71		003600	PROPERTY	5A	DAT	DRY			RREND	eg eg	PAIL TO GIVE FULL TIME/ATTENT
2.71	,	082000	PROPERTY	42	DAY	DRY			OPOIR	me ee	TRAFFIC CONTROL DEVICE INOP.
2.74	,	051400	PROPERTY	SA.	DAY	DRY			OTHER	IS na	anthre.
2.76		121099	J Inj.	46	MIGHT	WET			SDSWP	MG WS	Wat
2.65		040239	PROPERTY	104	DAY	DRY			SDSMP	WS WE	Improper Lane Change
2.05		072499	PROPERTY	12P	DAY	DRY			AREND	WG WS	PAIL TO GIVE FULL TIME/ATTENT
2.09		012999	PROPERTY	10A	DAT	DRY			OTHER	WS na	UNICHONE OR OTHER CAUSE
2.94		021402	PROPERTY	éP.	HIGHT	DRY			KABND	BG EG	FAIL TO GIVE FULL TIME/ATTENT
2.95		032599	PROPERTY	37	DAY	DIEY			REESTO	NS NS	FAIL TO CIVE PULL TIME/ATTEMT
2.95		071779	5 Ini	1.2P	DAY	DRY			REMERCO	WS MB	FAIL TO GIVE FULL TIME/ATTENT
2.95		012700	PROPERTY	71	CHAY	DRY		Ö6	PROBJ	RS na	PAIL TO GIVE PULL TIME/ATTENT
2.95		22050C	PROPERTY	#P	NIGHT	WET		03	PROBJ	MØ DA	ICY OR SHOW COVERED
2.95		181880	PROPERTY	114	DAY	OKY	4	- :	RREND	WE WE	UMBER INPLUENCE OF ALCOHOL
2.95		072300	a taj.	11	DAT	DRY			PRESTU	NE NE	POLLOWED TOO CLOSELY
2.95		042600	PROPERTY	9P	MIGHT	WILL			OTHER.	WE SA	ANTHAL
2.55		071507	1 Inj.	SP	DAY	DRY		05	PXORJ	ES Da	PELL ASLEEP, PAINTED, RTC.
2.55		070902	a inj.	7 P	DAY	DRY	4	11	PRODI	UU ne	UNDER IMPLUENCE OF ALCOHOL
2.95		063202	PROPERTY	6P	DAY	DRY			OTHER	MS UU	UNITERONIS OF OTHER CAUSE
2.95		052602	PROPERTY	OF	DAY	WELL			RREND	WS WS	PAIL TO GIVE PULL TIME/ATTENT

PIOS (01) = Bridge (02) - Building (03) - Culver/Ditch (04) - Curb (05) - Guardrail/Barrier (06) - Buhankment (07) = Fence (08) - Light Pole (09) - Sign Pole (10) - Great Aftenuator (11) - Tree/Shrubbery (12) - Construct (13) - Creat Aftenuator

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2025 CAPACITY ANALYSIS WORKSHEETS

Bay Bridge 2025 Summer Weekend Day Westbound Analysis

HCS2000: Basic Freeway Segments Release 4.1a

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 10 AM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 3 WB LANES

Flow Inputs and A	Adjustments	
	0.51.5	1 (1
Volume, V	2717	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	755	V
Trucks and buses	6	%
Recreational vehicles	0	%
Terrain type:	Grade	_
Grade	3.50	8
Segment length	0.60	mi
Trucks and buses PCE, ET	2.0	
Recreational vehicle PCE, ER	3.0	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, vp	1.00	
Flow rate, vp	1067	pc/h/ln
Speed Inputs and	Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	2.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Ideal	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	1.6	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	3.0	mi/h
Free-flow speed, FFS	60.4	mi/h
	Urban Freeway	,
LOS and Performan	nce Measures	
Flow rate are	1067	pc/h/ln
Flow rate, vp Free-flow speed, FFS	60.4	pc/n/in mi/h
<u>-</u>		
Average passenger-car speed, S	60.4	mi/h
Number of lanes, N	3	/
Density, D	17.7	pc/mi/ln
Level of service, LOS	В	

HCS2000: Basic Freeway Segments Release 4.1a

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 11 AM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 3 WB LANES

Flow Inputs and Adjustments			
Volume, V	3160	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	878	V	
Trucks and buses	6	%	
Recreational vehicles	0	%	
Terrain type:	Grade		
Grade	3.50	8	
Segment length	0.60	mi	
Trucks and buses PCE, ET	2.0		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.943		
Driver population factor, vp	1.00		
Flow rate, vp	1241	pc/h/ln	
Speed Inputs and	Adjustments		
Lane width	12.0	ft	
Right-shoulder lateral clearance	4.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	3		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	0.8	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	3.0	mi/h	
Free-flow speed, FFS	61.2	mi/h	
	Urban Freeway		
LOS and Performance Measures			
Flow rate, vp	1241	pc/h/ln	
Free-flow speed, FFS	61.2	mi/h	
Average passenger-car speed, S	61.2	mi/h	
Number of lanes, N	3	,	
Density, D	20.3	pc/mi/ln	
Level of service, LOS	C	<u> </u>	
· · · · · · · · · · · · · · · · · · ·			

HCS2000: Basic Freeway Segments Release 4.1a

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 12 PM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 3 WB LANES

Flow Inputs and Adjustments			
Volume, V	3474	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	965	V	
Trucks and buses	6	%	
Recreational vehicles	0	%	
Terrain type:	Grade		
Grade	3.50	96	
Segment length	0.60	mi	
Trucks and buses PCE, ET	2.0		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.943		
Driver population factor, vp	1.00		
Flow rate, vp	1364	pc/h/ln	
Speed Inputs and Adjustments			
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	3		
Free-flow speed:	Ideal		
FFS or BFFS Lane width adjustment, fLW	65.0 0.0	mi/h mi/h	
Lateral clearance adjustment, fLC	1.6	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	3.0	mi/h	
Free-flow speed, FFS	60.4	mi/h	
rice flow speed, rib	Urban Freeway	1112/11	
LOS and Performance Measures			
Flow rate, vp	1364	pc/h/ln	
Free-flow speed, FFS	60.4	mi/h	
Average passenger-car speed, S	60.4	mi/h	
Number of lanes, N	3		
Density, D	22.6	pc/mi/ln	
Level of service, LOS	C		

HCS2000: Basic Freeway Segments Release 4.1a

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 1 PM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 3 WB LANES

Flow Inputs and Adjustments			
Volume, V	3785	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	1051	V	
Trucks and buses	6	%	
Recreational vehicles	0	%	
Terrain type:	Grade		
Grade	3.50	%	
Segment length	0.60	mi	
Trucks and buses PCE, ET	2.0		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.943		
Driver population factor, vp	1.00		
Flow rate, vp	1486	pc/h/ln	
Speed Inputs and	Adjustments		
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	3		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	1.6	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	3.0	mi/h	
Free-flow speed, FFS	60.4	mi/h	
	Urban Freeway		
LOS and Performa	nce Measures		
Flow rate, vp	1486	pc/h/ln	
Free-flow speed, FFS	60.4	mi/h	
Average passenger-car speed, S	60.4	mi/h	
Number of lanes, N	3	, -	
Density, D	24.6	pc/mi/ln	
Level of service, LOS	C	<u> </u>	
	-		

HCS2000: Basic Freeway Segments Release 4.1a

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 2 PM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 3 WB LANES

Flow Inputs and Adjustments			
Volume, V	3749	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	1041	V	
Trucks and buses	6	%	
Recreational vehicles	0	%	
Terrain type:	Grade		
Grade	3.50	%	
Segment length	0.60	mi	
Trucks and buses PCE, ET	2.0		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.943		
Driver population factor, vp	1.00		
Flow rate, vp	1472	pc/h/ln	
Speed Inputs and	Adjustments		
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	3		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	1.6	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	3.0	mi/h	
Free-flow speed, FFS	60.4	mi/h	
	Urban Freeway		
LOS and Performan	LOS and Performance Measures		
Flow rate, vp	1472	pc/h/ln	
Free-flow speed, FFS	60.4	mi/h	
Average passenger-car speed, S	60.4	mi/h	
Number of lanes, N	3	•	
Density, D	24.4	pc/mi/ln	
Level of service, LOS	С	-	
•			

HCS2000: Basic Freeway Segments Release 4.1a

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 3 PM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 3 WB LANES

Flow Inputs and Adjustments			
Volume, V	4341	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	1206	v	
Trucks and buses	6	%	
Recreational vehicles	0	%	
Terrain type:	Grade		
Grade	3.50	%	
Segment length	0.60	mi	
Trucks and buses PCE, ET	2.0		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.943		
Driver population factor, vp	1.00		
Flow rate, vp	1704	pc/h/ln	
Speed Inputs and A	Adjustments		
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	3		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	1.6	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	3.0	mi/h	
Free-flow speed, FFS	60.4	mi/h	
	Urban Freeway		
LOS and Performance Measures			
Flow rate, vp	1704	pc/h/ln	
Free-flow speed, FFS	60.4	mi/h	
Average passenger-car speed, S	60.3	mi/h	
Number of lanes, N	3		
Density, D	28.2	pc/mi/ln	
Level of service, LOS	D		

HCS2000: Basic Freeway Segments Release 4.1a

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 4PM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 3 WB LANES

Flow Inputs and	Adjustments	
	J	
Volume, V	4107	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1141	V
Trucks and buses	6	%
Recreational vehicles	0	90
Terrain type:	Grade	
Grade	3.50	%
Segment length	0.60	mi
Trucks and buses PCE, ET	2.0	
Recreational vehicle PCE, ER	3.0	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, vp	1.00	
Flow rate, vp	1612	pc/h/ln
Speed Inputs and	Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	2.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Ideal	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	1.6	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	3.0	mi/h
Free-flow speed, FFS	60.4	mi/h
	Urban Freeway	
LOS and Performa	nce Measures	
Flow rate, vp	1612	pc/h/ln
Free-flow speed, FFS	60.4	mi/h
Average passenger-car speed, S	60.4	mi/h
Number of lanes, N	3	,
Density, D	26.7	pc/mi/ln
Level of service, LOS	D	F - //
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HCS2000: Basic Freeway Segments Release 4.1a

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 5 PM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 3 WB LANES

Flow Inputs and Adjustments			
Volume, V	3658	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	1016	V	
Trucks and buses	6	%	
Recreational vehicles	0	%	
Terrain type:	Grade		
Grade	3.50	8	
Segment length	0.60	mi	
Trucks and buses PCE, ET	2.0		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.943		
Driver population factor, vp	1.00		
Flow rate, vp	1436	pc/h/ln	
Speed Inputs and Adjustments			
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	3		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	1.6	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	3.0	mi/h	
Free-flow speed, FFS	60.4	mi/h	
	Urban Freeway		
LOS and Performan	ce Measures		
Flow rate, vp	1436	pc/h/ln	
Free-flow speed, FFS	60.4	mi/h	
Average passenger-car speed, S	60.4	mi/h	
Number of lanes, N	3	•	
Density, D	23.8	pc/mi/ln	
Level of service, LOS	С	<u>-</u>	

___Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 6 PM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 3 WB LANES

Flow Inputs and Adjustments			
Volume, V	3475	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	965	V	
Trucks and buses	6	%	
Recreational vehicles	0	%	
Terrain type:	Grade		
Grade	3.50	%	
Segment length	0.60	mi	
Trucks and buses PCE, ET	2.0		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.943		
Driver population factor, vp	1.00		
Flow rate, vp	1364	pc/h/ln	
Speed Inputs and Adjustments			
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	3		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	1.6	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	3.0	mi/h	
Free-flow speed, FFS	60.4	mi/h	
	Urban Freeway		
LOS and Performan	ce Measures		
Flow rate, vp	1364	pc/h/ln	
Free-flow speed, FFS	60.4	mi/h	
Average passenger-car speed, S	60.4	mi/h	
Number of lanes, N	3	/ 	
Density, D	22.6	pc/mi/ln	
Level of service, LOS	C	F - // 222	
	-		

__Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 7 PM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 3 WB LANES

Flow Inputs and	Adjustments	
-	•	
Volume, V	2988	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	830	V
Trucks and buses	6	%
Recreational vehicles	0	%
Terrain type:	Grade	
Grade	3.50	%
Segment length	0.60	mi
Trucks and buses PCE, ET	2.0	
Recreational vehicle PCE, ER	3.0	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, vp	1.00	
Flow rate, vp	1173	pc/h/ln
Speed Inputs and	d Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	2.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Ideal	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	1.6	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	3.0	mi/h
Free-flow speed, FFS	60.4	mi/h
_	Urban Freeway	
LOS and Perform	ance Measures	
Flow rate, vp	1173	pc/h/ln
Free-flow speed, FFS	60.4	mi/h
Average passenger-car speed, S	60.4	mi/h
Number of lanes, N	3	1111
Density, D	19.4	pc/mi/ln
Level of service, LOS	19.4 C	PC/1111
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__Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 8 PM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 3 WB LANES

Flow Inputs and Adjustments			
Volume, V	2520	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	700	V	
Trucks and buses	6	%	
Recreational vehicles	0	%	
Terrain type:	Grade		
Grade	3.50	%	
Segment length	0.60	mi	
Trucks and buses PCE, ET	2.0		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.943		
Driver population factor, vp	1.00		
Flow rate, vp	989	pc/h/ln	
Speed Inputs and Adjustments			
Lane width	12.0	ft	
Right-shoulder lateral clearance	4.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	3		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	0.8	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	3.0	mi/h	
Free-flow speed, FFS	61.2	mi/h	
	Urban Freeway		
LOS and Perform	ance Measures		
Flow rate, vp	989	pc/h/ln	
Free-flow speed, FFS	61.2	mi/h	
Average passenger-car speed, S	61.2	mi/h	
Number of lanes, N	3		
Density, D	16.2	pc/mi/ln	
Level of service, LOS	В		

__Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 9 PM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 3 WB LANES

Flow Inputs and Adjustments			
Volume, V	2104	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	584	v	
Trucks and buses	6	%	
Recreational vehicles	0	%	
Terrain type:	Grade		
Grade	3.50	%	
Segment length	0.60	mi	
Trucks and buses PCE, ET	2.0		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.943		
Driver population factor, vp	1.00		
Flow rate, vp	826	pc/h/ln	
Speed Inputs and A	djustments		
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	3		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	1.6	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	3.0	mi/h	
Free-flow speed, FFS	60.4	mi/h	
	Urban Freeway		
LOS and Performance Measures			
Flow rate, vp	826	pc/h/ln	
Free-flow speed, FFS	60.4	mi/h	
Average passenger-car speed, S	60.4	mi/h	
Number of lanes, N	3		
Density, D	13.7	pc/mi/ln	
Level of service, LOS	В		

Bay Bridge 2025 Summer Weekend Day Eastbound Analysis

__Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 10 AM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 2 EB LANES

Flow Inputs and Adjustments			
Volume, V	4029	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	1119	V	
Trucks and buses	6	8	
Recreational vehicles	0	8	
Terrain type:	Grade		
Grade	3.00	%	
Segment length	0.70	mi	
Trucks and buses PCE, ET	1.5		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.971		
Driver population factor, vp	1.00		
Flow rate, vp	2305	pc/h/ln	
Speed Inputs and	Adjustments		
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	2		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	2.4	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	4.5	mi/h	
Free-flow speed, FFS	58.1	mi/h	
	Urban Freeway		
LOS and Performa	nce Measures		
Flow rate, vp	2305	pc/h/ln	
Free-flow speed, FFS	58.1	mi/h	
Average passenger-car speed, S		mi/h	
Number of lanes, N	2		
Density, D		pc/mi/ln	
Level of service, LOS	F	_	

__Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 11 AM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 2 EB LANES

Flow Inputs and Adjustments			
Volume, V	4521	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	1256	V	
Trucks and buses	6	%	
Recreational vehicles	0	%	
Terrain type:	Grade		
Grade	3.00	%	
Segment length	0.70	mi	
Trucks and buses PCE, ET	1.5		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.971		
Driver population factor, vp	1.00		
Flow rate, vp	2587	pc/h/ln	
Speed Inputs an	d Adjustments		
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	2		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	2.4	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	4.5	mi/h	
Free-flow speed, FFS	58.1	mi/h	
	Urban Freeway		
LOS and Perform	ance Measures		
Flow rate, vp	2587	pc/h/ln	
Free-flow speed, FFS	58.1	mi/h	
Average passenger-car speed, S		mi/h	
Number of lanes, N	2		
Density, D		pc/mi/ln	
Level of service, LOS	F		

___Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 12 PM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 2 EB LANES

Debeliperon: Z LD Limite			
Flow Inputs and A	djustments		
Volume, V	4784	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	1329	V	
Trucks and buses	6	%	
Recreational vehicles	0	%	
Terrain type:	Grade		
Grade	3.00	%	
Segment length	0.70	mi	
Trucks and buses PCE, ET	1.5		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.971		
Driver population factor, vp	1.00		
Flow rate, vp	2738	pc/h/ln	
Speed Inputs and Adjustments			
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	2		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	2.4	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	4.5	mi/h	
Free-flow speed, FFS	58.1	mi/h	
	Urban Freeway		
LOS and Performance Measures			
Flow rate, vp	2738	pc/h/ln	
Free-flow speed, FFS	58.1	mi/h	
Average passenger-car speed, S		mi/h	
Number of lanes, N	2	•	
Density, D		pc/mi/ln	
Level of service, LOS	F	± , , , ,	

__Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 1 PM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 2 EB LANES

Flow Inputs and	Adjustments	
Volume, V	4939	veh/h
Peak-hour factor, PHF	0.90	VE11/11
Peak 15-min volume, v15	1372	V
Trucks and buses	6	00
Recreational vehicles	0	%
Terrain type:	Grade	
Grade	3.00	%
Segment length	0.70	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	3.0	
Heavy vehicle adjustment, fHV	0.971	
Driver population factor, vp	1.00	
Flow rate, vp	2826	pc/h/ln
Speed Inputs and	d Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	2.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Ideal	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	2.4	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.1	mi/h
	Urban Freeway	
LOS and Performa	ance Measures	
Flow rate, vp	2826	pc/h/ln
Free-flow speed, FFS	58.1	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

__Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 2 PM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 2 EB LANES

Flow Inputs and	Adjustments	
77-1 77	F462	la / la
Volume, V	5462	veh/h
Peak-hour factor, PHF Peak 15-min volume, v15	0.90 1517	
Trucks and buses		V %
Recreational vehicles	6 0	6 6
	_	6
Terrain type: Grade	Grade 3.00	8
	0.70	•
Segment length Trucks and buses PCE, ET	1.5	mi
Recreational vehicle PCE, ER	3.0	
	0.971	
Heavy vehicle adjustment, fHV	1.00	
Driver population factor, vp		ng/h/ln
Flow rate, vp	3125	pc/h/ln
Speed Inputs an	d Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	2.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Ideal	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	2.4	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.1	mi/h
	Urban Freeway	
LOS and Perform	ance Measures	
Flow rate, vp	3125	pc/h/ln
Free-flow speed, FFS	58.1	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	•
Density, D	_	pc/mi/ln
Level of service, LOS	F	<u> </u>
	=	

___Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 3 PM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 2 EB LANES

Flow Inputs and Adjustments			
Volume, V	5762	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	1601	V	
Trucks and buses	6	%	
Recreational vehicles	0	%	
Terrain type:	Grade		
Grade	3.00	%	
Segment length	0.70	mi	
Trucks and buses PCE, ET	1.5		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.971		
Driver population factor, vp	1.00	4343	
Flow rate, vp	3297	pc/h/ln	
Speed Inputs and A	Adjustments		
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	2		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	2.4	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	4.5	mi/h	
Free-flow speed, FFS	58.1	mi/h	
	Urban Freeway		
LOS and Performance Measures			
Flow rate, vp	3297	pc/h/ln	
Free-flow speed, FFS	58.1	mi/h	
Average passenger-car speed, S	- 	mi/h	
Number of lanes, N	2	•	
Density, D		pc/mi/ln	
Level of service, LOS	F	_	

__Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 4 PM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 2 EB LANES

Flow Inputs and Adjustments			
Volume, V	5703	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	1584	V	
Trucks and buses	6	%	
Recreational vehicles	0	%	
Terrain type:	Grade		
Grade	3.00	%	
Segment length	0.70	mi	
Trucks and buses PCE, ET	1.5		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.971		
Driver population factor, vp	1.00		
Flow rate, vp	3263	pc/h/ln	
Speed Inputs and	Adjustments		
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	2		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	2.4	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	4.5	mi/h	
Free-flow speed, FFS	58.1	mi/h	
	Urban Freeway		
LOS and Performan	nce Measures		
Flow rate, vp	3263	pc/h/ln	
Free-flow speed, FFS	58.1	mi/h	
Average passenger-car speed, S		mi/h	
Number of lanes, N	2		
Density, D		pc/mi/ln	
Level of service, LOS	F		

__Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 5 PM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 2 EB LANES

Flow Inputs and	Adjustments	
Volume, V	5759	veh/h
Peak-hour factor, PHF	0.90	VeII/II
Peak 15-min volume, v15	1600	V
Trucks and buses	6	%
Recreational vehicles	0	%
Terrain type:	Grade	v
Grade	3.00	ଚ୍ଚ
Segment length	0.70	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	3.0	
Heavy vehicle adjustment, fHV	0.971	
Driver population factor, vp	1.00	
Flow rate, vp	3295	pc/h/ln
Speed Inputs and	Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	2.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Ideal	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	2.4	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.1	mi/h
	Urban Freeway	
LOS and Performa	nce Measures	
Flow rate, vp	3295	pc/h/ln
Free-flow speed, FFS	58.1	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

__Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 6 PM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 2 EB LANES

Flow Inputs and Adjustments			
Volume, V	4517	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	1255	V	
Trucks and buses	6	%	
Recreational vehicles	0	%	
Terrain type:	Grade		
Grade	3.00	%	
Segment length	0.70	mi	
Trucks and buses PCE, ET	1.5		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.971		
Driver population factor, vp	1.00		
Flow rate, vp	2585	pc/h/ln	
Speed Inputs and	d Adjustments		
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	2		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	2.4	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	4.5	mi/h	
Free-flow speed, FFS	58.1	mi/h	
	Urban Freeway		
LOS and Performa	ance Measures		
Flow rate, vp	2585	pc/h/ln	
Free-flow speed, FFS	58.1	mi/h	
Average passenger-car speed, S		mi/h	
Number of lanes, N	2		
Density, D		pc/mi/ln	
Level of service, LOS	F	_	

__Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 7 PM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 2 EB LANES

Flow Inputs and Adjustments			
Volume, V	4147	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	1152	V	
Trucks and buses	6	%	
Recreational vehicles	0	%	
Terrain type:	Grade		
Grade	3.00	%	
Segment length	0.70	mi	
Trucks and buses PCE, ET	1.5		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.971		
Driver population factor, vp	1.00		
Flow rate, vp	2373	pc/h/ln	
Speed Inputs and	Adjustments		
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	2		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	2.4	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	4.5	mi/h	
Free-flow speed, FFS	58.1	mi/h	
	Urban Freeway		
LOS and Performan	nce Measures		
Flow rate, vp	2373	pc/h/ln	
Free-flow speed, FFS	58.1	mi/h	
Average passenger-car speed, S		mi/h	
Number of lanes, N	2		
Density, D		pc/mi/ln	
Level of service, LOS	F		

HCS2000: Basic Freeway Segments Release 4.1a

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 8 PM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 2 EB LANES

Flow Inputs and	Adjustments		
_			
Volume, V	3983	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	1106	V	
Trucks and buses	6	%	
Recreational vehicles	0	%	
Terrain type:	Grade		
Grade	3.00	%	
Segment length	0.70	mi	
Trucks and buses PCE, ET	1.5		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.971		
Driver population factor, vp	1.00		
Flow rate, vp	2279	pc/h/ln	
Speed Inputs and Adjustments			
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	2		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	2.4	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	4.5	mi/h	
Free-flow speed, FFS	58.1	mi/h	
	Urban Freeway		
LOS and Performa	ance Measures		
Flow rate, vp	2279	pc/h/ln	
Free-flow speed, FFS	58.1	mi/h	
Average passenger-car speed, S	50.8	mi/h	
Number of lanes, N	2	1111	
Density, D	44.9	pc/mi/ln	
Level of service, LOS	44.9 E	PC/11111	
TEACT OF PETATCE, TOP	15		

__Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 9 PM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Description: 2 EB LANES

Flow Inputs and Adjustments			
Volume, V	4048	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	1124	V	
Trucks and buses	6	%	
Recreational vehicles	0	8	
Terrain type:	Grade		
Grade	3.00	%	
Segment length	0.70	mi	
Trucks and buses PCE, ET	1.5		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.971		
Driver population factor, vp	1.00		
Flow rate, vp	2316	pc/h/ln	
Speed Inputs and	Adjustments		
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	2		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	2.4	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	4.5	mi/h	
Free-flow speed, FFS	58.1	mi/h	
	Urban Freeway		
LOS and Performan	nce Measures		
Flow rate, vp	2316	pc/h/ln	
Free-flow speed, FFS	58.1	mi/h	
Average passenger-car speed, S		mi/h	
Number of lanes, N	2		
Density, D		pc/mi/ln	
Level of service, LOS	F		

Bay Bridge 2025 Average Weekday Westbound Analysis

HCS2000: Basic Freeway Segments Release 4.1a

Analyst: BKA
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 10 AM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 3 WB LANES

Flow Inputs and A	djustments	
	<u></u>	
Volume, V	2216	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	616	v
Trucks and buses	14	%
Recreational vehicles	0	%
Terrain type:	Grade	
Grade	3.50	%
Segment length	0.60	mi
Trucks and buses PCE, ET	2.0	
Recreational vehicle PCE, ER	3.0	
Heavy vehicle adjustment, fHV	0.877	
Driver population factor, vp	1.00	
Flow rate, vp	936	pc/h/ln
Speed Inputs and	Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	2.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Ideal	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	1.6	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	3.0	mi/h
Free-flow speed, FFS	60.4	mi/h
	Urban Freeway	
LOS and Performance Measures		
Flow rate, vp	936	pc/h/ln
Free-flow speed, FFS	60.4	mi/h
Average passenger-car speed, S	60.4	mi/h
Number of lanes, N	3	
Density, D	15.5	pc/mi/ln
Level of service, LOS	В	<u>-</u> · · · · ·

__Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 11 AM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 3 WB LANES

Flow Inputs and	Adjustments	
Volume, V	2200	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	611	v
Trucks and buses	14	%
Recreational vehicles	0	%
Terrain type:	Grade	
Grade	3.50	%
Segment length	0.60	mi
Trucks and buses PCE, ET	2.0	
Recreational vehicle PCE, ER	3.0	
Heavy vehicle adjustment, fHV	0.877	
Driver population factor, vp	1.00	
Flow rate, vp	929	pc/h/ln
Speed Inputs and	d Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	2.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Ideal	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	1.6	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	3.0	mi/h
Free-flow speed, FFS	60.4	mi/h
	Urban Freeway	
LOS and Performance Measures		
Flow rate, vp	929	pc/h/ln
Free-flow speed, FFS	60.4	mi/h
Average passenger-car speed, S	60.4	mi/h
Number of lanes, N	3	
Density, D	15.4	pc/mi/ln
Level of service, LOS	В	

__Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 12 PM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 3 WB LANES

Flow Inputs and	Adjustments	
Volume, V	2201	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	611	V
Trucks and buses	14	%
Recreational vehicles	0	%
Terrain type:	Grade	
Grade	3.50	%
Segment length	0.60	mi
Trucks and buses PCE, ET	2.0	
Recreational vehicle PCE, ER	3.0	
Heavy vehicle adjustment, fHV	0.877	
Driver population factor, vp	1.00	
Flow rate, vp	929	pc/h/ln
Speed Inputs and	Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	2.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Ideal	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	1.6	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	3.0	mi/h
Free-flow speed, FFS	60.4	mi/h
	Urban Freeway	
LOS and Performance Measures		
Flow rate, vp	929	pc/h/ln
Free-flow speed, FFS	60.4	mi/h
Average passenger-car speed, S	60.4	mi/h
Number of lanes, N	3	
Density, D	15.4	pc/mi/ln
Level of service, LOS	В	

HCS2000: Basic Freeway Segments Release 4.1a

Analyst: BKA
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 1 PM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 3 WB LANES

Flow Inputs and	Adjustments	
Volume, V	2166	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	602	V
Trucks and buses	14	%
Recreational vehicles	0	%
Terrain type:	Grade	
Grade	3.50	%
Segment length	0.60	mi
Trucks and buses PCE, ET	2.0	
Recreational vehicle PCE, ER	3.0	
Heavy vehicle adjustment, fHV	0.877	
Driver population factor, vp	1.00	
Flow rate, vp	915	pc/h/ln
Speed Inputs and	d Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	2.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Ideal	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	1.6	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	3.0	mi/h
Free-flow speed, FFS	60.4	mi/h
-	Urban Freeway	
LOS and Performance Measures		
Elev vete ve	015	ng/h/ln
Flow rate, vp	915	pc/h/ln
Free-flow speed, FFS	60.4	mi/h
Average passenger-car speed, S	60.4	mi/h
Number of lanes, N	3	/ 1 / 3
Density, D	15.1	pc/mi/ln
Level of service, LOS	В	

__Operational Analysis_____

Analyst: BKA
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 2 PM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 3 WB LANES

Flow Inputs and Ad	ljustments	
Volume, V	2370	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	658	V
Trucks and buses	14	%
Recreational vehicles	0	%
Terrain type:	Grade	
Grade	3.50	%
Segment length	0.60	mi
Trucks and buses PCE, ET	2.0	
Recreational vehicle PCE, ER	3.0	
Heavy vehicle adjustment, fHV	0.877	
Driver population factor, vp	1.00	
Flow rate, vp	1001	pc/h/ln
Speed Inputs and A	Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	2.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Ideal	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	1.6	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	3.0	mi/h
Free-flow speed, FFS	60.4	mi/h
	Urban Freeway	
LOS and Performance Measures		
Flow rate, vp	1001	pc/h/ln
Free-flow speed, FFS	60.4	mi/h
Average passenger-car speed, S	60.4	mi/h
Number of lanes, N	3	
Density, D	16.6	pc/mi/ln
Level of service, LOS	В	

HCS2000: Basic Freeway Segments Release 4.1a

Analyst: BKA
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 3 PM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 3 WB LANES

Flow Inputs and	Adjustments		
77-1	2404	1- /1-	
Volume, V	2484	veh/h	
Peak-hour factor, PHF Peak 15-min volume, v15	0.90 690		
Trucks and buses	690 14	V %	
Recreational vehicles	0	6 6	
Terrain type:	Grade	6	
Grade	3.50	ે	
Segment length	0.60	mi	
Trucks and buses PCE, ET	2.0	ШТ	
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.877		
Driver population factor, vp	1.00		
Flow rate, vp	1049	pc/h/ln	
riow race, vp	1049	pe/11/111	
Speed Inputs and Adjustments			
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	3		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	1.6	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	3.0	mi/h	
Free-flow speed, FFS	60.4	mi/h	
	Urban Freeway		
LOS and Performance Measures			
Flow rate, vp	1049	pc/h/ln	
Free-flow speed, FFS	60.4	mi/h	
Average passenger-car speed, S	60.4	mi/h	
Number of lanes, N	3		
Density, D	17.4	pc/mi/ln	
Level of service, LOS	В	_	

HCS2000: Basic Freeway Segments Release 4.1a

Analyst: BKA
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 4PM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 3 WB LANES

1			
Flow Inputs and A	djustments		
Volume, V	2471	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	686	V	
Trucks and buses	14	%	
Recreational vehicles	0	%	
Terrain type:	Grade		
Grade	3.50	%	
Segment length	0.60	mi	
Trucks and buses PCE, ET	2.0		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.877		
Driver population factor, vp	1.00		
Flow rate, vp	1043	pc/h/ln	
Speed Inputs and	Adjustments		
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	3		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	1.6	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	3.0	mi/h	
Free-flow speed, FFS	60.4	mi/h	
	Urban Freeway		
LOS and Performance Measures			
Flow rate, vp	1043	pc/h/ln	
Free-flow speed, FFS	60.4	mi/h	
Average passenger-car speed, S	60.4	mi/h	
Number of lanes, N	3	/	
Density, D	17.3	pc/mi/ln	
Level of service, LOS	В	F 0 / / 111	
20.01 01 001,100, 200	_		

HCS2000: Basic Freeway Segments Release 4.1a

Analyst: BKA
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 5 PM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 3 WB LANES

Flow Inputs and	Adjustments	
Volume, V	2393	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	665	V
Trucks and buses	14	8
Recreational vehicles	0	8
Terrain type:	Grade	
Grade	3.50	%
Segment length	0.60	mi
Trucks and buses PCE, ET	2.0	
Recreational vehicle PCE, ER	3.0	
Heavy vehicle adjustment, fHV	0.877	
Driver population factor, vp	1.00	
Flow rate, vp	1010	pc/h/ln
Speed Inputs an	d Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	2.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Ideal	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	1.6	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	3.0	mi/h
Free-flow speed, FFS	60.4	mi/h
	Urban Freeway	
LOS and Performance Measures		
Flow rate, vp	1010	pc/h/ln
Free-flow speed, FFS	60.4	mi/h
Average passenger-car speed, S	60.4	mi/h
Number of lanes, N	3	/ 11
Density, D	16.7	pc/mi/ln
Level of service, LOS	В	PC/ MT/ 111
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__Operational Analysis_____

Analyst: BKA
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 6 PM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 3 WB LANES

Flow Inputs and	Adjustments	
_		
Volume, V	1925	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	535	V
Trucks and buses	14	%
Recreational vehicles	0	%
Terrain type:	Grade	
Grade	3.50	%
Segment length	0.60	mi
Trucks and buses PCE, ET	2.0	
Recreational vehicle PCE, ER	3.0	
Heavy vehicle adjustment, fHV	0.877	
Driver population factor, vp	1.00	
Flow rate, vp	813	pc/h/ln
Speed Inputs and	d Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	2.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Ideal	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	1.6	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	3.0	mi/h
Free-flow speed, FFS	60.4	mi/h
	Urban Freeway	
LOS and Performance Measures		
Flow rate, vp	813	pc/h/ln
Free-flow speed, FFS	60.4	mi/h
Average passenger-car speed, S	60.4	mi/h
Number of lanes, N	3	1111
Density, D	13.5	pc/mi/ln
Level of service, LOS	13.5 B	PC/1111
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__Operational Analysis_____

Analyst: BKA
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 7 PM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 3 WB LANES

Flow Inputs and	Adjustments		
_			
Volume, V	1418	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	394	V	
Trucks and buses	14	%	
Recreational vehicles	0	%	
Terrain type:	Grade		
Grade	3.50	%	
Segment length	0.60	mi	
Trucks and buses PCE, ET	2.0		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.877		
Driver population factor, vp	1.00		
Flow rate, vp	599	pc/h/ln	
Speed Inputs and Adjustments			
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	3		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	1.6	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	3.0	mi/h	
Free-flow speed, FFS	60.4	mi/h	
-	Urban Freeway		
LOS and Performance Measures			
Flow rate, vp	599	pc/h/ln	
Free-flow speed, FFS	60.4	mi/h	
-	60.4	mi/h	
Average passenger-car speed, S	60.4 3	III / 11	
Number of lanes, N	-	/ / 1	
Density, D	9.9	pc/mi/ln	
Level of service, LOS	A		

__Operational Analysis_____

Analyst: BKA
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 8 PM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 3 WB LANES

Flow Inputs and A	djustments		
Volume, V	1073	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	298	V	
Trucks and buses	14	%	
Recreational vehicles	0	8	
Terrain type:	Grade		
Grade	3.50	%	
Segment length	0.60	mi	
Trucks and buses PCE, ET	2.0		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.877		
Driver population factor, vp	1.00		
Flow rate, vp	453	pc/h/ln	
Speed Inputs and Adjustments			
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	3		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	1.6	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	3.0	mi/h	
Free-flow speed, FFS	60.4	mi/h	
	Urban Freeway		
LOS and Performan	ce Measures		
Flow rate, vp	453	pc/h/ln	
Free-flow speed, FFS	60.4	mi/h	
Average passenger-car speed, S	60.4	mi/h	
Number of lanes, N	3		
Density, D	7.5	pc/mi/ln	
Level of service, LOS	A		

__Operational Analysis_____

Analyst: BKA
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 9 PM

Freeway/Direction: BAY BRIDGE WESTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 3 WB LANES

Flow Inputs and A	Adjustments	
Volume, V	872	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	242	V
Trucks and buses	14	%
Recreational vehicles	0	%
Terrain type:	Grade	
Grade	3.50	%
Segment length	0.60	mi
Trucks and buses PCE, ET	2.0	
Recreational vehicle PCE, ER	3.0	
Heavy vehicle adjustment, fHV	0.877	
Driver population factor, vp	1.00	
Flow rate, vp	368	pc/h/ln
Speed Inputs and	Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	2.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Ideal	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	1.6	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	3.0	mi/h
Free-flow speed, FFS	60.4	mi/h
-	Urban Freeway	
LOS and Performan	nce Measures	
Flow rate, vp	368	pc/h/ln
Free-flow speed, FFS	60.4	mi/h
Average passenger-car speed, S	60.4	mi/h
Number of lanes, N	3	m±/11
Density, D	6.1	pc/mi/ln
Level of service, LOS	0.1 A	PC/1111
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Bay Bridge 2025 Average Weekday Eastbound Analysis

HCS2000: Basic Freeway Segments Release 4.1a

___Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 10 AM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 2 EB LANES

Flow Inputs and Adjustments			
Volume, V	2136	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	593	V	
Trucks and buses	15	%	
Recreational vehicles	0	%	
Terrain type:	Grade		
Grade	3.00	%	
Segment length	0.70	mi	
Trucks and buses PCE, ET	1.5		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.930		
Driver population factor, vp	1.00		
Flow rate, vp	1276	pc/h/ln	
Speed Inputs and Adjustments			
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	2		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	2.4	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	4.5	mi/h	
Free-flow speed, FFS	58.1	mi/h	
	Urban Freeway		
LOS and Performan	ce Measures		
Flow rate, vp	1276	pc/h/ln	
Free-flow speed, FFS	58.1	mi/h	
Average passenger-car speed, S	58.1	mi/h	
Number of lanes, N	2	/ 	
Density, D	22.0	pc/mi/ln	
Level of service, LOS	C	F - // 222	
	-		

___Operational Analysis______

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 11 AM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 2 EB LANES

Flow Inputs and Ad	ljustments	
Volume, V	2159	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	600	V
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Grade	
Grade	3.00	%
Segment length	0.70	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	3.0	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, vp	1.00	
Flow rate, vp	1289	pc/h/ln
Speed Inputs and A	Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	2.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Ideal	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	2.4	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.1	mi/h
	Urban Freeway	
LOS and Performanc	ce Measures	
Flow rate, vp	1289	pc/h/ln
Free-flow speed, FFS	58.1	mi/h
Average passenger-car speed, S	58.1	mi/h
Number of lanes, N	2	
Density, D	22.2	pc/mi/ln
Level of service, LOS	C	

__Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 12 PM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 2 EB LANES

Flow Inputs and	Adjustments	
	<u>-</u>	
Volume, V	2263	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	629	V
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Grade	
Grade	3.00	%
Segment length	0.70	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	3.0	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, vp	1.00	
Flow rate, vp	1352	pc/h/ln
Speed Inputs and	d Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	2.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Ideal	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	2.4	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.1	mi/h
_	Urban Freeway	
LOS and Performa	ance Measures	
Flow rate, vp	1352	pc/h/ln
Free-flow speed, FFS	58.1	mi/h
Average passenger-car speed, S	58.1	mi/h
Number of lanes, N	2	/ 11
Density, D	23.3	pc/mi/ln
Level of service, LOS	C C	PO, 1111

___Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 1 PM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 2 EB LANES

Flow Inputs and Adjustments			
Volume, V	2210	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	614	V	
Trucks and buses	15	%	
Recreational vehicles	0	%	
Terrain type:	Grade		
Grade	3.00	%	
Segment length	0.70	mi	
Trucks and buses PCE, ET	1.5		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.930		
Driver population factor, vp	1.00		
Flow rate, vp	1320	pc/h/ln	
Speed Inputs and Adjustments			
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	2		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	2.4	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	4.5	mi/h	
Free-flow speed, FFS	58.1	mi/h	
	Urban Freeway		
LOS and Performance Measures			
Flow rate, vp	1320	pc/h/ln	
Free-flow speed, FFS	58.1	mi/h	
Average passenger-car speed, S	58.1	mi/h	
Number of lanes, N	2	/	
Density, D	22.7	pc/mi/ln	
Level of service, LOS	C C	F - , ,	
	-		

HCS2000: Basic Freeway Segments Release 4.1a

_____Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 2 PM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 2 EB LANES

Flow Inputs and	Adjustments	
_		
Volume, V	2580	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	717	V
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Grade	
Grade	3.00	%
Segment length	0.70	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	3.0	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, vp	1.00	
Flow rate, vp	1541	pc/h/ln
Speed Inputs and	d Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	2.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	3 .
Free-flow speed:	Ideal	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	2.4	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.1	mi/h
	Urban Freeway	,
LOS and Performa	ance Measures	
The water and	1 5 4 1	/1- /1
Flow rate, vp	1541	pc/h/ln
Free-flow speed, FFS	58.1	mi/h
Average passenger-car speed, S	58.1	mi/h
Number of lanes, N	2	
Density, D	26.5	pc/mi/ln
Level of service, LOS	D	

__Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 3 PM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 2 EB LANES

Flow Inputs and	Adjustments	
Volume, V	3402	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	945	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Grade	
Grade	3.00	%
Segment length	0.70	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	3.0	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, vp	1.00	
Flow rate, vp	2032	pc/h/ln
Speed Inputs and	l Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	2.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Ideal	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	2.4	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.1	mi/h
	Urban Freeway	
LOS and Performa	nce Measures	
Flow rate, vp	2032	pc/h/ln
Free-flow speed, FFS	58.1	mi/h
Average passenger-car speed, S	56.1	mi/h
Number of lanes, N	2	
Density, D	36.2	pc/mi/ln
Level of service, LOS	E	

__Operational Analysis_____

Analyst: Bala Akundi
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 4 PM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 2 EB LANES

Flow Inputs and	Adjustments	
Volume, V	4170	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1158	V
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Grade	
Grade	3.00	%
Segment length	0.70	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	3.0	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, vp	1.00	
Flow rate, vp	2490	pc/h/ln
Speed Inputs and	Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	2.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Ideal	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	2.4	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.1	mi/h
	Urban Freeway	
LOS and Performa	nce Measures	
Flow rate, vp	2490	pc/h/ln
Free-flow speed, FFS	58.1	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

HCS2000: Basic Freeway Segments Release 4.1a

__Operational Analysis_____

Analyst: BKA
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 5 PM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 2 EB LANES

Flow Inputs and	Adjustments	
	41.00	1. /1.
Volume, V	4189	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1164	V •.
Trucks and buses	15	%
Recreational vehicles	0	8
Terrain type:	Grade 3.00	96
Grade		•
Segment length	0.70	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	3.0	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, vp	1.00	(1, (7,
Flow rate, vp	2502	pc/h/ln
Speed Inputs and	d Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	2.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Ideal	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	2.4	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.1	mi/h
	Urban Freeway	
LOS and Performa	ance Measures	
Flow rate, vp	2502	pc/h/ln
Free-flow speed, FFS	58.1	mi/h
Average passenger-car speed, S	30.1	mi/h
Number of lanes, N	2	/ 11
Density, D	_	pc/mi/ln
Level of service, LOS	F	PC/ MT/ 111
TOVEL OF DELATER! HOD	±	

HCS2000: Basic Freeway Segments Release 4.1a

_____Operational Analysis_____

Analyst: BKA
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 6 PM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 2 EB LANES

Flow Inputs and Adjustments			
Volume, V	3520	veh/h	
Peak-hour factor, PHF	0.90		
Peak 15-min volume, v15	978	v	
Trucks and buses	15	%	
Recreational vehicles	0	%	
Terrain type:	Grade		
Grade	3.00	%	
Segment length	0.70	mi	
Trucks and buses PCE, ET	1.5		
Recreational vehicle PCE, ER	3.0		
Heavy vehicle adjustment, fHV	0.930		
Driver population factor, vp	1.00		
Flow rate, vp	2102	pc/h/ln	
Speed Inputs and Adjustments			
Lane width	12.0	ft	
Right-shoulder lateral clearance	2.0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	2		
Free-flow speed:	Ideal		
FFS or BFFS	65.0	mi/h	
Lane width adjustment, fLW	0.0	mi/h	
Lateral clearance adjustment, fLC	2.4	mi/h	
Interchange density adjustment, fID	0.0	mi/h	
Number of lanes adjustment, fN	4.5	mi/h	
Free-flow speed, FFS	58.1	mi/h	
	Urban Freeway		
LOS and Performan	nce Measures		
Flow rate, vp	2102	pc/h/ln	
Free-flow speed, FFS	58.1	mi/h	
Average passenger-car speed, S	55.0	mi/h	
Number of lanes, N	2		
Density, D	38.2	pc/mi/ln	
Level of service, LOS	E		

HCS2000: Basic Freeway Segments Release 4.1a

__Operational Analysis_____

Analyst: BKA
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 7 PM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 2 EB LANES

Flow Inputs and I	Adjustments	
_		
Volume, V	2130	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	592	V
Trucks and buses	15	8
Recreational vehicles	0	%
Terrain type:	Grade	
Grade	3.00	%
Segment length	0.70	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	3.0	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, vp	1.00	
Flow rate, vp	1272	pc/h/ln
Speed Inputs and	Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	2.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Ideal	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	2.4	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.1	mi/h
	Urban Freeway	
LOS and Performan	nce Measures	
Elevinote in	1 272	ng/h/ln
Flow rate, vp	1272	pc/h/ln
Free-flow speed, FFS	58.1	mi/h
Average passenger-car speed, S	58.1	mi/h
Number of lanes, N	2	/
Density, D	21.9	pc/mi/ln
Level of service, LOS	С	

HCS2000: Basic Freeway Segments Release 4.1a

Operational Analysis______

Analyst: BKA
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 8 PM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 2 EB LANES

Volume, V Peak-hour factor, PHF Peak-hour factor, PHF Peak 15-min volume, v15 Peak 15 Peak 15-min volume, v15 Peak 15-min volume, v15 Peak 15-min volu	Flow Inputs and	Adjustments	
Peak-hour factor, PHF 0.90 Peak 15-min volume, v15 439 v Trucks and buses 15 % Recreational vehicles 0 % Terrain type: Grade 3.00 % Grade 3.00 % Segment length 0.70 mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 3.0 Heavy vehicle adjustment, fHV 0.930 Description of Particular PCE, ER 3.0 Heavy vehicle adjustment, FM 0.930 Description PCE, ER 3.0 Heavy vehicle adjustment, FM 0.00 Description PCE, ER 3.0 Heavy vehicle adjustment, FM 0.00 Description PCE, ER 3.0 Heavy vehicle adjustment Description PCE, ER 3.0 Heavy PCE, ER 3.0 Heavy PCE, ER Bit Terciption PCE, ER 3.0 Bit Terciption PCE, ER		<u> </u>	
Peak 15-min volume, v15	Volume, V	1579	veh/h
Trucks and buses	Peak-hour factor, PHF	0.90	
Recreational vehicles	Peak 15-min volume, v15	439	V
Terrain type:	Trucks and buses	15	०
Segment length	Recreational vehicles	0	%
Segment length 0.70 mi Trucks and buses PCE, ET 1.5 Recreational vehicle PCE, ER 3.0 Heavy vehicle adjustment, fHV 0.930 Driver population factor, vp 1.00 Flow rate, vp 943 pc/h/ln Speed Inputs and Adjustments Lane width 12.0 ft Right-shoulder lateral clearance 2.0 ft Interchange density 0.50 interchange/mi Number of lanes, N 2 Free-flow speed: Ideal FFS or BFFS 65.0 mi/h Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC 2.4 mi/h Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 4.5 mi/h Free-flow speed, FFS 58.1 mi/h Free-flow speed, FFS 58.1 mi/h Free-flow speed, FFS 58.1 mi/h Pree-flow speed, FFS 58.1 mi/h	Terrain type:	Grade	
Trucks and buses PCE, ET Recreational vehicle PCE, ER Recreational vehicle Pch/ln Register PCH/ln Recreational vehicle Pch/ln Regis	Grade	3.00	०
Recreational vehicle PCE, ER Heavy vehicle adjustment, fHV Driver population factor, vp 1.00 Flow rate, vp Speed Inputs and Adjustments Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: Ideal FFS or BFFS Lane width adjustment, fLW Lane width adjustment, fLW Lane width adjustment, fLC Interchange density adjustment, fLC Interchange density adjustment, fLD Lane width adjustment, fLD Lane width adjustment, fLD Lateral clearance adjustment, fLD Interchange density adjustment, fID Number of lanes adjustment, fN Free-flow speed, FFS LOS and Performance Measures LOS and Performance Measures Flow rate, vp Free-flow speed, FFS Average passenger-car speed, S S8.1 mi/h Mi/h Pree-flow speed, FFS S8.1 mi/h Average passenger-car speed, S	Segment length	0.70	mi
Heavy vehicle adjustment, fHV Driver population factor, vp Flow rate, vp Speed Inputs and Adjustments Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density 0.0 FFS or BFFS FFS	Trucks and buses PCE, ET	1.5	
Driver population factor, vp 943 pc/h/ln Speed Inputs and Adjustments Lane width 12.0 ft Right-shoulder lateral clearance 2.0 ft Interchange density 0.50 interchange/mi Number of lanes, N 2 Free-flow speed: Ideal FFS or BFFS 65.0 mi/h Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC 2.4 mi/h Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 4.5 mi/h Free-flow speed, FFS 58.1 mi/h Free-flow speed, FFS 58.1 mi/h Average passenger-car speed, S 58.1 mi/h Average passenger-car speed, S 58.1 mi/h	Recreational vehicle PCE, ER	3.0	
Flow rate, vp 943 pc/h/ln Speed Inputs and Adjustments Lane width 12.0 ft Right-shoulder lateral clearance 2.0 ft Interchange density 0.50 interchange/mi Number of lanes, N 2 Free-flow speed: Ideal FFS or BFFS 65.0 mi/h Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC 2.4 mi/h Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 4.5 mi/h Free-flow speed, FFS 58.1 mi/h Urban Freeway LOS and Performance Measures Flow rate, vp 943 pc/h/ln Free-flow speed, FFS 58.1 mi/h Average passenger-car speed, S 58.1 mi/h	Heavy vehicle adjustment, fHV	0.930	
Speed Inputs and Adjustments Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Ideal FFS or BFFS Ideal FFS or BFFS Ideal FFS or BFFS Interchange density Interchange density adjustment, fLC Interchange density adjustment, fID Interchange density adjustment, fID Interchange density adjustment, fN Interchange density adjustment, fLC Interchange/mi I	Driver population factor, vp	1.00	
Lane width Right-shoulder lateral clearance 2.0 ft Interchange density 0.50 interchange/mi Number of lanes, N Free-flow speed: FFS or BFFS 65.0 mi/h Lane width adjustment, fLW Lane width adjustment, fLC Interchange density adjustment, fLC Interchange density adjustment, fLD Interchange density adjustment, fLD Interchange density adjustment, fN Interchange density adjustment, fLC Interchange/mi Mi/h Mi/h Interchange/mi Mi/h Mi/h Mi/h Mi/h Free-flow speed, FFS Interchange/mi Mi/h Mi/h Mi/h Average passenger-car speed, S S8.1 mi/h Mi/h	Flow rate, vp	943	pc/h/ln
Right-shoulder lateral clearance 2.0 ft Interchange density 0.50 interchange/mi Number of lanes, N 2 Free-flow speed: Ideal FFS or BFFS 65.0 mi/h Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC 2.4 mi/h Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 4.5 mi/h Free-flow speed, FFS 58.1 mi/h Urban Freeway LOS and Performance Measures Flow rate, vp 943 pc/h/ln Free-flow speed, FFS 58.1 mi/h Average passenger-car speed, S 58.1 mi/h	Speed Inputs an	d Adjustments	
Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fID Number of lanes adjustment, fN Free-flow speed, FFS LOS and Performance Measures Flow rate, vp Flow rate, vp Free-flow speed, FFS S8.1 Average passenger-car speed, S Ideal D.0 mi/h 0.0 mi/h At.5 mi/h Free-flow speed, FFS S8.1 mi/h Free-flow speed, FFS S8.1 mi/h Free-flow speed, FFS S8.1 mi/h Mi/h Free-flow speed, FFS S8.1 mi/h Free-flow speed, FFS S8.1 mi/h Average passenger-car speed, S	Lane width	12.0	ft
Number of lanes, N 2 Free-flow speed: Ideal FFS or BFFS 65.0 mi/h Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC 2.4 mi/h Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 4.5 mi/h Free-flow speed, FFS 58.1 mi/h Urban Freeway LOS and Performance Measures Flow rate, vp 943 pc/h/ln Free-flow speed, FFS 58.1 mi/h Average passenger-car speed, S 58.1 mi/h	Right-shoulder lateral clearance	2.0	ft
Free-flow speed: FFS or BFFS G5.0 mi/h Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fID Number of lanes adjustment, fN Free-flow speed, FFS LOS and Performance Measures LOS and Performance Measures Flow rate, vp Free-flow speed, FFS Average passenger-car speed, S Ideal 65.0 mi/h 0.0 mi/h 74.5 mi/h 4.5 mi/h 78.1	Interchange density	0.50	interchange/mi
FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC L	Number of lanes, N	2	
Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fID Number of lanes adjustment, fN Free-flow speed, FFS LOS and Performance Measures LOS and Performance Measures Flow rate, vp Free-flow speed, FFS Average passenger-car speed, S DO mi/h 4.5 mi/h Urban Freeway PC/h/ln mi/h Number of lanes adjustment, fN 4.5 mi/h Number of lanes adjustment, fN 4.5 mi/h S8.1 mi/h Mi/h S8.1 mi/h	Free-flow speed:	Ideal	
Lateral clearance adjustment, fLC 2.4 mi/h Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 4.5 mi/h Free-flow speed, FFS 58.1 mi/h Urban Freeway LOS and Performance Measures Flow rate, vp 943 pc/h/ln Free-flow speed, FFS 58.1 mi/h Average passenger-car speed, S 58.1 mi/h	FFS or BFFS	65.0	mi/h
Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 4.5 mi/h Free-flow speed, FFS 58.1 mi/h Urban Freeway LOS and Performance Measures Flow rate, vp 943 pc/h/ln Free-flow speed, FFS 58.1 mi/h Average passenger-car speed, S 58.1 mi/h	Lane width adjustment, fLW	0.0	mi/h
Number of lanes adjustment, fN 4.5 mi/h Free-flow speed, FFS 58.1 mi/h Urban Freeway LOS and Performance Measures Flow rate, vp 943 pc/h/ln Free-flow speed, FFS 58.1 mi/h Average passenger-car speed, S 58.1 mi/h	Lateral clearance adjustment, fLC	2.4	mi/h
Free-flow speed, FFS LOS and Performance Measures LOS and Performance Measures Flow rate, vp Free-flow speed, FFS Average passenger-car speed, S 58.1 mi/h mi/h mi/h 58.1 mi/h	Interchange density adjustment, fID	0.0	mi/h
LOS and Performance Measures	Number of lanes adjustment, fN	4.5	mi/h
LOS and Performance Measures Flow rate, vp 943 pc/h/ln Free-flow speed, FFS 58.1 mi/h Average passenger-car speed, S 58.1 mi/h	Free-flow speed, FFS	58.1	mi/h
Flow rate, vp 943 pc/h/ln Free-flow speed, FFS 58.1 mi/h Average passenger-car speed, S 58.1 mi/h		Urban Freeway	
Free-flow speed, FFS 58.1 mi/h Average passenger-car speed, S 58.1 mi/h	LOS and Perform	ance Measures	
Free-flow speed, FFS 58.1 mi/h Average passenger-car speed, S 58.1 mi/h	Flow rate, vp	943	pc/h/ln
Average passenger-car speed, S 58.1 mi/h	· -		-
	<u>-</u>		
			•
Density, D 16.2 pc/mi/ln			pc/mi/ln
Level of service, LOS B			<u>.</u>

HCS2000: Basic Freeway Segments Release 4.1a

_____Operational Analysis_____

Analyst: BKA
Agency or Company: Parsons
Date Performed: 8/13/02
Analysis Time Period: 9 PM

Freeway/Direction: BAY BRIDGE EASTBOUND SPAN

From/To:

Jurisdiction:

Analysis Year: 2025 WEEKDAY

Description: 2 EB LANES

-		
Flow Inputs and	Adjustments	
Volume, V	1437	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	399	V
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Grade	
Grade	3.00	%
Segment length	0.70	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	3.0	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, vp	1.00	
Flow rate, vp	858	pc/h/ln
Speed Inputs and	d Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	2.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Ideal	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	2.4	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	58.1	mi/h
	Urban Freeway	
LOS and Perform	ance Measures	
Flow rate, vp	858	pc/h/ln
Free-flow speed, FFS	58.1	mi/h
Average passenger-car speed, S	58.1	mi/h
Number of lanes, N	2	
Density, D	14.8	pc/mi/ln
Level of service, LOS	В	

Bay Bridge 2025 Summer Weekend Day Reversible Lane Operation Westbound Analysis

___OPERATIONAL ANALYSIS____

Analyst: BA
Agency/Co: Parsons
Date: 8/18/02
Analsis Period: 10 AM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION - 2 WB Lanes

FREE-FLOW SPEED					
Direction	1		2		
Lane width	12.0	ft	12.0	ft	
Lateral clearance:					
Right edge	2.0	ft	2.0	ft	
Left edge	6.0	ft	2.0	ft	
Total lateral clearance	8.0	ft	4.0	ft	
Access points per mile	0		0		
Median type	Undivided	Ĺ			
Free-flow speed:	Base		Measured		
FFS or BFFS	60.0	mph	60.0	mph	
Lane width adjustment, FLW	0.0	mph	0.0	mph	
Lateral clearance adjustment, FLC	0.9	mph	1.8	mph	
Median type adjustment, FM	1.6	mph	0.0	mph	
Access points adjustment, FA	0.0	mph	0.0	mph	
Free-flow speed	57.5	mph	60.0	mph	
	TACT TIME				
VOLUME					
Direction	1		2		
Volume, V	2717	vph	0	vph	
Peak-hour factor, PHF	0.90	_	0.90	_	
Peak 15-minute volume, v15	755		0		
Trucks and buses	6	%	6	%	
Recreational vehicles	0	%	0	%	
Terrain type	Grade		Grade		
Grade	3.50	%	3.00	%	
Segment length	0.60	mi	0.70	mi	
Number of lanes	2		2		
Driver population adjustment, fP	1.00		1.00		
Trucks and buses PCE, ET	2.0		1.5		
Recreational vehicles PCE, ER	3.0		3.0		
Heavy vehicle adjustment, fHV	0.943		0.971		
Flow rate, vp	1600	pcphpl	0	pcphpl	
	RESULTS				
Direction	1		2		
Flow rate, vp	1600	pcphpl	0	pcphpl	
Free-flow speed, FFS	57.5	mph	60.0	mph	
Avg. passenger-car travel speed, S	56.8	mph	60.0	mph	
Level of service, LOS	D	±	A	_	
Density, D	28.2	pc/mi/ln	0.0	pc/mi/ln	

___OPERATIONAL ANALYSIS____

Analyst: BA
Agency/Co: Parsons
Date: 8/18/02
Analsis Period: 11 AM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION - 2 WB Lanes

FREE-FLOW SPEED					
Direction	1		2		
Lane width	12.0	ft	12.0	ft	
Lateral clearance:					
Right edge	2.0	ft	2.0	ft	
Left edge	6.0	ft	2.0	ft	
Total lateral clearance	8.0	ft	4.0	ft	
Access points per mile	0		0		
Median type	Undivided				
Free-flow speed:	Base		Measured		
FFS or BFFS	60.0	mph	60.0	mph	
Lane width adjustment, FLW	0.0	mph	0.0	mph	
Lateral clearance adjustment, FLC	0.9	mph	1.8	mph	
Median type adjustment, FM	1.6	mph	0.0	mph	
Access points adjustment, FA	0.0	mph	0.0	mph	
Free-flow speed	57.5	mph	60.0	mph	
	_VOLUME				
D1	1		0		
Direction	1	,	2	1	
Volume, V	3160	vph	0	vph	
Peak-hour factor, PHF	0.90		0.90		
Peak 15-minute volume, v15	878	0.	0	0.	
Trucks and buses	6 0	00	6 0	%	
Recreational vehicles	-	6	· ·	90	
Terrain type	Grade	0	Grade	0	
Grade	3.50	% :	3.00	% '	
Segment length	0.60	mi	0.70	mi	
Number of lanes	2		2		
Driver population adjustment, fP	1.00		1.00		
Trucks and buses PCE, ET	2.0		1.5		
Recreational vehicles PCE, ER	3.0		3.0		
Heavy vehicle adjustment, fHV	0.943	- a-b-1	0.971	n ambu l	
Flow rate, vp	1860	pcphpl	0	pcphpl	
	_RESULTS				
Direction	1		2		
Flow rate, vp	1860	pcphpl	0	pcphpl	
Free-flow speed, FFS	57.5	mph	60.0	mph	
Avg. passenger-car travel speed, S	55.4	mph	60.0	mph	
Level of service, LOS	D	_	A	-	
Density, D	33.6	pc/mi/ln	0.0	pc/mi/ln	

__OPERATIONAL ANALYSIS___

Analyst: BA
Agency/Co: Parsons
Date: 8/18/02
Analsis Period: 12 PM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION - 2 WB Lanes

FREE-FLOW SPEED					
Direction	1		2		
Lane width	12.0	ft.	12.0	ft.	
Lateral clearance:					
Right edge	2.0	ft	2.0	ft	
Left edge	6.0	ft	2.0	ft	
Total lateral clearance	8.0	ft	4.0	ft	
Access points per mile	0		0		
Median type	Undivided	l			
Free-flow speed:	Base		Measured		
FFS or BFFS	60.0	mph	60.0	mph	
Lane width adjustment, FLW	0.0	mph	0.0	mph	
Lateral clearance adjustment, FLC	0.9	mph	1.8	mph	
Median type adjustment, FM	1.6	mph	0.0	mph	
Access points adjustment, FA	0.0	mph	0.0	mph	
Free-flow speed	57.5	mph	60.0	mph	
VOLUME					
Direction	1		2		
Volume, V	3474	vph	0	vph	
Peak-hour factor, PHF	0.90		0.90		
Peak 15-minute volume, v15	965		0	_	
Trucks and buses	6	%	6	%	
Recreational vehicles	0	&	0	ે	
Terrain type	Grade	0	Grade	٥	
Grade	3.50	8	3.00	% .	
Segment length	0.60	mi	0.70	mi	
Number of lanes	2		2		
Driver population adjustment, fP	1.00		1.00		
Trucks and buses PCE, ET	2.0		1.5		
Recreational vehicles PCE, ER	3.0		3.0		
Heavy vehicle adjustment, fHV	0.943	1- 1	0.971	1- 1	
Flow rate, vp	2045	pcphpl	0	pcphpl	
	_RESULTS				
Direction	1		2		
Flow rate, vp	2045	pcphpl	0	pcphpl	
Free-flow speed, FFS	57.5	mph	60.0	mph	
Avg. passenger-car travel speed, S	54.3	mph	60.0	mph	
Level of service, LOS	E	-	A	-	
Density, D	37.7	pc/mi/ln	0.0	pc/mi/ln	

__OPERATIONAL ANALYSIS___

Analyst: BA
Agency/Co: Parsons
Date: 8/18/02
Analsis Period: 1 PM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION - 2 WB Lanes

FREE-FLOW SPEED					
Direction	1		2		
Lane width	12.0	ft.	12.0	ft.	
Lateral clearance:	12.0	10	12.0	10	
Right edge	2.0	ft	2.0	ft	
Left edge	6.0	ft	2.0	ft	
Total lateral clearance	8.0	ft	4.0	ft	
Access points per mile	0		0		
Median type	Undivided	l			
Free-flow speed:	Base		Measured		
FFS or BFFS	60.0	mph	60.0	mph	
Lane width adjustment, FLW	0.0	mph	0.0	mph	
Lateral clearance adjustment, FLC	0.9	mph	1.8	mph	
Median type adjustment, FM	1.6	mph	0.0	mph	
Access points adjustment, FA	0.0	mph	0.0	mph	
Free-flow speed	57.5	mph	60.0	mph	
VOLUME					
Direction	1		2		
Volume, V	3785	vph	0	vph	
Peak-hour factor, PHF	0.90	v P11	0.90	V P11	
Peak 15-minute volume, v15	1051		0		
Trucks and buses	6	%	6	00	
Recreational vehicles	0	%	0	%	
Terrain type	Grade		Grade		
Grade	3.50	%	3.00	%	
Segment length	0.60	mi	0.70	mi	
Number of lanes	2		2		
Driver population adjustment, fP	1.00		1.00		
Trucks and buses PCE, ET	2.0		1.5		
Recreational vehicles PCE, ER	3.0		3.0		
Heavy vehicle adjustment, fHV	0.943		0.971		
Flow rate, vp	2228	pcphpl	0	pcphpl	
	_RESULTS				
Direction	1		2		
Flow rate, vp	2228	pcphpl	0	pcphpl	
Free-flow speed, FFS	57.5	mph	60.0	mph	
Avg. passenger-car travel speed, S	- · ·	mph	60.0	mph	
Level of service, LOS	F	T. ==	Α	£	
Density, D		pc/mi/ln		pc/mi/ln	

__OPERATIONAL ANALYSIS___

Analyst: BA
Agency/Co: Parsons
Date: 8/18/02
Analsis Period: 2 PM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION - 2 WB Lanes

FREE	-FLOW SPEED)			
Direction	1		2		
Lane width	12.0	ft.	12.0	ft.	
Lateral clearance:	12.0		12.0	10	
Right edge	2.0	ft	2.0	ft.	
Left edge	6.0	ft	2.0	ft	
Total lateral clearance	8.0	ft	4.0	ft.	
Access points per mile	0		0		
Median type	Undivided	[
Free-flow speed:	Base		Measured		
FFS or BFFS	60.0	mph	60.0	mph	
Lane width adjustment, FLW	0.0	mph	0.0	mph	
Lateral clearance adjustment, FLC	0.9	mph	1.8	mph	
Median type adjustment, FM	1.6	mph	0.0	mph	
Access points adjustment, FA	0.0	mph	0.0	mph	
Free-flow speed	57.5	mph	60.0	mph	
		1		1	
VOLUME					
Direction	1		2		
Volume, V	3749	vph	0	vph	
Peak-hour factor, PHF	0.90	-	0.90	-	
Peak 15-minute volume, v15	1041		0		
Trucks and buses	6	%	6	%	
Recreational vehicles	0	%	0	૪	
Terrain type	Grade		Grade		
Grade	3.50	%	3.00	%	
Segment length	0.60	mi	0.70	mi	
Number of lanes	2		2		
Driver population adjustment, fP	1.00		1.00		
Trucks and buses PCE, ET	2.0		1.5		
Recreational vehicles PCE, ER	3.0		3.0		
Heavy vehicle adjustment, fHV	0.943		0.971		
Flow rate, vp	2207	pcphpl	0	pcphpl	
	RESULTS				
Direction	1		2		
Flow rate, vp	2207	pcphpl	0	pcphpl	
Free-flow speed, FFS	57.5	mph	60.0	mph	
Avg. passenger-car travel speed, S		mph	60.0	mph	
Level of service, LOS	F	1	A	-	
Density, D		pc/mi/ln	==	pc/mi/ln	

___OPERATIONAL ANALYSIS____

Analyst: BA
Agency/Co: Parsons
Date: 8/18/02
Analsis Period: 3 PM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION - 2 WB Lanes

FREE-FLOW SPEED				
Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	2.0	ft	2.0	ft
Left edge	6.0	ft	2.0	ft
Total lateral clearance	8.0	ft	4.0	ft
Access points per mile	0		0	
Median type	Undivided			
Free-flow speed:	Base		Measured	
FFS or BFFS	60.0	mph	60.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.9	mph	1.8	mph
Median type adjustment, FM	1.6	mph	0.0	mph
Access points adjustment, FA	0.0	mph	0.0	mph
Free-flow speed	57.5	mph	60.0	mph
	MOI IIME			
	_VOLUME			
Direction	1		2	
Volume, V	4341	vph	0	vph
Peak-hour factor, PHF	0.90	_	0.90	_
Peak 15-minute volume, v15	1206		0	
Trucks and buses	6	%	0	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Level	
Grade	3.50	%	3.00	%
Segment length	0.60	mi	0.70	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	2.0		1.5	
Recreational vehicles PCE, ER	3.0		1.2	
Heavy vehicle adjustment, fHV	0.943		1.000	
Flow rate, vp	2556	pcphpl	0	pcphpl
	_RESULTS			
Direction	1		2	
Flow rate, vp	2556	pcphpl	0	pcphpl
Free-flow speed, FFS	57.5	mph	60.0	mph
Avg. passenger-car travel speed, S	55	mph	60.0	mph
Level of service, LOS	F		A	[-11
Density, D	-	pc/mi/ln	==	pc/mi/ln
		r = , + , +11	- • •	r 5, , 111

__OPERATIONAL ANALYSIS___

Analyst: BA
Agency/Co: Parsons
Date: 8/18/02
Analsis Period: 4 PM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION - 2 WB Lanes

Direction	1		2			
Lane width	12.0	ft	12.0	ft		
Lateral clearance:						
Right edge	2.0	ft	2.0	ft		
Left edge	6.0	ft	2.0	ft		
Total lateral clearance	8.0	ft	4.0	ft		
Access points per mile	0		0			
Median type	Undivide	ed				
Free-flow speed:	Base		Measure	d		
FFS or BFFS	60.0	mph	60.0	mph		
Lane width adjustment, FLW	0.0	mph	0.0	mph		
Lateral clearance adjustment, FLC	0.9	mph	1.8	mph		
Median type adjustment, FM	1.6	mph	0.0	mph		
Access points adjustment, FA	0.0	mph	0.0	mph		
Free-flow speed	57.5	mph	60.0	mph		
rice from Speed	37.3	P11	00.0	mp11		
VOLUME						
Direction	1		2			
Volume, V	4107	vph	0	vph		
Peak-hour factor, PHF	0.90		0.90			
Peak 15-minute volume, v15	1141		0			
Trucks and buses	6	%	0	%		
Recreational vehicles	0	%	0	%		
Terrain type	Grade		Level			
Grade	3.50	%	3.00	%		
Segment length	0.60	mi	0.70	mi		
Number of lanes	2		2			
Driver population adjustment, fP	1.00		1.00			
Trucks and buses PCE, ET	2.0		1.5			
Recreational vehicles PCE, ER	3.0		1.2			
Heavy vehicle adjustment, fHV	0.943		1.000			
Flow rate, vp	2418	pcphpl	0	pcphpl		
		F -FF -		F +FF -		
	RESULTS					
Direction	1		2			
Flow rate, vp	2418	pcphpl	0	pcphpl		
Free-flow speed, FFS	57.5	mph	60.0	mph		
Avg. passenger-car travel speed, S		mph	60.0	mph		
Level of service, LOS	F	_	A	-		
Density, D		pc/mi/ln	0.0	pc/mi/ln		

___OPERATIONAL ANALYSIS____

Analyst: BA
Agency/Co: Parsons
Date: 8/18/02
Analsis Period: 5 PM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION - 2 WB Lanes

FREE-FLOW SPEED						
Direction	1		2			
Lane width	12.0	ft	12.0	ft		
Lateral clearance:						
Right edge	2.0	ft	2.0	ft		
Left edge	6.0	ft	2.0	ft		
Total lateral clearance	8.0	ft	4.0	ft		
Access points per mile	0		0			
Median type	Undivided					
Free-flow speed:	Base		Measured			
FFS or BFFS	60.0	mph	60.0	mph		
Lane width adjustment, FLW	0.0	mph	0.0	mph		
Lateral clearance adjustment, FLC	0.9	mph	1.8	mph		
Median type adjustment, FM	1.6	mph	0.0	mph		
Access points adjustment, FA	0.0	mph	0.0	mph		
Free-flow speed	57.5	mph	60.0	mph		
-		-		-		
VOLUME						
Direction	1		2			
Volume, V	3658	vph	0	vph		
Peak-hour factor, PHF	0.90		0.90			
Peak 15-minute volume, v15	1016		0			
Trucks and buses	6	%	0	%		
Recreational vehicles	0	%	0	%		
Terrain type	Grade		Level			
Grade	3.50	%	3.00	%		
Segment length	0.60	mi	0.70	mi		
Number of lanes	2		2			
Driver population adjustment, fP	1.00		1.00			
Trucks and buses PCE, ET	2.0		1.5			
Recreational vehicles PCE, ER	3.0		1.2			
Heavy vehicle adjustment, fHV	0.943		1.000			
Flow rate, vp	2154	pcphpl	0	pcphpl		
	_RESULTS					
Direction	1		2			
Elemente m	2154	nanhn1	0	n anha l		
Flow rate, vp	2154	pcphpl	0	pcphpl		
Free-flow speed, FFS	57.5	mph	60.0	mph		
Avg. passenger-car travel speed, S	_	mph	60.0	mph		
Level of service, LOS	F	/ ' /3	A	/ /		
Density, D		pc/mi/ln	0.0	pc/mi/ln		

__OPERATIONAL ANALYSIS___

Analyst: BA
Agency/Co: Parsons
Date: 8/18/02
Analsis Period: 6 PM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION - 2 WB Lanes

FREE	-FLOW SPEED)			
Direction	1		2		
Lane width	12.0	ft.	12.0	ft.	
Lateral clearance:	12.0	10	12.0		
Right edge	2.0	ft	2.0	ft.	
Left edge	6.0	ft	2.0	ft	
Total lateral clearance	8.0	ft	4.0	ft	
Access points per mile	0		0		
Median type	Undivided				
Free-flow speed:	Base	-	Measured		
FFS or BFFS	60.0	mph	60.0	mph	
Lane width adjustment, FLW	0.0	mph	0.0	mph	
Lateral clearance adjustment, FLC	0.9	mph	1.8	mph	
Median type adjustment, FM	1.6	mph	0.0	mph	
Access points adjustment, FA	0.0	mph	0.0	mph	
Free-flow speed	57.5	mph	60.0	mph	
Tree rrem speed	37.0			<u>F</u>	
VOLUME					
Direction	1		2		
Volume, V	3475	rmh	0	rmh	
Peak-hour factor, PHF	0.90	vph	0.90	vph	
Peak 15-minute volume, v15	965		0.90		
Trucks and buses	6	%	0	%	
Recreational vehicles	0	%	0	%	
Terrain type	Grade	0	Level	0	
Grade	3.50	%	3.00	%	
Segment length	0.60	mi	0.70	mi	
Number of lanes	2	шт	2	шт	
Driver population adjustment, fP	1.00		1.00		
Trucks and buses PCE, ET	2.0		1.5		
Recreational vehicles PCE, ER	3.0		1.2		
Heavy vehicle adjustment, fHV	0.943		1.000		
Flow rate, vp	2046	pcphpl	0	pcphpl	
riow race, vp	2040	pcpiipi	O	рсрирт	
	_RESULTS				
Direction	1		2		
Flow rate, vp	2046	pcphpl	0	pcphpl	
Free-flow speed, FFS	57.5	mph	60.0	mph	
Avg. passenger-car travel speed, S	54.3	mph	60.0	mph	
Level of service, LOS	E	T	Α		
Density, D	37.7	pc/mi/ln	==	pc/mi/ln	

___OPERATIONAL ANALYSIS___

Analyst: BA

Agency/Co:

Date: 8/18/02 Analsis Period: 7 AM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2001 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION

FREE	-FLOW SPEE	D		
Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	4.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	10.0	ft	12.0	ft
Access points per mile	0		0	
Median type	Undivide	f		
Free-flow speed:	Base		Measured	
FFS or BFFS	60.0	mph	60.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.4	mph	0.0	mph
Median type adjustment, FM	1.6	mph	0.0	mph
Access points adjustment, FA	0.0	mph	0.0	mph
Free-flow speed	58.0	mph	60.0	mph
Tice flow byced	30.0	mpii	00.0	mp11
	VOLUME			
Direction	1		2	
Volume, V	1019	vph	0	vph
Peak-hour factor, PHF	0.90		0.90	
Peak 15-minute volume, v15	283		0	
Trucks and buses	6	%	0	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Level	
Grade	3.00	%	0.00	%
Segment length	0.70	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	3.0		1.2	
Heavy vehicle adjustment, fHV	0.971		1.000	
Flow rate, vp	583	pcphpl	0	pcphpl
				1 1 1
	_RESULTS			
Direction	1		2	
Flow rate, vp	583	pcphpl	0	pcphpl
Free-flow speed, FFS	58.0	mph	60.0	mph
Avg. passenger-car travel speed, S	58.0	mph	60.0	mph
Level of service, LOS	38.0 A	шБш	A	m511
Density, D	10.1	pc/mi/ln		pc/mi/ln
Demotoj, D	10.1	PC/ III / 111		P = / 1111

___OPERATIONAL ANALYSIS____

Analyst: BA
Agency/Co: Parsons
Date: 8/18/02
Analsis Period: 8 PM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION - 2 WB Lanes

FREE-FLOW SPEED					
Direction	1		2		
Lane width	12.0	ft	12.0	ft	
Lateral clearance:					
Right edge	2.0	ft	2.0	ft	
Left edge	6.0	ft	2.0	ft	
Total lateral clearance	8.0	ft	4.0	ft	
Access points per mile	0		0		
Median type	Undivided				
Free-flow speed:	Base		Measured		
FFS or BFFS	60.0	mph	60.0	mph	
Lane width adjustment, FLW	0.0	mph	0.0	mph	
Lateral clearance adjustment, FLC	0.9	mph	1.8	mph	
Median type adjustment, FM	1.6	mph	0.0	mph	
Access points adjustment, FA	0.0	mph	0.0	mph	
Free-flow speed	57.5	mph	60.0	mph	
	MOT LIME				
	_VOLUME				
Direction	1		2		
Volume, V	2520	vph	0	vph	
Peak-hour factor, PHF	0.90	_	0.90	_	
Peak 15-minute volume, v15	700		0		
Trucks and buses	6	%	0	%	
Recreational vehicles	0	%	0	%	
Terrain type	Grade		Level		
Grade	3.50	%	3.00	%	
Segment length	0.60	mi	0.70	mi	
Number of lanes	2		2		
Driver population adjustment, fP	1.00		1.00		
Trucks and buses PCE, ET	2.0		1.5		
Recreational vehicles PCE, ER	3.0		1.2		
Heavy vehicle adjustment, fHV	0.943		1.000		
Flow rate, vp	1484	pcphpl	0	pcphpl	
	_RESULTS				
Direction	1		2		
Flow rate, vp	1484	pcphpl	0	pcphpl	
Free-flow speed, FFS	57.5	mph	60.0	mph	
Avg. passenger-car travel speed, S	57.3	mph	60.0	mph	
Level of service, LOS	C		A		
Density, D	25.9	pc/mi/ln	0.0	pc/mi/ln	

__OPERATIONAL ANALYSIS___

Analyst: BA
Agency/Co: Parsons
Date: 8/18/02
Analsis Period: 9 PM

Highway: BAY BRIDGE WESTBOUND SPAN

From/To:
Jurisdiction:

Analysis Year: 2025 SUMMER WEEKEND

Project ID: REVERSIBLE LANE OPERATION - 2 WB Lanes

FREE-FLOW SPEED					
Direction	1		2		
Lane width	12.0	ft	12.0	ft	
Lateral clearance:					
Right edge	2.0	ft	2.0	ft	
Left edge	6.0	ft	2.0	ft	
Total lateral clearance	8.0	ft	4.0	ft	
Access points per mile	0		0		
Median type	Undivided	Į.			
Free-flow speed:	Base		Measured		
FFS or BFFS	60.0	mph	60.0	mph	
Lane width adjustment, FLW	0.0	mph	0.0	mph	
Lateral clearance adjustment, FLC	0.9	mph	1.8	mph	
Median type adjustment, FM	1.6	mph	0.0	mph	
Access points adjustment, FA	0.0	mph	0.0	mph	
Free-flow speed	57.5	mph	60.0	mph	
	_VOLUME				
Direction	1		2		
Volume, V	2104	vph	0	vph	
Peak-hour factor, PHF	0.90		0.90		
Peak 15-minute volume, v15	584		0		
Trucks and buses	6	%	0	%	
Recreational vehicles	0	%	0	%	
Terrain type	Grade		Level		
Grade	3.50	%	3.00	%	
Segment length	0.60	mi	0.70	mi	
Number of lanes	2		2		
Driver population adjustment, fP	1.00		1.00		
Trucks and buses PCE, ET	2.0		1.5		
Recreational vehicles PCE, ER	3.0		1.2		
Heavy vehicle adjustment, fHV	0.943		1.000		
Flow rate, vp	1239	pcphpl	0	pcphpl	
	_RESULTS				
Direction	1		2		
Flow rate, vp	1239	pcphpl	0	pcphpl	
Free-flow speed, FFS	57.5	mph	60.0	mph	
Avg. passenger-car travel speed, S	57.5	mph	60.0	mph	
Level of service, LOS	C C	шЪп	A	P11	
Density, D	21.5	pc/mi/ln	==	pc/mi/ln	

Bay Bridge 2025 Summer Weekend Day Reversible Lane Operation Eastbound Analysis (2 Lanes, 80 Percent Traffic)

HCS2000: Basic Freeway Segments Release 4.1a

·	Operational Ana	lysis	
Analyst:	Bala Akundi		
Agency or Company:	Parsons		
Date Performed:	8/13/02		
Analysis Time Period:	10 AM		
Freeway/Direction: From/To:		OUND	
Jurisdiction:	Anne Arundel Cou	nty	
Analysis Year:	2025		
Description: REVERSIBI	E OPERATION 2 LAN	ES 80% EB TRAFFIC	
	Flow Inputs and	Adjustments	
Volume, V		3223	veh/h
Peak-hour factor, PHF		0.90	
Peak 15-min volume, v15		895	V
Trucks and buses		10	%
Recreational vehicles		4	%
Terrain type:		Grade	
Grade		3.00	8
Segment length		4.00	mi
Trucks and buses PCE, E	T	2.0	
Recreational vehicle PC	E, ER	1.5	
Heavy vehicle adjustmen		0.893	
Driver population factor	or, vp	1.00	
Flow rate, vp		2005	pc/h/ln
	Speed Inputs an	d Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		2	
Free-flow speed:		Ideal	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	fLW	0.0	mi/h
Lateral clearance adjus		2.4	mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjustm	nent, fN	4.5	mi/h
Free-flow speed, FFS		58.1	mi/h
		Urban Freeway	
	LOS and Perform	ance Measures	
Flow rate, vp		2005	pc/h/ln
Free-flow speed, FFS		58.1	mi/h
Average passenger-car s	speed, S	56.5	mi/h
Number of lanes, N		2	
Density, D		35.5	pc/mi/ln
Level of service, LOS		E	

_____Operational Analysis_____ Bala Aku Parsons Date Performed: 8/12/00 Analysis Time Analyst: Bala Akundi Freeway/Direction: BAY BRIDGE EASTBOUND From/To: Jurisdiction: Anne Arundel County Analysis Year: 2025 Description: REVERSIBLE OPERATION 2 LANES 80% EB TRAFFIC ____Flow Inputs and Adjustments___ Volume, V 3617 veh/h Peak-hour factor, PHF 0.90 Peak 15-min volume, v15 1005 Trucks and buses 10 Recreational vehicles 4 Terrain type: Grade 3.00 용 Grade Segment length 4.00 Trucks and buses PCE, ET 2.0 Recreational vehicle PCE, ER 1.5 Heavy vehicle adjustment, fHV 0.893 Driver population factor, vp 1.00 Flow rate, vp 2251 pc/h/ln _____Speed Inputs and Adjustments____ Lane width 12.0 £t. Right-shoulder lateral clearance 2.0 ft Interchange density 0.50 interchange/mi Number of lanes, N 2 Free-flow speed: Ideal FFS or BFFS 65.0 mi/h Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fLC 2.4 mi/h Interchange density adjustment, fID 0.0 mi/h Number of lanes adjustment, fN 4.5 mi/h Free-flow speed, FFS 58.1 mi/h Urban Freeway LOS and Performance Measures_____ pc/h/ln Flow rate, vp 2251 Free-flow speed, FFS 58.1 mi/h Average passenger-car speed, S 51.6 mi/h Number of lanes, N 2 Density, D 43.6 pc/mi/ln Level of service, LOS

HCS2000: Basic Freeway Segments Release 4.1a

	Operational A	Analysis	
Analyst:	Bala Akundi		
Agency or Company:	Parsons		
Date Performed:	8/13/02		
Analysis Time Period:			
Freeway/Direction:	BAY BRIDGE EAS	STROIND	
From/To:			
Jurisdiction:	Anne Arundel	County	
Analysis Year:	2025		
Description: REVERSIBL	E OPERATION 2	LANES 80% EB TRAFFIC	
	Flow Inputs a	and Adjustments	
Volume, V		3827	veh/h
Peak-hour factor, PHF		0.90	, 555, 55
Peak 15-min volume, v15		1063	V
Trucks and buses		10	ତ୍ୱ
Recreational vehicles		4	0/0
Terrain type:		Grade	0
Grade		3.00	%
Segment length		4.00	mi
Trucks and buses PCE, E	т	2.0	
Recreational vehicle PC		1.5	
Heavy vehicle adjustmen		0.893	
Driver population factor		1.00	
Flow rate, vp		2381	pc/h/ln
Tiow race, vp		2301	PC/11/111
	Speed Inputs	and Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		2	
Free-flow speed:		Ideal	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	fLW	0.0	mi/h
Lateral clearance adjus	tment, fLC	2.4	mi/h
Interchange density adj	ustment, fID	0.0	mi/h
Number of lanes adjustm	ent, fN	4.5	mi/h
Free-flow speed, FFS		58.1	mi/h
		Urban Freeway	
- <u></u>	LOS and Perfo	ormance Measures	
Flow rate		2201	ng/h/ln
Flow rate, vp		2381	pc/h/ln
Free-flow speed, FFS	O	58.1	mi/h
Average passenger-car s	peea, S	2	mi/h
Number of lanes, N		2	(/ 1
Density, D		-	pc/mi/ln
Level of service, LOS		F	

HCS2000: Basic Freeway Segments Release 4.1a

	Operational An	alysis	
Analyst:	Bala Akundi		
Agency or Company:	Parsons		
Date Performed:	8/13/02		
Analysis Time Period:			
Freeway/Direction:	BAY BRIDGE EAST	BOUND	
From/To:			
Jurisdiction:	Anne Arundel Co	unty	
Analysis Year:	2025		
Description: REVERSIBI	E OPERATION 2 LA	NES 80% EB TRAFFIC	
	Flow Inputs an	d Adjustments	
Volume, V		3951	veh/h
Peak-hour factor, PHF		0.90	
Peak 15-min volume, v15	1	1098	V
Trucks and buses		10	8
Recreational vehicles		4	90
Terrain type:		Grade	•
Grade		3.00	90
Segment length		4.00	mi
Trucks and buses PCE, E	lT	2.0	
Recreational vehicle PC		1.5	
Heavy vehicle adjustmer		0.893	
Driver population factor		1.00	
Flow rate, vp	, 1	2458	pc/h/ln
	Speed Inputs a	nd Adjustments	
I and width		12.0	£
Lane width	-1	12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density		0.50 2	interchange/mi
Number of lanes, N		z Ideal	
Free-flow speed: FFS or BFFS		65.0	mi/h
Lane width adjustment,	ft W	0.0	mi/h
Lateral clearance adjus		2.4	mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjustm		4.5	mi/h
Free-flow speed, FFS	ielic, in	58.1	mi/h
riee ilow speed, rrs		Urban Freeway	1111/11
		Olban Fleeway	
	LOS and Perfor	mance Measures	
		2458	pc/h/ln
Flow rate, vp			
Flow rate, vp Free-flow speed, FFS		58.1	mi/h
	speed, S	58.1	mi/h mi/h
Free-flow speed, FFS	speed, S	58.1 2	•
Free-flow speed, FFS Average passenger-car s	speed, S		•
Free-flow speed, FFS Average passenger-car s Number of lanes, N	speed, S		mi/h

HCS2000: Basic Freeway Segments Release 4.1a

	Operational Anal	lysis	
Analyst:	Bala Akundi		
Agency or Company:	Parsons		
	8/13/02		
Analysis Time Period:			
Freeway/Direction:		NUND	
From/To:			
Jurisdiction:	Anne Arundel Cour	ıty	
Analysis Year:	2025		
Description: REVERSIBL	E OPERATION 2 LANE	ES 80% EB TRAFFIC	
	Flow Inputs and	Adjustments	
Volume, V		4370	veh/h
Peak-hour factor, PHF		0.90	
Peak 15-min volume, v15		1214	V
Trucks and buses		10	%
Recreational vehicles		4	%
Terrain type:		Grade	
Grade		3.00	%
Segment length		4.00	mi
Trucks and buses PCE, E	Т	2.0	
Recreational vehicle PC	E, ER	1.5	
Heavy vehicle adjustmen	t, fHV	0.893	
Driver population facto	r, vp	1.00	
Flow rate, vp		2719	pc/h/ln
	Speed Inputs and	d Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density	0100101100	0.50	interchange/mi
Number of lanes, N		2	3 - ,
Free-flow speed:		Ideal	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	fLW	0.0	mi/h
Lateral clearance adjus		2.4	mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjustm	ent, fN	4.5	mi/h
Free-flow speed, FFS		58.1	mi/h
		Urban Freeway	
	LOS and Performa	ance Measures	
Flow rate, vp		2719	pc/h/ln
Free-flow speed, FFS		58.1	mi/h
TICC TIOW DPCCG, TID		JU. 1	•
Average passenger-car s	peed. S		mi/h
Average passenger-car s Number of lanes, N	peed, S	2	mi/h
Number of lanes, N	peed, S	2	
	peed, S	2 F	mi/h pc/mi/ln

HCS2000: Basic Freeway Segments Release 4.1a

	Operational Anal	ysis			
Analyst:	Bala Akundi				
Agency or Company:	Parsons				
	8/13/02				
Analysis Time Period:					
Freeway/Direction:		DUND			
From/To:					
Jurisdiction:	Anne Arundel Cour	ity			
Analysis Year:	2025				
Description: REVERSIBL	E OPERATION 2 LANE	S 80% EB TRAFFIC			
	Flow Inputs and	Adjustments			
Volume, V		4610	veh/h		
Peak-hour factor, PHF		0.90			
Peak 15-min volume, v15		1281	V		
Trucks and buses		10	%		
Recreational vehicles		4	%		
Terrain type:		Grade			
Grade		3.00	%		
Segment length		4.00	mi		
Trucks and buses PCE, E	Т	2.0			
Recreational vehicle PC	E, ER	1.5			
Heavy vehicle adjustmen	t, fHV	0.893			
Driver population facto	r, vp	1.00			
Flow rate, vp		2868	pc/h/ln		
	Speed Inputs and	l Adjustments			
Lane width		12.0	ft		
Right-shoulder lateral	clearance	2.0	ft		
Interchange density		0.50	interchange/mi		
Number of lanes, N		2	_		
Free-flow speed:		Ideal			
FFS or BFFS		65.0	mi/h		
Lane width adjustment,	fLW	0.0	mi/h		
Lateral clearance adjus	tment, fLC	2.4	mi/h		
Interchange density adj		0.0	mi/h		
Number of lanes adjustm	ent, fN	4.5	mi/h		
Free-flow speed, FFS		58.1	mi/h		
		30.1	1111 / 11		
LOS and Performance Measures					
	LOS and Performa	Urban Freeway			
Flow rate, vp	LOS and Performa	Urban Freeway			
Flow rate, vp Free-flow speed, FFS	LOS and Performa	Urban Freeway ince Measures 2868	pc/h/ln		
Free-flow speed, FFS		Urban Freeway			
Free-flow speed, FFS Average passenger-car s		Urban Freeway ince Measures 2868	pc/h/ln mi/h		
Free-flow speed, FFS		Urban Freeway ince Measures 2868 58.1	pc/h/ln mi/h		
Free-flow speed, FFS Average passenger-car s Number of lanes, N		Urban Freeway ince Measures 2868 58.1	pc/h/ln mi/h mi/h		

HCS2000: Basic Freeway Segments Release 4.1a

	Operational Anal	ysis	
Analyst:	Bala Akundi		
Agency or Company:	Parsons		
	8/13/02		
Analysis Time Period:			
Freeway/Direction:		UND	
From/To:			
Jurisdiction:	Anne Arundel Coun	ity	
Analysis Year:	2025	10 000 ED EDITETO	
Description: REVERSIBL	E OPERATION 2 LANE	S 80% EB TRAFFIC	
	Flow Inputs and	Adjustments	
Volume, V		4562	veh/h
Peak-hour factor, PHF		0.90	
Peak 15-min volume, v15		1267	V
Trucks and buses		10	%
Recreational vehicles		4	%
Terrain type:		Grade	
Grade		3.00	%
Segment length		4.00	mi
Trucks and buses PCE, E	T	2.0	
Recreational vehicle PC	E, ER	1.5	
Heavy vehicle adjustmen	t, fHV	0.893	
Driver population facto	er, vp	1.00	
Flow rate, vp		2839	pc/h/ln
	Speed Inputs and	Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density	0100101100	0.50	interchange/mi
Number of lanes, N		2	3 - ,
Free-flow speed:		Ideal	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	fLW	0.0	mi/h
Lateral clearance adjus		2.4	mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjustm		4.5	mi/h
Free-flow speed, FFS		58.1	mi/h
		Urban Freeway	
	LOS and Performa	nce Measures	
Flow rate, vp		2839	pc/h/ln
Free-flow speed, FFS		58.1	mi/h
Average passenger-car s	meed. S	50.1	mi/h
Number of lanes, N	-F	2	/ 44
Density, D		=	
Delibity, D			pc/mi/ln
Level of service, LOS		F	pc/mi/ln

HCS2000: Basic Freeway Segments Release 4.1a

	Operational	Analysis	
Analyst:	Bala Akundi		
Agency or Company:	Parsons		
	8/13/02		
Analysis Time Period:			
Freeway/Direction:		STBOUND	
From/To:			
Jurisdiction:	Anne Arundel	County	
Analysis Year:	2025		
Description: REVERSIBE	E OPERATION 2	LANES 80% EB TRAFFIC	
	Flow Inputs	and Adjustments	
Volume, V		4607	veh/h
Peak-hour factor, PHF		0.90	V C11/ 11
Peak 15-min volume, v15		1280	V
Trucks and buses		10	00
Recreational vehicles		4	00
Terrain type:		Grade	•
Grade		3.00	ે
Segment length		4.00	mi
Trucks and buses PCE, E	T	2.0	
Recreational vehicle PC		1.5	
Heavy vehicle adjustmen	t, fHV	0.893	
Driver population factor	or, vp	1.00	
Flow rate, vp		2867	pc/h/ln
	Speed Inputs	and Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density	CICALATICC	0.50	interchange/mi
Number of lanes, N		2	incer enange, mi
Free-flow speed:		Ideal	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	fLW	0.0	mi/h
Lateral clearance adjus		2.4	mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjustm		4.5	mi/h
Free-flow speed, FFS	•	58.1	mi/h
<u>.</u>		Urban Freeway	
	LOS and Perf	ormance Measures	
Til		2067	/b /l
Flow rate, vp		2867	pc/h/ln
Free-flow speed, FFS	D boom	58.1	mi/h
Average passenger-car s	peea, s	2	mi/h
Number of lanes, N Density, D		۷	ng/mi/ln
Level of service, LOS		F	pc/mi/ln
TEACT OF SCIATCE, TOP		P	

HCS2000: Basic Freeway Segments Release 4.1a

	Operational Ana	lysis	
Analyst:	Bala Akundi		
Agency or Company:	Parsons		
	8/13/02		
Analysis Time Period:			
Freeway/Direction:		DUND	
From/To:			
Jurisdiction:	Anne Arundel Cour	nty	
Analysis Year:	2025		
Description: REVERSIBL	E OPERATION 2 LAN	ES 80% EB TRAFFIC	
	Flow Inputs and	Adjustments	
Volume, V		3614	veh/h
Peak-hour factor, PHF		0.90	
Peak 15-min volume, v15		1004	V
Trucks and buses		10	%
Recreational vehicles		4	%
Terrain type:		Grade	
Grade		3.00	%
Segment length		4.00	mi
Trucks and buses PCE, E	Т	2.0	
Recreational vehicle PC	E, ER	1.5	
Heavy vehicle adjustmen	t, fHV	0.893	
Driver population factor	r, vp	1.00	
Flow rate, vp		2249	pc/h/ln
	Speed Inputs and	d Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density	orcar arroc	0.50	interchange/mi
Number of lanes, N		2	111001 011011130,
Free-flow speed:		Ideal	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	fLW	0.0	mi/h
Lateral clearance adjus		2.4	mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjustm	ent, fN	4.5	mi/h
Free-flow speed, FFS		58.1	mi/h
		Urban Freeway	
	LOS and Performa	ance Measures	
Flow rate, vp		2249	pc/h/ln
Free-flow speed, FFS		58.1	mi/h
Average passenger-car s	peed. S	51.6	mi/h
Number of lanes, N	F	2	/ 44
Density, D			4 1 43
		43.6	pc/m1/ln
Level of service, LOS		43.6 E	pc/mi/ln

HCS2000: Basic Freeway Segments Release 4.1a

	Operational Ar	nalysis	
Analyst:	Bala Akundi		
Agency or Company:	Parsons		
Date Performed:	8/13/02		
Analysis Time Period:			
Freeway/Direction:	BAY BRIDGE EAST	TBOUND	
From/To:			
Jurisdiction:	Anne Arundel Co	ounty	
Analysis Year:	2025	NIEG OOS ED EDADEG	
Description: REVERSIBI	JE OPERATION 2 LA	ANES 80% EB TRAFFIC	
	Flow Inputs ar	nd Adjustments	
Volume, V		3317	veh/h
Peak-hour factor, PHF		0.90	
Peak 15-min volume, v15	5	921	V
Trucks and buses		10	8
Recreational vehicles		4	%
Terrain type:		Grade	
Grade		3.00	%
Segment length		4.00	mi
Trucks and buses PCE, I	T	2.0	
Recreational vehicle PO	CE, ER	1.5	
Heavy vehicle adjustmer		0.893	
Driver population factor	or, vp	1.00	
Flow rate, vp		2064	pc/h/ln
	Speed Inputs a	and Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	2.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		2	
Free-flow speed:		Ideal	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	fLW	0.0	mi/h
Lateral clearance adjus	stment, fLC	2.4	mi/h
Interchange density ad	justment, fID	0.0	mi/h
Number of lanes adjustr	ment, fN	4.5	mi/h
Free-flow speed, FFS		58.1	mi/h
		Urban Freeway	
	LOS and Perfor	rmance Measures	
Flow rate, vp		2064	pc/h/ln
Free-flow speed, FFS		58.1	mi/h
Average passenger-car s	speed, S	55.7	mi/h
Number of lanes, N	,	2	•
Density, D		37.1	pc/mi/ln
Level of service, LOS		E	-

	Operational Ana	alysis	
Analyst:	Bala Akundi		
Agency or Company:	Parsons		
	8/13/02		
Analysis Time Period:			
Freeway/Direction:	BAY BRIDGE EAST	BOUND	
From/To:			
Jurisdiction:	Anne Arundel Co	unty	
Analysis Year:	2025		
Description: REVERSIBL	E OPERATION 2 LA	NES 80% EB TRAFFIC	
	Flow Inputs and	d Adjustments	
Volume, V		3186	veh/h
Peak-hour factor, PHF		0.90	V 322, 22
Peak 15-min volume, v15		885	V
Trucks and buses		10	%
Recreational vehicles		4	%
Terrain type:		Grade	
Grade		3.00	%
Segment length		4.00	mi
Trucks and buses PCE, E	Т	2.0	
Recreational vehicle PC	E, ER	1.5	
Heavy vehicle adjustmen	t, fHV	0.893	
Driver population facto	r, vp	1.00	
Flow rate, vp		1982	pc/h/ln
	Speed Inputs a	nd Adjustments	
I and width		12.0	ft
Lane width Right-shoulder lateral	aloarango	2.0	ft.
Interchange density	Clearance	0.50	interchange/mi
Number of lanes, N		2	Tifter Change/ mi
Free-flow speed:		Ideal	
FFS or BFFS		65.0	mi/h
Lane width adjustment,	ft.W	0.0	mi/h
Lateral clearance adjus		2.4	mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjustm		4.5	mi/h
Free-flow speed, FFS	,	58.1	mi/h
<u> </u>		Urban Freeway	
	LOS and Perfor	mance Measures	
Flow rate, vp		1982	pc/h/ln
Free-flow speed, FFS		58.1	mi/h
Average passenger-car s	peed, S	56.7	mi/h
Number of lanes, N		2	
Density, D		34.9	pc/mi/ln
Level of service, LOS		D	

HCS2000: Basic Freeway Segments Release 4.1a

·	Operational Anal	ysis	
Analyst:	Bala Akundi		
Agency or Company:	Parsons		
Date Performed:	8/13/02		
Analysis Time Period:	9 PM		
Freeway/Direction: From/To:	BAY BRIDGE EASTBO	DUND	
Jurisdiction:	Anne Arundel Cour	nty	
Analysis Year: 2025			
Description: REVERSIBI	E OPERATION 2 LANE	ES 80% EB TRAFFIC	
-	Flow Inputs and	Adjustments	
Volume, V		3238	veh/h
Peak-hour factor, PHF		0.90	
Peak 15-min volume, v15		899	V
Trucks and buses		10	%
Recreational vehicles		4	%
Terrain type:		Grade	
Grade		3.00	%
Segment length		4.00	mi
Trucks and buses PCE, ET		2.0	
Recreational vehicle PCE, ER		1.5	
Heavy vehicle adjustment, fHV		0.893	
Driver population factor, vp		1.00 2015	/lo /ll
Flow rate, vp		2015	pc/h/ln
	Speed Inputs and	d Adjustments	
Lane width		12.0	ft
Right-shoulder lateral clearance		2.0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		2	
Free-flow speed:		Ideal	
FFS or BFFS		65.0	mi/h
Lane width adjustment, fLW		0.0	mi/h
Lateral clearance adjustment, fLC		2.4	mi/h
Interchange density adjustment, fID		0.0	mi/h
Number of lanes adjustment, fN Free-flow speed, FFS		4.5 58.1	mi/h mi/h
riee-liow speed, rrs		Urban Freeway	1111/11
	LOS and Performa	ance Measures	
Flow rate, vp		2015	pc/h/ln
Free-flow speed, FFS		58.1	mi/h
Average passenger-car speed, S		56.4	mi/h
Number of lanes, N		2	4 1 45
Density, D		3 E ()	/ / 1
Level of service, LOS		35.8 E	pc/mi/ln

