

APPENDIX I
TECHNICAL REPORT ON
TRAFFIC AND TRANSPORTATION (372)
CHERRY POINT COGENERATION PROJECT

(REVISED)

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EXECUTIVE SUMMARY

The primary access to the Cherry Point Cogeneration Project (Cogeneration Project) site would be from a proposed private site access road that would intersect the south side of SR 548 approximately 1,000 feet east of Blaine Road. Secondary access to the site would be from the existing extension of Blaine Road south from SR 548 into the BP Cherry Point Refinery (Refinery) site. Private roads within the BP property would provide access between the Refinery and the Cogeneration Project.

Significantly greater traffic volumes would be generated during construction of the Cogeneration Project than during the operation of the completed facility. Vehicle traffic would be produced by employees commuting to and from work at the site, as well as by owner, contractor, supplier, regulator, and service vehicles (including trucks of various sizes). Construction would require approximately 23 months, and the work force would fit a bell curve distribution over that time. Construction work at the site is expected to occur primarily during the daytime on weekdays.

During construction, most of the site-generated traffic is expected to use the existing extension of Blaine Road south from SR 548 into the BP property. The contractors' parking lot, construction trailer parking, and the large laydown areas would be located on the west side of this existing Blaine Road extension.

Large, heavy equipment would be transported by rail or barge, and then transferred to oversize trucks for delivery to the project site. If the railroad cars can be unloaded on BP property, the oversize trucks would use the internal BP private roads. Barge shipments would be unloaded onto oversize trucks at Bellingham or Gulf Road piers. The oversize trucks would use public roads adjacent to the BP Cherry Point property for at least a portion of the trip to the project site.

This report evaluated the potential impacts of Project-related construction traffic, and concludes that the traffic could adversely affect levels of service on SR 548. BP intends to discuss traffic-related impacts with the Washington State Department of Transportation (WSDOT) and decide upon appropriate mitigation measures. Mitigation measures might include adding eastbound and/or westbound left turn lanes on Grandview Road at the intersection with Blaine Road and Grandview Road on SR 548, and/or replacing the 4-way stop at the intersection of SR 548 and Portal Way with a traffic light control signal.

~~This report also concludes that the location originally proposed for the Cogeneration Project site a Access Road 1 (shown at the top of Figure 2) may be relocated from its position about 1,000 feet east of Blaine Road to a location between 660 and 750 feet east of Blaine Road to from SR 548 does not comply with WSDOT sight distance requirements for the vertical curve located just east of the Project site. BP would like to explore alternative solutions to this problem with the WSDOT. This report recommends that the site access be moved so that it is located between 660 feet to approximately 750 feet east of Blaine Road. BP has agreed to do so.~~

During operation, the Cogeneration Project will generate minimal traffic because it will only have 30 employees. The total volumes on SR 548 would remain low relative to the capacity of the roadway. There will be no significant cumulative traffic or transportation

impacts, and no significant unavoidable adverse traffic or transportation impacts due to the Cogeneration Project.

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Attachment A – Traffic Volume Counts

WSDOT 1998 Annual Traffic Report, Page 140
WSDOT 2000 Annual Traffic Report, Pages XXI, 139

Traffic Count Consultants, Inc., SR 548/I-5 NB Peak Hour Count
Traffic Count Consultants, Inc., SR 548/I-5 SB Peak Hour Count
Traffic Count Consultants, Inc., SR 548/Vista Drive Peak Hour Count
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Traffic Count Consultants, Inc., Grandview Road/BP Refinery Peak Hour Count
Traffic Count Consultants, Inc., SR 548/Birch Bay Lynden Road Peak Hour
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BP Cherry Point Refinery – Daily Traffic Counts at Entry Gates
BP Cherry Point Cogeneration Project – Heavy Equipment and Weights List

Attachment B – Traffic Accident Data

WSDOT 1995 Washington State Highway Accident Report, Page 3-75
WSDOT 1996 Washington State Highway Accident Report, Page 3-75
Patricia Foley, WSDOT, Letter, and Accident Data for SR 548 from MP 0.00 to
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Attachment C – Level of Service Calculations

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[SR 548/Proposed Site Access](#)

1. TRAFFIC AND TRANSPORTATION

The information included in this report is summarized from the *Traffic And Transportation Report (372) Cherry Point Cogeneration Project Whatcom County, Washington* ([Traffic and Transportation, December TP&E, 2001](#))

1.1 Existing Conditions

1.1.1 Site Location and Access

Figure 1 is a vicinity map showing the location of the BP Cherry Point Cogeneration Project (Cogeneration Project) site and the network of major through roads in the surrounding area. The Cogeneration Project site is located on the south side of State Route (SR) 548, just east of Blaine Road, and on the east side of the existing BP Cherry Point Refinery (Refinery) in the northwestern part of Whatcom County.

SR 548 is also known as Grandview Road from the I-5 intersection to Blaine Road. At the Blaine Road intersection, however, SR 548 turns north, and is also known as Blaine Road. In order to minimize confusion, this report generally refers to SR548 as "SR 548," and uses the terms "Grandview Road" and "Blaine Road" to refer to the portions of those roads that do not constitute SR 548.

Figure 2 is a preliminary site plan. The primary access to the Cogeneration Project site would be from a proposed private site access road (Access Road 1) that would intersect the south side of SR 548, east of Blaine Road. The proposed access road would run approximately 320 feet south to the Project site, then continue into the site to connect with a network of internal private roads, including a loop road around the perimeter of the Cogeneration Project site.

Secondary access to the Cogeneration Project site would be from a proposed private site access road (Access Road 2) that would run from the southwest corner of the site to the existing private road extension of Blaine Road south from SR 548 into the BP property. The Blaine Road extension, Brown Road, and other existing private roads within the BP property would provide internal access between the Refinery and the Cogeneration Project. These roads would allow access to the Cogeneration Project from the existing Refinery gates to the east, west, and south.

A third Cogeneration Project site access would be via a proposed private maintenance road (Access Road 3) to be constructed on BP property from the Cogeneration Project site south to Brown Road. This proposed road would also access the site of the proposed transmission line Tower 4 just south of the Cogeneration Project site. Another proposed maintenance road would run within the transmission line corridor from proposed Tower 3 to Tower 2, then south to intersect Brown Road just west of the BNSF railroad grade crossing, all within BP property.

1.1.2 Existing Roadways

Figure 3 shows existing roadway characteristics on the public roads in the vicinity of the project site. Figure 3 shows existing stop sign traffic control and approach lanes at several intersections on SR 548. There are no signalized intersections in the area.

SR 548 is a two-lane state highway operated and maintained by the Washington State Department of Transportation (WSDOT). The highway is classified by WSDOT as a collector. SR 548 has a 90-foot wide right-of-way, including 25 feet north of the centerline and 65 feet south of the centerline (WSDOT, 2000). The existing roadway appears to be constructed within the northern 50 feet of the right-of-way. SR 548 is also classified by WSDOT as an access class two highway (WSDOT, 1996a). Private direct access to a class two highway is permitted only when the property has no other reasonable access to the general street system or if access to the general street system would cause traffic operational conditions or safety concerns unacceptable to the local governmental entity. According to WSDOT regulations, the minimum distance from a private direct access to another public or private access connection is 660 feet (State of Washington, 1994).

SR 548 from I-5 to Blaine Road was recently improved by a WSDOT pavement overlay project (WSDOT, 1999b), and the surface condition of the roadway pavement appears to be good. The load-bearing capacity of the pavement is considered to be typical for a state highway with the functional classification, physical characteristics, and traffic conditions of SR 548. The recent project also improved the pavement markings and traffic signing. The roadway has 11-foot wide lanes, 8-foot wide paved shoulders, drainage ditches, and wire fences on both sides. The posted speed limit is 50 MPH.

The following bridges, road intersections, and at-grade railroad crossings occur on SR 548 at the state route mileposts (MP) listed. All of the railroad grade crossings on SR 548 are protected by active warning devices, including flashing red lights and gate arms, as well as passive warning devices such as signs and pavement markings.

I-5 Overcrossing	MP 0.00
Portal Way	MP 0.29
BNSF Railroad Grade Crossing (No. 084841X)	MP 0.31
Vista Drive	MP 0.97
Kickerville Road	MP 4.93
BNSF Railroad Grade Crossing (No. 096133H)	MP 5.16
Blaine Road/SR 548	MP 5.93
Bay Road	MP 6.95
Birch Bay Lynden Road	MP 8.96
Dakota Creek Bridge	MP 11.58
BNSF Railroad Grade Crossing (No. 084853S)	MP 11.78
Peace Portal Drive/Bell Road	MP 11.80

The SR 548/Blaine Road intersection is the closest public road intersection to the Cogeneration Project site. SR 548 makes a right-angle turn at this intersection, with the state highway designated on the east and north legs. North of this intersection, SR 548 does not have paved shoulders, and the posted speed limit is 35 MPH. The SR 548/Blaine Road intersection also has SR 548 directional signing, signing to Birch Bay State Park to the west, and is controlled by a stop sign on Blaine Road.

A 400-foot crest vertical curve exists on SR 548 just east of the Project site. The crest of the vertical curve is located approximately 1,700 feet east of the Blaine Road intersection. The slight downgrades on either side of the crest are 1.353% to the east, and 2.846% to the west (Whatcom County, 1970). There is a paved driveway apron at

the crest, from the highway shoulder to the south fence line. A gap in the fence exists at this driveway apron, with a padlocked cable gate, but there is no access road into the BP property.

Other than SR 548, the public roads in the vicinity of the site are operated and maintained by Whatcom County. West of Blaine Road, along the frontage of the Refinery, Grandview Road is a County road ~~named Jackson Road~~. The County roads in the area are two-lane rural roads. The speed limits on the County roads are generally 50 MPH, except for areas where more land development has occurred and the speed limits are lower, such as in the Birch Bay area and near Blaine, Ferndale and the I-5 interchanges.

The BP property has a network of existing private roads serving the Refinery and providing access to the vicinity of the Cogeneration Project site. The south leg of the SR 548/Blaine Road intersection is a gated, paved private road into BP property. The south leg is posted with a sign stating, "BP Property, Contractor Entrance, Not a Through Road." The gate is normally closed and locked, and is marked with orange reflectors.

The main entrance to the Refinery is located on the south side of Grandview Road west of Blaine Road. Besides an extension of Blaine Road into the BP property south of Grandview Road, another contractor entrance that normally is closed by a locked gate intersects Grandview Road to the west of the main entrance. Another gated and locked access to the Refinery exists on Brown Road, a 16-foot wide, partially paved, east-west private road on BP property that intersects Kickerville Road to the east. Other entrances to the Refinery are located on Jackson Road to the west.

There are no improved pedestrian or bicycle facilities in the vicinity of the site. Pedestrians may walk on the roadway shoulders. Bicyclists may ride on the paved roadway shoulders, where available, such as on SR 548.

1.1.3 Existing Traffic Volumes

Table 1 summarizes Average Daily Traffic Volumes (ADT) on SR 548 in recent years. The volumes are from the WSDOT Annual Traffic Reports (WSDOT, 1999a and 2001a). Trucks comprised approximately 12% of the 1999 ADT on SR 548 between I-5 and Portal Way, including 6% single unit trucks, 3% double units, and 3% triple units (WSDOT, 2001a).

Figure 4 shows average daily traffic volume counts conducted on the roads in the vicinity of the project site. The counts were conducted by WSDOT and Whatcom County at various times in recent years. During 2000, the ADT on the I-5 freeway south of SR 548 was 33,000 and the ADT on I-5 north of SR 548 was 25,000 (WSDOT, 2001a).

Average weekday traffic volumes are generally higher in the summer and lower in the winter, due to increased recreational, agricultural and construction traffic in the summer. The location closest to the Cogeneration Project site for which data on the seasonal variation in traffic volumes is available is WSDOT's Automated Data Collection Recorder Station on I-5 south of the Birch Bay Lynden Road interchange (recorder no. S803). Traffic volume data from the I-5 recorder in 2000 showed that June and September were the months closest to the annual average. August was the peak month, with volumes approximately 13% higher than the annual average, and January was the

lowest month, with volumes approximately 20% lower than the annual average (WSDOT, 2001a).

Figure 5 shows projected 2001 average daily traffic volumes on the roads in the vicinity of the project site. The earlier counts were projected to 2001 using a 6% annual traffic volume growth rate. This rate was calculated based on ADT volumes on SR 548 in the WSDOT Annual Traffic Reports (WSDOT, 1999a and 2001a). Daily traffic volumes provide a good indication of general travel patterns in the area.

Figure 6 shows weekday PM peak hour traffic volumes at relevant intersections on SR 548. Weekday peak hour traffic volumes are typically used for analysis at key locations, since they reflect traffic conditions when the potential for congestion is greatest. The PM peak hour traffic volumes shown in Figure 6 were counted during the two-hour commuter peak period from 4:00 to 6:00 PM. The PM peak hour typically began between 4:30 and 5:00 PM. The peak traffic direction on SR 548 is eastbound during the PM peak hour, largely due to employees leaving the Refinery.

The AM commuter peak hour traffic volume totals (during the 7:00 to 9:00 AM time period) on SR 548 in the vicinity of the site are less than the PM peak hour volume totals. The peak traffic direction on SR 548 is westbound during the AM peak hour, largely due to employees approaching the Refinery. The AM and PM peak hours on SR 548 are expected to occur at about the same time of the day year-round, regardless of the season, due to the employees commuting to and from the Refinery.

BP conducted daily traffic counts at the entry gates to the Refinery from August 29, 2001 through October 10, 2001 (BP, 2001). Mondays through Thursdays are typically the days with the most personnel on site, and the highest site-generated traffic volumes. Sunday is the lowest traffic volume day, followed by Saturday, then Friday. The total number of personnel on the Refinery site (over the 24 hours of each day) averaged 527 over all 43 of the count days, and 705 on typical Mondays through Thursdays. The number of trucks entering the site ranged from 30 to 104 per day, averaged 57 per day over all the count days, and averaged 61 per day on typical Mondays through Thursdays. On the average, 40 of the trucks entered via the West Brown gate, one entered via the Jackson Road gate, and the rest entered via the main gate on Grandview Road. Counts of vehicles exiting the Refinery site were not taken, but it is expected that nearly all of the trucks that entered the site later exited on the same day.

BP reports that construction activities are usually occurring at the Refinery. The number of construction workers varies between approximately 400 and occasionally up to 2,400 depending upon the projects underway (Shapiro, 2001). The construction peak occurs during a two- to three-week period every two to three years when a major Refinery turnaround is being performed.

There is no transit bus service in the vicinity of the project site. Existing pedestrian and bicycle traffic volumes on the roadways in the area are extremely low.

1.1.4 Existing Levels of Service

Level of service (LOS) is a qualitative measure describing operational conditions within a traffic flow, and the perception of these conditions by drivers or passengers. These conditions include factors such as speed, delay, travel time, freedom to maneuver, traffic

interruptions, comfort, convenience, and safety. Levels of service are given letter designations, from A to F, with LOS A representing the best operating conditions (free flow, little delay) and LOS F the worst (congestion, long delays). Generally, LOS A and B are high levels of service, LOS C and D are moderate, and LOS E and F are low.

At roadway intersections, LOS is determined by the calculated average delay per vehicle. Delays are calculated using the procedures in the Highway Capacity Manual (Transportation Research Board, 2000). Stop-controlled intersection calculations were conducted using the HCS 2000 computer software. The average delay in seconds and corresponding LOS are summarized in Table 2.

Table 3 shows existing PM peak hour LOS and average delays at eight intersections on SR 548. Due to the relatively low existing traffic volumes, these intersections currently operate at LOS B or C. These LOS indicate that there is no significant traffic queuing or congestion.

The Transportation Element of the Whatcom County Comprehensive Plan (Whatcom County, 1997) designates LOS C as the LOS standard for rural state routes and LOS D as the LOS standard for urban state routes in Whatcom County. The Comprehensive Plan designates various Urban Growth Areas (UGA) within the County. The Cogeneration Project site is located within the Major/Port Industrial UGA. SR 548 is within the UGA from I-5 to Vista Drive, from Kickerville Road to approximately one-half mile north of [SR-548 Grandview Road](#), and from approximately one-quarter mile north of Bay Road to the north. All eight of the intersections listed in Table 3 are within the County's UGA.

The I-5 freeway has two lanes in each direction, and the capacity of a freeway lane is generally greater than 2,000 vehicles per hour per lane (TRB, 2000). I-5 operates at a high level of service, with volumes well below the capacity of the freeway.

1.1.5 Existing Roadway Safety

Table 4 summarizes a five-year traffic accident history on two segments of SR 548 (1995-1996, and 1998-2000). The data in Table 4 is from the 1995 and 1996 Washington State Highway Accident Reports (WSDOT, 1996b and 1997) and a detailed compilation of WSDOT accident data from January 1, 1998 through December 31, 2000 (Foley, 2001). Accident types included fixed object, rear end, overturn, left turn, wildlife, enter at angle and driveway entering, and are typical of this type of rural highway. There were no fatal accidents. The accident rates shown in Table 4 are expressed in terms of accidents per million vehicle miles of travel. For comparison, the 1996 average accident rates on state highways were 1.74 in Whatcom County, and 1.88 statewide (WSDOT, 1997). There are no High Accident Locations (HALs) or High Accident Corridors (HACs) on SR 548 (Foley, 2001).

Table 5 summarizes a three-year traffic accident history at selected major intersections on SR 548 between I-5 and Peace Portal Drive/Bell Road. The accident rates shown in Table 5 are expressed in terms of accidents per million vehicles entering the intersection. The intersection accidents summarized in Table 5 are included in the totals for the roadway segment accidents summarized in Table 4. The numbers of intersection accidents and the resulting rates shown in Table 5 are low, and SR 548 does not appear to be unusually hazardous.

Since SR 548 is straight and relatively flat, sight distances appear to be adequate in both directions from the Blaine Road intersection.

1.1.6 Existing Waterborne, Air, and Rail Traffic

Recreational boats and commercial ships and barges operate on the Strait of Georgia and its bays in the vicinity of the project site. Boat launch ramps and associated facilities are available to recreational boaters at Birch Bay.

BP owns and operates a pier at Cherry Point, about one mile southwest of the Cogeneration Project site. The BP pier serves ocean-going tankers that deliver crude oil from Alaska to the Refinery. Barges also operate from the pier to move refined petroleum products from the Refinery to market. Barge traffic has been higher for approximately the last year or so because of damage to the main petroleum pipeline in Whatcom County. As a result, BP has had to move much more refined product by barge than it would normally ship (Shapiro, 2001).

The nearest airport is the Blaine Municipal Airport, located approximately seven miles north of the project site in Blaine. The other airport in the area is the Bellingham Airport, located approximately 12 miles to the southeast of the project site. Some larger aircraft use the Bellingham Airport, and there is limited scheduled airline service. Small planes use both of these airports, and may also use private runways at fields in the area; however, the frequency of this type of use is unknown (Shapiro, 2001).

An active railroad track owned and operated by the BNSF parallels I-5 along the west side of Portal Way and Peace Portal Drive. The single-track line connects the BNSF transcontinental mainline in Everett with Bellingham, Ferndale, Blaine and Vancouver, Canada. Amtrak passenger trains use the track, but the nearest passenger stations are at Bellingham and Vancouver, Canada. The railroad speed limit is 50 MPH.

A BNSF spur track runs from the junction at Intalco (just north of Custer) on the Everett-Vancouver track approximately five miles to the Refinery. The spur track approaches the Refinery from the northeast, crosses SR 548 approximately 1,200 feet west of Kickerville Road, then continues southward, approximately one half mile to the east of the Cogeneration Project site. The railroad speed limit on the spur track is 25 MPH. The proposed BP transmission line would extend over the spur track at one point (Shapiro, 2001).

1.2 Environmental Impacts on Traffic

1.2.1 Construction Related Impacts

1.2.1.1 Site Access and Parking During Construction

During construction, most of the site-generated traffic is expected to use the existing private road extension of Blaine Road south from SR 548 into the BP property. The contractors' parking lot, construction trailer parking, and the large laydown areas would be located on the west side of this existing Blaine Road extension. The laydown areas would be used for the storage and assembly of construction materials and equipment. A proposed private site access road (Access Road 2) approximately 300 feet in length

would connect the Blaine Road extension with the southwest corner of the proposed loop road around the perimeter of the Cogeneration Project site.

~~Some~~ Construction traffic would also use the proposed primary site access road (Access Road 1) that would intersect the south side of SR 548 ~~approximately 1,000 feet~~ east of Blaine Road. The proposed access road would run approximately 320 feet south to the plant site, then continue into the site to connect with a network of internal private roads, including a loop road around the perimeter of the site. Construction trucks and other vehicles would use the proposed private site access road for access directly into the construction site. Also, a construction laydown area would be located on the south side of SR 548 immediately east of the proposed road, with access from the proposed road.

The proposed private maintenance road (Access Road 3) to be constructed on the BP property from the Cogeneration Project site south to Brown Road would be used for construction access to the site of the proposed transmission line Tower 4 just south of the Cogeneration Project. The other proposed maintenance road running within the transmission line corridor from proposed Tower 3 to Tower 2, then south to intersect Brown Road, would be used for construction access to those tower sites.

The existing internal private roads connecting to the Blaine Road extension within the BP property would provide for the relatively small amount of traffic expected between the Refinery and the Cogeneration Project site. These internal roads would also allow access to the Cogeneration Project from the existing Refinery gates to the east, west, and south. However, these other existing gates would not normally be used by traffic generated by the Cogeneration Project.

1.2.1.2 Vehicle Trip Generation During Construction

Project-generated traffic volumes during construction would be produced by employees commuting to and from work at the site, as well as owner, contractor, supplier, regulator, and service vehicles (including trucks of various sizes) doing business at the site. BP has estimated the number of vehicle round trips each month during construction, assuming mobilization in February 2004 through December 2005 (Duke, 2001a). These round trip estimates are based on detailed monthly estimates of the number of workers on site for each construction craft and trade, the number of management staff on site, truck deliveries of equipment, heavy equipment deliveries, and deliveries of site preparation materials. Construction would require approximately 23 months, and the work force would fit a bell curve distribution over that time. Construction work at the site is expected to occur primarily during the daytime on weekdays.

Table 6 shows the estimated vehicle trip generation during construction of the proposed Cogeneration Project during average construction conditions and peak construction conditions. Estimates are shown for an average weekday and for the roadway traffic AM and PM peak hours. The trip generation estimates are based on the BP round-trip estimates (Duke, 2001a), supplemented by published trip generation data available for utilities and other comparable land uses (ITE, 1997).

A vehicle trip, as shown on Table 6 and as used in this analysis, is defined as a single or one-direction vehicle movement with either the origin or destination (exiting or entering) inside the project site. The trip generation values shown in Table 6 account for

all site trips made by all vehicles for all purposes, including employee, owner, contractor, supplier, regulator, visitor, and service and delivery vehicle trips.

Based on the BP estimates, the average number of monthly round trips during construction is approximately 6,339. Assuming 20 working days in an average month, the BP estimates would result in an average of 317 round trips each workday, or 634 one-way trips. For this analysis, a conservative estimate of 650 (one-way) site-generated trips is shown in Table 6 for an average weekday during average construction conditions.

The peak number of monthly round trips is estimated by BP to be 10,343. A conservative estimate [has been made](#) of about 1,200 (one-way) site-generated trips during this peak period, and this number of one-way site-generated trips is shown in Table 6 for an average weekday during peak construction conditions.

The roadway traffic PM peak hour is the highest traffic volume hour of the day, and is used as the basis for determining traffic impacts. As shown on Table 6, the PM peak hour vehicle trips generated by the proposed Cogeneration Project during peak construction conditions are estimated to be 46 entering the site and 258 exiting, for a total of 304 trips.

1.2.1.3 Truck Trips During Construction

Trucks would primarily be used to deliver typical construction equipment and materials. Many of these trucks would have a gross vehicle weight as great as 105,500 pounds. The surface condition of the pavement near the site is good, and the delivery of typical construction materials and equipment is not expected to significantly degrade existing conditions (Shapiro, 2001). Truck trips are included in the trip generation estimates shown on Table 6.

BP has provided a list of 69 turbines, generators, transformers, and other pieces of large, heavy equipment required for the project (Duke, 2001b). The approximate sizes of these various pieces of equipment range up to almost 17 feet in height, over 19 feet in width, and 77 feet in length. Approximate weights range from 85,000 to 741,000 pounds.

Large, heavy equipment would be transported to the vicinity of the project site by rail (preferably), or barge. This large, heavy equipment would be transferred by cranes from the railroad car or barge to an oversize truck for delivery to the project site. BP and the contractor would work with BNSF to determine where rail shipments could be unloaded, with the closest locations on the BNSF spur track on the BP property near the project site. If the railroad cars can be unloaded on BP property, the oversize trucks will be able to use the internal BP private roads, and will not need to use off-site public roads.

The preferred shipment method would be by rail, and rail deliveries would be made on BP property. Barge shipments, if any, would probably be unloaded onto oversize trucks at locations in Ferndale or Bellingham. The oversize trucks would need to use public roads adjacent to BP property for at least a portion of the trip to the project site.

Loaded oversize trucks may be so wide as to require the use of both roadway lanes, and would travel slowly. Temporary road closures, detours, and/or other temporary traffic control may be required on the affected public roads during the transport of large, heavy equipment by oversize truck. BP and the contractor would work with Whatcom County

and WSDOT as necessary to identify any required traffic control and to obtain any required permits.

1.2.1.4 Vehicle Trip Distribution During Construction

Figure 7 shows the estimated distribution and assignment of the site-generated trips for the peak construction conditions. The majority of the site-generated trips would use SR 548 east of Blaine Road, to and from I-5 and the Ferndale and Bellingham areas. Some site-generated traffic would use SR 548 north to Blaine and the Canadian border area. Some site-generated traffic would use County roads to Ferndale, Birch Bay, and other local destinations.

The distribution of the site-generated trips is estimated based on the characteristics of the road network, existing traffic volume patterns, land development patterns in the area, locations where workers would likely reside, and the location of other potential trip origins and destinations. The locations where workers would likely reside are discussed in Appendix L, Population and Housing.

The actual sources of construction materials cannot be determined at this time. However, construction materials would arrive at the site in trucks via I-5 and SR 548, except for large, heavy equipment arriving via barge or rail, as discussed above. Truck trips are included in the estimated distribution and assignment of the site-generated trips shown on Figure 7.

The estimated site-generated trip distribution percentages for average construction conditions are expected to be the same as for the peak construction conditions shown in Figure 7. Since the estimated vehicle trip generation is proportional to employment as shown in Table 6, the average weekday and PM peak hour volumes generated during average construction conditions would be approximately 54% of the volumes shown in Figure 7 for peak conditions.

1.2.1.5 Traffic Volumes During Construction

Travel demand on the road network is typically composed of three elements:

- Existing traffic,
- Estimated project-generated traffic, and
- Estimated future non-project traffic.

Existing traffic volumes are discussed above and are shown on Figures 5 and 6. Estimated project-generated traffic is discussed above and is shown on Figure 7.

Estimated future non-project traffic volume growth may include traffic volumes generated by other land development projects that are planned but not yet operational, changes in traffic patterns due to roadway improvements or operations, and the effects of population and business growth. [There are no known land development projects in the vicinity that would add to future traffic volumes.](#) No changes in traffic patterns due to roadway improvements or operations are expected by 2004. A 5% annual traffic volume growth rate was used to estimate future background traffic volume growth. [This rate was calculated on the PM peak hour traffic volumes at the SR 548/Kickerville Road intersection.](#) This assumed growth rate, which accounts for the effects of general

population and business growth in the area, provides a conservative estimate of traffic volume since the rate of population growth in Whatcom County is expected to be about 2% per year over this period of time. ~~This rate is then applied to the PM peak hour traffic volumes at the SR 548/Kickerville Road intersection.~~

Figure 8 shows projected 2004 average weekday and PM peak hour traffic volumes during peak construction conditions at the relevant intersections on SR 548. These volumes include the existing traffic volumes shown on Figure 6, the estimated project-generated traffic shown on Figure 7 for peak construction conditions, and a 5% annual background traffic volume growth.

1.2.1.6 Levels of Service During Construction

Table 3 shows calculated LOS at the intersections on SR 548 during the PM peak hour during peak construction conditions. Average delays would increase due to the Cogeneration Project, but the intersections would continue to operate at LOS B or C, except for the I-5 northbound ramp intersection and the Portal Way intersection. During peak construction conditions, the I-5 northbound ramp intersection would drop from LOS C to LOS D during the PM peak hour, which is still considered to be acceptable by WSDOT.

Calculations indicate that the LOS at the SR 548/Portal Way intersection would drop from LOS D to LOS F during the PM peak hour during peak Cogeneration Project construction conditions. BP intends to meet with WSDOT to discuss appropriate measures to address LOS at this location. For example, it might be appropriate to install a traffic control signal at the SR 548/Portal Way intersection. .

Approximately 45% of the site-generated traffic (approximately 540 vehicles per day during the construction peak) is expected to use I-5 south of SR 548. Much less site-generated traffic would use I-5 north of SR 548. I-5 is six miles from the project site, and most platoons of site-generated traffic would disperse over this distance. With the project, I-5 would continue to operate at a high level of service, with traffic volumes well below capacity. The project would not have a significant impact on I-5.

1.2.1.7 Other Traffic Impacts During Construction

In order to meet the WSDOT sight distance requirement ~~for the vertical curve located just east of the Project site, the proposed Cogeneration Project site a~~ Access Road 1 onto SR 548 should may be relocated ~~from between~~ 660 feet to approximately and 750 feet east of Blaine Road. In Figure 2 this road is shown intersecting SR 548 about 1000 feet east of Blaine Road but BP has agreed to make this change. BP would like to explore alternative solutions to this problem with the WSDOT. It may also be appropriate to construct a westbound left turn storage lane on SR 548 at the intersection of Blaine Road and Grandview Road. The left turn lane would primarily serve traffic entering the Cogeneration Project site during the AM peak hour during construction. BP intends to discuss this possibility with WSDOT.

Brown Road and Kickerville Road would be used by construction traffic to and from the transmission tower sites, including trucks delivering equipment and materials. However, the volume of traffic generated by the construction of the transmission line

and towers would be low. No significant traffic impacts are expected on Kickerville Road or Brown Road.

Accident rates are not expected to increase due to the project. Any modifications or improvements made to County roads and SR 548 would be constructed in accordance with the appropriate County and WSDOT safety standards.

1.2.1.8 Waterborne, Air, and Rail Traffic During Construction

Most construction materials for the facility would not require waterborne, air or rail transport. However, large, heavy pieces of equipment (such as turbines, generators, transformers, etc.) may be delivered by barge or rail and transferred to oversize trucks as discussed above in the Truck Trips section. Such transport is anticipated to be incidental, and the transfer of components to oversize trucks for delivery on-site would likely occur at existing local barge facilities or railroad tracks. Cranes could be used to offload equipment onto oversize trucks that would then transport the equipment to the site. If rail transport is used, it is expected that BNSF would be able to coordinate transport and unloading activities without adversely affecting their system. It is unknown what reasonable options may be under consideration for barge transport (Shapiro, 2001).

The project would not need other waterborne or air transport during construction of the facilities, and there would be no impacts on either mode of transport (Shapiro, 2001).

1.2.2 **Operation-Related Impacts**

1.2.2.1 Site and Roadway Conditions During Operation

The primary access to the Cogeneration Project site (Access Road 1) would be from a proposed private site access road that would intersect the south side of SR 548 approximately 1,000 feet east of Blaine Road. ~~(As noted above, however, BP has agreed to move this access road slightly, so that it is between 660 and 750 feet from Blaine Road, and compl with WSDOT requirements. The WSDOT has determined that this location provides adequate stopping sight distance for eastbound traffic on Grandview.~~ The proposed access road would run approximately 320 feet south to the plant site, then continue into the site to connect with a network of internal private roads, including a loop road around the perimeter of the Cogeneration Project site. Passenger vehicle parking would be provided in a parking lot adjacent to the administration building, on the west side of the proposed site access road. Storm water runoff from parking areas is discussed in Appendix F, Water. It is expected that the primary access would be used by nearly all of the site-generated traffic during operation of the project.

Secondary access to the site (Access Road 2) would be available from the existing extension of Blaine Road south from SR 548 into the Refinery site. A third access would be via the maintenance road (Access Road 3) running from the Cogeneration Project site south to Brown Road. The existing private roads within the BP property would provide for the relatively small amount of internal traffic expected between the Refinery and the Cogeneration Project. These internal roads would also allow access to the Cogeneration Project from the existing Refinery gates to the east, west, and south. However, the Blaine Road extension and these other existing gates would not normally be used by traffic generated by operation of the Cogeneration Project.

The private maintenance road (Access Road 3) from the Cogeneration Project site south to Brown Road would be used for maintenance access to transmission line Tower 4 just south of the Cogeneration Project. The other proposed maintenance road running within the transmission line corridor from Tower 3 to Tower 2, then south to intersect Brown Road, would be used for maintenance and security access to those tower sites.

Future improvements to roadways in the area proposed by the responsible public agencies are described below in the Proposed Roadway Improvements section. The traffic and transportation aspects of the Cogeneration Project are consistent with the Transportation Element of the Whatcom County Comprehensive Plan.

[An analysis of the potential occurrence of icing and fogging as a result of the cooling tower was performed to determine if there would be any impact to local traffic. The analysis determined that there is no potential for icing, and that fogging may occur 2.5 hours in a year, 400 to 1000 meters to the northwest and northeast, which is on the north side of Grandview Road, and would not impact vehicle traffic. Appendix E provides additional details on the icing and fogging analysis.](#)

1.2.2.2 Vehicle Trip Generation During Operation

Traffic volumes generated during operation of the Cogeneration Project would be produced by employees commuting to and from work at the site, as well as owner, supplier, regulator, maintenance and service vehicles (including trucks of various sizes) doing business at the site. When the project is operational, only 30¹ employees would be needed to staff the facility daily. No more than 25 individuals working in operations are expected to be present on-site at any point in time (including shift change and training). The plant is expected to operate 24 hours per day, seven days per week. It is anticipated that some workers would work standard office hours, while others would work shifts (Shapiro, 2001).

Table 6 shows the estimated vehicle trip generation during operation of the Cogeneration project. Estimates are shown for an average weekday and for the roadway traffic AM and PM peak hours. The trip generation estimates are calculated using the number of employees and published average vehicle trip generation rates available for utilities and other comparable land uses (ITE, 1997). The trip generation rates used are 4.0 trips per employee on an average weekday, 0.74 trips per employee during the roadway traffic AM peak hour, and 0.76 trips per employee during the roadway traffic PM peak hour.

Several chemicals would be shipped to the Cogeneration facility via tanker trucks, including anhydrous ammonia, caustic, sulfuric acid, [cooling tower chemicals](#), and BFW chemicals (oxygen scavenger, neutralizing amine). Each truck typically holds approximately 8,000 gallons. BP estimates that approximately 23 tanker truck round trips (46 one-way trips) per year would be required for anhydrous ammonia deliveries.

Caustic is typically shipped from Pioneer in Tacoma, Washington, or from Dow Chemical. Dow supplies caustic from their Fort Saskatchewan, Alberta, Canada plant or their Freeport, Texas plant or their Plaquemine, Louisiana plant. The Cogeneration Project would use approximately 83,000 gallons of caustic per year and have a storage

¹ [The trip generation estimates in Table 6 were based on 35 full time employees, which may be slightly high. As a practical matter, this should not change any conclusions or mitigation.](#)

capacity of 4,000 gallons. BP estimates that approximately 28 tanker truck round trips (56 one-way trips) per year would be required for caustic deliveries.

Sulfuric acid is typically shipped from General Chemical in Anacortes, Washington. The Cogeneration Project would use approximately ~~4080~~,000 gallons per year for cooling water treatment and boiler feedwater treatment and have two tanks with a combined storage capacity of about ~~4,000~~16,000 gallons. BP estimates that approximately 13 tanker truck round trips (26 one-way trips) per year would be required for sulfuric acid deliveries.

In addition to caustic and sulfuric acid mentioned above, the Cogeneration Project would have on-site storage capacity of various other water treatment chemicals used to create boiler feed water such as diethyl hydroxylamine oxygen scavenger, morpholine corrosion inhibitor, di- and tri-sodium phosphate PH/scale control agent. BFW chemicals (oxygen scavenger, neutralizing amine) are typically supplied by Baker Chemicals, and are shipped from manufacturing plants in various places. ~~The Cogeneration Project would use about~~Storage quantities vary from about ~~200~~50 to ~~300~~500 gallons per year and have an on-site storage capacity of 500 gallons. ~~BP estimates that usage rates would require~~ approximately three tanker truck round trips (six one-way trips) per year. ~~would be required for each BFW chemical~~

Cooling tower chemicals would be added to ensure efficient cooling and to prolong equipment life. Chemicals and estimated quantities typically added would include Sulfuric Acid (as mentioned above), 15% Sodium Hypochlorite (150,000 gallons per year), Zinc and Phosphonate Solution (10,000 Gallons per year) and Polyacrylamide polymer (10,000 Gallons per year). BP estimates that approximately 30 tanker truck round trips per year would be required for cooling tower chemical deliveries. The Refinery currently receives approximately 57 truck deliveries per day, and the addition of 30 deliveries per year would have a negligible traffic impact. Additionally, the cooling tower chemical deliveries to the Cogeneration Facility would be scheduled to correspond with deliveries to the Refinery, minimizing the number of required deliveries.

As shown on Table 6, the PM peak hour vehicle trips generated by operation of the project are estimated to be 4 entering the site and 23 exiting, for a total of 27 trips. Truck trips are included in the trip generation estimates shown on Table 6.

1.2.2.3 Vehicle Trip Distribution During Operation

The estimated site-generated trip distribution percentages during project operation are expected to be the same as for the peak construction conditions shown on Figure 7. The resulting trip assignment on an average weekday during project operation would be 104 trips on SR 548 east of the Cogeneration Project site (including 20 PM peak hour trips), six trips on Grandview Road west of Blaine Road (including one PM peak hour trip), and 31 trips on SR 548 north of the Blaine Road intersection (including six PM peak hour trips). Chemicals and most other materials and equipment would arrive at the site in trucks via I-5 and SR 548.

1.2.2.4 Traffic Volumes and Impacts During Operation

Project-generated traffic volumes during operation would be minimal. The increase in traffic volumes due to operation of the project would be low. The total volumes on SR 548 would remain low relative to the capacity of the roadway.

Due to the low traffic volumes during project operation, the relevant intersections on SR 548 would continue to operate at LOS B or C. The only exception is the SR 548/Portal Way intersection, which is calculated to operate at LOS D, and which is still acceptable. Delays would be low, and no substantial traffic queuing or congestion is expected. No significant traffic or transportation impacts would result from project operation.

Brown Road and Kickerville Road would be used by maintenance and security traffic to and from the transmission line towers. However, the volume of maintenance and security traffic generated by the transmission line towers would be very low. No significant traffic impacts are expected on Kickerville Road or Brown Road. Fuel for the power generation facility would be transported to the site via the existing natural gas pipelines that come from Canada via Sumas.

Electrical energy produced by the facility would be transported to customers and users via the proposed electrical transmission lines to be located east of the site, which would connect to the regional power grid.

The amount of hazardous waste generated at the site during project operation is expected to be small. Hazardous waste would be transported via licensed transporters to licensed disposal facilities, in accordance with existing regulations. No additional mitigation is warranted regarding the transport of hazardous waste.

1.2.2.5 Waterborne, Air, and Rail Traffic During Operation

Operation of the facility would not require waterborne, air, or rail transport except for the possible and unusual need to replace a piece of equipment. In that case, rail transportation may be used but is not expected to negatively affect the rail system (Shapiro, 2001).

The Federal Aviation Administration has indicated that warning lights are not needed on the exhaust stacks. It is not anticipated that the plant would result in a significant impact to air traffic (Shapiro, 2001).

1.3 Environmental Impacts of No Action

1.3.1 Proposed Roadway Improvements

Whatcom County's Six Year Transportation Improvement Program (Whatcom County, 2001) lists the following proposed road improvement projects in the vicinity of the project site (listed by priority number):

8. Birch Bay Lynden Road/Portal Way Intersection: Traffic Signalization - Total cost \$500,000. Proposed design start date January 1, 2002. Proposed construction start date May 1, 2002.

27. Kickerville Road from Rainbow Road to SR 548: Reconstruction - Total cost \$2,490,000. Proposed design start date January 1, 2003. Proposed construction start date May 1, 2004.
30. Vista Drive from Ferndale City Limits to SR 548: Reconstruction - Total cost \$2,410,000. Proposed design start date January 1, 2002. Proposed construction start date not listed.
37. Grandview/Pt. Whitehorn from Koehn Road to Jackson Road: Reconstruction - Design and right-of-way cost \$110,000. Proposed design start date January 1, 2002. Proposed construction start date not listed.
43. Bay Road from Valleyview Road to east 0.25 mile: Intersection Improvements - Design cost \$20,000. Proposed design and construction start dates not listed.
52. Kickerville Road from SR 548 to Birch Bay Lynden Road: Reconstruction - Design and right-of-way cost \$200,000. Proposed design and construction start dates not listed.

WSDOT has three proposed improvement projects scheduled for SR 548 as follows (WSDOT, 2001c):

- SR 548 from MP 3.75 to MP 3.80 Northstar Road Vicinity: Culvert Replacement – Construction cost \$100,000 to \$200,000. Proposed design start date December 3, 2001. Proposed advertising date for construction contractor bids July 7, 2003.
- SR 548 MP 5.16 Kickerville RR Xing: Culvert Installation – Construction cost \$100,000 to \$200,000. Proposed design start date December 3, 2001. Proposed advertising date for construction contractor bids July 7, 2003.
- SR 548 from MP 11.54 to MP 11.58 Dakota Creek Bridge 548/10: Bridge Replacement – Construction cost \$1,000,000 to \$1,500,000. Proposed design start date January 2, 2003. Proposed advertising date for construction contractor bids December 10, 2007.

1.3.2 Traffic Volumes and Impacts of No Action

For the no-action condition, travel demand on the road network would be composed of two elements:

- Existing traffic and
- Estimated future non-project traffic.

Existing traffic volumes are discussed above and are shown on Figures 5 and 6. Estimated future non-project traffic volume growth may include traffic volumes generated by other land development projects that are planned but not yet operational, changes in traffic patterns due to roadway improvements or operations, and the effects of population and business growth. There are no known land development projects in the vicinity that would add to future traffic volumes. No changes in traffic patterns due to roadway improvements or operations are expected by 2004. A 5% annual traffic volume growth rate was used to estimate future background traffic volume growth to

account for the effects of general population and business growth. This rate was ~~then applied to~~ calculated based on PM peak hour traffic volumes at the SR 548/Kickerville Road intersection.

Figure 9 shows projected 2004 average weekday traffic volumes, and PM peak hour traffic volumes at intersections on SR 548, with no action at the project site. These volumes include the existing traffic volumes shown on Figure 6 plus a 5% annual background traffic volume growth.

With no action at the project site, traffic volumes in the area would be expected to increase at approximately a 5% annual background traffic volume growth rate, due to the effects of general population and business growth in the area. As shown on Table 3, the analysis intersections on SR 548 would continue to operate at LOS B or C. The only exception is the SR 548/Portal Way intersection, which is calculated to operate at LOS D, and which is still acceptable. No traffic or transportation impacts would result if no action were taken at the project site, and no mitigation would be necessary.

The environmental impacts of roadway improvements proposed by others would require assessment and mitigation by the responsible agencies.

1.4 Mitigation Measures

In order to meet the WSDOT sight distance requirement for the vertical curve located just east of the Project site, the proposed Cogeneration site access onto SR 548 Access Road 1 should be located between ~~approximately 660 feet to~~ and 750 feet east of Blaine Road. BP ~~has agreed is willing to make this change from the current location of the access road accordingly,~~ but would like to explore alternative solutions to this problem with the WSDOT.

The proposed Cogeneration Project site access road will be constructed and paved to meet the appropriate geometric and safety standards. Appropriate pavement markings, gates, and traffic signs should be installed on the proposed road, including a stop sign at the SR 548 intersection.

BP will meet with WSDOT to discuss whether a westbound turn lane should be added to SR 548 at the Blaine Road/Grandview Road intersection. BP will also meet with WSDOT to discuss appropriate mitigation measures to address PM peak LOS issues at the SR 548/Portal Way intersection during construction. One possibility may be to add a traffic control signal at that intersection.

1.5 Cumulative Impacts

Due to the low population and rural nature of the surrounding area, there are no commercial services such as available housing, lodging, retail, restaurant, or medical facilities in the immediate vicinity of the site. The nearest groupings of these types of facilities are two miles to the north in Birch Bay and five miles to the east near I-5. More extensive commercial facilities and services are located in Blaine, Ferndale, and Bellingham. Because of the temporary nature of the project construction effort and its workforce, it is not expected that permanent commercial services would be established near the site. The low employment levels during project operation also would not

support permanent commercial services near the site. No additional traffic is expected to be generated by any other land development related to or resulting from the project. Therefore, there would be no significant cumulative traffic or transportation impacts.

1.6 Significant Unavoidable Adverse Impacts

There would be no significant unavoidable adverse traffic or transportation impacts due to the project that cannot be mitigated

2. REFERENCE LIST

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Whatcom County Public Works Department. 2001. Six Year Transportation Improvement Program 2002-2007. Whatcom County, 12 pp.

TABLES

TABLE 1

Average Daily Traffic Volumes on SR 548

Location	1996 ADT	1997 ADT	1998 ADT	1999 ADT	2000 ADT
West of I-5	7,300	7,500	7,500	7,600	9,100
West of Portal Way	Not Available	Not Available	Not Available	6,100	6,200
West of Vista Drive	2,800	2,900	3,500	3,600	3,700
West of Kickerville Rd.	2,700	2,800	2,800	3,200	3,200
South of Birch Bay Lynden Rd	2,000	2,000	2,100	2,100	2,800
South of Peace Portal Dr.	7,400	5,700	5,800	6,000	6,000

TABLE 2

Roadway Intersection Delays and Levels of Service

Type of Intersection	A	B	C	D	E	F
Signalized	≤10.0	>10.0 and ≤20.0	>20.0 and ≤35.0	>35.0 and ≤55.0	>55.0 and ≤80.0	>80.0
Stop Sign Control	≤10.0	>10 and ≤15	>15 and ≤ 25	>25 and ≤ 35	>35 and ≤ 50	>50

TABLE 3

PM Peak Hour Level Of Service Summary

Intersection	Movement/ Approach	Existing 2001	2004 Without Project	2004 Assuming Peak Project Constructio n
SR 548/I-5 northbound on-ramp (MP 0.00)	Northbound	C (17.6)	C (24.8)	D (29.4)
SR 548/I-5 southbound on-ramp (MP 0.09)	Southbound	B (11.7)	B (12.7)	B (13.3)
SR 548/Portal Way (MP 0.29)	OVERALL	C (16.3)	D (25.6)	F (64.6)
SR 548/Vista Dr. (MP 0.97)	OVERALL	B (10.7)	B (12.1)	C (18.1)
SR 548/Kickerville Rd. (MP 4.93)	Northbound	B (14.0)	C (15.6)	C (21.7)
SR 548/Blaine Rd. (MP 5.93)	Southbound	B (12.0)	B (13.0)	C (24.0)
SR 548/Birch Bay Linden Rd. (MP 8.96)	OVERALL	B (13.8)	B (18.8)	C (21.6)
SR 548/Peace Portal Dr. (MP 11.80)	Southbound	C (16.8)	C (20.6)	C (20.8)

Notes:

Number shown is the average control delay in seconds per vehicle for the overall intersection at all-way stop controlled intersections, or worst case approach at stop sign control intersections. These values determine the LOS for intersections per the 2000 Highway Capacity Manual.

TABLE 4

Traffic Accidents on Segments of SR 548
(Including Intersection Accidents)

Year	I-5 to Blaine Road/SR 548 (5.93 miles)		Blaine Road/SR 548 to Dakota Creek Bridge (5.65 miles)	
	Number	Rate	Number	Rate
1995	4	0.7	14	3.0
1996	20	3.3	26	5.6
1997	N/A	N/A	N/A	N/A
1998	10	1.3	8	1.6
1999	9	1.2	12	2.5
2000	7	0.9	15	2.3

Note: 1996 Average Rate in Whatcom County (WSDOT, 1997): 1.74
 1996 Average Rate State-wide (WSDOT, 1997) 1.88

TABLE 5

Traffic Accidents at Intersections on SR 548

Intersection	1998*	1999	2000	Total	Rate
I-5 northbound on-ramp (MP 0.00)	0	0	0	0	0.00
I-5 southbound on-ramp (MP 0.09)	0	0	0	0	0.00
Portal Way (MP 0.29)	1	1	2	4	0.34
Vista Drive (MP 0.97)	1	0	1	2	0.23
Kickerville Road (MP 4.93)	1	2	0	3	0.45
Blaine Road (MP 5.93)	1	0	1	2	0.28
Bay Road (MP 6.96)	0	0	0	0	0.00
Birch Bay Linden Road (MP 8.96)	0	3	1	4	0.37
Drayton Harbor Road (MP 10.85)	1	1	1	3	0.30
Peace Portal Drive/Bell Road (MP 11.80)	2	2	3	7	0.72

Note: * Partial Listing. According to WSDOT approximately 36% of the accident records are not yet entered into the system. See Attachment B.

Rate - Accident rate per million entering vehicles

TABLE 6

Estimated Vehicle Trip Generation

Time Period	Trips Entering	Trips Exiting	Total Trips
Average Construction Conditions			
Average Weekday	325 (50%)	325 (50%)	650
AM Peak Hour	144 (90%)	16 (10%)	160
PM Peak Hour	25 (15%)	140 (85%)	165
Peak Construction Conditions			
Average Weekday	600 (50%)	600 (50%)	1,200
AM Peak Hour	266 (90%)	30 (10%)	296
PM Peak Hour	46 (15%)	258 (85%)	304
Project Operation Conditions			
Average Weekday	70 (50%)	70 (50%)	140
AM Peak Hour	23 (90%)	3 (10%)	26
PM Peak Hour	4 (15%)	23 (85%)	27

FIGURES

ATTACHMENT A

TRAFFIC VOLUME COUNTS

WSDOT 1998 Annual Traffic Report, Page 140
WSDOT 2000 Annual Traffic Report, Pages XXI, 139
Traffic Count Consultants, Inc., SR 548/I-5 NB Peak Hour Count
Traffic Count Consultants, Inc., SR 548/I-5 SB Peak Hour Count
Traffic Count Consultants, Inc., SR 548/Vista Drive Peak Hour Count
Traffic Count Consultants, Inc., SR 548/Grandview Road/Blaine Road Peak Hour
Count
Traffic Count Consultants, Inc., Grandview Road/BP Refinery Peak Hour Count
Traffic Count Consultants, Inc., SR 548/Birch Bay Lynden Road Peak Hour
Count
BP Cherry Point Refinery – Daily Traffic Counts at Entry Gates
Construction Traffic Analysis – BP Cherry Point Cogeneration Project
BP Cherry Point Cogeneration Project – Heavy Equipment and Weights List

ATTACHMENT B

TRAFFIC ACCIDENT DATA

WSDOT 1995 Washington State Highway Accident Report, Page 3-75

WSDOT 1996 Washington State Highway Accident Report, Page 3-75

Patricia Foley, WSDOT, Letter, and Accident Data for SR 548 from MP 0.00 to
MP 13.85

[See REVISED Attachment C](#)

~~ATTACHMENT C~~

~~LEVEL OF SERVICE CALCULATIONS~~

~~SR 548/I-5 Northbound Ramp
SR 548/I-5 Southbound Ramp
SR 548/Portal Way S.
SR 548/Vista Drive
SR 548/Kickerville Road
SR 548(Grandview Road)/Blaine Road
SR 548/Birch Bay Lynden Road
SR 548/Portal Way N.~~