Carlsborg Area Transportation Study

Clallam County

September 2008

LOCHNER

PTV America

LOCHNER

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August 28, 2008

Mr. Rich James
Transportation Manager
Clallam County
223 E. Fourth Street, Suite 6
Port Angeles, Washington 98362-3015

Re: Summary of June 23rd Community Meeting
Carlsborg Area Transportation Study

Dear Rich:

During the June 23rd public meeting with the Carlsborg Community Advisory Council, we reviewed the content and final recommendations for the *Carlsborg Area Transportation Study.* Elements highlighted in our presentation included:

- Data Collection;
- The Existing Roadway Network;
- The Simulation Model;
- Existing & Future Traffic Impacts;
- Recommendations; and
- Funding for Recommended Improvements.

As you know, the discussion was very productive and in the end the Advisory Council agreed the report should go forward to the County Commission with three recommended changes. Those changes included:

1. Acknowledge the Sequoia Lane connection, from Taylor Cutoff Road to Hooker Road is a general recommendation for improved east/west connectivity, south of SR 101. The final location of this "connector" may or may not be along Sequoia Lane. A detailed engineering analysis, including robust public involvement process should precede this determination.
2. At the appropriate time, an evaluation of improvements to the Old Olympic Highway and Carlsborg Road intersection should be completed; keeping in mind this is both a key route into Sequim and an important emergency vehicle access route.
3. The Council recommended that traffic study information on the option of installing a traffic light at the intersection of Taylor Cutoff and US 101 be included as an appendix to the report as a possible means of eliminating the need for a Taylor Cutoff to Hooker Road east to west connector route. Including this information in the appendix reveals the viability of the option in terms of cost and intersection flow improvement but recognized that the decision to install a

traffic light at this location depends on the concurrence of the Washington State Department of Transportation who may object to the time delays imposed on a great number of US 101 travelers to the benefit of a much lower number of Taylor Cutoff Road and Gilbert Road residents.

With these amendments incorporated as part of the Study, the Council recommended the final report be forwarded on to the County Commission for acceptance. If you have any questions, please do not hesitate to call.

Sincerely,

H.W. LOCHNER, INC.

Stephen G. Lewis, AICP
Vice President

Carlsborg Area Transportation Study

Clallam County, Washington

September 4, 2008

Board of County Commissioners

District 1: Steve Tharinger
District 2: Mike Chapman
District 3: Mike Doherty
County Administrator: Jim Jones, Jr.
Public Works Director: Craig Jacobs

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CHAPTER 1

Introduction

Location within Clallam County

Carlsborg is an unincorporated area located in Clallam County on the North Olympic Peninsula of the State of Washington. Founded in 1916, it lies approximately five miles west of downtown Sequim and approximately 14 miles east of downtown Port Angeles along the US 101 corridor. Just north of Carlsborg is the Strait of Juan de Fuca, and southwest is the Olympic National Park. According to the U.S. Census Bureau, Carlsborg is a CDP, or 'Census Designated Place' as of 2000, with an area of approximately 0.9 square miles as of 2006. The location of Carlsborg is shown in Exhibit 1.1.

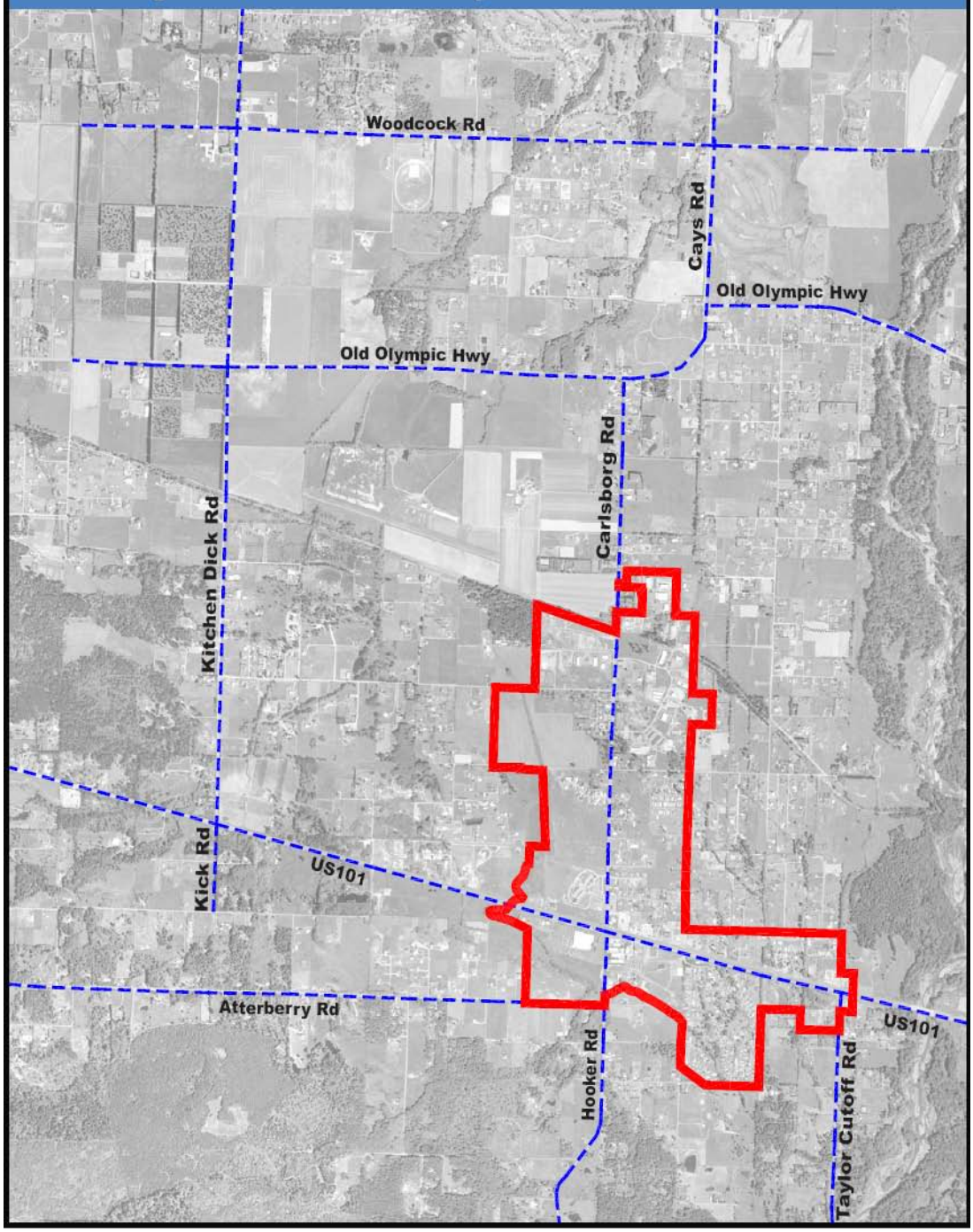
Both the State Legislature and the Office of Financial Management classify Clallam as a rural county, with an average population density of approximately 39 persons per square mile. However, land use in Clallam County is heavily influenced by the high percentage of land in recreational use, such as the Olympic National Park and Olympic National Forest. As a result, in a county with over 1.1 million acres, only 137,000 acres are developable. If developable land area is considered, the population density of Clallam County more closely approximates 320 persons per square mile.[1]

The Influence of the Growth Management Act

Clallam County adopted a Comprehensive Plan in 1995 in accordance with the state Growth Management Act (GMA), part of which requires designated Urban Growth Areas (UGAs) to be reviewed once every ten years. The Carlsborg area is one of the six UGAs of Clallam County, receiving its UGA designation in 2000. The other five UGAs were all designated in 1995. The GMA "*encourages development to occur in urbanized areas where adequate public facilities and services already exist or can be provided efficiently*." Historically, outward residential growth from the town center on Carlsborg Road, industrial park development as well as commercial development along the US 101 corridor prompted Clallam County to re-designate Carlsborg from a rural activity center to a UGA. With its UGA designation, Carlsborg is planned and projected to increase its development in both the mid- and long-terms.

[1] Source: Clallam County.

Exhibit 1-1
Carlsborg Urban Growth Boundary



Source: HW LOCHNER

Legend:
- Urban Growth Boundary
- Existing Major Roads

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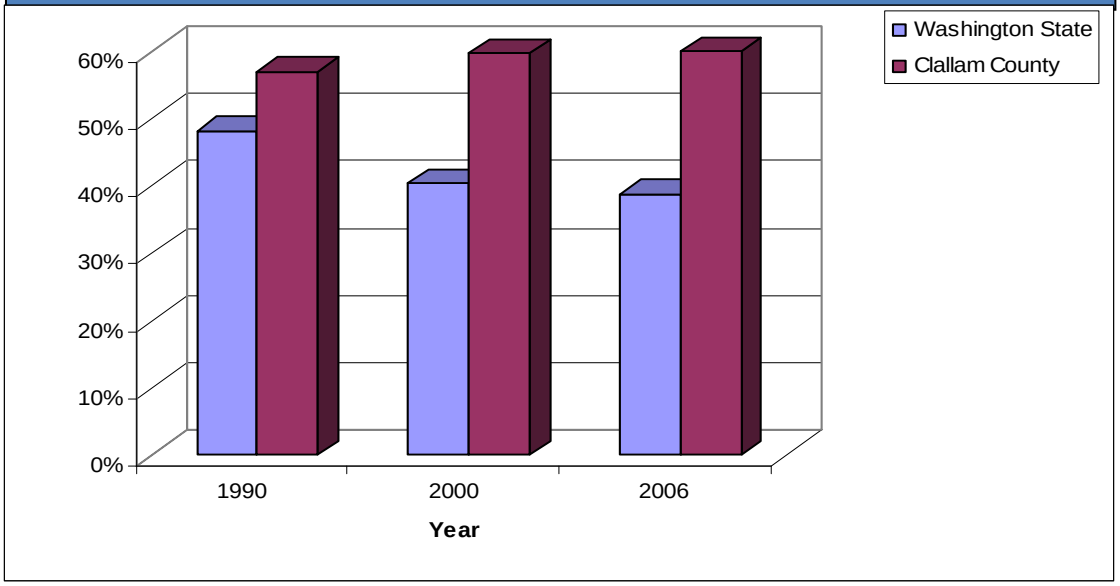
Demographics & General Land-Use

Currently, the unincorporated population of Clallam County (including Carlsborg) exceeds its incorporated population. Between the years 1990 and 2006, total population in Washington State rose from approximately 4.9 million to 6.4 million and that of Clallam County from approximately 56 to 68 thousand. Between the same span, the unincorporated population of Washington State fell from 48 percent to 39 percent, while that of Clallam County rose, albeit slightly, from 57 percent to 60 percent. Much of the increase in population in Clallam County is due to migration, with over 4,800 persons settling in Clallam County between the years 2000 and 2006. This has countered the natural decrease of 1,219 people that occurred during the same period (i.e., due to births and deaths).

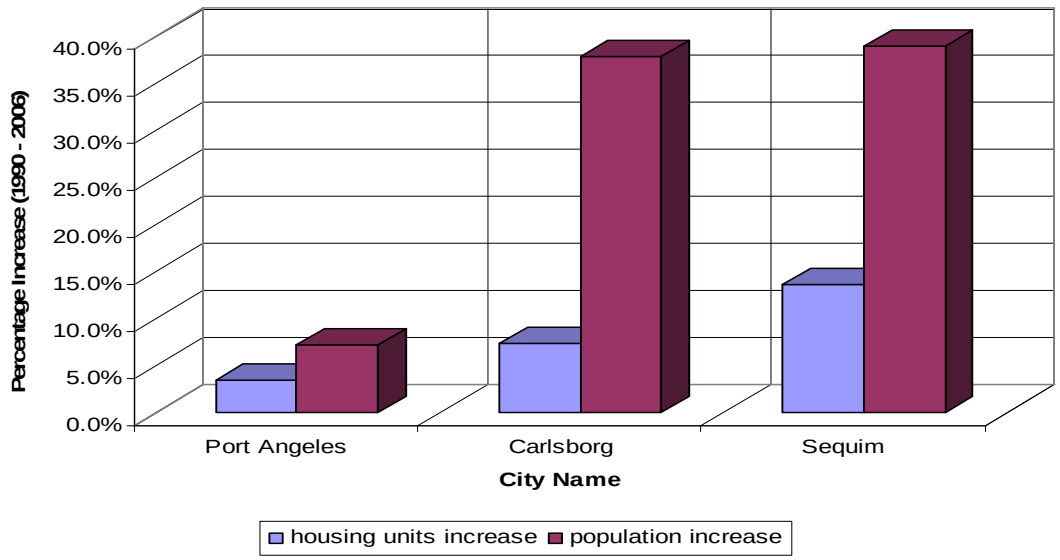
Exhibit 1-2: Comparative Unincorporated Population Percentages



Source: OFM, Clallam County

Against this backdrop, Carlsborg has also grown, with its population increasing from 602 in 1990 to 806 in 2000 and reaching 828 in 2006. Though the actual number is small, the percentage increase during this 16-year period (38%) is much larger than that of Port Angeles (7%), and almost the same as neighboring Sequim (39%). Consistent with population in unincorporated areas, the number of dwelling units in Carlsborg has also increased. From 2000 to 2006, the number of dwelling units increased from 461 to 495. Though this number is only half the dwelling units increase in neighboring Sequim, it is double that in Port Angeles. The following exhibit shows dwelling unit and population increases for all three areas.

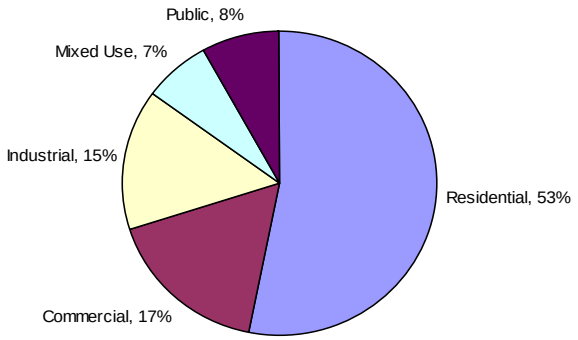
Exhibit 1-3: Percentage Housing Unit & Population Increases, 2000 - 2006



Source: OFM, Clallam County

General land-use in the Carlsborg UGA is illustrated in the following figure. Though not shown in the diagram, among Port Angeles, Carlsborg, and Sequim, Carlsborg easily has both the highest percentage of mobile home park residential units and the lowest percentage of single family residential units.

Exhibit 1-4: General Land Use, Carlsborg Urban Growth Boundary



Source: Clallam County, 2007

CHAPTER 2

Existing Roadway Network

General Characteristics

Carlsborg is subdivided by two major roadways; US 101 on an east-west axis and Carlsborg Road on a north-south axis. These two roadways provide access to the majority of commercial, office and industrial space in the study area. Carlsborg Road intersects US 101 at its southernmost end and is a signalized intersection in the study area. Directly south of US 101, Carlsborg Road becomes Hooker Road, which runs southerly and extends beyond the Carlsborg limits.

Old Olympic Highway, also an east-west roadway on the north side of the study area, essentially parallels US 101. Old Olympic Highway starts at Sequim-Dungeness Way in Sequim and connects to US 101 opposite of Obrien Road west of the study area. Though originally known as Olympic Highway, it picked up the name "Old" after the current US 101 highway was completed.

US 101 – State/Federal Classifications & Access Control

Within the Carlsborg area, US 101 is a *Highway of Statewide Significance* (HSS), as designated by RCW 47.06.140. HSS are important to the movement of people, goods, and services at a statewide level and legislation stipulates that they be planned accordingly. According to the WSDOT functional classification system, US 101 is a Principal Arterial throughout Carlsborg. In addition, US 101 through Carlsborg is classified as T-2 because it transports between four and ten million tons of freight per year, giving it Strategic Freight Corridor Status in the *Washington State Freight and Goods Transportation System* (FGTS). The FHWA has designated US 101 a *Highway of National Significance* (HNS) because it serves major population centers, intermodal transportation facilities, and major travel destinations.

The Access Control Classification System and Standards of Washington State are defined in Chapter 468.52 of the Washington Administrative Code (WAC). US 101 in Carlsborg is classified as 'Class 2' for which mobility is favored over local access, and typical speed limits range from 35 to 50 mph in urban areas and 45 to 55 mph in rural areas. Minimum access spacing is 660 feet, and access restrictions include limiting access connections for contiguous parcels under the same ownership to one unless frontage is greater than 1,320 feet, as well as restricting private direct access unless no other reasonable access exists.

Functional Classification of Links

According to Clallam County, links in the Carlsborg area are classified as: rural principle arterial, rural major collector, rural minor collector, and local access. US 101 is the only rural principal arterial in the study area. Rural major collectors include Carlsborg Road, Cays Road and Kitchen Dick Road running north-south, as well as Old Olympic Highway and Woodcock Road running east-west. All other roadways are either rural minor collector or local access. A brief description of these links as well as their locations in the network is shown in the following exhibits.

Roadway Lanes & Median Separation

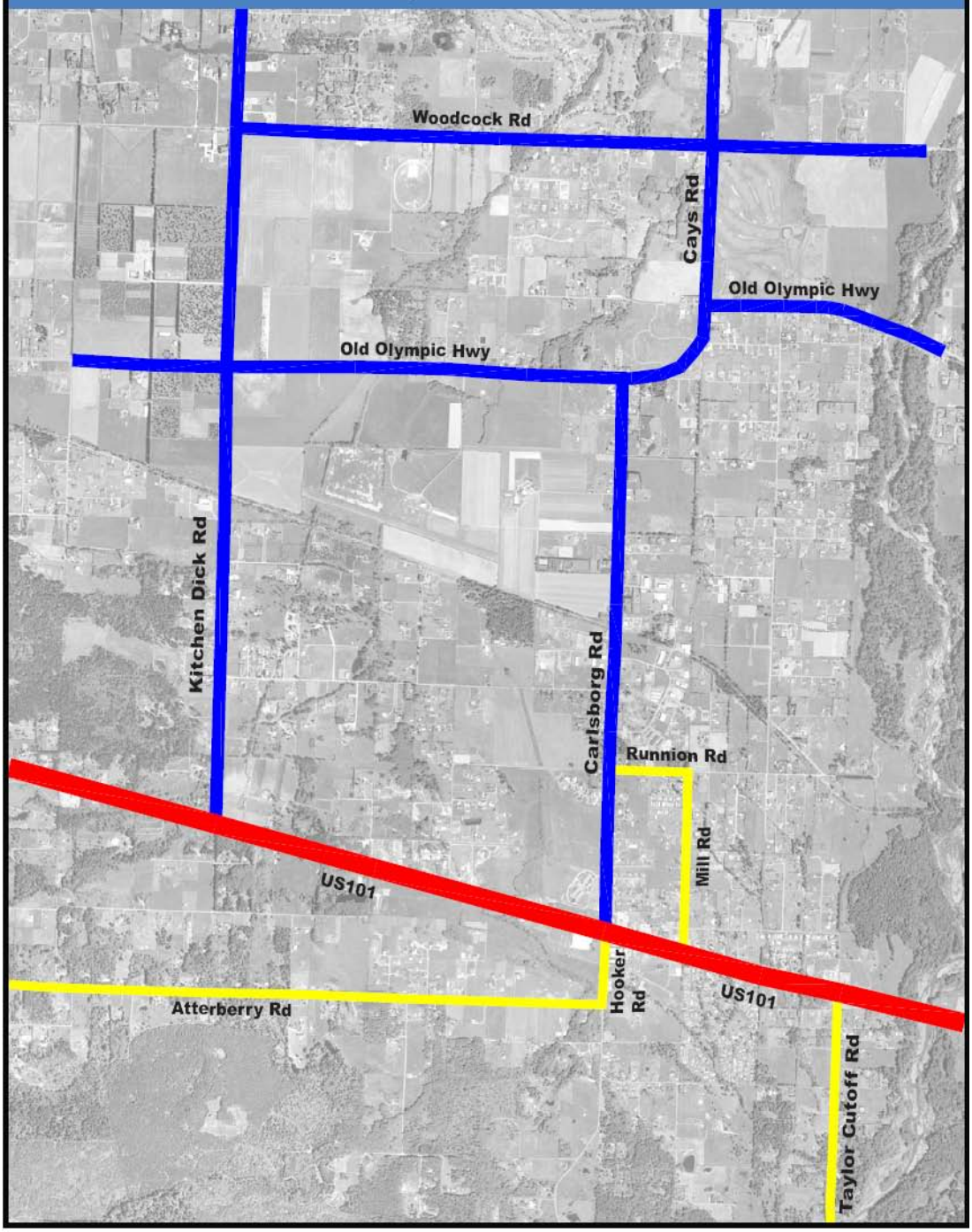
US 101 is the only roadway in the study area with two lanes in both east bound (EB) and west bound (WB) directions. All other roadways (except the Carlsborg Road NB and SB approaches to US 101) are one lane in each direction. US 101 has a Jersey median barrier from Dungeness River to Taylor Cutoff Road. From Taylor Cutoff Road to Carlsborg Road traffic is separated by a grass median, with gaps at Taylor Cutoff Road and Mill Road. The grass median terminates about 1,600 feet west of Carlsborg Road, where US 101 becomes a four-lane roadway without separation. This continues until Kitchen Dick Road, where US 101 becomes a two-lane roadway without separation.

Exhibit 2-1: Carlsborg Link Types & Attributes

Classification	Standard Capacity (per lane per hour)	Total Lane Miles
rural principle arterial	1800	12.0
rural major collector	1400	21.3
rural minor collector	1200	8.8
local access	800	52.9

Source: HW Lochner

Exhibit 2-2
Functional Classification Map



Source: HW LOCHNER

Legend:

- Existing Rural Principal Arterial
- Existing Rural Major Collector
- Existing Rural Minor Collector

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Sidewalks & Pedestrian Facilities

Sidewalks and pedestrian facilities are very limited in Carlsborg. Directly south of US 101, a sidewalk runs along the west shoulder of Hooker Road, terminating at the Valley Center Place entrance. There is also a sidewalk along the northeast quadrant of the US 101/Carlsborg Road intersection, between the corner property limits on Carlsborg Road and US 101. Between Smithfield Drive and East Runnion Road, a pedestrian path runs along Mill Road about eight feet west of the roadway. The Olympic Discovery Trail also runs east-west through the study area, and is located north of the Business Park Loop.

Speed Limits

As the overwhelming majority of links in the study area are local access, most links have a speed limit of 25 mph. Speed limits of major roadways in the study area are listed in the following exhibit.

Exhibit 2-3: Speed Limits

Roadway Section	Speed Limit
US 101 (Dungeness River eastwards)	55 mph
US 101 (Dungeness River to Carlsborg Rd)	45 mph
US 101 (Carlsborg Rd westwards)	55 mph
Kitchen Dick Ln (US 101 to Woodcock Rd)	50 mph
Old Olympic Hwy (Vautier Rd to Carlsborg Rd)	50 mph
Old Olympic Hwy (Carlsborg Rd eastwards)	40 mph
Woodcock Rd (Kitchen Dick Ln to Cays Rd)	45 mph
Woodcock Rd (Kitchen Dick Ln westwards)	35 mph
Woodcock Rd (Cays Rd eastwards)	50 mph
Carlsborg Rd	35 mph
Hooker Rd	35 mph
Taylor Cutoff Rd	45 mph

Source: Clallam County

Crosswalks

There are a limited number of marked crosswalks in the Carlsborg area, with all being located along Carlsborg Road. The largest intersection, US 101 and Carlsborg Road, has crosswalks on the SB, EB, and NB approaches. The intersection of Carlsborg Road and Smithfield Drive has crosswalks on the SB, EB, and WB approaches, and the driveway directly north of Smithfield Drive has a crosswalk on the EB approach. The crosswalks at Smithfield Drive and its neighboring northwards driveway have been installed due to the existence of a school at Carlsborg Road and Smithfield Drive.

Exhibit 2-4: Turn Pockets at Selected Intersections in Carlsborg

Intersection	Turn-Pocket Location							
US 101 & Carlsborg Road	EBL	EBR	WBL	WBR	NBL		SBL	
US 101 & Taylor Cutoff Road	EBL	EBR	WBL	WBR				
US 101 & Parkwood Blvd/Mill Road	EBL	EBR		WBR			SBL	SBR
US 101 & Joslin Road	EBL			WBR				
US 101 & Kitchen Dick Road	EBL	EBR	WBL	WBR			SBL	SBR
Carlsborg Road & Smithfield Drive					NBL		SBL	
Carlsborg Road & Winterhawk Street	EBL	EBR						
Carlsborg Road & Runnion Road					NBL		SBL	
Carlsborg Road & South Business Park Loop					NBL		SBL	
Carlsborg Road & Spath Road					NBL			
Carlsborg Road & North Business Park Loop						NBR	SBL	
Carlsborg Road & Old Olympic Hwy			WBL		NBL	NBR		
Kitchen Dick Road & Old Olympic Hwy	EBL		WBL		NBL		SBL	
Kitchen Dick Road & Spath Road								
Hooker Road & Valley Center Place					NBL		SBL	

EBL = East Bound Left; EBR = East Bound Right; WBL = West Bound Left; WBR = West Bound Right; NBL = North Bound Left; NBR = North Bound Right; SBL = South Bound Left; SBR = South Bound Right

Source: H.W. Lochner

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CHAPTER 3

Existing Traffic & Land Use

Study Area Traffic Analysis Zones

For the purposes of this study, Carlsborg was divided into 62 traffic analysis zones (TAZs), with 51 being internal and 11 being external. TAZs were created in accordance with conventional wisdom, by demarcating zones based on hard boundaries such as roadways and rivers. Zonal boundaries are shown in the following exhibit. External zones are all four-digit numbers and account for traffic exiting and entering the study area.

Existing Land-Use Distribution

Land-use in the Carlsborg area was divided into nine categories. Exhibit 3-1 contains information concerning land-use type and the corresponding zones of their largest quantities. (Storage and warehouse land-use types have been omitted.)

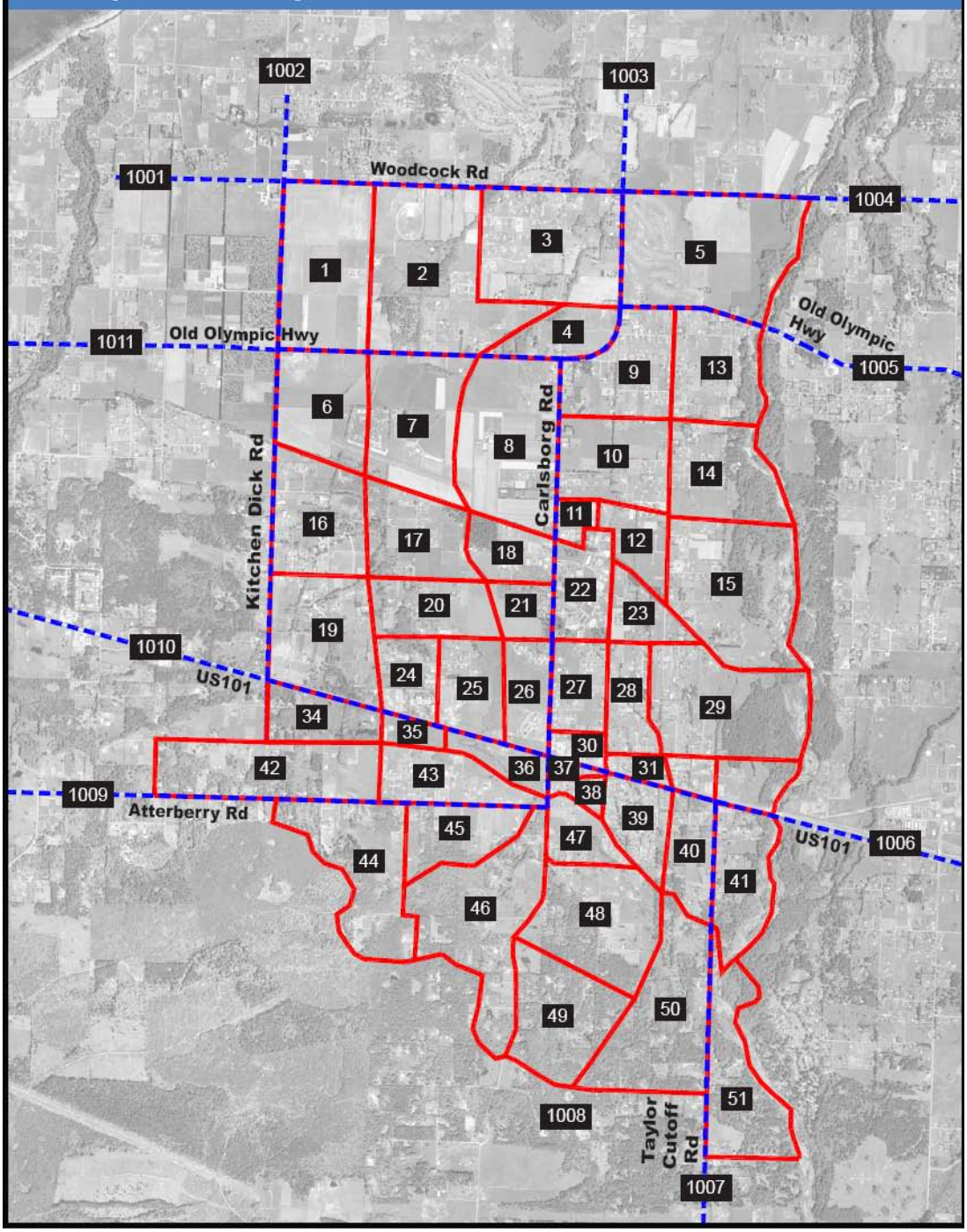
Though small in percentage, the largest number of homes is located in Zone 39 (south of US 101, between Hooker Road and Taylor Cutoff Road) where a large number of retirees reside. Access to both US 101 and subsequently other building facilities is comparatively good, and homes are more densely concentrated. The exhibit indicates that homes are scattered throughout the study area, and in fact, all internal zones except one (Zone 36) contain at least one dwelling unit.

Exhibit 3-1: Distribution of Building Facilities by TAZ (2005)

Land Use	TAZs with Largest Percentage of Given Land Use					
	TAZ	%	TAZ	%	TAZ	%
Dwelling Units	39	14%	29	9%	3	5%
Government Facilities*	11	89%	22	7%		
Office Facilities	22	48%	18	13%	11	12%
Industrial Facilities	22	56%	11	43%		
Medical Facilities	18	100%				
Retail Facilities	36	44%	38	15%	30	13%
Schools	26	74%	25	25%		

*Fire district buildings and their land-uses are included in Government Facilities. **Source: HW Lochner**

Exhibit 3-2
Transportation Analysis Zones



Legend:

Number Transportation Analysis Zone

N

7000 0 3500 7000

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As mentioned earlier, the area encompassed by the business park loop is one of the core sections of Carlsborg, with the overwhelming majority of both office and industrial building facilities located in Zones 22 and 11. Good access and egress to and from these areas is essential. Retail building facilities are less concentrated than other building facilities, and approximately 72% of these are located at the intersection of Carlsborg Road and US 101 in Zones 36, 38, and 30.

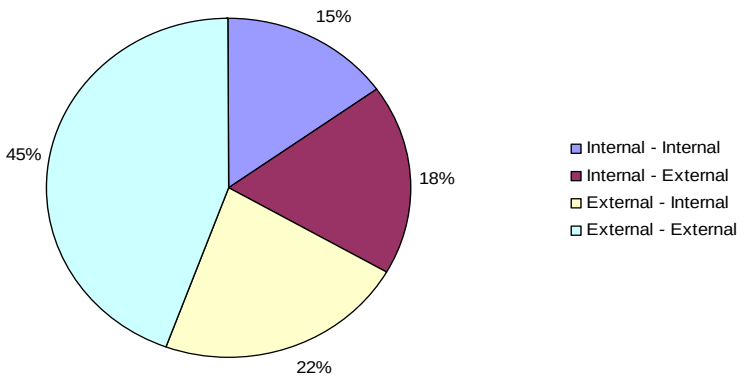
Existing Trip Characteristics

As discussed in Chapter 1, Carlsborg lies between Sequim and Port Angeles. This is one of the reasons numerous trips counted within the study area are purely external; meaning their origin and destination are both outside of the study area. In Exhibit 3-3, trips are categorized generally according to their origin and destination. The four categories and their definitions are as follows:

- Internal to Internal – Trips beginning and terminating within the study area
- Internal to External – Trips beginning in the study area and terminating outside the study area
- External to Internal – Trips beginning outside the study area and terminating inside the study area
- External to External – Trips both beginning and terminating outside the study area

External to external, or thru trips, account for almost one-half of all trips occurring in the study area; with probable destinations being either Port Angeles or Sequim. (The termini of these trips were not recorded past the study area limits.) External to internal trips account for the second largest percentage with a large proportion of these terminating in Zones 11, 22, 30, and 36 – 39. This is consistent with intuition as various employment buildings as well as the largest concentration of dwelling units are located among these zones.

Exhibit 3-3: Existing Trip Characteristics (2005)



Total Trips: 3,631

Source: HW Lochner

Existing Traffic Counts

Traffic counts from the years 2002 – 2006 were used in the model development process. The base year was set at 2005, and a total of 98 of the 618 links in the network had counts against which modeled volumes could be checked. Existing directional segment tube counts or peak hour intersection counts were available at locations shown on Exhibit 3-4.

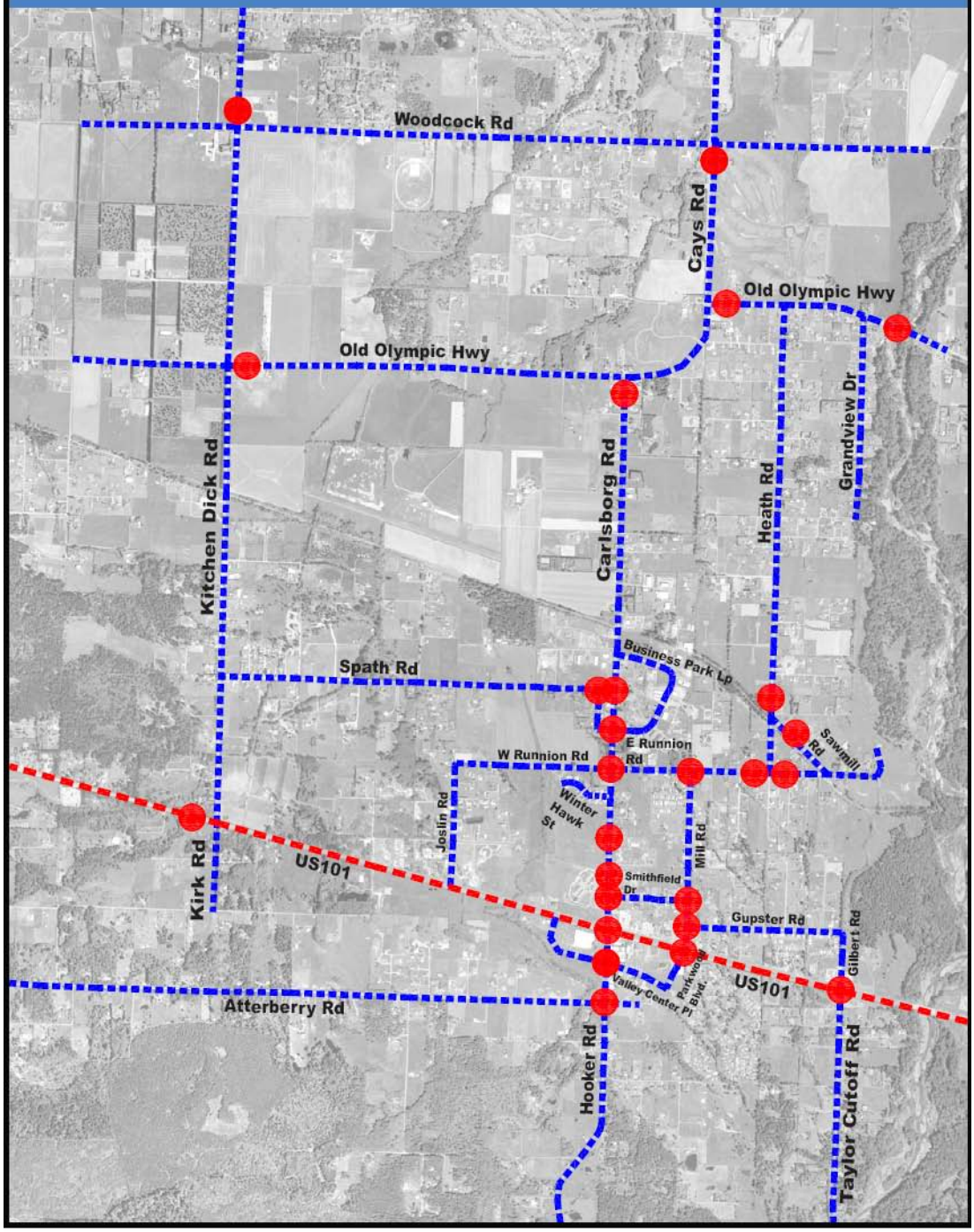
For the purposes of this report, only 15 major intersections of a total of 284 intersections were analyzed. Exhibit 3-5 lists these intersections as well as their modeled PM peak-hour traffic counts for the year 2005. (An explanation of the model built to generate these counts will be described in Chapter 5.)

Existing Level-of-Service (LOS)

Intersection LOS is usually calculated using the PM peak hour volumes. Overall traffic volumes are usually highest between the hours of 4:00 PM to 7:00 PM, and, therefore, the PM peak hour is considered the worst case scenario for the day. By calculating the Level of Service for intersections based on the PM peak hour, a snapshot of the most congested areas is determined. Intersection delay includes initial deceleration delay, move-up time, stopped delay, and finally acceleration delay. In urbanized areas, intersection delay is a more appropriate measurement of the street systems capacity because intersections are usually the bottlenecks in an urbanized street system. Intersection delays are a measure of a drivers discomfort, frustration, fuel consumption, and lost travel time. Exhibit 3-6 shows LOS criteria for signalized intersections, as described in the Highway Capacity Manual (HCM) and Exhibit 3-7 for Two-way stop controlled intersections.

Existing (2005) LOS for the 15 intersections is shown in Exhibit 3-8. All intersections currently operate at LOS ‘A’. However, three of the 15 intersections have approaches whose LOS is either ‘E’ or ‘F’. The worst of these is at the intersection of US 101 and Kirk Road, where the average northbound vehicle must wait approximately 145 seconds before entering the mainstream during the peak hour. Southbound traffic at the intersection of US 101 and Mill Rd must wait approximately 67 seconds before entering the mainstream during the peak hour. This is true for all un-signalized intersections in the study area, where traffic from side streets trying to enter the mainstream experience the longest delays.

Exhibit 3-4
Traffic Count Location 2005



Source: HW LOCHNER

Legend:

Traffic Count Location

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Exhibit 3-5: Base Year PM Peak Hour Traffic Movements (2005)												
Intersection	**EBL**	**EBT**	**EBR**	**NBL**	**NBT**	**NBR**	**WBL**	**WBT**	**WBR**	**SBL**	**SBT**	**SBR**
Old Olympic Hwy and Carlsborg Rd	-	182	21	35	-	105	57	179	-	-	-	-
Kitchen Dick Ln & Spath Rd	-	-	-	-	203	19	23	-	0	1	90	-
Carlsborg Rd & Spath Rd	4	-	4	0	253	-	-	-	-	-	280	11
Carlsborg Rd and North Business Park Loop	-	-	-	-	202	55	92	-	24	11	199	-
Carlsborg Rd and South Business Park Loop	0	0	0	10	247	13	22	0	5	2	281	0
Carlsborg Rd and E Runnion Rd	4	0	0	0	272	0	0	0	6	28	272	11
Carlsborg Rd and Smithfield Dr	4	1	14	15	274	15	38	0	9	5	273	4
US 101 and Mill Rd/Parkwood Blvd	43	576	47	9	0	26	102	619	69	21	0	40
Hooker Rd and Valley Center Pl	93	10	10	9	130	6	4	10	84	42	140	122
US 101 and Carlsborg Rd	96	512	61	61	74	170	63	512	113	113	74	138
US 101 and Taylor Cutoff Rd/Gilbert Rd	4	557	66	53	0	45	55	732	26	5	0	4
US 101 and Kitchen Dick Ln/Kirk Rd	162	591	36	57	0	12	18	613	60	47	0	66
US 101 and Joslin Rd	3	639	-	-	-	-	-	680	26	11	-	0
Old Olympic Hwy and Kitchen Dick Ln	0	87	30	23	71	109	30	166	7	5	30	62
Carlsborg Rd and Winterhawk St	0	-	0	0	273	-	-	-	-	-	272	0

Source: HW Lochner

Exhibit 3-6: Level of Service Criteria for Signalized Intersections			
Level of Service	**Average Control Delay** (sec/veh)	**General Description**	**Preferred Description**
A	≤10	Free flow	Progression is extremely favorable
B	> 10 – 20	Stable flow	Good progression, short signal cycle lengths
C	> 20 – 35	Stable flow (acceptable delays)	Fair progression, longer signal cycle length
D	> 35 – 55	Approaching unstable flow (tolerable delay)	Congestion becomes more noticeable
E	> 55 – 80	Unstable flow (intolerable delay)	Poor progression, long cycle lengths, high v/c ratios
F	> 80	Forced flow (jammed)	Unacceptable progression, over saturation

Source: Highway Capacity Manual, 2000

Exhibit 3-7: Level of Service Criteria for TWSC Intersections	
Level of Service	**Average Control Delay (s/veh)**
A	0-10
B	>10-15
C	>15-25
D	>25-35
E	>35-50
F	>50

Source: TrafficWare 2003

Exhibit 3-8: Existing Level of Service Summary (2005)								
			Worst Approach Values					
Location	Traffic Control Type	Approach	Approach	LOS*	Approach	Delay	Approach	V/C**
Old Olympic Hwy and Carlsborg Rd	one-way stop	NB	NBL, NBR	B	NBL, NBR	11.2	NBL, NBR	0.21
Kitchen Dick Ln & Spath Rd	one-way stop	WB	WBL, WBR	B	WBL, WBR	10.5	NBT	0.09
Carlsborg Rd & Spath Rd	one-way stop	EB	EBL, EBR	B	EBL, EBR	11.4	SBT, SBR	0.19
Carlsborg Rd and North Business Park Loop	one-way stop	WB	WBL, WBR	B	WBL, WBR	12.7	WBL, WBR	0.21
Carlsborg Rd and South Business Park Loop	two-way stop	EB, WB	WBL, WBR	B	WBL, WBR	13.3	SBT, SBR	0.17
Carlsborg Rd and E Runnion Rd	two-way stop	EB, WB	EBL, EBT,EBR,WBL, WBT,WBR	B	EBL, EBT, EBR	12.6	SBT, SBR	0.15
Carlsborg Rd and Smithfield Dr	two-way stop	EB, WB	WBL, WBR	C	WBL, WBR	15	NBT,NBR	0.22
US 101 and Mill Rd/Parkwood Blvd	two-way stop	NB, SB	SBL, SBR	C	SBL, SBR	24.8	SBL, SBR	0.23
Hooker Rd and Valley Center Pl	two-way stop	EB, WB	EBL, EBT, EBR	C	EBL, EBT, EBR	18	EBL, EBT, EBR	0.31
US 101 and Carlsborg Rd	traffic signal	all	EBL	C	overall delay	8.9	EBL	0.59
US 101 and Taylor Cutoff Rd/Gilbert Rd	two-way stop	NB, SB	SBL, SBT, SBR	E	SBL, SBT, SBR	48.5	NBL, NBT, NBR	0.42
US 101 and Kitchen Dick Ln/Kirk Rd	two-way stop	NB, SB	NBL, NBR	F	NBL, NBR	144.8	NBL, NBR	0.86
S 101 and Joslin Rd	one-way stop	SB	SBL, SBR	C	SBL, SBR	23.4	WBT	0.22
Old Olympic Hwy and Kitchen Dick Ln	two-way stop	NB, SB	NBL, NBT, SBL, SBT	B	SBL	14.7	NBT, NBR	0.17
Carlsborg Rd and Winterhawk St	one-way stop	EB	NBT, SBT	A	NBT, SBT	0	SBT	0.17

**This ratio is the resultant of dividing counted (estimated) corridor or intersection traffic volume by its estimated capacity for the same increment of time.*

***For an explanation of LOS see page 14.*

Source: HW Lochner

CHAPTER 4

Future Traffic & Land Use Conditions

Introduction

Traffic was forecasted for the years 2015 (mid-term) and 2025 (long-term). This was based on population and land-use estimates for both respective years. In the Carlsborg model, the mid-term is defined as half of the full build-out (long-term), which is assumed to occur within the ten-year time span. Full build-out is expected to occur on or before the year 2025.

Mid-Term Land-Use Distribution

As with existing land-use distribution, land-use types were divided into nine categories. The following exhibit contains information concerning land-use type and the corresponding TAZs of their largest quantities during the mid-term. (Storage and warehouse land-use types have been omitted.)

In comparison with the base-year, dwelling units become increasingly scattered across the study area, with housing development in the Old Olympic Highway vicinity (Zone 9) containing the fourth highest percentage of dwelling units. Both the quantity and percentage of government building facilities remain unchanged, with nearly all (approximately 37,700 square feet total) located either directly north of or in the business park loop. Quantities and percentage distribution of office building facilities also remain unchanged, with the majority located in the business park loop vicinity and a small portion located at the southeast quadrant of US 101 and Carlsborg Road. Industrial facility area increases by 150,000 square feet; entirely occurring in the business park loop.

Exhibit 4-1: Distribution of Building Facilities by TAZ (2015)*

Land Use	TAZs with Largest Percentage of Given Land Use					
	TAZ	%	TAZ	%	TAZ	%
Dwelling Units	39	9%	27	5%	3 & 9	4%
Government Facilities	11	89%	22	7%		
Office Facilities	22	48%	18	13%	11 & 37	11%
Industrial Facilities	22	86%	11	13%		
Medical Facilities	18	100%				
Retail Facilities	36	19%	18	15%	38 & 21	15%
Schools	26	74%	25	25%		

*See Appendix 4 for more detailed information.

Source: HW Lochner

Retail facility space also increases by more than 260,000 square feet to approximately 424,000 square feet, with large portions cropping up in Zones 18 and 21. This makes sense as it occurs in congruence with the industrial development in the business park loop. Lastly, school facility square footage remains unchanged.

Long-Term Land-Use Distribution

As with existing and mid-term land-use distributions, land-use types were divided into nine categories. The following exhibit contains information concerning land-use type and the corresponding zones of their largest quantities during the long-term. (Storage and warehouse land-use types have been omitted.)

Similar to the mid-term, there is an increase in dispersed, low-density housing. Though Zone 39 adjacent US 101 still contains the highest number of dwelling units, Zones 20 and 21 along Spath Road, as well as Zone 2 along Old Olympic Highway experience the largest increase in number of dwelling units. Quantities and percentages for both government and office building square footage remain unchanged, while that for industrial facilities increases by 150,000 square feet; exclusively in the business park loop. Retail facility space square footage increases by approximately 261,000 to about 685,000. The highest percentage retail facility space moves from the US 101/Carlsborg Road vicinity to the business park loop vicinity. This mirrors both the residential and industrial square footage increases in the same area. School facility space does not increase throughout the entire 20-year study horizon.

Mid- and Long-Term Trip Characteristics

As described in Chapter 3, trips were divided generally into four categories: internal to internal, internal to external, external to internal, and external to external. The percentages of these trip types for the mid- and long-terms are shown in Exhibit 4-3. For the mid-term, while the numerical values of all trip types increase from the base-year, the proportionate shares of all types, except internal-to-internal, decrease. This can be due in part to the increase in retail services in the area abrogating the need to visit retail centers in Sequim or Port Angeles. External to external trips experiences the sharpest decrease, falling seven percent to 38 percent of all trip types.

Exhibit 4-2: Distribution of Building Facilties by TAZ (2025)*

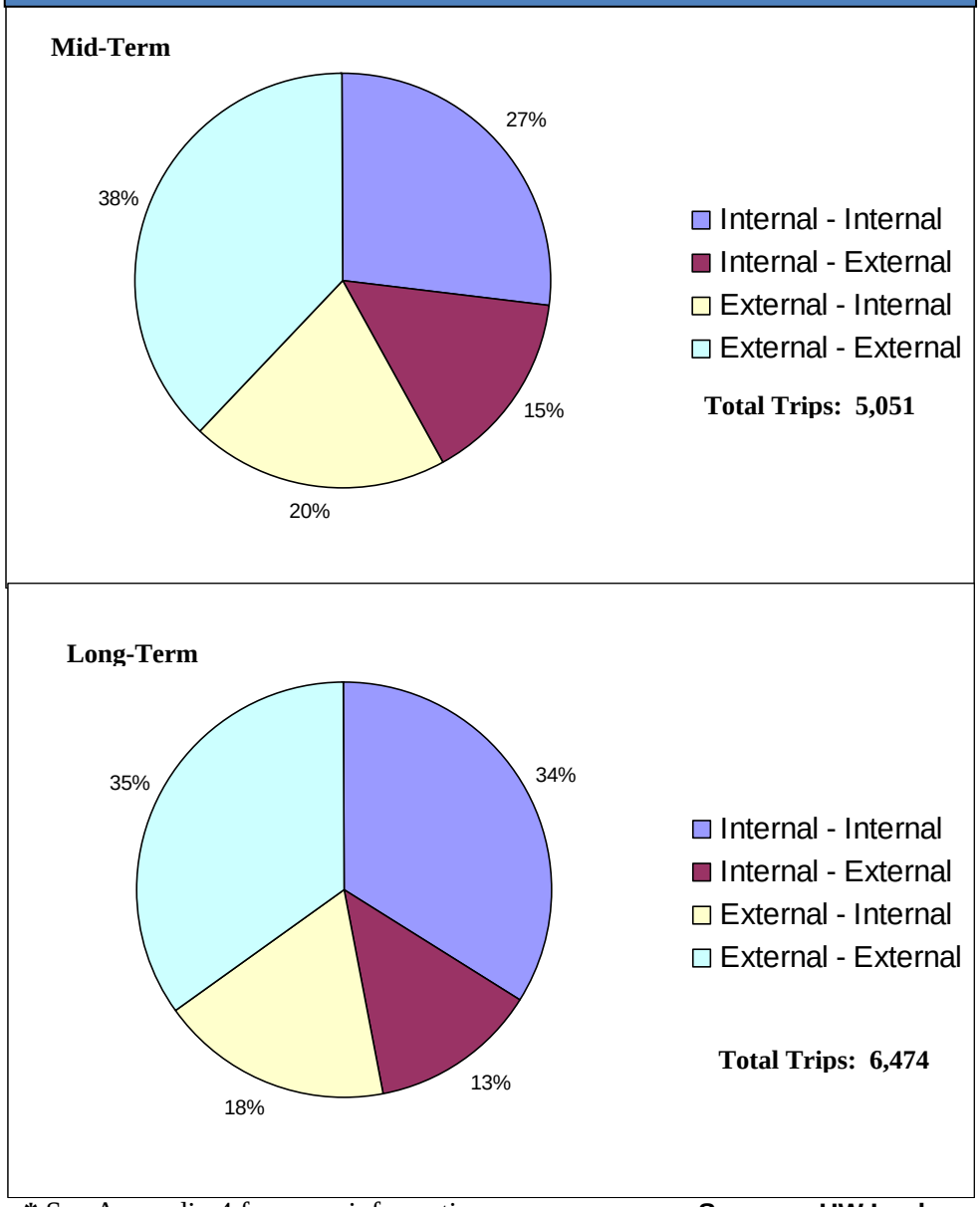
Land Use	TAZs with Largest Percentage of Given Land Use					
	TAZ	%	TAZ	%	TAZ	%
Dwelling Units	39	7%	27	5%	21, 2, 3	4%
Government Facilities	11	89%	22	7%		
Office Facilities	22	48%	18	13%	11, 37	12, 11%
Industrial Facilities	22	92%	11	8%		
Medical Facilities	18	100%				
Retail Facilities	18	19%	21	18%	38 & 36	15%
Schools	26	74%	25	25%		

* See Appendix 4 for more detailed information.

Source: HW Lochner

Consistent with the mid-term pie-chart, the percentages of all trip types in the long-term, except internal to internal, continue to decrease. Again, the increase in retail and industrial square footage can be seen to reduce the need for trips to neighboring jurisdictions. Internal to internal trips are almost as large as external to external trips, supporting the assertion that quality internal circulation in the Carlsborg area is vital to a reliable roadway network.

Exhibit 4-3:
Mid- and Long-Term Trip Characteristics (2015, 2025)*



* See Appendix 4 for more information

Source: HW Lochner

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CHAPTER 5

Future Traffic Volumes & Level of Service

Model Structure

To gain an understanding regarding how future growth would impact the roadway network and subsequently LOS, it was necessary to model future traffic volumes and intersection LOS's for the study area. A simple diagram of the modeling process is shown in Exhibit 5-1.

Steps (1) thru (4) in the modeling process were taken in calibrating the model using base year data, as well as determining no-build traffic volumes for both the mid-term and long-term scenarios. For testing proposed improvements, both steps (5a) and (5b) were incorporated.

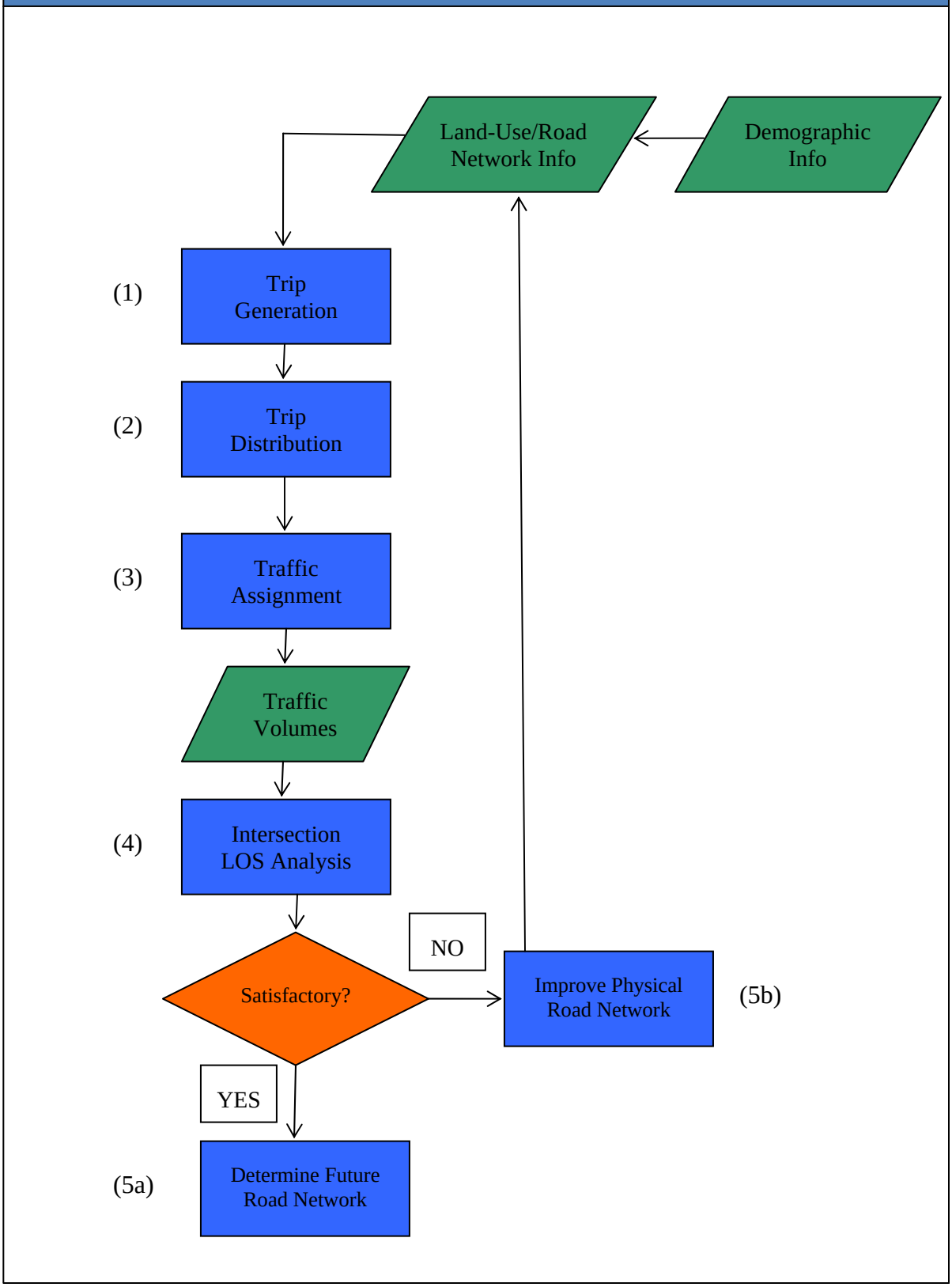
Mid-Term Volumes

Mid-term traffic volumes were determined based on projected land-use scenarios as described in Chapter 4. Dwelling units, as well as industrial and retail square footage all markedly increase during through the mid-term, providing the traffic generators for the increased volume. Exhibit 5-2 on the following page provides traffic volumes at selected intersections for the mid-term. The exhibit indicates that the preponderance of traffic increases occur northbound and southbound on Carlsborg Road, as well as eastbound and westbound on US 101. The average northbound and southbound increases in peak-hour traffic at intersections on Carlsborg Road are 189 and 154 vehicles, respectively, while those for eastbound and westbound peak-hour traffic at intersections on US 101 are 156 and 152 vehicles, respectively. This growth is consistent with the land-use changes mentioned in the previous chapter which includes large increases in retail and industrial square footage in the business park loop area.

Mid-Term LOS

Exhibit 5-3 contains information about intersection level-of-service for the mid-term. Except for US 101 and Carlsborg Road, which operates at LOS 'C', all intersections operate at a LOS of 'A' or 'B'. However, there is a general decrease in worst-leg LOS, as well as an increase in the volume-to-capacity ratio at all intersections. The worst-leg LOS values are at the intersections of US 101 and Parkwood Boulevard/Mill Road, US 101 and Taylor Cutoff Road, and US 101 and Kitchen Dick Road. At all three intersections, the LOS's of the northbound and southbound approaches all deteriorate to 'F', with the peak-hour worst-leg delay increasing to 86, 206, and 733 seconds for northbound traffic, respectively. This is true for most of the intersections under study, with side-street traffic trying to enter the mainstream experiencing the worst delay.

Exhibit 5-1: Modeling Process



Source: HW Lochner

Exhibit 5-2: Carlsborg Mid-Term PM Peak Hour Traffic Movements (2015)												
Intersection	**EBL**	**EBT**	**EBR**	**NBL**	**NBT**	**NBR**	**WBL**	**WBT**	**WBR**	**SBL**	**SBT**	**SBR**
Old Olympic Hwy and Carlsborg Rd	-	216	44	70	-	145	82	212	-	-	-	-
Kitchen Dick Ln & Spath Rd	-	-	-	-	244	48	68	-	1	1	105	-
Carlsborg Rd & Spath Rd	39	-	14	0	390	-	-	-	-	-	383	46
Carlsborg Rd and North Business Park Loop	-	-	-	-	368	61	108	-	34	15	321	-
Carlsborg Rd and South Business Park Loop	0	0	0	26	382	14	25	1	8	4	393	0
Carlsborg Rd and E Runnion Rd	10	0	0	0	526	4	0	0	24	70	456	19
Carlsborg Rd and Smithfield Dr	36	7	78	85	480	16	43	8	26	9	419	30
US 101 and Mill Rd/Parkwood Blvd	78	716	57	10	0	36	113	812	65	21	0	59
Hooker Rd and Valley Center Pl	71	12	14	11	193	12	10	10	138	81	205	122
US 101 and Carlsborg Rd	154	603	80	221	155	87	173	422	271	191	157	192
US 101 and Taylor Cutoff Rd/Gilbert Rd	10	664	103	82	1	53	63	883	32	11	3	7
US 101 and Kitchen Dick Ln/Kirk Rd	215	691	42	67	0	21	31	696	77	59	0	113
US 101 and Joslin Rd	4	767	-	-	-	-	-	804	32	17	-	0
Old Olympic Hwy and Kitchen Dick Ln	0	106	35	27	83	136	39	201	9	8	33	74
Carlsborg Rd and Winterhawk St	0	-	0	0	530	-	-	-	-	-	456	0

Source: HW Lochner

Exhibit 5-3: Carlsborg - Mid-Term LOS Summary (2015)

Location	Traffic Control Type	Approach	Worst Approach Values					
			Approach	LOS*	Approach	Delay	Approach	V/C*
Old Olympic Hwy and Carlsborg Rd	one-way stop	NB	NBL, NBR	B	NBL, NBR	14.7	NBL, NBR	0.39
Kitchen Dick Ln & Spath Rd	one-way stop	WB	WBL, WBR	B	WBL, WBR	11.6	WBL, WBR	0.12
Carlsborg Rd & Spath Rd	one-way stop	EB	EBL, EBR	C	EBL, EBR	16.5	SBT, SBR	0.27
Carlsborg Rd and North Business Park Loop	one-way stop	WB	WBL, WBR	C	WBL, WBR	19.5	WBL, WBR	0.39
Carlsborg Rd and South Business Park Loop	two-way stop	EB, WB	WBL, WBT, WBR	C	WBL, WBT, WBR	18.5	SBT, SBR	0.25
Carlsborg Rd and E Runnion Rd	two-way stop	EB, WB	EBL	D	EBL	34.6	NBT, NBR	0.34
Carlsborg Rd and Smithfield Dr	two-way stop	EB, WB	WBL, WBR	D	WBL, WBR	30	EBL, EBT, EBR	0.37
US 101 and Mill Rd/Parkwood Blvd	two-way stop	NB, SB	SBL, SBR	F	SBL, SBR	51.4	SBL, SBR	0.53
Hooker Rd and Valley Center Pl	two-way stop	EB, WB	EBL, EBT, EBR	D	EBL, EBT, EBR	26.8	EBL, EBT, EBR	0.39
US 101 and Carlsborg Rd	traffic signal	all	WBL, NBL	C	overall delay	11.4	NBL	0.71
US 101 and Taylor Cutoff Rd/Gilbert Rd	two-way stop	NB, SB	SBL, SBT, SBR, NBL, NBT, NBR	F	NBL, NBT, NBR	206	NBL, NBT, NBR	1.18
US 101 and Kitchen Dick Ln/Kirk Rd	two-way stop	NB, SB	NBL, NBR, SBL, SBR	F	NBL, NBR	733.1	NBL, NBR	2.16
US 101 and Joslin Rd	one-way stop	SB	SBL, SBR	D	SBL, SBR	31.9	WBT	0.26
Old Olympic Hwy and Kitchen Dick Ln	two-way stop	NB, SB	SBL	C	SBL	17.7	NBT, NBR	0.21
Carlsborg Rd and Winterhawk St	one-way stop	EB	NBT, SBT	A	NBT, SBT	0	SBT	0.29

**V/C, LOS, and ICU are explained via Exhibit 3-8.*

Source: HW Lochner

Long-Term Volumes

Long-term traffic volumes were also derived from projected land-use scenarios listed in the previous chapter. Dwelling units increase in both number and location, and industrial and retail square footage markedly increase in the business park loop area. Exhibit 5-4 shows PM peak hour volume counts at selected intersections for the long-term. Consistent with the mid-term trend, the largest traffic volume increases occur on the mainstream flows of US 101 and Carlsborg Road. From the base year, traffic along the Carlsborg Road intersections increases by approximately 348 and 315 peak-hour vehicles in the northbound and southbound directions, respectively. Traffic volumes at intersections along US 101 increase by approximately 310 and 314 peak-hour vehicles in the eastbound and westbound directions, respectively. Eastbound and westbound side-street traffic increases by approximately 52 vehicles per leg along Carlsborg Road, while northbound and southbound side-street traffic along US 101 increases by approximately 45 vehicles per leg. Though overall peak hour volumes along US 101 are larger than Carlsborg Road, peak hour volume increases are larger along Carlsborg Road due to the development expected to occur in this area.

Long-Term LOS

The long-term LOS values for each of the 15 intersections analyzed are listed in Exhibit 5-5. Of the 15, ten contain legs whose LOSs drop to ‘E’ or ‘F’ by the year 2025. In particular, traffic entering the mainstream from side-streets along US 101 exemplify the problem, with northbound traffic at the intersection of Taylor Cutoff Road and US 101 expected to wait more than twelve minutes to enter the mainstream. The same situation exists along Carlsborg Road. Projected industrial, retail, and residential development will subsequently cause considerable traffic increases along Carlsborg Road, and thus increasing difficulty for vehicles attempting to enter the mainstream during the peak-hour. In short, though overall LOSs for all intersections under analysis is satisfactory, certain individual approaches at many intersections have LOS’s that are beneath standard (LOS ‘D’).

Exhibit 5-4: Carlsborg – Long Range PM Peak Hour Traffic Movements (2025, without improvements)												
Intersection	**EBL**	**EBT**	**EBR**	**NBL**	**NBT**	**NBR**	**WBL**	**WBT**	**WBR**	**SBL**	**SBT**	**SBR**
Old Olympic Hwy and Carlsborg Rd	-	251	71	108	-	180	104	247	-	-	-	-
Kitchen Dick Ln & Spath Rd	-	-	-	-	287	67	96	-	1	2	122	-
Carlsborg Rd & Spath Rd	71	-	24	0	525	-	-	-	-	-	497	77
Carlsborg Rd and North Business Park Loop	-	-	-	-	525	70	127	-	44	20	447	-
Carlsborg Rd and South Business Park Loop	0	0	0	42	515	16	29	2	10	5	517	0
Carlsborg Rd and E Runnion Rd	16	0	0	0	736	9	26	0	65	142	608	26
Carlsborg Rd and Smithfield Dr	3	15	128	138	659	18	32	10	21	14	575	70
US 101 and Mill Rd/Parkwood Blvd	108	852	63	11	0	46	131	997	68	23	0	75
Hooker Rd and Valley Center Pl	66	12	16	13	257	18	15	10	191	123	271	134
US 101 and Carlsborg Rd	201	699	99	239	239	111	192	499	375	254	239	242
US 101 and Taylor Cutoff Rd/Gilbert Rd	14	773	138	111	3	61	72	1036	38	14	7	10
US 101 and Kitchen Dick Ln/Kirk Rd	260	800	48	78	0	31	43	796	94	72	0	147
US 101 and Joslin Rd	5	903	-	-	-	-	-	942	37	21	-	0
Old Olympic Hwy and Kitchen Dick Ln	0	125	41	30	95	163	48	235	11	10	36	87
Carlsborg Rd and Winterhawk St	73	-	0	0	672	-	-	-	-	-	635	0

Source: HW Lochner

Exhibit 5-5: Carlsborg – Long-Term LOS Summary (2025, without improvements)

Location	Traffic Control Type	Approach	Worst Approach Values					
			Approach	LOS*	Approach	Delay	Approach	V/C*
Old Olympic Hwy and Carlsborg Rd	two-way stop	NB	NBL, NBR	C	NBL, NBR	24.4	NBL, NBR	0.64
Kitchen Dick Ln & Spath Rd	one-way stop	WB	WBL, WBR	B	WBL, WBR	12.9	WBL, WBR	0.19
Carlsborg Rd & Spath Rd	one-way stop	EB	EBL, EBR	D	EBL, EBR	28.3	EBL, EBR	0.4
Carlsborg Rd and North Business Park Loop	one-way stop	WB	WBL, WBR	E	WBL, WBR	44.1	WBL, WBR	0.69
Carlsborg Rd and South Business Park Loop	two-way stop	EB, WB	WBL, WBT, WBR	D	WBL, WBT, WBR	31.4	NBT,NBR	0.34
Carlsborg Rd and E Runnion Rd	two-way stop	EB, WB	EBL, WBL, WBR	F	EBL	154.7	WBL, WBR	0.7
Carlsborg Rd and Smithfield Dr	two-way stop	EB, WB	WBL, WBT, WBR	F	WBL, WBT, WBR	666.3	WBL, WBT, WBR	1.91
US 101 and Mill Rd/Parkwood Blvd	two-way stop	NB, SB	NBL, NBR, SBL, SBR	F	SBL, SBR	156.6	SBL, SBR	1.34
Hooker Rd and Valley Center Pl	two-way stop	EB, WB	EBL, EBT, EBR	F	EBL, EBT, EBR	61	EBL, EBT, EBR	0.64
US 101 and Carlsborg Rd	traffic signal		NBL, WBL	F	overall delay	22.4	NBL	1.02
US 101 and Taylor Cutoff Rd/Gilbert Rd	two-way stop	NB, SB	NBL, NBT, NBR, SBL, SBT, SBR	F	NBL, NBT, NBR	834.4	NBL, NBT, NBR	2.57
US 101 and Kitchen Dick Ln/Kirk Rd	two-way stop	NB, SB	NBL, NBR, SBL, SBR	F	NBL, NBR, SBL, SBR	error	NBL, NBR	5.36
US 101 and Joslin Rd	one-way stop	SB	SBL, SBR	E	SBL, SBR	47.3	WBT	0.3
Old Olympic Hwy and Kitchen Dick Ln	two-way stop	NB, SB	NBL, SBL	C	SBL	21.9	NBT, NBR	0.27
Carlsborg Rd and Winterhawk St	one-way stop	EB	EBL	F	EBL	55.6	EBL	0.54

**V/C, LOS, and ICU are explained via Exhibit 3-8.*

Source: HW Lochner

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CHAPTER 6

Roadway Improvements

Improvement Principles

Based on the information given in the previous chapters, various improvements were considered that would facilitate the smooth flow of traffic in both the mid- and long-terms. These roadway network improvements were entered into the modeling process illustrated at the beginning of Chapter 5, and their adequacy was judged based on the intersection LOS they produced. Improvements were incorporated into model runs based on the following principles:

- Through various link additions and/or roadway functional reclassifications, a roadway network should be conceived that can accommodate the projected increase of *internal-to-internal* trips;
- Improvements should be made such that detrimental traffic movements onto US 101 and Carlsborg Road will be discouraged (prohibited); and
- Installing additional traffic signals along US 101 should be avoided due to its classification as a *Highway of Statewide Significance*, and to facilitate the continuous flow of traffic.

Roadway Classification

New links were established, and a few existing links were reclassified, according to their intended service. Mobility and access are the primary functions a roadway should provide, and the extent to which each of these functions are provided is an integral aspect of classifying roads. In general, as access increases mobility decreases. The eventual goal is to provide a roadway network that will yield an optimum balance between mobility and access. US 101 is a rural principal arterial, whose primary functions are to provide both connection between major urban areas as well as a level-of-service suitable for statewide travel. To maintain US 101's function as a regional highway used for longer, uninterrupted travel, new east-west links spanning the length of the study area located both north and south of US 101 were proposed (Exhibit 6-1). These major collectors would serve to absorb the projected increase in internal-to-internal trips in the study area, and thus would provide a greater degree of internal mobility than the existing network. The same is true for other link additions, which would also serve to accommodate rerouted traffic from US 101.

Prohibiting Detrimental Traffic Movements

Carlsborg Road and US 101 are the two major thoroughfares in the study area. US 101 is a principal arterial which must facilitate the smooth flow of long trips. Carlsborg Road is a major collector that does and will accommodate much of the current and projected future development in the study area. In order to maintain an acceptable level-of-service on both these roadways, prohibiting traffic movements at intersections that cause the intersection to fail was determined as another effective countermeasure. In particular, left-turns at intersections onto both Carlsborg Road and US 101 are difficult to make due to large traffic volumes and also may prevent other traffic queued at the same approach from flowing smoothly.

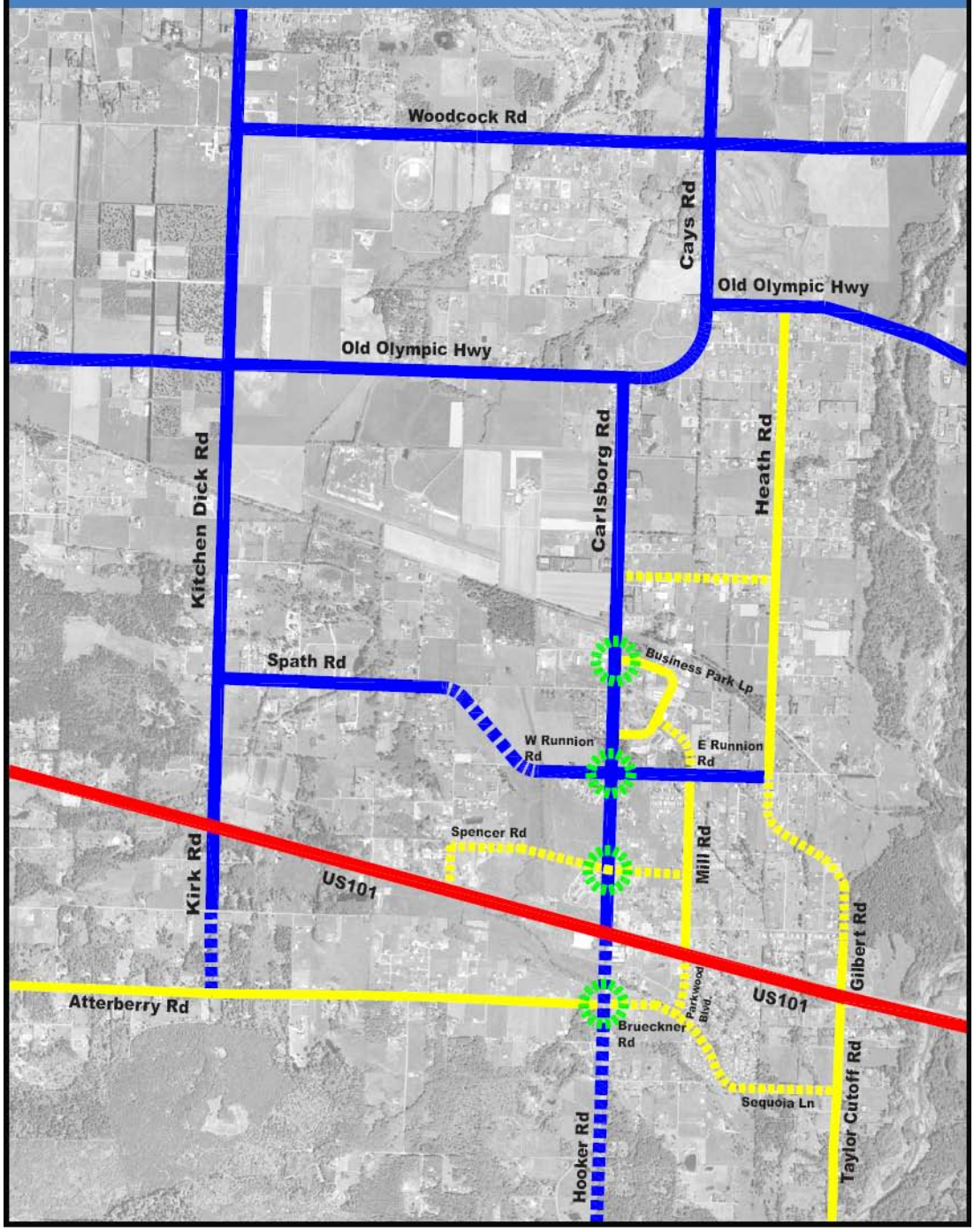
Traffic Signals on US 101

Increasing the number of traffic signals on US 101 would also decrease inter-regional traffic flow. US 101 is a Highway of Statewide Significance whose function is to efficiently transport people and freight at a statewide level. Adding traffic signals to US 101 would encourage its use as a local roadway, subverting the purpose of an HSS. Consequently, though traffic signals are envisioned to be installed on Carlsborg Road due to its function as a collector street providing access to various local developments, additional traffic signals are not envisioned to be installed on US 101.

Improvement Implementation

The above principles served to guide the improvements proposed and modeled for the study area. The future traffic volumes they produced, as well as their accompanying LOS's are described in Exhibits 6-2 and 6-3. Each improvement was categorized as a mid-term (2015) improvement or a long-term (2025) improvement according to these projected volumes. The timeframes as well as the anticipated benefits of the improvements are listed in Exhibit 6-4.

Exhibit 6-1
Proposed Roadway Network, 2025



Source: HW LOCHNER

Legend:

- Existing Rural Principal Arterial
- Existing Rural Major Collector
- Existing Rural Minor Collector
- Future Rural Major Collector
- Future Rural Minor Collector
- Future Roundabout or Signal Location

2800 0 2800 5600
SCALE IN FEET

Exhibit 6-2: Carlsborg - Long Range Traffic Movements (2025, with improvements)												
Intersection	**EBL**	**EBT**	**EBR**	**NBL**	**NBT**	**NBR**	**WBL**	**WBT**	**WBR**	**SBL**	**SBT**	**SBR**
Old Olympic Hwy and Carlsborg Rd	-	251	131	112	-	145	101	247	-	-	-	-
Kitchen Dick Ln & Spath Rd	-	-	-	-	280	33	20	-	4	4	60	-
Carlsborg Rd & Spath Rd	68	-	0	0	498	-	-	-	-	-	534	58
Carlsborg Rd and North Business Park Loop	-	-	-	-	526	40	-	-	49	21	592	-
Carlsborg Rd and South Business Park Loop	-	-	0	0	386	9	-	-	111	72	461	0
Carlsborg Rd and E Runnion Rd	85	23	57	0	479	11	63	22	0	0	606	59
Carlsborg Rd and Smithfield Dr	-	-	31	-	632	85	-	-	28	-	729	24
US 101 and Mill Rd/Parkwood Blvd	-	849	235	-	-	87	170	613	170	-	-	216
Hooker Rd and Valley Center Pl	-	-	19	-	337	1	-	-	240	-	174	167
US 101 and Carlsborg Rd	290	738	38	341	310	8	156	538	117	390	150	219
US 101 and Taylor Cutoff Rd/Gilbert Rd	84	748	137	-	-	100	130	883	133	-	-	36
US 101 and Kitchen Dick Ln/Kirk Rd	230	820	58	-	-	90	67	940	83	-	-	80
US 101 and Joslin Rd	-	907	-	-	-	-	-	1065	34	-	-	0
Old Olympic Hwy and Kitchen Dick Ln	0	164	2	28	93	163	43	237	13	26	20	87
Carlsborg Rd and Winterhawk St	0	-	38	65	491	-	-	-	-	-	718	9
W Runnion Rd and Winterhawk St**	-	112	-	83	-	55	-	82	-	-	-	-
Mill Rd and Brueckner Rd**	30	-	0	0	30	-	-	-	-	-	11	30
Mill Rd and Mariposa Ln**	1	-	0	0	29	-	-	-	-	-	8	2
Mill Rd and Roupe Rd**	0	41	0	0	0	0	0	139	25	4	0	0
Roupe Rd and Taylor Cutoff Rd**	38	-	8	68	60	-	-	-	-	-	138	103
E Runnion Rd and Mill Rd**	0	16	19	8	187	4	8	13	27	42	141	64

**Newly created intersections

Source: HW Lochner

Exhibit 6-3: Carlsborg – Long-Term LOS Summary (2025 with improvements)								
			Worst Approach Values					
Location	**Traffic Control Type**	**Approach**	**Approach**	**LOS***	**Approach**	**Delay**	**Approach**	**V/C***
Old Olympic Hwy and Carlsborg Rd	one-way stop	NB	NBL	D	NBL	27.7	NBL	0.44
Kitchen Dick Ln & Spath Rd	one-way stop	WB	WBL, WBR	B	WBL, WBR	10.9	NBT, NBR	0.12
Carlsborg Rd & Spath Rd	one-way stop	EB	EBL	D	EBL	34.8	SBT, SBR	0.43
Carlsborg Rd and North Business Park Loop	one-way stop	WB	WBR	B	WBR	14.5	SBT	0.43
Carlsborg Rd and South Business Park Loop	two-way stop	EB, WB	WBR	B	WBR	12.1	SBT, SBR	0.29
Carlsborg Rd and E Runnion Rd	traffic signal		WBL, WBT, WBR,EBL,EBT,EBR	B	overall delay	8.8	EBL, EBT, EBR	0.58
Carlsborg Rd and Smithfield Dr	two-way stop	EB, WB	EBR, WBR	C	WBR	16.7	SBT, SBR	0.48
US 101 and Mill Rd/Parkwood Blvd	two-way stop	NB, SB	NBR	C	NBR	15.1	EBT, EBR	0.36
Hooker Rd and Valley Center Pl	two-way stop	EB, WB	WBR	B	WBR	11.3	WBR	0.32
US 101 and Carlsborg Rd	traffic signal		EBT, WBT, NBT, SBL, SBT	D	overall delay	34.1	EBT	0.81
US 101 and Taylor Cutoff Rd/Gilbert Rd	two-way stop		EBL, WBL, NBR, SBR	B	NBR	12.4	WBT	0.28
US 101 and Kitchen Dick Ln/Kirk Rd	two-way stop	NB, SB	EBL,WBL,NBR, SBR	B	EBL	14.6	EBL	0.4
US 101 and Joslin Rd	one-way stop	SB	EBT,WBT,WBR	A	EBT,WBT, WBR	0	WBT	0.34
Old Olympic Hwy and Kitchen Dick Ln	two-way stop	NB, SB	NBL, SBL	C	SBL	23.7	NBT, NBR	0.27
Carlsborg Rd and Winterhawk St	one-way stop	EB	EBR	C	EBR	15.2	SBT, SBR	0.46

**V/C, LOS, and ICU are explained via Exhibit 3-8.*

Source: HW Lochner

Exhibit 6-4: Carlsborg Road Network Improvement Recommendations

No.	Location	Timeframe	Improvement	Anticipated Benefit	Cost (2006) w/out roundabout*	Cost (2006) w/roundabout
1	Carlsborg Rd/Runnion Rd intersection	mid-term	Install a traffic signal or roundabout and widen all approaches to three lanes with left-turn pockets at each approach.	Increases in traffic due to development along Carlsborg Rd and re-routed traffic will be accommodated more easily.	$790,000	$590,000
2	(a) Carlsborg Rd (Smithfield Dr to Old Olympic Hwy)	long-term	Reconstruct as a three-lane roadway (one-lane in each direction with a center two-way left-turn lane), with bicycle lanes and sidewalks from Smithfield Dr to Old Olympic Hwy. At Carlsborg Rd & Smithfield Dr, prohibit EBL, EBT, WBL, WBT, NBL, and SBL movements.**	Due to its proximity to the US 101 & Carlsborg Rd intersection, side-street traffic entering the mainstream (especially left and thru movements) is problematic as evidenced by its LOS. Vehicles will re-route to the north school entrance or Runnion Rd.	$3,460,000	$3,570,000
	(b) Carlsborg Rd & North BP Loop	long-term	Prohibit WBL movement or install roundabout.	WBL traffic from the S Business Park Loop and N Business Park Loop intersections will re-route through the link described in No. 6. (With a roundabout, WBL can enter the mainstream easier.)		
	(c) Carlsborg Rd & South BP Loop	long-term	Prohibit EBL, EBT, WBL, and WBT movements.	Side-street traffic movements will be re-routed to Carlsborg Rd & Runnion Rd intersection.		
	(d) Carlsborg Rd & Old Olympic Hwy	long-term	Widen NB approach to one left turn lane and one right turn lane.	Queuing of NBR traffic will decrease.		
3	US 101 & Carlsborg Rd/Hooker Rd	long-term	Reconstruct roadway from approx. Smithfield Dr to Harrison Rd to provide a double left-turn lane, one through lane, and one right-turn lane for both the NB and SB approaches. This would include reconstruction of the existing traffic signal.	The additional lanes will accommodate the increases in traffic volume due to both development and re-routed traffic.	$1,180,000	
4	Hooker Rd	long-term	Reconstruct as a three-lane roadway (one lane in each direction with a center two-way left-turn lane) with bicycle lanes and sidewalks from Harrison Rd to Roupe Rd. Include left-turn prohibition as necessary.	EB side-street traffic that causes the intersection to fail will re-route to Atterberry Rd/Brueckner Rd, Mariposa Ln, or Roupe Rd.	$520,000	
5	New Spath Rd/W Runnion Rd connector	mid-term	Construct a new north-south rural major collector roadway between Spath Rd and W Runnion Rd approximately 1000 to 2000 ft west of Carlsborg Rd.	SBL traffic trying to access US 101 can be re-routed to Carlsborg Rd via this link, and EB and WB traffic accessing areas north of US 101 are provided with an alternative link.	$1,080,000	

Exhibit 6-4: Carlsborg Road Network Improvement Recommendations (cont.)

No.	Location	Timeframe	Improvement	Anticipated Benefit	Cost (2006) w/out roundabout*	Cost (2006) w/roundabout
6	Business Park Loop (Ruth's Place) to E Runnion Rd connector	long-term	Construct a new north-south rural minor collector roadway between the Business Park Loop and E Runnion Rd at least 1000 ft east of Carlsborg Rd.	WBL traffic from the S Business Park Loop and N Business Park Loop intersections will re-route through this link.	$360,000	
7	Harrison Rd to Roupe Rd connection	mid-term	Construct a new north-south rural minor collector roadway from Harrison Road southwesterly to the Brueckner Rd extension. This will necessitate a realignment of the Mill Rd/US 101 intersection. Construct a new access and egress point at the intersection of Parkwood Blvd & Roupe Rd. Redesign the Mill Rd/US 101 intersection such that WBL will be the only left-turn permitted.	NBL traffic at US 101 & Mill Rd is re-routed via this link.	$1,010,000	
8	Brueckner Rd extension	long-term	Widen roadway to minor collector standards and extend to new north-south connection of Harrison Rd/Mill Rd (No. 7). Extend this roadway southwards to intersect with Mariposa Ln and merge with the newly constructed Roupe Rd (No 9). Construct a roundabout at the intersection of Hooker Rd & Atterberry Rd/Brueckner Rd.	Re-routed traffic described in No. 11, as well as WBL traffic at US 101 and Parkwood Blvd/Mill Rd intersection will be provided with an alternative route.	$1,720,000	$1,830,000
9	Sequoia Rd connection	mid-term	Construct a new east-west rural minor collector roadway from Taylor Cutoff Rd to intersect with the newly extended Brueckner Rd connection.	Restricted NBL traffic at the US 101 & Taylor Cutoff Rd intersection is re-routed via this link.	$1,530,000	
10	Kirk Rd	mid-term	Construct new north-south rural major collector roadway on the Kirk Rd alignment between Parrish Rd and Atterberry Rd.	NBL traffic at the US 101 & Kitchen Dick Ln intersection is re-routed via this link after completion of No. 11.	$810,000	
11	US 101 – Kitchen Dick Ln to Taylor Cutoff Rd	mid-term	(a) Construct median islands to restrict left turns on and off US 101 and eliminate cross traffic as necessary to bring roadway into LOS compliance and to provide access management. (b) At Kitchen Dick Ln/Kirk Rd, construct a raised traffic island to allow only EB and WB left turns. (c) At Taylor Cutoff Rd/Gilbert Rd, construct a raised traffic island to allow only EB and WB left-turns. (d) At Mill Rd/Parkwood Blvd, construct a raised traffic island to allow only WB left-turns.	Movements that cause the intersection to fail will be eliminated and access will be managed better, bringing the intersections into LOS compliance.	$5,130,000 $130,000 $190,000 $110,000	

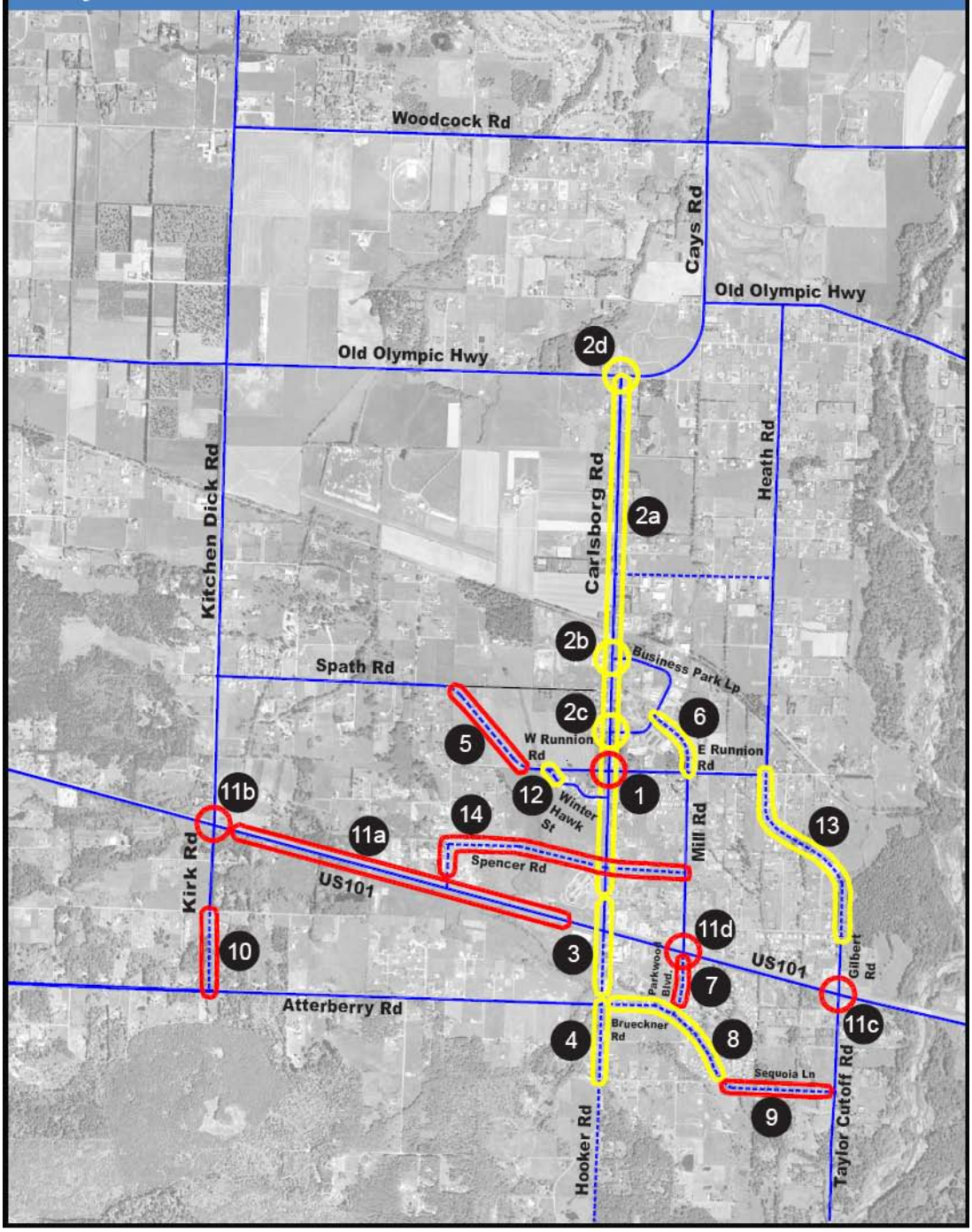
Exhibit 6-4: Carlsborg Road Network Improvement Recommendations (cont.)

No.	Location	Timeframe	Improvement	Anticipated Benefit	Cost (2006) w/out roundabout*	Cost (2006) w/roundabout
12***	Winterhawk St – W Runnion Rd connector	long-term	Create a new link that connects Winterhawk St with W Runnion Rd (Exhibit 6-1). The Winterhawk St/W Runnion Rd intersection will be designed as exit only, while the Winterhawk St/Carlsborg Rd intersection will remain unchanged.	Anticipated growth in traffic in the Winterhawk St area will be provided an alternative egress route, decreasing EB queuing at the Winterhawk St/Carlsborg Rd intersection.	$100,000	
13	Taylor Cutoff Rd – north of US 101	long-term	Construct a new north-south rural minor collector roadway on the Gilbert Rd alignment between US 101 and E Runnion Rd.	WBR traffic will access the Carlsborg Rd and Business Park Loop areas via this alternative route.	$1,530,000	
14**	Spencer Rd connector/Smithfield Dr closing	long-term	Extend Spencer Rd easterly to intersect with Mclo Ln and Carlsborg Rd, and terminate at its intersection with Mill Rd. At its intersection with Carlsborg Rd, install a roundabout. Close the EB approach of Smithfield Dr and construct the school access/egress point from the new extension of Spencer Rd.	Traffic exiting/entering Smithfield Dr will re-route to either Spencer Rd or W Runnion Rd.	$2,180,000	$2,300,000
TOTAL (without and with roundabouts)					**$21,830,000**	**$21,970,000**

** Right-of-way costs are not included in the cost estimates.*
*** The Smithfield Dr turn prohibitions of No. 2(a) & Improvement No. 14 are substitutes for one another.*
****Though this improvement was modeled based on projected future volumes, Winterhawk Street currently provides only dead-end local access to a fully developed street with single-family dwelling units. Unless it is connected to an adjacent future development, it will not experience an increase in trip generation, rendering this improvement unnecessary.*

Source: HW Lochner

Exhibit 6-5
Project Locations



Source: HW LOCHNER

Legend:
- Existing Road
- Proposed Road
- Project Location - Mid-term
- Project Location - Long-term

No. Project Number

2800 0 2800 5600
SCALE IN FEET

CHAPTER 7

Finance

Introduction

Chapter 6 concluded with a series of recommendations to improve the safety and operations of the transportation system within the Carlsborg Study Area. While the population of the Carlsborg Area has continued to grow and change over time, the growth in traffic has occurred at an even more rapid rate. Additionally, because of the nature of traffic in and through Carlsborg – many travelers are simply coming from and going to a destination outside of Carlsborg – or simply bypass traffic (Exhibit 7-1).

The demands placed on the system, whether by through traffic or locally generated traffic, have placed an ever growing burden on the County to keep pace with maintenance. Roadway preservation and maintenance is expected to increase by nearly 63% in the County Road Fund, from $4,982,382 in 2007 to $8,097,734 in 2014. Excluding the federally funded share of new road projects, preservation and maintenance will increase from 28% of the county road fund to just over 66% in this same period.

Exhibit 7-1: Percentage of Through Traffic on Main Corridors (model values)[2]

CORRIDOR	Base Line		Medium Term		Long Term	
	EB/SB	WB/NB	EB/SB	WB/NB	EB/SB	WB/NB
1. US 101 – Kithchen Dick Ln to Carlsborg Rd	64%	40%	64%	41%	65%	43%
2. US 101 – Carlsborg Rd to Taylor Cutoff Rd	73%	40%	71%	39%	63%	40%
3. Carlsborg Rd – US 101 to Spath Rd	6%	9%	4%	5%	9%	3%
4. Carlsborg Rd – Spath Rd to Old Olympic Hwy	18%	15%	12%	11%	20%	5%
5. Kitchen Dick Ln – US 101 to Spath Rd	40%	72%	31%	66%	36%	72%
6. Kitchen Dick Ln – Spath Rd to Old Olympic Hwy	49%	79%	50%	78%	44%	79%
7. Old Olympic Hwy – Kitchen Dick to Carlsborg Rd	86%	83%	84%	80%	78%	77%

EB/SB = East Bound or South Bound; WB/NB = West Bound or North Bound. Values for corridors 1, 2, and 7 indicate EB and WB percentages, while those for corridors 3 - 6 indicate SB and NB percentages.

Source: HW Lochner

[2] Model values are a representation of how traffic operates, not an exact predictor.

Road Fund Revenues & Expenditures

Road fund revenues come from a variety of sources including but not limited to the Road Levy, Private Harvest Tax, Federal Forest Yield (expected to go to zero in the year 2008), Federal Grants, emergency funding including FEMA (Federal Emergency Management Agency), IAC (was the Interagency Committee for Outdoor Recreation but has been changed to the Recreation and Conservation Funding Board), CRAB (County Road Administration Board), Motor Fuel Taxes, REET (Real Estate Excise Tax), SEPA (State Environmental Policy Act) mitigation payments, charges for goods and services, and sale of County timber (Exhibit 7-2). The greatest source of revenue for the Road Fund (excluding grants that can vary dramatically from year to year) comes from the Road Levy, followed by the Motor Fuel Tax. In 2007, excluding revenue from grants, these two revenue sources make up more than 45% of the revenues in the County Road Fund (34.4% & 10.9% respectively). By the year 2014 they are anticipated to represent almost 78% of the road fund revenue, excluding grants.

In 2007, preservation and maintenance consumed approximately 66% of the revenue generated from the Road Levy and Motor Fuel Tax. By 2014 it is anticipated that it will consume over 92% of those two major revenue sources. What this tells us is that as time goes on, the County will have to seek additional revenue sources to both maintain and improve the County road system.

Exhibit 7-2: Revenues & Expenditures, with forecasts to 2014, County Road Fund ($1,000)

YEAR	Expenditures w/o Construction	Expenditures with Construction	Revenues w/o Construction Grants	Revenues with Construction Grants
1999	$8,334	$12,316	$18,047	$20,136
2000	$7,623	$10,343	$16,760	$17,884
2001	$7,612	$10,908	$16,419	$17,302
2002	$7,601	$10,541	$15,281	$17,160
2003	$7,797	$10,591	$16,254	$17,274
2004	$7,408	$9,347	$16,161	$18,132
2005	$8,153	$11,358	$18,629	$19,972
2006	$10,319	$14,598	$18,277	$20,514
2007	$8,626	$16,800	$16,674	$22,321
2008	$8,833	$26,591	$14,542	$30,883
2009	$9,037	$11,761	$13,483	$16,121
2010	$9,570	$13,764	$13,693	$17,771
2011	$10,139	$14,521	$13,486	$17,052
2012	$10,744	$12,809	$12,159	$14,583
2013	$11,390	$12,411	$11,552	$13,736
2014	$12,078	$12,078	$11,258	$13,453

Source: Clallam County

Funding Capacity

As is implied from the discussion above, the County's capacity to fund new transportation projects is limited by present revenue sources. For "discretionary" projects to proceed, new revenues must be found. Examples of sources from which County staff are already familiar include:

- ***Federal Grants:*** Through the federal gas tax, Congress makes available funding through a grant program generally called the Intermodal Surface Transportation Efficiency Act (ISTEA) – although every six-years the title changes somewhat such as the current National Economic Crossroads Transportation Efficiency Act (NEXTEA). Clallam County already benefits substantially from this program, with over $4 million in federal grants in the road fund in 2007 and an anticipated nearly $15 million in 2008.
- ***State Sources:*** The State of Washington has a variety of grant and loan funds that could potentially yield additional revenues for road projects in Clallam County, depending on the location and project. Among the more common are Public Works Trust Fund loans; Community Development Block Grants (an unlikely source for the Carlsborg area); Community Economic Revitalization Board grants and loans (if tied to job generation); Transportation Improvement Board grants (if applied within an urban growth boundary); and County Road Administration Board (CRAB) grants. County staff has been fairly effective at "tapping" into CRAB funds for both the Rural Arterial Program and the Arterial Preservation Program.
- ***Local Sources:*** In addition to state and federal sources, there are a variety of local revenue sources that can be utilized to fund road projects, the most common of which include: impact fees (at least six counties in Washington now implement transportation impact fees); the countywide motor fuel tax (already in use in Clallam County), local improvement districts, and SEPA mitigation payments.

Because of the nature of the grant programs, few of the projects in the Carlsborg Area, other than the US 101 Corridor, would compete well for grants[3] (other than the Rural Arterial Program under CRAB).That leaves three primary sources of revenue that could potentially be used to address the projects identified in Chapter 6:

- Mitigation Payments;
- A Local or Road Improvement District (LID or RID);
- REET 2; and
- The Transportation Benefit District (TBD) and Vehicle License Tab Fee.

In addition, it is possible to bond revenue sources with fairly consistent revenue "streams" like the TBD to raise more money early in the process and pay it off over time.

[3] There is an exception to this statement. As the Carlsborg Area grows and both congestion and collisions increase (assuming it remains within and Urban Growth Boundary), projects may become more competitive for grant funding.

Mitigation Payments

Mitigation payments are direct payments or improvements made by developers or builders to defray all or part of the impact their projects have on the transportation system. In many cases, the payment or improvement is determined when a project is going through the permit process, typically as a SEPA outcome. For the purposes of this project we estimated mitigation payments by dividing the "trips" on the Carlsborg system into three basic categories – existing, new and pass through. While there is growth in "pass through" trips, that increase in trips is not attributable to development in Carlsborg and is deleted as a relative proportion of improvement projects. Fortunately, most pass through trips are on US 101 and the US 101 improvement projects are listed in the proposed funding scenarios as the responsibility of WSDOT.

According to the transportation model completed as part of this project, there are approximately 6,474 peak hour trips on the Carlsborg system. Of those, 2,843 are new trips and of the new trips, 2,211 are local (see Exhibit 7-3).

Exhibit 7-3: Origin & Destination Trip Table, 2005 & 2025

Origin/Destination	2005	2025	New Trips	New Local Trips
Internal to External	654	1,165	512	512
External to Internal	799	842	43	43
Internal to Internal	545	2,201	1,657	1,657
External to External	1,634	2,266	632	
Total	**3,631**	**6,474**	**2,844**	**2,211**

Source: HW Lochner

If we use impact fees in Washington as a one measure of per trip mitigation payments, a recent survey completed by Lochner established a range of $15 to $14,706.89 for per trip impact fees. Taking out the high and low, the average was approximately $1,520 per peak hour trip. If growth in the Carlsborg area were to occur uniformly and we used the average peak hour mitigation rate, annual mitigation payments would approximate $168,000.

Local/Road Improvement District

Through an LID or RID, state law provides a legal way to pay for the cost of road improvements that provide a special benefit to adjacent property. A group of property owners agrees on the improvement, and the county builds it. Then all the property owners pay for the project, usually over 10 to 20 years. The cost may be allocated based on front footage and area; front footage only; area only; or equal assessment for each parcel.

For the purposes of this project, we assumed an RID/LID would be formed, with a 6% interest rate for 20 years and an average assessed value in the Carlsborg Subarea of $100 million. With a $1.20 assessment per $1,000 or $15 per month on a $150,000 home, and LID/RID could generate approximately $120,000 annually for road improvements in the Carlsborg area.

REET 2

This part of the real estate excise tax (REET 2) may only be levied by cities and counties that are required to or choose to plan under the Growth Management Act. For this quarter percent of the real estate excise tax, "capital project" means those:

> "Public works projects of a local government for planning, acquisition, construction, reconstruction, repair, replacement, rehabilitation, or improvement of streets, roads, highways, sidewalks, street and road lighting systems, traffic signals, bridges, domestic water systems, storm and sanitary sewer systems, and planning, construction, reconstruction, repair, rehabilitation, or improvement of parks." RCW 82.46.035(5).

Note that acquisition of land for parks is not a permitted use of REET 2 receipts, although it is a permitted use for street, water, and sewer projects.

For the purposes of the Carlsborg Area Transportation Study, we assumed $700,000 could be collected county-wide, with one-third going to each of the three county districts and one-third of that going to Carlsborg (1/6 of the total) or approximately $117,000 annually.

Transportation Benefit District

Transportation Benefit Districts (TBD) have been a funding option since 1987, but recently the legislature added a provision that allows cities and counties to impose up to $20 in additional license fees without a vote to fund specific transportation improvement projects (it is unclear at this time how recently passed Initiative 960 will impact the non-voting component of TBDs).

A transportation benefit district is a quasi-municipal corporation and independent taxing district created for the sole purpose of acquiring, construction, improving, providing, and funding transportation improvements within the district.

A TBD can fund any transportation improvement contained in any existing state or regional transportation plan that is necessitated by existing or reasonably foreseeable congestion levels. Revenue options within a TBD include:

- A one year excess levy;
- Up to 0.2% in sales and use tax;
- Up to $100 in annual vehicle fee per vehicle registered in the district; and
- Vehicle tolls.

For the purposes of the Carlsborg Area Transportation Study, we assumed a county-wide TBD would raise $1.2 million annually at the $20 level, with 60% going to the County and 40% going to cities in the County. Of the County portion, we assumed 1/6 would be expended in the Carlsborg area or approximately $120,000 annually.

The following two tables (Exhibits 7-4 & 7-5) demonstrate potential funding scenarios, one assuming no grants funding and one assuming a conservative $1.5 million dollar grant in each of the three funding periods (0-6 years, 7-13 years, 14-20 years).

EXHIBIT 7-3: Revenue & Expense Projection

Project No.	Priority	Revenue Sources	Cost	Short-Term Year 1	Short-Term Year 2	Short-Term Year 3	Short-Term Year 4	Short-Term Year 5	Short-Term Year 6	Six-Year Total	Mid-Term Year 7-13	Long-Term Year 14-20	Total	Unfunded Beyond 20 Years
		REET 2*		$117,000	$117,000	$117,000	$117,000	$117,000	$117,000	**$702,000**	$702,000	$702,000	$2,106,000	
		Transportation Benefit District^		$120,000	$120,000	$120,000	$120,000	$120,000	$120,000	**$720,000**	$720,000	$720,000	$2,160,000	
		Mitigation Payments		$189,000	$189,000	$189,000	$189,000	$189,000	$189,000	**$1,134,000**	$538,000	$538,000	$2,210,000	
		LID/RID		$120,000	$120,000	$120,000	$120,000	$120,000	$120,000	**$720,000**	$720,000	$720,000	$2,160,000	
		WSDOT or Others				$6,740,000				**$6,740,000**	$0	$0	$6,740,000	
		Total		**$546,000**	**$546,000**	**$7,286,000**	**$546,000**	**$546,000**	**$546,000**	**$10,016,000**	**$2,680,000**	**$2,680,000**	**$15,376,000**	
		Short-Term 1-6 Years												
11	**6**	US 101 - Kitchen Dick Ln to Taylor Cutoff	$5,560,000			$5,560,000				**$5,560,000**				
3	**7**	US 101/Carlsborg Road Intersection	$1,180,000			$1,180,000				**$1,180,000**				
1	**1**	Carlsborg Rd/Runnion Rd Intersection	$1,380,000		$1,380,000					**$1,380,000**				
5	**2**	New Spath Rd Connector	$1,080,000					$1,080,000		**$1,080,000**				
		Subtotal A	**$9,200,000**	**$0**	**$1,380,000**	**$6,740,000**	**$0**	**$1,080,000**	**$0**	**$9,200,000**	**$0**	**$0**	**$0**	
		Mid-Term 7-12 Years												
9	**3**	Roupe Rd Connection	$1,530,000							**$0**	$1,530,000		$1,530,000	
7	**4**	Harrison Rd Roupe Rd Connector	$1,010,000						$1,010,000	**$1,010,000**			$3,030,000	
10	**5**	Kirk Rd	$810,000							**$0**		$810,000	$810,000	
		Subtotal B	**$3,350,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$1,010,000**	**$1,010,000**	**$1,530,000**	**$810,000**	**$5,370,000**	
		Long-Term Projects 13-25 Years												
2	**10**	Carlsborg Road Improvements	$3,570,000										$0	$3,570,000
4	**11**	Hooker Road Improvements	$520,000										$0	$520,000
6	**9**	Business Park Loop to Runnion Rd Connector	$360,000									$360,000	$360,000	
8	**12**	Brueckner Rd Extention	$1,830,000										$0	$1,830,000
12	**13**	Winterhawk St - E Runnion Rd Connector	$100,000									$100,000	$100,000	
13	**14**	Taylor Cutoff Rd Extension	$1,530,000										$0	$1,530,000
14	**8**	Spencer Rd Connector	$2,300,000									$2,300,000	$2,300,000	$2,300,000
		Subtotal C	**$10,210,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$2,760,000**	**$2,760,000**	**$9,750,000**
CASH FLOW SUMMARY		**Total**	**$22,760,000**	**$0**	**$1,380,000**	**$6,740,000**	**$0**	**$1,080,000**	**$1,010,000**	**$10,210,000**	**$1,530,000**	**$3,570,000**	**$15,310,000**	
		Revenue - Expense		$546,000	-$834,000	$546,000	$546,000	-$534,000	-$464,000	-$194,000	$956,000	-$890,000	$66,000	
		Surplus/(Debt)		$546,000	-$288,000	$258,000	$804,000	$270,000	-$194,000		$956,000	$66,000		

*Assumes $700,000 annually, countywide, with one-third going to each district and one-sixth going to the Carlsborg Subarea.

^Assumes $1.2 million will be raised countywide at the $20 level, with 60% going to the County, 40% to cities in the County, then one sixth to Carlsborg as stated above.

RID/LID Assumes 6% interest for 20 years with an average assessed value in the Carlsborg Subarea of $100 million and a $1.20 assessment per $1,000 or $15 per month on a $150,000 home.

Right-of-Way costs are not included and all costs are in 2007 dollars.

EXHIBIT 7-4: Revenue & Expense Projection, with limited grant funding.

Project No.	Priority	Revenue Sources	Cost	Short-Term Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Six-Year Total	Mid-Term Year 7-13	Long-Term Year 14-20	20-Year Total	Unfunded Beyond 20 Years
		REET 2*		$117,000	$117,000	$117,000	$117,000	$117,000	$117,000	**$702,000**	$702,000	$702,000	$2,106,000	
		Transportation Benefit District^		$120,000	$120,000	$120,000	$120,000	$120,000	$120,000	**$720,000**	$720,000	$720,000	$2,160,000	
		Mitigation Payments		$189,000	$189,000	$189,000	$189,000	$189,000	$189,000	**$1,134,000**	$538,000	$538,000	$2,210,000	
		LID/RID		$120,000	$120,000	$120,000	$120,000	$120,000	$120,000	**$720,000**	$720,000	$720,000	$2,160,000	
		Grants					$1,500,000			**$1,500,000**	$1,500,000	$1,500,000	$4,500,000	
		WSDOT or Others				$6,740,000				**$6,740,000**	$0	$0	$6,740,000	
		Total		**$546,000**	**$546,000**	**$7,286,000**	**$2,046,000**	**$546,000**	**$546,000**	**$11,516,000**	**$4,180,000**	**$4,180,000**	**$19,876,000**	
		Short-Term 1-6 Years												
11	6	US 101 - Kitchen Dick Ln to Taylor Cutoff	$5,560,000			$5,560,000				**$5,560,000**			$5,560,000	
3	7	US 101/Carlsborg Road Intersection	$1,180,000			$1,180,000				**$1,180,000**			$1,180,000	
1	1	Carlsborg Rd/Runnion Rd Intersection	$1,380,000		$1,380,000					**$1,380,000**			$1,380,000	
5	2	New Spath Rd Connector	$1,080,000				$1,080,000			**$1,080,000**			$1,080,000	
9	3	Roupe Rd Connection	$1,530,000						$1,530,000	**$1,530,000**			$1,530,000	
		Subtotal A	**$10,730,000**	**$0**	**$1,380,000**	**$6,740,000**	**$1,080,000**	**$0**	**$1,530,000**	**$10,730,000**	**$0**	**$0**	**$10,730,000**	
		Mid-Term 7-12 Years												
7	4	Harrison Rd Roupe Rd Connector	$1,010,000						$1,010,000	**$1,010,000**			$1,010,000	
10	5	Kirk Rd	$810,000							**$0**	$810,000		$810,000	
		Subtotal B	**$1,820,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$1,010,000**	**$1,010,000**	**$810,000**	**$0**	**$1,820,000**	
		Long-Term Projects 13-25 Years												
2	10	Carlsborg Road Improvements	$3,570,000									$3,570,000	$3,570,000	
4	11	Hooker Road Improvements	$520,000									$520,000	$520,000	
6	9	Business Park Loop to Runnion Rd Connector	$360,000								$360,000		$0	
8	12	Brueckner Rd Extention	$1,830,000										$0	$1,830,000
12	13	Winterhawk St - E Runnion Rd Connector	$100,000										$0	$100,000
13	14	Taylor Cutoff Rd Extension	$1,530,000										$0	$1,530,000
14	8	Spencer Rd Connector	$2,300,000								$2,300,000		$2,300,000	
		Subtotal C	**$10,210,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$2,660,000**	**$4,090,000**	**$6,390,000**	**$3,460,000**
CASH FLOW SUMMARY		**Total**	**$22,760,000**	**$0**	**$1,380,000**	**$6,740,000**	**$1,080,000**	**$0**	**$2,540,000**	**$11,740,000**	**$3,470,000**	**$4,090,000**	**$19,300,000**	
		Revenue - Expense		$546,000	-$834,000	$546,000	$966,000	$546,000	-$1,994,000	-$224,000	$486,000	$90,000	$576,000	
		Surplus/(Debt)		$546,000	-$288,000	$258,000	$1,224,000	$1,770,000	-$224,000		$486,000	$576,000		

*Assumes $700,000 annually, countywide, with one-third going to each district and one-sixth going to the Carlsborg Subarea.

^Assumes $1.2 million will be raised countywide at the $20 level, with 60% going to the County, 40% to cities in the County, then one sixth to Carlsborg as stated above.

RID/LID Assumes 6% interest for 20 years with an average assessed value in the Carlsborg Subarea of $100 million and a $1.20 assessment per $1,000 or $15 per month on a $150,000 home.

Right-of-Way costs are not included and all costs are in 2007 dollars.

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APPENDIX ONE
Sample Project Sheets

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Exhibit A-1
Carlsborg Rd/Runnion Rd Intersection

Carlsborg Rd/Runnion Rd intersection

Improvement:

Install a traffic signal or roundabout and widen all approaches to three lanes with left-turn pockets at each approach

Anticipated Benefit:

Increases in traffic due to both development along Carlsborg Rd as well as due to rerouted traffic will be accommodated more easily.

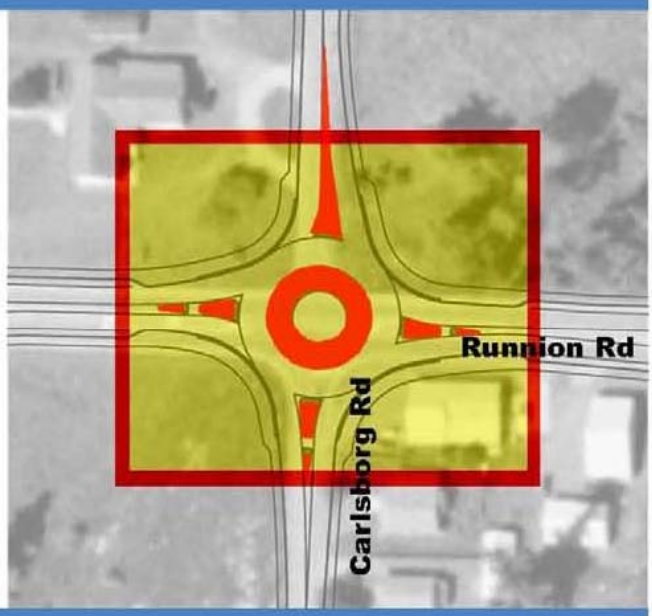


Exhibit A-2
US101 & Carlsborg Rd/Hooker Rd

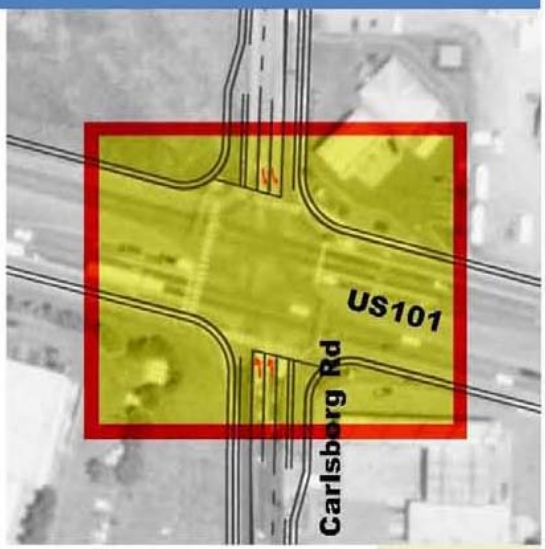
US 101 & Carlsborg Rd/Hooker Rd

Improvement:

Reconstruct roadway from approx. Smithfield Dr to Harrison Rd to provide a double left-turn lane, one through lane, and one right-turn lane for both the NB and SB approaches. This would include reconstruction of the existing traffic signal

Anticipated Benefit:

The additional lanes will accommodate the increases in traffic volume due to both development and rerouted traffic.



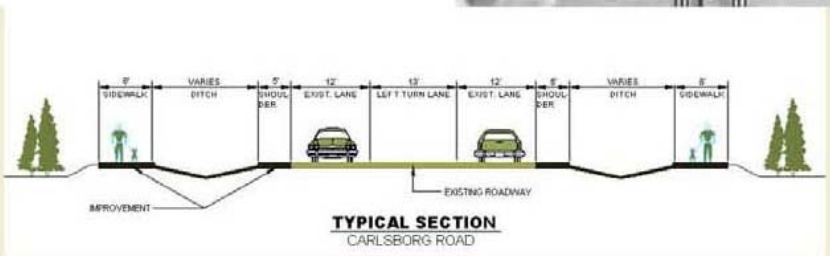


Exhibit A-3

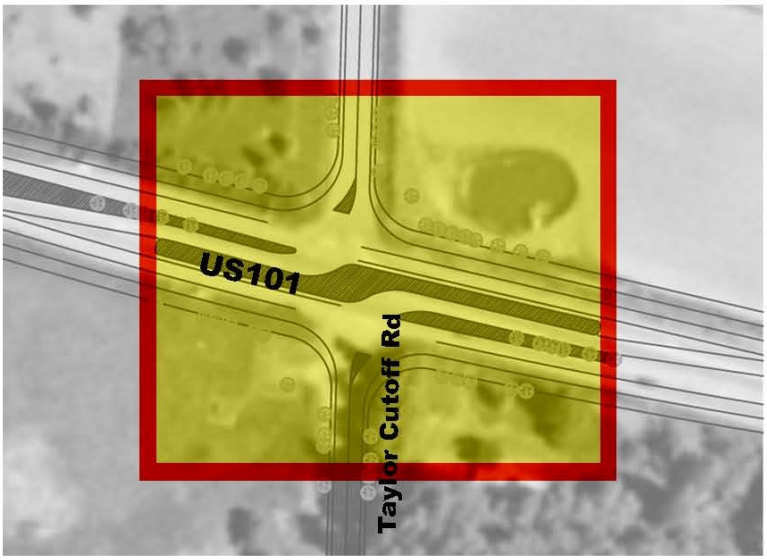
US101 at Kitchen Dick Ln & Taylor Cutoff Rd

Improvement:

- At Kitchen Dick Ln/Kirk Rd, construct a raised traffic island to allow only EB and WB left turns.
- At Taylor Cutoff Rd/Gilbert Rd, construct a raised traffic island to allow only EB and WB left-turns.
- At Mill Rd/Parkwood Blvd, construct a raised traffic island to WB left-turns.

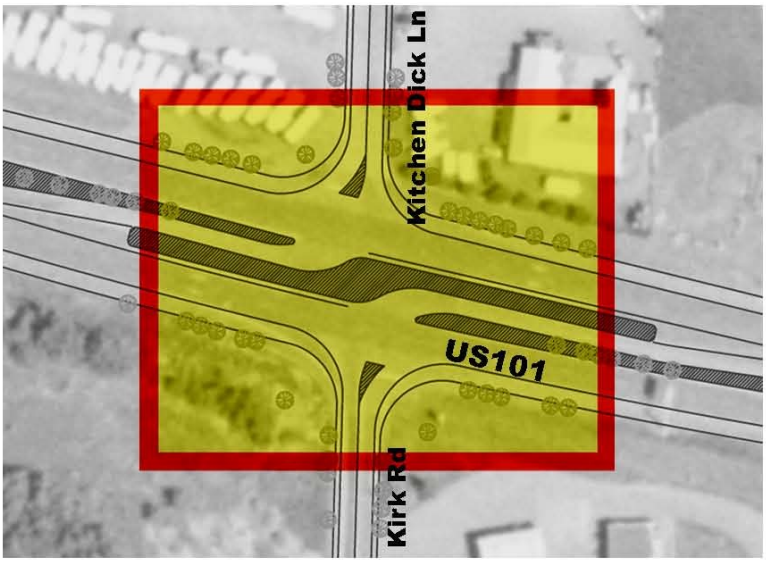
Anticipated Benefit:

Improvements that cause the intersection to fail will be eliminated and access will be managed better, bringing the intersection into LOS compliance.



Existing Intersection
at Taylor Cutoff Rd

Existing Intersection
at Kitchen Dick Ln



APPENDIX TWO

MITIGATION POLICIES

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Draft Development Impact Mitigation Policies
(Existing Clallam County policies included)

Goal – Develop a systematic approach to managing the current transportation system in a comprehensive and cost-effective manner

- **Objective -** Review and monitor the transportation system such that adequate service can be provided to existing and future land use

  Policy – The County will monitor traffic volumes on major roadways to assist in the planning and improvement of transportation facilities.

  Policy – The County will strive to ensure that the current transportation system is consistent with adopted land use plans as well as current land use patterns.

  Policy – The County will periodically re-assess the Land-Use and Transportation Elements of the County's Comprehensive Plan determine if planned facilities coincide with growth and development impacts and vice-versa.

- **Objective -** Balance land use decisions with the County's financial capacity to provide transportation facilities and services

  Policy – The County will establish regulations detailing compatibility between existing and future land use and transportation facilities and will provide the transportation facilities needed in the future based on permissible development as indicated in the comprehensive plan.

  Policy – The County will make land use decisions only after thoroughly considering the short and long term costs that would be incurred by the public for the accompanying transportation facilities necessary to support the new development.

  Policy – The County will actively try to prevent conflicts and impacts from increased travel demand by allocating, when possible, new development to areas where long-term transportation capacity already exists.

  Policy – The County will give priority to transportation demand management and transportation system management over large capital expenditures when mitigating travel demand needs.

Goal – Provide levels-of-service that satisfy current and forecasted travel demand

- **Objective** – Establish levels of service based on the circulation needs of the local and regional transportation network

  Policy – The County will adopt levels of service for roads that are consistent with their functional class.

  Policy – For individual road concurrency, the County will calculate the LOS standard using methodology selected by the county engineer(s).

  Policy – The County will review LOS standards as well as land use designations and intensities when road improvements are not financially or otherwise feasible for that particular land-use designation.

Goal – Establish specific guidelines such that the costs of future transportation improvements are distributed equitably

- **Objective -** In accordance with the GMA, require construction or financial commitments for transportation improvements from the private or public sector entities generating the impact at the time of development or within a six year time-frame

Policy – The County will prohibit new development if *all* of the following are true:

a. the current transportation system cannot accommodate its impacts;

b. the necessary transportation improvements will not be implemented concurrently; and

c. financial backing to actualize the necessary improvements within six years has not been established.

Policy – The County will consider the use of impact fees to set in motion the construction of appropriate transportation facilities to accommodate impacts generated by new development.

Policy – The County, in cooperation with each city in the County, will consider entering into cost sharing arrangements where each Agency shares impact fees collected by the other for impacts to their roads.

Policy – The County will determine the future costs of improvements necessary to mitigate development impacts and their fair and equitable collection.

Policy – If the County cannot finance the necessary transportation improvements by the aforementioned policies, it is entitled to implement one or more the following:

a. Decrease the LOS standard as long as it does not run contrary to the GMA;

b. Find a less expensive alternative or change the improvement scope;

c. Decrease the demand for the service by re-allocating the development or growth elsewhere; and

d. Increase revenue through bonds, new or increased user fees, taxes, and voluntary developer funds.

Existing Policies

3) Public Transportation. Encourage ridership and support transit expansion to reduce single occupant vehicles (SOVs).

(a) **[Policy No. 15]** Develop and adopt transit friendly design standards for high capacity and priority transit corridors. Land use densities in these corridors should support transit usage.

(b) Transit-compatible design standards should apply to new development within one-half mile of an existing transit route or an urban growth area to ensure cohesive and efficient transit service to major commercial, medium to high density residential and public facility development. Clallam Transit System shall be involved in the development review process.

(c) Developers should be given the opportunity to utilize transit credits for their development if located within one-half mile of an existing transit facility in lieu of road capacity (mitigation) improvements.

(d) Promote government/private partnerships in public transportation facilities.

(e) Pursue the Port Angeles Multimodal Transportation Center for most efficient usage as a regional facility.

(f) Encourage public transportation service around the Olympic Loop.

(g) Develop neighborhood-scale park-and-ride lots at Highway 101 junction with collectors. Design lots with bicycle storage facilities on-site.

(h) The supply of transit service shall be consistent with population and employment densities. More service should be provided to urban growth areas and the interconnection of urban growth areas than to rural areas.

(i) Transit level of service should be evaluated according to Clallam Transit System performance criteria and Peninsula Regional Transportation Planning Organization methodology which analyzes supply and demand in terms of passengers per seat, headway, and comparison travel time. Refer to "Transit Demand and Supply LOS Tables" in CCC 31.02.430.

(j) Concurrency for transit level of service shall be met within six (6) years of new development when demand LOS standard is deficient. Supply LOS should be representative of ways to resolve demand deficiencies. However, this concurrency requirement shall be governed by the current financial ability of the transit organization to fund service improvements.

(k) Transit level of service shall have a minimum acceptable level of service of "D" for either supply or demand. Target ranges are set to consider optimum performance efficiency and comfort level for urban, intercity, and rural routes as per table in CCC 31.02.430.

(6) **Finance. [Policy No. 22]** Identify and develop a practical and realistic financial plan that is both adequate and equitable in terms of meeting the needs of the people of Clallam County. Such a plan shall seek to provide efficient and effective services and facilities.

(a) Maximize private funding of transportation facilities and maintenance.

(b) Ensure new development projects contribute a "fair share" of financing transportation improvements needed to accommodate the impacts to the transportation system resulting from new developments. "Fair share" means that existing and new revenue sources to finance transportation system improvements (see CCC 31.02.460) maintains level of service standards adopted in this Plan. If these revenue sources do not maintain level of service standards, then new development must be responsible for funding the balance. "Fair share" also means ensuring that new development projects on roads not meeting minimum safety standards (see Policy No. 10.d, subsection (1)(j)(iv) of this section) adheres to mitigation goals of the County (see Policy No. 23, subsection (7) of this section).

(c) The non-motorized element shall be a part of the funding component of the capital improvement program.

(d) Encourage and support volunteer participation in transportation facility construction and maintenance.

(e) Coordinate Federal, State, and private funding.

(f) Public agencies should coordinate joint projects that would consolidate funding and benefit multiple jurisdictions. Public-private partnerships should also be encouraged.

(g) Spending priorities will be established that recognize the practicable limits of public and private funding sources.

(7) **Mitigation. [Policy No. 23]** Clallam County should require new development to mitigate impacts on transportation facilities which are insufficient to safely handle transportation demands. The County should require new development to rectify and/or compensate for impacts to transportation facilities not meeting minimum safety standards, when reasonable and capable of being accomplished.

Reference Plans:

Kenmore, Yakima, Chelan, Clark, Walla-Walla, Sammamish, Kitsap, Grant

APPENDIX THREE

ESTIMATES OF PROBABLE COST

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PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	1	Date:	6/24/2007
Location & Brief	Runnion Rd & Carlsborg Rd	Date of Cost Index:	2006
Description:	Install traffic signal system and widen all approaches to a 3 lanes.	Calculated By/Entered By:	Y.Z.
		Checked By:	

1

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (urban developed)	SF	$45	-	$0
		RIGHT OF WAY (urban undeveloped)	SF	$20	-	$0
		RELOCATIONS: BUSINESSES	EA	$150,000	-	$0
		RELOCATIONS: RESIDENCES	EA	$110,000	-	$0
		CONDEMNATION PROCEDURE	EA	$100,000	-	$0
		ADMINISTRATION (TITLES, APPRAISALS, ETC.)	EA	$15,000	-	$0
		RIGHT OF WAY TOTAL				**$0**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB,DEMO	ACRE	$6,000	0.4	$2,400
		REMOVING EXISTING PAVEMENT	SY	$10	-	$0
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$0	1	$0
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	1,300	$26,000
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$16	1,800	$28,800
		EMBANKMENT COMPACTION	CY	$2	1,000	$2,000
	1.3	**STORMWATER MITIGATION**				
		DETENTION AND TREATMENT	SF	$6	-	$0
	1.4	**STORM SEWER**				
		CATCH BASIN TYPE 1	EA	$1,200	-	$0
		CATCH BASIN TYPE 2	EA	$2,200	-	$0
		PLAIN CONC. STORM SEWER PIPE 12 IN. DIAM.	LF	$35	-	$0
		PLAIN CONC. STORM SEWER PIPE 18 IN. DIAM.	LF	$45	-	$0
		STRUCTURE EXCAVATION CL. B	CY	$15	900	$13,500
2		**STRUCTURE**				
		CONCRETE BRIDGES	LS	$0	-	$0
		CONCRETE BRIDGES WIDENING	LS	$0	-	$0
		PEDESTRIAN BRIDGES	SF	$400	-	$0
		STEEL BRIDGES	LS	$0	-	$0
		BRIDGE ABUTMENT RETROFIT	SF	$150	-	$0
		RETAINING WALLS (Cast in Place)	SF	$65	-	$0
		RETAINING WALLS (Soil Nail with Cast in Place Facing)	SF	$210	-	$0
		BRIDGE REMOVAL	SF	$30	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$10	-	$0
		HOT MIX ASPHALT	TON	$65	500	$32,500
		CRUSHED SURFACING	TON	$25	400	$10,000
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	-	$0
		SEEDING, MULCHING & FERTILIZING	ACRE	$2,000	1.2	$2,400
		WETLAND MITIGATION	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL (6%)	LS	$0	1	$0
		LANDSCAPING	LS	$56,000	1	$56,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$20	400	$8,000
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$170,000	1	$170,000
		ILLUMINATION	LS	$26,000	1	$26,000
		SIGNING	LS	$5,000	1	$5,000
		CURBS	LF	$15	-	$0
		SIDEWALKS	SY	$25	2,000	$50,000

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	1	Date:	6/24/2007
Location & Brief	Runnion Rd & Carlsborg Rd	Date of Cost Index:	2006
Description:	Install traffic signal system and widen all approaches to a 3 lanes.	Calculated By/Entered By:	Y.Z.
		Checked By:	

1

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
		ITS FOR HOT-LANES	LS	$0	1	$0
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL (10%)	LS	$43,300	1	$43,300
5.1		**OTHER ITEMS**				
		SURVEYING (2%)	LS	$9,600	1	$9,600
		SPECIAL ITEMS	EST	$5,000	1	$5,000
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$490,500**
7		**MOBILIZATION (10%)**				
		10% OF ITEM 7	EST	$49,100	1	$49,100
8		**SUBTOTAL (ITEMS 7 & 8)**				**$539,600**
9		**SALES TAX**				
		9.3% OF ITEM 9	EST	$50,200	1	$50,200
10		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
11		**SUBTOTAL (ITEMS 9 THRU 11)**				**$589,800**
12		**CONSTRUCTION**				
		ENGINEERING (15% OF ITEM 12)	EST	$89,000	1	$89,000
13		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$678,800**
III.		**PRELIMINARY WORK**				
		PRELIMINARY ENGINEERING (15.0% OF ITEM 14)	EST	$101,900	1	$101,900
		REGIONAL ITS FACILITY (0.5% OF ITEM 14)	EST	$3,400	1	$3,400
		ENVIRONMENTAL PERMITS	EST	$0	1	$0
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$790,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.00%	2010	2006	**$790,000**

The above opinion of cost is a planning level estimate only. It is based on best available information and scope at the time, not on the results of a detailed engineering study, and is supplied as a budgeting guide only. H.W. Lochner, Inc. does not guarantee or warrant the accuracy of this planning level estimate.

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	1	Date:	6/26/2007
Location:	Carlsborg Rd &Runnion Rd	Date of Cost Index:	2006
	install roundabout	Calculated By/Entered By:	Y.Z
		Checked By:	

1

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (urban developed)	SF	$45	-	$0
		RIGHT OF WAY (urban undeveloped)	SF	$20	-	$0
		RELOCATIONS: BUSINESSES	EA	$150,000	-	$0
		RELOCATIONS: RESIDENCES	EA	$110,000	-	$0
		CONDEMNATION PROCEDURE	EA	$100,000	-	$0
		ADMINISTRATION (TITLES, APPRAISALS, ETC.)	EA	$15,000	-	$0
		RIGHT OF WAY TOTAL				**$0**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB,DEMO	ACRE	$6,000	0.4	$2,400
		REMOVING EXISTING PAVEMENT	SY	$10	-	$0
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$20,000	1	$20,000
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	1,400	$28,000
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$16	1,900	$30,400
		EMBANKMENT COMPACTION	CY	$2	1,100	$2,200
	1.3	**STORMWATER MITIGATION**				
		DETENTION AND TREATMENT	SF	$6	-	$0
	1.4	**STORM SEWER**				
		CATCH BASIN TYPE 1	EA	$1,200	-	$0
		CATCH BASIN TYPE 2	EA	$2,200	-	$0
		PLAIN CONC. STORM SEWER PIPE 12 IN. DIAM.	LF	$35	-	$0
		PLAIN CONC. STORM SEWER PIPE 18 IN. DIAM.	LF	$45	-	$0
		STRUCTURE EXCAVATION CL. B	CY	$15	800	$12,000
2		**STRUCTURE**				
		CONCRETE BRIDGES	LS	$0	-	$0
		CONCRETE BRIDGES WIDENING	LS	$0	-	$0
		PEDESTRIAN BRIDGES	SF	$400	-	$0
		STEEL BRIDGES	LS	$0	-	$0
		BRIDGE ABUTMENT RETROFIT	SF	$150	-	$0
		RETAINING WALLS (Cast in Place)	SF	$65	-	$0
		RETAINING WALLS (Soil Nail with Cast in Place Facing)	SF	$210	-	$0
		BRIDGE REMOVAL	SF	$30	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$10	-	$0
		HOT MIX ASPHALT	TON	$65	1,400	$91,000
		CRUSHED SURFACING	TON	$25	1,300	$32,500
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	-	$0
		SEEDING, MULCHING & FERTILIZING	ACRE	$2,000	0.6	$1,200
		WETLAND MITIGATION	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL (6%)	LS	$19,000	1	$19,000
		LANDSCAPING	LS	$11,000	1	$11,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$20	800	$16,000
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$0	1	$0
		ILLUMINATION	LS	$16,000	1	$16,000
		SIGNING	LS	$10,000	1	$10,000
		CURB & GUTTER	LF	$15	-	$0
		SIDEWALKS	SY	$25	1,300	$32,500

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	1	Date:	6/26/2007
Location:	Carlsborg Rd &Runnion Rd	Date of Cost Index:	2006
	install roundabout	Calculated By/Entered By:	Y.Z
		Checked By:	

1

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
		ITS FOR HOT-LANES	LS	$0	1	$0
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL (10%)	LS	$32,500	1	$32,500
5.1		**OTHER ITEMS**				
		SURVEYING (2%)	LS	$7,200	1	$7,200
		SPECIAL ITEMS	EST	$5,000	1	$5,000
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$368,900**
7		**MOBILIZATION (10%)**				
		10% OF ITEM 7	EST	$36,900	1	$36,900
8		**SUBTOTAL (ITEMS 7 & 8)**				**$405,800**
9		**SALES TAX**				
		9.3% OF ITEM 9	EST	$37,800	1	$37,800
10		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
11		**SUBTOTAL (ITEMS 9 THRU 11)**				**$443,600**
12		**CONSTRUCTION**				
		ENGINEERING (15% OF ITEM 12)	EST	$67,000	1	$67,000
13		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$510,600**
III.		**PRELIMINARY WORK**				
		PRELIMINARY ENGINEERING (15.0% OF ITEM 14)	EST	$76,600	1	$76,600
		REGIONAL ITS FACILITY (0.5% OF ITEM 14)	EST	$2,600	1	$2,600
		ENVIRONMENTAL PERMITS	EST	$0	1	$0
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$590,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.00%	2010	2006	**$590,000**

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PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	2	Date:	6/24/2007
Location & Brief	Carlsborg Rd	Date of Cost Index:	2006
Description:	Install 7400' Bike lanes and sidewalks from Smithfield Drive to Old Olympic Hwy	Calculated By/Entered By:	Y.Z.
		Checked By:	

2

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (urban developed)	SF	$45	-	$0
		RIGHT OF WAY (urban undeveloped)	SF	$20	-	$0
		RELOCATIONS: BUSINESSES	EA	$150,000	-	$0
		RELOCATIONS: RESIDENCES	EA	$110,000	-	$0
		CONDEMNATION PROCEDURE	EA	$100,000	-	$0
		ADMINISTRATION (TITLES, APPRAISALS, ETC.)	EA	$15,000	-	$0
		RIGHT OF WAY TOTAL				**$0**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB,DEMO	ACRE	$6,000	3.4	$20,400
		REMOVING EXISTING PAVEMENT	SY	$10	-	$0
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$50,000	1	$50,000
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	13,900	$278,000
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$16	19,300	$308,800
		EMBANKMENT COMPACTION	CY	$2	10,500	$21,000
	1.3	**STORMWATER MITIGATION**				
		DETENTION AND TREATMENT	SF	$6	-	$0
	1.4	**STORM SEWER**				
		CATCH BASIN TYPE 1	EA	$1,200	-	$0
		CATCH BASIN TYPE 2	EA	$2,200	-	$0
		PLAIN CONC. STORM SEWER PIPE 12 IN. DIAM.	LF	$35	-	$0
		PLAIN CONC. STORM SEWER PIPE 18 IN. DIAM.	LF	$45	-	$0
		STRUCTURE EXCAVATION CL. B	CY	$15	5,500	$82,500
2		**STRUCTURE**				
		CONCRETE BRIDGES	LS	$0	-	$0
		CONCRETE BRIDGES WIDENING	LS	$0	-	$0
		PEDESTRIAN BRIDGES	SF	$400	-	$0
		STEEL BRIDGES	LS	$0	-	$0
		BRIDGE ABUTMENT RETROFIT	SF	$150	-	$0
		RETAINING WALLS (Cast in Place)	SF	$65	-	$0
		RETAINING WALLS (Soil Nail with Cast in Place Facing)	SF	$210	-	$0
		BRIDGE REMOVAL	SF	$30	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$10	-	$0
		HOT MIX ASPHALT	TON	$65	3,100	$201,500
		CRUSHED SURFACING	TON	$25	3,000	$75,000
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	-	$0
		SEEDING, MULCHING & FERTILIZING	ACRE	$2,000	5.5	$11,000
		WETLAND MITIGATION	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL (6%)	LS	$109,000	1	$109,000
		LANDSCAPING	LS	$153,000	1	$153,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$20	3,700	$74,000
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$250,000	1	$250,000
		ILLUMINATION	LS	$0	1	$0
		SIGNING	LS	$15,000	1	$15,000
		CURBS	LF	$15	-	$0
		SIDEWALKS	SY	$25	10,900	$272,500
		ITS FOR HOT-LANES	LS	$0	1	$0

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	2	Date:	6/24/2007
Location & Brief	Carlsborg Rd	Date of Cost Index:	2006
Description:	Install 7400' Bike lanes and sidewalks from Smithfield Drive to Old Olympic Hwy	Calculated By/Entered By:	Y.Z.
		Checked By:	

2

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL (10%)	LS	$192,200	1	$192,200
5.1		**OTHER ITEMS**				
		SURVEYING (2%)	LS	$42,300	1	$42,300
		SPECIAL ITEMS	EST	$5,000	1	$5,000
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$2,161,200**
7		**MOBILIZATION (10%)**				
		10% OF ITEM 7	EST	$216,200	1	$216,200
8		**SUBTOTAL (ITEMS 7 & 8)**				**$2,377,400**
9		**SALES TAX**				
		9.3% OF ITEM 9	EST	$221,100	1	$221,100
10		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
11		**SUBTOTAL (ITEMS 9 THRU 11)**				**$2,598,500**
12		**CONSTRUCTION**				
		ENGINEERING (15% OF ITEM 12)	EST	$390,000	1	$390,000
13		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$2,988,500**
III.		**PRELIMINARY WORK**				
		PRELIMINARY ENGINEERING (15.0% OF ITEM 14)	EST	$448,300	1	$448,300
		REGIONAL ITS FACILITY (0.5% OF ITEM 14)	EST	$15,000	1	$15,000
		ENVIRONMENTAL PERMITS	EST	$0	1	$0
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$3,460,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.00%	2010	2006	**$3,460,000**

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PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	3	Date:	6/24/2007
Location & Brief	Carlsborg Rd & US 101	Date of Cost Index:	2006
Description:	Install additional SBL, SBR, NBL and NBR pockets	Calculated By/Entered By:	Y.Z.
		Checked By:	

3

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (urban developed)	SF	$45	-	$0
		RIGHT OF WAY (urban undeveloped)	SF	$20	-	$0
		RELOCATIONS: BUSINESSES	EA	$150,000	-	$0
		RELOCATIONS: RESIDENCES	EA	$110,000	-	$0
		CONDEMNATION PROCEDURE	EA	$100,000	-	$0
		ADMINISTRATION (TITLES, APPRAISALS, ETC.)	EA	$15,000	-	$0
		RIGHT OF WAY TOTAL				**$0**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB,DEMO	ACRE	$6,000	0.5	$3,000
		REMOVING EXISTING PAVEMENT	SY	$10	-	$0
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$30,000	1	$30,000
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	1,900	$38,000
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$16	3,500	$56,000
		EMBANKMENT COMPACTION	CY	$2	1,900	$3,800
	1.3	**STORMWATER MITIGATION**				
		DETENTION AND TREATMENT	SF	$6	-	$0
	1.4	**STORM SEWER**				
		CATCH BASIN TYPE 1	EA	$1,200	-	$0
		CATCH BASIN TYPE 2	EA	$2,200	-	$0
		PLAIN CONC. STORM SEWER PIPE 12 IN. DIAM.	LF	$35	-	$0
		PLAIN CONC. STORM SEWER PIPE 18 IN. DIAM.	LF	$45	-	$0
		STRUCTURE EXCAVATION CL. B	CY	$15	1,400	$21,000
2		**STRUCTURE**				
		CONCRETE BRIDGES	LS	$0	-	$0
		CONCRETE BRIDGES WIDENING	LS	$0	-	$0
		PEDESTRIAN BRIDGES	SF	$400	-	$0
		STEEL BRIDGES	LS	$0	-	$0
		BRIDGE ABUTMENT RETROFIT	SF	$150	-	$0
		RETAINING WALLS (Cast in Place)	SF	$65	-	$0
		RETAINING WALLS (Soil Nail with Cast in Place Facing)	SF	$210	-	$0
		BRIDGE REMOVAL	SF	$30	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$10	-	$0
		HOT MIX ASPHALT	TON	$65	1,900	$123,500
		CRUSHED SURFACING	TON	$25	1,800	$45,000
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	-	$0
		SEEDING, MULCHING & FERTILIZING	ACRE	$2,000	0.8	$1,600
		WETLAND MITIGATION	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL (6%)	LS	$37,000	1	$37,000
		LANDSCAPING	LS	$19,000	1	$19,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$20	1,800	$36,000
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$170,000	1	$170,000
		ILLUMINATION	LS	$32,000	1	$32,000
		SIGNING	LS	$10,000	1	$10,000
		CURBS	LF	$15	-	$0
		SIDEWALKS	SY	$25	1,000	$25,000

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	3	Date:	6/24/2007
Location & Brief	Carlsborg Rd & US 101	Date of Cost Index:	2006
Description:	Install additional SBL, SBR, NBL and NBR pockets	Calculated By/Entered By:	Y.Z.
		Checked By:	

3

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
		ITS FOR HOT-LANES	LS	$0	1	$0
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL (10%)	LS	$65,100	1	$65,100
5.1		**OTHER ITEMS**				
		SURVEYING (2%)	LS	$14,400	1	$14,400
		SPECIAL ITEMS	EST	$5,000	1	$5,000
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$735,400**
7		**MOBILIZATION (10%)**				
		10% OF ITEM 7	EST	$73,600	1	$73,600
8		**SUBTOTAL (ITEMS 7 & 8)**				**$809,000**
9		**SALES TAX**				
		9.3% OF ITEM 9	EST	$75,300	1	$75,300
10		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
11		**SUBTOTAL (ITEMS 9 THRU 11)**				**$884,300**
12		**CONSTRUCTION**				
		ENGINEERING (15% OF ITEM 12)	EST	$133,000	1	$133,000
13		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$1,017,300**
III.		**PRELIMINARY WORK**				
		PRELIMINARY ENGINEERING (15.0% OF ITEM 14)	EST	$152,600	1	$152,600
		REGIONAL ITS FACILITY (0.5% OF ITEM 14)	EST	$5,100	1	$5,100
		ENVIRONMENTAL PERMITS	EST	$0	1	$0
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$1,180,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.00%	2010	2006	**$1,180,000**

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PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	4	Date:	6/24/2007
Location & Brief	Hooker Road	Date of Cost Index:	2006
Description:	Install 1100' Bike lanes and sidewalks	Calculated By/Entered By:	Y.Z.
	from Harrison Rd to Atterberry Road	Checked By:	

4

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (urban developed)	SF	$45	-	$0
		RIGHT OF WAY (urban undeveloped)	SF	$20	-	$0
		RELOCATIONS: BUSINESSES	EA	$150,000	-	$0
		RELOCATIONS: RESIDENCES	EA	$110,000	-	$0
		CONDEMNATION PROCEDURE	EA	$100,000	-	$0
		ADMINISTRATION (TITLES, APPRAISALS, ETC.)	EA	$15,000	-	$0
		RIGHT OF WAY TOTAL				**$0**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB,DEMO	ACRE	$6,000	0.6	$3,600
		REMOVING EXISTING PAVEMENT	SY	$10	-	$0
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$25,000	1	$25,000
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	2,100	$42,000
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$16	2,900	$46,400
		EMBANKMENT COMPACTION	CY	$2	1,600	$3,200
	1.3	**STORMWATER MITIGATION**				
		DETENTION AND TREATMENT	SF	$6	-	$0
	1.4	**STORM SEWER**				
		CATCH BASIN TYPE 1	EA	$1,200	-	$0
		CATCH BASIN TYPE 2	EA	$2,200	-	$0
		PLAIN CONC. STORM SEWER PIPE 12 IN. DIAM.	LF	$35	-	$0
		PLAIN CONC. STORM SEWER PIPE 18 IN. DIAM.	LF	$45	-	$0
		STRUCTURE EXCAVATION CL. B	CY	$15	900	$13,500
2		**STRUCTURE**				
		CONCRETE BRIDGES	LS	$0	-	$0
		CONCRETE BRIDGES WIDENING	LS	$0	-	$0
		PEDESTRIAN BRIDGES	SF	$400	-	$0
		STEEL BRIDGES	LS	$0	-	$0
		BRIDGE ABUTMENT RETROFIT	SF	$150	-	$0
		RETAINING WALLS (Cast in Place)	SF	$65	-	$0
		RETAINING WALLS (Soil Nail with Cast in Place Facing)	SF	$210	-	$0
		BRIDGE REMOVAL	SF	$30	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$10	-	$0
		HOT MIX ASPHALT	TON	$65	500	$32,500
		CRUSHED SURFACING	TON	$25	500	$12,500
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	-	$0
		SEEDING, MULCHING & FERTILIZING	ACRE	$2,000	1.0	$2,000
		WETLAND MITIGATION	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL (6%)	LS	$17,000	1	$17,000
		LANDSCAPING	LS	$23,000	1	$23,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$20	600	$12,000
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$0	1	$0
		ILLUMINATION	LS	$0	1	$0
		SIGNING	LS	$10,000	1	$10,000
		CURBS	LF	$15	-	$0
		SIDEWALKS	SY	$25	1,700	$42,500

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	4	Date:	6/24/2007
Location & Brief	Hooker Road	Date of Cost Index:	2006
Description:	Install 1100' Bike lanes and sidewalks	Calculated By/Entered By:	Y.Z.
	from Harrison Rd to Atterberry Road	Checked By:	

4

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
		ITS FOR HOT-LANES	LS	$0	1	$0
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL (10%)	LS	$28,600	1	$28,600
5.1		**OTHER ITEMS**				
		SURVEYING (2%)	LS	$6,300	1	$6,300
		SPECIAL ITEMS	EST	$5,000	1	$5,000
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$325,100**
7		**MOBILIZATION (10%)**				
		10% OF ITEM 7	EST	$32,600	1	$32,600
8		**SUBTOTAL (ITEMS 7 & 8)**				**$357,700**
9		**SALES TAX**				
		9.3% OF ITEM 9	EST	$33,300	1	$33,300
10		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
11		**SUBTOTAL (ITEMS 9 THRU 11)**				**$391,000**
12		**CONSTRUCTION**				
		ENGINEERING (15% OF ITEM 12)	EST	$59,000	1	$59,000
13		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$450,000**
III.		**PRELIMINARY WORK**				
		PRELIMINARY ENGINEERING (15.0% OF ITEM 14)	EST	$67,500	1	$67,500
		REGIONAL ITS FACILITY (0.5% OF ITEM 14)	EST	$2,300	1	$2,300
		ENVIRONMENTAL PERMITS	EST	$0	1	$0
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$520,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.00%	2010	2006	**$520,000**

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PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	5	Date:	6/24/2007
Location & Brief	New Connector to W Runnion Rd	Date of Cost Index:	2006
Description:	Install 1870' 2 lane major collector	Calculated By/Entered By:	Y.Z.
		Checked By:	

5

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (urban developed)	SF	$45	-	$0
		RIGHT OF WAY (urban undeveloped)	SF	$20	-	$0
		RELOCATIONS: BUSINESSES	EA	$150,000	-	$0
		RELOCATIONS: RESIDENCES	EA	$110,000	-	$0
		CONDEMNATION PROCEDURE	EA	$100,000	-	$0
		ADMINISTRATION (TITLES, APPRAISALS, ETC.)	EA	$15,000	-	$0
		RIGHT OF WAY TOTAL				**$0**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB,DEMO	ACRE	$6,000	2.4	$14,400
		REMOVING EXISTING PAVEMENT	SY	$10	400	$4,000
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$30,000	1	$30,000
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	5,100	$102,000
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$16	2,400	$38,400
		EMBANKMENT COMPACTION	CY	$2	1,300	$2,600
	1.3	**STORMWATER MITIGATION**				
		DETENTION AND TREATMENT	SF	$6	-	$0
	1.4	**STORM SEWER**				
		CATCH BASIN TYPE 1	EA	$1,200	-	$0
		CATCH BASIN TYPE 2	EA	$2,200	-	$0
		PLAIN CONC. STORM SEWER PIPE 12 IN. DIAM.	LF	$35	-	$0
		PLAIN CONC. STORM SEWER PIPE 18 IN. DIAM.	LF	$45	-	$0
		STRUCTURE EXCAVATION CL. B	CY	$15	1,400	$21,000
2		**STRUCTURE**				
		CONCRETE BRIDGES	LS	$0	-	$0
		CONCRETE BRIDGES WIDENING	LS	$0	-	$0
		PEDESTRIAN BRIDGES	SF	$400	-	$0
		STEEL BRIDGES	LS	$0	-	$0
		BRIDGE ABUTMENT RETROFIT	SF	$150	-	$0
		RETAINING WALLS (Cast in Place)	SF	$65	-	$0
		RETAINING WALLS (Soil Nail with Cast in Place Facing)	SF	$210	-	$0
		BRIDGE REMOVAL	SF	$30	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$10	-	$0
		HOT MIX ASPHALT	TON	$65	2,500	$162,500
		CRUSHED SURFACING	TON	$25	2,400	$60,000
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	-	$0
		SEEDING, MULCHING & FERTILIZING	ACRE	$2,000	3.3	$6,600
		WETLAND MITIGATION	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL (6%)	LS	$34,000	1	$34,000
		LANDSCAPING	LS	$65,000	1	$65,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$20	1,900	$38,000
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$0	1	$0
		ILLUMINATION	LS	$0	1	$0
		SIGNING	LS	$15,000	1	$15,000
		CURBS	LF	$15	-	$0
		SIDEWALKS	SY	$25	-	$0

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	5	Date:	6/24/2007
Location & Brief	New Connector to W Runnion Rd	Date of Cost Index:	2006
Description:	Install 1870' 2 lane major collector	Calculated By/Entered By:	Y.Z.
		Checked By:	

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		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
		ITS FOR HOT-LANES	LS	$0	1	$0
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL (10%)	LS	$59,400	1	$59,400
5.1		**OTHER ITEMS**				
		SURVEYING (2%)	LS	$13,100	1	$13,100
		SPECIAL ITEMS	EST	$5,000	1	$5,000
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$671,000**
7		**MOBILIZATION (10%)**				
		10% OF ITEM 7	EST	$67,100	1	$67,100
8		**SUBTOTAL (ITEMS 7 & 8)**				**$738,100**
9		**SALES TAX**				
		9.3% OF ITEM 9	EST	$68,700	1	$68,700
10		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
11		**SUBTOTAL (ITEMS 9 THRU 11)**				**$806,800**
12		**CONSTRUCTION**				
		ENGINEERING (15% OF ITEM 12)	EST	$122,000	1	$122,000
13		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$928,800**
III.		**PRELIMINARY WORK**				
		PRELIMINARY ENGINEERING (15.0% OF ITEM 14)	EST	$139,400	1	$139,400
		REGIONAL ITS FACILITY (0.5% OF ITEM 14)	EST	$4,700	1	$4,700
		ENVIRONMENTAL PERMITS	EST	$0	1	$0
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$1,080,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.00%	2010	2006	**$1,080,000**

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PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	6	Date:	6/24/2007
Location & Brief	Business Park Loop to E Runnion Rd	Date of Cost Index:	2006
Description:	Install 550' 2 lane minor collector	Calculated By/Entered By:	Y.Z.
		Checked By:	

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		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (urban developed)	SF	$45	-	$0
		RIGHT OF WAY (urban undeveloped)	SF	$20	-	$0
		RELOCATIONS: BUSINESSES	EA	$150,000	-	$0
		RELOCATIONS: RESIDENCES	EA	$110,000	-	$0
		CONDEMNATION PROCEDURE	EA	$100,000	-	$0
		ADMINISTRATION (TITLES, APPRAISALS, ETC.)	EA	$15,000	-	$0
		RIGHT OF WAY TOTAL				**$0**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB,DEMO	ACRE	$6,000	0.7	$4,200
		REMOVING EXISTING PAVEMENT	SY	$10	-	$0
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$15,000	1	$15,000
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	1,500	$30,000
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$16	800	$12,800
		EMBANKMENT COMPACTION	CY	$2	400	$800
	1.3	**STORMWATER MITIGATION**				
		DETENTION AND TREATMENT	SF	$6	-	$0
	1.4	**STORM SEWER**				
		CATCH BASIN TYPE 1	EA	$1,200	-	$0
		CATCH BASIN TYPE 2	EA	$2,200	-	$0
		PLAIN CONC. STORM SEWER PIPE 12 IN. DIAM.	LF	$35	-	$0
		PLAIN CONC. STORM SEWER PIPE 18 IN. DIAM.	LF	$45	-	$0
		STRUCTURE EXCAVATION CL. B	CY	$15	500	$7,500
2		**STRUCTURE**				
		CONCRETE BRIDGES	LS	$0	-	$0
		CONCRETE BRIDGES WIDENING	LS	$0	-	$0
		PEDESTRIAN BRIDGES	SF	$400	-	$0
		STEEL BRIDGES	LS	$0	-	$0
		BRIDGE ABUTMENT RETROFIT	SF	$150	-	$0
		RETAINING WALLS (Cast in Place)	SF	$65	-	$0
		RETAINING WALLS (Soil Nail with Cast in Place Facing)	SF	$210	-	$0
		BRIDGE REMOVAL	SF	$30	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$10	-	$0
		HOT MIX ASPHALT	TON	$65	800	$52,000
		CRUSHED SURFACING	TON	$25	700	$17,500
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	-	$0
		SEEDING, MULCHING & FERTILIZING	ACRE	$2,000	1.0	$2,000
		WETLAND MITIGATION	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL (6%)	LS	$11,000	1	$11,000
		LANDSCAPING	LS	$19,000	1	$19,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$20	600	$12,000
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$0	1	$0
		ILLUMINATION	LS	$0	1	$0
		SIGNING	LS	$10,000	1	$10,000
		CURBS	LF	$15	-	$0
		SIDEWALKS	SY	$25	-	$0

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	6	Date:	6/24/2007
Location & Brief	Business Park Loop to E Runnion Rd	Date of Cost Index:	2006
Description:	Install 550' 2 lane minor collector	Calculated By/Entered By:	Y.Z.
		Checked By:	

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		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
		ITS FOR HOT-LANES	LS	$0	1	$0
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL (10%)	LS	$19,400	1	$19,400
5.1		**OTHER ITEMS**				
		SURVEYING (2%)	LS	$4,300	1	$4,300
		SPECIAL ITEMS	EST	$5,000	1	$5,000
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$222,500**
7		**MOBILIZATION (10%)**				
		10% OF ITEM 7	EST	$22,300	1	$22,300
8		**SUBTOTAL (ITEMS 7 & 8)**				**$244,800**
9		**SALES TAX**				
		9.3% OF ITEM 9	EST	$22,800	1	$22,800
10		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
11		**SUBTOTAL (ITEMS 9 THRU 11)**				**$267,600**
12		**CONSTRUCTION**				
		ENGINEERING (15% OF ITEM 12)	EST	$41,000	1	$41,000
13		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$308,600**
III.		**PRELIMINARY WORK**				
		PRELIMINARY ENGINEERING (15.0% OF ITEM 14)	EST	$46,300	1	$46,300
		REGIONAL ITS FACILITY (0.5% OF ITEM 14)	EST	$1,600	1	$1,600
		ENVIRONMENTAL PERMITS	EST	$0	1	$0
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$360,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.00%	2010	2006	**$360,000**

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PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	7	Date:	6/24/2007
Location & Brief	Harrison Rd to Roupe Rd	Date of Cost Index:	2006
Description:	Install 1200' 2 lane minor collector, install new intersection at US 101	Calculated By/Entered By:	Y.Z.
		Checked By:	

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		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (urban developed)	SF	$45	-	$0
		RIGHT OF WAY (urban undeveloped)	SF	$20	-	$0
		RELOCATIONS: BUSINESSES	EA	$150,000	-	$0
		RELOCATIONS: RESIDENCES	EA	$110,000	-	$0
		CONDEMNATION PROCEDURE	EA	$100,000	-	$0
		ADMINISTRATION (TITLES, APPRAISALS, ETC.)	EA	$15,000	-	$0
		RIGHT OF WAY TOTAL				**$0**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB,DEMO	ACRE	$6,000	1.6	$9,600
		REMOVING EXISTING PAVEMENT	SY	$10	-	$0
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$10,000	1	$10,000
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	3,300	$66,000
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$16	1,600	$25,600
		EMBANKMENT COMPACTION	CY	$2	900	$1,800
	1.3	**STORMWATER MITIGATION**				
		DETENTION AND TREATMENT	SF	$6	-	$0
	1.4	**STORM SEWER**				
		CATCH BASIN TYPE 1	EA	$1,200	7	$8,400
		CATCH BASIN TYPE 2	EA	$2,200	3	$6,600
		PLAIN CONC. STORM SEWER PIPE 12 IN. DIAM.	LF	$35	1,320	$46,200
		PLAIN CONC. STORM SEWER PIPE 18 IN. DIAM.	LF	$45	1,320	$59,400
		STRUCTURE EXCAVATION CL. B	CY	$15	1,900	$28,500
2		**STRUCTURE**				
		CONCRETE BRIDGES	LS	$0	-	$0
		CONCRETE BRIDGES WIDENING	LS	$0	-	$0
		PEDESTRIAN BRIDGES	SF	$400	-	$0
		STEEL BRIDGES	LS	$0	-	$0
		BRIDGE ABUTMENT RETROFIT	SF	$150	-	$0
		RETAINING WALLS (Cast in Place)	SF	$65	-	$0
		RETAINING WALLS (Soil Nail with Cast in Place Facing)	SF	$210	-	$0
		BRIDGE REMOVAL	SF	$30	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$10	-	$0
		HOT MIX ASPHALT	TON	$65	1,500	$97,500
		CRUSHED SURFACING	TON	$25	1,400	$35,000
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	-	$0
		SEEDING, MULCHING & FERTILIZING	ACRE	$2,000	2.2	$4,400
		WETLAND MITIGATION	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL (6%)	LS	$32,000	1	$32,000
		LANDSCAPING	LS	$42,000	1	$42,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$20	1,200	$24,000
		CONCRETE BARRIER	LF	$65	1	$65
		SIGNAL SYSTEMS	LS	$0	1	$0
		ILLUMINATION	LS	$0	1	$0
		SIGNING	LS	$15,000	1	$15,000
		CURBS	LF	$15	-	$0
		SIDEWALKS	SY	$25	1,800	$45,000

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	7	Date:	6/24/2007
Location & Brief	Harrison Rd to Roupe Rd	Date of Cost Index:	2006
Description:	Install 1200' 2 lane minor collector, install new intersection at US 101	Calculated By/Entered By:	Y.Z.
		Checked By:	

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		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
		ITS FOR HOT-LANES	LS	$0	1	$0
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL (10%)	LS	$55,800	1	$55,800
5.1		**OTHER ITEMS**				
		SURVEYING (2%)	LS	$12,300	1	$12,300
		SPECIAL ITEMS	EST	$5,000	1	$5,000
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$630,165**
7		**MOBILIZATION (10%)**				
		10% OF ITEM 7	EST	$63,100	1	$63,100
8		**SUBTOTAL (ITEMS 7 & 8)**				**$693,265**
9		**SALES TAX**				
		9.3% OF ITEM 9	EST	$64,500	1	$64,500
10		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
11		**SUBTOTAL (ITEMS 9 THRU 11)**				**$757,765**
12		**CONSTRUCTION**				
		ENGINEERING (15% OF ITEM 12)	EST	$114,000	1	$114,000
13		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$871,765**
III.		**PRELIMINARY WORK**				
		PRELIMINARY ENGINEERING (15.0% OF ITEM 14)	EST	$130,800	1	$130,800
		REGIONAL ITS FACILITY (0.5% OF ITEM 14)	EST	$4,400	1	$4,400
		ENVIRONMENTAL PERMITS	EST	$0	1	$0
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$1,010,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.00%	2010	2006	**$1,010,000**

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PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	8	Date:	6/24/2007
Location & Brief	Brueckner Rd extention	Date of Cost Index:	2006
Description:	Install 1500' 2 lane minor collector	Calculated By/Entered By:	Y.Z.
		Checked By:	

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		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (urban developed)	SF	$45	-	$0
		RIGHT OF WAY (urban undeveloped)	SF	$20	-	$0
		RELOCATIONS: BUSINESSES	EA	$150,000	-	$0
		RELOCATIONS: RESIDENCES	EA	$110,000	-	$0
		CONDEMNATION PROCEDURE	EA	$100,000	-	$0
		ADMINISTRATION (TITLES, APPRAISALS, ETC.)	EA	$15,000	-	$0
		RIGHT OF WAY TOTAL				**$0**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB,DEMO	ACRE	$6,000	1.9	$11,400
		REMOVING EXISTING PAVEMENT	SY	$10	-	$0
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$15,000	1	$15,000
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	4,100	$82,000
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$16	1,900	$30,400
		EMBANKMENT COMPACTION	CY	$2	1,100	$2,200
	1.3	**STORMWATER MITIGATION**				
		DETENTION AND TREATMENT	SF	$6	-	$0
	1.4	**STORM SEWER**				
		CATCH BASIN TYPE 1	EA	$1,200	9	$10,800
		CATCH BASIN TYPE 2	EA	$2,200	3	$6,600
		PLAIN CONC. STORM SEWER PIPE 12 IN. DIAM.	LF	$35	1,650	$57,750
		PLAIN CONC. STORM SEWER PIPE 18 IN. DIAM.	LF	$45	1,650	$74,250
		STRUCTURE EXCAVATION CL. B	CY	$15	1,300	$19,500
2		**STRUCTURE**				
		CONCRETE BRIDGES	LS	$0	-	$0
		CONCRETE BRIDGES WIDENING	LS	$0	-	$0
		PEDESTRIAN BRIDGES	SF	$400	-	$0
		STEEL BRIDGES	LS	$0	-	$0
		BRIDGE ABUTMENT RETROFIT	SF	$150	-	$0
		RETAINING WALLS (Cast in Place)	SF	$65	-	$0
		RETAINING WALLS (Soil Nail with Cast in Place Facing)	SF	$210	-	$0
		BRIDGE REMOVAL	SF	$30	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$10	-	$0
		HOT MIX ASPHALT	TON	$65	2,100	$136,500
		CRUSHED SURFACING	TON	$25	1,900	$47,500
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	-	$0
		SEEDING, MULCHING & FERTILIZING	ACRE	$2,000	2.6	$5,200
		WETLAND MITIGATION	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL (6%)	LS	$54,000	1	$54,000
		LANDSCAPING	LS	$52,000	1	$52,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$20	1,500	$30,000
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$250,000	1	$250,000
		ILLUMINATION	LS	$0	1	$0
		SIGNING	LS	$10,000	1	$10,000
		CURBS	LF	$15	-	$0
		SIDEWALKS	SY	$25	2,200	$55,000

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	8	Date:	6/24/2007
Location & Brief	Brueckner Rd extention	Date of Cost Index:	2006
Description:	Install 1500' 2 lane minor collector	Calculated By/Entered By:	Y.Z.
		Checked By:	

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		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
		ITS FOR HOT-LANES	LS	$0	1	$0
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL (10%)	LS	$95,100	1	$95,100
5.1		**OTHER ITEMS**				
		SURVEYING (2%)	LS	$21,000	1	$21,000
		SPECIAL ITEMS	EST	$5,000	1	$5,000
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$1,071,200**
7		**MOBILIZATION (10%)**				
		10% OF ITEM 7	EST	$107,200	1	$107,200
8		**SUBTOTAL (ITEMS 7 & 8)**				**$1,178,400**
9		**SALES TAX**				
		9.3% OF ITEM 9	EST	$109,600	1	$109,600
10		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
11		**SUBTOTAL (ITEMS 9 THRU 11)**				**$1,288,000**
12		**CONSTRUCTION**				
		ENGINEERING (15% OF ITEM 12)	EST	$194,000	1	$194,000
13		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$1,482,000**
III.		**PRELIMINARY WORK**				
		PRELIMINARY ENGINEERING (15.0% OF ITEM 14)	EST	$222,300	1	$222,300
		REGIONAL ITS FACILITY (0.5% OF ITEM 14)	EST	$7,500	1	$7,500
		ENVIRONMENTAL PERMITS	EST	$0	1	$0
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$1,720,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.00%	2010	2006	**$1,720,000**

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PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	9	Date:	6/24/2007
Location & Brief	Sequoia Rd Connector to Taylor Cutoff Rd	Date of Cost Index:	2006
Description:	Reconstruct 1700' existing Roupe Road to meet the minor collector criteria.	Calculated By/Entered By:	Y.Z.
		Checked By:	

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		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (urban developed)	SF	$45	-	$0
		RIGHT OF WAY (urban undeveloped)	SF	$20	-	$0
		RELOCATIONS: BUSINESSES	EA	$150,000	-	$0
		RELOCATIONS: RESIDENCES	EA	$110,000	-	$0
		CONDEMNATION PROCEDURE	EA	$100,000	-	$0
		ADMINISTRATION (TITLES, APPRAISALS, ETC.)	EA	$15,000	-	$0
		RIGHT OF WAY TOTAL				**$0**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB,DEMO	ACRE	$6,000	2.2	$13,200
		REMOVING EXISTING PAVEMENT	SY	$10	2,700	$27,000
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$50,000	1	$50,000
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	4,700	$94,000
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$16	2,200	$35,200
		EMBANKMENT COMPACTION	CY	$2	1,200	$2,400
	1.3	**STORMWATER MITIGATION**				
		DETENTION AND TREATMENT	SF	$6	-	$0
	1.4	**STORM SEWER**				
		CATCH BASIN TYPE 1	EA	$1,200	10	$12,000
		CATCH BASIN TYPE 2	EA	$2,200	4	$8,800
		PLAIN CONC. STORM SEWER PIPE 12 IN. DIAM.	LF	$35	1,870	$65,450
		PLAIN CONC. STORM SEWER PIPE 18 IN. DIAM.	LF	$45	1,870	$84,150
		STRUCTURE EXCAVATION CL. B	CY	$15	1,400	$21,000
2		**STRUCTURE**				
		CONCRETE BRIDGES	LS	$0	-	$0
		CONCRETE BRIDGES WIDENING	LS	$0	-	$0
		PEDESTRIAN BRIDGES	SF	$400	-	$0
		STEEL BRIDGES	LS	$0	-	$0
		BRIDGE ABUTMENT RETROFIT	SF	$150	-	$0
		RETAINING WALLS (Cast in Place)	SF	$65	-	$0
		RETAINING WALLS (Soil Nail with Cast in Place Facing)	SF	$210	-	$0
		BRIDGE REMOVAL	SF	$30	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$10	-	$0
		HOT MIX ASPHALT	TON	$65	2,300	$149,500
		CRUSHED SURFACING	TON	$25	2,200	$55,000
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	-	$0
		SEEDING, MULCHING & FERTILIZING	ACRE	$2,000	3.0	$6,000
		WETLAND MITIGATION	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL (6%)	LS	$48,000	1	$48,000
		LANDSCAPING	LS	$59,000	1	$59,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$20	1,700	$34,000
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$0	-	$0
		ILLUMINATION	LS	$0	-	$0
		SIGNING	LS	$20,000	1	$20,000
		CURBS	LF	$15	-	$0
		SIDEWALKS	SY	$25	2,500	$62,500
		ITS FOR HOT-LANES	LS	$0	-	$0

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	9	Date:	6/24/2007
Location & Brief	Sequoia Rd Connector to Taylor Cutoff Rd	Date of Cost Index:	2006
Description:	Reconstruct 1700' existing Roupe Road to meet the minor collector criteria.	Calculated By/Entered By:	Y.Z.
		Checked By:	

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		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL (10%)	LS	$84,800	1	$84,800
5.1		**OTHER ITEMS**				
		SURVEYING (2%)	LS	$18,700	1	$18,700
		SPECIAL ITEMS	EST	$5,000	1	$5,000
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$955,700**
7		**MOBILIZATION (10%)**				
		10% OF ITEM 7	EST	$95,600	1	$95,600
8		**SUBTOTAL (ITEMS 7 & 8)**				**$1,051,300**
9		**SALES TAX**				
		9.3% OF ITEM 9	EST	$97,800	1	$97,800
10		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
11		**SUBTOTAL (ITEMS 9 THRU 11)**				**$1,149,100**
12		**CONSTRUCTION**				
		ENGINEERING (15% OF ITEM 12)	EST	$173,000	1	$173,000
13		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$1,322,100**
III.		**PRELIMINARY WORK**				
		PRELIMINARY ENGINEERING (15.0% OF ITEM 14)	EST	$198,400	1	$198,400
		REGIONAL ITS FACILITY (0.5% OF ITEM 14)	EST	$6,700	1	$6,700
		ENVIRONMENTAL PERMITS	EST	$0	1	$0
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$1,530,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.00%	2010	2006	**$1,530,000**

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PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	10	Date:	6/24/2007
Location & Brief	Kirk Rd Connector to Atterberry Rd	Date of Cost Index:	2006
Description:	Install 1350' 2 lane major collector	Calculated By/Entered By:	Y.Z.
		Checked By:	

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		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (urban developed)	SF	$45	-	$0
		RIGHT OF WAY (urban undeveloped)	SF	$20	-	$0
		RELOCATIONS: BUSINESSES	EA	$150,000	-	$0
		RELOCATIONS: RESIDENCES	EA	$110,000	-	$0
		CONDEMNATION PROCEDURE	EA	$100,000	-	$0
		ADMINISTRATION (TITLES, APPRAISALS, ETC.)	EA	$15,000	-	$0
		RIGHT OF WAY TOTAL				**$0**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB,DEMO	ACRE	$6,000	1.8	$10,800
		REMOVING EXISTING PAVEMENT	SY	$10	-	$0
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$30,000	1	$30,000
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	3,700	$74,000
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$16	1,800	$28,800
		EMBANKMENT COMPACTION	CY	$2	1,000	$2,000
	1.3	**STORMWATER MITIGATION**				
		DETENTION AND TREATMENT	SF	$6	-	$0
	1.4	**STORM SEWER**				
		CATCH BASIN TYPE 1	EA	$1,200	-	$0
		CATCH BASIN TYPE 2	EA	$2,200	-	$0
		PLAIN CONC. STORM SEWER PIPE 12 IN. DIAM.	LF	$35	-	$0
		PLAIN CONC. STORM SEWER PIPE 18 IN. DIAM.	LF	$45	-	$0
		STRUCTURE EXCAVATION CL. B	CY	$15	1,000	$15,000
2		**STRUCTURE**				
		CONCRETE BRIDGES	LS	$0	-	$0
		CONCRETE BRIDGES WIDENING	LS	$0	-	$0
		PEDESTRIAN BRIDGES	SF	$400	-	$0
		STEEL BRIDGES	LS	$0	-	$0
		BRIDGE ABUTMENT RETROFIT	SF	$150	-	$0
		RETAINING WALLS (Cast in Place)	SF	$65	-	$0
		RETAINING WALLS (Soil Nail with Cast in Place Facing)	SF	$210	-	$0
		BRIDGE REMOVAL	SF	$30	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$10	-	$0
		HOT MIX ASPHALT	TON	$65	1,900	$123,500
		CRUSHED SURFACING	TON	$25	1,800	$45,000
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	-	$0
		SEEDING, MULCHING & FERTILIZING	ACRE	$2,000	2.5	$5,000
		WETLAND MITIGATION	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL (6%)	LS	$26,000	1	$26,000
		LANDSCAPING	LS	$47,000	1	$47,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$20	1,400	$28,000
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$0	1	$0
		ILLUMINATION	LS	$0	1	$0
		SIGNING	LS	$10,000	1	$10,000
		CURBS	LF	$15	-	$0
		SIDEWALKS	SY	$25	-	$0

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	10	Date:	6/24/2007
Location & Brief	Kirk Rd Connector to Atterberry Rd	Date of Cost Index:	2006
Description:	Install 1350' 2 lane major collector	Calculated By/Entered By:	Y.Z.
		Checked By:	

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		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
		ITS FOR HOT-LANES	LS	$0	1	$0
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL (10%)	LS	$44,600	1	$44,600
5.1		**OTHER ITEMS**				
		SURVEYING (2%)	LS	$9,800	1	$9,800
		SPECIAL ITEMS	EST	$5,000	1	$5,000
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$504,500**
7		**MOBILIZATION (10%)**				
		10% OF ITEM 7	EST	$50,500	1	$50,500
8		**SUBTOTAL (ITEMS 7 & 8)**				**$555,000**
9		**SALES TAX**				
		9.3% OF ITEM 9	EST	$51,700	1	$51,700
10		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
11		**SUBTOTAL (ITEMS 9 THRU 11)**				**$606,700**
12		**CONSTRUCTION**				
		ENGINEERING (15% OF ITEM 12)	EST	$92,000	1	$92,000
13		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$698,700**
III.		**PRELIMINARY WORK**				
		PRELIMINARY ENGINEERING (15.0% OF ITEM 14)	EST	$104,900	1	$104,900
		REGIONAL ITS FACILITY (0.5% OF ITEM 14)	EST	$3,500	1	$3,500
		ENVIRONMENTAL PERMITS	EST	$0	1	$0
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$810,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.00%	2010	2006	**$810,000**

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PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	11(a)	Date:	6/24/2007
Location & Brief	US 101 west of Carlsborg Rd	Date of Cost Index:	2006
Description:	Install 5120' median on US 101	Calculated By/Entered By:	Y.Z.
		Checked By:	

11(a)

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (urban developed)	SF	$45	-	$0
		RIGHT OF WAY (urban undeveloped)	SF	$20	-	$0
		RELOCATIONS: BUSINESSES	EA	$150,000	-	$0
		RELOCATIONS: RESIDENCES	EA	$110,000	-	$0
		CONDEMNATION PROCEDURE	EA	$100,000	-	$0
		ADMINISTRATION (TITLES, APPRAISALS, ETC.)	EA	$15,000	-	$0
		RIGHT OF WAY TOTAL				**$0**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB,DEMO	ACRE	$6,000	9.5	$57,000
		REMOVING EXISTING PAVEMENT	SY	$10	14,300	$143,000
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$50,000	1	$50,000
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	14,900	$298,000
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$16	20,600	$329,600
		EMBANKMENT COMPACTION	CY	$2	11,200	$22,400
	1.3	**STORMWATER MITIGATION**				
		DETENTION AND TREATMENT	SF	$6	-	$0
	1.4	**STORM SEWER**				
		CATCH BASIN TYPE 1	EA	$1,200	-	$0
		CATCH BASIN TYPE 2	EA	$2,200	-	$0
		PLAIN CONC. STORM SEWER PIPE 12 IN. DIAM.	LF	$35	-	$0
		PLAIN CONC. STORM SEWER PIPE 18 IN. DIAM.	LF	$45	-	$0
		STRUCTURE EXCAVATION CL. B	CY	$15	3,800	$57,000
2		**STRUCTURE**				
		CONCRETE BRIDGES	LS	$0	-	$0
		CONCRETE BRIDGES WIDENING	LS	$0	-	$0
		PEDESTRIAN BRIDGES	SF	$400	-	$0
		STEEL BRIDGES	LS	$0	-	$0
		BRIDGE ABUTMENT RETROFIT	SF	$150	-	$0
		RETAINING WALLS (Cast in Place)	SF	$65	-	$0
		RETAINING WALLS (Soil Nail with Cast in Place Facing)	SF	$210	-	$0
		BRIDGE REMOVAL	SF	$30	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$10	-	$0
		HOT MIX ASPHALT	TON	$65	14,600	$949,000
		CRUSHED SURFACING	TON	$25	13,800	$345,000
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	-	$0
		SEEDING, MULCHING & FERTILIZING	ACRE	$2,000	14.3	$28,600
		WETLAND MITIGATION	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL (6%)	LS	$162,000	1	$162,000
		LANDSCAPING	LS	$353,000	1	$353,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$20	1,000	$20,000
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$0	1	$0
		ILLUMINATION	LS	$0	1	$0
		SIGNING	LS	$40,000	1	$40,000
		CURBS	LF	$15	-	$0
		SIDEWALKS	SY	$25	-	$0

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	11(a)	Date:	6/24/2007
Location & Brief	US 101 west of Carlsborg Rd	Date of Cost Index:	2006
Description:	Install 5120' median on US 101	Calculated By/Entered By:	Y.Z.
		Checked By:	

11(a)

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
		ITS FOR HOT-LANES	LS	$0	1	$0
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL (10%)	LS	$285,500	1	$285,500
5.1		**OTHER ITEMS**				
		SURVEYING (2%)	LS	$62,900	1	$62,900
		SPECIAL ITEMS	EST	$5,000	1	$5,000
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$3,208,000**
7		**MOBILIZATION (10%)**				
		10% OF ITEM 7	EST	$320,800	1	$320,800
8		**SUBTOTAL (ITEMS 7 & 8)**				**$3,528,800**
9		**SALES TAX**				
		9.3% OF ITEM 9	EST	$328,200	1	$328,200
10		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
11		**SUBTOTAL (ITEMS 9 THRU 11)**				**$3,857,000**
12		**CONSTRUCTION**				
		ENGINEERING (15% OF ITEM 12)	EST	$579,000	1	$579,000
13		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$4,436,000**
III.		**PRELIMINARY WORK**				
		PRELIMINARY ENGINEERING (15.0% OF ITEM 14)	EST	$665,400	1	$665,400
		REGIONAL ITS FACILITY (0.5% OF ITEM 14)	EST	$22,200	1	$22,200
		ENVIRONMENTAL PERMITS	EST	$0	1	$0
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$5,130,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.00%	2010	2006	**$5,130,000**

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PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	11(b)	Date:	6/24/2007
Location & Brief	Kichen Dick Ln & US 101	Date of Cost Index:	2006
Description:	Install median on US 101 that provides turn pockets for EBL and WBL	Calculated By/Entered By:	Y.Z.
		Checked By:	

11(b)

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (urban developed)	SF	$45	-	$0
		RIGHT OF WAY (urban undeveloped)	SF	$20	-	$0
		RELOCATIONS: BUSINESSES	EA	$150,000	-	$0
		RELOCATIONS: RESIDENCES	EA	$110,000	-	$0
		CONDEMNATION PROCEDURE	EA	$100,000	-	$0
		ADMINISTRATION (TITLES, APPRAISALS, ETC.)	EA	$15,000	-	$0
		RIGHT OF WAY TOTAL				**$0**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB,DEMO	ACRE	$6,000	0.4	$2,400
		REMOVING EXISTING PAVEMENT	SY	$10	-	$0
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$0	1	$0
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	-	$0
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$16	-	$0
		EMBANKMENT COMPACTION	CY	$2	-	$0
	1.3	**STORMWATER MITIGATION**				
		DETENTION AND TREATMENT	SF	$6	-	$0
	1.4	**STORM SEWER**				
		CATCH BASIN TYPE 1	EA	$1,200	-	$0
		CATCH BASIN TYPE 2	EA	$2,200	-	$0
		PLAIN CONC. STORM SEWER PIPE 12 IN. DIAM.	LF	$35	-	$0
		PLAIN CONC. STORM SEWER PIPE 18 IN. DIAM.	LF	$45	-	$0
		STRUCTURE EXCAVATION CL. B	CY	$15	1,000	$15,000
2		**STRUCTURE**				
		CONCRETE BRIDGES	LS	$0	-	$0
		CONCRETE BRIDGES WIDENING	LS	$0	-	$0
		PEDESTRIAN BRIDGES	SF	$400	-	$0
		STEEL BRIDGES	LS	$0	-	$0
		BRIDGE ABUTMENT RETROFIT	SF	$150	-	$0
		RETAINING WALLS (Cast in Place)	SF	$65	-	$0
		RETAINING WALLS (Soil Nail with Cast in Place Facing)	SF	$210	-	$0
		BRIDGE REMOVAL	SF	$30	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$10	-	$0
		HOT MIX ASPHALT	TON	$65	-	$0
		CRUSHED SURFACING	TON	$25	-	$0
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	-	$0
		SEEDING, MULCHING & FERTILIZING	ACRE	$2,000	0.4	$800
		WETLAND MITIGATION	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL (6%)	LS	$4,000	1	$4,000
		LANDSCAPING	LS	$0	1	$0
5		**TRAFFIC**				
		GUARD RAIL	LF	$20	-	$0
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$0	1	$0
		ILLUMINATION	LS	$0	1	$0
		SIGNING	LS	$10,000	1	$10,000
		CURBS	LF	$15	-	$0
		SIDEWALKS	SY	$25	1,300	$32,500

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	11(b)	Date:	6/24/2007
Location & Brief	Kichen Dick Ln & US 101	Date of Cost Index:	2006
Description:	Install median on US 101 that provides turn pockets for EBL and WBL	Calculated By/Entered By:	Y.Z.
		Checked By:	

11(b)

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
		ITS FOR HOT-LANES	LS	$0	1	$0
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL (10%)	LS	$6,500	1	$6,500
5.1		**OTHER ITEMS**				
		SURVEYING (2%)	LS	$1,500	1	$1,500
		SPECIAL ITEMS	EST	$6,000	1	$6,000
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$78,700**
7		**MOBILIZATION (10%)**				
		10% OF ITEM 7	EST	$7,900	1	$7,900
8		**SUBTOTAL (ITEMS 7 & 8)**				**$86,600**
9		**SALES TAX**				
		9.3% OF ITEM 9	EST	$8,100	1	$8,100
10		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
11		**SUBTOTAL (ITEMS 9 THRU 11)**				**$94,700**
12		**CONSTRUCTION**				
		ENGINEERING (15% OF ITEM 12)	EST	$15,000	1	$15,000
13		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$109,700**
III.		**PRELIMINARY WORK**				
		PRELIMINARY ENGINEERING (15.0% OF ITEM 14)	EST	$16,500	1	$16,500
		REGIONAL ITS FACILITY (0.5% OF ITEM 14)	EST	$600	1	$600
		ENVIRONMENTAL PERMITS	EST	$0	1	$0
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$130,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.00%	2010	2006	**$130,000**

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PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	11(C)	Date:	6/24/2007
Location & Brief	Taylor Cutoff Rd & US 101	Date of Cost Index:	2006
Description:	Install median on US 101 that provides turn pockets for EBL and WBL	Calculated By/Entered By:	Y.Z.
		Checked By:	

11(C)

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (urban developed)	SF	$45	-	$0
		RIGHT OF WAY (urban undeveloped)	SF	$20	-	$0
		RELOCATIONS: BUSINESSES	EA	$150,000	-	$0
		RELOCATIONS: RESIDENCES	EA	$110,000	-	$0
		CONDEMNATION PROCEDURE	EA	$100,000	-	$0
		ADMINISTRATION (TITLES, APPRAISALS, ETC.)	EA	$15,000	-	$0
		RIGHT OF WAY TOTAL				**$0**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB,DEMO	ACRE	$6,000	0.4	$2,400
		REMOVING EXISTING PAVEMENT	SY	$10	-	$0
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$0	1	$0
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	-	$0
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$16	200	$3,200
		EMBANKMENT COMPACTION	CY	$2	200	$400
	1.3	**STORMWATER MITIGATION**				
		DETENTION AND TREATMENT	SF	$6	-	$0
	1.4	**STORM SEWER**				
		CATCH BASIN TYPE 1	EA	$1,200	-	$0
		CATCH BASIN TYPE 2	EA	$2,200	-	$0
		PLAIN CONC. STORM SEWER PIPE 12 IN. DIAM.	LF	$35	-	$0
		PLAIN CONC. STORM SEWER PIPE 18 IN. DIAM.	LF	$45	-	$0
		STRUCTURE EXCAVATION CL. B	CY	$15	1,100	$16,500
2		**STRUCTURE**				
		CONCRETE BRIDGES	LS	$0	-	$0
		CONCRETE BRIDGES WIDENING	LS	$0	-	$0
		PEDESTRIAN BRIDGES	SF	$400	-	$0
		STEEL BRIDGES	LS	$0	-	$0
		BRIDGE ABUTMENT RETROFIT	SF	$150	-	$0
		RETAINING WALLS (Cast in Place)	SF	$65	-	$0
		RETAINING WALLS (Soil Nail with Cast in Place Facing)	SF	$210	-	$0
		BRIDGE REMOVAL	SF	$30	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$10	-	$0
		HOT MIX ASPHALT	TON	$65	200	$13,000
		CRUSHED SURFACING	TON	$25	200	$5,000
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	-	$0
		SEEDING, MULCHING & FERTILIZING	ACRE	$2,000	0.5	$1,000
		WETLAND MITIGATION	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL (6%)	LS	$6,000	1	$6,000
		LANDSCAPING	LS	$2,000	1	$2,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$20	100	$2,000
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$0	1	$0
		ILLUMINATION	LS	$0	1	$0
		SIGNING	LS	$10,000	1	$10,000
		CURBS	LF	$15	-	$0
		SIDEWALKS	SY	$25	1,400	$35,000

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	11(C)	Date:	6/24/2007
Location & Brief	Taylor Cutoff Rd & US 101	Date of Cost Index:	2006
Description:	Install median on US 101 that provides turn pockets for EBL and WBL	Calculated By/Entered By:	Y.Z.
		Checked By:	

11(C)

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
		ITS FOR HOT-LANES	LS	$0	1	$0
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL (10%)	LS	$9,700	1	$9,700
5.1		**OTHER ITEMS**				
		SURVEYING (2%)	LS	$2,200	1	$2,200
		SPECIAL ITEMS	EST	$5,000	1	$5,000
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$113,400**
7		**MOBILIZATION (10%)**				
		10% OF ITEM 7	EST	$11,400	1	$11,400
8		**SUBTOTAL (ITEMS 7 & 8)**				**$124,800**
9		**SALES TAX**				
		9.3% OF ITEM 9	EST	$11,700	1	$11,700
10		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
11		**SUBTOTAL (ITEMS 9 THRU 11)**				**$136,500**
12		**CONSTRUCTION**				
		ENGINEERING (15% OF ITEM 12)	EST	$21,000	1	$21,000
13		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$157,500**
III.		**PRELIMINARY WORK**				
		PRELIMINARY ENGINEERING (15.0% OF ITEM 14)	EST	$23,700	1	$23,700
		REGIONAL ITS FACILITY (0.5% OF ITEM 14)	EST	$800	1	$800
		ENVIRONMENTAL PERMITS	EST	$0	1	$0
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$190,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.00%	2010	2006	**$190,000**

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PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	11(d)	Date:	6/24/2007
Location & Brief	Mill RD/Parkwood Rd & US 101	Date of Cost Index:	2006
Description:	Install median on US 101 that provides turn pocket for WBL	Calculated By/Entered By:	Y.Z.
		Checked By:	

11(d)

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (urban developed)	SF	$45	-	$0
		RIGHT OF WAY (urban undeveloped)	SF	$20	-	$0
		RELOCATIONS: BUSINESSES	EA	$150,000	-	$0
		RELOCATIONS: RESIDENCES	EA	$110,000	-	$0
		CONDEMNATION PROCEDURE	EA	$100,000	-	$0
		ADMINISTRATION (TITLES, APPRAISALS, ETC.)	EA	$15,000	-	$0
		RIGHT OF WAY TOTAL				**$0**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB,DEMO	ACRE	$6,000	0.3	$1,800
		REMOVING EXISTING PAVEMENT	SY	$10	-	$0
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$0	1	$0
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	-	$0
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$16	200	$3,200
		EMBANKMENT COMPACTION	CY	$2	100	$200
	1.3	**STORMWATER MITIGATION**				
		DETENTION AND TREATMENT	SF	$6	-	$0
	1.4	**STORM SEWER**				
		CATCH BASIN TYPE 1	EA	$1,200	-	$0
		CATCH BASIN TYPE 2	EA	$2,200	-	$0
		PLAIN CONC. STORM SEWER PIPE 12 IN. DIAM.	LF	$35	-	$0
		PLAIN CONC. STORM SEWER PIPE 18 IN. DIAM.	LF	$45	-	$0
		STRUCTURE EXCAVATION CL. B	CY	$15	600	$9,000
2		**STRUCTURE**				
		CONCRETE BRIDGES	LS	$0	-	$0
		CONCRETE BRIDGES WIDENING	LS	$0	-	$0
		PEDESTRIAN BRIDGES	SF	$400	-	$0
		STEEL BRIDGES	LS	$0	-	$0
		BRIDGE ABUTMENT RETROFIT	SF	$150	-	$0
		RETAINING WALLS (Cast in Place)	SF	$65	-	$0
		RETAINING WALLS (Soil Nail with Cast in Place Facing)	SF	$210	-	$0
		BRIDGE REMOVAL	SF	$30	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$10	-	$0
		HOT MIX ASPHALT	TON	$65	-	$0
		CRUSHED SURFACING	TON	$25	100	$2,500
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	-	$0
		SEEDING, MULCHING & FERTILIZING	ACRE	$2,000	0.3	$600
		WETLAND MITIGATION	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL (6%)	LS	$3,000	1	$3,000
		LANDSCAPING	LS	$0	1	$0
5		**TRAFFIC**				
		GUARD RAIL	LF	$20	-	$0
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$0	1	$0
		ILLUMINATION	LS	$0	1	$0
		SIGNING	LS	$10,000	1	$10,000
		CURBS	LF	$15	-	$0
		SIDEWALKS	SY	$25	900	$22,500

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	11(d)	Date:	6/24/2007
Location & Brief	Mill RD/Parkwood Rd & US 101	Date of Cost Index:	2006
Description:	Install median on US 101 that provides turn pocket for WBL	Calculated By/Entered By:	Y.Z.
		Checked By:	

11(d)

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
		ITS FOR HOT-LANES	LS	$0	1	$0
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL (10%)	LS	$5,300	1	$5,300
5.1		**OTHER ITEMS**				
		SURVEYING (2%)	LS	$1,200	1	$1,200
		SPECIAL ITEMS	EST	$6,000	1	$6,000
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$65,300**
7		**MOBILIZATION (10%)**				
		10% OF ITEM 7	EST	$6,600	1	$6,600
8		**SUBTOTAL (ITEMS 7 & 8)**				**$71,900**
9		**SALES TAX**				
		9.3% OF ITEM 9	EST	$6,700	1	$6,700
10		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
11		**SUBTOTAL (ITEMS 9 THRU 11)**				**$78,600**
12		**CONSTRUCTION**				
		ENGINEERING (15% OF ITEM 12)	EST	$12,000	1	$12,000
13		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$90,600**
III.		**PRELIMINARY WORK**				
		PRELIMINARY ENGINEERING (15.0% OF ITEM 14)	EST	$13,600	1	$13,600
		REGIONAL ITS FACILITY (0.5% OF ITEM 14)	EST	$500	1	$500
		ENVIRONMENTAL PERMITS	EST	$0	1	$0
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$110,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.00%	2010	2006	**$110,000**

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PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	12	Date:	6/24/2007
Location & Brief	New Connector to Winterhawk St	Date of Cost Index:	2006
Description:	Install 150' 1-lane access road	Calculated By/Entered By:	Y.Z.
		Checked By:	

12

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (urban developed)	SF	$45	-	$0
		RIGHT OF WAY (urban undeveloped)	SF	$20	-	$0
		RELOCATIONS: BUSINESSES	EA	$150,000	-	$0
		RELOCATIONS: RESIDENCES	EA	$110,000	-	$0
		CONDEMNATION PROCEDURE	EA	$100,000	-	$0
		ADMINISTRATION (TITLES, APPRAISALS, ETC.)	EA	$15,000	-	$0
		RIGHT OF WAY TOTAL				**$0**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB,DEMO	ACRE	$6,000	0.1	$600
		REMOVING EXISTING PAVEMENT	SY	$10	-	$0
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$10,000	1	$10,000
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	300	$6,000
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$16	200	$3,200
		EMBANKMENT COMPACTION	CY	$2	100	$200
	1.3	**STORMWATER MITIGATION**				
		DETENTION AND TREATMENT	SF	$6	-	$0
	1.4	**STORM SEWER**				
		CATCH BASIN TYPE 1	EA	$1,200	-	$0
		CATCH BASIN TYPE 2	EA	$2,200	-	$0
		PLAIN CONC. STORM SEWER PIPE 12 IN. DIAM.	LF	$35	-	$0
		PLAIN CONC. STORM SEWER PIPE 18 IN. DIAM.	LF	$45	-	$0
		STRUCTURE EXCAVATION CL. B	CY	$15	200	$3,000
2		**STRUCTURE**				
		CONCRETE BRIDGES	LS	$0	-	$0
		CONCRETE BRIDGES WIDENING	LS	$0	-	$0
		PEDESTRIAN BRIDGES	SF	$400	-	$0
		STEEL BRIDGES	LS	$0	-	$0
		BRIDGE ABUTMENT RETROFIT	SF	$150	-	$0
		RETAINING WALLS (Cast in Place)	SF	$65	-	$0
		RETAINING WALLS (Soil Nail with Cast in Place Facing)	SF	$210	-	$0
		BRIDGE REMOVAL	SF	$30	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$10	-	$0
		HOT MIX ASPHALT	TON	$65	200	$13,000
		CRUSHED SURFACING	TON	$25	100	$2,500
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	-	$0
		SEEDING, MULCHING & FERTILIZING	ACRE	$2,000	0.2	$400
		WETLAND MITIGATION	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL (6%)	LS	$3,000	1	$3,000
		LANDSCAPING	LS	$6,000	1	$6,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$20	-	$0
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$0	1	$0
		ILLUMINATION	LS	$0	1	$0
		SIGNING	LS	$1,000	1	$1,000
		CURBS	LF	$15	-	$0
		SIDEWALKS	SY	$25	-	$0

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	12	Date:	6/24/2007
Location & Brief	New Connector to Winterhawk St	Date of Cost Index:	2006
Description:	Install 150' 1-lane access road	Calculated By/Entered By:	Y.Z.
		Checked By:	

12

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
		ITS FOR HOT-LANES	LS	$0	1	$0
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL (10%)	LS	$4,900	1	$4,900
5.1		**OTHER ITEMS**				
		SURVEYING (2%)	LS	$1,100	1	$1,100
		SPECIAL ITEMS	EST	$7,000	1	$7,000
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$61,900**
7		**MOBILIZATION (10%)**				
		10% OF ITEM 7	EST	$6,200	1	$6,200
8		**SUBTOTAL (ITEMS 7 & 8)**				**$68,100**
9		**SALES TAX**				
		9.3% OF ITEM 9	EST	$6,400	1	$6,400
10		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
11		**SUBTOTAL (ITEMS 9 THRU 11)**				**$74,500**
12		**CONSTRUCTION**				
		ENGINEERING (15% OF ITEM 12)	EST	$12,000	1	$12,000
13		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$86,500**
III.		**PRELIMINARY WORK**				
		PRELIMINARY ENGINEERING (15.0% OF ITEM 14)	EST	$13,000	1	$13,000
		REGIONAL ITS FACILITY (0.5% OF ITEM 14)	EST	$500	1	$500
		ENVIRONMENTAL PERMITS	EST	$0	1	$0
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$100,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.00%	2010	2006	**$100,000**

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PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	13	Date:	6/24/2007
Location & Brief	New Connector to Taylor Cutoff Rd	Date of Cost Index:	2006
Description:	Install 2750' 2-lane minor collector	Calculated By/Entered By:	Y.Z.
		Checked By:	

13

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (urban developed)	SF	$45	-	$0
		RIGHT OF WAY (urban undeveloped)	SF	$20	-	$0
		RELOCATIONS: BUSINESSES	EA	$150,000	-	$0
		RELOCATIONS: RESIDENCES	EA	$110,000	-	$0
		CONDEMNATION PROCEDURE	EA	$100,000	-	$0
		ADMINISTRATION (TITLES, APPRAISALS, ETC.)	EA	$15,000	-	$0
		RIGHT OF WAY TOTAL				**$0**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB,DEMO	ACRE	$6,000	3.5	$21,000
		REMOVING EXISTING PAVEMENT	SY	$10	-	$0
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$30,000	1	$30,000
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	7,500	$150,000
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$16	3,500	$56,000
		EMBANKMENT COMPACTION	CY	$2	1,900	$3,800
	1.3	**STORMWATER MITIGATION**				
		DETENTION AND TREATMENT	SF	$6	-	$0
	1.4	**STORM SEWER**				
		CATCH BASIN TYPE 1	EA	$1,200	-	$0
		CATCH BASIN TYPE 2	EA	$2,200	-	$0
		PLAIN CONC. STORM SEWER PIPE 12 IN. DIAM.	LF	$35	-	$0
		PLAIN CONC. STORM SEWER PIPE 18 IN. DIAM.	LF	$45	-	$0
		STRUCTURE EXCAVATION CL. B	CY	$15	2,100	$31,500
2		**STRUCTURE**				
		CONCRETE BRIDGES	LS	$0	-	$0
		CONCRETE BRIDGES WIDENING	LS	$0	-	$0
		PEDESTRIAN BRIDGES	SF	$400	-	$0
		STEEL BRIDGES	LS	$0	-	$0
		BRIDGE ABUTMENT RETROFIT	SF	$150	-	$0
		RETAINING WALLS (Cast in Place)	SF	$65	-	$0
		RETAINING WALLS (Soil Nail with Cast in Place Facing)	SF	$210	-	$0
		BRIDGE REMOVAL	SF	$30	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$10	-	$0
		HOT MIX ASPHALT	TON	$65	3,700	$240,500
		CRUSHED SURFACING	TON	$25	3,500	$87,500
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	-	$0
		SEEDING, MULCHING & FERTILIZING	ACRE	$2,000	4.8	$9,600
		WETLAND MITIGATION	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL (6%)	LS	$48,000	1	$48,000
		LANDSCAPING	LS	$95,000	1	$95,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$20	2,800	$56,000
		CONCRETE BARRIER	LF	$65	1	$65
		SIGNAL SYSTEMS	LS	$0	1	$0
		ILLUMINATION	LS	$0	1	$0
		SIGNING	LS	$15,000	1	$15,000
		CURBS	LF	$15	-	$0
		SIDEWALKS	SY	$25	-	$0

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	13	Date:	6/24/2007
Location & Brief	New Connector to Taylor Cutoff Rd	Date of Cost Index:	2006
Description:	Install 2750' 2-lane minor collector	Calculated By/Entered By:	Y.Z.
		Checked By:	

13

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
		ITS FOR HOT-LANES	LS	$0	1	$0
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL (10%)	LS	$84,400	1	$84,400
5.1		**OTHER ITEMS**				
		SURVEYING (2%)	LS	$18,600	1	$18,600
		SPECIAL ITEMS	EST	$5,000	1	$5,000
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$951,965**
7		**MOBILIZATION (10%)**				
		10% OF ITEM 7	EST	$95,200	1	$95,200
8		**SUBTOTAL (ITEMS 7 & 8)**				**$1,047,165**
9		**SALES TAX**				
		9.3% OF ITEM 9	EST	$97,400	1	$97,400
10		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
11		**SUBTOTAL (ITEMS 9 THRU 11)**				**$1,144,565**
12		**CONSTRUCTION**				
		ENGINEERING (15% OF ITEM 12)	EST	$172,000	1	$172,000
13		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$1,316,565**
III.		**PRELIMINARY WORK**				
		PRELIMINARY ENGINEERING (15.0% OF ITEM 14)	EST	$197,500	1	$197,500
		REGIONAL ITS FACILITY (0.5% OF ITEM 14)	EST	$6,600	1	$6,600
		ENVIRONMENTAL PERMITS	EST	$0	1	$0
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$1,530,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.00%	2010	2006	**$1,530,000**

The above opinion of cost is a planning level estimate only. It is based on best available information and scope at the time, not on the results of a detailed engineering study, and is supplied as a budgeting guide only. H.W. Lochner, Inc. does not guarantee or warrant the accuracy of this planning level estimate.

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	14	Date:	6/24/2007
Location & Brief	New Connector to Spencer Rd	Date of Cost Index:	2006
Description:	Install 3000' 2-lane minor collector	Calculated By/Entered By:	Y.Z.
		Checked By:	

14

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
I.		**RIGHT OF WAY**				
		RIGHT OF WAY (urban developed)	SF	$45	-	$0
		RIGHT OF WAY (urban undeveloped)	SF	$20	-	$0
		RELOCATIONS: BUSINESSES	EA	$150,000	-	$0
		RELOCATIONS: RESIDENCES	EA	$110,000	-	$0
		CONDEMNATION PROCEDURE	EA	$100,000	-	$0
		ADMINISTRATION (TITLES, APPRAISALS, ETC.)	EA	$15,000	-	$0
		RIGHT OF WAY TOTAL				**$0**
II.		**CONSTRUCTION**				
1		**PREPARATION/GRADING/DRAINAGE**				
	1.1	**PREPARATION**				
		CLEAR & GRUB,DEMO	ACRE	$6,000	3.8	$22,800
		REMOVING EXISTING PAVEMENT	SY	$10	-	$0
		REMOVAL STRUCTURES & OBSTRUCTIONS	LS	$50,000	1	$50,000
	1.2	**EARTHWORK**				
		ROADWAY EXCAVATION INCL, HAUL	CY	$20	8,200	$164,000
		STRUCTURE EX. CL. A INCL. HAUL	CY	$25	-	$0
		BORROW INCL. HAUL	TON	$16	3,800	$60,800
		EMBANKMENT COMPACTION	CY	$2	2,100	$4,200
	1.3	**STORMWATER MITIGATION**				
		DETENTION AND TREATMENT	SF	$6	-	$0
	1.4	**STORM SEWER**				
		CATCH BASIN TYPE 1	EA	$1,200	-	$0
		CATCH BASIN TYPE 2	EA	$2,200	-	$0
		PLAIN CONC. STORM SEWER PIPE 12 IN. DIAM.	LF	$35	-	$0
		PLAIN CONC. STORM SEWER PIPE 18 IN. DIAM.	LF	$45	-	$0
		STRUCTURE EXCAVATION CL. B	CY	$15	2,200	$33,000
2		**STRUCTURE**				
		CONCRETE BRIDGES	LS	$0	-	$0
		CONCRETE BRIDGES WIDENING	LS	$0	-	$0
		PEDESTRIAN BRIDGES	SF	$400	-	$0
		STEEL BRIDGES	LS	$0	-	$0
		BRIDGE ABUTMENT RETROFIT	SF	$150	-	$0
		RETAINING WALLS (Cast in Place)	SF	$65	-	$0
		RETAINING WALLS (Soil Nail with Cast in Place Facing)	SF	$210	-	$0
		BRIDGE REMOVAL	SF	$30	-	$0
		NOISE WALLS	SF	$40	-	$0
3		**SURFACING**				
		PORTLAND CEMENT CONCRETE	SF	$10	-	$0
		HOT MIX ASPHALT	TON	$65	4,100	$266,500
		CRUSHED SURFACING	TON	$25	3,800	$95,000
4		**ROADSIDE DEVELOPMENT**				
		FENCING	LF	$15	-	$0
		SEEDING, MULCHING & FERTILIZING	ACRE	$2,000	5.2	$10,400
		WETLAND MITIGATION	LS	$0	1	$0
		TEMPORARY WATER POLLUTION & EROSION CONTROL (6%)	LS	$69,000	1	$69,000
		LANDSCAPING	LS	$104,000	1	$104,000
5		**TRAFFIC**				
		GUARD RAIL	LF	$20	3,000	$60,000
		CONCRETE BARRIER	LF	$65	-	$0
		SIGNAL SYSTEMS	LS	$250,000	1	$250,000
		ILLUMINATION	LS	$0	1	$0
		SIGNING	LS	$20,000	1	$20,000
		CURBS	LF	$15	-	$0
		SIDEWALKS	SY	$25	-	$0

PLANNING LEVEL OPINION OF COST SUMMARY

Project Description:	Carlsborg Transportation Plan	Client:	Clallam County
Project #:	14	Date:	6/24/2007
Location & Brief	New Connector to Spencer Rd	Date of Cost Index:	2006
Description:	Install 3000' 2-lane minor collector	Calculated By/Entered By:	Y.Z.
		Checked By:	

14

		ITEM	UNIT	ESTIMATED UNIT COST	QTY	COST
		ITS FOR HOT-LANES	LS	$0	1	$0
		SC&DI (ITS)	LS	$0	1	$0
		TRAFFIC CONTROL (10%)	LS	$121,000	1	$121,000
5.1		**OTHER ITEMS**				
		SURVEYING (2%)	LS	$26,700	1	$26,700
		SPECIAL ITEMS	EST	$5,000	1	$5,000
		UTILITY RELOCATIONS	EST	$0	1	$0
6		**CONSTRUCTION SUBTOTAL (ITEMS 1 THRU 6)**				**$1,362,400**
7		**MOBILIZATION (10%)**				
		10% OF ITEM 7	EST	$136,300	1	$136,300
8		**SUBTOTAL (ITEMS 7 & 8)**				**$1,498,700**
9		**SALES TAX**				
		9.3% OF ITEM 9	EST	$139,400	1	$139,400
10		**AGREEMENTS (Utilities, WSP, etc.)**				
			EST	$0	1	$0
11		**SUBTOTAL (ITEMS 9 THRU 11)**				**$1,638,100**
12		**CONSTRUCTION**				
		ENGINEERING (15% OF ITEM 12)	EST	$246,000	1	$246,000
13		**CONSTRUCTION TOTAL (ITEMS 12 & 13)**				**$1,884,100**
III.		**PRELIMINARY WORK**				
		PRELIMINARY ENGINEERING (15.0% OF ITEM 14)	EST	$282,700	1	$282,700
		REGIONAL ITS FACILITY (0.5% OF ITEM 14)	EST	$9,500	1	$9,500
		ENVIRONMENTAL PERMITS	EST	$0	1	$0
IV.		**TOTAL ESTIMATED COST**				
		(ITEMS I, 14 & III)				**$2,180,000**
V.		**FUTURE ESTIMATED COST**				
			Inflation	**Const. Year**	**Cost Index**	**Future Cost**
		FUTURE COST BASED ON INFLATION RATE	0.00%	2010	2006	**$2,180,000**

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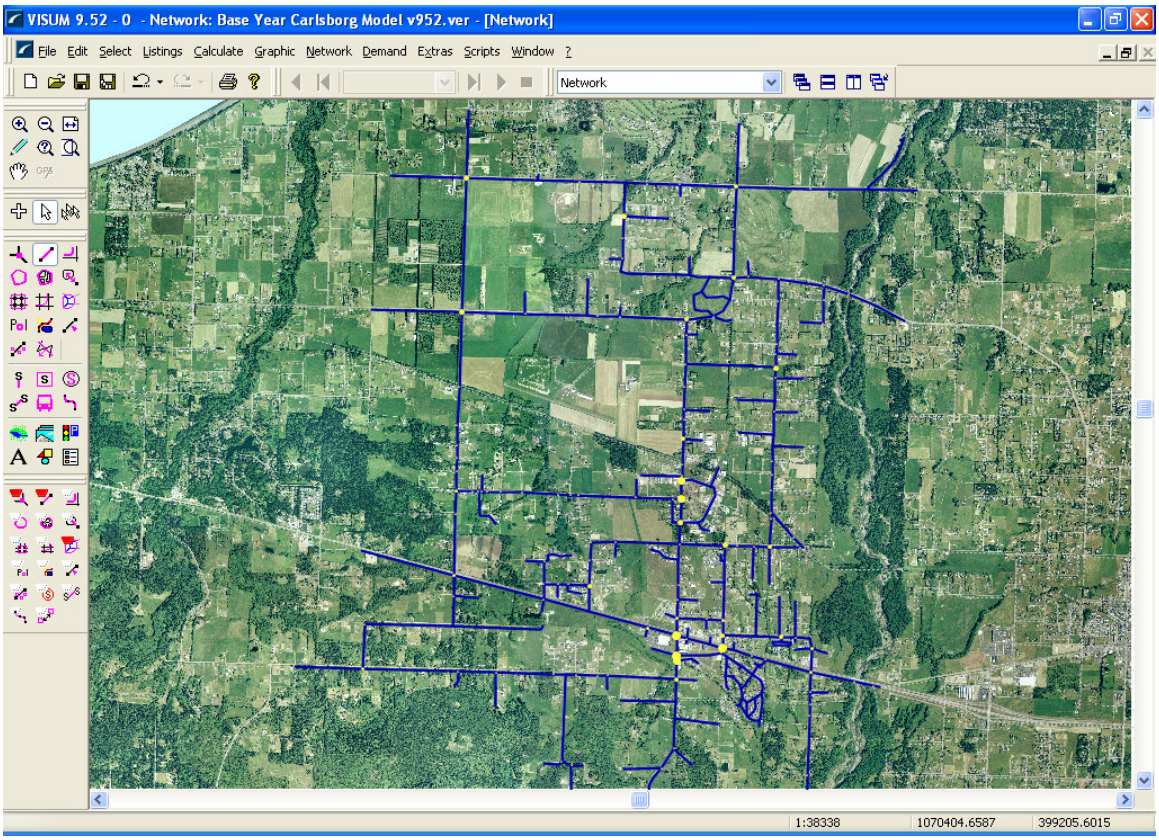
APPENDIX FOUR

CLALLAM COUNTY MODEL DEVELOPMENT (CARLSBORG) by PTV America

PJ.740 Carlsborg Clallam County Model Development



traffic mobility logistics.

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Project Information

The client for this project is:

Rich James
Clallam County
(360) 417-2290

Project Number: 740

Project Scope:

Phase 1: Development, in conjunction with the client, a travel demand model for the city of Carlsborg, WA. The model development is to include three horizon years.

The model years to be considered are:

1. Base Year Model (2005)
2. Mid Term Model (assumed to be 2015 for purposes of model development).
3. Long Range Model (assumed to be 2025 for purposes of model development).

The project directory is located at:

K:\740 Carlsborg-Clallam County

Model Network Development

Links and Nodes

Navteq Import

The 2005 baseline highway network was built using data from NAVTEQ. All links, turns and nodes were imported from the NAVTEQ version file for Washington State North Tile 1. The links in and around the city of Carlsborg were assigned Transport Systems to make them active for this model. In order to ensure a smoother transition from this small city model to a future countywide model, all the remaining links and nodes for the Olympic Peninsula were left in the version file for future use. The blue links in Figure 1 are the highway links that comprise the Carlsborg model network.

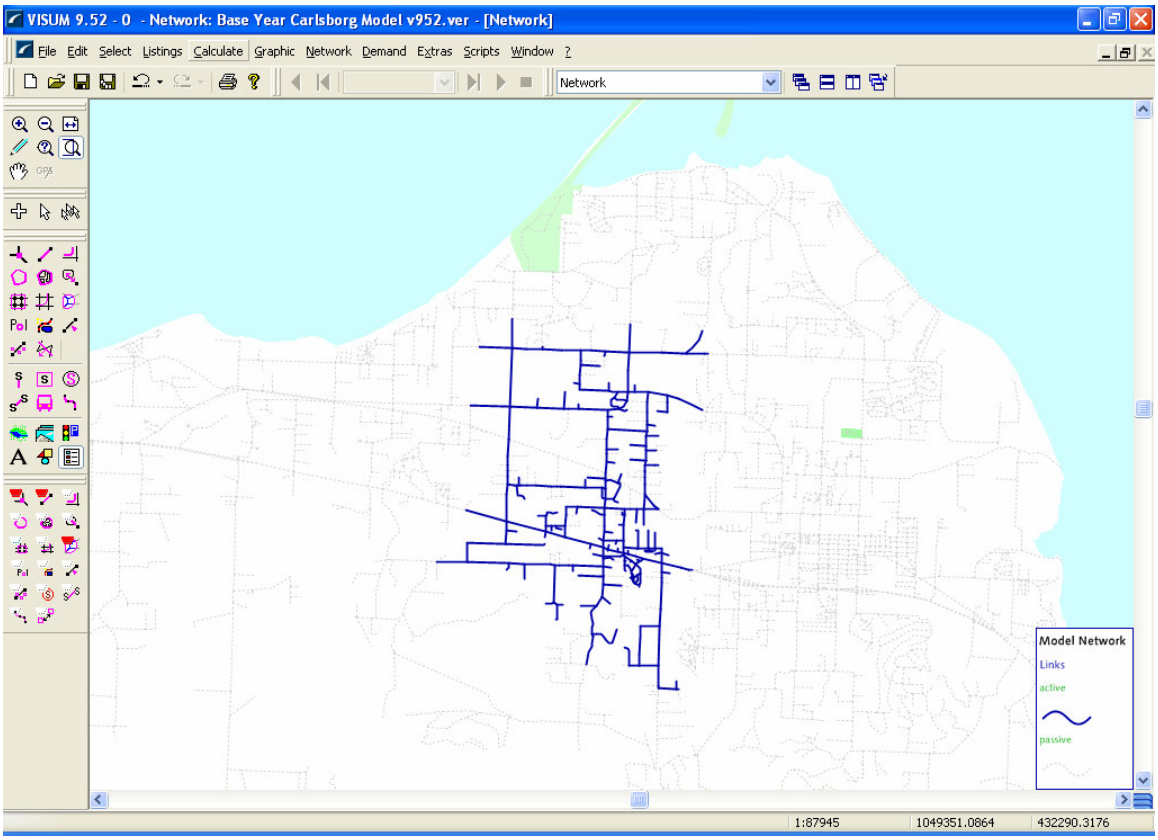

Figure 1. Carlsborg Active Links

Function Classification of Links

Once the links were made active, they were coded with the functional classification system used by Clallam County. Each link type is assigned its own volume delay function for use in the model assignments. The link types used in the model and their total lane miles are shown in Table 1.

Table 1. Link Types

Type #	Name	Per Lane Capacity	Total Lanes Miles
2	Rural Principle Arterial	1800	12.0
7	Rural Major Collector	1400	21.3
8	Rural Minor Collector	1200	8.8
9	Local Access	800	52.9

As shown in Figure 2, a majority of the links in the network are local access links. Of the three functional classification types, over half of the network is classified as Local Access. Each functional classification was assigned a default per lane capacity value. This capacity is used before each model run to calculate the link and node capacity. If it is ever determined that these values should be changed, they can be accessed via the "Network – Link Types" menu in VISUM.

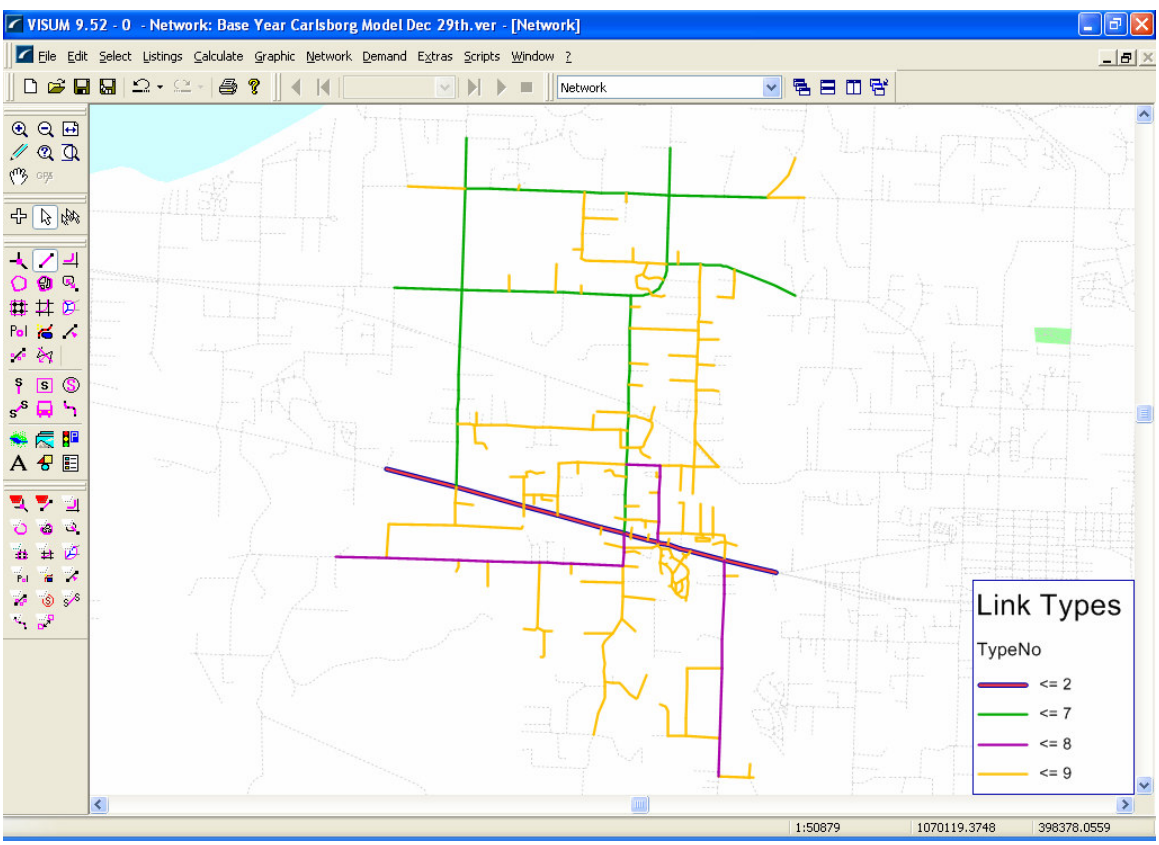

Figure 2. Link Types and Functional Classification

Intersection Control

All of the nodes in the Carlsborg model were reviewed to determine their intersection control. This control type was then used to specify the node type and control of the Intersection in VISUM. Just like the links, each control type has its own specific volume delay function.

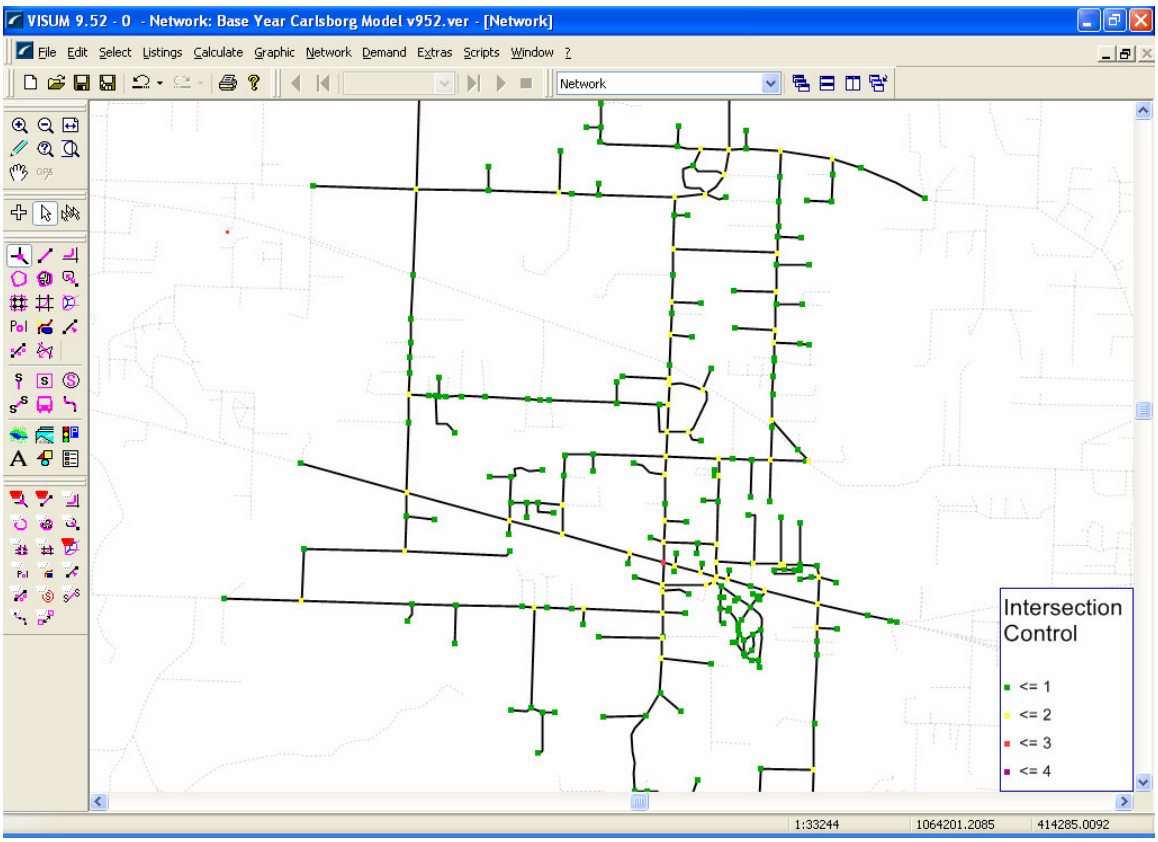

Figure 3. Intersection Control of Nodes

The intersection control types of the model are Uncontrolled, Two-Way Stop, Signalized intersection and Four Way Stop. The control type and the number of intersections by type are shown in Table 2.

Table 2. Intersection Control Type

Type #	Name	Number of Intersections
1	Uncontrolled	214
2	Two Way Stop	69
3	Signalized	1
4	Four Way Stop	0

Number of Lanes

Once the link and node types were specified and cleaned up, the total number of lanes from the NAVTEQ file was reviewed for consistency with actual field conditions. As shown in Figure 4, only US 101 has more than 1 lane in each direction in the baseline model network.

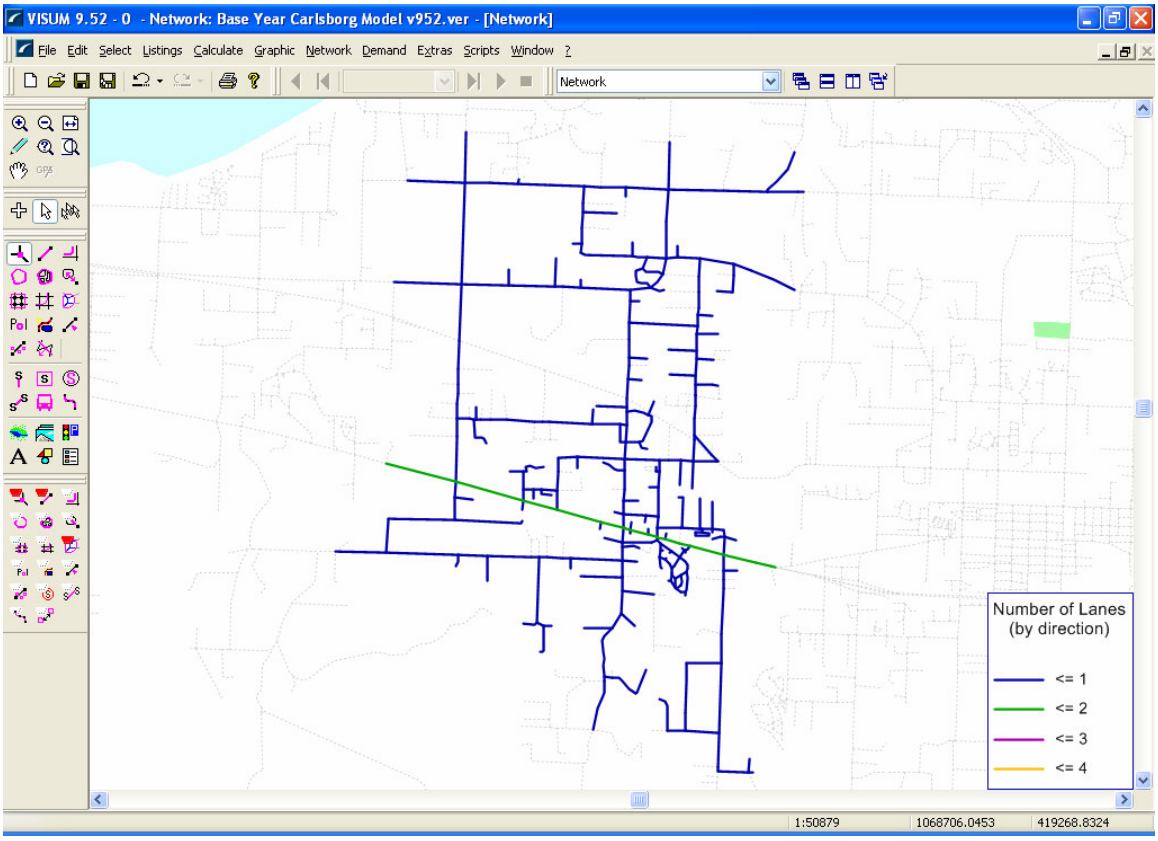

Figure 4. Number of Lanes

Posted Speed Limit

In addition to the other model checks of lanes and intersection control, the posted speed limit was also reviewed and modified from the assumptions in the NAVTEQ networks.

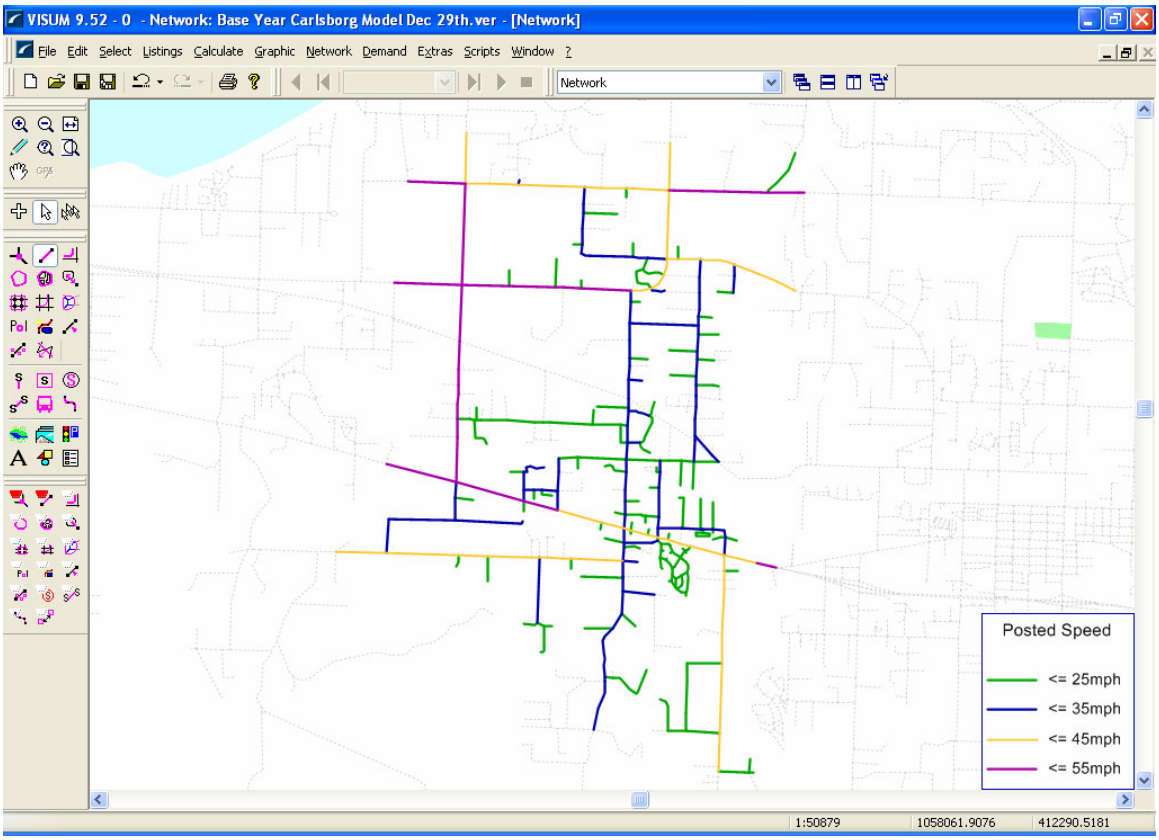

Figure 5. Posted Speed Limit

As can been seen in Figure 5, a majority of the network has a posted speed of 25mph or less. This makes sense as a majority of the 618 links in the model network are classified as Local Access links. The number of links by Speed Limit range is shown in Table 3.

Table 3. Links by Speed Limit

Speed Limit Range	Number of Links
<= 25 mph	286
<= 35 mph	190
<= 45 mph	74
<= 55 mph	68

Traffic Counts

As part of the model development effort, several new traffic counts were taken in and around the city of Carlsborg in early 2006. These counts, as well as other counts maintained by Clallam County, were input into the model to provide a frame of reference for how well the model network was replicating the existing conditions. In all, 98 of the 618 links in the model network have a count that can be compared to.

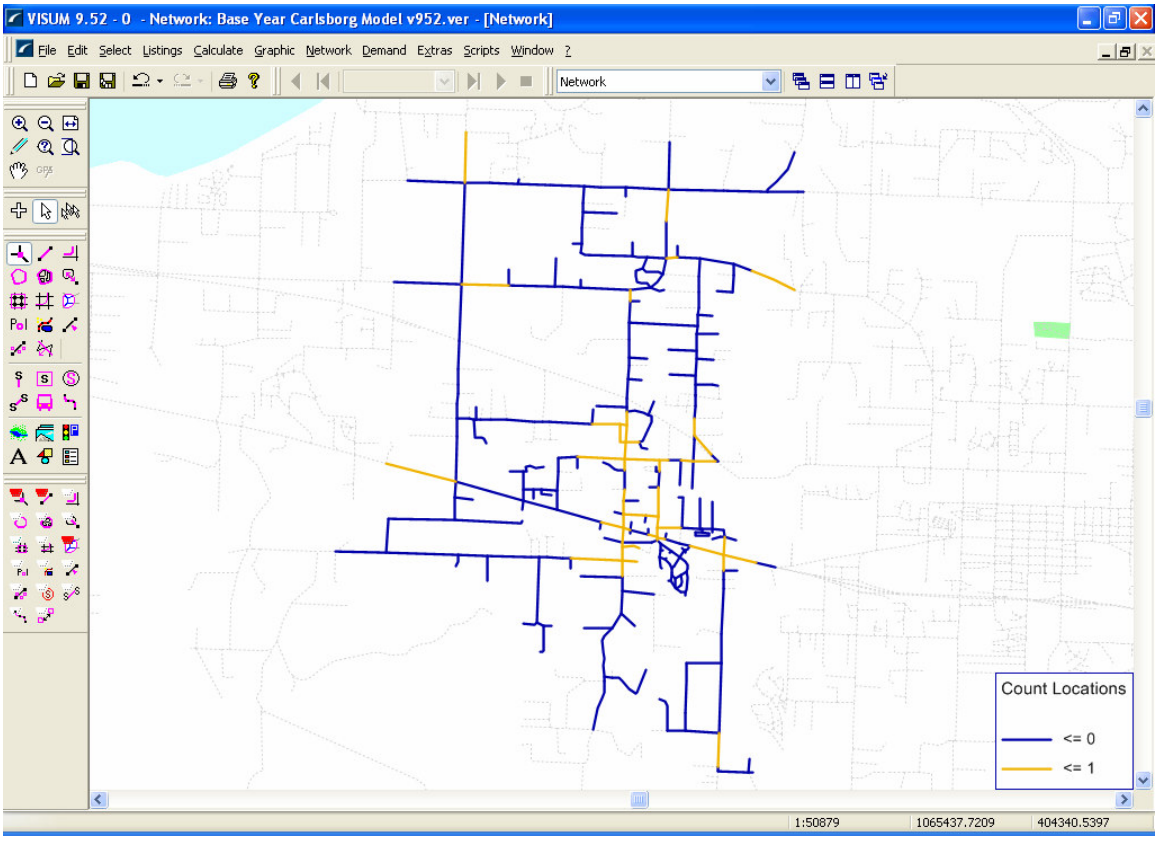

Figure 6. Count Locations

All the links shown in orange in Figure 6 have a traffic count to compare against. All the traffic counts are stored in a user defined attributes on the links called "PM Best Count". Links with a traffic count also have a bool user defined attribute titled "Count Locations" that can be used to quickly filter on and off any links that have counts.

Zones and Connectors

Census Data and Parcel Level Import

The starting point for the land use data for the base year model was available census data. The census blocks and housing estimates were imported into the model as a Point of Interest so that the housing data could be aggregated into the Traffic Analysis Zones. The Clallam County Parcel level database was also imported into the version file to aggregate the employment level square footage numbers into number of employees for each zone.

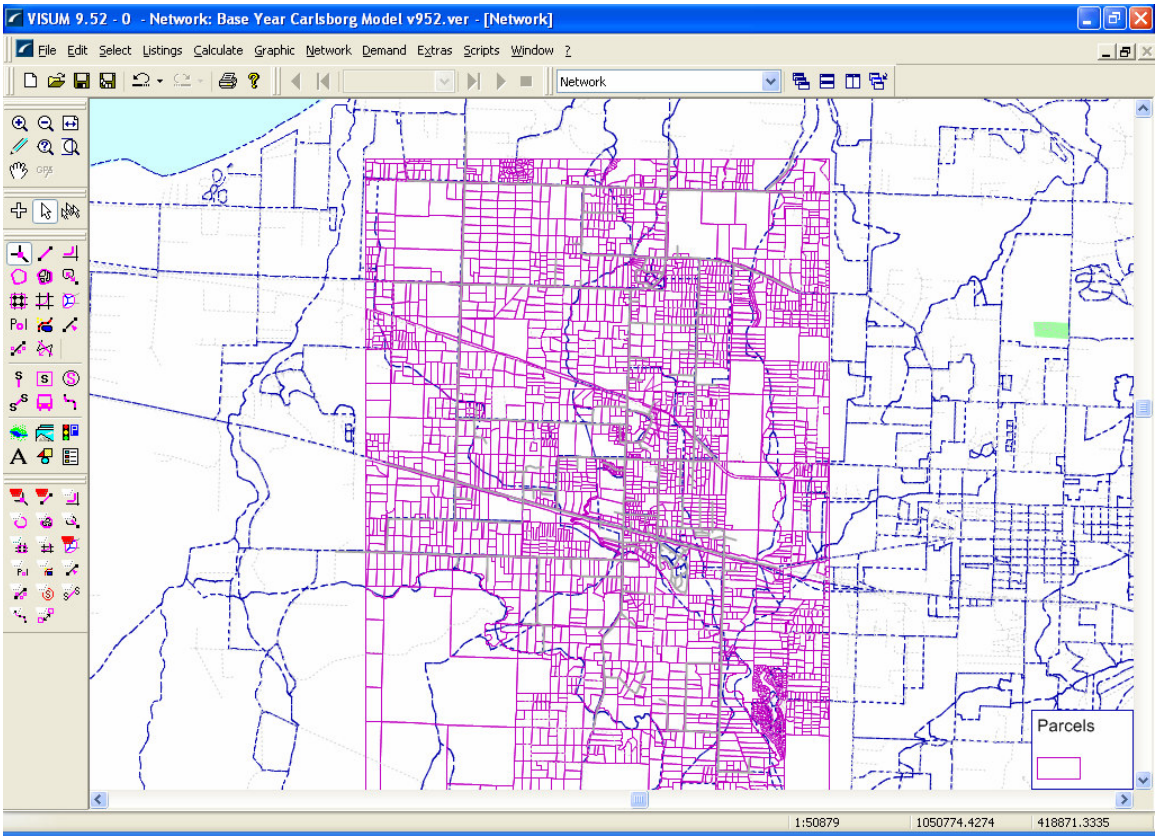

Figure 7. Clallam County Parcel Database for Carlsborg

Traffic Analysis Zone Definition

Once all of the network detail was added and the GIS database was imported into VISUM, the traffic analysis zones were defined. The zones were defined using a combination of natural boundaries, similar land use characteristics, roads, census boundaries and parcel definitions. In all, there are 51 internal traffic analysis zones (number 1 thru 51) and 11 external traffic analysis zones (numbered 1001 thru 1011).

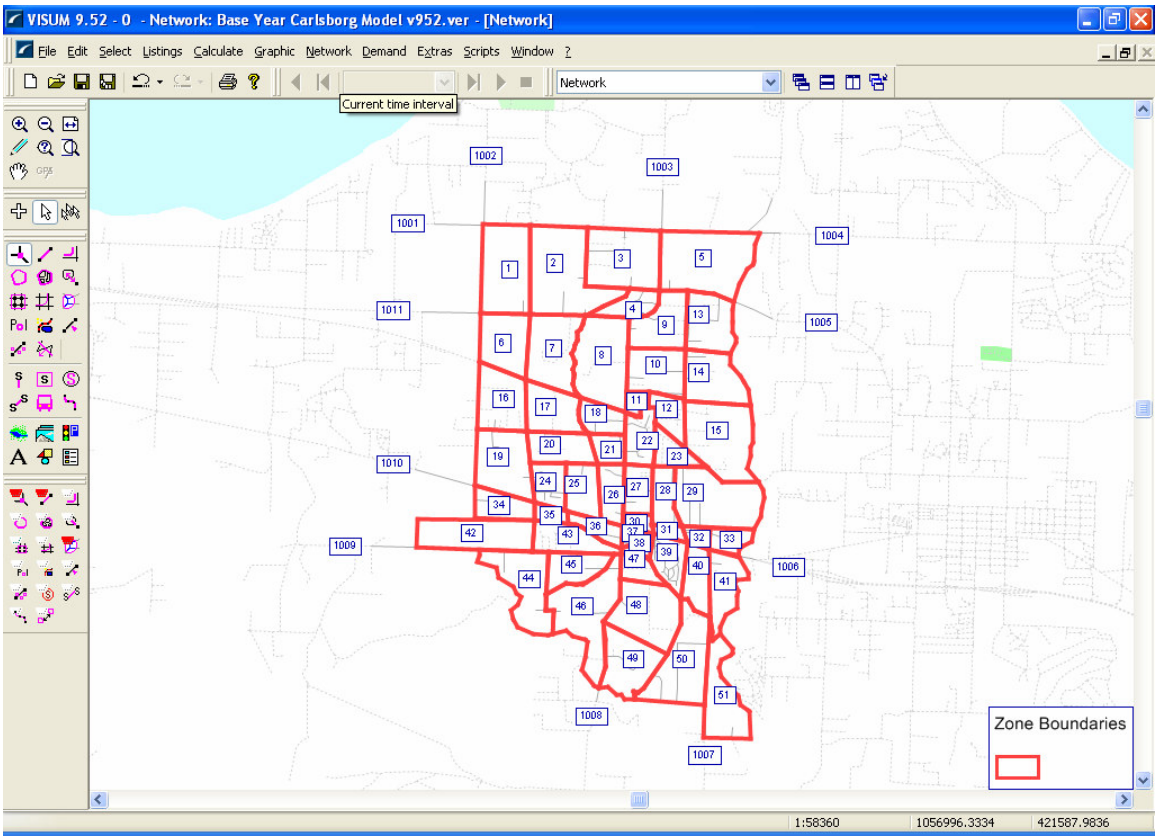

Figure 8. Traffic Analysis Zone Boundaries

Once the boundaries were defined, a GIS intersect function of VISUM was utilized to aggregate the Census and Parcel Level data into the Traffic Analysis zones. The results of this aggregation were then reviewed and verified by Clallam County staff and final adjustments were made in the model. The final results of this step were traffic analysis zones with land use data that could then be used for trip generation.

Land Use Data

Land use data for the Carlsborg model is stored in user defined attributes on the zones. The land use data for the baseline, mid term and full build is all stored in the same version file. This allows the user to easily run any forecast year on whatever network is stored in the version file. The land use assumptions built in the model are shown on the following three pages. In this model, the mid term is defined as ½ of the total build out and is assumed to occur in 10 years and full build out in 20 years.

Table 4. 2005 Land Use Inputs

Zone	HH	Square Footage							
		Govt	Office	Ind	Medical	Retail	School	Storage	Warehouse
1	3	0	0	0	0	0	0	0	0
2	40	0	0	0	0	0	0	0	0
3	75	0	0	0	0	0	0	0	0
4	3	0	0	0	0	0	0	0	0
5	4	0	0	0	0	0	0	0	0
6	1	0	0	0	0	0	0	0	0
7	3	0	0	0	0	0	0	0	0
8	19	0	0	0	0	0	0	0	0
9	66	0	0	0	0	0	0	0	0
10	35	0	0	0	0	0	0	0	0
11	8.93	33543	12865	29459	0	16900	0	2250	0
12	6	0	0	0	0	0	0	0	0
13	56	0	0	0	0	0	0	0	0
14	34	0	0	0	0	0	0	0	0
15	37	0	0	0	0	0	0	0	0
16	29	0	0	0	0	0	0	0	0
17	14	0	0	0	0	0	0	0	0
18	8	0	13805	0	1600	0	0	11520	6264
19	18	0	0	0	0	0	0	0	0
20	25	0	0	0	0	0	0	0	0
21	25	0	247	0	0	1331	0	0	0
22	10	2556	51129	38278	0	7931	0	4240	4800
23	20	0	0	0	0	0	0	0	0
24	68	0	0	0	0	0	0	0	0
25	26	0	0	0	0	0	11399	0	0
26	24	0	3548	0	0	10	33692	0	0
27	101	0	983	434	0	0	199	66	0
28	37	0	69	0	0	0	0	0	0
29	53	0	0	0	0	0	0	0	0
30	14	1600	1984	86	0	21614	38	1536	0
31	8	0	0	0	0	136	0	0	0
32	53	0	0	0	0	0	0	0	0
33	8	0	0	0	0	0	0	0	0
34	12	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0
36	0	0	1266	0	0	72023	0	0	0
37	10	0	12110	0	0	18246	0	2590	4123
38	18	0	6325	0	0	24950	0	6004	4813
39	210	0	0	0	0	0	0	0	0
40	24	0	0	0	0	0	0	0	0
41	31	0	0	0	0	0	0	0	0
42	33	0	0	0	0	0	0	0	0
43	39	0	0	0	0	0	0	0	0
44	21	0	0	0	0	0	0	0	0
45	14	0	0	0	0	0	0	0	0
46	28	0	0	0	0	0	0	0	0
47	10	0	2706	0	0	123	0	0	1591
48	30	0	0	0	0	0	0	0	0
49	18	0	0	0	0	0	0	0	0
50	36	0	0	0	0	0	0	0	0
51	44	0	0	0	0	0	0	0	0
1001	0	0	0	0	0	0	0	0	0
1002	0	0	0	0	0	0	0	0	0
1003	0	0	0	0	0	0	0	0	0
1004	0	0	0	0	0	0	0	0	0
1005	0	0	0	0	0	0	0	0	0
1006	0	0	0	0	0	0	0	0	0
1007	0	0	0	0	0	0	0	0	0
1008	0	0	0	0	0	0	0	0	0
1009	0	0	0	0	0	0	0	0	0
1010	0	0	0	0	0	0	0	0	0
1011	0	0	0	0	0	0	0	0	0

Table 5. Mid-Term Land Use Inputs

Zone	HH	Square Footage							
		Govt	Office	Ind	Medical	Retail	School	Storage	Warehouse
1	20	0	0	0	0	0	0	0	0
2	75	0	0	0	0	0	0	0	0
3	93	0	0	0	0	0	0	0	0
4	21	0	0	0	0	0	0	0	0
5	13	0	0	0	0	0	0	0	0
6	12	0	0	0	0	0	0	0	0
7	16	0	0	0	0	0	0	0	0
8	39	0	0	0	0	0	0	0	0
9	79	0	0	0	0	0	0	0	0
10	59	0	0	0	0	0	0	0	0
11	9	33543	12865	29459	0	16900	0	2250	0
12	28	0	0	0	0	0	0	0	0
13	67	0	0	0	0	0	0	0	0
14	55	0	0	0	0	0	0	0	0
15	55	0	0	0	0	0	0	0	0
16	45	0	0	0	0	0	0	0	0
17	25	0	0	0	0	0	0	0	0
18	34	0	13805	0	1600	65000	0	11520	6264
19	38	0	0	0	0	0	0	0	0
20	73	0	0	0	0	0	0	0	0
21	73	0	247	0	0	62831	0	0	0
22	10	2556	51129	188278	0	7931	0	4240	4800
23	31	0	0	0	0	0	0	0	0
24	72	0	0	0	0	0	0	0	0
25	41	0	0	0	0	0	11399	0	0
26	47	0	3548	0	0	40005	33692	0	0
27	117	0	983	434	0	0	199	66	0
28	47	0	69	0	0	0	0	0	0
29	76	0	0	0	0	0	0	0	0
30	17	1600	1984	86	0	28114	38	1536	0
31	12	0	0	0	0	16386	0	0	0
32	58	0	0	0	0	13000	0	0	0
33	8	0	0	0	0	0	0	0	0
34	20	0	0	0	0	0	0	0	0
35	9	0	0	0	0	0	0	0	0
36	0	0	1266	0	0	82023	0	0	0
37	10	0	12110	0	0	27996	0	2590	4123
38	18	0	6325	0	0	63950	0	6004	4813
39	210	0	0	0	0	0	0	0	0
40	61	0	0	0	0	0	0	0	0
41	33	0	0	0	0	0	0	0	0
42	47	0	0	0	0	0	0	0	0
43	68	0	0	0	0	0	0	0	0
44	28	0	0	0	0	0	0	0	0
45	18	0	0	0	0	0	0	0	0
46	47	0	0	0	0	0	0	0	0
47	14	0	2706	0	0	123	0	0	1591
48	48	0	0	0	0	0	0	0	0
49	34	0	0	0	0	0	0	0	0
50	56	0	0	0	0	0	0	0	0
51	49	0	0	0	0	0	0	0	0
1001	0	0	0	0	0	0	0	0	0
1002	0	0	0	0	0	0	0	0	0
1003	0	0	0	0	0	0	0	0	0
1004	0	0	0	0	0	0	0	0	0
1005	0	0	0	0	0	0	0	0	0
1006	0	0	0	0	0	0	0	0	0
1007	0	0	0	0	0	0	0	0	0
1008	0	0	0	0	0	0	0	0	0
1009	0	0	0	0	0	0	0	0	0
1010	0	0	0	0	0	0	0	0	0
1011	0	0	0	0	0	0	0	0	0

Table 6. Long Term (Full Build Out) Land Use Inputs

		Square Footage							
Zone	HH	Govt	Office	Ind	Medical	Retail	School	Storage	Warehouse
1	36	0	0	0	0	0	0	0	0
2	110	0	0	0	0	0	0	0	0
3	110	0	0	0	0	0	0	0	0
4	39	0	0	0	0	0	0	0	0
5	21	0	0	0	0	0	0	0	0
6	23	0	0	0	0	0	0	0	0
7	29	0	0	0	0	0	0	0	0
8	59	0	0	0	0	0	0	0	0
9	91	0	0	0	0	0	0	0	0
10	83	0	0	0	0	0	0	0	0
11	9	33543	12865	29459	0	16900	0	2250	0
12	49	0	0	0	0	0	0	0	0
13	78	0	0	0	0	0	0	0	0
14	76	0	0	0	0	0	0	0	0
15	73	0	0	0	0	0	0	0	0
16	60	0	0	0	0	0	0	0	0
17	36	0	0	0	0	0	0	0	0
18	60	0	13805	0	1600	130000	0	11520	6264
19	58	0	0	0	0	0	0	0	0
20	120	0	0	0	0	0	0	0	0
21	120	0	247	0	0	124331	0	0	0
22	10	2556	51129	338278	0	7931	0	4240	4800
23	41	0	0	0	0	0	0	0	0
24	75	0	0	0	0	0	0	0	0
25	56	0	0	0	0	0	11399	0	0
26	70	0	3548	0	0	80000	33692	0	0
27	132	0	983	434	0	0	199	66	0
28	57	0	69	0	0	0	0	0	0
29	98	0	0	0	0	0	0	0	0
30	20	1600	1984	86	0	34614	38	1536	0
31	16	0	0	0	0	32636	0	0	0
32	62	0	0	0	0	26000	0	0	0
33	8	0	0	0	0	0	0	0	0
34	27	0	0	0	0	0	0	0	0
35	18	0	0	0	0	0	0	0	0
36	0	0	1266	0	0	92023	0	0	0
37	10	0	12110	0	0	37746	0	2590	4123
38	18	0	6325	0	0	102950	0	6004	4813
39	210	0	0	0	0	0	0	0	0
40	98	0	0	0	0	0	0	0	0
41	34	0	0	0	0	0	0	0	0
42	61	0	0	0	0	0	0	0	0
43	97	0	0	0	0	0	0	0	0
44	34	0	0	0	0	0	0	0	0
45	22	0	0	0	0	0	0	0	0
46	65	0	0	0	0	0	0	0	0
47	18	0	2706	0	0	123	0	0	1591
48	66	0	0	0	0	0	0	0	0
49	49	0	0	0	0	0	0	0	0
50	76	0	0	0	0	0	0	0	0
51	53	0	0	0	0	0	0	0	0
1001	0	0	0	0	0	0	0	0	0
1002	0	0	0	0	0	0	0	0	0
1003	0	0	0	0	0	0	0	0	0
1004	0	0	0	0	0	0	0	0	0
1005	0	0	0	0	0	0	0	0	0
1006	0	0	0	0	0	0	0	0	0
1007	0	0	0	0	0	0	0	0	0
1008	0	0	0	0	0	0	0	0	0
1009	0	0	0	0	0	0	0	0	0
1010	0	0	0	0	0	0	0	0	0
1011	0	0	0	0	0	0	0	0	0

A majority of the forecasted land use changes for Carlsborg involve the build out of the housing in the area. Most employment level statistics, with the exception of retail employment, remains constant throughout the forecasts. A summary of the total changes in the forecasted households and land use is shown in the tables below:

Table 7. Summary of Households and External Trips

Land Use	Base	Mid Term	Long Range
Households	1,510	2,225	2,941
External to Internal	845	1,014	1,183
Internal to External	615	738	861

Table 8. Summary of Employment Categories

	Square Footage			Employment		
Land Use Type	Base	Mid Term	Long Range	Base	Mid Term	Long Range
Government	37,699	37,699	37,699	143	143	143
Office	107,037	107,037	107,037	405	405	405
Industrial	68,257	218,257	368,257	105	339	571
Medical	1,600	1,600	1,600	4	4	4
Retail	163,264	424,259	685,254	307	772	1,247
School	45,328	45,328	45,328	30	30	30
Storage	28,206	28,206	28,206	9	9	9
Warehouse	21,591	21,591	21,591	31	31	31
Total	472,982	883,977	1,294,972	1,034	1,733	2,440

External Trip Estimation

A major contributor to the traffic on the roadways in and around the City of Carlsborg is associated with trips that begin or end outside of the city limits as well as any traffic that passes through the city. This traffic was estimated and calibrated using existing count data at the external locations on the model. In the absence of any survey data, local knowledge was used as a first input into the estimation of the external to external as well as external to internal movements. The remaining land use and traffic counts were then used to adjust these assumptions until the external and internal traffic volumes matched the base year counts within accepted tolerances.

For purposes of the forecasts, the external stations were assumed to grow at a rate of 2% per year. This assumption is consistent with the overall travel growth on US 101 over the past several years. Since the external to external movements are an estimate, this forecasted growth can quickly and easily be modified for future scenarios.

Connectors

All traffic in the model begins or ends at a traffic analysis zone. Traffic is loaded onto the highway network via connectors. These connectors can be though of as the driveways or local circulation streets that are used to get traffic from our driveway onto a local street in the network.

In order to connect the zones properly to the network, a background image was brought into VISUM. A very detailed *.TIFF aerial photograph of the area in and around the city of Carlsborg was imported directly into the version file. With this as a background, the connectors for each zone were then added to the network.

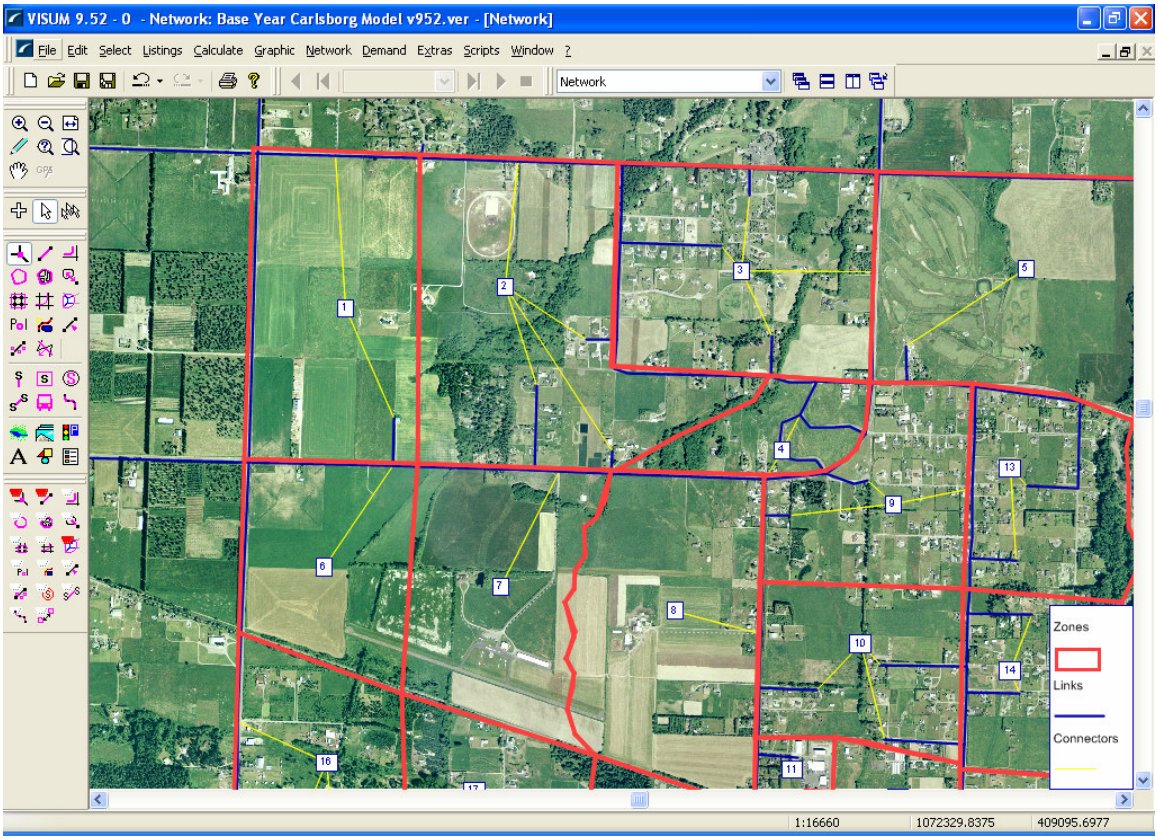

Figure 9. Zone Connectors

VISUM allows the user to specify what percentage of the trips should enter and exit the network via each connector. This ability, referred to as the "Multi-Point Assignment (MPA)" techniques, was brought over into VISUM from TModel. The aerial photo as helped in the creation of these connector shares.

Travel Demand Model

Once all of the network detail was created, the next stage of the model development was creation of the model stream. This included Trip Generation, Trip Distribution and Highway Assignment. For the purposes of this model, only the auto mode was considered and forecasted.

Trip Generation

The Carlsborg model was created for the PM Peak Hour. There are five trip purposes in the model as shown in Figure 10. Each of these five trip purposes is used in Trip Generation and distribution.

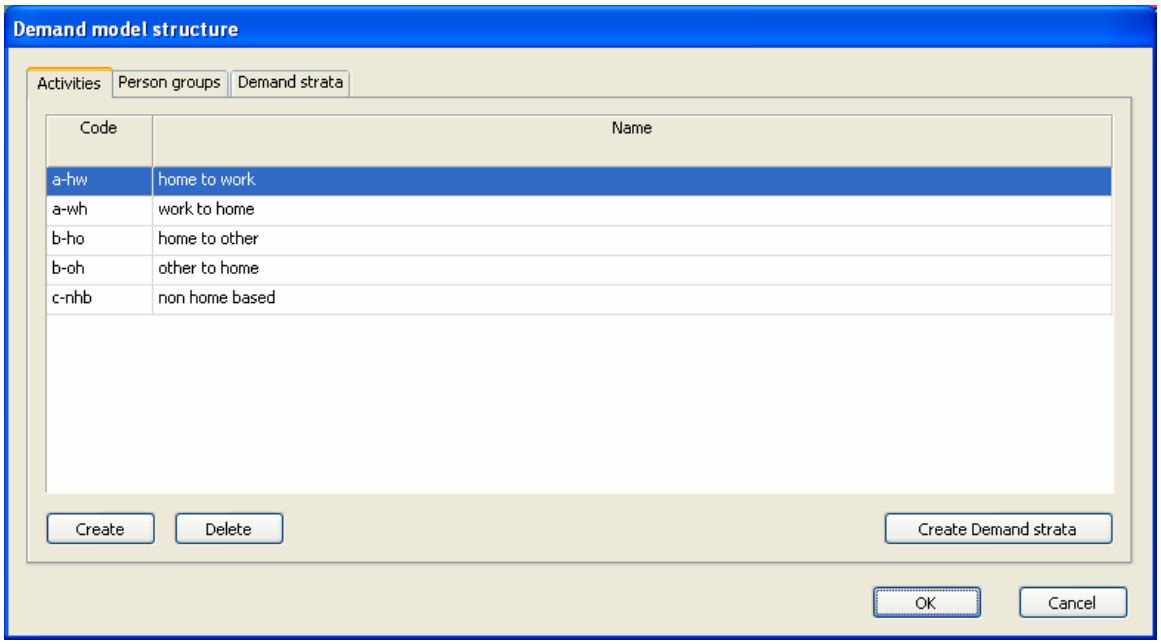

Figure 10. Trip Purposes

The land use inputs that are considered in the trip generation step include the employment type as well as the number of households in a zone. The trip generation rates used in the Carlsborg model were borrowed from a model of the Tri-Cities region in Eastern Washington. An example of the dialog for input into the VISUM model is shown in Figure 11.

As shown in the dialog box to the right, the trip generation involves production and attraction rates for various employment categories as well as the households and internal to external characteristics of a zone. The categories used in trip generation include:

- Government Employment
- Office Employment
- Industrial Employment
- Medical Employment
- Retail Employment
- Warehouse Employment
- School Employment
- Storage Employment
- Households
- External to Internal Trips
- Internal to External Trips

The rates vary by the trip purposes. Each trip purpose balances the total productions and attractions to a mean of both totals. This means that at the en d of the trip generation step, the total productions and attractions are balanced to each other and this total is based on the mean of the productions and attractions. This balancing is required due to the fact that every trip production in the model must have an attraction.

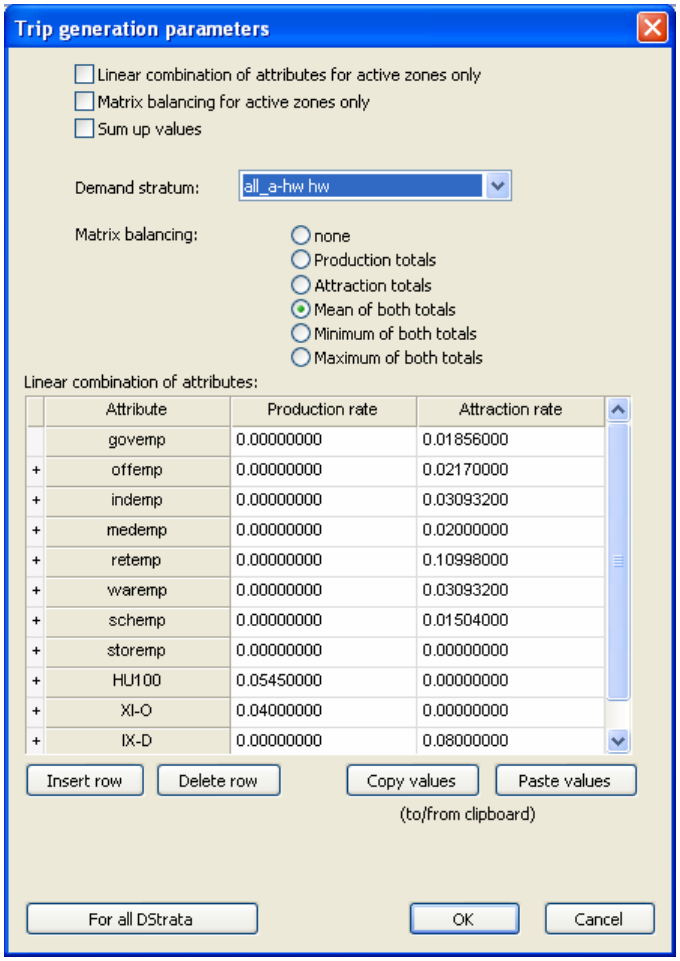

Figure 11. Trip Generation Dialog in VISUM

The trip generation rates by purpose are shown in the tables below.

Table 9. Work Based Trip Generation Rates

	Home to Work		Work to Home	
Attribute	Production Rate	Attraction Rate	Production Rate	Attraction Rate
Governement Employment	0.000000	0.018560	0.197200	0.000000
Office Employment	0.000000	0.021700	0.241500	0.000000
Industrial Employment	0.000000	0.030932	0.103600	0.000000
Medical Employment	0.000000	0.020000	0.090000	0.000000
Retail Employment	0.000000	0.109980	0.220480	0.000000
Warehouse Employment	0.000000	0.030932	0.103600	0.000000
School Employment	0.000000	0.015040	0.033920	0.000000
Storage Employment	0.000000	0.000000	0.000000	0.000000
Households	0.054500	0.000000	0.000000	0.225280
External to Internal	0.040000	0.000000	0.080000	0.000000
Internal to External	0.000000	0.080000	0.000000	0.120000

Table 11. Other Based Trip Generation Rates

	Home to Other		Other to Home	
Attribute	Production Rate	Attraction Rate	Production Rate	Attraction Rate
Governement Employment	0.000000	0.074240	0.118320	0.000000
Office Employment	0.000000	0.086800	0.144900	0.000000
Industrial Employment	0.000000	0.024420	0.041440	0.000000
Medical Employment	0.000000	0.000000	0.000000	0.000000
Retail Employment	0.000000	0.659880	0.551200	0.000000
Warehouse Employment	0.000000	0.024420	0.041440	0.000000
School Employment	0.000000	0.052640	0.084800	0.000000
Storage Employment	0.000000	0.000000	0.000000	0.000000
Households	0.232704	0.000000	0.000000	0.290880
External to Internal	0.200000	0.000000	0.240000	0.000000
Internal to External	0.000000	0.160000	0.000000	0.280000

Table 10. NonHome Based Trip Generation Rates

	Non Home Based	
Attribute	Production Rate	Attraction Rate
Governement Employment	0.067048	0.083520
Office Employment	0.082110	0.088970
Industrial Employment	0.010360	0.034188
Medical Employment	0.270000	0.100000
Retail Employment	0.564980	0.415480
Warehouse Employment	0.010360	0.034188
School Employment	0.045792	0.076704
Storage Employment	0.000000	0.000000
Households	0.069084	0.054944
External to Internal	0.440000	0.000000
Internal to External	0.000000	0.360000

Trip Distribution

The trip distribution in the Carlsborg model is based on a Gravity Model. The co-efficient and exponents in the equations also originated from a model in the Tri-Cities area of Washington. In the absence of any survey data, the model calibration focused more on the traffic counts than trip length frequency distributions. Considering the large amount of external traffic in this region, this approach leads to fairly strong correlations between the model and observed data. All five trip purposes are distributed based on auto travel time skims and an adjustment matrix to prevent the distribution of trips between the external zones.

An example of the dialog for inputting the Trip Distribution details is shown in Figure 12 on the next page.

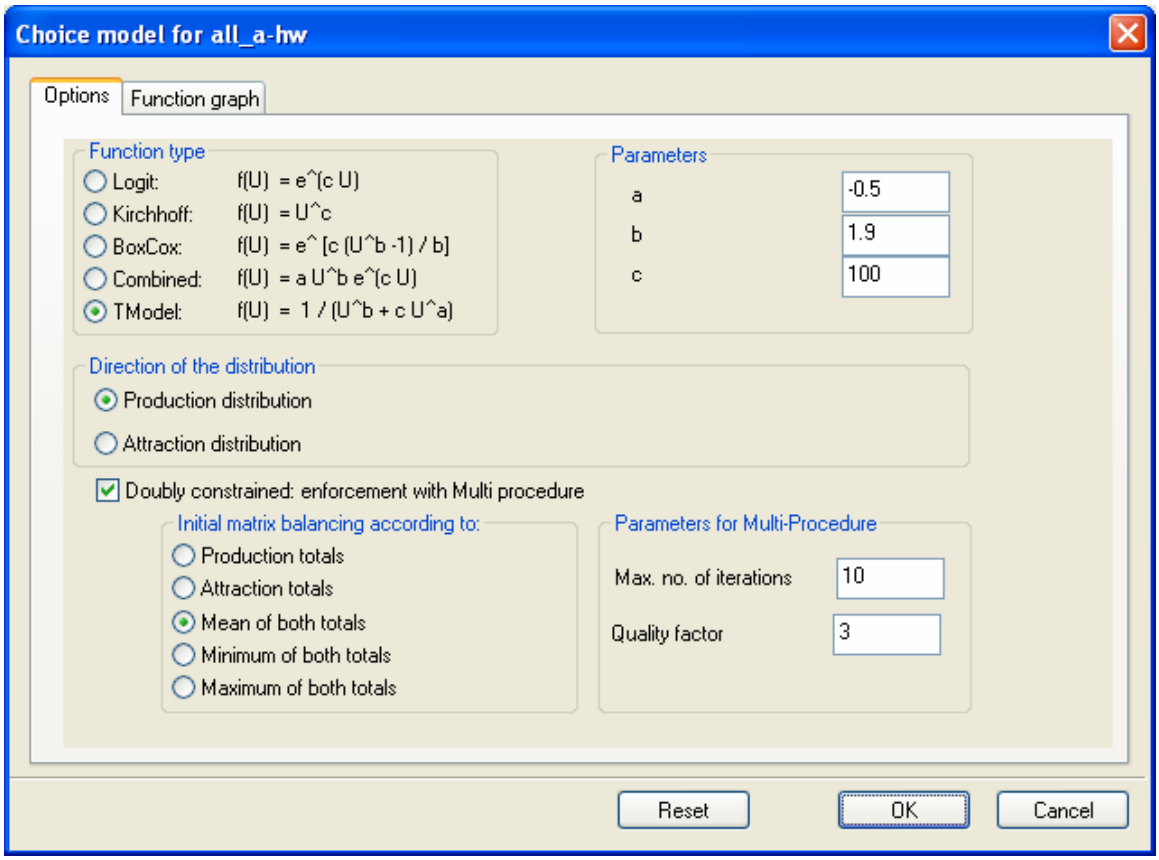

Figure 12. Trip Distribution Equation and Input Dialog

Each trip purpose uses the same utility function but each can have its own parameters. For simplicity as well as consistency, the Home to Work and Work to home directions use the same parameters. This is also true for the Home to Other and Other to Home purposes. All the parameters used in the trip distribution are shown in

Table 12. Trip Distribution Parameters

Parameter	Home to Work	Work to Home	Home to Other	Other to Home	Non Home Based
a	-0.5	-0.5	-0.5	-0.5	-0.5
b	1.9	1.9	2.6	2.6	2.8
c	100	100	100	100	100

Highway Assignment

The Carlsborg model uses both link and node volume delay functions in combination with a Multi-Point Mutli-Equilibirum assignment technique.

Each individual trip purpose is assigned to the network so that analysis on the types of trips using certain facilities can be performed. To make the assignments run quicker and to save display space, the Home to Work and Work to Home purposes were combined into Home Based Work before the assignment process. The same is true for the Home Based Other trip purpose.

The settings for the equilibrium assignment are shown in Figure 13. These settings are designed so that the assignment will converge to the relative gap. Because of the relatively small network, the model converges even in the Long Range Horizon in only a few iterations.

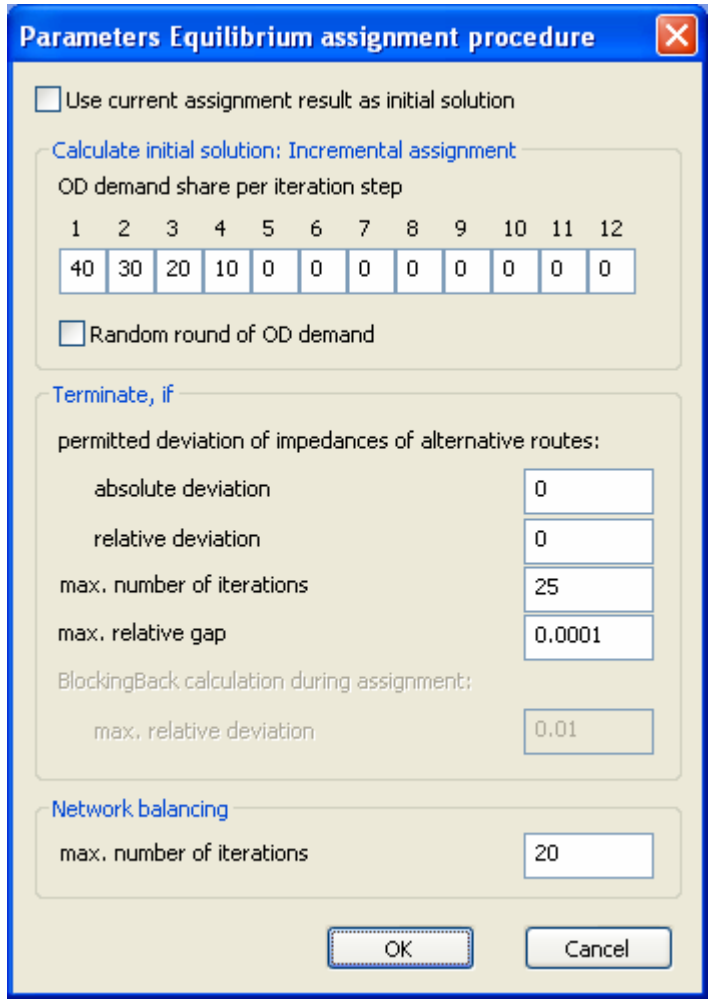

Figure 13. Equilibrium Assignment Settings

Link Volume Delay Functions

There are three different link volume delay functions used in the Carlsborg Model. The functional form, which is a modified version of the BPR equation, is the same for all link classifications however the critical saturation flow rate and parameters vary slightly by functional class. The basic functional form is shown in Figure 14.

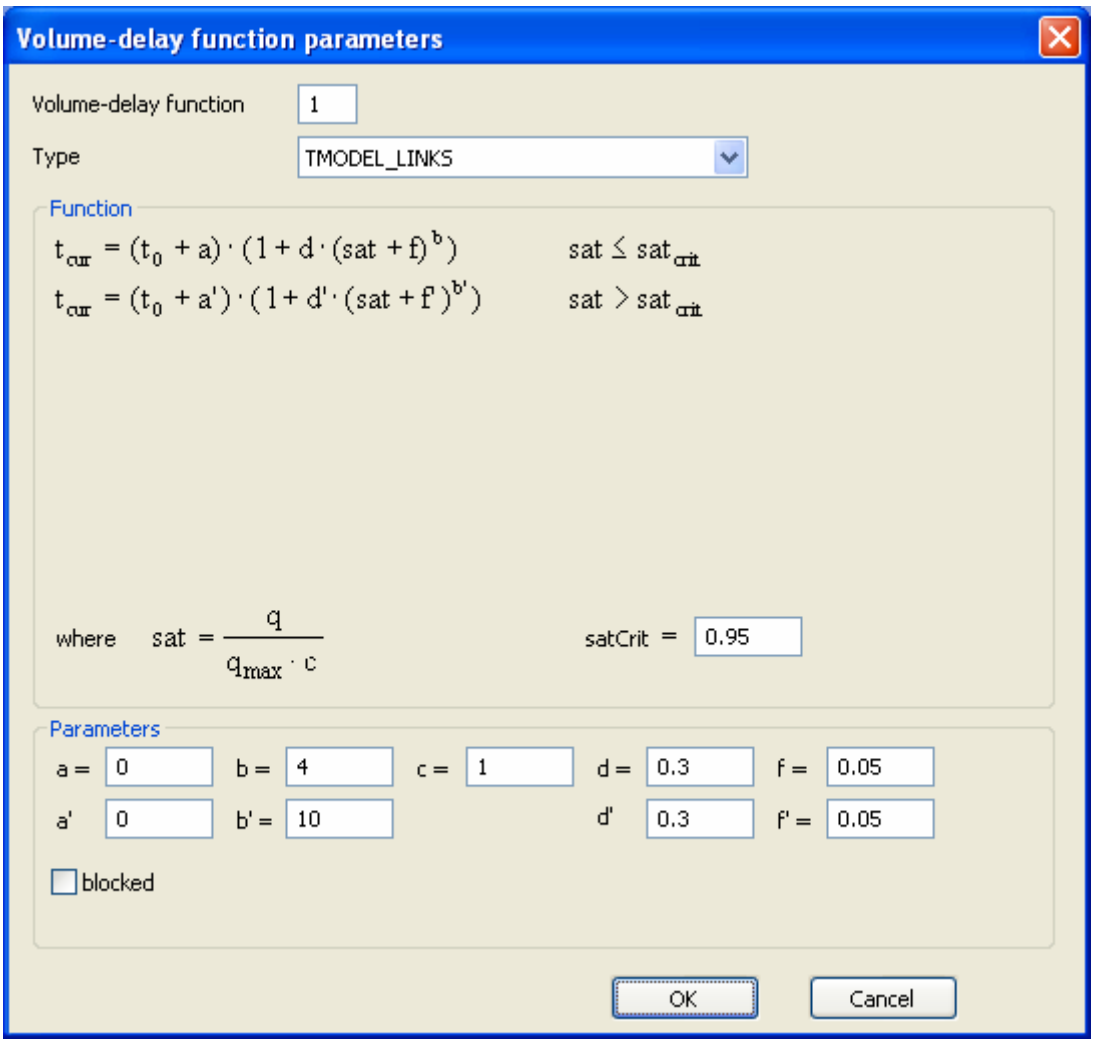

Figure 14. Volume Delay Function

The detailed parameters for each link classification are shown below.

Table 13. Link Volume Delay Function Parameters - Below SatCrit

Type #	Name	a	b	c	d	f	SatCrit
2	Rural Principle Arterial	0.00	4.00	1.00	0.30	0.05	0.95
7	Rural Major Collector	0.00	4.00	1.00	0.30	0.15	0.85
8	Rural Minor Collector	0.00	4.00	1.00	0.30	0.25	0.75
9	Local Access	0.00	4.00	1.00	0.30	0.25	0.75

Table 14. Link Volume Delay Function Parameters - Above SatCrit

Type #	Name	a'	b'	d'	f'
2	Rural Principle Arterial	0.00	10.00	0.30	0.05
7	Rural Major Collector	0.00	10.00	0.30	0.15
8	Rural Minor Collector	0.00	10.00	0.30	0.25
9	Local Access	0.00	10.00	0.30	0.25

Node Volume Delay Functions

There are three different node volume delay functions used in the Carlsborg Model as well. Similar to the links, the only difference between the volume delay functions are the parameters.

The volume delay functions vary for each node type which is defined by the control type for the intersection. If any new nodes are added to the network, it is important that they are assigned the proper node type based on their intersection control.

The detailed parameter settings for the node volume delay functions are shown in the tables on the next page.

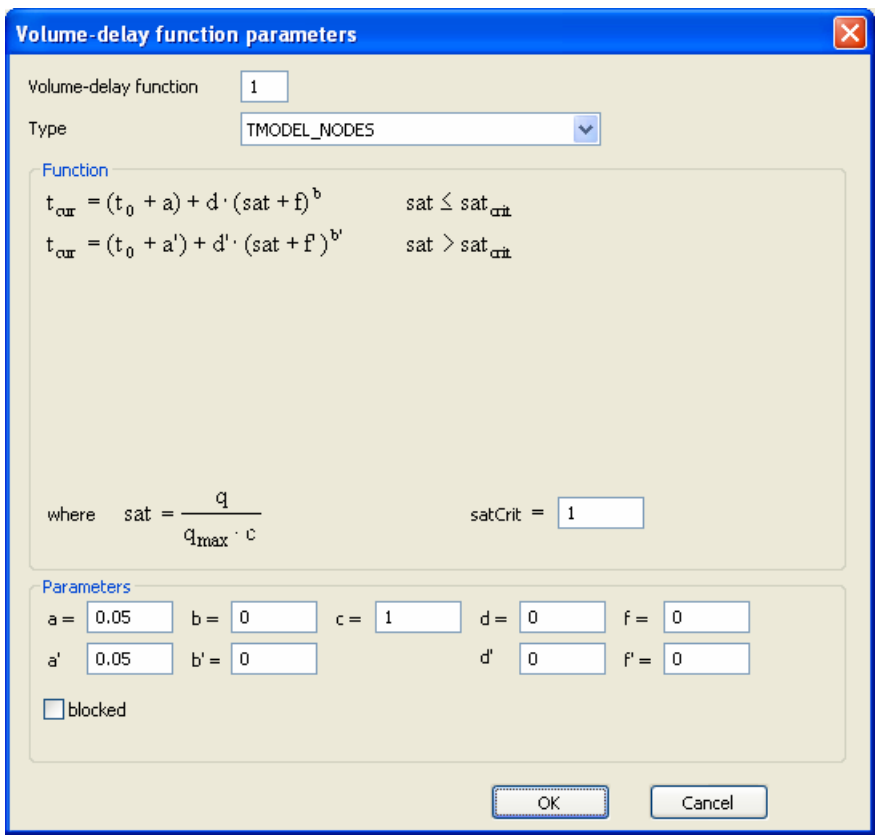

Figure 15. Node Volume Delay Function Definition

Table 15. Node Volume Delay Function Parameters - Below SatCrit

Type #	Name	a	b	c	d	f	SatCrit
1	Uncontrolled	0.05	0.00	1.00	0.00	0.00	1.00
2	Two Way Stop	2.00	2.60	1.00	0.50	0.15	0.85
3	Signalized	2.00	3.80	1.00	1.00	0.10	1.00
4	Four Way Stop	2.00	2.60	1.00	0.50	0.15	0.85

Table 16. Node Volume Delay Function Parameters - Above SatCrit

Type #	Name	a'	b'	d'	f'
1	Uncontrolled	0.05	0.00	0.00	0.00
2	Two Way Stop	4.00	4.60	0.50	0.15
3	Signalized	4.00	4.80	1.00	0.10
4	Four Way Stop	4.00	4.60	0.50	0.15

MSA Averaging and Model Convergence

To ensure that any oscillations between model iterations is at a minimum, the Carlsborg model utilizes the Method of Successive Averages to average the od demand between each model iteration of trip distribution and highway assignment. At the end of each iteration in the feedback loop, the trip table results for all the trip purposes are stored. After the skim matrices are used to create the new trip tables, this trip table is averaged with the previous iteration trip table to ensure minimal oscillation and model convergence in as few model iterations as necessary. The current model is set to run until the change in each OD pair is less than 0.05 trips without running more than 10 iterations. The future build out model converges in 6 feedback loops with no network improvements in the model. The feedback settings are shown in Figure 16.

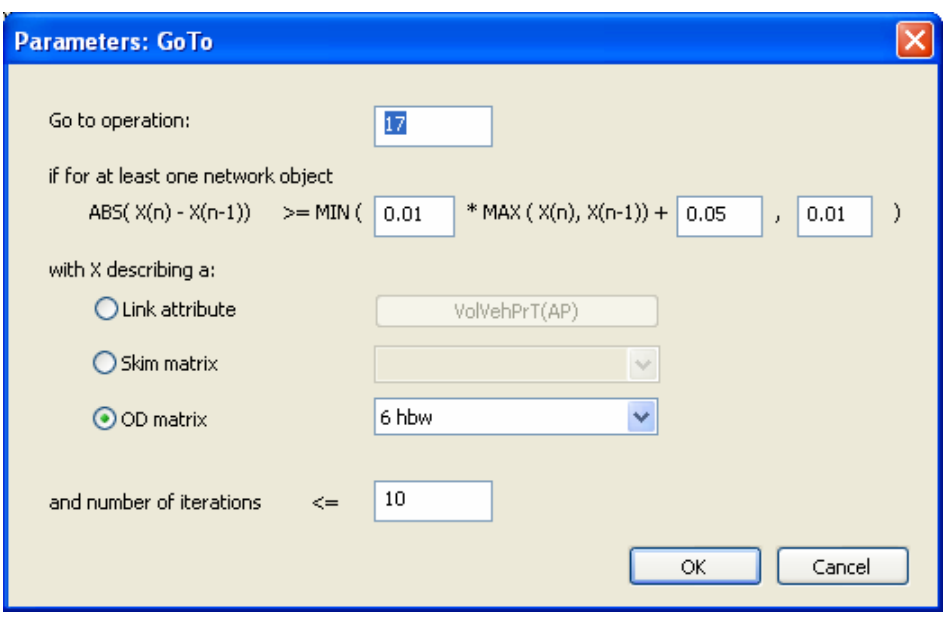

Figure 16. Feedback Loop Convergence Criteria

Base Model Validation Statistics

Link Volume Statistics

After the base year model was run through, the resulting link volumes were compared at the 98 link locations with base year counts. In the calibration stage, the external trip matrices as well as the link and node volume delay functions were adjusted to better replicate the existing conditions. The results of a statistical analysis of the model to count volumes are shown in Figure 17.

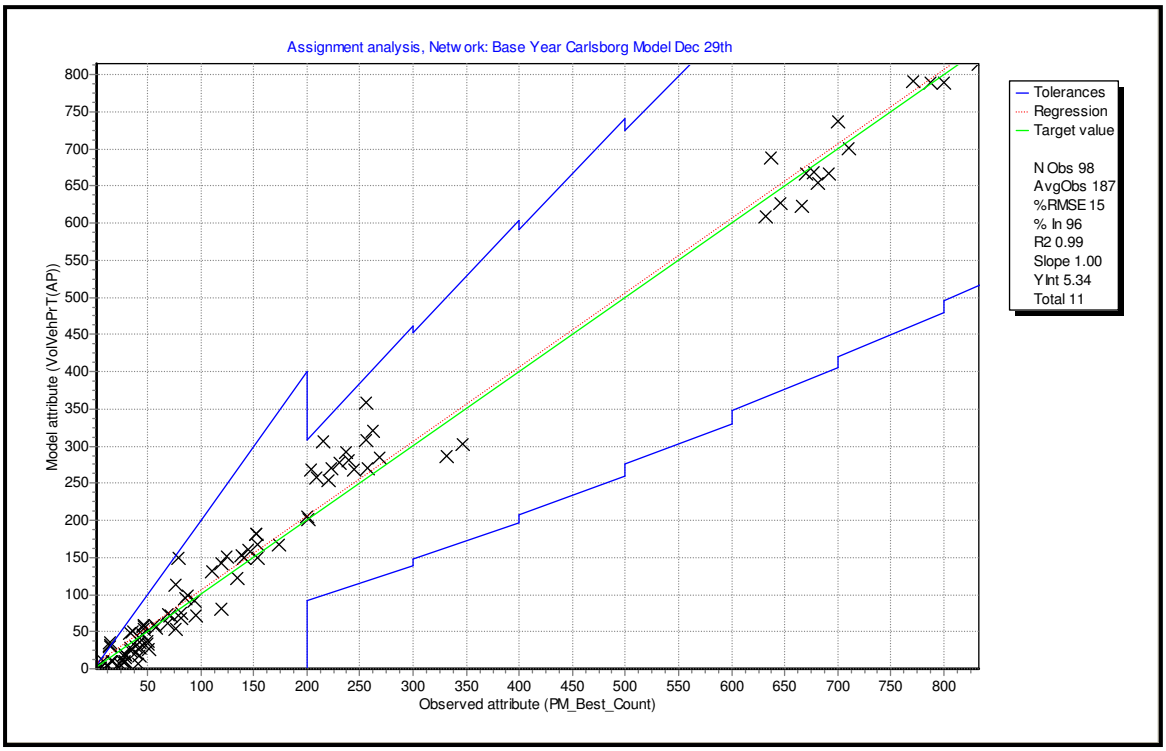

Figure 17. Base Year Model Scattergram

As can be seen in Figure 17, the model replicates the existing counts extremely well. With an overall Root Mean Square Error of 15 and an R2 of 0.99 and slope of 1.00, the model exceeds the standards for travel demand models. The blue lines on the chart show the accepted tolerance level for link volumes of this type. All the link volumes are within the accepted tolerances for PM Peak Hour models. The traditional standards for travel demand models call for an R2 of at least 0.88 and an RMSE under 35.

Base and Future Model Results

Link Level Results

The base year model shows very little link congestion in the PM Peak Hour. There are currently no links with a volume to capacity ratio over 0.70 and even with the growth of travel demand related to a full build out of the City of Carlsborg, there would still be little or no congestion on the links in and around the city.

This does not mean that travel would not change between the baseline and a full build out. As can be seen in Table 20, the overall VMT would increase by over 58% however the overall speed only decreases by 5%.

Table 17. Base Year VMT, VHT and Delay

Type #	Name	Lane Miles	Vehicle Miles Traveled	Vehicle Hours Traveled	Free-Flow Vehicle Hours Traveled	PM Peak Vehicle Hours of Delay	PM Peak Average Speed
2	Rural Principle Arterial	12.0	4,178	89	89	0	47.1
7	Rural Major Collector	21.3	3,237	74	74	0	43.6
8	Rural Minor Collector	8.8	604	15	15	0	39.7
9	Local Access	52.9	900	29	29	0	31.2
All	All Link Types	95.0	8,919	207	207	0	43.1

Table 18. Mid Term VMT, VHT and Delay

Type #	Name	Lane Miles	Vehicle Miles Traveled	Vehicle Hours Traveled	Free-Flow Vehicle Hours Traveled	PM Peak Vehicle Hours of Delay	PM Peak Average Speed
2	Rural Principle Arterial	12.0	4,979	106	106	0	47.0
7	Rural Major Collector	21.3	4,309	101	100	1	42.6
8	Rural Minor Collector	8.8	788	20	20	0	39.4
9	Local Access	52.9	1,462	49	49	0	29.8
All	All Link Types	95.0	11,538	276	275	1	41.8

Table 19. Full Build Out VMT, VHT and Delay

Type #	Name	Lane Miles	Vehicle Miles Traveled	Vehicle Hours Traveled	Free-Flow Vehicle Hours Traveled	PM Peak Vehicle Hours of Delay	PM Peak Average Speed
2	Rural Principle Arterial	12.0	5,854	125	124	0	46.9
7	Rural Major Collector	21.3	5,346	128	126	2	41.8
8	Rural Minor Collector	8.8	973	25	25	0	39.0
9	Local Access	52.9	1,975	68	67	1	29.1
All	All Link Types	95.0	14,148	345	342	3	41.0

Table 20. Comparison of Base Year and Build Out

Type #	Name	Lane Miles	Vehicle Miles Traveled	Vehicle Hours Traveled	Free-Flow Vehicle Hours Traveled	PM Peak Vehicle Hours of Delay	PM Peak Average Speed
2	Rural Principle Arterial	12.0	40%	40%	40%	329%	0%
7	Rural Major Collector	21.3	65%	72%	70%	1081%	-4%
8	Rural Minor Collector	8.8	61%	64%	62%	351%	-2%
9	Local Access	52.9	119%	135%	134%	494%	-7%
All	All Link Types	95.0	59%	67%	65%	653%	-5%

This is also visible when one looks at a plot showing the overall link volumes plotted as bars which are also color coded based on the link volume to capacity ratio. As the two figures below show, even though the bar width gets wider with more volume, there is still enough excess capacity that the Link Volume to Capacity ratio does not move into another V/C category, hence the speed does not change much either.

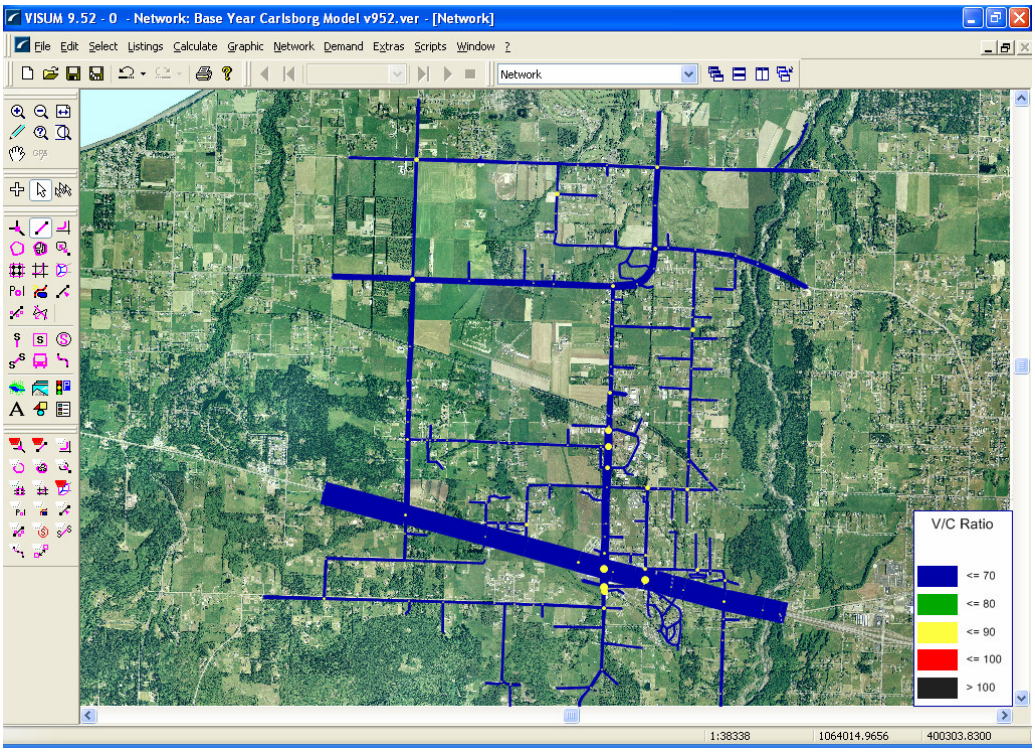

Figure 18. Base Year Link Volume and V/C Ratios

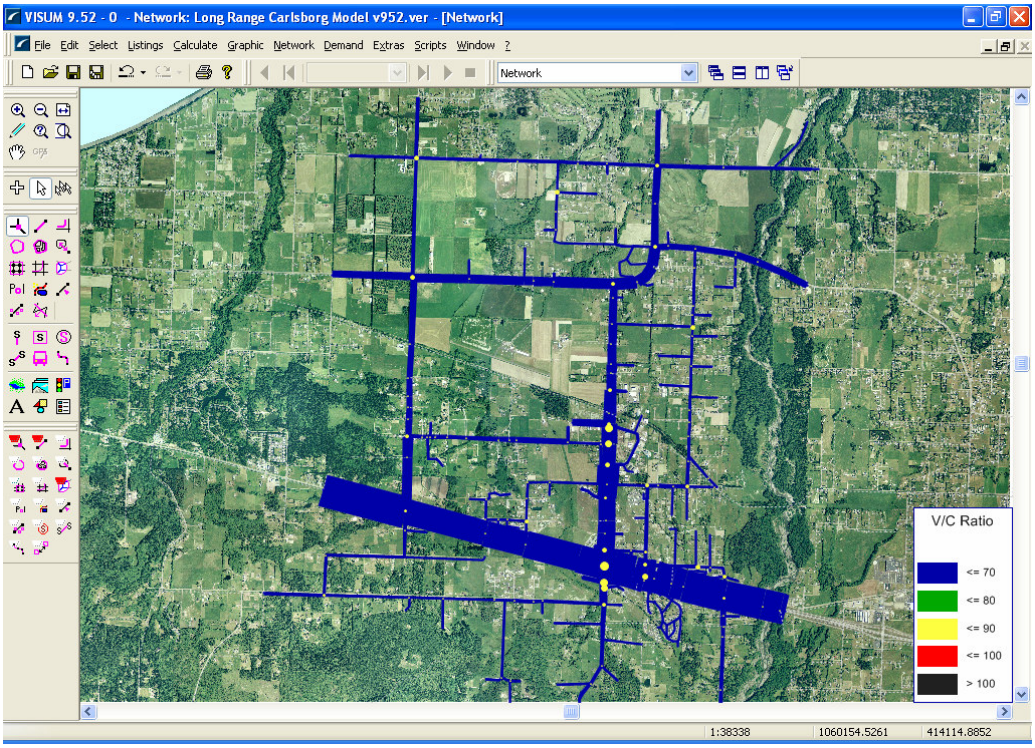

Figure 19. Full Build Out Link Volume and V/C Ratios

Intersection Level of Service

Even though the link volume to capacity ratios show little delay in the base or future scenarios, the intersection Level of Service does change in the future scenarios. Table 21 shows the intersection Level of Service for 37 intersections within the City of Carlsborg and Figures 20 thru 23 graphically show the intersection LOS on the network. In all scenarios, US 101 and Carlsborg Road is the only signalized intersection. The remaining intersections are all two way stop control.

As can be seen in the table and the plots, there are only two intersections in the Baseline that are at LOS D. Both of these intersections are two way stop controlled intersections that intersect with US 101 and are Kitchen Dick and US 101 and Taylor Cutoff and US 101. In each case, the causes for the higher LOS are the left turn movements on the side streets to US 101. This is due to the large flow of mainline traffic that makes it difficult to find acceptable gaps for left turns onto US 101. This is reflected by the fact that the overall intersection average delay is less than 5 seconds and yet the maximum intersection leg delay is over 30 seconds in each case.

With the increased traffic with the Mid Term development, these two intersections are pushed to an LOS F with the side street delay up over 3 minutes while the overall intersection delay is still around 15 seconds. The intersections of US 101 and Joslin as well as US 101 and Parkwood are both pushed to an LOS D for the same reasons explained above. The intersections on Carlsborg Road from US 101 up to Business Park Loop also start to see more delay and a few are at or near the threshold for deficiency as well.

By Long Term Full Build Out, 6 intersections would have an LOS of F and three with an LOS E. All of these intersections are on US 101 or Carlsborg Road south of the Business Park Loop. With much more intense development of retail along Carlsborg Road and the increased demand due to housing farther north, it may be necessary to consider signalization and access control on Carlsborg Road.

It should be noted that all the failing intersections are currently two way stops. With the Highway Capacity Manual Unsignalized Intersection Analysis, when the mainline flow reaches a certain point, the intersection LOS is driven up by substantial delay on the side streets. This causes the intersection to fail even if the side street movements are fairly light.

Table 21. Intersection Level of Service

		Baseline			Mid Term			Long Term		
Node #	Intersection	Level of Service	Average Intersection Delay	Maximum Intersection Leg Delay	Level of Service	Average Intersection Delay	Maximum Intersection Leg Delay	Level of Service	Average Intersection Delay	Maximum Intersection Leg Delay
131554550	Old Olympic Hwy and Carlsborg	B	4s	11s	B	5s	15s	C	8s	24s
131707333	Woodcock and Kitchen Dick	B	6s	11s	B	6s	11s	B	7s	12s
131707367	Woodcock and Wheeler	A	0s	9s	A	0s	9s	A	0s	9s
131707375	Woodcock and Cays Rd	B	5s	14s	C	5s	16s	C	6s	19s
131708169	Old Olympic Hwy and Cays	B	4s	14s	C	4s	16s	C	5s	20s
131708170	Old Olympic Hwy and Heath	A	0s	10s	A	0s	10s	B	0s	10s
131708880	Heath Rd and Pheasant Run Dr	A	3s	9s	A	4s	9s	A	4s	9s
131708881	Carlsborg and Pheasant Run Dr	A	1s	10s	B	1s	11s	B	1s	13s
131709297	Carlsborg Rd and Idea Pl	B	4s	11s	B	3s	14s	C	3s	18s
131709610	Spath and Kitchen Dick	B	1s	11s	B	2s	12s	B	3s	14s
131709637	Carlsborg and Spath Rd	B	0s	11s	C	1s	16s	D	2s	25s
131709749	Carlsborg and North Business Park Loop	B	3s	12s	C	3s	19s	E	6s	41s
131709758	Carlsborg and South Business Park Loop	B	1s	13s	C	1s	19s	D	1s	30s
131709847	Mill Rd and E Runnion Rd	A	6s	9s	A	4s	9s	A	4s	9s
131709848	Carlsborg and E Runnion Rd	B	1s	15s	D	1s	29s	F	3s	91s
131709941	US 101 and Costco Entrance	B	1s	11s	B	1s	12s	B	1s	13s
131709967	Heath and E Runnion Rd	A	6s	9s	A	6s	10s	B	6s	10s
131710110	Carlsborg and Jenifer Ct	B	1s	13s	C	1s	18s	D	1s	26s
131710141	US 101 and Boyce Rd	C	0s	22s	C	0s	17s	D	1s	26s
131710196	Carlsborg and Smithfield Dr	B	2s	15s	E	6s	38s	F	45s	300s
131710197	Mill Rd and Smithfield	A	2s	9s	A	2s	10s	A	2s	10s
131710245	Mill and Guptster	A	2s	9s	A	3s	10s	B	4s	10s
131710305	US 101 and Parkwood	C	2s	34s	D	2s	72s	F	4s	224s
131710325	Hooker and Valley Center Pl	C	5s	16s	C	6s	25s	F	9s	55s
131710326	US 101 and Carlsborg	C	23s	32s	C	30s	45s	D	50s	94s
131710352	US 101 and Frederick Dr	B	0s	10s	B	0s	11s	B	0s	12s
131710442	Hooker and Atterberry	A	2s	10s	B	2s	11s	B	3s	12s
131710489	US 101 and Taylor Cutoff	D	2s	30s	F	16s	207s	F	174s	300s
131874144	US 101 Kitchen Dick	D	3s	53s	F	9s	210s	F	52s	300s
131874145	US 101 and Joslin Rd	C	0s	22s	D	0s	27s	E	0s	38s
131933150	Old Olympic Hwy Kitchen Dick	B	6s	14s	B	6s	16s	B	7s	19s
131979668	Carlsborg and Savannah Ln	B	1s	10s	B	3s	14s	D	8s	34s
131979726	Carlsborg and Winterhawk	B	0s	12s	B	0s	18s	E	2s	44s
132093851	Carlsborg and Childers Ln	B	0s	10s	B	0s	12s	B	1s	14s
132214278	US 101 and Access to Zone 30 and 37	B	0s	11s	B	0s	12s	B	0s	13s
132214279	US 101 and Access to Zone 30	A	0s	10s	B	0s	10s	B	0s	11s
132214301	Carslborg Rd and Drive SO Olympic	A	0s	10s	B	1s	11s	B	1s	12s

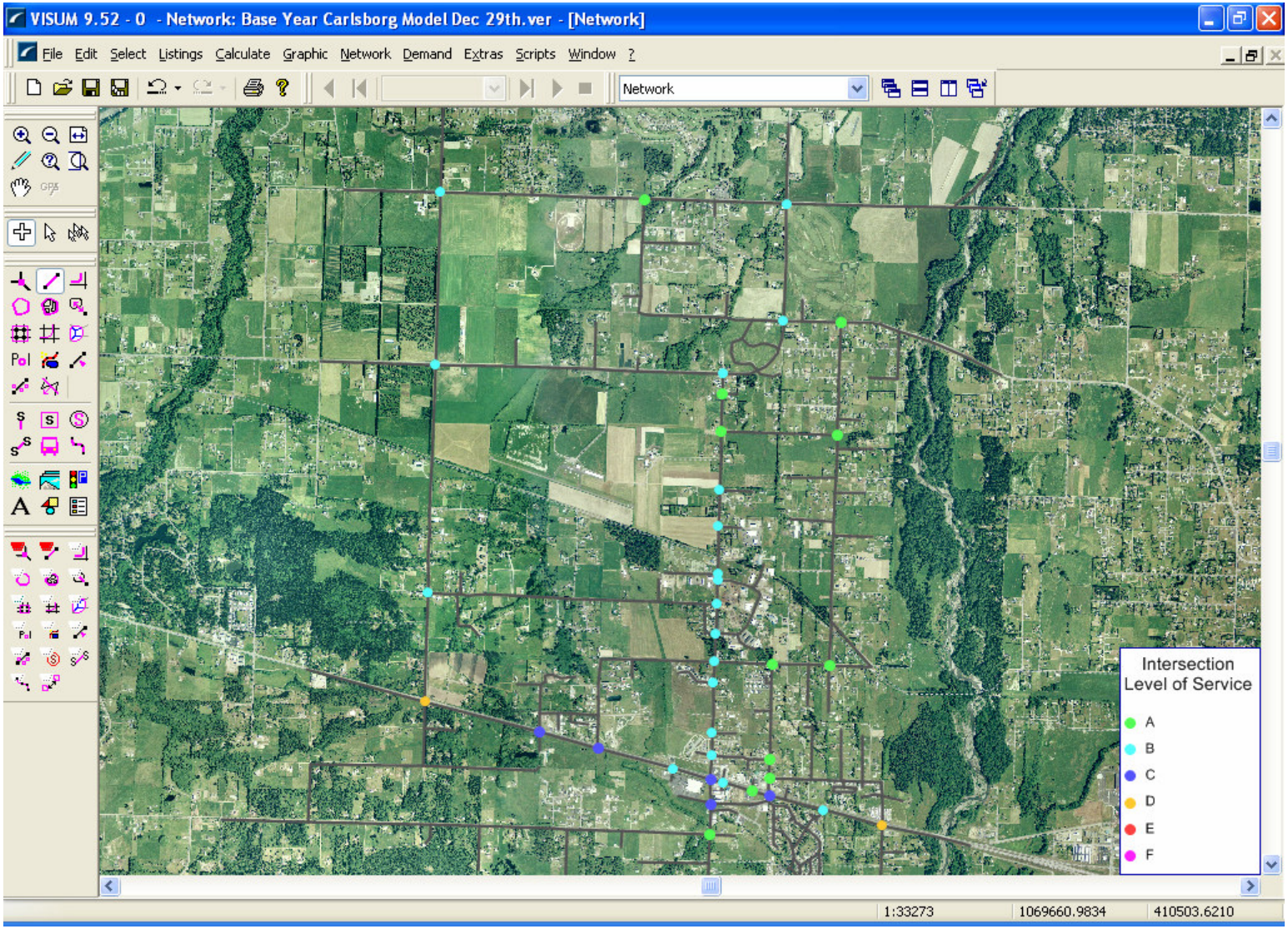

Figure 20. Baseline Intersection Level of Service

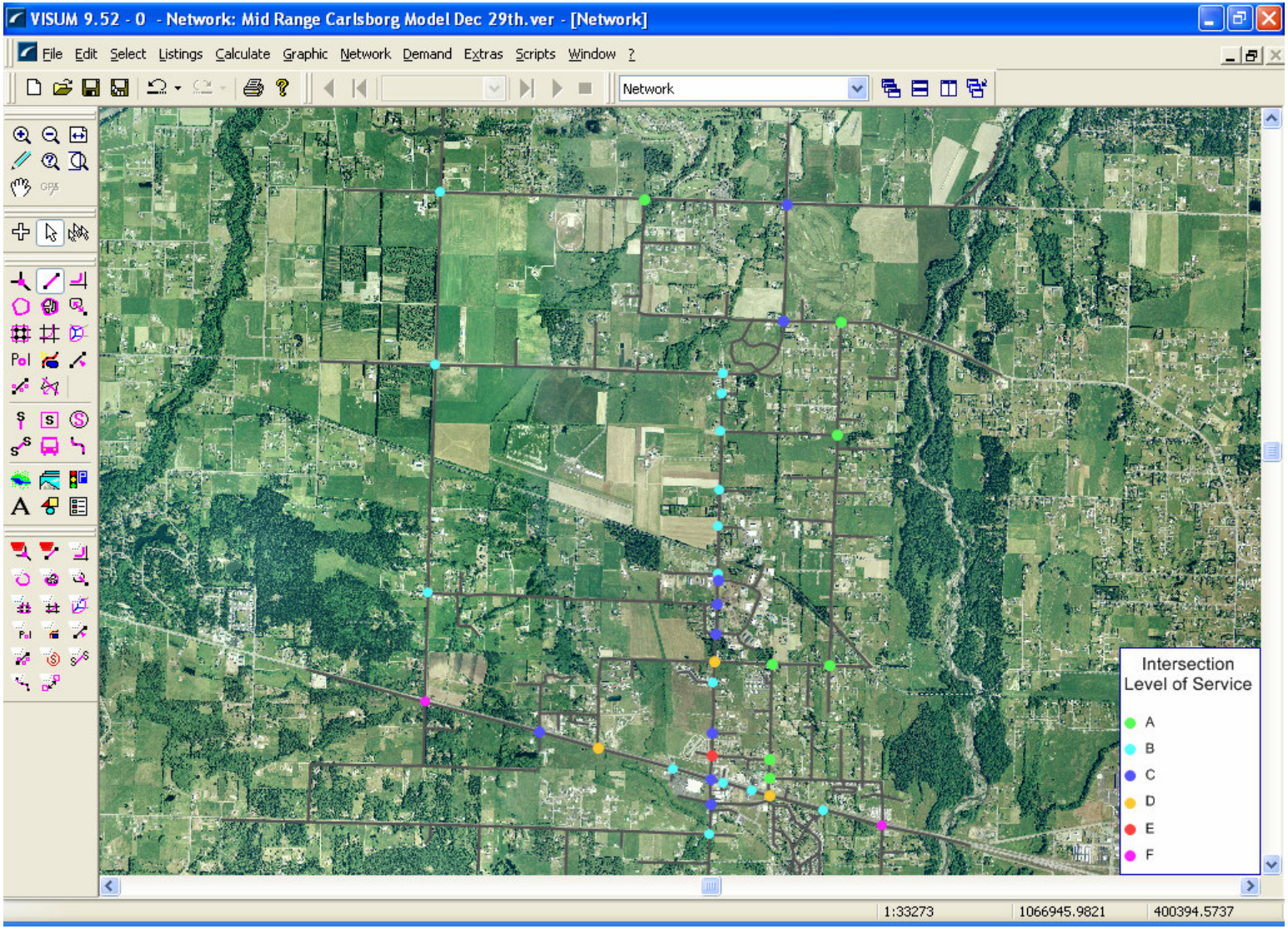

Figure 21. Mid Term Intersection Level of Service

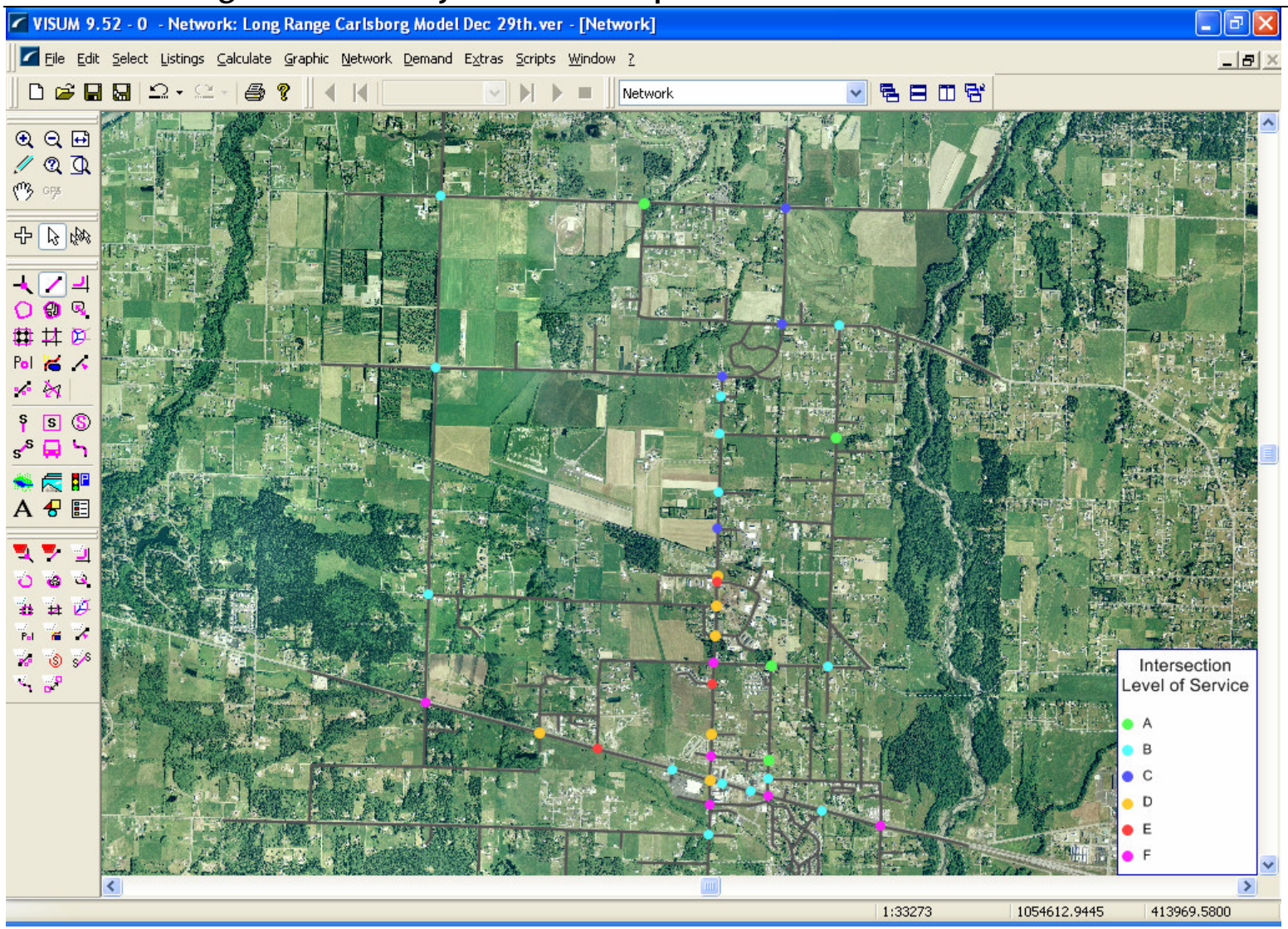

Figure 22. Long Term Intersection Level of Service

APPENDIX FIVE

CONCURRENCY ORDINANCE SAMPLES

Approved: November 5, 2003
Effective: November 17, 2003

SNOHOMISH COUNTY COUNCIL
SNOHOMISH COUNTY, WASHINGTON

AMENDED ORDINANCE NO. 03-127

AMENDING CHAPTER 30.66B SCC TO REVISE AND CLARIFY REQUIREMENTS FOR CONCURRENCY OF LAND DEVELOPMENT WITH ROAD IMPROVEMENTS

WHEREAS, the state Growth Management Act (GMA) requires Snohomish County to adopt regulations related to the concurrency of transportation improvements or strategies with land developments; and

WHEREAS, the county adopted ordinances to regulate the concurrency of transportation improvements in 1995, by Amended Ordinance No. 95-039, and 2001, by Amended Ordinance Nos. 01-011 and 01-013, which were codified in Title 26B SCC; and

WHEREAS, Title 26B SCC was repealed and incorporated into the Unified Development Code as Chapter 30.66B SCC by Amended Ordinance No. 02-064, effective February 1, 2003; and

WHEREAS, the Washington Administrative Code (WAC) in Section 365-195-835(3)(e), which addresses the form, timing and duration of concurrency approvals, states that such approvals should "specify the length of time that a concurrency determination will remain effective"; and

WHEREAS, the county has been implementing GMA concurrency regulations since 1995 and experience to date has suggested the need for additional revisions, clarifications, and efficiencies to the county's concurrency regulations related to the duration and expiration of concurrency approvals as set forth in this ordinance; and

WHEREAS, the proposed revisions are consistent with and implement the county's Countywide Planning Policies and GMA Comprehensive Plan (GMACP), as amended; and

WHEREAS, the proposed revisions are consistent with and implement the GMACP Transportation Element and facilitate implementation of the concurrency management system for transportation as required by the GMA; and

WHEREAS, the proposed revisions are internally consistent with the county's existing GMA development regulations; and

WHEREAS, the county has provided for public participation in developing the proposed revisions in accordance with state law and county codes; and

WHEREAS, the Department of Public Works has provided for environmental review of the proposed revisions in accordance with the state law and county codes; and

WHEREAS, the planning commission held a a work session June 24, 2003, and a public hearing on July 22, 2003 and sent its recommendations to the county council; and

WHEREAS, having considered the recommendations of the planning commission, the county council finds that it is appropriate to amend Chapter 30.66B SCC to revise and clarify concurrency regulations consistent with state law.

THEREFORE, BE IT ORDAINED:
Section 1. The county council hereby adopts the foregoing recitals as findings of fact and conclusions.

Section 2. Snohomish County Code Section 30.66B.055, added by Amended Ord. No. 02-064 on December 9, 2002, is amended to read:

30.66B.055 Imposition of mitigation requirements.

(1) The county shall impose mitigation required under this chapter as a condition of approval of development.

(2) Mitigation imposed as a condition of approval shall expire on the expiration date of the ((~~certificate of~~)) concurrency determination for a development. Any building permit application submitted after the concurrency expiration date shall be subject to full reinvestigation of traffic impacts under this chapter before the building permit can be issued. Determination of new or additional impact mitigation measures shall take into consideration, and may allow credit for, mitigation measures fully accomplished in connection with the prior approval when those mitigation measures addressed impacts of the current building permit application.

(3) The director of public works, following review of any required traffic study and any other pertinent data, shall inform the developer in writing of the mitigation required pursuant to this chapter.

(4) If a development proposes transportation demand management measures or measures to mitigate impacts on roads under the jurisdiction of another agency, the applicant must provide a written proposal to the department of public works describing those measures. The director of public works shall review the developer's proposal and provide a recommendation of approval or denial of the development application to the department as required by SCC 30.66B.050, based on the requirements of this chapter. If the developer has not submitted a written proposal by the time the department of public works makes its written recommendation on the case to the department, the director of public works will recommend denial.

(5) Required mitigation measures shall be binding on the real property that is legally described in the development application and administered in accordance with the provisions of SCC 30.66B.070.

Section 3. Snohomish County Code Section 30.66B.070, added by Amended Ord. No. 02-064 on December 9, 2002, is amended to read:

30.66B.070 Record of development obligations.

(1) Satisfaction of development obligations is required as a pre-condition to development approval, unless the development obligation is deferred to issuance of subsequent building permit necessary to initiate the development.

(a) For subdivisions and short-subdivisions, any development obligations that will be deferred to the building permit stage will be recorded on the final plat. All development obligations related to subdivisions and short-subdivisions that are not deferred to building permit issuance shall be satisfied prior to the recording of the final plat.

(b) For all development other than subdivisions and short-subdivisions in which satisfaction of development obligations is deferred, the ((~~concurrency certificate and a~~)) record of development obligations shall be recorded on the title of the property on which the development is located.

(2) The form of the record of development obligations shall be as follows:

(a) For all developers required as a condition of approval under this chapter to meet transportation demand management requirements, or to mitigate impacts on roads under the jurisdiction of another agency, the record of development obligations shall state the measures proposed by the developer pursuant to SCC 30.66B.055(4).

(b) For developers choosing to construct offsite improvements to satisfy a transportation impact mitigation obligation of a development, the record of development obligations shall describe the offsite improvements to be constructed by the developer.

(c) For all developments required as a condition of approval to pay a road system impact fee under the authority provided to the county under RCW 82.02.050(2), the document stating the mitigation requirements imposed shall be a record of development obligations.

(d) The record of development obligation shall document the concurrency determination for the development including the concurrency determination date, the concurrency expiration date, and any conditions that have to be satisfied by the developer prior to building permit issuance.

(3) Where the developer is not the legal owner of the property on which the development is proposed, the legal owner shall sign a statement agreeing that the mitigation measures imposed will be binding on the real property and will run with the land until the development approval has expired or the obligations contained within the document or agreement have been fulfilled. The statement shall be attached to the record of development obligations.

(4) The record of development obligations shall contain, as appropriate, a complete legal description of the real property which is the subject of the development, an adequate description of the mitigation measures, the development and/or road system events triggering subsequent phases or parts of the mitigation measures, performance

security, and notice to subsequent purchasers of the mitigation obligations related to development of the property. The continued validity of the development permit approval shall be conditioned upon adequate compliance with terms and conditions of the mitigation measures and the written agreement.

(5) Voluntary agreements((~~,~~)) and records of development obligations((~~, and certificates of concurrency~~)) shall be recorded as a precondition to approval of conditional and administrative conditional use permits, and rezone applications accompanied by an official site plan, or at the time of recording for binding site plans for nonresidential use. If the development is a subdivision or short subdivision for non residential use, voluntary agreements and records of development obligations shall be recorded prior to or at the time of recording.

(6) Voluntary agreements((~~,~~)) and records of development obligations((~~, and/or certificates of concurrency~~)) will be released from the title of the property on which the development is proposed upon request to the director of public works once the development approval has expired or the obligations contained within the document or agreement have been fulfilled.

Section 4. Snohomish County Code Section 30.66B.120, added by Amended Ord. No. 02-064 on December 9, 2002, is amended to read:

30.66B.120 Concurrency determination - Required.

(1) The department of public works shall make a concurrency determination for each development application to ensure that the development will not impact a county arterial unit in arrears. The approving authority shall not approve any development that is not determined concurrent under this chapter.

(2) A concurrency determination shall ((~~be documented by a "certificate of concurrency" which shall be included as part of the director of public work's recommendation made pursuant to SCC 30.66B.050. The certificate shall~~)) state

(a) When the concurrency determination was made (the "concurrency determination date"),

(b) Whether the ((~~certificate of~~)) concurrency determination is conditioned upon satisfaction of specific conditions, and

(c) The expiration date of the ((~~certificate of~~))concurrency determination (the "concurrency expiration date").

Section 5. Snohomish County Code Section 30.66B.135, added by Amended Ord. No. 02-064 on December 9, 2002, is amended to read:

30.66B.135 Development deemed concurrent.

The following development shall be deemed concurrent:

(1) Any residential development that generates fewer than seven peak-hour trips, or any nonresidential development that generates fewer than five peak-hour trips;

(2) Any development that has a valid pre-application concurrency approval pursuant to SCC 30.66B.175; and

(3) Building permit applications for development within an approved binding site plan, rezone accompanied by an official site plan, nonresidential subdivision or short

subdivision for which a concurrency determination has already been made in accordance with this chapter if the following are met:

(a) The ((~~certificate of~~)) concurrency determination for the development approval has not expired;

(b) The building permit will not cause the approved traffic generation of the prior approval to be exceeded;

(c) There is no change in points of access; and

(d) Mitigation required pursuant to the previous development approval is performed as a condition of building permit issuance.

Section 6. Snohomish County Code Section 30.66B.145, added by Amended Ord. No. 02-064 on December 9, 2002, is amended to read:

30.66B.145 Concurrency determination - Forecasting level-of-service.

(1) An inventory of developments that have been determined concurrent, also referred to as "developments in the pipeline," will be used to estimate future traffic volumes for forecasting future level-of-service conditions. This inventory will be established and maintained by the department of public works in accordance with the department's administrative rules. Developments in the pipeline will also include developments given pre-application concurrency approval pursuant to SCC 30.66B.175.

(a) The department of public works shall use the inventory of developments in the pipeline when conducting analysis to determine whether an arterial unit is in arrears. Inventories or estimates shall be in accordance with the department of public works' administrative rules.

(b) A developer may be required to provide a forecast of future level-of- service conditions to the department of public works for purposes of making a concurrency determination on a proposed development. When required to provide a forecast, the developer shall use the inventory of developments in the pipeline, as established and maintained by the department of public works, when providing a forecast of future level-of service conditions to the department. The inventory of developments in the pipeline used for making a concurrency determination on a proposed development shall not include any development that has been deemed concurrent subsequent to the proposed development.

(2) Estimates of future traffic volumes used for purposes of making level-of-service forecasts for concurrency determinations shall consist of the sum of the following: the current traffic volumes, the additional traffic volume that will be generated by the proposed development, and the additional traffic volume that will be generated by other developments in the pipeline.

(a) Estimates of current traffic volumes will be based on recent counts acceptable to the department of public works. The department of public works will provide them when available. When acceptable counts are not available, the applicant must provide them. The department of public works may specify by administrative rule the methodology for performing traffic counts of current traffic volumes.

(b) Additional traffic volume that will be generated by the proposed development will be based on the development's forecast trip generation at full occupancy, in accordance with SCC 30.66B.130(3).

(c) The following shall apply to forecasting additional traffic volume that will be generated by the inventory of developments in the pipeline:

(i) the inventory of developments in the pipeline shall not include developments that have been deemed concurrent subsequent to the proposed development;

(ii) estimates of additional traffic volume that will be generated by the inventory of developments in the pipeline will include, at minimum, residential developments generating seven (7) or more peak-hour trips and commercial developments generating five (5) or more peak-hour trips that have been determined concurrent based on the department's concurrency determination;

(iii) the department may, in its discretion, determine that certain developments in the pipeline should not be included in the inventory. The department may exclude a development, or part of a development, in the pipeline based on a factual demonstration by the applicant that one or more of the following is applicable:

(A) a development is not going to be constructed;

(B) a development is not going to be approved; or

(C) a development was already occupied at the time the current traffic volumes were counted; and

(iv) a threshold of three AM and/or PM peak-hour trips will be used for trip distributions.

(d) The department of public works will provide the applicant with the information in the department's inventory of developments in the pipeline and the number of trips added to the individual traffic movements at the intersections on the identified arterial units.

(e) The department of public works will identify the arterial unit(s) for which an applicant must make estimates of future traffic volumes and specify the methodology for level-of-service forecasts used by the applicant in forecasting level of service from the estimates of future traffic volumes. Estimates of future traffic volumes may be required of the applicant for weekday a.m. and p.m. peak hour vehicle trips for any traffic movements on any intersection located on the identified arterial unit(s) including termini.

(f) Forecasts will analyze traffic impacts for arterial units in the development's road system for the "forecast year" (i.e., the year of the proposed expiration date of the development's ((~~certificate of~~)) concurrency determination).

Section 7. Snohomish County Code Section 30.66B.155, added by Amended Ord. No. 02-064 on December 9, 2002, is amended to read:

30.66B.155 Concurrency determination - Expiration.

(1) The concurrency expiration date ((~~of the certificate of concurrency~~)) for a development shall be six years after the ((~~date of the~~)) concurrency determination date, except

(a) When it is determined by the director of public works that an earlier concurrency expiration date should be established due to the impact of the development on level-of-service conditions;

(b) When a later ((~~date of~~)) concurrency expiration date is established in accordance with SCC 30.66B.810; and

(c) The concurrency expiration date ((~~of the certificate of concurrency~~)) for a binding site plan ((~~that generates more than fifty peak-hour trips shall be the expiration date of the binding site plan, as determined by~~)) may, at the request of the applicant, be established as the date of the latest certificate of occupancy for the development as proposed by the applicant, ((~~and the~~)) provided that the same or later date is used for the forecast year in the traffic study for determining impacts on level-of-service in accordance with SCC ((~~30.66B.035~~)) 30.66B.145.

(2) The concurrency expiration date ((~~of the certificate of concurrency~~)) shall be based upon the size of the development, the level of service of impacted arterial units, and shall be consistent with the level-of-service standards and revenue/expenditure forecast adopted in the comprehensive plan.

(3) Building permits for a development must be issued prior to expiration of the ((~~certificate of~~)) concurrency determination for the development, except when

(a) The development is a residential subdivision or short-subdivision, in which case the subdivision or short-subdivision must ((~~be recorded~~)) receive preliminary approval prior to expiration of the concurrency determination, ((~~and~~)) or

(b) The development is a residential development which requires site plan approval, in which case the site approval must be issued prior to expiration of the concurrency determination, or

((~~(b)~~))(c) ((~~No building permit will be associated with~~)) The development is a conditional or administrative conditional use permit with no associated building permits, in which case the conditional or administrative conditional use permit must be issued prior to expiration of the ((~~certificate of~~)) concurrency determination for the development.

(4) No additional concurrency determination is required for residential dwellings within a subdivision or short subdivision ((~~recorded~~)) that receives preliminary approval in compliance with this section.

(5) If a ((~~certificate of~~)) concurrency determination expires, ((~~prior to building permit issuance~~)) or within one year will expire, the director of public works shall, at the request of the developer, consider evidence that conditions have not significantly changed((~~. The director of public works shall~~)), make a new concurrency determination, and may establish a new concurrency expiration date in accordance with this section. If the concurrency determination for a binding site plan has expired, subsequent building permit applications for development within the binding site plan will be evaluated for concurrency as stand-alone development applications in accordance with SCC 30.66B.100 - .185.

(6) A concurrency determination is tied to the development application upon which the determination is made, cannot be transferred to another development application, and always expires in cases in which the underlying development application expires.

Section 8. Snohomish County Code Section 30.66B.175, added by Amended Ord. No. 02-064 on December 9, 2002, is amended to read:

30.66B.175 Optional pre-application concurrency evaluation.

(1) Prior to submitting an application, any developer may request a pre-application concurrency decision in accordance with the requirements of this section. All requirements of this chapter applicable to pre-submittal conferences shall apply to pre-application concurrency evaluations, unless expressly excepted in this section.

(2) A request for a pre-application concurrency evaluation must be made to the department of public works in accordance with the following and in the form and manner prescribed by the department. A pre-application concurrency evaluation is a Type 1 decision and shall be processed in accordance with chapter 30.71 SCC, except as otherwise provided in this chapter and SCC 30.66B.180.

(a) The developer must provide the department of public works with a detailed description of the proposed development's maximum possible impact on the level-of-service of the road system. The information provided must include projected trip generation and trip distribution, as well as site plan information indicating access points for the development.

(b) The developer must propose a year of expiration date for the requested ((~~certificate of~~)) concurrency determination, which shall be used as the forecast year for the evaluation of future level-of-service conditions on the road system. The expiration date for any ((~~certificate of~~)) concurrency determination issued pursuant to this section for a subsequent development application shall be in accordance with SCC 30.66B.155 and the forecast year used for the pre-application concurrency evaluation.

(c) The developer shall provide a traffic study consistent with SCC 30.66B.035. The department of public works will meet with the developer to identify the scope of the traffic study required to make the pre-application concurrency decision.

(d) Application for a pre-application concurrency evaluation shall be accompanied by a fee payment in the amount specified in SCC 13.110.030. For purposes of SCC 13.110.030, a request for a pre-application concurrency evaluation shall be considered a development application.

(3) Following receipt of a traffic study that meets the requirements established in the pre-application concurrency scoping meeting, notice of the request for a pre-application concurrency evaluation shall be made in accordance with the procedures of SCC 30.70.050. The department of public works will have fourteen (14) days following the close of the public and agency comment period to make a pre-application concurrency decision.

(4) Pre-application concurrency evaluations shall be consistent with the requirements of SCC 30.66B.130, except that the threshold for requiring a traffic study shall be seven (7) peak-hour trips for residential developments and five (5) peak hour trips for commercial developments instead of fifty (50) peak-hour trips.

(5) A pre-application concurrency evaluation is an action subject to the requirements of chapter 30.61 SCC.

(6) If the department of public works' pre-application concurrency decision is that the proposed development can be determined concurrent, the department will issue a pre-application concurrency approval. If the pre-application concurrency decision is that the proposed development cannot be determined concurrent, the department shall notify the developer in writing of the decision and the reasons therefore. The developer shall have 90 days from such notification to respond with revisions or alternative analyses or proposals. Responses may include revisions to the traffic study, alternative analysis of the conclusions drawn by the department, or utilization of options under SCC 30.66B.167. A response shall be treated like a new application for a pre-application concurrency decision.

(7) The department of planning and development services shall provide notice of the department of public works' pre-application concurrency decision and the time period for filing an administrative appeal in accordance with SCC 30.71.050. The pre-application concurrency decision may be appealed pursuant to SCC 30.66B.180.

(8) A development with a pre-application concurrency approval that is valid at the time of application submittal will be deemed concurrent under SCC 30.66B.135 without further review, provided that the administrative appeal period for the concurrency approval has expired or the concurrency approval has been upheld on appeal and there is no further opportunity for administrative or judicial review.

(9) Concurrency determinations for developments that received a pre-application concurrency approval shall not be subject to further administrative review or appeal during project review, including review pursuant to the State Environmental Policy Act (SEPA).

(10) A pre-application concurrency approval shall be valid only for subsequent development applications for the same parcel of property and where the maximum possible impact on the level-of-service of the road system established in the pre-application concurrency approval is not exceeded by the proposed development. A pre-application concurrency approval cannot be transferred to a different parcel of property.

(11) Pre-application concurrency approvals under this subsection shall be valid for six months following the notice of decision unless an appeal is pending, in which case the approval shall be valid for six months following resolution of all appeals.

Section 9. Snohomish County Code Section 30.66B.340, added by Amended Ord. No. 02-064 on December 9, 2002, is amended to read:

30.66B.340 Timing of road system impact fee payment.

(1) Payment of a road system impact fee is required prior to building permit issuance. Where no building permit will be associated with the development, such as a development requiring a conditional or administrative conditional use permit, payment is required as a precondition to approval. For a ((~~development~~)) binding site plan for which the concurrency expiration date ((~~of the certificate of concurrency for a binding site plan~~)) is more than six years after the ((~~date of the~~)) concurrency determination date, one-half of the payment is required prior to recording of the binding site plan with record of survey.

(2) The amount of the road system impact fee payment shall be based upon the rate in effect at the time of filing of a complete application for development.

Section 10. Applicability. The provisions of this ordinance, except all procedural provisions, shall not apply to any development permit application that is complete prior to the effective date of this ordinance. An applicant for any pending application may choose to apply all applicable provisions of this ordinance to such application upon written request to PDS.

Section 11. Severability and savings. If any provision of this ordinance is held invalid or unconstitutional, such invalidity or unconstitutionality shall not affect the validity or constitutionality of the remainder of this ordinance. Provided, however, that if any provision of this ordinance is held invalid, then the provision in effect prior to the effective date of this ordinance shall be in full force and effect for that individual provision as if this ordinance had never been adopted.

PASSED this 5th day of November, 2003.

SNOHOMISH COUNTY COUNCIL
Snohomish County, Washington

ATTEST:

Barbara Sikorski
Asst. Clerk of the Council

Gary Nelson
Chairperson

(X) APPROVED
( ) EMERGENCY
( ) VETOED

Date: November 7, 2003

Robert J. Drewel
County Executive

ATTEST:

Pamela Sandoz

Approved as to form only:

_____
Deputy Prosecuting Attorney

ORDINANCE NO. _____

AN ORDINANCE primarily relating to transportation Concurrency; repealing CCC 12.40 and adopting CCC 12.41; modifying the Clark County Comprehensive Growth Management Plan and related documents; and providing for effective dates and other miscellaneous provisions.

WHEREAS, the Growth Management Act (Chapter 36.70A RCW) requires that transportation facilities be adequate under locally-adopted level-of-service standards to accommodate traffic generated from new development; and

WHEREAS, The Western Washington Growth Management Hearings Board has concluded that the transportation element of the County's Comprehensive Plan is inconsistent with it's 20 year land use plan due to inadequate anticipated funding; and

WHEREAS, at the direction of the Board of County Commissioners, the Department of Public Works and the Department of Community Development have reviewed past practices related to transportation Concurrency; and

WHEREAS, the amendments and additional code provisions approved herein have been reviewed by the Clark County Planning Commission, following a duly-advertised public hearing, and a report thereon from the Planning Commission has been transmitted to the Board; and

WHEREAS, the Board of County Commissioners has held it's own duly-advertised public hearing on these proposed amendments and code provisions; and

WHEREAS, the Board of County Commissioners concludes that adoption of this Ordinance and the associated modifications to the Comprehensive Growth Management Plan and transportation Capital Facilities Plan is in the public interest: now, therefore,

BE IT ORDERED AND RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF CLARK COUNTY, STATE OF WASHINGTON, as follows:

Section 1. Amendatory. Chapter 12.40 CCC (Transportation Concurrency Management System) is hereby repealed and Chapter 12.41 is adopted as set forth in Exhibit A.

Section 2. Amendatory. Chapter 3 and Appendix A of the Clark County Comprehensive Growth Management Plan (Transportation Element) are hereby revised as set forth in Exhibit B.

Section 3. Amendatory. A revised Transportation Capital Facilities Plan (CFP) is hereby adopted on an interim basis as set forth in the Exhibit C. The revised CFP shall be reconsidered for final adoption in conjunction with the Traffic Impact Fee Program update scheduled for consideration by the Board of County Commissioners in October 2000.

Section 4. Effective Date. The amendments and code provisions shall go into effect at midnight on the date of adoption and shall apply to all land use applications subject to the provisions of CCC 12.41 thereafter filed.

Section 5. Pending Land Use Applications. CCC 12.41 shall also apply to any applications pending for approval on the date of adoption if the applicant voluntarily agrees in writing to subject such application to all the provisions of this Ordinance and waive vested rights accordingly. If an applicant does agree to be subject to the provisions of this new Ordinance, the processing timeline set forth in CCC18.600 shall be restarted as of the date of receipt of such written notice.

Section 6. SEPA Appeal. The Board of County Commissioners hereby affirms the DNS threshold determination made by the Responsible Official.

Section 7. Instructions to Clerk. The Clerk to the Board of County Commissioners shall:

(a) Transmit a copy of this Ordinance to the Washington State Department of Community Trade and Economic Development within ten days of it's adoption, pursuant to RCW 36.70A.106.
(b) Record a copy of this Ordinance with the Clark County Auditor.
(c) Cause notice of adoption of this Ordinance to be published forthwith pursuant to RCW 37.70A.290.
(d) Transmit a copy of this Ordinance to the Western Washington Growth Management Hearings Board.

ADOPTED this _____ day of _____, 2000.

Attest

_____
Clerk to the Board

Approved as to Form Only
ARTHUR D. CURTIS
Prosecuting Attorney

By_____
Deputy Prosecuting Attorney

BOARD OF COUNTY COMMISSIONERS
FOR CLARK COUNTY, WASHINGTON

By_____
Craig A. Pridemore, Chair

By_____
Betty Sue Morris, Commissioner

By_____
Judie Stanton, Commissioner

Chapter 12.41

TRANSPORTATION CONCURRENCY MANAGEMENT SYSTEM

Sections:

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12.41.050	Transportation impact study.
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12.41.170	Application of SEPA to the Director's determinations.

12.41.010 Purpose.

This chapter implements the requirements in RCW 36.70A.070 that counties (1) establish level of service standards for arterial and transit routes, and (2) ensure that such standards are met or reasonably funded before new development is approved.

12.41.020 Applicability.

This chapter applies to applications for subdivision, short subdivision, site plan and conditional use permit approvals which have a potential vehicular impact on the level of service of a segment or intersection of (1) any County roadway with a comprehensive plan functional classification of arterial or collector or (2) any state Highway of Regional Significance.

12.41.030 Definitions.

Unless a contrary definition is provided below, the definitions in Chapter 12.05, Clark County Code shall apply:

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(1) "Administrative Manual" means the written documentation adopted by the Director pursuant to this chapter.

(2) "Affected transportation corridor" means any transportation corridor which is reasonably projected to be affected by the transportation related impacts of a proposed development.

(3) "Capacity" means a measurement expressed as the maximum number of peak hour vehicle trips that an individual development may generate as defined in CCC 12.41.140.

(4) " Development" or "Proposed Development" means a proposed subdivision, short subdivision, site plan approval or conditional use permit.

(5) "Development application" means any application for approval of a development to which the provisions of this chapter apply.

(6) "Director" means the Director of the Clark County Department of Public Works or the Director's authorized designee

(7) "Intersection of regional significance" means an intersection at which at least three (3) approaches have a comprehensive plan functional classification of collector or higher.

(8) "Level of Service Standard" or " LOS Standard" means a quantitative standard for the performance of a transportation corridor or intersection of regional significance.

(9) "Mitigation" means the avoidance or minimization of a proposed development' s impact upon an affected transportation corridor or intersection of regional significance through such means as limiting or altering the proposed uses, intensities, or design of the development, or by compensating for the impact by replacing, enhancing, or providing transportation system improvements which provide additional capacity.

(10) "Operating Level" means the performance of a transportation corridor or intersection of regional significance, pursuant to CCC 12.41.70.

(11) "Peak Hour" means the consecutive sixty (60) minute period during a twenty-four (24) hour period which experiences the highest sum of traffic volumes, as determined by the Director.

(12) "Reasonably funded" means a mitigation measure or other transportation system improvement that is designated as reasonably funded in the most recent recently adopted version of the County's Transportation Improvement Program,-or is designated by the Board of County Commissioners as being reasonably funded.

(13) "Regional Industry" means an industrial or commercial land use which provides significant community-wide or regional economic benefit through the creation of new economic growth and employment opportunity.

(14) "Regional Public Facility" means a land use which is designed to serve the needs of the community or region affected by the impact(s) of development. Regional Public Facilities include: airports, colleges, hospitals, and regional parks or community centers.

(15) "Reserved capacity" means the capacity of a transportation corridor or intersection of regional significance used to accommodate approved but unbuilt developments

(16) "Review authority" means the Planning Director, the County's Hearing Examiner, the Planning Commission, or the Board of County Commissioners, whomever is authorized to approve a development application.

(17) "State Highway of Regional Significance" means a state of Washington owned and maintained roadway or intersection not designated by the state as a Highway of Statewide Significance.

(18) "Transportation Corridor" or " Corridor" means an identified system of road(s) and street(s), which are consistently utilized by vehicular traffic for travel along an identified circulation pattern.

(19) "Transportation Improvement Program" means the current six (6) year financing plan for roads adopted by the County pursuant to RCW 36.81.121, or similar plan adopted by the State Department of Transportation or cities for their highway and street facilities.

12.41.040 Review authority.

The review authority shall approve, approve with conditions, or deny proposed developments in accordance with the provisions of this chapter.

12.41.050 Transportation impact study.

A. A transportation impact study shall be required for all development applications in which the proposed development is projected to have an impact upon any affected transportation corridor or intersection of regional significance, unless the development application is exempt from the provisions of this chapter as provided for in CCC 12.41.050 (G), or the requirement for a study has been waived by the Director.

B. A transportation impact study shall include, at a minimum, an analysis of the following elements:
   (a) trip generation, modal split, distribution, and assignment for the proposed development; and
   (b) an analysis of the projected impact of the proposed development upon the current operating level of any affected transportation corridor or intersection of regional significance.

C. A transportation impact study shall be prepared by and/or under the supervision of a registered professional engineer in the state of Washington.

D. A transportation impact study shall be based on traffic counts obtained within twelve (12) months of the fully complete date of the development application as determined under CCC 18.600.050. The traffic counts shall reflect representative traffic conditions within transportation corridors and at intersections of regional significance.

E. A transportation impact study shall not be required to analyze impacts on affected transportation corridors or intersections of regional significance located more than the following distances from the proposed development (as measured by straight-line distance).
   50 or less new peak hour trips at development site – one (1) mile
   51 to 250 new peak hour trips at development site – two (2) miles
   251 or more new peak hour trips at development site – three (3) miles

F. The Director reserves the right to require an applicant to provide additional data and/or analysis as part of a particular transportation impact study, where the Director determines

that additional information or analysis is required to implement the standards and requirements contained in this chapter.

G. No traffic impact study shall be required, pursuant to the provisions of this chapter, where the proposed development will generate less than ten (10) peak hour vehicle trips. However, these proposed developments are still subject to Concurrency reviews and require Concurrency approvals.

H. Upon the written request of an applicant, the Director may waive the requirement for a transportation impact study, or limit the scope of analysis and required elements of a traffic impact study where the Director determines that the potential transportation impacts upon the affected transportation corridor(s) and/or intersection(s) of regional significance have been adequately analyzed in prior research or reports and/or are not projected to cause a reduction in the operating level of affected transportation corridors and/or intersections.

12.41.060 Requirements for Concurrency Approval

A. Each development application subject to the provisions of this chapter shall require a Concurrency review. No development application may be approved by the review authority until such time as a Concurrency approval or conditional Concurrency approval has been issued by the Director.

B. The Concurrency determination for multiple development applications impacting the same transportation corridors or intersections shall be tested chronologically in accordance with the respective applications' fully complete dates as determined under CCC 18.600.050 (but not the contingent vesting provisions of CCC 18.600.055). For the purpose of this subsection only, the fully complete date for an application delayed in processing for sixty (60) days or longer due to actions or inaction of the applicant (as determined by the Planning Director) shall be adjusted according to the length of such delay.

C. The Director shall issue a Concurrency approval where the Director determines that the proposed development' s impacts upon all affected transportation corridors and intersections of regional significance do not result in the operating levels for the transportation corridors, signalized intersections, and unsignalized intersections falling below the adopted level of service standards established in 12.41.080.

D. A Concurrency review and approval shall not be required for those affected transportation corridors and intersections of regional significance located more than the following distances from the proposed development (as measured by straight-line distance).

50 or less new peak hour trips at development site – one (1) mile
51 to 250 new peak hour trips at development site – two (2) miles
251 or more new peak hour trips at development site – three (3) miles

E. The Director may approve and condition mitigation (if volunteered by the applicant) where the Director determines that the proposed development's projected impacts upon an affected transportation corridor or intersection of regional significance can be offset by the mitigation such that the operating levels will not further deteriorate because of the additional traffic generated by the proposed development. The Review Authority may approve a development when the Director determines that achieving the level of service standards would cause significant negative environmental impacts as identified in a SEPA review.

F. Appeals to the determination of the Director with respect to Concurrency shall be made in accordance with CCC 18.600.100. Applications reviewed as Type I and Type II procedures shall be appealed as Type II procedures. For applications reviewed as Type III procedures, the Director's determination shall be treated as a recommendation to the Hearings Examiner.

12.41.070 Determination of Operating Levels

The operating level for a transportation corridor, signalized intersection, and/or unsignalized intersection shall be defined as the traffic characteristics of those roadways and intersections with consideration of the following factors:

(1) the existing traffic levels on the roadways and intersections.
(2) any mitigation measures proposed by the applicant which will be completed and/or implemented prior to occupancy of the proposed development.
(3) any mitigation measures conditioned to other approved developments which will be completed and/or implemented prior to occupancy of the proposed development.
(4) the traffic impacts of the proposed development on the affected transportation corridors and intersections.
(5) the traffic impacts of other approved developments not yet fully built-out on the affected transportation corridors and intersections.
(6) any improvements being implemented as part of the County's Transportation Improvement Program that are reasonably funded <u>and</u> scheduled for completion of construction within three (3) years of the final date for a decision upon the development application.
(7) any capacity which has been assigned or reserved to other and/or future developments pursuant to the terms of a development agreement or capacity reservation authorized and executed under the provisions of this chapter.
(8) Any background traffic growth or traffic from developments exempt from the requirements of this chapter that the Director determines could have an impact on the operating level of the transportation corridors or intersections.
(9) Any other factors that the Director has determined could have an impact on the operating level of the transportation corridors or intersections.

12.41.080 Level of service standards

A. Level of service or LOS standards shall be as follows:

(1) The minimum travel speeds for each designated transportation corridor are shown in - Table I. The designated transportation corridors are shown in Figure I.

(2) Within the designated transportation corridors, individual movements at each signalized intersection of regional significance shall not exceed an average of two cycle lengths or 240 seconds of delay (whichever is less). All signalized intersections located inside of incorporated cities shall be excluded from this requirement .

(3) Outside of designated transportation corridors, all signalized intersections of regional significance shall achieve LOS D standards or better, except the intersections of SR-

500/Falk Road and SR-500/NE 54th Avenue which shall achieve LOS E standards or better.

(4) All unsignalized intersections of regional significance in the unincorporated County shall achieve LOS E standards or better (if warrants are not met). If warrants are met, unsignalized intersections of regional significance shall achieve LOS D standards or better. The signalization of unsignalized intersections shall be at the discretion of the Director and shall not be obligated upon the County to meet this LOS standard.

(5) The LOS standards shown in Table I shall be reduced by three (3) mph for those proposed developments that the Director determines comply with the mitigated LOS standards for master-planned developments pursuant to CCC 12.41.150.

(6) The LOS standards identified in this subsection shall be applied during peak hour traffic conditions.

B. The LOS standards established in this subsection shall be applied and interpreted as stated in the Administrative Manual prepared pursuant to CCC 12.41.140.

C. The LOS standards and the operating levels for each transportation corridor and intersection of regional significance shall be evaluated and reviewed on an annual basis by the Board of County Commissioners.

D. Notwithstanding the provisions for the annual review of LOS standards pursuant to this section, the Board of County Commissioners reserves the authority to enact and renew emergency moratoria and interim zoning or other official controls upon development approvals affecting designated transportation corridors and intersections of regional significance pursuant to RCW 36.70A.390, and may specify qualifications or conditions for the application of such moratoria and interim zoning or other official controls.

12.41.090 Exemptions from Concurrency Requirements

The following types of development applications shall not be subject to a Concurrency denial.

(a) K-12 public schools incorporating commitments to commute trip reduction consistent with CCC 5.50

(b) Fire/police stations

(c) Public transit facilities

12.41.100 Concurrency survey.

A. For purposes of monitoring the cumulative transportation-related impacts of developments which are exempt from the requirements of CCC 12.41, such development applications shall be required to submit a concurrency survey for review by the Director.

B. Submittals of concurrency surveys shall be made upon written forms provided by the Director and shall be filed with the Director. The concurrency survey shall indicate, at a minimum:

(1) The type and location of the development;
(2) An identification of all affected transportation corridors and intersections of regional significance.
(3) The specific reason the development is exempt from the provisions of this chapter;
(4) An estimate of the projected total peak hour trips that will be generated by the development;
(5) An estimate of the date of occupancy of the development.

C. The Director shall review and approve the concurrency survey, and may require the submission of additional information prior to approving the survey.

D. No development application may be approved by the review authority until such time as the applicant has complied with the requirements of this section, and the Director has approved the concurrency survey.

12.41.110 Reservation of capacity.

A. Upon issuance of a Concurrency approval by the Director, the transportation capacity allocated by the Director to the development application shall become encumbered capacity. This encumbered capacity shall not be considered for use by another development application until such time as the Concurrency approval expires pursuant to CCC 12.41.110 (D).

B. Upon issuance of a development approval by the Review Authority, this encumbered capacity shall become reserved capacity and shall not be considered for use by another development application.

C. Reserved capacity shall not be transferable to another development upon another site. Reserved capacity from a previous development approval shall not be transferable to a different land use development upon the same site.

D. Concurrency approvals shall be valid for the same period of time as the development approval, and shall expire upon the date the development approval expires. Notwithstanding the provisions of this subsection, a Concurrency approval shall expire upon the date the development application for which the Concurrency approval was required is:

(a) withdrawn by the applicant; or
(b) denied approval by the Review Authority, provided that for purposes of this section, an application shall not be deemed to be denied by the Review Authority until a final decision has been issued pursuant to any administrative appeal under CCC 18.600.100; or until a final decision has been rendered by a Superior Court with competent jurisdiction, where such judicial appeal has been timely filed.

12.41.120 Capacity Reservation for Development Agreements

The Board of County Commissioners may reserve capacity, prior to approval of a development application by the review authority, through the approval of a development agreement authorized and executed under the provisions of RCW 36.70B.170 . This reserved

capacity shall be accounted for in establishing and reviewing LOS standards and in the determination of operating levels for transportation corridors and intersections.

12.41.130 Capacity Reservation for Regional Industry/Public Facility/Preferred Land Use

A. Where the Board of County Commissioners finds that there is a significant public interest or need to provide for the approval of a regional industry, regional public facility, or preferred land use, that would affect the transportation corridors and/or intersections of regional significance, the Board of County Commissioners may provide for the reservation of capacity for such facilities and land uses. The Board of County Commissioners may direct, by ordinance, that the transportation capacity necessary to accommodate such regional industry, regional public facility, or land use be reserved for the future approval of such regional facilities and land uses.

B. Such reservation shall be for an identified period of time and shall be subject to annual review by the Board of County Commissioners. This reserved capacity shall be accounted for in establishing and reviewing LOS standards and in the determination of operating levels for the transportation corridors and intersections.

12.41.140 Establishment of Administrative Manual.

A. The Director shall establish and adopt the methodology and criteria to be used to identify transportation corridors and evaluate the operating level for each transportation corridor and intersection of regional significance.

B. The Director shall establish and adopt the methodology and criteria to be used to identify and evaluate the transportation impacts of developments which are required to be addressed in the transportation impact studies required by CCC 12.41.050.

C. The Director shall publish and regularly update an administrative manual setting forth the methodology and criteria adopted for the purposes described in subsections (A) and (B) above.

D. A copy of the most recent version of the administrative manual shall be made available for public inspection and review.

E. The provisions of the administrative manual shall be consistent with and implement the provisions of this chapter. To the extent the provisions of the manual are inconsistent with the provisions of this chapter, the provisions of this chapter shall control.

12.41.150 Mitigated level of service for master-planned developments.

Mitigated level of service standards shall be approved for master-planned industrial, university or office uses, which the review authority finds:

(1) Provides for family wage jobs as defined in CCC 12.41.160;
(2) Are approved under CCC 18.414, or, if previously approved, are found to

substantially comply with CCC 18.414;

(3) Are served by a transportation corridor which incorporates measures to mitigate traffic congestion, such as high occupancy vehicle lanes, fifteen (15) minute or better peak hour transit service, freeway ramp metering, or traffic signal coordination; and

(4) Incorporates a commitment to commute trip reduction for all industrial, university and office on-site employers, consistent with CCC 5.50.

12.41.160 Criteria for Family-Wage Job Definition

A. "Threshold family wage" is the income and benefit package needed to support a three (3) person, single-earner family that precludes them from eligibility for supplemental public assistance. The threshold family wage includes a cash wage and a minimum benefit package. The benefit package must be present, but is not generally included in the value of the cash wage. A cash wage that meets the threshold but does not include benefits does not meet the definition.

1. The threshold cash wage is measured by calculating the county's average annual covered wages, plus twenty-five percent (25%). The annual covered wage data is calculated by and shall be obtained from the Washington State Employment Securities Department. "Covered wages" means wages covered under unemployment compensation laws.
2. To be considered for inclusion in the threshold family wage, a minimum benefit package equal to twelve and one-half (12 1/2) percent of the average annual covered wage of the industry or actual average annual covered wages of the employees, whichever is lower, must be provided and available. Benefits provided by the employer must include, but are not limited to, an employer-paid health insurance, retirement or defined benefit program and a personal leave program.
3. Any benefits with a cash equivalent value in excess of seventeen and one-half (17 1/2) percent of the cash wage may be credited toward cash wage if it falls under the threshold. Excess benefit value may include, but is not limited to, such things as a cafeteria plan, dental, vision, childcare; however, the definition does not include the value of stock options or other investment-based benefits.

B. Standards

1. To be eligible for mitigated level of service, an employer or prospective employer or employer group(s) must demonstrate that the median number of all covered wage jobs will meet or exceed the threshold family wage. Family wage jobs may be demonstrated by any of the following methods:
   (a) Provide written documentation such as payroll history, tax records or other verification, as approved by the development approval authority, that average annual covered wages will meet or exceed the threshold family wage. The covered wages are measured at the company's own established internal thirty-six (36) month level-of-pay scale offered to employees, excluding overtime, in place at the time of application for mitigated level of service; or
   (b) Provide copy of the three (3) digit Standard Industrial Classification code for the business(es) applying for the mitigated LOS incentive. If the average annual covered wages for the industry classification meet or exceed the threshold family wage, and benefits as defined herein are provided, it is assumed that the employer meets the threshold family

wage. The state Employment Securities Department data shall be used to determine compliance with this criteria; or

(c) Sign a developer agreement to include affirmation of the fact that average annual wages of all on- site industrial or office employers will meet the threshold family wage upon legal occupancy of the building(s); and

2. Provide a signed, notarized statement and documentation that a minimum benefit package as prescribed in CCC 12.41.160 (A)(2) of this section is provided and available to all regular full-time employees.

C. Director Obligations. The threshold family wage shall be updated annually in the County code by the Director of Community Development or designee upon publication of the average annual covered wages for Clark County by the Employment Security Department.

D. Enforcement.

1. At the time of annual update of the threshold family wage data, each recipient of mitigated LOS standard shall be reviewed for compliance with the threshold family wage criteria. This review shall include all employers who have had continuous occupancy of their development for a period of at least thirty-six (36) months and who have not been released from the requirements of this code section. The review shall take place for five (5) consecutive years including the first thirty-six (36) month review. The review shall consist of confirmation with the Washington State Employment Security Department that reported average annual covered wages for the past year meets or exceeds the threshold family wage.

2. If, after thirty-six (36) months after the date of certificate of occupancy of a building or addition thereto, or as specified in a developer agreement, the recipient fails to meet the threshold family wage for the median of all thirty-six (36) month level-of-pay scale covered wage workers, the developer/employer shall pay a monetary penalty to the County. The penalty moneys shall then be used by the County to improve public roadways and intersections in the vicinity of the development. The amount of the penalty will be calculated as the difference between the threshold family wage required to satisfy the mitigated LOS eligibility standard and the actual average wage paid by the employer, multiplied by the total number of covered wage workers of the employer. This amount will then be increased by fifty percent (50%) and interest added consistent with RCW 82.02.020. The total amount added together will be considered as the amount of the penalty.

3. If the threshold family is not met after the annual reviews, the penalty shall be as follows:

Third year: one hundred (100) percent of the amount calculated in subsection (2) above;

Fourth year: eighty (80) percent of the amount calculated in subsection (2) above;

Fifth year: seventy (70) percent of the amount calculated in subsection (2) above;

Sixth year: sixty (60) percent of the amount calculated in subsection (2) above;

Seventh year: fifty (50) percent of the amount calculated in subsection (2) above;

D. Expenditure of Funds. The penalty funds shall be expended or encumbered for a

permissible use within five (5) years of receipt, consistent with RCW 82.02.020.

12.41.170 Application of SEPA to the Director's determinations.

Any determination made by the Director pursuant to this chapter shall be an administrative action that is categorically exempt from the State Environmental Policy Act.

ORDINANCE NO. 10897

AN ORDINANCE adopting a concurrency management system for transportation facilities as required by RCW 36.70A.080(e).

WHEREAS, RCW 36.70A.080(e), part of the Growth Management Act, requires that jurisdictions subject to the Act "adopt and enforce ordinances which prohibit development approval if the development causes the level of service on a transportation facility to decline below the standards adopted in the transportation element of the comprehensive plan, unless transportation improvements or strategies to accommodate the impacts of development are made concurrent with the development."

WHEREAS, RCW 36.70A.080(e) also specifies that "concurrent with the development" means that the improvements or strategies are in place at the time of development, or that a financial commitment is in place to complete the improvements or strategies within six years.

WHEREAS, the measures adopted through this ordinance are designed to meet these requirements. The measures are further designed to ensure that adopted levels of service standards for transportation facilities are not degraded below the levels adopted in the Thurston County Comprehensive Plan by the approval of a development permit, to inform citizens about infrastructure deficiencies, and to create options to mitigate such deficiencies.

WHEREAS, the Thurston County Planning Commission held public hearings on this ordinance on September 6 and 8, 1994. The Board of County Commissioners of Thurston County held public hearings on March 13 and March 23, 1995.

WHEREAS, developments generating 25 or more motor vehicle trips in or out of the development in the p.m. peak hour are of such size that an individual development could cause transportation facilities to reach or exceed capacity (based on adopted levels of service specified in the Thurston County Comprehensive Plan). Therefore, such developments shall undergo a concurrency determination.

WHEREAS, developments generating fewer than 25 motor vehicle trips in or out of the development, but more than or equal to one motor vehicle trip in or out of the development, in the p.m. peak hour are of such size that an individual development could cause

transportation facilities to reach or exceed capacity if such facilities are already at or above 90 percent of capacity (based on adopted levels of service specified in the Thurston County Comprehensive Plan). Therefore, such developments shall undergo a concurrency determination only where affected transportation facilities are already at or above 90 percent of capacity.

WHEREAS, developments generating fewer than one motor vehicle trip in or out of the development in the p.m. peak hour are of such size that an individual development would not cause transportation facilities to reach or exceed capacity if such facilities are currently measurably below capacity (based on adopted levels of service specified in the Thurston County Comprehensive Plan). Therefore, such developments shall undergo a concurrency determination only where affected transportation facilities are already at or above capacity.

WHEREAS, this ordinance is not intended to affect the scope of the State Environmental Policy Act.

NOW, THEREFORE, BE IT ORDAINED by the Board of Thurston County Commissioners, as follows:

Section 1. A new chapter 17.10 is hereby added to the Thurston County Code to read as follows:

17.15.010 Definitions.

A. Annual Capacity Statement: The statement issued by the County each year indicating the available capacity of transportation facilities or services.

B. Building Permit: That authorization for the commencement of construction or land alteration without need for further application and approval.

C. Capital Facilities Chapter: That chapter of the Thurston County Comprehensive Plan which evaluates the need for public facilities as identified in the other comprehensive plan elements and as defined in the applicable definition of each type of public facility, which estimates the cost of improvements for which the local government has fiscal responsibility, which analyzes the fiscal capability of the local government to finance and construct improvements, which adopts financial policies to guide the funding or improvement, and which schedules the funding and construction of improvements in a manner necessary to ensure that capital improvements are provided when required based on needs identified in the other comprehensive plan chapters.

D. Change of Use: For purposes of this ordinance, a modification to an existing building or site to accommodate a

more intensive use will be subject to concurrency determination for the new increase in traffic only.

E. Comprehensive Plan: The Thurston County Comprehensive Plan adopted by Resolution No. 10896 on April 17, 1995, including any joint comprehensive plan adopted by the County with any city or town, as amended.

F. Concurrency: The provision for assuring that improvements or strategies to accommodate the impacts of development are in place at the time of development or that a guaranteed financial commitment is in place to complete the improvements or strategies within six years so the levels of service for transportation facilities do not fall below the level of service standards adopted in the Comprehensive Plan due to the impacts of new development.

G. Concurrency Approval: The official determination by the County that a development permit (except single-family lots in plats already approved for concurrency) will not result in the reduction of the level of service standards set forth in the Thurston County Comprehensive Plan for transportation facilities and services.

H. Concurrency Determination: A technical study of the impacts on the road system, including forecasted level of service, of a proposed land use development using current data and analytical techniques that may include a comprehensive traffic impact study based on the Concurrency Management Manual.

I. Concurrency Management Manual: A manual outlining the administrative actions necessary to implement the concurrency management system.

J. Concurrency Management System: The procedures and processes utilized by the County to determine that development permits, site plan review approvals, or preliminary plat approvals, when issued, will not result in the reduction of the level of service standards as set forth in the Thurston County Comprehensive Plan.

K. Conditions of Approval: As they apply to concurrency evaluations, those conditions necessary to ensure that the proposed development as identified in the preliminary development plan will not cause an impact to transportation facilities in such a way as to lower the level of service standard to an unacceptable level. The conditions of approval shall be part of the approved preliminary development permit and are binding upon the approval of a final development permit.

L. Development: Any construction, reconstruction or any use of real property which requires review and approval of a development permit.

M. Development Permit: Any land use permit which must be approved by Thurston County prior to the development of land.

N. Level of Service (LOS): A measure describing the operational conditions or degree of service provided by existing and proposed transportation facilities, based on quantitative standards for measurement.

O. Peak Hour: The hour-long time period in the afternoon when traffic volumes are highest, usually a one-hour period between 4:00 p.m. and 6:00 p.m.

P. Preliminary Development Permit: The development permit that grants preliminary approval of an application to develop land. An example is preliminary approval of a subdivision.

Q. Pro-rata Share: The fair and equitable cost obligation assigned to a proposed development which is attributable to the peak hour motor vehicle trips generated by the development on the affected transportation facilities as calculated by the County.

R. Reserve Capacity: The available capacity of a roadway in motor vehicles per hour based upon adopted level of service.

17.10.020 Concurrency Evaluation.

A. A concurrency determination will be undertaken for the following development permit applications:

1. Any development that generates 25 or more motor vehicle trips in or out of the development in the p.m. peak hour;

2. Any development that generates fewer than 25 motor vehicle trips in or out of the development, but more than or equal to one motor vehicle trip in or out of the development, in the p.m. peak hour when transportation facilities are at or above 90 percent of their capacity (based on adopted levels of service); and

3. Any application that generates fewer than one motor vehicle trip into or out of the development in the p.m. peak hour when transportation facilities are at or above 100 percent of their capacity (based on adopted levels of service).

B. If the transportation facility has no reserve capacity at the time of the concurrency evaluation, the County will not approve the project for concurrency until County staff has identified conditions of approval to mitigate the development impact as specified in TCC 17.10.030 F. These conditions, included in the approved preliminary development permit or final development permit when no preliminary permit is required, must

be completed or guaranteed at the time of final approval, and will insure an Approval of Concurrency as long as the permit is valid. When the development permit is no longer valid, capacity reserved for the development shall be returned to the system. Changes to the preliminary development plan adding more than five percent of additional motor vehicle trips will require a new concurrency review.

C. If the reserve capacity of the transportation facility exceeds projected motor vehicle trips and it has sufficient capacity to warrant approval of the preliminary development permit during concurrency evaluation without mitigating conditions of approval as identified in TCC 17.10.030 F., it shall be guaranteed an Approval of Concurrency. Approval is current for as long as the permit is valid and may be transferred to another owner as long as it stays with the property to which it applies and the scope of development has not changed. Reserved capacity shall be returned to the system when the development permit is no longer valid. Changes to the preliminary development plan adding more than five percent of additional motor vehicle trips will require a new concurrency review.

D. If some reserve capacity exists on the affected transportation facility, but projected motor vehicle trips will exceed available capacity, and the project requires some degree of mitigation to meet concurrency requirements at the time of preliminary development permit review, the County will not approve the project for concurrency until County staff has identified conditions of approval to mitigate the development impact as specified in TCC 17.10.030 F. These conditions, included in the approved preliminary development permit must be completed or guaranteed in the final development permit. Changes to the preliminary development plan adding more than five percent of additional motor vehicle trips will require a new concurrency review.

<u>17.10.030 Development Guidelines for Concurrency Determination</u>.

A. A concurrency determination shall be required with the issuance of any development permit:

1. generating 25 or more motor vehicle trips in or out of the development in the p.m. peak hour,

2. generating fewer than 25 motor vehicle trips in or out of the development, but more than or equal to one motor vehicle trip in or out of the development, in the p.m. peak hour when transportation facilities are at or above 90 percent of their capacity (based on adopted levels of service), or

3. generating fewer than one motor vehicle trip in or out of the development in the p.m. peak hour when transportation

facilities are at or above 100 percent of their capacity (based on adopted levels of service).

B. If a development requires more than one preliminary development permit, the concurrency approval shall occur with the issuance of the first preliminary development permit.

C. If the development permit is for a change of use for an existing structure, the concurrency determination will be for the new increase only.

D. Concurrency approval shall be valid as long as the development permit to which it applies is valid.

E. If the concurrency determination results in a finding that transportation facilities and services are sufficient to serve the development, the appropriate County department shall reserve the capacity required for the development at the time of preliminary approval for said development permit. This capacity shall not be returned to the system unless and until the application is, for whatever reason, denied, rejected, invalidated or abandoned.

F. If the concurrency determination results in a finding that transportation facilities and services fall below adopted levels of service, the application for the development permit shall not be approved unless one of the following conditions are met. Upon request, the County shall provide the reasons for denying an application under this section.

1. LOS standards are met by the developer and mitigating measures needed to meet such standards are identified in an approved traffic impact study or other approved document, and the project developer shall have guaranteed the funding of the approved mitigating measures, and the anticipated completion date of the construction is within six years from the date of preliminary approval;

2. The developer pays a pro-rata share towards necessary improvements identified in the 6 year Capital Facilities Plan that have secured funding sources, including grant obligation;

3. The applicant reduces the traffic impacts to achieve an acceptable LOS by scaling the project down to reduce the number of motor vehicle peak hour trips generated by the project; or

4. The applicant may choose to wait until such time as there may be sufficient transportation facility capacity due to improvements identified with secured funding in the 6 year Capital Facilities Plan, and then reapply for a concurrency determination. This approach shall not relieve the applicant of restrictions regarding expiration of permits and may result in a requirement of full application procedures.

17.10.040 Minimum Requirements for Concurrency.

In order to obtain a concurrency approval based on meeting minimum required levels of service for transportation facilities, one of the following conditions must be satisfied:

A. The necessary facilities and services are in place at the time the development is available for use or occupancy or at the time of approval is granted for a preliminary development permit, or a final development permit when a preliminary permit is not required;

B. Approval is granted for a preliminary development permit, or final development permit when a preliminary permit is not required, subject to the condition that the necessary facilities and services are included in the six year list of improvements in the Capital Facilities Chapter current at the time of preliminary approval of the application, and the developer has agreed to pay a pro-rata share of costs towards these improvements (Note: If grant funding does not come through for projects identified in the Capital Facilities Chapter, the County's first priority will be to find alternative funds, the second priority is to lower levels of service); or

C. Provision of facilities and services are guaranteed in an enforceable development agreement. The agreement must guarantee that the necessary transportation facilities will be in place within six years of the time that the first development permits are issued. A latecomer agreement can be established for developer reimbursement.

17.10.050 Recognition of Established Levels of Service in the Thurston County Comprehensive Plan.

The County shall recognize those levels of service for transportation facilities adopted in the Thurston County Comprehensive Plan, including joint plans with cities and towns.

17.10.060 Monitoring Concurrency.

The County shall monitor what the impact of approving concurrency will be on the capacity of transportation facilities. Monitoring will be accomplished through the Annual Capacity Statement based upon a permit tracking system.

17.10.070 Fees.

No fees will be charged by the County for determining concurrency. Applicants for development permits will be allowed to submit a traffic impact analysis (TIA) from a licensed engineer to assist the County in determining concurrency of the

development. The County may undertake an independent TIA to confirm the results, but at no cost to the applicant.

17.10.080 Mandatory Review of Ordinance.

The County staff shall periodically examine the provisions of this ordinance and submit a report to the Board of County Commissioners advising them as to the operation of the ordinance and recommending changes and amendments, if any, which are desirable for meeting the goals and policies of the Thurston County Comprehensive Plan or are in the interest of furthering the public health, safety and general welfare.

17.10.090 Other Authority.

Nothing in this ordinance is intended to limit the County's authority under the State Environmental Policy Act or any other source. Vested rights are determined based on applicable state law of the State of Washington.

17.10.100 Severability.

If any section, paragraph, subsection, clause, sentence, or provision of this ordinance is adjudged by any court of competent jurisdiction to be invalid or unconstitutional, the remainder of this ordinance shall not be affected by such judgment and shall remain in full force and effect.

ADOPTED: _____

ATTEST:

_____
Clerk of the Board

APPROVED AS TO FORM:

BERNARDEAN BROADOUS
PROSECUTING ATTORNEY

By: _____
Thomas R. Bjorgen, Senior
Deputy Prosecuting Attorney

BOARD OF COUNTY COMMISSIONERS
Thurston County, Washington

_____
Chairman

_____
Commissioner

_____
Commissioner

APPENDIX SIX

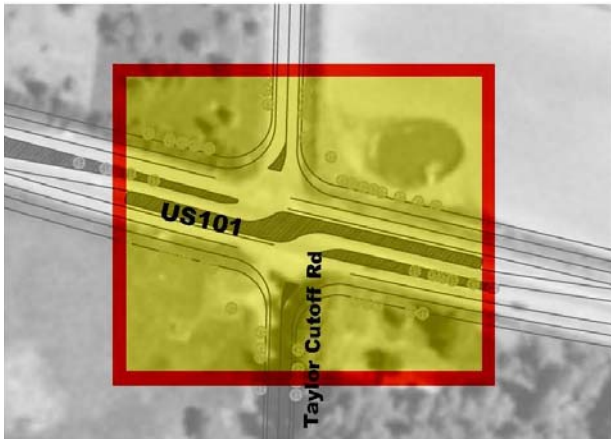
TAYLOR CUTOFF ROAD, TRAFFIC SIGNAL OPTION

APPENDIX 6

Taylor Cutoff Road Signal Option

Carlsborg Community Advisory Committee Meeting

In advance of the Carlsborg Community Advisory Committee Meeting on June 23, 2008, members of the Committee requested an additional evaluation of the intersection of Taylor Cutoff Road and US 101. The recommendation within the Carlsborg Area Transportation Study was to prohibit left turns at this location as shown on the diagram at right.



The Advisory Committee requested an additional evaluation of the operational characteristics of this intersection if a traffic signal was put in place, rather than the current recommendation.

Utilizing Synchro 6 traffic analysis software, the additional analysis requested was completed and the intersection simulation indicates an average control delay of 7 seconds, with an HCM Level of Service A.

While the intersection will operate well with a signal, several issues should be kept in mind prior to implementation of this alternative:

On the positive side, by installing a signal rather than the proposed solution at Taylor Cutoff Road and US 101, full turning movements can be achieved from all directions, not just from the US 101 approaches. Additionally, this improvement could delay the implementation and expense of connectivity recommendations, including connecting Taylor Cutoff to Hooker Road sometime in the future; although the purpose of US 101 is not to promote internal circulation.

The disadvantage of this approach is that an additional traffic signal on US 101 will delay a significant number of US 101 users to provide full turning movements for a relatively fewer number of Taylor Cutoff/ Gilbert Road users. In 2025, traffic forecasts show 969 vehicles going east bound on US 101 as they approach this intersection, most of which continue through the intersection. In the forecast year, 1,146 vehicles are anticipated to approach this intersection from the east, again, most of which continue through the intersection. Only 36 vehicles approach the intersection from the north and 100 from the south, again according to the forecast. Although the signal could be programmed to minimize the impact, at this location, US 101 represents more than 15 times the trips as do Taylor Cutoff and Hooker Road during the PM peak hour.

Historically when traffic signals are installed at high volume intersections, we typically see an increase in rear-end collisions; this too should be considered prior to installing a signal at this location.

Finally, the community should be aware that before any modification to this intersection can be made, WSDOT must approve final designs and in the case of the signal, a warrant analysis would have to be completed.

The HCM Signalized Intersection Capacity Analysis is attached as the 2nd page of this appendix.

HCM Signalized Intersection Capacity Analysis
16: US 101 & Taylor Cutoff Rd

8/29/2008

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.95			0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97			0.98	
Satd. Flow (prot)	1676	3353	1500	1676	3353	1500		1630			1651	
Flt Permitted	0.24	1.00	1.00	0.31	1.00	1.00		0.79			0.85	
Satd. Flow (perm)	418	3353	1500	539	3353	1500		1323			1428	
Volume (vph)	14	773	138	72	1036	38	111	3	61	14	7	10
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	840	150	78	1126	41	121	3	66	15	8	11
RTOR Reduction (vph)	0	0	75	0	0	21	0	48	0	0	8	0
Lane Group Flow (vph)	15	840	75	78	1126	20	0	142	0	0	26	0
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	16.9	16.9	16.9	16.9	16.9	16.9		9.0			9.0	
Effective Green, g (s)	16.9	16.9	16.9	16.9	16.9	16.9		9.0			9.0	
Actuated g/C Ratio	0.50	0.50	0.50	0.50	0.50	0.50		0.27			0.27	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	208	1672	748	269	1672	748		351			379	
v/s Ratio Prot		0.25			c0.34							
v/s Ratio Perm	0.04		0.05	0.14		0.01		c0.11			0.02	
v/c Ratio	0.07	0.50	0.10	0.29	0.67	0.03		0.40			0.07	
Uniform Delay, d1	4.4	5.7	4.5	5.0	6.4	4.3		10.2			9.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	0.1	0.2	0.1	0.6	1.1	0.0		0.8			0.1	
Delay (s)	4.6	5.9	4.5	5.6	7.5	4.3		11.0			9.4	
Level of Service	A	A	A	A	A	A		B			A	
Approach Delay (s)		5.7			7.3			11.0			9.4	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM Average Control Delay	7.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	33.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			