



FEHR & PEERS  
TRANSPORTATION CONSULTANTS

# DRAFT WINTERS I-505/GRANT AVENUE PLANNING AREA TRAFFIC ANALYSIS

*March 2012*

*Prepared for:  
City of Winters*

*RS10-2811.D*

## 1. INTRODUCTION

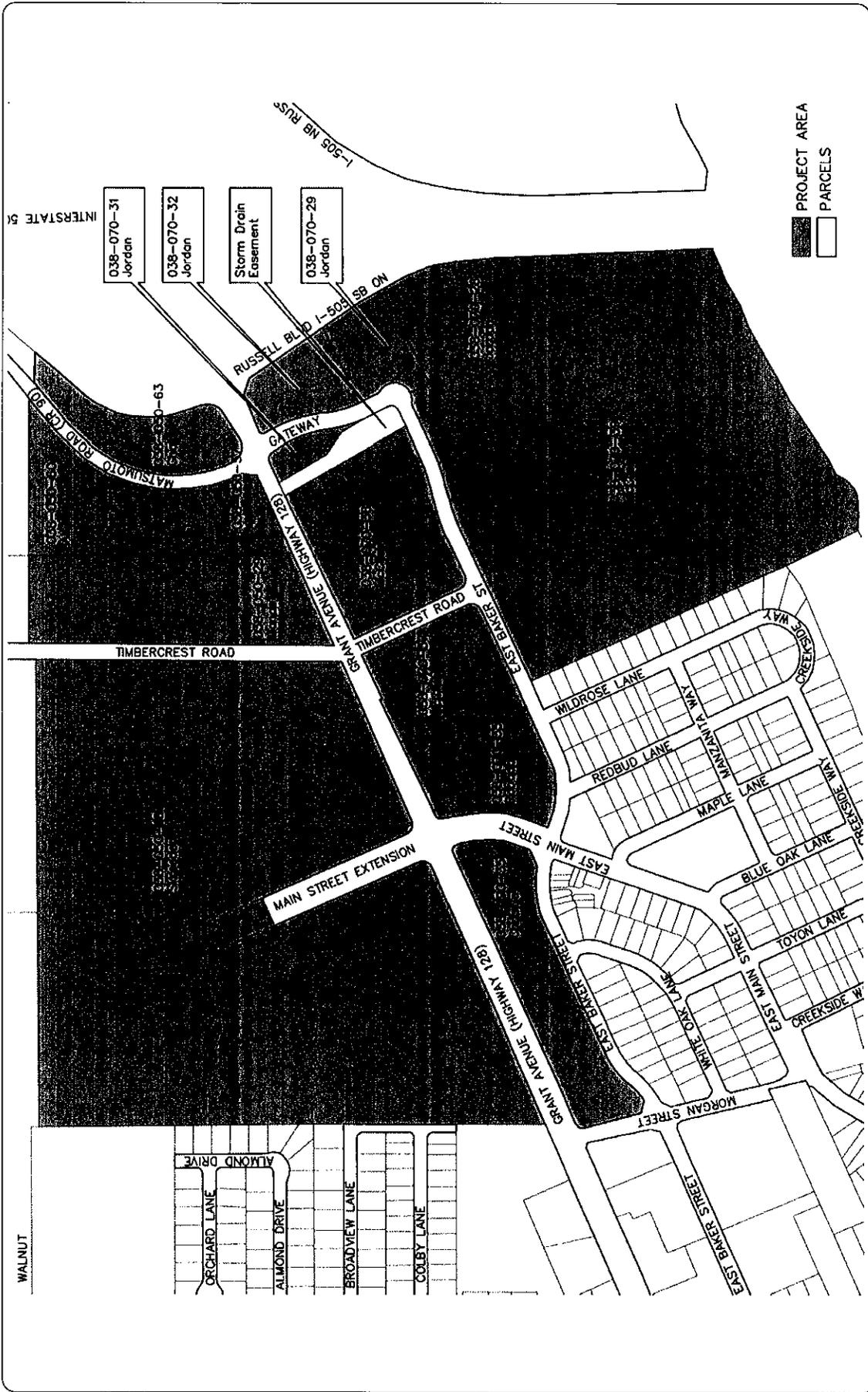
The purpose of this traffic analysis is to evaluate the potential transportation impacts of modifying land use designations within a project area totaling 140.1 acres in the eastern area of the City of Winters, on the north and south sides of State Route (SR) 128 (Grant Avenue), and on the west side of and adjoining Interstate 505 (I-505).

The purpose of this study is to provide an evaluation of potential development over the next 10 to 20 years so that transportation infrastructure needs can be identified and an environmental clearance can be provided. As individual development applications are submitted to the City of Winters in the coming years, this traffic study and the associated environmental clearance will address cumulative impacts and mitigation needs for the I-505/Grant Avenue Planning Area as long as the accumulative number of trips generated by the projects does not exceed the amount evaluated in this study. Individual development applications will need to submit project specific traffic information (i.e., trip generation, traffic count data on Grant Avenue) to determine if the proposed project triggers the need for new transportation improvements or measures.

### DEVELOPMENT ASSUMPTIONS

This study evaluates the development levels identified in Table 1 for the parcels located within the project planning area shown in Figure 1. The development assumptions do not necessarily represent the potential build-out of uses on the designated parcels. The land uses are illustrative, based on the range of potential uses that could be developed within the project area according to the planned zoning of the parcels. The "Project" is the 140 acres referred to herein as the I-505/Grant Avenue Planning Area.

Property Owner	Land Use Type	Quantity
Ghai	Arco service station	13 fueling pumps
	Burger King restaurant	3,500 s.f.
Ali	Service station	4 fueling pumps
	Fast food restaurant	3,500 s.f.
	Hotel	50 rooms
Manas	Hotel	50 rooms
Skreedon	Single Family Residential	245 units
	Neighborhood commercial	25,000 s.f.
Jordan	3 northerly parcels - service stations or restaurants	
	Hotel	50 rooms
McClish	Light industrial	55,000 s.f.
	Office	35,000 s.f.
	Neighborhood commercial	15,000 s.f.
Robada	Neighborhood commercial	21,400 s.f.
Christie	Neighborhood commercial	28,600 s.f.
<i>Source: City of Winters.</i>		



## ANALYSIS SCENARIOS AND TIME PERIODS

The need for transportation improvements is determined by examining peak hour operations and traffic signal warrants at key intersections. The weekday morning and evening peak hours are evaluated in this access study, as they represent the time periods when the combination of existing traffic and traffic generated by the project are at their highest. An evaluation of intersection performance is provided for the following conditions:

- Existing Conditions
- Existing plus Project
- Existing plus Approved Developments
- Existing plus Approved Developments plus Project
- Cumulative No Project
- Cumulative plus Project

## STUDY INTERSECTIONS

This study addresses conditions at the following five intersections along Grant Avenue:

1. Grant Avenue / East Main Street
2. Grant Avenue / Timber Crest Road (future intersection)
3. Grant Avenue / Matsumoto Road (formerly County Road 90)
4. Grant Avenue / Interstate 505 (I-505) Southbound Ramps
5. Grant Avenue / I-505 Northbound Ramps

## GENERAL PLAN ASSUMPTIONS

This section provides a description of the transportation network improvements identified in the General Plan and the land use growth levels assumed in the General Plan EIR. A comparison of the daily trip generation for the study area parcels, as presented in the 1992 General Plan EIR and based on the proposed project as described in this study, is also provided. The General Plan EIR concluded that there would be no transportation impacts with implementation of the transportation improvements identified in the circulation element.

The General Plan identifies long-range transportation improvements for the project area. The following is a list of those in the vicinity of the study intersections.

- Grant Avenue– widen to four lanes
- East Main Street – extend East Main Street from Grant Avenue to the north and as part of a Main Street “loop” road
- Timber Crest Road – construction of a new roadway (i.e., Matsumoto Road realignment) extending north from Grant Avenue and connecting with Matsumoto Road and industrial development in the northeast portion of the city

- Baker Street – extend east from its present easterly terminus through the McClish parcel to the Jordan parcel
- New traffic signals along Grant Avenue at the East Main Street, Timber Crest Road, and I-505 southbound ramp intersections

Table 2 provides the land use and daily trip generation assumptions, for the project study area, from the 1992 General Plan EIR. The daily trip generation is based on trip rates identified in the transportation section of the General Plan EIR. The General Plan EIR assumed that the project parcels would generate a total of 14,468 daily vehicle trips.

Study Area Land Use	Quantity	Units	Daily Trips
Light Industrial (north of Grant)	10.9	acres	824
Highway Service Commercial (north of Grant)	5.1	acres	3,523
Planned Commercial (north of Grant)	15.6	acres	2,883
Planned Commercial/Business Park (south of Grant)	51.2	acres	3,871
Planned Commercial (south of Grant)	12.9	acres	2,384
Single Family Residential (Skreedden parcel)	103	units	984
<b>TOTAL</b>			<b>14,468</b>
Source: <i>City of Winters.</i>			

Table 3 provides the land use and daily trip generation assumptions, for the project study area, based on the proposed project described in this study. The daily trip generation is based on trip rates incorporated in the citywide travel model, which are mostly derived from ITE *Trip Generation*. The project parcels would generate a total of 20,532 daily vehicle trips based on the planned land use assumptions.

Development on parcels in the study area, based on the project proposal, would generate approximately 6,000 more daily trips than assumed in the 1992 General Plan EIR.

- 1992 General Plan – Daily Trip Generation Assumptions for Project = 14,468 total daily trips
- Current Project Description – Daily Trip Generation Assumptions for Project = 20,532 total daily trips

The following Traffic Analysis concludes that the project traffic can be accommodated with the transportation improvements identified in the General Plan Circulation Element. Implementation of the project would not change the conclusions of the General Plan EIR transportation analysis for the study area, which were that the roadway system would operate at acceptable levels with implementation of the circulation element improvements.

**TABLE 3:  
 PROJECT DAILY TRIP GENERATION ASSUMPTIONS**

Property Owner	Land Use	Quantity	Units	Daily Trips
Ghai	Arco service station	13	Fuel pumps	2,119
	Burger King restaurant	3.5	1,000 s.f.	1,736
Ali	Service Station	4	Fuel pumps	652
	Fast food restaurant	3.5	1,000 s.f.	1,736
	Hotel	50	rooms	446
Manas	Hotel	50	rooms	446
Skreeden	Single family residential	245	Units	2,450
	Neighborhood commercial	25	1,000 s.f.	1,170
Jordan	3 northerly parcels – service stations or restaurants	Per 1992 study		5,310
	Hotel	50	rooms	446
McClish	Light Industrial	55	1,000 s.f.	383
	Office	35	1,000 s.f.	595
	Neighborhood commercial	15	1,000 s.f.	702
Robada	Neighborhood commercial	21.4	1,000 s.f.	1,002
Christie	Neighborhood commercial	28.6	1,000 s.f.	1,338
<b>TOTAL</b>				<b>20,532</b>

Source: Fehr & Peers.

## ANALYSIS METHODOLOGIES

### *Travel Forecasts*

Cumulative travel forecasts were developed using the City of Winters' Travel Demand Model that was initially prepared in 2002. The land use forecasts that are incorporated in the model and evaluated for cumulative conditions represent approximately 20 years of development, and are consistent with the 2035 regional forecasts developed by SACOG for the Metropolitan Transportation Plan. The roadway network incorporated in the citywide travel model is based on the General Plan circulation element.

Under "Existing plus Approved Developments" conditions, existing traffic data was adjusted to account for the addition of trips associated with already approved and pending developments in the project planning area. Existing traffic counts were collected in July 2010 during both the AM and PM peak hours at the study intersections. The following is a summary of approved developments that are included in the near-term scenario.

- Highlands, Callahan Estates, Ogando-Hudson, & Creekside Estates
- Winters Commercial Center
- Orchard Village (former American Communities) Project
- Anderson Place (former Brzeski) Project
- Arco/Burger King Project
- Jordan Property (3 parcels)
  - 3 highway commercial parcels generating 434 pm peak hour trips

For both the "Existing plus Project" and "Existing plus Approved plus Project" near-term scenarios, the vehicle trips generated by the project were added to the baseline "Existing" and "Existing plus Approved" conditions, respectively.

### *Intersection Analysis Methodologies*

The study intersections were analyzed using procedures and methodologies defined in the *Highway Capacity Manual* (Transportation Research Board, 2010). Table 4 displays the average control delay in seconds per vehicle for each level of service (LOS) threshold for signalized and unsignalized intersections. The LOS for signalized and all-way stop-controlled intersections is based on the average control delay of all vehicles traveling through the intersection. The LOS for side-street stop-controlled intersections is determined by the movement with the greatest average delay.

**TABLE 4:  
 LEVEL OF SERVICE CRITERIA – INTERSECTIONS**

Level of Service	Average Control Delay (seconds/vehicle)	
	Signalized	Unsignalized
A	≤ 10.0	≤ 10.0
B	10.1 – 20.0	10.1 – 15.0
C	20.1 – 35.0	15.1 – 25.0
D	35.1 – 55.0	25.1 – 35.0
E	55.1 – 80.0	35.1 – 50.0
F	> 80.0	> 50.0

Source: *Highway Capacity Manual* (Transportation Research Board, 2010).

**INTERSECTION PERFORMANCE THRESHOLDS**

This traffic analysis applies the goals and policies of the City of Winters General Plan (City of Winters, May 19, 1992) to evaluate the operations performance of the study intersections. The General Plan includes the following performance thresholds:

Policy III.A.1: The City shall endeavor to maintain a Level of Service “C” or better as defined by the 1985 Highway Capacity Manual or subsequent revisions, on all streets and intersections within the City.

Policy III.A.8: The City shall comply with and implement the program and policies of the Yolo County Congestion Management Plan (CMP).

The CMP identifies LOS D as the threshold for Grant Avenue. This study will assume LOS D to be the minimum acceptable operations performance of the study intersections. A level of service worse than LOS D will be considered unacceptable.

## 2. EXISTING CONDITIONS

The following section provides a description of the existing roadway network, existing traffic data, and existing traffic conditions. Pending transportation improvements for the Arco/Burger King project are not assumed to be in place for existing conditions, but are assumed in the "Existing plus Approved" and "Cumulative" scenarios.

### ROADWAY NETWORK

I-505 is a north-south highway that provides the primary regional access to the City from Vacaville and central Solano County to the south, and from Woodland and I-5 to the north. Through the City, it is a four-lane, divided facility. I-505 has a flat alignment through Winters with a grade-separated interchange at Grant Avenue.

Grant Avenue is an east-west state highway (State Route 128) that serves as the major east-west route through the City. It is a two-lane undivided facility through the City. In the Gateway Area, the posted speed limit is 45 miles per hour.

Matsumoto Road is a north-south, two-lane facility that has its southern terminus at Grant Avenue and extends approximately one and a half miles to the north.

### EXISTING TRAFFIC CONDITIONS

The traffic counts used in the existing conditions analysis for the study intersections were collected on a weekday in July 2010. The counts were taken during both the morning (between 7:00 and 9:00 AM) and afternoon (between 4:00 and 6:00 PM) peak periods. Figure 2 illustrates the existing intersection turning movement volumes and lane configurations.

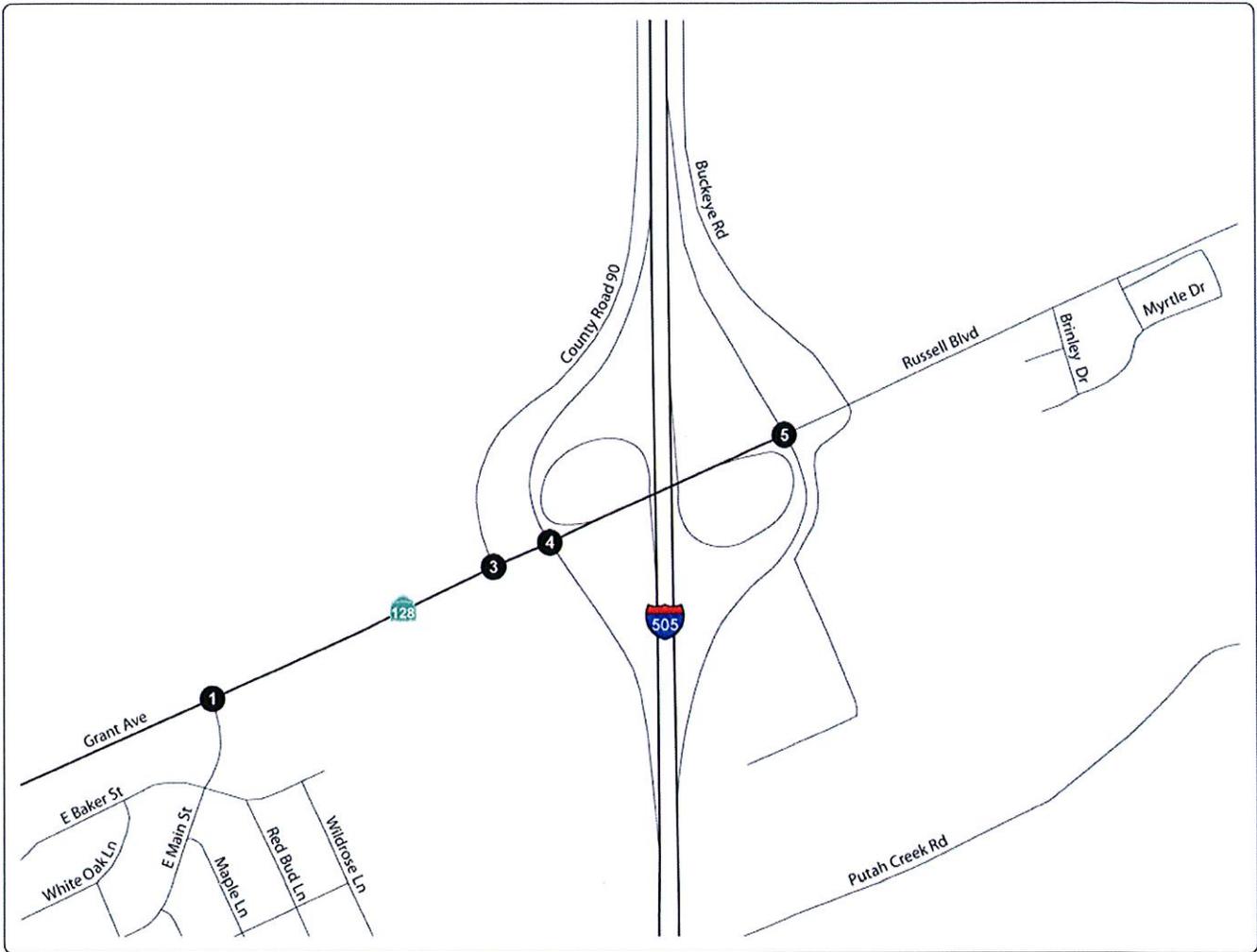
#### *Intersection Operations and Signal Warrant Analysis*

Table 5 below summarizes the AM and PM peak hour levels of service at each of the study intersections (see Appendix A for calculations). Based on Table 5, all of the study intersections operate acceptably at LOS B or better during both the AM and PM peak hours.

TABLE 5: PEAK HOUR INTERSECTION OPERATIONS – EXISTING CONDITIONS					
Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		Delay <sup>1</sup>	LOS <sup>2</sup>	Delay <sup>1</sup>	LOS <sup>2</sup>
1. Grant Ave / E Main St	Side Street Stop	7	A	12	B
3. Grant Ave / Matsumoto Road	Side Street Stop	6	A	12	B
4. Grant Ave / I-505 Southbound Ramps	Side Street Stop	5	A	11	B
5. Grant Ave / I-505 Northbound Ramps	Signal	8	A	9	A

Notes: <sup>1</sup> For signalized and all-way stop-controlled intersections, the overall average intersection control delay is reported in seconds per vehicle. For side-street stop control, the average control delay for the worst movement is reported in seconds per vehicle.  
<sup>2</sup> Level of Service based on *Highway Capacity Manual* (Transportation Research Board, 2010)

Source: Fehr & Peers, 2011



1. Grant Ave. / E Main St.	3. Grant Ave. / Co. Rd. 90	4. Grant Ave. / I-505 SB Ramps	5. Grant Ave. / I-505 NB Ramps
<p>Grant Ave</p> <p>← 188 (491) → 4 (61)</p> <p>375 (369) 3 (12)</p> <p>E Main St</p> <p>5 (11) 66 (29)</p>	<p>Grant Ave</p> <p>← 2 (11) → 6 (13)</p> <p>Co. Rd. 90</p> <p>12 (11) 184 (567)</p> <p>6 (6) 439 (395)</p>	<p>Grant Ave</p> <p>50 (70) 0 (0) 4 (9)</p> <p>I-505 SB Ramps</p> <p>13 (33) 146 (508)</p> <p>280 (246) 165 (162)</p>	<p>Grant Ave</p> <p>2 (10) 104 (342)</p> <p>I-505 NB Ramps</p> <p>246 (219) 38 (36)</p> <p>55 (199) 0 (0) 11 (20)</p>

**LEGEND**

- ↔ Turn Lane
- AM (PM) Peak Hour Traffic Volume
- ① Study Intersection
- 🚦 Traffic Signal
- ⊙ Stop Sign
- 📍 Not to Scale

### 3. EXISTING PLUS PROJECT CONDITIONS

The following section provides a description of the proposed project, the trip generation of projected development, significant impacts, and mitigation measures.

#### PROJECT TRAVEL CHARACTERISTICS

##### *Project Land Use and Trip Generation*

The trip generation of projected developments within the planning area is estimated based on trip rates in the citywide travel model, which are generally based on rates published in *Trip Generation, 8<sup>th</sup> Edition* (Institute of Transportation Engineers, 2008). Table 6 below presents the number of vehicle trips that will access development within the planning area, based on the land use program identified in Table 1, during the weekday AM and PM peak hours.

TABLE 6: PROJECT LAND USE AND TRIP GENERATION					
Parcel Owner	Land Use	Quantity	Units <sup>1</sup>	Vehicle Trips	
				AM Peak Hour	PM Peak Hour
Ghai	Arco service station	13	vfp	132	174
	Burger King restaurant	3.5	ksf	173	118
Ali	Service station	4	vfp	41	54
	Fast food restaurant	3.5	ksf	173	118
	Hotel	50	rooms	34	35
	Hotel	50	rooms	34	35
Skreedon	Residential	245	units	181	235
	Neighborhood commercial	25	ksf	72	72
Jordan	3 northerly parcels - 3 service stations or 2 fast food, 1 sit-down restaurant	-	-	254	434 <sup>2</sup>
	Hotel	50	rooms	34	35
McClish	Light industrial	55	ksf	51	53
	Office	345	ksf	67	88
	Neighborhood commercial	15	ksf	43	43
Robada	Neighborhood Commercial	21.4	ksf	62	62
Christie	Neighborhood commercial	28.6	ksf	82	82
<b>Total Vehicle Trips</b>				<b>1,430</b>	<b>1,638</b>
Notes: <sup>1</sup> ksf = 1,000 square feet; vfp = vehicle fueling positions					
<sup>2</sup> Vehicle trips identified in previously approved traffic study for Phase 1 development of Jordan parcels.					
Source: Citywide Travel Model Trip Rates; <i>Trip Generation</i> , 8th Edition (Institute of Transportation Engineers, 2008)					

### ***Project Trip Distribution***

The distribution of new vehicle trips onto the roadway system is based on trip assignments derived from the citywide travel model. A large share of the vehicle trips, particularly those generated from highway commercial uses such as service stations or restaurants, go to and from I-505.

### **EXISTING PLUS PROJECT TRAFFIC CONDITIONS**

This section provides the analysis of the Existing Plus Project Scenario at the five study intersections. Figure 3 illustrates the forecasted intersection turning movement volumes and lane configurations.

The analysis assumes transportation improvements identified as mitigations for the approved Arco/Burger King project are in place.

- Installation of a traffic signal at Grant Avenue / Matsumoto Road
- Addition of a second westbound through lane on Grant Avenue from I-505 southbound ramps to just west of Matsumoto Road
- Addition of a southbound left-turn lane on Matsumoto Road at Grant Avenue
- Extension of the eastbound left-turn lane on Grant Avenue at Matsumoto Road to 300 feet
- Reconstruction of the Grant Avenue/I-505 Southbound Ramps intersection to convert the yield-controlled right turn lane to a stop-controlled right turn lane
- Construction of a new side-street stop controlled intersection at Grant Avenue / Timber Crest Road with a connection to the Jordan parcel (i.e., Timber Crest Road, East Baker Street, Gateway (Jordan parcel access))

The improvements also include reconstruction of the segment of Grant Avenue to eliminate the southbound yield-controlled right-turn at the I-505 southbound off-ramp. Vehicles exiting the southbound off-ramp from I-505 will come to a complete stop at the terminus of the ramp before proceeding onto Grant Avenue.

### ***Intersection Operations and Signal Warrant Analysis***

Table 7 below summarizes the operations performance of the study intersections under Existing Plus Project Conditions.

**TABLE 7:  
 PEAK HOUR INTERSECTION OPERATIONS – EXISTING PLUS PROJECT CONDITIONS**

Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		Delay <sup>1</sup>	LOS <sup>2</sup>	Delay <sup>1</sup>	LOS <sup>2</sup>
1. Grant Avenue (SR 128) / E. Main Street	Side Street Stop	13	B	30	D
2. Grant Avenue (SR 128)/Timber Crest Road	Side Street Stop	<b>59</b>	<b>F</b>	<b>108</b>	<b>F</b>
3. Grant Avenue (SR 128) / Matsumoto Road	Signal	14	B	12	B
4. Grant Avenue (SR 128) / I-505 Southbound Ramps	Side Street Stop	8	A	22	C
5. Grant Avenue (SR 128) / I-505 Northbound Ramps	Signal	9	A	11	B

Notes: <sup>1</sup> For signalized and all-way stop-controlled intersections, the overall average intersection control delay is reported in seconds per vehicle. For side-street stop control, the average control delay for the worst movement is reported in seconds per vehicle.  
<sup>2</sup> Level of Service based on *Highway Capacity Manual* (Transportation Research Board, 2010)  
**BOLD** text indicates that the intersection operates unacceptably based on the operations thresholds.

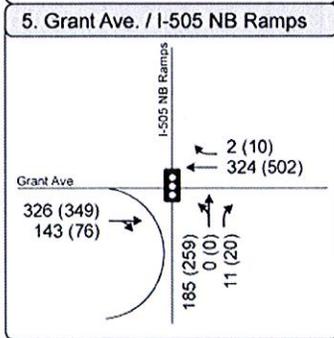
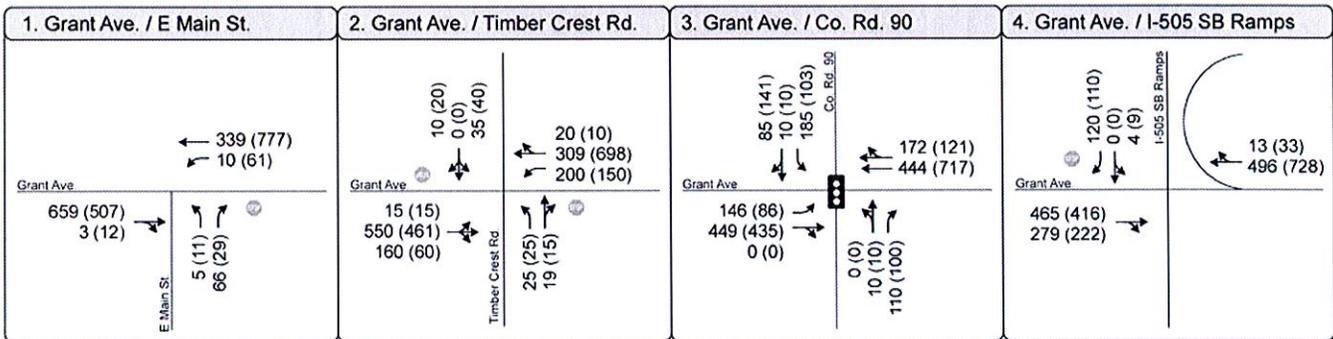
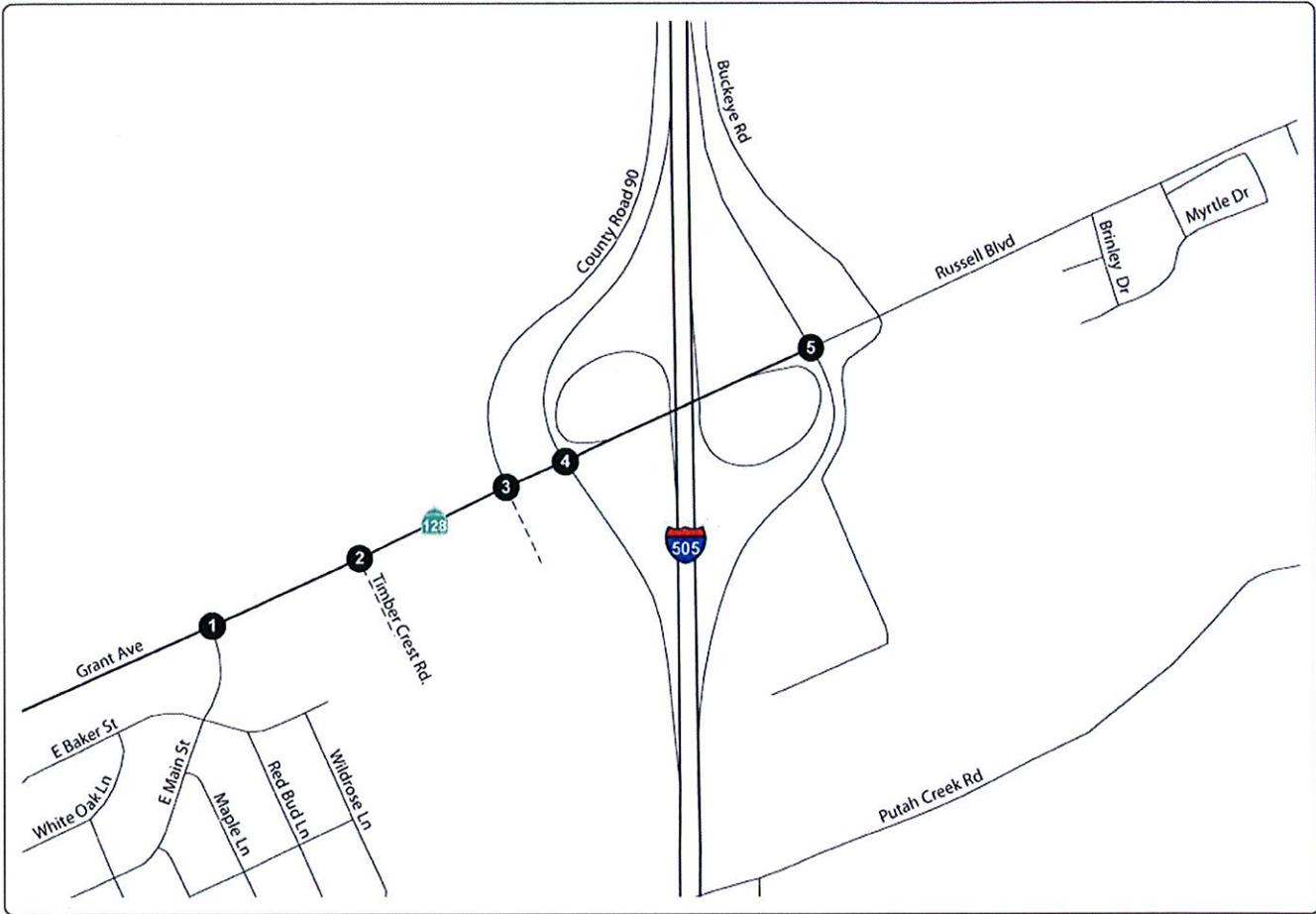
Source: Fehr & Peers, 2012

**EXISTING PLUS PROJECT IMPACTS**

The project results in a significant impact at the intersection of Grant Avenue (SR 128)/Timber Crest Road, which would operate at LOS F conditions during the AM and PM peak hour. The new Grant Avenue (SR 128)/Timber Crest Road intersection would be constructed when development on the McClish, Manas or Jordan parcels occurs.

**EXISTING PLUS PROJECT MITIGATIONS**

The installation of a traffic signal at the Grant Avenue/Timber Crest Road intersection would reduce the project impacts to a less-than-significant level. As noted above, installation of a traffic signal at this new intersection would be triggered when development on the McClish, Manas or Jordan parcels occurs. The intersection would operate at LOS C conditions during both the AM and PM peak hour with the mitigation measure.



**LEGEND**

- Turn Lane
- AM (PM) Peak Hour Traffic Volume
- Study Intersection
- Traffic Signal
- Stop Sign
- Future Road



**PEAK HOUR TRAFFIC VOLUME AND LANE CONFIGURATIONS - EXISTING PLUS PROJECT CONDITIONS**

**FIGURE 3**

## **4. EXISTING PLUS APPROVED DEVELOPMENTS**

The following section provides a description of near-term conditions without the project.

### **LAND USE ASSUMPTIONS**

The following approved developments are included in the "Existing plus Approved Developments" scenario. Trips generated by these developments are added to the existing traffic volumes.

- Highlands, Callahan Estates, Ogando-Hudson & Creekside Estates
- Winters Commercial Center
- Orchard Village (former American Communities) Project
- Anderson Place (former Brzeski) Project
- Arco/Burger King Project
- Jordan Property (3 parcels)

### **NETWORK ASSUMPTIONS**

The transportation network assumes implementation of the following planned improvements, as they are identified as mitigations for the approved Arco/Burger King project.

- Installation of a traffic signal at Grant Avenue / Matsumoto Road
- Addition of a second westbound through lane on Grant Avenue from I-505 southbound ramps to just west of Matsumoto Road
- Addition of a southbound left-turn lane on Matsumoto Road at Grant Avenue
- Extension of the eastbound left-turn lane on Grant Avenue at Matsumoto Road to 300 feet
- Reconstruction of the Grant Avenue/I-505 Southbound Ramps intersection to convert the yield-controlled right turn lane to a stop-controlled right turn lane
- Construction of a new side-street stop controlled intersection at Grant Avenue / Timber Crest Road with a connection to the Jordan parcel (i.e., Timber Crest Road, East Baker Street, Gateway (Jordan parcel access))

### **EXISTING PLUS APPROVED DEVELOPMENT TRAFFIC CONDITIONS**

This section provides the analysis of the Existing plus Approved Development Scenario at the five study intersections. Figure 4 illustrates the forecasted intersection turning movement volumes and lane configurations.

**Intersection Operations**

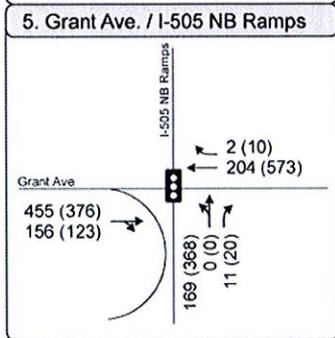
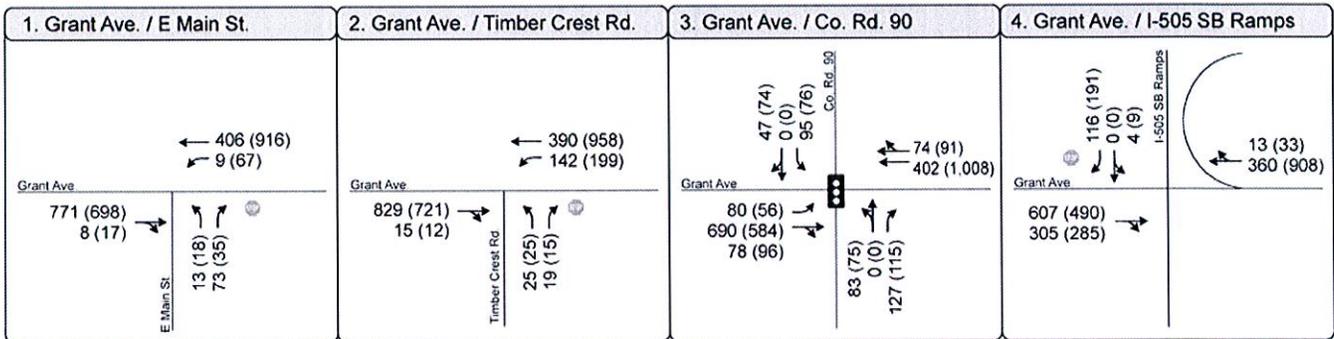
Table 8 below summarizes the operations performance of the study intersections under Existing plus Approved Development Conditions.

<b>TABLE 8: PEAK HOUR INTERSECTION OPERATIONS – EXISTING PLUS APPROVED DEVELOPMENT SCENARIO</b>					
Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		Delay <sup>1</sup>	LOS <sup>2</sup>	Delay <sup>1</sup>	LOS <sup>2</sup>
1. Grant Ave / E Main St	Side Street Stop	18	C	<b>55</b>	<b>F</b>
2. Grant Ave / Timber Crest Rd	Side Street Stop	<b>54</b>	<b>E</b>	<b>92</b>	<b>F</b>
3. Grant Ave / Matsumoto Road	Signal	13	B	13	B
4. Grant Ave / I-505 Southbound Ramps	Side Street Stop	11	B	26	D
5. Grant Ave / I-505 Northbound Ramps	Signal	9	A	13	B
Notes: <sup>1</sup> For signalized and all-way stop-controlled intersections, the overall average intersection control delay is reported in seconds per vehicle. For side-street stop control, the average control delay for the worst movement is reported in seconds per vehicle. <sup>2</sup> Level of Service based on <i>Highway Capacity Manual</i> (Transportation Research Board, 2010) <b>BOLD</b> text indicates that the intersection operates unacceptably based on the operations thresholds.					
Source: Fehr & Peers, 2011					

The following stop-controlled intersections would operate at unacceptable conditions under the Existing plus Approved Development scenario.

- Grant Avenue/East Main Street – PM peak hour
- Grant Avenue/Timber Crest Road – AM and PM peak hours

The transportation development fee program for the City of Winters includes installation of traffic signals at the above two intersections. The installation of traffic signals at the above intersections would yield acceptable conditions.



**LEGEND**

- Turn Lane
- AM (PM)** Peak Hour Traffic Volume
- Study Intersection
- Traffic Signal
- Stop Sign
- Future Road



**PEAK HOUR TRAFFIC VOLUME AND LANE CONFIGURATIONS - EXISTING PLUS APPROVED CONDITIONS**

**FIGURE 4**

## 5. EXISTING PLUS APPROVED DEVELOPMENTS PLUS PROJECT

The following section provides a description of near-term conditions with the proposed project, significant impacts, and mitigation measures.

Trips generated by the project are added to the Existing plus Approved Developments scenario volumes for the study intersections. The same transportation network evaluated for the Existing plus Approved Developments scenario is assumed for the Existing plus Approved Developments plus Project scenario analysis.

### EXISTING PLUS APPROVED DEVELOPMENT PLUS PROJECT TRAFFIC CONDITIONS

This section provides the analysis of the Existing plus Approved Developments plus Project Scenario at the five study intersections. Figure 5 illustrates the forecasted intersection turning movement volumes and lane configurations.

#### Intersection Operations

Table 9 below summarizes the operations performance of the study intersections under Existing plus Approved Development Conditions.

TABLE 9: PEAK HOUR INTERSECTION OPERATIONS – EXISTING PLUS APPROVED DEVELOPMENT SCENARIO					
Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		Delay <sup>1</sup>	LOS <sup>2</sup>	Delay <sup>1</sup>	LOS <sup>2</sup>
1. Grant Ave / E Main St	Side Street Stop	27	D	<b>43</b>	<b>E</b>
2. Grant Ave / Timber Crest Rd	Side Street Stop	>150	<b>F</b>	>150	<b>F</b>
3. Grant Ave / Matsumoto Road	Signal	25	C	19	B
4. Grant Ave / I-505 Southbound Ramps	Side Street Stop	26	D	<b>61</b>	<b>F</b>
5. Grant Ave / I-505 Northbound Ramps	Signal	11	B	18	B
Notes: <sup>1</sup> For signalized and all-way stop-controlled intersections, the overall average intersection control delay is reported in seconds per vehicle. For side-street stop control, the average control delay for the worst movement is reported in seconds per vehicle. <sup>2</sup> Level of Service based on <i>Highway Capacity Manual</i> (Transportation Research Board, 2010) <b>BOLD</b> text indicates that the intersection operates unacceptably based on the operations thresholds.					
Source: Fehr & Peers, 2011					

### EXISTING PLUS APPROVED DEVELOPMENTS PLUS PROJECT IMPACTS

The project results in significant impacts at the following intersections.

- Grant Avenue (SR 128)/East Main Street – LOS E conditions during the PM peak hour
- Grant Avenue (SR 128)/Timber Crest Road - LOS F conditions during the AM and PM peak hour
- Grant Avenue (SR 128)/I-505 Southbound ramps – LOS F conditions during the PM peak hour

## **EXISTING PLUS APPROVED DEVELOPMENTS PLUS PROJECT MITIGATIONS**

The implementation of the following mitigation measures would reduce project impacts, for the Existing plus Approved Developments plus Project scenario, to a less-than-significant level.

### Grant Avenue (SR 128)/East Main Street

- Widen Grant Avenue from two lanes to four lanes from East Main Street to Timber Crest Road
- Install traffic signal
- Extend westbound left turn pocket to be approximately 300 feet in length
- Provide new eastbound left turn pocket approximately 300 feet in length

Implementation of the above mitigation measures would result in LOS B conditions during the AM and PM peak hours.

### Grant Avenue (SR 128)/Timber Crest Road

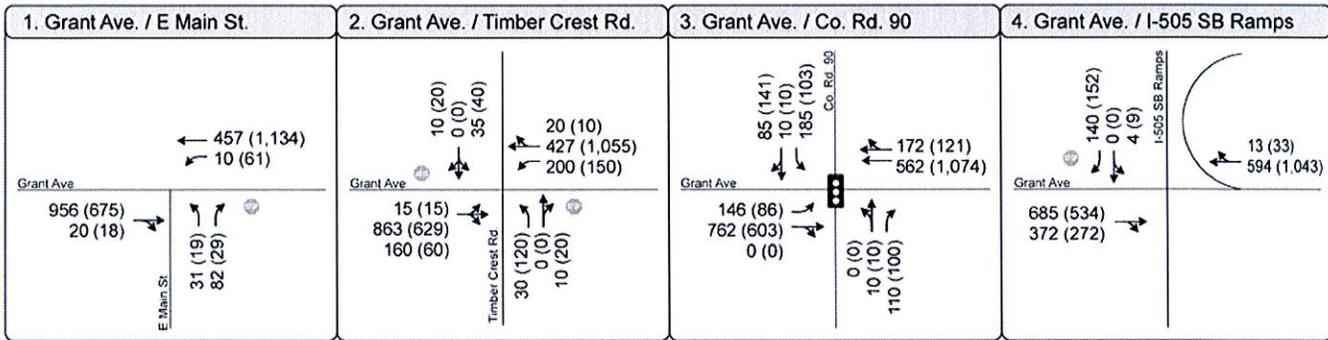
- Widen Grant Avenue from two lanes to four lanes from Timber Crest Road to Matsumoto Road
- Install traffic signal (note: also required for Existing plus Project scenario)
- Provide new westbound left turn pocket 300 feet in length
- Provide new eastbound left turn pocket 300 feet in length

Implementation of the above mitigation measures would result in LOS C conditions during the AM and PM peak hours.

### Grant Avenue (SR 128)/I-505 Southbound ramps

- Install traffic signal

Implementation of the above mitigation measure would result in LOS B conditions during the AM peak hour and LOS D conditions during the PM peak hour.



**LEGEND**

- Turn Lane
- AM (PM) Peak Hour Traffic Volume
- Study Intersection
- Traffic Signal
- Stop Sign
- Future Road



## 6. CUMULATIVE NO PROJECT CONDITIONS

This section provides the analysis of Cumulative No Project conditions at the study intersections. Figure 5 illustrates the forecasted intersection turning movement volumes and lane configurations.

The intersection volumes for the Cumulative No Project scenario were developed using the Winters citywide travel model based on the following land use and network assumptions.

### CUMULATIVE NO PROJECT DEVELOPMENT ASSUMPTIONS

The development assumptions for the Cumulative No Project scenario are based on a 20-year horizon as documented in the citywide travel model. This includes all of the approved developments included in the Existing plus Approved Developments scenario. The Cumulative No Project scenario assumes no development of the parcels within the I-505/Grant Avenue project area.

### CUMULATIVE NO PROJECT NETWORK ASSUMPTIONS

The transportation network assumes implementation of roadway improvements that are identified in the General Plan and included in the citywide traffic impact fee program. These include the following improvements in the project study area.

- Grant Avenue– widen to four lanes from East Main Street to the I-505 southbound ramps
- East Main Street – extend East Main Street from Grant Avenue to the north and complete a Main Street “loop” road
- New traffic signals along Grant Avenue at the East Main Street and I-505 southbound ramp intersections

### CUMULATIVE NO PROJECT TRAFFIC CONDITIONS

This section provides the analysis of the Cumulative No Project Scenario at the study intersections. Figure 6 illustrates the forecasted intersection turning movement volumes and lane configurations.

It should be noted that the intersection of Grant Avenue/Timber Crest Road would not exist under the Cumulative No Project scenario, as no development was assumed to occur on the adjacent parcels (i.e., Manas, McClish).

#### *Intersection Operations*

Table 10 below summarizes the operations performance of the study intersections under Cumulative No Project Conditions.

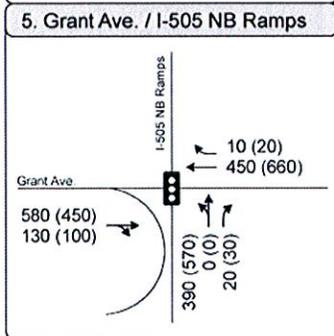
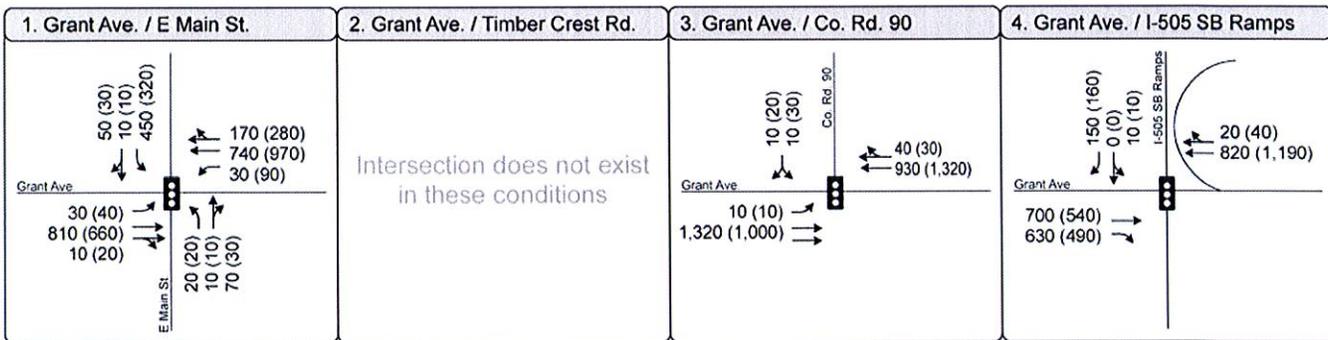
**TABLE 10:  
 PEAK HOUR INTERSECTION OPERATIONS –  
 CUMULATIVE NO PROJECT CONDITIONS**

Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		Delay <sup>1</sup>	LOS <sup>2</sup>	Delay <sup>1</sup>	LOS <sup>2</sup>
1. Grant Ave / E Main St	Side Street Stop	28	C	26	C
2. Grant Ave / Timber Crest Rd	Signal				
3. Grant Ave / Matsumoto Road	Signal	6	A	6	A
4. Grant Ave / I-505 Southbound Ramps	Signal	3	A	4	A
5. Grant Ave / I-505 Northbound Ramps	Signal	21	C	29	C

Notes: <sup>1</sup> For signalized and all-way stop-controlled intersections, the overall average intersection control delay is reported in seconds per vehicle. For side-street stop control, the average control delay for the worst movement is reported in seconds per vehicle.  
<sup>2</sup> Level of Service based on *Highway Capacity Manual* (Transportation Research Board, 2010)  
**BOLD** text indicates that the intersection operates unacceptably based on the operations thresholds.

Source: Fehr & Peers, 2011

All of the study intersections would operate at LOS C or better conditions under the Cumulative No Project scenario.



**LEGEND**

- Turn Lane
- AM (PM)** Peak Hour Traffic Volume
- 1** Study Intersection
- Traffic Signal
- Future Road



**PEAK HOUR TRAFFIC VOLUME AND LANE CONFIGURATIONS - CUMULATIVE NO PROJECT CONDITIONS**

## 7. CUMULATIVE PLUS PROJECT CONDITIONS

The following section provides a description of cumulative conditions with the proposed project, significant impacts, and mitigation measures.

The intersection volumes for the Cumulative plus Project scenario were developed using the Winters citywide travel model based on the following land use and network assumptions.

### CUMULATIVE PLUS PROJECT DEVELOPMENT ASSUMPTIONS

The development assumptions for the Cumulative plus Project scenario are based on a 20-year horizon as documented in the citywide travel model. This includes all of the approved developments included in the Existing plus Approved Developments scenario. The Cumulative plus Project scenario assumes development of the parcels within the I-505/Grant Avenue project area as described in Table 1.

### CUMULATIVE PLUS PROJECT NETWORK ASSUMPTIONS

The transportation network evaluated for the Cumulative No Project scenario is assumed for the Cumulative plus Project scenario analysis, with the following additions.

- Timber Crest Road – construction of a new roadway (i.e., Matsumoto Road realignment) extending north from Grant Avenue and connecting with Matsumoto Road and industrial development in the northeast portion of the city
- Baker Street – extend east from its present easterly terminus through the McClish parcel to the Jordan parcel

### CUMULATIVE PLUS PROJECT TRAFFIC CONDITIONS

This section provides the analysis of the Cumulative plus Project Scenario at the study intersections. Figure 7 illustrates the forecasted intersection turning movement volumes and lane configurations.

#### *Intersection Operations*

Table 11 below summarizes the operations performance of the study intersections under Cumulative plus Project Conditions.

**TABLE 11:  
 PEAK HOUR INTERSECTION OPERATIONS –  
 CUMULATIVE PLUS PROJECT CONDITIONS**

Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		Delay <sup>1</sup>	LOS <sup>2</sup>	Delay <sup>1</sup>	LOS <sup>2</sup>
1. Grant Ave / E Main St	Signal	46	D	32	C
2. Grant Ave / Timber Crest Rd	Signal	35	D	23	C
3. Grant Ave / Matsumoto Road	Signal	24	C	14	B
4. Grant Ave / I-505 Southbound Ramps	Signal	9	A	7	A
5. Grant Ave / I-505 Northbound Ramps	Signal	34	C	<b>59</b>	<b>E</b>

Notes: <sup>1</sup> For signalized and all-way stop-controlled intersections, the overall average intersection control delay is reported in seconds per vehicle. For side-street stop control, the average control delay for the worst movement is reported in seconds per vehicle.  
<sup>2</sup> Level of Service based on *Highway Capacity Manual* (Transportation Research Board, 2010)  
**BOLD** text indicates that the intersection operates unacceptably based on the operations thresholds.

Source: Fehr & Peers, 2011

### CUMULATIVE PLUS PROJECT IMPACTS

The project results in significant impacts at the following intersections.

- Grant Avenue (SR 128)/I-505 Northbound ramps – LOS E conditions during the PM peak hour

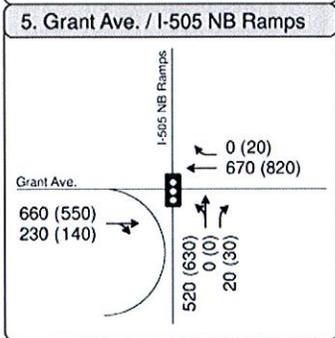
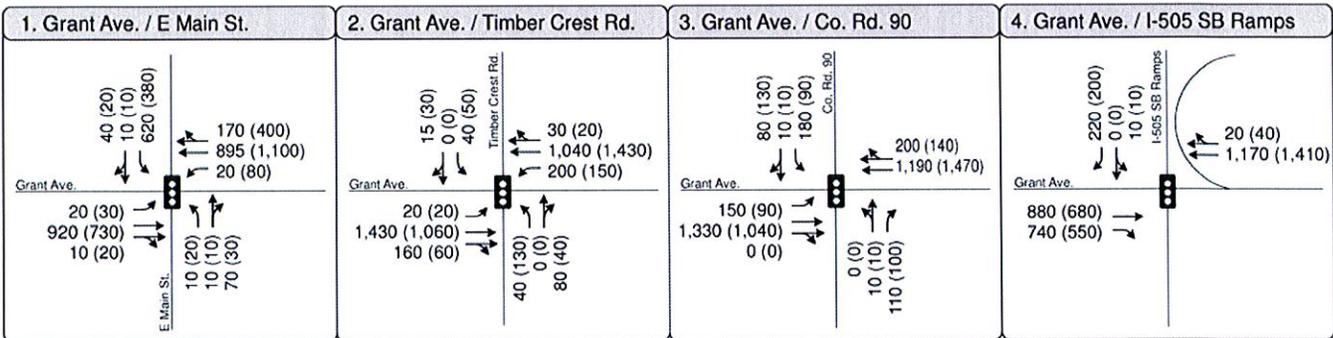
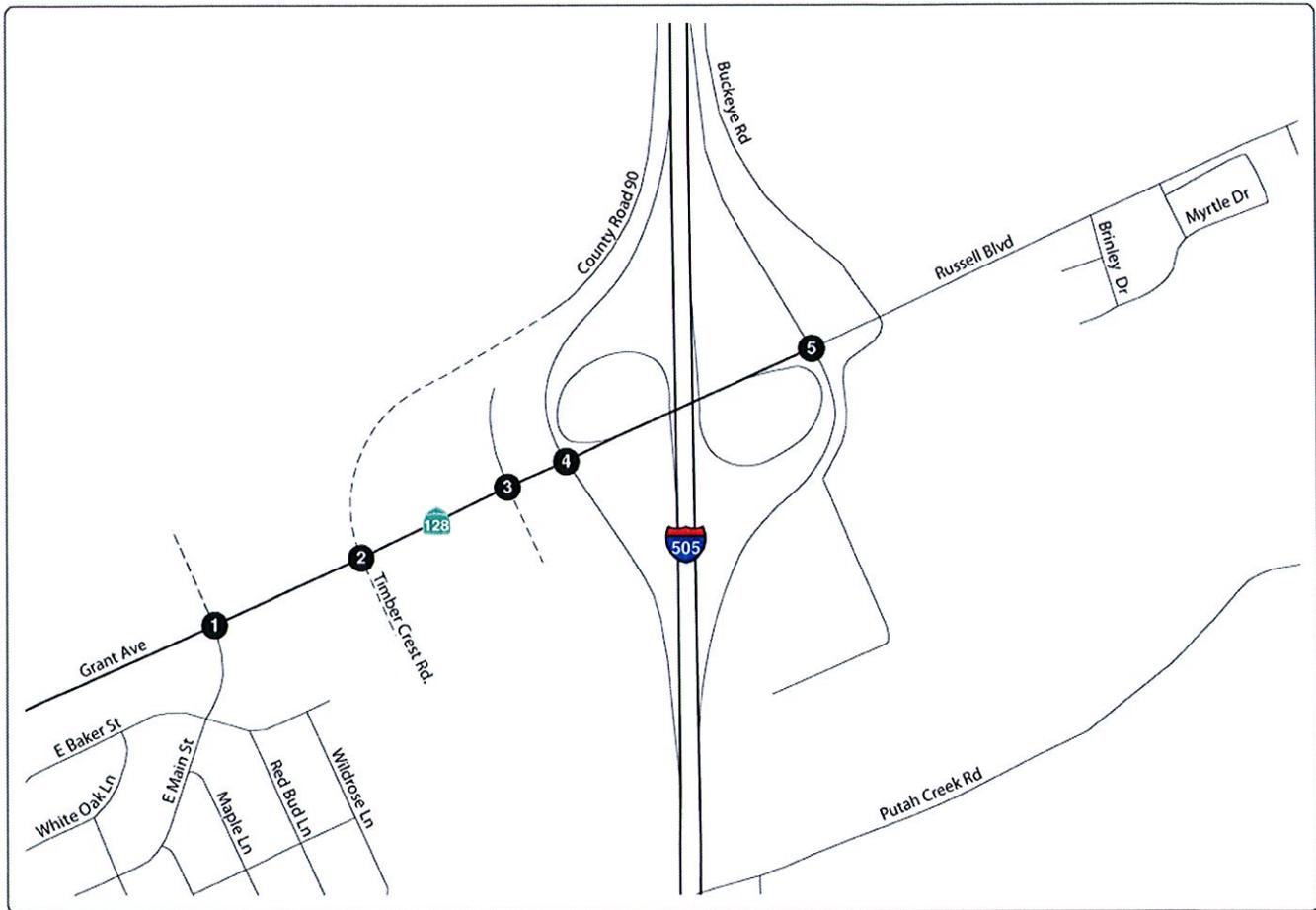
### CUMULATIVE PLUS PROJECT MITIGATIONS

The implementation of the following mitigation measures would reduce project impacts, for the Cumulative plus Project scenario, to a less-than-significant level.

#### Grant Avenue (SR 128)/I-505 Northbound ramps

- Widen the Grant Avenue (SR 128) overpass, from the I-505 southbound ramps to the I-505 northbound ramps, from two to four lanes
- Install a second northbound left turn lane at the intersection of Grant Avenue/I-505 northbound ramps

Implementation of the above mitigation measure would result in LOS B conditions during the AM peak hour and LOS C conditions during the PM peak hour.



**LEGEND**

- Turn Lane
- AM (PM) Peak Hour Traffic Volume
- Study Intersection
- Traffic Signal
- Future Road



**PEAK HOUR TRAFFIC VOLUME AND LANE CONFIGURATIONS - CUMULATIVE PLUS PROJECT CONDITIONS**

**FIGURE 7**

## 8. PHASING ANALYSIS

This section provides a phasing analysis that identifies when planned transportation improvements and mitigation measures need to be implemented.

### TRAFFIC SIGNALS

The installation of traffic signals along Grant Avenue will be triggered either by new development activity in the I-505/Grant Avenue planning area or the addition of through trips generated by other cumulative development. Table 12 identifies the specific triggers for each of the three traffic signals that will be needed in the study area.

IMPROVEMENT TYPE	LOCATION	TRIGGER
Traffic Signal	Grant Avenue/East Main Street	Triggered by first development on Skreedon parcel or 70% of approved developments plus project pm peak hour trips, whichever occurs first
Traffic Signal	Grant Avenue/ Timber Crest Road	Triggered by first development on Manas or McClish parcel, whichever occurs first
Traffic Signal	Grant Avenue/Southbound I-505 Ramps	Triggered by 50% of approved developments plus project pm peak hour trips

The implementation of traffic signals at the Grant Avenue/East Main Street and Grant Avenue/Southbound I-505 Ramps intersections are triggered by traffic generated by a combination of approved developments and developments within the I-505/Grant Avenue planning area as identified in Table 1. The signals would be triggered when the accumulative development in the I-505/Grant Avenue planning area generates the following approximate number of pm peak hour trips.

- Grant Avenue/East Main Street Traffic Signal – total of 880 pm peak hour trips generated by development within the I-505/Grant Avenue planning area
- Grant Avenue/Southbound I-505 Ramps Traffic Signal - total of 630 pm peak hour trips generated by development within the I-505/Grant Avenue planning area

The above triggers for the Grant Avenue/East Main Street and Grant Avenue/Southbound I-505 Ramp intersections are based on a comparison of existing and near-term intersection volumes and overall delay calculations. When these future volume triggers are met, a formal traffic signal warrant analysis should be prepared to evaluate all the designated criteria and determine if sufficient warrants are met, or if additional growth can occur. When it is determined that the installation of a traffic signal is warranted, the analysis should be submitted to Caltrans for review (as Grant Avenue is a state highway).

The above triggers assume that approved currently unbuilt developments (Highlands, Callahan Estates, Ogando-Hudson, Creekside Estates, Winters Commercial Center, and Anderson Place) are constructed prior to or at the same time as the project. This is due to the fact that the list of approved developments includes approximately 670 units in west Winters that will take many years to build out. If all of the approved developments were to build

out prior to the first project within the I-505/Grant Avenue planning area, construction of the traffic signals would need to be advanced.

**NEW ROADWAY CONNECTIONS TO GRANT AVENUE (SR 128)**

The installation of new roadway connections to Grant Avenue (SR 128), in the study planning area, will be triggered by new development activity for any of the study parcels along Grant Avenue. As designated in the General Plan, major new access points are planned at the north leg of the Grant Avenue/East Main Street intersection, Timber Crest Road, and the south leg of the Grant Avenue/Matsumoto Road intersection. New connections to State Route 128 (Grant Avenue) require an encroachment permit from Caltrans. Table 13 identifies the triggers for these new access points.

TABLE 13: NEW GRANT AVENUE ROADWAY CONNECTION PHASING		
FACILITY TYPE	LOCATION	TRIGGER
New Roadway Connection	Grant Avenue/East Main Street – north side of Grant Avenue	Triggered by development of Skreeden parcel
New Roadway Connection	Grant Avenue/Timber Crest – south side of Grant Avenue	Triggered by development of McClish or Jordan parcels
New Roadway Connection	Grant Avenue/Timber Crest – north side of Grant Avenue	Triggered by development of Manas parcel
New Roadway Connection	Grant Avenue/ Matsumoto Road – south side of Grant Avenue	Triggered by development of Jordan parcel

**PLANNING AREA – INTERNAL ROADWAYS**

The extension of East Baker Street and the construction of Timber Crest Road are the two primary internal roadways within the study planning area. Table 14 identifies the triggers for these two roadways.

TABLE 14: INTERNAL PROJECT ROADWAY PHASING		
FACILITY TYPE	LOCATION	TRIGGER
Internal Roadways	Timber Crest Road – new roadway extending north from Grant Avenue	Triggered by development of Manas/Skreeden parcels or need to realign Matsumoto Road based on new development accessing Matsumoto Road to the north of the planning area, whichever occurs first
Internal Roadways	Timber Crest Road – new roadway extending south from Grant Avenue	Triggered by development of McClish or Jordan parcels
Internal Roadways	Extension of East Baker Street – from Wildrose Lane to Timber Crest Road	Triggered by development of McClish parcel (i.e., northwest parcel)
Internal Roadways	Extension of East Baker Street – from Timber Crest Road to Jordan parcel	Triggered by development of McClish or Jordan parcels (i.e, northeast parcel)

**PLANNING AREA – REGIONAL ROADWAYS (GRANT AVENUE/SR 128)**

The widening of Grant Avenue, from two to four lanes, is the primary regional roadway improvement within the study planning area. Table 15 identifies the triggers for three different segments of Grant Avenue.

TABLE 15: REGIONAL ROADWAY PHASING		
FACILITY TYPE	LOCATION	TRIGGER
Regional Roadway	Widen Grant Avenue to four lanes – East Main Street to Timber Crest Road	Triggered by 40% of cumulative development trips, or 1,700 peak hour two-way vehicle trips on Grant Avenue
Regional Roadway	Widen Grant Avenue to four lanes – Timber Crest Road to Southbound I-505 Ramps	Triggered by 40% of cumulative development trips, or 1,700 peak hour two-way vehicle trips on Grant Avenue
Regional Roadway	Widen Grant Avenue – I-505 overpass from southbound ramps to northbound ramps	Triggered by 80% of cumulative development trips, or 1,900 peak hour two-way vehicle trips on Grant Avenue

The trigger for the widening of the first two segments of Grant Avenue listed above in Table 12, between East Main Street and the Southbound I-505 Ramps, is based on a roadway capacity of 1,700 vehicles per hour for Grant Avenue. At this roadway volume, it is estimated that Grant Avenue will begin to experience LOS E conditions and trigger the need for widening. Currently, there are 950 vehicles per hour on the segment of Grant Avenue between East Main Street and County Road 90 during the pm peak hour. It should be noted that the triggers for new traffic signals along this segment, as identified in Table 9, will likely be met prior to the need for widening Grant Avenue to four lanes.

The trigger for widening the I-505 overpass to four lanes is the level of service at the Grant Avenue/I-505 Northbound Ramps intersection. The constraint is the single left turn lane that exists on the northbound off-ramp. As development occurs in Winters, the volume on the northbound left turn lane will increase to the point where a second left turn lane will need to be added to maintain LOS D conditions. This will trigger the need to widen the overpass from two to four lanes, to provide a second receiving lane for the two left turn lanes at the northbound off-ramp. This will occur when approximately 80 percent of cumulative development trips are reached, or when the peak hour volume on the overpass reaches approximately 1,900 vehicles per hour. Currently, there are approximately 800 vehicles per hour on the overpass during the pm peak hour.