

Technical Report

TRAFFIC IMPACT ANALYSIS

RECYCLED WATER PIPELINE CONSTRUCTION PROJECT

SANTA CLARA VALLEY WATER DISTRICT / SOUTH COUNTY REGIONAL WASTEWATER AUTHORITY

Prepared for

RECON

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November 2005

Santa Clara Valley Water District/
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**SOUTH COUNTY RECYCLED WATER
MASTER PLAN**

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Santa Clara Valley Water District/
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EXECUTIVE SUMMARY

Background

The Santa Clara Valley Water District (District) and the South County Regional Wastewater Authority (SCRWA) plan to implement the Short-Term Capital Improvement Program (CIP) in the next five years to increase the use of recycled water in the City of Gilroy. The Long-Term CIP considers the expansion of the recycled water system for the final build-out.

The proposed project consists of approximately ten miles of transmission and distribution pipelines that would deliver recycled water from the wastewater treatment plant owned by SCRWA and located at the southeastern edge of the City of Gilroy to end users throughout the City.

In the Short-Term CIP the recycled water pipeline starting at the wastewater treatment plant follows Southside Drive, Rossi Lane, Luchessa Avenue, across Miller Avenue to a pump station in Christmas Hill Park, to Club Drive, and then south to Santa Teresa Boulevard. Two short connections from the existing pipeline to industrial customers, totaling about .57 mile, would also be part of the Short-Term CIP.

Study Locations

The purpose of this study is to analyze the traffic impacts during construction of the installation of the proposed Short-Term CIP recycled water pipeline. To analyze the traffic impacts during construction, counts were taken at the following locations:

1. Luchessa Avenue east of Monterey Road
2. Monterey Road north of Luchessa Avenue
3. Miller Avenue south of Christmas Hill Park

As Monterey Road is a State Highway an Encroachment Permit was obtained from Caltrans to install a traffic counter.

Pipelines ranging in size from 8 to 30 inches would be constructed primarily within existing public streets or public rights-of-way using the open trench method, approximately 4 to 5 feet underground. It was assumed that the width of the work zone would not exceed 20 feet.

Caltrans District 4 Lane Closure Calculations for construction operations were used in the analysis.

Key Findings

The following is a summary of the results of the traffic analysis for the various roadway segments

- Southside Drive / Rossi Lane: No significant impact.
- Luchessa Avenue east of Monterey Road: Loss of parking on one or both sides of the street during construction of the pipeline.

- Luchessa Avenue / Monterey Road Intersection: Adjust signal timing to favor traffic movements impacted by pipeline construction. Use flag control when traffic the signal needs to be turned off.
- Luchessa Avenue west of Monterey Road: Loss of bike lane / shoulders on both sides of street in construction zone.
- Miller Avenue: One-way traffic control with flagmen if the width of the work zone prevents two 11 foot Lanes of traffic.

The results of the analysis are discussed in more detail in Section 3.0 Lane Closure Analysis and in Section 4.0 Recommendations.

1.0 INTRODUCTION

This technical report examines the potential traffic impacts resulting from the proposed construction of the recycled water pipeline as identified in the South County Recycled Water Master Plan EIR/EA of July 2005, and adopted by the Santa Clara Valley Water District (District), South County Regional Wastewater Authority (SCRWA), and member agencies including the City of Gilroy and the City of Morgan Hill. The report focuses primarily on the Short-Term Capital Improvement Program (CIP) scheduled in the next 5 years. The Long-Term CIP is scheduled in the 10-15 year period.

The existing roadways, traffic volumes and transportation facilities are discussed in Section 2.0 Existing Traffic Conditions. The analysis for traffic during construction of the pipeline is discussed in Section 3.0 Lane Closure Analysis. The recommendations and mitigation measures are discussed in Section 4.0.

1.2 Project Overview

The South County Recycled Water Master Plan study area encompasses the City of Gilroy. The area is bound by agricultural fields to the north, east, and south, and by hills to the west. Land uses within the study area are primarily agricultural, residential, commercial, and light industrial. The wastewater treatment plant owned by SCRWA is located at the southeastern edge of the Gilroy city limit boundary. **Figure 1.1** shows the Vicinity Map.

The proposed project consists of approximately ten miles of transmission and distribution pipelines that would deliver recycled water to end users throughout the City of Gilroy. The pipelines, which range in size from 8 to 30 inches, would be constructed primarily within the existing Public Street or public rights-of-way. All pipelines would be constructed using the open trench method, approximately 4 to 5 feet underground depending on the presence of other utilities and regulatory requirements. **Figure 1.2** illustrates the Selected Pipeline Alignment Alternatives as adopted by the District / SCRWA.

Under the Short-Term CIP, 4.5 miles of 30-inch transmission pipeline connecting from the SCRWA treatment plant to the existing pump station in Christmas Hill Park would be constructed to serve as the backbone of the recycled water distribution system. The pipeline would start from the SCRWA treatment plant, follow Southside Drive to Rossi Lane, and then turn west along Luchessa Avenue. The pipeline would cross US 101 using the underpass on Luchessa Avenue, then under the railroad crossing east of Chestnut Street, and across Monterey Road. At the end of Luchessa Avenue, the pipeline would enter the proposed Glen Loma Ranch Development by way of Miller Avenue and follow the new public streets within this development and finally connecting to a pump station in Christmas Hill Park.

After the Short-Term CIP is completed, the Long-Term CIP would extend the pipeline from Gilroy Sports Park along a proposed trail heading southwest toward Santa Teresa Boulevard where it would turn south along Santa Teresa to reach Gavilan College, Gavilan Sports Park and Gavilan Golf Course. The pipeline construction would be coordinated with the City of Gilroy as part of trail construction that is planned in the City's parks and recreation master plan.

The other long-term project is to convey recycled water to serve customers along Hecker Pass Highway. This pipeline would start west of the existing pump station in Christmas Hill Park and travel west to Santa Teresa Boulevard. The pipeline would travel north along Santa Teresa Boulevard and turn west

Figure 1.1

onto Hecker Pass Highway to serve Bonfonte Gardens. The pipeline alignment west of Santa Teresa Boulevard. is not known at this time.

1.1 Purpose of Study

The main purpose for this study is to determine the traffic impacts during construction and to propose mitigation measures if warranted.

The scope of work for this study includes the following tasks:

Task 1 – Collect Traffic Data / Existing Conditions

Conduct 7-day, 24-hour traffic counts at pipeline alignment crossings (Luchessa Avenue, Monterey Road, and Miller Avenue). Collect information on the lane geometrics for each study location including data on nearby traffic signals, driveways, transit facilities, and bike lanes, etc.

Task 2 – Traffic Analysis

Analyze qualitative levels of service for detours. Compare existing traffic volumes with existing capacities as well as probable detour routes. Identify traffic impacts based upon these analyses.

Task 3 – Documentation

Summarize assumptions (including possible detours), methodologies, results and recommendations. Provide a description of the proposed mitigation measures including lane closure recommendations for any traffic impacts.

Figure 1.2

2.0 EXISTING TRAFFIC CONDITIONS

2.1 Existing Roadway Network

The proposed pipeline construction will start from the SCRWA wastewater treatment plant and follow Southside Drive to Rossi Lane, and then turn west along Luchessa Avenue across the signalized intersection of Monterey Road. At the end of Luchessa Avenue, the pipeline would enter the proposed Glen Loma Ranch Development by way of Miller Avenue and follow the new public streets within this development and connecting to a pump station in Christmas Hill Park. East of Monterey Road, the land use is predominantly commercial and light industrial with driveways at fairly close spacing on Luchessa Avenue. To the west of Luchessa Avenue, driveways are few and far between given the predominance of open space and undeveloped land.

The roadways described below will be impacted by the pipeline alignment under the Short-Term CIP.

Luchessa Avenue is an east-west, undivided, two-lane minor arterial that provides access to the SCRWA wastewater treatment plant in southeast Gilroy. Luchessa Avenue passes under US-101 between the Monterey Road and Tenth Street freeway interchanges. The Gilroy Traffic Circulation Master Plan classifies Luchessa Avenue as an arterial roadway. The pavement of Luchessa Avenue east of Monterey Road is 60 – 64 feet wide with parking permitted on both sides. West of Monterey Road it is 44 – 48 feet wide with no parking. Luchessa Avenue has an exclusive left-turn lane in each direction at the intersection of Monterey Road.

Monterey Road is a median-divided, four-lane roadway that runs parallel to and west of US-101. It is an arterial roadway north of Luchessa Avenue and classified as an expressway south of Luchessa Avenue up to the southern terminus of Monterey Road south of the project area, where it merges with US-101. To the north, Monterey Road extends through Morgan Hill and continues as State Route 82 into downtown San Jose. The planned Recycled Water pipeline has already been constructed on Monterey Road both north and south of Luchessa Avenue. However, the Short-Term CIP pipeline is planned to traverse Luchessa Avenue across Monterey Road.

Monterey Road is 88 feet wide with a 20 foot median with two through lanes and an exclusive left-turn lane in each direction at the intersection of Luchessa Avenue. In addition, Monterey Road has a short right-turn lane in each direction at Luchessa Avenue.

Miller Avenue south of the collector road Uvas Park Drive is an undivided, two-lane local roadway with a width of 36 – 40 feet. It connects the Santa Teresa Boulevard Expressway to the west and Uvas Park Drive to the east, and provides access to Christmas Hill Park. Miller Avenue provides access to Gavilan College to the south and continues as Eighth Street to the northeast.

Under the Long-Term CIP (next 10-15 years), the following roadways are likely to be impacted:

Hecker Pass Highway (State Route 152), west of Santa Teresa Boulevard is a regional roadway facility that provides access to Watsonville in the west and is classified as an expressway in the Gilroy Traffic Circulation Master Plan. East of Santa Teresa Boulevard, access to US-101 is provided by a route consisting of First Street, Monterey Road, and Leavesley Road, which is designated as State Route 152.

Santa Teresa Boulevard both north and south of Hecker Pass Highway is classified as an expressway in the Gilroy Traffic Circulation Master Plan. The intersection of Santa Teresa Boulevard and Hecker Pass Highway is presently under construction.

2.2 Existing Traffic Volumes

The traffic analysis focuses on the operation of roadway segments considered most likely to be affected during construction of the proposed project. The roadway count locations are shown in **Figure 2.1**. TY Lin International collected seven-day, 24-hour directional traffic counts from Friday, October 21 through Thursday, October 27, 2005 on the following roadway segments:

1. Luchessa Avenue, east of Monterey Road
2. Monterey Road, north of Luchessa Avenue
3. Miller Avenue, south of Christmas Hill Park

The traffic counts for the three roadway segments collected at these locations are included in **Appendix A**. These counts have been summarized and the Volume ~ Time of Day profiles for the three locations are depicted in **Figures 2.2a, 2.2b, 2.3a, 2.3b, 2.4a and 2.4b**. The figures show the directional hourly traffic volumes by time of day, and day of week for each of the three roadway locations.

Based on the data collected and the figures, eastbound Luchessa Avenue shows three distinct peaks for the traffic flow around 6:00 am, 12:00 pm mid-day, and 3:00 pm. In the westbound direction, Luchessa Avenue does not show a noticeable peak in the AM period, but highlights a 12:00 pm mid-day peak and a PM peak between 3:00 pm and 5:00 pm. The maximum peak hour volume counted was 464 in the PM period westbound direction.

Monterey Road shows traffic flow in both directions to peak between 7:00 am and 8:00 am, and again between 3:00 pm and 5:00 pm with higher volumes during PM period. The maximum peak hour volume of 423 occurs in the PM period southbound direction.

Miller Avenue displays a distinct AM peak around 7:00 am in the eastbound direction and 8:00 am in the westbound direction with maximum hourly volumes of 156 and 161 respectively.

The counts show the following Average Daily Traffic (ADT) volumes, directional as well as the two-way total, for the three roadway segments:

	<u>Direction</u>				Total
	EB	WB	NB	SB	
1. Luchessa Avenue, east of Monterey Road	4,619	3,791			8,410
2. Monterey Road, north of Luchessa Avenue			4,063	3,779	7,842
3. Miller Avenue, south of Christmas Hill Park	1,351	1,504			2,855

The following two-way ADT volumes at selected locations are from the City of Gilroy City-Wide Traffic Monitoring Program, 2005 Traffic Volume Data:

4. Luchessa Avenue, west of Monterey Road	9,000
5. Monterey Road, south of Luchessa Avenue	15,700
6. Miller Avenue, between Santa Teresa Blvd. and Loma Parkway (future roadway)	3,200

Figure 2.1

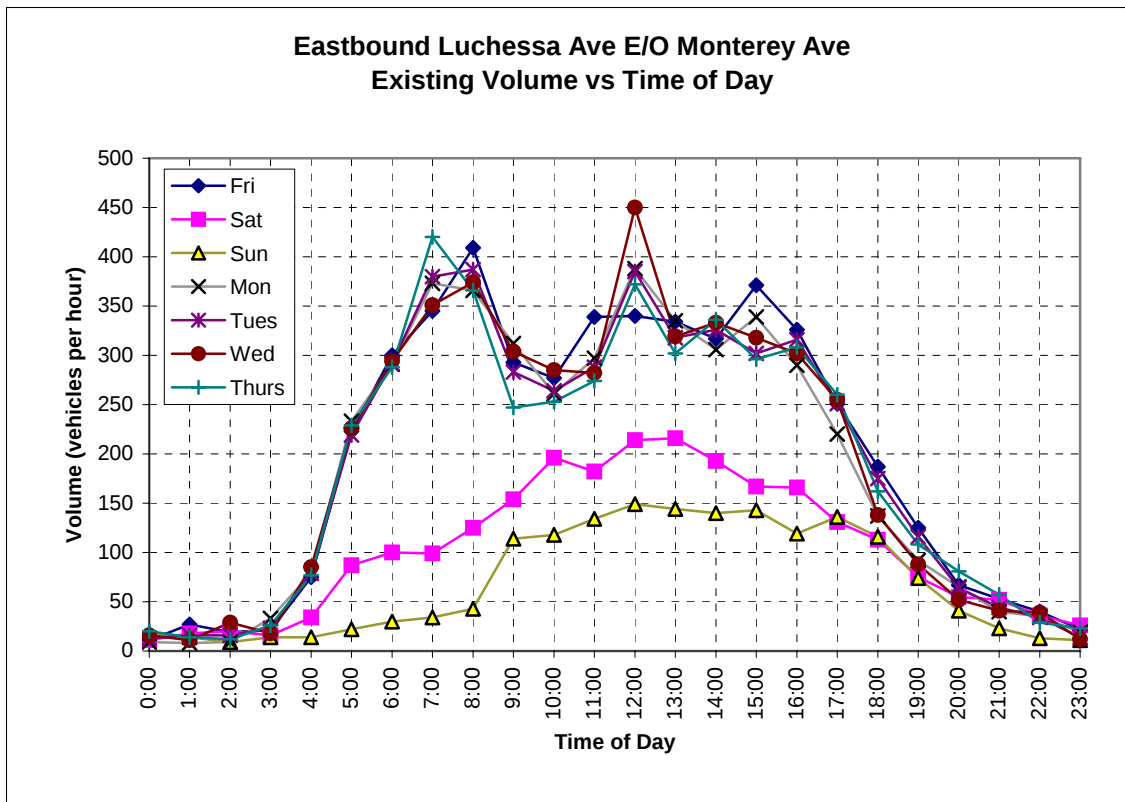


Figure 2.2a

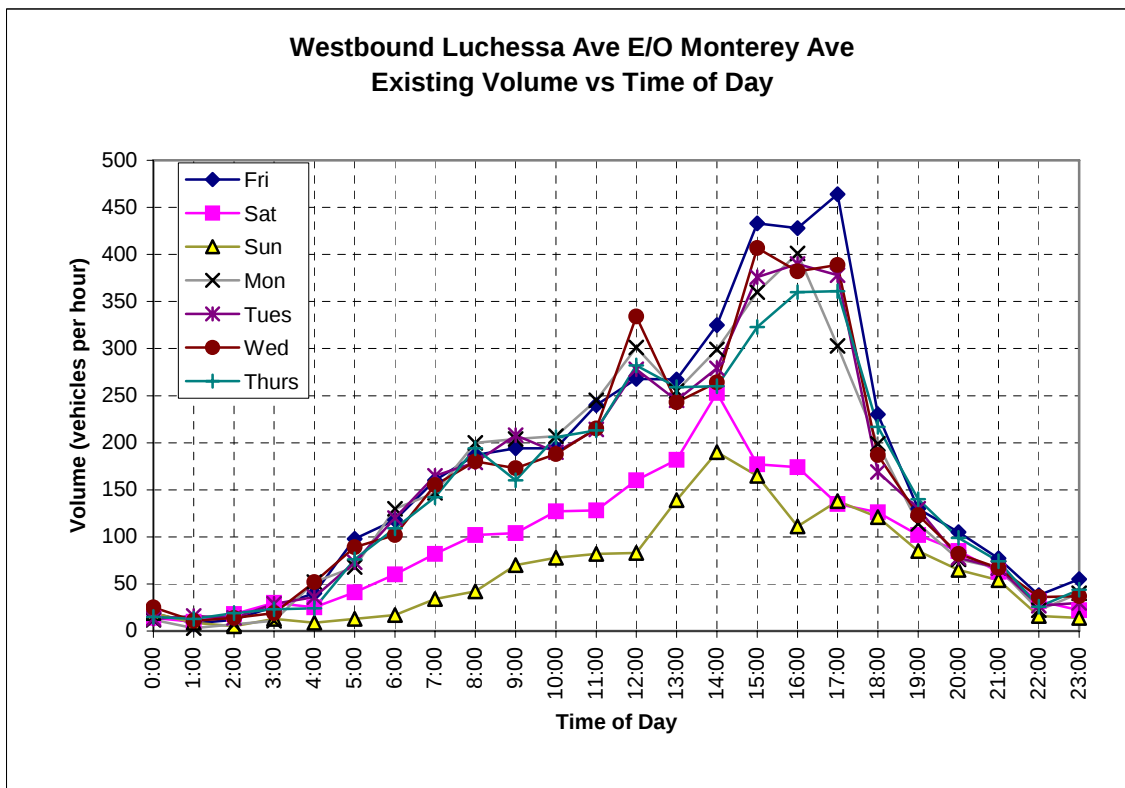


Figure 2.2b

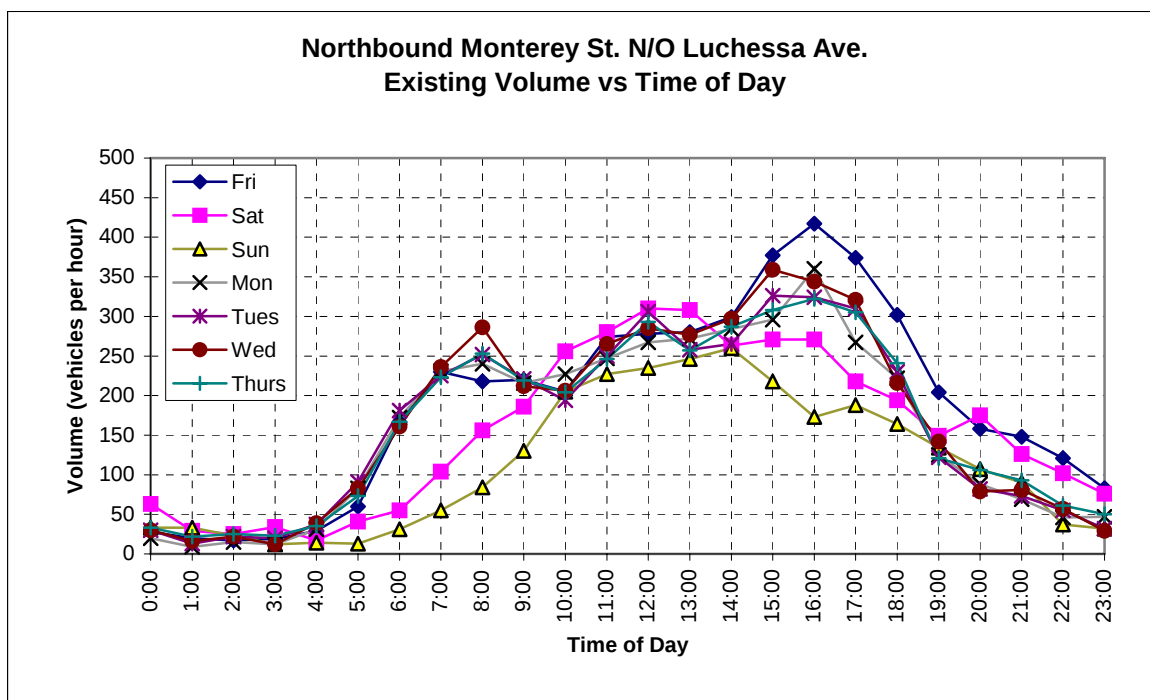


Figure 2.3a

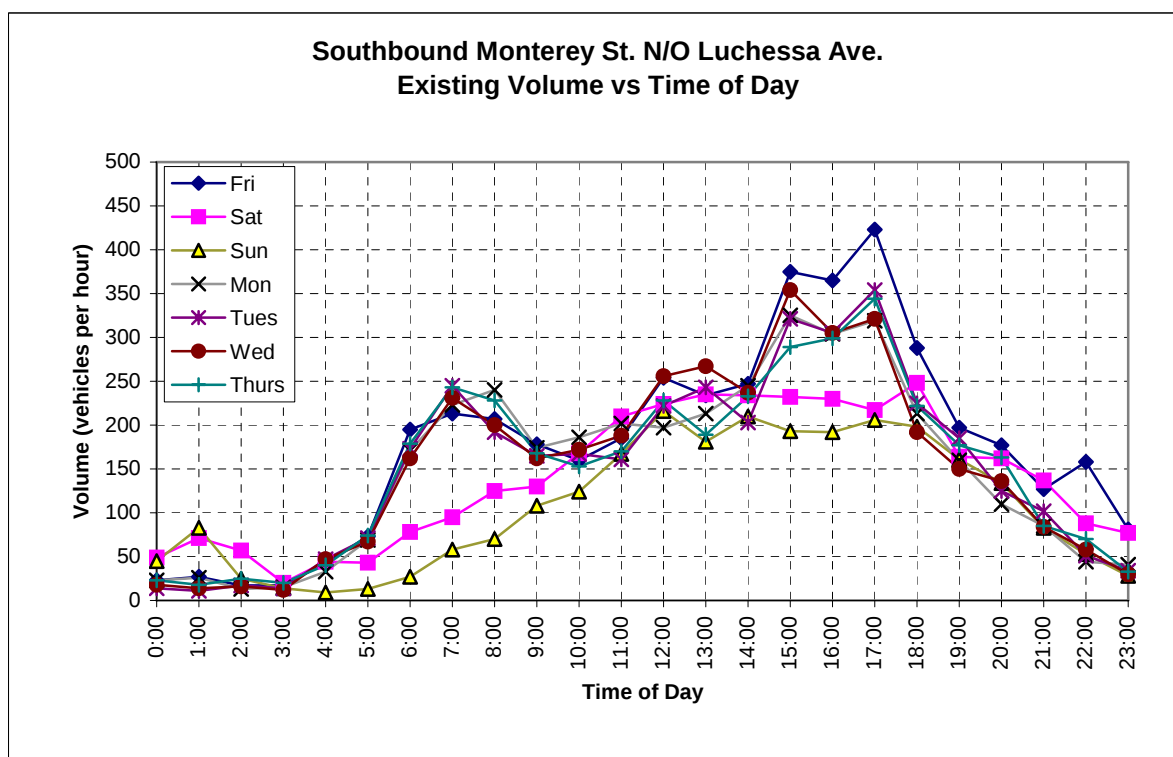


Figure 2.3b

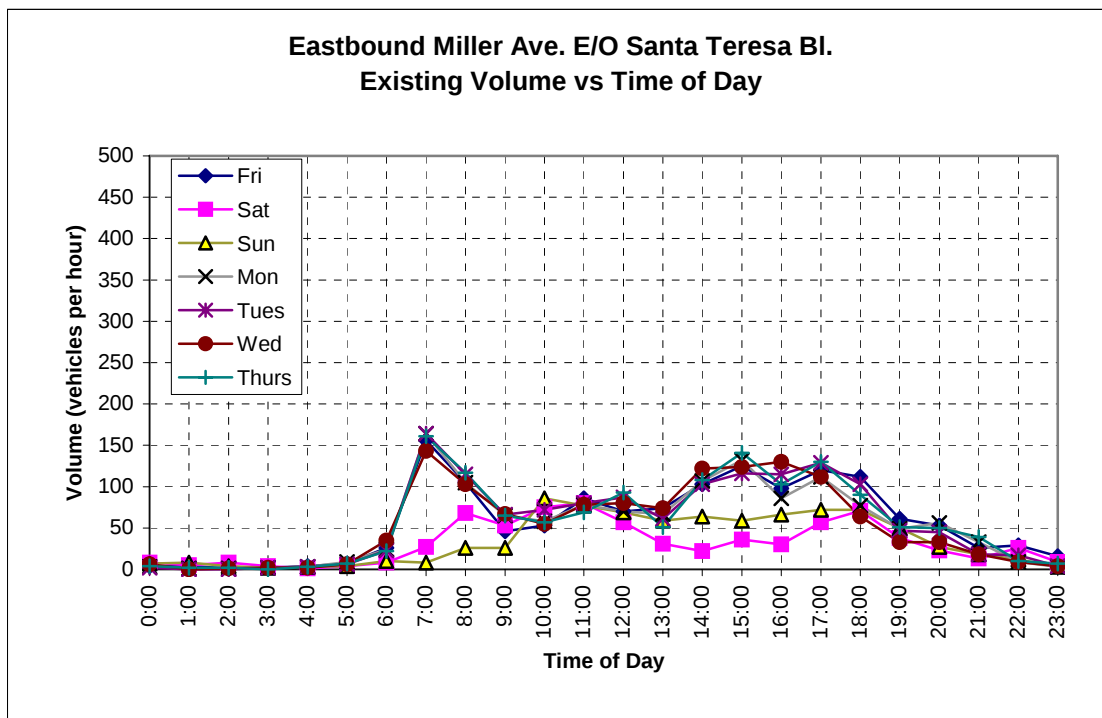


Figure 2.4a

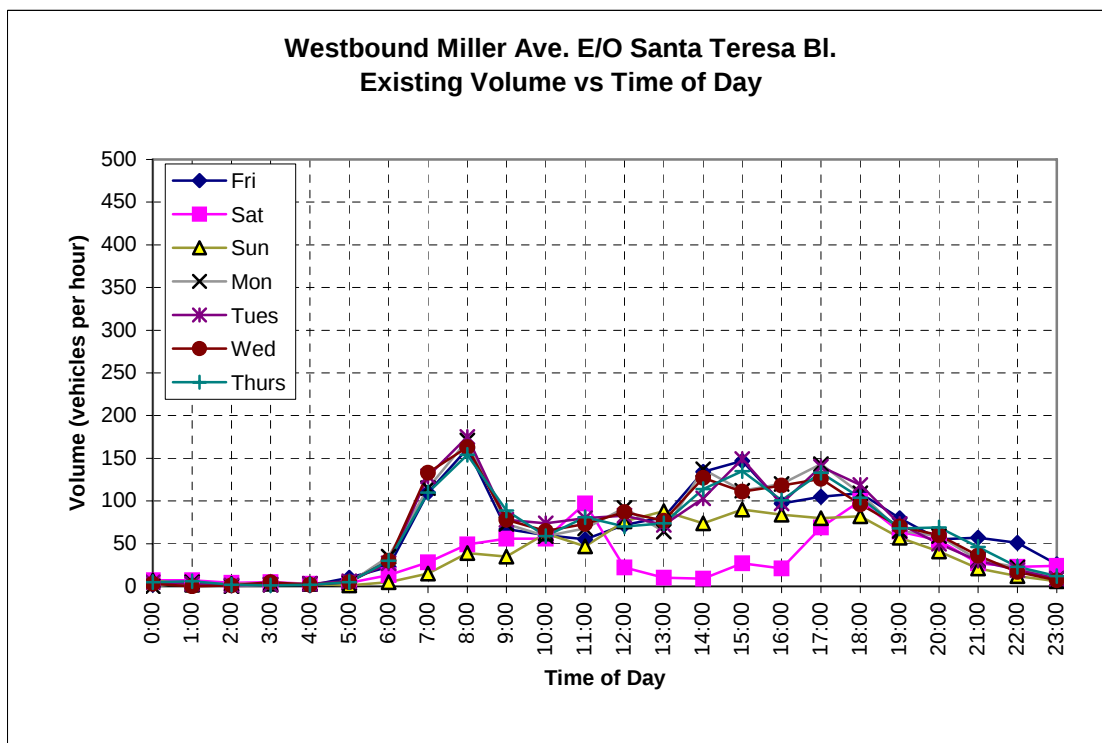


Figure 2.4b

7. Rossi Lane	1,600
8. Southside Drive	400
9. First Street (Rte 152), east of Santa Teresa Blvd.	17,700
10. Hecker Pass Hgwy. (Rte 152), west of Santa Teresa	6,700
11. Santa Teresa Blvd., south of Hecker Pass Highway	12,000

Without a vehicle classification count the percent of heavy vehicles cannot be determined. In view of the commercial and light industrial land use on Luchessa Avenue east of Monterey Road, it is likely that the percent of heavy vehicles in the street system would be higher than otherwise.

The City of Gilroy roadway classifications are shown on the Traffic Circulation Master Plan Road Network and included in **Appendix B**.

2.3 Existing Transit Facilities and Bike Ways

The only Valley Transit Authority (VTA) Bus Service that will in anyway be impacted is Route No. 68. The VTA Route 68 Bus Service travels south from Morgan Hill and San Martin on Monterey Road to Gilroy. From Monterey Road it makes a right turn to Tenth Street, a left to Princevalle and a right to Luchessa Avenue for a short distance. It then makes a left turn to go south on Thomas Road and Santa Teresa Boulevard before it terminates near Gavilan College. The VTA Gilroy Service Map is included in **Appendix C**.

Luchessa Avenue and Monterey Road both include Class II Bikeways. In the Caltrans Highway Design Manual, a Class II Bikeway is referred to as a “Bike Lane” with striping for one-way travel on a street or highway.

Miller Avenue between Uvas Park Drive and the future Loma Parkway is proposed to include a Class I Bikeway. This would be a “Bike Path” with bicycle travel on a paved right-of-way completely separated from any street or highway.

Miller Avenue between Santa Teresa Boulevard and the future Loma Parkway is proposed to include a Class II Bikeway.

The City of Gilroy has adopted the Caltrans classification of Bikeways. Traffic Circulation Master Plan Proposed Bikeways is included in **Appendix D**.

3.0 LANE CLOSURE ANALYSIS

This section of the report presents the traffic control options, analysis and recommendations of lane closure requirements for construction of the recycled water pipeline along Luchessa Avenue and along Miller Avenue south of Christmas Hill Park.

3.1 Lane Capacity

Capacity through a construction work zone often times varies depending on the nature of the work being performed, the number and size of equipment used, and the location of equipment and personnel with respect to the lanes of traffic. In summary, the following two typical scenarios would likely occur during the construction of the proposed pipeline:

1. Temporary lane closure for miscellaneous activities such as installation of pavement markers, striping, pavement replacement, etc.
2. Construction lane closures for the installation of pipeline along and within the roadways of Southside Drive, Rossi Lane, Luchessa Avenue and Miller Avenue.

Capacity rates for typical construction operations from Caltrans District 4 Lane Closure Calculations are shown on Table 4.1 for roadway segments.

Table 3.1
Capacity Rates for Typical Operations

No. of Lanes, One Direction (Normal Operation)	2 or 3	3 or 4	4	5
No. of Lanes Open In One Directions	1	2	3	4
Type of Operation:				
Median Barrier or Guard Rail Repair	1500 vph (375) vp 15 min.	3200 vph. (800) vp 15 min	4800 vph (1200 vp 15 min.	6400 vph (1600) vp 15 min.
Pavement Repair, Mudjacking, Pavement Grooving	1400 vph (350)	3000 vph (750)	4500 vph (1125)	6000 vph (1500)
Striping, Resurfacing Slide Removal	1200 vph (300)	2500 vph (650)	4000 vph (1000)	5333 vph (1333)
Pavement Markers	1100 vph (275)	2400 vph (600)	3600 vph (900)	4800 vph (1200)
Middle Lanes – Any Reason	-----	2200 vph (550)	3400 vph (850)	4533 vph (1133)

From Caltrans **Table 3.1** the single lane capacity for roadway segments during construction on Luchessa Avenue and Miller Avenue is 1,200 vehicles per hour (vph).

3.2 Temporary Lane Closure Capacity

Luchessa Avenue / Monterey Road Intersection

Adjustments to the capacities at the intersection are estimated by applying a green time over cycle length (G/C) ratio, and a “K” factor to the above categories of capacities. For the Luchessa Avenue/Monterey Road intersection, a G/C ratio of 0.36 was used. Based on the percentage split of traffic volumes on Luchessa Avenue / Monterey Road signalized intersection, 36% $[9,000 / (9,000 + 15,700)]$ of the cycle length was estimated to be allocated to Luchessa Avenue movements. The “K” or adjustment factor is a ratio of the year’s Annual Average Daily Traffic (AADT) and Peak Month Average Daily Traffic. Due to the commercial / light industrial land use in the area, it was assumed that the “K” adjustment factor would be 1.0.

Applying the 0.36 G/C ratio and the “K” factor to the capacity of 1,200 vph from **Table 3.1**, a 432 vph per lane (vphpl) $(= 1,200 \times 1.0 \times 0.36)$ was calculated to assess the impact of the temporary lane closure on Luchessa Avenue. However, the capacity of 432 vphpl is less than the peak demand volume of 450 vph in the eastbound direction and 464 vph in the westbound direction of Luchessa Avenue (see **Figures 2.2a and 2.2b**) resulting in a Volume to Capacity (V/C) ratio greater than 1.00 and a failing level of service (LOS F). As shown on **Figures 2.2a and 2.2b**, the capacity of 432 is exceeded in the eastbound direction on Wednesday mid-day, and the westbound direction on Friday PM peak. To mitigate this negative impact, it is recommended that the green time for Luchessa Avenue be increased to give a G/C ratio of 0.40. This would increase the capacity of the temporary lane closure to 480 vphpl $(= 1,200 \times 1.0 \times 0.40)$ giving a V/C ratio of 0.97 $(= 464/480)$. This would result in the LOS E category for Luchessa Avenue during pipeline construction through the intersection when one lane in each direction is maintained. As a comparison, the existing pre-construction single lane capacity is 576 vph $(= 1,600 \times 1.0 \times 0.36)$. This gives a V/C ratio of 0.81 $(= 464/576)$, which approximates to an LOS D. Level of Service Definitions for Signalized Intersections are shown on **Table 3.2**.

Assuming 10% of the cycle length is used for the red and yellow intervals, Monterey Road would have a G/C ratio of 0.50 $(1.0 - 0.4 - 0.1)$. This would give Monterey Road a temporary lane closure capacity of 600 vphpl $(= 1,200 \times 1.0 \times 0.5)$, which exceeds the maximum peak hour volumes of 417 in the northbound direction and 423 in the southbound direction (see **Figures 2.3a and 2.3b**).

During pipeline construction on the east leg of the intersection, assuming a maximum 20 foot wide work zone, it should be possible to provide three travel lanes (westbound through/right + westbound left-turn + eastbound through) by removing the existing parking on both sides of the street.

During construction on the west leg of the intersection, assuming a maximum 20 foot wide work zone, it is likely that only two travel lanes (eastbound left/through/right + westbound through) could be provided in view of the narrower width of the pavement. On the west leg of the intersection there is a row of mature trees on the north side of Luchessa Avenue.

During construction of the pipeline within the Luchessa Avenue / Monterey Road intersection the traffic signal may be turned off by the City. When the traffic signals are out the traffic approaching the intersection would be controlled by flagmen. Once the pipeline is constructed through the intersection, detector loops shall be replaced along with any other equipment that would be disturbed before restoring the pavement.

The Luchessa Avenue / Monterey Road intersection is shown in **Figure 3.1**.

Table 3.2
Level of Service Definitions
Signalized Intersections

Level of Service	Stopped Delay per Vehicle (seconds)	Description
A	≤ 10	Free/Insignificant Delays: No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication
B	> 10 and ≤ 20	Stable Operation/Minimal Delays: An occasional approach phase is fully utilized. Many drivers begin to feel somewhat restricted within platoons of vehicles
C	> 20 and ≤ 35	Stable Operation/Acceptable Delays: Major approach phases fully utilized. Most drivers feel somewhat restricted
D	> 35 and ≤ 55	Approaching Unstable/Tolerable Delays: Drivers may have to wait through more than one red signal indication. Queues may develop but dissipate rapidly, without excessive delays
E	> 55 and ≤ 80	Unstable Operation/Significant Delays: Volumes at or near capacity. Vehicles may wait through several signal cycles. Long queues form upstream from intersection
F	> 80	Forced Flow/Excessive Delays: Represents jammed conditions. Intersection operates below capacity with low volumes. Queues may block upstream intersections

Source: *Highway Capacity Manual* (Transportation Research Board, 2000)

Figure3.1

Luchessa Avenue

The peak hourly volume on Luchessa Avenue is 450 vph in the eastbound and 464 vph in the westbound lanes. The traffic volumes on Luchessa Avenue would be under capacity in both directions during construction of the pipeline. However, it is important to note that one travel lane in each direction must be open to traffic during construction.

On Luchessa Avenue, east of Monterey Road, one lane of traffic in each direction can be maintained by removing temporarily the existing parking on one, or if necessary, both sides of the street in the work zone, depending on the alignment location of the pipeline and the width of the construction zone. If the pipeline is constructed in the pavement close to the curb, and the width of the work zone can be restricted to less than 20 feet, it would be possible to maintain one lane in each direction with parking permitted on the opposing side. If the pipeline is constructed in the middle of the pavement, it is likely that parking may have to be removed on both sides.

On Luchessa Avenue, west of Monterey Road, one lane of traffic in each direction can be maintained by removing temporarily the existing shoulder/bike lane in both directions in the construction zone. If the work zone width can be restricted to less than 20 feet, it should be possible to stripe two 11 foot travel lanes.

Miller Avenue

The recycled water pipeline intersects Miller Avenue and follows the street for a short distance before turning to a public street in the proposed Glen Loma Ranch Development south of Christmas Hill Park. With the proposed residential development the current alignment of Miller Avenue may be reconfigured in the vicinity of the sub-division. This section of the pipeline would be installed in coordination with the Glen Loma Ranch construction. Please refer to the Glen Loma Ranch EIR for more details.

Figures 2.4a and 2.4b show the peak hourly volumes to be 164 in the eastbound direction and 175 in the westbound direction of Miller Avenue. These volumes are well below the lane closure capacity of 1,200 vph from **Table 3.1**. However, in the worst-case scenario if the width of the pipeline construction zone is 20 feet, the remaining roadway width would be 16-20 feet, which would be inadequate for two-way traffic. Under these circumstances traffic during construction would be under one-way control with flagmen. Caltrans **Table 3.3** shows Capacity and Length of One-way Control. It shows that the maximum demand volume of 339 (= 164 + 179) can be accommodated with up to a one-mile work zone. If the work zone width can be reduced to less than 20 feet to allow two 11 foot lanes, the need for one-way control would be eliminated.

Table 3.3
Control Length Chart

Capacity VPH	Length of One-Way Control
1000	1000'
950	1320' (1/4 mile)
770	2640' (1/2 mile)
410	5280' (one mile)

Source: Caltrans District 4 Lane Closure Calculations

Southside Drive and Rossi Lane

Given the low ADT volumes on Southside Drive and Rossi Lane, the pipeline construction would have no significant impact on these two roadways.

In general, as can be seen from Figures 2.2a through 2.4b, the daily traffic volumes on the weekend is approximately 50-60% of the average weekday daily traffic. Therefore construction on weekends would have minimal impact compared with construction on weekdays.

4.0 RECOMMENDATIONS

The analysis was performed based upon the 7-day 24-hour counts collected by TY Lin and traffic volume data obtained from the City of Gilroy. Capacity rates for typical construction operations from Caltrans District 4 Lane Closure Calculations for roadway segments were used in the analysis. The analysis focuses on the Short-Term CIP.

Southside Drive / Rossi Lane

The pipeline construction would start at the SCRWA treatment plant, follow Southside Drive to Rossi Lane, then turn west along Luchessa Avenue. The pipeline construction would have no significant impact on Southside Drive (ADT = 400) and Rossi Lane (ADT = 1,600) due to the low traffic volumes on these two roadways.

Luchessa Avenue east of Monterey Road

With the increase in traffic volumes on Luchessa Avenue there would be impacts during construction. From Rossi Lane to east of Monterey Road (ADT = 8,410) parking would have to be temporarily removed on one or both sides depending on the width of the work zone. Parking on Luchessa Avenue is more intense west of the underpass at US-101. Advance notice of parking removal may be given to avoid any confusion.

Luchessa Avenue / Monterey Road Intersection

At the east leg of the Luchessa Avenue / Monterey Road intersection it should be possible to provide three travel lanes (westbound through/right + westbound left-turn + eastbound through) by removing the existing parking on both sides of the street during construction. It is recommended that three lanes be provided at the east leg of the intersection in order to maintain the westbound left-turn lane

It is recommended that the green time for Luchessa Avenue be increased to give a G/C ratio of at least 0.40 during construction of the intersection area to avoid an LOS F condition. This would increase the capacity of the temporary lane closure to 480 vphpl exceeding the demand volume of 464 vph. This would result in an LOS E for Luchessa Avenue during pipeline construction through the intersection when only one lane in each direction can be provided. In general, the timing should be adjusted to favor traffic movements impacted by the pipeline construction.

At any given time during construction of the pipeline within the Luchessa Avenue / Monterey Road intersection when the traffic signal is turned off by the City the traffic would be controlled by flagmen. Once the pipeline is constructed through the intersection, detector loops shall be replaced along with any other equipment that would be disturbed before restoring the pavement and restriping.

Luchessa Avenue west of Monterey Road

On Luchessa Avenue west of Monterey Road (ADT = 9,000), it would be possible to provide two travel lanes by removing the bike lane / shoulders on both sides of the street during construction. Owing to the narrower width of the west leg, it is unlikely that the eastbound left-turn lane can be maintained. The signal timing could be adjusted in favor of the eastbound traffic to compensate for the loss of the exclusive left-turn lane.

Miller Avenue

When the pipeline reaches Miller Avenue it would follow the new public streets within the proposed Glen Loma Ranch Development. Though the traffic volumes on Miller Avenue would be well under capacity, the width of the roadway may not allow two-way traffic with 11 foot lanes in the construction zone. In this case one-way traffic control with flagmen is recommended. Two-way traffic would be possible if the width of the work zone can be restricted to allow two 11 foot lanes.

Transit

There is no impact on transit service due to pipeline construction.

Bike Ways

There would be no bike lanes on Luchessa Avenue during construction. Bicycles would use the traffic lanes in the construction areas.

Pedestrian Facilities

Pedestrian facilities including sidewalks and crosswalks would be maintained at all times during construction. Advanced warning and signage shall be provided where sidewalks or crosswalks need to be temporarily relocated.

Driveways

There are numerous driveways on Luchessa Avenue east of Monterey Road. Some parcels have multiple driveways. Access to driveways shall be maintained.

Minor Street Control

When the pipeline construction crosses a minor street it would be under flag control. The work zone would block not more than one-half of the minor street at any time to allow for turning traffic. It is often the case that the traffic into and out of the minor street will be under one-way control.

Long-Term CIP

No traffic forecasts were done as part of this study to determine long-term traffic impacts. Also, Santa Teresa Boulevard and Hecker Pass Highway, both roadways that are heavily impacted by the Long-Term CIP, are presently under construction. Once both these roadways are widened, the traffic patterns and traffic volumes in this area are likely to change significantly.