

2.4.4.2 UNION HOUSE CREEK TO FRANKLIN BOULEVARD

This 0.8 mile-long portion of the LRT alignment would lie north of the future extension of CRB within the Sacramento County Regional Sanitation District (SCRSD) treatment plant bufferlands. This segment is illustrated in the layout plans on Figures 2.4-7 through 2.4-9.

The City of Sacramento plans to extend CRB to the west from its existing terminus at Franklin Boulevard with two lanes in each direction and a center median. The proposed LRT alignment has been designed consistent with the future roadway geometry.

The CRB extension would cross over the UPRR corridor on a bridge structure just to the south of the previously-described LRT bridge structure. The two bridge structures could share a common embankment approach on the eastern end. East of the bridge, the embankment would be up to nine feet high to keep the roadway and LRT above the 100-year floodplain elevation. The maximum allowable train speed across the bridge would be 37 mph due to the curvature.

Once the LRT bridge crosses the UPRR corridor, the LRT tracks would continue east to Franklin Boulevard across the SCRSD bufferlands. The maximum allowable train speed across the bufferlands would be 55 mph. Approximately mid-way across the bufferlands, the LRT alignment would turn to the northeast away from CRB to provide space for the Franklin Boulevard Station park-and-ride lot between the LRT tracks and the roadway. A City-operated flood control detention basin would be reconfigured to make room for the LRT tracks to run along the south edge of basin while leaving room for a future SCRSD interceptor sewer. The tracks would then swing southeast toward the intersection of CRB and Franklin Boulevard with the platform located at MP 2.2, just west of Franklin Boulevard. The Franklin Station and park-and-ride lot would be constructed on engineered fill above the 100-year floodplain. After leaving the Franklin Station, the LRT alignment would swing eastward and run parallel to CRB. The maximum allowable train speeds would vary from 25 to 38 mph on the series of curves that skirt the park-and-ride lot. The at-grade crossing at Franklin Boulevard would be protected with warning signals and gates consistent with California PUC regulations and would require approval by the CPUC.

A Franklin Boulevard flyover option would carry the tracks up to approximately 21 feet above the street. See Chapter 4, Section 4.1.4.2, Figure 4.1-8 for a visual simulation of this flyover.

2.4.4.3 FRANKLIN BOULEVARD TO BRUCEVILLE ROAD

The LRT alignment on this 1.5-mile-long segment would lie within the CRB corridor. The City of Sacramento plans to widen CRB to two traffic lanes and a bike lane in each direction with a center median in this area, and the US Army Corps of Engineers and Sacramento Flood Control Agency are currently planning the widening of Union House Creek some 18 feet to the south between Franklin and Center Parkway. The proposed LRT alignment takes the future roadway geometry and creek widening into account. The layout plans in Figures 2.4-9 to 2.4-14 and the typical sections on Figures 2.4-21 and 2.4-22 illustrate this segment.

After crossing Franklin Boulevard, the LRT alignment would continue east on the north side of widened CRB. The tracks would be located in the space between the future widened roadway and Union House Creek at approximately the same level as the roadway or a few feet higher. A concrete safety barrier would separate the LRT tracks from adjacent CRB improvements. The position of the tracks allows for future approximate 18 foot widening of the creek. The track section would be approximately 30 feet wide. The maximum allowable train speed between Franklin Boulevard and the Center Parkway station varies from 55 mph on tangent track to 38 mph on the sharpest curve.

A LRT station would be built at Center Parkway at MP 3.2. The Center Parkway Station would have side platforms located north of the CRB roadway immediately west of the Center Parkway intersection. Immediately east of the station, the alignment would cross Center Parkway at grade and continue east along the north side of CRB. The at-grade crossing would be protected with warning signals and gates in compliance with California PUC regulations.

As shown on Figure 2.4-13, about midway between Center Parkway and Bruceville Road, the LRT alignment would cross to the south side of CRB. After the at-grade crossing, the LRT alignment would continue easterly immediately south of, and parallel to, the CRB roadway, along the northern edge of the CRC campus. As the tracks approach Bruceville Road, they would curve south, crossing at grade a campus access road, cut through a portion of the stadium berm at the northeast corner of the CRC stadium, and enter the landscaped strip of land between the stadium berm and Bruceville Road. A new retaining wall would be required along the western portion of the trackway to support the stadium embankment.

The at-grade crossings would be protected with warning signals and gates consistent with California PUC regulations. The maximum allowable train speed between the Center Parkway station and Bruceville Road varies from 55 mph on tangent track and 27 mph on the sharpest curve.

A flyover design option would use a bridge structure to cross over CRB, while turning south to descend to the west side of Bruceville Road. For this option, the tracks would again be located in a landscaped strip of land between the stadium berm and Bruceville Road. See Chapter 4, Section 4.1.4.2, Figure 4.1-9 for a visual simulation of this flyover. The maximum allowable train speed between Center Parkway station and Bruceville Road would vary between 55 mph on tangent track and 30 mph on the sharpest curve.

2.4.4.4 BRUCEVILLE ROAD

The LRT alignment on this 0.4 mile-long segment of the proposed project would lie just to the west of Bruceville Road along the easterly edge of the CRC campus. This segment would include an LRT station located near the entrance to CRC at MP 4.0. South of the station, the tracks would cross the college entrance at grade to provide a final short length of tracks before terminating. The at-grade crossing would be protected with warning signals and gates in compliance with California PUC regulations. The layout plans in Figures 2.4-14 to 2.4-15 and the typical sections on Figure 2.4-23 illustrate this segment.

The City of Sacramento has widened Bruceville Road which will ultimately be three lanes in each direction for a total of six lanes with additional turning lanes at intersections. A major development project called College Square is under construction on the Southeast corner of CRB and Bruceville Road, across Bruceville Road from the proposed LRT alignment. According to current plans for that project, West Stockton Boulevard will be widened to a divided roadway

The LRT tracks would enter this segment at grade or descending from the optional flyover and would be located in the landscaped strip between the college stadium and Bruceville Road. The alignment would continue south in the landscaped strip between the toe of the CRC stadium's embankment and the western edge of Bruceville Road. The tracks would pass to the east of an existing PG&E high voltage tower. This tower may be replaced with a pole structure and repositioned to provide adequate maintenance access to the utility.

The tracks would continue to a station at MP 4.1, located just north of the College entrance road adjacent to the existing College parking lot. The station would serve CRC and the College Square development project located south of West Stockton Boulevard and north of Cotton Road. South of this station, the tracks would cross the college entrance roadway at grade to provide a final short length of tail tracks.

These two tail tracks would be long enough to store one train set on each, improving the operating efficiency of the LRT service.

2.4.5 LPAP2 Stations

Four new LRT stations are proposed to be constructed along the LPAP2 alignment. Proceeding from Meadowview Road along the corridor they are: Morrison Creek, Franklin Boulevard, Center Parkway, and CRC. All stations would have low platforms with a special high platform to facilitate wheel chair access. Station platforms would be approximately 400 feet long to accommodate a four-car light rail train. Platform widths would vary from 18 to 25 feet, depending upon location and configuration.

Park-and-ride lots would be built at the Morrison Creek and Franklin Boulevard with a parking structure at the CRC stations; the Center Parkway station is a walk-on station. The project's parking demand was estimated using travel demand modeling (see Section 3.4). The proposed parking may be constructed in stages based on monitoring of actual use.

Stations have been located and planned to minimize acquisition of private property, encourage transit oriented development, and minimize impacts on adjacent neighborhoods and businesses. Criteria for the design of station layouts and access pathways included:

- Achieve the best balance between station frequency and average train speed;
- Provide opportunity for associated transit oriented development;
- Minimize residential and commercial displacements/disruption;
- Minimize potential for conflict among different access modes;
- Ensure pathways of access for the disabled;
- Create a pedestrian-supporting environment;
- Provide pedestrian and vehicular safety; and
- Minimize major environmental issues.

Typical passenger amenities at stations would include:

- Covered shelter with comfortable seating;
- Telephones for outgoing calls only;
- Landscaping;
- Lighting;
- Drinking fountains;
- Bicycle racks and lockers;
- Information displays; and
- Easy access for elderly and disabled passengers.

Design details and landscaping plans would be refined during the Project's final design phase. The public will have the opportunity to review and comment upon station design and landscaping plans during this phase. RT will work closely with the public to identify critical station design issues early in the planning process and incorporate public input into station design.

2.4.5.1 MORRISON CREEK STATION

Location and Layout - The Morrison Creek Station would be constructed approximately one-mile south of the existing Meadowview Road Station. It would be located just to the west of Morrison Creek and north of the planned extension of CRB. The station would have side platforms, as shown in Figure 2.4-6. The platforms would be 400 feet long and about 18 feet wide. The station is designed to serve a proposed transit oriented development planned for the area to the west of the station.

Pedestrian Access - The station would be designed to connect with the future westerly development's pedestrian network in a manner that encourages future residents to walk and bike to the LRT station.

Bus Access – Buses would use the same access as automobiles coming from the future westerly development's yet to be designed street network.

Automobile Access – Automobiles would gain access to the station via a driveway that would connect to the yet to be designed adjacent development street network. It is assumed the future street network would connect to both CRB and Detroit Boulevard which would provide maximum vehicular access opportunities to the station.

Park-and-Ride Facilities – This station is designed primarily for “walk on” traffic, and therefore limited park-and-ride capacity is provided. Fifty parking spaces would be provided, including the handicapped spaces.

Kiss-and-Ride Facilities – Kiss-and-ride facilities would be provided adjacent to the platforms. The appropriate number of kiss-and-ride spaces would be provided in conformance with RT's Station Guidelines.

2.4.5.2 FRANKLIN STATION

Location and Layout - The Franklin Station would be located in the SCRSD bufferlands area north of the planned CRB extension and just to the west of Franklin Boulevard as shown in Figure 2.4-9. As the LRT alignment approaches from the west, it would turn northeast away from CRB and run along the south edge of a reconfigured City flood control detention basin, then turn southeast on a diagonal path to cross at grade the north leg of the intersection of Franklin Boulevard with CRB. The station would have side platforms that would be located on the southeasterly diagonal segment about 300 feet from Franklin Boulevard. The LRT alignment makes this diversion away from CRB so vehicles can enter the station's park-and-ride lot without crossing the LRT tracks.

Under the flyover option wherein the LRT alignment would cross over Franklin Blvd., the platforms would be located approximately 1,200 feet from Franklin Boulevard. This option would have side platforms on an embankment that would run along the southern edge of the City's detention basin. This platform would be about two feet higher than the adjacent park-and-ride lot. In either location, the platforms would be 400 feet long and about 18 feet wide.

The station's park-and-ride lot would be constructed on engineered fill to conform to the expected elevation of the CRB extension and to be above the elevation of the 100-year floodplain.

Pedestrian Access - Pedestrian access to the platforms would be provided from both Franklin Boulevard and the future CRB Extension. The station also includes a pedestrian access path from the end of Deer Lake Drive in the subdivision to the north. This path would start at the Deer Lake Drive cul-de-sac, cross over Union House Creek on a pedestrian bridge, pass through the northerly bufferlands area, and end at the station platforms. The exact route of this path through the bufferlands would be determined working with the SCRSD during the project's final design process.

Bus Access - Buses would use the same access as cars initially entering the station from an entrance driveway that would make up the western leg of the Franklin Boulevard/CRB intersection. Upon future completion of the CRB extension this entrance would be closed and a new permanent driveway access would be opened approximately 800 feet west of the Franklin Blvd/CRB intersection.

Automobile Access – Vehicular access to the station would initially be via an entrance driveway that would make up the western leg of the Franklin Boulevard/CRB intersection. Upon future completion of the CRB extension, this entrance would be closed and a new permanent driveway access would be opened approximately 800 feet west of the Franklin Blvd/CRB intersection.

Park-and-ride Facilities – The station would contain space for approximately 650 vehicles to include the required number of handicapped spaces.

Kiss-and-ride Facilities – The station would include kiss-and-ride facilities adjacent to the platforms. The appropriate number of kiss-and-ride spaces would be provided in conformance with RT's Station Guidelines.

2.4.5.3 CENTER PARKWAY STATION

Location and Layout – The Center Parkway Station would be a walk-on station with no park-and-ride facilities. As shown in Figure 2.4-12, the station would be located north of CRB directly west of Center Parkway. The station would have a side platform configuration. The southerly platform would be 25 feet wide and 400 feet long. The northerly platform would be 18 feet wide and 400 feet long.

Pedestrian Access - Pedestrian access to the platforms Access to the station would be via sidewalks along both CRB and Center Parkway. A pedestrian access bridge/path would be provided from the south end of Valley Green Drive in the subdivision to the north. This path would start at the Valley Green Drive cul-de-sac, cross over Union House Creek on a pedestrian bridge, and continue along the southern edge of Union House Creek to end at the station platforms and Center Parkway. The path along the southern edge of Union House Creek would also extend west to Franklin Blvd. thus also providing access to the Franklin Station.

The Center Parkway Station also includes an optional pedestrian bridge over CRB that would provide grade separated access to the station from areas south of CRB. The optional pedestrian bridge would start on the Southwest corner of CRB and Center Parkway (it would require acquisition of an existing property at this location), pass over CRB, and end at the station platforms. Each end of the bridge would include an elevator and stairways. The location of the north tower would require coordination with the SAFCA Union House Creek widening project.

Bus Access - Bus access would be provided to the station by providing bus stops along Center Parkway. Bus stops would be provided on Center Parkway just north of the intersection with CRB for northbound and southbound Center Parkway traffic. The existing bridge would be widened to mitigate traffic impacts. This widening would require acquisition of a small strip of property north of the bridge.

Automobile Access – Automobile access to this station is via the existing street network. As this is primarily a walk on station only kiss-and-ride facilities will be provided along westbound CRB.

Park-and-ride Facilities – No park-and-ride facilities are proposed for this station.

Kiss-and-ride Facilities – The station would include kiss-and-ride pull outs immediately adjacent to the southern platform along westbound CRB and at the southeast corner of the intersection. The appropriate number of kiss-and-ride spaces would be provided in conformance with RT's Station Guidelines.

2.4.5.4 COSUMNES RIVER COLLEGE STATION

Location and Layout - The CRC Station would be located just north of the College entrance along the west side of Bruceville Road as shown in Figure 2.4-15. Tail tracks would extend south of the station and south of the College entrance. The station would have side platforms 18 feet wide and 400 feet long.

Parking on the campus would be open to both students and commuters. A 2,000 space parking garage would be constructed on the southeast corner of the CRC campus, as shown in Figure 2.4-16, and would be open to both students and commuters. It is anticipated that the structure could be constructed by the Los Rios Community College District and CRC, with future financial participation from RT.

Bus terminal, kiss-and-ride and handicapped parking would be provided immediately adjacent to and west of the platforms. The station would be the terminus station for the LPAP2 Project, and would be designed so as not to constrain options for future extensions as part of a Phase 3 extension.

Pedestrian Access - Pedestrians access the station via walkways within the college campus.

Bus Access - Bus circulation would be provided west of the platforms and with access from Bruceville Road and the College entrance.

Automobile Access – Automobile access for kiss-and-ride and handicapped parking would be via the main College Entrance and Bruceville Road. Access to the parking structure would be via a new campus driveway off of Old Calvine Road as well as the main college entrance off of Bruceville Road.

Park-and-ride Facilities – An optional parking structure is under review just to the west of the platforms. Two thousand surface parking spaces are also under review. This option would involve construction of nine acres of parking on the northern portion of the campus and 12.7 acres of parking across Bruceville Road to the east of the platform. The two options are shown in Figures 2.4-17 and 2.4-18.

Kiss-and-ride Facilities – The station would include kiss-and-ride facilities west of the platforms and bus circulation in conformance with RT's Station Guidelines. Figure 2.4.24 provides a visual simulation of LRT platform area and transit facility for the CRC Station.

2.4.6 Traction Power

The traction power system provides electricity necessary to operate the light rail vehicles. It consists of contact wire, support structures (i.e. poles that support the contact wire), and substations.

Four traction power substations (TPSS) will be required along the corridor to feed electricity from the SMUD power system to the LRT overhead contact system. The proposed traction power substations are labeled TPSS on figures included in this document. The TPSSs have been located away from sensitive environmental areas and residential land uses. In particular, the TPSSs are located on street or utility rights-of-way, station/park-and-ride lot areas, and on a college campus away from the student and administrative buildings.

Figure 2.4-24: Visual Simulation of Cosumnes River College Light Rail Station



TPSSs are proposed in the following locations:

- On the north boundary of the Morrison Creek Station (see Figure 2.4-6).
- In the southwest corner of the Franklin Station park-and-ride lot (see Figure 2.4-9).
- On the southeast corner of CRB and Center Parkway or a site 600 feet east (see Figure 2.4-12).
- In the vicinity of the tail tracks at CRC (see Figure 2.4-15).

The overhead contact system would consist of steel poles supporting copper wires in a catenary configuration. Generally, the poles would be located between the LRT tracks. However, the catenary poles will be located at the edges of the trackway in the UPRR corridor segment where the LRT tracks straddle SMUD high voltage poles.

It is assumed that the LPAP2 LRT line would operate with a “base” service of four trains per hour with 15 minute headways throughout the day, with two additional trains per hour operated during the peak periods. Total peak hours service frequency would be six trains per hour, yielding an average 10 minute headway. Actual headways would vary somewhat for each station. Train consists would include a maximum of four cars.

Part of the work effort to identify suitable locations for the traction power substations was to perform a provisional traction power simulation. The simulation used the existing Siemens cars as models and ran the system at 7 ½ minute headways with each of the proposed substations taken out of service in turn. The program was run using the cars loaded to AW2 level and maximum simultaneous acceleration of two trains. The program measured the voltage drop and rail potential rise at all points of the route. The results showed that the power system would operate satisfactorily and safely under all contingency conditions.

2.4.7 Right-of-Way Requirements

Figures 2.4-3 to 2.4-19 show the proposed right-of-way lines for the South Sacramento Corridor Phase 2 LRT Extension and facilities. Property within those lines would be acquired for the LRT facilities. Additional right-of-way would also be required for station park-and-ride lots, and there would be need for added strips of right-of-way or property easements in limited areas. Displacements are discussed in Section 4.13.3, Property Acquisition and Relocation. Right-of-way requirements will be further defined during the preliminary engineering and final design phases of the project.

2.5 FLEET AND MAINTENANCE FACILITY REQUIREMENTS

RT completed a *Fleet Management Plan (2004)* that evaluates RT's future requirements for LRT and bus fleet sizes and associated maintenance facilities. Table 2.5-1 shows the anticipated fleet requirements as shown in the *Fleet Management Plan*, along with anticipated fleet and maintenance facility requirements for each of the alternatives.

As shown, an additional 21 buses (excluding shuttle buses) systemwide would be needed for the TSM Alternative. No additional LRT vehicles or maintenance facility capacity expansion is included or necessary for either the TSM or LPAP2 Alternatives.

2.6 CAPITAL COST SUMMARY

This section presents a summary of capital costs estimated for the TSM and LPAP2 alternatives. Cost estimates were based on the latest local unit cost information available for the types of construction and procurement items. They can be compared with the capital costs for the rest of the MTP, which total \$11.3 billion in constant 2002 dollars excluding the cost of the LPAP2 and Phase 3. Of that amount, \$2.4 billion would go to transit improvements, \$2.5 billion to state highway improvements, \$4.5 billion to local street and road improvements, and the remainder to other transportation modes and related programs.

Table 2.5-1: Vehicle Maintenance Facilities and Requirements		
	Buses	Light Rail Vehicles
Current Maintenance Facility (2005)	29 th & N Streets	Academy Way
Current Capacity	275	97
Planned Future Facilities		
Location	McClellan Business Park (Maintenance)	13 th Street (LRT storage) + Folsom Blvd Satellite Facility
LRT Running Repair Facility		On DNA Line
Total Capacity Available (2025)	475 -525	137
No Action Alternative (2025)		
Additional Vehicles Needed for No-Action Alternative	89 [a]	12 [b]
System Requirements for No-Action Alternative	364 [a]	109 [b]
TSM (2025)		
Additional Vehicles Needed for TSM	21	0
System Requirements for TSM	385 [a]	109 [b]
LPAP2		
Additional Vehicles Needed for Vehicles LPAP2	0	4 [c]
System Requirements for LPAP2 (2025)	364 [a]	113 [d]
Notes:		
[a] Excluding shuttle buses and spares.		
[b] Vehicles in service for Amtrak/Folsom and DNA, excluding spares, <i>RT Financial cost model, 2005</i> .		
[c] Additional vehicles to be acquired as part of for DNA project.		
[d] Vehicles in service for Amtrak/Folsom, DNA, and S. Sacramento Phase 2, excluding spares, <i>RT Financial cost model, 2005</i> .		
<i>Sources: (1) Fleet Management Plan, 2003-2013, Sacramento Regional Transit District, May 2004, (2) RT Financial Operating Model, 2005, and (3) Transportation Model Outputs, DKS, 2005.</i>		

2.6.1 TSM Alternative Capital Costs

Table 2.6-1 presents capital cost estimates for the principal components of the TSM Alternative: new bus vehicles and the construction of a new park-and-ride lot and bus terminal at CRC. These costs include contingencies, engineering, and reserve. Escalation to year of expenditure (2008) is shown separately. Total capital costs, escalated to year of expenditure (FY 2008), are estimated to be \$52,118,000.

Table 2.6-1: Capital Cost Summary Transportation Systems Management Alternative	
BASE YEAR 2006 \$	\$ X000
Buses (21 buses)	\$15,574
Park-and-Ride and Related Facilities	\$19,047
Systems	\$2,432
Right-of-Way	\$12,073
Subtotal (2006 \$'s)	\$49,126
Escalation to Year of Expenditure (2008)	\$2,992
Total Cost Year of Expenditure (FY 2008 \$)	\$52,118
Source: Sacramento Regional Transit District and Parsons, 2006.	

2.6.2 LPAP2 Capital Costs

Table 2.6-2 presents capital costs for the principal components of the Base Case LPAP2 extension to CRC. Total base case costs, escalated to the year of expenditure through FY 2010, are estimated to be \$226,250,000, which is \$174,132,000 more than the estimated TSM Alternative costs. RT has acquired additional LRT vehicles to operate on the LPAP2. The base case does not include costs for optional design options such as the roadway grade separations. These optional costs are listed in Table 2.6-3 and are additive to the base escalated costs given in Table 2.6-2.

Table 2.6-2: LPAP2 Capital Cost Estimate by Cost Category	
Element	Cost Estimate (Year of Expenditure dollars)
Guideway and Track Elements	\$34,240,000
Stations, Stops, Terminals, Intermodal	\$45,780,000
Support Facilities: Yards, Shops, Administration	\$0
Sitework & Special Conditions	\$51,28,000
Systems	\$23,770,000
ROW, Land, Existing Improvements	\$14,780,000
Vehicles	\$0
Professional Services	\$45,620,000
Unallocated Contingency	\$10,770,000
Finance Charges	\$0
Total Project Cost	\$226,250,000
Source: RT Financial Forecasting Model, August 2006.	
Notes: Construction costs include 28% contingency.	
ROW costs include 25% contingency.	

Additional vehicles will not be acquired as part of the LPAP2 Project. Vehicle maintenance for LRT vehicles would occur at RT's central maintenance facility at Academy Way. A new maintenance facility will not be required for the LPAP2 Project.

Table 2.6-3: Capital Cost Summary – Incremental Increase in Costs for LPAP2 Design Options Above the Base Case Costs	
<i>Cost Adjustments for Design Options</i>	<i>Year of Expenditure \$</i>
Meadowview Road Grade Separation	\$11,767,000
LRT Flyover, or	\$12,087,000
Meadowview Underpass	
Franklin Boulevard Flyover	\$4,087,000
CRB Pedestrian Overcrossing at Center Parkway Station	\$7,266,000
CRB Flyover	\$6,393,000
Satellite Shuttle Park-and-ride Lot at Calvine/Auberry	\$2,246,000
CRC Station Surface Parking Lot Alternative	-\$12,827,000
CRC Station North Lot Parking Garage Alternative	\$18,379,000
Note: Costs escalated to year of expenditure, assumed as median year of 2009. Source: Sacramento Regional Transit District and Parsons, 2005.	

2.7 OPERATING AND MAINTENANCE COST SUMMARY

2.7.1 RT's Current Operating and Maintenance Costs

For Fiscal Year 2006, the budgeted bus and rail operating and maintenance costs were \$92.4³ million and \$43.9 million respectively (in FY 2006 dollars). The operating and maintenance cost for 2030 No-Action Alternative is estimated to be \$261.3 million in 2006 dollars.

2.7.2 Operating and Maintenance Costs of the TSM Alternative

Operating and maintenance costs for the TSM Alternative are based upon the service and fleet assumptions contained in RT's operating cost model. Fleet requirements are described in Section 2.5. In 2030, to maintain the proposed level of light rail and bus service, RT's annual LRT vehicle revenue miles of service would total 7.172 million and revenue train hours of service would total 0.141 million. RT's annual bus miles and hours operated would total 15.597 and 1.216 million, respectively. Year 2030 annual operating costs for RT are projected to be approximately \$268.4 million (FY 2006\$), which corresponds to incremental operating costs of \$7.1 million per year for additional bus and LRT operations compared with the No-Action Alternative.

³ Includes ADA paratransit cost of \$10.0 million (FY 2006\$).

2.7.3 Operating and Maintenance Costs of the LPAP2

Operating and maintenance costs for the LPAP2 are based upon the service and fleet assumptions described in Section 2.4. Table 2.7-1 lists RT's projected 2030 LRT and bus vehicle revenue hours and miles of service, which correspond to annual operating and maintenance costs of \$266.9 million (FY 2006\$). The LPAP2 operating costs are expected to be approximately \$1.44 million lower than the costs for the TSM Alternative (FY 2006\$).

Table 2.7-1: 2030 Annual Operating Statistics for LPAP2				
Alternative	2030 Annual Vehicle Revenue Hours		2030 Annual Vehicle Revenue Miles	
	Bus	LRT	Bus	LRT
LPAP2	1,170,000	148,860	14,864,000	7,797,380
Source: RT Financial Forecasting Model, August 2006.				

2.8 ALTERNATIVES CONSIDERED AND WITHDRAWN FROM FURTHER CONSIDERATION

This section outlines alternatives considered in the project planning process and subsequently withdrawn from further consideration. The LPAP2 Project was first evaluated in an Alternatives Analysis/Draft Environmental Impact Statement/Draft Environmental Impact Report (AA/DEIS/DEIR) prepared by Sacramento Regional Transit in 1994. This document evaluated seven investment alternatives for the South Sacramento Corridor and included a comprehensive public involvement process designed to help inform the selection of a locally preferred alternative (LPA). On May 8, 1995, the RT Board of Directors certified the Final EIR and selected the "LRT-Low/Union Pacific Railroad (UPRR) alignment" as the LPA, withdrawing the other six alternatives from further consideration (RT Board Resolution 95-05-2356, included as Appendix F). These six alternatives and the public involvement in the selection process are described in detail in the AA/DEIS/DEIR.

The LPA selection established the preferred mode and alignment for transit improvements in the South Sacramento Corridor, but left open a variety of specific design options. These design options were evaluated as part of the planning process to develop an alignment that fit the basic project features while accommodating other existing and planned developments and attempting to avoid impacts to natural resources, utilities, and other area land uses. The following discussion of alternatives considered and withdrawn focuses on these design options within each LRT alignment segment. The public involvement process for withdrawal of these design options consisted of input at RT Board meetings where the South Sacramento Corridor Phase 2 project was discussed. One key meeting took place on April 12, 2004, when the RT Board eliminated several design options based on the results of a public issues paper and associated public comments.

2.8.1 Meadowview Road to Union House Creek

The alignment selected for this segment runs south from the Meadowview Road station straddling the SMUD high voltage poles to Morrison Creek where it turns slightly east and south again to the Morrison Creek Station. From there the alignment runs south and turns east on a flyover over Morrison Creek and the UPRR tracks.

Three design options were considered for this segment in addition to the one selected. The first followed the selected alignment to Morrison Creek but then continued directly south across the creek to the UPRR flyover. It was rejected in order to add the Morrison Creek Station. The second alignment (essentially the same as that presented in the 1994 AA/DEIS/DEIR) would have required relocating the SMUD high voltage power poles, a 20-inch high pressure gas line, and the UPRR tracks. It was rejected due to the high cost of relocating these major infrastructure items and because it had greater noise, vibration, and visual impacts on neighboring residences than the other alternatives. The third option would have been the same as the selected option to the north of Morrison Creek, but then it would have crossed Morrison Creek, continued south, turned west, crossed Morrison Creek again, and turned south to the flyover. This option was intended to allow higher speed operation over the UPRR flyover since the flyover would follow a gentler curve. It was rejected because it required three bridges over Morrison Creek, required breaching the Morrison Creek levees at each bridge, and required significant acquisition of right-of-way.

2.8.2 Bufferlands Corridor (UPRR Corridor to Franklin Boulevard)

Five design options were considered for the LRT alignment segment leaving the UPRR corridor and heading eastward across the SCRSD Bufferlands to Franklin Boulevard. Numerous options were developed because of the need to avoid development that would be inconsistent with SCRSD policies, to coordinate with the alignment of the planned CRB extension (by others), and to accommodate constructability and maintenance access for a new future sewer interceptor to be located in the strip of land between the City of Sacramento detention pond and Union House Creek.

The selected option would place the LRT alignment on the north side of CRB. It would follow the south berm of the SCRSD detention basin and swing around the Franklin Station parking lot (see Figure 2.4-7).

Four options were withdrawn from further consideration on this segment. The first alignment would have been similar to the selected alignment but it would have run along the northern berm of the SCRSD detention basin. This option was rejected because it would have had greater noise and vibration impacts on the residences north of the detention basin in the Deer Creek subdivision.

The second design option would have followed the selected option but the LRT alignment would have followed CRB rather than swinging around the Franklin Station parking lot. This option was rejected because it would have required vehicles to cross the LRT tracks at-grade to enter the parking lot.

The third design option would have required locating the Franklin Station platforms in the median of CRB, raising issues of transit patron safety in crossing CRB to the platform. Providing a pedestrian overpass to serve the station platforms in the CRB median was considered to address the safety concern, but rejected because of its excessive cost.

The fourth design option would have followed the selected option but the LRT alignment would have gone through the middle of the area between the City of Sacramento's detention basin and Union House Creek. It was rejected because it would have encroached into the area reserved for the future SCRSD sewer interceptor.

2.8.3 Franklin Boulevard to Bruceville Road

The selected LRT alignment on this segment follows the northern edge of CRB Boulevard from Franklin Boulevard across Center Parkway, and midway between Center Parkway and Bruceville Road, the alignment would cross CRB and follow the south edge of CRB to Bruceville Road. This segment of the alignment includes optional flyovers of Franklin Boulevard and CRB.

Many design options have been considered on this segment of the alignment to address the following constraints:

- The need to maintain manhole access to two large (84-inch and 90-inch) existing sewer interceptors;
- Space challenges to accommodate LRT as well as the future widened CRB, and the physical constraint represented by a future widened Union House Creek;
- The impacts to traffic operations with an at-grade crossing of LRT crossing CRB through the Franklin Boulevard and Center Parkway Intersections; and
- The “pinch point” between the detention pond on the northeast corner of the CRC campus adjacent to the Center Parkway/CRB intersection; and the northeast corner of the college stadium berm that was intersected by all the alignment options in this segment, given that the berm provides habitat for burrowing owls.

Several alignments were developed and rejected during the planning process for the CRB widening project and the Union House Creek widening project. Sacramento RT staff worked with project sponsors (SAFCA, the Corps of Engineers, City of Sacramento, and Regional Sanitation District) as the designs proceeded. This extensive coordination led to the development of numerous sketch-plan alignments that were rejected during the design process because they interfered with access to a large sewer interceptor, would have grade crossings that had unacceptable traffic impacts, or otherwise interfered with the widening projects.

Three options were considered in more detail, the selected option (north of CRB), a CRB Median option, and a CRB South option. Under the CRB South option, the LRT alignment would have crossed the Franklin Boulevard/CRB intersection on a flyover to land on the south side of CRB and continue eastward crossing Center Parkway at grade and thence along the northern edge of the CRC campus to the west side of Bruceville Road. The CRB South design option was withdrawn from further consideration due to unacceptable noise, vibration, and visual impacts to residences between Franklin Boulevard and Center Parkway, concerns regarding access to the 90-inch sewer interceptor, and the need for a costly retaining structure at the CRC detention pond. Under the CRB Median option, the alignment would have crossed Franklin Boulevard to the north of CRB and then crossed west bound CRB lanes while moving into the median of CRB (via either a flyover or an at-grade crossing). The CRB Median option was rejected because it would conflict with the major sewer interceptor in this area.

2.8.4 Bruceville Road Segment

The selected alignment along the Bruceville Road starts at the southwest corner of Bruceville Road and CRB where the LRT alignment turns south and runs along the west side of Bruceville road to a station just north of the CRC entrance roadway.

Four design options were evaluated for this segment in order to achieve the best fit given the following issues and constraints:

- Need to locate station platforms as close as possible to college entrance;
- Need to minimize impacts to proposed College Square Marketplace development;
- Infeasibility of mid-block crossings of Bruceville Road given close proximity of adjacent intersections;
- Adverse traffic operations impacts of an at-grade crossing through the Bruceville Road/West Stockton Boulevard intersection;
- Need to work out a feasible LRT crossing of Bruceville Road at the College entrance; and

- Desire not to preclude future possibility of extending the next phase of LRT southward along Bruceville Road rather than eastward along Calvine Road.

The selected option best addresses these constraints and the other three design options were withdrawn. The first withdrawn option would have followed the same basic alignment from CRB south on Bruceville Road, but about 1,000 feet south of CRB. It would turn east, cross into the median of Bruceville Road and include a station in the median. This option would have required a diagonal at grade LRT crossing of the intersection of Bruceville with West Stockton (the entrance to the new College Square development project). It was rejected due to the traffic impacts on this intersection and because CRC agreed to allow construction of a station on its property on the west side of Bruceville. The second rejected option would have been the similar to the first, but the alignment would have completely crossed Bruceville Road and constructed a station on the east side of Bruceville Road. It was rejected for the same reasons, traffic impacts and the ability to construct a station on the CRC property.

The third option would have crossed the West Stockton Boulevard intersection at grade and continued southeasterly (diagonally) across the College Square development area and located the College Station platforms in the middle of the mixed-use development. It was eliminated from further consideration because of the distance of the station platform from the college and the resultant disadvantage to college student riders, the adverse impacts of the diagonal crossing alignment on pedestrian and vehicular circulation within the development, and the impact of this alignment on the development potential of the College Square itself.

2.8.5 LRT Segment from the CRC to Calvine/Auberry

On April 12, 2004, the RT Board determined that the LPAP2 Project should terminate at CRC, thus withdrawing the LRT segment from CRC to Calvine/Auberry from further consideration as part of the LPAP2. The RT Board noted the following reasons for elimination of this LRT segment from the current Project:

- The adopted Elk Grove General Plan identifies Bruceville/ Big Horn as the preferred LRT or Bus Rapid Transit (BRT) alignment. The Segment from CRC to Calvine/Auberry would be inconsistent with this Plan.
- Withdrawal of this LRT segment from the LPAP2 Project would reduce Project costs by ~\$28 Million, making the Project more cost effective and competitive for federal funding.
- While costs are reduced by ~\$28 million, the projected ridership would be reduced by only 200-400 riders.
- Sufficient land exists in the CRC Station area to meet the estimated parking demand at this Station for 2000 spaces. The previously proposed 11-acre parking area for the Calvine/Auberry Station was developed in 2004 into residential units, and acquisition of these residences would have been required under the previously proposed plan for the Calvine/Auberry Station.

The future Phase 3 extension of LRT or BRT from the CRC Station will be the subject of a future alternatives analysis and environmental evaluation.

2.8.6 Storage and Maintenance Facility

Six locations, listed below, were considered as potential sites for a light rail vehicle storage and maintenance facility:

- Academy Way Maintenance Facility Site Option would have expanded the existing maintenance facility at 2760 Academy Way to allow storage for 115 LRT cars, in addition to the storage currently available at the existing yard.
- Florin Road Maintenance Facility Site Option would have allowed for storage of 50 LRT cars. The proposed site is located just north of the existing Florin Road LRT station.
- Meadowview Maintenance Facility Site Option, located north and west of Meadowview Station, would have provided storage for 50 LRT cars.
- 47th Avenue Maintenance Facility Site Option would have provided storage for 50 LRT cars. It is located along RT's South Line, just north of 47th Avenue.
- Morrison Creek Maintenance Facility Site Option would have been located across Morrison Creek from the project alignment south of the Morrison Creek crossing. It would have allowed storage of 50 cars.
- Cotton Lane Maintenance Facility Site Option would have been located along Cotton Lane south of the proposed College Square development. It would have offered storage for 50 cars.

As part of its recent fleet management plan, RT performed a study to evaluate systemwide storage and maintenance facility needs into the future. As noted in the fleet management plan, RT's central LRT vehicle maintenance facility at Academy Way has been expanded to accommodate a 97-car fleet of LRT vehicles. This is a sufficient capacity to meet the requirement for maintenance of the LPAP2 LRT vehicles.

Additionally, a site along the Downtown Sacramento—Folsom Corridor has been identified as a possible site for a maintenance and storage facility. The studies concluded that if RT completes the expansion of the Academy Way facility and develops the Folsom Corridor facility, RT will have sufficient facilities to meet systemwide maintenance needs, including the Phase 1 of the Downtown/Natomas/Airport Line and the LPAP2. Because of this, the RT Board determined on April 12, 2004 that a new maintenance facility will not be required for the LPAP2 Project, and the storage and maintenance facility options were eliminated from the LPAP2 Project.

2.9 RELATED PROJECTS

The following projects (shown in Figure 4.10-3) are planned or proposed within the South Sacramento Corridor. RT has in the past and will continue to coordinate its planning and conceptual design for the proposed transit alternatives with the conceptual design and possible development of these related projects.

Neither the TSM nor LPAP2 is dependent on any of these related projects to be implemented; and each related project has its own independent utility, i.e., could be built with or without implementation of either transit alternative. In several cases, however, design of the related project will need to be coordinated with the design of the proposed LPAP2. Such coordination is currently underway between RT and the various planning and implementing agencies identified below.

South Sacramento County Streams Project (Sacramento Area Flood Control Agency/U.S. Army Corps of Engineers). The SAFCA and ACOE propose to increase flood protection to the south Sacramento County area by (1) modifying existing levees or channels and constructing new levees or flood walls at the Sacramento Waste Water Treatment Plant and along portions of Morrison, Elder, Union House, and Florin creeks; and (2) retrofitting bridges on these same creeks. An EIS/EIR has been completed for this work. Improvements along Morrison Creek have been funded and construction started in 2005. Completion of Morrison Creek improvements in the LPAP2 project area is planned for November of 2007. Improvements for Union House Creek, including the widening to the south, or breaching of the existing south levee, between the UPRR bridge and Franklin Blvd, and the widening to the south by some 18 feet between Franklin and Center Parkway, are still under design review. It is anticipated that the improvements between the UPRR bridge and Franklin will be completed in November 2007 and improvements between Franklin and Center Parkway will be completed prior to the start of LPAP2 construction in this area in 2008. RT will continue to work with SAFCA and the ACOE to negotiate cost sharing, assure coordination of the appropriate design for transit facilities, and coordinate implementation of these levee and floodwall improvements.

Cosumnes River Boulevard Extension (City of Sacramento). This proposed new roadway would extend CRB from its current westerly terminus at Franklin Boulevard. An Environmental Impact Report is currently in preparation for this project. Alternatives under consideration include extending CRB from Franklin Boulevard west to terminate at an interchange with I-5; and constructing CRB from Franklin Boulevard west across I-5 (with an interchange) toward the Sacramento River to Freeport Boulevard (SR 160). Two alternative alignments are proposed for the CRB connection between Franklin Boulevard and the proposed I-5 interchange. The proposed Phase 2 LRT alignment would be located to the north and generally parallel to the roadway extension. Vehicular access to the Franklin Boulevard LRT Station and park-and-ride lot would be provided by the CRB extension or by a separate access road should the extension not be developed.

Cosumnes River Boulevard Widening (City of Sacramento). The City of Sacramento proposes to widen CRB from two to four⁴ lanes between Bruceville Road and Franklin Boulevard. The *Cosumnes River Boulevard – Franklin Boulevard to Bruceville Road Environmental Impact Report*, City of Sacramento Planning and Development Department, December 1991 was prepared for this widening project and states that:

“As evaluated in the EIR and adopted by the City, Route 148 Arterial within the project area would have ultimately been constructed to six lanes. The City of Sacramento is reevaluating this ultimate configuration based on the potential for other uses within the existing corridor. For example, a water transmission main may at some future date be proposed to be installed within the right-of-way of CRB, as well as, a light rail route and expansion of the Union House Creek. The amount of right-of-way necessary to accommodate a light rail corridor, landscaping, a pedestrian path, bicycle lanes, a water transmission main, the expansion of Union House Creek and six lanes of traffic is currently insufficient. Based upon these factors, the City will determine the relative merits of ultimately constructing CRB in the project area as either a four or six lane roadway.”

Bruceville Road Widening (City of Sacramento). The City of Sacramento is in the process of widening Bruceville Road from two to six lanes between CRB and Sheldon Road. RT will continue to coordinate with the City of Sacramento Public Works Department regarding the design of the LPAP2.

⁴ The adopted 2002 Metropolitan Transportation Plan (MTP) shows this improvement to be from two to four lanes. The City of Sacramento's General Plan designates this portion of Cosumnes River Boulevard as an “Expressway,” which could have a cross section with more than four lanes.

Freeport Regional Water (Diversion) Project (Freeport Regional Water Authority - County of Sacramento, East Bay Municipal Utility District). The Freeport Regional Water (Diversion) Project would divert water from the Sacramento River for use by Northern California areas. One of the project alternatives would locate the diversion pipe along CRB.

Monterey Trail High School and Edward Harris Jr. Middle School. The Monterey Trail High School and Edward Harris Jr. Middle School, which opened in June 2004, will be located south of Old Calvine Road just east of Auberry Drive. Both schools will utilize the same facilities, with each school maintaining its own identity. This will be the third combined-campus educational facility constructed by the Elk Grove Unified School District to accommodate population growth in the area. The combined capacity of the campus is estimated at 4,860 students.

Shasta Park Site at Bruceville Road and Shasta Avenue. The planned Shasta Park Site would be located at the northeast corner of Bruceville Road and Shasta Avenue. The Sacramento City Park and Recreation Department is currently in the preliminary stages of acquiring the 20 acres of land for a park and community center. The environmental review process for this project has not yet begun.

Transit for Livable Communities. RT's Transit for Livable Communities (TLC) project is a land use planning process that began in late 2000 to obtain community involvement in the development of land use plans surrounding 21 current and future light rail stations including the Marconi (at Academy Way), 47th Street, Florin Road, and Meadowview Road LRT Stations in the South Sacramento Corridor. The plans and recommendations emphasize pedestrian-oriented design, efficient use of land, and a mixture of residential, retail and office land uses, all designed to support and help create unique and sustainable communities at each station while increasing transit ridership.

The land use plans cover an approximately one-quarter mile radius around each of the 21 stations on the South, Folsom, and Northeast lines. Strategies for joint development are promulgated that apply to property that RT owns at seven of these stations. RT has initiated review of the TLC program to the Morrison Creek and CRC Station areas on the South Sacramento Corridor Phase 2 project. TLC Implementation measures are relevant to transit-oriented development throughout the Sacramento region.

College Square (Private Developer). The College Square development is located in the southeast quadrant at the CRB/Bruceville Road intersection. Fifty-three acres of planned unit development are proposed, including a mix of residential, office and retail uses. The proposed mixed-use development would meet the needs of the local community by providing residential uses including independent and assisted living for seniors, low-cost housing and conventional multi-family units, as well as neighborhood retail and office functions in close proximity to the CRC and the SR 99 interchange. Eleven acres of the proposed development site have been identified as a possible location for a LRT park-and-ride lot.

RT will continue to coordinate with the City of Sacramento, the developer and CRC regarding the design of the LRT station and park-and-ride lot as well as the design for the developer's proposed West Stockton Roadway and intersection with Bruceville Road and the proposed extension of Cotton Lane.

2.10 ISSUES TO BE RESOLVED/AREAS OF CONTROVERSY

With the exception of traffic impacts at one intersection – Bruceville road at Cosumnes River Boulevard – impacts can be fully mitigated as described in Chapter 4 subsections and summarized with level of impact before and after mitigation in Chapter 6, Table 6.2-1.