TO: BOARD OF DIRECTORS
FROM: JAMES L. de la LOZA, REGIONAL TRANSPORTATION PLANNING & DEVELOPMENT

SUBJECT: SUMMARY OF ALTERNATE RAIL TECHNOLOGY (ART) ANALYSIS

ISSUE

As part of its Long Range Transportation Plan (LRTP) analysis, MTA staff is analyzing self-propelled rail vehicles, known as Alternate Rail Technology (ART), as a demonstration technology for use in an appropriate corridor. This report provides a summary of efforts to date.

BACKGROUND

The LRTP, adopted in March, 1995, directed that MTA staff evaluate the feasibility of ART as a low cost rail transit alternative to light rail transit (LRT) in existing railroad rights-of-way. The Phase 1 ART evaluation provided an overview of issues related to ART vehicles, and was presented to the Board in August, 1995. Phase 2, which evaluated the Los Angeles/Glendale/Burbank Corridor as a prototypical ART corridor, was approved by the Board in November, 1995. At that time, the Board adopted ART as a demonstration technology for use in an appropriate corridor, and directed staff to return with additional information regarding ART feasibility in other corridors and a financial plan for the Los Angeles/Glendale/Burbank Corridor.

A follow-up report, including the Los Angeles/Glendale/Burbank financial plan and the information on other corridors, was received by the Board in June, 1996. The report considered six potential ART corridors, each of which contains an existing or former railroad right-of-way that was previously considered for LRT. A number of other rail corridors under development have not been considered for ART, for the following reasons:

Red Line Segment 3: Segment 3 of the Red Line encompasses rail extensions to North Hollywood, East Los Angeles, and Mid-City. ART was not considered in these corridors due to the lack of existing surface rail rights-of-way and the existence of a federal Record of Decision (ROD) and Full Funding Agreement for the project. In addition, the North Hollywood line is well under construction and scheduled to open in 2000, and the East Los Angeles line is nearing completion of final design.
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Red Line Segment 4 East L.A.: There are no surface rail rights-of-way in the corridor alignment extending from 1st and Lorena to Whittier and Atlantic; therefore, ART is not under consideration.

Red Line Segment 4 West L.A.: The 1995 LRTP defined a West L.A. Segment 4 extension that would begin at Pico and San Vicente and terminate near the Route 405 Freeway in Westwood. No alignment studies have yet been initiated for this line, and it is therefore premature to consider ART in this corridor.

Los Angeles/Pasadena: In 1995, the City of Pasadena retained a consultant to consider substitution of ART for LRT on this alignment. The study recommended against ART because this would trigger the reopening of the project’s environmental clearance, and would require extensive revision to the project’s design, which was 80% complete at the time of the ART study. The study also noted that the MTA would likely incur a substantial penalty due to cancellation of its order for the LRT vehicles currently being manufactured.

Crenshaw/Prairie: The MIS is underway for this corridor extending from Mid-City to the Los Angeles International Airport. The study has narrowed the number of transit alternatives from eleven to six. ART was not considered as an alternative, since there are no at-grade rail rights-of-way following this route.

CURRENT STATUS

Potential Demonstration Corridors

The June 1996, report to the Board described six potential ART corridors, which are shown in Appendix A to this report. Based on the analysis conducted thus far as part of the LRTP update process, staff has focused its efforts on the three corridors considered to have the greatest potential to serve as a demonstration project, namely, the Los Angeles/Glendale/Burbank Corridor, the Exposition Corridor, and the North San Gabriel Valley Corridor.

Any ART corridor under consideration will fall under one of the following three categories, which have a significant effect on the type of issues encountered and the nature of potential future ART operations:

Abandoned Rail Corridor: The Exposition Line is an example of this type of corridor, in which all rail service has been abandoned, and the right-of-way removed from Federal Railroad Administration (FRA) jurisdiction. Tracks and signals are typically obsolete or removed, and an entirely new infrastructure must therefore be constructed. Because there are no current trains, there is sufficient capacity to accommodate ART. There is flexibility
for accommodating disabled access, although it may be desirable to use either the Metrolink or MTA Blue Line platform standard.

**Light Local Freight Corridor:** The North San Gabriel Valley Line would be an example of this category. This line is a former mainline railroad on which all but local freight service has recently been eliminated due to freight consolidation and Pasadena Light Rail Line construction. The tracks and signals are still in adequate condition for use by ART, although some upgrading and construction of passing tracks or double tracking will be needed. If the relatively infrequent local freight trains can be limited to late night hours, the ART could likely be removed from FRA jurisdiction. With freight train movements prohibited during the day, there will be sufficient capacity to accommodate ART. There is flexibility for accommodating disabled access, although it may be desirable to use either the Metrolink or MTA Blue Line platform standard, with bypass tracks possibly necessary to separate freight trains from the platforms.

**Mixed Traffic Corridor:** The Los Angeles/Glendale/Burbank Line would be considered a Mixed Traffic Corridor, as the existing right-of-way will continue to serve as a major rail corridor for the foreseeable future. As a result, ART vehicles must conform with FRA requirements unless a waiver can be obtained or new train separation technologies, acceptable to the federal government, are developed. The existing tracks and signals have already been upgraded for passenger service and therefore could be used by ART. However, the ART will require additional tracks and signal improvements, due to existing corridor capacity constraints. Areas of concern include disabled access and station dwell times, since the proposed federally-compliant ART vehicles would have high floors, and high platforms are prohibited due to freight train clearance requirements.

**Corridor Descriptions**

The following is a description and status summary for each rail corridor that was considered for ART demonstration.

**Burbank Branch West Right-of-Way**

The San Fernando Valley East-West Transportation Corridor Major Investment Study (MIS) evaluated various alternatives which generally extended from North Hollywood to Warner Center. However, the ART alternative would follow the MTA-owned Burbank Branch right-of-way for 18 miles, from North Hollywood to Chatsworth. The proposed alignment would begin at the future North Hollywood Metro Rail Station, and travel west, approximately parallel to Chandler and Victory Boulevards, through the communities of Valley Village, Van Nuys, Reseda, and Woodland Hills. At Canoga Avenue, the line would turn north, paralleling Canoga Avenue through the communities of Canoga Park and Chatsworth, and terminating near the Chatsworth Metrolink Station. Eleven stations
were proposed for the line, which would serve several trip generators including Los Angeles Pierce College, Los Angeles Valley College and the Van Nuys Civic Center.

The ART alternative was dropped from consideration during the MIS alternatives screening process. Because the Burbank Branch was historically used as a railroad freight spur rather than a mainline track, no grade separations were constructed. A total of 20 at-grade crossings exist in the corridor, and without grade separations, the resulting ART vehicle speed would have no significant advantage in comparison to parallel bus and commuter rail service. If grade separations were provided for the ART alternative, the construction cost of the project would increase to become similar to that of LRT. However, the LRT alternative was projected to provide higher ridership at a similar cost, and was therefore preferred to the ART alternative. As a result of the MIS findings, the Burbank Branch right-of-way is no longer considered a potential ART corridor.

**Exposition Right-of-Way**

As part of the LRTP analysis, the MTA is considering ART service on an abandoned MTA-owned right-of-way extending 14 miles parallel to Exposition Boulevard between the City of Santa Monica and Exposition Park. The proposed ART line would begin at the Exposition Boulevard station of the Harbor (I-110) Transitway, and would pass through the Crenshaw District, a portion of the City of Culver City, terminating at 4th and Colorado in the City of Santa Monica. Major trip generators served by the corridor include the Exposition Park/USC area, the Baldwin Hills Crenshaw Plaza, the Culver City Central Business District, and the Santa Monica Central Business District.

A feasibility study completed in 1994 considered light rail or busway alternatives serving eleven stations along this right-of-way, but no studies have been performed of ART. The LRT and busway study raised several issues which are likely to exist for ART. The study noted several major grade crossings in the western corridor segment, which may require construction of grade separations, at a significant cost, or a reduction in train speeds. Furthermore, the previous transit proposals encountered significant opposition from several adjacent neighborhoods, particularly in the middle section of the corridor, and this opposition would likely occur with ART as well. Should these two issues affect ART feasibility in the middle and western corridor segments, a stand-alone ART line could be implemented in the eastern corridor segment, where there are no known fatal flaws. Therefore, the Exposition Corridor is being considered in the LRTP as a potential demonstration ART corridor. Since this right-of-way is abandoned, FRA compatibility is not an issue.

A potential ART extension for the corridor would turn north at Flower Street, join the Metro Blue Line and terminate at the Seventh/Metro Center Station. Extensive analysis would be needed to determine this extension's feasibility given the Blue Line's track capacity, signal system, and tunnel ventilation.
Harbor Subdivision

The Harbor Subdivision is an active freight right-of-way which extends from South-Central Los Angeles to the L.A. Harbor. A potential 20-mile ART corridor would utilize a segment of this right-of-way, beginning at the Metro Blue Line Slauson Station, traveling west along Slauson Avenue, then paralleling Florence Avenue through the City of Inglewood, and interfacing with the Green Line Aviation Station near LAX. The line would then turn to the southeast, passing through the Cities of El Segundo, Hawthorne, Lawndale, Redondo Beach, and Torrance, before terminating in the vicinity of the Route 1/Route 110 interchange near the City of Carson. Since no feasibility studies have been performed, the possible station locations and activity centers served are unknown.

Although this right-of-way is owned by the MTA, ART service is currently infeasible due to the high volume of port-related freight railroad traffic, which will continue until the completion of the Alameda Corridor. This corridor is not under consideration in the LRTP, due to its infeasibility prior to Alameda Corridor completion.

Los Angeles/Glendale/Burbank Corridor

The Los Angeles/Glendale/Burbank Corridor extends 14 miles from Los Angeles Union Station, paralleling San Fernando Road and San Fernando Boulevard through the Cities of Burbank and Glendale, to the Hollywood Way/San Fernando Boulevard intersection near the proposed new Burbank-Glendale-Pasadena Airport terminal. The ART vehicles would share tracks with existing Metrolink, Amtrak, and freight traffic. The MTA previously completed environmental clearance for LRT in this corridor, as well as an ART feasibility study which proposed serving 11 of the 12 stations identified in the LRT study. Major trip generators along this line include the Burbank and Glendale Central Business Districts as well as the airport.

Because this ART service would operate in an active railroad corridor, it would fall under FRA jurisdiction. FRA’s requirements raise a significant timing issue which is discussed in Section 3.3, Evaluation of Feasibility Issues. Although the FRA issue may preclude ART implementation for several years, the Los Angeles/Glendale/Burbank Corridor remains under consideration in the LRTP as a potential demonstration ART corridor. The high-floor ADTranz IC-3 ART vehicle was demonstrated in this corridor in July, 1996, operating under an FRA waiver.

An additional issue discussed in Section 3.3 is the track capacity within and adjacent to Union Station. To provide sufficient capacity for a 20-minute clockface headway, the ART corridor’s capital cost must increase by $24 million to $154 million; while the cost must increase by an additional $5 million, to $159 million, to accommodate 15-minute
clockface headways. Due to capacity constraints, ART clockface headways of less than 15 minutes are infeasible in this corridor, unless future signal technological improvements allow the ART line to share tracks with the non-FRA compliant Los Angeles/Pasadena LRT vehicles to access Union Station.

North San Gabriel Valley Corridor

The LRTP analysis is considering ART deployment on a 20-mile segment of the former Pasadena Subdivision right-of-way between the Claremont Metrolink Station and the Sierra Madre Villa Blue Line Station in eastern Pasadena. The previous environmental document for this corridor provides clearance for either LRT or ART. Ten stations are proposed for this corridor, which would enhance access to Santa Anita Racetrack, Citrus College, and other locations in the north San Gabriel Valley cities of Arcadia, Duarte, Azusa, Glendora, and San Dimas.

Prior to the commencement of Los Angeles/Pasadena Blue Line construction, the Pasadena Subdivision was a mainline railroad. Therefore, the tracks and signals are in reasonably good condition, and can be refurbished and upgraded at moderately low cost to accommodate ART. The few freight trains currently utilizing the right-of-way would be restricted to late night hours, thus facilitating the use of non-FRA compliant ART vehicles. SCRRA has indicated that FRA would likely allow non-compliant vehicles to be deadheaded from the North San Gabriel Valley Corridor over mixed-traffic railroad lines to one of SCRRA's yards, potentially eliminating the need for a separate rail yard along the corridor.

There are no known technical barriers to ART implementation in this corridor. This corridor is therefore being considered in the LRTP for potential ART demonstration, and the Siemens Regio Sprinter ART vehicle was tested here in January, 1997.

Santa Clarita/Ventura Corridor

The former Santa Paula Branch is a largely abandoned, 45-mile rail right-of-way which begins in the Saugus community within the City of Santa Clarita, passes through the Valencia community within Santa Clarita, and then follows the Route 126 corridor through the Ventura County community of Piru and Cities of Fillmore, Santa Paula, and Ventura. In 1991, the former LACTC and VCTC (Ventura County Transportation Commission) initiated a feasibility study which concluded that the right-of-way should be preserved for a bikeway and rail transit. Both VCTC and the City of Santa Clarita are interested in future ART service on this alignment.

Based on the results of the feasibility study, VCTC has moved forward with purchasing the right-of-way segment between Piru and Ventura. The right-of-way between Piru and Saugus is owned by the Newhall Land & Farming Company. A short segment of the
right-of-way within Santa Clarita has been lost due to a development which occurred prior to the feasibility study. The study identified vacant land which could be utilized to bypass the blocked right-of-way segment; however, this land is likely to be built upon within the next few years if no action is taken to preserve it.

Due to the unresolved right-of-way issue, ART is considered infeasible in the short term, and therefore the corridor is not being considered in the LRTP for potential ART demonstration. The City of Santa Clarita has obtained SCAG funding to determine the precise alignment to preserve, and has released a Request for Proposals for a consultant study of this issue. In addition, the Siemens Regio Sprinter ART vehicle was demonstrated on a Ventura County portion of this corridor in January, 1997.

**Route 10/60 Corridor (added at the June 1996 Board meeting)**

This 15.4-mile corridor is an east-west line parallel to the I-10 Freeway between Union Station and the I-605 Freeway in El Monte. The proposed route would utilize an active freight right-of-way owned by the Union Pacific Railroad. The light rail project originally proposed for this route as part of a 1993 feasibility study would feature 11 stations, and would serve L.A. County General Hospital and California State University at Los Angeles.

A significant issue identified in the feasibility study was the high volume of freight traffic in the corridor. It is anticipated that this right-of-way will not be available for ART unless the railroad implements a freight consolidation program at some future time.

**Evaluation of Feasibility Issues**

The Los Angeles/Glendale/Burbank Corridor Feasibility Report determined that ART is feasible in an active railroad corridor, subject to resolution of certain issues. Two of the key issues which needed to be addressed were ART compliance with FRA requirements, and Union Station capacity. Although there has been progress on both issues since the last Board report, the FRA issue has not yet been resolved.

**Federal Railroad Requirements:**

Federal law requires that all railroad cars operating in the United States have 800,000 pounds of buff strength. The FRA has allowed two exceptions to this rule: (1) for rail transit vehicles operating on a railroad where freight trains are only permitted to operate late at night, after transit operations cease; and (2) for rail cars manufactured for use in other countries being operated in the United States for testing purposes. Within Los Angeles County, the 800,000 pound buff strength requirement would be an issue in the Los Angeles/Glendale/Burbank corridor, where heavy mixed traffic, including Metrolink, Amtrak, and freight, would preclude segregation of freight trains to late night hours.
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Although earlier self-propelled diesel rail cars manufactured in the United States (Budd Cars) met the federal buff strength requirement, all of the modern ART vehicles are built overseas, and none of the current ART manufacturers have produced an FRA-compliant prototype vehicle. Several manufacturers, believe, however, that they could easily produce a compliant vehicle through modifying existing designs for cars operating on European railroads. However, the proposed compliant ART vehicles would be limited to high-floor configurations, and the effect of the proposed modifications on vehicle performance is not fully known.

The Pennsylvania Department of Transportation (PennDot) has issued a request for comments from car builders, in anticipation of releasing in June a Request for Bids for new high-floor FRA-compliant ARTs, to be delivered in approximately two years. The State of Vermont has also issued a Request for Comments, intending in June to issue a Request for Bids for three high-floor FRA compliant vehicles which could be either new ARTs or refurbished 1950's vintage Budd diesel multiple units. Should new FRA-compliant ARTs be successfully produced for either PennDot or Vermont, the risk to the MTA associated with placing such an order would be significantly reduced.

Assuming that FRA-compliant high-floor vehicles do become readily available, there are issues resulting from the high floor which must be addressed. Currently, the dimensions of freight loads on certain northeast lines are restricted to allow high passenger platforms. Elsewhere, high platforms are prohibited to allow larger freight loads, and any introduction of high platforms would likely be opposed by the railroads. Therefore, wheelchair access to a high-floored ART vehicle would be by means of a wheelchair lift or a long ramp which would significantly reduce platform capacity. Able-bodied passengers would use stairs, which take longer for passengers to use. The stairs and wheelchair access would require increased dwell times, which will be difficult given the tight scheduling required to accommodate mixed traffic in the Los Angeles/Glendale/Burbank corridor.

MTA staff is currently pursuing the following actions regarding the ART issue:

- The Board Chairman has convened two meetings with FRA officials to pursue the possibility of obtaining a waiver, or possibly exempting the ART vehicles through signaling technology improvements such as utilizing Global Position System (GPS) technology.

- MTA staff is attending a national ART consortium which is pursuing potential joint procurement of FRA-compliant vehicles, to minimize the risk associated with a unilateral decision to purchase ART. However, the need for a joint procurement could be minimized if PennDot or Vermont successfully moves forward with their procurements.
• MTA staff is also participating on a Transportation Research Board (TRB) committee to explore alternative methods to isolate ART vehicles from conventional railroad traffic and thus exempt them from federal requirements. Attachment B provides a consultant status report on this effort.

• MTA-owned right-of-way was utilized to demonstrate two European ART vehicles: the ADTranz Flexliner was run on the Los Angeles/Glendale/Burbank Line in July, 1996, and the Siemens Regio Sprinter was demonstrated on the North San Gabriel Valley Line and a portion of the Ventura/Santa Clarita Line in January, 1997.

The feasibility of procuring federally-compliant ART vehicles is still unknown; however, should the PennDot or Vermont procurements lead to the construction of new vehicles, then off-the-shelf FRA-compliant ARTs could be available in approximately two years. However, these would be high-floor vehicles, which would have operating limitations due to the scheduling uncertainties associated with wheelchair lifts.

Union Station Capacity:

The Los Angeles/Glendale/Burbank ART Feasibility Study recommended a combined corridor in which ART trains would share track with Metrolink, Amtrak, and Union Pacific freight trains. Additional track was recommended in some areas to accommodate the additional ART traffic; however, the ability to add track approaching Union Station was found to be limited by right-of-way constraints. Therefore, the capacity of Union Station and its approach tracks is the limiting factor in ART headways for the Los Angeles/Glendale/Burbank corridor. This finding of the ART Feasibility Study led SCRRA to conduct, at the request of the MTA, a more in-depth analysis of Union Station capacity.

The SCRRA study identified current capacity constraints and recommended solutions to allow 15 minute clockface ART headways. Headways of under 15-minutes are unlikely to be feasible in the Los Angeles/Glendale/Burbank Corridor, unless future signal technological improvements allow the ART line to share tracks with the non-FRA compliant Los Angeles/Pasadena LRT vehicles to access Union Station.

• Trackage Between the Metrolink Central Maintenance Facility (CMF) and Mission Tower: There are currently three tracks connecting Union Station to Metrolink’s CMF. However, these tracks are currently utilized by all Metrolink, Amtrak, and Union Pacific revenue trains between Los Angeles and points north, as well as Metrolink and Union Pacific “deadhead” moves between Union Station and the Metrolink and Union Pacific maintenance facilities. Additional capacity would be required to accommodate ART clockface headways. SCRRA has recommended construction of an additional track on the bridge adjacent to Mission Tower, which would connect with an existing freight track, to effectively provide a fourth track
between Union Station and the CMF. SCRRA also recommends signal improvements, with the total cost for these new tracks and signals estimated to be $11.6 million.

- **Union Station Platforms**: SCRRA has recommended adding two new platforms at Union Station to provide sufficient capacity to accommodate ART. These platforms are estimated to cost $12 million, which includes the cost of relocating the existing mail platform to create the necessary space for new passenger platforms.

- **New Metrolink Yard South of Union Station**: SCRRA has determined that additional ART capacity could be provided through a shift of "deadhead" Metrolink trains away from its Central Maintenance Facility to a proposed storage yard south of Union Station. This new Metrolink yard is estimated to cost $5 million.

**SUMMARY**

The June 1996 ART Status Report to the Board identified six possible ART corridors, of which the LRTP analysis is considering three: the Los Angeles/Glendale/Burbank Corridor, the Exposition Corridor, and the North San Gabriel Valley Corridor. The cost-effectiveness of ART in these three corridors is being evaluated and compared with other potential uses of MTA funds. The following table provides the status of the six previously-identified potential ART corridors, as well as the Los Angeles/Pasadena Line evaluated for ART by the City of Pasadena, and other rail corridors which were never considered due to specific previously-cited reasons:
<table>
<thead>
<tr>
<th>CORRIDOR</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burbank Branch West</td>
<td>The San Fernando Valley East-West Transportation Corridor MIS eliminated ART from consideration due to the numerous grade separations required, resulting in significant cost.</td>
</tr>
<tr>
<td>Los Angeles/Glendale/Burbank</td>
<td>ART currently under consideration. Issues regarding FRA compliance and capital cost for 15-minute headway are yet to be resolved.</td>
</tr>
<tr>
<td>Exposition</td>
<td>ART currently under consideration. In the western portion of the corridor, issues regarding community acceptance and the need for grade separations are yet to be resolved. Should ART be infeasible in along the western segment, a stand-alone project might be feasible on the eastern segment.</td>
</tr>
<tr>
<td>Harbor Subdivision</td>
<td>ART dropped from consideration due to infeasibility prior to completion of the Alameda Corridor.</td>
</tr>
<tr>
<td>North San Gabriel Valley</td>
<td>ART currently under consideration. At this time, there are no outstanding issues to be resolved.</td>
</tr>
<tr>
<td>Santa Clarita/Ventura</td>
<td>ART dropped from consideration due to unresolved right-of-way issue. Santa Clarita is performing an alignment study using SCAG funds.</td>
</tr>
<tr>
<td>10/60 Corridor</td>
<td>ART not considered feasible in this corridor, unless future freight consolidation occurs.</td>
</tr>
<tr>
<td>Red Line Segment 3</td>
<td>ART not considered due to completed ROD and full funding agreement, lack of available right-of-way.</td>
</tr>
<tr>
<td>Red Line Segment 4 East LA</td>
<td>ART not considered due to completed ROD, nearly completed design, and lack of available right-of-way.</td>
</tr>
<tr>
<td>Red Line Segment 4 West LA</td>
<td>ART not yet considered, as no alignment study has been performed.</td>
</tr>
<tr>
<td>Red Line Segment 4 San Fernando Valley</td>
<td>The MIS for this corridor considered, but eliminated, an ART alternative utilizing the Burbank Branch right-of-way, as described above under “Burbank Branch West.”</td>
</tr>
<tr>
<td>Los Angeles/Pasadena</td>
<td>ART was considered, but not recommended, in a study performed for the City of Pasadena, due to completed environmental clearance, design 80% complete, with LRT vehicles currently being manufactured.</td>
</tr>
<tr>
<td>Crenshaw/Prairie</td>
<td>ART not considered due to lack of available right-of-way in corridor, aside from Harbor Subdivision (see below).</td>
</tr>
</tbody>
</table>

All three corridors currently under consideration are technically feasible. At present, however, it appears that the Exposition and North San Gabriel Valley Corridors can be implemented more quickly, since there is no requirement for FRA-compliant vehicles in these corridors. The Los Angeles/Glendale/Burbank Line cannot be built until the FRA-compliance issue is resolved through potential procurements by PennDot, Vermont, or elsewhere; by a consortium procurement; or through FRA approval of a waiver. The Union Station capacity issue appears resolved for 15-minute headways on the Los Angeles/Glendale/Burbank line. However, there is a significant cost associated with the required Union Station capital improvements and the construction of a second Metrolink rail yard.
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Although the Exposition Corridor appears to be technically feasible, there are two significant issues which need to be addressed in the western portion of the corridor: (1) community acceptance will likely become a major issue; and (2) there is likely to be a significant cost associated with grade separations. Should these issues prevent ART implementation in the western corridor segment, a stand-alone ART line could likely be built in the eastern section.

NEXT STEPS

As part of the LRTP analysis, staff will finalize the operating cost estimates and patronage forecasts for the three corridors under consideration, and will use this information to develop a cost-effectiveness evaluation. A corridor for potential ART implementation will not be identified until the LRTP analysis is complete and the Board has adopted the LRTP. There are no other tasks which staff can perform in pursuit of ART operation, aside from performing detailed corridor feasibility studies, which have not been authorized by the Board. Staff will continue monitoring ART developments nationwide, and will work with FRA and other agencies to address ART-related issues. As appropriate, staff will report further developments to the Board.

APPENDICES

The following appendices are included with this report:

Appendix A - Corridor Location Map
Appendix B - TRB Study Status Report
Appendix C - ART Vehicle Demonstrations

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APPENDIX A

Potential ART Corridors

- Los Angeles–Glendale–Burbank Corridor
- Northern San Gabriel Valley Corridor
- Harbor Subdivision Corridor
- Exposition Corridor
- Burbank Branch West Corridor
- Santa Clarita-Ventura Corridor

MTA-Owned Rail Rights-of-Way

- Los Angeles–Glendale–Burbank Corridor
- Northern San Gabriel Valley Corridor
- Harbor Subdivision Corridor
- Exposition Corridor
- Burbank Branch West Corridor
- Santa Clarita-Ventura Corridor
APPENDIX B

TRANSPORTATION RESEARCH BOARD (TRB)
STUDY STATUS REPORT

OPERATION ON NON-FRA COMPLIANT
RAIL VEHICLES IN MIXED RAILROAD TRAFFIC
Joint Operation of Light Rail Transit or Diesel Multiple Unit Vehicles with Railroads

a) INTRODUCTION

Research Problem Statement - Many urban areas in the United States are considering new or expanded rail transit services. In a number of these areas, active railroad trackage (freight and/or passenger) provides an opportunity for a potentially cost-effective joint-use rail transit alternative.

Of particular recent interest has been the potential joint operation of light rail transit (LRT) or lightweight diesel multiple unit (DMU) vehicles with railroads. Thus far, technical, institutional, and regulatory issues have limited consideration of such operations in the United States. In other countries, however, joint operation of LRT or lightweight DMU vehicles with railroads has been successful, indicating potential feasibility in the United States.

Research is needed to investigate in detail the issues associated with the joint operation of rail transit with railroads, and to offer potential solutions and recommendations that, if adopted, would allow the joint operation of LRT or lightweight DMU vehicles with railroads. Such solutions and recommendations would require acceptance by the Federal Railroad Administration (FRA), freight railroads, rail transit agencies, and other relevant organizations.

Objectives - Objectives of this research are to (1) identify and examine issues relevant to the safe operation of rail transit services on joint trackage with railroads; (2) prioritize the most critical issues affecting such use of LRT or lightweight DMU vehicles that do not meet current U.S. railroad regulations, standards, or practices; and (3) develop recommended solutions for the most critical issues pertaining to implementing joint operations using LRT or lightweight DMU vehicles. The purpose of this research is to determine whether the joint operation of light rail transit or lightweight DMU vehicles with railroads is a viable transportation option and, if so, to develop recommendations to facilitate its implementation.

b) NARRATIVE OF ACTIVITIES DURING THE REPORT PERIOD

Preparation of a Working Plan that incorporated responses to panel comments on the Research Plan in the original EK proposal.


Preliminary research on the regulatory framework that influences/controls joint rail and/or non-conforming rail vehicles and railroads. Investigation of both primary regulatory
agencies and secondary agencies that create "de facto" standards by issuing recommended guidelines. The rationale behind the regulations is being reviewed and interpreted relative to the joint operations issue. Investigation of the regulatory process relative to identifying whether technology can "drive" regulation or regulation "drives" technology.

Identify representatives and initiate discussions with appropriate Federal officials of FRA, APTA, AAR, FTA and the National Transportation Safety Board to identify existing regulations and disclose new regulations in process or under consideration.

- Federal Railroad Administration regulations relating to joint use of railroads and non-conforming vehicles utilized on railroads under FRA jurisdiction (both non-conforming DMU and EMU vehicles).

- FRA decisions relative to demonstration projects (identification of specific procedures/practices that must be followed during the course of the projects).

- State of potential emerging regulations that may be under consideration by FRA relative to joint use of railroad facilities.

- Regulations that may have been issued by State Public Utility Commissions, or other regulatory entities, for operations wherein there is presently (or the planned potential for) some form of shared-trackage utilization (includes California and New Jersey).

Preliminary examination of other administrative "institutional barriers" that could potentially affect the capability of systems to operate DMU/EMU on railroads.

- Implication of being subject to the jurisdiction of the Railroad Labor Act of 1926, as amended, and/or the concern that RLA protections could also affect existing non-covered transportation employees.

- Implications of being subject to the jurisdiction of the Railroad Retirement Act and FELA, and/or the concern that these programs could also affect existing non-covered transportation employees.

Preliminary investigation into the subject of risk and liability assessments. Determination as to those jurisdictions and/or entities that are presently addressing the subject of risk shifting between joint operators (shared trackage use) and between political subdivisions and private transportation providers. This effort will also examine the present "state of the art" relative to indemnification agreements.

Task 2. Relevant operating standards, practices, and issues that may apply to joint operation of rail transit and railroads.

Initial research on those aspects of rules affecting methods of rail operation, based on operational source documents such as transit and commuter rail rule books and operating procedures, collective bargaining agreements and orders/practices:
dispatching

signaling

methods of communication

issuance of train orders, track warrants, clearance cards, and other forms of authority for movement

close-up of single track

protection of work equipment

circumstances under which “absolute block” rules are utilized, and their operating requirements/implications

Initial review of operating policies, rules, labor practices, and command and control procedures for traffic management and track access for existing LRT systems, commuter rail systems, freight railroad systems and heavy rail (transit) systems, to identify differences, similarities and feasibility of modification.

Task 3 Physical plant issues associated with joint operation of rail transit and railroads.

Initiate research on physical plant issues such as station configuration, clearances, signaling and train control, grade crossing protection, track configuration, and electrification, among others. Investigation of the differences associated with LRT/DMU plant features compared to those essential to standard freight operational requirements. Impacts/benefits to an LRT/DMU passenger operation with incorporation of freight standards.

Task 4 Rail transit vehicles currently available for potential joint operation with railroads.

- Electrically-propelled Light Rail Vehicles (LRV), with pantograph power collectors compatible with overhead catenary power distribution, including:
  - High Floor LRVs
  - Low Floor LRVs

- Lightweight Diesel Multiple Unit (DMU) vehicles:
  - Conventional high floor DMU vehicles
  - Articulated low floor DMU vehicles

Our initial research has focused on inventorying the range of DMU cars available for potential joint operation with railroads.

- Our TCRP efforts are complemented by work on active projects that are evaluating DMU operation as an alternative to LRT
Booz-Allen has an extensive library of LRV characteristics

To complete our data gathering process, information not readily available must be obtained directly from manufacturers.

The two federal regulations with the greatest effect on rail vehicle design and construction are most likely body structure and ADA:

- For FRA, 800,000 pounds compression at draft stops without permanent deformation
- For ADA, floor height, door and passageway widths

In the past, body structure requirements were different for vehicles used in trains less than 600,000 pounds; was 400,000 pounds.

Our preliminary findings revealed that there are three basic types of DMUs currently offered worldwide:

- Classical high floor (International equivalent of the BUDD RDC) DMUs
- Lightweight "low floor" DMUs or DLRVs
- Railbuses

Some classical DMUs are manufactured to N.A. standards but no DLRVs currently.

At least four manufacturers of classical DMUs have potentially FRA-compliant vehicles:

- Adtranz (existing but modifications required)
- Bombardier (in design)
- Goninan Sprinter (existing but modifications required)
- Nippon Sharyo (in design)

The vehicles must meet 800,000 pounds buff strength for total train weight greater than 600,000 pounds.

UIC-compliant DMUs are built to comply with a buff strength of 1500 KN (337,000 pounds):

- Manufacturers interviewed can comfortably meet 400,000 pounds buff strength by modifying existing designs
- 800,000 pounds buff strength will require redesigned car body structures, which will add weight and cost
This key issue will be dealt with in Phase II of the project.

Light weight, as a classification, may be misleading because the weight variances between DMUs and DLRVs can be very small:

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>Train Mass (empty)</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Siemens DM 90</td>
<td>93.8 t</td>
<td>DMU</td>
</tr>
<tr>
<td>Siemens VT610</td>
<td>51.1 t</td>
<td>DMU</td>
</tr>
<tr>
<td>Siemens VT628</td>
<td>70.4 t</td>
<td>DMU</td>
</tr>
<tr>
<td>ABB Flexliner IC3D</td>
<td>96.0 t</td>
<td>DMU</td>
</tr>
<tr>
<td>Bombardier MR 90</td>
<td>57.8 t</td>
<td>DMU</td>
</tr>
<tr>
<td>Nippon Sharyo</td>
<td>58.5 t</td>
<td>DMU</td>
</tr>
<tr>
<td>Duewag 628.4</td>
<td>41.4 t</td>
<td>DMU</td>
</tr>
<tr>
<td>ABB Class 158/9</td>
<td>2 car - 75.5 t</td>
<td>DMU</td>
</tr>
<tr>
<td>ABB Class 158/9</td>
<td>3 car - 113.3 t</td>
<td>DMU</td>
</tr>
<tr>
<td>ABB Class 165</td>
<td>37.5 t</td>
<td>DMU</td>
</tr>
<tr>
<td>ABB Class 150/1</td>
<td>76.1 t</td>
<td>DMU</td>
</tr>
<tr>
<td>Siemens Regio Sprinter</td>
<td>31.9 t</td>
<td>DLRV</td>
</tr>
<tr>
<td>Adtranz Regio Shuttle</td>
<td>36.7 t</td>
<td>DLRV</td>
</tr>
<tr>
<td>Bombardier Talbot Talent</td>
<td>1 car - 37.2 t</td>
<td>DLRV</td>
</tr>
<tr>
<td>Bombardier Talbot Talent</td>
<td>2 car - 41.0 t</td>
<td>DLRV</td>
</tr>
<tr>
<td>Bombardier Talbot Talent</td>
<td>3 car - 50.0 t</td>
<td>DLRV</td>
</tr>
<tr>
<td>Bombardier Talbot Talent</td>
<td>4 car - 59.0 t</td>
<td>DLRV</td>
</tr>
</tbody>
</table>

Our research will be broadened to include light rail transit vehicles available for potential joint railroad operations.

Task 5 For LRT or lightweight DMU vehicles that do not meet current U.S. railroad regulations, standards, and practices, prioritize those issues most critical to joint operation with railroads. Prepare a Phase II work plan to analyze and develop possible solutions and recommendations for the most critical issues pertaining to the implementation of joint operation using LRT or lightweight DMU vehicles.

Start to identify and prioritize the issues relevant to safe joint operations, such as:

- Safety and liability concerns
- Ability of LRT or lightweight DMU vehicles to operate on overall inferior quality U.S. railroad tracks
- Compatibility with U.S. railroad signaling and communications systems
- Ability to comply with ADA requirements
- Ability of diesel engine vehicles to comply with air pollution laws
• Curving performance of diesel LRVs that use single axle-trucks
• Provisions for reliable and comfortable operation in extreme weather

NARRATIVE OF ACTIVITIES TO BE UNDERTAKEN DURING THE ENSUING PERIOD

Continued preparation of Tasks 1-5, as highlighted below and in detail in the Working Plan transmitted in November 1996. Response to additional panel comments on the Working Plan. By the end of the next quarter (March 31, 1997), we anticipate completion of research, analysis and documentation identified in the Working Plan for Tasks 1-5.

Task 1

Current and emerging regulations affecting joint operation of rail transit and railroads.

Contact the Transportation Technology Center and Volpe National Transportation Systems Center to uncover any associated research programs planned or underway.

Investigate and compare European UIC requirements and practices to U.S. conditions and standards. Dialogue with leading rail consultants such as Verkehrs - Consult Karlsruhe GmbH and Rail Consult of Cologne and Saarbrücken, Germany is underway.

The San Diego MTDB System, MTA’s Baltimore LRT System, and NJ TRANSIT are being contacted to obtain the structure of their present agreements, understand operational implications of joint use, and understand cost allocations and maintenance standards development and promulgation.

Two other joint use operations are being investigated: Virginia Rail Express and MARC in Maryland. We are also contacting the owner and operating railroads (CSX, Norfolk Southern, Amtrak) to assess impacts of joint operation on both freight and passenger railroads.

Task 2

Relevant operating standards, practices, and issues that may apply to joint operation of rail transit and railroads.

Investigation of aspects of operating with “mixed-mode” technologies:

• operating rules and employee timetables
• signal aspects and indications
• service recoveries and emergency response to mechanical failures, signal failures, traction power failure, derailments, hazardous materials and other unplanned interruptions
• track, signal, and electric traction maintenance and safety practices
• dispatcher traffic control, SCADA systems
• number of labor unions and craft skills required
• crew size
• training and certification, qualification on operating rules, and physical characteristics and equipment operation

and labor issues, including:
• personnel requirements in accordance with labor agreements.
• personnel requirements in accordance with regulatory directives.
• personnel requirements in conformance with operating rules and instructions.
• minimum crew requirements actually needed to safely operate trains.
• potential implications of co-mingling railroad employees, and their federal-based employment terms (Railway Labor Act, Railroad Retirement, FELA) with transit employees, whose employment basis is under state and local laws and customs.

and scheduling and track-management strategies, including:
• peak-hour commuter “windows” for passenger trains
• off-peak “windows” for freight operation
• peak embargoes of freight operation
• restriction of all freight trains to night operation only
• continuous, interwoven passenger and freight operations
• first-come, first-served operation
• interweaving high-speed, and local/commuter passenger services

Analysis of operating dynamics of each class of service (high-speed passenger, commuter rail, electrified light rail, diesel multiple-unit, mixed freight, unit train, container train) will also be analyzed and compared (differentiating between passenger-dominant and freight-dominant corridors), including such factors as:
• acceleration
• maximum speed
- traffic volume
- service braking rates and distance to stop
- emergency braking rates and distance to stop
- minimum/maximum train lengths

Task 3  
Physical plant issues associated with joint operation of rail transit and railroads.

Research components of the railroad environment, including:
- roadbed and track
- structures; support track, stations, system-related buildings
- yards and shops, maintenance-of-way facilities
- work equipment used to maintain the physical plant
- command and control systems including signal systems, communication systems and operational control centers (e.g. CTC or CAD installations)
- electric traction facilities including catenary (or third rail), substations, signal power generation, SCADA system
- diesel or electric vehicle maintenance facilities

Task 4  
Rail transit vehicles currently available for potential joint operation with railroads.

Create a comprehensive inventory of light-weight DMUs from both a literature search and catalogues and detailed information from manufacturers of these vehicles.

Inventory applicable vehicles and categorize them based on degree of compliance with U.S. railroad regulations, standards and practices.

Create a computerized database that lists potentially applicable LRT and lightweight DMU vehicles, and provides information relevant to categorizing vehicles in terms of their degree of compliance with U.S. railroad standards, including:
- buff strength and other FRA safety regulations
- AAR standards
• physical compatibility with the range of U.S. railroad track geometry, rail profiles, clearances and track quality
• compatibility with railroad signaling and communications systems
• railroad operational requirements including performance, capacity and range

Task 5 For LRT or lightweight DMU vehicles that do not meet current U.S. railroad regulations, standards, and practices, prioritize those issues most critical to joint operation with railroads. Prepare a Phase II work plan to analyze and develop possible solutions and recommendations for the most critical issues pertaining to the implementation of joint operation using LRT or lightweight DMU vehicles.

Continue the identification and prioritization process, leading to a Phase II Work Plan.
APPENDIX C

ART VEHICLE DEMONSTRATIONS

July 17, 1996: ADTranz IC-3
Los Angeles/Glendale/Burbank/Burbank Airport/Santa Clarita

January 10, 1997: Siemens Regio Sprinter
Arcadia/San Dimas (Portion of North San Gabriel Valley Corridor)

January 25/26, 1997: Siemens Regio Sprinter
Santa Paula/Fillmore (Portion of Santa Clarita/Ventura Corridor)
The Flexliner is equipped with a computerized diagnostic system that allows the driver and maintenance personnel to monitor train conditions. The trains feature a rubber front and a unique “fold-back” door design that allow easy passage between coupled trains, permitting unrestricted movement through the length of the modular Flexliner.

The train’s flexible interior is designed to accommodate a minimum of 140 passengers. Each train can be adjusted for high capacity, short-distance commuter service and for spacious configurations for longer intercity journeys.

Flexliner Fast Facts

- Trains are self-propelled (locomotive not required), lightweight multiple units built of aluminum profiles;
- Trains can consist of two to four cars and up to five trains can be connected to comprise a Flexliner trainset;
- The train is designed for quick acceleration and can travel up to 112 mph;
- Trains are available with diesel (DMU) as well as electric (EMU) traction;
- For passenger comfort, the Flexliner is equipped with state-of-the-art electronic equipment and passenger information systems, panoramic windows, roomy seats and other world-class amenities.

The Flexliner is manufactured by Adtranz, a 50/50 joint venture combining the worldwide transportation businesses of ABB Asea Brown Boveri Ltd. and Daimler-Benz. The company is a complete global provider of transportation products, systems and services, especially passenger rail systems, automated guideway transit systems and automated train control systems.
Amtrak, The National Railroad Passenger Corporation, is proud to welcome the European-designed Flexliner passenger train to the United States. The modern, high-tech train is embarking on a two-year demonstration program throughout North America. The Flexliner has been in successful operation abroad for more than five years. Currently, nearly 200 Flexliner trains are in service in four countries.

The Flexliner sets a new standard for comfort and efficiency in rail travel. The passenger train features world-class onboard amenities, versatile operational technology, and state-of-the-art design. Its modern comfort and flexibility embody Amtrak's vision of 21st century American rail travel.

With its innovative design and advanced technology, the Flexliner provides a distinctive level of onboard comfort, ease and convenience for both business and leisure travelers. The spacious cars feature comfortable, adjustable seats, panoramic windows, cellular phones, outlets for laptop computers and electronic route maps and schedule status systems. The Flexliner also provides generous storage space and access for persons with disabilities.

As its name suggests, the Flexliner is versatile. The bi-directional train employs an automated "coupling" connecting system that allows individual trains to be joined and separated within minutes — even while the trains are moving at low speeds. This technology enables multiple trains leaving a station as one unit to be quickly "uncoupled" to form two or more trains traveling to different destinations. Its modular design also enables the Flexliner to be adjusted according to passenger volume.

Unlike conventional trains, the Flexliner does not require a locomotive to power the train. The self-propelled train is built to run on existing, conventional rails. In addition, the Flexliner employs advanced tilt technology for curved rail lines.

The Flexliner's computer technology allows diesel and electric equipment to run as a single train with either the electric or diesel motors providing traction power. This enables the same level of transport quality to be provided on intercity, regional and local lines, whether these lines are electrified or not. The touring Flexliner is diesel powered.
Amtrak is America's only national passenger rail service. It provides safe, comfortable and environmentally friendly transportation throughout the United States. From hometowns to business and travel destinations, Amtrak's 23,000 miles of track serves more than 500 communities nationwide.

Amtrak customers make approximately 21 million trips annually on Amtrak trains. Another 33 million people ride Amtrak-operated commuter trains each year. By joining with states and cities to meet the changing demands of local and regional travellers, Amtrak is now the largest provider of commuter service in the United States.

And to secure the future of national rail passenger service, Amtrak is increasing capital investments in modern and safe technology and rail infrastructure. It will launch state-of-the-art high-speed rail service between Washington, D.C. and Boston in 1999.

Headquartered in Washington, D.C., Amtrak is comprised of three strategic business units: Northeast Corridor (Philadelphia), Intercity (Chicago), and Amtrak West (Oakland). Its workforce of more than 23,000 employees is dedicated to meeting the needs of rail travellers nationwide.
IT'S “ALL ABOARD” AS MTA AND OTHER OFFICIALS TAKE A DEMONSTRATION RIDE ON A NEW ALTERNATE RAIL VEHICLE

MTA officials will be among those to take a ride on the Regio Sprinter in a demonstration run of the rail vehicle between San Dimas and Arcadia on Saturday, January 18, 1997.

The Regio Sprinter is the second Alternate Rail Technology (ART) vehicle currently to be evaluated by the MTA for possible use in several existing rail rights-of-way in Los Angeles County. Developed by Siemens, the Regio Sprinter is a bi-directional, light weight, low-floor, self-propelled rail car which was first introduced in Europe in 1995. The typical operating speed of the Regio Sprinter is 60 mph and the vehicle seats 74 passengers with room for 100 standing.

The initial trip will originate in Claremont at 8 a.m. with subsequent trips traveling between San Dimas and Arcadia, with a stop in Monrovia. The public will have the opportunity to get a close look at the Regio Sprinter in San Dimas on the tracks at the corner of Bonita Avenue and Cataract between 8:15 a.m. and 8:55 a.m., and in Arcadia on the tracks at the corner of 1st Avenue and Saint Joseph Street between 2:00 p.m. and 3:00 p.m.

Mini transportation fairs will be held at the San Dimas and Arcadia sites as well as in Monrovia on the tracks at the corner of Duarte Road and Myrtle Avenue.

The MTA Board adopted Alternate Rail Technology as a demonstration technology in November 1995.

Among the officials expected to attend the demonstration run are MTA Board Chairman Larry Zarian and Board member John Fasana.

# # #

MTA-010
RegioSprinter Tour-USA

Los Angeles County
Demonstration Event

January 18, 1997
### RegioSprinter Demonstration

**Boarding Schedule**

#### WESTBOUND

<table>
<thead>
<tr>
<th>CITY</th>
<th>TRIP</th>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Inaugural</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>CLAREMONT</td>
<td>8:00 AM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAN DIMAS*</td>
<td>8:55 AM</td>
<td>10:30 AM</td>
<td>11:55 AM</td>
<td>1:30 PM</td>
</tr>
<tr>
<td>AZUSA</td>
<td>9:11 AM</td>
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</tr>
<tr>
<td>MONROVIA</td>
<td>9:35 AM</td>
<td>10:54 AM</td>
<td>12:19 PM</td>
<td>1:54 PM</td>
</tr>
<tr>
<td>ARCADIA*</td>
<td>9:40 AM**</td>
<td>10:59 AM**</td>
<td>12:24 PM**</td>
<td>1:59 PM*</td>
</tr>
</tbody>
</table>

#### EASTBOUND

<table>
<thead>
<tr>
<th>CITY</th>
<th>TRIP</th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>ARCADIA</td>
<td>9:55 AM</td>
<td>11:16 AM</td>
<td>12:45 PM</td>
</tr>
<tr>
<td>MONROVIA</td>
<td>10:55 AM</td>
<td>11:25 AM</td>
<td>12:55 PM</td>
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<tr>
<td>AZUSA</td>
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<td></td>
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<tr>
<td>SAN DIMAS*</td>
<td>10:24 AM*</td>
<td>11:44 AM*</td>
<td>1:14 PM*</td>
</tr>
<tr>
<td>CLAREMONT</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The Inaugural Trip will allow 15 minutes for a station activity at Monrovia and a 5 minute photo opportunity at Azusa. After the Inaugural Trip, stops at each station will be 5 minutes to allow for boardings only.

*Public Viewings:*

- San Dimas: 8:15 - 8:55 AM
- Arcadia: 2:00 - 3:00 PM

**Designates arrival times.**
MAKE YOUR SUPER BOWL WEEKEND
A SUPER TRAIN WEEKEND
ON THE SANTA PAULA BRANCH LINE

Saturday, January 25 and Sunday January 26, 1997

COME TO SANTA PAULA AND FILLMORE FOR FREE TRAIN RIDES ON
THE REGIO SPRINTER—A NEW GENERATION OF RAIL CAR!

On Saturday, the events will take place in Santa Paula beginning with a ribbon cutting to kick off
the start of the City’s downtown redevelopment project and Farmers Market. There will be free
rides on the RegioSprinter.

On Sunday head on out to Fillmore to celebrate 110 years of train history. Ride the
RegioSprinter for free and if you like take a ride on one of two trips on the Fillmore & Western
Railroad’s Sunday Scenic Limited (fee required).

The RegioSprinter is a lightweight, self-propelled train which features two diesel engines designed to meet the most
stringent emissions standards. No locomotive is required. Two low-floor sections afford easy boarding and exiting by
the physically challenged, as well as people with strollers or bicycles. A push-button at the door activates a ramp for
ease and independent access. With a top speed of 62 mph, it has seating for 74 passengers and 100 standees.

<table>
<thead>
<tr>
<th>Saturday, January 25, 1997</th>
<th>Sunday, January 26, 1997</th>
</tr>
</thead>
<tbody>
<tr>
<td>Santa Paula Rail Station</td>
<td>Fillmore City Rail Plaza</td>
</tr>
<tr>
<td>9:30 a.m. Event Opens</td>
<td>9:30 a.m. Photo Opportunity-</td>
</tr>
<tr>
<td>9:45 a.m. Ribbon Cutting For Farmers Market</td>
<td>110 Years of Train History on</td>
</tr>
<tr>
<td>10:00 a.m. RegioSprinter Trip #1</td>
<td>this Branch Line</td>
</tr>
<tr>
<td>10:20 a.m. Return to Santa Paula</td>
<td>10:00 a.m. RegioSprinter Train #1</td>
</tr>
<tr>
<td></td>
<td>10:20 a.m Return to Fillmore</td>
</tr>
<tr>
<td></td>
<td>Train Will Be on Display</td>
</tr>
<tr>
<td></td>
<td>Between Trips</td>
</tr>
<tr>
<td>11:00 a.m. RegioSprinter Trip #2</td>
<td>11:00 a.m Fillmore &amp; Western Trip #1 to</td>
</tr>
<tr>
<td>12:00 noon RegioSprinter Trip #3</td>
<td>Santa Paula</td>
</tr>
<tr>
<td>1:00 p.m. RegioSprinter Trip #4</td>
<td>(There is a fee for this trip)</td>
</tr>
<tr>
<td>2:00 p.m. RegioSprinter Trip #5</td>
<td>11:30 a.m. Regio Train Trip #2</td>
</tr>
<tr>
<td>3:00 p.m. RegioSprinter Trip #6 (Final Trip)</td>
<td>12:00 noon Regio Train Trip #3</td>
</tr>
<tr>
<td>3:20 p.m. Event Closes</td>
<td>1:15 p.m. Fillmore &amp; Western Trip #2 to</td>
</tr>
<tr>
<td></td>
<td>Santa Paula (Fee Required)</td>
</tr>
<tr>
<td></td>
<td>1:30 p.m. Regio Train Trip #4</td>
</tr>
<tr>
<td></td>
<td>2:00 p.m. Regio Train Trip #5</td>
</tr>
<tr>
<td></td>
<td>3:00 p.m. Regio Train Trip #6</td>
</tr>
<tr>
<td></td>
<td>3:20 p.m. RegioSprinter Returns to LA</td>
</tr>
</tbody>
</table>

SUNDAY SCENIC LIMITED
Year around, rain or shine, except March 16.
Board in either Fillmore or Santa Paula for an
exciting ride through the countryside. Two roundtrips to
Santa Paula depart from Central Park in Fillmore at
11:00 AM and 1:15 PM. A single round trip to Fillmore
departs from the Santa Paula Depot at 12:15 PM.

REGULAR FARE: Adult $14.00; Senior $12.00;
Child (4-12) $8.00; Under 4 Free.
FIRST CLASS FARE: Adult $24.00;
Senior $22.00; Child (infant-12) $16.00.