Providing Platform/Vehicle Access To Satisfy the Americans with Disabilities Act: Santa Clara County Solution

Willard D. Weiss, *Morrison Knudsen Corporation*
Robert E. Murphy, *ICF Kaiser/Santa Clara County Transportation Agency*
Paul S. McCauley, *Parsons Brinckerhoff Quade & Douglas, Inc.*

As part of the Tasman Corridor Project light rail transit (LRT) extension, the Santa Clara County (California) Transportation Agency is designing new passenger stations and light rail vehicles to satisfy requirements of the Americans with Disabilities Act. Following an exhaustive evaluation of alternatives, the agency initially decided to implement level boarding using high platforms with high-floor vehicles. Existing Guadalupe Corridor street-level platform passenger stations were to be rebuilt as high-platform stations. Existing light rail vehicles would be modified to cover stepwells and replace doors. A combination of budget concerns and opposition to high platforms in the downtown San Jose transit mall resulted in a subsequent proposal to defer the purchase of new vehicles and redesign station platforms to accommodate low-floor light rail vehicles that would be procured at some future date. Temporary minihigh platforms and modified existing vehicles will be used until then. The alternatives evaluated, the rationale for selecting the high-platform alternative, and the circumstances that led to the current plan are described.

The initial segment of Santa Clara County's (California) 33-km (20-mi) Guadalupe Corridor light rail transit (LRT) line opened for revenue service in December 1987; the south segment of the line opened in April 1991.

The 50 Guadalupe Corridor light rail vehicles (LRVs) are high-floor [990 mm (39 in.) above top of rail] articulated vehicles with four bifolding doors on each side and a stepwell at each door. The 33 Guadalupe Corridor passenger stations have street-level platforms 140 mm (5½ in.) above top of rail [except in the San Jose transit mall, where they are 100 mm (4 in.)]. The system is designed for operation with trains of up to three vehicles in length. Access for mobility-impaired passengers is provided by wayside mechanical wheelchair lifts operated by the train operator. Every vehicle has two wheelchair positions at each end, but only the positions at the head of a train are adjacent to the wayside lift. Passengers in wheelchairs must use the lifts to board or exit the train through the first door of the lead vehicle, and the train operator must exit the cab to deploy, operate, and secure the lift each time it is used.

The Santa Clara County Transportation Agency (TA) is now completing design of the Tasman Corridor Project, the first of a series of planned extensions to the light rail system. The east-west Tasman Line will be a 20-km (12-mi) extension to the primarily north-south Guadalupe Line, connecting at the Guadalupe Line's northerly terminus. Figure 1 indicates the relationship between the existing rail corridors and the planned extensions to the system. The Guadalupe Corridor, Tasman Corridor, and subsequent extensions are planned to operate as a single system; that is, trains will be through-routed from one corridor to another.

As part of the Tasman Project, the TA has taken a fresh look at its approach to vehicle accessibility. The reexamination is partially a result of the 1990 Americans with Disabilities Act (ADA) and the associated U.S. Department of Transportation rules. Even without the ADA, however, the TA was determined to improve its approach to LRV accessibility. The operating department sought ways to reduce or eliminate the delays inherent in the use of staff-operated lifts, and the mobility-impaired community has expressed concern about the attention received by wheelchair users when using the lifts.

This paper summarizes the TA's analysis of the ADA requirements, the range of methods available for providing access to LRVs for patrons in wheelchairs, and the accessibility approach to be implemented on the Tasman Corridor and retrofitted in the Guadalupe Corridor.

ADA Requirements

The ADA and the associated Code of Federal Regulations (CFR) set forth new requirements for "accessibility" including those that must be met by transportation facilities such as the Santa Clara County light rail system. The basic ADA requirements for *system* accessibility stem from Title 49 CFR Part 37, *Transportation Services for Individuals with Disabilities (ADA).* These requirements address the construction of new facilities such as the Tasman Corridor Project stations, modifications to existing stations, and the acquisition of LRVs. Requirements for accessible *vehicles* are addressed in

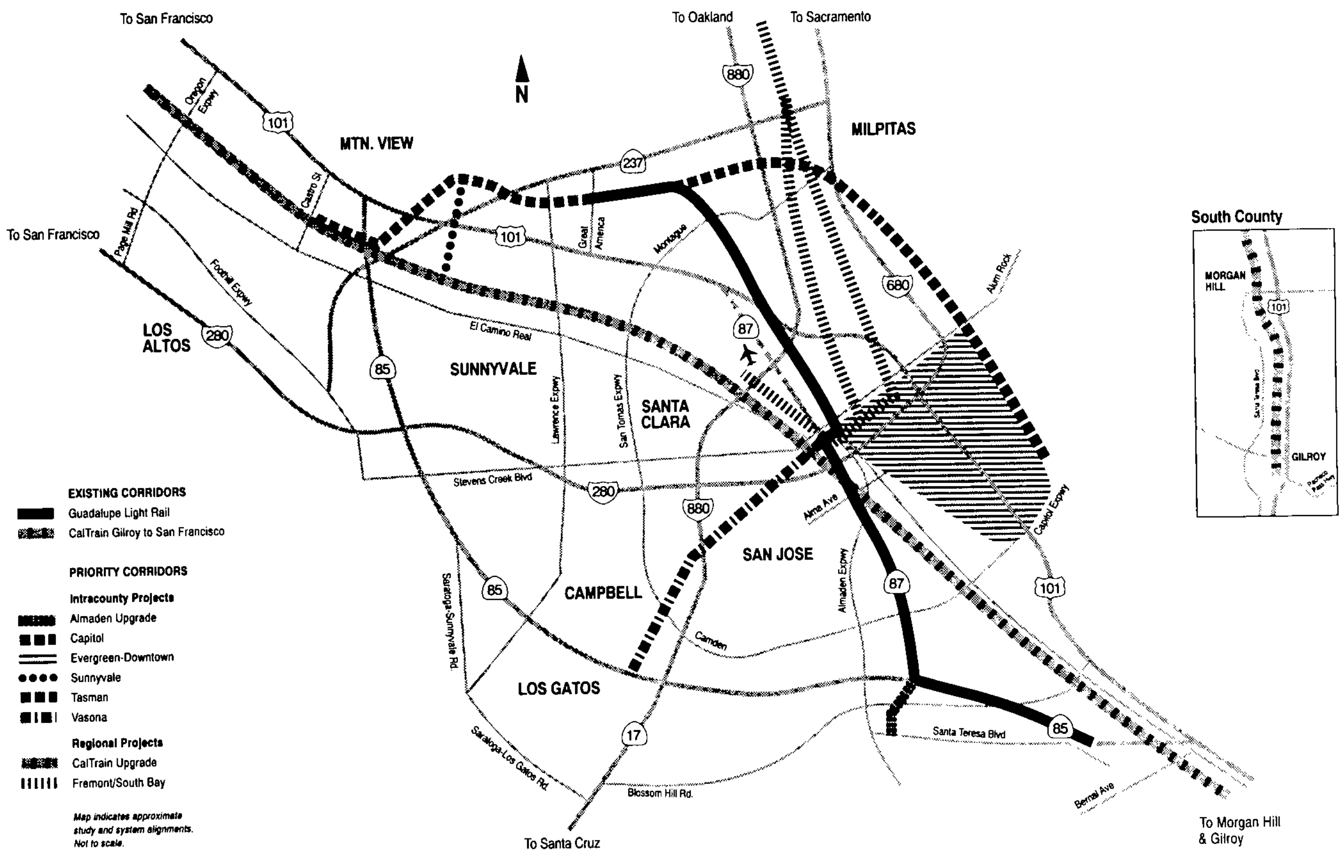

FIGURE 1 Rail master plan.

Title 49 CFR Part 38, *Accessibility Specifications for Transportation Vehicles.*

In interpreting the CFR rules, the implications of the ADA requirements as they pertain to the Santa Clara County light rail system are considered to be as follows:

- The Tasman Corridor must be fully accessible. That is, every new vehicle at a new station must be accessible, and at least one old vehicle per multicar train must be accessible.
- On the existing Guadalupe Corridor, at least one car per multicar train must be accessible. (This accessibility is currently provided by use of the wayside lifts.)
- Where level boarding is not practicable, level-change mechanisms such as wayside or carborne lifts, minihigh platforms, or similar means of access must be provided.
- With single-door accessibility (lifts or minihigh platforms), double/multiple stopping is required when all available wheelchair positions in the first car are occupied, additional wheelchair space is needed, and there are other accessible cars on the train. If wheelchair space is available on the first car, it is not required that the wheelchair user be given a choice of cars.
- The extent to which *new* cars must be accessible when operating on the Guadalupe Corridor line is made questionable by the one-car-per-train rule, which suggests that not all cars in a train need to be accessible on an existing system. However, the problem of coordinating boardings and deboardings of mobility-impaired riders on trains running between the Tasman and Guadalupe corridors requires that there must be a compatible method of vehicle access on the Tasman and Guadalupe corridors for the success of interline train operation.

Alternatives Considered

A range of vehicle accessibility alternatives were identified by the TA for evaluation; these alternatives are described in the sections that follow and summarized in Table 1. As noted, there are two categories of vehicle access: level-change boarding and level boarding.

Level-Change Boarding

Level-change boarding provides access to and from vehicles by using lifts or ramps to assist a mobility-impaired rider in making the transition between the platform at one level and the vehicle floor at another. This type of boarding is compliant with the ADA requirements when it is deemed to be impracticable to achieve level boarding. Alternatives in this group employ conventional (high-floor) LRVs and street-level platforms, with either vehicle-mounted lifts or wayside lifts or ramps. The alternatives in this group typically

TABLE 1 Alternative Station Platform and Vehicle Configurations

Alternative No	Ref	Mobility Impaired Access	Platform	Vehicle	Comments
LEVEL-CHANGE BOARDING:					
1	WSL	Wayside lift at single door	Street level	High floor, fixed steps	Guadalupe Corridor system
2	LOV	Lift on veh. at single door	Street level	High floor, fixed steps w/lift	San Diego system, but four lifts/car
3	MHP	Mini-high platform at single door	Street level	High floor, fixed or movable steps	Sacramento system
LEVEL BOARDING:					
4	HPMS	Level boarding, all doors	High (990 mm (39") above top of rail); [not all platforms need to be high]	High floor, movable steps	SF Muni, Buffalo
5	HPNS	Level boarding, all doors	High (990 mm (39") above top of rail)	High floor, no steps	LA, St. Louis Calgary
6	LFV30	Level boarding, center doors	Low (355 mm (14") above top of rail)	Low floor, center w/2nd articulation	European (interior steps in vehicles)
7	LFV30	Level boarding, all doors	Low (355 mm (14") above top of rail)	Low floor, between (conventional) trucks	Portland (interior steps in vehicle)
8	LFV100	Level boarding, all doors	Low (355 mm (14") above top of rail)	Low floor, 100% low	Unproven technology

provide boarding at only a single door of each accessible vehicle, and all add some time to the normal station dwell time.

Wayside Lifts

Figure 2 shows the existing wayside lift (WSL) on the Guadalupe Corridor. Pertinent accessibility elements include

- Street-level platform,
- High-floor (conventional) LRVs,
- Single-door mobility-impaired access,
- Other doors with step access, and
- All doors usable if wayside lift not used.

The accessible door (usually the front door nearest the train operator) must be aligned with the wayside lifting device. Once aligned, the operator deploys the lift, the wheelchair passenger moves onto the lift, and the lift is raised to car-floor level. A bridge plate is extended from the lift to cross over the stepwell area on the car. The entire operation takes from 2 to 5 min. If the wayside lift is not used, the train is stopped just short of the lift so that all doors are usable by mobile passengers.

Lifts on Vehicle

Figure 3 shows the lifts on vehicles (LOV) on the San Diego light rail system. Pertinent accessibility elements include

- Street-level platform;
- High-floor (conventional) LRVs;
- Front-door mobility-impaired access; not usable by other patrons; and

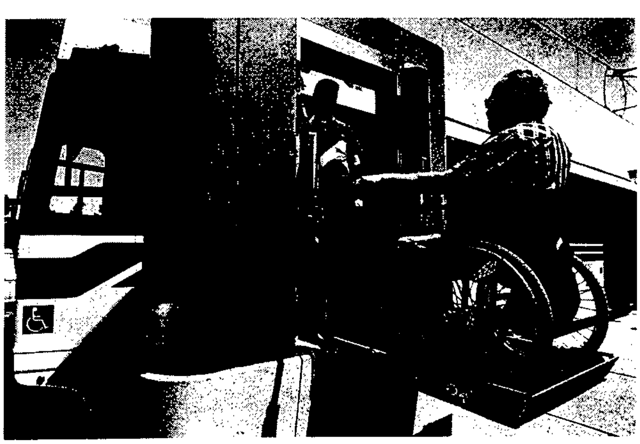

FIGURE 2 Wayside lift.

FIGURE 3 Lift on vehicle.

- Other doors with step access.

This alternative includes vehicles with special lifting devices installed in the front door. Current systems that use such lifts require dedicated doors for the lifts because of their placement when stored. The train operator positions the lift and assists the mobility-impaired rider onto the train. The operation takes approximately 3 min. (It may be possible, though unproven, to design an automatic lift that would not require a dedicated door.) For maximum flexibility in consist makeup, all four end doors require lifts; however, lifts on only one end (two lifts) may be used if the vehicles are always oriented with these lifts at the head of the train.

Minihigh Platforms

Figure 4 shows the minihigh platform on the Sacramento light rail system. This setup was considered the original basis for design of the Tasman Corridor Project. Pertinent accessibility elements include

- Street-level platform,
- High-floor (conventional) LRVs,
- High-level miniplatforms at single door location, and
- Other doors with step access.

At one location along the station platform, normally at the front door of the first car, a raised platform is built level with the car floor. (Space limitations normally prevent more than one minihigh platform on each platform). The train is always stopped with the front door at the minihigh platform. Access to the minihigh platform is via a ramp or a lift, independent of train op-

FIGURE 4 **Minihigh platform.**

eration. The train operator positions the accessible door adjacent to the minihigh platform and extends a bridge plate (from the car or from the platform) to span over the stepwell. The boarding operation takes approximately 1½ min.

Level Boarding

With level boarding, the vehicle floor height matches the platform height so that passengers can move directly in and out of the vehicles without changing their level—no steps, ramps, or lifts. Two groups of alternatives were considered that provide level boarding: one that employs conventional LRV design and high-level platforms [990 mm (39 in.) above top of rail], and one that uses a low-floor LRV design and platforms that would match [about 355 mm (14 in.) above top of rail]. Ramps are commonly used to reach the platform from an adjacent sidewalk.

High Platforms

High-Floor, Movable-Step Vehicles Figures 5 and 6 show the high-platform, movable steps (HPMS) on the San Francisco MUNI light rail system, in the raised and lowered positions. Pertinent accessibility elements include

- Full-length, high-level [990-mm (39-in.)] platform where practical,
- Street-level platforms where required, and
- High-floor (conventional) LRVs with movable steps.

With a movable step, the step can be placed in the raised position as an extension of the floor when stops are at high-level platforms and in the lowered or step position (for use with wayside lifts) when the stops are at street-level platforms.

High-Floor, No-Step Vehicles Figure 7 shows the high-platform, no-step (HPNS) vehicle on the Los Angeles light rail system. Pertinent accessibility elements include

- High-level [990 mm (39-in)] platforms, and
- High-floor (conventional) LRVs.

The car door design, track alignment, and load-leveling capabilities allow only a small gap between the car and the platform [76 mm (3 in.) horizontal, 15.9 mm ($^5/_8$ in.) vertical]. This design permits wheelchairs to roll on or off the vehicle without using a bridge plate.

Low Platforms

As mentioned, low-floor vehicles have floor levels that are about 355 mm (14 in.) above the top of rail. These

FIGURE 5 **High platform, movable steps; steps in raised position.**

FIGURE 6 **High platform, movable steps; steps in lowered position.**

FIGURE 7 **High platform, no steps.**

vehicles can be manufactured in three alternative configurations:

- LFV30: Separation of a conventional, single-articulated high-floor vehicle and addition of a special low-floor section and a conventional truck, resulting in a double-articulated vehicle with up to 30 percent of the vehicle having a low-level floor;
- LFV70: Design of the nonpowered center truck so that the center portion of the car between end trucks can be lowered, resulting in up to 70 percent of the vehicle having a low-level floor; and
- LFV100: Design of the center and end trucks so that the entire interior floor area is at a low level.

Figure 8 shows a side view of these three types of vehicles. All three configurations have been employed in various locations in Europe, and Portland and Boston have ordered LFV70-type vehicles.

Vehicles with Low Floor at Center

Pertinent accessibility elements for LFV30 vehicles include

- Low [355-mm (14-in.)] platform,
- Vehicles with low-floor center sections (up to 30 percent) of floor space),
- Level boarding at center doors, and
- Steps between center section and end sections.

The LFV30 alternative allows the option of raising only a portion of the platform adjacent to the center doors.

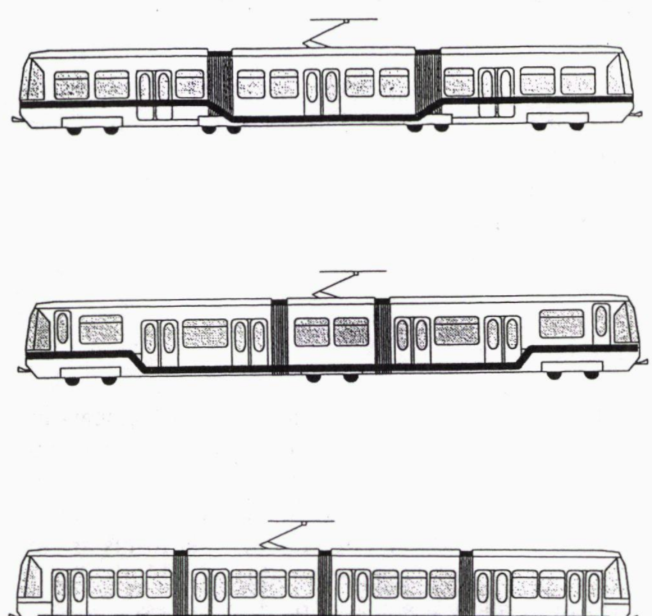

FIGURE 8 **Three types of low-floor LRVs:** ***top*****, LFV30;** ***middle*****, LFV70;** ***bottom*****, LFV100.**

Low-Floor, Conventional-End-Truck Vehicles

Pertinent accessibility elements for LFV70 vehicles include

- Low [355-mm (14-in.)] platform,
- Vehicles with low floors between end trucks (70 percent low floor),
- Level boarding through all doors, and
- Interior steps at each end of each car.

The LFV70 alternative provides level boarding at all doors using a low floor between high-floor end trucks, which are accessed via interior steps.

Completely Low-Floor Vehicles Pertinent accessibility elements for LFV100 vehicles include

- Low [355-mm (14-in.)] platform,
- Vehicles with low floors end to end (100 percent low floor), and
- Level boarding at all doors.

The LFV100 alternative provides level boarding at all doors.

Evaluation of Alternatives

Evaluation Criteria

TA considered a number of factors in evaluating the alternatives. These factors were consolidated into five criteria:

1. Compliance with ADA,
2. Impacts on Guadalupe Corridor and future extensions,
3. Costs,
4. Community impact, and
5. Potential risks.

Compliance with ADA

All the alternatives comply with ADA requirements for vehicle accessibility and vehicle/station interface, but some provide easier access than others.

The number of accessible doors varies for each alternative. If wayside lifts or minihigh platforms are incorporated, the vehicle must be aligned with the lift or platform to allow a single door to be accessible. Multiple stopping or multiple lifts/minihigh platforms would be required to access other doors or other vehicles. The vehicle-lift alternative would provide access to the front door of each vehicle at each stop; however, the operator would have to leave the train to operate the lift on other than the first vehicle. The full-length high-platform alternative and two low-floor-vehicle alternatives enable every door on the vehicle to be accessible. LFV30 vehicles have only center doors accessible.

As developed for this evaluation, the LFV70 and LFV100 alternatives would result in a mixed fleet of vehicle types (existing high-floor and new low-floor). The existing type of vehicle would not be accessible by the mobility-impaired. Furthermore, enough new vehicles must be purchased to have at least one new vehicle on every train. This requires more new vehicles than would otherwise be needed to fill out the fleet requirements.

Double/multiple stopping is an undesirable means for complying with the ADA. It involves stopping each vehicle in the train at the station's single boarding device (e.g., wayside lift or minihigh platform). As with the vehicle-lift alternative, the operator would have to leave the cab in order to operate the boarding device at the second and third vehicles, which would result in substantial delays. In addition, double/multiple stopping would not be feasible at many intersections because the first vehicle would block cross traffic.

The ADA requires each level-change accessible vehicle to have at least two wheelchair positions. There has been some debate on whether installing four or six wheelchair positions in the first vehicle of a two- or three-vehicle train would meet ADA requirements without making it necessary to double/multiple stop. However, one interpretation is that limiting riders in wheelchairs to the front vehicle of a train would constitute segregation, which is prohibited. In any event, further research by the TA has indicated that it is not feasible to modify the existing vehicles to accommodate four or six wheelchair positions, since it would remove at least 12 seats per vehicle and would allow little room in the vehicle for maneuvering.

Impacts on Guadalupe Corridor and Future Extensions

Interface

Compatibility with the existing Guadalupe Corridor Line is a major factor in evaluating vehicle accessibility for the Tasman Corridor Project. Most of the existing platforms are 140 mm ($5\frac{1}{2}$ in.) above top of rail. All of the alternatives would allow vehicles to serve passenger stations on both lines, except for HPNS vehicles, which would not be compatible.

Operating with separate fleets and separate lines is considered unacceptable by the TA because of the loss of flexibility in both operations and maintenance. Consequently, the HPNS vehicle alternative would require converting the existing Guadalupe Corridor stations as well. And even though the low-floor vehicle alternatives would allow level boarding at the Tasman Corridor stations with level-change boarding at the Guadalupe Corridor stations (like the HPMS alternative), it has been assumed that the Guadalupe Corridor station platforms would be raised to 355 mm (14 in.) to provide level boarding on both lines.

Operations

A significant disadvantage of the wayside or vehicle lifts is the time it takes for wheelchair passengers to board and deboard the train: 2 to 5 min for either operation. This can severely affect headway and make it difficult to maintain schedules. Apart from mobility-impaired boarding, ordinary passenger boarding and deboarding times are approximately three times longer for step-entry vehicles than for level boarding. As a result, any level boarding alternative would improve service for the entire riding public.

The alternatives also vary in how much they would affect operations due to possible restrictions in the makeup of train consists. Currently, any Guadalupe vehicle can be coupled with any other vehicle to form a revenue service train of up to three cars. The LFV70 and LFV100 alternatives would result in a fleet with two different types of vehicles. The LFV30 alternative would result in a basic vehicle unit that is 50 percent larger than the existing vehicles, which would be oversized for off-peak operations when it is desirable to operate the minimum capacity to reduce energy costs.

Wayside clearance requirements are of concern because a portion of the Tasman Corridor Line and future extensions will be shared with freight trains. All the level-boarding platform configurations encroach on the required freight train clearance envelope. To allow shared light rail and freight operations, the track arrangement must be configured to allow greater clearance for the freight operation (e.g., addition of a gauntlet track).

Use of Existing Fleet

The LFV70 and LFV100 alternatives assume that the existing Guadalupe Corridor vehicles could operate on the Tasman Corridor Line even though they would not be accessible to mobility-impaired riders. In these alternatives, multiple-car trains could include both new low-floor vehicles and existing Guadalupe Corridor vehicles, but the existing vehicles could not be operated individually. The LFV30 alternative would involve modification of the existing fleet to create fully accessible vehicles.

For the high-platform alternatives, the existing vehicles would be made compatible with high platforms by covering the stepwells or adding movable steps and by converting to sliding doors. For the LOV alternative, lifts would be added to give the existing fleet the same accessibility as new vehicles. The WSL alternative would not require any modifications to the existing fleet.

Costs

The capital cost elements unique to implementing each alternative have been estimated, including both platform and vehicle costs, plus any related costs that differ for any alternative (e.g., maintenance facility modifications for LFV30). Table 2 gives costs for each alternative.

Operations and maintenance costs will also vary with each alternative because of costs associated with requirements such as lift maintenance, added maintenance of low-floor vehicles, and additional train operations (required if run times are increased). However, with respect to the overall light rail operations and maintenance budget, the variations in operations and maintenance costs among alternatives would not be significant.

TABLE 2 Summary of Capital Costs by Alternative

		Costs ($ Millions)		
Ref.	Alternative	Tasman Corridor	Guadalupe Corridor	Total
WSL	Wayside Lifts	67	0	67
LOV	Lifts on Vehicles	70	0	70
MHP	Mini-High Platforms	69	0	69
HPMS	High Platforms, Movable Steps	89	0	89
HPNS	High Platforms, No Steps	77	19	96
LFV30	Low-Floor Vehicles (30% Low)	91	12	103
LFV70	Low-Floor Vehicles (70% Low)	119	12	131
LFV100	Low-Floor Vehicles (100% Low)	140	12	152

Community Impact

Although wayside lifts, minihigh platforms, and low platforms for low-floor vehicles would all have some aesthetic effect, the high-platform alternatives would have the most significant impact. The LOV alternative, by eliminating the need for wayside lifts, would be the least obtrusive of all alternatives.

Impacts associated with the construction were considered to be limited to the station modifications required on the Guadalupe Corridor for the level-boarding alternatives. A variety of methods are available for performing the construction under revenue service, most of them involving operation of "bus bridges" around stations being modified. It was assumed that the effect of any additional construction required on the Tasman Corridor Project would be insignificant considering the other construction work required to complete the new line.

On light rail systems with minihigh platforms, some congestion problems have occurred at accessible doors. The single vehicle door is used not only by wheelchair passengers, but also by people with strollers and other mobility-impaired riders. A similar problem could arise with the LFV30 alternative where a single door is available for level boarding.

Risks

Risks and uncertainties in each alternative could threaten the goal of completing the Tasman Corridor Project on schedule and within budget. The risks associated with wayside and vehicle lifts, minihigh platforms, and high platforms are more user-related (as opposed to technical and procurement issues) and can be summarized as follows:

- Would user advocates accept wayside or vehicle lifts or minihigh platforms?
- Could wayside lifts or minihigh platforms be implemented without requiring double/multiple stopping? If not, is there a way to eliminate or minimize the operational and safety effects of double/multiple stopping?
- Could full-length high-platform stations be implemented without strong public opposition?

Reliability is an additional concern with level-change devices and in particular with automatic vehicle-mounted lifts. If the lift should fail during operation, the vehicle would be out of service.

Risks associated with the partial low-floor-vehicle alternatives are related to technology, procurement, and liability and could ultimately affect cost and schedule. The development of 100 percent low-floor vehicles is preliminary in nature and may therefore pose risks that cannot be known at this time. Partial low-floor vehicles are common in Europe, are being considered in Chicago and New Jersey, and have been ordered for Portland and Boston.

There is also a risk of limited competition among car builders for the initial procurement. Also, since no standard low-floor vehicle has emerged, there will be the associated future risk of limited competition when future, compatible vehicles are to be purchased.

A liability risk may also be introduced with partial low-floor vehicles, related to the interior steps at each end of the low-floor section leading to high-level end compartments. Any interior steps pose a potential hazard to passengers, especially when the vehicle is accelerating or decelerating.

ALTERNATIVE SELECTED

Initial Evaluation

In initiating the final design for the Tasman Corridor Project, the TA evaluated the aforementioned factors with a view to selecting the most suitable alternative for implementation. Of the eight alternatives investigated, only three were considered possible candidates:

1. High platform with a full high-floor vehicle (HPNS),
2. Low platform with a 30 percent low-floor vehicle (LFV30), and
3. Low platform with a 70 percent low-floor vehicle (LFV70).

Table 3 presents a detailed comparison of the three candidates; the rationale for disqualifying the other candidates is given in Table 4.

After considering all the technical, operational, and cost factors, the TA selected the HPNS alternative as the best solution. The advantages that were considered especially important are as follows:

- Uses proven technology already in use in other North American cities;
- Meets all ADA requirements without qualification and provides universal level boarding, which would speed the boarding of all passengers;
- Costs the least of the three alternatives;
- Provides the shortest station dwell times and therefore the fastest run times;
- Reduces the need for new cars and permits flexibility in equipment assignments by modifying the 50 existing cars to the required configuration; and

TABLE 3 Comparison of Top Alternatives

Alt.	Cost* ($M)	ADA Compliance	Impact on Guadalupe and Extensions	Urban Impact	Risks
High Platform, No Steps	96	Full	Rebuild Guad($19M), marginally higher extension costs	Negative	Urban impact; Constructibility
30% Low Floor	103	Full	Rebuild Guad($12M), marginally higher extension costs	Improved	Vehicle reconstruction
70% Low	131	Issue with existing cars	Rebuild Guad($12M), marginally higher extension costs	Improved	Vehicle development

*Includes costs of modifying Guadalupe Corridor stations, shown in fourth column.

• Requires no additional modifications to the maintenance facility.

This alternative assumes that the Guadalupe Corridor stations would also be modified to include high platforms at an estimated cost of $19 million. This modification is complex and would take considerable time.

The low-floor vehicle configurations were not recommended. While feasible, any decision to adopt low-floor vehicles was not considered a risk-free or impact-free solution.

The LFV30 alternative would meet ADA mobility-impaired access requirements without qualification and would also provide speedier boarding of mobility-impaired passengers at some of the doors. However, its disadvantages were considered to be as follows:

• Costs more than the recommended configuration;
• Requires modifying vehicles, making them more difficult to maintain;
• Results in 50 percent larger vehicles, which are inefficient in off-peak periods;
• Has no present market for three-section articulated vehicles;
• Requires maintenance shop modifications to accommodate longer cars;
• Forces inconsistent passenger interface between different vehicle types; and
• Poses potential falling hazard due to steps within the vehicle aisle.

The 70 percent low-floor vehicle uses conventional running gear, but the articulation area poses a special technical challenge to achieve necessary stability and load-leveling functionality. The LFV70 alternative was considered to have the following disadvantages:

• Costs much more than the recommended configuration;
• Requires development of workable designs to meet U.S. standards for crashworthiness and flammability of materials;
• Requires additional vehicles to operate mixed train consists;

TABLE 4 Basis of Alternative Elimination

Alternative	Rationale for Elimination
Wayside Lifts (WSL)	Causes delays, general ridership does not benefit, requirement for multiple stopping to meet ADA is unacceptable.
Lifts on Vehicles (LOV)	Causes delays, general ridership does not benefit, operator assistance in use of lift undesirable, four doors on each car dedicated to lifts.
Mini-High Platforms(MHP)	General ridership does not benefit, requirements for multiple stopping to meet ADA is unacceptable.
High Platforms, Movable Steps (HPMS)	Provides inconsistent access on Tasman (level boarding) and Guadalupe (lifts), potential delays on Guadalupe, significant coordination of boarding on interline trains Tasman to Guadalupe.
100% Low-Floor Vehicles (LFV100)	Highest cost, highest technical risk, may not allow use of existing cars on Tasman.

- Provides level boarding only on the low-floor vehicles when operating a Guadalupe vehicle; and
- Poses potential falling hazard due to steps within the vehicle aisle.

Final Alternative Selection

In the process of final design of the Tasman Corridor Project, efforts to provide full compliance with the ADA requirements have continued. In February 1994 the TA staff recommended adoption of the HPNS alternative. Given the circumstances at the time, the high-platform recommendation was supported by the local Ad Hoc Committee on Transportation for the Mobility Impaired, the cities being served along the Tasman Corridor, and the Tasman Corridor Policy Oversight Committee. This support was given with the caveat that acceptable solutions be found to provide vehicle access in the downtown San Jose transit mall.

Several interrelated issues have recently prompted the TA staff to develop an alternative scope for the Tasman Corridor Project:

- The addition of financing costs to the project budget, which has increased the project cost to more than $600 million;
- The indication by the Federal Transit Administration (FTA) that less stringent requirements apply to the accessibility of existing vehicles on new lines;
- Continued opposition to the construction of high platforms in the San Jose transit mall; and
- The opportunity to defer the purchase of new LRVs, allowing time to evaluate in-service, low-floor vehicle technology in North America, particularly in Portland, Oregon.

Minimum-Cost Alternative

In response to these developments, a minimum-cost alternative was developed that provides a solution to both the budget and vehicle accessibility issues. This alternative best suits the existing budget, FTA guidance on ADA requirements, long-term accessibility goals, and concerns of the partner cities. It is summarized as follows:

- The Tasman Corridor stations would use 355-mm (14-in.) platforms to allow level boarding of future low-floor LRVs.
- No new vehicles would be purchased until subsequent system expansions.
- Temporary minihigh platforms would be included at all new Tasman stations to provide mobility-impaired access to the existing vehicles.
- The 50 existing vehicles would be modified so that the door operation does not conflict with the higher platforms, and movable stepwell covers would be added to allow access to the minihigh platforms.
- All platform modifications on the Guadalupe Corridor would be deferred until low-floor vehicles are purchased. At that time all Guadalupe Corridor platforms, including those in the San Jose transit mall, would be raised to 355 mm (14 in.).

The effects of the decision to adopt the minimum-cost alternative are summarized as follows:

- *Transit mall.* The San Jose transit mall is the area most sensitive to the impacts of station platform modifications. No changes are anticipated in the short term, but when new vehicles are placed in service, the boarding platform must be raised to 355 mm (14 in.) along with those in the other Guadalupe Corridor stations.
- *Mobility-impaired access.* In the short term, mobility-impaired access will be provided to the front door of the first vehicle on each train through the use of minihigh platforms on the new Tasman stations and the existing wayside lifts on the Guadalupe stations. When the new low-floor vehicles are purchased, these devices will be removed, and the Guadalupe stations will be raised to the 355-mm (14-in.) height.
- *Operations.* Planned Tasman/Guadalupe service levels will be somewhat reduced with the minimum-cost alternative. Several possible operating plans, supportable with the existing 50-vehicle fleet, have been identified, some of them involving shuttle service on some links, with transfers between the Guadalupe and Tasman corridors.

What Is Next?

In March 1995 the Santa Clara County Transportation Agency Board of Directors approved the minimum-cost alternative, and low-platform station design is proceeding on that basis. Final design is nearly completed, but local construction funding for the Tasman Project is still dependent on a forthcoming ruling by the state Supreme Court, which court is currently considering the validity of Measure A, a half-cent local sales tax passed by a majority (54 percent) of Santa Clara County voters in November 1992.