Evolving Vintage Trolley Projects

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Ten years ago, on May 29, 1982, the Municipality of Metropolitan Seattle began operations of the Waterfront Streetcar. Arguably the prototype for the vintage trolley lines that have followed, Seattle's pioneering installation has been one of the most successful. During the past decade vintage trolley lines have become important transportation elements in several cities and are being considered in many others. Some key lessons have been learned from professional experience in planning, implementing, and operating vintage trolley services. Systems in San Jose, Denver, Memphis, and Orlando, where the author has been closely involved, are highlighted here. In reviewing various existing and planned lines, it will be obvious that not all desirable features will be met in every case. Happily, vintage trolleys can succeed given a wide range of physical and operating conditions. However, in assessing the likelihood of success of a given proposal, it appears that the closer the line can come to meeting the ideals outlined here, the more chance of its community acceptance and a long-term role within the community.

To a large extent, the current vintage trolley movement can be traced to the advent of trolley museums, which have preserved examples of this colorful mode of transportation since the late 1930s. However, a vintage trolley property differs significantly from a museum and it is critical that vintage trolley proponents and trolley museum members understand this difference. First, the vintage trolley operates to provide transportation to the general public. It usually operates 7 days a week, adheres to a published schedule, and relies on a full set of policies and procedures. Thus the service must be reliable and dependable. In effect it functions like any other public transit mode except that it uses an unusual and colorful variety of technology. Trolley museum operations, by contrast, tend to be relatively relaxed as to schedules, which are often confined to weekends.

A vintage trolley must often operate in a crowded downtown, sharing streets with automobiles and pedestrians alike, whereas the typical trolley museum operates on its own right-of-way in a suburban or rural environment. The museum labor force is composed of volunteers whose interest in the equipment is that of true hobbyists. By contrast, vintage trolleys are usually operated by transit system employees who, although fully qualified for their work, do not necessarily have the affection and care for the equipment that a typical museum member does.

The vintage trolley line must serve as an accommodation to the entire public, which leads to differences in liability exposure and care for the handicapped when compared to the typical museum operation.

Finally, museums tend to restore equipment as museum pieces. This often means that a given car will have its own particularities that, although they may be fully understood by museum personnel, would render such a vehicle unacceptable to the typical vintage trolley operator who must insist on a reliable and dependable vehicle. The nature of the service also means that the meticulous and painstaking restoration of a museum piece is somewhat inappropriate to the operating conditions of a vintage trolley for which easy maintainability and resistance to the ravages of rugged use are more important.

In summary, the philosophy of a vintage trolley operation—a full-fledged transportation mode for an urban area—is significantly different from the philosophy of a museum installation. To attempt to operate a vintage trolley service under the philosophy of a museum would almost certainly result in a service that, in the end, would disappoint the majority of the community.

TRANSIT FUNCTION

A vintage trolley must serve a legitimate transportation function. This function can range from that of a shuttle within the central business district (CBD) to a connection between parking and retail or amusement areas to serving a sports venue, but in any event the system must provide mobility for users. The ride should be a means of getting from Point A to Point B and back and not exclusively an amusement ride.

Nonetheless, much of the attraction of a vintage trolley ride is in the ride itself. In some cases, this means that people will take a ride on the trolley just for the experience of riding a historical or "old-time" vehicle. However, this kind of ridership is not strongly repetitive. A family that takes a ride on the trolley just for the experience will not repeat that ride as often as if the same trip linked a parking lot to a major attraction that the family could enjoy regularly. Thus several of the existing vintage trolley operations are actively seeking to extend their lines to tap potential trip generators to increase their ridership. Furthermore, some vintage trolley lines have had severe difficulties because their routes were not sufficient to provide a useful transportation link within the communities served.

COMMUNITY SUPPORT

Obviously a vintage trolley project cannot be implemented nor can it succeed without strong community support and backing. Yet in the frantic efforts to get the line built and keep it going on a day-to-day basis, several systems have neglected to continuously cultivate the community support so vital to ongoing success. This has meant that ridership has

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slipped as has financial support. By contrast, in communities that have actively sought a widespread basis of involvement, the support for the vintage trolley has helped the system to become a significant local attraction. The New Orleans St. Charles Line and San Francisco cable cars epitomize how community support can make a system into an icon of the community.

FUNDING

Strong, widespread community support and the recognition of the system as a transportation provider is needed for an adequate funding base that covers both operating and capital costs. Although it is true that some systems have functioned for several years on a "shoestring" budget, the more successful examples have managed to achieve permanent and ongoing funding sources that allow them to provide a high level of quality service.

Funding has typically been from a combination of public and private sources. Perhaps uniquely among fixed-guideway transit projects, vintage trolleys have attracted significant private participation for both capital and operating costs. Examples include the following:

- In San Jose and Memphis, vehicles have been wholly or partially funded by local corporations. Typically, this takes the form of an outright cash grant to the vintage trolley sponsoring organization. The grant is dedicated to a particular car. Acknowledgment of the donor appears on print material and a plaque on the car. Sponsorship of vehicles is probably the easiest way to attract large chunks of private investment, because the money yields a very tangible and visible product.
- The Kelley Park Facility in San Jose (where cars have been restored) was funded partially by donations of time and materials from local contractors and suppliers.
- In Galveston, it was the guarantee that operating deficits would be covered by a private organization for a multiyear period that was critical to implementation of the project.
- Close relations with served attractions—and an appreciation of the value of the Platte Valley Trolley's contribution to patronage—has brought operating assistance from several popular entities in the Denver area for the past 4 years. Similarly, car card advertising for restaurants, bars, and shops along the line is a salable—or tradable—commodity.

Public funding is somewhat more conventional in nature. In most systems the local transit system has been a participant at some level. This may be as basic as in San Jose, where the physical plant for the vintage trolley is the Guadalupe Corridor light rail project, which was planned, engineered, and built by the Santa Clara County Transit District. (The fact that both the transit district's board chairman and general manager were founding directors of San Jose Historic Trolley, Inc., was fortuitous in this situation.) In a similar vein, the latest Portland vintage trolley operation uses the facilities of Tri-Met's MAX system. On the other hand, lines in Lowell, Galveston, and Dallas are operated independently of the local bus system; whereas in Seattle and Memphis the entire property is owned *and* operated by the local transit provider. In Denver, the Platte Valley Trolley has received annual contributions from the transit agency and operates in part on an old railroad right-of-way owned by the agency. In addition, after the Platte Valley Trolley purchased the original portion of its trackage from the Burlington Northern, it was able to sell its interest to the transit agency for potential future use and in return received a guaranteed contribution for the next 5 years. There are undoubtedly other possible mechanisms, but the point is that the local transit system can often play a role in vintage trolley implementation.

ORGANIZATION

The previous sections lead to the inescapable conclusion that a vintage trolley operation must be organized in a businesslike manner. In terms of organizational structure, a great deal of variety is represented by the more successful systems in operation. Most such lines feature a partnership between public and private interests, an arrangement that tends to maximize support, increase potential funding, and reinforce strong ties to community constituencies, such as the preservationists and downtown neighborhoods.

Operations and maintenance functions must be crisply run. In some cases the degree of volunteer participation is an issue. Most operations have some or all paid staff. However in many cases volunteers are also encouraged to participate, the relative proportion ranging widely among properties. To the extent consensus exists, it would appear desirable that management personnel and operators plus one or two key maintenance personnel be paid staff and volunteers serve primarily as tour guides, conductors, and restoration assistants for vehicles. It should be noted, however, that there is sufficient variety in the specific employment arrangements of the various systems and those under construction to render this judgment no more than a gross generalization. The relationship between paid and volunteer staff should be determined on a case-by-case basis and should consider such factors as these:

- Funding constraints,
- Relationships with local transit providers and their represented employees,
- Liability considerations, such as insurance coverage,
- Availability of personnel (volunteer staffing requires more people than paid staffing), and
- Size and scope of the operation.

It is axiomatic that safety is paramount in the operation. Most vintage trolleys have enviable safety records. This is the result of a combination of good training, including periodic refresher courses, well-defined policies and procedures, and competent staff. No compromise can be made in this important area.

As mentioned, many vintage trolley operations combine public and private representation so as to secure not only community support but also to tap various funding sources. Indeed, vintage trolley projects by their nature tend to be fertile grounds for public-private funding initiatives. Thus the organization structure should include the private sector, either in a direct board relationship or as part of an advisory committee or its equivalent. In several cases, the vehicles have been purchased or restored by private interests. In other cases,

the operational deficit is born in part or entirely by the private sector. Marketing tie-ins and promotions between retailers and vintage trolley operators are extremely common, indeed, de rigueur for well-run systems. Similarly the local transit agency and local historical preservation groups can provide strong support and helpful political constituencies.

In summary the organization to build and operate a vintage trolley system must be a businesslike organization whose operating code is safety first, closely followed by reliable and dependable service to the public. Whatever organizational model is adopted, a blending of private and public interests should be strongly considered to maximize the support of community constituencies and funding sources.

FITTING INTO THE COMMUNITY

A vintage trolley must fit into the community it serves, both in terms of the physical plant and the service it provides. In the case of the former, it is helpful if the line can be linked to a historical district or to an area whose theme is compatible with that of vintage trolleys. Mining the lode of nostalgia that exists in most communities is a serendipitous exercise for many vintage trolley operations, inasmuch as the historical preservationists can play a major role in implementing the project and can be a base of long-term support. As mentioned above, it is important to the life of the organization that it become part of the community it serves. This involves people who will interact with the community to educate its citizens to the value of the vintage trolley installation in providing customers, retailers, attendees to museums and entertainment venues, happy conventioneers, and so forth. Although the purpose of the ride must be transportation from one point to another, the experience itself should be memorable for the rider and promote the community of which the system has become an integral part.

The degree to which the vintage trolley project reaches out to the community and imaginatively promotes itself and attractively positions its service will be the measure of its adoption by the community as a civic symbol.

PHYSICAL PLANT

The "hardware" of the vintage trolley system is often the image created. Although it is true that the cars are the primary symbol of the system, considerations of the physical part of the system have been relegated to the last element in this paper to emphasize the criticality of other issues. Good-looking cars, smooth track, and nonintrusive overhead can enhance any vintage trolley project. However, they cannot by themselves turn a poorly conceived and inadequately funded project into a winner.

The past decade has not been without its share of lessons on how to physically assemble a high-quality vintage trolley project.

An important consideration in planning a vintage trolley is whether the community has or is planning to have a light rail transit (LRT) system. If such a system is contemplated, the physical parameters of that system will govern most of the engineering considerations applicable to the vintage trolley. For example, in San Jose the vintage trolley vehicles were configured to operate on the LRT system. This resulted in wheel profiles, voltage, and other design practices compatible with the LRT but that, in some cases, required modification to the vintage trolleys or application of modern appliances. Similarly where a vintage trolley line precedes potential LRT application, as in Memphis, it is prudent to design the physical plant to accommodate proposed LRT operation. Not only does such a practice permit the future joint use of facilities where appropriate, but it is also a more comfortable approach for the engineering consultants who will, in large part, design the physical plant. Finally such a practice allows the system to comply with the various codes and practices now in effect that have been implemented since the halcyon days of the old-time trolleys.

Notwithstanding all of this, instances may well exist where no LRT operation is contemplated (as, for example, smaller cities) or where the vintage trolley line's route need not be shared by LRT vehicles. In such cases, more traditional vintage trolley standards may be used, including tighter radii for curves.

Whether the vintage trolley line uses an LRT system, is intended as a precursor to LRT, or functions as a stand-alone system, it is important that system designers and engineers have a feel for vintage trolleys. Many aspects of vintage trolley design and construction were thoroughly understood years ago by track workers, linemen, and car repairmen with no more than a grade school education. Somehow in the intervening years much of this heritage has been forgotten, and despite high-powered computers, computer-aided design systems, and Ph.D.s to run them, matching the product of three-quarters of a century ago is often unattainable.

Track

Modern street railway track design is reasonably well understood by most qualified engineering firms. LRT practice may be used for either street trackage or private right-of-way trackage. The relative advantages of girder versus T-rail, wood versus concrete versus street ties, direct fixation, and so forth can and should be argued in the context of an individual community and with the background of the cost and the system versus the benefits sought in terms of aesthetics, noise, and community acceptance.

In some cities, the use of abandoned track has been put forward as a cost-saving advantage. This scenario states that simply scraping off the asphalt from Main Street to expose the long-buried streetcar track underneath will provide a ready-to-run roadbed at minimal cost. This concept is often a snare for several reasons. First, unless the tracks go where people want to go, any saving in track construction will be more than offset by diminished ridership and revenue. Second, when streetcars were abandoned, the rail on which they rode was often close to the end of its economic life. Decades of being buried under asphalt have not helped in terms of corrosion. Railbonds are usually completely gone and must be replaced, crossties may well be thoroughly rotted out, and public works projects such as sewer line replacements and other utility relocations may well have caused sections of track to be torn up. If streetcar or railroad track of relatively recent vintage

can be found along the desired route, and if the track can be put into reasonable shape at relatively low cost, it may be desirable to rehabilitate such track.

Overhead

The design and construction of an overhead wire system should be simple and easy. However, numerous examples exist around the country of both vintage trolley lines and LRT systems with overhead design that resulted in massive, ugly, and intrusive cobwebs of copper. Because of the strong need for community acceptance, it is very important to spend significant time in designing and building overhead that is as aesthetically pleasing as possible as well as being properly installed. Some potential design features for consideration include the following:

- Vintage trolley overhead can be integrated with existing street fixtures. It is both physically practical and historically correct to use line poles for more than one purpose. In some cases, joint use agreements have been negotiated that allow multifunctional use of line poles. Another possibility—equally authentic—is to anchor span wires directly to building fronts in downtown areas.
- Simple suspension, as opposed to catenary, is almost universally appropriate. This results in fewer visible wires. Where possible, various types of "masking" can be used to render even the single 4/0 copper wire nearly invisible. Trees are a commonly used method, as seen in San Jose and Memphis. Building fronts also provide a backdrop that masks the wire.
- Attractive and eye-catching line pole bases and bracket arms can help to enhance the feel of the streetscape. Fortunately a wide variety of appropriate pole bases is available.

Vehicles

Basically three vehicle choices exist for vintage trolley systems. The first, a restoration vehicle, is generally defined as one that actually ran in the city where the vintage trolley system is being built and that is restored to the condition in which it was once operated in that city. Such vehicles tend to be the "star of the show" within the local community. Excellent examples are Car 124 and its sister, Car 73, operating in San Jose. Both were restored over a period of several years using lots of tender loving care with a large dollop of seasoned trolley restoration skills furnished by an individual who is truly a master car builder. The advantage of the restored car—if a suitable candidate can be found—is that it truly is part of the heritage of the community it serves. The disadvantage is the length of time required for restoration and the difficulty in finding the car to be restored. In terms of costs, this option is often the least expensive in dollars, although if restoration labor is not volunteer any cost advantage can quickly disappear. It is possible that as a landmark such a car could be exempt from Americans with Disabilities Act (ADA) requirements, assuming such an exemption is politically acceptable locally.

The second vehicle option, rehabilitation, is commonly used and examples are found in the majority of vintage trolley systems. Typically a streetcar from another nation is purchased and required modifications are made to adapt it to its new home. Melbourne, Australia, and Oporto, Portugal, have furnished many cars for U.S. vintage trolley projects. The advantage of this option is that the cars are usually close to reasonably operable condition (if one is extremely careful in selecting the vehicle to be purchased) and the cost of rehabilitation is usually relatively low. On the other hand, if extensive modifications are required to meet local conditions, the cost can escalate quickly. Further the vehicles are, in most cases, several decades old and thus may quickly become maintenance nightmares unless they are fully rehabilitated. The low first cost of the rehabilitated car may turn into a high lifecycle cost as the car ages and various problems come to light. Wood-bodied cars are particularly notorious in this respect. A further consideration to this option is the degree to which the car can readily be adapted to handle ADA requirements. Although there are no absolutes as yet in terms of ADA regulations for vintage trolley operations, it is reasonable to assume that all such vehicles will be required to be fully accessible either by regulation or through local political pressure (with a possible exception of restored cars, which fall under the historical exemption clause of the act). One can easily envision the difficulty in engineering appropriate modifications to a single-truck wooden car to enable it to handle powered wheelchairs and their occupants adequately. A final consideration when considering rehabilitation as a vehicle option is the availability of suitable equipment. The fleet of good Melbourne W2 cars is largely exhausted and many of the remaining Portuguese vehicles are in extremely poor condition. Cars from other cities such as Milan and St. Petersburg (Leningrad) may become available in the future but, as has been mentioned, the operating constraints of these vehicles (single-ended cars in Milan, for example) may make them unsuitable for some installations.

The third vehicle option is that of mounting a new, replica body on rehabilitated trucks and electrical gear. Because of safety, engineering, and conformance to modern design practices, this option is becoming preferred. It is, however, also the most expensive although such vehicles are typically one-third the cost of a new light rail vehicle. The vehicles that have been delivered to date grace the rails in Portland, Lowell, Denver, Galveston, and Mason City, Iowa. Experience with these vehicles, such as the car in Denver, has shown them to be extremely reliable with minimal maintenance requirements. The advantages of this option also include the known contract price at award, the relatively fast delivery, and the provision of warranties on the car body and major components as well as reliability and conformance to modern design codes and practices. The drawback is that these advantages are purchased at a price.

Maintenance Facility

The maintenance facility for the vintage trolley system is often relegated to a minor position in the design and construction process. This is unfortunate because not only is the system's reliability and dependability in part a function of the design of the maintenance facility, but the facility itself can become an attraction. The proliferation of light rail maintenance fa-

cilities in the past decade has generally led to an appreciation of the design elements of such a building. Although certain functional requirements for vintage trolleys are particular to that vehicle and must be carefully considered by the shop designer, the basic layout and tool list is fairly straightforward and several experienced design firms can handle this work adequately.

A few vintage trolley systems have considered the shop facility as an attraction in itself. This concept probably originated with the restoration of the San Francisco Municipal Railway's cable car barns with the attendant provision of balconies, lighting, and so forth, to allow tourists to witness the operation of the cable driving mechanism. In San Jose, the shop at Kelley Park was designed to permit viewers to watch cars under restoration. Memphis will have similar provisions, and designs for Denver are incorporating this feature. Detroit's barn features glass swing panels. The process can become an educational one when accompanied by appropriate lectures and so forth. Such an arrangement allows a small shop to be provided for sale of incidental merchandise having a connection with the vintage trolley system. It should also be noted that several museums, notably the Trolley Museum in Baltimore, have taken the "visitor center" design element and made it a very attractive part of the overall system. Such an option should strongly be considered when designing the maintenance facility for any modern vintage trolley installation.

CONCLUSION

The vintage trolley movement has gained ground rapidly during the past decade. Originally positioned by many transportation professionals as an amusement park gimmick, vintage trolley service has gradually gained respect as a transportation mode to assist communities in meeting certain specialized mobility requirements in a manner that brings fun and excitement to the process of moving about. Such systems are not confined to any one geographic area or to large cities. Indeed, actual examples and planned installations can be found in communities of 50,000 as well as in cities of well over 1 million population. It is important to apply sound transportation principles and good engineering and design practices in implementing such systems, rather than to simply let them be "cute" interpretations of civic nostalgia. Properly done, vintage trolleys have been extremely successful. With the knowledge gained from a decade of growth, new systems can look forward to similar results.