Red Rose Transit Authority

City of Lancaster Streetcar Feasibility Report

Final Report

February 2006

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A Streetcar for Lancaster

Introduction

The Red Rose Transit Authority retained Stone Consulting & Design, Inc. to explore the feasibility of establishing a heritage streetcar route within downtown Lancaster. This report describes the potential operation, explores the various factual and cost issues and suggests actions that should be accomplished in order to successfully demonstrate the possible advantages of trolley operations in Lancaster.

The Transit Authority and its Streetcar Steering Committee has laid out the following goals for such a project:

- Improve transportation and connectivity between downtown Lancaster and the Amtrak station for both residents and visitors.
- Develop an identifiable icon for the community.
- Provide property and economic developers with sense of progressive permanence to encourage private investments throughout the downtown zone.
- Develop a heritage attraction that will attract more of the 5,000,000 yearly Lancaster County tourists to downtown and circulate them through the city without developing additional traffic.

There are now over twenty heritage streetcar operations across the country. They range from part-time one mile lines in Fort Smith, Arkansas to 12 mile systems in San Francisco handling over 25,000 riders each day. The operations in Memphis, Portland, Kenosha and Little Rock have spurred multi-millions of primarily privately-funded new and restorative development along the corridors they serve.

The focus on a corridor between downtown and the Amtrak station led to a number of alternatives being reviewed. The layout of Lancaster with its one way streets

automatically leads to a loop type layout. The distance of a basic loop would result in 2.3 miles of track.

Background

It helps to understand why this is being investigated by looking at what is happening across the country. There are currently 27 streetcar operations across the United States and Canada. Thirteen of these provide transit functions in addition to their tourism appeal. All are a mix of transit and tourism and consider themselves part of the integral structure of their communities.

The original heritage streetcar is the New Orleans St. Charles Street Line. A transit operation since 1830, it was last rebuilt with new equipment in 1927. By the 1960's, it was considered part of the historic fabric of the community and was not replaceable. Unlike most cities, New Orleans never shut down their system and it has expanded from the original survivor lines. Even after Hurricane Katrina, one of the first infrastructure systems to be repaired as evidence that the system was up and running was the streetcar system.

Other communities followed New Orleans' example to give their business districts a greater sense of identity. Seattle, Portland, Memphis and Lowell Massachusetts all built heritage lines to add character to their communities. San Francisco's biggest transit success is not the cable cars, but the F Line heritage streetcar on Market Street which handles over 25,000 riders each day. Riders in each of these cities regularly let air-conditioned comfortable buses pass so that they can ride the streetcar instead.

Why is it that riders prefer this vintage-style equipment? Several years ago, Seattle rebuilt its Waterfront streetcar line. They substituted a rubber tired trolley look-alike bus on the same route with the same schedule and fares. Ridership immediately dropped by 40%. Eight months later, the rebuilt and expanded streetcar went back into service and ridership immediately jumped that same 40%. The only difference in service was a real heritage experience versus a transportation experience. Consumers did notice the difference and respond. With the possible exception of equipment such as London-style double-decker busses, consumers simply don't seem to have the same passion for the equipment as on the heritage streetcar services.

Economic Development Potential & Other Historic Trolley Projects

Many communities are looking at the possibility of initiating an historic trolley project to promote tourism and economic development for their downtown.

In the beginning of the 20th Century, the classic American suburb was created not by the automobile, but by the expansion of the trolley lines away from the center city. Metropolitan areas such as Los Angeles were not initially defined as much by the highway system as where the electric and interurban systems were built. Development

followed the tracks, and in many cases, developers purchased large land parcels with the direct intent of adding them to developing adjacent electric railway services. Small amusement parks, city recreation areas, and 'destination stops' all grew up around electric streetcar services. Privately-owned electric rail systems often built their own parks and destinations simply to increase their ridership.

As we contacted communities that had instituted historic trolley systems today, we learned that some of them had done a better job than others of tracking the economic benefits of their projects, some have not kept any economic development data while other communities have very carefully kept track of the resulting development.

Kenosha, WI

In Kenosha, WI, the streetcar circulator system which connects the lakefront to the intermodal terminal and the Chicago Metra commuter rail station was completed in 2000. At that time, there was no development at the Lake Michigan waterfront; it was an industrial brownfield site waiting to be reclaimed. The historic AMC/Jeep manufacturing plant was demolished, leaving a vast area of the lakefront in ruins.

By 2002, a museum of natural history had been constructed and opened, the marina on the lake was thriving and numerous condominiums and townhouses had been constructed, or were being constructed, on the lakefront. Assessed valuation had increased by $50 million in three years. Kenosha is now looking at expanding their streetcar system with an additional proposed route to a second brownfield and residential redevelopment site in the community.

Figure 1 - Part of the Kenosha condominium redevelopment adjacent

Within a relatively small two-mile loop of track, Kenosha successfully connected the heavy-rail commuter train station (METRA) to downtown Chicago, an existing downtown commercial and business district, an intermodal bus/rail transportation center between transit lines and the streetcar, new residential districts, new museums, lakefront walking paths, a marina district, and a joint carbarn and streetcar museum/display. It has served as a leading model for the potential impacts of a small-community system.

Kenosha has achieved attention not just for the streetcar project itself, but for the relatively inexpensive construction/operation approach and the high ratio of community impact to project cost. By connecting undeveloped land to a commuter rail station, it established a highly-desired new residential zone that developed a practical, 'auto-free' transit connection between a condominium resident in Kenosha that wanted to work in

downtown Chicago. The streetcar project not only made this possible, but provided a fixed-path investment decision that produced commitment on the part of developers. Redevelopment has been dramatic, and rapid.

Galveston, TX

In Texas, Galveston has revitalized its historic district with a streetcar circulator project; they built track but no overhead wire and have been running a diesel-driven replica streetcar. The latest information we have is that there are plans to install overhead wire

Figure 2 – Galveston has seen a recommitment to "The Strand" area

to make the streetcar more authentic and reduce noise levels from the vehicle. The streetcar has encouraged development in Old Galveston along its route and the numerous shops along the route are doing very well. The vehicle itself is one of the few hybrid diesel/historic streetcar projects attempted, and while generally successful, has not been imitated elsewhere.

Dallas, TX

Downtown Dallas has the McKinney Street Trolley system, which has been operated as an all-volunteer (IRS 501c(3)) system for many years and is one of the most successful historic trolley operations in the country. The system currently operates four cars and has just acquired a fifth car from Fort Worth. They are also remodeling a car to use as a future dining car.

In 2002, the McKinney Avenue Transit Authority carried 81,311[1] passengers. Their group is funded in part by Dallas Area Rapid Transit, The Downtown Improvement District and The Uptown Property Improvement District. They recently reported that they have tracked $800 million in new development over the last five years.

Figure 3 - The retail environment prospers along McKinney Avenue

Their website at www.mata.org has additional information on service, project and financial results.

[1] Trolley Stop, Volume 14, Number 1, Summer 2003

Charlotte, NC

Charlotte, NC had begun operating on a former railroad track with a pull behind generator, using a single historic car owned by a local museum. The publicity and success of the heritage streetcar project led to a much larger light rail transit corridor project connecting downtown and outlying areas with an abandoned freight railroad right-of-way. The heritage streetcar corridor is already reacting to the transit opportunities of the new service. As of July 2004, investment value along the corridor was $400 million.

Figure 4 - Charlotte saw development even before the system was completed.

The light rail/historic streetcar dual-use corridor is currently out of service for major new project construction into the downtown area. Ridership had been above 250,000.

Lowell, MA

Lowell, MA has a streetcar route operated by the US Park Service using three replica trolleys constructed new by Gomaco Trolley Corporation. It currently serves primarily as a shuttle serving visitors to the various National Park Service museums within a one-mile distance from the visitors center.

Lowell has such unique system features as operating on conventional freight-railroad trackage in the street, an all-replica car fleet including two 90-seat open cars, 'stop and flag' rules across busy intersections, and simple folding ramp access for ADA patrons Planning is now underway to extend the line to the commuter rail station at one end and to the University at Lowell at the other providing true transit linkages.

Figure 5 - Lowell puts on a smiling face

New Orleans, LA

New Orleans, LA has the oldest continuously operating historic streetcar system in the country. New Orleans has constructed new replica streetcars in the style of the original cars used on their line. These cars were placed on the rebuilt Canal Street streetcar line which was reopened last year after being abandoned in 1964. They have just completed an environmental impact study for a proposed new line called the Desire Line. See www.regionaltransit.org/news/desire.

Hurricane Katrina impacts closed the entire system and damaged all of their new cars, but the original downtown line was rapidly reopened. New Orleans recognized that restoration of streetcar services was a priority to put the nation on notice that they were able to receive tourism benefits and circulate their residents again.

Memphis, TN

Memphis, which boasts one of the oldest historic streetcar projects, has not effectively tracked the economic and development impact of the system on the community. Their project was constructed in the early 90's and went into service in 1993. It was a very well done project with ornate trolley stations, decorative street pavers around the track, water fountains and a central station plaza. They initially purchased and rebuilt five streetcars, three from Melbourne and two from Portugal. In discussing the project with various members of their economic development community, we were told that the streetcar system has had very little influence on the economic well being of their downtown.

Figure 6 - Memphis Main Street

We visited the downtown in 1997, 2002 and again in 2003, observing a significant change during that six-year interval. Memphis has seen slower reaction than most communities to reap the benefits from its streetcar project. In 1997, almost five years after the project was completed, tangible evidence of redevelopment was finally evident in the downtown. We saw several historic buildings just starting to be renovated. The waterfront route had no new development other

than an arena in 1997.

By 2003, we found the downtown area surrounding the streetcar tracks to be vibrant. There were many shops and restaurants, condominiums had been built along the waterfront line and the renovation of many of the historic buildings was complete. A new line to the medical center has been constructed and Memphis has purchased five additional Melbourne cars which are currently being rehabilitated or have been completed.

Equally impressive is all of the development adjacent to the trolley lines. On Main Street, a great deal of commercial development is apparent along the tracks. Although there are still many vacant storefronts, there are also numerous rehabilitated historic buildings as well as significant new construction. Along the Riverfront Line, there are now significant numbers of new homes in evidence as well as a flurry of loft conversions underway in some truly incredible historic industrial buildings. The Memphis Center City Commission values the current building boom at over $2 billion dollars.

Other Developing Systems

Tampa has just completed its first streetcar project and is seeing an explosion of development along the route. The benefits have been so significant that they are moving up a project to extend the line further through the center city area. Tampa had $400 million in new development before streetcar construction was even completed. In 2005, Little Rock opened a double loop line connecting Little Rock with North Little Rock. Although open for only a year, already measurable differences in patronage have been seen in the downtown businesses. Other cities that have either looked at, or are in development of, historic streetcar projects include Oklahoma City, Sioux City, St. Paul, Minneapolis, Madison, Colorado Springs, Petaluma, Savannah, St. Joseph, Issaquah, El Paso and San Antonio to mention just a few.

Lancaster's Streetcar History

Lancaster was the center of a comprehensive and county-wide streetcar system. The Conestoga Transportation Company's 160 miles of track connected downtown with all of the major communities of the county. Service was comprehensive and frequent. The operations ran as often as every six minutes on the major routes and hourly even to distant points such as Coatesville, Elizabethtown and Ephrata. Connections were even made to Hershey and Reading. The ten Lancaster city routes were upgraded with new, more economical single truck cars in the late 1920's called Birneys

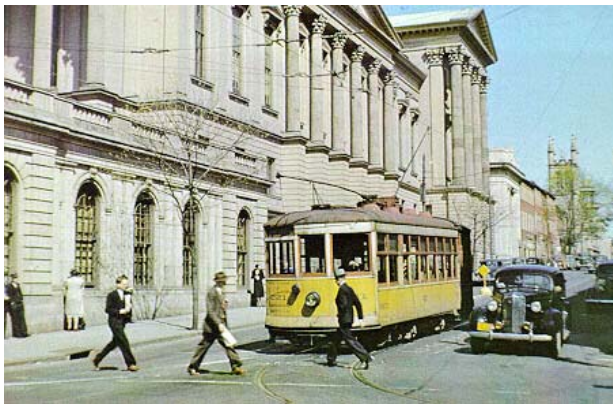


Figure 7 - Duke & King 1946

after their designer. While less costly to maintain and operate, these small, 4-wheel cars rode rough and were uncomfortable. New buses replaced the city lines starting in 1939. World War II forced the company to restore service on some streetcar lines, and as late as 1946 service to Ephrata and five city lines still existed, long after many other cities converted to buses. Service on the last line to the southeast of the city and Rocky Ridge Park ended in September 1947.

The Process

Red Rose Transit requested that this study be prepared in conjunction with a Steering Committee of key stakeholders in the community. This group met several times to discuss their views on various topics. They looked at Lancaster, the needs of downtown, received an orientation on heritage streetcars and their effects and discussed the relative advantages of various route and service options.

The study team from Stone Consulting interviewed numerous key people throughout the community. These interviews focused on the transit and tourism dynamics of both the downtown and its relationships out into the county. The Stone team looked for both similarities and differences of Lancaster to other communities where streetcars have been implemented.

Many successful community projects have featured a core system functionality that consists of a relatively small district that can be constructed with maximum community purpose and limited construction costs. This allows for fewer initial cars, lower budgets, tangible results in less time, and far lower operating costs. As a system proves itself within the community, it may be expanded accordingly. Determining a key core project, and its sustainability, was a primary goal of this report.

Streetcar Route Layout (or, where should it go and why?)

The network of north-south one-way streets in downtown Lancaster effectively defines the core system and actually works to its advantages. Today, streetcars are expected to work with surface traffic rather than to be an obstruction to it as they predated the automobile. Historic centerline alignments with two-way traffic on either side are not preferred today. Placing the trackage in a vehicular traffic lane with one-way traffic movement creates an effective one-way loop system without creating a barrier to existing street traffic.

A loop layout based upon existing one way streets resulted in looking at two primary alternates. The principal northbound street for a loop is Queen Street. The simplest return streets south are Duke or Prince Streets. Possibilities of connecting Franklin-Marshall College and/or the Armstrong complex were analyzed. A further discussion of the routing options will be found in The Market section below.

The streetcar track layout must be coordinated with the Pennsylvania Department of Transportation, who owns most of the streets being considered for the streetcar route, and with the City of Lancaster for their view of traffic issues and parking issues. Typically, streetcar tracks are built in the right most existing traffic lane. The loss of parking is minimized as the streetcar simply runs adjacent to the parking lane. At 'station' stops, the streetcar may divert to curbside, or the curbside may come out to meet the track.

The original streetcars in Lancaster had tracks laid in the middle of the streets on the current centerlines. As auto traffic increased, the safety hazard to passengers boarding and getting off of the streetcars became worse. Today, most new lines are built so that people can board from the curb. Where there is a parking lane, one or two parking spaces will be eliminated by bumping out the sidewalk and curb to the traffic/streetcar lane or by swinging the track in against the curb at car stops.

As streetcars move with existing vehicle traffic, no significant effect on traffic signals or timing is expected. If Prince Street is used as the southbound part of the loop, a traffic light pre-empt will be needed at Vine so that the streetcar traveling south in the right most lane could safely cross over traffic and make a left turn going east on Vine.

Streetcars have the ability to travel and accelerate with normal traffic flow, in much the same way as a city bus would. The electric propulsion motors can have strong torque and high power. Design and performance criteria of the cars will be matched to normal travel speed. Streetcar design in the 1930's created designs and technology that proved operations in the 40-mph range were sustainable, as long as large enough motors, robust control systems and supplemental braking systems were included. It is expected that the cars will have this performance potential, even if it is not necessarily used throughout the entire system.

What will it do for me?

For the Lancaster resident and worker, the system can serve some very utilitarian functions. While it may unquestionably be an 'attraction' and may spur online development leading to a more attractive city and a stable tax base for all, these issues do not necessarily benefit the average citizen on a daily basis.

Lancaster is a busy city with limited on-street parking and has heavy traffic during portions of the work day. Existing parking ramps are well patronized to the point of being to capacity at times, and 'islands' of economic well-being tend to spring up around them within easy walking distance. A few blocks away, businesses still find it difficult to survive without adequate parking and a long distance to a ramp. The streetcar allows the existing ramps to serve a much wider area, and decrease the need to re-park elsewhere to patronize a downtown business.

One of the key purposes of the streetcar can become the 'park it outside, and park it once' approach – where parking lots at some of the outer limits of the proposed loops

can serve multiple purposes yet well serve the entire downtown district. If a worker or resident has found a parking spot in a ramp, they can easily travel the entire downtown district without moving the car again during the day. This will increase mobility for the entire downtown without increasing traffic. Parking costs can decrease because high-value center down land is not being used for parking ramps.

Visitors can not only be encouraged to park at outlying lots – the streetcar will encourage them to park there simply to enjoy the streetcar experience. Tour groups and large busses that have reluctantly accepted the 'outlying parking' policy for busses concept are far more likely to embrace the streetcar as it can be 'sold' as part of the experience and turn a negative Lancaster perception into a positive sale. For the Lancaster resident and worker, this removes the sometimes lost and generally traffic-confused visitor from the downtown vehicle mix, and squarely addresses the issue of tour bus parking. The short and compact loop design encourages local riders and workers to use the service during lunch, and to gain access to special events at various downtown locations. Transit bus issues such as route numbers and schedules are obviously not a complication with a simple, fixed-loop design that travels in one direction only.

It is entirely possible that Lancaster may find a developing resident/transit niche where residents can effectively use a streetcar to connect to the Amtrak/Philadelphia heavy rail corridor, tap Philadelphia-area employment, and not use their personal vehicle on a daily basis. These kinds of home/transit/work linkages and investments are so significant as to be the driving forces behind new residential property development adjacent to the streetcar lines across the nation.

Track and Facilities

The track for a new streetcar would be considerably different in construction from the original tracks that were in Lancaster's streets. The use of continuously welded rail (CWR) will make the ride smoother and minimize long term maintenance. This CWR will be laid into a concrete base, which in most areas will result in a smoother pavement than the existing asphalt roadway. This concrete base results in a relatively thin slab construction.

This slab is generally no more than two feet thick and does not reach the existing water, sewer, gas, phone and other buried utility lines. An initial survey of the possible routes determined that minimal interference with manholes, gas and water utility in-street junction boxes will result. There are identifiable locations that may need coordination with the City Department of Public Works to construct offset manholes to accommodate the streetcar track alignment in the selected traffic lane If absolutely necessary, manholes can even be located between the running rails, as was done in one tight utility location in Kenosha.

Power and Safety

The Lancaster car would operate electrically by being powered with historically accurate overhead feed wiring. This is in keeping with the historical character and goals of the Downtown area. The visual impact will be minimal as the existing street lighting would be replaced with historic replica street light poles that will carry the bracket needed for the overhead contact electrical wire. That wire should be run at a desired minimum height of 16 feet above street level, and can be as high as 23 feet. The power supply wire itself consists of a single wire approximately 3/8" in diameter directly over the track center.

The existing pedestrian overpass on Queen Street has posted clearances at 14'-6". While the community intent is reportedly to remove this overpass, other historic streetcar systems have lowered the wire to clear specific problems to as low as 12'-6". This is currently in regular operation at two locations on the Memphis system – an expressway overpass and a hotel covered entranceway. It should be noted that this was on a restricted-access street with highly visible low-clearance and protection signs, and is not a recommended practice unless all other alternatives are exhausted.

Careful examination of many of the downtown buildings of Lancaster disclosed that the original overhead wire support brackets, referred to as 'span wire' brackets, remain in place today from the original downtown streetcar system. Wire may be supported on new poles, modified lighting poles, or even supported by these historic brackets on nearby buildings.

The power comes from the electric utility into a new, streetcar-only substation that can be delivered as a self-contained package with a small footprint. A substation is a combination of a transformer to change the voltage, a rectifier to change the current from commercial AC to DC, and a series of switches and breakers to safely provide the power out to the streetcar. The overhead wire is energized with 600 volts Direct Current (DC). These power lines are protected by circuit breakers similar to ground fault interrupters in a house. If the wire falls to the ground or is shorted out, it automatically trips the breaker and shuts off the power.

As the track will be used as the return ground path, care will be taken to assure solid grounds by the use of welded rail, welded-on jumper wires between track joints or other means as necessary. Assuring a good ground path is an important issue for any electrification. These procedures all but eliminate the possibility of gas or water line corrosion due to stray currents. Just as in a home or automotive ground, there are no safety risks involved.

Also investigated was a pre-electrification trailer/generator approach which can be an effective and relatively inexpensive approach to handling the immediate need to make equipment actually move without the higher initial capital expense of overhead wire. The Willamette Shore trolley (Portland, OR), Charlotte, NC, and also the Issaquah

trolley in Issaquah, WA have successfully used this approach. Charlotte is now in the process of putting in the overhead wire over the entire system.
The primary negatives to the use of the generator are engine noise and liability. The ambient noise level of a diesel generator (running at a constant speed and higher rpm) and sometimes exhaust noise and fumes can be considered to be objectionable, when the actual streetcar itself is very quiet. This tends to distract from the ambiance of the trolley experience. The selection, design, and performance of the portable generator can lessen, but not totally remove, this concern. A noisy or soot-producing diesel generator can create a poor public image and negatively impact the initial project. Both pulling and pushing a generator car/trailer can add to the liability issues of the operation by making it a longer vehicle and possibly having pedestrians in a blind spot created by the generator. Self-contained, under-floor generators located within the car require a custom-built or heavier car frame to support the weight and vibration, and as in the experience of Galveston, can dramatically increase the per-car cost.

Stops/Stations

The boarding stops, or stations, will be simple affairs. Small shelters, with some artistic icon to blend in with the neighborhoods, will provide protection from the wind and rain. These will be an improvement over the current bus stops that typically are just signed locations. Each stop will include clearly visible signage to help spot the locations, and to inform about the service. Stops may be as simple as a marked brick sidewalk with a bench (Kenosha), or as ornate as the unequalled central streetcar station at Memphis.

There are two ways to address ADA accessibility. Either the streetcar stops need a ramp to the car floor level, or each car will need an on-board wheelchair lift. Decisions on the economics of ADA approach are based on total number of cars and stops. A lower number of cars favor on-board lifts, a lower number of stops favor building of ramps. On-board lifts are very flexible for ad-hoc stops, but take time to deploy and load. Ramps can require sidewalk and curb space to implement, and restrict the number of possible stops. This access issue has been successfully confronted in every historic streetcar system in the nation with some dramatically different approaches – ranging from on-board folding aluminum ramps at Lowell to in-ground hydraulic elevators in Memphis.

Complex systems such as the in-ground, built-in hydraulic elevator systems at Memphis cannot be recommended due to the high cost, difficulty of maintenance, and the ability to inadvertently 'lock the system' by jamming an elevator into a car side, which SC&D staff have personally witnessed.

Mechanical

Electric Streetcars are not a new technology. They were first commercially practical around 1890. The industry grew to over 30,000 miles of track throughout the country. As the technology matured, the 1920's saw them developed to a state of the art solution for urban mobility. The technology that Lancaster would use is based on this long

proven reliability of equipment. The technology of current light rail and subway lines around the world is very similar to what is used in heritage streetcar operations.
Streetcars are similar in size and weight to the existing Red Rose buses. Even though the streetcar has steel wheels on steel rails, it behaves much like a bus or car in traffic. Sure-footed vehicles, they accelerate up to 30 mph faster than a bus and can keep up with traffic. They have sanders for extra traction in the winter, but normally very little sand is left in its path. Normally, much more sand and grit is left in the winter by highway snowplows.

Streetcars require regular maintenance and covered storage. Vintage cars and reproduction cars often feature some or partial wood construction, making covered storage imperative. Fleet size is determined by service density, cycle time and reserve for spares. Older/restored cars can sometimes be obtained for significantly less money at the expense of reliability; it is not necessarily uncommon for some systems to have a 30% spare factor if outfitted strictly with older/restored vehicles instead of reproduction/new equipment. Due to the higher cost of such equipment, a larger fleet of older cars may be more cost-effective.

Operations Startup and Schedule

The basic loop operation proposed would be fairly simple. One car would make a loop in less than twenty minutes, two cars could provide ten minute headways. The advantage of two cars is that at almost all times a car would be in sight and a waiting passenger could predict the arrival of the next car.

- The streetcar would run north on Queen and south on either Duke or Prince Street.
- Automobile vehicles will run normally during streetcar operations.

Streetcars would normally operate Monday through Saturday 7am to 7pm.

There could be up to 16 designated stops if one was made on almost every city block. It can be estimated that there would be an average of eight stops in each direction.

With a total project length of 12,000 feet = 2.3 mile, at an average speed of ten mph, it will be roughly fifteen minutes trip time, plus 3 minutes for total stops, which equals 18 minutes each trip. That equates to twenty-minute round trips; still relatively effective for transportation but also an adequate 'experience' as an attraction unto itself.

The operation would not change parking patterns along the streets except at stops. It should encourage tourists to park at one end of the loop, as they will know that they can get a ride on the trolley back to their car. It is likely that these tourists would be more willing to walk along the route, and therefore see more of the downtown.

The streetcars could also be used for traffic calming, if desired, by holding a low maximum speed or stopping in driving lanes to discharge passengers.

Training

There are several practical options for training new operators. Seashore Trolley Museum (Kennebunkport, ME) provides formal training for their own operations. Several of their volunteers were trainers for various transit streetcar operations including Boston and Philadelphia. Individuals within this organization have acted as contract trainers for other historic trolley operations including the new startups in Kenosha, WI and Little Rock, AR. Other trolley museums also have structured training programs.

Operational Safety Qualification

Most tourism operations develop safety and emergency procedure manuals. These guidebooks are both reviewed with the operational employees and they are provided copies in each streetcar. A cell phone or emergency radio should be required equipment in each streetcar. These operations are also governed by regulations of the Federal Transit Administration. Our Associate, Jim Graebner, has provided manuals and training for a number of systems including Little Rock and Kenosha.

What is the Market?

Streetcar systems are generally constructed to accomplish several goals. They include transportation and development.

Figure 8 - A good connection to rail service is essential.

Many of the systems that have been constructed recently provide for two types of riders. Those that are going to a specific location (transit riders) and those that are riding for the "experience" (visitors).

The transit market requires connectivity. The loop must take people where they want to go. The Amtrak station is a logical end point. There are several alternate configurations for tying into the station. First, the streetcar could duplicate the original interface by doing a clockwise loop in front of the station. The original loading platform is still in place in the grass crescent just south of the station's circular drive.

Figure 9 - The original streetcar platform still exists

Second, the streetcar could tie into a multimodal facility with a streetcar stop, museum and parking garage. This garage can be located in one of several locations, either to the west of the station on Amtrak-owned

property or across McGovern Street. The principal of keeping the customer's walk to a minimum would favor the Amtrak property location.

The multi-modal facility would serve as a replacement for the current Red Rose Transit Park-n-Ride lot which is expected to not be available long term. It can also provide an excellent site for streetcar maintenance and storage. Finally, many heritage operations include a visitor and/or interpretive center showing the history of the local streetcars. As one of the original Conestoga Transportation Company trolleys has been preserved, this could serve as the prefect permanent storage site for that car. It would allow its use on special occasions while continuing to protect it indoors.

The downtown Lancaster parking is near capacity according to the Lancaster Parking Authority figures.

Lancaster Parking Authority Garage Data

Garage	*Total Spaces*	*Occupancy*	*Peak Entry*	*Peak Exit*
King Street Parking Garage	766	91%	6:30-9:30 am	2:30-5:30 pm
Duke Street Parking Garage	459	70%*	6:30-9:30 am	2:30-5:30 pm
Water Street Parking Garage	637	69%	6:30-9:30 am	2:30-5:30 pm
Prince Street Parking Garage	1150	83%	6:30-9:30 am	2:30-5:30 pm

* Of the 30% (137.7 spaces) not filled, 135 spaces are reserved for transient parking by hotel guests.

Figure 10 - A parking/multimodal facility tied to the station would enhance all uses.

The perception of a full garage is different than the actuality. Studies have shown that when a parking lot or garage is at 85% or fuller, people begin to think that the garage is full and do not even try to find a space. Three of the four garages are showing that utilization level already. There is a need for more capacity in downtown Lancaster, capacity that can be fulfilled by the streetcar in conjunction with a remote parking facility.

Downtown Lancaster also has very limited parking for tour buses. The streetcar can work as an extension of the tour bus, allowing it to park at a remote facility and then providing desirable transportation through downtown.

Fares

Rate structures are usually set up for both transit and tourism rider types. Standard transit fares and bus transfers can be used for riding to a single destination. For those using the streetcars as an experience, to ride and to see the City, a day fare is charged so that riders can get off and on as many times during the day as they desire. This also provides an incentive to get off at a stop, visit the shops and restaurants in a particular area, and then get back on the streetcar to move on to the next area of interest.

People are attracted to the brightly painted historic streetcars. Riding on them harks back to a simpler time. Many people have never ridden on an electric streetcar and do it for the experience. Riding a city bus is done out of necessity, but riding on a streetcar is fun.

Visitor packages can often include 'free' passes to use the streetcar, where the overall visitor package is directly paying the fare, in advance, to the operator of the service. This results in significant revenue streams coming from on-line hotels, lodging and tour companies. As a nominally-priced service, the streetcar is a cost-effective add-on to a visitor package.

Developers invest money in locations along a streetcar route. They know from experience in many other communities that the streetcars bring people to the area. Streetcars raise the value of the property near streetcar stops and along the route.

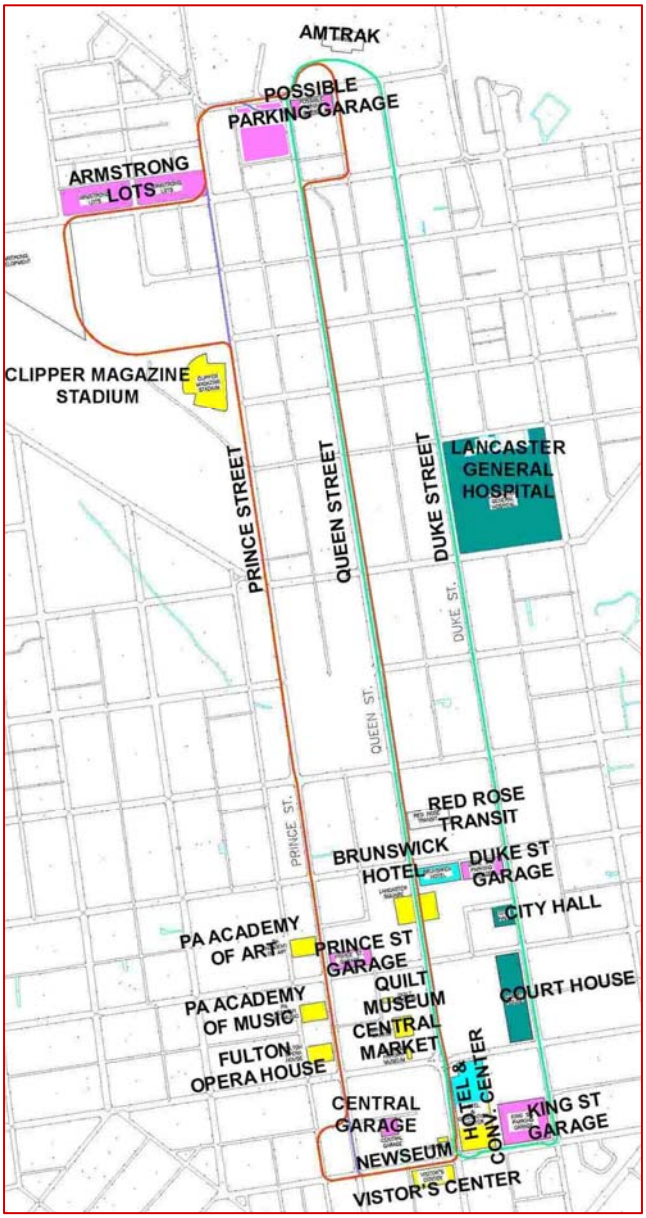
Potential ridership is difficult to assess, but is projected initially in the 240,000 annual trips range – comparable to the most conservative results of similar systems on a closed-downtown loop in a densely-occupied downtown area such as Lancaster. The most accepted way to assess ridership as well as impact on business is the use of questionnaires in high visitation tourist areas. A combination of 50% locals and 50% visitors seems to give the best data.

What we know for sure is that a streetcar system will attract visitors that normally would not visit the downtown and that streetcar riders will spend money while visiting the City.

Marketing Issues

Concern has been voiced that while the "Pennsylvania Dutch County" hosts an estimated 5.5 million visitors annually, only a tiny fraction of those visitors make it to downtown. It is not for a lack of promotional dollars (the state's tourism budget is $24.7 million and another $10.7 million in matching funds is ear marked for local promotional efforts), nor is it a lack of interest in promoting the city on the part of the Pennsylvania Dutch Country Convention & Visitors Bureau.

The single biggest problem is the clash between the public image of the Amish Country (rural, God fearing, simple, easygoing) versus the public image of the City of Lancaster (with all of its inner-city characteristics). It is hard to compete with the public movie image of Harrison Ford and Alley McNichols as Lancaster County has recently been portrayed.



It does not make it an impossible task, only a bit more difficult. Targeted promotional efforts by the Pennsylvania Dutch Country Convention & Visitors Bureau and the Lancaster Chamber of Commerce will help cover the gap. The Barnstormers minor-league baseball team will help. And, of course, the proposed Convention Center/Hotel project will attract a new, untapped market segment. All of this will help community visitation and be helped by the trolley project to increase visitor circulation.

The proposed steel-rail trolley loop, linking the Amtrak Station with the Visitors Center on Vine Street via either Duke or Prince Street, with a return on North Queen Street offers the promise of:

- Increasing awareness and interest in currently under-developed areas within and immediately adjacent to the loop.
- Increasing awareness of, and usage of satellite parking lots/garages (especially if combination tickets were offered).
- Proving a boost to the new Lancaster Barnstormers team by relieving traffic congestion at the stadium site.
- Boosting interest in, and usage of, the emerging theater and arts community.
- Increasing daytime shopping by downtown workers who might normally depart the city without sampling what the inner-city shops have to offer.

- Increasing usage of downtown restaurants both during the normal work hours and, especially after hours.

It should be noted that none of the above items noted involve the proposed Convention Center and its adjoining hotel. While the Convention Center may have renewed interest in the trolley, the primary market and circulation pattern existed before it was ever proposed. It is important to note that the trolley project is workable with or without the convention center/hotel project's successful completion.

Quite obviously, the reverse is likewise true. The trolley project and the convention center/hotel project working in combination will greatly assist in the further development of the downtown area. The public assumption that the trolley and the convention center are somehow linked into one massive public project must be addressed, and contested as to facts.

The Flaws, None Fatal

The major flaw, simply put, is the rails and the perception of what rails mean. A trolley on rails just can't get out of the way of trucks, buses and automobiles, the drivers of which are convinced they have a right to go where they wish, when they wish without any interference.

The evolution of the word 'trolley' is part of the problem. The widespread use of faux-wood rubber-tired vehicles that evoke some distant memory of actual steel-railed streetcars has effectively seized the definition in today's world. This is apparently true in Lancaster, where proposing a 'trolley' effectively means a rubber-tired trolley bus on a service-loop circuit. Considering that the word 'trolley' actually refers to the pickup wheel on the overhead contact wire of a real streetcar, it's a strange evolution indeed, but Lancaster is not alone. Stone Consulting's experience in other communities that have had some experience with rubber-tired 'trolleys' is that the word becomes synonymous with a 'brass and wood tourist bus', and the word 'streetcar' is often needed to distinguish a street-railed vehicle from an adapted rubber-tired bus 'trolley'.

The concept of a 'trolley' running a loop around downtown sparks instant interest. Visions of the existing rubber-tire 'trolley' loom large in peoples' minds. The concept of a steel-railed trolley *streetcar* running a loop around downtown can spark instant negative reaction. Issues about traffic movement, parking, lane flexibility, and overhead wire loom large in peoples' minds, though there is very limited personal experience to base those assumptions upon.

These issues were also a major concern for the people of Little Rock prior to the construction of their downtown streetcar system. What they have

Figure 11 - Little Rock met public concerns head on.

discovered is that the streetcars do not significantly impact traffic and that the activity in the downtown, especially during evenings and weekends, has picked up significantly. We recommend that a group from Lancaster take a trip to Little Rock, Memphis or both to see the effect a streetcar has had on the economy and the activity in these areas.

Parking issues are seen as a primary obstacle to the downtown community. It is not clearly understood by the public and the stakeholders that the trolley will most likely occupy the right-hand traffic lane, rather than the right-hand parking lane. Initial responses to the issue of an additional overhead wire for propulsion did not seem to be as critical as in many communities, but the downtown curbside parking issues may become an insurmountable perception if not included in the conceptual discussion and design.

Figure 12 - Work zone set up and street excavation in Little Rock.

The problem of traffic disruption during construction has also been raised. There is no avoiding construction causing some short term traffic interference. The combination of thin slab construction with a small three block moving construction zone has minimized most traffic impacts in other communities.

Figure 13 - Base concrete pour from adjacent lane.

The thin slab construction minimizes the construction effects of the streetcar in several ways. First, the design focuses on the reality that urban streets cover a variety of buried utilities. City water lines, sanitary and storm sewer systems both cross and parallel each street. More important is that except in limited ways, utilities do not have to be relocated. Downtown Lancaster also has telephone and fiber optic lines along with buried electric cables and gas lines. All of these utility uses must be accounted for in the design. Fortunately, with thin slab being only two feet deep, most of these utilities are installed deeper below the surface.

Figure 14 - rebar grid installed ready for track.

The steps of thin slab construction are shown in the accompanying photos. First, initially a two block work zone is established. An excavator then breaks up the existing pavement and it is removed.

Then the street is excavated approximately two feet deep and a flat base is established. Notice that only the one driving and one parking lane is closed for most of the work. As the work progresses, the work zone is extended to three blocks. The shallow two foot excavation minimizes the interference with underground utilities. The almost complete elimination of utility interference dramatically lowers the costs of a streetcar project.

Figure 15 - Completed section of track.

As the first concrete is curing, a reinforcing bar grid is constructed to set up a solid base for the track and the combined streetcar and truck traffic loading it must support. Since the typical streetcar weighs no more than 65,000 pounds, it is actually a lighter load than standard tractor trailers of 80,000.

The finished streetcar track and road surface is both long term durable and smooth. Similar pavement sections have experienced a forty to fifty year life before renewal.

What Will the Finished Project Look Like?

It is important to be able to visualize what a streetcar would actually look like in Lancaster, updated to the present day. The sense of vehicle size and presence in a city street is sometimes difficult to compare to expectations.

We created these two views of well-known Lancaster locations using the streetcar vehicles currently produced for Tampa, FL and Little Rock, AR as representative of 'off the shelf' solutions, "painted" in the historic Conestoga Traction Company livery. While many other alternatives are certainly present, this vision is achievable for Lancaster.

Public Cost Issues

'Return on Public Investment' is always a concern for any capital project when a community has a large number of needs and limited funds to meet them. Could the fixed-rail money be better spent elsewhere? What are the community priorities? Is it just "an interesting idea for re-building downtown, but it is not right for this street or that"? Do specific features of such a project effectively address other underlying greater needs, such as parking, land development, low-emissions transportation and traffic control?

The most important action is to be one of education. Obviously, what is needed is a course of action that will show concerned citizens that their concerns are answered. That the streetcar will blend in with traffic and not creep slowly along disrupting all in its path; that a streetcar can work with other streetscape improvements to be a traffic calming device that does not eliminate much needed curbside parking spaces; that a streetcar, its rails and wires, do not constitute a visual blight but a visual enhancement.

Lancaster has a two-stage presentation issue. First, many key stakeholders in the community do not have a clear idea of what the project means to Lancaster, either for the technology employed, or the impact. The second phase is to develop a community presentation at large, so that opinions and feedback can be solicited to assure that the project serves the community goals openly and objectively.

For both of these efforts, what is needed is data, data that will show that traffic will not be snarled beyond recognition (primarily because street traffic is far below maximum); data to show that there are sufficient parking spaces close to any shop during most, if not all, time segments.

The recommendation is to plan a series of small group "interested parties" meetings to develop support for the project. Once a cadre of supporters has been developed to these "key parties" a charrette-style presentation should be scheduled for input, followed by wider-audience community presentations – with the same message and explanations of the Lancaster benefits.

Finally, the recent development of the Convention Center, and the funding methodology has heightened community suspicions on private-public partnerships, total cost, and funding issues. The historic streetcar project enters the scene when increased public scrutiny will be expected, and the need for carefully-crafted and clearly communicated goals has never been higher.

Based on our on-site visit and additional research, it is quite clear that the project is feasible physically, financially and, probably, desirable from an economic development position.

Implementation

Riders will usually make unsolicited commentary and attentive operators will take note of repeated requests for additional times, schedule changes, etc. that can best be addressed through experimentation. Underlying this approach is the very real capability of the project adapting to the market, rather than commit excess resources and energy to highly detailed planning that actually may not be as cost-effective as simply doing a project.

Ridership Projections

There are two components to the projection of ridership for a Lancaster streetcar. First is transit ridership. Here, we are looking at the point to point connectivity of the service, of its convenience versus other rider options and how the cost and schedule meet expectations. Second is the analysis of tourist activity and the probability of attracting Lancaster County tourists into the city using the streetcar. The proposed streetcar is intended to replace the current trolley bus service.

The transit connections include the Amtrak station, the Clipper Magazine Stadium, the Pennsylvania Academy of Music, the various office spaces downtown, the county office buildings, Red Rose Transit's new Queen Street Station and the Lancaster General Hospital complex.

The ridership on the streetcar will be dependent partly on how well it replaces the perceived service currently provided. The current bus handles 150 passengers per day from the park-and-ride lot. As that lot is anticipated not to be available long term, an alternate site will be needed near the north end of the streetcar route. That number equates to about 40,000 riders per year.

The transit service must be convenient. The rider is essentially impatient. They want the convenience of a car without the cost. In the best case scenario, they want to always come to a car stop and be able to see the car coming. If two cars are running, they could almost see a car and if three cars are used one will always be in sight. Existing and successful downtown streetcar systems typically run at either a high density making posted schedules unnecessary such as in Memphis, or a widely posted and clearly visible and predictable schedule at each stop such as in Little Rock.

The tourism ridership is more related to the quality of the experience rather than where it goes. The huge tourism market only three miles away makes the streetcar critical to Lancaster's ability to attract a greater percentage of tourists into the city. A comparison of the draw of Strasburg and downtown Lancaster is in order. The Strasburg Railroad regularly receives 10% of the region's annual tourism numbers. Strasburg has a mature tourism infrastructure and brand recognition. Downtown Lancaster will need to build its tourism recognition by comparison. It is not unreasonable to predict that after a couple of years, the Red Rose Lancaster streetcar will draw 5% of the region's annual tourism numbers, or about 200,000.

Tourism Consumer Behavior

Training for a successful operation which deals with tourists does not stop with operational and safety issues. The most successful tourism operations understand the definition of the words, "Consumer Behavior". This means that the operator and Car Ambassador must understand the role they play. They must learn to treat every passenger as a guest. Disney calls their employees cast members for this very reason. The operation of the two-man Melbourne cars allows one person to act as a Car Ambassador. The motorman has a part to play in this role. He wears the uniform, changes the trolley pole at each end of the run and can ring a gong all the way down the street.

Operators of one-man cars in Galveston are equipped with headsets and provide a running narrative of attractions and key points around every stop. Some operations have the operators telling the story of the car, its route and/or the community. The operations tied to museums or preservation societies often have a brochure available giving the history of the heritage car.

Consumer behavior means that the streetcar operator/motorman is not just a trained employee, but also needs to be a showman. He needs to make people want to ride the car and give them a memorable experience to want to do it again.

Revenue Sources

Based on the demand for services described above, a combined transit and tourism volume of 240,000 is then used to determine projections of revenues. Additional revenues can be had by charters, advertising on equipment, franchising and sales of merchandise and special promotions.

Charters can make a significant impact on both the streetcar's visibility to the public and its revenues. Some communities have seen their streetcars used for wedding vehicles taking people from the church to the reception. There are at least 5 churches along the proposed route.

Merchandising can play an important role for multiple reasons. First, logo/brand recognition creates a sense of attraction identity. Just as people wear Liberty Bell, Orlando and Disney shirts, visitors are always looking for something different to bring back or wear at home. Second, local residents like to show pride in their own community's sports and attractions. This will help create brand recognition in the Lancaster area. Third, and maybe most important, merchandise typically nets 40-50% gross profit from retail sales in the rail attractions market and is a critical revenue source for any tourism-related rail attraction, and can have high potential here as well.

The retail sales location could be the current RRTA information center on Queen Street which has excellent visibility to the Lancaster resident and the visitor.

Special events can also be a strong piece of the revenue picture. Many tourist railroads and the local Strasburg Railroad in particular have done very well with coordinated events of Thomas the Tank Engine. September 2005, "Thomas" attendance was in excess of 50,000 visitors, setting a new US record. Our initial discussions with the Strasburg Railroad indicated a willingness to package rail event tours with an historic streetcar in downtown Lancaster, as they have packaged with other off-site local attractions such as Dutch Wonderland.

While it has not been attempted, a "Thomas" style new character/event parallel could be made to the PBS Mister Robert's Neighborhood trolley that is known and loved nationwide. Strasburg's assistance and participation to develop such a program would be invaluable. On the retail side, replicas of the trolleys are already made by the Holgate Toy Company in Kane, PA.

Costs

The budgeting and costs of operating a streetcar operation are not unknown quantities. As a proven, over one hundred year old technology, the determining of costs is a relatively straightforward analysis with current operating systems to provide real-world data. Costs are divided up into four areas of labor, operational supplies, fuel and maintenance materials. Labor is the largest single item. Red Rose Transit operators would be qualified and trained to operate streetcars in a tourism venue. The one person operator cars will help contain labor costs versus the two people Melbourne cars operated in Seattle and Memphis.

The second largest cost will be 'fuel' in terms of a peak demand electric contract. Despite a pricing based on peak demand, streetcars are relatively energy efficient and have no emissions. Compared with steeply rising diesel fuel costs, these electrically propelled vehicles will over time be less costly than petroleum based vehicles. Other communities including Kenosha have successfully tapped federal CMAQ (Congestion Mitigation Air Quality) grants to construct their heritage streetcar systems, based upon specific non-attainment criteria.

The maintenance on the vehicles is relatively simple. As there is no diesel engine or transmission to maintain there are fewer moving parts to wear. These vehicles regularly operate for 50,000 to 100,000 miles without breakdowns. Long term, the maintenance of track will mean budgeting sections for renewal over a period of years. This issue should not be a significant cost factor due to the proposed construction methods for at least twenty years.

Red Rose Transit Authority

Lancaster Phase 1

Downtown Circulator

Prepared by Stone Consulting & Design, Inc. 2/0

Description	Unit	Quantity	Unit Cost	Total Cost
General Requirements				
Street Running Track - Paved	**x**	**x**	**x**	**x**
Rail Installation Tangent	TF	13,234	$28.00	$370,541
Rail Installation Curves 3 degrees and over	TF	600	$30.00	$18,000
Cut Pavement	LF	27,667	$3.00	$83,002
Excavation	CY	9,407	$11.00	$103,475
Place subballast	CY	3,458	$10.00	$34,584
Steel Ties (6' on tangent, 3' on curves)	EA	2,406	$70.00	$168,392
Welded Rail	Ton	583	$850.00	$495,819
Welds	EA	379	$360.00	$136,335
Rail boot (insulation)	LF	27,667	$15.00	$415,008
Inside Guard Rail	LF	600	$100.00	$60,000
Concrete and Reinforcing	CY	5,976	$350.00	$2,091,600
Powered Turnout	EA	8	$48,500.00	$388,000
At-Grade Turf Track	**x**	**x**	**x**	**x**
Rail Installation Tangent	TF	0	$28.00	$0
Rail Installation Curves 3 degrees and over	TF	0	$30.00	$0
Drainage	LF		$45.00	$0
Excavation	CY	0	$11.00	$0
Place subballast	CY	0	$10.00	$0
Concrete ties (36" spacing)	EA	0	$85.00	$0
Welded Rail	LF	0	$850.00	$0
Welds	EA	0	$360.00	$0
Ballast	Ton	0	$15.00	$0
Geotextile	SY	0	$1.50	$0
Top Soil, Seed and Fertilizer	SY	0	$36.00	$0
Powered Turnout	EA		$48,500.00	$0
Trackwork Subtotal				**$4,364,756**
Street Modifications	LS	1	$50,000.00	$50,000
Utility Modifications	LS	1	$250,000.00	$250,000
Vehicles - refurbished	EA	3	$650,000.00	$1,950,000
Maintenance Facility	LS	1	$800,000.00	$800,000
Stations	EA	16	$25,000.00	$400,000
Sub Total Civil				**$7,814,756**
Civil Contingencies			20%	$1,562,951
Sub Total Civil Construction Cost				**$9,377,707**
Traffic Signals	LS	2	250,000.00	$500,000
Communications	EA	3	10,000.00	$30,000
Traction Power	x	x	x	x
Substations	EA	2	200,000.00	$400,000
Overhead Wire Including Poles	TF	13,834	100.00	$1,383,360
Sub Total Electric & Communications				$2,313,360
Electric & Communications Contingencies			15%	$347,004
Sub Total Systems				**$2,660,364**
Total Construction Cost				**$12,038,071**
Estimated Cost of Railroad Right-of-way	LF	0	$15	$0
Estimated Right-of-Way Cost (Legal Costs Only)		1	$40,000	$40,000
Engineering.CM/Admin			17%	$2,046,472
Total Project Cost				**$14,124,543**
Cost Per Mile				**$5,391,047**

Lancaster Historic Streetcar Operations
Income / Expense Model

REVENUES:

Projected riders		
Tourism ridership / trips - standard	132,000	55%
Tourism ridership / trips / parking / tour group	72,000	30%
Transit riders @ standard trips	7,200	3%
Transit riders @ discount (multitrip)	28,800	12%
Total Ridership	240,000	100%
Full Ticket / ride	$1.20	58%
Discounted group sales	$0.80	42%
Total ticket sales	$247,680.00	
Logo license sales (3 %) royalty	$2,000.00	
Direct Concessions / Sales / Advertising	$102,000.00	
Less: Cost of goods sold	($51,000.00)	
Gross Profits - Concessions / Advertising	$53,000.00	
TOTAL REVENUES:	**$300,680.00**	
OPERATING EXPENSES		
	10 min Headway	
	11 hr. day Budget	
Activity Base: car hours estimated	$6,920.00	2 cars
Labor:		
Operator labor ($17/hr estimated), 3 cars max	$81,600.00	Full+Part time
Overtime	$45,900.00	
Overhead / benefits	$52,417.10	41.11%
Operations Labor Total	$179,917.10	
Fuel (electricity) (includes AC option)	$65,340.00	2 cars
Other Utilities	$2,920.00	
Facilities Maintenance:		
Track Maintenance	$3,000.00	
Overhead Wire Maintenance	$5,000.00	
Car maintenance, parts	$15,000.00	
Building & Grounds Maintenance	$5,000.00	
Building & Grounds Supplies	$1,200.00	

Lancaster Historic Streetcar Operations
Income / Expense Model (Continued)

Other Operating Expenses:		
Mechanics	$35,360.00	Full+Part time
Overhead/Benefits @ 30%	$14,537.01	
Supplies and Materials	$12,000.00	
Contracted Services	$12,000.00	
Communications Equip	$2,000.00	
Depreciation allowance (maintenance reserve)	$179,206.51	@40%
TOTAL OPERATING EXPENSE	**$532,480.62**	
General Expenses		
Liability Insurance (third party)	$30,068.00	
Track Lease Payments to Class 1	$0.00	
ADMINISTRATIVE		
Administrative Salaries	$25,000.00	Manager
Admin benefits	$10,277.86	41.11%
Absorbed Admin overhead	$46,881.00	5% Direct Exp.
Professional Services	$8,000.00	
Other Administrative	$2,500.00	
Marketing & Promotion	$30,000.00	
TOTAL GENERAL & ADMINISTRATIVE EXPENSES	**$152,726.86**	
TOTAL OPERATING AND ADMINISTRATIVE EXPENSE	**$685,207.48**	
OPERATING PROFIT (LOSS)	**($384,527.48)**	
Percent fare box recovery of operating cost	36.15%	
(does not include conc. & adv)		
Operating Subsidies:		
FTA transit operating subsidy	$0.00	
Local & City Tax Support	$384,527.48	
State Tax Support - various	$0.00	
Foundation Grants - operating	$0.00	
Donations / Memberships	$0.00	
Total Operating Subsidies	$384,527.48	
OPERATING RESULTS AFTER SUBSIDY	**$0.00**	
Average cost per car mile	$18.34	
Average cost per vehicle hour	$99.02	
Average cost per passenger	$2.86	

Conclusion

To be effective and affordable, a startup heritage streetcar service must serve its community and its visitors, and have a clearly understandable role. Many proposed systems fail the initial feasibility review because they have no existing community transport need, have relatively few visitors, require too much track construction to be affordable and deliver frequent service, or have little potential to economically improve the area they could serve. In all of these essential issues, Lancaster's downtown loop meets the basic tests of purpose and affordability.

Community experience with existing projects has demonstrated that the installation of a streetcar line can enhance the economic development potential of the property along the route. It has also been proven by many similar projects that the streetcar ride is an enhancement that will attract visitors for a nostalgic ride on an antique streetcar, and provide equally practical and affordable transportation for the worker and resident. All of these people will become more aware of the stores along the route, eat in the restaurants and see the downtown as a cohesive, identified area. In Lancaster's case, the effectiveness of the project can also do much to alleviate parking and transportation circulator issues that must be addressed in some manner for the community to continue to develop. Ridership, to a large degree, will be a function of the combined uses that are made of the businesses, parking connectivity and attractions.

The next step will be to obtain funding for the construction of the line, procurement and rehabilitation of a car, or cars, and the construction of the intermodal facility. Many sources of funding are available for projects such as these, and imaginative grant writing can help obtain funding from several different sources in order to make this project viable. Some of the sources include the Pennsylvania Capital Budget, Community Development Block Grants for handicapped accessibility, Congestion Mitigation Air Quality (CMAQ) funding, and the federal government and a SAFE TEA (formerly TEA-21) allocation. Many of these programs will require a specific earmark in the next year's allocation placed there by your state of federal representatives or senators.

We truly believe that this is a worthwhile project that will assist in the future development of the area and enhance the park, living facilities, and current and future retail establishments.

Respectfully submitted,

Stone Consulting & Design, Inc.

Harvey H. Stone, P.E.
President

HHS/fsc