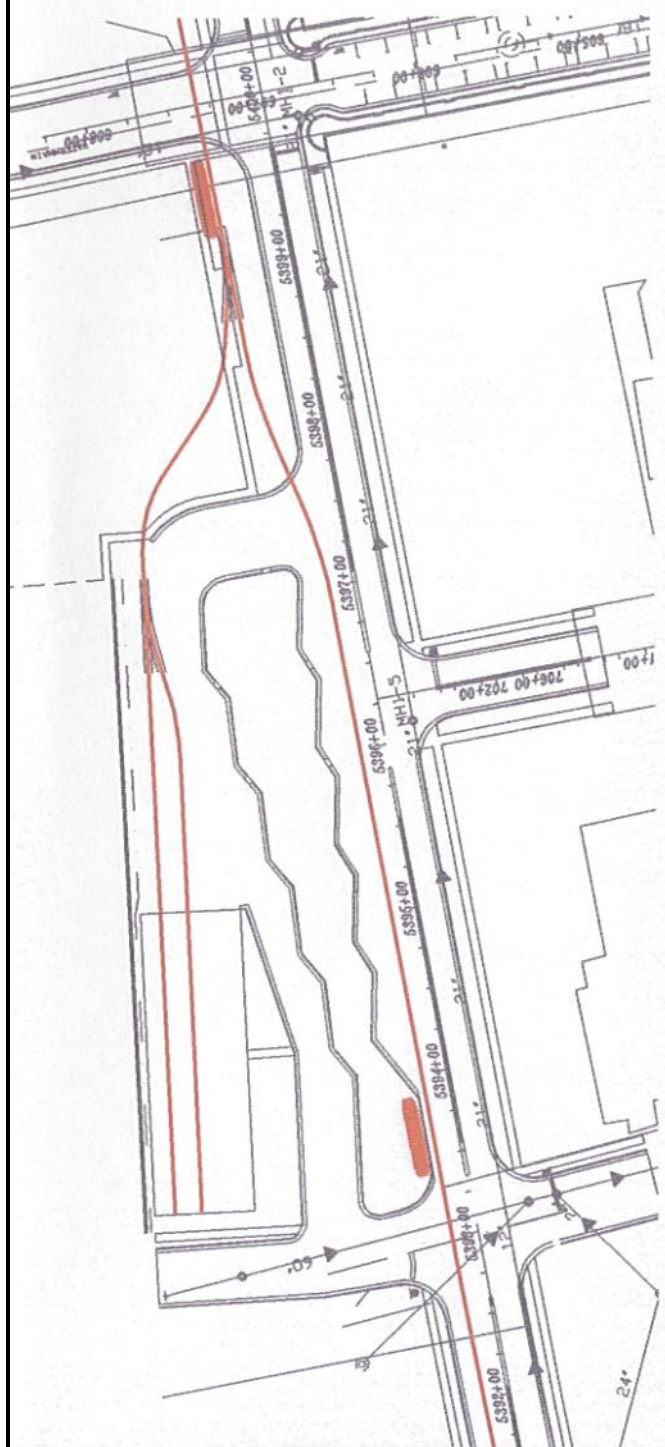


Stone Consulting, Inc.

Historic Trolley Projects



324 Pennsylvania Avenue West, P. O. Box 306, Warren PA 16365
Phone: 814.726.9870 Fax: 814.726.9855

The Kenosha Transit Electric Streetcar Circulator

Harborpark is a new community on the shores of Lake Michigan that would not exist without the streetcar.

This redeveloped 69-acre site of a former Nash Engine Plant has approximately 450 new residential units consisting of condominiums, townhouses, garden apartments, and

- ◆ Pike Creek Plaza offers shops, outdoor cafes, and a seasonal farmers' market
- ◆ Celebration Place is a 12-acre major gathering place
- ◆ Fountain Plaza is a major water feature which serves as Harborpark's focal point



- ◆ Harborwalk Promenade – an 8'-wide walkway along the water's edge
 - ▢ A mile-long multi-purpose trail with a 7-acre recreational area
 - ▢ Added more than \$50,000,000 in assessments to the tax rolls
 - ▢ A natural history museum was completed in 2001



Stone Consulting, Inc. (Stone) was chosen by the City of Kenosha to provide the preliminary and final design for the track, overhead wire, and the rectifier package for this two-mile historic trolley system connecting the harborfront development with the commuter rail station.



The two-mile trolley is an urban connector providing transportation for both tourists and residents. It connects Harborpark to the existing central city area, the METRA commuter rail station, and the city bus transfer station. The presence of the streetcars enhances the character of the area while providing needed mobility and reliability. Kenosha is the first city in Wisconsin to reintroduce an electric trolley system for public transportation.

We also provided design assistance for the trolley car barn.



February 5, 1998



August 10, 1999



April 3, 2000



June 17, 2000



A little over two years and Opening Day brings quite a change!



Stone Consulting, Inc.

Historic Trolley Projects

Stone Consulting, Inc.
designs track & overhead for the distinct purpose
of supporting a historic streetcar system.



The Kenosha Streetcar Circulator Project incorporates a typical embedded track design with a new **“turf” track design developed by Stone Consulting, Inc.** that hides the track in grass-seeded areas on median strips & throughout the landscaped Harborpark.

Turf track construction consists of new continuous welded rail fastened to concrete ties, supported by compacted crushed concrete subgrade section, secured with typical railroad ballast. The track section is surrounded by geotextile filter fabric and has a layer of topsoil over the ties and to the top of rail to facilitate vegetation growth.

Electric flash-butt welding of rail to provide cost effective continuous welded rail (CWR)



Embedded track construction with new continuous welded rail wrapped in the Ironhorse “Boot”®, fastened to steel ties.

Embedded track construction in existing streets was coordinated with street resurfacing projects to compensate for slight differences between track profile and existing pavement without excessive costs incurred.

The system is constructed using all new 115# welded rail and concrete & steel ties which will result in lower maintenance costs & increased longevity.

The track route avoided existing utilities whenever possible. Where conflicts could not be avoided, utility manholes and valves were located next to and between the rails. Only one manhole had to be adjusted during track construction.



Facing west toward downtown, the new “turf” track construction.

To keep overhead wire costs down, Stone completed a detailed design of the system including a separate drawing and material list for every pole in the system.



By using steel ties where track runs through pavement, the cost of the in-street track was reduced.



Looking west on 56th Street toward the downtown from Harborpark.

Contact: Joe Antaramian, former Mayor of Kenosha (currently with Emerging Communities Corp.) 262.697.8566



Stone Consulting, Inc.

Historic Trolley Projects

Hillsborough Area Regional Transit (HART), Tampa FL



This project expanded the existing TECO Streetcar system into the Tampa downtown. The project was bid as a design/build project and our firm teamed with Kimmins Construction of Tampa, Florida to submit the winning bid. That bid was almost half of the second bid received by HART.

Our firm was responsible for providing topographic surveys, geotechnical studies, traffic planning, traffic signal design, corrosion control, utility relocation design, station design, track design and overhead contact system design.

A design charrette was held for the station design and we provided input to HART on track design issues and recommended changes from the furnished 10% design drawings.

Utility permitting included potable water, sanitary sewer, storm sewer and coordination with overhead electric, underground electric, fiber optics and natural gas.

The entire project from bid to opening was completed in 19 months.

Contact: Bob Attack, P.E. - HART - 813.449.4711



Delmar Loop Trolley Project, St. Louis MO

Stone Consulting, Inc. was chosen by the East-West Gateway Council of Governments to lead the final design team for the Delmar Loop Trolley project that includes such firms CH2MHill, URS and a number of local subcontractors.



Stone Consulting will provide the Project Manager as well as be responsible for track design, cost estimating and the overhead contact system design. The project includes approximately 3.5 miles of track on a two mile long route that stretches from Forest Park at the southeastern end of the project to the Delmar Loop and University City at the northwestern end of the project.



The project will include both street track and track in a new greenway area along DeBaliviere Avenue. Estimated to cost \$43 million, this project is funded in part with an FTA Urban Circulator grant and is being fast tracked to go out to bid 8 months after design was authorized.

Contact: Jerry Blair, Executive Director
East-West Gateway Council of Governments - 314.421.4220



Chatham Area Transit Authority, Savannah GA

Stone Consulting, Inc. was retained as a subconsultant by Chatham Area Transit Authority to complete the streetcar phase of the multi-modal transportation plan for Savannah. As a result of that study, The City of Savannah elected to move ahead with the streetcar project.



City of Savannah, Savannah GA

Stone Consulting, Inc. has managed a project to establish heritage streetcar service along the tourism district on River Street along the waterfront. The initial River Street operations will cover one mile with a total project cost under \$2,000,000.



Stone designed a hybrid streetcar that is both ADA accessible and cost-effective utilizing an existing vintage streetcar for the visitor experience. This vehicle was rebuilt for efficient quiet operation using on-board power generation, AC motors, and state-of-the-art computer control systems. One car is based on a Melbourne W-5 shell and a second car will be based on a San Francisco PCC.

Innovative Streetcar Control and Propulsion System

Stone Consulting, Inc., together with Electric Motor and Supply (Altoona PA), created a energy-efficient and cost-effective computer controlled streetcar control and propulsion system. This solid state system utilizes regenerative braking from the propulsion motors and ultra-capacitors to recapture wasted braking energy.



Contact: Sean Brandon - City of Savannah - 912.651.6420

City of New Haven, New Haven CT

Our streetcar team was retained by the South Central Regional Council of Governments to provide a downtown streetcar circulator plan for the City of New Haven, CT.

Our team met with City officials, provided alternate routes and cost estimates. We then met with newspapers and held a public meeting to present the streetcar proposal.

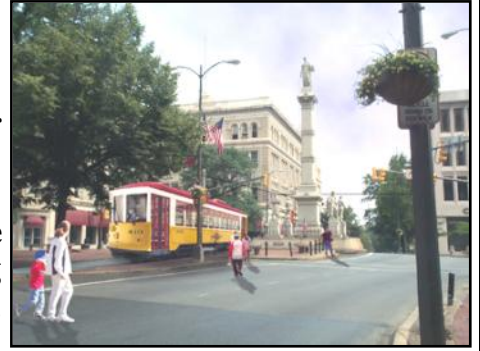
Contact: Michael Piscitelli, Director of Transportation, Traffic & Parking
City of New Haven - 203.946.8076



Red Rose Transit Authority, Lancaster PA **City of Lancaster Streetcar Feasibility Study**

Stone Consulting, Inc. completed the City of Lancaster Streetcar Feasibility Report for the Red Rose Transit Authority of Lancaster.

The report outlines and investigates a 2-mile loop connecting the Amtrak station with the Penn Square downtown district, providing a historic streetcar circulator system connecting parking facilities, local attractions, businesses and transportation facilities.



Contact: David Kilmer, Executive Director - Red Rose Transit Authority 717.397.5613

Lorain Port Authority, Lorain OH **Black River Landing Trolley Project**

Stone Consulting, Inc. prepared a feasibility study examining possible operation of a streetcar at Black River Landing. Stone assisted the Lorain Port Authority and Lorain County Community Development Department with procuring trackage and a start up system.

Contact: Richard M. Novak - Lorain Port Authority 440.204.2265

San Pedro CA **Red Car Trolley Line Extension**

Stone Consulting, Inc. provided route design and maintenance building layout for the Red Car Extension Study team. The Port of Los Angeles has retained the team to study 6 different possible line extensions and provide capital and operating expenses.



City of Sedro-Woolley WA **Green Space and Trolley Park Feasibility Study**

In the interest of obtaining additional tourists, Stone was retained to develop a Streetcar Study. The project involved providing several possible routings, construction cost estimates, operational plans and costs and equipment recommendations. Ridership estimates and revenues were also projected.

Routings included a connection to the fairgrounds for the Loggerodeo, connection to the river, and a downtown circulator.

Contact: Lacy J. Lahr - City of Sedro-Woolley 360.855.0771



Issaquah Historical Society, Issaquah WA

The Society retained Stone to examine the feasibility and to provide technical assistance in the planned restoration of 2-1/2 miles of track of the original Seattle Lake Shore and Eastern Railway.



Our tasks included:

- ★ Overall feasibility and concept analysis
- ★ Track rehabilitation cost estimates
- ★ Facility condition inspection
- ★ Vehicle research and recommendation
- ★ Gift shop and purchasing guidelines
- ★ Grade crossing analysis

The project opened to the public May 31, 2001 with the inaugural mile of service between downtown Issaquah and Gilman Boulevard using a leased Oporto 'Brill convertible' trolley. This is hoped to be the demonstration for a much longer, transit-oriented project which will connect the Microsoft campuses with Issaquah business centers.

Contact: J. Craig Thorpe 425.643.4250

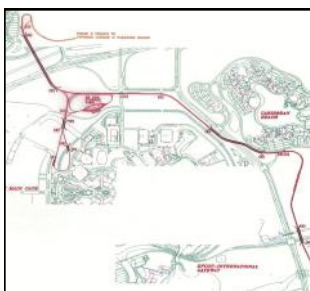
Lowell National Historic Park, Lowell MA Feasibility Study & Engineering Analysis of the Extension of the Lowell Historic Trolley System

The Lowell National Historic Park owns and operates the Lowell Historic Trolley. It is the only National Park Service owned streetcar system in the country.

Our staff examined the market and engineering issues necessary to determine the viability of expanding the existing Lowell Historic Trolley for transit use. This project included engineering analysis of four alternate routes to reach various target sites and a review of available heritage trolley vehicles. Study tasks also involved surveying target sites for market interest and ridership projections.

Stone Consulting was again retained to undertake the next phase of the project to study extending the streetcar into the downtown. Design charettes were held and a route consensus reached with the stakeholders. Cost estimates and route maps were completed as well as the economic benefits and alternatives.

Contact: Christina Briggs, Lowell National Historic Park - 978.275.1725



Amusement Park, Orlando FL

Stone Consulting, Inc. produced a Feasibility Study and Cost Analysis for an historic trolley transportation system. This system would replace many of the current bus routes and reduce travel times significantly.

Upon request, Stone also provided a design/build proposal for the project.

Note: Mr. Welsh will provide a personal recommendation but is not permitted to give a recommendation on behalf of Disney.

Contact: Dan Welsh 407.824.4735



Stone Consulting, Inc.

Historic Trolley Projects

About Stone Consulting, Inc.

Stone Consulting, Inc. was formed to provide a dynamic, creative environment for its professional staff. With our extensive experience in engineering, consulting, streetcars, railroading and industrial development, we bring knowledge, expertise and enthusiasm to each project.

We are able to give your project the personal attention only a smaller engineering firm can.

Combine the "hands-on" experience in track engineering and an all-encompassing knowledge of the rail industry with a hearty grasp of today's economics and you have a firm ready to serve your project needs!

Our home office is located in Warren, Pennsylvania, along the scenic Allegheny River.

Key Trolley Personnel



Harvey H. Stone, P.E.
Executive Vice President



Randall D. Gustafson
Vice President Operations



Stone Consulting, Inc.

324 Pennsylvania Avenue West

P.O. Box 306

Warren PA 16365

814.726.9870 telephone 814.726.9855 fax

www.stoneconsulting.com

stone@stoneconsulting.com