

Market Demand/ Financial Feasibility Study for
An Alternative Transportation System-
Keweenaw National Historical Park

FINAL REPORT

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Executive Summary

This report documents an Alternative Transportation Market Demand and Financial Feasibility Study for the Keweenaw National Historical Park (KNHP). The study was performed by Michigan Technological University in 2004 and 2005 in accordance with Cooperative Agreement No. H6310010001 issued by the National Park Service (NPS). The purpose of the study was to assess the feasibility and appropriateness of an Alternative Transportation System (ATS) serving the Park and its cooperating sites.

KNHP was established in 1992 to commemorate the rich and complex story of copper mining on the Keweenaw Peninsula in northern Michigan's Upper Peninsula. The KNHP is comprised of two units (Quincy and Calumet) and several cooperating sites.

The earliest mining activity in the area has been traced to Native Americans. In 1843 reports of enormous copper deposits spawned one of the earliest mining rushes in the United States. Between the 1850s and early part of the 20th century, when mining activity boomed, thousands of immigrants poured into the region in search of the many job opportunities that were available. At one time at least 38 different ethnic groups lived in the Calumet and Hancock areas. The copper mining companies became known worldwide as leaders in modern scientific and mining technology. The Keweenaw Peninsula had a vibrant culture and thriving mining industry. A bitter strike in 1913 combined with more profitable mining operations in the western United States lead to a decline in copper mining in the region. Copper production ended in 1968. A very wide and rich range of cultural and industrial remnants remain, many unique. It is this window to the past that will attract people to the KNHP.

Research showed that there is a lack of accurate tourism statistics for the Keweenaw Peninsula. From rough data, based on overnight accommodation activity and other activity information, an estimate of 190,000 tourists visit during the season in which the ATS would operate. Tourism activity is expected to grow at modest rates in future years, as the Park becomes better known and becomes a destination rather than an adjunct to other attractions. It was assumed that a portion of this total tourist base would use the ATS. Evidence is presented suggesting that future tourism could be significantly higher.

Although current ground transportation is entirely road based, other modes flourished in the 20th century. These earlier transportation systems, which were socially progressive and technologically advanced, formed the basis of the alternatives postulated in this study. The transportation elements identified and studied consisted of: (1) a cog railroad linking a new Visitor Orientation Facility at the Quincy Smelter with other activities in the Quincy Unit, (2) an interurban streetcar linking the Quincy and Calumet Units, (3) a separate streetcar system in downtown Calumet, and (4) a steam railroad linking Calumet, Lake Linden, and the Quincy Smelter area. Conceptually, these elements serve the dual purpose of providing mobility without relying on automobiles and enable Park visitors to interpret the rich cultural and industrial history of the region. It was assumed that a ride on any of the modes would include a live narration of the history of transportation, culture, and mining.

To put the KNHP alternatives into a broader context, information on comparable transportation systems in other national parks and locations was gathered and compiled. These include museums, tourist railroads, and vintage trolley systems.

The transportation alternatives for KNHP were characterized in detail in written, photographic, and diagrammatic form so that they could become the basis of a comprehensive, statistically significant survey to forecast ridership. The survey was conducted over two weeks in June and July 2004. Survey locations were the lobby of the gift shop of the Quincy Mine site, the tourist information office in Calumet, and the streets of Copper Harbor. The response for the historic modes as alternative transportation was very positive. Applying the results of the survey to current tourist numbers, it was

concluded that 50,000 persons would definitely ride each historic mode and that 140,000 persons would either definitely or probably ride each mode. The survey results were based on assumed fare levels as stated in the report and other descriptive information provided to those persons who were surveyed.

Both capital and O&M costs for each ATS element were estimated to the conceptual level of development. Fare box recovery ratios for O&M costs were calculated. The report includes a discussion on various means of capital and O&M funding from grants and other sources. As well, information about alternative methods of equipment procurement, construction, and operation/maintenance are included.

Several options for staging the development of the ATS were identified and studied. These include a starter bus system to demonstrate the value of transportation alternatives and the ability for the historic modes to be developed incrementally both in terms of passenger capacity and system length.

Conclusions and Recommendations

This study shows that the alternatives studied are technically feasible to implement and are similar to successful tourist transportation modes in other locations that include parks and urban or rural areas.

The survey results indicate a high level of acceptance of the four alternative transportation systems. Over 70% of those persons surveyed said they definitely or probably would ride the alternative systems.

Based on the conceptual cost estimates, fare box recovery of O&M costs appear to be quite feasible. There are several potential sources of funds for capital development costs available from grants and other funding mechanisms that could include various levels of privatization.

KNHP is unique in that there are no specific physical boundaries. The survey indicated that many tourists were not aware of the Park as an entity. Thus, there is a high potential for increasing the Park's market share of regional tourism by emphasizing the Park as a distinct destination. The historic alternative transportation modes addressed in this study – the interurban line, the Calumet streetcar system and the steam railroad – would provide a strong link to the past that has captured the imagination of tourists in other parts of the country where these modes have been successfully reintroduced. These transportation elements could form a key part of the Park and thus help make it a more recognized destination.

There are several attractive options for staging development of the ATS, including a starter bus system and incremental expansion/extension as ridership grows and funds become available.

It is recommended that consulting firms with expertise in vintage rail planning, engineering, and operation undertake preliminary engineering studies for (1) a streetcar system for Calumet, (2) the extension of the cog railroad or construction of a funicular in the Quincy Unit, (3) a steam train between Calumet and the Quincy Unit, and (4) an interurban streetcar between Calumet and the Quincy Unit. The preliminary engineering studies would identify preferred elements, property requirements, environmental aspects, and other issues related to implementation. These studies would add technical details to the conceptual plan presented in this study and refine cost estimates. The first study should be on the streetcar system for Calumet.

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Background

When the U.S. Congress established the Keweenaw National Historical Park (KNHP) in 1992, it created the first national park system unit to commemorate the rich and complex story of copper mining on the Keweenaw Peninsula in northern Michigan's Upper Peninsula. The General Management Plan (GMP) was approved in 1998.

The earliest mining activity in this area has been traced to Native Americans, but in 1843 reports of enormous copper deposits on the Keweenaw Peninsula spawned one of the earliest mining rushes in the United States. It actually preceded the famed California gold rush by six years. After a wave of individual fortune seekers, entrepreneurs arrived to direct an ordered extraction of this valuable mineral. From their efforts came a complex system of mining, processing, smelting, and transporting copper that helped stimulate the growth of industrial America.

By 1849, the "Copper Country", as it became known, provided 85 percent of the entire United States copper. Through the latter part of the century and into the early 1900s, it was the largest copper-producing region in the country. During this era, thousands of immigrants poured into the region in search of the many job opportunities that the mines provided. Not only did they provide a pool of laborers, but their varied languages, dress, politics, and religions created a vibrant culture. At one time, as many as 38 different ethnic groups lived in the Calumet and Hancock areas.

The copper companies became known worldwide as leaders in modern, scientific mining technology. By the late 1800s, the Calumet and Hecla (C&H) Mining Company was one of the nation's best known business enterprises, and the company's directors and shareholders in the northeast enjoyed high profits and dividends. The Quincy Mining Company and Copper Range were also major companies. As the need for efficiency and profitability increased, numerous smaller companies were absorbed by the three major mining companies.

Following a bitter labor strike in 1913, a decline in copper mining began as the local mines became less profitable compared to other copper districts, and copper production ended in the region in 1968. Detailed histories chronicling the Lake Superior copper mining era have been written by Larry Lankton and may be found in his books, *Cradle to Grave* and *Beyond the Boundaries*.

The Keweenaw National Historical Park is comprised of two geographic units (Quincy and Calumet) and sixteen cooperating sites. Together they encompass the historic industrial, commercial, residential and transportation infrastructure that was developed during the last half of the 19th and early part of the 20th century (*National Park Service, 1998*). Figure 1 shows a vicinity map and the two units of the Park.

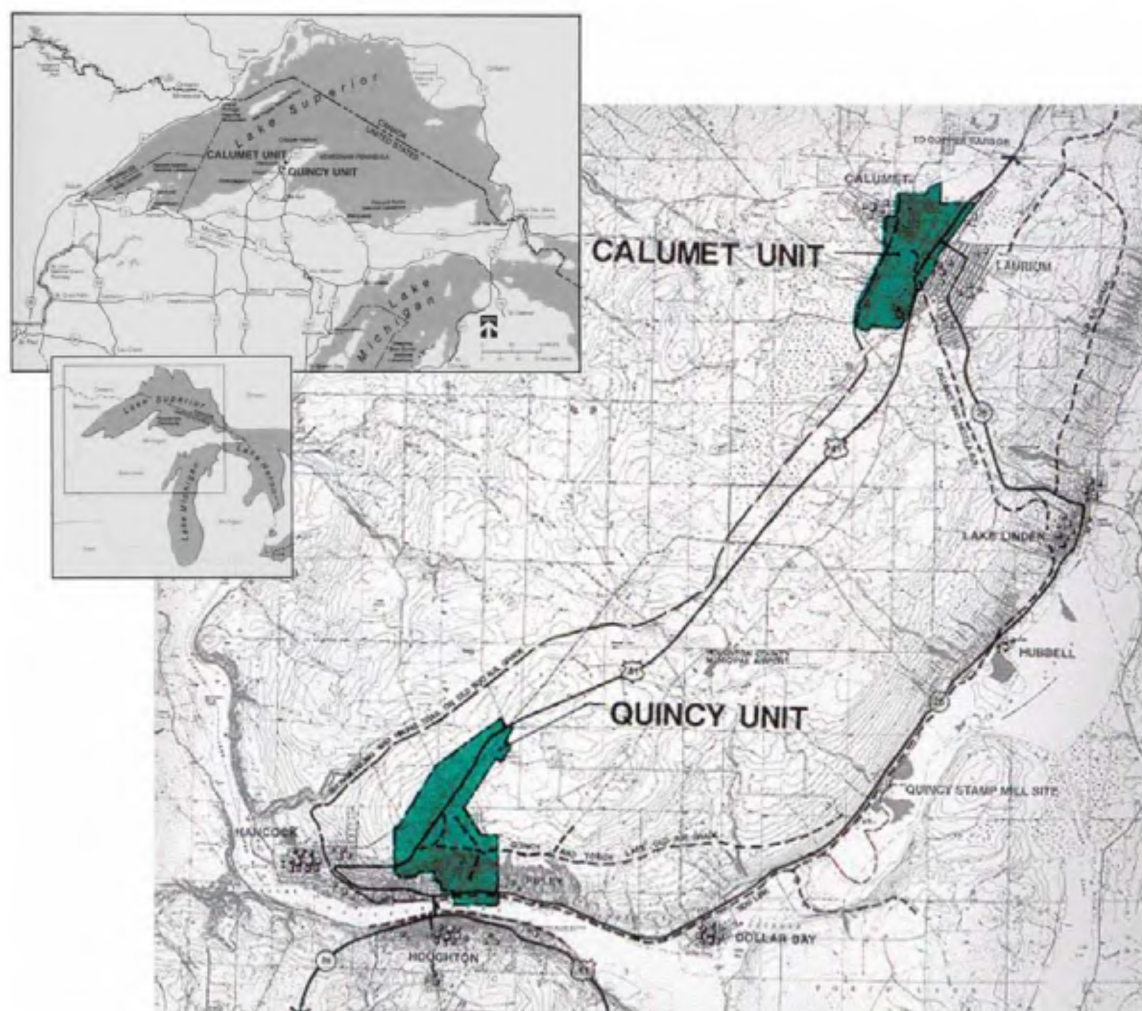


Figure 1 - Vicinity map.

[Quincy Unit](#)

The Quincy Unit, with 1,120 acres, is located just north and east of the City of Hancock and adjacent to Portage Lake. This unit includes remnant structures, mines, and railroad infrastructure of the Quincy Mining Company. There are seven Quincy mineshafts and surface works, and remnant worker houses, company administrative and service buildings and managers' residences on the site. Two of the significant structures on the site are the #2 Shaft House, which is built over a shaft that eventually reached 9,300 feet on the incline, and the #2 Hoist House. The largest steam powered hoist ever built, a Nordberg Hoist, is on display in the #2 Hoist House.



Figure 2 - Photograph of the #2 Shaft House.
(#2 Hoist House is shown on the right of the photograph).

Two narrow gauge steam locomotives (Locomotives No. 1 and No. 5) of the Quincy & Torch Lake Railroad and many pieces of smaller equipment, including portable steam boilers, pneumatic rock drills, and pumps may be seen on the site.

The Quincy Mine Hoist Association operates a gift shop and provides guided tours of the Nordberg Hoist and underground works to a depth of 400 feet. There are also numerous interpretive exhibits and a video on the history of the Quincy Mining Company. A cog railroad, the Quincy Mine Tramway, currently links the area around the hoist house with the mine adit, which is used as the entrance for the underground tour. Visitors ride the cog railroad to the mine adit and then board a tractor-drawn wagon to enter the mine to continue their tour.

Plans are in place, and funding is being incrementally obtained, to relocate the A.E. Seaman Mineral Museum from its current location on the Michigan Tech campus to restored blacksmith and machine shop buildings in the Quincy Unit. When the relocation is complete, the A.E. Seaman Museum will be much more visible to motorists on US-41 and is expected to become a very popular attraction in the Quincy unit.

Another exciting component of the Quincy Unit is the Quincy Smelter. It is located on the Portage Lake waterfront and is the only remaining smelter associated with 19th century copper mining (see Figure 3). The KNHP General Management Plan discusses a future Visitor Orientation Facility to be located at the Quincy Smelter and the KNHP is developing plans for this use. In the summer of 2004 the NPS and the City of Houghton completed a Portage Lake waterfront study that included, among other topics, the KNHP and Isle Royale National Park (IRNP). One element of the study is the possible relocation of IRNP headquarters from Houghton to the area of the smelter. This move, and the eventual establishment of a permanent Visitor Orientation Facility for KNHP, would result in a combination of park facilities that would be highly utilized by visitors (*Daily Mining Gazette*, 2004).



Figure 3 - Photograph of Existing Quincy Smelter Site on the Portage Lake Waterfront.

Calumet Unit

The 750-acre Calumet Unit is located 11 miles north of Hancock and includes remnant administrative structures, mine buildings, the associated historic landscape of the Calumet and Hecla Mining Company, and associated commercial, cultural, and residential areas of the Village of Calumet and Calumet Township. Calumet retains considerable integrity of its historic setting. In 2003 Calumet /Calumet Township received one of four “Main Street” designations by the Michigan Economic Development Corporation. Initiated by the National Trust for Historic Preservation, the program seeks to reestablish America’s downtown districts as centers of community life including shopping, working, recreation, and living. Once a center of financial and cultural activity, and an almost state capitol, Calumet includes some of the finest historic architecture in Michigan (*National Park Service, 2004*). The Main Street Program will provide year-round assistance to Calumet in restoring a vibrant economy centered on its historic assets. The KHNP Headquarters are located in the Calumet Unit.

Cooperating Sites

The National Park Service owns several buildings designated as park facilities, but unlike most national parks, individuals and groups continue to own and operate most of the properties in the Park. Several cooperating sites are located on the Keweenaw Peninsula and offer interesting perspectives of the mining era. These sites are public or commercial facilities and were established by informal agreements between the owners and the Park using two basic standards for selection: (1) the site has a direct relationship to at least one aspect of the copper mining story, and (2) the site is open to the public on a regular basis. The cooperating sites are shown on Figure 4 and include:

- A.E. Seaman Mineral Museum
- Copper Range Historical Museum
- Delaware Mine
- McLain State Park
- Fort Wilkins State Park
- Hanka Homestead
- Historic Calumet (all in the Calumet Unit)
 - Calumet Theatre
 - Coppertown USA Museum
 - Keweenaw Heritage Center at St. Anne’s Church

Upper Peninsula Fire Fighters' Memorial Museum
 Houghton County Historical Museum
 Keweenaw County Historical Society
 Laurium Manor Inn
 Old Victoria
 Porcupine Mountains Wilderness State Park
 Quincy Mine Hoist and Underground Mine (in the Quincy Unit)

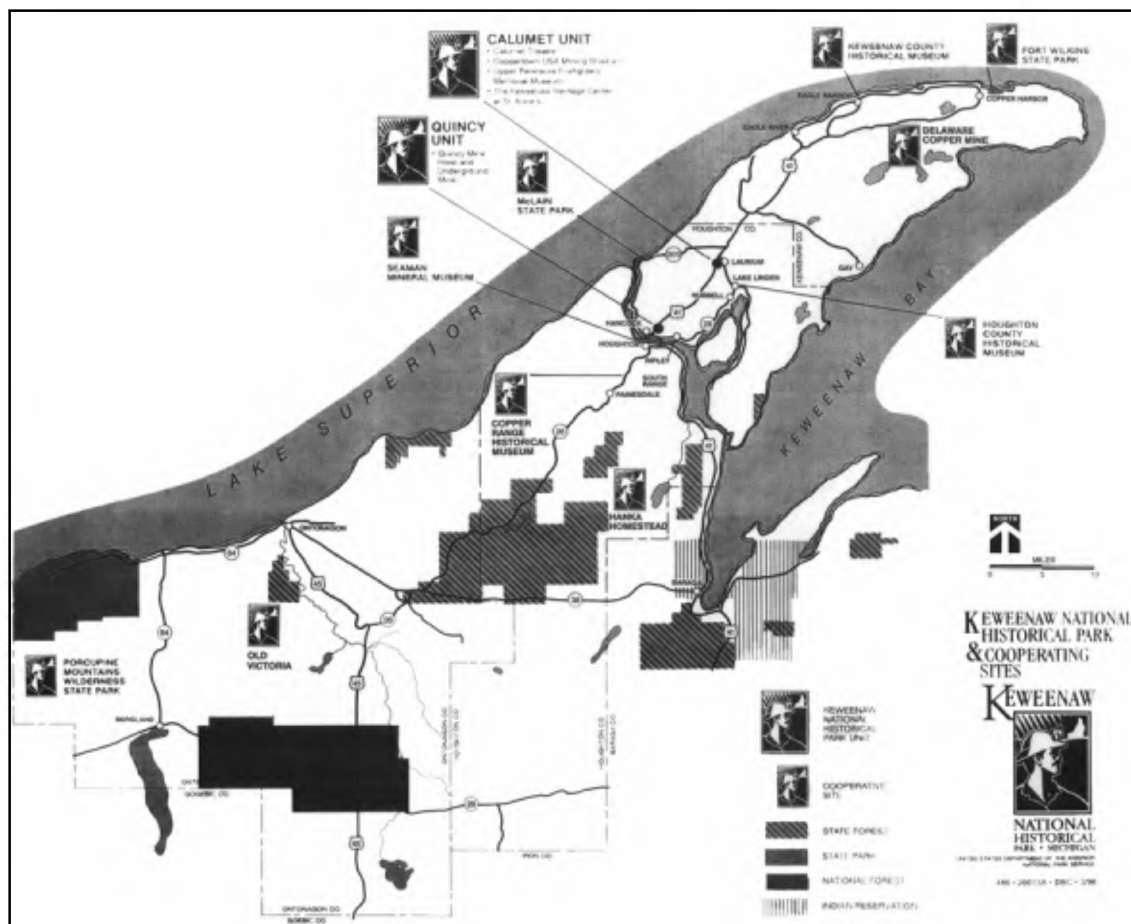


Figure 4 - The KNHP Cooperating Sites.

Isle Royale National Park

The Isle Royale National Park (IRNP) encompasses the Isle Royale island archipelago in Lake Superior, about 60 miles northwest of Houghton. The IRNP headquarters currently is located in Houghton on the Portage Lake waterfront. Isle Royale is maintained as a wilderness area and vehicles are not allowed on the island. Visitor access from the Keweenaw to the Isle Royale National Park is provided on National Park Service (NPS) vessels operating from Houghton and Copper Harbor and by a private amphibious aircraft from the Houghton County Memorial Airport. In recent years, the total annual visitors to the Park have ranged from 14,000 to 18,000 persons and about 75% of the visitors have accessed the Park from the Keweenaw (Green, 2004).

Principal Communities

KNHP is located in Houghton and Keweenaw Counties. Although there are many small communities in the counties, the principal population centers are the cities of Houghton and Hancock and the Village of Calumet. Year 2000 populations are given in the Table 1 below.

Table 1 - Population of Area Communities (2000 Census Data)

	Population
Houghton County	36,016
Includes	
City of Houghton	7,010
City of Hancock	4,323
Calumet Township	6,997
Village of Calumet	879
Keweenaw County	2,301

It is hard to imagine, but in 1910 the local population reached its peak when there were over 100,000 people in Houghton and Keweenaw Counties (*Forstall, 1995*). The area was served by an extensive network of intercity railway lines that transported passengers in and out of the Copper Country, and streetcar and interurban service provided for transportation between local communities. The population declined as copper mining activity decreased and no other significant economic activity filled the void. Today Keweenaw County is the least populated county in Michigan.

Houghton became the commercial center of the Copper Country and is the home of Michigan Technological University (MTU). MTU was founded in 1885 above the Houghton Fire Hall as the Michigan Mining School, and today has an enrollment of 6,500 students and is the region's largest employer.

Tourism and Park Visitor Statistics

There is no single entrance to the KNHP, and this makes estimating total park attendance difficult. Attendance figures for the cooperating sites were provided by the KNHP and are presented in Table 2 (*NPS, 2003*). In several cases these are estimates because no admission charges are assessed and no formal records are kept.

Table 2 - Visitors to the KNHP Cooperating Sites, 2003

Site	No. Visitors
A.E. Seaman Mineral Museum	10,000
Calumet Theatre	25,000
Copper Range Historical Museum	1,200
Coppertown USA	3,500
Delaware Mine	10,000
Houghton County Historical Museum	10,000
Keweenaw County Historical Society	1,500
Keweenaw Heritage Center at St. Anne's	2,500
Hanka Homestead	3,000
Laurium Manor Inn	2,200
Old Victoria	5,000
Quincy Mine Hoist and Underground Tours	45,000
U.P. Fire Fighters Memorial Museum	800

Fort Wilkins State Park	165,000
McLain State Park	183,000
Porcupine Mountains Wilderness State Park	366,000

An analysis of tourism statistics was undertaken to determine the total number of tourists that visit Houghton and Keweenaw Counties. The Tourism Resource Center at Michigan State University makes periodic estimates of tourism for all of the counties in Michigan. The estimates are based on telephone surveys to estimate pleasure trip nights. The latest data for Houghton and Keweenaw Counties is 1996 (see <http://tourism.msu.edu/t-aoe/html-aoe/co-profile-aoe/recentProfiles/31-Houghton.pdf>). A copy of the report is located in Appendix A. In 1996 there were approximately 1,300,000 total pleasure tourist nights in the two counties. If one assumes an average length of stay of three nights, this represents about 430,000 tourists. Another way to estimate tourist activity is to use data from the 2% room tax for hotels, motels, and bed and breakfasts in the area. Assuming an average room rate and national values for length of stay and persons per group, there were 175,000 tourists that stayed in hotels, motels, or in bed and breakfasts in 2002. Tourists might also stay with friends, in cottages, or campgrounds. Using national figures that account for this type of tourist and adding these to hotel, motel, and bed and breakfast guest, the total number of tourists would be 320,000. Not all of the visitors to the cooperating sites are tourists. Some are undoubtedly local residents who accompany visitors or who are discovering the attractions on their own. Taking all of the very rough estimates and approaches, the annual tourist activity on the Keweenaw Peninsula is probably about 300,000 to 450,000 tourists. This tourism activity is also very seasonal and about 67% of tourist activity is between June and September.

Current Transportation

Current transportation resources are summarized in this section. The modest extent and use of these resources is a reflection of the remote location and relatively low population of the region. Milwaukee Road passenger rail service, provided by the “Copper Country Limited” that connected Chicago and points north to Houghton and Calumet ended in 1969. The automobile is the primary mode that tourists use when visiting the Keweenaw Peninsula. Figure 5 presents a map to show the primary highway network in the study area.

Roads

The two major roads linking Hancock and Calumet are US-41 and M-26. The two routes experience some peaking conditions due to commuter traffic that travels daily between the two locations. US41 is a two-lane arterial and is the most direct route between Hancock and Calumet and passes the Quincy Mine Hoist site. The average annual daily traffic (AADT) ranges from 6600 vpd near the Quincy location to 6900 vpd near Calumet. M26 is located along the east side of the Keweenaw Peninsula and passes through Dollar Bay, Mason, Hubbell, and Lake Linden. Access to the proposed Visitor Orientation Facility would be on M-26. The 2003 AADT on M-26 adjacent to the Visitor Orientation Facility site is 7100 vpd, 4100 vpd through Dollar Bay, 5500 vpd between Dollar Bay and Lake Linden, and 2900 vpd between Lake Linden and Calumet.

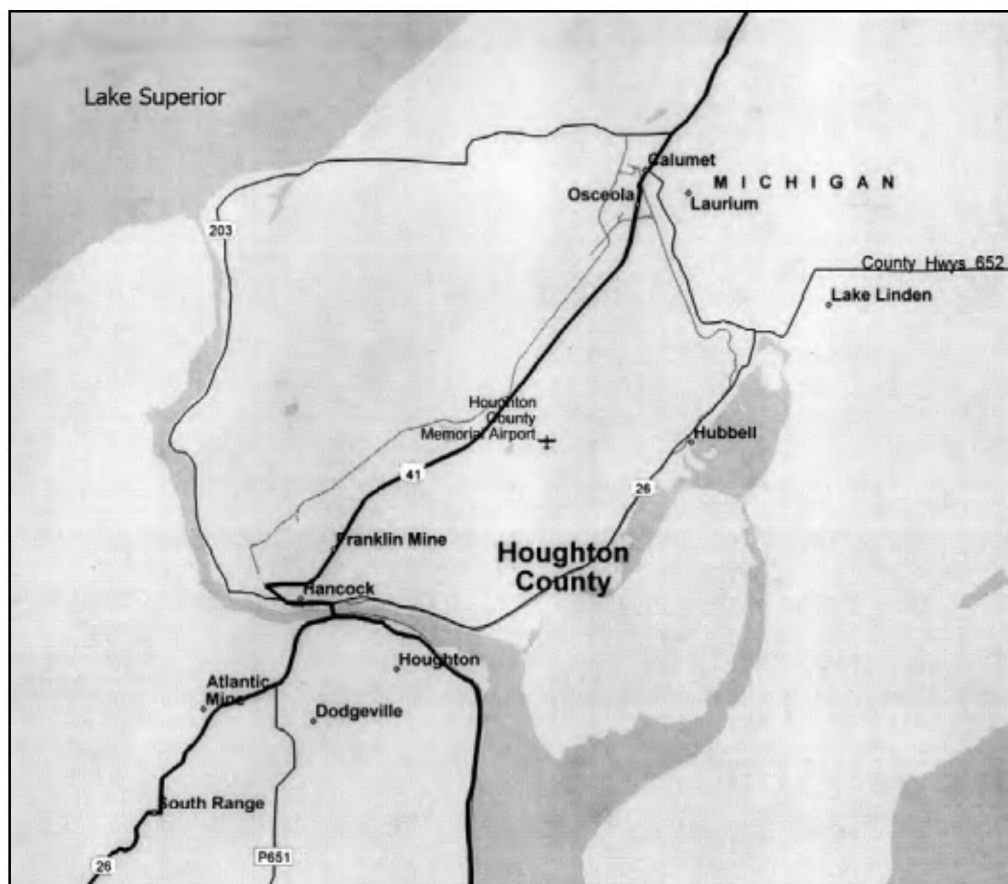


Figure 5 - The Major Highway Network in the Keweenaw Peninsula.

Air Travel

The Houghton County Memorial Airport (CMX), located between Hancock and Calumet, provides facilities for general aviation and air carrier service. Currently Northwest Airlink serves the Keweenaw with three flights per day to and from Minneapolis/St. Paul International Airport (MSP) using 34-passenger Saab turboprop aircraft. MSP is a major hub for Northwest Airlines where an extensive array of domestic and international connections are available. In 2003, 51,500 Northwest Airlink passengers got on or off scheduled flights at Houghton County Memorial Airport. July was the peak month with 5,400 passengers.

Intercity Bus Service

Greyhound Bus provides service to the Keweenaw area with stops in Calumet, Hancock, and Houghton. One bus per day operates between Calumet and Chicago, Illinois with several stops enroute and major transfer opportunities in Escanaba, Michigan (for downstate Michigan) and Green Bay, Wisconsin.

Local Public Transit

The Cities of Houghton and Hancock each have very modest bus systems that operate within the limits of the two cities. The City of Houghton operates one-fixed route service between Michigan Tech and the Copper Country Mall through downtown Houghton during weekdays, and a demand responsive door-to-door service for Houghton residents on weekdays from early morning to late afternoon. The City of Hancock service started operations in 2002 and today operates a demand responsive door-to-door service on weekdays from early morning to late afternoon for Hancock residents. Both services tend to cater to students and seniors.

Alternative Transportation System (ATS) Concept Development

The General Management Plan (GMP) for the Park identified the need to develop more detailed plans for park access and circulation. One vision for the Park would be a visitor transportation system that would link the three major components – a proposed Park Visitor Orientation Facility at the Quincy Smelter site, the Quincy Mine Hoist and Mine complex, and Calumet. Visitors could park their automobiles at the Visitor Orientation Facility and then board a visitor transportation system to ride to other units of the Park. Such a system would enhance a visitor's experience, simplify travel in the Park, reduce automobile congestion, and make it easier for visitors to enjoy Park features and attractions. Over the past few years, several senior design and graduate research projects were completed by Michigan Tech students that examined visitor transportation alternatives and concepts to serve the Park. One of the gaps in these studies was an estimate or forecast of the market demand and potential ridership and is the focus of this study.

The National Park Service established the Alternative Transportation Program (ATP) in cooperation with the U.S. Department of Transportation Federal Highway Administration and Federal Transit Administration. As stated by the NPS Director, Ms. Fran Mainella, in the 2003 report, *National Park Service Accomplishments in Alternative Transportation*:

“We must work with our partners and gateway communities in developing creative, long-term transportation solutions in and around our parks. Often, transportation challenges are difficult. However, starting planning early and communicating often will help turn challenges into successes. The visitors to our parks expect a meaningful and enjoyable experience, and it is my challenge to park managers to make sure that our transportation systems are part of that experience.”

The objectives of the Alternative Transportation Program are:

- Improving the visitor experience
- Protecting natural and cultural resources
- Promoting economic development
- Fostering strong partnerships
- Enhancing visitor safety and security
- Enabling new services

The term “Alternative Transportation Systems (ATS)” is used in the Program to describe a range of transportation alternatives for a Park. As the study team began to develop an alternative transportation system to serve the KNHP, the objectives of the ATP were used as well as the following specific guidelines:

- the transportation system should link or connect parts of the Park
- the system would primarily serve Park visitors
- the system must be financially feasible

A vision for a transportation system to serve the Park would take visitors back in time, to the early 1900s, and introduce them to the modes that residents of that era used. While riding the system, visitors would receive a narrated tour in which historical sites would be identified and the stories and history of the mining industry and area would be told.

Area Transportation History

From a transportation history perspective, three components were identified in the system:

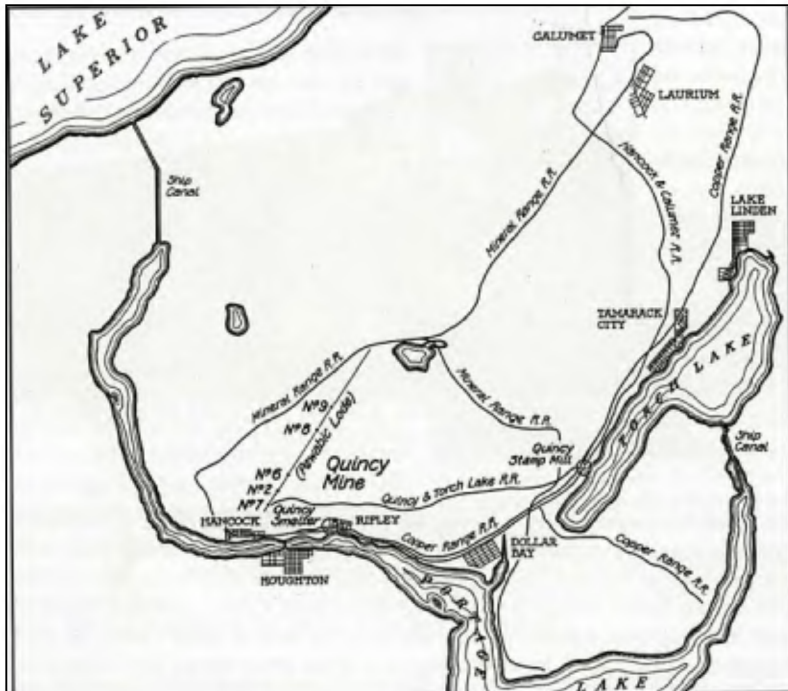
- (1) steam railroads that primarily supported mining operations

- (2) streetcars that provided circulation within the towns and interurban lines that linked nearby communities
- (3) a cog railroad that emulates an early 20th century ore tram and currently operates in the Quincy unit

Steam Railroads

Rail lines first reached the Keweenaw Peninsula in 1883, when the Marquette, Houghton & Ontonagon Railroad was extended to Portage Lake. However, the first steam locomotive was first introduced in 1864, when the Pewabic and Franklin mines purchased a small engine to deliver rock from the mine to the mill. Many private enterprises followed, and short rail lines grew north of Portage Lake. By the late 1880's, the spine of the Keweenaw had a network of narrow-gauge, standard gauge, and dual-gauge lines. The first railroad bridge to cross Portage Lake was built in the 1880's. A line heading south out of Houghton linked the mines in the region to cities like Milwaukee and Chicago. The greatest concentration of rail service was the "loop" from Hancock, past the Quincy and Osceola mines up to Calumet; then over to the mills on Torch Lake; and back to Hancock through Dollar Bay. The Mineral Range and the Calumet & Hecla formed the perimeters of the loop, and the individual companies' lines tied into it at convenient points. The Mineral Range Railroad, founded by Hancock businessmen, carried rock from the Osceola Mine to its mill, but it also carried a substantial number of passengers. The steam locomotive played a major role in the expansion of the copper industry in the late nineteenth century, not only because it dramatically improved production rates in the mines, but it allowed the area to be successful commercially as well. Although there were many railroads in the Keweenaw, the lines shown on the map of Figure 6 were among the most extensively developed (*Molloy, 2001*). They linked what are now the Quincy and Calumet Units of the Park to each other and to bustling ore processing mills, smelters, and coal docks on Portage and Torch Lakes. The following railroads are shown on the map:

- The Quincy & Torch Lake Railroad, owned and operated by the Quincy Mining Company
- The Mineral Range Railroad
- The Hancock and Calumet Railroad
- The Copper Range Railroad



Courtesy of Larry Malloy

Figure 6 - Railroad Routes in the Copper Country, circa 1910.

Many of the graded right-of-ways used by these lines still exist although the tracks and ties were removed many years ago. Sections are often overgrown with trees while several routes have become part of an extensive network of snowmobile trails. Figure 7 shows a photograph of one of the Quincy and Torch Lake Railroad trains that once operated in the area; it was restored and is now operating on the Huckleberry Railroad at Crossroads Village in Flint, Michigan.



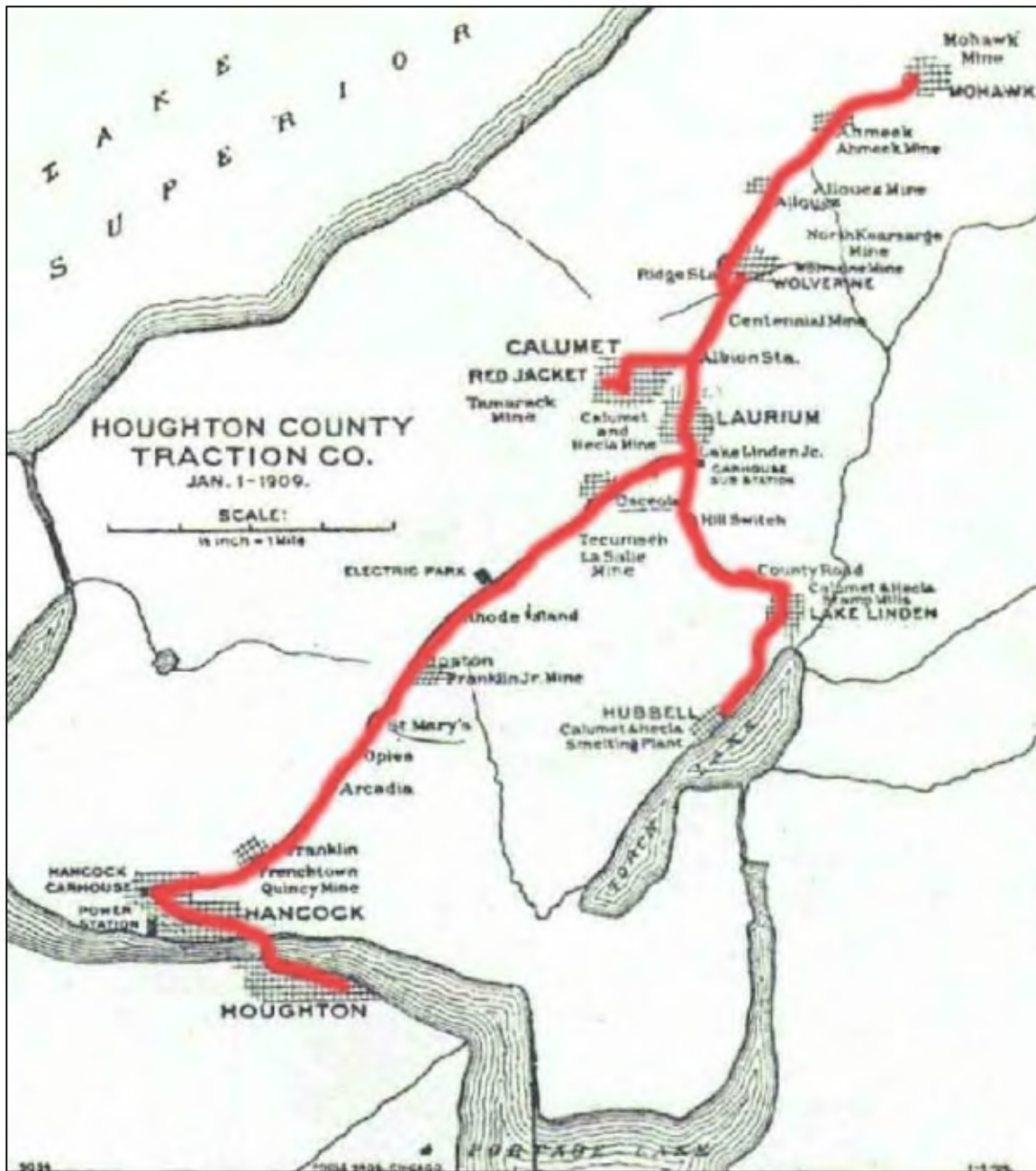
Figure 7 - Photograph of a Quincy and Torch Lake Railroad train now operating at Crossroads Village, Flint, Michigan.

Remnants of the Quincy & Torch Lake Railroad may be found at the Quincy Unit. These include two narrow-gauge steam locomotives, a round house, a water tower structure, and several rail cars. These lines pass through scenic areas of substantial terrain relief, including the escarpment along the north shore of Portage Lake. The change in elevation from the Quincy Unit to Portage and Torch Lakes is about 520 feet, which affords panoramic views. As well, many points and remnant structures of historical interest lie along these lines.

The Copper Range right-of-way skirts the village of Lake Linden, the location of the Houghton County Historical Museum (HCHM). The HCHM is one of the KNHP cooperating sites. The museum complex is in the midst of a major expansion program and boasts some of the best collections in the Keweenaw. These include a large model railroad in HO scale depicting the Copper Range Railroad in the 1920s and the recently restored C&H No. 3, a 36-inch gauge 0-4-0 Porter steam locomotive that was used in switching operations at the copper ore stamp mills. The Houghton County Historical Society is constructing a 0.9 mile rail alignment with a 130 foot trestle bridge, and has begun offering excursion rides on the partially completed line.

Streetcar and Interurban Lines

The streetcar and interurban era in the Keweenaw began in 1899 with the formation of the Houghton County Electric Street Railway Company, later renamed Houghton County Traction Company (*Monette, 2001*). Over the next decade, an extensive network of lines was developed, extending from Houghton to Hancock, Laurium, Calumet, Mohawk, Lake Linden, and Hubbell. A route map is given in Figure 8. Nearly 6,000 patrons rode the system on opening day, about 80% of the current population of Houghton. Annual ridership exceeded six million passengers in 1909, the peak year of operation (*Hewitt, 1999*).



Headlights

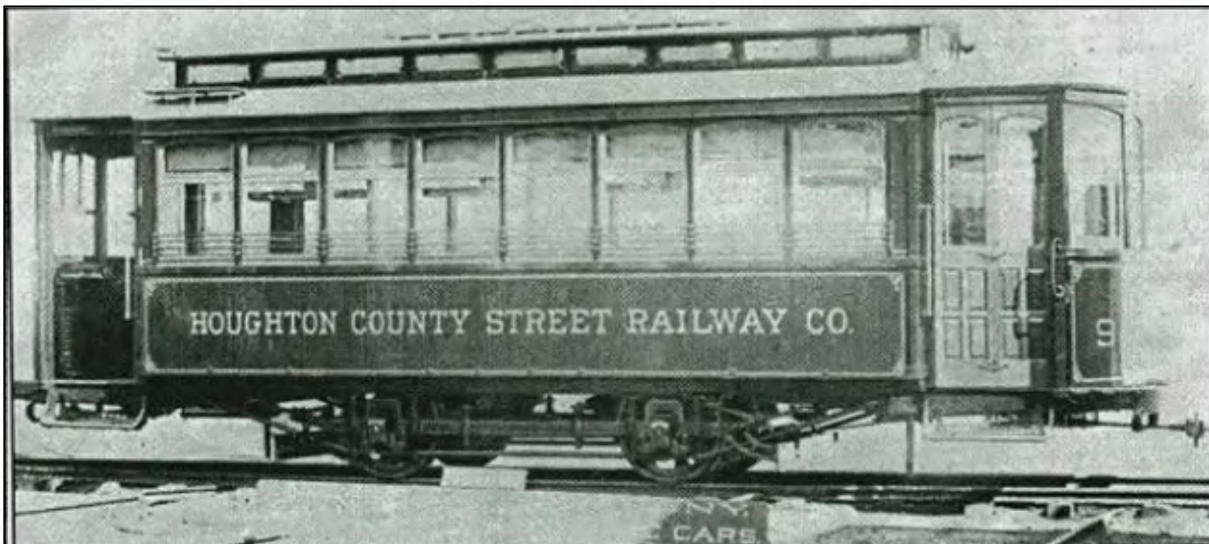
Figure 8 - Map of the Houghton County Traction Company Line.

By 1910, the thriving company had 32 miles of track, 19 motorcars, 16 miscellaneous cars, and a power station in Hancock. The top speed was 30 miles per hour. The work force consisted of 137 employees, and annual revenue was \$320,000. Two types of cars were operated - the "through" or larger cars holding 32 persons that were used as interurbans (Figure 9), and the 20-passenger locals or "dinkeys" (Figure 10) that ran between Houghton and Hancock and in the Calumet area.



James Alain Collection

Figure 9 - The Interurban: No. 38, a 42-foot, double-ended Brill car used for interurban service.



George Krambles Collection

Figure 10 - The Streetcar: No. 9, a 30-foot, two-axle vehicle used for service within the cities.

One of the most innovative ideas was the development of Electric Park, which the Traction Company built about half way between Hancock and Calumet, adjacent to its right-of-way. Electric Park was a very popular destination for summer picnics, band concerts, dancing, and general socializing. The park increased streetcar and interurban patronage on weekends and holidays, typically low periods of use. In 1911 there were over 40,000 visits to Electric Park. Although the buildings have disappeared, a few

foundations exist and the site is somewhat overgrown. It was recently announced that KNHP would provide assistance to Osceola Township in developing interpretation for the site.

During the early years of operation, the streetcar system was very popular. It provided a high level of mobility to the many inhabitants who could not afford automobiles. Patronage was especially high during winter months, when many automobiles simply were not used because of the high snowfall. The Traction Company removed snow from its tracks with special electrically powered rotary snowplow cars.

As the automobile became more prevalent, streetcar and interurban use declined. The Traction Company struggled financially, was in receivership for a period, and finally ceased all operations in May 1932.

Unfortunately, few remnants of the streetcar and interurban system remain today. The Hancock car barn and the building on the Hancock waterfront that housed the steam powered electric generation equipment are the only significant structures that remain. Some of the stations became houses and still exist. All the cars were scrapped or dismantled and used for other purposes, with no known existing remnants. Some of the interurban right-of-ways can be seen, but no tracks remain. However, the streetcar and interurban story, which was very progressive for its time, is well documented in writing and by photographs.

The Cog Railroad

From the 1850s to the 1890s, the Quincy Mining Company operated a gravity tram to transport ore from its mines to a stamp mill on Portage Lake. By 1887, the practice of disposing stamp sand (a mill by-product) into Portage Lake was raising concerns about blocking water navigation in the narrow channel. Quincy then built a new mill on the shoreline of Torch Lake, near Mason, and developed the Quincy and Torch Lake (Q&TL) Railroad to transport the ore to the stamp mill. The Q&TL Railroad route is shown in Figure 6.

The Quincy Mine Hoist Association began underground mine tours during the early 1990s. Initially vans were used to transport visitors between the Hoist atop Quincy Hill and the mine entrance (a former drainage adit) located adjacent to an East Hancock residential neighborhood. As the number of visitors grew, local residents began expressing concerns about traffic impacts, and the Hoist Association developed a cog railroad to replace the vans. The system is known as the “Quincy Mine Tramway”. The tramway service began in 1997 (*Sproule, 1997*) using a single 28-passenger vehicle that operates bi-directionally on a single track between the Quincy Hoist House and the mine adit. Visitors transfer from the cog vehicle onto a wagon pulled by a tractor to enter the mine. Construction of the cog railroad was funded through federal grants and donations from a local fund drive.

Because, the 2,300 foot long alignment involves an elevation change of 360 feet, the cog railroad technology is well suited to this application. The maximum grade is 35%. A cable-propelled technology was considered, but the cog railroad was considered to be superior with regard to maintenance (*Pudelko, 2003*). The technology is similar to cog railroads in operation at Pike’s Peak in Colorado and Mt. Washington in New Hampshire.

The narrated cog railroad experience offers panoramic views of Houghton, Hancock, and Portage Lake. It provides a passenger experience that helps in understanding the ore tram operation of the Quincy Mining Company. In 2003, there were 20,036 riders on the Cog Railroad (*Yarbrough, 2004*).

Linking KNHP Major Activity Centers

The concept of an Alternative Transportation System (ATS) is to provide narrated excursion on transportation modes between major activity centers within the Park. These modes would provide Park visitors alternatives to use of private automobiles. The alternative modes would link the Quincy Unit, the Calumet Unit, Lake Linden, and the proposed KNHP Visitor Orientation Facility at the Quincy Smelter. In addition, there would be a circulator in the Calumet central business district. In its ultimate

development stage, the components identified in Table 3 would comprise the system. The concept is illustrated in Figure 11.

Table 3 - Components of the ATS for the Keweenaw National Historical Park

Component	Description
Visitor Orientation Facility to Quincy Unit (a)	Cog Railroad
Quincy Unit to Calumet Unit	Electric Interurban Trolley
Calumet Circulator (b)	Electric Streetcar
Calumet Unit to Lake Linden	Steam Train
Lake Linden to Visitor Orientation Facility	Steam Train

- (a) The Quincy circulator would stop at the entrance to the mine tour, the Hoist House, and the A.E. Seaman Mineral Museum.
- (b) The streetcar would circulate through the historic Calumet central business district with stops at key points of interest, about every two to three blocks.

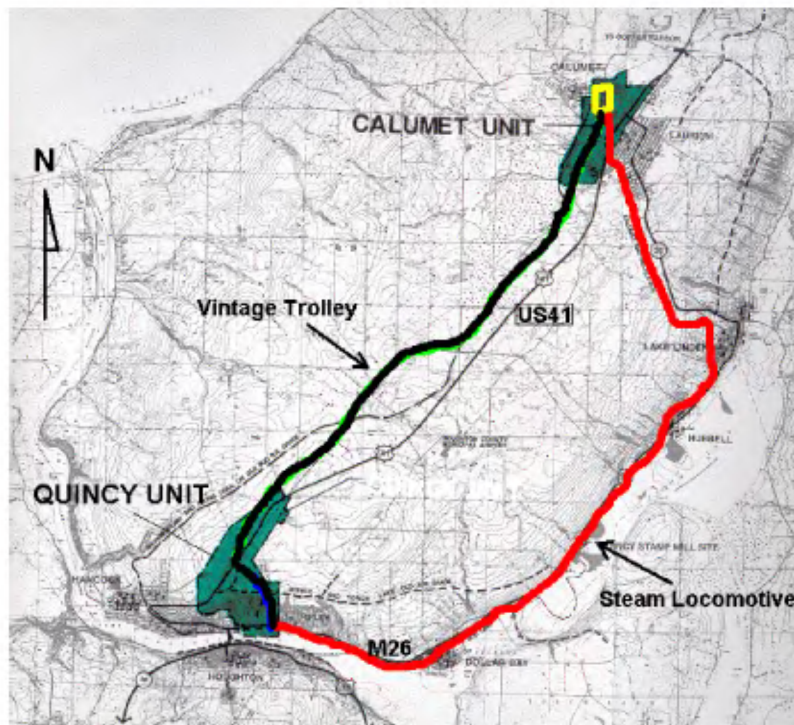


Figure 11 - The ATS Concept for the KNHP.

Complete Round Trip

Cog Railroad

A park visitor who arrives at the Visitor Orientation Facility could purchase a ticket or pass that would be good for unlimited use of the entire ATS for a specified period of time of one, two, or three days. The visitor would park his/her automobile at the Visitor Orientation Facility and board the Cog Railroad, stopping at the entrance to the mine tour. After completing the mine tour, the visitor would reboard the Cog Railroad, and proceed to the Hoist House for a narrated tour. From the Hoist House, the visitor would walk to the A.E. Seaman Mineral Museum or board the cog railroad and travel to the museum.

Interurban Streetcar

After experiencing the mineral collections in the museum, the visitor could board the interurban trolley for the ten mile trip to Calumet. There would be a narration along the way focusing on mining, Electric Park, and other items of historical interest. The interurban would stop at a transportation plaza on the south side of Calumet, near the intersection of US-41 and the Sixth Street Extension.

Calumet Streetcar

At this point, the visitor could board a streetcar that would circulate through Calumet. There would be ample opportunities to alight at points of interest, to have a meal, or to shop, and then reboard the streetcar. Upon returning to the transportation plaza, the visitor could board a steam train.

Steam Train

The steam train would follow a historical alignment through the village of Laurium, winding down a steep hill to Lake Linden. At Lake Linden, the visitor could alight and proceed on foot, or perhaps by van, to the Houghton County Historical Museum and its associated displays. There would be time to explore the period churches and mercantile buildings of Lake Linden before reboarding the steam train. The steam train would follow a historic railroad alignment along the shore of Torch and Portage Lakes to the Visitor Orientation Facility. There would be narration during the trip to identify specific sites and relate the history.

The complete round trip described in this section, although rather ambitious, describes the widest potential use. The following three points help explain the operation of the ATS:

The system would operate on a published schedule that would help the visitor plan his/her time at each destination. This would be essential, given the “hop-on / hop-off” method of use.

A round trip could begin and end at any station on the system. However, beginning at the Visitor Orientation Facility would provide the most coherent visitor orientation and would enhance understanding of the historical context.

A visitor could choose to use only a single part or several parts of the ATS without taking an entire round trip.

To illustrate partial use, a visitor could ride only the Cog Railroad from the Hoist House to the mine tour entrance, as is done today. Another option would be to ride only the Calumet streetcar, or the steam train to and from Lake Linden, or perhaps both of these components, but not the entire ATS round trip.

Transportation Centers

Three transportation centers or stations have been identified where visitors would transfer from one mode to another mode. A plaza type setting with facilities for information and ticketing, commercial opportunities, and displays could be developed around these locations. Covered waiting areas would also be provided.

(1) The Visitor Orientation Facility

For many visitors the Visitor Orientation Facility at the Quincy Smelter site would be their introduction to the Park. In addition to information on the Park and transportation options, exhibits and displays would be part of this site. Visitors may park their automobile at the Visitor Orientation Facility and board a cog railroad to travel to the Quincy Mine site for a mine tour, hoist tour, or visit the A.E. Seaman Mineral Museum. They can return to the Visitor Orientation Facility on the cog railroad or continue on their way to Calumet. Visitors could head eastbound on a steam railroad that would operate on the east side of the Keweenaw Peninsula passing through Dollar Bay, Mason, Hubbell, and Lake Linden, to Calumet.

(2) The Quincy Mine Center

The Quincy Mine location would provide for the transfer of passengers between the cog railroad and the interurban streetcar. The Quincy Mine Center would be located adjacent to the A.E. Seaman Mineral Museum.

(3) Calumet Transportation Plaza

The Calumet Transportation Plaza would be a connection node for the interurban streetcar, the Calumet streetcar, and the steam railroad. An attractive location would be in the Sixth Street - Mine Street area. This location is a few blocks from the historic Calumet business district and would have good visibility from US-41 for tourists intent on traveling north to Copper Harbor. The Center could also serve as an important new gateway to Calumet, and an information kiosk, displays, automobile parking, and opportunities for concessions could be provided at this location.

Technologies

Technical details pertaining to the ATS technologies are discussed in this section.

Cog Railroad

The current cog railroad vehicle operated by the Quincy Mine Hoist Association is shown in Figure 12. Engineering and performance parameters follow:

Dimensions	Length	35' – 2 ¼"
	Height	10' – 8 5/8"
	Width	8' – 6 ¼"
	Wheelbase	22' – 0"
Weight	Empty	19,000 pounds
	Maximum	25,000 pounds
Capacity	<i>28 passengers plus operator</i>	
Speed	5 mph on 18 – 37% grades	
	10 mph on grades of 17% or less	

Power Train Closed loop hydrostatic drive with engine drive pumps and four hydraulic propulsion motors connected to gears engaging track mounted toothed rack.

Braking Primary dynamic braking by motor port mounted counterbalance valves. Parking and emergency braking by enclosed motor mounted spring applied by hydraulic released brakes operated by system propulsion pressure. Emergency rail clamp brake in the event of complete drive failure provided by spring applied, hydraulic released rail clamps mounted between tandem wheel sets in four locations.

Operator Control Dual operator control for bi-directional travel.

The front of the car is oriented downhill to provide a large front windshield view of Portage Lake. Passengers face down hill at all times (*Pudelko, 2003*).



Figure 12 - Photograph of the cog railroad (Quincy Tramway).

The roadbed consists of two, standard 90-pound steel rails with a standard gauge of 4' – 8 ½" and a center mounted toothed steel rack serving as a reaction rail for traction. Conventional wooden ties and aggregate ballast are used. Although there are neither switches nor grade crossings in the existing system, they are technically feasible and could be added if necessary as part of an extension. Stations are very simple platforms adjacent to the tracks used for boarding and alighting the vehicle.

Interurban and Streetcar Trolley

Currently there are no interurbans or streetcar trolleys at the KNHP, and there is no opportunity to restore any of the trolleys used by the Houghton County Traction Company, as none exist. Custom made rail trolley vehicle reproductions (new vehicles that are faithful reproductions in appearance with modern engineering details) may be procured. An example, designed and built by the Gomaco Trolley Company of Ida Grove, Iowa, for the Lowell National Historical Park, is shown in Figure 13.



Figure 13 - Replica streetcar operating at the Lowell National Historical Park.

Another possible source would be to acquire restored or restorable vintage trolleys from other operators. However, because vintage trolley applications have grown dramatically in popularity in recent years, the market for these cars has become very competitive (*Costelo, 2003*). Moreover, such trolleys would not be faithful to the appearance of Houghton County Traction Company rolling stock. There are several commercial suppliers that are sources of replica or restored streetcars and interurban cars. In addition to the Gomaco Trolley Company, they include Miner Rail Services, Edwards Rail Car Company, and Brookville Equipment Corporation.

Reproductions are available in various sizes and styles. An example set of engineering and performance details for a trolley recently delivered to Portland, Oregon follow (*Gomaco Company, 2004*):

Dimensions	Length	40' – 0"
	Height	12' – 7"
	Width	8' – 6"
Weight	Maximum	55,000 pounds
Capacity	40 passengers	
Speed	30 mph maximum	

Running Equipment 750 volt, 55 hp traction motors, air brakes, Westinghouse cineston controller installed in replica K35 enclosure Westinghouse motor-generator with a Quincy 325LS compressor.

In interurban use, the 30 mph speed is attained for most of the trip. As a streetcar circulator, average speeds may be considerably lower due to operation on city streets in mixed traffic. Traction power may be supplied to onboard DC electric motors using overhead catenary distribution in order to be historically

accurate. However, as a potentially lower cost alternative, internal combustion engines may be used to power the reproductions. Other details of trolley systems use conventional railroad technology.

Steam Train

There are numerous examples of steam powered excursion trains operating in Canada and the United States and there are many excursion trains using diesel locomotives (*Empire State Railway Museum, Inc., 2004*). An important step would be to explore the secondary market for restored or restorable steam locomotives and vintage passenger cars. These may be available from museums or private collections.

A missed opportunity occurred in 2004, when a steam locomotive that once operated on the Copper Range Railroad (#29) was acquired and moved from Hancock to the Mid Continent Railway Museum in New Freedom, Wisconsin. Figure 14 show the train as it operated as an excursion train between Calumet and Lake Linden in the early 1970s.



Courtesy of Charles Sincok

Figure 14 - Photograph of Copper Range #29 operating as an excursion train between Calumet and Lake Linden, early 1970s.

There are two Quincy & Torch Lake Railroad narrow gauge steam locomotives on display at the Quincy Unit of the Park and it might be possible to restore them to operating condition. An older locomotive is also located on the Quincy Smelter site. These locomotives should be assessed for potential use. If they cannot be restored to operating conditions, restoration for display purposes should be considered. The three locomotives are currently unprotected and immediate steps should be taken to protect them from further deterioration. These steps would include sheltering the locomotives from rain and snow.

The search for equipment will guide design parameters for the rail line. For example, if the two Quincy & Torch Lake Railroad locomotives can be restored for operations, narrow gauge may be the preferred design option. Other component parts of a steam railroad (track bed, rails, ties, switches, grade crossings) use conventional railroad technology and are readily available.

ATS Routes and Operating Characteristics

This section describes in more detail the routes and operating characteristics on the mode for each route.

Visitor Orientation Facility to Quincy Mine

In a Michigan Tech masters degree research project, Pudelko has described in detail a plan to extend the cog railroad to the relocated A.E. Seaman Mineral Museum to the north, and to the future KNHP Visitor Orientation Facility to the southeast (*Pudelko, 2003*). The northerly extension would be about 1,500 feet long, connecting the hoist house with the museum site. The Visitor Orientation Facility extension to the Quincy Smelter would be 3,800 feet long. The extended cog railroad, 1.5 miles long, is shown in Figure 15. By-pass tracks could be added so that more than one car could operate on the line. Tramcars would be added based on increased ridership. With two tramcars, a headway (spacing in time between tramcars) of 30 minutes could be achieved.

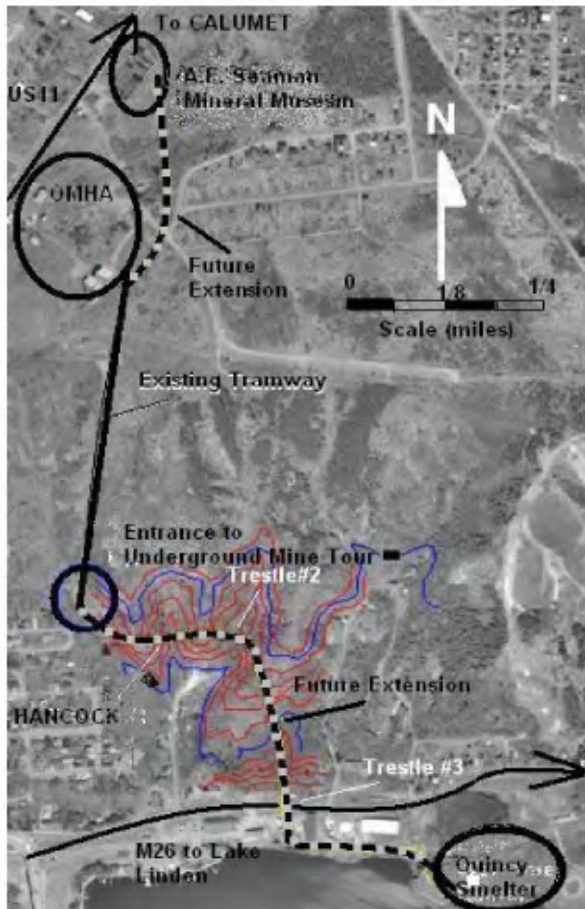


Figure 15 - Potential alignment of cog railroad extension.

There would be four stations or stops on the route – (1) the Visitor Orientation Facility at the Quincy Smelter site, (2) the mine adit for underground mine tours, (3) the Quincy Hoist House, and (4) the A.E. Seaman Mineral Museum (Quincy Mine Transportation Center). The operating characteristics for a cog railroad extension with one, two, and three car options are included in Appendix D.

Because the existing cog railroad car is a one-of-a-kind, unique vehicle, the alternative of using a commercially available cable-propelled system, known as a *funicular*, on the route was examined. Funiculars may be procured from several manufacturers. Their availability, including parts and support services, may be an advantage over the existing cog railroad equipment.

Funiculars utilize a stationary electric drive motor that is assisted by gravity to propel cars that are permanently connected to a cable. The cars are equipped with wheels and run on fixed guideways that can be at grade or on aerial structures. Funiculars were originally developed for applications with very steep grades. Figure 16 illustrates the funicular technology. Funicular car capacity ranges from 20 to 100 passengers and with speeds up to about 20 mph. Thus, a funicular would offer considerably better performance than an extension of the existing cog railroad. Even at a speed of 10 mph, a funicular would make the trip between the A.E. Seaman Museum and the Quincy Smelter Visitor Orientation Facility in about eight minutes (not including station dwell time).



Figure 16 - A funicular vehicle.

In earlier work, Pudelko examined the use of vintage streetcars and buses as alternatives to extending the cog railroad. Although vintage streetcars would be an attractive alternative, the steep grades required on the route from the Visitor Orientation Facility to the Quincy Mine area would have to follow the snowmobile trail along the Portage Lake waterfront and pass the County Fairgrounds. Pudelko concluded that the property acquisition, environmental concerns, operating issues, and costs would make this alternative difficult to implement. An analysis of the option of operating a vintage streetcar through downtown Hancock was also considered but the alignment and design elements for this route and impact on street traffic operations were concerns, so the cog railroad or alternative funicular options were seen to be preferred alternatives for linking the Visitor Orientation Facility to the Quincy Mine area.

Quincy Mine to Calumet

The interurban route linking the A.E. Seaman Mineral Museum (Quincy Mine Center) with the Calumet Transportation Plaza would be ten miles long and run parallel to US-41 as shown by Figure 11. The route would follow much of the alignment on the original interurban route. The route would be served by a single track with short by-pass sections of dual track to permit the simultaneous operation of more than one car. The by-pass tracks could be added as more cars would be necessary to meet ridership growth. Operating parameters for one, two, and three interurban cars with an average speed of 25 mph are provided in Appendix D. Other alignment options, property issues, and environmental aspects would be examined in the next phase.

Calumet Streetcar

Four alternative streetcar alignments within Calumet were explored at the conceptual level to illustrate the range of possibilities. These alternatives are shown in Figure 17. The figures identify the points of historic interest adjacent to the routes. As well, many Calumet businesses are located along or in close proximity to the routes. All alternatives begin and end at the planned Transportation Plaza.

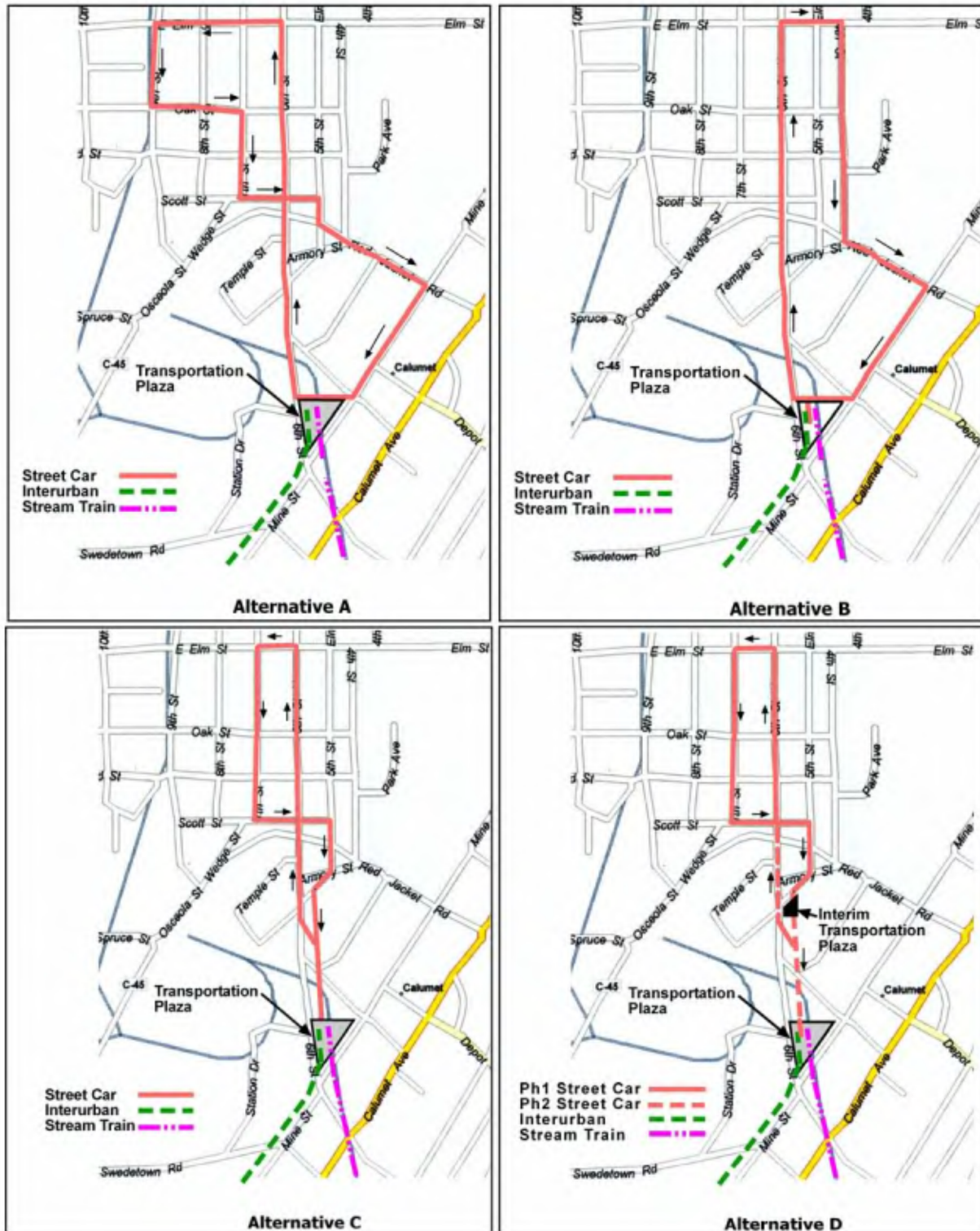


Figure 17 - Concept Alternatives for a Calumet Streetcar.

Alternative A

The streetcars depart the Transportation Plaza, proceeding north on 6th Street, west on Elm Street, south on 9th Street, east on Oak Street, south on 7th Street, east on Scott Street, southeast on Red Jacket Road, and southwest on Mine Street to the point of beginning. This route is 9,200 feet long.

Alternative B

The streetcars depart the Transportation Plaza, proceeding north on 6th Street, east on Elm Street, south on 4th Street, southeast on Red Jacket Road, and southwest on Mine Street to the point of beginning. This route is 7,200 feet long.

Alternative C

The streetcars depart the Transportation Plaza, proceeding north parallel to and then on to 6th Street, west on Elm Street, south on 7th Street, east on Scott Street, south on Fifth Street, southwest on Old Dam Street, and then south parallel to 6th Street, to the point of beginning. This route is 6,300 feet long.

Alternative D

The streetcars depart an Interim Transportation Plaza located at 6th and Old Dam Streets, proceeding north on 6th Street, west on Elm Street, south on 7th Street, east on Scott Street, south on Fifth Street, and southeast on Old Dam Street to the point of beginning. This route is 4,600 feet long and illustrates the way in which a starter streetcar could be incrementally extended to the future Transportation Plaza farther south.

Operating parameters for Alternatives A through D, with one to three cars for each alternative, operating at an average speed of 25 mph, are provided in Appendix D.

These, and other alternative routes, need to be further analyzed as part of more detailed transportation planning that involves all the stakeholders -- for example, the Village of Calumet, the Main Street organization, business owners, and the NPS. Recommended considerations include but are not limited to: economic development potential, proximity to historic resources, traffic engineering details associated with street running rail vehicles, the location and number of stops, the size and location of a vehicle maintenance and storage facility, electric power supply, disruption during construction, and cost.

Staged development of the streetcar system should be further analyzed. The system could begin with a modest route that would be expanded incrementally as community interest grows, ridership increases, and more funding becomes available. Likewise, the number of streetcar vehicles could be increased to meet ridership and route length needs.

Calumet to Visitor Orientation Facility

The route for a steam train linking the Visitor Orientation Facility at the Quincy Smelter with Lake Linden and the Transportation Plaza in Calumet is shown on Figure 11. It would follow the route of the Copper Range Railroad from the Visitor Orientation Facility to Lake Linden, and the Calumet and Hecla Railroad from Lake Linden to the Calumet Transportation Center. Three stops or stations are planned – (1) the Visitor Orientation Facility, (2) Lake Linden, and (3) the Calumet Transportation Plaza. Other stops, such as the Dredge, could be included. Operating parameters, based on an average speed of 25 mph, are shown in Appendix D. At each end of the line, the locomotive would be switched to the opposite end of the train using a short by-pass track. In the preliminary engineering phase, extensive work would be undertaken to examine alignment alternatives, operating issues, property and infrastructure requirements, and more detailed cost estimates.

A second route was explored in which steam trains would operate between the Quincy Mine area and Mason following the alignment of Quincy and Torch Lake Railroad on the escarpment. This option was

seen as an alternative to the Copper Range Railroad between Mason and the Visitor Orientation Facility. The route is also shown in Figure 11.

ATS Staging

There are opportunities to incrementally stage the development of the ATS modes and network over time based on the availability of funding and growth in visitor attendance. Thus, complete development over a period of years is envisioned

Interim Use of Buses as a Starter System

During the time it will take to obtain approvals, secure funding, complete engineering studies and designs, procure equipment, and construct the vintage systems, it would be possible to use buses to provide visitor transportation on part or all of the ATS routes discussed in this report. A detailed description of interim bus transportation was developed as part of this ATS Study and is described in a later section.

Incremental Development of the Vintage Modes and the Cog Railroad

Separate and apart from the interim use of buses, it would be feasible to incrementally develop the vintage and cog railroad (or funicular alternative) components. For example, perhaps the Calumet streetcar circulator could be developed first, as part of the Main Street Program. Other components could be added (and replace interim bus service) as funding becomes available and park attendance increases.

However, from a functional standpoint, the various pieces of the complete system could be added in any order.

Examples of staging are outlined below:

The cog railroad (or funicular replacement) could be extended to the A.E. Seaman Museum and Visitor Orientation Facility as these facilities are added.

Track could be added to the Calumet streetcar system to serve more points of interest and cars could be added to accommodate more riders over a period of years.

The steam railroad could begin as a short excursion segment operating in shuttle mode from one station at the Visitor Orientation Facility. Track could be added as future funding becomes available and visitor interest grows, with the eventual goal of completing the line to Calumet.

There do not appear to be viable staging opportunities for the interurban line.

Alternative Visitor Orientation Facility Location

At the time of this study, the Quincy Smelter is undergoing an investigation for hazardous materials and a functional study is underway to further establish its feasibility as a Visitor Orientation Facility. If the smelter site is ruled out as a Visitor Orientation Facility, there would be two affects on the ATS.

The stream railroad would follow the Quincy & Torch Lake rather than the Copper Range alignment. The railroad would stay at the crest of the escarpment with a station at or near the A.E. Seaman Mineral Museum instead of the Quincy Smelter. This alternative alignment provides dramatic vistas of the Portage Lake Waterway, Houghton, Hancock, and the smelter not available at the lower elevation of the Copper Range alignment.

The cog railroad (or funicular replacement) would not need to serve the Quincy Smelter as a Visitor Orientation Facility. However, this extension could be provided if the smelter is open to the public for guided or self-guided tours in much the same way as is the mine.

The Calumet Streetcar and interurban line components of the ATS would not change.

Comparable Systems

In response to the transportation planning requirements of the Transportation Equity Act for the 21st Century (TEA-21), the National Park Service established the Alternative Transportation Program (ATP) in cooperation with the U.S. Department of Transportation. The program was to coordinate and support planning and implementation of alternative transportation systems at parks across the country. Currently there are over 100 alternative transportation systems moving visitors to and through more than 90 national parks. There are also several parks in which alternative transportation systems are the only means of accessing the park. The Isle Royale National Park is a good example of such a system as the park is not accessible by land. A summary of these systems is included in Appendix B.

In 2001, the U.S. Department of the Interior and the U.S. Department of Transportation released the report, *Federal Lands Alternative Transportation Systems Study*, in which the transit needs of 169 national park units were assessed. The study concluded that 118 NPS sites were found to have current and future transit needs. Several exciting projects have been implemented or are being planned as a result of this study.

The early railroads played an important role in the development of North America and there is a passion by many to preserve this rail heritage for future generations. Rail was particularly important in the development of the Keweenaw Peninsula and this has been an important consideration in the development of a long range transportation plan for the KNHP involving alternative transportation systems.

There are numerous collections of rail and transit equipment throughout North America that range from static display collections to operating systems. In general, the collections and systems could be grouped into three broad categories – museums, tourist or excursion systems, and historic or vintage transit systems. There is a wealth of published information and web resources on these collections and systems.

Museums

The largest category of historic rail operations is the museum. The museums are generally non-profit organizations that have been established with the goal of preservation of historic artifacts and records, and displays will typically include rail equipment and structures. Equipment pieces are often donated and stored on the grounds for public viewing, and in most cases the equipment is inoperable.

There are over 160 historic railroad and transit museums in the United States and Canada. There are collections that are dedicated to specific modes of rail, such as trolleys or logging railroads, to museums that have broad collections of a variety of rail and transportation equipment. The largest of these museums have their own shop areas with the tools and skilled volunteers to restore equipment, as well as operate the equipment. There are over 60 museums that have an operating line for visitors to experience travel on historic steam or diesel powered trains or vintage trolleys.

One of the museums is a national historic site – the Steamtown National Historic Site (www.nps.gov/stea) in Scranton, Pennsylvania, opened in 1995. It includes two display buildings, a fully restored roundhouse, and 12 miles of track for the operation of restored equipment.

The Illinois Railway Museum in Union, Illinois (www.irm.org) is the largest and most encompassing museum with over 25 steam locomotives, more than 300 pieces of historic rail equipment, and five miles of track.

The largest electric railway museum is the Seashore Trolley Museum (www.trolley-museum.org) in Kennebunkport, Maine. Its collection includes over 250 trolley and transit vehicles, and a 3.5-mile rail line for trips on vintage trolleys through the scenic Maine woods.

Tourist Systems

The tourist railroad industry has flourished over the past twenty years as local groups of enthusiasts and preservationists have banded together to return rail service that had been abandoned years before. They are typically for-profit companies that operate service for pleasure or sightseeing trips, and may offer scenic tours, special event trips, and dinner or entertainment trains that provide passengers a unique experience. There are over 150 tourist systems in the United States and Canada. Probably the two most famous examples of steam trains are the Durango and Silverton Railroad in Durango, Colorado, and the Cumbres and Toltec Scenic Railroad in Charma/Antonio, New Mexico.

Durango and Silverton Narrow Gauge Railroad

The Durango and Silverton Narrow Gauge Railroad (www.durangotrain.com) has been in continuous operation for over 120 years, carrying passengers behind vintage steam locomotives and rolling stock indigenous to the line. During the latter part of the 1960s the Durango and Silverton was registered as a National Historic Landmark and was recognized as a National Historic Civil Engineering Landmark. The railroad has been used in several Hollywood movies including Butch Cassidy and the Sundance Kid. Over the years several improvements to the line and equipment have been made. Passengers board the train at Durango for the 45-mile trip to Silverton. There is a two-hour layover in Silverton and then passengers re-board the train for their return trip. The train travels at an average speed of 18 mph. One trip a day is made during the summer tourist season and the adult fare is \$60. Half-day wilderness adventure education trips and winter trips are also available. The Durango and Silverton is owned and operated by American Heritage Railways with home offices in Coral Gables, Florida.

Cumbres and Toltec Scenic Railroad

The Cumbres and Toltec Scenic Railroad (www.cumbrestoltec.com) was originally constructed in 1880 to serve the silver mining district in the San Juan mountains in southwestern Colorado. Today, narrow-gauge steam locomotive powered trains operate on a 64-mile line that connects Antonito, Colorado to Carma, New Mexico. One trip is made each day during the summer tourist season and the adult fares range from \$55 to \$70. The railroad is registered as a National Historic Landmark and is a National Historic Civil Engineering Landmark. The railroad is jointly owned by the states of Colorado and New Mexico and is managed by the Cumbres and Toltec Scenic Railroad Commission, an interstate agency authorized by Congress in 1974. The railroad is operated under contract to Rio Grande Railway Preservation Corporation, a non-profit supporting group of the Friends of the Cumbres and Toltec Scenic Railway, Inc.

Vintage Trolleys

While there are several museums dedicated to trolleys, streetcars, and interurbans, vintage trolleys are defined as a regularly scheduled operation using genuine historic or replica cars in an urban environment. The cars run on rails and operate electrically from overhead wires or from a mobile generator. In some cities, vintage trolleys have been placed into service on lines with other streetcars or new light rail transit vehicles.

In several cities, new vintage trolleys are being introduced as part of an urban redevelopment initiative. The trolley can be an excellent way to circulate people between local attractions and at the same time the ride becomes part of the experience. There are over 25 cities that have vintage trolleys, and many more cities have vintage trolley projects under active consideration. An excellent resource on vintage trolleys and the systems that are currently operating or are being planned is the American Public Transit Association (APTA) Heritage Trolley and Streetcar Site (www.heritagetrolley.org). Links are available on the site to find additional information on existing and planned systems.

Existing Systems

New Orleans	Dallas	Seattle	Edmonton, AB
Memphis	Galveston	Tacoma	El Reno, OK
Portland, OR	Kenosha, WI	Tucson	Fort Collins, CO
San Francisco	Lowell, MA	Vancouver, BC	Issaquah, WA
Tampa	San Jose	Astoria, OR	Nelson, BC
Charlotte	San Pedro	Denver	Whitehorse, NT
Little Rock	Philadelphia	Yakima, WA	Astoria, WA

Lowell Streetcar System

As part of the development of Lowell National Historical Park, streetcars were reestablished in Lowell, MA, in 1984 on a one-mile line that connects key visitor areas in the park. It is operated by the National Park Service and typically runs from March through November. Planning has been undertaken to expand the system. The Lowell system would be one of several comparable systems to the one envisioned for Calumet.

Under Active Planning

Atlanta	Columbus, OH	Minneapolis	Salt Lake City
Austin	Columbus, GA	Omaha	San Antonio
Baltimore	Corpus Christi	Racine, WI	Santa Cruz
Birmingham	Dayton	Richmond, VA	Spokane
Boise	Dubuque	Roanoke, VA	Surrey, BC
Cedar Rapids	Fort Worth	Sacramento	Toledo
Champaign, IL	Honolulu	Savannah, GA	Winston-Salem
Chicago	Ithaca, NY	St. Joseph, MO	Los Angeles
Cincinnati	Kitchener, ON	St. Louis	Madison, WI
Colorado Springs	Miami	Salem, OR	Huntington, WV

Other Resources

The most complete listing of tourist railroads and museums is the Empire State Railway Museum's annual guide, *Tourist Trains* (Kalmbach Publishing, Waukesha, WI). There are also several resources on the internet that describe steam railroad and vintage streetcar systems:

Association of Railway Museums, Inc. (www.railwaymuseums.org)

National Alliance of Public Transportation Advocates (NAPTA) (www.napta.net)

National Railway Historical Society (www.nrhs.com)

The Michigan State Trust for Railway Preservation, Inc. (www.mstrp.com)

John Smatlak's Railway Preservation Resources - North American vintage trolley systems and other railway equipment (www.railwaypreservation.com)

Steam Central (www.steamcentral.com) – steam train resources

Tourist Railroad Association, Inc. (www.traininc.org)

Tourist Railroad Information Center (www.touristrailways.com)

Ridership

Keweenaw National Historical Park Survey

A survey of Park visitors was undertaken to assist in developing a forecast of ridership for a range of transportation alternatives for the Keweenaw National Historical Park. The questionnaire obtained some general visitor information and presented several transportation options for comments:

1. a link between the Visitor Orientation Facility (the Quincy Smelter) and the Quincy Mine Hoist area – using the cog railroad.
2. a link between the Quincy Mine Hoist area and Calumet – using a vintage trolley following the alignment of the interurban trolley line of the early 1900s.
3. a circulation system for downtown Calumet – using a vintage trolley.
4. a link between Calumet and the Visitor Orientation Facility or Quincy Mine Hoist passing through Lake Linden and along the east side of the Keweenaw Peninsula – using a stream locomotive train following the alignment of the early 1900s.

The survey was conducted over two weeks in June and July 2004. The results of the survey and a copy of the questionnaire are included in Appendix C. Photographs, potential routes, approximate travel times and fares were presented to measure the level of ridership interest if such a system were available. Another KNHP survey was also undertaken during the summer of 2004 to examine tourists and their characteristics. The results from that survey are not expected until spring 2005.

The surveys were conducted at three locations:

1. the lobby of the gift shop at the Quincy Mine site,
2. the tourist information center in Calumet, and
3. on the streets of Copper Harbor.


The same questionnaire was used for all sites to enable comparisons of the responses and all were conducted on the same date at all locations. A display poster (Figure 18) was available at each location to create interest as well as present the concepts. Interviewers would approach visitors requesting assistance in completing a questionnaire. The questionnaire was self-administered, but an interviewer was close at hand to answer questions and help interpret the concepts. 346 surveys were completed.

Want to Take a Ride Back in Time?


The Keweenaw National Historical Park would like your opinion.




Would you like to ride a trolley down Main Street Calumet, and take it to "work" at the Quincy Mine like the miners did 100 years ago?



The trolley would take nearly the same path as the originals (possible route shown in green & yellow).



The train would be much like this model, and would follow some of the same routes as the original railways used in mining days (possible route shown in red).




The cog railway would extend beyond the existing system, and continue down to the proposed Quincy Smelter Visitor Center (possible route shown in blue).



Do you think you'd like a ride on a cog railway from the Welcome Center straight to the top of Quincy Hill?

How about riding a steam locomotive from historic Calumet, through the old mining town of Lake Linden, and down to the Quincy Smelter?



The Park Service is exploring the idea of building a cog railway, trolley, and/or steam railroad to connect Keweenaw National Historical Park sites.

Our goal is to learn about the expectations, opinions, and interests of visitors to the Keweenaw National Historical Park. This information will assist us in our efforts to better manage this site and to serve you, the visitor.

If you have any comments or questions, please contact Bill Sproule at Michigan Tech University, 906-487-2568 <wsproule@mtu.edu> or Frank Fiala, Keweenaw National Historical Park, 906-337-3168 <frank_fiala@nps.gov>.

Figure 18 - Display Poster at interview locations for Transportation Survey.

Tourist Activity

One purpose of the survey was to estimate tourist activity on the Keweenaw Peninsula. This was necessary in order to be able to estimate potential ridership on the proposed transportation modes. Unfortunately, very little secondary data are available concerning the number of tourists in Houghton and Keweenaw Counties. Possibly the best approach in developing a figure is to use tourism activity based on the 2% room tax that is assessed by all hotels, motels, cabins, and resorts, and combining it with results from the survey on size of parties and length of stay in the area.

It is estimated that there are about 215,000 tourists that spend one night on the Keweenaw Peninsula. In addition, there are tourists that can be classified as day-trippers. These did not spend a night on the Keweenaw Peninsula, and in many cases includes local residents that are sightseeing and visiting local attractions. Based on the survey, it is estimated that about 65,000 tourists fall into this category. Adding the two groups yields an estimate of 280,000 annual tourists.

In the development of the transportation systems to serve the Park it was assumed that it would initially operate during the summer tourist season (mid-May to mid-October), so a further adjustment was made to estimate the number of tourists during this season. About two-thirds of the annual tourists visit during this season. This results in an estimate of 190,000 tourists during the season in which the transportation systems are envisioned to operate.

The trend in tourist activity is not clear and a review of room tax receipts over the past several years indicates both increases and decreases. It is extremely difficult to project trends into the future with the realization that so many factors can affect tourism in this area. Ridership estimates for a potential system are based on current tourists and believed to be very conservative.

One factor that will certainly increase tourists and potential ridership would be the development of KNHP as a destination park. The trade area from which the Park would draw would expand significantly. The national interest and the results from the survey indicate that transportation systems with a historical focus that tell the story and link the Park attractions may be one of the catalysts to transform the Park into a tourist destination. If that occurs, dramatic increases in tourist and ridership may result.

A growth in tourism of 5% per year would double the number of park visitors in fourteen to fifteen years. This level of growth in KNHP visitation seems reasonable given the current low market penetration for the Park, the change in the Park to a destination location, and modest increases in general tourism activity in future years.

Demand for Alternative Transportation

The survey asked respondents about the alternative transportation systems that are envisioned for the Park and developed in the study. The modes, concepts, potential routes, travel times, and potential fares were presented, and respondents were asked to choose one of five choices on the likelihood that they would use the systems presented. The choices were:

- Definitely would not
- Probably would not
- Don't know
- Probably would
- Definitely would

The response for the alternative transportation systems was very positive. For the question related to the vintage trolley/interurban that would travel between the Quincy Unit and Calumet (Question 6 on the survey), 73.9% of the respondents said that they either *probably would* or *definitely would use* the system.

For the steam locomotive train between Calumet and the Quincy Unit (second part of Question 6 on the survey), 73.5% of the respondents said that they either *probably would* or *definitely would use* the system. The results showed 73.1% of the respondents said that they either *probably would* or *definitely would use* the vintage trolley/streetcar in Calumet (Question 7). On the question related to the extension of the cog railroad in the Quincy unit (Question 9 in the survey), 70.7% of the respondents said that they either *probably would* or *definitely would use* the cog extension. Of those respondents that had ridden on the cog railroad, an impressive 88.7% indicated that they either *probably would* or *definitely would use* the cog extension. When analyzing the data for those tourists who were more familiar with the KNHP and its cooperating sites it was generally found that they were more likely to respond favorably to questions concerning the likelihood of using an alternative transportation system in the Park.

Respondents were also asked if they would be likely to purchase a one-day pass that would entitle them to unlimited use of the transportation systems for a day (Question 11 on the survey). The enthusiasm for the one-day pass was somewhat muted with 58.8% indicating that they *probably would* or *definitely would* buy the pass. Comments by the respondents suggested that a two-day or three-day pass would be preferable.

Combining these responses with the estimated tourists in the Keweenaw Peninsula yields ridership estimates for the four modes in the alternative transportation system. Two approaches were taken. In the first approach, the percentage of survey respondents that indicated that they *definitely would use* the mode was applied to the seasonal tourists. In the second approach, the percentage of survey respondents that indicated that they *definitely would use* plus those that indicated that they *probably would use* was applied. The results are as shown on Table 4.

Table 4 - Seasonal Ridership Estimates for Alternative Transportation Systems

Transportation Systems	Ridership Estimates
Cog Railroad Extension in the Quincy Unit	50,000 ¹ to 140,000 ²
Vintage Streetcar in Calumet	50,000 ¹ to 140,000 ²
Vintage Trolley/Interurban operating between Calumet and the Quincy Unit (Quincy Mine area)	50,000 ¹ to 140,000 ²
Steam Locomotive Train operating between Calumet and the Quincy Unit (Visitor Orientation Facility)	50,000 ¹ to 140,000 ²

¹ Based on survey respondents that indicated that they *definitely would use*

² Based on survey respondents that indicated that they *definitely would use* plus those that indicated that they *probably would use*

It has been assumed that the season (mid-May to mid-October) has 150 operating days, so on an average day, the ridership would be 335 to 935 passengers per day for each mode. No analysis has been made in this study to examine daily or hourly peaking that would occur during the season

Costs

This section provides information on estimated capital and operation & maintenance (O&M) costs for all transportation modes discussed in the report except the Starter Bus System. Bus costs are described in a later section. Because many of the engineering details of the transportation modes have not been defined at this point in the planning process, these costs are conceptual in nature and subject to refinement.

However, the costs are sufficient for the purposes of this study -- to provide planning level approximations of costs and to make general comparisons of the investments in and cost to operate and maintain the transportation components of the overall plan. In transportation projects it is customary for more precise cost estimates to be developed as the engineering details are developed in the preliminary and final design phases.

Capital cost estimates do not include the cost of obtaining easements or purchasing property. The extent to which costs would be incurred for the purchase or use of property will be determined when more precise alignments are established in later, detailed studies.

Cost information is presented for the following transportation components:

- Calumet Streetcar
- A.E. Seaman Mineral Museum to Calumet Interurban Trolley
- Steam Train
- Expanded Cog Railroad (A.E. Seaman Mineral Museum to Quincy Smelter with intermediate stops at the mine hoist and mine adit)
- Funicular (alternative to Cog Railroad)

Summary cost information is provided in this chapter. Detailed costs in tabular form may be found in Appendix D.

Sources of Cost Data

Conceptual cost estimates were derived using unit price and other data obtained from a wide variety of sources. They include:

- Previous studies undertaken at Michigan Technological University
- U.S. Bureau of Transportation Statistics
- American Public Transportation Association
- A National Park Service sponsored study of the Lowell Historical National Park vintage trolley system
- Doppelmayr Garaventa (a supplier of funicular and other rope hauled transportation systems)
- Stone Consulting and Design (a consulting engineering firm specializing in vintage trolley system planning, design and construction)
- Gomaco Trolley Company and other suppliers of vintage trolley reproductions
- The Quincy Mine Hoist Association
- Huckleberry Railroad, Crossroads Village, Flint, Michigan
- Michigan State Trust for Railway Preservation

Because some information was for previous years, costs were escalated to 2004 dollars where necessary.

Operating Schedule

O&M costs are partly a function of the operating schedule. To assure consistency, the following schedule was assumed for all of the modes based on a 150 day per year season.

Days	Hours/Day	Hours
90	8	720
30	6	180
30	4	120
150 (total)		1020 (total)

This schedule provides the most frequent service during the 90 day peak summer season (June, July and August) with less frequent service in late spring and early fall.

Background on Calumet Streetcar and Interurban O&M Cost Data

Accurate cost estimation for operating and maintenance is difficult for various reasons. Several factors significantly influence O&M costs for vintage systems, including:

- The scale of the system.

- Costs of labor (including fringe benefits), services, material, and equipment, which have wide regional variations.

- Cost of electric power.

- Cost of insurance.

- Working conditions and rules.

- The extent that labor is provided by volunteers or those interested persons who are willing to work for lower than customary wages as a means of supporting historic preservation.

Moreover, there is no standard methodology used to account for O&M costs. Values from various sources often are not compiled on a consistent basis. Volunteer hours may not have been counted.

There is no known single source of vintage rail O&M data. One relevant source is the report titled, *Lowell National Historical Park Alternative Transportation System Historic Planning Study* dated December 2002. That report was prepared for the National Park Service by the John A. Volpe National Transportation Systems Center as part of a study to expand the vintage trolley system associated with the park. The report cites three O&M values (year 2002 dollars) as follows:

Kenosha, Wisconsin Vintage Trolley	\$10.30 per vehicle mile
Memphis, Tennessee Vintage Trolley	\$7.61 per vehicle mile
National average for light rail transit systems	\$12.05 per vehicle mile

Because Kenosha is physically the closest vintage system to the KNHP, the \$10.30 amount, escalated to 2004 dollars at 4% per year was used. The resulting value is \$11.14 per vehicle mile.

It is anticipated that there will be significant local interest at KNHP in vintage rail systems and obtaining volunteers from local communities who will be very willing to contribute their time to operation and maintenance will not be a problem. All volunteers will receive training appropriate to their duties.

Calumet Streetcar Costs

Capital Costs: Range from \$4.6 million for 4,600 feet of track with two cars to \$7.9 million for 9,600 of track with three cars. (See Appendix D for details.)

O&M Costs: Range from \$79,000 per year for a 4,600 foot route with two cars to \$178,000 per year for a 9,600 foot route with three cars. (See Appendix D for details.)

A.E. Seaman Mineral Museum to Calumet Interurban Costs

Capital Costs: Range from \$13.8 million for 10 miles of track and one car to \$15.5 million for 10 miles of track and two cars. The high cost of the interurban, compared to the Calumet Streetcar, is caused by its much longer route. (See Appendix D for details.)

O&M Costs: Range from \$200,520 per year for one car to \$602,000 per year for three cars. Because of the much longer route, compared to the Calumet Streetcar, annual vehicle miles are much higher, which drives up the O&M costs. (See Appendix D for details.)

Steam Train Costs

Capital Costs: Range from \$1.2 million for 0.5 miles of track with one restored locomotive and one car to \$13.2 million for 14.5 miles of track with one restored locomotive and four cars. The largest single cost item is the locomotive restoration. As the route grows in length, the cost of track is a major influence on the total capital cost. (See Appendix D for details.)

O&M Costs: A detailed analysis was not undertaken. Insurance costs, condition of equipment and infrastructure, operating hours, and level of volunteer participation were some of the factors identified that will result in an extremely large range of O&M costs. For most excursion railroads, the fares are set to cover the O&M costs.

Expanded Cog Railroad Costs

Capital Costs: Range from \$2.4 million to \$2.7 million depending on headway provided. More frequent service would require an additional vehicle and provision for bypassing. (See Appendix D for details.)

O&M Costs: Based on the current annual O&M costs for the cog railroad, costs were developed for an expanded route. The annual O&M costs range from \$84,000 to \$121,000 depending on the headway provided to serve the demand.

Funicular Costs

Capital Costs: \$13.0 million for 1.44 miles of track and two cars.

O&M Costs: A detailed analysis was not undertaken, but it is assumed to similar to the cog railroad extension.

Fares and Financing

Fares

Fares were presented in the survey for the alternative transportation systems to provide respondents with an order of magnitude fare that might be assessed to determine ridership levels. These fares were derived early in the study from an analysis of fares charged on excursion and museum type rail systems operating throughout the United States. A relationship was developed relating fares to system length and applied to the concepts developed in the study. One-way adult fares were presented as:

Vintage Streetcar in Calumet	\$5.00
Vintage Trolley/Interurban operating between Calumet and the Quincy Unit (Quincy Mine area)	\$10.00
Steam Locomotive Train operating between Calumet and the Quincy Unit (Visitor Orientation Facility)	\$20.00

The survey also indicated that reduced rates would be available for children and seniors.

The question of a fare for the extension of the cog tramway/railroad in the Quincy Unit was a little more complex. Today there are four fare levels – children under 6, children, adult, and senior (over 55) and the fares are also packaged for two options: Option 1 - a surface tour with a tramway ride, Option 2 - a surface tour, tramway ride, and mine tour combination. The current fares are:

	Option 1	Option 2
Children under 6	free	free
Children	\$4.50	\$7.50
Adults	9.50	12.50
Seniors	8.50	11.50

For the survey, Option 2 was used and the adult fare was increased by \$3.00 to help determine potential ridership levels on a cog railroad extension. A one-day adult pass of \$30 that would allow unlimited use of all of the transportation modes was also presented in the survey for comment.

Alternative Construction, Operation, And Funding Methods

Alternative ways in which the alternative transportation elements (Calumet Streetcar, Interurban, Quincy Unit Cog Railroad Extension/Replacement, and Steam Railroad) could be constructed, operated, and funded will be discussed in this section.

Conventional Approach

Under a conventional approach, the KNHP as project owner would award contracts, based on NPS procurement criteria, for detailed planning, environmental clearance, design, project management, acquisition of new or rehabilitation of existing equipment, and construction of track and other fixed facilities. An outline of key features follows:

Capital funding would come from various sources including the NPS itself, grants from federal and state government agencies, historic preservation and other public or private foundations, donations, and local fund raising. This “patchwork” approach to raising capital is typical for public transportation projects.

The KNHP would obtain easements and other land use rights or ownership as needed.

Volunteer labor and the donation of materials and construction equipment time also could play a role but would need close coordination.

The NPS would be directly responsible for Operation and Maintenance (O&M). A combination of seasonal hired employees with requisite basic skills and volunteers would constitute the workforce. A training program would be developed and implemented to assure safety and minimum performance levels. The local labor component would be augmented by a third party contract for technical assistance and a purchasing function to acquire materials, supplies, utilities associated with operation and maintenance.

KNHP could pursue advertising as a source of revenue.

Concessions or other commercial arrangements located at the Transportation Plaza in Calumet at the junction of the streetcar, interurban, and steam railroad lines, currently owned by the KNHP, could become a significant source of revenue. A large number of Park visitors would patronize the Transportation Plaza.

To the extent that farebox, advertising, and concession revenues did not cover O&M costs, funds from the KNHP operating budget or other subsidies would be required.

Advantages

KNHP retains complete control of all aspects.

Ownership, although vested in the NPS, would be perceived as local.

Disadvantages

Considerable effort and expertise would be required to manage the procurement and construction phase and for O&M. KNHP would become, in addition to its other functions, a construction manager and a transit agency. However, this may not be a significant disadvantage because of the experience within NPS that could be used for the projects.

Obtaining sufficient capital funds could take a long time.

KNHP would assume all implementation and financial risks, although NPS experience could be invaluable in mitigating this disadvantage.

Design-Build-Operate-Maintain-Transfer (DBOMT)

Under a privatized DBOMT approach, KNHP would be responsible for detailed planning and environmental clearance. However, most responsibilities and risks for construction, as well as O&M, would be transferred to a private sector contractor. Additionally, the contractor would provide part or all of the capital financing and assume some or all financial risks during O&M. There would be a single master contract between KNHP and a DBOMT contractor that would be awarded based on competitive proposals that meet NPS procurement criteria. An outline of key features follows:

The DBOMT contractor would be responsible for final design, procurement, and construction. The KNHP would provide easements and other required land.

The DBOMT contractor would finance all capital requirements.

Upon completion of construction, the DBOT contractor would provide O&M.

The term of the DBOMT contract would be substantial -- sufficient for the KNHP to pay the debt service (principal and interest) on the contractor-provided financing.

Farebox revenue would be retained by the DBOMT contractor to cover O&M costs. The DBOMT contractor and KNHP would share any farebox revenue in excess of O&M costs based on criteria agreed upon in the DBOMT contract, or fare box profits could be used to accelerate the term of the DBOMT contract, thus paying off the contractor loan early. To the extent farebox revenue did not cover O&M and debt service costs, KNHP would make payments to the DBOMT contractor. Advertising and concession or other commercial revenue associated with the historic modes would be sources of funds for these payments.

KNHP would retain responsibility for all policy decisions.

Detailed design and construction criteria, terms and conditions, and O&M performance requirements would be specified by KNHP in extensive DBOMT contract documents. Also, the details of the financial and commercial arrangements would be specified in writing.

In the United States, DBOMT is a relatively new project delivery method for public transportation systems that is, however, growing in use.

Advantages

The DBOMT approach likely could be carried out in less time than the conventional approach.

To the extent that capital funds could not be quickly obtained by KNHP, the DBOMT contractor would provide the balance of the money to get the project built. Competitive proposals would help assure the lowest possible carrying cost to the KNHP.

Unlike the conventional approach, KNHP would not be in the transit agency business. Extensive performance criteria in the DBOMT contract would be relied upon to assure that design, construction, and O&M meet minimum standards. The KNHP would need to provide top-level project oversight and take steps to assure contract compliance but not day-to-day management.

Disadvantages

Although many risks would be shifted to the DBOMT contractor, KNHP would not have the direct control that it would under the conventional approach.

Profit and overhead would be included in the DBOMT contractor payments. These would be a cost to KNHP.

Contingency plans would be needed, for example in the event the DBOMT contractor declared bankruptcy or KNHP found it necessary to terminate the contract for non-performance.

The DBOMT contractor would need assurance that the KNHP would be able to cover its payment obligations.

Other Approaches

Other methods for design, construction, operation, maintenance, and funding could be derived using some aspects of each approach described above. Some examples follow:

Most elements of the conventional approach could be used, but operation and maintenance could be contracted.

Most elements of the DBOMT approach could be used, but some of the O&M labor could be provided by volunteers, e.g., the operators and maintainers of the transportation equipment could be contractor employees with the requisite skills and training, but conductors who provide narration could be volunteers.

There are many other variations that could be developed. Moreover, the preferred approach for one mode -- Calumet Streetcar, for example -- might not fit the circumstances for the steam railroad. Considerable thought should be given to the overall implementation approach as more detailed planning is accomplished.

Funding Sources

There are many potential sources of money. Some key sources that should be explored during detailed planning are listed below.

Capital

The NPS Alternative Modes Transportation Program.

The Federal Land and Water Conservation Fund.

The Federal Transit Administration grant program through TEA-21 extension legislation.

The Community Streetcar Development and Revitalization Act (HR 1315)

The Michigan Department of Transportation.

The Federal Economic Development Agency.

Public and private foundations that support historic preservation.

Most of these capital sources require local matching shares in varying percentages.

Operation and Maintenance

Farebox revenue.

KNHP operating budget.

The Federal Transit Administration operating grant program. However, this is an unlikely source because of the procedures used to award funds and the demands of many large transit agencies for sources of money to cover farebox gaps.

Local subsidies could come from entities most likely to receive economic benefits such as the Houghton County Historical Society, the Keweenaw Peninsula Chamber of Commerce, the Keweenaw Convention and Visitors Bureau, the Keweenaw Community Foundation, the City of Hancock, the Villages of Calumet, Laurium, and Lake Linden, Houghton County, and the Quincy Mine Hoist Association.

Starter Bus System

It was realized that the long range transportation system concept presented in this study would involve several additional studies for the planning, design, construction, and implementation of the various components. As an option, a starter bus system was examined that would link major activity centers of the Park and provide a narrated tour for visitors (Sundberg, 2004). Two bus system concepts were considered – one serving the Quincy and Calumet Units, and one serving only the Calumet Unit.

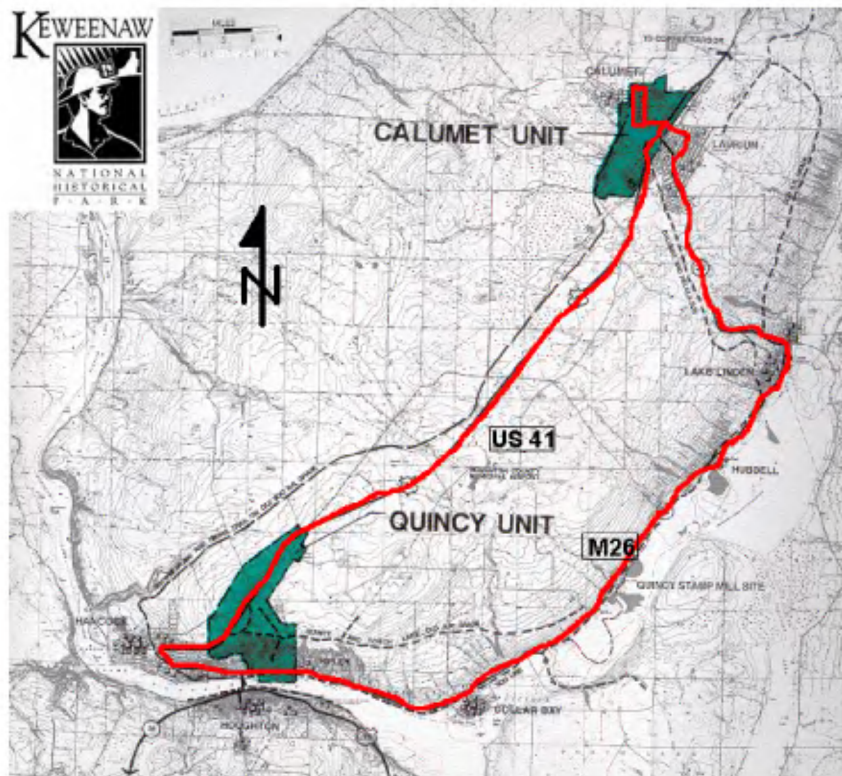
Quincy-Calumet Service

The vision for a Quincy-Calumet service would be that visitors would begin their park experience at the Visitor Orientation Facility would park their vehicles and board a bus for a narrated tour that would include the downtown Hancock, the Quincy Mine area, Calumet, Laurium, and Lake Linden. Visitors could disembark at any stop along the route and board a later bus to continue their tour.

The following objectives were identified for route and service planning:

- the system would provide non-stop service between the two main units of the Park with stops at specified cooperating sites so that visitors have the option to depart the bus and tour the individual sites.
- the system will pass notable historical landmarks and include narrative interpretations along the entire ride.
- the system will operate on an efficient route with a set policy-based schedule.
- the system will primarily serve park visitors

Several possible routes were considered. A 30-mile loop that begins and ends at the Visitor Orientation Facility was judged to best meet the initial objectives. Figure 19 shows the selected route.



Map Courtesy of the National Park Service

Figure 19 - The KNHP Tour Bus System.

The service would be one-way and operate clock-wise. Buses would travel westbound through downtown Hancock on US-41 to the first stop at the Quincy Mine Hoist and Underground Tours. From the Quincy Mine site, the bus would continue north on US-41 to Calumet. Figure 20 shows a map of the possible route through the Calumet and Laurium area with stops denoted with dots. The bus leaves the Calumet – Laurium area on M-26 to Lake Linden, where a stop could be made at the Houghton County Historical Museum. The bus then returns to the Park Visitor Orientation Facility on M-26 passing through Hubbell, Mason, and Dollar Bay. The estimated time for the complete tour would be 60 minutes.



Courtesy of MSN

Figure 20 - Map of route through Calumet and Laurium.

A counter-clockwise option was considered but it was judged that the Quincy Mine would be a popular site to disembark for the mine and hoist tours, and then board a later bus to continue the tour. It was felt that if the Quincy Mine were the last stop, visitors may be tired and not bother to disembark. Buses could also be operated in both directions on the loop, but the costs would roughly be double and it may not be necessary for establishing ridership. The two-way loop is a potential option for the future. Another option would be a shuttle service between the Visitor Orientation Facility and the Quincy Mine area. One of the attractive advantages of bus service is the flexibility to adjust routes and service to accommodate passenger demand.

If the development of the Visitor Orientation Facility is delayed at the Quincy Smelter site, the narrated tour could follow the proposed route and visitors would begin and end their tour at the Quincy Mine site. The Quincy Smelter site would be an important attraction and story to hear on the tour.

There are a variety of bus vehicle options available ranging from small minibuses seating 16-25 passengers, mid-sized buses, standard urban buses seating 45-50 passengers, to intercity coaches. Houghton Motor Transit and Hancock Transit currently use minibuses in their operations. Several exciting visitor transportation systems using buses have recently been implemented in other national parks. These include the shuttle services in Acadia and Zion National Parks, the red “Jammers” in Glacier National Park, and the Snow Coaches in Yellowstone National Park.

In recent years, rubber tired trolley buses have become very popular for tour applications. The rubber-tired trolley has the outward appearance of a vintage streetcar, but it is mounted on a standard bus classic. The interior, like the exterior, can be decorated to replicate that of a vintage streetcar, right down to the wooden benches, window panes and light fixtures. A vintage paint job in the colors of the old streetcars can make it a historical attraction for the Park and it would help create an image with exciting advertising potential. The City of Houghton has a rubber-tired trolley that is used for special occasions. A trolley bus tour system operating in Mackinaw City by the Mackinaw Trolley Company could be a Michigan model for a park system. For the purpose of this study, a 14-passenger transit minibus bus and a rubber-tired trolley bus were considered. A photograph of a typical minibus is shown in Figure 21.



Champion Bus, Inc.

Figure 21 - Typical Transit Bus (handicap accessible).

Rubber-tired trolley buses come in a variety of sizes and designs and there are several manufacturers. Size ranges from 25-40 feet in length, with passenger capacities ranging from 25 to 40 seated passengers, and most can be manufactured to include a wheelchair lift. For the purpose of this study, a 30-foot 25 passenger rubber-tired trolley was used, which includes room to accommodate two wheelchairs. Figure 22 presents a photograph of a typical rubber-tired trolley bus.



Figure 22 - Typical rubber-tired trolley bus.
(Source: Specialty Vehicles, www.specialtyvehicles.com)

Cost Estimate

There are three main options for the Park regarding operations for this service and each option has both advantages and disadvantages. The options include KNHP owned and operated, KNHP-owned vehicles and contracted operations, and a contract with private party to provide service. The first option was assumed in the development of cost estimates.

In order to develop cost estimates, several assumptions were made on hours and frequency of service. A 150-day operating season, with 1020 hours, has been assumed from mid-May to mid-October to be consistent with the assumptions used for the other modes presented in previous sections. Service frequency has been assumed at one, two, and three buses per hour, or headways of 60, 30, and 20 minutes. If a round trip takes 60 minutes and the headway or time between successive buses is 60 minutes, one bus would be required for service. If the headway is 20 minutes, three buses would be required. Based on the number of passengers per bus, one can then calculate the capacity of the service, i.e., the number of passengers that can be accommodated with the 150-day schedule and the service options.

Initial costs of the proposed system are dependent on the schedule chosen, the size of the fleet required to meet the demands of that schedule, and most importantly, the style and type of vehicle chosen. Construction costs or leasing costs for storage and maintenance facilities have not been included in the initial costs for the system. Costs include the purchase price of each vehicle and other miscellaneous supplies required for startup such as radio equipment, uniforms, tickets, bus detailing, signage, and administrative. The preliminary cost estimate for these miscellaneous capital items is shown in the “Other” category and was set at \$10,000.

Tables 5 and 6 summarize the initial capital costs for each of three schedules. Schedule 1 is service with a 60-minute headway or one bus per hour; Schedule 2 is service with 30-minute headway; and Schedule 3 is one with 20-minute. The costs for both minibuses and trolleybuses were estimated. Schedules 1 and 2 both incur the purchase price of two vehicles, one regular vehicle and one that is ADA compliant (handicap accessible). Schedule 3 requires the purchase of a third bus.

Table 5 - Capital Cost Estimates for a Minibus System

Capital Cost Item	Schedule 1	Schedule 2	Schedule 3
Minibus	-----	-----	\$62,000
Minibus (with lift)	\$72,000	\$72,000	\$72,000
Minibus	\$62,000	\$62,000	\$62,000
Other	\$10,000	\$10,000	\$10,000
Total Capital Costs	\$144,000	\$144,000	\$206,000

Table 6 - Capital Cost Estimates for a Trolleybus System

Capital Cost Item	Schedule 1	Schedule 2	Schedule 3
Trolleybus	-----	-----	\$125,000
Trolleybus (with lift)	\$140,000	\$140,000	\$140,000
Trolleybus	\$125,000	\$125,000	\$125,000
Other	\$10,000	\$10,000	\$10,000
Total Capital Costs	\$275,000	\$275,000	\$400,000

The trolley bus can accommodate more seated passengers than the minibus, so the resulting capacity of trolley bus service is higher. On an annual basis, minibus capacity under Schedule 1 would be 14,000 passengers, whereas trolley bus capacity would be 25,000 passengers. Under Schedule 3, minibus capacity is 59,000 annual passengers and trolley bus is 78,000 passengers.

Operation and Maintenance Costs

Operation and maintenance costs for this system will vary depending on which system of operations is chosen. These costs include salaries, wages, and benefits; services; materials and supplies (fuel and tires); utilities; casualty and liability costs; taxes; purchased transportation (contracted transportation and services); and miscellaneous expenses (TCRP Report 78, pg II-47). Several factors determine the operational and maintenance costs of a transit system, such as the number of vehicles in service, the hours the vehicles are in operation, and the frequency of service provided.

There are several types of cost models used for the operation and maintenance of bus systems. The technique used in this study is a popular planning tool described by Cherwony et al. (1982). This model takes the form of:

$$OC = A(VM) + B(VH) + C(PV)$$

where OC = operating and maintenance costs (\$)

VM = vehicle-miles of service

VH = vehicle-hours of service

PV = peak-hour vehicles in service

The other parameters (A, B, and C) are estimated by the unit cost approach (the units are as follows: “A” in miles/year, “B” in hours/year, and “C” in peak vehicles/year). Data provided by Houghton Transit and the Mackinaw Trolley Company was used with the resulting model formulation for this study.

$$OC = .85(VM) + 14.52(VH) + 9,665(PV)$$

The costs range from \$60,150 to \$139,450 depending on the schedule. Table 7 summarizes the O&M costs for the three service options. The vehicle-miles and hours, and peak hour vehicles are the same regardless of whether the minibus or trolley bus is selected. Based on the data sources, the unit cost values are also the same for planning purposes.

Table 7 - O&M Costs for Bus Options

	Headway	Vehicle Miles	Vehicle Hours	Peak Hour Vehicles	Total O&M
Schedule 1	60 minutes	30,600	1,020	2	\$60,150
Schedule 2	30 minutes	56,700	1,890	2	\$94,968
Schedule 3	20 minutes	82,400	2,760	3	\$139,450

Fares

There are several approaches in setting fares. Fares could be set to cover both capital and O&M costs, cover only O&M costs, or some combination of covering capital and O&M costs. Figure 23 and 24

graphically presents the average passenger fares at different demand levels, assuming that all capital costs are funded, and fares cover the O&M costs. Figure 23 shows fares if a minibus is used, and Figure 24 shows the fares if a trolley bus is used. The lines end for Schedule 1, Schedule 2 and Schedule 3 when the maximum capacity of the vehicles has been reached.

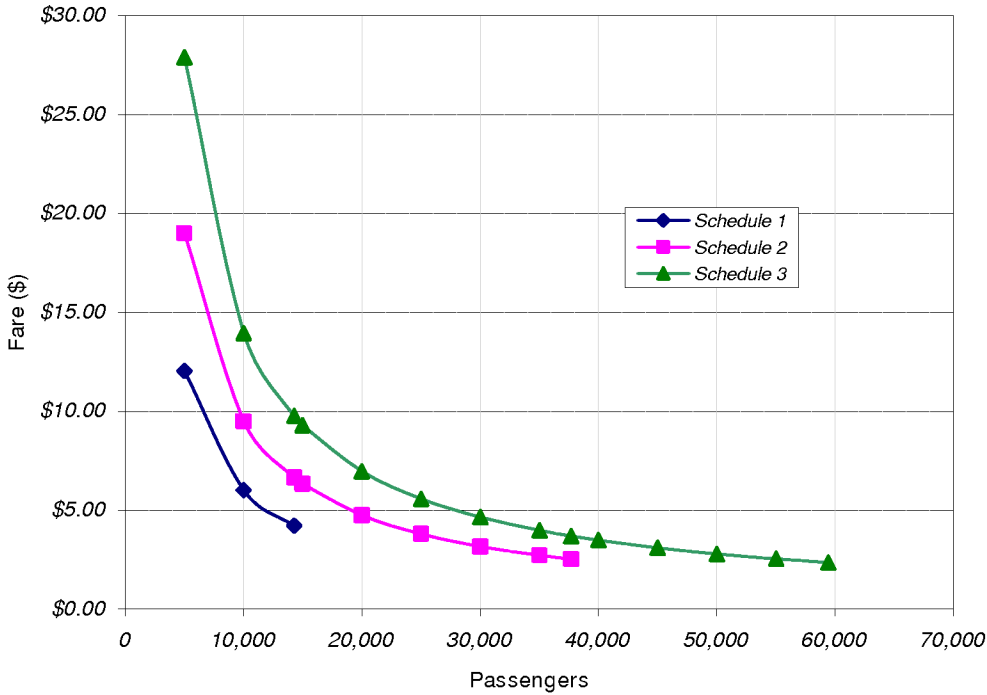


Figure 23 - Average passenger fare to recover annual O&M costs for the Minibus.

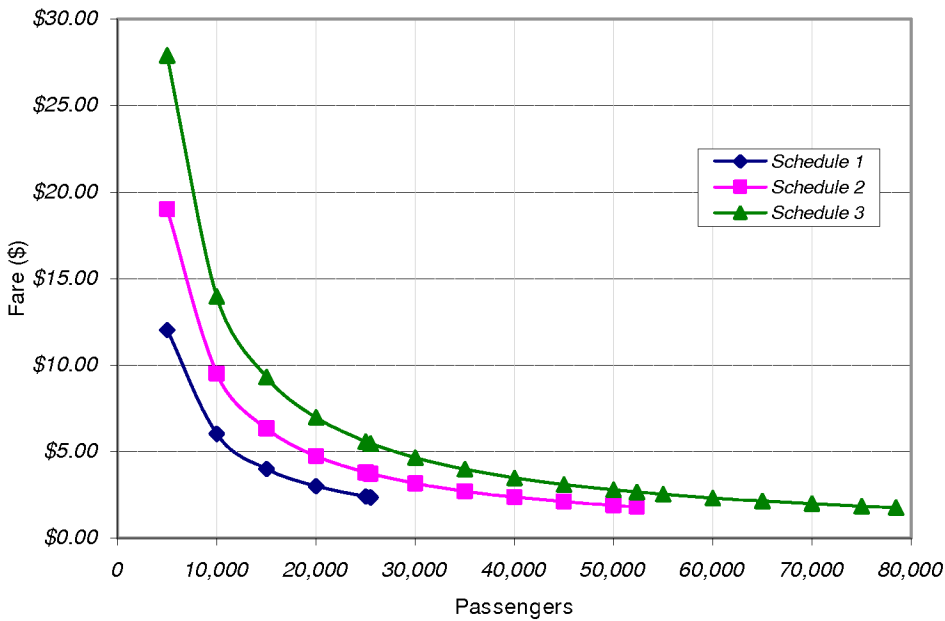


Figure 24 - Average passenger fare to recover annual O&M costs for the Trolleybus.

For example, if the demand is 20,000 passengers, the minibus would not be able to handle the demand with Schedule 1 service (60 minute headways), but could be accommodated using trolley buses. For Schedule 1 service, the average fare needed to recover annual O&M costs would be about \$3.00. For more frequent service (Schedule 2), the average fare would be \$4.75, and for the most frequent service (Schedule 3) the average fare would be about \$7.00. At higher demand levels, the average fares would be lower.

Calumet Service

Another interesting option would be to initiate a “starter” system that would operate within Calumet only. Such a service could be in operation within a year or two and would provide a heightened awareness of the Park’s existence, add some historical flavor to the village, and provide a preview of what the Park has in mind for the future transportation. The rubber-tired trolleybus would be particularly attractive for this service. Once initial capital purchases are made and ridership has been established, the service could be expanded to include other sites in the Park.

A potential route for the Calumet service is shown on Figure 25. It would include many historical sites and points of interest in Calumet and, with narration, the tour would provide visitors with fascinating stories. The route could begin and end at the KNHP headquarters building and several stops could be identified for boarding and alighting on the route. Riders could get off at any stop to visit a specific attraction and board a later bus to continue their tour. It would take 15 to 20 minutes to complete the tour.

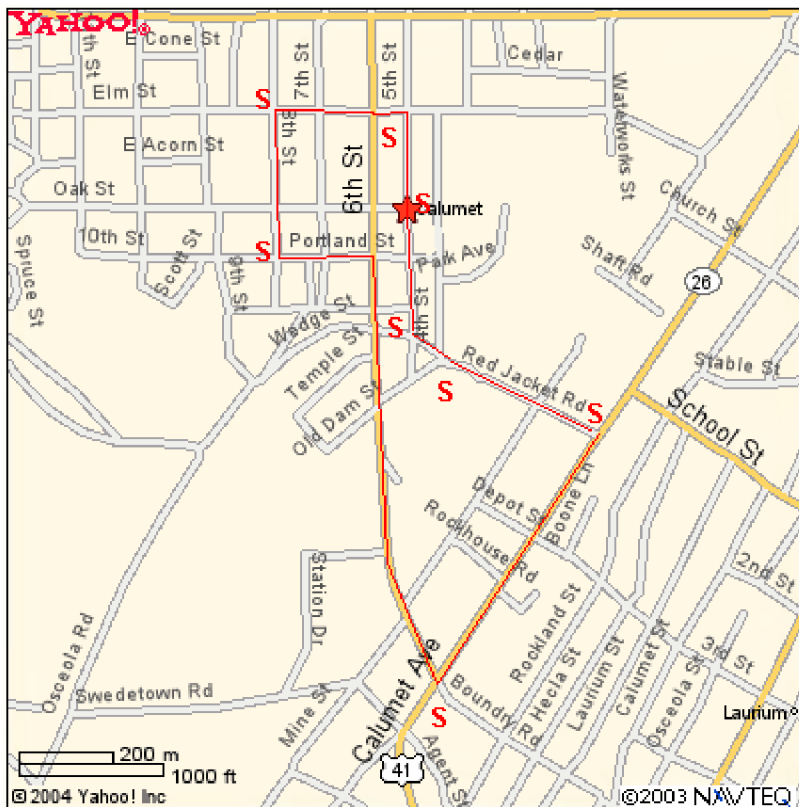


Figure 25 - Potential Route for Calumet Service.
Red “S” indicates possible stops on the route

Costs

More frequent service may be attractive for the Calumet route. If a 20-minute headway is used, one bus will be required. It can be used to complete a tour and be available for the next tour. Using a similar approach as presented earlier in this section, costs were estimated for both capital and operating and maintenance costs. The resulting capital cost for a trolley bus option, including one trolley bus (with lift), a back-up trolley bus, and other startup cost, is \$275,000. The use of a minibus as a back-up substitute would reduce the initial cost. The annual O&M costs would be \$29,677.

Fares

Figure 26 shows an analysis for fares on a Calumet service if the fares were set to cover only the O&M. A similar approach was presented earlier for the larger network. If the annual demand was 15,000 passengers, the average fare would be \$2.00.

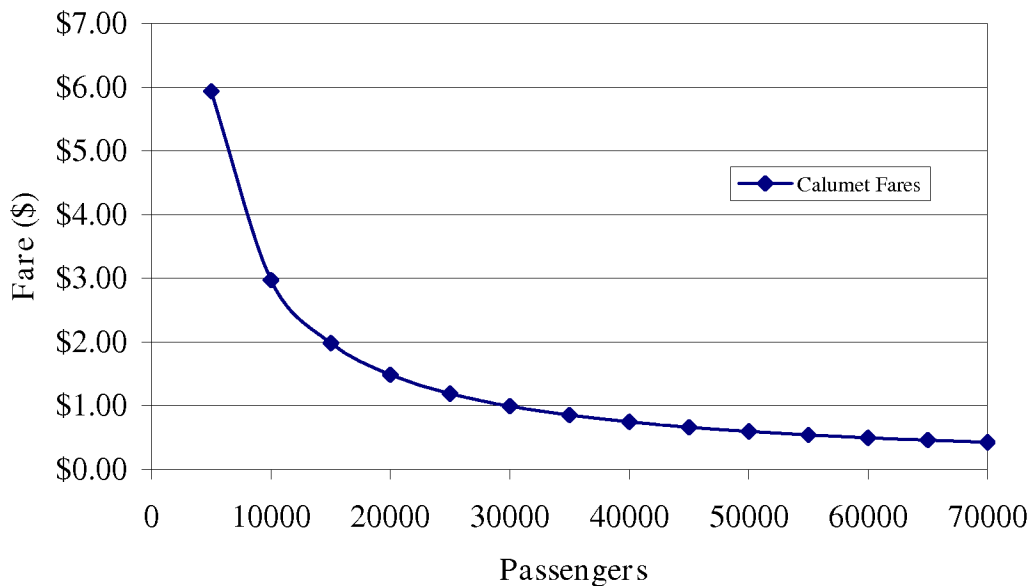


Figure 26 - Average passenger fare to recover annual O&M costs on a Calumet trolley bus starter service.

Conclusions and Recommendations

The following conclusions can be made for the study on the market demand and financial feasibility of an alternative transportation system for the Keweenaw National Historical Park (KNHP).

There are a variety of approaches to estimate the number of tourists that visit the Keweenaw Peninsula. Based on hotel room taxes, national trends, and estimates of local residents as tourists, it is estimated that today there are about 280,000 annual tourists that visit the Keweenaw Peninsula. About two-thirds of the annual tourists visit during the mid-May to mid-October period.

- There is considerable uncertainty associated with forecasting future tourism for the Keweenaw Peninsula as there are many unknowns that affect tourism in the area. The current measurement techniques are crude, yielding rough estimates at best.
- A comprehensive survey of a statistically significant sample of tourists was undertaken in June and July 2004 to determine characteristics and preferences for alternative transportation systems to serve the Keweenaw National Historical Park (KNHP).
- The Keweenaw National Historical Park is unique in that there are no specific physical boundaries. The survey indicated that many tourists were not aware of the Park as an entity. The KNHP attracts only a small portion of the area tourists. Thus there is significant potential for increased Park patronage based on current tourism levels alone. Future increases in general tourism, coupled with increased Park awareness, should produce even greater Park visitation. A modest growth of 5% per year would double the number of visitors in fourteen to fifteen years.
- A long-range transportation concept plan has been developed in this study that links components of the KNHP using modes of the early 20th Century. The plan includes a vintage streetcar system operating in downtown Calumet, the extension of the cog railroad or a funicular to connect the Quincy Mine/A.E. Seaman Museum with the Quincy Smelter site, a steam train operating between Calumet and the Quincy Smelter site on the east side of the Keweenaw Peninsula, and a vintage interurban streetcar operating between Quincy Mine and Calumet. The systems would operate during the mid-May to mid-October tourist season. Narrated tours by trained guides would be an important feature of the systems and would enrich the visitors' interpretation of the region's industrial, cultural, and natural history.
 - o The Calumet vintage streetcar system would be an attractive part of the Main Street revitalization program and provide economic development. Since the streetcar would operate on the street, there would be minor property acquisition.
 - o The cog railroad extension ties the Quincy Unit together well and would be an important element in linking the proposed Visitor Orientation Facility at the Quincy Smelter site, the Quincy Mine Tours, Quincy Mine Hoist House, and the proposed A.E. Seaman Mineral Museum. The extension should be coordinated with the development of the Visitor Orientation Facility and A.E. Seaman Museum. A funicular system could be considered as an alternative to the extension of the cog railroad
 - o The steam train would link Calumet with the Visitor Orientation Facility to provide an exciting excursion that would pass through Lake Linden, Hubbell, Mason, and Dollar Bay. The Houghton County Historical Museum could be the location of a stop in Lake Linden. An alternate route could be Calumet, Lake Linden, Hubbell, Mason, and the

Quincy Mine area, instead of the Quincy Smelter. There are several opportunities for staging including Calumet – Lake Linden and Quincy Mine – Mason.

- The vintage interurban streetcar would provide a unique link between the Quincy area and Calumet and take visitors past the Electric Park site.
- There is a nationwide interest in vintage streetcars/trolleys and steam locomotive excursion trains, and the survey of area tourists confirms this interest. Based on the preferences of existing tourists, over 50,000 annual passengers definitely would use the alternative transportation systems, and over 140,000 annual passengers probably would or definitely would use the systems. The estimates are conservative based on existing total tourism estimates. It is expected that as the components in the transportation concept plan are built, the KHNP would become a major destination park with a resulting growth in regional tourists and vintage transportation system passengers.
- There is an opportunity to develop transportation centers to accommodate transfers between modes at three locations – the Visitor Orientation Facility at the Quincy Smelter, the Quincy Mine area, and a Transportation Plaza in Calumet. A Transportation Plaza in Calumet, adjacent to US-41, would be highly compatible with the Main Street Calumet program and would make Calumet more visible to passing motorists.
- A starter bus system using rubber-tired buses that look like vintage streetcars could begin operating narrated tours in the Calumet-Laurium area. The service could be expanded to link Calumet with the Visitor Orientation Facility, Quincy Mine, and the Houghton County Museum, as the demand warrants. The starter bus system is seen as a relatively low-cost precursor to implementing the historic systems. The buses would be a useful way of testing the market.
- The concept plan using the historic modes is technically feasible. More work needs to be undertaken on each component of the plan. The capital costs are substantial but not insurmountable with various sources of funding and grants available. Based on the fares presented in the tourist survey, there is a high potential for recovery of the operating and maintenance costs.
- Several options are available for ownership and operation. These include:
 - Complete ownership and operation by the NPS
 - Ownership by the NPS and contracting of operations and maintenance
 - Several design-build-operate-maintain-transfer approaches that involve varying degrees of privatization.

With appropriate training and oversight, all options can include volunteer participation especially in operation and maintenance

The following recommendations are made:

1. Retain consulting firms with expertise in vintage rail planning, engineering, and operations to undertake the following preliminary engineering studies:
 - (1) A streetcar system for Calumet;
 - (2) The extension of the cog railroad or construction of a funicular from the A.E. Seamen Museum to the Quincy Smelter site on the Portage Lake waterfront;

- (3) A steam train between Calumet and the Quincy Smelter site or the Quincy Mine site, including phased development options; and
- (4) An interurban streetcar between the Quincy Unit and Calumet.

The preliminary engineering studies would identify the preferred alignments, property requirements, environmental aspects, and other issues related to implementation. These studies would add technical details to the conceptual plan presented in this study and include more refined cost estimates.

The preliminary engineering studies would also include a public participation program, and additional travel surveys would be undertaken focusing on alignment options and service preferences to refine ridership forecasts. The property a requirement and acquisition issues related to the steam train and interurban streetcar will present several challenges in the planning process.

- 2. To coordinate with the planning for Calumet's Main Street program and take advantage of opportunities for economic development, the first preliminary engineering study should be for the vintage streetcar system in Calumet.
- 3. As an initial step, examine in more detail the ownership and operating options for the KNHP transportation system alternatives. Local entities with commercial and financial expertise, National Park Service staff, and perhaps a consulting firm should be involved.
- 4. Protect the historic steam locomotives at the Quincy Mine site and Quincy Smelter site from further deterioration and investigate the potential for restoration to running condition or museum quality display condition. These park assets are an important link to the past. Currently they are exposed to adverse weather conditions.
- 5. Begin a narrated tour bus service through Calumet and Laurium using a rubber-tired trolley buses. Expand the tour bus service to link the Visitor Orientation Facility, Quincy Mine area, Calumet, and Lake Linden, as Park awareness grows and demand warrants.

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Tourism Profiles

Houghton County Tourism Profile

Keweenaw County Tourism Profile



Houghton County Tourism Profile

June 2001

Donald F. Holecek, Teresa Herbowicz, Alex Nikoloff, and Philip J. Alexander

Michigan State University Extension's Tourism Area of Expertise (TAOE) has prepared this profile to help developers, tourism professionals, public officials, and others make informed decisions regarding the travel and tourism industry in Houghton County. All statistics pertain to Houghton County unless otherwise noted and are the most current available at this date. As more recent data become available, they will be posted on the TAOE web site: www.tourism.msu.edu. Further assistance is also available from the Travel, Tourism, and Recreation Resource Center at Michigan State University (517-353-0793) or the MSU Extension office in Houghton County (906-482-5830).

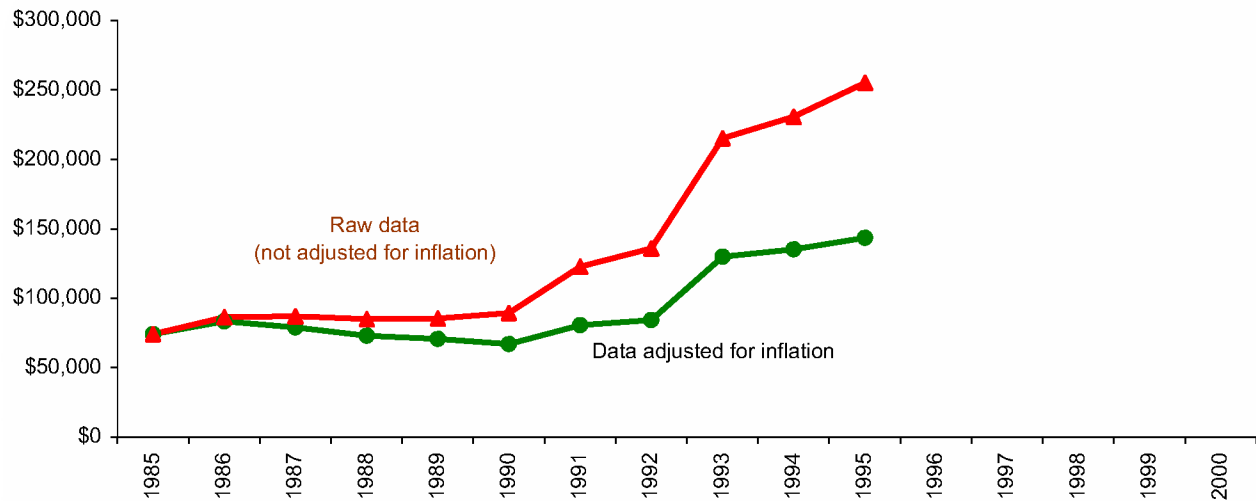


ESTIMATED MARKET SHARE, TRIP VOLUME, AND EXPENDITURES BY TOURISTS IN HOUGHTON AND NEIGHBORING COUNTIES, 1996

COUNTY OF MAIN DESTINATION	ESTIMATED MARKET SHARE	ESTIMATED NO. PLEASURE TRIP-NIGHTS	ESTIMATED DIRECT EXPENDITURES
Baraga	0.3%	259,900	\$14,118,000
Houghton	0.6%	591,200	\$32,116,000
Iron	0.6%	545,800	\$29,652,000
Keweenaw	0.7%	693,100	\$37,656,000
Ontonagon	0.5%	440,200	\$23,917,000

NOTE: Estimates are based on results from a telephone survey being conducted by the Travel, Tourism, and Recreation Resource Center at Michigan State University. "Pleasure trips" are overnight or day trips to places at least 50 miles from respondents' homes that were made for enjoyment, including vacations, weekend getaways, shopping trips, and trips to visit friends and relatives. The study region consists of Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin, and Ontario. "Market share" is the percentage of pleasure trips to Michigan that originated from this region and had a given county as its main destination. Estimated pleasure trip-nights are the product of these percentages and a survey-based estimate of 93.8 million pleasure trip-nights in Michigan in 1996. Direct expenditures are the product of these percentages and a survey-based estimate of \$5.1 billion in direct pleasure trip expenditures in Michigan in 1996. Estimates do not include pleasure trip-nights or expenditures of travelers who resided outside the study region or who merely passed through a county. Estimates are preliminary and subject to revision as additional data become available. They should be used judiciously since they are in some cases based on small samples for a given county.

TRENDS IN STATE OF MICHIGAN LODGING USE TAX COLLECTIONS FOR HOUGHTON COUNTY

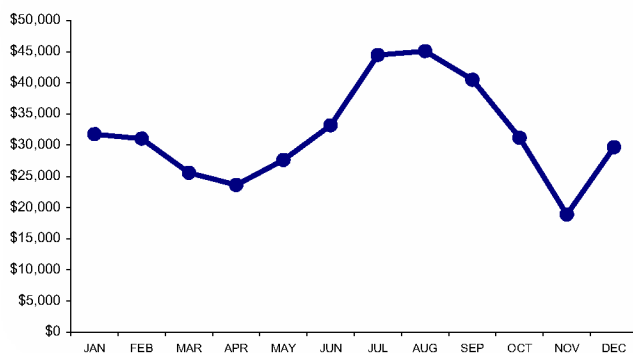


NOTE: The lodging use tax is a state tax on the rental of a guest-room or cabin. To ensure comparability of statistics over the entire 10-year period shown, tax collections after May 1, 1994, when the tax rate increased from 4% to 6%, were adjusted so that they equaled what they would have been at the 4% rate. The comparable statewide average annual change figures are 6.3% in the case of raw data and 0.4% in the case of adjusted data.

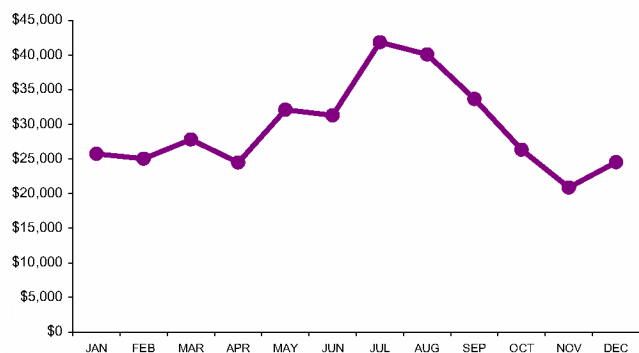
SOURCE: Michigan Department of Treasury, Systems Division.

SEASONALITY IN ECONOMIC ACTIVITY

**State of Michigan
Lodging Use Tax Collections for
Houghton County, 1995**



**State of Michigan Sales Tax Collections of
Family Restaurants and Cafeterias for
Houghton County, 1995**



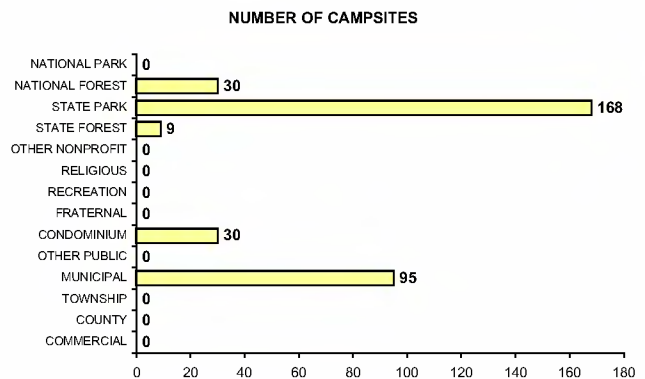
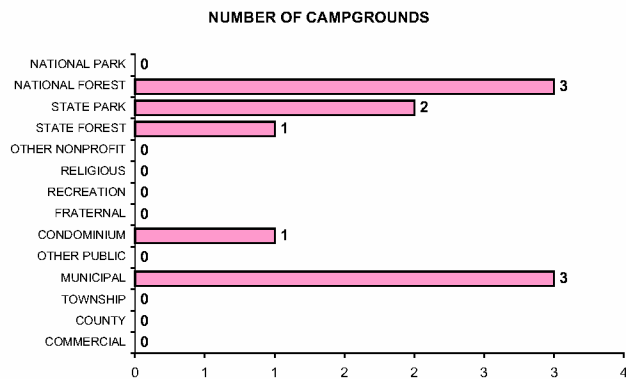
INDICATORS OF TRAVEL ACTIVITY FOR HOUGHTON COUNTY

Estimated no. visits to McLain State Park	1996	184,166
Estimated no. visits to Twin Lakes State Park	1996	52,712
Unadjusted (6%) Michigan Dept. of Treasury lodging use tax collections	1995 \$	382,546

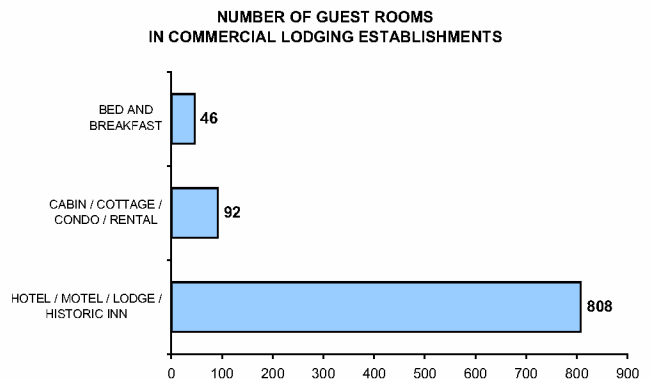
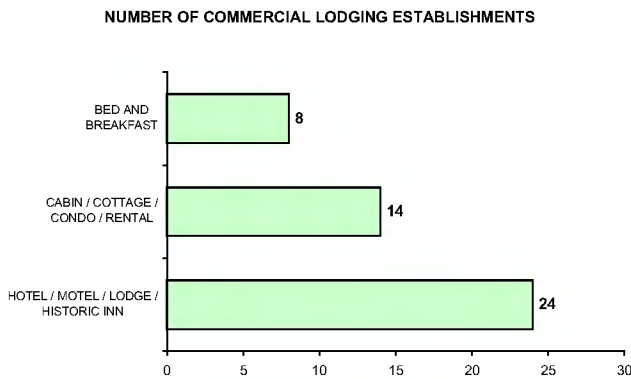
AN INVENTORY OF SELECTED RECREATION AND TOURISM RESOURCES IN HOUGHTON COUNTY

NATURAL RESOURCES	YEAR	VALUE
No. land acres in county	1989	648,704
No. water acres in county	1989	19,200
Total no. acres in county	1989	667,904
No. acres of public recreation land	1990	201,941
No. acres of national parks/lake-shores	1990	4
No. acres of national wildlife refuges	1990	0
No acres of national forests	1990	156,605
No. acres of state parks & recreation areas	1990	593
No. acres of state boating & fishing sites	1990	521
No. acres of state game/wildlife areas	1990	0
No. acres of state forests	1990	44,218
No. acres of other areas	1990	0
No. acres of publicly or privately owned forest land	1994	540,400
Total no. acres of designated state or federal wilderness	1990	9,609
No. natural heritage sites	1990	1
No. miles of Great Lake shoreline	N.A.	51
Total no. acres of legislatively protected sand dunes	1989	0
Total no. miles of rivers and streams	N.A.	923
No. miles of state or federal wild/scenic/natural river	1990	27
No. inland lakes >50 acres in size	N.A.	20,324
Combined acres of natural or artificial lakes and ponds	1991	20,324
Average no. inches of snowfall (1981/82-1990/91).....	207
RECREATION AND TRAVEL FACILITIES		
No. public access sites	1990	29
No. recreational harbors on the Great Lakes	1990	3
No. Great Lake marinas	1994	4
No. Great Lake marina slips	1994	119
No. licensed charter boats	1996	0
No. boat liveries	1990	12
No. watercraft for rent	1990	55
No. lifts or tows at downhill ski areas	1990	2
No. 9-hole golf courses	1995	2
No. 18-hole golf courses	1995	1
No. owned second homes	2000	2,646
No. licensed food service establishments	1995	172
Table service	1995	69
Fast Food	1995	27
Cafeteria	1995	30
Bar only	1995	29
Other	1995	17
Total no. campsites	2000	332
Total no. units in commercial lodging establishment	2000	946
No. miles of designated scenic highway	1990	46
No. miles of state-funded snowmobile trail	1990	157
No. miles of hiking/skiing/mtn.biking trail	1994	144
No. of miles of designated off-road vehicle trail	1992	26
Rail trails	N.A.	
No. miles of interstate highway	1990	0
No. museums	N.A.	3
No. historical attractions open to the public	1990	5
No. agricultural markets/wineries/u-picks	1993	8
OTHER		
Population	2000	36,016
Estimated direct pleasure trip expenditures (\$)	1996	32,116,000

CAMPING INVENTORY, 2000



LODGING INVENTORY, 2000



PRINCIPAL ATTRACTIONS AND EVENTS

Cooper Country State Forest; J.F. McLain State Park; Finnish, Scandinavian, Cornish, Slovak, and German cultural heritage; Finlandia University; Historic town of Calumet with the Calumet Theatre; Quincy Mine and Steam Hoist; Old copper mines (rockhounding paradise); Outdoor recreation activities, including fishing, boating, camping, hunting, and hiking; 51 miles of Lake Superior shoreline with many agate beaches; Snowmobiling (5 major trails, 250 miles) and skiing; Michigan Technological University; Isle Royal National Park (headquarters and ferry service); Keweenaw National Historic Park; Keweenaw Water Trail; Twin Lakes State Park.

SOURCES OF STATISTICS IN THIS PUBLICATION

U.S. Bureau of the Census; Michigan Departments of Agriculture, Natural Resources, Public Health, Transportation, and Treasury; National Forest Service; Travel, Tourism, and Recreation Resource Center at Michigan State University (Tourism Resource Center).

RESOURCES FOR FURTHER ASSISTANCE

- Keweenaw Peninsula Chamber of Commerce: P.O. Box 335, Houghton, MI 49931-0336. 906-482-5240. Fax: 906-482-5241. E-mail: kpcc@iname.com Web site: <http://www.keweenaw.org>
- Upper Peninsula Travel and Recreation Association: P.O. Box 400, Iron Mountain, MI 49801. 906-774-5480. Fax: 906-774-5190. E-mail: travelup@up.net Web site: <http://www.uptravel.com>
- Travel Michigan: P.O. Box 30226, Lansing, MI 48909. 517-373-0670. Web site: <http://www.Michigan.org>
- Travel, Tourism, and Recreation Resource Center, Michigan State University: 172 Natural Resources Building, East Lansing, MI 48824-1222. 517-353-0793. Fax: 517-432-2296. E-mail: dholecek@msu.edu Web site: <http://www.tourismcenter.msu.edu>



Keweenaw County Tourism Profile

June 2001

Donald F. Holecek, Teresa Herbowicz, Alex Nikoloff, and Philip J. Alexander

Michigan State University Extension's Tourism Area of Expertise (TAOE) has prepared this profile to help developers, tourism professionals, public officials, and others make informed decisions regarding the travel and tourism industry in Keweenaw County. All statistics pertain to Keweenaw County unless otherwise noted and are the most current available at this date. As more recent data become available, they will be posted on the TAOE web site: www.tourism.msu.edu. Further assistance is also available from the Travel, Tourism, and Recreation Resource Center at Michigan State University (517-353-0793) or the MSU Extension office in Keweenaw County (906-482-5830).

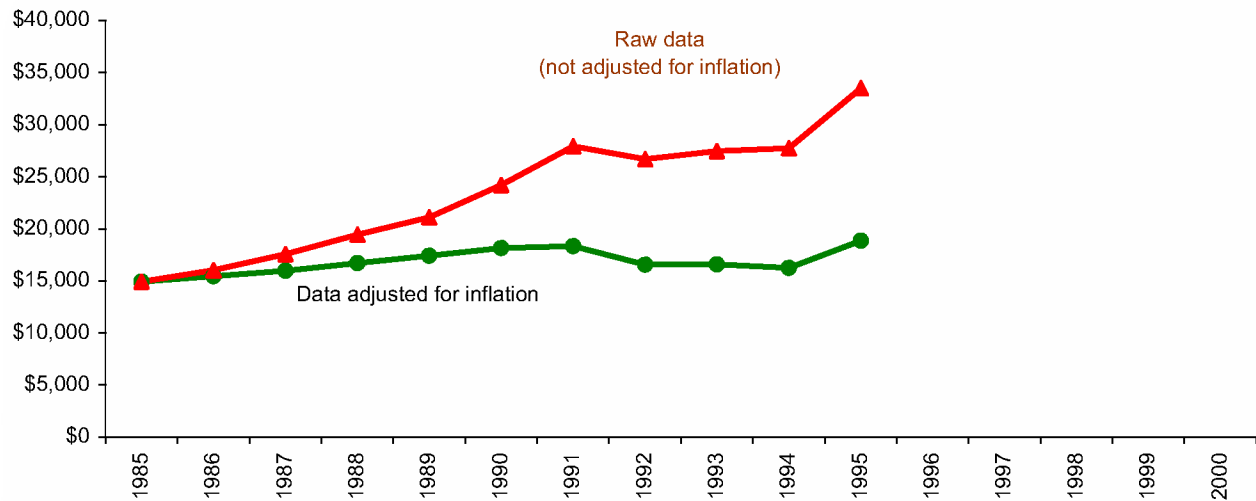


ESTIMATED MARKET SHARE, TRIP VOLUME, AND EXPENDITURES BY TOURISTS IN KEWEENAW AND NEIGHBORING COUNTIES, 1996

COUNTY OF MAIN DESTINATION	ESTIMATED MARKET SHARE	ESTIMATED NO. PLEASURE TRIP-NIGHTS	ESTIMATED DIRECT EXPENDITURES
Baraga	0.3%	259,900	\$14,118,000
Houghton	0.6%	591,200	\$32,116,000
Keweenaw	0.7%	693,100	\$37,656,000
Marquette	1.5%	1,425,600	\$77,448,000
Ontonagon	0.5%	440,200	\$23,917,000

NOTE: Estimates are based on results from a telephone survey being conducted by the Travel, Tourism, and Recreation Resource Center at Michigan State University. "Pleasure trips" are overnight or day trips to places at least 50 miles from respondents' homes that were made for enjoyment, including vacations, weekend getaways, shopping trips, and trips to visit friends and relatives. The study region consists of Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin, and Ontario. "Market share" is the percentage of pleasure trips to Michigan that originated from this region and had a given county as its main destination. Estimated pleasure trip-nights are the product of these percentages and a survey-based estimate of 93.8 million pleasure trip-nights in Michigan in 1996. Direct expenditures are the product of these percentages and a survey-based estimate of \$5.1 billion in direct pleasure trip expenditures in Michigan in 1996. Estimates do not include pleasure trip-nights or expenditures of travelers who resided outside the study region or who merely passed through a county. Estimates are preliminary and subject to revision as additional data become available. They should be used judiciously since they are in some cases based on small samples for a given county.

TRENDS IN STATE OF MICHIGAN LODGING USE TAX COLLECTIONS FOR KEWEENAW COUNTY

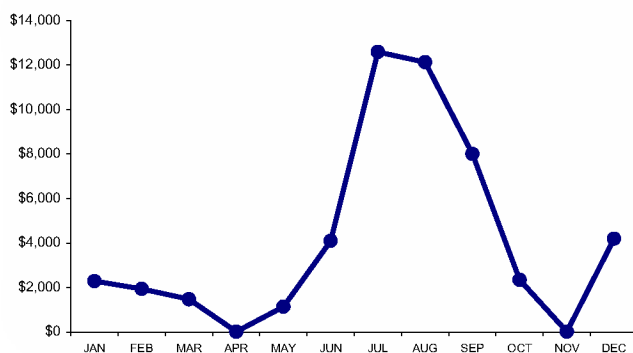


NOTE: The lodging use tax is a state tax on the rental of a guest-room or cabin. To ensure comparability of statistics over the entire 10-year period shown, tax collections after May 1, 1994, when the tax rate increased from 4% to 6%, were adjusted so that they equaled what they would have been at the 4% rate. The comparable statewide average annual change figures are 6.3% in the case of raw data and 0.4% in the case of adjusted data.

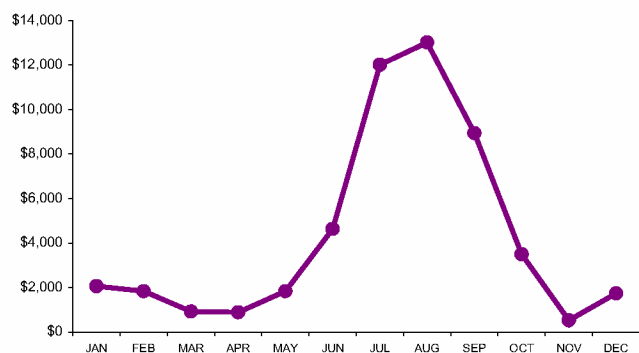
SOURCE: Michigan Department of Treasury, Systems Division.

SEASONALITY IN ECONOMIC ACTIVITY

**State of Michigan
Lodging Use Tax Collections for
Keweenaw County, 1995**



**State of Michigan Sales Tax Collections of
Family Restaurants and Cafeterias for
Keweenaw County, 1995**



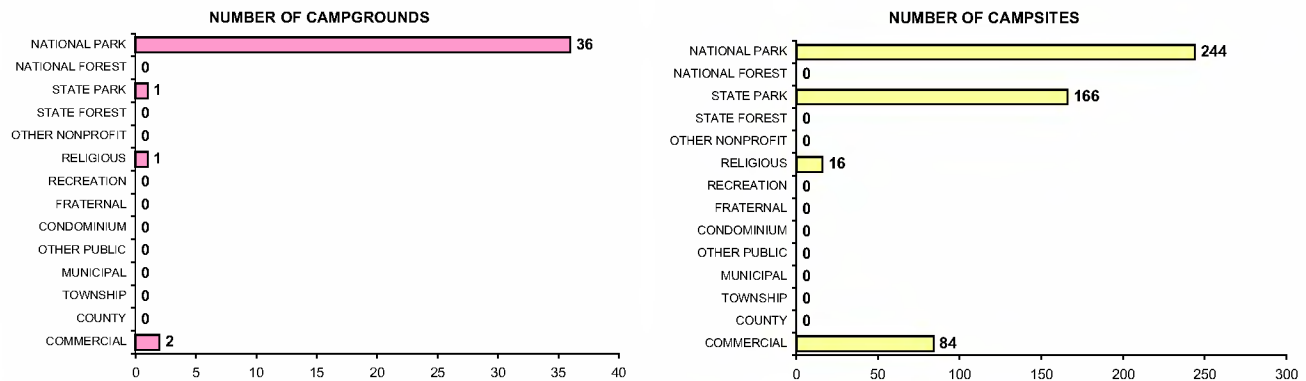
INDICATORS OF TRAVEL ACTIVITY FOR KEWEENAW COUNTY

Estimated no. visits to Fort Wilkins State Park	1996	171,217
Unadjusted (6%) Michigan Dept. of Treasury lodging use tax collections	1995 \$	50,236

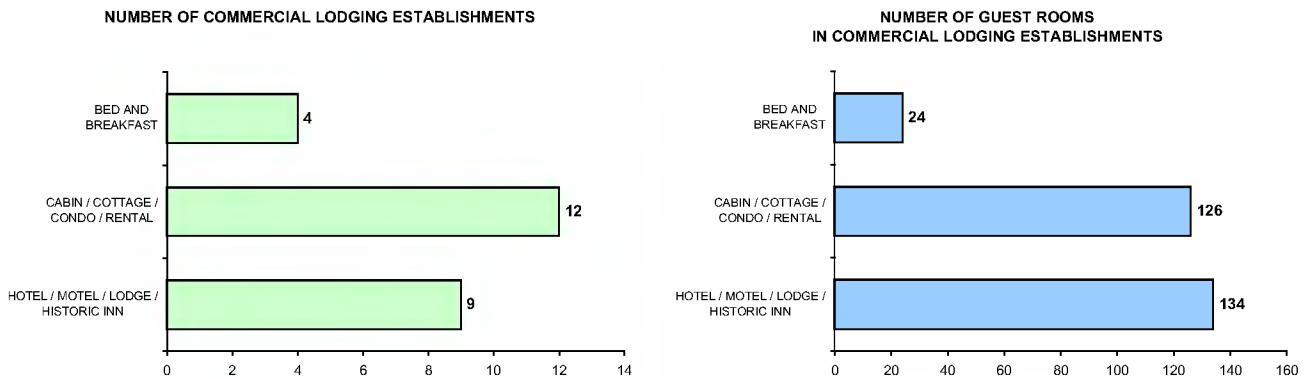
AN INVENTORY OF SELECTED RECREATION AND TOURISM RESOURCES IN KEWEENAW COUNTY

NATURAL RESOURCES	YEAR	VALUE
No. land acres in county	1989	347,840
No. water acres in county	1989	31,552
Total no. acres in county	1989	379,392
No. acres of public recreation land	1990	138,388
No. acres of national parks/lake-shores	1990	133,776
No. acres of national wildlife refuges	1990	0
No. acres of national forests	1990	0
No. acres of state parks & recreation areas	1990	189
No. acres of state boating & fishing sites	1990	7
No. acres of state game/wildlife areas	1990	0
No. acres of state forests	1990	4,416
No. acres of other areas	1990	0
No. acres of publicly or privately owned forest land	1994	312,100
Total no. acres of designated state or federal wilderness	1990	132,018
No. natural heritage sites	1990	10
No. miles of Great Lake shoreline	N.A.	424
Total no. acres of legislatively protected sand dunes	1989	924
Total no. miles of rivers and streams	N.A.	271
No. miles of state or federal wild/scenic/natural river	1990	0
No. inland lakes >50 acres in size	N.A.	2,775
Combined acres of natural or artificial lakes and ponds	1991	2,775
Average no. inches of snowfall (1981/82-1990/91).....	237
RECREATION AND TRAVEL FACILITIES		
No. public access sites	1990	11
No. recreational harbors on the Great Lakes	1990	5
No. Great Lake marinas	1994	6
No. Great Lake marina slips	1994	28
No. licensed charter boats	1996	8
No. boat liveries	1990	4
No. watercraft for rent	1990	30
No. lifts or tows at downhill ski areas	1990	0
No. 9-hole golf courses	1995	1
No. 18-hole golf courses	1995	0
No. owned second homes	2000	1,176
No. licensed food service establishments	1995	23
Table service	1995	12
Fast Food	1995	6
Cafeteria	1995	2
Bar only	1995	3
Other	1995	0
Total no. campsites	2000	510
Total no. units in commercial lodging establishment	2000	284
No. miles of designated scenic highway	1990	67
No. miles of state-funded snowmobile trail	1990	87
No. miles of hiking/skiing/mtn.biking trail	1994	249
No. of miles of designated off-road vehicle trail	1992	0
Rail trails	N.A.	
No. miles of interstate highway	1990	0
No. museums	N.A.	2
No. historical attractions open to the public	1990	3
No. agricultural markets/wineries/u-picks	1993	0
OTHER		
Population	2000	2,301
Estimated direct pleasure trip expenditures (\$)	1996	37,656,000

CAMPING INVENTORY, 2000



LODGING INVENTORY, 2000



PRINCIPAL ATTRACTIONS AND EVENTS

Lake Superior shoreline; Brockway Mountain Drive and Summit Lookout; Historic Lighthouse Boat Tour; Copperman Triathlon (August); Fort Wilkins State Park; Isle Royale National Park; rock and mineral hunting - numerous agate beaches and mine sites; Estivant Pines Nature Sanctuary (600 year-old giant pines); Fanny Hooe Resort; outdoor recreation activities, including fishing, snowmobiling, skiing, and scuba diving.

SOURCES OF STATISTICS IN THIS PUBLICATION

U.S. Bureau of the Census; Michigan Departments of Agriculture, Natural Resources, Public Health, Transportation, and Treasury; National Forest Service; Travel, Tourism, and Recreation Resource Center at Michigan State University (Tourism Resource Center).

RESOURCES FOR FURTHER ASSISTANCE

- Upper Peninsula Travel and Recreation Association: P.O. Box 400, Iron Mountain, MI 49801. 906-774-5480. Fax: 906-774-5190. E-mail: travelup@up.net Web site: <http://www.uptravel.com>
- Travel Michigan: P.O. Box 30226, Lansing, MI 48909. 517-373-0670. Web site: <http://www.Michigan.org>
- Travel, Tourism, and Recreation Resource Center, Michigan State University: 172 Natural Resources Building, East Lansing, MI 48824-1222. 517-353-0793. Fax: 517-432-2296. E-mail: dholecek@msu.edu Web site: <http://www.tourismcenter.msu.edu>

National Park Alternative Transportation Systems

Inventory of Existing Alternative Transportation Systems

Inventory of Alternative Transportation Systems as the Only Access

Fares and Characteristics of Selected Museum and Tourist Railroads

Keweenaw National Historical Park Transportation Survey Results

Keweenaw National Historical Park Transportation Survey Results
Alan Brokaw, School of Business and Economics, Michigan Technological University
9-10-04

INTRODUCTION

The National Park Service funded an alternative transportation study for the Keweenaw National Historical Park (KNHP) through the Civil Engineering Department at Michigan Technological University. Part of this study included a survey of tourists to gauge their attitudes concerning the proposed alternative transportation methods for the park. The methodology for the survey and the questionnaire used are shown in Exhibit I and Exhibit II, respectively. 77.63% of the people who were approached and asked to participate in the survey agreed to cooperate (see Exhibit IV for frequency distributions for all of the questions in the questionnaire).

TOURIST ACTIVITY

One purpose of the survey was to estimate tourist activity on the Keweenaw Peninsula. This was necessary in order to be able to estimate initial use of the proposed transportation methods. Unfortunately, very little solid secondary data are available concerning the number of tourists; one of the few estimates is one made by Michigan State University in 1996.¹ Possibly, the most solid number concerning tourism activity is based on the 2% room tax that is assessed by all hotels, motels, cabins, and resorts (called HMCR in this report) in Houghton and Keweenaw Counties.² For 2002 (the latest full year available), the total room tax receipts were \$173,496. Assuming a \$70 average per room rental fee, there are about 124,000 room-nights each year.³ Based on the survey, the average size of the parties that spend at least one night on the Keweenaw Peninsula in HMCR is 2.99. Therefore, about 370,000 tourist-nights, staying in HMCR, are generated each year ($124,000 \times 2.99$). Also based on the KNHP survey, for tourists who stay in HMCR, they stay an average of 3.07 nights. This suggests that the total number of tourists who are staying in HMCR is about 120,000 ($370,000 / 3.07$). Based on the survey, 56.3% of tourists who spend at least one night on the Keweenaw stay in HMCR. Therefore, the total

¹ The Tourism Resource Center at Michigan State University makes periodic estimates of tourism activity for all of the counties in Michigan. The estimates are based on telephone surveys. The latest data are for 1996 (see <http://tourism.msu.edu/t-aoe/html-aoe/co-profile-aoe/RecentProfiles/31-Houghton.pdf>, accessed 11-13-03). For 1996, they estimate 259,900 tourist-nights for Baraga County, 591,200 tourist-nights for Houghton County, 693,100 tourist nights for Keweenaw County and 440,200 tourist-nights for Ontonagon County.

² The room-tax assessment is only for Houghton and Keweenaw Counties. Nine respondents said that they were staying in bed and breakfast establishments in the "other" category in question #4. These responses were recoded as hotel or motel.

³ Some people, such as government employees, do not pay the room tax. Therefore the total receipts may understate actual activity. Nationally, 77% of rooms are rented to tourists, based on Travel Industry Association of America data (<http://www.tia.org>, accessed 11-13-03). The percentage of rooms occupied by tourists on the Keweenaw Peninsula is not known. Certainly, during some periods (such as Michigan Technological University's graduation or Winter Carnival celebration) essentially all of the rooms are rented to tourists. Also it is almost certain that people who stay in cabins or resorts (10.4% of the respondents to the survey) are all tourists. Therefore, the percentage of rooms rented to tourists is almost certainly above 77%. Even for those who come to the Keweenaw primarily for non-tourist activities (e.g., visitors to Michigan Technological University), there is frequently a tourist component to their visit. They are certainly part of the potential target market for the KNHP.

number of tourists who stay at least one night on the Keweenaw Peninsula is about 215,000 (120,000/0.563).

23.7% of the tourist parties in the survey were day-trippers (i.e., did not spend at least one night on the Keweenaw, in some cases because they were local residents).⁴ Assuming that this ratio of day-trippers to over-night tourists remains constant (0.237 to 0.763), then for every over-night tourist there would be an additional 0.309 day-tripper tourist (0.237/0.767).⁵ Therefore, the number of day-tripper tourists per year is about 65,000 (215,000x0.309).⁶ The total number of tourists (both day-trippers and over-night tourists) is about therefore about 280,000 (215,000 + 65,000). These estimates are summarized in Table 1, below.

Table 1: Summary of Calculations of Number of Tourists

	Calculation	Number
Tourist-nights in HMCR	(\$173,496 tax receipts/0.02 tax rate/\$70 per room)x 2.99 people	370,000
Overnight Tourists	[370,000/3.07 nights]/0.563 percentage staying in hotels, etc.	215,000
Day-tripper Tourists	210,000 over-night tourists x 0.309 day-trippers per tourist-night	65,000
Total tourists	215,000 + 65,000	280,000

All of these tourists are not part of the target market for KNHP because the park's main tourist activities (e.g., the Quincy Mine site) are open from mid-May to mid-October; this is the season when the transportation systems would most likely operate, at least initially. Based on the room assessment tax receipts, 67% of the tourist activity occurs during these months.⁷ Therefore, about 190,000 (280,000 x 0.67) tourists are estimated to be on the Keweenaw Peninsula during the operation of the proposed transportation systems.

The survey asked respondents for their home zip-codes. Using the zip-codes, the home state or country of each respondent was determined and is shown in Exhibit III.⁸ A distribution of respondents' home area, using larger geographic areas, is shown in the Table 2, below.

⁴ 50% of the respondents who did not spend at least one night in HMCR or other accommodations were residents of the Keweenaw Peninsula. 19.6% of the parties interviewed who were residents of the Keweenaw Peninsula were staying in accommodations other than their home residency, mostly at their own camps or in campgrounds.

⁵ The size of day-tripper parties is almost identical to over-night tourists – 2.95 versus 3.08.

⁶ Not surprisingly, tourists who do not stay in HMCR tend to stay a bit longer, an average of 3.52 nights, in comparison to those who stay in HMCR. Those who stay in HMCR generate about 370,000 tourist-nights; those who stay in other accommodations generate about (210,000 – 120,000)x3.52 = 310,000 tourist-nights, for a total of 680,000 tourist nights. Note that this number is about half of Michigan State University's estimate of almost 1.3million tourist-nights for Keweenaw and Houghton Counties (see footnote #1). Michigan State University's estimate includes day-trippers that travel more than 50 miles from their home.

⁷ If anything, the summer season is a greater portion of the total tourist activity since during the summer, campgrounds and similar overnight accommodations are available that are not available during the winter. Therefore, this estimate tends to be conservative.

⁸ Michigan was divided into three geographic areas: the Keweenaw Peninsula, the Upper Peninsula of Michigan not including the Keweenaw Peninsula, and the Lower Peninsula of Michigan. Two respondents did not reply to the zip-code question. The percentages add up to 100.2 because of rounding error.

Table 2: Home Regions of Respondents

Region	Number of respondents	Percentage
Keweenaw Peninsula	51	14.7
UP other than the Keweenaw	16	4.6
Lower Peninsula	114	32.9
IN, OH, MN, or WI	91	26.3
All other states or countries	75	21.7
Total	346	100

MARKET PENETRATION FOR KNHP

It is difficult to get a clear estimate of the number of tourists visiting the KNHP because there is no turnstile for the park. The closest thing to a turnstile for the park is at the Quincy Mine. Attendance at the Quincy Mine in 2003 was about 45,000. If this number is taken as representative of KNHP attendance, then market penetration of summer tourists to the Keweenaw is about 24% (45,000/190,000).

The survey asked respondents if they had visited the Quincy Mine. 26.7% of the respondents said that they had.⁹ It is interesting to note that all but three of the 348 respondents claimed to have visited at least one of the cooperating sites. This implies a market penetration for the park as a whole of about 99%.¹⁰ However, of those who claimed to have visited at least one of the cooperating sites, 62.4% said that they were aware of the existence of KNHP. In other words, almost all of the respondents claimed to have visited at least one of KNHP's cooperating sites, yet 37.6% of them were not sure that they were aware of the park. Of course, it may be that visitors to the popular state parks (Fort Wilkins, McLain, and Porcupine Mountains State Parks) are not aware that these are cooperating sites of KNHP. If these state parks are eliminated from the list and only those are chosen who have visited at least one of the other cooperating sites (i.e., other than the state parks), then 70.5% say that they are aware of the existence of KNHP. Even for the 113 respondents who said they had visited the Quincy Mine site, only 71.7% said that they were aware of KNHP. This suggests that a better job needs to be done to make people who are visiting the cooperating sites that they are also visiting part of KNHP.

DEMAND FOR ALTERNATIVE TRANSPORTATION

The questionnaire asked respondents about the alternative transportation systems that are envisioned for KNHP (see questions #6, #7, #9, and #11 in Exhibit II). For each question, respondents were asked to choose one of five alternatives concerning each of the questions about the likelihood that they would use the alternative transportation system. The choices were: Definitely would not, Probably would not, Don't know, Probably would, Definitely would.

⁹ This is based only on those respondents from the Calumet and Copper Harbor sites who were staying at least one night on the Keweenaw. The Quincy Mine site respondents were not included in this number because of the obvious bias.

¹⁰ It is possible, of course, that there could be some response error. That is, people may say that they have been to a site when in fact they have not.

The first part of question #6 asked about the likely use of a vintage trolley that would travel between the Quincy Unit and Calumet. There was strong acceptance for the use of a vintage trolley between Quincy and Calumet; 73.9% of the respondents said that they either probably would or definitely would use the trolley, as shown below in Table 3.

Table 3: Use of vintage trolley from Quincy

		Frequenc	Percen	Vali Percen	Cumulativ ePercen
Valid	Definitely would	8	2.3	2.3	2.3
	Probably would	60	17.2	17.6	19.9
	Do not	21	6.0	6.2	26.1
	Probably	161	46.3	47.2	73.3
	Definitely	91	26.1	26.7	100.0
	Tota	341	98.0	100.0	
Missin	9	7	2.0		
Tota		348	100.0		

If 73.9% of tourists actually used the vintage trolley between the Quincy Unit and Calumet, estimated ridership would be about 140,000 per season ($0.739 \times 190,000$) or an average of about 935 people per day ($140,000/150$ days). 26.7% of the respondents said that they definitely would use the trolley; this amounts to a ridership of about 50,000 per season ($0.267 \times 190,000$) or an average of about 350 people per day ($50,000/150$).¹¹

The second part of question #6 asked about the likely use of a steam locomotive train between Calumet and the Quincy Unit. Again, there was strong acceptance; 73.5% of the respondents said that they either probably would or definitely would use the train, as shown in Table 4. If 73.5% of tourists actually used the steam locomotive train, estimated ridership would again be about 140,000 per season ($0.735 \times 190,000$). 26.8% of the respondents said that they definitely would use the train, for a ridership again of about 50,000 per season ($0.268 \times 190,000$).

Table 4: Use of steam locomotive

		Frequenc	Percen	Vali Percen	Cumulativ ePercen
Valid	Definitely would	6	1.7	1.8	1.8
	Probably would	60	17.2	17.9	19.6
	Do not	23	6.6	6.8	26.5
	Probably	157	45.1	46.7	73.2
	Definitely	90	25.9	26.8	100.0
	Tota	336	96.6	100.0	
Missin	9	12	3.4		
Tota		348	100.0		

¹¹ The answers given by respondents may be subject to response error. What people say they will do may be different from what people actually will do.

Question #7 in the questionnaire asked about the use of a vintage trolley in the village of Calumet. The results are shown in Table 5. If 73.1% of tourist actually used the trolley (the percentage of respondents who answered probably would or definitely), then ridership would also be about 140,000 per season ($.731 \times 190,000$). Using only the percentage who said that they definitely would use the trolley, ridership would again be about 50,000 ($0.268 \times 190,000$).

Table 5: Use of vintage trolley in Calumet

		Frequenc	Perce	Vali Perce	Cumulativ ePerce
Valid	Definitely would	6	1.7	1.8	1.8
	Probably would	65	18.7	19.2	20.9
	Do not	20	5.7	5.9	26.8
	Probably	157	45.1	46.3	73.2
	Definitely	91	26.1	26.8	100.0
	Tota	339	97.4	100.0	
Missin	9	9	2.6		
Tota		348	100.0		

Question #9 asked respondents about the use of an extended cog railroad at the Quincy Unit. Again, the response was very positive, as is shown in Table 6. The ridership numbers are very similar to the other scenarios – between 50,000 riders to 140,000 riders per season. However, it is interesting to note that for those who had ridden on the cog railroad, the response was much better, as shown in Table 7. 37.1% of these respondents said that they definitely would use the cog railroad, and another 51.6 said that they probably would use it, for a total of an impressive 88.7% of respondents. This was generally true in analyzing the data. Those tourists who were more familiar with KNHP and its cooperating sites were more likely to respond favorably to the questions concerning likelihood of use of the alternative transportation systems for the park.

Table 6: Use of cog railroad

		Frequenc	Perce	Vali Perce	Cumulativ ePerce
Valid	Definitely would	6	1.7	1.8	1.8
	Probably would	54	15.5	16.3	18.1
	Do not	26	7.5	7.8	25.9
	Probably	169	48.6	50.9	76.8
	Definitely	77	22.1	23.2	100.0
	Tota	332	95.4	100.0	
Missin	9	16	4.6		
Tota		348	100.0		

Table 7: Use of cog railroad by those who had ridden before on the cog railroad

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Probably would	3	4.8	4.8	4.8
	Do not	4	6.3	6.5	11.3
	Probably	32	50.8	51.6	62.9
	Definitely	23	36.5	37.1	100.0
	Total	62	98.4	100.0	
Missing	9	1	1.6		
Total		63	100.0		

Finally question #11 asked respondents if they would be likely to buy a one day pass for \$30 that would entitle them to use any of the proposed alternative transportation systems for one day. The enthusiasm for the one day pass was somewhat more muted than for the single passes with 18.5% saying that they definitely would buy the pass (representing about 35,000 tourists per season) and 58.8% saying that they probably would or definitely would buy the pass (representing about 110,000 tourists (see Table 8). This may be caused by respondents worrying about the size of their family and the total cost associated with the one-day pass. However, the relationship between likelihood of buying the pass and family size was not statistically significant.¹² Another possibility for this apparent anomaly may be found in the comments section (see Exhibit V). One respondent said, “One person cannot take all those trips in one day.” Another said, “2-day pass would be better; it’s a lot to do in one day.” Therefore, it may be wise to have the pass for two or three days. This would also encourage tourists to stay longer on the Keweenaw.

Table 8: Buy a one day pass for \$30?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Definitely would	16	4.6	4.7	4.7
	Probably would	93	26.7	27.4	32.1
	Do not	31	8.9	9.1	41.2
	Probably	137	39.4	40.3	81.5
	Definitely	63	18.1	18.5	100.0
	Total	340	97.7	100.0	
Missing	9	8	2.3		
Total		348	100.0		

Again, for those tourists who said that they had ridden on the cog railroad, the inclination to buy the one day pass increases, as shown in Table 9. This suggests that in marketing the park and its alternative transportation systems, it is important to “hook” tourists into at least one location in the park. The Quincy Unit is an obvious place to do this. If a new park entrance is built at the

¹² Indeed, Kendall’s Tau was positive, indicating that, if anything, people in larger tourist parties were more likely to be interested in the one-day pass.

Quincy Smelter site, that will be another good location. However, in addition, given the relatively low awareness of the existence of the park and the lack of understanding of the elements of the park, it is important that each cooperating sites reinforces the park's message of its existence, of the cooperating sites, of the historical ties among the sites, and of the variety of activities available.

Table 9: Buy a one day pass for \$30? by those who had ridden before on the co railroad

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Definitely would	3	4.8	4.8	4.8
Probably would	14	22.2	22.2	27.0
Do not	7	11.1	11.1	38.1
Probably	21	33.3	33.3	71.4
Definitely	18	28.6	28.6	100.0
Total	63	100.0	100.0	

The numbers developed in the previous section were based on conservative assumptions. The actual number of tourists to the Keweenaw are likely to be higher than 190,000 during the summer season. As pointed out in footnote #6, Michigan State University's estimate of the number of tourist-nights in Houghton and Keweenaw Counties is roughly double the estimate of 680,000 developed in this report. Therefore, if Michigan State University's estimate is used instead, the estimates of usage of the alternative transportation methods would also double. In addition, the measure of tourist activity used in this report is based on tourists staying in HMCR in Houghton and Keweenaw Counties (the 2% room tax is only for those two counties). Certainly, these two counties represent the primary area from which tourists to the park will be drawn, at least in the near term. However, tourists staying in nearby counties, especially Baraga and Ontonagon, are likely to participate as well. The Michigan State University study reported that tourist activity in these two counties is about half of the combined tourist activity in Houghton and Keweenaw Counties (actually about 0.545 - see footnote #1). This suggests a possible demand of from about 540 riders per day (350×1.545) to 1,500 riders per day (935×1.545).

The trend in tourist activity is not clear. Based on the 2% room-tax receipts for 1998 to 2002, it appeared that tourist activity increased significantly from 1998 to 1999. In 2000 and even more so in 2001, activity dropped significantly, possibly reflecting the downturn in the economy. Activity seems to have rebounded to 1998 levels in 2002 (see Table 10).

Table 10: Room-tax Receipts: 1998 to 2002

Year	1998	1999	2000	2001	2002
Room-tax receipts for Houghton and Keweenaw Counties	\$114,060	\$174,786	\$161,231	\$149,854	\$173,496

Most importantly, if KNHP becomes a destination park, the trade area from which the park will draw its visitors will expand significantly. A historical transportation system that helps to tell the story of the park and to tie the disparate elements of the park together is a key to transforming the park into a tourist destination. If that is done, dramatic increases in ridership may result.

CONCLUSION

1. The number of tourists using the four proposed transportation modes is likely to be at least 350 per day, based on those respondents who said that that would definitely use the transportation mode. Including those who said that they probably would use the transportation mode, there would be about 935 users per day for each mode.
2. The estimates given in point #1 are conservative. If the prime trade area is expanded to include Baraga and Ontonagon Counties, ridership would be expected to increase about 50% to about 540 to 1,500 users per day. In addition, the number of tourist-nights estimated in this study for Houghton and Keweenaw Counties is about half that reported by Michigan State University in 1996. If the Michigan State numbers are correct, ridership should be about double or 1,080 to 3,000 users per day. Finally, as the trade area expands for KNHP and as it comes to be viewed as a destination park, continued increases should be expected.
3. The park needs to do a better job of informing tourists about the park and its cooperating sites. Each contact with a tourist should be viewed as precious, as an opportunity to promote the image of the park, park activities, and its cooperating sites. The message should be clear, consistent, and engaging at each contact.
4. The more familiar people are with KNHP, the more they like it. This is good news and suggests that once tourists enter one of the cooperating sites, they need to be informed of the other activities of the park to give them an opportunity to strengthen their ties to the park.
5. The park will need to consider its price structure for the transportation modes. Discounts for families, for example, may increase ridership. In addition, instead of a day pass, a multi-day pass should be considered.

The response to the proposed alternative transportation systems was very positive. This was true in the analysis in the previous section, and it was also reflected in the comments that some of the respondents wrote down, even though some respondents thought the costs were too high. Other respondents suggested that bus transportation might be a good idea too. The respondents also seemed to be hungry for additional information about the area. This supports the view that once tourists become partly exposed to the park, they want to know and experience more. Complete comments in answer to question #12 are given in Exhibit V.

Exhibit I Methodology for Keweenaw National Historical Park Survey

The purpose of this survey is to assist in developing a forecast of ridership for a range of transportation alternatives for the Keweenaw National Historical Park. The questionnaire presents a “dream system” for the Park that includes four pieces:

- (1) a link between the Welcome Center (the Quincy Smelter) and the Quincy Hoist area – using the cog railroad or a bus
- (2) a link between the Quincy Hoist area and Calumet – using a vintage trolley following the alignment of the interurban trolley line of the early 1900s, or a bus
- (3) a circulation system for downtown Calumet – using a vintage trolley or a bus
- (4) a link between Calumet and the Welcome Center or Quincy Hoist passing through Lake Linden and along the east side of the Keweenaw Peninsula – using a stream locomotive train following the alignment of the early 1900s, or a bus.

Other possibilities are being examined such as a vintage trolley through downtown Hancock to link the Welcome Center with the Quincy Hoist area, using vintage trolley instead of the steam locomotive train, using buses that look like trolleys, and other alternative alignments for various options, but we wanted to capture a systems concept that isn’t too complex for the respondents to grasp.

Three locations will be utilized for the survey: (1) the lobby of the gift shop at the Quincy Mine site, (2) the tourist information center in Calumet, and (3) Copper Harbor. The same questionnaire will be used for all sites to enable comparisons of the responses (see attached proposed questionnaire) and the location and date of the survey will be noted on each survey. All surveys will be conducted on the same date at all locations. The survey unit will be a “party” (i.e., a group traveling together) and only one person will be interviewed per party.

It is planned that the surveys will be conducted over two weeks - a week in June and a week in July, concentrating on Thursday, Friday, and Saturday – June 24-26, and July 15-17. Initially we proposed the last week of July, but another KHNP tourism survey is being planned, so we will move our second week of interviews to early in July.

Quincy Mine Site

Because the respondent has already shown an interest in the Quincy Site by stopping at the gift shop (which is where tickets for the Hoist and Mine tour are purchased), these respondents will clearly be visitors to Keweenaw National Historical Park and at least have minimal knowledge of one of the park. During the summer season, there are about 125-150 parties per day that visit the site, and we expect to complete 100 interviews each week. In addition, an extension of the cog railroad is one of the transportation alternatives that is presented in the questionnaire. Since visitors can actually see and ride the cog railroad, they should be able to visualize a possible extension.

Tourist Center in Calumet

The Tourist Center is located on US 41 and those that stop are clearly tourists, but they may not be aware of the park. During the summer season, about 100 parties per day stop at this location and we expect to complete 100 interviews each week. The tourist center is on the edge of Calumet and one can actually see the potential location of the transportation plaza where the Quincy-Calumet vintage trolley and steam locomotive train may link.

Copper Harbor

In Copper Harbor, the interviewers will use an intercept method to randomly stop visitors in the town. They will be stationed in front of the Country Village Store at the main intersection in Copper Harbor. The purposes of this part of the study would be to estimate the proportion of tourists (both locals and non-locals) who know about the KNHP and have visited the park or one of its cooperating sites, and to further refine attitudes on alternative transportation modes. This would be a more random sample of tourists and ones have not necessarily stopped at the Quincy Mine Site or the Calumet Tourist Center. We expect to complete 100 interviews each week in Copper Harbor.

Interviewers

Six interviewers from Michigan Tech have been recruited for the survey and they will work in two-person teams. Lindsay Sundberg, a graduate student in civil engineering, will be the supervisor and will be able to fill-in for an interviewer if necessary. The questionnaires will be self-administered, but the interviewers will be close at hand to answer questions that might arise and we expect that this will help in getting high response rates. The interviewers have been trained with an introduction to the project, a review of a protocol (shown below) to be followed in conducting interviews, and potential questions, issues, and difficulties that may occur and how to handle them.

Interview Protocol

The following should be followed in conducting the interviews:

1. The interviews will be conducted on the same day at all three locations. The purpose of this is to keep conditions for all interview sites as similar as possible.
2. For each party, interview an adult (someone 18 years or older) – preferably the “head of household”. A party is a group traveling together, so the interviewer should establish this to ensure that only one respondent is interviewed from any given party.
3. A systematic sampling method will be used at each interview site based on the estimated number of parties per day and a targeted number of completed interviews per day. Every fifth party will be interviewed.
4. The interviewer is to approach a person in a party and identify themselves as working on a study for the Keweenaw National Historical Park. Ask if they would be willing to take a few minutes to answer questions about the Park. If NO, thank them for their time. If YES, continue with the survey.

5. The questionnaire is designed to be completed by the respondent, but the interviewer should indicate that he/she is available to answer questions. Information posters with larger maps and photos will be on display at each of the three sites, and interviewers will have additional information to help respond to questions that may arise.
6. The interviewer should never react negatively to any rude remarks by respondents. If anyone says anything rude (we doubt that it will happen), thank them and end the interview.
7. Keep track of the number of non-respondents during each interview period and site. We actually expect close to 100% response for the survey

Exhibit II
Keweenaw National Historical Park Questionnaire



United States Department of the Interior

NATIONAL PARK SERVICE
Keweenaw National Historical Park
P.O. Box 471
Calumet, Michigan 49913

IN REPLY REFER TO:

June 15, 2004

Dear Visitor:

Thank you for participating in this important study. Our goal is to learn about the expectations, opinions, and interests of visitors to Keweenaw National Historical Park. This information will assist us in our efforts to better manage this site and to serve you, the visitor.

This questionnaire is only being given to a select number of visitors, so your participation is very important! It should only take a few minutes for you to complete.

If you have any questions, please contact Dr. William Sproule, Professor of Civil and Environmental Engineering, Michigan Technological University, phone 906-487-2568, email: wsproule@mtu.edu.

We appreciate your help.

Sincerely,

**Frank Fiala
Superintendent**

Expiration Date: 01/31/2005

☐ Quincy ☐ Calumet ☐ Copper Harbor

Survey date: _____

Interviewer: _____

1. Are you aware of the existence of the Keweenaw National Historical Park (KNHP)?

☐ Yes ☐ No ☐ Not sure

2. The Keweenaw National Historical Park is not a traditional park. It consists of 16 cooperating sites that partner with the National Park Service. The following is a list of the 16 cooperating sites. Please check the appropriate box to indicate if you (1) are aware of the site, (2) plan to visit the site on this trip, or (3) have visited the site on this trip

Site	Aware of site?		Plan to visit	Have visited
	Yes	No		
Calumet Theater	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coppertown USA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Keweenaw Heritage Center at St. Anne's	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Keweenaw Historical Society	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Laurium Manor Bed & Breakfast	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A. E. Seaman Mineral Museum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Copper Range Historical Museum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Houghton County Historical Museum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Upper Peninsula Firefighters Museum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Delaware Copper Mine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quincy Mine Hoist and Underground Mine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hanka Homestead	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Old Victoria	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fort Wilkins State Park	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
McLain State Park	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Porcupine Mountains Wilderness State Park	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Including yourself, how many people are in your group in each of the following age categories?

_____ Number of Adults 55 and over
 _____ Number of Adults 18 to 54
 _____ Number of Children 7 to 17
 _____ Number of Children 6 and under

4. On this trip, how many nights are you staying on the Keweenaw Peninsula (if you are a local resident, how many nights other than in your own home; if none, put zero)?

_____ Number of nights → What accommodations are or will you be using?

☐ Hotel or motel ☐ Cabins or resort rental ☐ Own cabin or camp
☐ Campground ☐ Staying with friends or relatives
☐ Other (please specify) _____

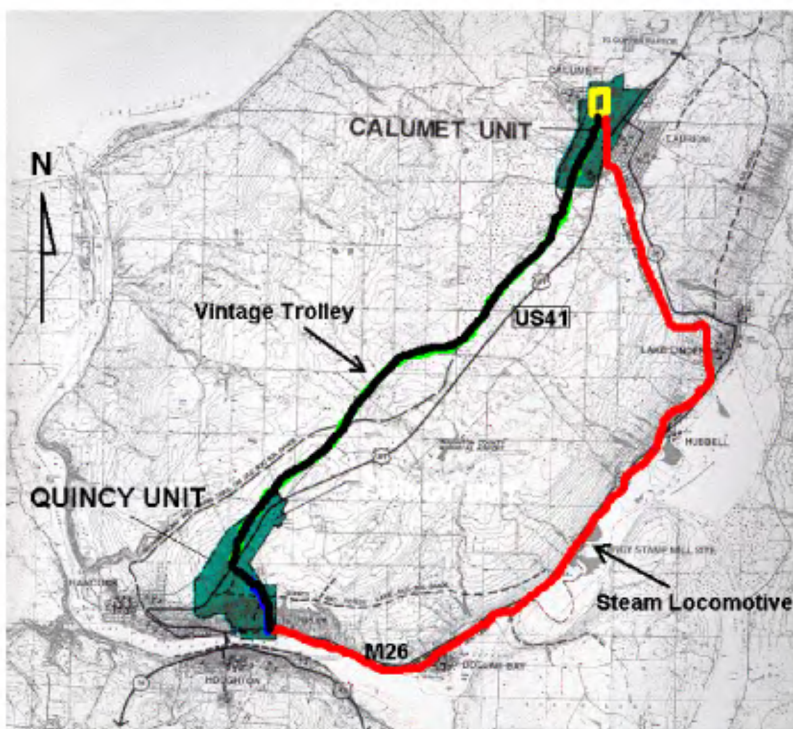
5. What is the five digit zip-code of your home residence? _____
 (If you are not from the United States, what country is home? _____)

6. There are two main units and many cooperating sites of the Keweenaw National Historical Park. The two main units are in Calumet and at Quincy. If a vintage trolley operated between the Calumet and Quincy units (see diagram below of a possible route and an example of a vintage trolley – it would be a 30-40 minute trip) and it would cost \$10 for a narrated one-way trip (reduced rates for children and seniors), what is the likelihood that you would use this transportation?

☐ Definitely would not ☐ Probably would not ☐ Probably would ☐ Definitely would ☐ Don't know

If a steam locomotive train operated between the Calumet and Quincy units (see diagram below of a possible route and an example of a steam locomotive train – it would be a 45-60 minute trip) and it would cost \$20 for a narrated one-way trip (reduced rates for children and seniors), what is the likelihood that you would use this transportation?

☐ Definitely would not ☐ Probably would not ☐ Probably would ☐ Definitely would ☐ Don't know

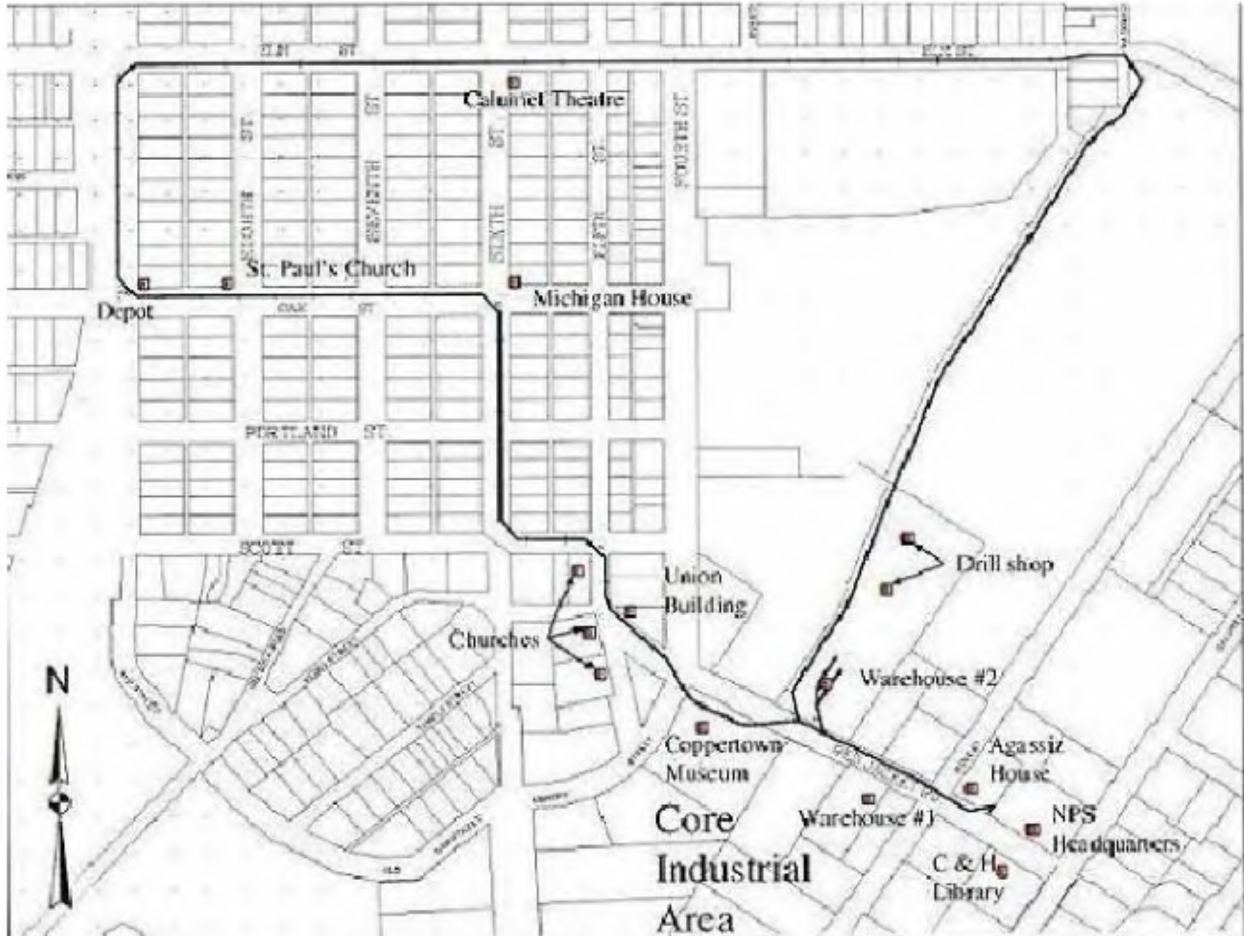


Vintage Trolley

Steam Locomotive Train

7. If a vintage trolley were built that passed the main historical sites in Calumet (see diagram below of Calumet that shows a possible route – it would be a 15-20 minute trip) with a narrated round-trip fare of \$5 (reduced rates for children and seniors), what is the likelihood that you would ride the trolley?

☐ Definitely would not ☐ Probably would not ☐ Probably would ☐ Definitely would ☐ Don't know



Map of Downtown Calumet Showing a Possible Route for a Vintage Trolley

8. Have you ever been in downtown Calumet?

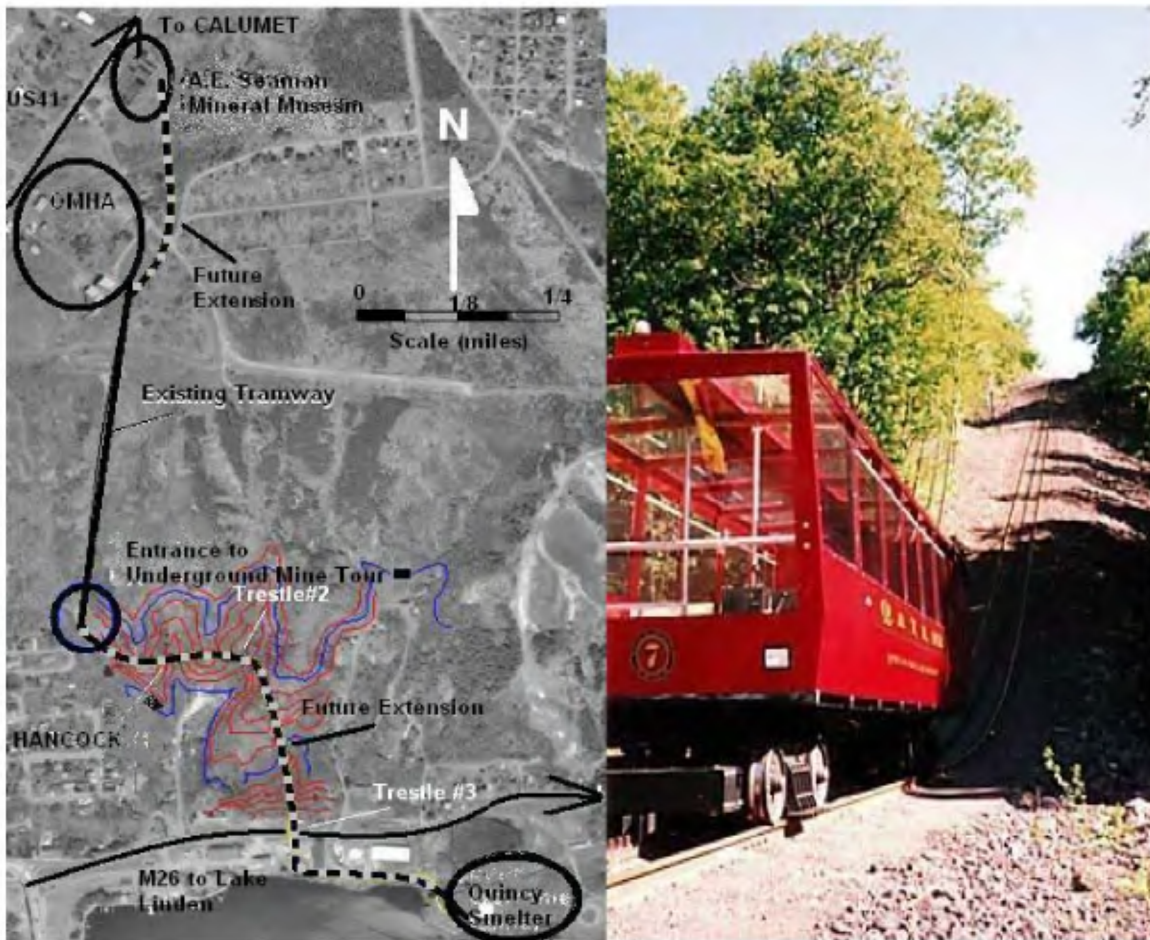
☐ Yes ☐ No



Vintage Trolley

9. At the Quincy unit, a cog railroad currently carries passengers from the Quincy Hoist area to the underground mine tour. If the cog railroad were extended and operated between a proposed Welcome Center at the Quincy Smelter and a proposed A. E. Seaman Mineral Museum site (see diagram below of the current route and possible extensions – it would be a 25-30 minute trip) and if the round-trip ride, including the cost for the hoist and mine tour, increased by \$3 (from \$12.50 to \$15.50, with reduced rates for children and seniors), what is the likelihood that you would ride the cog railroad?

☐ Definitely would not ☐ Probably would not ☐ Probably would ☐ Definitely would ☐ Don't know



Existing Cog Railroad Car

10. Have you ever ridden on the cog railroad at the Quincy unit?
- ☐ Yes ☐ No
11. If you could buy a one-day pass for \$30 (reduced rates for children and seniors) that would allow you unlimited use for the day of the transportation modes described in questions #6 (the vintage trolley and the steam locomotive between the Quincy and Calumet units), #7 (the vintage trolley in Calumet), and #9 (the cog railroad), what is the likelihood that you would buy the pass?
- ☐ Definitely would not ☐ Probably would not ☐ Probably would ☐ Definitely would ☐ Don't know
12. Comments. Please include any comments or suggests below or on the back.

PRIVACY ACT and PAPERWORK REDUCTION ACT statement:

16 U.S.C. 1a-7 authorizes collection of this information. This information will be used by park managers to better serve the public. Response to this request is voluntary. No action may be taken against you for refusing to supply the information requested. Permanent data will be anonymous. Data collected through public surveys may be disclosed to the Department of Justice when relevant to litigation or anticipated litigation, or to appropriate Federal, State, local or foreign agencies responsible for investigating or prosecuting a violation of law. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

Burden estimate statement: Public reporting for this form is estimated to average 4 minutes per response. Direct comments regarding the burden estimate or any other aspect of this form to the Information Collection Clearance Officer, WASO Administrative Program Center, National Park Service, 1849 C Street, NW, Washington, D.C. 20240.

Exhibit III
Geographic Distribution of Home Residences of Respondents

Home Location

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>MA</i>	1	.3	.3	.3
	<i>NH</i>	2	.6	.6	.9
	<i>SC</i>	2	.6	.6	1.4
	<i>GA</i>	1	.3	.3	1.7
	<i>FL</i>	8	2.3	2.3	4.0
	<i>OH</i>	7	2.0	2.0	6.0
	<i>IN</i>	8	2.3	2.3	8.3
	<i>LP of MI</i>	114	32.8	32.8	41.1
	<i>Keweenaw</i>	51	14.7	14.7	55.7
	<i>Other UP of MI</i>	16	4.6	4.6	60.3
	<i>IA</i>	4	1.1	1.1	61.5
	<i>WI</i>	51	14.7	14.7	76.1
	<i>MN</i>	25	7.2	7.2	83.3
	<i>IL</i>	18	5.2	5.2	88.5
	<i>NE</i>	1	.3	.3	88.8
	<i>TX</i>	10	2.9	2.9	91.7
	<i>AZ</i>	4	1.1	1.1	92.8
	<i>CA</i>	3	.9	.9	93.7
	<i>HI</i>	1	.3	.3	94.0
	<i>WA</i>	1	.3	.3	94.3
	<i>NJ</i>	1	.3	.3	94.5
	<i>NY</i>	1	.3	.3	94.8
	<i>PA</i>	1	.3	.3	95.1
	<i>MD</i>	1	.3	.3	95.4
	<i>VA</i>	1	.3	.3	95.7
	<i>NC</i>	1	.3	.3	96.0
	<i>KY</i>	2	.6	.6	96.6
	<i>SD</i>	2	.6	.6	97.1
	<i>LA</i>	2	.6	.6	97.7
	<i>OK</i>	3	.9	.9	98.6
	<i>MO</i>	3	.9	.9	99.4
	<i>Canada</i>	1	.3	.3	99.7
	<i>Turkey</i>	1	.3	.3	100.0
	<i>Total</i>	348	100.0	100.0	

Exhibit IV
Frequency Distributions for Questionnaire Questions

LOCATION

	<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid Quincy</i>	113	32.5	32.5	32.5
<i>Calumet</i>	102	29.3	29.3	61.8
<i>Copper Harbor</i>	133	38.2	38.2	100.0
<i>Total</i>	348	100.0	100.0	

DATE

	<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid June</i>	178	51.1	51.1	51.1
<i>July</i>	170	48.9	48.9	100.0
<i>Total</i>	348	100.0	100.0	

Aware of KNHP?

	<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid No</i>	126	36.2	38.0	38.0
<i>Maybe</i>	26	7.5	7.8	45.8
<i>Yes</i>	180	51.7	54.2	100.0
<i>Total</i>	332	95.4	100.0	
<i>Missing 9</i>	16	4.6		
<i>Total</i>	348	100.0		

Aware - Calumet Theater?

	<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid No</i>	118	33.9	35.4	35.4
<i>Yes</i>	215	61.8	64.6	100.0
<i>Total</i>	333	95.7	100.0	
<i>Missing 9</i>	15	4.3		
<i>Total</i>	348	100.0		

Plan to visit - Calumet Theater

	<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid Not checked</i>	301	86.5	86.5	86.5
<i>Checked</i>	47	13.5	13.5	100.0
<i>Total</i>	348	100.0	100.0	

Have visited - Calumet Theater

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	234	67.2	67.2	67.2
	<i>Checked</i>	114	32.8	32.8	100.0
	<i>Total</i>	348	100.0	100.0	

Aware - Coppertown USA?

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>No</i>	141	40.5	42.9	42.9
	<i>Yes</i>	188	54.0	57.1	100.0
	<i>Total</i>	329	94.5	100.0	
<i>Missing</i>	9	19	5.5		
<i>Total</i>		348	100.0		

Plan to visit - Coppertown USA

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	302	86.8	86.8	86.8
	<i>Checked</i>	46	13.2	13.2	100.0
	<i>Total</i>	348	100.0	100.0	

Have visited - Coppertown USA

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	280	80.5	80.5	80.5
	<i>Checked</i>	68	19.5	19.5	100.0
	<i>Total</i>	348	100.0	100.0	

Aware - St Anne?

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>No</i>	230	66.1	74.0	74.0
	<i>Yes</i>	81	23.3	26.0	100.0
	<i>Total</i>	311	89.4	100.0	
<i>Missing</i>	9	37	10.6		
<i>Total</i>		348	100.0		

Plan to visit - St Anne

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	327	94.0	94.0	94.0
	<i>Checked</i>	21	6.0	6.0	100.0
	<i>Total</i>	348	100.0	100.0	

Have visited - St Anne

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	316	90.8	90.8	90.8
	<i>Checked</i>	32	9.2	9.2	100.0
	<i>Total</i>	348	100.0	100.0	

Aware - Keweenaw Historical Society?

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>No</i>	172	49.4	55.5	55.5
	<i>Yes</i>	138	39.7	44.5	100.0
	<i>Total</i>	310	89.1	100.0	
<i>Missing</i>	<i>9</i>	38	10.9		
<i>Total</i>		348	100.0		

Plan to visit - Keweenaw Historical Society

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	322	92.5	92.5	92.5
	<i>Checked</i>	26	7.5	7.5	100.0
	<i>Total</i>	348	100.0	100.0	

Have visited - Keweenaw Historical Society

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	309	88.8	88.8	88.8
	<i>Checked</i>	39	11.2	11.2	100.0
	<i>Total</i>	348	100.0	100.0	

Aware - Manor B&B?

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>No</i>	172	49.4	55.0	55.0
	<i>Yes</i>	141	40.5	45.0	100.0
	<i>Total</i>	313	89.9	100.0	
<i>Missing</i>	<i>9</i>	35	10.1		
<i>Total</i>		348	100.0		

Plan to visit - Manor B&B

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	325	93.4	93.4	93.4
	<i>Checked</i>	23	6.6	6.6	100.0
	<i>Total</i>	348	100.0	100.0	

Have visited - Manor B&B

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	296	85.1	85.1	85.1
	<i>Checked</i>	52	14.9	14.9	100.0
	<i>Total</i>	348	100.0	100.0	

Aware - Seaman Museum?

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>No</i>	180	51.7	57.0	57.0
	<i>Yes</i>	136	39.1	43.0	100.0
	<i>Total</i>	316	90.8	100.0	
<i>Missing</i>	<i>9</i>	32	9.2		
<i>Total</i>		348	100.0		

Plan to visit - Seaman Museum

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	324	93.1	93.1	93.1
	<i>Checked</i>	24	6.9	6.9	100.0
	<i>Total</i>	348	100.0	100.0	

Have visited - Seaman Museum

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	282	81.0	81.0	81.0
	<i>Checked</i>	66	19.0	19.0	100.0
	<i>Total</i>	348	100.0	100.0	

Aware - Copper Range Museum?

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>No</i>	169	48.6	55.4	55.4
	<i>Yes</i>	136	39.1	44.6	100.0
	<i>Total</i>	305	87.6	100.0	
<i>Missing</i>	<i>9</i>	43	12.4		
<i>Total</i>		348	100.0		

Plan to visit - Copper Range Museum

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	321	92.2	92.2	92.2
	<i>Checked</i>	27	7.8	7.8	100.0
	<i>Total</i>	348	100.0	100.0	

Have visited - Copper Range Museum

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	318	91.4	91.4	91.4
	<i>Checked</i>	30	8.6	8.6	100.0
	<i>Total</i>	348	100.0	100.0	

Aware - Houghton Historical Museum?

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>No</i>	174	50.0	55.2	55.2
	<i>Yes</i>	141	40.5	44.8	100.0
	<i>Total</i>	315	90.5	100.0	
<i>Missing</i>	<i>9</i>	33	9.5		
<i>Total</i>		348	100.0		

Plan to visit - Houghton Historical Museum

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	325	93.4	93.4	93.4
	<i>Checked</i>	23	6.6	6.6	100.0
	<i>Total</i>	348	100.0	100.0	

Have visited - Houghton Historical Museum

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	305	87.6	87.6	87.6
	<i>Checked</i>	43	12.4	12.4	100.0
	<i>Total</i>	348	100.0	100.0	

Aware - Firefighters Museum?

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>No</i>	201	57.8	63.6	63.6
	<i>Yes</i>	115	33.0	36.4	100.0
	<i>Total</i>	316	90.8	100.0	
<i>Missing</i>	<i>9</i>	32	9.2		
<i>Total</i>		348	100.0		

Plan to visit - Firefighters Museum

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	329	94.5	94.5	94.5
	<i>Checked</i>	19	5.5	5.5	100.0
	<i>Total</i>	348	100.0	100.0	

Have visited - Firefighters Museum

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	316	90.8	90.8	90.8
	<i>Checked</i>	32	9.2	9.2	100.0
	<i>Total</i>	348	100.0	100.0	

Aware - Delaware Mine?

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>No</i>	108	31.0	33.0	33.0
	<i>Yes</i>	219	62.9	67.0	100.0
	<i>Total</i>	327	94.0	100.0	
<i>Missing</i>	9	21	6.0		
<i>Total</i>		348	100.0		

Plan to visit - Delaware Mine

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	308	88.5	88.5	88.5
	<i>Checked</i>	40	11.5	11.5	100.0
	<i>Total</i>	348	100.0	100.0	

Have visited - Delaware Mine

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	266	76.4	76.4	76.4
	<i>Checked</i>	82	23.6	23.6	100.0
	<i>Total</i>	348	100.0	100.0	

Aware - Quincy Mine?

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>No</i>	72	20.7	21.7	21.7
	<i>Yes</i>	260	74.7	78.3	100.0
	<i>Total</i>	332	95.4	100.0	
<i>Missing</i>	9	16	4.6		
<i>Total</i>		348	100.0		

Plan to visit - Quincy Mine

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	272	78.2	78.2	78.2
	<i>Checked</i>	76	21.8	21.8	100.0
	<i>Total</i>	348	100.0	100.0	

Have visited - Quincy Mine

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	230	66.1	66.1	66.1
	<i>Checked</i>	118	33.9	33.9	100.0
	<i>Total</i>	348	100.0	100.0	

Aware - Hanka Homestead?

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>No</i>	236	67.8	75.4	75.4
	<i>Yes</i>	77	22.1	24.6	100.0
	<i>Total</i>	313	89.9	100.0	
<i>Missing</i>	<i>9</i>	35	10.1		
<i>Total</i>		348	100.0		

Plan to visit - Hanka Homestead

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	320	92.0	92.0	92.0
	<i>Checked</i>	28	8.0	8.0	100.0
	<i>Total</i>	348	100.0	100.0	

Have visited - Hanka Homestead

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	328	94.3	94.3	94.3
	<i>Checked</i>	20	5.7	5.7	100.0
	<i>Total</i>	348	100.0	100.0	

Aware - Old Victoria?

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>No</i>	224	64.4	73.7	73.7
	<i>Yes</i>	80	23.0	26.3	100.0
	<i>Total</i>	304	87.4	100.0	
<i>Missing</i>	<i>9</i>	44	12.6		
<i>Total</i>		348	100.0		

Plan to visit - Old Victoria

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	330	94.8	94.8	94.8
	<i>Checked</i>	18	5.2	5.2	100.0
	<i>Total</i>	348	100.0	100.0	

Have visited - Old Victoria

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	315	90.5	90.5	90.5
	<i>Checked</i>	33	9.5	9.5	100.0
	<i>Total</i>	348	100.0	100.0	

Aware - Fort Wilkins?

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>No</i>	73	21.0	21.8	21.8
	<i>Yes</i>	262	75.3	78.2	100.0
	<i>Total</i>	335	96.3	100.0	
<i>Missing</i>	<i>9</i>	13	3.7		
<i>Total</i>		348	100.0		

Plan to visit - Fort Wilkins

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	298	85.6	85.6	85.6
	<i>Checked</i>	50	14.4	14.4	100.0
	<i>Total</i>	348	100.0	100.0	

Have visited - Fort Wilkins

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	179	51.4	51.4	51.4
	<i>Checked</i>	169	48.6	48.6	100.0
	<i>Total</i>	348	100.0	100.0	

Aware - McLain?

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>No</i>	130	37.4	40.5	40.5
	<i>Yes</i>	191	54.9	59.5	100.0
	<i>Total</i>	321	92.2	100.0	
<i>Missing</i>	<i>9</i>	27	7.8		
<i>Total</i>		348	100.0		

Plan to visit - McLain

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	322	92.5	92.5	92.5
	<i>Checked</i>	26	7.5	7.5	100.0
	<i>Total</i>	348	100.0	100.0	

Have visited - McLain

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	228	65.5	65.5	65.5
	<i>Checked</i>	120	34.5	34.5	100.0
	<i>Total</i>	348	100.0	100.0	

Aware - Porcupine Mountains?

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>No</i>	64	18.4	19.0	19.0
	<i>Yes</i>	272	78.2	81.0	100.0
	<i>Total</i>	336	96.6	100.0	
<i>Missing</i>	<i>9</i>	12	3.4		
<i>Total</i>		348	100.0		

Plan to visit - Porcupine Mountains

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	289	83.0	83.0	83.0
	<i>Checked</i>	59	17.0	17.0	100.0
	<i>Total</i>	348	100.0	100.0	

Have visited - Porcupine Mountains

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Not checked</i>	196	56.3	56.3	56.3
	<i>Checked</i>	152	43.7	43.7	100.0
	<i>Total</i>	348	100.0	100.0	

Number of Adults 55 & over

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	0	162	46.6	46.7	46.7
	1	55	15.8	15.9	62.5
	2	99	28.4	28.5	91.1
	3	11	3.2	3.2	94.2
	4	17	4.9	4.9	99.1
	5	3	.9	.9	100.0
	<i>Total</i>	347	99.7	100.0	
<i>Missing</i>	9	1	.3		
	<i>Total</i>	348	100.0		

Number of Adults 18 to 54

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	0	126	36.2	36.2	36.2
	1	60	17.2	17.2	53.4
	2	122	35.1	35.1	88.5
	3	13	3.7	3.7	92.2
	4	10	2.9	2.9	95.1
	5	6	1.7	1.7	96.8
	6	7	2.0	2.0	98.9
	7	3	.9	.9	99.7
	8 or more	1	.3	.3	100.0
	<i>Total</i>	348	100.0	100.0	

Number of Children 7 to 17

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	0	261	75.0	75.0	75.0
	1	36	10.3	10.3	85.3
	2	35	10.1	10.1	95.4
	3	8	2.3	2.3	97.7
	4	5	1.4	1.4	99.1
	5	1	.3	.3	99.4
	6	1	.3	.3	99.7
	7	1	.3	.3	100.0
	<i>Total</i>	348	100.0	100.0	

Number of Children 6 and under

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	0	324	93.1	93.1	93.1
	1	14	4.0	4.0	97.1
	2	7	2.0	2.0	99.1
	3	2	.6	.6	99.7
	4	1	.3	.3	100.0
	<i>Total</i>	348	100.0	100.0	

Number of nights spent

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	0	82	23.6	23.7	23.7
	1	51	14.7	14.7	38.4
	2	68	19.5	19.7	58.1
	3	41	11.8	11.8	69.9
	4	34	9.8	9.8	79.8
	5	11	3.2	3.2	82.9
	6	11	3.2	3.2	86.1
	7	22	6.3	6.4	92.5
	8 or more	26	7.5	7.5	100.0
	<i>Total</i>	346	99.4	100.0	
<i>Missing</i>	9	2	.6		
<i>Total</i>		348	100.0		

Accommodations #1)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None checked - applicable	74	21.3	21.3	21.3
	Hotel or	114	32.8	32.9	54.2
	Cabins or	36	10.3	10.4	64.6
	Own cabin or	20	5.7	5.8	70.3
	Campground	68	19.5	19.6	89.9
	Friends or	26	7.5	7.5	97.4
	Other	9	2.6	2.6	100.0
	Total	347	99.7	100.0	
Missing	9	1	.3		
Total		348	100.0		

Accommodations #2)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None checked - applicable	334	96.0	96.0	96.0
	Cabins or	4	1.1	1.1	97.1
	Campground	6	1.7	1.7	98.9
	Friends or	3	.9	.9	99.7
	Other	1	.3	.3	100.0
	Total	348	100.0	100.0	

Use of vintage trolley from Quincy

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Definitely would not	8	2.3	2.3	2.3
	Probably would not	60	17.2	17.6	19.9
	Do not know	21	6.0	6.2	26.1
	Probably would	161	46.3	47.2	73.3
	Definitely would	91	26.1	26.7	100.0
	Total	341	98.0	100.0	
Missing	9	7	2.0		
Total		348	100.0		

Use of steam locomotive

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Definitely would not</i>	6	1.7	1.8	1.8
	<i>Probably would not</i>	60	17.2	17.9	19.6
	<i>Do not know</i>	23	6.6	6.8	26.5
	<i>Probably would</i>	157	45.1	46.7	73.2
	<i>Definitely would</i>	90	25.9	26.8	100.0
	<i>Total</i>	336	96.6	100.0	
<i>Missing</i>	9	12	3.4		
<i>Total</i>		348	100.0		

Use of vintage trolley in Calumet

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Definitely would not</i>	6	1.7	1.8	1.8
	<i>Probably would not</i>	65	18.7	19.2	20.9
	<i>Do not know</i>	20	5.7	5.9	26.8
	<i>Probably would</i>	157	45.1	46.3	73.2
	<i>Definitely would</i>	91	26.1	26.8	100.0
	<i>Total</i>	339	97.4	100.0	
<i>Missing</i>	9	9	2.6		
<i>Total</i>		348	100.0		

Have you been in Calumet?

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>No</i>	105	30.2	31.6	31.6
	<i>Yes</i>	227	65.2	68.4	100.0
	<i>Total</i>	332	95.4	100.0	
<i>Missing</i>	9	16	4.6		
<i>Total</i>		348	100.0		

Use of cog railroad

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Definitely would not</i>	6	1.7	1.8	1.8
	<i>Probably would not</i>	54	15.5	16.3	18.1
	<i>Do not know</i>	26	7.5	7.8	25.9
	<i>Probably would</i>	169	48.6	50.9	76.8
	<i>Definitely would</i>	77	22.1	23.2	100.0
	<i>Total</i>	332	95.4	100.0	
<i>Missing</i>	9	16	4.6		
<i>Total</i>		348	100.0		

Ever ridden on Quncy's cog railroad?

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>No</i>	276	79.3	81.4	81.4
	<i>Yes</i>	63	18.1	18.6	100.0
	<i>Total</i>	339	97.4	100.0	
<i>Missing</i>	<i>9</i>	9	2.6		
<i>Total</i>		348	100.0		

Buy a one day pass for \$30?

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>Definitely would not</i>	16	4.6	4.7	4.7
	<i>Probably would not</i>	93	26.7	27.4	32.1
	<i>Do not know</i>	31	8.9	9.1	41.2
	<i>Probably would</i>	137	39.4	40.3	81.5
	<i>Definitely would</i>	63	18.1	18.5	100.0
	<i>Total</i>	340	97.7	100.0	
<i>Missing</i>	<i>9</i>	8	2.3		
<i>Total</i>		348	100.0		

Comments

		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<i>Valid</i>	<i>No comment</i>	291	83.6	83.6	83.6
	<i>Comment</i>	57	16.4	16.4	100.0
	<i>Total</i>	348	100.0	100.0	

Exhibit V

Comments (answers to question #12)

ID	COMMENT
14	<i>First time visitor!</i>
22	<i>Would be nice if sites were marked. For example - 1/2 mi. to _____.</i>
32	<i>We are visiting relatives in Houghton. If we lived here my "probably would" would more likely be a "definitely would."</i>
33	<i>Driving behind mines, there is so much beauty, I would like to see some kind of transportation back there so more people could see what I have seen the past couple of days.</i>
49	<i>Have brochure available to the public advertising the "overall program" - also a website attached to the U.P.</i>
58	<i>Sounds good, ideas are great!</i>
85	<i>Why not a van tour rather than railroad. That would cover many of the old mining sites.</i>
86	<i>Railroads are restrictive though historically "quaint."</i>
87	<i>This is great!</i>
88	<i>Let's think long term and prohibit snowmobiles from this extraordinary area on the world's largest freshwater lake.</i>
108	<i>Public transit would be a great benefit to lessen the pollutant load in the area. Thanks.</i>
111	<i>We are most likely one time visitors, so our opinions probably don't reflect actual opinions of other visitors.</i>
112	<i>Go for it!</i>
115	<i>These proposed prices are too high</i>
129	<i>Go for it!</i>
133	<i>One of the most interesting things about Superior is the big boats - ore, grain, cargo. It would be nice to have more info about the shipping. Possibly an observation tower with spotting scopes, drawings of how the various boats are configured, access to shipping timetables. Visitors could know the names and destinations of passing ships.</i>
146	<i>Very attractive area</i>
158	<i>One person cannot take all those trips in one day.</i>
159	<i>McClain State Park is one of the nicer campgrounds I have camped at. The staff is great and the grounds are very clean and beautiful.</i>
160	<i>This idea of connecting the two units is just <u>wonderful</u></i>
165	<i>This is a great service to the community. You are telling people how things were and preserving important things otherwise they would not know.</i>
166	<i>This is a great untapped resource up here. Signage is a problem, email info has been great</i>
167	<i>Advertise the UP more outside of Michigan (Wisconsin papers).</i>
168	<i>People with money don't know about the natural resources here.</i>
169	<i>Not excited about going underground. I'm a flatlander, don't like tunnels</i>
171	<i>Everyone is friendly here. (These people were here on business and took some extra days.)</i>
172	<i>The park is doing a wonderful job. I'm happy with these ideas.</i>
173	<i>Would rather see old buildings raised than improvements made to a pile of old rubble.</i>
178	<i>(Quincy bldgs & Smelter - they are eyesores)</i>
182	<i>It's an excellent idea to invest in a more elaborate historic park to support and enhance tourism, for visitors and locals alike.</i>
186	<i>2-day pass would be better, it's a lot to do in one day.</i>
187	<i>People up here are nice to visitors</i>
198	<i>Tourism bureau staff very helpful. We are at the beginning of our trip but we anticipate a wonderful experience.</i>
199	<i>Would like to see the area "attractions" improved and exploited (local employment and enhancement)</i>
202	<i>In Europe, taking the tourist bus is the best way to have transportation around the city.</i>
211	<i>Too much in one day!</i>
220	<i>Enjoy time exploring and learning about Keweenaw Copper History</i>
226	<i>Have free food to fill this survey out!</i>
235	<i>One/two day passes for several. Good idea</i>
252	<i>Great place of Michigan to have the ideas you are thinking of</i>
255	<i>Very pretty Copper Country</i>
260	<i>I support anything that involves preserving the past especially if it involves railroads, trolleys, etc.</i>
265	<i>Travelling, this is probably a once in a lifetime visit - Answers were based on an "if it were available now" opinion.</i>
271	<i>Interested in the scenic and nature of the area.</i>
280	<i>Too much activity for little kids. Would split it up into several trips.</i>
288	<i>Make it a three day pass then it would be worth it.</i>
295	<i>I've made several trips to the area and plan to return. These possible new attractions would be great.</i>
296	<i>Some excellent ideas!</i>
305	<i>Can't wait to come back.</i>
311	<i>Most tourists enjoy Covered Trail. Should be included.</i>
314	<i>Good Idea!</i>
315	<i>Delaware Mine is not a good example of Keweenaw Park, it needs clean up and made safe.</i>
319	<i>Please don't disrupt the wildlife and the trees. We have enough of this already. Too many commercial sites.</i>
321	<i>We're familiar with the area</i>
	<i>I didn't know Quincy had a cog railroad. When was it put in?</i>
	<i>Area seems too spread out for economical tourist transportation. Not sure I want to be captive to a complete tour with 50% not interested in.</i>
	<i>If Multiple Day Pass</i>
	<i>I'm from this area. My take is that many tourists don't know about the attractions. Need one brochure that includes everything, if don't already have.</i>
	<i>How about a special 1 or 2 day locomotive engineer/foreman school?</i>

System Operating Parameters

Calumet Streetcar Capital Cost Estimates

Calumet Streetcar Operating Parameters

Performance

O&M Costs

A.E. Seaman Mineral Museum to Calumet Interurban Line

Interurban Operating Parameters

Performance

O&M Costs

Steam Railroad Capital Costs

Quincy Visitor Orientation Facility to Calumet via Lake Linden

Steam Train Operating Parameters

Cog Railroad Capital Costs and O&M Costs

A.E. Seaman Mineral Museum to Quincy Smelter

Cog Railroad Operating Parameters

Funicular Operating Parameters

A.E. Seaman Mineral Museum to Quincy Smelter

CALUMET STREET CAR CAPITAL COST ESTIMATES
8/18/2004

Alternative A -- 1 Car

Item No.	Item	Quantity	Units	Unit Cost	Extension
1.	Track	9200	Ft.	\$ 350	\$ 3,220,000
2.	Wayside Power Distribution	9200	Ft.	\$ 80	\$ 736,000
3.	Power Distribution Substation	1	Ea.	\$ 250,000	\$ 250,000
4.	Maintenance and Storage Facil.	2000	Sq. Ft.	\$ 50	\$ 100,000
5.	Subtotal				\$ 4,306,000
6.	Contingency	15%			\$ 645,900
7.	Engineering/CM/Testing	15%			\$ 645,900
8.	Subtotal				\$ 5,597,800
9.	Cars (ADA compliant)	1	Ea.	\$ 750,000	\$ 750,000
10.	Total				\$ 6,347,800
	Cost/Mile	5280			\$ 3,643,085

Alternative A -- 2 Cars

Item No.	Item	Quantity	Units	Unit Cost	Extension
1.	Track	9200	Ft.	\$ 350	\$ 3,220,000
2.	Wayside Power Distribution	9200	Ft.	\$ 80	\$ 736,000
3.	Power Distribution Substation	1	Ea.	\$ 250,000	\$ 250,000
4.	Maintenance and Storage Facil.	2500	Sq. Ft.	\$ 50	\$ 125,000
5.	Subtotal				\$ 4,331,000
6.	Contingency	15%			\$ 649,650
7.	Engineering/CM/Testing	15%			\$ 649,650
8.	Subtotal				\$ 5,630,300
9.	Cars (ADA compliant)	2	Ea.	\$ 750,000	\$ 1,500,000
10.	Total				\$ 7,130,300
	Cost/Mile	5280			\$ 4,092,172

Alternative A -- 3 Cars

Item No.	Item	Quantity	Units	Unit Cost	Extension
1.	Track	9200	Ft.	\$ 350	\$ 3,220,000
2.	Wayside Power Distribution	9200	Ft.	\$ 80	\$ 736,000
3.	Power Distribution Substation	1	Ea.	\$ 250,000	\$ 250,000
4.	Maintenance and Storage Facil.	3000	Sq. Ft.	\$ 50	\$ 150,000
5.	Subtotal				\$ 4,356,000
6.	Contingency	15%			\$ 653,400
7.	Engineering/CM/Testing	15%			\$ 653,400
8.	Subtotal				\$ 5,662,800
9.	Cars (ADA compliant)	3	Ea.	\$ 750,000	\$ 2,250,000
10.	Total				\$ 7,912,800
	Cost/Mile	5280			\$ 4,541,259

CALUMET STREET CAR CAPITAL COST ESTIMATES
8/18/2004

Alternative B -- 1 Car

Item No.	Item	Quantity	Units	Unit Cost	Extension
1.	Track	7200	Ft.	\$ 350	\$ 2,520,000
2.	Wayside Power Distribution	7200	Ft.	\$ 80	\$ 576,000
3.	Power Distribution Substation	1	Ea.	\$ 250,000	\$ 250,000
4.	Maintenance and Storage Facil.	2000	Sq. Ft.	\$ 50	\$ 100,000
5.	Subtotal				\$ 3,446,000
6.	Contingency	15%			\$ 516,900
7.	Engineering/CM/Testing	15%			\$ 516,900
8.	Subtotal				\$ 4,479,800
9.	Cars (ADA compliant)	1	Ea.	\$ 750,000	\$ 750,000
10.	Total				\$ 5,229,800
	Cost/Mile	5280			\$ 3,835,187

Alternative B -- 2 Cars

Item No.	Item	Quantity	Units	Unit Cost	Extension
1.	Track	7200	Ft.	\$ 350	\$ 2,520,000
2.	Wayside Power Distribution	7200	Ft.	\$ 80	\$ 576,000
3.	Power Distribution Substation	1	Ea.	\$ 250,000	\$ 250,000
4.	Maintenance and Storage Facil.	2500	Sq. Ft.	\$ 50	\$ 125,000
5.	Subtotal				\$ 3,471,000
6.	Contingency	15%			\$ 520,650
7.	Engineering/CM/Testing	15%			\$ 520,650
8.	Subtotal				\$ 4,512,300
9.	Cars (ADA compliant)	2	Ea.	\$ 750,000	\$ 1,500,000
10.	Total				\$ 6,012,300
	Cost/Mile	5280			\$ 4,409,020

Alternative B -- 3 Cars

Item No.	Item	Quantity	Units	Unit Cost	Extension
1.	Track	7200	Ft.	\$ 350	\$ 2,520,000
2.	Wayside Power Distribution	7200	Ft.	\$ 80	\$ 576,000
3.	Power Distribution Substation	1	Ea.	\$ 250,000	\$ 250,000
4.	Maintenance and Storage Facil.	3000	Sq. Ft.	\$ 50	\$ 150,000
5.	Subtotal				\$ 3,496,000
6.	Contingency	15%			\$ 524,400
7.	Engineering/CM/Testing	15%			\$ 524,400
8.	Subtotal				\$ 4,544,800
9.	Cars (ADA compliant)	3	Ea.	\$ 750,000	\$ 2,250,000
10.	Total				\$ 6,794,800
	Cost/Mile	5280			\$ 4,982,853

CALUMET STREET CAR CAPITAL COST ESTIMATES
8/18/2004

Alternative C -- 1 Car

Item No.	Item	Quantity	Units	Unit Cost	Extension
1.	Track	6300	Ft.	\$ 350	\$ 2,205,000
2.	Wayside Power Distribution	6300	Ft.	\$ 80	\$ 504,000
3.	Power Distribution Substation	1	Ea.	\$ 250,000	\$ 250,000
4.	Maintenance and Storage Facil.	2000	Sq. Ft.	\$ 50	\$ 100,000
5.	Subtotal				\$ 3,059,000
6.	Contingency	15%			\$ 458,850
7.	Engineering/CM/Testing	15%			\$ 458,850
8.	Subtotal				\$ 3,976,700
9.	Cars (ADA compliant)	1	Ea.	\$ 750,000	\$ 750,000
10.	Total				\$ 4,726,700
	Cost/Mile	5280			\$ 3,961,425

Alternative C -- 2 Cars

Item No.	Item	Quantity	Units	Unit Cost	Extension
1.	Track	6300	Ft.	\$ 350	\$ 2,205,000
2.	Wayside Power Distribution	6300	Ft.	\$ 80	\$ 504,000
3.	Power Distribution Substation	1	Ea.	\$ 250,000	\$ 250,000
4.	Maintenance and Storage Facil.	2500	Sq. Ft.	\$ 50	\$ 125,000
5.	Subtotal				\$ 3,084,000
6.	Contingency	15%			\$ 462,600
7.	Engineering/CM/Testing	15%			\$ 462,600
8.	Subtotal				\$ 4,009,200
9.	Cars (ADA compliant)	2	Ea.	\$ 750,000	\$ 1,500,000
10.	Total				\$ 5,509,200
	Cost/Mile	5280			\$ 4,617,234

Alternative C -- 3 Cars

Item No.	Item	Quantity	Units	Unit Cost	Extension
1.	Track	6300	Ft.	\$ 350	\$ 2,205,000
2.	Wayside Power Distribution	6300	Ft.	\$ 80	\$ 504,000
3.	Power Distribution Substation	1	Ea.	\$ 250,000	\$ 250,000
4.	Maintenance and Storage Facil.	3000	Sq. Ft.	\$ 50	\$ 150,000
5.	Subtotal				\$ 3,109,000
6.	Contingency	15%			\$ 466,350
7.	Engineering/CM/Testing	15%			\$ 466,350
8.	Subtotal				\$ 4,041,700
9.	Cars (ADA compliant)	3	Ea.	\$ 750,000	\$ 2,250,000
10.	Total				\$ 6,291,700
	Cost/Mile	5280			\$ 5,273,044

CALUMET STREET CAR CAPITAL COST ESTIMATES
8/18/2004

Alternative D -- 1 Car

Item No.	Item	Quantity	Units	Unit Cost	Extension
1.	Track	4600	Ft.	\$ 350	\$ 1,610,000
2.	Wayside Power Distribution	4600	Ft.	\$ 80	\$ 368,000
3.	Power Distribution Substation	1	Ea.	\$ 250,000	\$ 250,000
4.	Maintenance and Storage Facil.	2000	Sq. Ft.	\$ 50	\$ 100,000
5.	Subtotal				\$ 2,328,000
6.	Contingency	15%			\$ 349,200
7.	Engineering/CM/Testing	15%			\$ 349,200
8.	Subtotal				\$ 3,026,400
9.	Cars (ADA compliant)	1	Ea.	\$ 750,000	\$ 750,000
10.	Total				\$ 3,776,400
	Cost/Mile	5280			\$ 4,334,650

Alternative D -- 2 Cars

Item No.	Item	Quantity	Units	Unit Cost	Extension
1.	Track	4600	Ft.	\$ 350	\$ 1,610,000
2.	Wayside Power Distribution	4600	Ft.	\$ 80	\$ 368,000
3.	Power Distribution Substation	1	Ea.	\$ 250,000	\$ 250,000
4.	Maintenance and Storage Facil.	2500	Sq. Ft.	\$ 50	\$ 125,000
5.	Subtotal				\$ 2,353,000
6.	Contingency	15%			\$ 352,950
7.	Engineering/CM/Testing	15%			\$ 352,950
8.	Subtotal				\$ 3,058,900
9.	Cars (ADA compliant)	2	Ea.	\$ 750,000	\$ 1,500,000
10.	Total				\$ 4,558,900
	Cost/Mile	5280			\$ 5,232,824

Alternative D -- 3 Cars

Item No.	Item	Quantity	Units	Unit Cost	Extension
1.	Track	4600	Ft.	\$ 350	\$ 1,610,000
2.	Wayside Power Distribution	4600	Ft.	\$ 80	\$ 368,000
3.	Power Distribution Substation	1	Ea.	\$ 250,000	\$ 250,000
4.	Maintenance and Storage Facil.	3000	Sq. Ft.	\$ 50	\$ 150,000
5.	Subtotal				\$ 2,378,000
6.	Contingency	15%			\$ 356,700
7.	Engineering/CM/Testing	15%			\$ 356,700
8.	Subtotal				\$ 3,091,400
9.	Cars (ADA compliant)	3	Ea.	\$ 750,000	\$ 2,250,000
10.	Total				\$ 5,341,400
	Cost/Mile	5280			\$ 6,130,998

CALUMET STREETCAR OPERATING PARAMETERS

Updated 09/09/04

		Alt. A	Alt. B	Alt. C	Alt. D
Route Length (feet)		9200	7200	6300	4600
Assumed Number of Stops	(a)	10	6	6	5
Travel Time (min.)	(b)	6.97	5.45	4.77	3.48
Dwell Time (min.)	(c)	7.50	4.50	4.50	3.75
Schedule Regulation Time	(d)	5.53	5.05	5.73	7.77
Total		20.00	15.00	15.00	15.00
1 Car	1				
Headway (min.)	(e)	20.00	15.00	15.00	15.00
Capacity/Hour (passengers)		84	112	112	112
Capacity/Day (passengers)	(f)	571	762	762	762
Capacity/Season (passengers)	(g)	85680	114240	114240	114240
Vehicle-Miles/Season		5332	5564	4868	3555
2 Cars	2				
Headway	(e)	10.00	7.50	7.50	7.50
Capacity Per Hour		168	224	224	224
Capacity Per Day	(f)	1142	1523	1523	1523
Capacity Per season	(g)	171360	228480	228480	228480
Vehicle-Miles/Season		10664	11127	9736	7109
3 Cars	3				
Headway	(e)	6.67	5.00	5.00	5.00
Capacity Per Hour		252	336	336	336
Capacity Per Day	(f)	1714	2285	2285	2285
Capacity Per season	(g)	257040	342720	342720	342720
Vehicle-Miles/Season		15995	16691	14605	10664
Assumptions and Criteria:					
Average speed while moving		15	mph	1320	fpm
Average dwell per stop		45	seconds	0.75	min
Car Capacity		28	passengers		
Minutes/Hr		60			
Average Hrs/Day		6.8			
Days/Season		150			
Feet/Mile		5280			

Schedule:	<i>Days</i>	<i>Hrs/Day</i>	<i>Hours</i>
	90	8	720
	30	6	180
	30	4	120
	150		1020

Notes:

- (a) Number of stops is a function of route length and points of interest.
Locations and final number of stops to be determined in later phase.
- (b) Time the streetcar is moving based on an assumed average speed of 15 mph in mixed traffic.
- (c) Average time the streetcar waits at each stop for boarding and de-boarding passengers..
- (d) Waiting time at the Transportation Plaza before the next trip is begun.
- (e) Time between streetcars.
- (f) Assumes the streetcar operates per above schedule.
- (g) Assumes a 150 day season.

CALUMET STREETCAR O&M COSTS

CALUMET STREET CAR O&M COSTS

Cost / Veh Mile = \$ 11.14
 Annual Riders = 140,000 50,000
 Average Fare = \$ 3.75

	Alt. A	Alt. B	Alt. C	Alt. D	Alt. A	Alt. B	Alt. C	Alt. D
2 Cars								
Annual Capacity	171,360	228,480	228,480	228,480	171,360	228,480	228,480	228,480
Annual Veh Miles	10,664	11,127	9,736	7,109	10,664	11,127	9,736	7,109
Cost / Veh Mile	\$ 11.14	\$ 11.14	\$ 11.14	\$ 11.14	\$ 11.14	\$ 11.14	\$ 11.14	\$ 11.14
Annual Cost	\$ 118,793	\$ 123,958	\$ 108,463	\$ 79,195	\$ 118,793	\$ 123,958	\$ 108,463	\$ 79,195
Annual Riders	140,000	140,000	140,000	140,000	50,000	50,000	50,000	50,000
Average Fare	\$ 3.75	\$ 3.75	\$ 3.75	\$ 3.75	\$ 3.75	\$ 3.75	\$ 3.75	\$ 3.75
Annual Fare Revenue	\$ 525,000	\$ 525,000	\$ 525,000	\$ 525,000	\$ 187,500	\$ 187,500	\$ 187,500	\$ 187,500
Fare Box Recovery Ratio	4.42	4.24	4.84	6.63	1.58	1.51	1.73	2.37
Load Factor	0.82	0.61	0.61	0.61	0.29	0.22	0.22	0.22
3 Cars								
Annual Capacity	257,040	342,720	342,720	342,720	257,040	342,720	342,720	342,720
Annual Veh Miles	15,995	16,691	14,605	10,664	15,995	16,691	14,605	10,664
Cost / Veh Mile	\$ 11.14	\$ 11.14	\$ 11.14	\$ 11.14	\$ 11.14	\$ 11.14	\$ 11.14	\$ 11.14
Annual Cost	\$ 178,189	\$ 185,937	\$ 162,695	\$ 118,793	\$ 178,189	\$ 185,937	\$ 162,695	\$ 118,793
Annual Riders	140,000	140,000	140,000	140,000	50,000	50,000	50,000	50,000
Average Fare	\$ 3.75	\$ 3.75	\$ 3.75	\$ 3.75	\$ 3.75	\$ 3.75	\$ 3.75	\$ 3.75
Annual Fare Revenue	\$ 525,000	\$ 525,000	\$ 525,000	\$ 525,000	\$ 187,500	\$ 187,500	\$ 187,500	\$ 187,500
Fare Box Recovery Ratio	2.95	2.82	3.23	4.42	1.05	1.01	1.15	1.58
Load Factor	0.54	0.41	0.41	0.41	0.19	0.15	0.15	0.15

Seaman Mineral Museum to Calumet Interurban Line
8/18/2004

1 Car

Item No.	Item	Quantity	Units	Unit Cost	Extension
1.	ROW Grading and Drainage	52740	Ft.	\$ 20	\$ 1,054,800
2.	Track	52740	Ft.	\$ 100	\$ 5,274,000
3.	US 41 Grade Crossing	60	Ft.	\$ 350	\$ 21,000
4.	US 41 Crossing Signals	1	Ea.	\$ 20,000	\$ 20,000
5.	Wayside Power Distribution	52800	Ft.	\$ 80	\$ 4,224,000
5.	Power Distribution Substation	2	Ea.	\$ 250,000	\$ 500,000
6.	Maintenance and Storage Facil.	500	Sq. Ft.	\$ 50	\$ 25,000
7.	Subtotal				\$ 10,064,000
6.	Contingency	15%			\$ 1,509,600
7.	Engineering/CM/Testing	15%			\$ 1,509,600
8.	Subtotal				\$ 13,083,200
9.	Cars (ADA compliant)	1	Ea.	\$ 750,000	\$ 750,000
10.	Total				\$ 13,833,200
	Cost/Mile	5280			\$ 1,384,894

2 Cars

Item No.	Item	Quantity	Units	Unit Cost	Extension
1.	ROW Grading and Drainage	52940	Ft.	\$ 20	\$ 1,058,800
2.	Track	52940	Ft.	\$ 100	\$ 5,294,000
3.	US 41 Grade Crossing	60	Ft.	\$ 350	\$ 21,000
4.	US 41 Crossing Signals	1	Ea.	\$ 20,000	\$ 20,000
5.	Wayside Power Distribution	53000	Ft.	\$ 80	\$ 4,240,000
5.	Power Distribution Substation	2	Ea.	\$ 250,000	\$ 500,000
6.	Maintenance and Storage Facil.	1000	Sq. Ft.	\$ 50	\$ 50,000
7.	Subtotal				\$ 10,125,000
6.	Contingency	15%			\$ 1,518,750
7.	Engineering/CM/Testing	15%			\$ 1,518,750
8.	Subtotal				\$ 13,162,500
9.	Cars (ADA compliant)	2	Ea.	\$ 750,000	\$ 1,500,000
10.	Total				\$ 14,662,500
	Cost/Mile	5280			\$ 1,462,372

3 Cars

Item No.	Item	Quantity	Units	Unit Cost	Extension
1.	ROW Grading and Drainage	53140	Ft.	\$ 20	\$ 1,062,800
2.	Track	53140	Ft.	\$ 100	\$ 5,314,000
3.	US 41 Grade Crossing	60	Ft.	\$ 350	\$ 21,000
4.	US 41 Crossing Signals	1	Ea.	\$ 20,000	\$ 20,000
5.	Wayside Power Distribution	53140	Ft.	\$ 80	\$ 4,251,200
5.	Power Distribution Substation	2	Ea.	\$ 250,000	\$ 500,000
6.	Maintenance and Storage Facil.	1500	Sq. Ft.	\$ 50	\$ 75,000
7.	Subtotal				\$ 10,181,200
6.	Contingency	15%			\$ 1,527,180
7.	Engineering/CM/Testing	15%			\$ 1,527,180
8.	Subtotal				\$ 13,235,560
9.	Cars (ADA compliant)	3	Ea.	\$ 750,000	\$ 2,250,000
10.	Total				\$ 15,485,560
	Cost/Mile	5280			\$ 1,538,648

Cost Estimate Notes:

- (a) 10 mile station-to-station length = 52,800 feet.*
- (b) One by-pass 200 feet long for 2-car operation.*
- (c) Two by-passes 200 feet long each for 3-car operation.*
- (d) Grade crossing special requirements other than at US 41 assumed to be included in Item 1.*
- (e) Cost of minimal station facilities included in contingency.*
- (f) ROW acquisition through easements or fee simple titles not included.*
- (g) Wood ties with conventional aggregate ballast assumed except at US 41 grade crossing.*
- (h) Interurban maintenance and storage assumed to be added to Calumet Streetcar facility.*

INTERURBAN OPERATING PARAMETERS -- SEAMAN MINERAL MUSEUM
TO CALUMET

Updated 09/09/04

Criteria			
Route Length	10 miles one way 20 miles round trip		
Stations	2 (one at each end)		
Average Speed	25 mph		
Station Dwell	10 minutes		
Car Capacity	40 passengers/car		
Operating Hours	1020 hours/season		
Season	150 days/year		
Performance			
Station to station trip time	0.4 hours 24 minutes		
Round trip time	68 minutes		
Operating Fleet ----->	1 Car 1	2 Cars 2	3 Cars 3
	68.0	34.0	22.7
	35	71	106
	240	480	720
	36000	72000	108000
	18000	36000	54000
Conversion Factors		Schedule	
60 minutes/hour	Days	Hrs/Day	Hours
1020 hrs/season	90	8	720
150 days/season	30	6	180
	30	4	120
	150		1020

Steam Railroad Capital Costs
9/8/2004

0.50 Mile

Item No.	Item	Quantity	Units	Unit Cost	Extension
1.	ROW Grading and Drainage	2640	Ft.	\$ 20	\$ 52,800
2.	Track	2640	Ft.	\$ 100	\$ 264,000
3.	US 41 Grade Crossing	0	Ft.	\$ 350	\$ -
4.	US 41 Crossing Signals	0	Ea.	\$ 20,000	\$ -
5.	Maintenance and Storage Facil.	3500	Sq. Ft.	\$ 50	\$ 175,000
6.	Subtotal				\$ 491,800
7.	Contingency	15%			\$ 73,770
8.	Engineering/CM/Testing	15%			\$ 73,770
9.	Subtotal				\$ 639,340
10.	Locomotive	1	Ea.	\$ 500,000	\$ 500,000
11.	Cars	2	Ea.	\$ 100,000	\$ 200,000
12.	Total				\$ 1,339,340

7 miles

Item No.	Item	Quantity	Units	Unit Cost	Extension
1.	ROW Grading and Drainage	36960	Ft.	\$ 20	\$ 739,200
2.	Track	36960	Ft.	\$ 100	\$ 3,696,000
3.	US 41 Grade Crossing	0	Ft.	\$ 350	\$ -
4.	US 41 Crossing Signals	0	Ea.	\$ 20,000	\$ -
5.	Maintenance and Storage Facil.	4000	Sq. Ft.	\$ 50	\$ 200,000
6.	Subtotal				\$ 4,635,200
7.	Contingency	15%			\$ 695,280
8.	Engineering/CM/Testing	15%			\$ 695,280
9.	Subtotal				\$ 6,025,760
10.	Locomotive	1	Ea.	\$ 500,000	\$ 500,000
11.	Cars	3	Ea.	\$ 100,000	\$ 300,000
12.	Total				\$ 6,825,760

14.5 miles

Item No.	Item	Quantity	Units	Unit Cost	Extension
1.	ROW Grading and Drainage	76560	Ft.	\$ 20	\$ 1,531,200
2.	Track	76560	Ft.	\$ 100	\$ 7,656,000
3.	US 41 Grade Crossing	1	Ft.	\$ 350	\$ 350
4.	US 41 Crossing Signals	1	Ea.	\$ 20,000	\$ 20,000
5.	Maintenance and Storage Facil.	4500	Sq. Ft.	\$ 50	\$ 225,000
6.	Subtotal				\$ 9,432,550
7.	Contingency	15%			\$ 1,414,883
8.	Engineering/CM/Testing	15%			\$ 1,414,883
9.	Subtotal				\$ 12,262,315
10.	Locomotive	1	Ea.	\$ 500,000	\$ 500,000
11.	Cars	4	Ea.	\$ 100,000	\$ 400,000
12.	Total				\$ 13,162,315

Cost Estimate Notes:

- (a) Grade crossing special requirements other than at US 41 assumed to be included in Item 1.
- (b) Cost of minimal station facilities included in contingency.
- (c) ROW acquisition through easements or fee simple titles not included.
- (d) Wood ties with conventional aggregate ballast assumed except at US 41 grade crossing.
- (e) Maintenance and Storage Facility assumed to be located at Quincy Smelter Welcome Center or Quincy Hoist, depending on alignment.

STEAM TRAIN OPERATING PARAMETERS -- QUINCY WELCOME CENTER
TO CALUMET VIA LAKE LINDEN

Updated 09/09/04

Criteria				
Route Length	14.5	miles one way		
	29	miles round trip		
Stations	3	(one at each end, one in Lake Linden)		
Average Speed	25	mph		
Station Dwell	10	minutes		
Car Capacity	60	passengers/car		
Operating Hours	1020	hours/season		
Season	150	days/year		
Performance				
End to End Trip Time	0.75	hours		
	44.8	minutes		
Round trip time	109.6	minutes		
Passenger Consist----->	1 Car 1	2 Cars 2	3 Cars 3	
Headway (minutes)	109.6	109.6	109.6	
Passengers/Direction/Hour	33	66	99	
Passengers/Direction/Average Day	223	447	670	
Passengers/Direction/Season	33504	67007	100511	
Locomotive-Miles/Season	16193	16193	16193	
Passenger Car-Miles/Season	16193	32387	48580	
Conversion Factors		Schedule		
60 minutes/hour	Days	Hrs/Day	Hours	
1020 hours/season	90	8	720	
150 days/season	30	6	180	
	30	4	120	
	150		1020	

COG RAILROAD CAPITAL COST ESTIMATES

Cost Classification	Quincy Tramway 1996	Quincy Hill Extension (2003)		Quincy Smelter Extension(2003)		TOTAL COST (40-minute headway)	TOTAL COST (20-minute headway)	
Administration & Leal Expenses	\$8,100	\$6,000		\$20,000		\$26,000	\$26,000	
Land, Structures, rights-of-ways, appraisals, etc.	\$0	\$0	(1)	\$0	(1)	\$0	\$0	
Architectural & Engineering Fee	\$51,500	\$20,000		\$95,000		\$115,000	\$115,000	
Project inspection fees	\$12,000	\$9,000		\$25,000		\$34,000	\$34,000	
Demolition & Removal	\$0	\$0		\$0		\$0	\$0	
Construction	\$349,929	\$250,000	(2)	\$650,000	(4)	\$900,000	\$900,000	
Turnouts (switches at bypass)				2 @ \$40,000		\$80,000	\$160,000	(8)
Tramway Vehicle	\$170,000	\$0		\$200,000		\$200,000	2 @ \$200,000	
Tramway Vehicle		\$15,000				\$15,000	\$15,000	
Trestle(s) Structures		\$0		\$475,000	(5)	\$475,000	\$475,000	
Shelter Buildings		\$96,000	(3)	\$132,000	(6)	\$228,000	\$228,000	
Contingencies	\$28,471	\$21,783		\$291,400	(7)	\$313,183	\$313,183	
GRAM TOTAL	\$620,000	\$417,783		\$1,968,400		\$2,386,183	\$2,666,183	

(1) No cost assumed with land acquisition at this time

(2) Construction of track, including at-grade crossing

(3) Two 800 SF covered platforms (\$60/SF) at Quincy Hoist House and A.E. Seaman Mineral Museum

(4) Construction of track, including fill between tracks at MDNR trail

(5) Costs for three trestles (see section 6.3.4 Trestle Structures for cost breakdown)

(6) Cost for Mine Adit and Park Welcome Center shelters (see section 6.3.6 Stations for breakdown)

(7) Contingencies for Quincy Smelter Extension set at 20% of construction cost to account for unforeseen costs

(8) Total of four turnouts required when three tramcars are in operation

COG RAILROAD OPERATING & MAINTENANCE COSTS

Description	Current O&M Costs (FY 2002)	O&M Costs for the Proposed System (2003)	
		Schedule 1	Schedule 2
Repairs	\$1,500	\$3,850	\$6,000
Restricted Expenses			
Tramway Expenses	\$4,850	\$12,400	\$19,300
Wages			
Maintenance	\$8,000	\$20,450	\$31,800
Operators	\$11,700	\$25,150	\$38,900
Utilities			
Gas & Electric	\$2,500	\$6,400	\$9,950
Administration & Overhead	\$10,000	\$15,350	\$15,350
TOTAL EXPENSES	\$38,550	\$83,600	\$121,300

COG RAILROAD OPERATING PARAMETERS -- SEAMAN MINERAL MUSEUM TO QUINCY SMELTER

Updated 09/09/04

Criteria			
Route Length	1.44 miles one way 2.88 miles round trip		
Stations	4 (Seaman, hoist, mine, smelter)		
Average Speed	7.5 mph		
Station Dwell	7.0 minutes		
Car Capacity	28 passengers/car		
Operating Period	9 hours/day		
Season	100 days/year		
Performance			
End to end travel time	0.192 hours (not including station dwells) 11.52 minutes		
Round trip time	65.04 minutes (includes 6 dwells)		
Operating Fleet ----->	1 Car 1	2 Cars 2	
Headway (minutes)	65.04	32.52	
Passengers/Direction/Hour	26	52	
Passengers/Direction/Day	176	351	
Passengers/Direction/Season	26347	52694	
Vehicle-Miles/Season	2710	5420	
Conversion Factors		Schedule	
60 minutes/hour	Days	Hrs/Day	Hours
1020 hours/season	90	8	720
150 days/season	30	6	180
	30	4	120
	150		1020

Notes: Dwell time of 7 minutes is an assumption based on the current vehicle design with one door and forward facing bench seating. This is based on 28 passenger debarking and 28 new passengers boarding at each station, which is the worst case.

Speeds range from 5 mph to 10 mph, depending on grade.

2 car operation requires a by-pass with switches and synchronized operations with closely controlled station dwells.

FUNICULAR OPERATING PARAMETERS -- SEAMAN MINERAL MUSEUM
TO QUINCY SMELTER

Updated 09/09/04

Criteria			
Route Length	1.44 miles one way 2.88 miles round trip		
Stations	4 (Seaman, hoist, mine, smelter)		
Average Speed	15 mph		
Station Dwell	7.0 minutes		
Car Capacity	40 passengers/car		
Operating Hours	1020 hours/season		
Season	150 days/year		
Performance			
End to end travel time	0.096 hours (not including station dwells) 5.76 minutes		
Round trip time	53.52 minutes (includes 6 dwells)		
Operating Fleet ----->	1 Car 1	2 Cars 2	
Headway (minutes)	53.52	26.76	
Passengers/Direction/Hour	45	90	
Passengers/Direction/Average Day	305	610	
Passengers/Direction/Season	45,740	91,480	
Vehicle-Miles/Season	3,293	6,587	
Conversion Factors		Schedule	
60 minutes/hour	Days	Hrs/Day	Hours
1020 hours/season	90	8	720
150 days/season	30	6	180
	30	4	120
	150		1020

Notes: Dwell time of 7 minutes is an assumption based on vehicle design with forward facing bench seating. This is based on 40 passengers deboarding and 40 new passengers boarding at each station, which is the worst case.

2 car operation requires a by-pass with switches and synchronized operations with closely controlled station dwells.