REQUEST FOR COUNCIL ACTION

Date: 05/11/2009
Item No.: 12.b

Department Approval | Acting City Manager Approval

Item Description: Authorize a Joint Fiber Optic Installation Project

BACKGROUND

Since 2002, the City has capitalized on a number of opportunities to install fiber optic communication lines to connect City facilities. In 2006 the City partnered with Access Corporation, a private telecommunications service provider, to install fiber along County Road B2 between Snelling Avenue and Rice Street that would serve the City of Roseville, the Roseville School District, and Independent School District #916 (Northeast Metro).

Most recently in 2008, the County Road B2 backbone was extended to Harriet Alexander Nature Center, Central Park Elementary School, Roseville Fire Station #3, and Park View School via a lateral fiber optic connection along the Dale Street Corridor.

Over the past winter City Staff met with officials from the Roseville Area School District and Ramsey County Library to develop a fiber construction plan to connect additional public facilities to the existing fiber backbone. Both the City and the School District rely heavily on the Comcast-provided Institutional Network (INET) for inter-building network connectivity. The use of the network is granted by the City's competitive local cable television franchise agreement. However not all sections of the INET provide fiber connectivity. A number of sites use cable modem technology with outdated equipment that cannot deliver the network speeds and bandwidth required to deliver applications to remote facilities. Additionally recent FCC rulings bring into question the availability and use of the INET beyond the current franchise agreement due to expire in 2012. To insure continuity of business services absent the use of the INET, it is necessary to develop a strategic communications plan to include construction of municipal fiber optic cable to public facilities.

City Staff, in conjunction with Roseville School and Ramsey County Library Staff, are recommending that the following facilities be connected in 2009:

- Roseville Area High School (RAHS) connection to City Hall.
- Roseville Library connection to City Hall and RAHS.
- Cedarholm Golf Course connection to City Hall
- Falcon Heights Elementary to RAHS and Library
- Brimhall Elementary to RAHS, Fairview, and Library
- Fairview Community Center to RAHS, Library, and City Hall

The inclusion of Roseville Library in this project is part of a county-wide municipal effort to interconnect the library system with METRO-INET, the consortium of cities that share information technology services.

The cost of this multi-segment fiber optic pathway would be approximately $275,000, of which, $118,750 would be paid for by the City with the remainder paid by the School District and Ramsey County Library. Each agency would individually be responsible for the cost of connecting their respective facilities to the pathway. The cost to connect City facilities would be approximately $16,000 to connect City Hall and the Golf Course to the fiber pathway. If the project is approved, it is anticipated that cost-sharing and usage agreements would be entered into by the City, the School District, and Ramsey County Library.

POLICY OBJECTIVE

Multi-jurisdictional agreements and projects are consistent with the goals and strategies identified in the Imagine Roseville 2025 process. The joint construction of a fiber optic network will serve a larger number of constituents and achieve greater economies of scale than if the City would to construct one separately.

FINANCIAL IMPACTS

The estimated cost for the fiber project detailed above for the City of Roseville would be $134,750. Monies for the project were included in the City's 2009 Equipment Fund Budget.

STAFF RECOMMENDATION

Staff recommends the Council authorize Staff to solicit proposals for the 2009 Joint Fiber Outlay project with the Roseville School District and Ramsey County Library System

REQUESTED COUNCIL ACTION

Motion to authorize Staff to solicit proposals for the 2009 Joint Fiber Outlay project with the Roseville School District and Ramsey County Library as outlined in this Staff Report.

Prepared by: Chris Miller, Finance Director
Terre Heiser, Information Technology Manager

Attachments:
A: Draft Fiber Optic Network and Technology Master Plan (for background purposes only)
B: Ramsey County Library System Summary (for background purposes only)
C: 2009 Fiber Project Summary and Fiber Map

Attachment A **- Working Draft – City Fiber Optic Network and Technology Master Plans**

City staff has begun assessing its network infrastructure needs and interests for the future, taking into account both the needs of the City for its municipal operations, but also the opportunity to extend a municipal fiber utility infrastructure to other public entities, including our school districts, neighboring cities, the County and also to the State of Minnesota. The City desires to be well-positioned to enhance the quality of life, economic vitality and delivery of government services in Roseville through the strategic use of telecommunications technologies and fiber optic utility infrastructure. The Imagine Roseville 2025 process identified the need to provide sustainable, cutting edge technology to support educational opportunities, provide cost effective city services, and support a citywide technology infrastructure that is accessible to the private sector.

Within this context, the City seeks to develop a Municipal Fiber Optic Network and Technology Master Plan to identify the current telecommunications infrastructure; ascertain future telecommunications needs and services; and determine potential roles and partnership opportunities to help the City meet such needs.

The effort would include an analysis of:

- the uses of existing City rights-of-way for telecommunications infrastructure and methods to protect these valuable assets while encouraging location of new technology within the community;
- the types of telecommunications systems that best promote community objectives and the electronic delivery of government and institutional services;
- public and business partnership models that promote increased use of telecommunications technologies within the community;
- alternate strategies that could accomplish the same goals without public financing;
- how telecommunications providers might help the City achieve these objectives; and;
- financial models that clarify likely City roles in the telecommunications arena.

The kinds of questions that need to be explored include:

- how the City might encourage greater competition and consumer choice in telecommunication services;
- what the City can do to promote universal access and telecommunication literacy;
- whether the City should construct its own fiber network or "loop";
- how the City might enhance the delivery of government services;
- and the role of telecommunications to enhance the economic climate of the City.

It is suggested that the City explore two economic models to determine the appropriate role for the City to undertake: a Citywide full-service network (cable TV; telephone; high speed data services); and a City institutional network model. Regardless of the network approach chosen, it is important to note that the recommendations of the modeling component are in addition to the services and telecommunication solutions offered by the traditional private telecommunication providers.

Potential roles for the City may include:

- Develop internal infrastructure, including City-owned conduit with fiber linking its facilities on a priority and cost-justified basis. The first phase of this approach would also include other governmental institutions such as facilities of the Roseville Area School District
- Become a provider of external infrastructure as a lesser of conduit and/or fiber to non-governmental institutional entities.
- Become a provider of a full-service network to external, non-governmental institutional entities and City residents.

In any of the above three options, the City might partner with an established telecommunications provider. The partner and City could jointly develop and provide the above assets and services, subject to their economic and technical feasibility, under a multi-phase agreement.

Staff recommends the development of a fiber optic telecommunications network for use by public agencies and institutions with additional capacity for leased conduit and/or fiber to non-governmental entities.

Enhancements to Delivery of Government Services

Over the past few years, the City's internal use of telecommunications technologies has grown significantly. The City now operates and depends on a sophisticated local and wide area network that connects staff at all City facilities for voice and computer communications. This advanced network is extended to 14 other public agencies (Chart A.). There are currently 43 public buildings (Chart B.) connected on an existing network compromised of municipal fiber optic cabling and a Comcast provided coaxial and fiber optic network. Whereas the City has already made investments in it's own fiber optic network, the vast majority of the infrastructure is provided by Comcast as part of the City's local cable television franchise through the provision of an Institutional Network (INET). However many portions of the INET still operate on outdated coaxial cable connections and equipment which do not provide the reliability necessary to sustain advanced applications like IP telephony and GIS applications. And with the uncertainty of any provision of local cable television franchising beyond the current agreement that expires in 2012, it is necessary that the City make every effort to begin development of an alternate to the Comcast network.

The City has made significant investments in telecommunications technologies, including IP Telephony, Geographical Information Services, document imaging and management, network video security and surveillance, and Internet access. To support these services, high bandwidth connections are required to interconnect key network hubs like the City Hall Data Center to municipal facilities located throughout the City and neighboring communities.

Fiber optic networks provide the capacity for supporting technologies now being implemented and provide opportunities to deliver high bandwidth video and multimedia applications to City facilities and the public as planned in the near future, facilitating video conferencing, video training, integrated voice and data applications, and full motion video and sound. Other facilities on the City wide area network now require bandwidth upgrades to support new demands.

Benefits of Municipal Fiber Network

Development of a municipal fiber optic network has been identified as a key strategy to provide the bandwidth necessary to support enhanced service delivery and to give the City control over operating costs for its internal telecommunications needs. Additionally, the network would:

- present opportunities for sharing telecommunications services with the school district and joint powers agencies;
- provide a secured and reliable private network for supporting public safety and emergency response;
- present revenue opportunities for the leasing of City-owned conduit and fiber to telecommunications providers and businesses in Roseville;
- provide a foundation for promoting continued investments in the City's telecommunications infrastructure by telecommunications providers and local institutions and businesses;
- provide a framework to contribute to a regional telecommunications network;
- extend infrastructure into strategic areas of the City and provide the backbone to enable a broader network to be developed if it is shown to be technically and economically feasible.

The proposed municipal fiber network could be developed in conjunction planned public works projects which will provide cost savings by combining utility trenching required for other purposes like sewer and water.

The fiber optic network should be viewed as a foundational network, harnessing one-time opportunities in a coherent infrastructure plan and setting the parameters for future infrastructure investment. A municipal fiber network serves several immediate objectives of the City and at the same time lays the foundation for the evolution of a wider network serving more customers, if deemed feasible in the future telecommunications market. The City's exploration of strategic public/private partnerships will yield important information about what private sector providers will commit to further develop the telecommunications network in Roseville and the region. In short, immediate City business opportunities can be realized and the business risk elements of the network can be mitigated and minimized with this proposed approach to a network venture.

In summary, the following are key policy recommendations to be considered for inclusion in the Fiber Optic Network Master Plan.

[DRAFT] The City should continue to develop its municipal fiber network for the purpose of connecting key public institutions. The network should be tied to other public works projects whenever possible to lower construction costs and can be expected to provide service to identified sites within 48 months to coincide with expiration of the current cable franchise agreement. Priority must be given to underserved facilities currently connected to the outdated coaxial network. The network will support the continued development of advanced voice, data and video services for institutional partners and ensure that the City will continued to be a leader in the use of modern telecommunications systems to provide quality public service.

[DRAFT] Potential public and private partners for construction, financing and operation of the fiber optic network should be identified. This effort should proceed while the network is under development, as an independent project with its own schedule and goals. The scope of partnership could range from lease of

excess City-owned telecommunications conduit and/or fiber strands to full partnership in the development, financing and management of the municipal fiber optic network.

[DRAFT] A policy statement should be adopted that encourages cooperative access to modern telecommunications services, taking the following concepts into account:

- Encouraging access at specific types of facilities such as schools, libraries, and public facilities owned or controlled by government.
- Promoting interconnectivity, interoperability and open access.
- Providing incentives or other mechanisms to promote businesses and others to support the policies, such as a special fund for those who adopt and take actions consistent with the policies.

[DRAFT] City staff will continue to expand upon the use of telecommunications technologies for electronic delivery of government services. Expected outcomes include increased availability of government information and services, support of community services, increasing public awareness of local issues, promoting public involvement and sense of community, and enhancement of City business activities through electronic commerce.

BUDGET/FINANCIAL IMPACT

Preliminary estimates for the City portion of the Municipal Fiber Optic Network to be $2 million required over the next five years. These funds could be considered in the context of preparation of the 10-year Capital Improvement Plan as part of the 2009 City budget process.

Attachment B - Connecting Community Partners – Ramsey County Library System

The Ramsey County Library System is comprised of seven branch libraries located in suburban Ramsey County; Roseville, Arden Hills, Mounds View, Shoreview, North St. Paul, Maplewood, and White Bear Lake.

> *Currently the branch library in Shoreview serves as the primary data distribution point for the Library system. Each of the other branch libraries connect back to the Shoreview Central Library to access internal database servers and to provide patron access to the Internet. With the increased demand and use of Internet access terminals at the branch libraries, providing sufficient bandwidth to these locations became increasingly difficult to sustain and afford. Leased data circuits (T1 data lines) that were sufficient 5 years ago could no longer provide the necessary bandwidth to support library operations.*

In 2005, City staff met with representatives from the Library to explore technology partnering opportunities. Identified was the need to improve connectivity between the branch libraries and to increase Internet bandwidth for library patrons. A relationship was forged to find a solution.
The first phase of the project was to utilize the existing Institutional Network (INET) to provide county-wide connectivity between the branch libraries. This required building a network connection between the local library building and the adjacent City Hall.

Shoreview
In a joint project with the City of Shoreview, a fiber optic connection was constructed between the Shoreview Library and Shoreview City Hall. This provided the Central Library access to the INET. With this new connection, the Library was now able to access a shared Internet connection at Roseville City Hall. This connection increased the Library's connection speed from 3Mb/s to 10 Mb/s, and reduced the City's operating expense for Internet access.

North St. Paul
In North St. Paul, the Library participated in a remodel of the North St. Paul Community Center to add a branch library within the building. This cooperative effort provided access to the INET through the City's existing connection, paving the way for the first high-speed connection between a branch library and the Central Library.
The partnership continues to create additional cost sharing opportunities and benefits to the community. The Library provides three managed Internet terminals at the Community Center, providing patron Internet access even when the Library is closed.

Maplewood
With the opening of the new Maplewood Library in 2007, the number of Internet terminals increased considerably, putting more pressure on the Library system for bandwidth between the branch library and Shoreview. The City of North St. Paul constructed a fiber optic connection between the North St. Paul branch location and the new Maplewood Library. The Library leases the connection from the City. This provides an ultra-high speed connection between these two libraries and aggregates access back to the Central Library.

Mounds View
Following on the success of the projects with the other cities, in 2007 Mounds View constructed fiber between their City Hall and the Mounds View branch library. Like with Maplewood, the Library leases

the fiber. By connecting to City Hall, the Library and the City share the INET connection that provides access back to the Shoreview Library.

White Bear Lake

In 2008 the same concept was applied to the White Bear Lake branch library; connect City Hall to the Library with fiber optic cable, creating a network cluster. The Library leases a portion of the fiber to connect to City Hall and utilizes White Bear Lake's INET to make a connection to the Maplewood-North St. Paul network cluster and to connect to the Central Library.

Roseville and Arden Hills

> *The branch libraries in Roseville and Arden Hills are currently on lower speed, leased data circuits. The proposed 2009 Joint Fiber Optic Project will connect the Roseville branch to Roseville City Hall to connect to the INET and subsequently to the Central Library in Shoreview.*

Summary

The concept was relatively simple. Create network clusters by interconnecting a library building with a City Hall (and any other nearby public buildings). This provided an immediate improvement for the Library by sharing existing City network resources.

The challenge ahead is to find the financial resources to construct fiber between the groups (clusters) of buildings. Absent access to fiber, creating network clusters has already provided the opportunity to reduce the cost of leased data services. A single leased, high-speed data connection can serve an entire cluster. Dozens of public facilities can be interconnected with just a handful of leased data circuits.

Attachment C - 2009 Project Summary

Hamline Corridor Fiber Optic Service Area

The Hamline Corridor Fiber Optic Service Area (FOSA) extends from Roseville City Hall westerly to Hamline Avenue and then south to the intersection of Garden Avenue and Hamline. The fiber optic service line will provide connectivity to facilities directly adjacent to Hamline Avenue. This service line is divided into two sections; Hamline Corridor North; and Hamline Corridor South. The pathway is segmented to provide cost sharing opportunities with the School District and Ramsey County Library.

Hamline Corridor North (See Map A)

This fiber segment along the Hamline Corridor FOSA terminates at the intersection of Commerce Street and Hamline Avenue. This primary segment will provide connectivity between Roseville City Hall, Roseville Area High School, and the Roseville Library. Each agency has an equal need for interconnecting these three primary facilities to share in services delivery and to provide opportunities for equipment collocation. The Library will serve as a secondary fiber connection point for city and school district facilities located south of Trunk highway 36. Utilizing the Library for this purpose minimizes the amount of fiber necessary to provide network redundancy in the event a fiber cut. The three agencies will share the cost of this segment.

This fiber segment will also connect to the existing County Road B2 backbone at the intersection of Hamline and County Road B2 to reach City facilities within the Dale Street Corridor Fiber Service Area. These facilities include Fire Station #3 and the Nature Center. This segment will also provide fiber connectivity to Cedarholm Golf Course.

Hamline Corridor South (See Map B)

This fiber segment continues from the Commerce Street cross-connect vault o Garden Avenue. This segment will provide connectivity between Falcon Heights Elementary and Roseville Area High School. This segment will be used by the City for future connections to a number of storm water and sewer lift stations in this section of the City. The School District and the City will share the cost of this segment.

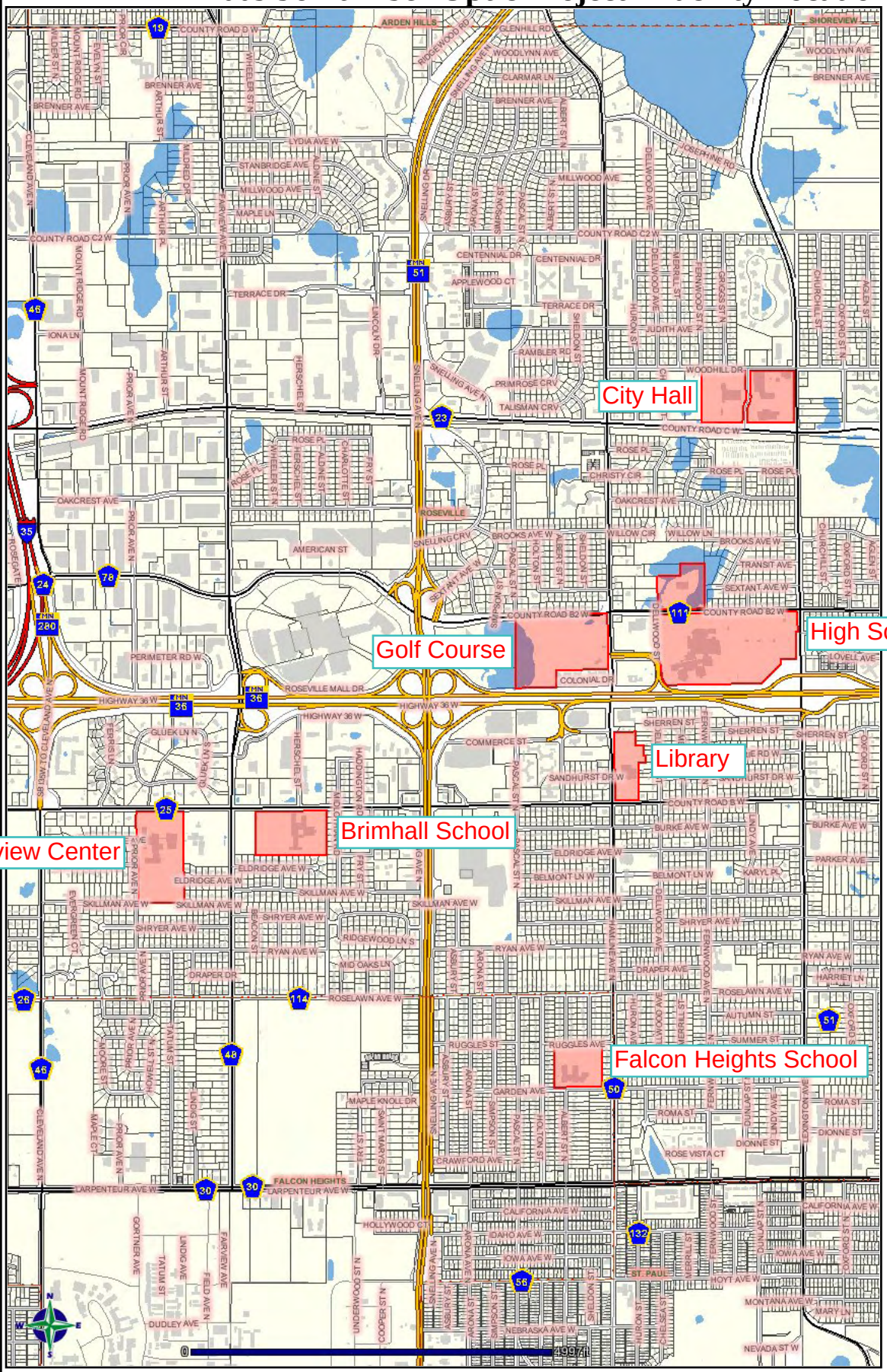
Commerce Street Fiber Optic Service Area (See Map C)

The Commerce Street Fiber Optic Trunk is a lateral extension of the Hamline Corridor that extends westerly from the intersection of Commerce/Hamline to Snelling Avenue, then southerly to County Road B, then westerly along County Road B to the Fairview Community Center. This fiber segment will provide connectivity to facilities adjacent to County Road B to include Brimhall Elementary and Fairview Community Center.

This segment will be used by the City for future extensions to a number of storm water and sewer lift stations located in the western portion of the City. The School District and the City will share the cost of this extension.

This trunk will also serve as the primary route for future connections to Lauderdale City Hall, Falcon Heights City Hall, and the University of Minnesota.

2009 Joint Fiber Optic Project - Facility Locations



DISCLAIMER: This map is neither a legally recorded map nor a survey and is not intended to be used as one. This map is a compilation of records, information and data located in various city, county, state and federal offices and other sources regarding the area shown, and is to be used for reference purposes only.
SOURCES: Ramsey County (March 30, 2009), The Lawrence Group;March 30, 2009 for County parcel and property records data; March 2009 for commercial and

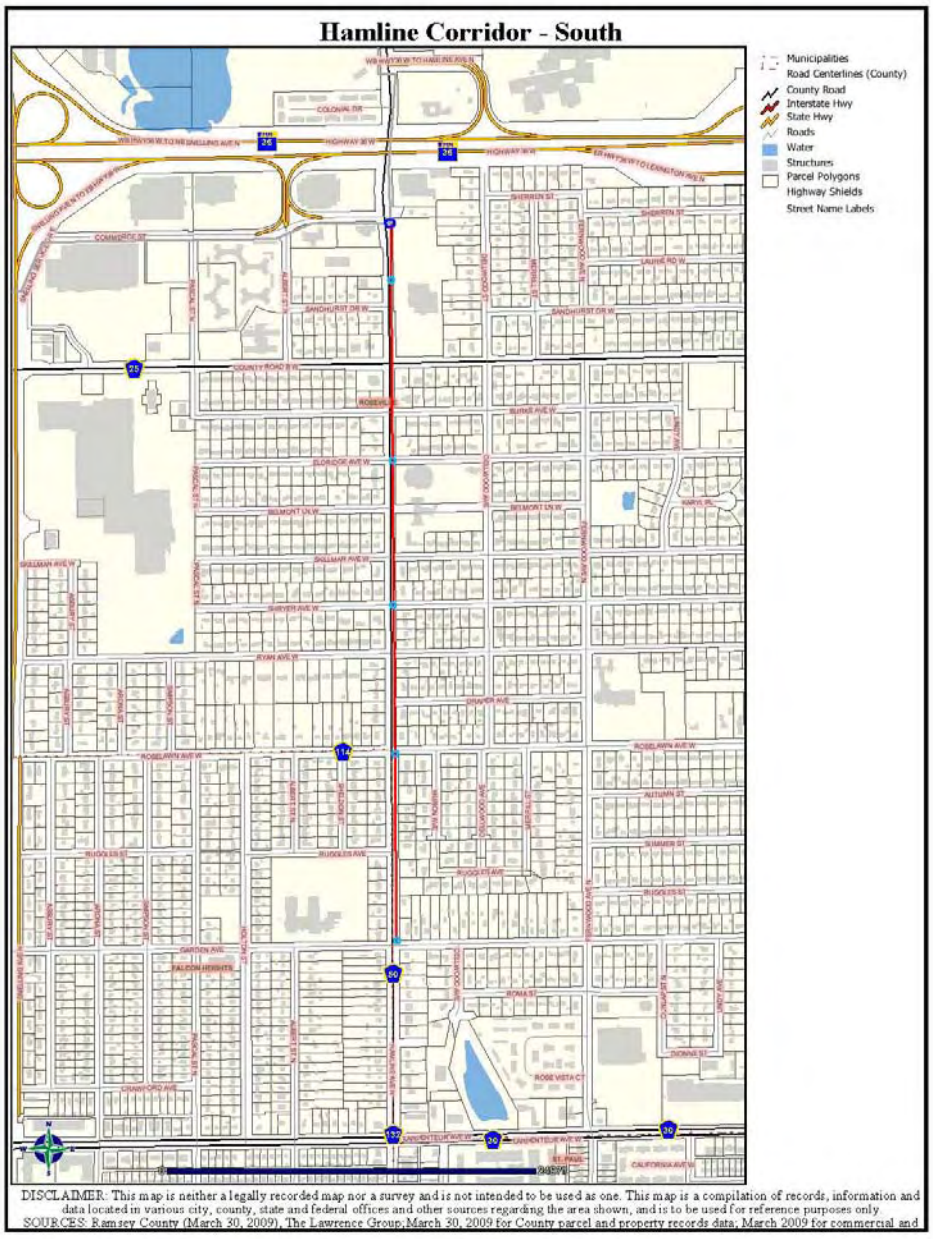
MAP A

Hamline Corridor North

Start Point: City Hall Vault – 2660 Civic Center Drive
End Point: Commerce Street Vault
Pathway Distance: 7,000 Feet
Vaults: 5
Fiber Optic Strands: 144

Estimated Cost of Construction: $112,000

MAP B

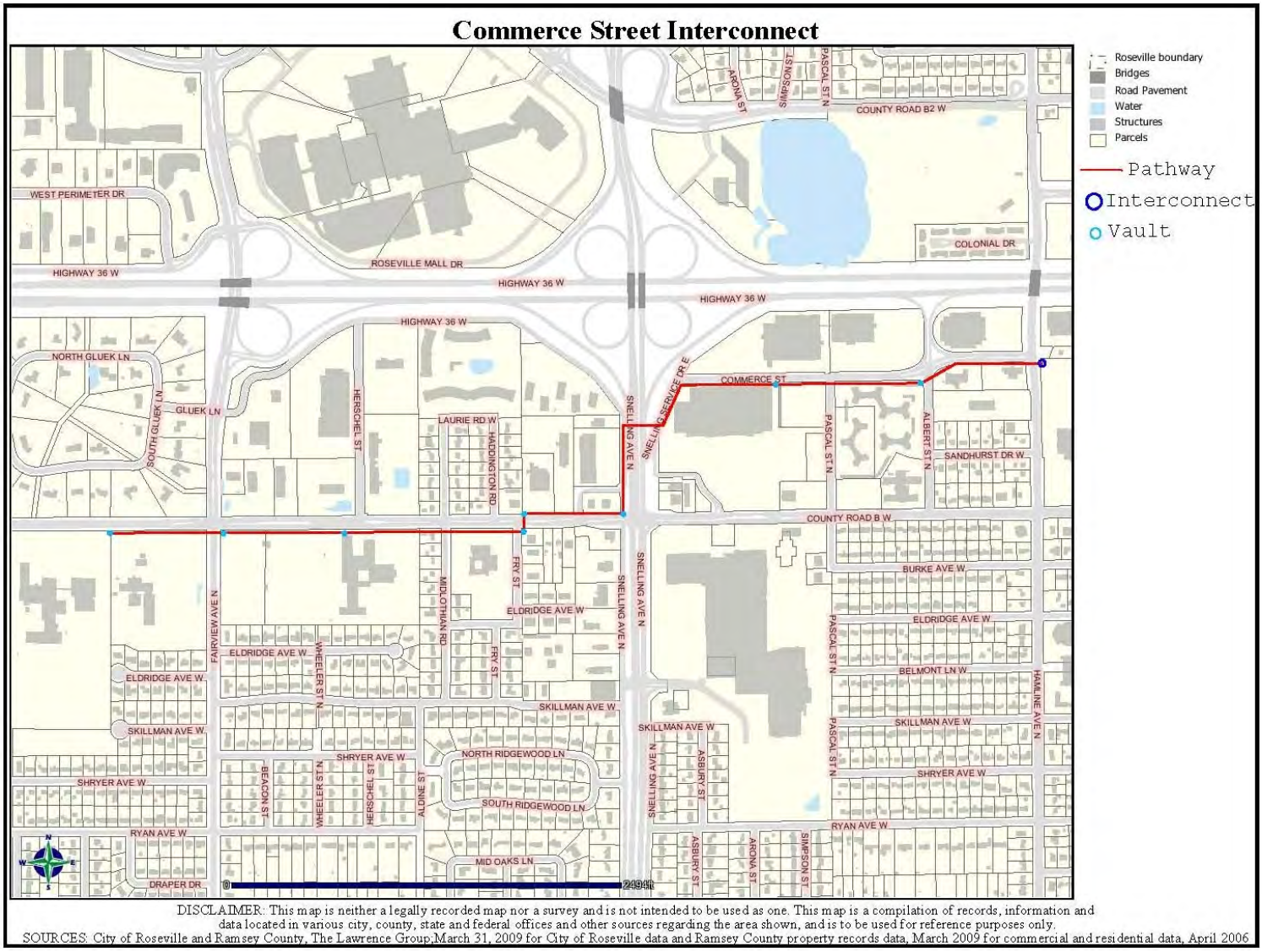


Hamline Corridor South

Start Point: Commerce Street Vault
End Point: Garden Avenue Vault
Pathway Distance: 4,850 Feet
Vaults: 5
Fiber Optic Strands: 144

Estimated Cost of Construction: $64,475

MAP C



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SOURCES: City of Roseville and Ramsey County, The Lawrence Group;March 31, 2009 for City of Roseville data and Ramsey County property records data, March 2009 for commercial and residential data, April 2006

Commerce Street Interconnect

Backbone Interconnect Point: Commerce Street / Hamline Avenue – Hamline Avenue Corridor
End Point (2009): Fairview Vault - 1910 County Road B
Pathway Distance: 6,600 Feet
Vaults: 8
Fiber Optic Strands: 144

Estimated Cost of Construction: $89,000

2009 Joint Fiber Optic Project - Financial Summary

Fiber Trunk

	Pathway (feet)	Cost/Foot	Est. Cost	Shares	
Hamline North	7,000	$ 16.00	$ 112,000	3	$ 37,333
Hamline South	4,850	$ 13.50	$ 65,475	2	$ 32,738
Commerce Interconnect	6,600	$ 13.50	$ 89,100	2	$ 44,550
	18,450				
			$ 266,575		

Fiber Backbone	City	$ 114,621	All Segments
	School	$ 114,621	All Segments
	Library	$ 37,333	Hamline North
		$ 266,575	

Summary		Pathway	Facility	Total	Agency Total
City	City Hall	$ 83,121	$ 12,000	$ 95,121	
	Cedarholm	$ 31,500	$ 3,850	$ 35,350	$ 130,471
School	RAHS	$ 37,333	$ 5,000	$ 42,333	
	Falcon Heights	$ 32,738	$ 9,925	$ 42,663	
	Brimhall	$ 22,275	$ 4,862	$ 27,137	
	Fairview	$ 22,275	$ 15,325	$ 37,600	$ 149,733
Library	Roseville	$ 37,333	$ 3,300	$ 40,633	$ 40,633
	Totals	$ 266,575	$ 54,262	$ 320,837	

Roseville City Hall

2660 Civic Center drive
Roseville, MN 55113

Primary Fiber Trunk: Hamline Corridor North

Connection Point: City Hall Vault

Estimated Costs

Facility Connection:

- Pathway – Building to City Hall Vault: 100 feet
- Pathway Cost ($20.00/foot): $2,000
- Fiber Count in Building: 96 strands
- Inside Termination (grounding, electrical, cabinet): $10,000
- Total Estimated Facility Cost: $ 12,000

Backbone Shared Cost:

- Fiber Count: 96 strands Hamline North, 96 strands Hamline South, 96 strands Commerce
- Pathway Cost : $ 83,121

Total Estimated Cost:	**$ 95,121**
Estimated Useful Life	20 Years
Annual Depreciation	$ 3,400
Annual Maintenance (Locates)	$ 3,600
Annual Depreciation (Equipment)	$ 10,000
Depreciated Annual Cost	**$ 21,756**

Leased Communication Line Options

Frame Relay (T1/DS1) (1.5MB)	$ 300/month	$ 3,600 Annual
Metro-Optical Ethernet (10 MB)	$ 1,530/month	$ 18,360 Annual
Metro-Optical Ethernet (100 MB)	$ 2,550/month	$ 30,600 Annual
***Metro-Optical Ethernet (1GB)**	**$11,560/month**	**$138,720 Annual**

***Comparable service in terms of technology and available bandwidth**

Cedarholm Golf Course

2395 Hamline Avenue
Roseville, MN 55113

Primary Fiber Trunk: Hamline Corridor North

Connection Point: Cedarholm Vault

Termination Point: Roseville City Hall

Estimated Costs

Facility Connection:

- Pathway – Building to Cedarholm Vault: 100 feet
- Pathway Cost ($13.50/foot): $1,350
- Fiber Count in Building: 12 strands (12 City Hall)
- Inside Termination (grounding, electrical, cabinet): $2,500
- Total Estimated Facility Cost: $ 3,850

Backbone Shared Cost:

- Fiber Count: 12 strands Hamline North
- Pathway Cost ($4.50/foot): $31,500

Total Estimated Cost:	**$ 35,350**
Estimated Useful Life	20 Years
Annual Depreciation	$ 1,767
Annual Maintenance (Locates)	$ 1,000
Annual Depreciation (Equipment)	$ 1,500
Depreciated Annual Cost	**$ 5,067**

Leased Communication Line Options

Frame Relay (T1/DS1) (1.5MB)	$ 300/month	$ 3,600 Annual
Metro-Optical Ethernet (10 MB)	$ 1,530/month	$ 18,360 Annual
Metro-Optical Ethernet (100 MB)	$ 2,550/month	$ 30,600 Annual
***Metro-Optical Ethernet (1GB)**	**$11,560/month**	**$138,720 Annual**

***Comparable service in terms of technology and available bandwidth**

Roseville Area High School

1261 Highway 36 W (approx. 1300 County Road B2)
Roseville, MN 55113

Primary Fiber Trunk: Hamline Corridor North

Connection Point: RAHS Vault

Termination Point: Roseville City Hall

Estimated Costs

Facility Connection:

- Pathway – Building to RAHS Vault: 300 feet
- Pathway Cost ($0/foot): $0 (Completed 2007)
- Fiber Count in Building: 48 strands (6 Fairview, 6 Brimhall, 6 Falcon Heights, 6 Library, 12 City Hall, 6 E.D. Williams, 6 open)
- Inside Termination (grounding, electrical, cabinet): $5,000
- Total Estimated Facility Cost: $ 5,000

Backbone Shared Cost:

- Fiber Count: 18 strands Hamline North
- Pathway Cost: $ 37,333

Total Estimated Cost:	**$ 42,333**
Estimated Useful Life	20 Years
Annual Depreciation	$ 2,100
Annual Maintenance (Locates)	$ 1,800
Annual Depreciation (Equipment)	$ 1,500
Depreciated Annual Cost	**$ 5,400**

Leased Communication Line Options

Frame Relay (T1/DS1) (1.5MB)	$ 300/month	$ 3,600 Annual
Metro-Optical Ethernet (10 MB)	$ 1,530/month	$ 18,360 Annual
Metro-Optical Ethernet (100 MB)	$ 2,550/month	$ 30,600 Annual
***Metro-Optical Ethernet (1GB)**	**$11,560/month**	**$138,720 Annual**

***Comparable service in terms of technology and available bandwidth**

Roseville Library

2180 Hamline Avenue
Roseville, MN 55113

Primary Fiber Trunk: Hamline Corridor North

Connection Point: Library Vault

Termination Point (s): Roseville City Hall
Roseville Area High School

Estimated Costs

Facility Connection:

- Pathway – Building to Library Vault: 100 feet
- Pathway Cost ($8/foot): $800 (conduit in place)
- Fiber Count in Building: 72 strands (6 High School, 24 City Hall, 6 Fairview, 6 Brimhall, 6 Falcon Heights, 24 open)
- Inside Termination (grounding, electrical, cabinet): $2,500
- Total Estimated Facility Cost: $ 3,300

Backbone Shared Cost:

- Fiber Count: 36 strands Hamline North
- Pathway Cost: $ 37,333

Total Infrastructure Cost:	**$ 40,633**
Estimated Useful Life	20 Years
Annual Depreciation	$ 2,031
Annual Maintenance (Locates)	$ 1,000
Annual Depreciation (Equipment)	$ 1,500
Estimated Annual Cost	**$ 4,531**

Leased Communication Line Options

Frame Relay (T1/DS1) (1.5MB)	$ 300/month	$ 3,600 Annual
Metro-Optical Ethernet (10 MB)	$ 1,530/month	$ 18,360 Annual
Metro-Optical Ethernet (100 MB)	$ 2,550/month	$ 30,600 Annual
***Metro-Optical Ethernet (1GB)**	**$11,560/month**	**$138,720 Annual**

***Comparable service in terms of technology and available bandwidth**

Falcon Heights Elementary School

1393 Garden Avenue
Falcon Heights, MN 55113

Primary Fiber Trunk: Hamline Corridor

Connection Point: Garden Avenue Vault

Termination Point(s): Roseville Area high School
Roseville Library

Estimated Costs

Facility Connection:

- Pathway – Building to Garden Avenue Vault: 550 feet
- Pathway Cost ($13.50/foot): $7,425
- Fiber Count in Building: 12 strands (6 High School, 6 Library)
- Inside Termination (grounding, electrical, cabinet): $2,500
- Total Estimated Facility Cost: $ 9,925

Backbone Shared Cost:

- Fiber Count: 12 strands Hamline South, 12 strands Hamline North
- Pathway Cost: $32,738

Total Estimated Cost:	$ 45,163
Estimated Useful Life	20 Years
Annual Depreciation	$ 2,300
Annual Maintenance (Locates)	$ 1,000
Annual Depreciation (Equipment)	$ 1,500
Depreciated Annual Cost	**$ 4,800**

Leased Communication Line Options

Frame Relay (T1/DS1) (1.5MB)	$ 300/month	$ 3,600 Annual
Metro-Optical Ethernet (10 MB)	$ 1,530/month	$ 18,360 Annual
Metro-Optical Ethernet (100 MB)	$ 2,550/month	$ 30,600 Annual
***Metro-Optical Ethernet (1GB)**	**$11,560/month**	**$138,720 Annual**

***Comparable service in terms of technology and available bandwidth**

Brimhall Elementary School

1744 County Road B
Roseville, MN 55113

Primary Fiber Trunk: Commerce Interconnect

Connection Point: Brimhall Vault

Termination Point(s): Roseville Area High School
Roseville Library
Fairview Community Center

Estimated Costs

Facility Connection:

- Pathway – Building to Brimhall Vault: 175 feet
- Pathway Cost ($13.50/foot): $2,362
- Fiber Count in Building: 24 strands (6 High School, 6 Fairview, 6 Library, 6 open)
- Inside Termination (grounding, electrical, cabinet): $2,500
- Total Estimated Facility Cost: $ 4,862

Backbone Shared Cost:

- Fiber Count: 18 strands Commerce, 12 strands Hamline North
- Pathway Cost: $ 22,275

Total Estimated Cost:	$ 27,137
Estimated Useful Life	20 Years
Annual Depreciation	$ 1,350
Annual Maintenance (Locates)	$ 2,000
Annual Depreciation (Equipment)	$ 1,500
Depreciated Annual Cost	**$ 4,850**

Leased Communication Line Options

Frame Relay (T1/DS1) (1.5MB)	$ 300/month	$ 3,600 Annual
Metro-Optical Ethernet (10 MB)	$ 1,530/month	$ 18,360 Annual
Metro-Optical Ethernet (100 MB)	$ 2,550/month	$ 30,600 Annual
***Metro-Optical Ethernet (1GB)**	**$11,560/month**	**$138,720 Annual**

***Comparable service in terms of technology and available bandwidth**

Fairview Community Center

1910 County Road B
Roseville, MN 55113

Primary Fiber Trunk: Commerce Interconnect

Connection Point: Fairview Vault

Termination Point(s): Roseville Area High School
Roseville Library
Roseville City Hall

Estimated Costs

Facility Connection:

- Pathway – Building to Fairview Vault: 950 feet
- Pathway Cost ($13.50/foot): $12,825
- Fiber Count in Building: 24 strands (6 High School, 6 Brimhall, 6 Library, 6 City Hall)
- Inside Termination (grounding, electrical, cabinet): $2,500
- Total Estimated Facility Cost: $ 15,325

Backbone Shared Cost:

- Fiber Count: 24 strands Commerce, 18 strands Hamline North
- Pathway Cost: $ 22,275 (requires completed construction to Brimhall)

Total Cost:	$ 37,600
Estimated Useful Life	20 Years
Annual Depreciation	$ 1,880
Annual Maintenance (Locates)	$ 2,000
Annual Depreciation (Equipment)	$ 1,500
Depreciated Annual Cost	**$ 5,380**

Leased Communication Line Options

Frame Relay (T1/DS1) (1.5MB)	$ 300/month	$ 3,600 Annual
Metro-Optical Ethernet (10 MB)	$ 1,530/month	$ 18,360 Annual
Metro-Optical Ethernet (100 MB)	$ 2,550/month	$ 30,600 Annual
***Metro-Optical Ethernet (1GB)**	**$11,560/month**	**$138,720 Annual**

***Comparable service in terms of technology and available bandwidth**