APEX
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International **PORT.**
International **PORTAL.**

NORTHEAST MINNESOTA.
NORTHWEST WISCONSIN.
POSITIONED FOR GROWTH.

AN EXCELLENT LOCATION FOR YOUR NEXT DATA CENTER

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AREA PARTNERSHIP FOR ECONOMIC EXPANSION

The Area Partnership for Economic Expansion (APEX) is the private-sector led business development engine for northeast Minnesota and northwest Wisconsin. Our investor-members represent some of the most influential companies in the region, with a collaborative approach to promoting sustainable economic growth.

The APEX mission is to leverage private sector resources to drive investment throughout the region. Our three-pronged focus involves the **retention and expansion** of businesses that are crucial to the local economy, while simultaneously working to **attract new businesses** that are compatible with the region's core strengths and capabilities. We prepare the compelling business case which cost justifies the decision to locate, expand or stay in the region.

This results-driven approach to business and economic development combines the right people, the right resources and the right attitude to help your business grow.

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APEX
306 West Superior Street, Suite 902
Duluth, Minnesota 55802

TF 877.431.3880
P 218.740.3667
F 218.740.3172

EXECUTIVE SUMMARY

Northeast MN and Northwest WI offer outstanding opportunities for growth and profitability. Our competitive advantages match the region's rich natural beauty and strategic site options.

• **Cost-competitive, Reliable Power**: Prices for electrical power in our region are among the most competitive in the nation. Local providers like Minnesota Power, an ALLETE Company, and Great River Energy specialize in meeting the needs of large power customers that operate 24 hours a day, 7 days a week.

• **Advanced Telecommunications:** Businesses in the region can count on global connectivity through numerous Network Access Points due to our robust infrastructure that includes fiber optics and a redundant SONET network.

• **Insulation from Natural Disasters:** The region has none of the catastrophic weather or seismological activity that might otherwise threaten to disrupt business. The region is free of earthquakes, hurricanes and tornadoes. An average annual temperature of approximately 39°F keeps cooling costs low resulting in over 7,000 hours of free cooling.

• **Productive, Loyal Workforce:** Absenteeism is low, wage rates are competitive, and local employers and state agencies report annual turnover rates of less than 2%. Compared to the United States, on average, the median technology worker wage is 20% less in Duluth.

• **Ability to Recruit and Retain Qualified Employees:** Our attractive urban communities are surrounded by world-renowned natural amenities, helping our region ensure your ability to recruit and retain talented and creative employees from around the globe. Duluth has been ranked North America's #1 "Adventure Hub" and runner-up "Best Adventure Hub in the World" by Outside Magazine.

• **Outstanding Academic Institutions:** The region is home to 13 post-secondary academic institutions, including the University of Minnesota Duluth, the College of St. Scholastica, the University of Wisconsin Superior, Lake Superior College, and the Wisconsin Indianhead Technical College. These five schools are all located within five miles of downtown Duluth/Superior and have a combined annual enrollment of roughly 23,000 students, including professionals in technology-based courses and MBA programs offered at both the UMD Labovitz School of Business and the College of St. Scholastica.

• **Access to Major Metropolitan Areas:** Duluth is an easy two-hour commute from the Twin Cities via the well maintained I-35 corridor, and the Duluth International Airport offers round-trip scheduled service to 5 major hubs: Chicago, Detroit, Minneapolis, Orlando and Las Vegas. And, as a Port of Call, Duluth has an international flair and offers small ship cruise service to major Great Lakes cities.

COMPETITIVE EDGE

Position your next Data Center on the competitive edge of the Great Lakes; partner with APEX to enhance your organization's success.

• **World-class Amenities:** Two leading-edge hospital systems, a variety of arts and entertainment offerings, a low cost-of-living and some of the shortest commutes in the nation allow the citizens of the region to enjoy an unparalleled quality of life.

REGIONAL OVERVIEW

The Duluth-Superior Metropolitan Statistical Area (MSA) has a combined population of about 274,000,and represents the economic heart of northeast Minnesota's Arrowhead Region. Located between the Canadian border and Minneapolis-St. Paul, this region serves as a shipping, commercial and manufacturing epicenter. The Port of Duluth-Superior has a unique status as the international seaport on the southwestern tip of Lake Superior providing access to the shipping lanes of the world via the St. Lawrence Seaway.

Natural resource-based industries such as iron and timber remain active components of the regional economy, however, the area has also benefited from significant growth among a cluster of employers in the manufacturing, metal fabrication, clean energy technology, aerospace, telecommunications, education and healthcare sectors.

The region is home to an educated and highly motivated workforce with strong productivity ratings. Approximately 92% of the population age 25 and older are high school graduates and 33% have post-secondary degrees.

The Duluth-Superior MSA also serves as a major tourist destination, making tourism one of the region's most vibrant economic sectors. Recently, millions of dollars in infrastructure improvements were invested in local attractions, including Canal Park, the Great Lakes Aquarium, Duluth Entertainment and Convention Center and the Amsoil Arena. The region is the gateway to the great outdoors and the beautiful lake country of the north including the scenic north shore of Lake Superior, the idyllic treasures of the Boundary Waters Canoe Area Wilderness and the Apostle Islands. These treasures draw visitors from around the world.

Additional highlights include an international airport, strategically located along major great circle routes from Asia and Europe; a top-rated convention center; two world-class healthcare systems; outstanding cultural and recreational amenities; and a wide variety of first-rate historic and tourist attractions.

Economic opportunities abound in northeast Minnesota and northwest Wisconsin. There is an estimated regional total of $9 billion in annual consumer spending and a planned expenditure of approximately $5 billion in new major capital investments under consideration by industries and organizations across the region.

Key Industries

We benefit from a diverse economy with an effective balance of traditional and emerging industry clusters including:

- *IT/Data Centers*
- *Next Generation Forest Products*
- *Clean Energy & Biofuels*
- *Healthcare/Biotech*
- *Mining & Metallurgy*
- *Precision Machining & Manufacturing*
- *Heavy Fabrication, Castings & Steel Production*
- *Aerospace/Aviation Manufacturing*
- *Education/R&D*
- *Call Centers/Back Office*
- *Tourism & Hospitality*

Leading Private Sector Employers

Employer	Primary	FTEs	Primary Line of Business
ESSENTIA HEALTH*	Duluth	5341	Offices of Physicians, General Medical & Surgical Hospitals
ST. LUKE'S*	Duluth	1602	Offices of Physicians - General Medical & Surgical Hospitals
ALLETE*	Duluth	1419	Electric Power Generation, Transmission, & Distribution
UNITED HEALTHCARE	Duluth	1368	Health Care Management
MINNESOTA TACONITE (USS)	Mountain Iron	1500	Metal Ore Mining
BLACK BEAR CASINO RESORT & GOLF COURSE	Carlton	907	Gambling Industries
FOND DU LAC RESERVATION	Cloquet	879	Executive, Legislative, & other General Government Support
BOISE WHITE PAPER	Int. Falls	830	Pulp Mills
BENEDICTINE HEALTH SYSTEM	Duluth	829	Ambulatory Health Care Services
FAIRVIEW UNIVERSITY MEDICAL CENTER - MESABI	Hibbing	786	General Medical & Surgical Hospitals
GREAT LAKES TRANSPORTATION	Duluth	776	Great Lakes Water Transportation
SAPPI FINE PAPER NORTH AMERICA	Cloquet	720	Pulp, Paper and Paperboard Mills
HIBBING TACONITE	Hibbing	720	Metal Ore Mining
ENBRIDGE ENERGY	Superior	652	Crude Oil Transportation
ACCESSNORTH	Hibbing	590	Community Care Facilities for the Elderly
CIRRUS AIRCRAFT	Duluth	565	Aerospace Product and Parts Manufacturing
INTEGRITY HEALTH NETWORK	Duluth	525	Offices of Physicians
NORTHSHORE MINING	Silver Bay	514	Metal Ore Mining
UNITED TACONITE	Eveleth	502	Metal Ore Mining
UPM/BLANDIN PAPER COMPANY	Grand Rapids	500	Pulp, Paper and Paperboard Mills
GRAND ITASCA CLINIC & HOSPITAL	Grand Rapids	488	General Medical & Surgical Hospitals
CN	Proctor	472	Rail Transportation
VIRGINIA REGIONAL MEDICAL CENTER	Virginia	443	General Medical & Surgical Hospitals
DELTA AIR LINES RESERVATION CENTER	Chisholm	426	Travel Arrangement and Reservation Services

Source: Northland Connection (http://www.northlandconnection.com)
* APEX Member Businesses

ELECTRIC UTILITY RATES AMONG THE LOWEST 10% IN THE NATION

Minnesota Power, an ALLETE Company, and Great River Energy and their coorperative members provide cost-competitive, reliable power for customers in northeast Minnesota, as well as northwest Wisconsin. The companies specialize in meeting the needs of some of the nation's largest energy users, such as data centers, mining and paper making operations. Customer rates for individual businesses vary depending on load, demand, and the type of service required. Both companies provide customer specific rate design, energy management services and incentives for qualifying high load factor projects.

Electric utility price comparisons for residential and commercial customers are as follows:

Average Retail Price of Electricity (cents per KWh), June 2011 and 2012

State	Residential		Commercial		All Sectors	
	Jun-12	Jun-11	Jun-12	Jun-11	Jun-12	Jun-11
MINNESOTA POWER	9.05	9.73	8.03	8.41	5.97	6.18
MINNESOTA	10.89	10.86	8.32	8.41	8.09	8.13
CALIFORNIA	15.82	15.71	14.05	14.44	13.85	14.28
DIST. OF COLUMBIA	12.73	13.97	13.43	14.72	13.20	14.45
FLORIDA	11.29	11.11	9.30	9.09	10.29	10.23
IOWA	10.60	10.42	7.88	7.82	7.32	7.32
KANSAS	10.45	9.80	8.18	7.85	8.75	8.23
MICHIGAN	13.81	13.09	10.94	10.35	11.17	10.30
MISSOURI	9.84	8.98	7.54	7.26	7.93	7.48
NEW YORK	17.83	18.77	16.85	17.56	15.91	16.84
N. CAROLINA	9.95	9.48	7.86	7.43	8.23	7.96
OHIO	11.94	11.48	11.04	9.99	9.56	9.12
TEXAS	9.47	8.67	7.70	6.54	7.12	6.44
WISCONSIN	13.27	12.97	10.47	10.21	10.34	10.10
U.S. TOTAL	12.18	12.07	10.27	10.19	10.11	10.11

Source: Edison Electric Institute – Summer 2011 and 2012

(See Appendix I for further information.)

COMMUNICATION INFRASTRUCTURE

Minnesota - Fiber Network

Northeast MN and northwest WI are connected to both the National and Global Networks and Internet Network Access Points (NAPs). Enventis and Qwest provide dedicated access to fiber optics at specific locations, at a service level of T1 through OCX. Ten additional companies provide high speed internet access and wide area connectivity. These providers are linked to the Chicago Network Access Point, the largest internet exchange point by volume. Some of the region's fiber networks are overlaid with DWDM and can provide 2.5Gb or 10Gb Wavelength services, or 1Gb/10Gb Ethernet connections to Midwest carrier hubs. These networks are route diverse, highly reliable, and based on SONET technology. When conducting business with these organizations, customers will have access to the following services:

- *Dark Fiber*
- *T1, DS3, OC3, OC12, OC48, OC-192 Private Line Services*
- *10 baseT, 100 baseT, GigE, 2.5 Gb,10Gb Ethernet Services*
- *2.5 Gb, 10 Gb Wavelength Services over DWDM*
- *MPLS, VPLS, ATM multi-point or point to point Services*
- *Access to multiple Tier 1 IP backbone providers and NAPs*
- *Dedicated Access to Carrier Hotels, Virtual POPS, and numerous Data Centers in the upper Midwest*

(See Appendix III regarding latency.)

Wisconsin - Fiber Network

network overview

- **Wisconsin Independent Network, LLC (WIN)** is a full service provider of wholesale transport solutions and next generation IP solutions. Started in 1999, **WIN** is a privately-held company owned by 31 independent local telephone companies.

WIN owns and operates the largest Wisconsin-based fiber optic transport network.

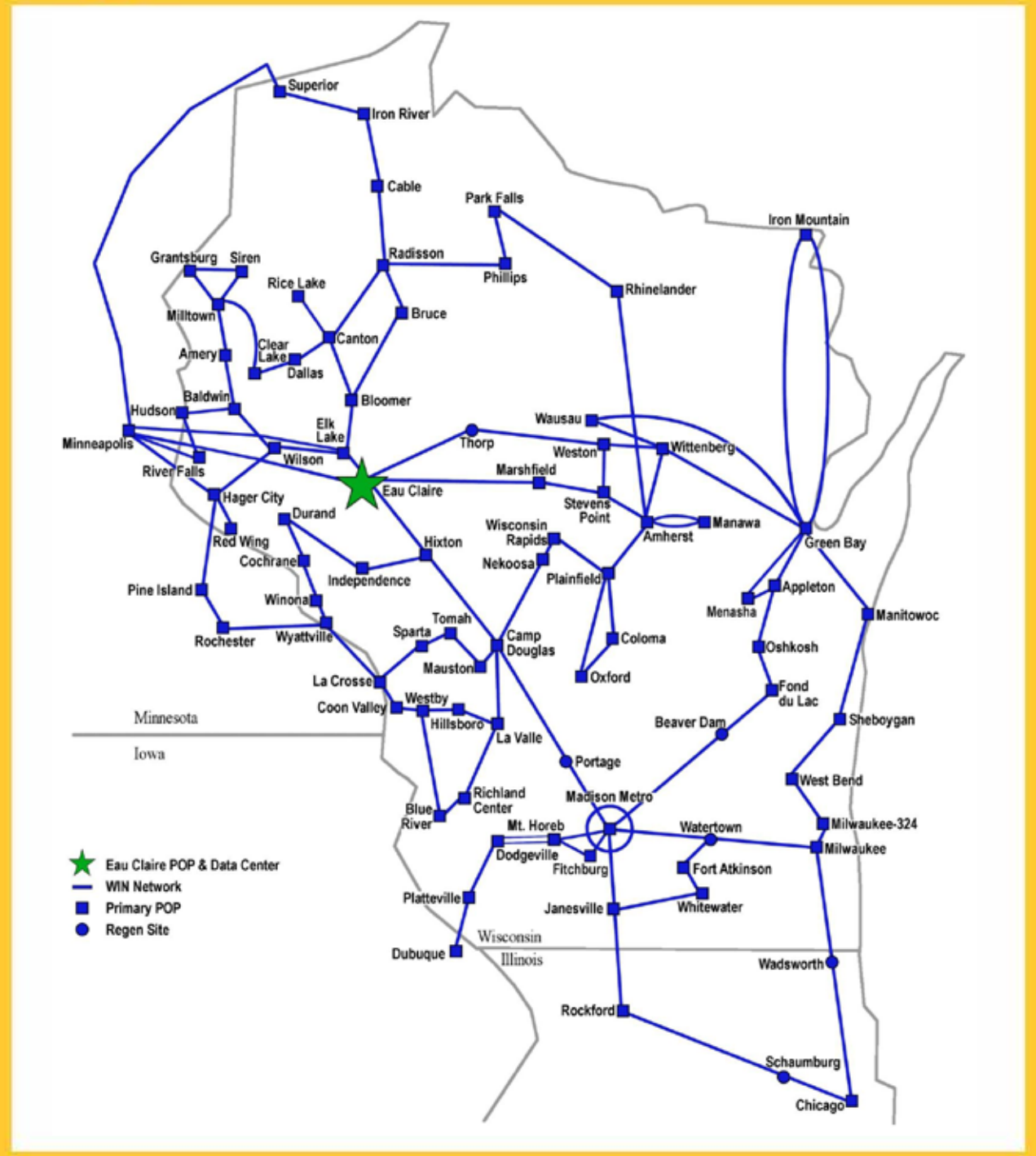
WIN has become the premier network provider in Wisconsin, Eastern Minnesota, and Northern Illinois by providing responsive customer service supporting the most reliable, dense, and redundant transport system in the Upper Midwest region.

- **WIN** operates over 3,500 miles of fiber network, connecting cities in 4 states through more than 80 Points of Presence, from large metro areas to smaller rural communities, on its reliable transport system.
- **WIN**'s network utilizes a combination of DWDM, SONET and Ethernet technologies to deliver bandwidth on 100% fiber optic facilities using primarily Cisco, Cyan, and Net Insight optics and electronics.
- **WIN** provides:
  - Private Line: DS1, DS3, OCn
  - Carrier Ethernet: 5 Mbps to 10 Gbps
  - MPLS Transport
  - Wavelengths: 2.5Gbps and 10Gbps
  - Ability to coordinate and bill local loops
  - Next generation network solutions
  - Custom builds/interconnections
  - Engineering and technical services
  - Data Center services
- **WIN**'s network availability: **99.999%.** We will meet your network latency requirements and standards.
- **WIN**'s wide range of customers trust their traffic to our state-of-the-art network. Many are telecommunication providers themselves, including a large number of wireless service providers, regional and national carriers, in-dependent telephone companies, IP-TV video signal providers, government and education network providers, and major CLECS.
- **WIN** has:
  - Dedicated/Experienced teams: Provisioning, Account Support, Operations, Engineering
  - Proactive network monitoring and management from our 24x7x365 Network Management Center.
  - Over 100 highly trained technicians from member-owner independent telephone companies taking care of your valued services.
- **WIN**'s staff takes pride in offering reliable and dependable customer solutions and is focused on our **"we can get you there"** approach in achieving a high level of customer satisfaction.
- **WIN**'s customers will attest: **WIN** will meet and often exceed your expectations for service delivery, provisioning, and reliability.

we can get you there™

800 Wisconsin St., Bldg. D2, Suite 219
Eau Claire, WI 54703-3612
877-946-6300
info@wins.net – www.wins.net

network map



we can get you there™

ENVIRONMENTAL STABILITY

Companies considering expanding or locating in the area often inquire about the weather in northeast Minnesota and northwest Wisconsin. We do have pronounced winters, complete with cold temperatures and snowfall, but most people who live and work here view seasonal changes as a benefit. With four distinct seasons, the changing climate offers residents a welcomed variety, not to mention splendid natural beauty.

Unlike other parts of the country, the region has no catastrophic weather or seismological events (hurricanes, tornadoes, earthquakes, etc.) that might otherwise disrupt business for an extended period of time. Our annual snowfall is taken in stride and has a limited impact on business, commerce and transportation. In 2011-2012 Bert Sperling's Best Places ranked our region 10th "Safest Metro Areas to Live and Avoid Natural Disasters" among all medium-sized MSAs.

Over **7,000** hours of free cooling annually *

Seismic Zone Classification: *0*

Maximum Wind Speed Criteria:
Minnesota has a 90 mph maximum wind speed.

Maximum Snow Load Design:
Minnesota has a 42 lb maximum snow load design for roofs.

Average Annual Temp: *39°F*

Average Annual High Temp: *48°F*

Average Annual Low Temp: *29°F*

Cloudy Days: *184.7*

Annual Precipitation:
31" rain and 83.1" snow

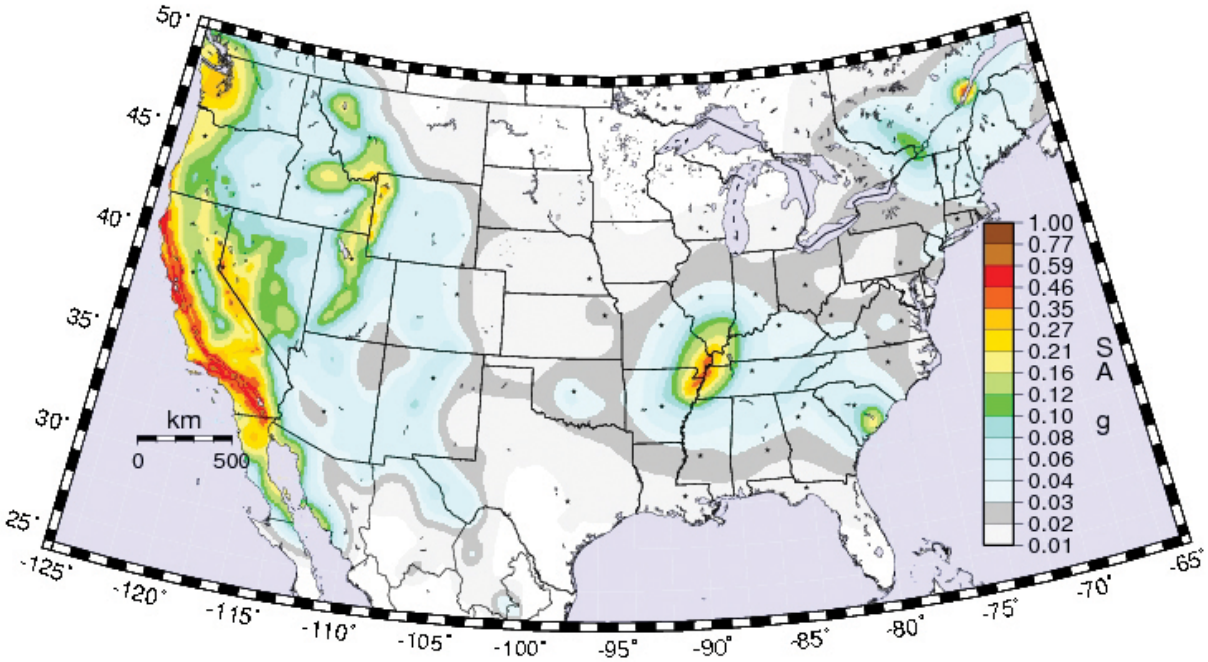
Thunderstorms:
33.3/year (1-2 severe)

Tornadoes: 0

Hurricanes: 0

Earthquakes: 0

*Sources: cooling.thegreengrid.org and Involta's water-side economization calculation.



PGA with 10% in 50 year PE. BC rock. 2008 USGS

STRATEGICALLY LOCATED SITE OPTIONS

Northeast MN and northwest WI boast strategically located site options with competitively-priced utilities and an advanced telecommunications infrastructure. These site options have access to the resources needed to ensure the long-term success of your business.

Property	Lake County	Arrowhead Crossing	Iron River Business Park
LOCATION	Two Harbors, MN	Duluth, MN	Iron River, WI
MILES FROM DULUTH	20	0	43
AVAILABLE ACRES	120	54.2	50
OWNERSHIP	Lake County	Private LLP	Bayfield Electric
FOR SALE OR LEASE	Sale	Lease or Sale	Sale
FEATURES	Septic/Well	City Sewer/Water on the street	City Sewer/Water
REDUNDANT POWER	Cooperative Light & Power new 10MW redundant feeder expansions from Waldo Substation and Clover Valley Substation	Minnesota Power 34 kV redundancy is available	Dahlberg Light and Power 3 phase 12.4 KV across Hwy 2 and Bayfield Electric 15 KV available to all lots in the park
REDUNDANT FIBER, NEAR NET	Lake County (DBA Lake Connections) fiber ring access at Ives Road	Paul Bunyan Communications fiber ring access at US53 & Haines Rd and US53 & Swan Lake Road	Norvado Fiber ring access in the park
REDUNDANT DARK FIBER, NEAR NET	Yes	Yes	Yes

LABOR MARKET AND WORKFORCE

The City of Duluth is part of the much larger Duluth Metropolitan Statistical Area. The MSA is comprised of St. Louis County (which includes Duluth), Carlton County (which includes Cloquet), and Douglas County, Wisconsin (which includes Superior.)

- Duluth's 2012 labor force reached 45,597.
- The Duluth MSA 2012 annual average labor force population was 144,227.
- The unemployment rate in Duluth was 6.3% on average in 2012, compared to 6.5% in the MSA, 5.6% in Minnesota, and 8.1% in the U.S.
- The median wage in the Duluth MSA in 2012 was $16.02/hour compared to $17.94/hour for the state and $16.95/hour for the U.S
- Low turnover rate of less than 2%

In 2012, the Area Development magazine ranked Duluth **6th** in America's top 25 mid-sized cities that are **prime for workforce growth!**

The region's workforce is well qualified and highly skilled with competitively positioned wage and benefit rates. Combined, these factors create an atmosphere that promotes a highly successful business climate.

Labor analysts predict that workforce challenges will increase nationwide over the next decade, as the baby boomer generation nears the age of retirement. In working to address these challenges, businesses in the region have a wealth of resources at their fingertips, including training and development grants, internship programs at the local colleges, community-based workforce development programs, and more.

LABOR MARKET STATISTICS

Area	Labor Force 2012 Annual Average	Unemployment Rate Annual Average 2012	Median Wage
CITY OF DULUTH	45,597	6.3%	NA
DULUTH MSA	144,221	6.8%	$16.02
NE MN REGION	169,259	6.9%	$15.91
MINNESOTA	2,969,366	5.6%	$17.94
U.S.	154,974,583	8.1%	$16.95

HIGH PRODUCTIVITY, LOW TURNOVER

The northeast MN and northwest WI workforce has an outstanding work ethic. Absenteeism is minimal and the work ethic is strong, resulting in higher productivity and an improved bottom line.

A recent survey of employee attitudes, conducted by the Bureau of Business and Economic Research at the UMD School of Business and Economics, quantified the quality of the region's work ethic by comparing worker attitudes in northeast Minnesota with those of workers statewide:

To the statement, "Wasting time is as bad as wasting money," 84.4% of the workers in northeast Minnesota agreed, versus 78% statewide. In answer to the statement, "A good indication of a man or woman's worth is how well they do their job," 84% of the northeast Minnesota workers polled agreed, compared to 77% statewide.

> In response to the statement, "Hard work makes a man or woman a better person," 93% of participants from northeast Minnesota agreed.

COMPETITIVE WAGE RATES: COMPARISONS

Compared to the United States, on average, the median technology worker wage is **20% less in Duluth**.

Your company will realize an average **savings of over 38%** hiring Computer Systems Analysts in Duluth compared to the US as a whole.

Location	Computer and Information Systems Managers	All Computer and Mathematical Occupations	Computer Systems Analysts	Computer Software Developers, Applications	Network and Computer Systems Administrators	Computer Support Specialists	Information Security Analysts, Web Developers, Computer Network Architects
Duluth, MN	42.12	27.12	23.28	33.96	26.33	23.70	28.39
Minneapolis - St. Paul - Bloomington, MN	55.19	36.24	36.31	43.29	34.03	24.44	38.91
Rochester, MN	67.28	39.44	41.86	42.66	31.20	21.63	51.72
St. Cloud, MN	47.70	27.06	32.02	35.60	27.64	21.02	30.83
Fargo, ND	42.07	25.10	25.72	30.61	28.66	18.19	26.52
Eau Claire, WI	43.72	27.62	27.98	31.87	18.79	23.49	28.45
Madison, WI	45.32	32.31	33.50	37.51	30.89	24.79	35.02
Milwaukee, WI	52.40	33.16	36.96	37.24	33.22	22.60	32.51
Des Moines, IA	53.65	33.21	36.42	37.20	31.82	21.61	33.90
Iowa City, IA	44.12	29.38	36.42	31.43	31.87	23.49	33.92
Chicago - Joliet - Naperville, IL - IN - WI	52.85	36.15	33.80	43.42	34.88	24.59	37.55
Austin - Round Rock - San Marcos, TX	60.85	38.28	37.45	44.53	32.14	24.29	40.86

SOURCE: BUREAU OF LABOR STATISTICS, OCCUPATIONAL EMPLOYMENT STATISTICS, 2011 ESTIMATES.

(See Appendix II for further information.)

ANNUAL DEGREES CONFERRED

Business, Management and Marketing; and Computer and Information Sciences (combined)

UNIVERSITY OF MINNESOTA-DULUTH	Bachelor's	2000
	Master's	195
COLLEGE OF SAINT SCHOLASTICA	Bachelor's	763
	Master's	240
UNIVERSITY OF WISCONSIN-SUPERIOR	Bachelor's	490
	Master's	67
LAKE SUPERIOR COLLEGE	Certificate	613
	Associate's	724
WITC*	Certificate	1271
	Associate's	439

Source: U.S. Dept. of Education Institute of Education Sciences
* Includes entire WITC System of 6 campuses.

EDUCATION AND TRAINING

The key to the region's quality workforce is its wealth of highly educated, competent and motivated people who are eager to put their skills to work.

The labor pool is fed by several outstanding public schools and higher educational facilities, including two universities, one private college, and ten community and technical colleges. In addition, a number of specialized vocational schools also support the region's high educational standards.

There are **5** colleges and universities located within five miles of downtown Duluth, boasting a combined annual enrollment of some **23,000** students

At present, 92.8% of young adults in the Duluth region, age 25 and older, are high school graduates. This compares to a national figure of 85.9%. In addition, 28.3% of young adults in the Duluth region, age 25 or older, have achieved a baccalaureate degree or higher.

With a well-educated, dependable workforce, businesses in the region benefit from eased training initiatives, higher productivity ratings, and an improved bottom line.

ACADEMIC INSTITUTIONS

University of Minnesota Duluth

The University of Minnesota Duluth (UMD) is a comprehensive regional university, affiliated with the University of Minnesota system based in the Twin Cities. The University of Minnesota is recognized as a National Center of Academic Excellence in Information Assurance Education, and UMD ranks consistently among the top Midwestern regional universities in U.S. News and World Report's "America's Best Colleges" issue. Providing an alternative to both larger university campuses and small liberal arts colleges, UMD attracts students in search of a personalized learning experience on the medium-sized campus of a major university.

The UMD campus recently invested in new, state-of-the-art buildings to house the University's science, engineering, medical, and business schools. The UMD Labovitz School of Business and Economics offers a competitive MBA program that caters to working professionals, and undergraduate students at UMD can choose from 12 bachelor degrees in more than 75 majors.

College of St. Scholastica

The College of St. Scholastica (CSS) is the only independent private college based in northeast Minnesota and is guided by the Benedictine values of community, hospitality, respect, stewardship and love of learning. St. Scholastica currently educates roughly 2,800 men and women each year.

The College of St. Scholastica's MBA program focuses on individual students by providing courses, experiences and coaching that improves their technical business skills and personal capacity. Understanding of organizations in a global environment is fundamental to the program. Through the CSS coaching lab, each student is partnered with a coach from the academic or professional community to assist the student in getting the most out of their MBA experience and beyond. The CSS MBA program offers students the opportunity to specialize their studies within a business field, or customize their own general management program. There is also the option to earn a dual degree: the MBA and the Master of Arts in Management (MAM).

CSS also offers graduate and undergraduate degrees in Computer Information Systems (CIS), along with 6 graduate CIS certificates that can be completed in a year. These certificates are in IT Leadership, IT Project Management, Enterprise Systems, IT Security, Software Engineering, and Internet and Wireless Technologies. They are designed for students who want specialized education without the commitment of a full master's degree program.

University of Wisconsin Superior (UW-Superior)

The University of Wisconsin Superior offers 30 undergraduate majors including accounting, teacher education, and biology, along with innovative programs in the fields of legal studies, art therapy, and transportation and logistics management.
As a Wisconsin Public Liberal Arts College, the University of Wisconsin-Superior fosters intellectual growth among students, preparing them for careers that exist today and for those that will be created in the future. Since its founding in 1893, UW-Superior has developed an atmosphere that emphasizes individual attention for each student and a respect for all cultures.

Lake Superior College

Lake Superior College (LSC) is a public, two-year college that offers a wide-range of programs including Electronic Technology, Information Technology - Network, Integrated Manufacturing Technology and Business Administration. LSC continues as an area leader in higher education, delivering excellent instruction, innovative programming and dedicated service, all within an engaging, comfortable environment. Current enrollment has reached a level of 5,000 students.

Wisconsin Indianhead and Technical College

Wisconsin Indianhead Technical College (WITC) has a history of providing customized training and certificate programs that cater to the specific needs of area businesses and industries. With six campus and branch locations situated throughout northwestern Wisconsin, WITC uses state-of-the-art technology to connect students and faculty with a world of resources and course material. WITC awards an average of 24 Associate's Degrees in the area of Computer and Information Sciences and Support Services each year, in addition to 148 Associate's Degrees in the area of Business, Management and Marketing.

Bethel University

The Bethel University Graduate School in St. Paul offers professionals in northeast Minnesota leadership and management courses which culminate in the completion of an MBA degree. Courses are six weeks in length on average and meet only one night a week in a face-to-face and online hybrid format or in a fully online format. Bethel's MBA instructors are business leaders who bring cutting edge experience and respected credentials to the program. They use personal examples from their professional lives to bring relevance to the course work. Course schedules are known in advance so you can plan your personal and professional commitments and avoid surprises as you work towards the completion of your MBA degree.

Duluth Business University

Duluth Business University is a private, for-profit two-year college located in West Duluth, offering Associate's degrees in the areas of Business, Management and Marketing; Visual and Performing Arts; and Health Professions and Related Clinical Sciences. The college has an annual enrollment rate of 436 students.

TRANSPORTATION

Northeast Minnesota and northwest Wisconsin have developed a multi-modal transportation network that works to the advantage of area businesses. In fact, Expansion Management magazine determined that the Duluth-Superior area represents one of "the most logistics-friendly metros in the country."

By Air The Duluth International Airport, the region's largest airport, including a 24-hour U.S. Customs and FAA control tower, a Category II Instrument Approach and two runways, including the second longest runway in Minnesota at 10,152 feet.

With three major carriers, Delta Airlines, United Airlines, and Allegiant Air, our Region's travelers have more options than ever before with connections to hundreds of domestic and international destinations. Delta offers daily flights to Minneapolis/Saint Paul and Detroit along with United providing daily service to Chicago O'Hare. Allegiant Air offers weekly flights to Las Vegas, Phoenix-Mesa and seasonal service to Orlando-Sanford. It's also home to the 148th Fighter Wing, AAR CORP, Cirrus Aircraft, Northstar Aerospace, Monaco Air Duluth and Lake Superior College's Minnesota Center for Advanced Aviation.

"Duluth International Airport is a key asset for economic development in the region by supporting over 4400 aviation related jobs and generating **$1.3 billion in annual economic impact**."

By Land Interstate 35 is the region's link to the rest of the country via the Interstate Highway System. Access to the interstate is less than ten minutes away from the Duluth International Airport, and the Minneapolis/St. Paul Metro Area is an easy two-hour commute from downtown Duluth. Away from the Port, an extensive network of rail and highway systems provides efficient delivery and distribution of in- and outbound cargo. With over 43 trucking companies and four Class 1 national railways serving the region (Burlington Northern Santa Fe, Canadian National, Canadian Pacific and Union Pacific), your business will be well positioned to compete in the global marketplace.

By Sea Northeast MN and northwest WI offer easy access to the Port of Duluth-Superior, situated at the western terminus of the Great Lakes' St. Lawrence Seaway, an independent shipping system that connects the region to the East Coast, the Atlantic Ocean and world markets beyond. Located just two weeks' sailing time from European markets, the Duluth Seaway Port Authority and its affiliates specialize in handling bulk commodities and oversized/heavy-lift cargo loads.

TAXATION

Minnesota had the **10th lowest effective tax rates on new capital investment**, according to a 2011 report by Ernst & Young an the Council on State Taxation. The report shows that a state's tax competitiveness needs to be based on the entire system of state and local business taxes, not just a single tax rate.

Minnesota's **overall effective tax rate** on investments in new or expanded facilities is **6.0%** - less than the U.S. mean rate of 7.9%. Minnesota's effective tax rate on new investment is also less than those in Georgia, Texas, New York, California, Massachusetts and North Carolina.

Minnesota and Wisconsin both allow political subdivisions to grant property tax incentives such as tax increment financing or tax abatement for economic development purposes.

Corporate Income Tax/Franchise Tax	Minnesota	Wisconsin
RATE	9.8%	7.9%
FORMULA (E.G. SALES, PROPERTY & PAYROLL)	Apportionment sales factor (100%)	Apportionment sales factor (100%)
Personal Income Tax	**Minnesota**	**Wisconsin**
RATE RANGE	5.35% - 7.85%	4.60% - 7.75%
EARNED INCOME	Yes	Yes
UNEARNED INCOME	Yes	Yes
Sales/Use Tax	**Minnesota**	**Wisconsin**
STATE TAX	6.875%	5.0%
LOCAL TAX	1.0% (Duluth)	0.5% (Douglas County)
TOTAL	7.875% (Duluth)	5.5% (Douglas County)

THE RIGHT INCENTIVES FOR THE RIGHT BUSINESS

Data Center Incentives

Our tax incentives make it more attractive than ever to build data and network operation centers in Minnesota.

Qualifying projects receive sales tax exemptions for 20 years on:

- *Computers and servers*
- *Cooling and energy equipment*
- *Energy use*
- *Software*
- *Pay no personal property tax - ever.*

(See Appendix V for further information.)

QUALIFYING FOR THE INCENTIVES

Companies that build data or network operation centers of at least 30,000 square feet and invest $50 million in the first two years qualify for the tax break.

Duluth 1200 Fund, Inc.

The 1200 Fund is a private, nonprofit corporation charged with creating new jobs for Duluth. The amount of assistance available is based upon the number of new jobs created. Loan proceeds can be used for building construction, purchase of equipment, or working capital. The 1200 Fund loan structure consists of participation in a private bank loan, therefore it is necessary that a private lending institution provide a loan in an amount at least equal to the 1200 Fund loan and with the same collateral position.

Iron Range Resources & Rehabilitation Board (IRRRB)

IRRRB is a unique MN State agency with a mission to enhance and diversify the economy in a defined region of northeast Minnesota known as the Taconite Assistance Area. The agency has a dedicated funding source from the mining industry and enjoys significant latitude in customizing financial incentive packages to meet the needs of clients. Examples include low-cost fixed asset debt financing, equity or mezzanine financing, and infrastructure grants through host municipalities. The agency also has the authority to issue revenue bonds and to offer direct cash incentives tied to the performance of the client.

Arrowhead Regional Development Commission (ARDC)

The ARDC Revolving Loan Fund (RLF) is in place to support business activities for which credit is not otherwise available on terms and conditions which would permit completion and/or the successful operation or accomplishment of the project in the seven county region of northeast Minnesota.

Northland Foundation

The Northland Foundation is a nonprofit organization dedicated to addressing economic, social, and human needs in our area. They provide project financing at a flexible and attractive interest rate for eligible borrowers.

Minnesota Development Fund Grant

The Minnesota Business Development Infrastructure Grant Program works to stimulate new economic development, in order to create and retain jobs in Greater Minnesota through public infrastructure investments. The program provides grants to cities of up to 50% of the capital costs for the public infrastructure needed to expand or retain jobs in the area.

Minnesota Investment Fund (MIF)

Accessed through the Department of Employment and Economic Development, this program provides funds to carry out specified programs, services, or activities to create new employment, maintain existing employment, increase the local tax base, or otherwise increase economic activity in a community.

"**APEX** assisted us with **identifying and meeting local customers, finding the ideal sites, and arranging an incentives package** to help us get established in the region. We probably would not be in Duluth if it weren't for the help of APEX and the local development partners. Now that we are here, Involta has become an APEX member!"

-Bruce Lehrman (Founder, CEO of Involta, a leading colocation data center company)

Minnesota Job Skills Partnership

This program provides grant funding up to $400,000 for job training based upon the number of new jobs created through a local educational institution such as Lake Superior College or the Northeast Higher Education District. The grant is made to the college for expenses, which are part of a program in which customer service facilities would contribute a matching amount for training. The academic institution will prepare the program and apply for the grant.

Minnesota Community Capital Fund (MCCF)

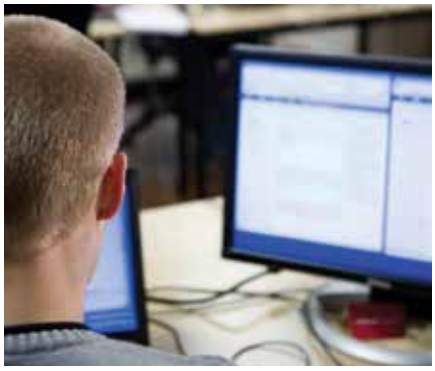
The Minnesota Community Capital Fund leverages millions of dollars in underutilized revolving loan fund capital on behalf of local communities and economic development organizations throughout Greater Minnesota.

Guaranteed Annual Revenue program

Minnesota Power's Guaranteed Annual Revenue Mechanism is a tool that allows the company to provide a credit to the customer for electric infrastructure extension costs based on a 5 to 10 year electric service agreement.

Wisconsin Economic Development Corporation (WEDC)

The Economic and Community Development division of WEDC makes investments in companies that are expanding operations in Wisconsin. Specifically, WEDC will invest in companies that retain or create family-supporting jobs in Wisconsin.



Northwest Regional Planning Commission

The Northwest Wisconsin Regional Economic Development Fund (NWREDF) administers its revolving loan programs in partnership with local communities and area partners. NWREDF provides low-cost financing for businesses seeking to either start or expand their operations in Northwest Wisconsin.

Wisconsin Housing & Economic Development Authority (WHEDA)

The WHEDA offers a number of programs and services in support of business development within the State of Wisconsin including guarantee programs, participation lending and small business credits.

Impact Seven

Impact Seven's Business Development Department offers a variety of loans and venture capital for growing Wisconsin businesses through its four major financing programs. Impact Seven offers low cost deals and flexible terms.

Northwest Wisconsin Concentrated Employment Program, Inc.

NWCEP's mission is to strengthen the economy of Northwest Wisconsin, by providing effective and efficient workforce development services to businesses and workers. NWCEP provides the On-the-Job Training (OJT) Hiring Initiative which can cover 50% of the salary and fringe expenses of a DVR referral hired by your company for up to 90 days.

LIFE AND LIVING

Housing Affordability

Affordable housing is readily available in Duluth and the region in a variety of ages, sizes, styles and types. The following statistics should be welcome news for employees who may be considering relocating here:

• Average Selling Price	$163,378
• Median Selling Price	$139,500
• Average Rent Per Month	$757

Duluth, MN runner-up for
"THE BEST ADVENTURE HUB IN THE WORLD"
by Outside Magazine, April 2013

Green Space

In addition to the many parks and green space areas found within the region's cities, residents also enjoy unique features like the Superior Hiking Trail, a 200+ mile hiking trail that runs along the scenic North Shore of Lake Superior, from Duluth to the Canadian Border. Near the Spirit Mountain Recreational Area, residents can access the Willard Munger State Trail, the 4th longest paved bike path in the United States at 63 miles.

Health Care

The citizens of the region enjoy some of the world's best healthcare services, with two major healthcare systems, Essentia and St. Luke's. State-of-the-art pre- and beginning-of-life care, coupled with patient-focused end-of-life services for the aging, have allowed the region to contribute significantly to the State of Minnesota's number 5 ranking by United Health Foundation as one of the healthiest states in the nation.

Crime

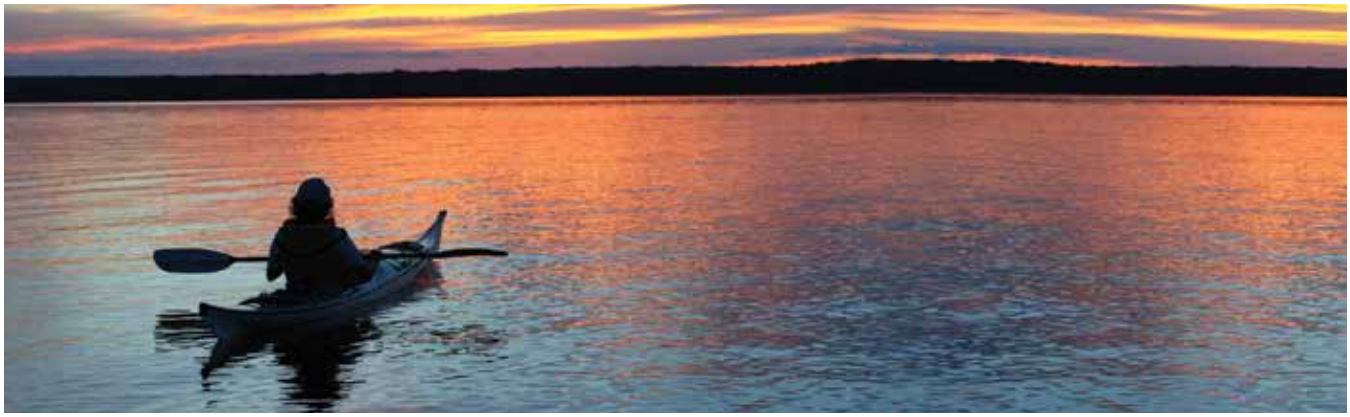
Northeast Minnesota and northwest Wisconsin have the lowest crime rate of any area in the two states. More notably, in April 2011, the Institute for Economics and Peace crunched some numbers and came up with the U.S. Peace Index, ranking Minnesota as the 4th most peaceful state in America.

Traffic

The average daily commute for working professionals in the City of Duluth is less than 9 minutes. There is no traffic congestion to speak of, minimal pollution and ample public parking in the downtown area as well as commuter bike lanes and walking paths.

Regional Highlights

Four distinct seasons offer year-round opportunities for fun and relaxation. Outdoor enthusiasts will enjoy the area's clear lakes, lush forests and rugged shorelines. Even the most sophisticated tastes and interests are satisfied by the region's natural attractions, rich culture, premier facilities and world-class events.



Premier Regional Events

American Birkebeiner Cross-Country Ski Race
Bayfield Apple Festival
Bayfront Blues Festival
Big Top Chautauqua
Book Across the Bay
Chequamegon Fat Tire Festival
Dragon Boat Festivals
Duluth Air Show
Duluth National Snocross Racing
Grand View Firehouse 50
Grandma's Marathon
John Beargrease Sled Dog Marathon
North Shore Inline Skating Marathon
Point to La Pointe Swim
Superior Vistas Bike Tour

Visitor Attractions

Aerial Lift Bridge & The Lakewalk
Apostle Islands National Lakeshore
North Shore of Lake Superior
Rose Garden/Leif Erickson Park
20+ 18-hole Golf Courses

Museums

Lake Superior Marine Museum, Duluth Children's Museum and Glensheen Mansion, which are some of the most visited attractions in the region.

Hiking & Cross Country Trails

Access to the 200-mile North Shore trail and the 63-mile Willard Munger trail, one of the longest paved trails in the U.S. Lester Park is the second most used cross country ski trail in the state of Minnesota.

Snowmobile Trails

Miles of trails, one of which connects to the North Shore trail, providing a direct link from Duluth to Canada.

Downhill Skiing

Giants Ridge Golf and Ski Resort
Lutsen Mountains
Mt. Ashwabay Ski and Recreation Area
Spirit Mountain

Parks

Over 100 national, state and local

Cultural Amenities

A wide variety of cultural amenities are offered seasonally and throughout the year. These include the Duluth Symphony Orchestra, Minnesota Ballet, the Duluth Art Institute, the Duluth Playhouse, Duluth Children's Theater, Weber Music Hall, the annual Bayfront Blues Fest in Bayfront Park and many more. For more information on the area's natural and cultural amenities, regional events and attractions, please see Appendix VI.

CONCLUSION

The advantages of locating your Data Center in northeast MN or northwest WI are clear. In addition to offering competitive site options, reliable, cost-effective electric power, advanced telecommunications infrastructure and a favorable climate, our region also possesses several other strengths and competitive advantages that suit your organization's needs.

With an immediate population over 86,600 and a regional population of roughly 400,000, the City of Duluth serves as the economic heart of the region. Its unique status as an international port city situated just north of the Minneapolis-St. Paul metro area has allowed Duluth to develop a rich culture that blends its Midwestern roots with Native American, Scandinavian and European traditions.

Other regional highlights include a highly educated, well-motivated workforce; world class health care; thirteen college and university campuses; an international airport with nine commercial flights per day and next-day service from multiple carriers; plus, a wide variety of outstanding cultural and recreational amenities.

APEX is committed to the success of your organization in this community. We know business, we understand business, and we work well with business. By locating your Data Center in the region, your company will gain an edge and will be provided an atmosphere that promotes a highly successful operating climate.

APPENDIX I

COST-COMPETITIVE ELECTRIC POWER

Minnesota Power

Minnesota Power, a division of ALLETE, provides electricity in a 26,000 square-mile service territory located in northeast Minnesota. The company supplies retail electric service to 144,000 customers and wholesale electric service to 16 municipalities. Minnesota Power also serves Superior, Wisconsin through its subsidiary, Superior Water Light and Power.

The company specializes in meeting the needs of large power customers that operate 24 hours a day, 7 days a week. In fact, several of the nation's largest energy users, such as mining and paper making operations, are served by Minnesota Power.

Minnesota Power has a robust electric transmission and distribution system. The company owns and operates 164 substations and its transmission network is interconnected with the transmission grid to promote reliability. The SAIDI average for Minnesota Power in 2012 was 89.78 minutes, compared with the Minnesota Power Utility Commissions (MPUC) goal of 97.69 minutes. The utility's average SAIFI in 2012 was 0.93, compared to the MPUC goal of 1.02.

Minnesota Power strives to have access to a diverse mix of energy producing technologies and fuels, ensuring that customers are provided with a reliable supply of electric energy at a reasonable cost. Energy supply diversity is important to reliability, as a hedge against the possibility of technical failure or limitations on a particular fuel supply.

The current generation portfolio includes coal-fired, hydroelectric facilities, wind facilities, natural gas, and biomass fueled generation. Minnesota Power searches continuously for opportunities to diversify both fuels and generation technologies, and the company invests in those opportunities that demonstrate clear benefits for its customers.

Minnesota Power has a history of providing its customers highly reliable electric service at very reasonable prices. In addition, Minnesota Power customers benefit from the company's participation in MISO, which is an essential link in the safe, cost-effective delivery of electric power.

1 SAIDI refers to the System Average Interruption Duration Index and serves as a reliability indicator. SAIDI is the average outage duration for each customer served and is the sum of all interruption durations divided by the total number of customers served.

2 SAIFI refers to the System Average Interruption Frequency Index and is a commonly used reliability indicator. SAIFI is the average number of interruptions that a customer would experience and is equal to the total number of customer interruptions divided by the total number of customers served.

minnesota power
AN ALLETE COMPANY
YOUR POWERFUL PARTNER

Great River Energy

Great River Energy is a not-for-profit cooperative which provides wholesale electric service to 28 distribution cooperatives in Minnesota and Wisconsin. Those member cooperatives distribute electricity to approximately 650,000 member accounts – or about 1.7 million people. With $3.7 billion in assets, Great River Energy is the largest electric power supplier in Minnesota and one of the largest generation and transmission cooperatives in the United States. Great River Energy's member cooperatives range from those in the outer-ring suburbs of the Twin Cities to the Arrowhead region of Minnesota to the farmland of southwestern Minnesota.

A Reliable and Responsive Transmission System

It takes a broad network of transmission lines, including more than 4,600 miles and 109 substations, to deliver electricity from generation facilities to our 28 member cooperatives. In order to carry out its mission as a dependable wholesale energy provider, it's vital that Great River Energy has an effective and efficient way to transport energy to our customer-owners. Electricity is carried from generation facilities to substations using our own transmission facilities and those of other utilities, with whom Great River Energy has long-standing agreements. Along with those utilities, Great River Energy jointly plans, builds, operates and maintains transmission facilities to ensure that the most efficient and cost-effective lines are available to provide reliable service at a reasonable rate for members.

Improving Environmental Performance

Since 2006, Great River Energy has increased its energy output by 588,000 megawatt hours, or 4 percent. During that same time, Great River Energy increased its purchase of renewable energy and reduced emissions at its power plants. As a result, sulfur dioxide emissions are down by approximately 50 percent; nitrogen oxides, 40 percent, and carbon dioxide, 20 percent. These measurements are based on pounds of emissions per megawatt hour of energy produced and purchased.

Member Cooperative Summary

Number of member accounts:	**650,000**
Sales to members (in megawatt hours) :	**11,749,814**
Total distribution line:	**87,500 miles**
Average density	**7.5 consumers/mile**
Distribution substations:	**550**
Combined annual revenue:	**$1.25 billion**
Electric plant in service (net):	**$1.8 billion**
Average kilowatt hours per account:	**18,200/year**
Distribution employees:	**1,600**

GREAT RIVER ENERGY®

A Touchstone Energy® Cooperative

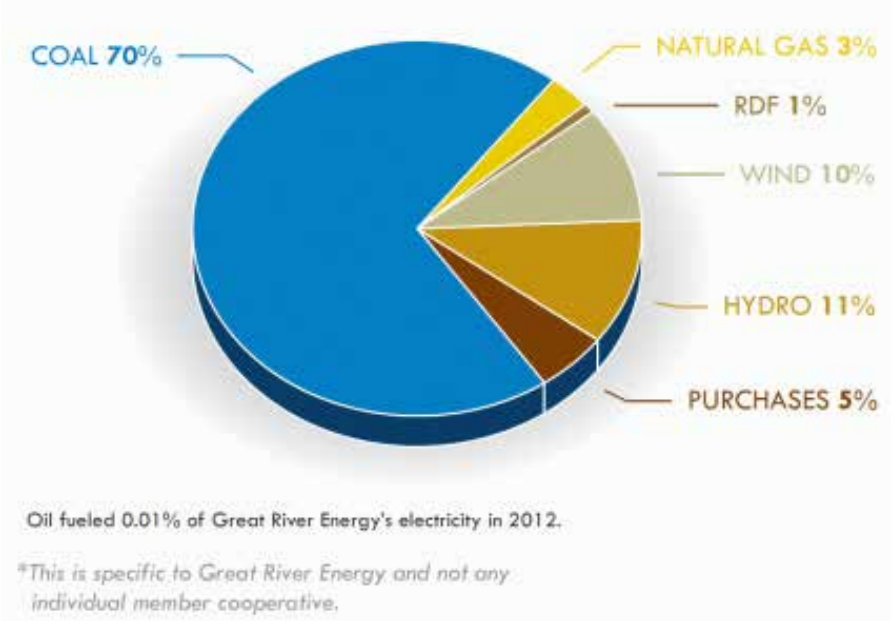
Generation Resources Mix

As a wholesale power provider, Great River Energy's generation resources must be reliable enough to provide energy around the clock yet possess the flexibility to meet fluctuations in demand. Great River Energy had a successful year on both fronts as the cooperative's generation resources produced 11.13 million megawatt hours, an all-time record amount of energy.

Great River Energy owns 12 power plants that generate more than 2,800 megawatts of electricity, plus we purchase additional power from several wind farms and other generating facilities.

Our energy primarily comes from:

- Coal-based power plants in North Dakota
- Natural gas-fired peaking plants
- RDF (Biomass)
- Wind energy
- Purchased power
- Hydropower
- Distributed generation



Systemwide Load Characteristics (Based on energy sales.)

Residential: 56.2%

Seasonal: 2.2%

Commercial, industrial and other: 41.6%

2012 Financial Highlights

Revenue: $921.2 million

Total assets: $3.7 billion

Utility plant investment (net): $2.7 billion

Long-term obligations, including current maturities: $2.8 billion

Great River Energy uses industry-accepted reliability indices such as SAIDI, CAIDI, MAIFI and CAIFI-Mom to measure transmission reliability.

SAIDI: The System Average Interruption Duration Index, measures the number of minutes over the year that the average consumer was without power. This index increases throughout the year as more sustained outages (outages that last one minute or longer) are experienced. Great River Energy's 2012 SAIDI was 30.38 minutes. Damage from a ferocious July 2 thunderstorm brought the average down. Without the effects of that storm, SAIDI would have ended at 20.54 minutes.

CAIDI: The Customer Average Interruption Duration Index measures the average amount of time a consumer was without power when an interruption occurred. This is a general indication of how long it is taking to restore power. This index varies throughout the year depending on the duration of outages and the total number of customers experiencing at least one sustained outage. The damage caused by the July 2, 2012 storm was evident in the CAIDI measure as well, which ended at 53.6 minutes. Without the effects of that storm, CAIDI would have ended at 40.04 minutes.

MAIFI: The Momentary Average Interruption Frequency Index measures the number of times the average consumer experienced an interruption in supply for less than one minute. This index increases throughout the year as more momentary outages are experienced. Great River Energy's MAIFI ended at 1.47 momentary outages per customer compared to the goal of 3.5. This is the second best recorded MAIFI metric in 14 years.

APPENDIX II

INVOLTA CASE STUDY

Involta
Securing Your Future

p. 855.364.3061
involta.com
e. info@involta.com

Case Study

Data Centers as an Economic Development Driver

Leveraging an industry to drive employment and infrastructure investment.

- The Area Partnership for Economic Expansion (APEX) in Duluth, Minnesota identified demand from local employers for a mission critical data center facility.
- APEX had developed a sophisticated data center recruitment strategy, leveraging the region's cool climate, competitively priced electrical rates, site options and proximity to the Twin Cities metropolitan area.
- Throughout the courtship of Involta, APEX worked with state, local and city public and private sector leadership to educate the community on the benefits of data centers as an industry.
- APEX partnered with Involta to build a business case to cost-justify their decision to invest more than $15 million in the City of Duluth.

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e. *info@involta.com*

Overview

APEX is a Duluth, Minnesota based private sector led business development engine for northeast Minnesota and northwest Wisconsin. APEX investor-members represent many of the most influential companies in the region. APEX promotes sustainable economic growth through attraction, retention and expansion of businesses and industries that align with the region's competitive advantages. The organization invests significant human and financial resources to build sophisticated strategies and business cases to cost-justify investment within the region.

Duluth, Minnesota is the world's largest inland port, located on the edge Lake Superior, the largest of the Great Lakes. Duluth forms a metropolitan area with Superior, Wisconsin referred to as the Twin Ports. The Duluth/Superior Metropolitan Statistical Area population approached 280,000 according to the 2010 Census.

The Opportunity

In 2005, APEX and their economic development partner and investor, Minnesota Power, had identified data centers as an emerging market. Information technology and data storage needs are a challenge for any business, particularly for compliance-driven corporations, healthcare and educational institutions. In fact, they represent realms of significant growth potential for the data center industry. It appeared to be a viable attraction strategy for the regional economic development partners to consider and validate.

In regions the size of the Twin Ports, often referred to as Tier II communities, companies are faced with the decision to invest considerable capital resources in privately owned data centers that are inadequate for compliance needs or very costly. Others choose to outsource colocation needs to other parts of the state or country.

With insight provided from APEX investor-members, Essentia Health and SISU Medical Solutions, APEX learned that they had potential anchor tenants for a data center expansion. Essentia Health, a Midwest integrated healthcare provider, headquartered in Duluth, was in dire need of a facility solution for the organization's IT operation. SISU Medical Solutions, a healthcare IT services provider, was also evaluating a solution that accommodated for growth, resiliency and flexibility. Both organizations were independently in the midst of evaluating whether to invest significant internal capital resources or work with a provider of colocation services.

Inquiries made to other APEX investor-members and employers in the Twin Ports region uncovered several additional entities that would be interested in colocating within a data center facility as well.

In addition to having potential customers, the Twin Ports area had several unique regional features that were of interest and value to the data center industry. These features included:

- Proximity to the Twin Cities Metropolitan market
- Energy savings due to a year-round cool climate
- Cost competitive, reliable power through Minnesota Power
- Available, cost-competitive real estate options
- Very low incidence of natural disasters that would impact a robustly designed datacenter
- Local and state economic development incentives
- Exceptional education and training resources

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Multi-tenant, carrier neutral data centers are powerful economic engines in rural communities. While data centers do not offer large employment figures on their own with the salary and benefits package generally average approximately $55,000, they are highly desirable in Tier II communities. In addition to generating additional spin-off employment in the construction, operations and maintenance, they are also often catalysts for additional telecommunication investment. "Data centers create an incredibly valuable infrastructure that draws other businesses that have business continuity and disaster recovery requirements," said Brian Hanson, President and CEO of Area Partnership for Economic Expansion.

The APEX staff and their regional economic development partners set forward an aggressive, sophisticated strategy to recruit a colocation data center to the region. APEX invested considerable financial and human capital to research and understand the industry players, motivators and drivers.

The Involta Story

In December of 2009, Involta and APEX crossed paths. The company, headquartered in Cedar Rapids, Iowa, fit the criteria that APEX was looking for in a data center operator. The company had a strong balance sheet, experienced management team and was strategically focused on expansion to mid-sized, Tier II markets like the Twin Ports.

APEX and the regional economic development partners leveraged their experience with the data center industry and their knowledge of the local market to align Involta with the potential tenants and to garner the financial and technical resources to cost-justify the company's investment in Duluth. APEX worked simultaneously to educate the public sector on the value of having a data center in the community. While Involta would employ a modest number of people, they were investing considerable capital in terms of datacenter and telecommunication infrastructure.

Another advantage to Duluth's location was proximity to the Twin Cities Metropolitan market. Chris Shroyer, Involta Vice President of Sales and Marketing, knew the value a community the size of Duluth could offer potential customers. "There are several data centers in the Twin Cities, but a Duluth location offered cost-effective power, real estate and human resources as compared to a major metro area. In addition, there is less environmental risks, air traffic, and traffic congestion. Those considerations are often part of any organizational decision regarding colocation solutions," commented Shroyer.

After considerable due diligence on both APEX and Involta's part, Involta announced in June 2011the official decision to build and operate two multi-tenant colocation facilities in Duluth. The company not only invested in a new concurrently maintainable and highly secure facility, but also partnered with a customer to redevelop an existing building as a second location. By September 2012 both of the facilities were operational. The data centers house mission critical computer systems and related infrastructure for healthcare organizations, compliance-driven businesses, government agencies and educational institutions.

Involta CEO Bruce Lehrman expressed great appreciation for the support shown by APEX and its investor-members. "Without the assistance of APEX, St. Louis County and the City of Duluth, it is unlikely this project would have made it out of the planning stage," stated Lehrman.

Lehrman also praised the efforts of Minnesota Power, a division of ALLETE, for their project assistance. "They stepped up with the community expertise, a desirable site location and the reliable power strategy we needed to locate a data center in Duluth," said Lehrman.

The Impact

The opening of Involta Duluth's multi-tenant data centers came after over five years of APEX's persistence and dedication to a strategy. The impact of Involta's investment in the region included:

- Construction of Involta's $13 million, world-class, concurrently maintainable data center facility in Duluth, incorporating state of the art technology, meticulous process and technical talent to secure customers' mission critical technology assets.
- Involta invested $2.6 million in redevelopment of an existing customer-owned facility to a data center that provided an "active/active" environment for the healthcare organization and other customers.
- Constructed a $1 million,144-count metro fiber ring between the Involta data centers to offer customers a resilient, cost-effective solution for an active/active environment.
- Construction-related employment over the course of the 12 months of construction amounted to approximately 38 full time equivalents.
- Within six months of operation, Involta directly employed six employees, with an expectation to grow to 10-15 within one year of operation.
- The Involta facility attracted and continues to attract additional telecommunication investment in the region from carrier companies including CenturyLink and Windstream, further enhancing competitive offerings and lower cost of connectivity.
- The attraction of Involta represents a monumental step in positioning the region of northeast Minnesota and northwest Wisconsin as a magnet for tech-based business development and industry growth for many years to come.

"This project was a great example of private sector investment in Duluth," commented Don Ness, Mayor of the City of Duluth. "Involta's investment revitalized an existing facility, constructed a world-class facility, added high-paying job opportunities and enhanced our community's network connectivity and technology infrastructure," continued Mayor Ness.

About Involta

Involta builds, owns and operates world-class data centers throughout the United States. The Involta team provides competent, experienced technical expertise allowing for solid business decision-making about your data center, disaster recovery and service management needs. The facilities Involta manages incorporate the highest industry standards and guidelines including: SSAE 16, ITIL and LEED. Involta partners with customers to "Secure Your Future" so you can confidently focus on running your organization today. Involta operates data centers in Arizona, Iowa, Ohio, Minnesota and Idaho.

Involta was named the second fastest growing IT Company in the country in 2010, according to Inc. Magazine 500 Fastest Growing Companies (#40 overall).

APPENDIX III

TECHNOLOGY TALENT

Technology Wage Information and Analysis

Computer Systems Analysts (SOC Code: 15-1121)

Occupational Description:
Analyze science, engineering, business, and all other data processing problems for application to electronic data processing systems. Analyze user requirements, procedures, and problems to automate or improve existing systems and review computer system capabilities, workflow, and scheduling limitations. May analyze or recommend commercially available software. Exclude persons working primarily as "Engineers" (17-2011 through 17-2199), "Mathematicians" (15-2021), or "Scientists" (19-1011 through 19-3099). May supervise computer programmers.

Tasks for Computer Systems Analysts:

- Analyzes and tests computer programs or system to identify errors and ensure conformance to standard.
- Formulates and reviews plans outlining steps required to develop programs to meet staff and user requirements.
- Writes documentation to describe and develop installation and operating procedures of programs.
- Reads manuals, periodicals, and technical reports to learn how to develop programs to meet staff and user requirements.
- Coordinates installation of computer programs and operating systems, and tests, maintains, and monitors computer system.
- Trains staff and users to use computer system and its programs.
- Assists staff and users to solve computer related problems, such as malfunctions and program problems.
- Modifies program to correct errors by correcting computer codes.
- Reviews and analyzes computer printouts and performance indications to locate code problems.
- Writes and revises program and system design procedures, test procedures, and quality standards.
- Devises flow charts and diagrams to illustrate steps and to describe logical operational steps of program.
- Consults with staff and users to identify operating procedure problems.

Computer Systems Analysts Regional Wage Information
Occupational Employment Statistics (OES) Wage Data
Wages Updated to Fourth Quarter 2012, Employment data is from 2011

		PERCENTILES				
Geography	**Employment**	**10th**	**25th**	**Median**	**75th**	**90th**
DULUTH-SUPERIOR MN-WI MSA	270	$12.79	$14.04	$23.79	$29.93	$41.33
NORTHEAST, MN	260	$12.77	$14.00	$23.86	$30.01	$41.36
MINNEAPOLIS-ST. PAUL MSA	11,340	$25.07	$30.66	$37.10	$44.85	$53.71
MINNESOTA	12,660	$24.49	$30.16	$36.66	$44.66	$53.61
US	487,740	$24.26	$30.58	$38.69	$48.38	$58.97

Management Analysts (SOC Code: 13-1111)

Occupational Description:
Conduct organizational studies and evaluations, design systems and procedures, conduct work simplifications and measurement studies, and prepare operations and procedures manuals to assist management in operating more efficiently and effectively. Include program analysts and management consultants. Exclude "Computer Systems Analysts" (15-1051) and "Operations Research Analysts" (15-2031).

Tasks for Computer Systems Analysts:

- Reviews forms and reports, and confers with management and users about format, distribution, and purpose, and to identify problems and improvements.
- Develops and implements records management program for filing, protection, and retrieval of records, and assures compliance with program.
- Prepares manuals and trains workers in use of new forms, reports, procedures or equipment, according to organizational policy.
- Recommends purchase of storage equipment, and designs area layout to locate equipment in space available.
- Gathers and organizes information on problems or procedures.
- Documents findings of study and prepares recommendations for implementation of new systems, procedures, or organizational changes.
- Analyzes data gathered and develops solutions or alternative methods of proceeding.
- Confers with personnel concerned to ensure successful functioning of newly implemented systems or procedures.
- Plans study of work problems and procedures, such as organizational change, communications, information flow, integrated production methods, inventory control, or cost analysis.
- Designs, evaluates, recommends, and approves changes of forms and reports.
- Interviews personnel and conducts on-site observation to ascertain unit functions, work performed, and methods, equipment, and personnel used.

Management Analysts
Occupational Employment Statistics (OES) Wage Data
Wages Updated to Fourth Quarter 2012, Employment data is from 2011

		PERCENTILES				
Geography	**Employment**	**10th**	**25th**	**Median**	**75th**	**90th**
DULUTH-SUPERIOR MN-WI MSA	160	$13.29	$17.33	$27.53	$39.96	$48.41
NORTHEAST, MN	170	$13.34	$17.36	$28.55	$40.23	$48.65
MINNEAPOLIS-ST. PAUL MSA	8,270	$25.07	$30.86	$39.32	$51.08	$68.40
MINNESOTA	9,230	$24.70	$30.46	$38.89	$50.21	$67.03
US	536,310	$21.56	$28.61	$38.38	$51.17	$68.15

Computer Software Developers, Systems Software (15-1133)

Occupational Description:

Research, design, develop, and test operating systems-level software, compilers, and network distribution software for medical, industrial, military, communications, aerospace, business, scientific, and general computing applications. Set operational specifications and formulate and analyze software requirements. Apply principles and techniques of computer science, engineering, and mathematical analysis.

Tasks for Computer Software Engineers, Systems Software

- Analyzes software requirements to determine feasibility of design within time and cost constraints.
- Analyzes information to determine, recommend, and plan layout for type of computers and peripheral equipment modifications to existing systems.
- Evaluates factors such as reporting formats required, cost constraints, and need for security restrictions to determine hardware configuration.
- Consults with engineering staff to evaluate interface between hardware and software and operational and performance requirements of overall system.
- Trains users to use new or modified equipment.
- Recommends purchase of equipment to control dust, temperature, and humidity in area of system installation.
- Enters data into computer terminal to store, retrieve, and manipulate data for analysis of system capabilities and requirements.
- Specifies power supply requirements and configuration.
- Consults with customer concerning maintenance of software system.
- Monitors functioning of equipment to ensure system operates in conformance with specifications.
- Coordinates installation of software system.
- Develops and directs software system testing procedures, programming, and documentation.
- Confers with data processing and project managers to obtain information on limitations and capabilities for data processing projects.
- Formulates and designs software system, using scientific analysis and mathematical models to predict and measure outcome and consequences of design.

Computer Software Developers, Systems Software Regional Wage Information
Occupational Employment Statistics (OES) Wage Data
Wages Updated to Fourth Quarter 2012, Employment data is from 2011

		PERCENTILES				
Geography	**Employment**	**10th**	**25th**	**Median**	**75th**	**90th**
DULUTH-SUPERIOR MN-WI MSA	20	$38.72	$41.89	$46.99	$55.24	$81.18
NORTHEAST, MN	20	$38.72	$41.89	$46.99	$55.24	$81.18
MINNEAPOLIS-ST. PAUL MSA	5,630	$31.95	$39.62	$48.10	$57.25	$70.91
MINNESOTA	7,560	$31.71	$39.15	$47.40	$56.87	$69.62
US	387,050	$30.68	$38.17	$47.45	$59.19	$72.22

Computer Support Specialists (15-1150)

Occupational Description:
Provide technical assistance to computer system users. Answer questions or resolve computer problems for clients in person, via telephone or from remote location. May provide assistance concerning the use of computer hardware and software, including printing, installation, word processing, electronic mail, and operating systems. Exclude "Network and Computer Systems Administrators" (15-1071).

Tasks for Computer Support Specialists

- Installs and performs minor repairs to hardware, software, and peripheral equipment, following design or installation specifications.
- Reads technical manuals, confers with users, and conducts computer diagnostics to determine nature of problems and provide technical assistance.
- Enters commands and observes system functioning to verify correct operations and detect errors.
- Prepares evaluations of software and hardware, and submits recommendations to management for review.
- Tests and monitors software, hardware, and peripheral equipment to evaluate use, effectiveness, and adequacy of product for user.
- Inspects equipment and reads order sheets to prepare for delivery to users.
- Supervises and coordinates workers engaged in problem-solving, monitoring, and installing data communication equipment and software.
- Reads trade magazines and technical manuals, and attends conferences and seminars to maintain knowledge of hardware and software.
- Conducts office automation feasibility studies, including workflow analysis, space design, and cost comparison analysis.
- Maintains record of daily data communication transactions, problems and remedial action taken, and installation activities.
- Refers major hardware or software problems or defective products to vendors or technicians for service.
- Develops training materials and procedures, and conducts training programs.
- Confers with staff, users, and management to determine requirements for new systems or modifications.

Computer Support Specialists Regional Wage Information
Occupational Employment Statistics (OES) Wage Data
Wages Updated to Fourth Quarter 2012, Employment data is from 2011

		PERCENTILES				
Geography	**Employment**	**10th**	**25th**	**Median**	**75th**	**90th**
DULUTH-SUPERIOR MN-WI MSA	320	$15.74	$18.80	$24.21	$28.52	$33.81
NORTHEAST, MN	310	$14.68	$18.22	$23.22	$28.02	$33.30
MINNEAPOLIS-ST. PAUL MSA	9,830	$16.48	$20.21	$24.97	$30.58	$37.01
MINNESOTA	12,550	$15.86	$19.51	$23.89	$29.75	$36.46
US	632,490	$14.23	$18.17	$23.41	$30.71	$39.88

Computer Programmers (15-1131)

Occupational Description:

Convert project specifications and statements of problems and procedures to detailed logical flow charts for coding into computer language. Develop and write computer programs to store, locate, and retrieve specific documents, data, and information. May program web sites.

Tasks for Computer Programmers

- Analyzes, reviews, and rewrites programs, using workflow chart and diagram, applying knowledge of computer capabilities, subject matter, and symbolic logic.
- Resolves symbolic formulations, prepares flow charts and block diagrams, and encodes resultant equations for processing.
- Prepares or receives detailed workflow chart and diagram to illustrate sequence of steps to describe input, output, and logical operation.
- Revises or directs revision of existing programs to increase operating efficiency or adapt to new requirements.
- Compiles and writes documentation of program development and subsequent revisions.
- Trains subordinates in programming and program coding.
- Assigns, coordinates, and reviews work and activities of programming personnel.
- Assists computer operators or system analysts to resolve problems in running computer program.
- Collaborates with computer manufacturers and other users to develop new programming methods.
- Prepares records and reports.
- Writes instructions to guide operating personnel during production runs.
- Consults with managerial and engineering and technical personnel to clarify program intent, identify problems, and suggest changes.
- Develops programs from workflow charts or diagrams, considering computer storage capacity, speed, and intended use of output data.
- Converts detailed logical flow chart to language processible by computer.

Computer Programmers Regional Wage Information
Occupational Employment Statistics (OES) Wage Data
Wages Updated to Fourth Quarter 2012, Employment data is from 2011

		PERCENTILES				
Geography	**Employment**	**10th**	**25th**	**Median**	**75th**	**90th**
DULUTH-SUPERIOR MN-WI MSA	80	$19.41	$25.02	$29.86	$39.28	$46.86
NORTHEAST, MN	100	$17.09	$21.74	$28.71	$39.12	$47.58
MINNEAPOLIS-ST. PAUL MSA	4,860	$21.05	$26.70	$33.76	$41.93	$48.39
MINNESOTA	5,690	$20.96	$26.40	$33.31	$41.65	$49.51
US	320,100	$20.50	$26.94	$35.68	$45.45	$56.79

Computer Software Developers, Applications (15-1132)

Occupational Description:
Develop, create, and modify general computer applications software or specialized utility programs. Analyze user needs and develop software solutions. Design software or customize software for client use with the aim of optimizing operational efficiency. May analyze and design databases within an application area, working individually or coordinating database development as part of a team. Exclude "Computer Hardware Engineers" (17-2061).

Tasks for Computer Software Engineers, Applications

- Analyzes software requirements to determine feasibility of design within time and cost constraints.
- Analyzes information to determine, recommend, and plan layout for type of computers and peripheral equipment modifications to existing systems.
- Formulates and designs software system, using scientific analysis and mathematical models to predict and measure outcome and consequences of design.
- Confers with data processing and project managers to obtain information on limitations and capabilities for data processing projects.
- Evaluates factors such as reporting formats required, cost constraints, and need for security restrictions to determine hardware configuration.
- Consults with engineering staff to evaluate interface between hardware and software and operational and performance requirements of overall system.
- Develops and directs software system testing procedures, programming, and documentation.
- Monitors functioning of equipment to ensure system operates in conformance with specifications.
- Coordinates installation of software system.
- Trains users to use new or modified equipment.
- Recommends purchase of equipment to control dust, temperature, and humidity in area of system installation.
- Enters data into computer terminal to store, retrieve, and manipulate data for analysis of system capabilities and requirements.
- Specifies power supply requirements and configuration.
- Consults with customer concerning maintenance of software system.

Computer Software Developers, Applications Regional Wage Information
Occupational Employment Statistics (OES) Wage Data
Wages Updated to Fourth Quarter 2012, Employment data is from 2011

		PERCENTILES				
Geography	**Employment**	**10th**	**25th**	**Median**	**75th**	**90th**
DULUTH-SUPERIOR MN-WI MSA	290	$26.28	$31.25	$34.70	$39.97	$48.85
NORTHEAST, MN	290	$26.06	$31.24	$34.75	$40.28	$49.06
MINNEAPOLIS-ST. PAUL MSA	11,810	$30.79	$36.32	$44.23	$53.51	$60.56
MINNESOTA	14,190	$30.24	$35.52	$43.51	$52.84	$59.70
US	539,880	$27.00	$34.53	$43.85	$55.01	$67.04

Network and Computer Systems Administrators (15-1142)

Occupational Description:

Install, configure, and support an organization's local area network (LAN), wide area network (WAN), and Internet system or a segment of a network system. Maintain network hardware and software. Monitor network to ensure network availability to all system users and perform necessary maintenance to support network availability. May supervise other network support and client server specialists and plan, coordinate, and implement network security measures. Exclude "Computer Support Specialists" (15-1041).

Tasks for Network and Computer Systems Administrators

- Develops plans to safeguard computer files against accidental or unauthorized modification, destruction, or disclosure and to meet emergency data processing needs.
- Tests data processing system to ensure functioning of data processing activities and security measures.
- Confers with personnel to discuss issues such as computer data access needs, security violations, and programming changes.
- Writes reports to document computer security and emergency measures policies, procedures, and test results.
- Monitors use of data files and regulates access to safeguard information in computer files.
- Modifies computer security files to incorporate new software, correct errors, or change individual access status.
- Coordinates implementation of computer system plan with establishment personnel and outside vendors.

Network and Computer Systems Administrators Regional Wage Information
Occupational Employment Statistics (OES) Wage Data
Wages Updated to Fourth Quarter 2012, Employment data is from 2011

		PERCENTILES				
Geography	**Employment**	**10th**	**25th**	**Median**	**75th**	**90th**
DULUTH-SUPERIOR MN-WI MSA	230	$17.61	$21.18	$26.90	$33.10	$38.99
NORTHEAST, MN	280	$17.48	$20.92	$26.40	$32.93	$39.43
MINNEAPOLIS-ST. PAUL MSA	7,230	$24.15	$28.88	$34.77	$42.15	$48.08
MINNESOTA	8,950	$22.43	$27.32	$33.58	$40.95	$46.99
US	341,800	$21.32	$27.10	$34.86	$44.28	$55.12

Information Security Analysts, Web Developers, and Computer Network Architects (15-1179)

Occupational Description:

Analyze, design, test, and evaluate network systems, such as local area networks (LAN), wide area networks (WAN), Internet, intranet, and other data communications systems. Perform network modeling, analysis, and planning. Research and recommend network and data communications hardware and software. Include telecommunications specialists who deal with the interfacing of computer and communications equipment. May supervise computer programmers.

Tasks for Network Systems and Data Communications Analysts

- Analyzes test data and recommends hardware or software for purchase.
- Reads technical manuals and brochures to determine equipment which meets establishment requirements.
- Identifies areas of operation which need upgraded equipment, such as modems, fiber optic cables, and telephone wires.
- Tests and evaluates hardware and software to determine efficiency, reliability, and compatibility with existing system.
- Monitors system performance.
- Develops and writes procedures for installation, use, and solving problems of communications hardware and software.
- Conducts survey to determine user needs.
- Trains users in use of equipment.
- Assists users to identify and solve data communication problems.
- Visits vendors to learn about available products or services.
- Develops Web Pages
- Monitors and analyzes information technology security

Information Security Analysts, Web Developers, and Computer Network Architects
Occupational Employment Statistics (OES) Wage Data
Wages Updated to Fourth Quarter 2012, Employment data is from 2011

		PERCENTILES				
Geography	**Employment**	**10th**	**25th**	**Median**	**75th**	**90th**
DULUTH-SUPERIOR MN-WI MSA	150	$19.01	$22.09	$29.01	$35.81	$43.80
NORTHEAST, MN	160	$19.04	$22.21	$29.27	$35.90	$42.77
MINNEAPOLIS-ST. PAUL MSA	5,890	$25.05	$31.95	$39.75	$47.96	$56.19
MINNESOTA	6,790	$24.58	$31.43	$39.04	$47.67	$56.23
US	272,670	$21.01	$28.64	$38.30	$49.89	$61.33

Computer Hardware Engineers (17-2061)

Occupational Description:

Research, design, develop, and test computer or computer-related equipment for commercial, industrial, military, or scientific use. May supervise the manufacturing and installation of computer or computer-related equipment and components. Exclude "Computer Software Engineers, Applications" (15-1031) and "Computer Software Engineers, Systems Software" (15-1032).

Tasks for Computer Hardware Engineers

- Analyzes software requirements to determine feasibility of design within time and cost constraints.
- Evaluates factors such as reporting formats required, cost constraints, and need for security restrictions to determine hardware configuration.
- Formulates and designs software system, using scientific analysis and mathematical models to predict and measure outcome and consequences of design.
- Develops and directs software system testing procedures, programming, and documentation.
- Monitors functioning of equipment to ensure system operates in conformance with specifications.
- Specifies power supply requirements and configuration.
- Recommends purchase of equipment to control dust, temperature, and humidity in area of system installation.
- Trains users to use new or modified equipment.
- Enters data into computer terminal to store, retrieve, and manipulate data for analysis of system capabilities and requirements.
- Consults with customer concerning maintenance of software system.
- Coordinates installation of software system.
- Confers with data processing and project managers to obtain information on limitations and capabilities for data processing projects.
- Analyzes information to determine, recommend, and plan layout for type of computers and peripheral equipment modifications to existing systems.
- Consults with engineering staff to evaluate interface between hardware and software and operational and performance requirements of overall system.

Computer Hardware Engineers Regional Wage Information
Occupational Employment Statistics (OES) Wage Data
Wages Updated to Fourth Quarter 2012, Employment data is from 2011

		PERCENTILES				
Geography	**Employment**	**10th**	**25th**	**Median**	**75th**	**90th**
DULUTH-SUPERIOR MN-WI MSA	N/A	N/A	N/A	N/A	N/A	N/A
NORTHEAST, MN	N/A	N/A	N/A	N/A	N/A	N/A
MINNEAPOLIS-ST. PAUL MSA	840	$31.76	$38.85	$47.72	$58.34	$68.49
MINNESOTA	1,250	$32.12	$38.31	$47.25	$60.18	$69.59
US	71,990	$30.65	$38.13	$48.44	$60.27	$72.51

Database Administrators (15-1411)

Occupational Description:

Coordinate changes to computer databases, test and implement the database applying knowledge of database management systems. May plan, coordinate, and implement security measures to safeguard computer databases.

Tasks for Database Administrators

- Writes logical and physical data base descriptions including location, space, access method, and security.
- Codes data base descriptions and specifies identifiers of data base to management system or directs others in coding descriptions.
- Tests, corrects errors, and modifies changes to programs or to data base.
- Develops data model describing data elements and how they are used, following procedures using pen, template or computer software.
- Establishes and calculates optimum values for data base parameters, using manuals and calculator.
- Reviews project request describing data base user needs, estimating time and cost required to accomplish project.
- Directs programmers and analysts to make changes to data base management system.
- Selects and enters codes to monitor data base performance and to create production data base.
- Trains users and answers questions.
- Specifies user and user access levels for each segment of data base.
- Revises company definition of data as defined in data dictionary.
- Confers with coworkers to determine scope and limitations of project.
- Reviews procedures in data base management system manuals for making changes to data base.
- Reviews workflow charts developed by programmer analyst to understand tasks computer will perform, such as updating records.

Database Administrators Regional Wage Information
Occupational Employment Statistics (OES) Wage Data
Wages Updated to Fourth Quarter 2012, Employment data is from 2011

		PERCENTILES				
Geography	**Employment**	**10th**	**25th**	**Median**	**75th**	**90th**
DULUTH-SUPERIOR MN-WI MSA	60	$17.11	$19.89	$23.70	$29.15	$42.88
NORTHEAST, MN	50	$18.75	$21.13	$25.34	$34.08	$46.86
MINNEAPOLIS-ST. PAUL MSA	2,220	$23.70	$30.98	$39.18	$48.29	$55.72
MINNESOTA	2,500	$22.85	$30.14	$38.03	$47.64	$55.39
US	108,500	$20.80	$27.43	$36.93	$47.47	$57.41

Computer and Information Systems Managers (11-3021)

Occupational Description:

Plan, direct, or coordinate activities in such fields as electronic data processing, information systems, systems analysis, and computer programming. Exclude "Computer Specialists" (15-1011 through 15-1099).

Tasks for Computer and Information Systems Managers

- Evaluates data processing project proposals and assesses project feasibility.
- Directs daily operations of department and coordinates project activities with other departments.
- Develops and interprets organizational goals, policies, and procedures, and reviews project plans.
- Directs training of subordinates.
- Participates in staffing decisions.
- Develops performance standards and evaluates work in light of established standards.
- Analyzes workflow and assigns or schedules work to meet priorities and goals.
- Meets with department heads, managers, supervisors, vendors, and others to solicit cooperation and resolve problems.
- Approves, prepares, monitors, and adjusts operational budget.
- Consults with users, management, vendors, and technicians to determine computing needs and system requirements.
- Prepares and reviews operational reports or project progress reports.

Computer and Information Systems Managers Regional Wage Information
Occupational Employment Statistics (OES) Wage Data
Wages Updated to Fourth Quarter 2012, Employment data is from 2011

		PERCENTILES				
Geography	**Employment**	**10th**	**25th**	**Median**	**75th**	**90th**
DULUTH-SUPERIOR MN-WI MSA	210	$30.44	$38.86	$42.97	$47.52	$56.46
NORTHEAST, MN	210	$28.58	$38.54	$42.85	$47.74	$56.68
MINNEAPOLIS-ST. PAUL MSA	8,190	$40.44	$48.56	$56.30	$67.78	>$80.00
MINNESOTA	9,480	$39.21	$47.51	$55.74	$67.53	>$80.00
US	300,830	$35.84	$45.35	$57.88	$72.83	>$80.00

Computer Operators (43-9011)

Occupational Description:

Monitor and control electronic computer and peripheral electronic data processing equipment to process business, scientific, engineering, and other data according to operating instructions. May enter commands at a computer terminal and set controls on computer and peripheral devices. Monitor and respond to operating and error messages. Exclude "Data Entry Keyers" (43-9021).

Tasks for Computer Operators

- Enters commands, using computer terminal, and activates controls on computer and peripheral equipment to integrate and operate equipment.
- Diagnoses reasons for equipment malfunction and enters commands to correct error or stoppage and resume operations.
- Records information, such as computer operating time and problems which occurred, such as down time, and actions taken.
- Clears equipment at end of operating run and reviews schedule to determine next assignment.
- Assists workers in classifying, cataloging, and maintaining tapes.
- Separates output, when needed, and sends data to specified users.
- Notifies supervisor of errors or equipment stoppage.
- Answers telephone calls to assist computer users encountering problems.
- Reads job set-up instructions to determine equipment to be used and order of use.
- Observes peripheral equipment operation and error messages displayed on terminal monitor to detect faulty output or machine stoppage.
- Enters commands to clear computer system and start operation, using keyboard of computer terminal.
- Loads peripheral equipment with selected materials for operating runs, or oversees loading of peripheral equipment by peripheral equipment operators.

Computer Operators Regional Wage Information
Occupational Employment Statistics (OES) Wage Data
Wages Updated to Fourth Quarter 2012, Employment data is from 2011

		PERCENTILES				
Geography	**Employment**	**10th**	**25th**	**Median**	**75th**	**90th**
DULUTH-SUPERIOR MN-WI MSA	10	$13.30	$15.11	$19.83	$24.23	$26.79
NORTHEAST, MN	20	$12.82	$15.41	$17.83	$22.97	$26.68
MINNEAPOLIS-ST. PAUL MSA	710	$12.86	$15.83	$19.78	$23.85	$28.16
MINNESOTA	890	$12.78	$15.36	$19.34	$23.47	$27.69
US	77,280	$11.18	$14.25	$18.67	$23.65	$28.48

APPENDIX IV

LATENCY STUDY FOR GREATER MINNEAPOLIS - ST. PAUL

Latency Study

Greater Minneapolis Saint Paul (GMSP) Regional Economic Development Partnership

City X	Chicago	Seattle	San Francisco	Santa Clara	Los Angeles	Denver	Phoenix	Dallas	Houston	Washington, DC	Kansas City, MO
Carrier											
Level3	10.89	49.56	63.76	65.28	65.89	29.87	61.24	32.11	35.87	29.08	14.58
CenturyLink	11.21	48.98	62.70	64.92	63.36	26.76	58.40	29.71	33.13	31.10	16.20
Verizon	10.67	50.21	64.88	66.03	65.45	29.99	63.39	33.51	34.23	33.12	13.66
Average	*10.92*	*49.58*	*63.78*	*65.41*	*64.90*	*28.87*	*61.01*	*31.78*	*34.41*	*31.10*	*14.81*

City X	St. Louis	Boston	Indianapolis	Cincinnati	Charlotte, SC	Nashville	Atlanta	Newark	Miami	Cleveland	Dayton, OH
Carrier											
Level3	20.03	44.12	17.66	20.58	43.30	26.54	35.67	37.32	59.20	22.77	22.68
CenturyLink	22.65	45.69	16.37	22.38	46.76	24.82	32.60	35.59	62.14	19.15	23.54
Verizon	19.58	42.52	16.37	24.19	42.01	27.33	34.25	33.71	60.88	18.10	22.96
Average	*20.75*	*44.11*	*16.80*	*22.38*	*44.02*	*26.23*	*34.17*	*35.54*	*60.74*	*20.01*	*23.06*

City X	Pittsburgh	Detroit	Philadelphia	Akron	Ashburn	Toledo	New York	Toronto	London	Hong Kong	Tokyo
Carrier											
Level3	25.41	20.89	35.57	24.10	35.34	18.40	35.92	35.13	105.65	160.05	158.60
CenturyLink	26.79	23.77	36.73	25.91	35.57	19.98	34.23				
Verizon	22.44	24.82	34.30	26.21	32.45	20.39	32.07				
Average	*24.88*	*23.16*	*35.53*	*25.41*	*34.45*	*19.59*	*34.07*	*11.71*	*35.22*	*53.35*	*52.87*

All figures represented are based on avaiable route analysis, distance measurements and calculated latency factors.

All calculations represent round-trip latency in milliseconds, using a layer 1 topology

International routes are mixed-provider routes

Table of Contents

Greater Minneapolis Saint Paul (GMSP) Regional Economic Development Partnership

Executive Summary

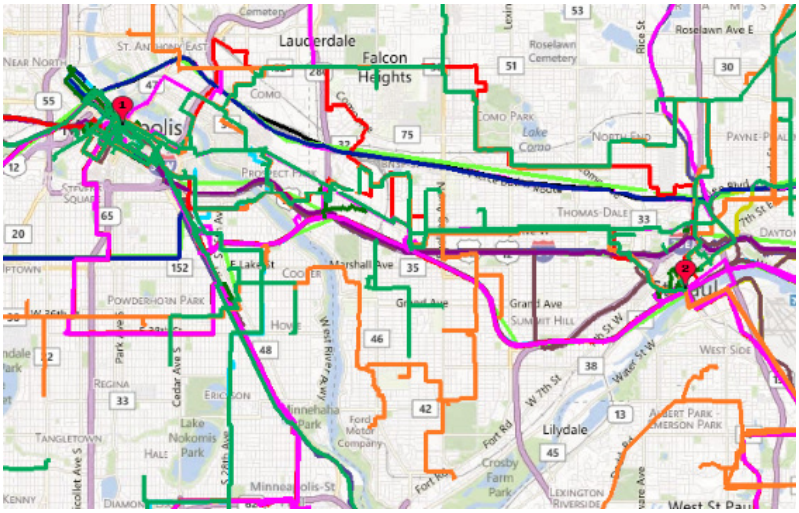
The latency profile for the Greater Minneapolis-St. Paul (GMSP) area is excellent despite its geographic location away from other more notable markets such as Chicago, New York, Washington, DC, etc.

The GMSP area is home to a rich supply of high-density metro fiber infrastructure and diverse long-haul fiber routes. As such, GMSP's metropolitan area can support a wide variety of vertical markets that require data, voice or video oriented services.

By comparison, Minneapolis-St. Paul exhibits network latency characteristics that are…

- *Slightly higher than Boston and New York*
- *Lower than New York City to Washington, DC*
- *Much lower than Miami to Atlanta*

The latency requirements of virtually any application can be met in GMSP if a network and supporting infrastructure are designed properly. The rare latency-sensitive exceptions would include synchronous replication or active/active application where the latency must be less than 6-7 milliseconds. It is always recommended that a specific network requirement design review be undertaken to ensure that all factors are considered when selecting a data center location.



GMSP enjoys abundant connectivity throughout the metro and surrounding areas

Improvements could be made by carriers to decrease the latency on the long-haul networks by optimizing, modernizing or upgrading the network components. The paths can also be straightened to further decrease the distances and the effective latency along these routes. Normally, when an optimization effort is undertaken, the metro and long-haul fiber is streamlined as part of the process.

A specialized, low latency design could be implemented to further reduce latency to approximately 15% lower than the posted results. Such a specialized route would be expensive to implement but could be done based on the route analysis. The latency is derived from a mix of available carriers and represents an average available latency.

Report Background

NEF is professional services firm that provides research, analysis, consulting and planning for large infrastructure projects such as fiber optic network deployments, municipal conduit systems, data center site selection and more. This study focuses on the network latency of commercially available facilities-based telecommunications services that support the Greater Minneapolis-St. Paul area. The content includes background on latency as well as an analysis of long-haul routes and the related metro connectivity to provide telecommunications network services. The information and analysis contained in this report is based upon data obtained from a wide variety of sources, including, but not limited to service providers, in-house resources, historical records, interviews with subject matter experts and facility owners/operators.

For the network portion of the report, NEF focused primarily on facilities-based providers. Facilities-based service providers are those that own and operate their own fiber network. Some service providers routinely lease fiber from other service providers; others lease fiber when they are out of their own operating area. Of the facilities-based service providers, some will lease dark fiber to other service providers or end users, while others only sell telecommunications or “lit” services. The telecommunications industry is evolving quickly and the best source for information about what the service providers are currently selling will always be from the service providers directly. Likewise metro networks are constantly expanding, and new buildings are being lit by service providers every day.

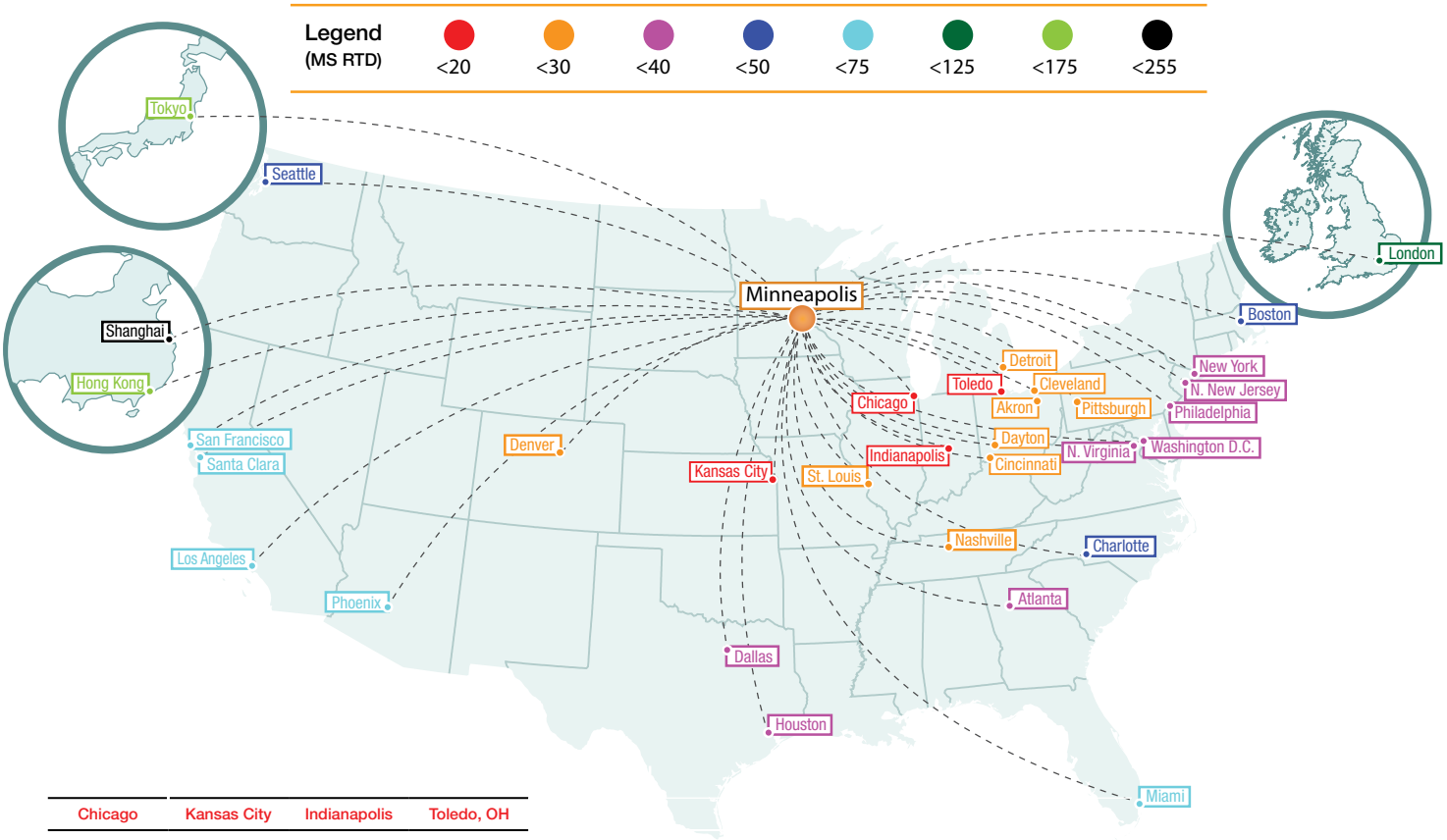
Most service providers have been generous in providing network maps and information; however, many do not allow public dissemination of their routes. The physical layer of the networks is always expanding, and the service providers and the services they offer continue to evolve. The service providers, of course, have the most up-to-date network and service information available. The service providers are presented in no specific order in keeping with NEF’s provider neutral position. The maps show the routes which the fiber networks take into and near the locations of interest.

NEF team of analysts strives to be accurate and thorough in the research and creation of this report; and while reasonable care has been taken in the preparation of this report, there is the possibility of errors and omissions in facts, figures or material. Information, statistics and data from a wide span of time has been included for the directional and historical value it represents. The intent of this report is to provide data and analysis that would be valuable in the data center site selection process and is not meant to take the place of any due diligence, specific investigational work or similar fact finding endeavors.

Network Overview

The rich fiber infrastructure in the immediate GMSP and surrounding area could support up to a Tier 4 data center. By contrast, a data center without ample fiber-based network connections is virtually useless, as the viability and success of most any network or data center is amplified by its connections to the outside world. Networks that support a data center have many different characteristics that affect their capabilities, reliability and performance. Components such as latency, path diversity (ingress/egress), long-haul networks, and metro networks are the four key factors in evaluating a location or data center's network connectivity. The following explanations illuminate each facet of the network in GMSP.

Latency to Key Locations from Minneapolis-St. Paul



Chicago	Kansas City	Indianapolis	Toledo, OH
10.75	15.06	18.25	19.71

St. Louis	Detriot	Cincinnati	Dayton	Cleveland	Akron, OH	Pittsburgh	Nashville	Denver
20.31	21.72	21.98	23.29	23.54	25.39	26.34	27.83	29.79

Wash. D.C.	Dallas	Philadelphia	Houston	Atlanta	Toronto	Northern VA	New York	New Jersey	Charlotte
30.96	32.59	36.06	36.08	36.16	36.83	36.98	37.99	39.90	44.74

Boston	Seattle	Miami	Phoenix	San Fran.	Santa Clara	Los Angeles	London	Hong Kong	Tokyo	Shaghai
45.78	49.20	59.67	62.32	64.26	65.12	65.90	109.89	164.30	164.30	253.72

Path Diversity (Ingress/Egress)

Having one entry point into a data center is a recipe for systematic failure. The network reliability of a data center, whether leased or owned, is directly affected by the diversity of fiber network paths entering and exiting a facility. Consequently, it is vital to understand and ensure that there are multiple ingress/egress paths, diverse service providers and some controlled and documented system for managing this critical aspect of the data center's connectivity.

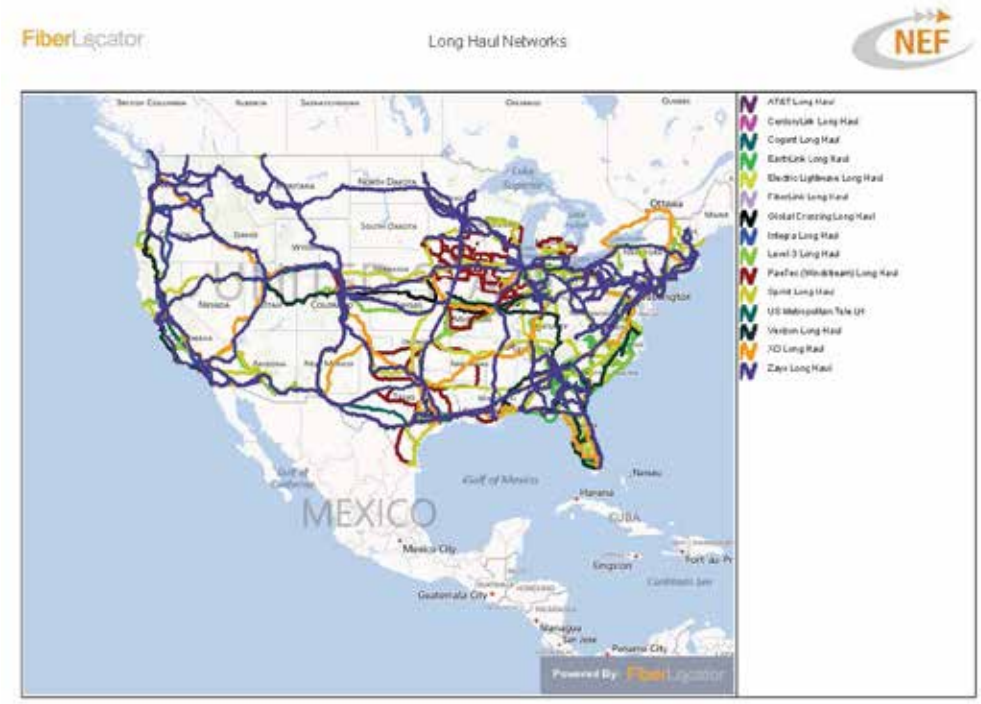
The standard rating system for data centers revolves around uptime, which is a percentage that states how reliable a data center operates with a focus on redundancy and diversity. For example, a Tier 4 rating indicates that any two systems operate completely independently of one another. Many Tier 3 & 4 data centers have at least three (3) or four (4) ingress/egress systems in place, managing the fiber that touches their facilities in a diverse, secure and controlled method.

Long-Haul Networks

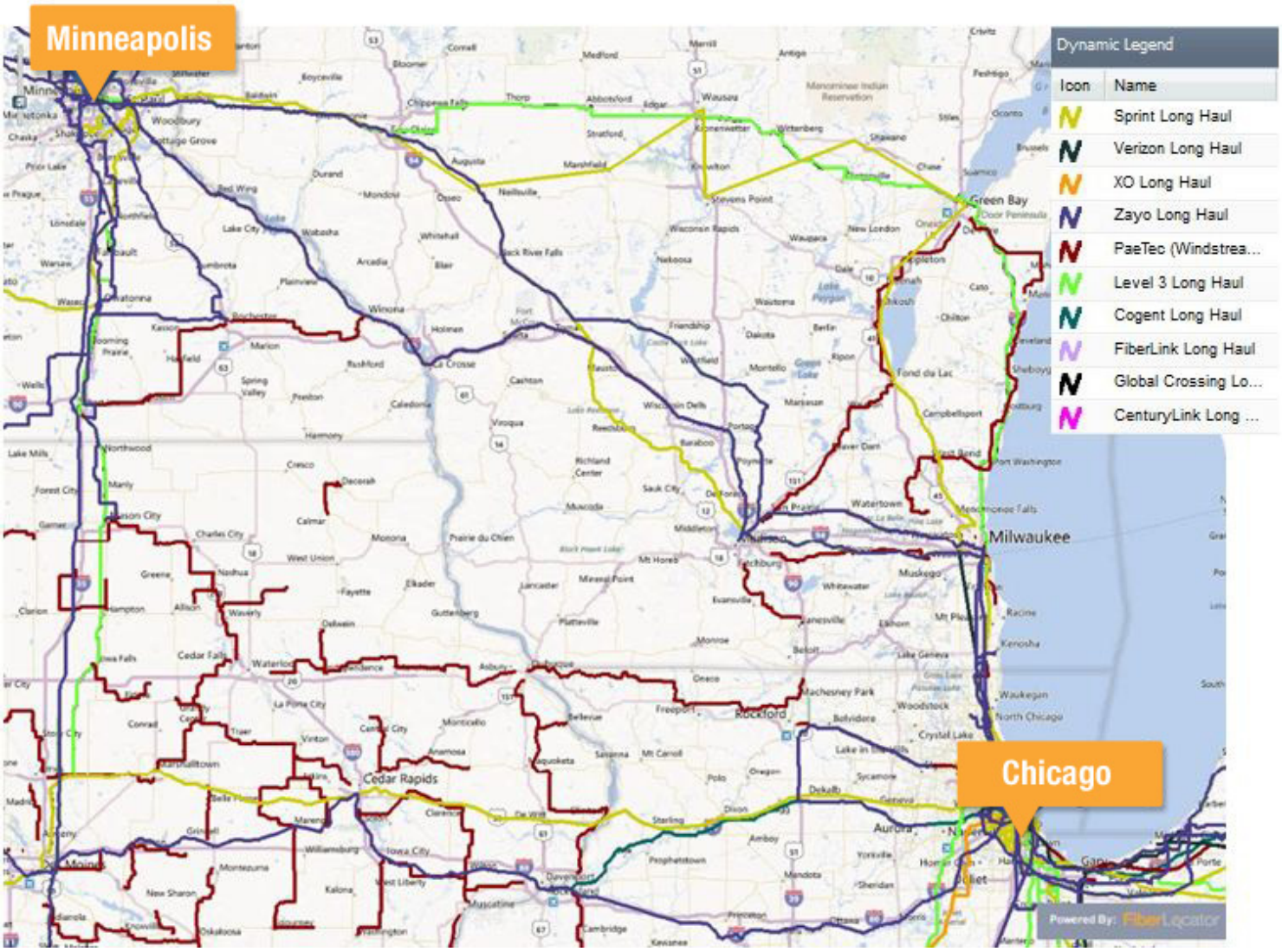
The long-haul networks are fiber-optic based networks that provide a standardized method of transporting traffic from state to state and city to city. They can be visualized like the highway system that crisscrosses the United States. In relationship to data centers, long-haul networks are the key backbone for transporting data and voice services, as they "mesh" with the local, metro networks to ensure that the traffic gets delivered.

Long-haul networks are typically designed to transport data and voice services between major markets. These networks connect to a central "hub" facility (data center) in a given city and then exit the city in another direction.

Most of the major metropolitan areas in the United States have robust and diverse connections to long-haul networks. (See *the US Long-Haul Networks Diagram below.)*



Long-Haul Network Map

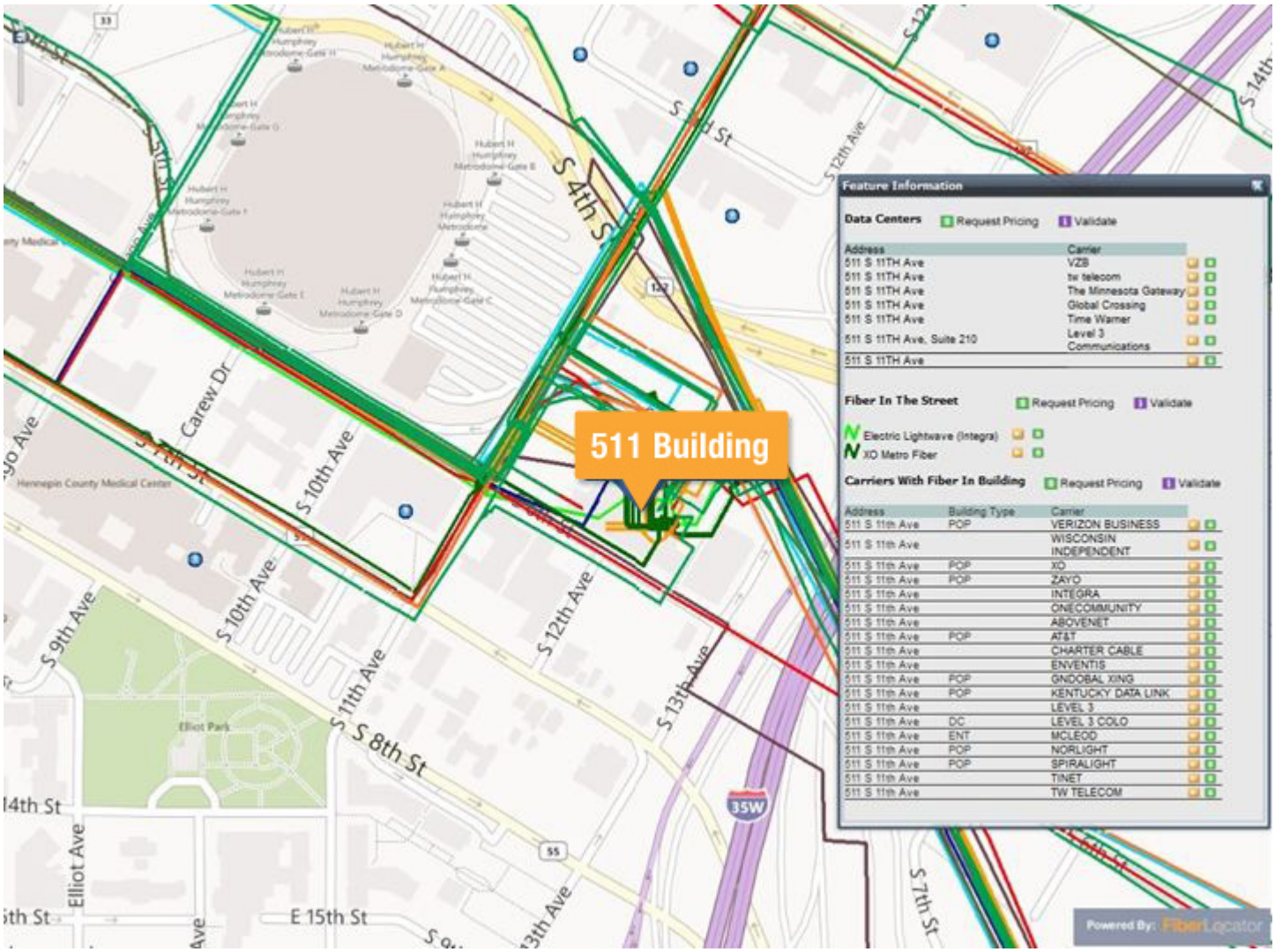


The Minneapolis/St. Paul region is supported by many different long-haul networks. The primary northern long-haul route, which transitions through Chicago, traverses straight through the center of the GMSP. This route can connect directly to Chicago, allowing access to a wide variety of optimized, low latency and ultra-low latency networks. Chicago is one of the top internet peering points in the United States. This route also connects directly to Seattle, using an optimized route design to support lower latency applications. There are five (5) other long-haul networks that support the GMSP region. These long-haul networks, combined with the many available metro networks, ensure that GMSP can support a large variety of corporate business applications and commercial/ retail data centers.

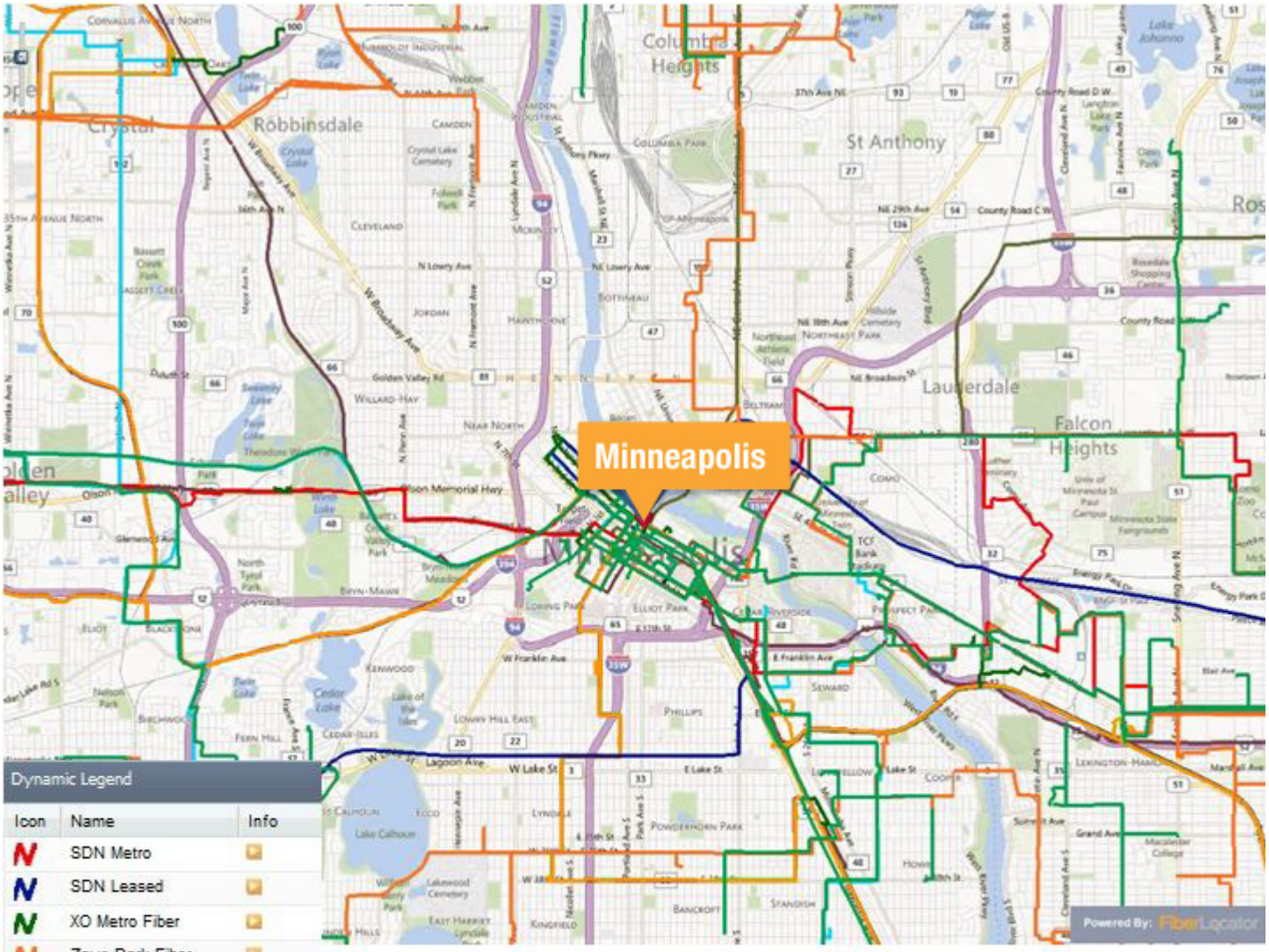
Data centers act as the beginning and end points for long-haul segments of fiber between two major metropolitan areas. These facilities house the equipment used to light the fiber segments. The type of equipment is based on a variety of factors, such as the age of the network, services deployed, and cost. Typical configurations for fiber-based long-haul services are SONET and DWDM (wavelengths). Some metro Ethernet is used but typically only on shorter inter-metro configurations like Minneapolis to St. Paul.

Most long-haul networks connect to large, well-established data centers, because inside the data centers the long-haul networks interface with the metro network distribution system. Many metro-area service providers can then increase their service offerings by utilizing the available long-haul networks. In addition to providing long-haul transport, the same networks and network paths provide the backbone for the Internet and the various Layer 2 & Layer 3 networks throughout the world. This is why there are several different long-haul fiber paths and providers going into major metropolitan areas.

Metro Network Map



Metro networks are more like the side streets and roads that support transportation within the town or city. As with the road infrastructure, metro networks typically have some kind of “on-ramp” to the long-haul network. This “on-ramp” connection is oftentimes the same “hub” where the long-haul networks terminate or transition through in a given area. Most metro networks are dynamic and built on customer demand. Many are built in a protected ring fashion, while others are built in a linear fashion to provide services to a single building. Regardless of their design, the metro networks are critical in providing the link to the long-haul and existing data centers in a given area. In the case of Minneapolis, for instance, most networks touch or can touch the “511 Building” at 511 11th Street in the core of the city.



Dynamic Legend

Icon	Name	Info
N	SDN Metro	
N	SDN Leased	
N	XO Metro Fiber	
N	Zayo Dark Fiber	
N	Zayo Metro	
N	PaeTec (Windstream)	
N	Level3 Metro	
N	Electric Lightwave (...	
N	Enventis	
N	Integra fiber	
N	KDL (Windstream)	
N	Century Tel	

Latency Background

Latency is defined as the time it takes for data to be transmitted from one point to another, across a network platform. Normally, this is expressed as Round Trip Delay (RTD) as data is sent and an acknowledgement of that data being received must be returned to the sender to ensure validity is maintained.

In telecom networks, "latency" is the term used to describe the amount of time it takes for data to travel round-trip from a point to a destination and back. Extrinsic factors businesses face such as competition, compliance or software applications drive the need for latency sensitive networks. For some businesses latency is a critical requirement in their IT infrastructure planning and for others a "nice to have" element of their network. Still others may not have any need for a lower latency network solution. It has become an important enough element of network design that companies should at least be aware of latency and how it affects their IT infrastructure and related applications that drive their business.

Multiple factors affect latency such as physical distance, natural and man-made obstructions, equipment and data processing. Fiber optic technology is based on light as a medium, and the speed of light travels at approximately 186,000 miles per second, which equates to 700 million miles per hour (299,792,458 meters per second). However, current technology has not completely harnessed nature's capabilities, so even with fiber optics, which is a transmission media capable of bending and controlling light-waves, only 80-85% of the speed of light can be achieved with today's equipment.

The general rule of thumb for calculating latency is using 8.2 microseconds per mile for a fiber-based solution with newer equipment designs.

The latency of a terrestrial network is based on two main factors:

- *Fiber route length (most important factor)*
- *Architecture (metro Ethernet, optical waves, hybrid)*

Because the actual length of the fiber route is the overriding element in calculating latency, long-haul fiber has the greatest impact on the speed of a network. In calculating long-haul latency, the metro network latency must be factored in to the measurement along with the long-haul paths themselves. Because metro networks are typically built over shorter distances, their effect on the overall latency is relatively minimal. However, there are cases where the metro network design and equipment are not optimized to support latency-sensitive services.

Compounding the inefficiencies of human-created media and technology, deployed fiber optic networks rarely follow a straight and direct line. Instead, networks have followed the railways, highways and transportation corridors which are never straight due to geological obstacles and right-of-way disputes. Most of the networks that are currently available are not "as the crow flies" routes. However, many providers have optimized their routes to create shorter connects between two points.

Companies with a business model based on speed of data transmission are constantly seeking a faster network alternative, and in turn fiber providers have sought to create solutions that address that demand. In some cases, these "ultra" low latency networks use a microwave transmission design because such a design is considered "line of sight" which delivers the shortest possible distance between two points. Deploying this technology has its drawbacks, but for some applications it is the best fit.

The majority of latency sensitive networks are centered on similar locations or hubs, and thus several providers have optimized fibers along a specific path in order to create low latency routes between two points. The optimization focuses on the two key factors of physical path distance and the latest advancements in equipment. These routes are typically owned by larger providers including AT&T, Verizon, Windstream and Level3; however, there are some smaller, niche providers that focus their business entirely around offering the lowest latency services available. Their networks are designed, deployed and optimized solely for the purpose of being faster than the next.

Types of Networks

There are five (5) basic types of network architectures that are prevalent in the industry, as they apply to latency and transport services:

1. *Long-haul Legacy Non-Optimized*
2. *Long-haul Optimized*
3. *Low Latency Networks*
4. *Ultra Low Latency Networks*
5. *Metro networks*

Long-Haul Legacy – are essentially networks that are older (15 plus years,) both in regard to the equipment powering the networks as well as the fiber that was deployed. As in most things of our world, efficiency and capabilities tend to increase considerably over time. These older networks have equipment that was primarily designed for lower speed networks, with very little emphasis on latency. Technically, these networks were designed and deployed for voice, primarily.

Long-Haul Optimized – are essentially networks that have either undergone optical gear upgrades, some redesigns to cut out excess fiber mileage or generally been "optimized" to provide more capabilities and lower latencies between city pairs.

Low Latency Networks – these networks were specifically engineered and designed (and continue to be) to provide exceptional latency characteristics at higher bandwidth (typically 10Gigabit.) Initially, these networks were deployed or optimized for the financial services sector, but as the low latency demand has increased for other business applications more of these low latency networks are being deployed or created. For instance, there are over eight low latency networks between Chicago and New York City nowadays.

Ultra Low Latency Networks – these networks were purpose-built networks, using the straightest paths possible, to ensure that the minimum latencies were achieved between two points. These networks, to date, have been deployed exclusively for the financial services sector, as their costs are extremely high. Some of these networks are using point to point microwave to create the shortest possible path between two points. As in all things "telecom," these networks will be open for use by other business applications as the costs come down. Most of these networks are configured between New York, Chicago, New Jersey, Washington DC, Philadelphia and London.

Metro Networks – as previously stated, Metro Networks typically "hub" from a carrier hotel or large data center. In the case of Boston, for instance, most networks touch or can touch 1 Summer Street, in the core of the city. This kind of design ensures that you get many interconnection options to both other metro networks as well as the long-haul. Essentially, these "hubs" act as the backbone of the modern day "internet" for each city. Normally, there are multiple "hubs" in each city.

Because every network has its own characteristic, the latency associated with Metro Networks is a critical piece of then the latency equation. One service provider might use SONET architecture, which will have very good latency characteristics for some applications; while another provider might use older Metro Ethernet equipment that could add 10-15 millisecond of latency, depending upon the design. The long haul transport latency can be fixed, especially in an all, Layer 1, optical networks; whereas the latency in a Metro can fluctuate based on the number of nodes or "hops." Many Metro Networks can be designed as Layer 1 (pure transport,) but most operate on a Layer 2 or Layer 3 architecture, which has more latency.

Historical Perspective of Latency

Latency has always been an issue in one form or another in communications. From postal mail a few centuries ago to today's cutting edge global communications networks, transmitting information faster from one point to another has always been the goal. When voice calls had to be manually patched through by an operator, it was annoying enough that an undertaker named Almon Strowger invented a switch to replace the manual operator patch panels. More recently, the wireless telecommunications and internet revolution created latency issues that had to be addressed by innovation. Many can recall the early days of AOL and other destination web-based services that were wrought with inefficiencies and slow delivery.

There have been many advances in equipment, networks and the respective applications all focused on negating or limiting the effects of latency. However, because latency is a factor in voice, video, storage, transactional and a variety of other applications or services, companies should be mindful when selecting facilities to ensure that required services can be delivered.

The New Latency Dynamic – Financial Networks

Around 2006, financial institutions and hedge funds became a powerful force driving low latency networks. Financial firms began to understand and exploit the variations in latency and created divisions within their companies that focused on trading financial instruments. These groups are known as algorithmic and high frequency traders.

Algorithmic trading (algo) – is automatic trading methodology based on the use of software applications that enter and manage trade orders using mathematically-based rules with no manual intervention.

High Frequency Trading (HFT) – an off-shoot of algo trading, high frequency trading takes transactions involving world markets to a new level, manufacturing fractional cents based on the timing of the trades and the speed of the transactions. This niche's entire existence revolves around creating the lowest latency possible.

Speculations of profits associated with algo/HFT are as numerous as the dollars themselves. It has been postulated that firms that employ these trading techniques made profits in excess of $20 billion in 2009. In recent discussions with industry players, NEF has learned that a first place position in trading (lowest possible latency for a single financial instrument) is thought to be worth in excess of $20 million per month. It stands to reason that the amount of money spent by these firms to ensure their networks are streamlined and optimized is substantial.

This demand for reduced latency created new fiber pathways between financial hubs most notably Chicago to New York, Chicago to Washington DC and New York to Washington, DC. While other low latency paths that have been created, the Chicago-NY-DC routes are the main networks that have been built or optimized to satisfy the push to create "zero" latency. These routes reflect the locations of the two largest financial areas within the United States, NY and Chicago. The Washington, DC destination is used primarily for data associated with the algorithmic trading programs.

Fast or Slow – Content Delivery

Content Delivery Networks, also known as CDNs, are simply large, national or international, well-distributed networks that interconnect at the carrier hotels or data centers along the path. In simplest terms, these networks power much of the Internet. Think of all the applications like Facebook, Twitter, YouTube, even on-line banking, etc. These sites are all using some kind of CDN to create the best delivery of services. When a user clicks on a web-page, quite a bit goes on in the background during the time it takes for the user to see the result of his or her click. The CDNs are responsible for making sure the Internet experience is the best that it can be within the limits of both a network connection and a network's capabilities.

Figure 1: Visualization of CDN

Latency in this instance is, simply, delay. If a user has too much delay in a video, for example, the user would quickly become disenchanted with the video and move on to something else. The value in a well optimized, high performance CDN can be clearly seen in companies like Amazon or Google, where most transactions happen as fast as a user can click, with the only limiting factor being the connection speed to their services. If a business requires content, video, and/or streams of data for its workforce, then the experience is only as good as the company's connection to the networks that provide such quality content.

Real-time Data – Storage/Replication, Cloud or Intelligence

From large, multi-national enterprises to small, local companies, today's businesses run on core applications that either generate revenue or are used to manage operations or both. Consequently, companies require a network design that enables applications to run smoothly and ensures the survival or continuance of their business in the event of a failure or a catastrophe. Such a design includes factoring in some level of system redundancy and diversity; this includes alternative data centers or off-site storage/replication facilities. Latency is one of key components to understand, calculate and manage to ensure the required applications work effectively to support the business.

Physical location is the primary factor in calculating network latency, as it would apply to any application demanding real-time performance. For example, if a company locates a primary or alternative critical network element in a remote location that has poor network connectivity options or is too far from their corporate core network, the application's response time would ultimately be delayed by the connection. This delay could impact the business as a whole, even hampering revenue generation in some cases.

Types of business applications that are latency-sensitive include the following:

- *Storage/Replication*
- *Cloud Computing*
- *Business Intelligence*

Storage/Replication applications or systems are designed for the specialty task of creating fault tolerance by replicating all critical and non-critical data or programs. For example, if there were a failure in the system, even with an operational server that supported one component of a business process, the storage/replication application would allow for the system managers to restore the critical process in a very short timeframe.

Obviously, latency could be a very important factor in such a restoration, as the business process would be stopped until such time as the restoration and reintegration was completed. In the past, this restoration could take hours or even days. In today's network environment, these applications have reduced this kind of restoration to milliseconds in some cases.

Real-time business data must be stored and replicated as quickly as the network can allow.

Cloud Computing applications are remotely hosted services that support an organization. The "cloud" could be internal data-oriented systems or applications spread across multiple physical locations, or the "cloud" can refer to an external, managed service provided by companies like Amazon, Apple, Microsoft or Google. Typically, cloud computing is used to reduce costs of the programs themselves or the management of the infrastructure to support hundreds of users.

An example of a cloud-based application can be illustrated with a 500 employee operation which runs document processing using remotely hosted applications like Word, Excel or PowerPoint. The users simply use the programs as if they existed on their desktop computers, when in fact the programs and the documents are being stored or manipulated at the remote hosting facility. Latency in the context of this cloud related example could be seen and measured in the delay to a user in opening an application or a document. This latency or delay has a cost to the individual and the organization and is an expense that companies are constantly attempting to reduce or eliminate to optimize productivity.

Business Intelligence (BI) applications are an umbrella of many different applications and their respective datasets which are used to provide insight and decision-making for the business. BI networks have grown tremendously over the years, and more recently they have become real-time components of large businesses and revenue machines in their own right. Any application that operates based on real-time effectively demands an effort to reduce latency. BI network designers have three areas of concern when it comes to latency:

- ***Data latency –*** *how quickly the data is available – mostly external network and equipment functions*
- ***Analysis latency –*** *how quickly the data can be digested – mostly internal design functions*
- ***Action latency –*** *how quickly results can be disseminated – both internal and external functions*

If the network speed is too slow, the real-time intelligence tool quickly loses value, and the investment associated with the application becomes wasted. Latency is a key variable.

Quality & Integrity of Information

Because the information contained in this report and derived from the database is used to make decisions requiring significant capital investment, the accuracy of the information is critical. As such, NEF includes the following:

- *Maps and data from nearly every alternative access carrier and data center provider* ***updated quarterly or at least once per year***
- ***Monthly updates*** *to the lit building database*
- *Data resolution of the network assets or data center* ***down to street level*** *…including lit building connectivity, interconnect points, and carrier POPs updated by the carriers themselves*
- *If applicable, budgetary estimates*

Background & Expertise on NEF

For nearly a decade, NEF has delivered high capacity telecommunications and data center solutions ranging from concept/design to installation and upgrades – and everything in between. NEF offers a unique solution suite aimed at addressing client needs at any stage of the infrastructure lifecycle. The expert consultants at NEF can provide insights on network and colocation planning while the team of experienced brokers on the NEF team can research, compare and negotiate among hundreds of provider options to optimize clients' services and budgets.

While our legacy is in dark fiber, those custom private optical networks were just the start. In 2004, NEF began as a primary source for a Boston-area utility company's dark fiber network and quickly grew into the trusted resource for any high capacity optical fiber network or colocation solution. NEF has designed and deployed telecom networks for organizations ranging from enterprises, educational institutions, healthcare networks, global financial services firms, and even data center operators and carriers.

Deep experience and expertise in bandwidth intensive networks enables NEF to present connectivity and data center solutions that serve initial requirements as well as an organization's long-term best interests. We seek to understand what the needs and challenges are today and how communications needs might change in the future. NEF leverages the following:

- *FiberLocator, the proprietary centralized searchable database of network assets, commercial buildings and data centers*
- *More than 100 combined years of telecommunications experience yielding an aggregated base of tribal knowledge and relationships that simply cannot be obtained through traditional sources*
- *Both depth and breadth of knowledge accumulated from managing projects for hundreds of clients of various sizes, in differing industries, with project sizes ranging from small business local data center deployments to international enterprise network infrastructure*
- *Knowledge of the latest equipment and platforms to fit requirements and budget*

Available Consulting Services

As enterprises demand more from their communications networks, NEF works as a trusted adviser to provide information and services to deliver performance and ROI. Whatever the goals of an organization, NEF understands the need for robust, scalable and affordable networks. This report's information provides insights and recommendations designed to do the following:

- ***Identify*** *location options*
- ***Address*** *scalability requirements*
- ***Optimize*** *telecom budgets*
- ***Maximize*** *efficiency, including low-latency options*

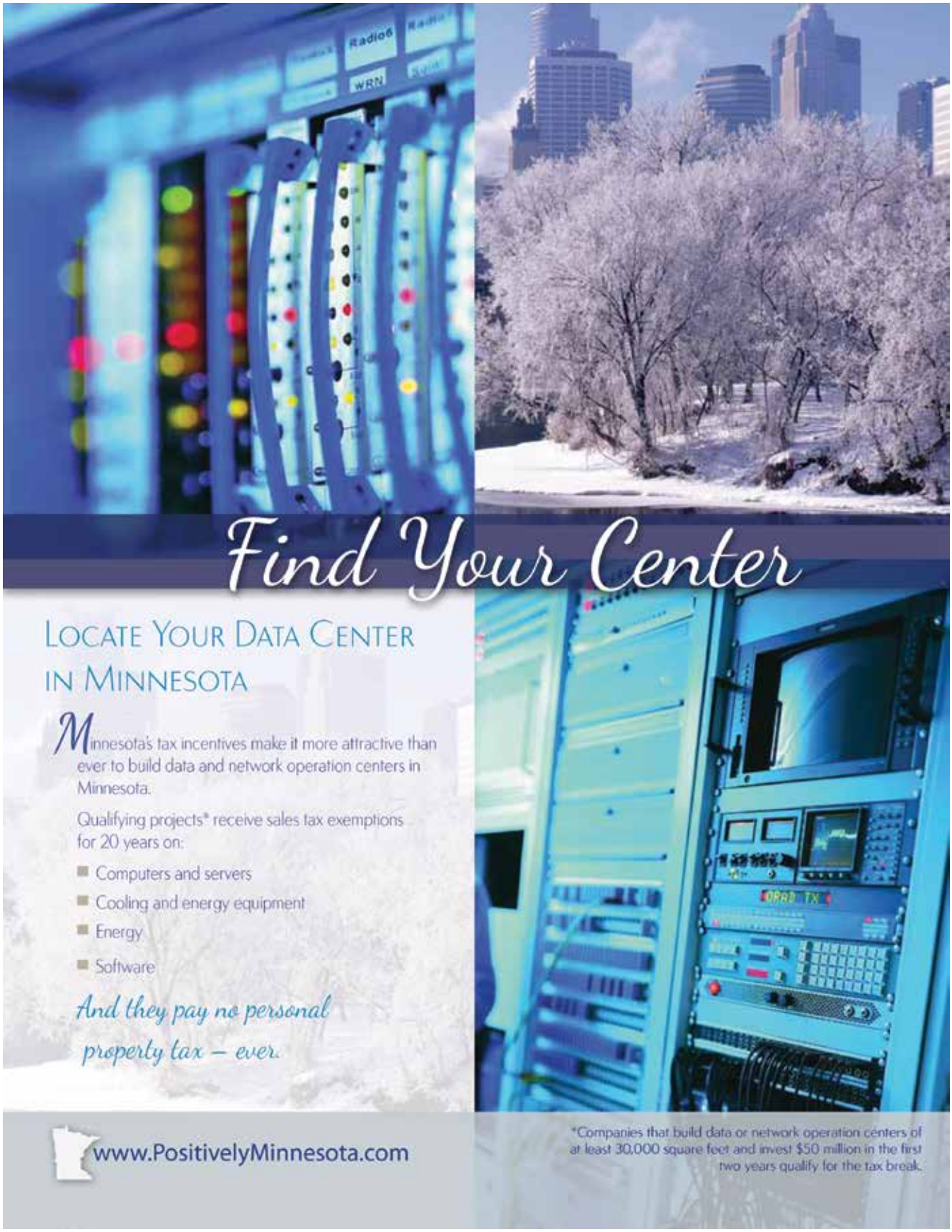
NEF utilizes its proprietary suite of database resources along with tribal knowledge and numerous industry relationships to add measured value to your search for connectivity. Having implemented thousands of network solutions over the past few decades, as well as helping organizations avoid costly builds in the wrong places, NEF leverages deep telecommunications experience to provide no-nonsense assessments and provider-neutral recommendations, including the following:

- ***Go/no-go recommendations on feasibility or availability***
- ***Report on available providers***
- ***Pricing for available providers (near-net and on-net)***
- ***Online reviews of options/solutions in FiberLocator***

By employing its knowledge, reach and carrier-neutrality, NEF has created a report designed specifically to help organizations avoid costly mistakes in buying the wrong network from the wrong provider. NEF works to ensure companies don't invest in a building without knowing its network capabilities first. NEF's deep and focused high cap and colo expertise, access to millions of fiber miles, and carrier-neutral mission enables trusted recommendations on the best, most feasible network solutions.

Disclaimer

APPENDIX V


Find Your Center
Locate Your Data Center in Minnesota
Minnesota's tax incentives make it more attractive than ever to build data and network operation centers in Minnesota.
Qualifying projects* receive sales tax exemptions for 20 years on:
Computers and servers
Cooling and energy equipment
Energy
Software
And they pay no personal property tax – ever.
www.PositivelyMinnesota.com
*Companies that build data or network operation centers of at least 30,000 square feet and invest $50 million in the first two years qualify for the tax break.

Find Your Center

Find Your Center: Lower Business Taxes

- At first glance, Minnesota appears to have high business taxes because its corporate income tax rate is higher than most states. However, other **favorable tax provisions produce tax competitive advantages for Minnesota.**
- **Minnesota does not tax personal property, intangible property, inventories, utilities, Internet access, information services or custom created software.** These exemptions, along with incentive packages and low tax liability on new investments, enable Minnesota to offer a generous tax package for prospective data centers.

Minnesota's business taxes rank among the 10 lowest in the nation, according to a report by Ernst & Young and the Council on State Taxation, which assessed business taxes as a share of private sector gross state product for fiscal year 2011.

Additionally, Minnesota's carryforward and lack of throwback encourages business startups, while the refundable research and development credit (10 percent for first $2.5 million, 2.5 percent thereafter) spurs Minnesota innovation and helps offset some tax liabilities.

CORPORATE INCOME TAX RATE

Corporate Income Tax Rate	Apportionment Formula (sales/ property/payroll)	Throwback Rule	Carryforward	R&D Credit
9.80%	90/5/5*	No	Yes (0 back, 15 forward)	Yes

*Minnesota is phasing in a single sales apportionment by 2014. Source: 2012 State Tax Handbook, CCH Inc.

Find Your Center: The Right Climate Reduces Utility and Other Costs

Cooler weather and less storm damage make Minnesota an ideal location for any data center. Data centers need to be continuously up and running. Minnesota's moderate climate means cooler temperatures and fewer storms. The cool year-round outside air provides any data center with a natural alternative to cool servers. This keeps down cooling costs and diminishes the economic burden of storm-related damage and downtime. Additionally, cutting edge technologies in data center cooling have been implemented globally using lake water. Minnesota has nearly 12,000 lakes of 10 or more acres.

MINNESOTA AVERAGE SEASONAL TEMPERATURES

Season	Temp (degrees F) Northern Minnesota	Temp (degrees F) Southern Minnesota
Winter	6	16
Spring	36	44
Summer	60	70
Fall	38	46

Source: Minnesota Department of Natural Resources Climatology Office historic climate data

Minnesota has some of the lowest energy costs in the country, and electricity is exempt from sales tax. With electricity use on the rise, a typical data center utilizing 120 to 200 million watts of electricity annually, can save millions of dollars (based on average electricity price per kilowatt/hour) by locating its operations in Minnesota, when compared to national averages.

MINNESOTA ENERGY RATES

	Minnesota	United States
Typical electric bill for industrial users	$29,678 per month	$37,331 per month
Typical electric bill for commercial users	$1,157 per month	$1,530 per month
Avg. annual electric price for industrial users	6.31¢ per kilowatt/hour	6.79¢ per kilowatt/ hour
Avg. annual electric price for commercial users	8.35¢ per kilowatt/hour	10.26¢ per kilowatt/ hour

Source: Electric Power Monthly, March 2011, Table 5.6.B, Average Retail Price of Electricity to Ultimate Customers by End Use Sector, by State, Year-To-Date Through December 2010 and 2009, U.S. Department of Energy, Energy Information Administration (www.eia.gov/electricity/monthly/current_year/march2011.pdf, accessed October 2011).

Some of the largest providers of electricity in Minnesota include: Minnesota Power, Xcel Energy, Great River Energy, Otter Tail Power, Cannexus Energy, Dakota Electric and East Central Energy. In addition, there are 125 municipally owned and operated electric utilities. **All of the electric utilities in the state offer both special high use rates and back-up power programs to select customers.** Minnesota also has one of the highest reliability rates for electricity in the country. Minnesota ranks at the high end of the first quartile for electric power reliability in the country.

Locate Your Data Center in Minnesota

Find Your Center: Reliable and Cutting Edge Infrastructure

Minnesota is heavily connected to fiber, cable, DSL and wireless broadband networks, with the infrastructure in place to help prospective data centers locate and expand.

72 percent of Minnesotans use broadband and over 95 percent of all households in Minnesota are served by broadband at speeds between 768 Kbps/200 Kbps and 3 Mbps/768 Kbps.

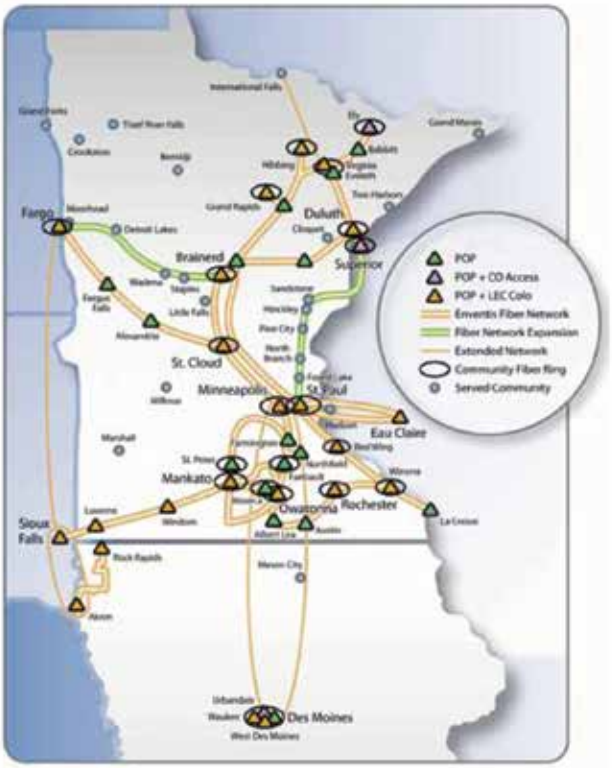
Median monthly bills for broadband services in Minnesota are lower than U.S. estimates.

BROADBAND IN MINNESOTA		
BROADBAND SERVICE - TECHNOLOGY	**Minnesota**	**U.S. Estimate**
DSL	41%	44%
Cable Modem	35%	34%
Dedicated Services	16%	17%
Fixed Wireless	13%	12%
Fiber	9%	9%
Satellite	4%	6%
BROADBAND SERVICE - STATISTICS		
Median monthly bill	$63.53	$68.32

Source: ConnectMN.org

TOP BROADBAND COMPANIES IN MINNESOTA (BY EMPLOYMENT)	
Company Name	**Employment**
Comcast Cable	1,200
AT&T	850
Dex One	305
Hickory Tech Corp	270
Arvig Communication Systems	202
Integra Telecom	200
Internet Broadcasting Systems	200
Comm-Works Holdings LLC	100
Egan Co	100
Evolution1	100
Garden Valley Telephone Co	100

Source: ReferenceUSA



Source: Enventis, Hickory Tech.

TIER THREE DATA CENTER ACTIVITY IN MINNESOTA SINCE 2007		
Company	**Square Feet**	**Investment**
UnitedHealth Group	250,000	$250 million
Thomson Reuters	50,000	$140 million
Target	161,300	$125 million
UnitedHealth Group	185,000	$125 million
Unisys	130,000	*
Iron Gate Solutions	80,000	*
CURRENT PROJECTS UNDERWAY		
Company	**Square Feet**	**Investment**
Inwolta	34,000	$12.8 million
Five 9's Digital	138,000	$75 - $100 million
Mayo Clinic	60,000	*
Visi Inc.	6,000	$10 million

*not available

Find your center in Minnesota. LOCATE YOUR DATA CENTER HERE!

Find Your Center: Networking Your Network

Nineteen Fortune 500 companies have their corporate headquarters in Minnesota.

2012 FORTUNE 1000 COMPANIES IN MINNESOTA

Company Name	Rank
UnitedHealth Group	22
Target	38
Best Buy	53
Supervalu	75
CHS	78
3M	102
U.S. Bancorp	132
Medtronic	164
General Mills	181
Land O'Lakes	210
Xcel Energy	246
Ameriprise Financial	248
C.H. Robinson Worldwide	259
Mosaic	268
Hormel Foods	327
Thrivent Financial for Lutherans	332
Ecolab	365
St. Jude Medical	437
Nash-Finch	498

Source: Fortune 500, 2012

Minnesota has the professional network and experience to help your data center succeed. Forty companies with 340 combined data processing, hosting, and related establishments (employing nearly 4,800 workers) are housed in Minnesota.

Among these are: Target, Century Link, Ceridian Corp., FIS, Datanetics, Computype, UnitedHealth Group, Unisys, Mayo Clinic., EMC Corp., 50 Below, and Adapt Inc.

POSITIVELY *Minnesota*

Department of Employment and Economic Development

Jim Gromberg · Office of Business Development
1st National Bank Building
332 Minnesota Street, Suite E200
Saint Paul, MN 55101-1351 USA
Phone: 651.259.7432, 800.657.3858
TTY/TDD: 651.296.3900
Jim.Gromberg@state.mn.us
www.PositivelyMinnesota.com

Find Your Center: High Quality, Reasonable Cost Workforce

Minnesota is a leader in connecting employers to the local workforce. Minnesota has a labor force of 2.6 million and an unemployment rate that was the 10th lowest in the U.S. in 2011 (6.7 percent). The state's average commute time was 22.4 minutes, ranking as the 17th lowest in the country.

Minnesota is ready to deliver a highly educated workforce for any data center, thanks to the second-highest high school graduation rate in the country.

Minnesota's colleges and universities awarded more than 261,000 degrees from 2006 to 2010. Of those, 127 doctorate degrees, 2,366 master's degrees and 4,363 bachelor's degrees were awarded in computer and information sciences. Additionally, Minnesota has 31 state-supported technical colleges, community colleges and universities.

EDUCATIONAL ATTAINMENT COMPARISON

Educational Attainment	MN	US	MN Rank
High school graduation or more	91.5%	85.3%	2nd
Bachelor's or more	31.5%	27.9%	11th
Advanced degree	10.3%	10.3%	18th

Source: U.S. Census Bureau 2012 Statistical Abstract

OCCUPATIONAL WAGE AND EMPLOYMENT COMPARISON

Occupation	Median Hourly Wage		Employment	
	MN	US	MN	US
Total, All Occupations	$17.73	$16.66	2,562,450	127,097,160
Computer and Information Research Scientists	$40.63	$49.54	170	24,900
Computer Systems Analysts	$36.60	$38.27	12,650	495,800
Computer Programmers	$32.96	$35.14	5,500	333,620
Software Developers, Applications	$43.05	$43.22	14,690	499,280
Software Developers, Systems Software	$45.87	$46.36	7,680	378,920
Database Administrators	$39.81	$36.17	2,060	104,080
Network and Computer Systems Administrators	$33.31	$34.04	9,490	333,210
Computer Support Specialists	$23.34	$22.77	11,400	579,270
Information Security Analysts, Web Developers, and Computer Network Architects	$39.54	$37.24	6,430	243,330
Computer Occupations, All Other	$36.34	$39.01	7,750	183,110
Actuaries	$46.04	$43.15	560	18,320
Operations Research Analysts	$30.57	$34.93	1,720	62,210
Statisticians	$40.62	$35.86	470	22,830
Mathematical Technicians	$27.87	$22.09	70	960

Source: Occupation Employment Statistics, Minnesota Department of Employment and Economic Development

1,000 10/2012

APPENDIX VI

DATA CENTER TAX REFUND CLAIMS FORM

INFORMATION BRIEFING

HOW TO PREPARE FOR THE DATA CENTER TAX REFUND CLAIM

OVERVIEW

An owner of a qualified data center may claim a refund of sales or use tax paid on enterprise information technology equipment and computer software used in the qualified data center.

Enterprise information technology equipment means computers and equipment supporting computing, networking, or data storage, including servers and routers. It includes, but is not limited to: temperature control systems and infrastructure, power infrastructure, racking systems, cabling, and trays, which are necessary for the maintenance and operation of the qualified data center.

If the qualified data center houses enterprise information technology equipment and software owned by different persons, the owners must file separate claims for the tax paid on the equipment and software they own.

QUALIFICATIONS

A qualified data center means a facility comprised of one or more buildings, consisting in aggregate of **at least 30,000 square feet**, where the total cost of construction or refurbishment, investment in enterprise information technology equipment and computer software is **at least $50,000,000** within a 24 month period. The facility must include the following characteristics:

Uninterruptible power supplies, generator backup power, or both

Sophisticated fire suppression and prevention systems

Enhanced security

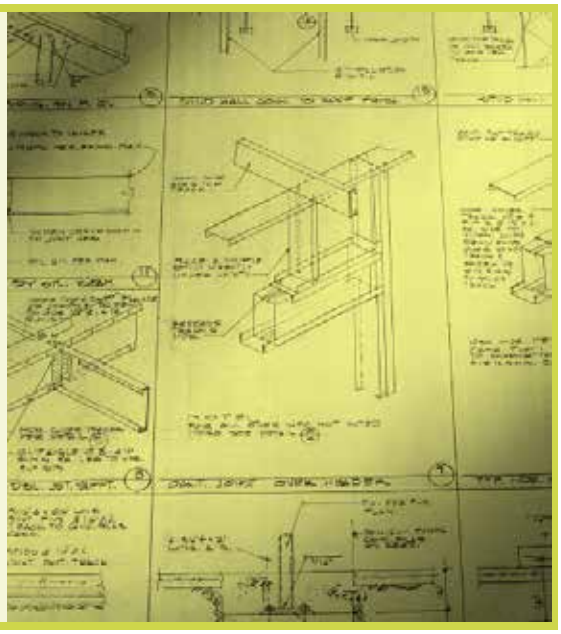
TIMEFRAME

1. Eligible purchases must be made after **June 30, 2012**.
2. Claims for refund of tax paid must be made after **June 30, 2013** and **within 20 years** of its first eligible purchase or June 30, 2042, whichever is earlier.

REQUIRED INFORMATION AND DOCUMENTATION

Project Information (if first claim):

- Project description
- Copies of all realty construction/improvement contracts involved, including all related addendums, attachments and/or schedules
- Map of project site with total project square footage
- Description of any office space, meeting space and mechanical facilities included in project square footage
- Planned construction or refurbishment cost summary
- Planned enterprise information technology equipment and computer software cost summary
- Date of first purchase of tech equipment
- Date of first capital purchase or construction or tech equipment



Schedule:

- Invoice number and date
- Vendor name
- Description of items purchased
- Detailed description of how equipment is used
- Purchase price and tax paid
- Whether sales or use tax was paid
- The date the tax was paid

If first claim is after 2-year period:

- Construction and refurbishment cost summary
- Enterprise information technology equipment cost summary

(Total of both must be greater than $50,000)

APPENDIX VII

AREA EVENTS & ATTRACTIONS

American Birkebeiner Cross-Country Ski Race

http://www.birkie.com/

The race known today as the American Birkebeiner began in 1973 as the dream of the late Tony Wise. Thirty-four men and one lone woman were on the starting line clad in woolen sweaters and knickers for the 50-kilometer race from the Lumberjack Bowl in Hayward to Telemark Lodge in Cable, Wisconsin. Nineteen more women and juniors would ski a shorter race from "OO" to Telemark. Few knew they were going to make history. There were no U.S. Ski Team members or foreign skiers, just a handful of enthusiasts from a couple of midwestern states, out to try something new. Many of the entrants were on cross-country skis for the first season - some for the first time. Today, over 11,000 skiers of all ages and abilities and 20,000 spectators from around the world gather every February in the Cable-Hayward, Wisconsin area to celebrate "The Birkie", a race which has become a legend in the cross-country ski world.

Amsoil Arena

http://decc.org/amsoil-arena/index.html

Through many years of planning and working closely with partners at UMD, the Amsoil Arena provides new opportunities to enjoy sporting events, major entertainers, more conventions, larger trade shows, and other events. The new arena seats 6,600 for men's and women's hockey and more than 8,500 for concerts.

Apostles Islands National Lakeshore

http://www.nps.gov/apis/index.htm

Along windswept beaches and cliffs, visitors experience where water meets land and sky, culture meets culture, and past meets present. The 21 islands and 12 miles of mainland host a unique blend of cultural and natural resources. Lighthouses shine over Lake Superior and the new wilderness areas. Visitors can hike, paddle, sail, or cruise to experience these Jewels of Lake Superior.

Bayfront Park

Bayfront Blues Festival

http://www.bayfrontblues.com

Since 1989, the Bayfront Blues Festival has featured more than 300 bands at Bayfront Park in Duluth's beautiful downtown waterfront district. This three-day event attracts thousands of visitors and blues music enthusiasts from across the nation, with acts like Blues Traveler, Los Lobos, Taj Mahal, Kenny Wayne Shepherd, Wilson Pickett and more.

Big Top Chautauqua

http://bigtop.org/

Lake Superior Big Top Chautauqua (sha-ta-qwa) is a year round non profit performing arts organization with a rich history. We operate an intimate 900-seat, all-canvas, state-of-the-art tent theater, producing and presenting a fifty-plus night summer season of concerts, plays, lectures, and a highly acclaimed professional local troupe which performs original multimedia musicals in the tent and on tour.

Boundary Waters Canoe Area Wilderness

http://www.bwca.com/

Great glaciers carved the physical features of what is today known as the Boundary Waters Canoe Area Wilderness (BWCA) by scraping and gouging rock. The glaciers left behind rugged cliffs and crags, canyons, gentle hills, towering rock formations, rocky shores, sandy beaches and several thousand lakes and streams, interspersed with islands and surrounded by forest. Approximately 1.3 million acres in size, the area extends nearly 150 miles along the International Boundary adjacent to Canada's Quetico Provincial Park and bordered on the west by Voyageurs National Park. The BWCA contains over 1200 miles of canoe routes, 15 hiking trails and approximately 2000 designated campsites.

Canal Park Business District

http://www.canalparkduluth.com

The historic Canal Park Business District once served as a warehouse district and manufacturing hub, but has since been revitalized as the epicenter of dining, shopping and recreational opportunities in the City of Duluth. Some of Canal Park's attractions include a three-mile long lakewalk, the Great Lakes Aquarium, the William A Irvin floating ship museum, numerous shops and restaurants and miles upon miles of beautiful sandy beaches.

Duluth Entertainment Convention Center

http://www.decc.org

The Duluth Entertainment Convention Center (DECC) provides the ideal setting for meetings and conventions. Panoramic views of Lake Superior and the Aerial Lift Bridge are a spectacular backdrop for the DECC's two ballrooms, 30 meeting rooms and 100,000 square feet of exhibit space. The Duluth Entertainment Convention Center is designed to suit every group and is barrier-free in compliance with the ADA.

Canal Park, Duluth, MN

Duluth Marcus Cinema & Ultrascreen

http://www.marcustheatres.com/Theatre/TheatreDetail/172/

The Marcus Duluth Cinema is your premiere entertainment destination featuring 10 state-of-the-art auditoriums. Located on the waterfront near the DECC, the Marcus Duluth Cinema & Ultrascreen provides an experience that transforms the viewer's surroundings from theatre to jungle, as the comfortable, reclining seats give way to a 65 foot wide, 3 story tall seat-of-your-pants excitement and adventure. Visitors become totally involved in the action that surrounds them on the screen overhead while a state-of-the-art, multi-channel sound system adds to the experience.

Duluth-Superior Excursions

http://www.vistafleet.com

Harbor cruises are one of the region's premier attractions. Visitors can enjoy the wonders of Lake Superior and the popular sights of the Duluth-Superior international harbor. Fully narrated sightseeing cruises are scheduled daily from May-Oct. During the cruise, your boat will pass under the famous Aerial Lift Bridge and out into Lake Superior. The tour then explores the harbor for a closer view of busy grain elevators, lake freighters and saltwater ships from around the world. Dinner and luncheon cruises are also available.

Glensheen Historic Estate

http://www.glensheen.org

The historic Congdon mansion is one of Duluth's premier estates, with over 7 acres located directly on the shore of Lake Superior. Glensheen features a 39-room Jacobean style mansion complete with custom designed original furnishings. The beautifully manicured grounds include formal gardens, carriage house with carriage collection, gardener's cottage, clay tennis courts and more. Completed in 1908, Glensheen is listed on the National Register of Historic Places.

Glensheen Historic Estate

Grandma's Marathon

http://www.grandmasmarathon.com

Grandma's Marathon is a point-to-point course run along the beautiful north shore of Lake Superior. The 26.2-mile stretch begins on scenic Old Highway 61, just outside Two Harbors, Minnesota and finishes in Duluth's Canal Park. Enthusiastic volunteers, spectators and live entertainers line the streets to cheer runners on as they stride to the finish line. Grandma's Marathon began in 1977 when a group of local runners planned a scenic road race from Two Harbors to Duluth, Minnesota. There were just 150 participants that year, but today, Grandma's Marathon is now a world-ranked race drawing more than 9,000 participants from across the globe each June.

Great Lakes Aquarium

http://www.glaquarium.org

Visitors can explore the magic of Lake Superior as otters scamper under waterfalls, gigantic sturgeon lurk in the two-story aquarium and large lake trout navigate their freshwater habitat, while a bald eagle presides over everything. With more than 120,000 gallons of freshwater displays, the aquarium provides an opportunity to dive into the history, culture, and majesty of Lake Superior, while daily programs and dive shows highlight some of the 70 species of freshwater fish, birds, amphibians, reptiles and mammals that are found in and around the Great Lakes.

Great Lakes Floating Maritime Museum

http://www.duluthfloatingmuseum.com

The William A. Irvin was the proud flagship of the U.S. Steel's Great lakes Fleet. In her working life the William A Irvin carried more than just millions of tons of rich, red iron ore; she transported dignitaries, the elite and the powerful of the day in her magnificently appointed, wood-paneled staterooms. Now a floating museum, the boat is permanently docked along the Duluth waterfront.

Heritage Sports Center

http://www.duluthheritagesportscenter.com

Set to open in the Spring of 2010, the Heritage Sports Center will be the cornerstone of the Heritage Village Development at the historic Clyde Iron property. With great accessibility from I-35 and all of Duluth's neighborhoods, the Village is sure to become a strong destination point for youth sports and private business development.

John Beargrease Sled Dog Marathon

http://www.beargrease.com/

At almost 400 miles, the John Beargrease Sled Dog Marathon is the longest sled dog race in the lower 48 of the United States. As an unofficial warm-up for the Iditarod in Alaska, the Beargrease Sled Dog Marathon sends teams of sled dogs up the North Shore of Lake Superior, on a historic wooded trail between Duluth and the Canadian Border. Crowds gather each year at Ordean Middle School on Duluth's east side, to pet the dogs and watch them take off on this exciting race - an experience that ius truly unique in the lower 48.

Lake Superior Hiking Trail

http://www.shta.org/

The Superior Hiking Trail (SHT) is a 205-mile long footpath that follows the rocky ridgeline above Lake Superior in northeast Minnesota from Two Harbors to the Canadian border. There are an additional 39 miles of trail through the City of Duluth from Jay Cooke State to Martin Road. The SHT has trail heads with parking lots every 5-10 miles making it ideal for both day hikes and backpacking. The trail has 81 backcountry campsites. There are no fees, reservations, or permits required to hike or backpack on the trail. The Superior Hiking Trail is built and maintained by the Superior Hiking Trail Association (SHTA).

Lake Superior Maritime Visitor Center

http://www.lsmma.com

Canal Park's Marine Museum draws more visitors than any other museum on Lake Superior. Film shows, model ships and exhibits feature the commercial shipping of Lake Superior and the Duluth-Superior Harbor. In the surrounding area, visitors can get within yards of the giant lake carriers and international ships that pass under the world-famous Aerial Lift Bridge. Sit back and enjoy the beautiful gulls, or walk along the canal's piers and explore its various lighthouses; either way, you're sure to enjoy the captivating sights of the Canal Park area.

Lake Superior Railroad Museum

The Depot, downtown Duluth

http://www.lsrm.org

Climb up into the cab of one of the world's largest steam locomotives and take the throttle of the huge Yellowstone Class Mallet. Take in the view from the cupola of a wooden caboose. Imagine what it was like to dine on the rails as you marvel at the one-of-a-kind dining car china and table settings, which are displayed in a restored, turn-of-the-century coach. Learn more about the history of railroading in Minnesota as you view the "William A. Crooks," the state's first steam engine, and explore the inside of the oldest known steam rotary snowplow still in existence.

The Depot, downtown Duluth

Lake Superior Zoo

http://www.lszoo.org

Looking for wild family fun? See hundreds of animals from around the world at the Lake Superior Zoo! The animal inhabitants are many and varied and include: Siberian tigers, African lions, polar bears, snow leopards, Alaskan grizzly & Kodiak bears, kangaroos, harbor seals, cougars, bats, colobus monkeys, cotton-topped tamarins, and ring-tailed lemurs. Just 10 minutes from downtown Duluth, the zoo is located at the base of West Duluth's Spirit Mountain, in Fairmont Park. The Lake Superior Zoo is the only Minnesota zoo outside of the Twin Cities metro area.

Mount Ashwabay Ski and Recreation Area

http://www.mtashwabay.org/

The Ashwabay Outdoor Educational Foundation, LLC (AOEF) was established in 2002 to develop, foster and encourage outdoor winter sports, such as Alpine and Nordic skiing and Snowboarding. The foundation wants to create opportunities for citizens to participate in and contribute to the outdoor culture of the region. With Mt. Ashwabay Ski and Recreational Area as the base for activities, the Foundation has an outstanding venue for healthful recreation that enhances physical fitness. As a family-oriented, community-based organization, the Foundation promotes high standards of fair play and sportsmanship.

North Shore Inline Marathon

http://www.northshoreinline.com

Following the same scenic course Grandma's marathoners have run along for the past 30 years, nearly 4,000 inline skaters test their endurance each fall in the North Shore Inline Marathon. As one of the country's most scenic and exciting inline skating events along, this 26.2 mile marathon begins just south of Two Harbors and continues along Scenic Hwy 61, rolling through the I-35 tunnels, and finishing at the Duluth Entertainment Convention Center (DECC).

North Shore Scenic Railroad

http://www.northshorescenicrailroad.org

The conductor checks your ticket and calls out "All Aboard!" Then, with a short blast of the whistle, the adventure begins! The train pulls out of the historic Union Depot in downtown Duluth and rumbles through the city, along the rugged shoreline of Lake Superior, and deep into the majestic northwoods. While riding in vintage coaches, you'll cross tall trestles over rivers that race down towards Lake Superior. All tours are fully narrated and lots of fun!

Richard I. Bong World War II Heritage Center

305 Harbor View Parkway, Superior, WI

http://www.bongheritagecenter.org

The Richard I. Bong World War II Heritage Center is a testament to the courage of a man and a nation. From the moment visitors walk through its doors, they travel back to a time when ordinary people became extraordinary heroes. Learn more about the global forces that pulled our country into war. Relive life on the home front. And above all, immerse yourself in the life of America's greatest fighter pilot, Richard I. Bong. Exhibits include "Marge," a fully restored P-38 Lighting WWII fighter aircraft, along with educational video theaters, flight simulators and an overview of the "Homefront" contribution to winning the war.

Spirit Mountain

http://www.spiritmt.com

Looking for some of the best skiing this side of the Rockies? With over 175 acres, 22 runs, a Big Air Terrain Park with Super-Pipe, 22 km of cross-country ski trails, and the best snow making and grooming equipment available, Spirit Mountain is designed to please everyone with some of the steepest vertical inclines in the Midwest.

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