

# Vital 21<sup>st</sup> Century "Infostructure"

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## Regional Cluster Initiative

- Action Item: Invest in regional infrastructure and institutions
- "Examine options for improving "infostructure" - both in terms of broadband connectivity for local governments, businesses and homes and data center capacity for growing IT cluster"

**3M**



THOMSON REUTERS



UnitedHealth Group

## 21<sup>st</sup> Century “Infostructure”

- Data Center Capacity
- Broadband Connectivity

## Data Center Capacity

- Two main types
  - Carrier hotel / colocation facility
    - e.g. 511 Building
  - Enterprise data center / hosted content server
    - e.g. UnitedHealth Group facilities
- Increasingly important in the modern economy, especially given move to “cloud” computing
- Minnesota is well-positioned to succeed
  - Cool climate
  - Stable geography
  - Skilled workforce

## Data Center Capacity

- Classified according to tier, 1 - 4
- Considerations
  - 2+ Internet uplinks
  - Redundant energy inputs
  - Redundant cooling systems
  - Square footage
  - Proximity to airports, railroad beds, interstate highways, flood plains

## One Recent Lead

- Fortune 1000 firm looking to site an enterprise data center facility
- Must be able to construct a new, 100,000 sf tier III data center
- Capital expenditure is \$100 million plus including building and equipment
- Minimum up to 30 acres
- Projected 30-60 jobs
- Average wage \$85K to \$175K

## One Recent Lead

- Power Requirement - annual usage 3 to 6 megawatts, 70% demand flow
- Strong preference for all utilities to be present at site already with ability to add second power feed within 2 years.
- Minimum of dual fiber provider options
- Minimum distance from rail: 1/2 mile
- Minimum distance from interstate: 1/4 mile
- Must be outside of 200 year flood plain
- Site must allow for burming/security fencing/private access

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## Broadband Connectivity

- Analogy: Next frontier of essential infrastructure
  - Intercontinental railroad (19<sup>th</sup> Century commerce)
  - Interstate highway system (20<sup>th</sup> Century defense)
  - “Information superhighway” (life in the 21<sup>st</sup> Century)
- Not all broadband is created equal
- Term encompasses wide range of service, increasingly becoming obsolete
- Fiber = “ultra-high speed broadband”

## Why Fiber?

- The need for speed:
  - Phone line = 56,000 bits per second (56 kilobits)
  - Cable = 2,000,000 bits per second (2 megabits)
  - Fiber = 1,000,000,000+ bits per second (1+ gigabit)
- Scalable, provides greater bandwidth
- Extends longer distances than copper cable
- Preferred medium for voice, video & data
- “Future proof”

## Broadband Service: U.S. versus the World

Average Values	US (Ranking)	Leading Country
Download Speed	8.9 Mbps (14 <sup>th</sup> )	93.7Mbps (Japan)
Monthly Price	\$53.06 (21 <sup>st</sup> )	\$31.18 (Finland)
Price/Mbps	\$12.60 (11 <sup>th</sup> )	\$3.09 (Japan)
Price/Mbps Fastest	\$2.83 (18 <sup>th</sup> )	\$0.13 (Japan)
Growth of new subscriptions	4.21% (15 <sup>th</sup> )	6.60% (Ireland)

## Brookings Studies (2007, 2011)

- For every 1 percentage point increase in broadband penetration, state employment increased by 0.2 - 0.3 percent annually
- Manufacturing and service sector **employment increased with broadband** penetration; within the service sector, this was especially true of finance, education, healthcare jobs
- State **output of goods and services was correlated with broadband** penetration
- Full economic impact of broadband was hard to measure
- **Data consistently showed that broadband is essential infrastructure**
- The study concluded that **all levels of government should pursue policies promoting broadband competition**, which tends to result in lower prices for consumers and greater use throughout the community

## General Landscape

- Most major metro markets are dominated by established teleco and cable providers
- Infrastructure is often dated; cable or T-1 lines
- Service can be limited and/or expensive
- Fiber is not always available for government, business or residential customers; if so, often very expensive
- Many cities and counties receive services on existing "I-net" arrangements through the Universal Services Fund; good deal for now, no guarantees for the future

## In Minnesota

- More and more local governments are investing in fiber networks; in metro:
  - Scott County, 100+ miles of redundant fiber connectivity linking county, city and school facilities
  - Anoka and Carver counties currently building
  - Ramsey County in early stages
- Several similar projects in Greater Minnesota

## In Minnesota

- Mostly county-led, but some cities have taken the initiative
  - Chaska, Minneapolis, Monticello, Windom
  - Eagan, Lake Minnetonka, North St Paul, Prior Lake, St Louis Park
- Some projects focus on the business of government, others on extending service to business and residential customers

## Municipal Broadband

- Various approaches and levels of government involvement
  - Publicly owned and operated
  - Public-private partnership
  - Often, but not always, involve existing utilities
- Incorporation of fiber, wireless and Smart Grid technologies, e-government applications
- "Broadband is no different than roads, sewer, water, natural gas, electricity or telephone ... a 21<sup>st</sup> Century utility"



## Spectrum of Activity

- Local policy and regulation
- Networks for government
- Public-private partnerships
- Dark fiber and open-access networks
- Direct service provision (competition)

## Minnesota Resources

- League of Minnesota Cities
- Institute for Local Self-Reliance
- Humphrey School Telecommunications (TISP) Forum
- Blandin Foundation

## National Resources

- Broadband Communities
- Fiber-to-the-Home Council
- Intelligent Community Forum
- National Association of Telecommunications Officers and Advisors (NATOA)

## Opportunity for RCM

- Jobs and Economic Development Committee attention?
- Potential for multi-partner project?
  - Education and best practices review
  - Local outreach and education
  - Regional broadband assessment
  - Standing resource / clearinghouse with metro focus

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