

E³ Ventures
for
**Michigan Economic
Development Corporation**

LinkMichigan

November 20, 2001

LinkMichigan

Contents:

- **The Broadband Vision and Current Status**
- **Benefits of LinkMichigan**
- **LinkMichigan Backbone and Access Network Costs**
- **Next Steps**

The Networked World

- **The proliferation of the Internet, mobile phones, communications devices, ecommerce, Has profoundly changed our world.**
- **These changes mark only the very beginning of a new age of anytime/anywhere connectedness. The emergence of the networked world.**
- **This phenomenon foretells a dramatic transformation in the very nature of our economies, societies and governments as well as interpersonal and international relationships.**
- **Five key criteria need to be met in order to start this dramatic transformation.**
 - **The Network Infrastructure - (A statewide hi speed highway reaching both urban and rural densities)**
 - **The Network Access - (The on/off ramps to the highway serving those communities in need)**
 - **The Standards/Protocols/policies on rights of way,privacy, competition, taxation, authentication - (The enforcement rules of the highway)**
 - **A Public/Private initiative for getting the wheels in motion in the right direction.**
 - **The Appliances/ Devices/ Applications and Services - (The cars, trucks, pedestrians).**

An explosion in usage of “the Network”

- **Businesses will incorporate the Network into every aspect of their operations, creating greater efficiencies, spurring innovation, and connecting on-line to everyone that is part of the business both internally and externally.**
- **Governments will use the Network to run operations more efficiently internally and to serve constituents 24x7 externally.**
- **Schools use the Network to connect students, teachers and parents, improve learning using digital content; and manage administrative responsibilities more efficiently.**
- **Health Care providers interact with their patients online and perform some consultations and procedures remotely.**
- **Public health/safety and other community based organizations are able to use the Network to intercommunicate amongst themselves and the community to make their services available to anyone, anywhere, any time and even through emergencies.**
- **People will continually and easily upgrade their skills to adjust to new technologies and best practices. On-line job banks are able to dynamically match employees with openings and connect to training/education programs to identify changing workforce skills requirements.**

“The \$500 Billion Opportunity”

- A new study says widespread deployment of broadband technology could have an economic benefit for US consumers and producers of \$500 billion a year or more.
- The economic benefit is assessed on the future of broadband penetration increasing from its present day 8% to levels ranging from 50 - 94%
- The study suggests that universal deployment of Broadband services will result in “huge network effects for consumers” including falling prices.
- It also says new wired or wireless applications will not develop until broadband becomes more ubiquitous
 - The study was commissioned by : Verizon Communications, Inc. and co-authored by The Brookings Institution.

A Gartner study for MEDC concludes that the economic benefit of a ubiquitous broadband infrastructure for the State of Michigan will be in the range of \$300 - \$500 Billion over a ten year period

The Elusive Economics of “the Network”

The value of a network explodes as its membership increases, and then the value explosion attracts yet more members, compounding the result.

In networks, we find self reinforcing virtuous circles. Each additional member increases the networks value. Which in turn attracts more members, initiating a spiral of benefits.

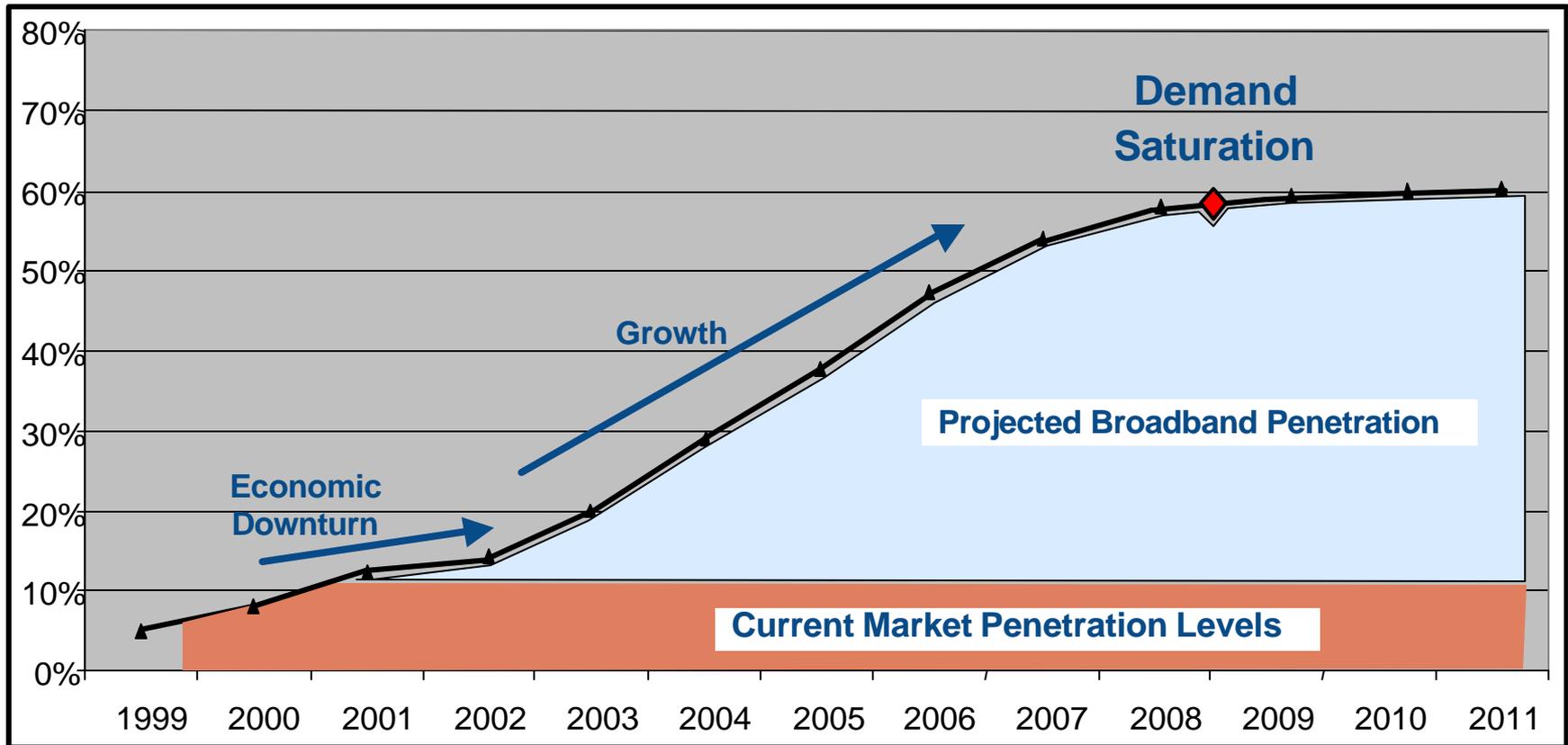
Mathematics says the sum value of a network increases as the square of the number of members. Hence value increases exponentially with each member added.

“The self-organizing techno-economic paradigm of the Internet cannot be understood by conventional arguments of economic growth”

- University of Texas Broadband Study

Projected Broadband Growth

Broadband Penetration of Internet Households



Projection is for 60% of Internet Households to utilize broadband access by 2010

Source: 10/01 Gartner composite model of multiple industry projections

Michigan's Current Broadband Status

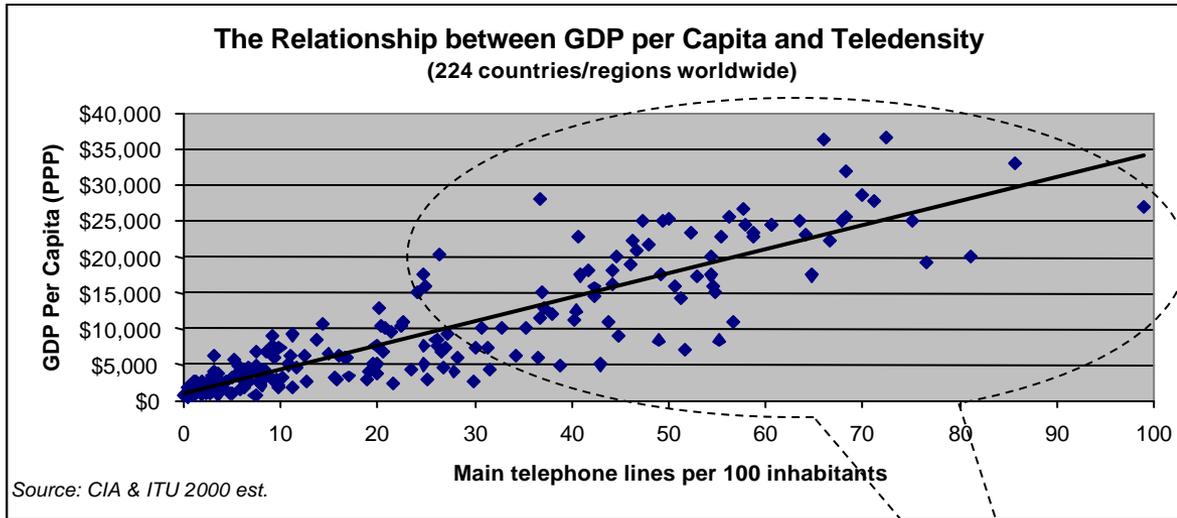
- Michigan closely tracks with socioeconomic breakdowns of the US market
 - Population diversity by life stage
 - Households owning a PC
 - Internet connectivity
- Michigan has 3.5%+ of U.S. population and is ranked as 8th largest state
- However, the August 2001 FCC report shows Michigan:
 - 198,200 broadband lines (all types) deployed
 - Ranked 10th with 2.7% of total broadband access lines deployed
1.3% of ADSL & 3.6% of cable modems
 - Ranked 24th in growth rate of deployed broadband lines
- Studies show that Michigan ILEC per-line investments in 2000 & 2001 were lowest in the U.S.
- ILEC's are far from goal of DSL availability to 80% of customers by 2002
 - Have curtailed broadband programs dramatically

Michigan, already behind, will fall further behind other U.S. markets in broadband availability in the future unless appropriate alternative steps are taken

The Benefits of LinkMichigan

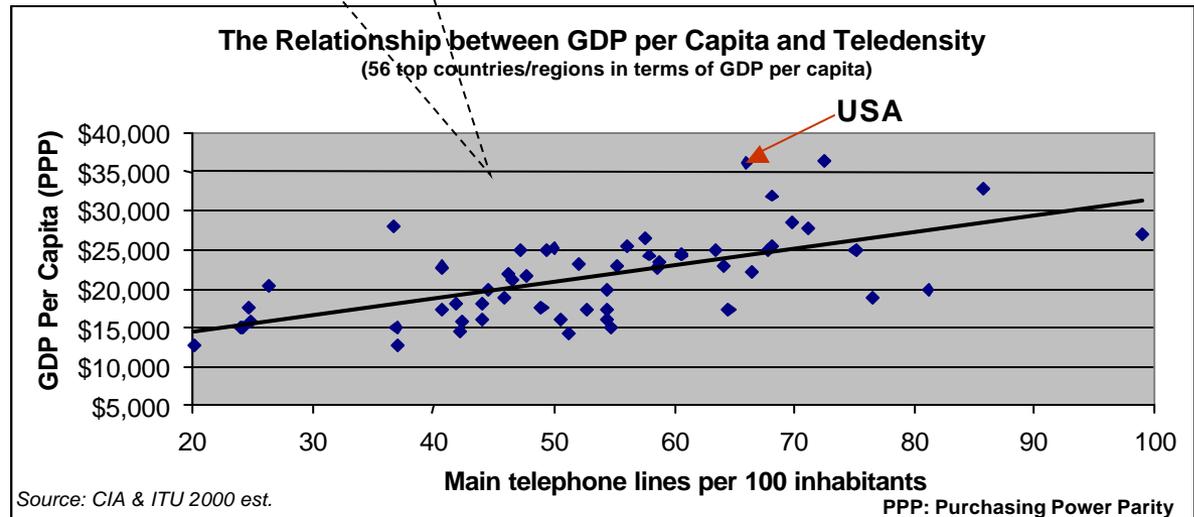
The Model

There is a known and tracked (by ITU) correlation between the GDP per capita and the penetration of telephones in a country.



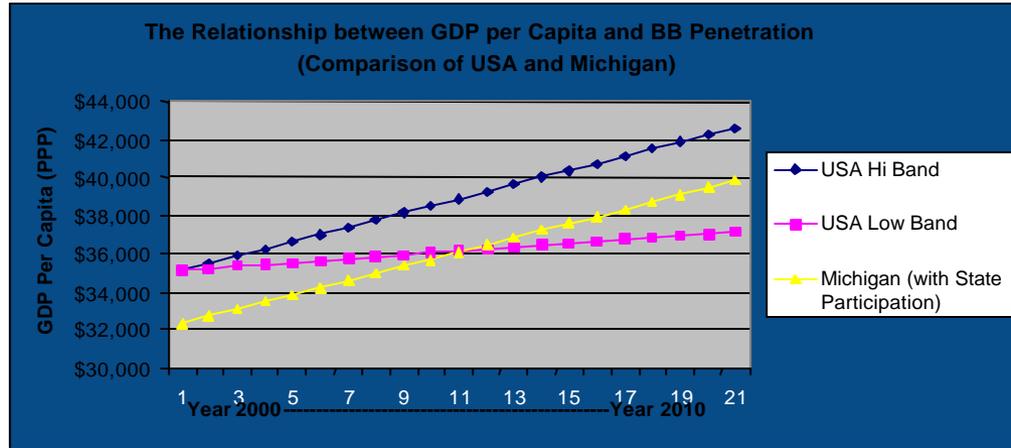
Teledensity is a recognized proxy for socioeconomic growth

The U.S. teledensity and resulting economy are an anomaly and represent a high-end result of early adoption of computing & Internet technologies



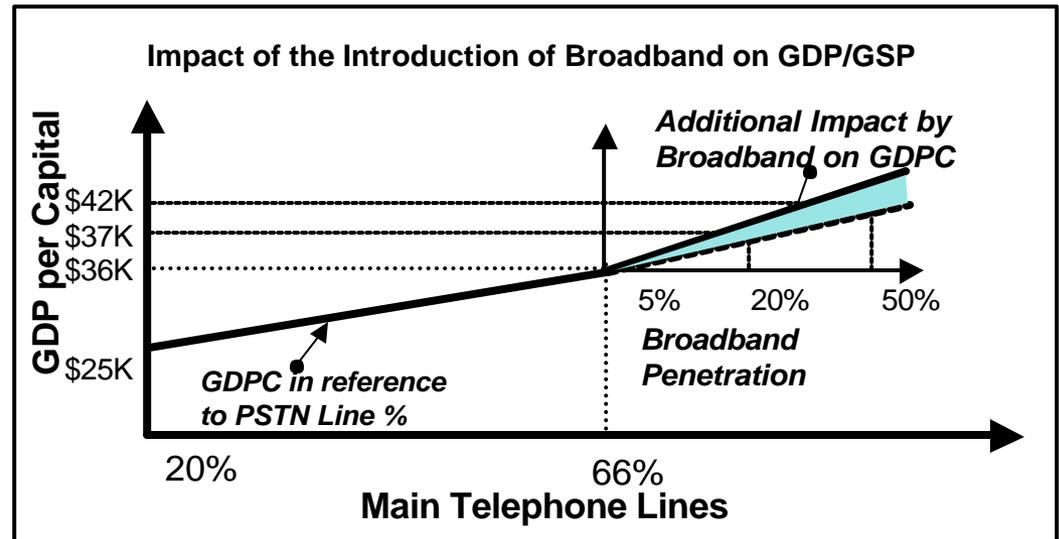
The Model

Similarly, the introduction of broadband connectivity will have a major impact on the productivity and GDP/GSP per capita gains.



- By taking alternative steps such as LinkMichigan initiative, the state GSP can recover to national average levels

- For advanced countries in terms of teledensity, a broadband infrastructure can add incremental growth to GSP.



The Model Results

Relative Distribution of GSP Gain Through State Broadband Initiative

Broadband Impact Index	NAICS Description	Employees 1999	Job Added '99-'10 -- Natural Growth	Job Added '99-'10 -- By BB Only	Employees 2010	Total GSP Gain (over 10 year) in US\$million
(1~20)						(differential of state and non-state participation)
1	11 Forestry, fishing, hunting, and agriculture support	3,736	665	0	4,401	\$33
4	21 Mining	6,788	1,208	0	7,996	\$243
20	22 Utilities (Communications included)	24,941	4,438	6,070	35,449	\$5,385
5	23 Construction	189,303	33,686	0	222,989	\$8,469
12	31 Manufacturing	816,625	145,318	114,501	1,076,443	\$98,113
12	42 Wholesale trade	189,534	33,727	26,575	249,836	\$22,771
12	44 Retail trade	541,841	96,420	75,973	714,234	\$65,099
7	48 Transportation & warehousing	95,562	17,005	7,621	120,188	\$6,390
20	51 Information	93,828	16,697	22,835	133,360	\$20,259
15	52 Finance & insurance	169,065	30,085	30,085	229,235	\$26,117
5	53 Real estate & rental & leasing	57,107	10,162	0	67,269	\$2,555
15	54 Professional, scientific & technical services	202,469	36,029	36,029	274,527	\$31,277
10	55 Management of companies & enterprises	148,486	26,423	17,175	192,084	\$14,590
9	56 Admin, support, waste mgmt, remediation services	285,768	50,852	29,599	366,219	\$25,034
11	61 Educational services	55,867	9,941	7,144	72,953	\$6,095
12	62 Health care and social assistance	492,761	87,686	69,091	649,538	\$59,202
9	71 Arts, entertainment & recreation	44,633	7,942	4,623	57,198	\$3,910
9	72 Accommodation & food services	322,205	57,336	33,373	412,914	\$28,226
8	81 Other services (except public administration)	180,587	32,135	16,543	229,265	\$13,931
5	95 Aux. (corporate, subsidiary & regional mgmt)	69,529	12,373	0	81,902	\$3,110
5	99 Unclassified establishments	5,665	1,008	0	6,673	\$253
	Total	3,996,300	711,137	497,238	5,204,675	\$441,064

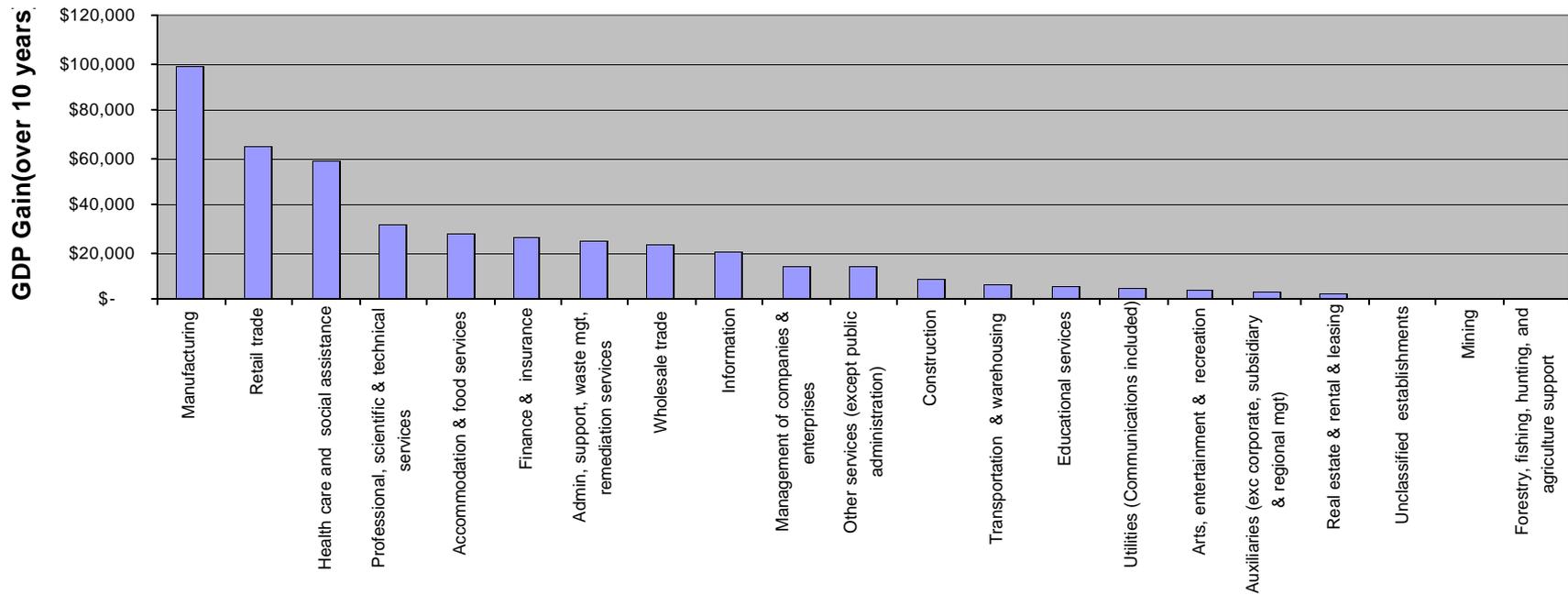
Note:

1. Growth of employment at each sector is adjusted according to productivity gains/overall sector growth.
2. The total employment growth due to BB is 1.07%, which represents ~500k new jobs.
The natural growth rate is projected at 1.5% for the next 10 year, which translates into 711K new jobs.
3. GSP gain is unevenly spread through the industrial sectors.
4. All \$ figures are assumed at current dollars.

The Model

A prioritized view of the significant gains in GSP by industry sector

Distribution of \$440 Billion GSP Gain (over 10 years) Among Industrial Sectors Due to Introduction of BB Infrastructure By the State

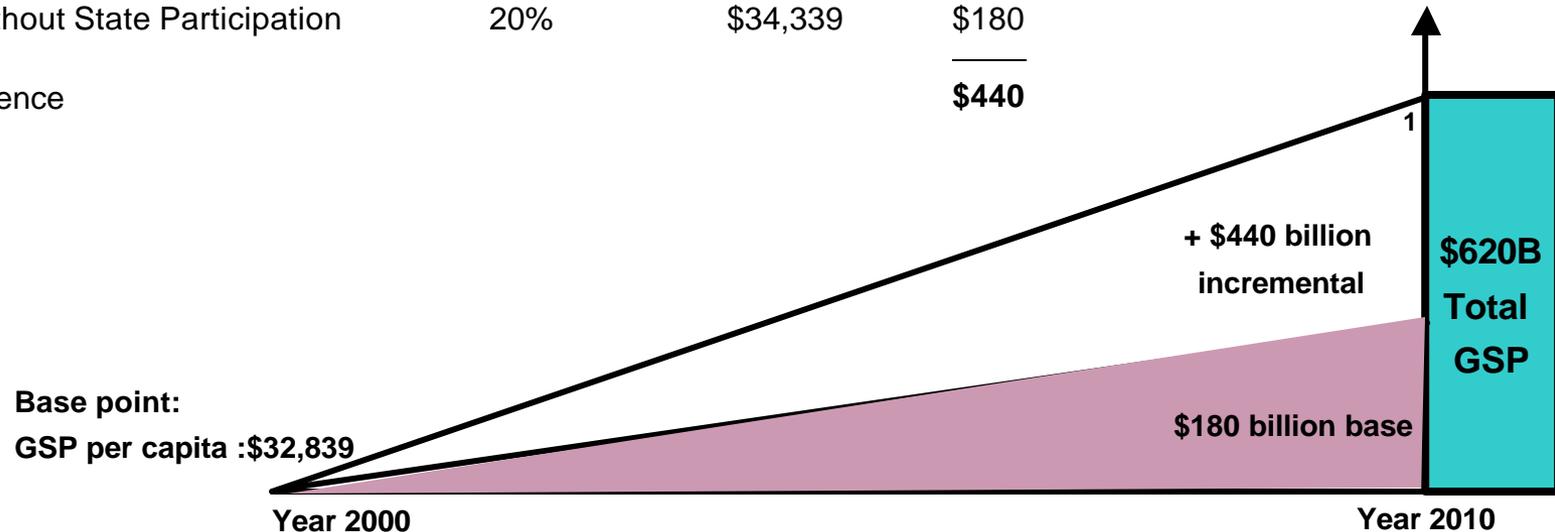


Growth will also benefit traditional industry sectors.

The GSP Model

The increase in Michigan GSP credited to the introduction of a state-wide broadband infrastructure will be \$440 billion over a 10 year period.

	Broadband 10-Year Penetration Rate	GSP Per Capita	GSP Gain (\$billion)
1. State Participation	50%	\$39,839	\$620
2. Without State Participation	20%	\$34,339	\$180
Difference			<u>\$440</u>



Sample calculation:

$$\begin{aligned}
 \$620 \text{ billion} &= 0.5 \times [10 \text{ years}] \times [(GSP \text{ in year } 10 \times \text{Population in } 2010) - (GSP \text{ now} \times \text{Population in } 2000)] \\
 &= 0.5 \times 10 \times [(\$39,839 \times 11.3M) - (\$32,839 \times 9.9M)]
 \end{aligned}$$

LinkMichigan Initiative Benefits

Increased Employment

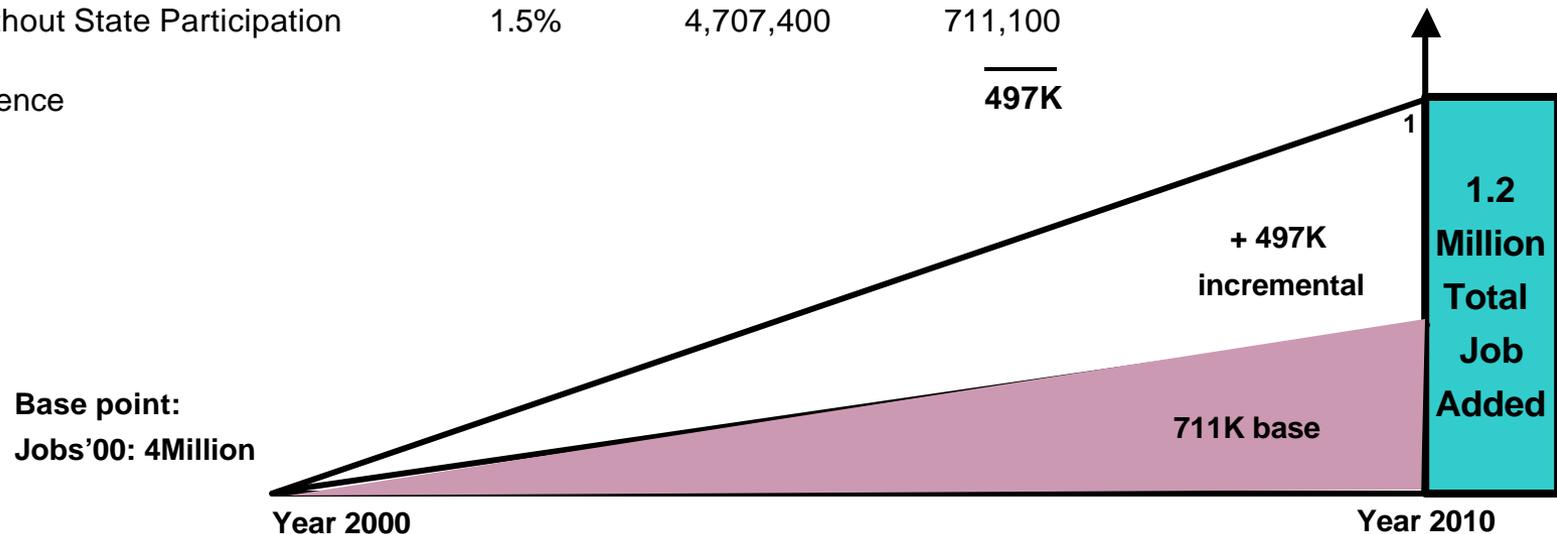
- **A viable broadband infrastructure with nearly ubiquitous access to business and residence promotes expansion of the “Internet economy”**
 - The “I” economy is transforming business structures and Business-to-Business (B2B) and Business-to-Consumer (B2C) relationships
 - This is creating new jobs
 - New hires and new opportunities within e-business companies
- **Driven by growth related to the Internet Economy, Michigan is estimated to gain 700,000 new jobs over the next 10 years**
 - 525,000 traditional jobs
 - Sales & Marketing; Finance; Administration; Manufacturing; Operations; etc.
 - 175,000 hi-tech jobs
 - Information Technology; Communications; Dot Com; Etc.
- **The ubiquity of the LinkMichigan initiative would drive an additional 497,000 incremental new jobs in the next 10 years**

Total employment gain — 1,200,000 jobs

The Employment Model

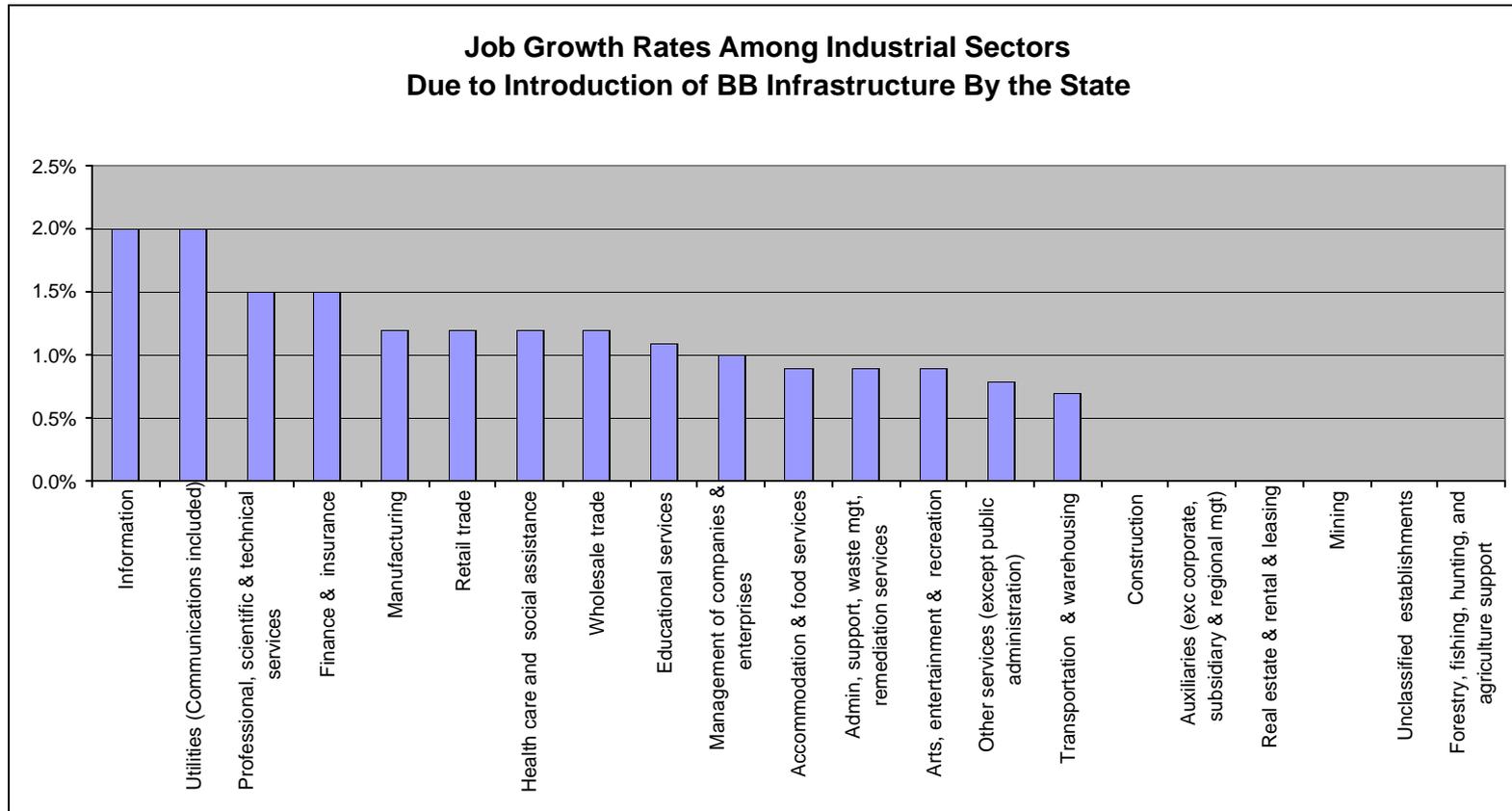
The increase in Michigan jobs credited to the introduction of a state-wide broadband infrastructure will be 497,000 over a 10 year period.

	10-Year Job Growth Rate	Total Employment	10-Year Job Added
1. State Participation	2.5%	5,204,600	1,208,375
2. Without State Participation	1.5%	4,707,400	711,100
Difference			<u>497K</u>



The Model

View of new jobs stimulated by LinkMichigan



Highest growth rate in high-skilled, high-paying sectors.

LinkMichigan Summary Benefits

Increased Security

- **LinkMichigan will increase and ensure the security, redundancy and reliability of the State's telecommunications infrastructure by spurring more rapid broadband deployment to provide ubiquitous availability throughout the State.**
- **Broadband facility deployment increases redundancy since such facilities increase the routing diversity available in the communications infrastructure.**

- Data hubs and remote terminals, which are the collection and distribution points for broadband traffic tend to be located in places other than the traditional wire centers built to handle concentrations of voice traffic.

Through route diversity, broadband deployment increases the overall reliability and security of the communications infrastructure in times of crisis.

- **In times of emergency more ubiquitous deployment of high-capacity facilities enables people to carry on work from remote locations.**
- **Recent events will spur development of low-cost video communications and conference equipment that will enable broadband communications to reduce the amount of needed business travel.**

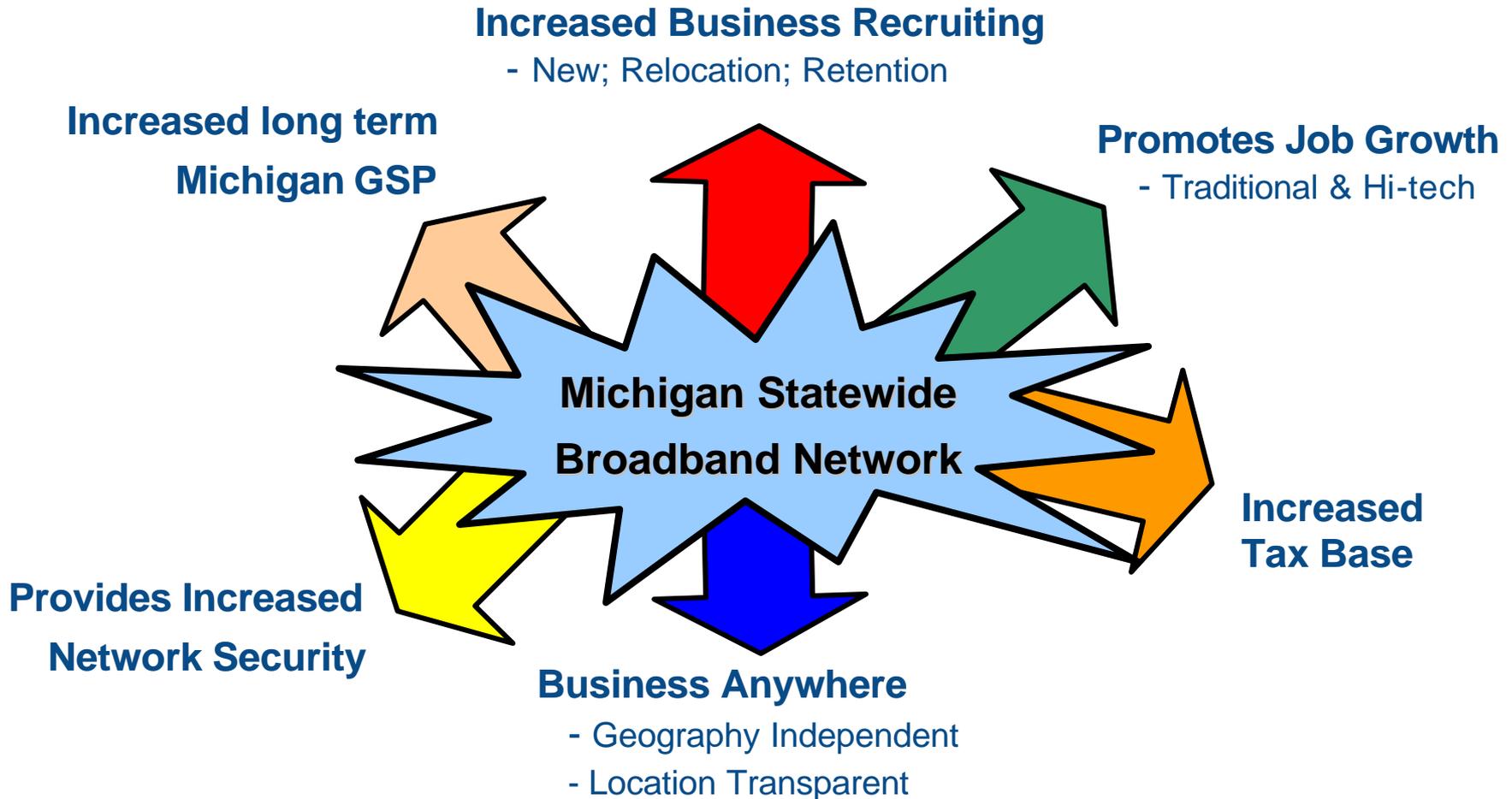
LinkMichigan Summary Benefits

Increased Tax Base

- **The State of Michigan and Local and County governments will benefit from an expanded business and consumer base**
- **The broadband infrastructure promotes:**
 - **Expanded business base with increased real property valuation**
 - Increased Property Tax base
 - Increased Inventory Tax base
 - **Expanded employment with increased wages**
 - Increased Income Tax base
 - **Expanded sales and revenues**
 - Increased Sales Tax base

Enhances state and municipal revenues

Tangible Benefits of a Broadband Infrastructure



The Gartner economic benefits model indicates an incremental \$440B LinkMichigan benefit to the Michigan GSP over the next 10 years

The Backbone Network Model

LinkMichigan Objectives

MEDC Objectives

- **Create statewide broadband backbone network — promote development**
 - Accessible transport
 - Promote access competition — business and residential
 - Operator built, owner, operated and maintained for profit
- **Aggregate communications traffic for state agencies into one contract to attract increased operator participation**
 - Voice/data/video
 - 150+ prioritized access communities identified statewide (“the Purple Dot map”)
 - RFP to be issued
- **Network-wide provision of excess capacity to be readily available for lease to local access competitors.**
 - Excess channelized (DS3/OC-3, etc.) capacity
 - Lease of dark fibers

Backbone Network Design: Objectives

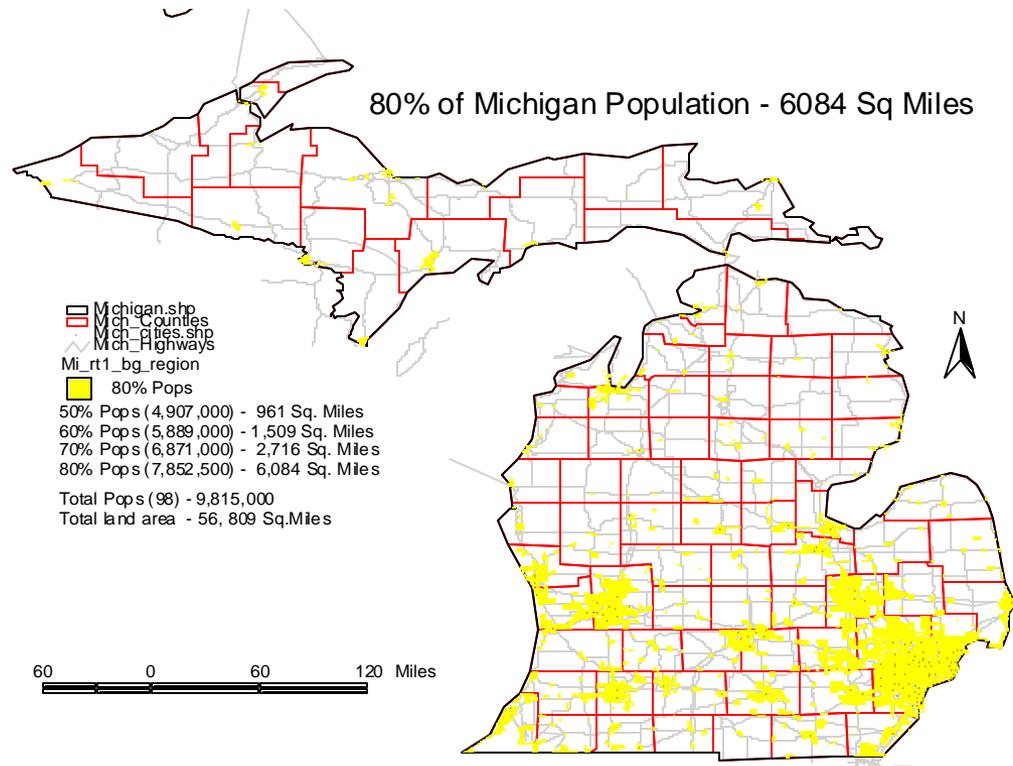
- **Statewide coverage: phased to communities of interest as provided by state**
 - “Purple Dot” map, objectives and prioritization listings
- **Broadband capacity to serve state needs with growth considerations**
 - State agency connectivity within communities of interest
 - Voice, data and video access and transport
 - to/from 150+ nodes and off-network access required
- **State requirements not fully defined**
 - Services required by node TBD
 - Traffic requirements at each node TBD
 - Traffic routing patterns between nodes & off-net TBD
- **State network design objectives**
 - QoS and assured performance
 - Security
 - Survivability
 - Cost effective
 - Ease of traffic growth and network expansion
 - Converged traffic on common backbone infrastructure

LinkMichigan network as modeled has inherent growth and expansion capabilities to scale to meet current and forecast demands

Potential Issue — Population Concentrations in Michigan

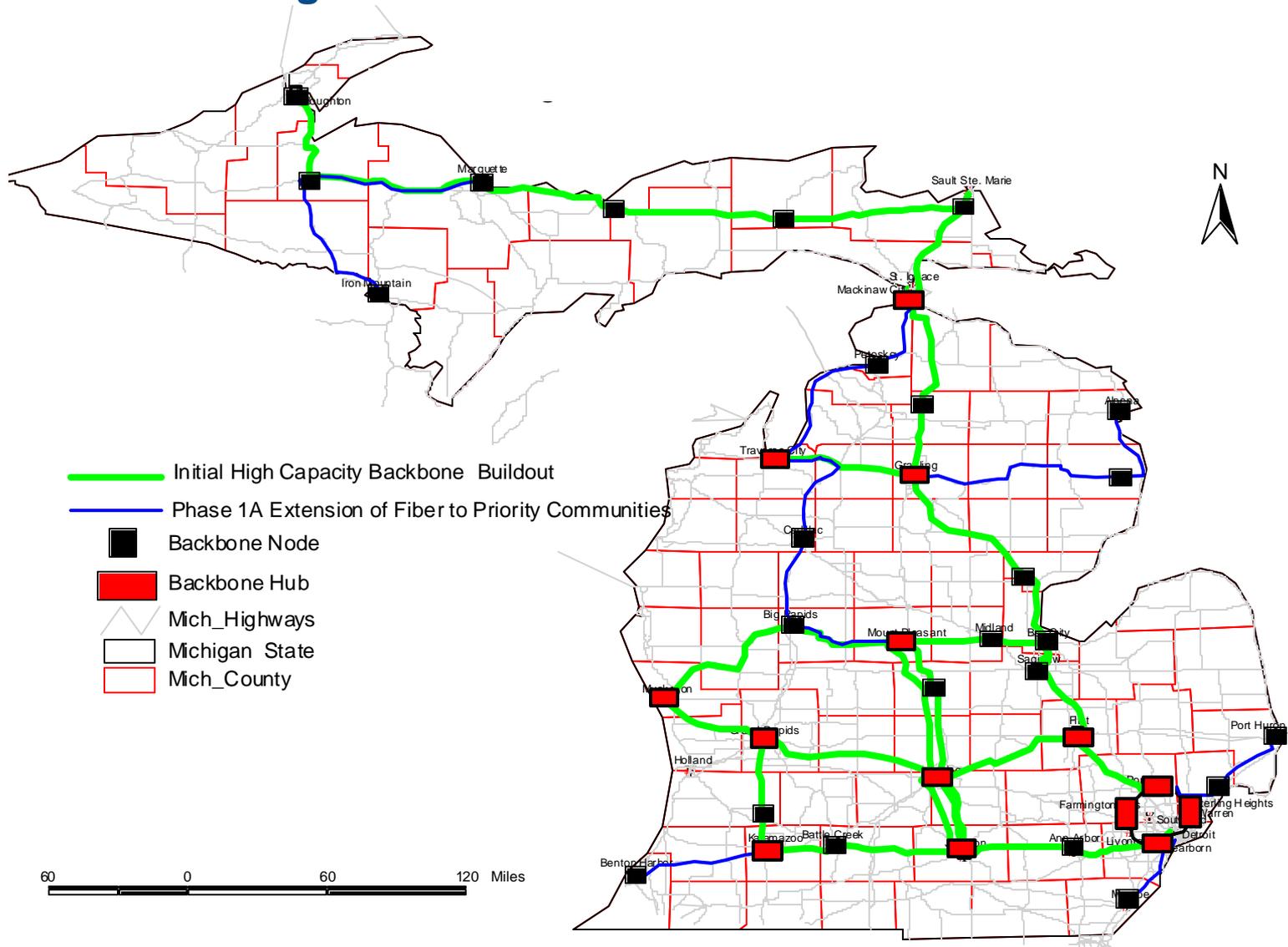
Light Density in Upper Portions of State

- **80% of Michigan residents live in 11% of the land area of the State.**
 - Population density of ~1900 people per square mile
- **20% of Michigan residents live in 89% of the land area of the State.**
 - Population density of ~39 people per square mile
- **Survey indicates little interest in broadband access among the 20% of population in rural areas.**

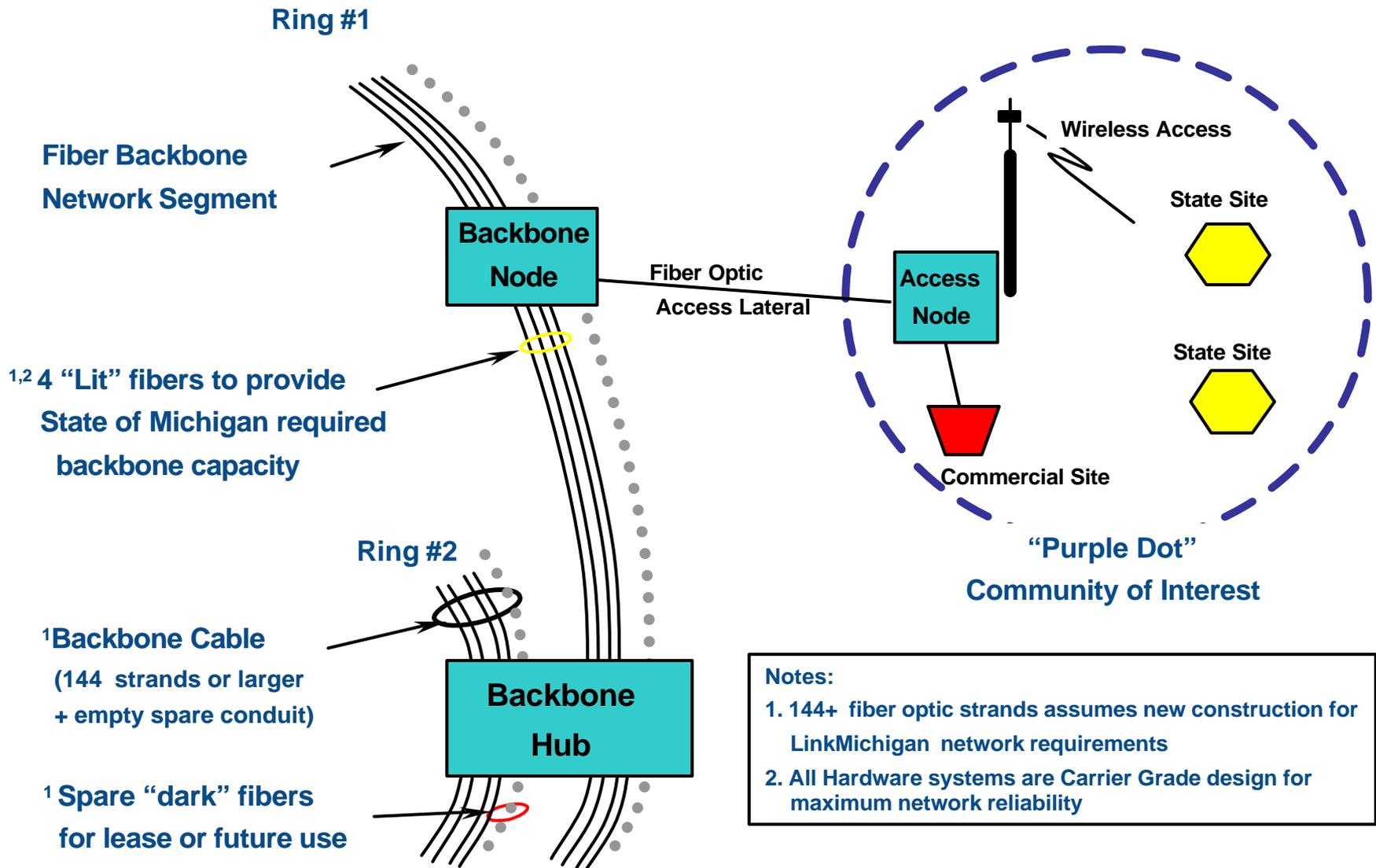


Operator built, owned, operated and maintained “for profit model may not work in rural areas without incentives.

LinkMichigan Broadband Backbone Network Phase 1 & 1A Configuration



LinkMichigan Fiber Optic Network Architectural Overview



LinkMichigan Statewide Backbone Rollout

Requirements by Year

Net. Element Description	Deployment Year							Cum.
	1	2	3	4	5	6	7	
Fiber Miles*	1071		395	1077		est. 100		2643*
Backbone Hub	4	9	1	0	0	0	0	14
Backbone Node	4	10	12	7	7	5	5	50
Access Node	5	15	34	26	26	30	30	166

Phase 1

Phase 1A

*Network rollout based on Gartner estimated
7 Year Network Construction Project Plan*

Phase 2

Phase 3

* = Route Miles

A Local Access Model

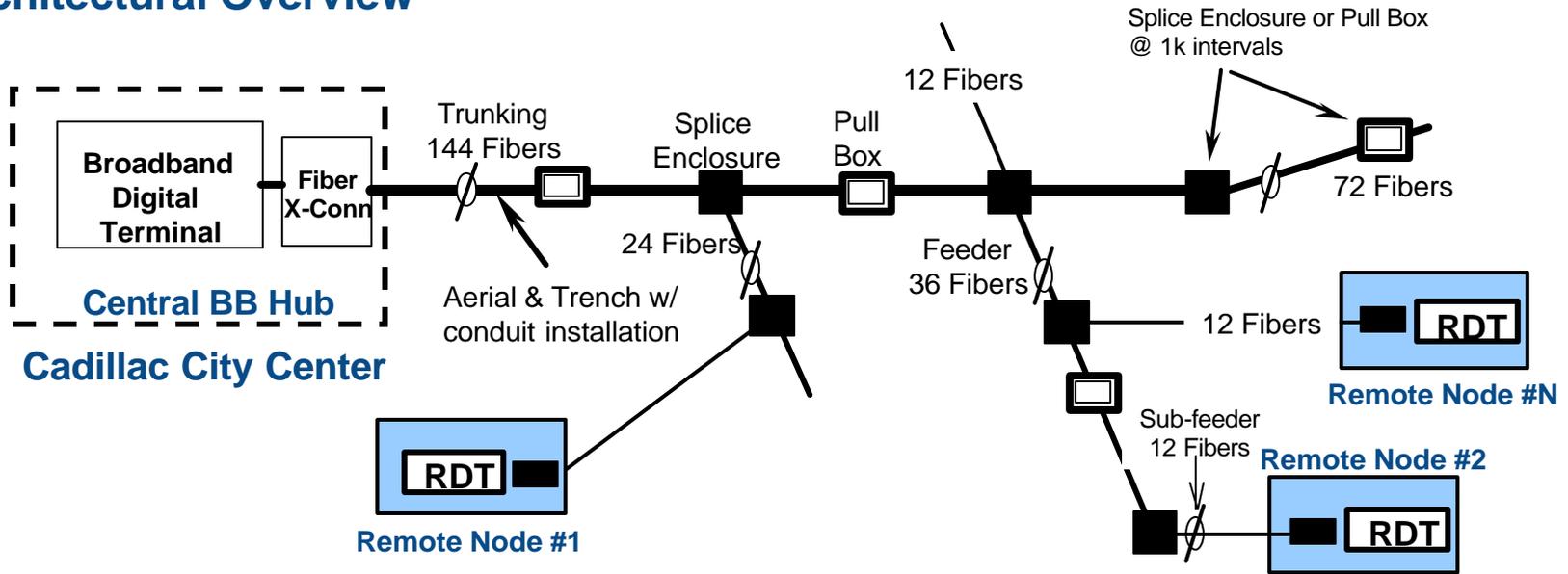
Cadillac Michigan: Local Broadband Access Network

High-level Cost Model

- **Cost Model provides voice, entertainment video and high-speed data services to an area within a 3 mile radius of city center.**
 - Coverage area can be expanded to additional areas as desired and economically justified
- **Model is based on a Fiber to the Node (FTTN) distribution architecture that combines fiber trunks to Remote Nodes supporting Very high-rate DSL (VDSL) access lines via copper plant distribution.**
- **The cost model provides coverage for approximately 60sq. miles around Cadillac city center.**
 - An estimated 58 Remote Nodes are required to provide coverage to the area.
 - Estimated 200 route miles of distribution for the coverage area
- **The model assumes the presence of incumbent telephone and CATV operators with an overlay coverage model and projected penetration rates. (<40%)**
 - 6261 HH and 1039 Enterprise Premises passed by network
 - 2400 active subscribers assumed for costing
- **Cost model is for capital expenses (CapEx) only and does not include cost of backbone connections, ongoing operations or costs of content. (staffing, video feeds or Internet connections, etc.)**

Cadillac: Access Distribution Model

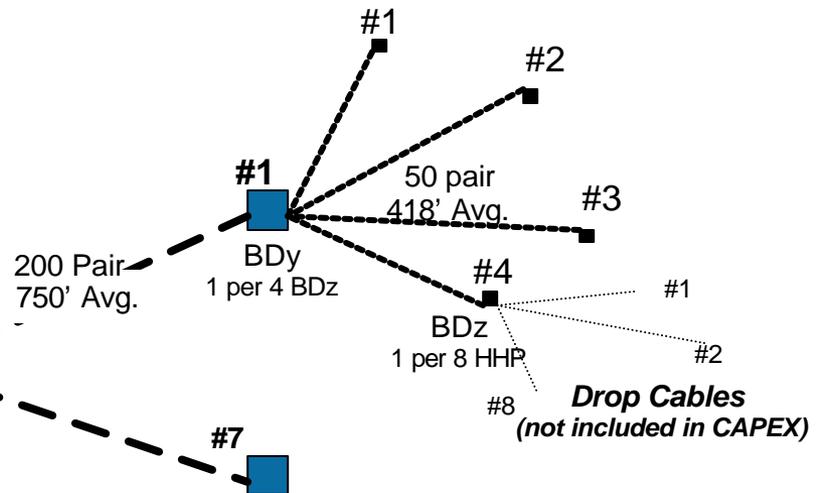
Architectural Overview



Design Parameters: Averaged
 Cadillac @ 7.4k HH/Business Passed
 58 Nodes Proposed
 200 Distribution Miles Total
 125 HH Passed/Node (avg.)
 3.4 Distribution Miles/Node
 Direct Burial (Plow) of distribution cables

Remote Distribution Terminal

Concrete Pad



Cadillac: Access Distribution Model

Cost Summary:

Estimated Costs for 2400 active Subscribers

- 40% penetration of residential HH

Cost Summary from Models

- Total estimated hardware costs = \$3.4M
- Total fiber trunk & feeder costs = \$1.5M
- Total access distribution costs = \$3.2M

Total Cadillac Access Model	= \$8.1M
------------------------------------	-----------------

Comments:

- Households passed 6,039; Enterprises passed 1,071
- Cost breakdown: \$1110 per HH/Enterprise passed
 \$3375 per subscriber served
- Cost per subscriber decreases with higher subscriber densities and penetration rates

High-level Cost Estimate Summary for LinkMichigan

<u>Backbone Model</u>	<u>Estimated Price</u>		
	<u>Phase 1*/1A</u>	<u>Phase 2*</u>	<u>Phase 3*</u>
1. Backbone Fiber Optic Construction	\$87.2M	\$52.4M	\$0.4M
2. Backbone Opto-electronic Systems	\$23.8M	\$5.8M	\$4.2
3. Local Access Lateral Fiber Optic Links	\$3.5M	\$3.4M	\$3.9M
4. Local Access Nodes (Total 166 Nodes)	\$23.7M	\$22.9M	\$26.4
5. NMC/OSS	\$4.7M	\$1.0M	\$0.5M
Estimated Backbone Costs by Phase	\$142.9M	\$85.5M	\$35.4M
Total Estimated Backbone Network Costs:		\$263.8M	
<u>Municipal Distribution Model</u>			
• Cadillac Access Model (2,400 subscribers)		\$8.1	
• No. of municipalities (10 – 20K people)		x 25	
Total cost Municipal Distribution Models		\$202.5M	
<u>Estimated cost of additional build-up</u>		\$100M	
Total estimated cost for LinkMichigan:		\$566.3M	

* Project phases as defined by LinkMichigan Goals & Objectives document

Next Steps

- **Develop a detailed technical Network Plan incorporating aggregation of public entity traffic**
- **Prepare Business Case for above network**
- **Prepare RFP for construction of above network**
- **Prepare technical network plan and business cases for non-metro municipality models**

Back-Up Slides

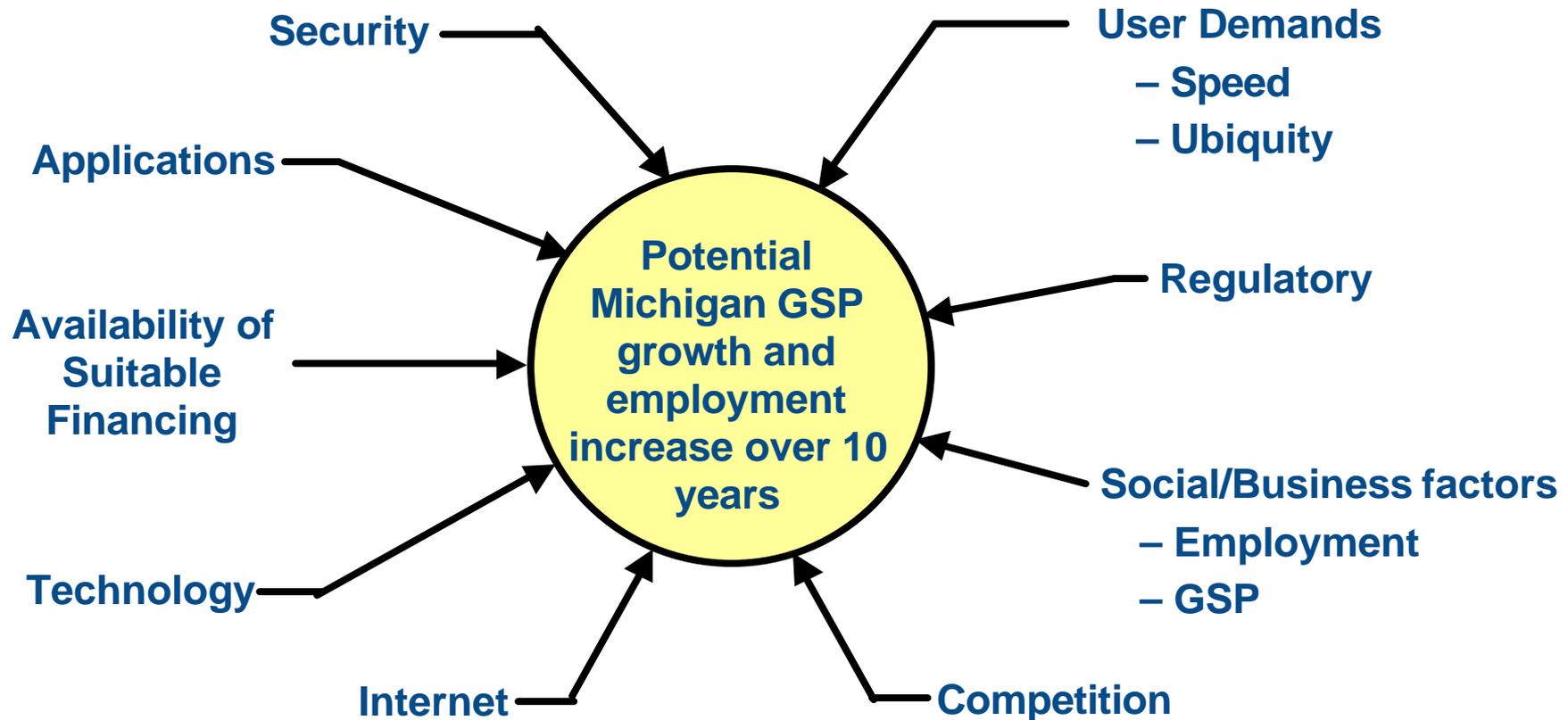
LinkMichigan Initiative

Basis for Gartner Model

The following assumptions have been used in Gartner's efforts to quantify the benefits of the LinkMichigan initiative to the State of Michigan.

- **A virtually ubiquitous statewide broadband network will be in place and in service according to the LinkMichigan plans and schedule.**
 - Serves business and residential interests and needs
 - Keeps Michigan from losing business to other states/attracts additional business from less aggressive areas
- **Population and GSP figures, and growth projections use U.S. Department of Commerce Bureau of Economic Analysis figures as underpinning.**
- **Growth projections for the broadband economic model are an extension of an ITU 50-year teledensity and GDP per capita correlation.**
 - Assumes continued access bandwidth growth in business and residence as defined in Gartner Dataquest study dated 4Q01.
 - Assumes increased reliance on network infrastructure based on basic structure of the Internet Economy and redefinition of business practices for reduced cost and increased security (9/11/01, etc.)

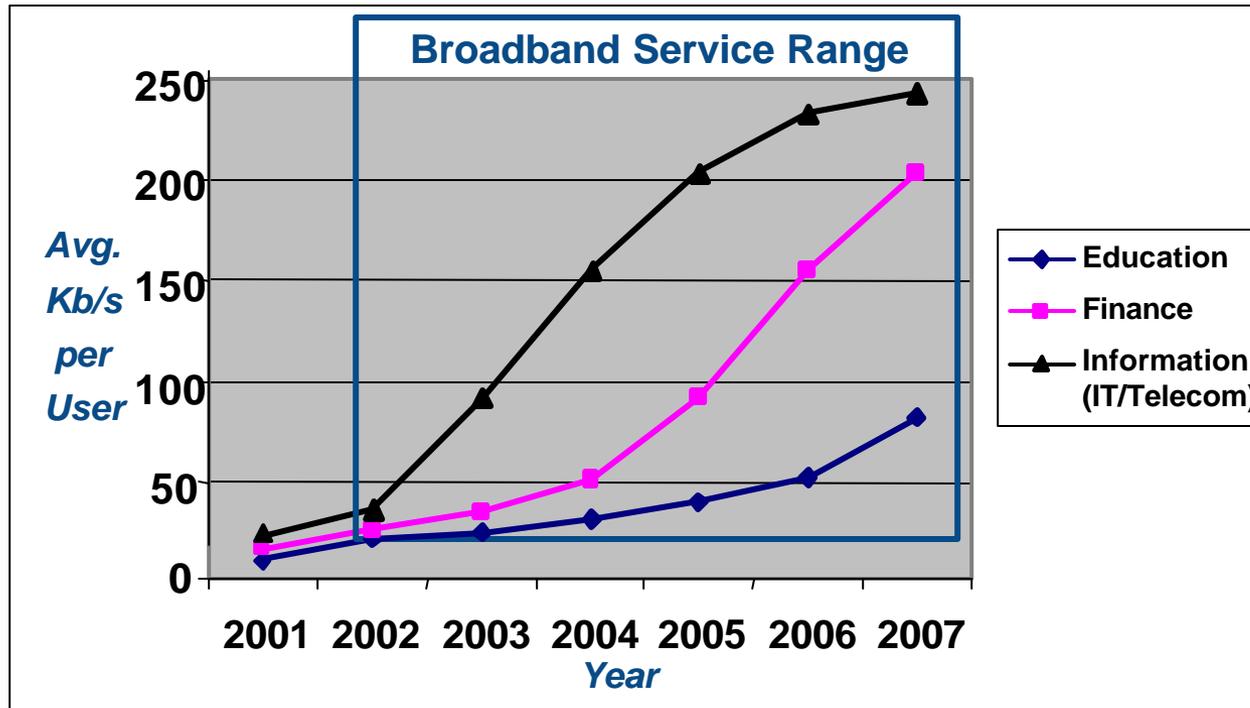
Broadband Demand Drivers



The network is evolving to broadband access and transport

Projected Access Bandwidth Growth

Example: 3 Michigan Industry Segments



- Projections are based on Users within business segments located in the State
- Bandwidth jump in years 3 to 5 reflect accelerated use of video communications resulting from business, security & lifestyle changes
- Bandwidth projections assume that users are part of a larger user group (LAN/WAN, etc.) of 12 or more
 - Coincidence of simultaneous transmissions range from 30% to 60% depending on industry and size of group
- Projections are based on Dataquest studies (4Q01) of application usage by industry profile and NAICS data for Michigan

**Network users quickly grow into broadband consumers.
Growth varies between industry segments**

LinkMichigan Network Model Highlights

- **Models consist of:**

- Backbone Network - designed in phases to provide broadband capacity to communities of interest (Purple Dots) as identified by S.O.M.

- Access Nodes - designed to support delivery of voice, video and data services to S.O.M. sites within Purple Dot communities; Also provides point of interconnection (POI) for “other” users.

- **Backbone routes form multiple bi-directional SONET ring structures with meshing for reliability and security**

- Multiple interconnection points between rings

- **Backbone model assumes use of state of the art DWDM opto-electronics with baseline provisioning for 1 operational light wave (1 Lambda)**

- Base design allows virtually unlimited future capacity expansions without regard for additional fiber strands.

- **Transport using well defined and widely understood IP over ATM (IP/ATM) protocols**

- Well defined standards provide support of voice, video and data with PSTN quality of service

- Supported by vendors with wide range of equipment

LinkMichigan Network Model Highlights

- **Access Node model provides an on/off ramp to backbone network for local communications requirements.**

Model includes:

1. Electronics for termination of fiber optic strands (Fiber Terminals) and POI interfaces (DS3; OC-3; etc.) to local broadband connections.
 2. Broadband Fixed Wireless Access (BFWA) system to provide connectivity to local State Sites (Colleges; DNR;DMV; ISDs, etc.)
 - Costing model assumes 10 sites average per Access Node
 - CPE typically provides 2 x 10/100Bt ports per site
 - Site distribution systems (LANs, PBX, Key systems, etc) not included
 3. Voice Gateways to allow distribution of local voice calls to local operator
 - Long Distance and on-net calls are distributed via backbone network
 4. New construction of lateral access cable between backbone and Access Nodes
 - Models assume 3 mile average distance
- **LinkMichigan Network model provides for hierarchical management of the network with Headquarters and Regional functions**
 - Network Management Centers
 - Headquarters & Regional Centers hierarchy
 - 7x24x365 coverage;
 - Operations Support Systems (billing, administration, services, call centers, etc.)

Local Access Model: Fixed Wireless - MMDS

Incremental Growth ^{1,2}

	Base Model	Growth Models →		
	<u>OMNI 2+2</u> +	<u>OMNI 3+3</u> +	<u>4 Sector</u> +	<u>12 Sector</u>
Estimated Capacity:	>35 Sites	>55 Sites	>70 Sites	>200 Sites
Hub Level	\$53,000	\$5,000	\$10,000	\$89,000
System H/W	\$153,830	\$79,930	\$73,900	\$588,410
RF Related	\$28,000	\$12,000	\$18,000	\$126,000
Total:	\$234,830	Add: \$96,930	\$101,900	\$803,410

Notes:

1. Assumes a composite mix of State of Michigan user sites (DMV, DNR, etc.) that will dynamically share available wireless link capacity. (i.e. Not all full period/constant use circuits.)
2. Assumes that sufficient 6 MHz ITFS/MMDS channels are available to support growth.
Systems generally support channel re-use schemes that will allow multiple use of the same channel in a sectored and/or multi-cell configuration.
3. Costs do not include the incremental costs of Subscriber Network Units (CPE) estimated at \$1,000 each
4. Costs do not include any costs associated with site specific hardware costs such as LAN, WAN, IPBX, Video Controllers, etc.

LinkMichigan Benefits

Increased Business Expansion

The broadband infrastructure and intensive participation in the “I” economy enables business growth and geographic expansion

- **Demonstrated productivity and efficiency gains**

- Over 11%* increase in revenues per employee in year 2000 for “I” economy companies nationally — not maintained in current economic downturn, but indicates potential
- This translates into business growth and increased jobs

- **The infrastructure provides transparent business borders and allows geographic independence for physical business locations**

- Locate anywhere in the state without a market or operations penalty
- Promotes low density/rural business fill-in
- And, expanded employment opportunities

* “Measuring the Internet Economy,” University of Texas, January 2001.

LinkMichigan Initiative Benefits

Establishing the Premise for Our Report

In evaluating benefits and quantification for the LM initiative, Gartner Consulting believes that the following basic tenets apply to broadband networks.

- **The Internet Economy is the driver for growth and ubiquitous broadband access is the enabler**
- **Broadband networks as an access and transport medium are in their early life buildout phase.**
 - Tangible benefits are being derived and fueling growth at a faster rate going forward
 - The “Internet Economy” is being formed
- **To keep pace with the growth, expansion of the broadband infrastructure must be promoted**
 - To not lead or at least keep pace with infrastructure expansion needs carries the risk of severely handicapping the State’s economic future.
 - At stake for business are Internet related revenues that are seeing substantial growth over traditional revenues
- **The economic downturn and events of 9-11-01 are forcing businesses to streamline and seek greater leverage from on-line resources**
 - Requirements will create acceleration of broadband requirements for faster, better, cheaper
 - Provides incentive for greater investment in a statewide broadband infrastructure

The Need for the LinkMichigan Initiative

The concept of “if you build it, they will come” has been validated for broadband networks by the current acceptance and growth of high-speed DSL and Cable Modem access

- However, some will need help with the trip
- Network operators will have trouble with the business economics of proving-in a broadband network expansion into sparsely populated areas.
and,
- Some assistance with the “ability to pay” for broadband services will likely be required in lower economic strata

State of Michigan must have a good understanding of the business/revenue drivers and the operator’s cost of network operations to evaluate the level of assistance required and the areas where it is most necessary

LinkMichigan Initiative Analysis

- **Current lag in access penetration if not addressed represents a \$440 billion shortfall in Michigan GSP over a 10-year period.**
- **It is not the lack of interest in the technology that is creating the gap between Michigan and the U.S. as a whole.**
 - **Price and ability to pay may be a contributor,**
 - **Lack of ubiquitous access to a broadband network may be a root cause, especially in higher socioeconomic levels**
 - **Other factors may be contributing**
- **A broadband network for the State of Michigan and investment incentives to make access ubiquitous and affordable would close the high-speed access gap for the citizens of the state**
- **National high-speed market saturation is not projected until after 2008**
The 5 to 7 year LinkMichigan rollout is well within this window

The broadband infrastructure in Michigan must support the requirements necessary to keep pace with the rest of the U.S.

Some Statistics from Other Studies*

Improves Business Recruiting Efforts

Businesses want to tap into the real potential of the new Internet Economy

- **Increased Revenues**

- "I" economy related revenues are increasing 3 times faster than non-related revenues
- \$1 of every \$5 of revenue for "I" economy companies was generated via the network in 2000
 - Significant growth projected over next 7 - 10 years

- **Productivity and efficiency gain long-term prediction from 2.7% - 3.5% nationwide**

- 11% increase in Internet Economy sectors in 2000
- Will require broadband network infrastructure to maintain positive momentum

- **Expanded market areas**

- Customer base grows beyond local outlook (regional, national, global)

Widely available broadband infrastructure would make Michigan more attractive to businesses looking to build, relocate or expand.

* "Measuring the Internet Economy," University of Texas, January 2001.