Southside Regional Connectivity Ring
Strategic Planning Discussion

Southside Network Authority Board

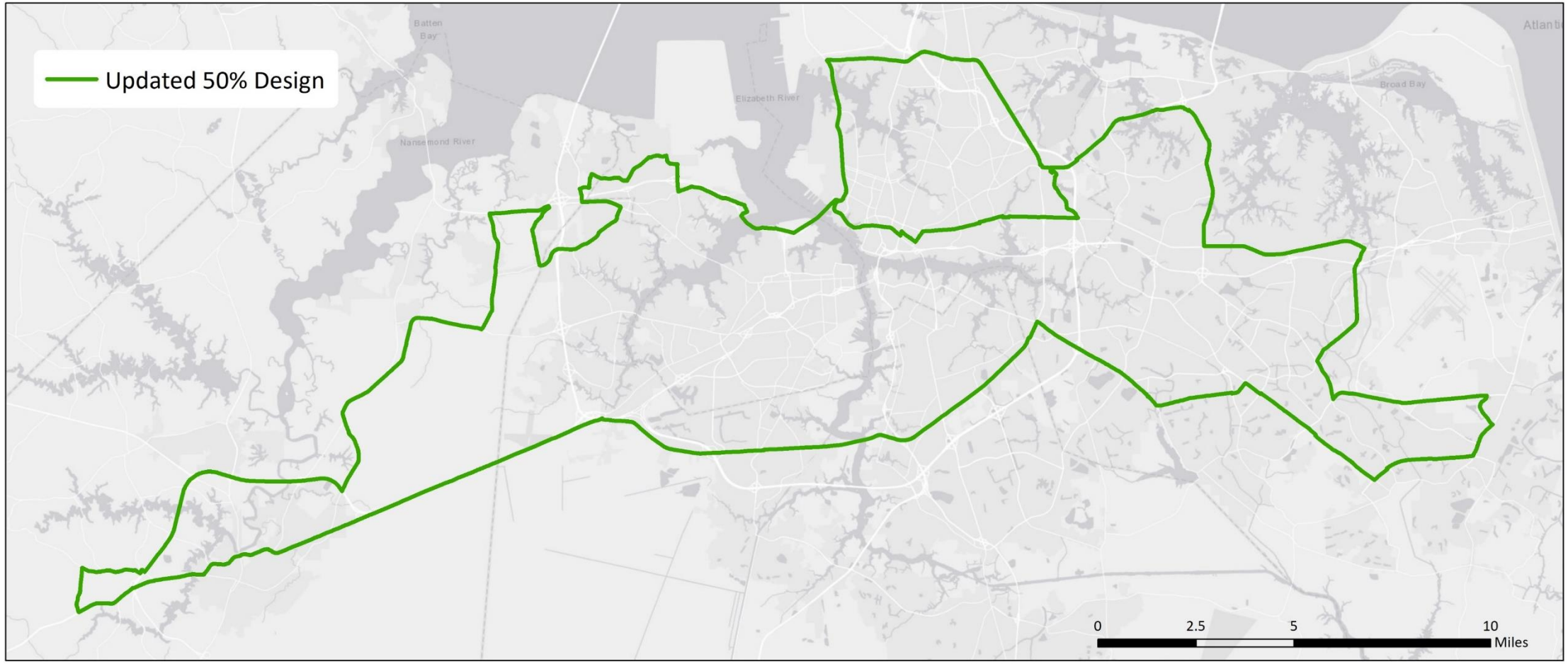
February 5, 2021

Agenda

- Review RCR Design Status and Cost Estimates
- Review Cost Avoidance Business Case Analysis
- Discuss strategy options
- Identify key decision points

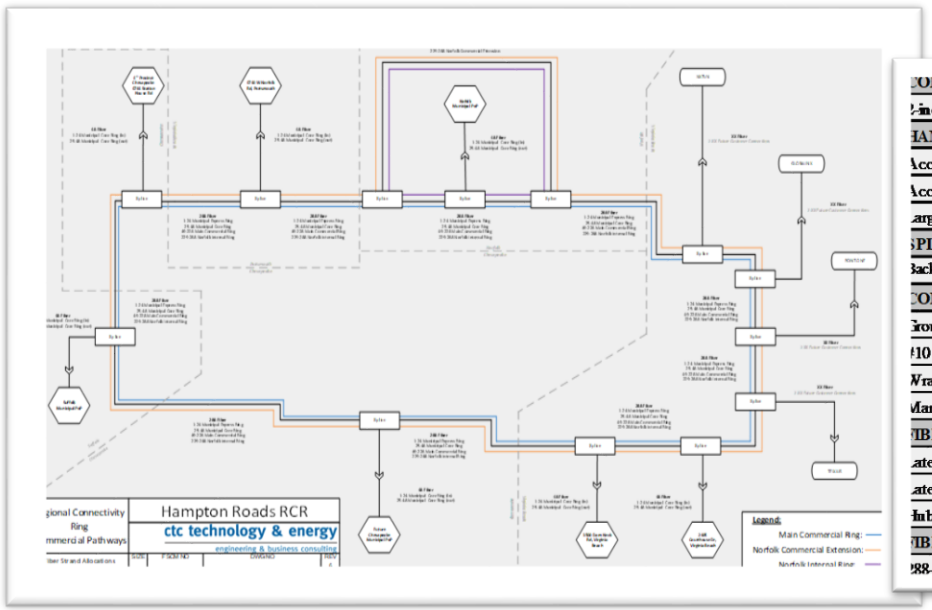
RCR Design Status and Cost Estimates

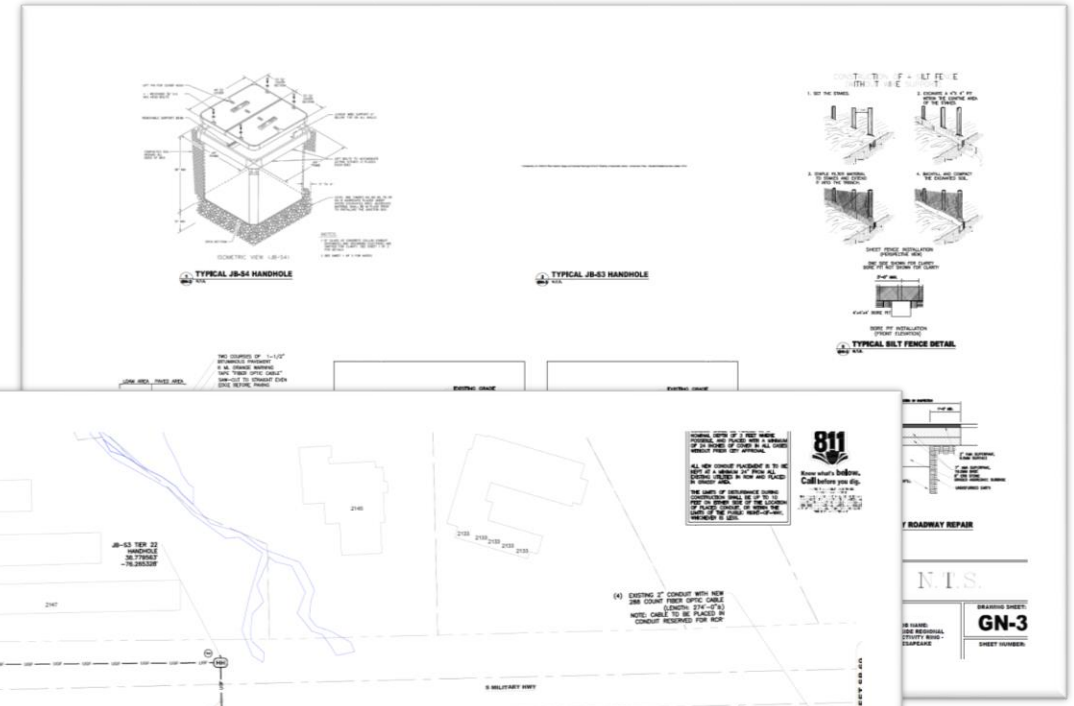
50% Design – Routes

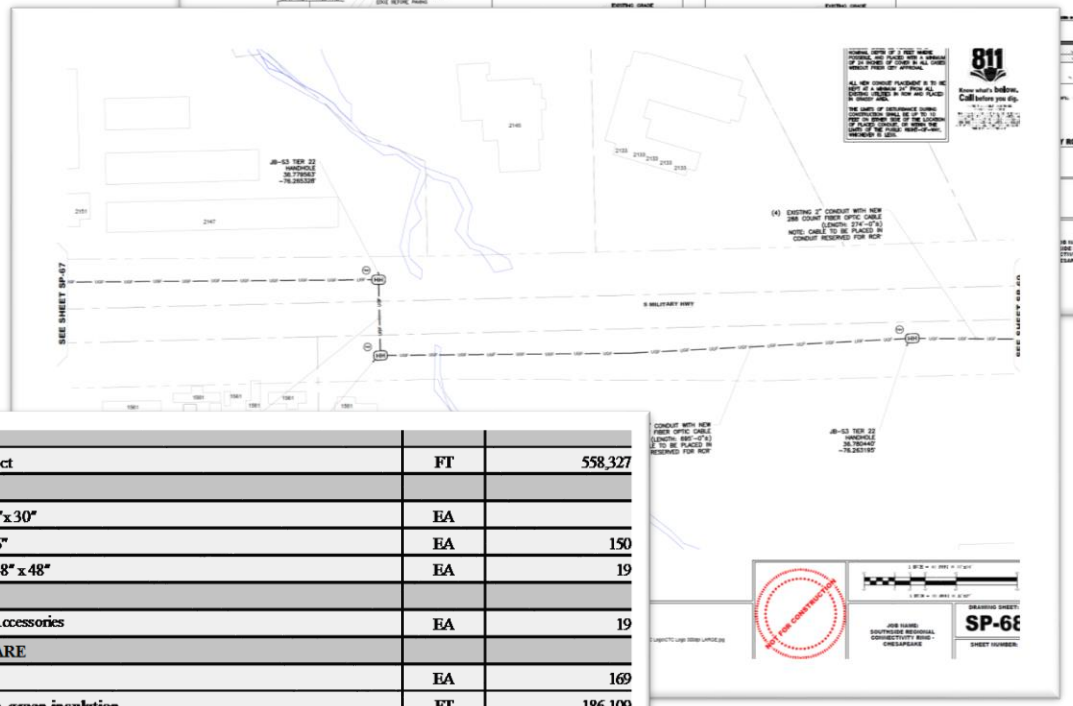


Status of RCR Design

- RCR 50-percent designs completed
  - Construction plans
  - Bill of materials
  - Fiber splice schematics and matrices
- Refined cost estimates completed







CONDUIT		
2-inch, SDR 11, HDPE Roll Duct	FT	558,327
HANDHOLES		
Access Handhole – JB-S2, 17"x 30"	EA	
Access Vault – JB-S3, 24" x 36"	EA	150
Large Access Vault – JB-S4, 48" x 48"	EA	19
SPLICE ENCLOSURES		
Backbone Splice Enclosure and Accessories	EA	19
CONSTRUCTION HARDWARE		
Ground rod, 8 ft.	EA	169
#10 copper tracer/ground wire, green insulation	FT	186,109
Wrap-Around Cable Marker Labels	EA	
Markers, Soil Disk or Dome Post	EA	169
FIBER DISTRIBUTION CLOSURES AND TERMINATION		
Lateral Termination Panel, rack-mount, 12-strands	EA	
Lateral Termination Panel, wall-mount, 12-strands	EA	
Hub Termination Panel, 144-strands	EA	
FIBER OPTIC CABLE		
288-strand backbone cable, ribbon, outdoor cable	FT	203,009

RCR Cost Estimates

Cost Component	Estimated Cost
Fiber Optic Outside Plant (OSP) Construction	$22,962,000
Network Hardware	$658,000
Network Integration and Testing	$165,000
Total	**$23,785,000**

Capital Construction and Equipment

Fixed Operations and Maintenance

Maintenance and Operating Costs	Qty	Unit	Unit Cost	Extended Cost
Fiber Plant Maintenance	119.1	Mile	$3,600	$428,760
Equipment Maintenance Contracts (Year 2+)	1	Year	$60,000	$60,000
NOC Fee ($150 per element per month)	10	EA	$1,800	$18,000
Network Engineer	0.25	FTE	$200,000	$50,000
Network / GIS Manager	0.50	FTE	$150,000	$75,000
Network Technician	0.25	FTE	$100,000	$25,000
Incidentals	1	EA	$10,000	$10,000
Equipment Replacement Fund (7-year lifecycle)	1	EA	$94,000	$94,000
Total Annual Maintenance and Operating Costs				**$760,760**

RCR Cost Avoidance Business Case Analysis

Business Case Analysis Considerations

Identified opportunities for near-term cost avoidance

- Bulk purchase & backhaul of commodity internet capacity
- Transport to cloud service providers in regional data centers

Projected requirements for long-term cost avoidance & regional collaboration

- Public safety interoperability
- Mutual aid / disaster recovery

Explore partnership strategies for revenue generation and economic development

- Fiber leasing
- Backhaul for wireline and mobile broad service providers
- Managed services for business

Cost Avoidance Opportunity – Commodity Internet for the Five Cities

Municipality	Connection Type	Capacity (Mbps)	Monthly Fees
Chesapeake	Internet	1,300	$11,730
Norfolk	Internet	1,000	$3,500
Portsmouth	Internet	2,000	$6,250
	Data Center Transport	1,000	$1,895
Suffolk	Internet	700	$3,282
Virginia Beach	Internet	6,000	$15,414
	Data Center Transport	10,000	$7,959
	Total	**22,000**	**$50,030**

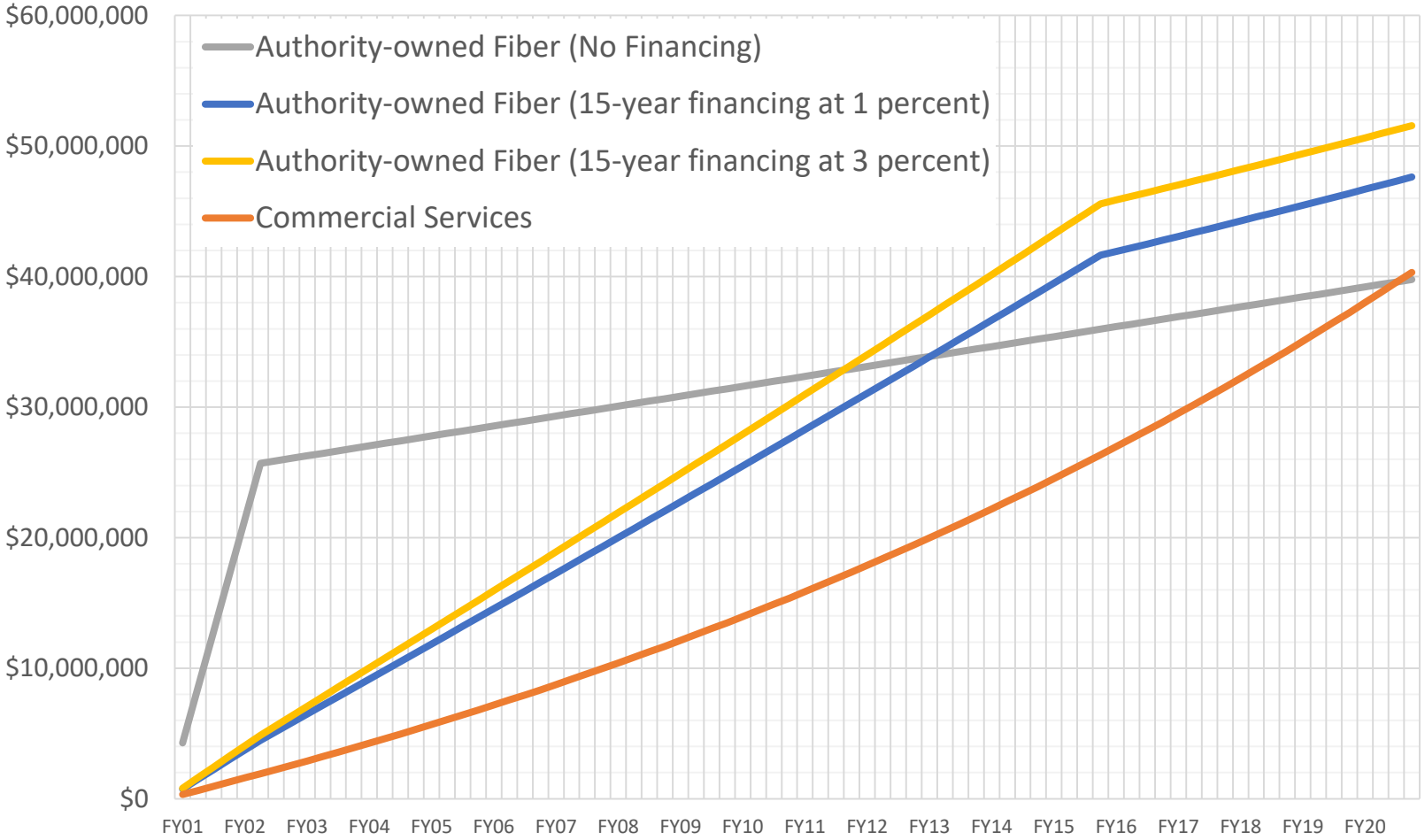
Existing internet expenditures

Forecasted near-term internet expenditures

Jurisdiction	Connection Type	Capacity (Mbps)	Estimated Monthly Fees
Chesapeake	Internet	2,000	$7,305
	Data Center Transport	5,000	$5,581
Norfolk	Internet	2,000	$7,305
	Data Center Transport	5,000	$5,581
Portsmouth	Internet	4,000	$14,609
	Data Center Transport	5,000	$5,581
Suffolk	Internet	2,000	$7,305
	Data Center Transport	5,000	$5,581
Virginia Beach	Internet	10,000	$36,524
	Data Center Transport	10,000	$11,163
	Total	**50,000**	**$106,536**

Forecasted monthly fees are based average existing monthly costs per Mbps for internet ($3.65/ Mbps) and data center ($1.12/ Mbps) connectivity.

Break-Even Analysis – Cumulative Cost of RCR vs. Forecasted Commercial Services



Assumptions:

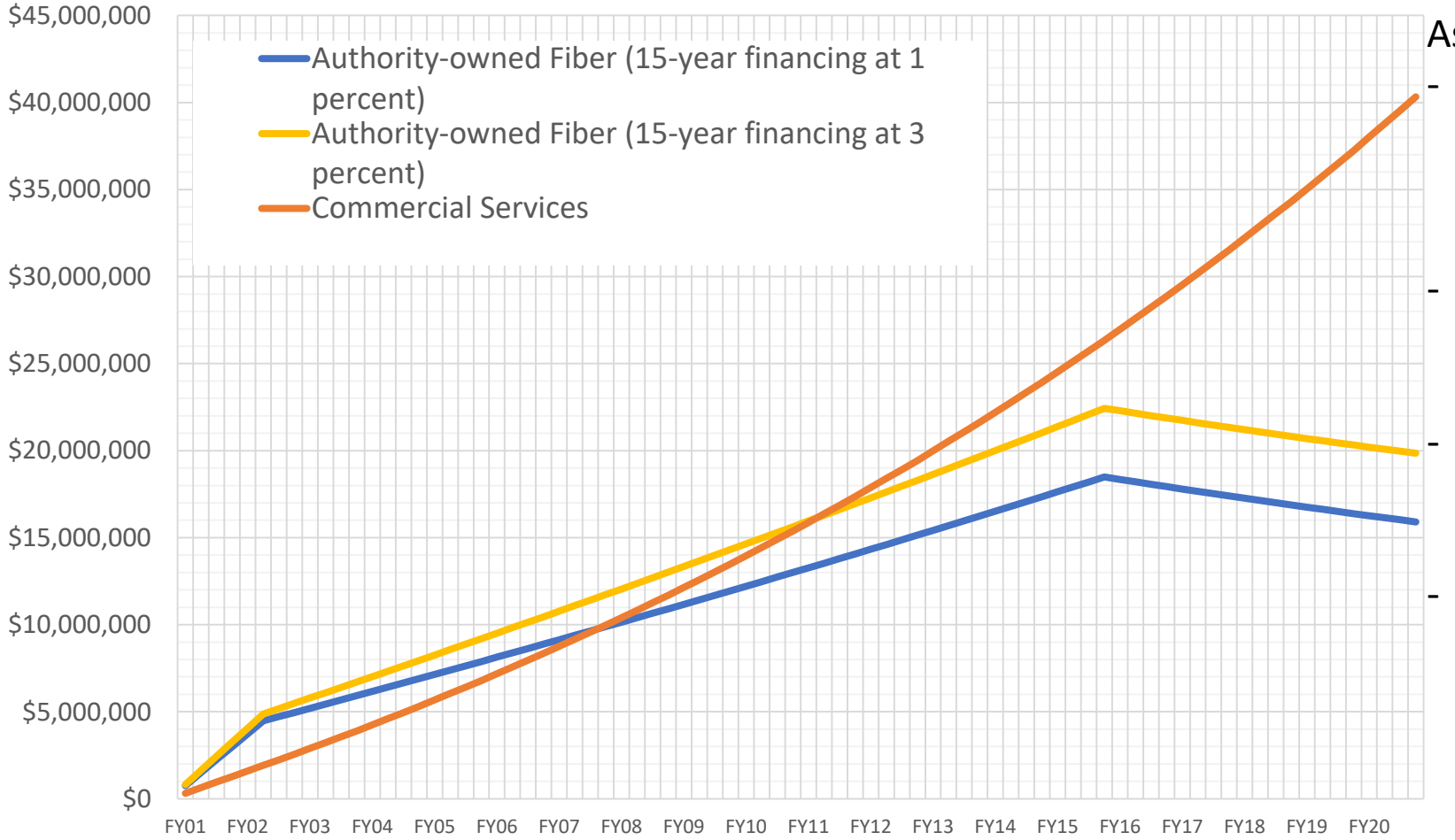
- Assumes 18-month fiber construction timeframe before elimination of leased service costs
- Does not include inflation for RCR O&M or commercial service costs
- 5% annual increase in internet costs / capacity demand

Dark Fiber Revenue Potential – Market Perspective

- Typical dark fiber lease pricing structures:
  - Long-term Indefeasible Right of Use (IRU) (15+ years)
    - Upfront payments of $1,000 to $3,000 per strand-mile
    - Annual maintenance payment of $250 to $350 per route mile per year (independent of the number of strands leased)
  - Monthly or annual lease
    - Recurring payments per strand-mile typically ranging from $50 to $500 per month
  - Specific pricing is highly market-specific
- Example revenues:

Monthly Lease Rate	Strand Miles Leased to Cover P&I and O&M (Less Cost Avoidance)			
	1% Financing		3% Financing	
	Strand-Miles	Percentage of Total RCR Capacity	Strand-Miles	Percentage of Total RCR Capacity
$50	3,261	9.5%	3,699	10.8%
$75	2,174	6.3%	2,466	7.2%
$150	1,087	3.2%	1,233	3.6%

Net Cumulative Costs with Example Dark Fiber Lease Revenues



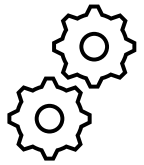
Assumptions:

- Assumes 18-month fiber construction timeframe before elimination of leased service costs
- Does not include inflation for RCR O&M or commercial service costs
- 5% annual increase in internet costs / capacity demand
- Authority-owned fiber scenarios assume lease of 8.33% of fiber capacity (24 strands along all routes) at $50 per strand-mile/month

RCR Investment Profile

RCR construction is low risk when viewed in the long-term

- Likely long-term ROI through replacement of existing internal services and avoiding future cost increases to meet growing capacity demands
- Business case does not depend on revenues



Functional benefits are significant

- Resilient
- Scalable
- Secure
- Control

Revenue potential is speculative but likely

- Wide ranging strategies for monetization of expansive spare capacity
  - Broker for dark fiber leases
  - Turnkey construction, operation, and even ownership by a commercial provider

Strategic Paths

Balancing Goals for the Regional Connectivity Ring

Scalable infrastructure for internal needs

Provide a mechanism for the Five Cities to meet internal communications needs while containing the financial risk associated with price increases for commercial services

Promote private investment that addresses the digital divide –service availability and affordability

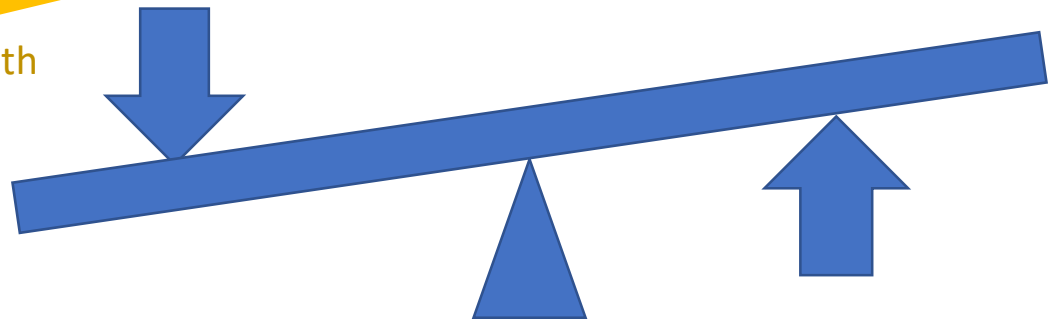
Reduce barriers to entry in new markets by making middle mile infrastructure available on a competitive and non-discriminatory basis

Promoting competition / economic development initiatives

Facilitate economic development initiatives with low- or no-cost access to middle mile infrastructure

Revenue generation

Enable revenue generation through dark fiber leases and/or lit service offerings



Primary Strategic Path Options

A. SNA Funded – Authority outsources operations and dark fiber leasing

B. SNA Funded - Authority operates in-house

C. Public-Private Partnership (“turnkey”) - Funded and operated by private entity

A. SNA Funded with Outsourced Operation of Fiber Ring

CTC takes the design to 100% completion

SNA funds construction

- SNA releases an RFP for construction and maintenance

SNA releases an RFP for a private entity to manage the excess fiber (fiber not used by the Cities/region)

- Fees and/or revenue sharing negotiated with the private entity to offset P&I and O&M costs
- SNA retains control over as much capacity as needed to meet municipal needs, address regional goals (economic development, digital equity, etc.), and/or facilitate competitive access
- SNA negotiates for non-exclusivity and/or operating policies and rates aligned with regional goals for promoting competition

B. SNA Funds and Operates Fiber Ring

CTC takes the design to 100% completion

SNA funds construction

- SNA releases an RFP for construction and maintenance

SNA leases fiber directly to Internet Service Providers (ISPs) and other anchor institutions to offset P&I and O&M costs

C. Public-Private Partnership (“turnkey”)

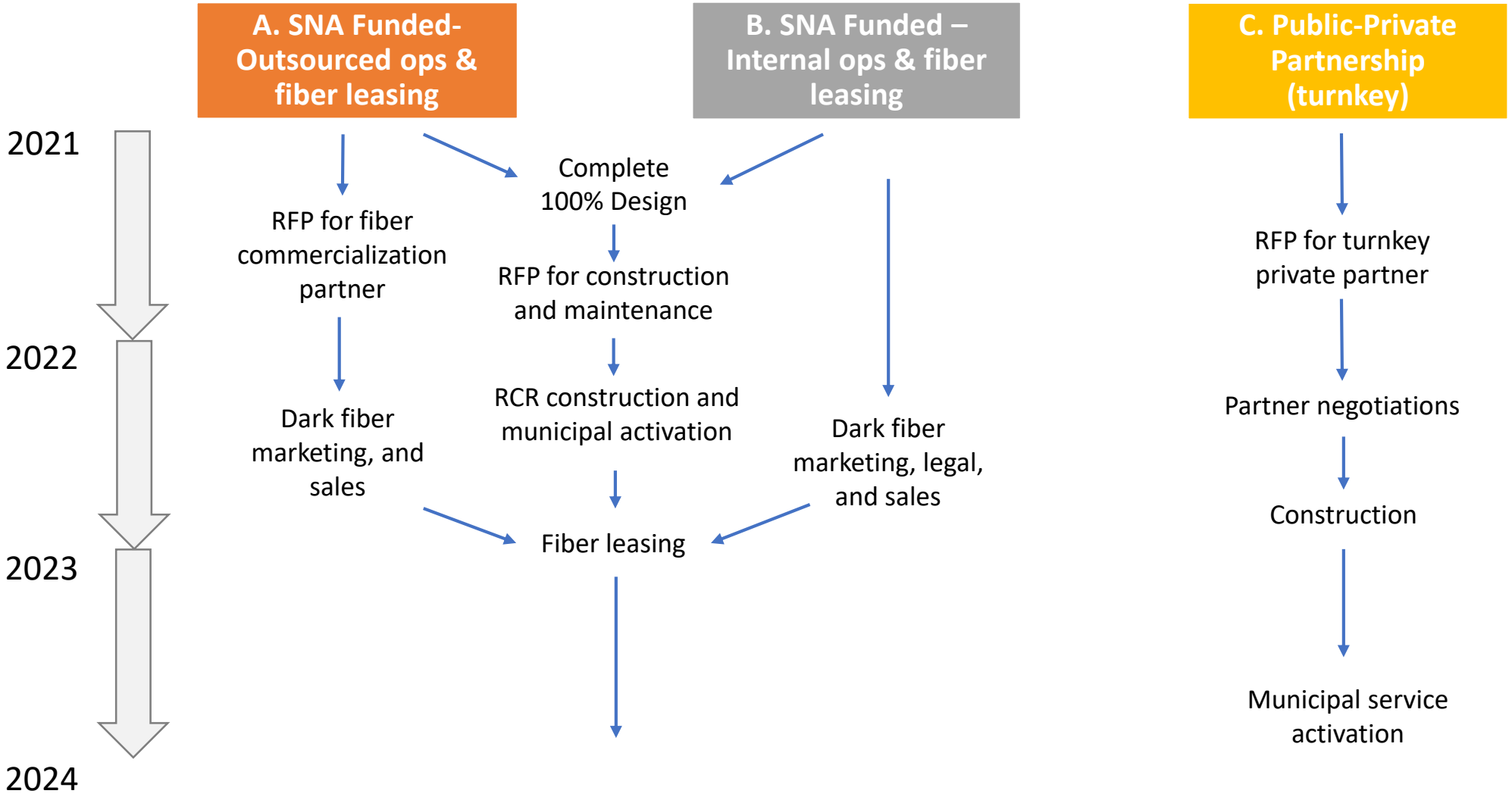
SNA seeks a private partner to design, construct, finance, maintain, and operate the RCR

- SNA would require access to fiber capacity and services needed to meet municipal needs

Other key elements of the partnership would be negotiable with parameters set by the SNA

- Ownership of the fiber and conduit assets
- Capital contributions, operating expenses, and revenue sharing
- Operating policies and service delivery aligned with regional goals for economic development, digital equity, broadband competition, etc.

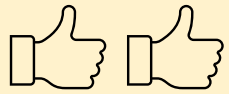
Summarized Strategic Path Timelines



Functional Comparison of Strategic Paths

Functional Attribute	A. SNA Funded- Outsourced ops & fiber leasing	B. SNA Funded – internal ops & fiber leasing	C. Public-Private Partnership (turnkey)
Ownership / Control	SNA ownership / full control	SNA ownership / full control	Negotiable; more control comes at greater risk and cost
Costs (short- to medium-term)	High – full cost of P&I and O&M	High – full cost of P&I and O&M	Low to medium
Financial risk (long-term)	Low	Low	Low to medium; higher cost of capital, and partner would likely require a revenue guarantee and/or availability payment
Political risk	Low	Low	Low to moderate (less direct ability to mitigate performance issues)
Financial gain	Low to moderate	Low to moderate	Potentially higher; greater potential market and negotiable revenue share
Timeline to activation of municipal services	< 2 years	< 2 years	3+ years (partner negotiations must precede construction)

Alignment of Goals and Strategic Paths

Goals		A. SNA Funded- Outsourced ops & fiber leasing	B. SNA Funded – Internal ops &fiber leasing	C. Public-Private Partnership (turnkey)
Internal municipal connectivity needs	Scalable capacity			
	Resiliency - redundant physical connections			
	Secure – end-to-end control			
Digital equity issues	Reduce cost barriers to reach unserved / underserved areas			
Economic development	Promote competition of broadband services			
Revenue generation	Dark fiber leases			
	Private partner revenue shares			

Key Decision Points

Key Decision Points for Next Steps *(not mutually exclusive)*

Complete the design and construct the RCR?

Considerations:

- Is SNA ownership of the fiber assets a primary goal?
- Can the necessary capital be secured within six to 12 months?
- Are potential private partner negotiations likely to substantially change the design of the network?

Examine financing options?

- Not a dichotomy between cash from the Cities or private funding
- Three basic sources of funds:
  - Public equity—cash from Cities
  - Debt—debt of the Authority funded by revenues of the system (potentially guaranteed by Cities)
  - Private equity—cash from private partner (always strings attached), either in a P3 or as part of a public ownership funding package
- Mix 'n' match depending on how an RFP for funding is structured.

Analyze the market to better quantify revenue potential and/or identify partnership opportunities?

- Conduct survey of businesses to produce a statistically valid assessment of relevant market factors
- Initiate direct marketing efforts to secure anchor tenants and/or dark fiber lessees

Issue RFP to solicit proposals from candidate partners?

- Can be broadly scoped stipulating only baseline requirements around SNA control and functionality