Southside Network Authority Board Meeting
Southside Regional Connectivity Ring
Strategic Planning Workshop

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CTC Technology & Energy

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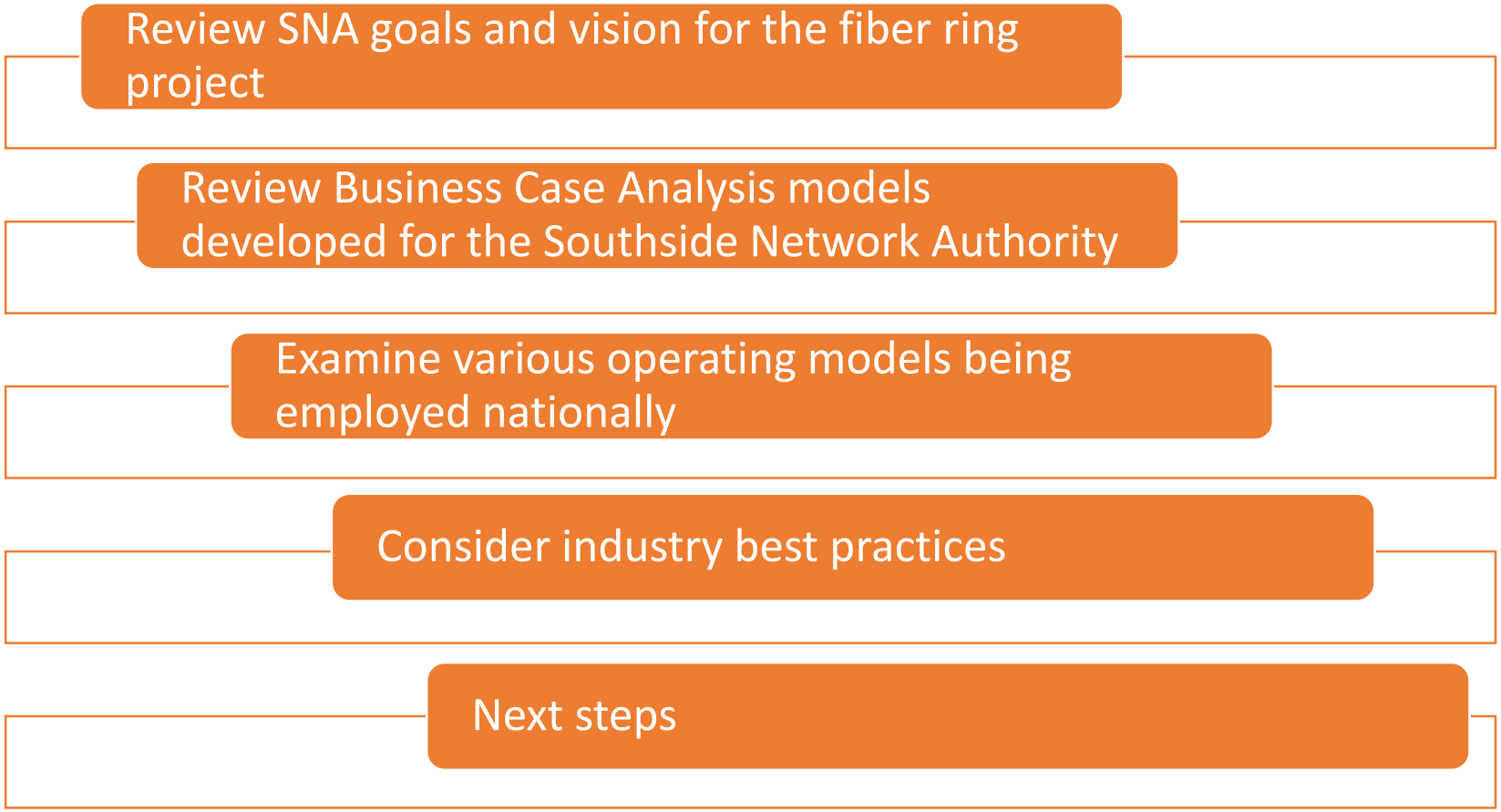
Agenda


Review SNA goals and vision for the fiber ring project
Review Business Case Analysis models developed for the Southside Network Authority
Examine various operating models being employed nationally
Consider industry best practices
Next steps

Goals and objectives

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

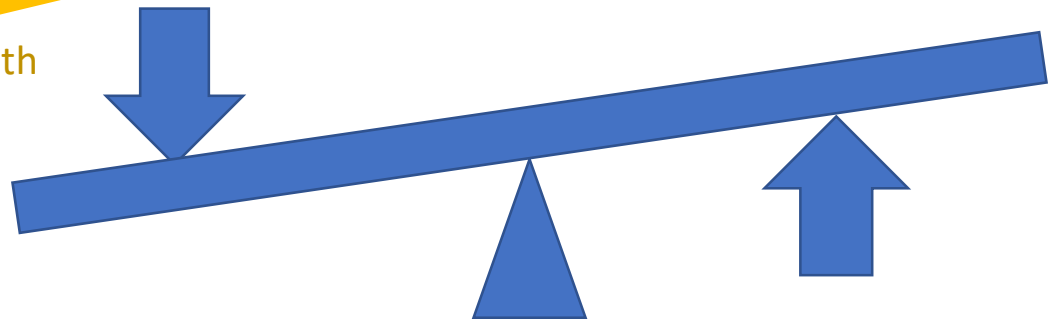
Reduce barriers to entry in new markets by making middle mile infrastructure available on a competitive and non-discriminatory basis

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



Workshop outcomes

Shortlist Strategies	Identify a short list of strategies for financing and constructing the RCR
Financial Analysis	SNA Executive Director to provide any additional financial analysis necessary to assist in the evaluation of each of the selected strategies
Finalize Approach	Provide input regarding preference for one of the identified strategies using financial analysis and other variables (each city's "environment", etc.).
Establish Timeline	Establish a timeline for completing locality review of short-listed options and a decision point for the SNA.

Business Case Analysis Overview

Operating Costs for RCR

Conduit & dark fiber O&M	Utility locates & ticket processing (i.e., “811” tickets)
	Required relocations
	Repairs
	Maintenance of network documentation
Network O&M	Network maintenance contracts
	Engineering and technician support
	NOC services
	Funded depreciation (7-year hardware refresh)
Financing costs for capital additions	Model assumes 15-year financing term
	Does not include debt service reserve or bond issuance costs

RCR cost estimates

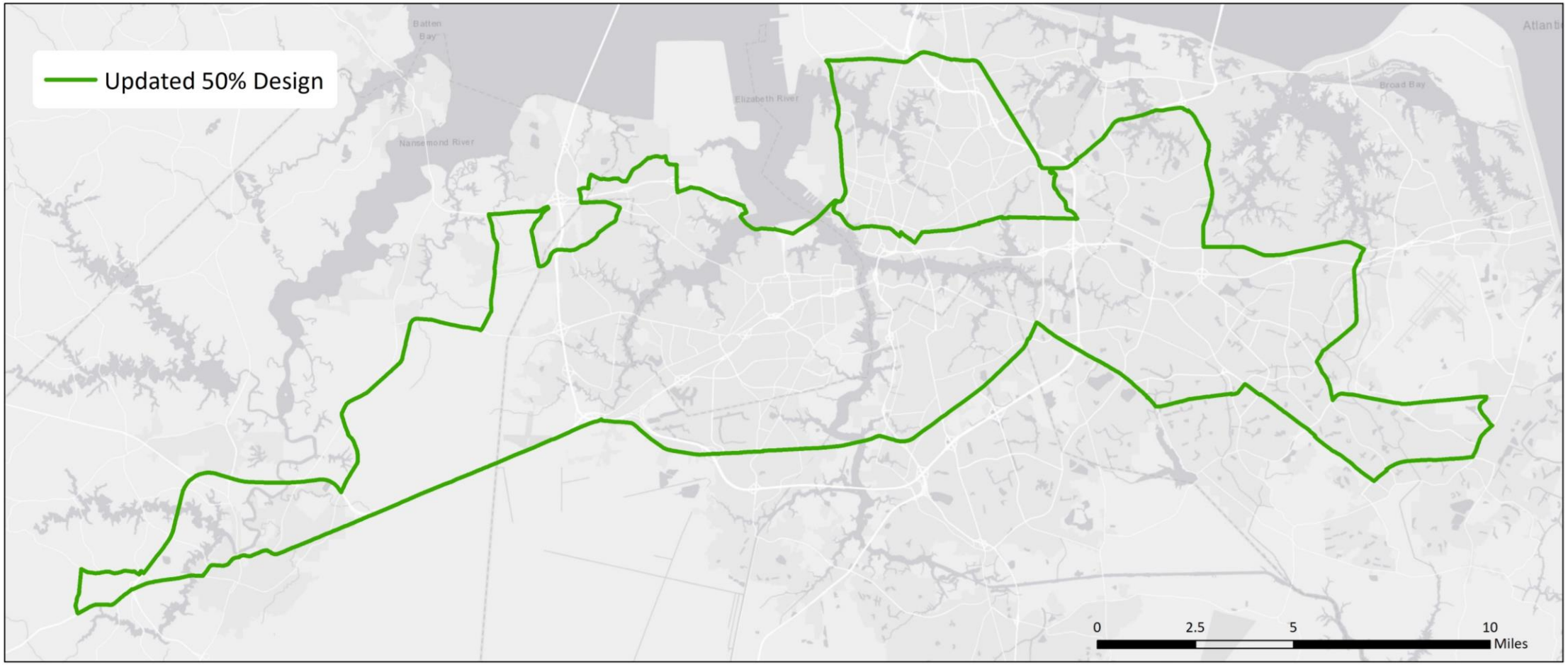
Cost Component	Estimated Cost
Fiber Optic Outside Plant (OSP) Construction	$22,962,000
Network Hardware	$658,000
Network Integration and Testing	$165,000
Total	**$23,785,000**

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**

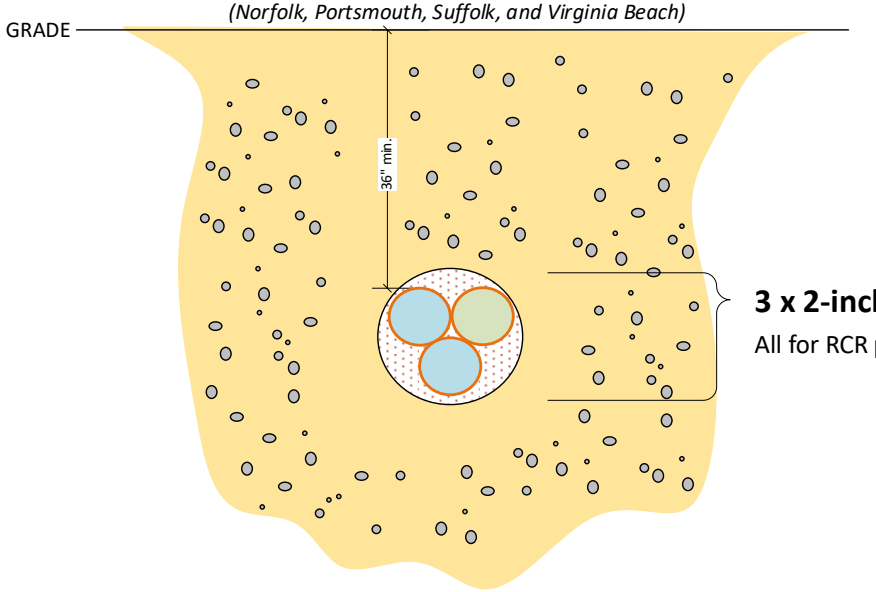
50% Design – Routes



Conduit configuration

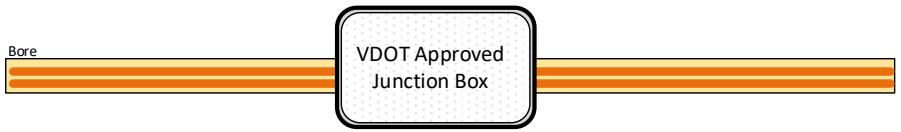
Standalone Construction

(Norfolk, Portsmouth, Suffolk, and Virginia Beach)



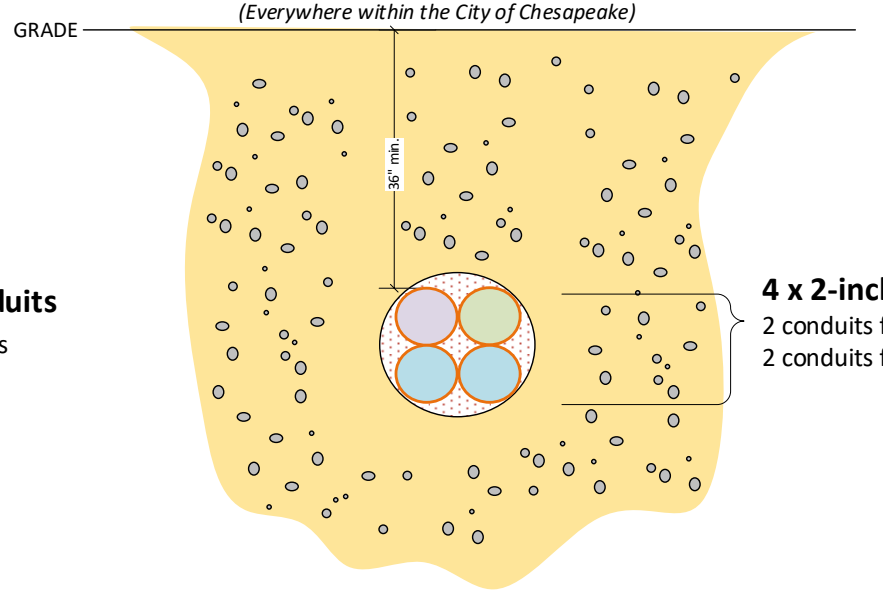
3 x 2-inch Conduits

All for RCR purposes



Joint Construction

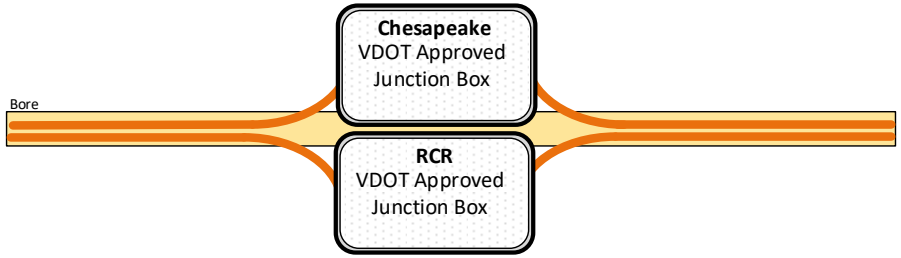
(Everywhere within the City of Chesapeake)



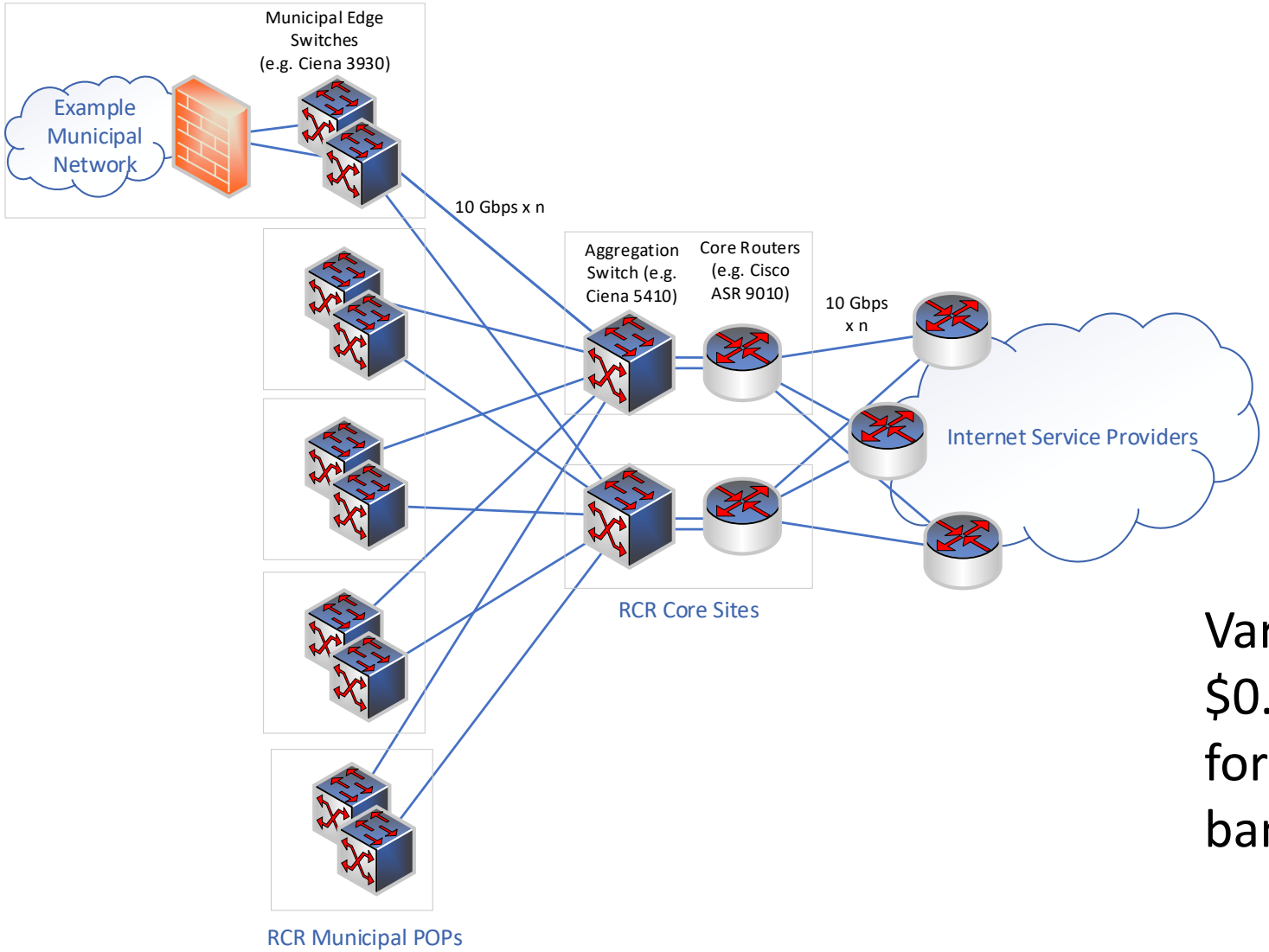
4 x 2-inch Conduits

2 conduits for RCR

2 conduits for Municipal purposes



Network electronics configuration



Variable operating expense of $0.25 Mbps / month included for commodity internet bandwidth from ISPs

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**

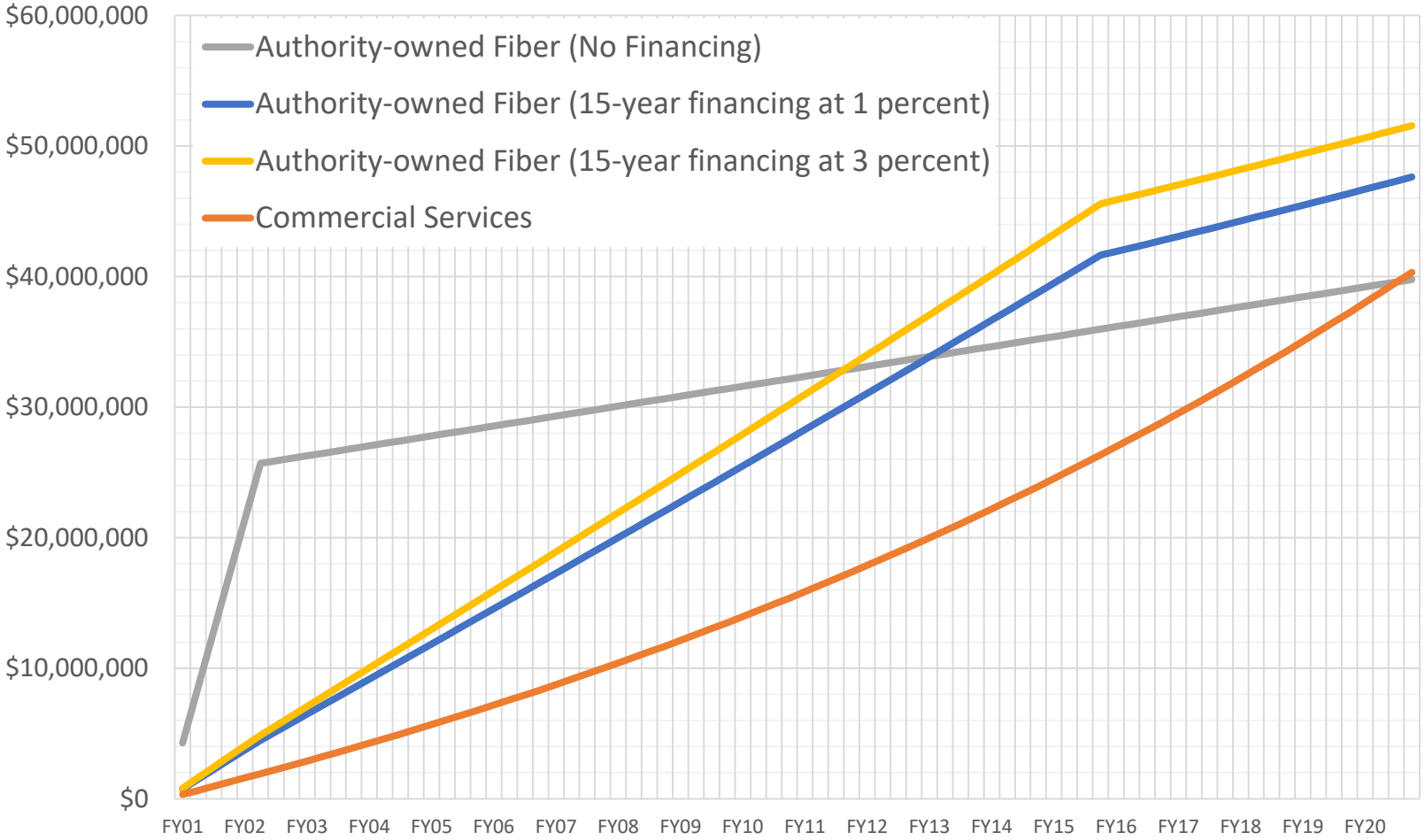
Existing internet expenditures

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

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**

Break-even analysis – Cumulative cost of RCR vs. forecasted commercial services



Assumptions:

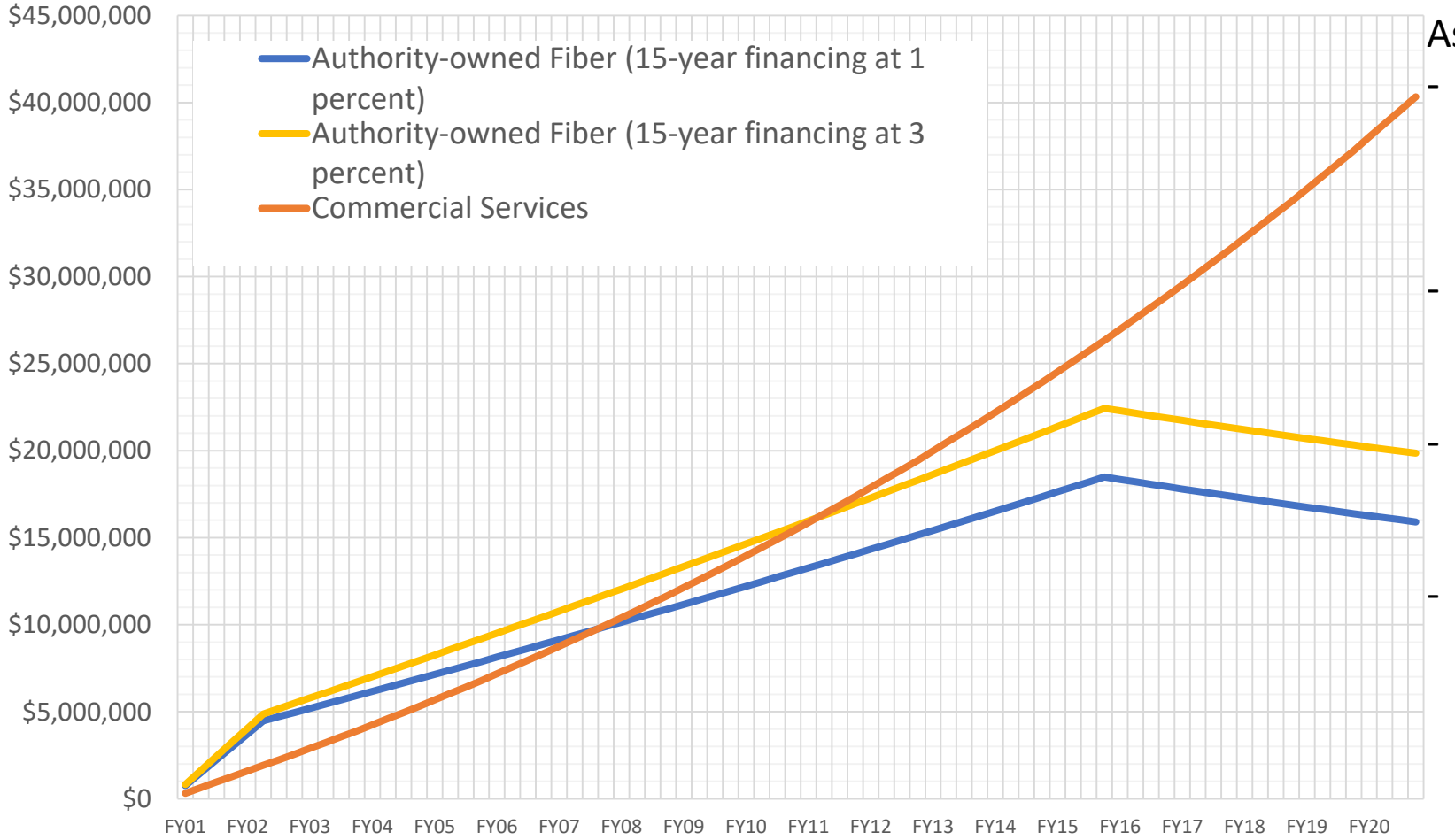
- Assumes 18-month fiber construction timeframe before elimination of leased service costs
- Does not include inflation for RCR O&M or commercial service costs
- 5% annual increase in internet costs / capacity demand

Dark fiber revenue – 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:

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- 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

Summary of Strategies, Case Studies, and Lessons Learned

Model	Example project	Additional capital cost	Additional operating cost	Mechanism	Risk	Cover business case shortfall?
1. Private leasing/services	PA Turnpike Authority	None	None	RFP	Low	Possible
2. Private turn-key concessionaire	KentuckyWired	None	High (in form of availability payments)	RFP	High	Unlikely
3. Authority dark fiber leasing	Arlington County	Minimal	Minimal	Internal structure	Low	Possible
4. Authority lit service sales to anchors	Garrett County, MD	Modest	Low	Internal structure	Low	Possible
5. Authority lit service sales in commercial market	Howard County, MD	High	High	Internal structure	Medium	Possible

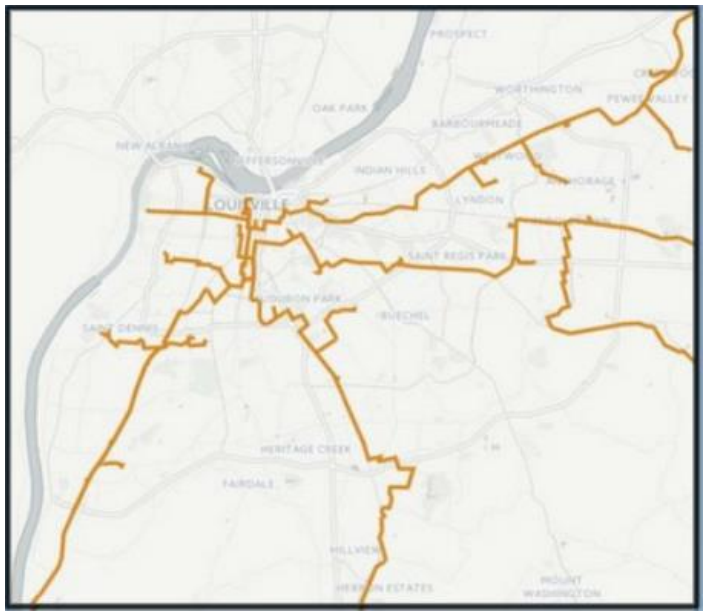
Private Fiber Commercialization: Pennsylvania Turnpike Authority

Award of commercialization opportunity to private company

- Authority granted to private entity opportunity to commercialize assets while retaining control over assets
- Part of a state effort to bridge rural digital divide
- Private sector capabilities, with potential to Authority for modest revenues
- Competitive procurement secured best outcome for Turnpike Authority

P3 Concession: Kentucky Wired

- Commonwealth selected private partner consortium to design, build, finance, operate, & maintain statewide middle mile network
- Public ownership of assets with private execution
- Commonwealth payments to private partner funded in part by avoided costs of leased circuits
- Extensive excess fiber available for private use with shared revenues
- Differentiators for Kentucky were bipartisan recognition of need & willingness to test new model



Middle Mile Fiber Lease: Lincoln, NE

Lease of assets to private company

- City used conduit and real estate assets as incentive to attract private partner while retaining control over assets
- City economic development effort & mechanism to address digital divide
- Private sector capital costs reduced & city realizes modest revenues
- Differentiators for Lincoln were scale of conduit assets & commitment of a private partner

Dark Fiber Lease Model: Public Utility

Lease of public fiber

- Municipal light plant built a fiber loop to support utility operations
- Crown Castle approached seeking to lease spare strands to provide data services to local enterprises
- Utility now realizes steady annual revenue stream to help support electric operations

Lit Services Lease Model: Howard County, MD

Sale of commercial services

- County uses fiber to provide services to wide range of entities
- Has effectively competed to serve school system, non-profits, and some commercial entities
- Modest revenues secured

Best Practices

1	Define goals	Decide what you want and what is important to you, regardless of who initiated the project
2	Assess assets	Fully understand the value of the assets
3	Develop business case	Assess the financial potential through the development of a business case (and benchmarking)
4	Engage potential partners	Build a process that includes relevant internal and external stakeholders
5	Analyze options	Identify and evaluate all structuring options that align with your goals and requirements
6	Ensure “value for money”	Ensure fair market pricing either through benchmarking or through a competitive process