1. City Council Workshop Agenda And Backup

    Documents:

        AGENDA 12-12-16.PDF
        BROADBAND UPDATE MEMO - 12-12-16 CITY COUNCIL WORKSHOP.PDF
        SIFI AUGUST 2016 PRESENTATION.PDF.PDF

2. Addendem - Portland ME Milestone 2 12-12-2016

    Documents:

        PORTLAND ME MILESTONE 2 121216.PDF

CITY OF PORTLAND, MAINE

CITY COUNCIL WORKSHOP

Monday, December 12, 2016
5:30 p.m.
City Hall – City Council Chambers

AGENDA

1. Broadband Update (15 Minutes)
2. High Speed Fiber Presentation (45 Minutes)

Portland, Maine Yes. Life's good here.

MEMORANDUM

TO: City Council

FROM: Brendan T O'Connell - Finance Director, Dan Boutilier - IT Director

DATE: November 30, 2016

SUBJECT: **Broadband Update – SiFi Networks**

In January of 2016 the City Council met to develop a clear understanding of key priorities and goals for the Council and its Committees. The full Council was present. Moving committee by committee, the Council agreed on the highest priority goals for each committee for 2016. **Developing high speed infrastructure and broadband** was listed one of the highest priority goals and assigned to the Economic Development Committee. This goal is a continuation of priorities set forth by previous City Councils. Maine has been recently ranked 49th out of the 50 US States in a survey on quality and availability of broadband access, a fact that is a potential deterrent to economic development. City staff has been working diligently throughout 2016 to make progress towards development of our City broadband capacity.

As many of you may know, the City of Portland maintains a fiber optic institutional network (I-NET) which provides connectivity to all City and School buildings. Our I-NET core consists of five 10 GB network switches arranged in a ring that spokes outward to all City and School buildings closest to each core switch location. Our I-NET is provided through our cable TV franchise agreement with Time Warner. Moving forward, the City will need to provide fiber optic connectivity to the new Canco Road facilities.

In May of 2016 we completed our review of the 14 proposals received in response to our RFP on development of a high speed municipal broadband network. The RFP contained two "options" as follows:

Option 1: "Run a limited number of fiber strands from the Canco Rd location to either Ocean Ave Elementary School or Ocean Ave Fire Station. Both locations are connected to our INET and the distance from Canco Rd to either location is approximately 1 mile."

Option 2: "Develop phase one of an open access fiber network connecting the downtown to Canco Rd. One possible route is shown below and includes a mainline/lateral type of route. Included in this routing method are approximately 838 residential properties and more than 350 commercial properties."

The City selected Time-Warner Cable as the winning vendor for **Option 1** and moved forward running a limited number of single mode fiber strands for a 1 mile stretch from the Canco Rd location to the Ocean Ave Fire Station. This connected our new facilities to our existing I-NET.

We also received several proposals for **Option 2**. The most intriguing proposal came from SiFi Networks of America who stated they could construct a City wide high speed fiber optic network at "no cost to City taxpayers". Under their initial proposal the network would be constructed by SiFi and would require lease payments from the City over a 30 year period. At the end of the 30 year period the network would be owned by the City. The lease payments would be funded by revenue received from the network subscribers (individual businesses and residents).

The City signed an initial three month exclusive negotiating agreement with SiFi Networks, during which the parties negotiated in good faith a plan forward on construction of the fiber optic network. The City agreed not to negotiate with any other parties during this period, and SiFi agreed to move forward with a basic demand survey, a feasibility plan, a detailed design methodology, and long term pro forma statements. The results of the high level demand survey indicated that there was demand for a fiber optic network in the City. However, the initial pro-forma models from SiFi included a requirement for the City to sign a multi-million dollar annual lease with SiFi. By year 5 the lease payments from the City to SiFi would reach $4M and would exceed $6.6M by year 30 of the lease. Over the same period, SiFi estimated that revenues from the network would increase from $5.3M in year 5 to $9.3M in year 30.

Since the initial proposal, SiFi has been working on alternative proposals which do not include such a significant annual lease payment, but also do not include ownership of the network by the City. Potential alternatives include a network fully owned funded privately (i.e. no City contribution) and a hybrid model in which the City would make a much smaller annual contribution as an anchor tenant. Each of these proposals will be outlined by SiFi in more detail at the December 12th workshop and the pros and cons of each will be discussed.

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Networks
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Milestone 1

Sustainability

How do we get there?

The 3 layer model:

- Infrastructure/FTTx/SmartCity Layer
- Independent Operational Layer
- Service Provider Layer

Sustainability

Reykjavik, Iceland

- Open Access Network
- SiFi Networks' Founder instrumental in it's creation
- 70,000 homes passed
- Over 40% take rate
- 6 Service Providers Including tier 1's such as Vodafone
- Cash flow positive and generates in excess of €5m per annum

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- **Financial assumptions**
  - 30,800 residential units (address list confirmation required)
  - 3,000 businesses (address list confirmation required)
  - Wholesale rate of $36.20 for residential ISPs target retail price of $70
  - Business revenue share of 25%
- Breakeven analysis for City is incredibly strong with only a 28.5% take rate required to meet lease obligations to SiFi Networks
- SiFi breakeven analysis is very promising also with a 34% take rate required

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- **Negative Base Case (34% take rate)**
- The base case demonstrates a breakeven scenario for all parties
- The due diligence has found that the City shall be able to service their financial obligations to SiFi Networks with only a 28.5% take rate on residential subscribers
- SiFi Networks who shall be responsible for the operations will achieve a stable financial position for both investors and O&M at between 33-35% take rate
    - Meets SiFi KPIs for investment

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- **Negative Base Case (34% take rate)**

SiFi Networks / City of Portland Year			1	2	3	4	5	10	20	30
Residential Revenue	Construction Period									
Annual Growth rate	18.0%	27.0%	30.0%	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%
Total Subscribers	1440	4590	9240	10472	10472	10472	10472	10472	10472	10472
Total Residential Revenue	$661,536.00	$2,072,646.00	$4,130,106.00	$4,579,836.80	$4,549,036.80	$4,640,017.54	$4,732,817.89	$5,225,413.37	$6,369,749.74	$7,764,689.40
Business Revenue	10%	18%	26%	30%	34%	38%	40%	40%	40%	40%
Subscribing Businesses	150	360	780	900	1020	1140	1200	1200	1200	1200
Business Revenue	$99,000	$241,920	$533,707	$627,052	$669,648	$762,391	$814,437	$895,230	$1,091,280	$1,330,264
Ancillary Revenue										
Cell Tower Connectivity/dark fiber	$0	$0	$0	$0	$140,000	$142,800	$145,656	$160,816	$196,034	$238,964
Total Annual Revenue	$760,536	$2,314,566	$4,663,813	$5,206,889	$5,358,685	$5,545,209	$5,692,911	$6,281,459	$7,657,063	$9,333,917
City Debt Service										
SiFi fixed annual lease fee	$0	$0	$1,405,000	$2,200,000	$3,850,000	$3,927,000	$4,005,540	$4,422,440	$5,390,929	$6,571,513
Subscribers over 36%	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Business Revenue Share	$0.00	$0.00	$0.00	$31,352.62	$33,482.42	$38,119.56	$40,721.85	$44,761.48	$54,563.99	$66,513.20
Lease Total	$0.00	$0.00	($1,405,000.00)	($2,231,352.62)	($3,883,482.42)	($3,965,119.56)	($4,046,261.85)	($4,467,201.30)	($5,445,493.45)	($6,638,026.13)
Managed Rate										
O&M	($552,680)	($675,294)	($987,342)	($1,132,808)	($1,163,561)	($1,225,037)	($1,242,338)	($1,346,537)	($1,595,432)	($1,898,834)
Electricity/Insurance	($190,000)	($250,000)	($250,000)	($250,000)	($250,000)	($250,000)	($250,000)	($276,020)	($336,467)	($410,151)
Additional Capex										
Additional Drops over 36%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Equipment Refresh	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Summary										
Total Annual Cost	($742,680)	($925,294)	($2,642,342)	($3,614,160)	($5,297,044)	($5,440,156)	($5,538,599)	($6,089,758)	($7,377,393)	($8,947,011)
Total Annual Revenue	$760,536	$2,314,566	$4,663,813	$5,206,889	$5,358,685	$5,545,209	$5,692,911	$6,281,459	$7,657,063	$9,333,917
	-	1	-	1	2	3	4	5	10	20	30
P&L	$17,855.88	$1,389,271.64	$2,021,471.24	$1,592,728.85	$61,641.63	$105,052.44	$154,311.44	$191,700.61	$279,670.80	$386,905.97
Project Cash Reserves:	$17,855.88	$1,407,128	$3,428,599	$5,021,328	$5,082,969	$5,188,022	$5,342,333	$6,223,601	$3,810,080	$3,579,074

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- **Tilson Estimate (38.5% take rate)**

- We believe the Tilson estimate to be conservative our findings against past surveys would extrapolate a take rate over 44% within 5 years of network commencement
- Take rate estimate is based upon the data given, comparable studies and assuming a positive skew from the sample as is traditional in self selecting surveys
- As SiFi Networks shall take all operational responsibilities for the networks upkeep we have also prepared a model displaying City specific financials quantifying benefits the City shall obtain, through GDP growth, and property price increases

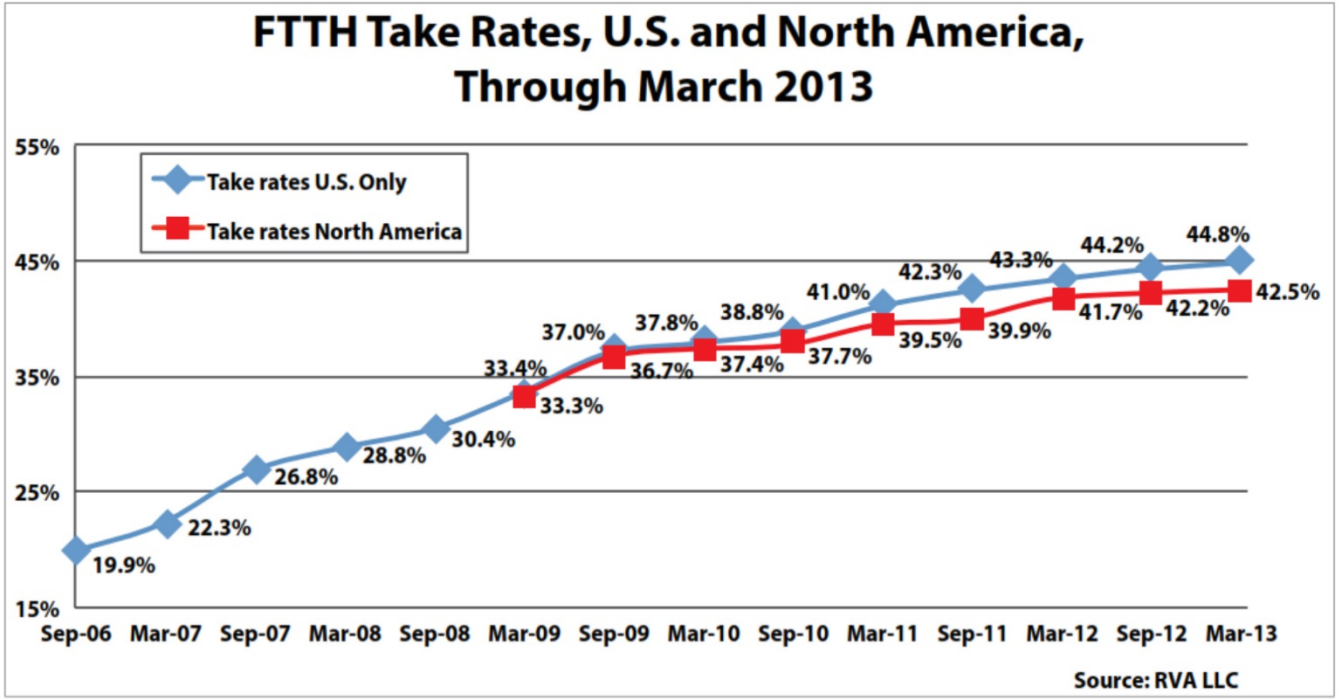
FiberCity™ Portland

- **Tilson Estimate (38.5% take rate)**

SiFi Networks / City of Portland Year			1	2	3	4	5	10	20	30
Residential Revenue	Construction Period									
Annual Growth rate	18.0%	27.0%	33.0%	36.0%	38.5%	38.5%	38.5%	38.5%	38.5%	38.5%
Total Subscribers	1440	4590	10164	11088	11858	11858	11858	11858	11858	11858
Total Residential Revenue	$661,536.00	$2,072,646.00	$4,554,591.60	$4,839,727.20	$5,003,121.20	$5,254,137.50	$5,359,220.25	$5,917,012.20	$7,212,804.86	$8,792,368.87
Business Revenue	10%	18%	26%	30%	34%	38%	40%	40%	40%	40%
Subscribing Businesses	150	360	780	900	1020	1140	1200	1200	1200	1200
Business Revenue	$99,000	$241,920	$533,707	$627,052	$669,648	$762,391	$814,437	$895,230	$1,091,280	$1,330,264
Ancillary Revenue										
Cell Tower Connectivity/dark fiber	$0	$0	$0	$0	$140,000	$142,800	$145,656	$160,816	$196,034	$238,964
Total Annual Revenue	$760,536	$2,314,566	$5,088,299	$5,466,780	$5,812,770	$6,159,329	$6,319,313	$6,973,058	$8,500,118	$10,361,597
City Debt Service										
SiFi fixed annual lease fee	$0	$0	$1,405,000	$2,200,000	$3,850,000	$3,927,000	$4,005,540	$4,422,440	$5,390,929	$6,571,513
Subscribers over 36%	$0.00	$0.00	$0.00	$0.00	$27,720.00	$27,720.00	$27,720.00	$27,720.00	$27,720.00	$27,720.00
Business Revenue Share	$0.00	$0.00	$0.00	$31,352.62	$33,482.42	$38,119.56	$40,721.85	$44,761.48	$54,563.99	$66,513.20
Lease Total	$0.00	$0.00	($1,405,000.00)	($2,231,352.62)	($3,911,202.42)	($3,992,839.56)	($4,073,981.85)	($4,494,921.30)	($5,473,213.45)	($6,665,746.13)
Managed Rate										
O&M	($552,680)	($675,294)	($1,004,528)	($1,144,265)	($1,189,341)	($1,250,816)	($1,268,633)	($1,375,569)	($1,630,822)	($1,941,974)
Electricty/Insurance	($190,000)	($250,000)	($250,000)	($250,000)	($250,000)	($250,000)	($250,000)	($276,020)	($336,467)	($410,151)
Additional Capex										
Additional Drops over 36%	$0	$0	$0	$0	($500,500)	$0	$0	$0	$0	$0
Equipment Refresh	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Summary										
Total Annual Cost	($742,680)	($925,294)	($2,659,528)	($3,625,618)	($5,851,043)	($5,493,656)	($5,592,615)	($6,146,510)	($7,440,502)	($9,017,872)
Total Annual Revenue	$760,536	$2,314,566	$5,088,299	$5,466,780	$5,812,770	$6,159,329	$6,319,313	$6,973,058	$8,500,118	$10,361,597
	- 1	-	1	2	3	4	5	10	20	30
P&L	$17,855.88	$1,389,271.64	$2,428,770.44	$1,841,161.65	($38,273.57)	$665,672.80	$726,698.62	$826,547.42	$1,059,616.05	$1,343,725.40
Project Cash Reserves:	$17,855.88	$1,407,128	$3,835,898	$5,677,060	$5,638,786	$6,304,459	$7,031,157	$10,959,266	$15,668,566	$24,180,944

sifi
Networks

Sustainability



Sifi
Networks
Portland, Maine
Milestone 2

Introduction

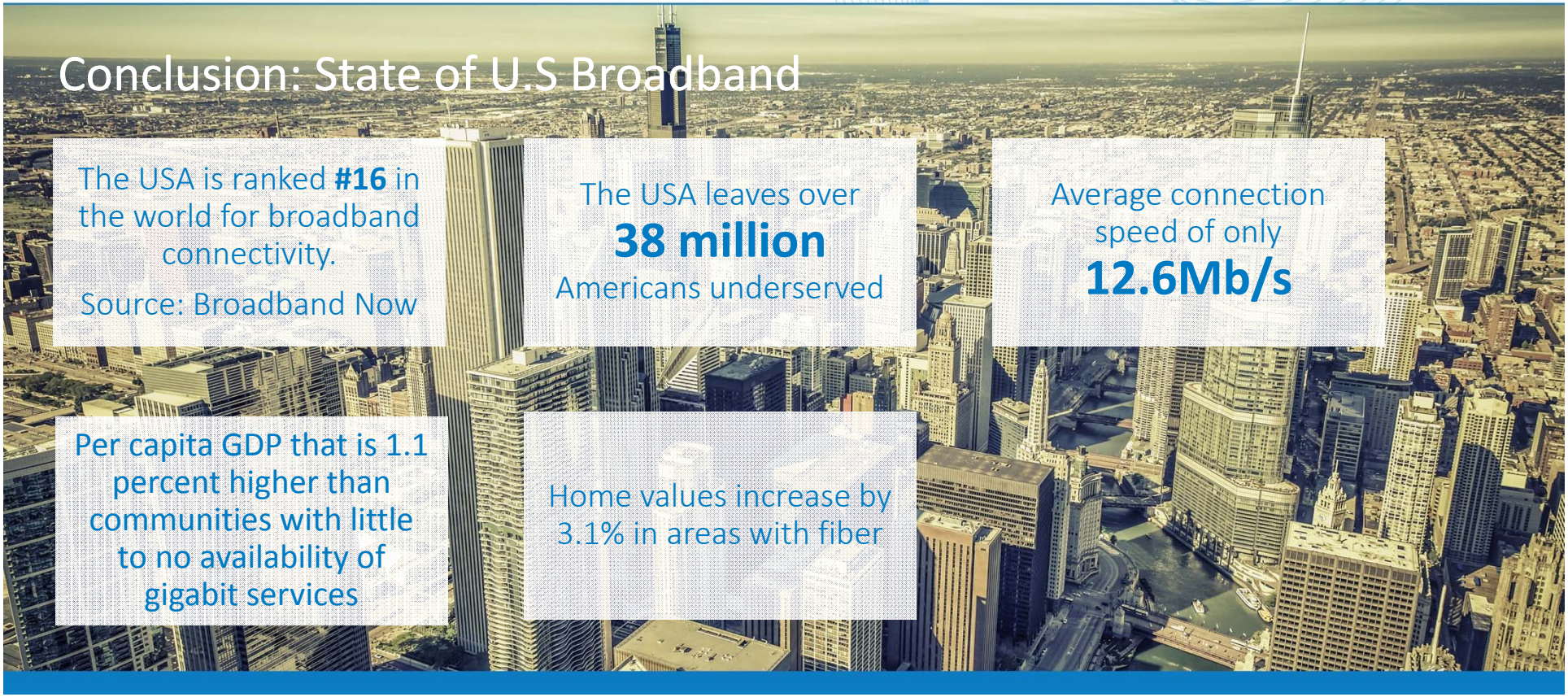
- SiFi Networks Role and Introduction
- U.S Broadband Market and Economic Development
- Smart City
- The Three Layer Model
- The Network Design and Construction
- The Survey results
- Sustainable Options
- Project Viability and Next Steps

Introduction

- SiFi Networks are a developer – take delivery, financial and operational risk
  - Long term investment
  - Long term sustainability
  - Future proof network
  - Operational and retail flexibility
- SiFi Networks have a highly experienced team including world leading partners

NOKIA GigabitNow KeyBanc Capital Markets DLA PIPER KPMG H&M HENKELS & McCOY ADCOM SOLUTIONS CORNING Chapman and Cutler LLP Attorneys at Law · Focused on Finance®

Introduction



Conclusion: State of U.S Broadband

The USA is ranked **#16** in the world for broadband connectivity.

Source: Broadband Now

The USA leaves over **38 million** Americans underserved

Average connection speed of only **12.6Mb/s**

Per capita GDP that is 1.1 percent higher than communities with little to no availability of gigabit services

Home values increase by 3.1% in areas with fiber

Sustainability

Chattanooga Economic Development

- Nokia lead network design
- Over 66,000 connected customers
- Over 60% penetration
- Between 2800 and 5200 new jobs

Sustainability

Reykjavik, Iceland

- Open Access Network
- SiFi Networks' Founder instrumental in it's creation
- 70,000 homes passed
- Over 40% take rate
- 6 Service Providers Including tier 1's such as Vodafone
- Cash flow positive and generates in excess of €5m per annum

Sustainability

Portland Requirements

- Municipal buildings – 101
- Traffic Light Control Boxes – 113
- Parking Kiosks – 55
- Fire Call Boxes – 606
- Bus Stops – 47
- Flood Warning Detection
- Bridge Freezing Detection
- School District to the Home
- Smart Grid/Metering

Sustainability

How do we get there?

The 3 layer model:

- Infrastructure/FTTx/SmartCity Layer
- Independent Operational Layer
- Service Provider Layer

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Design Overview – for both sustainable options

- All business and municipal fed diversely
- 31,564 residential units
- 4,500 business units
- 1,079 municipal Smart City demand points
- 2.5m ft of construction
- 2-2.5 year build (winter = 4.5 month shut down = 34 week construction season)
- Approximately 60% microtrenched 40% directional drilled
- 100% underground solution (no aerial)
- Options proposed with islands to be built in a later phase of deployment

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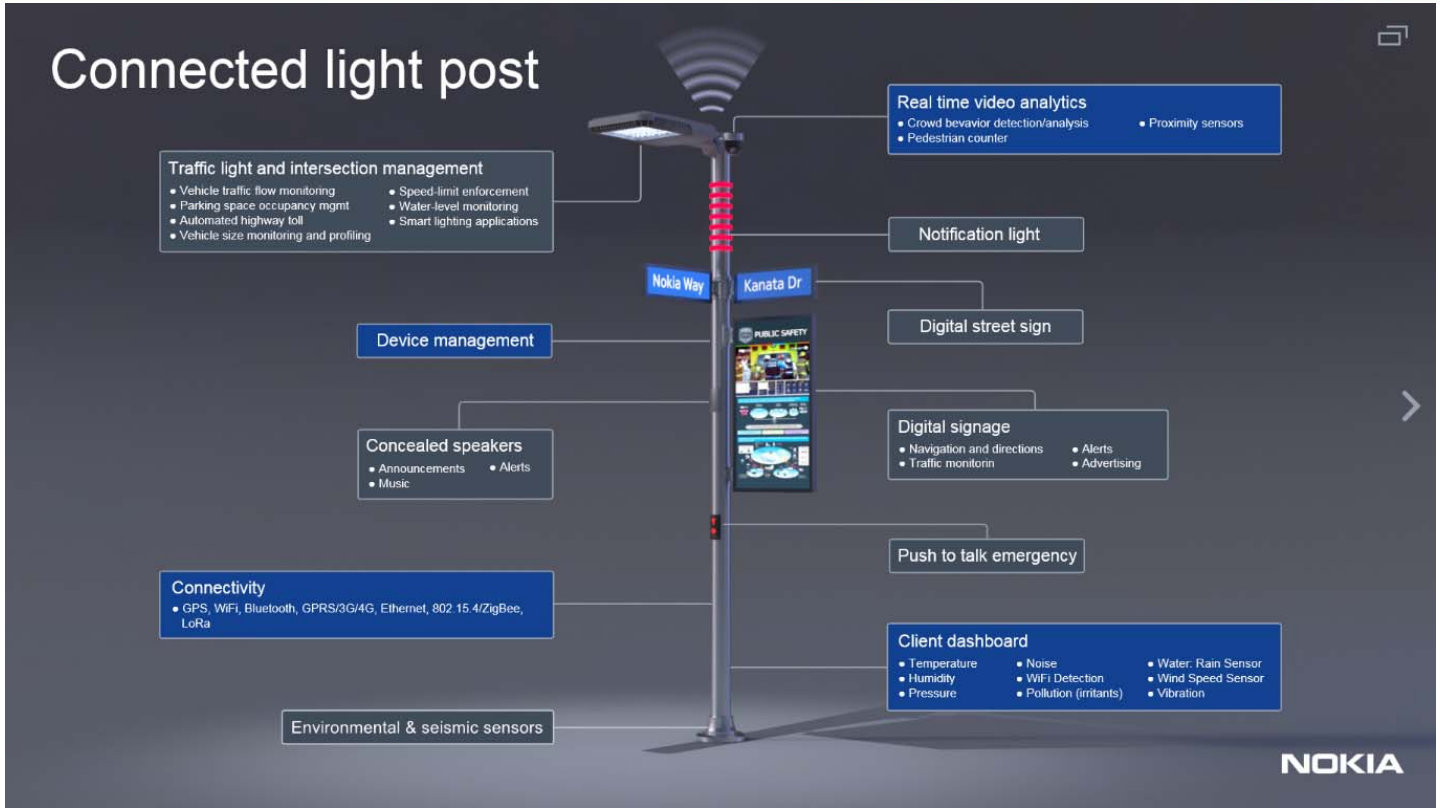

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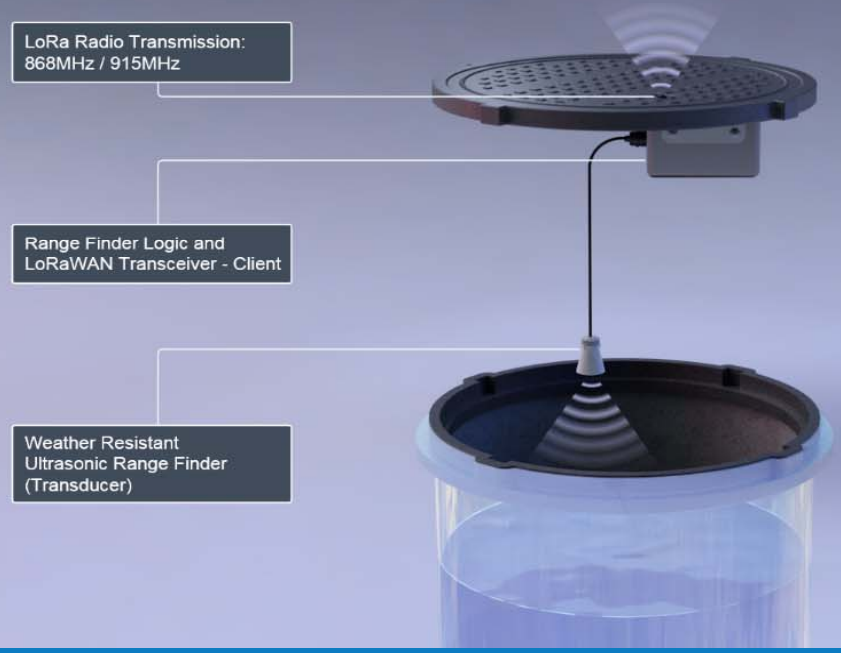
IoT – LoRa Storm Drain



The instrument measures the time it takes for a sound pulse to travel from the transducer to the level of water (or bottom) and then for the echo to return.
Because we know the speed of sound in air (1086 ft/sec or 331 m/sec), the distance to the target can be accurately calculated.

NOKIA

Key Survey Findings

- Time Warner is the ISP for 85% of respondents
- Likely significant cord cutting due to a significant number who do not appear to have additional services (TV/phone), whether through primary ISP or Secondary provider
- At least half of respondents were not satisfied with Internet speed, reliability and overall service by their ISP
- 72% of respondents were dissatisfied with cost; only 9% satisfied
- 69% of respondents would consider paying more for faster service. This suggests that customers do not perceive they are receiving value.
- 85% of respondents indicated that they supported or very strongly supported the City's involvement in improving Internet services.

TILSON

Key Survey Findings Cont'd

- Based on the available information, Tilson estimates that a new entrant to the Portland market could potentially obtain a possible take rate of 38.5%.

- Ultimate take rate achieved however, depends on myriad factors not known at this time, including:
  - New entrant's offering, price, speed, video offerings, marketing, ease of installation, and market movement, in particular, upgrades to the existing cable platform.

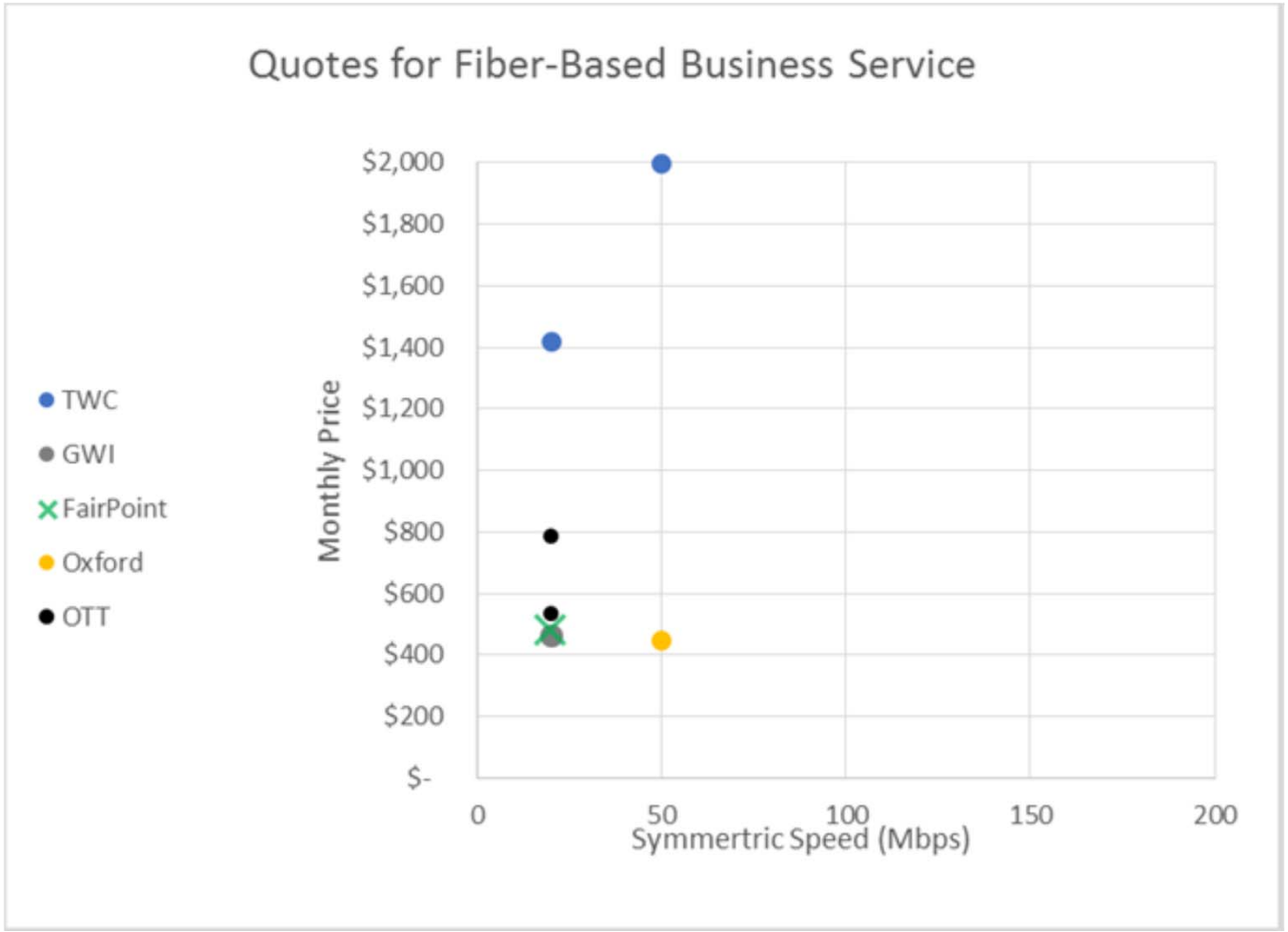
TILSON

Support for City Involvement

	Do not support at all	(no label)	(no label)	(no label)	Very strongly support	Total	Weighted Average
(no label)	2.35% 31	1.44% 19	10.69% 141	16.15% 213	69.37% 915	1,319	4.49

- Over 85% of respondents provided a response of 4 or greater
- Nearly 70% indicated that they very strongly supported the City assisting in Internet improvements
- Only 3.5% of respondents indicated that they were not supportive of the City's working to improve Internet service (rating of 1 or 2)
- Just over 10% (141 out of 1,319) indicated neither a strong support nor disapproval

TILSON


Quotes for Fiber-Based Business Service
TWC
GWI
FairPoint
Oxford
OTT
Monthly Price
$2,000
$1,800
$1,600
$1,400
$1,200
$1,000
$800
$600
$400
$200
$-
0
50
100
150
200
Symmertric Speed (Mbps)

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Options:

- Municipal Model
  - Citywide including downtown area excluding islands
    - Challenges faced in construction in these areas
  - Smart City connections
  - SiFi Networks and private partners - Construction, Operations, Service Provision
  - City Ownership/ lease obligation
  - Result – Sustainable, Return on Capital achieved and long term operational stability achieved with anticipated take rates
  - Capital Lease payment is guaranteed by private sector ISPs accessing the network:
    - Year1-3 = $0
    - Year 4 = $1,000,000
    - Year 5 = $2,000,000
    - Year 6 = $5,395,000

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Options:

- 100% Private Model:
  - Unsustainable without municipal Smart City service agreement in place
  - Return on Capital targets not met to satisfy private capital markets
- Hybrid Model (no long term lease):
  - Citywide build including downtown (excluding islands)
  - SiFi Networks owned operated and maintained
  - Smart City IRU and managed services agreement
    - Smart City connectivity
    - 30 Year Smart City Managed Services Agreement
  - Result – Sustainable, Return on Capital achieved and long term operational stability achieved with anticipated take rates
  - Smart City Managed Service Agreement for 30 years of $428,000 per annum
    - This Smart City infrastructure if built in the future would cost Portland in excess of $30m

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Benefits

- All homes and business can access regardless of demographics
- Smart City infrastructure to increase efficiencies and reduce City costs
- No operational burden on the City – SiFi Networks shall take responsibility
- Increase in property values
- GDP growth possible 1.1% as the average in other communities
- Economic development and businesses attracted to the City
- A world leading network
- Very low take rate required to cover cost (29.5%)
- Zero construction risk, development risk and all operations and maintenance risks
- ISPs signed on to cover revenue and demand generation risk
- Internet speed increase of between 20-100 times faster than current speeds
- New and more affordable services offered as the City and SiFi enable competition

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Viability

- Based on significant due diligence SiFi Networks can evidence a confident business case for a FiberCity network in Portland through Private and Public finance
- Both options create significant growth and Quality of Life improvement for the City
- Increase in property values throughout the city likely as a direct result
- GDP growth of 1.1% can be attributable to citywide Fiber networks vs cities without

BUT

- Timing is critical, a municipal model would likely have to commence construction in 2018, whereas the Hybrid model could commence construction in the early summer of 2017

Conclusion

Conclusion

- Demand is well supported by Tilson's survey to levels well in excess of a breakeven position
- Design shows favorable network architecture will exceed reliability required for institutions and public safety
- Three ISPs willing and able to guarantee the minimum revenue requirement
- Operational efficiencies are achieved in Portland through a citywide build
- Good Backhaul links to provide a scalable internet connection
- Only a third of the community required to subscribe by year 5
- When factoring in impact on property values, GDP growth, job creation and Smart City applications, Cities upside is outstanding

Conclusion

Conclusion Cont.

- Recommended next steps
- Decision on proceeding based on Municipal or Hybrid option
- Municipal Model:
  - Meetings scheduled with legal/bond counsel
  - Formal proposal and agreements drafted for council approval
  - Network construction commencement Spring 2018.
- Hybrid Model:
  - Development Agreement signed granting access to rights of way
  - Managed Service Agreement for Smart City agreed
  - Construction Commencement Summer 2017

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