Gigabit Cities Profiling and the Business Case

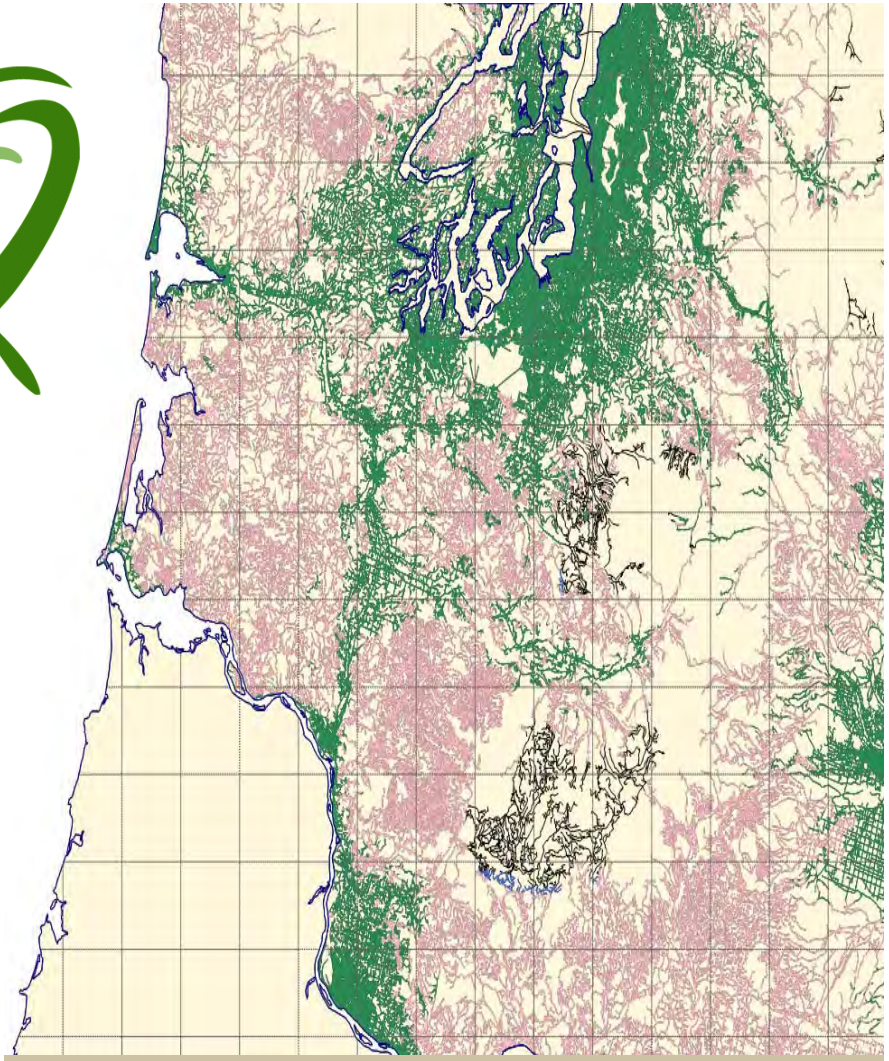
CostQuest Associates

January 2014

Introduction

CostQuest Associates

- *Cincinnati – Seattle – Washington D.C.*
- *Formed in 1999*
- Internationally recognized as leading telecommunication network modeling, costing and profitability experts
  - Broadband and USF models: BAM used by FCC for NBP, CACM being used as national CAF/USF model, CPM California, CPM Hong Kong, BCPM, NUSC Australia, CostPro-Core New Zealand
  - RCN and Loop models: CostPro in use by carriers with operations in over 40 states, adopted and well received by commissions in all UNE and Tax proceedings
  - Wireless Costing: Wireless Models NTIA, CTIA, Wireless Carriers
  - Wireless Work: USAC Filings, Audits and Reviews, USAC/USF Workshops, GIS Analysis, Policy Support
  - Interconnection model: CostPro-Core in use by the New Zealand Commerce Commission to set rates
  - Profitability models: COMPASS, MAPS, ProfitMap, CPMS, and MIDAS – economic based contribution models over various business dimensions
- Global experience in developing, supporting regulatory and competitive practices



- Economic Network Modeling
- Mapping/GIS
- Regulatory Support
- Valuation/Costing
- Profitability
- Expert Testimony

GIGABIT PRESS

Gigabit in the Press

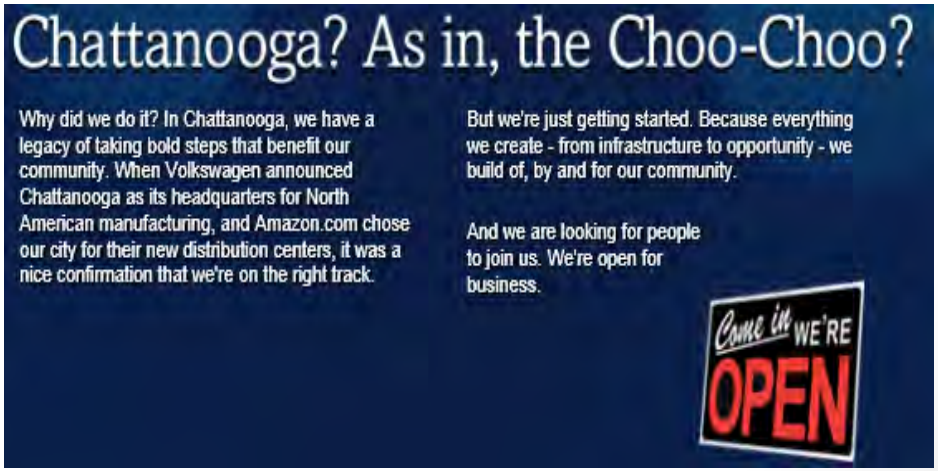
- FTTH Council Proposes Unspent CAF Money Fund 'Gigabit Communities' in Small and Rural Areas

"The Council envisions an annual national competition for Catalyst Funds by which the Commission would select up to fifteen meritorious proposals annually and provide each of them with up to $10,000,000 in Catalyst Funds. Accordingly, each year up to $150 million in Catalyst Funds would be awarded, and as many as seventy-five projects would be funded over the five-year life of the Program for a total of up to $750 million."

Gigabit in the Press

- Cedar Falls, IA –
  - Bob Seymour, economic development manager for the city of Cedar Falls, said the "gigabit city" label will help with business recruitment.
  - "This is a great tool for promoting Cedar Falls as a place to locate or expand a business," Seymour said. "It's an important part of the complete infrastructure package we bring to the table, and it means we can compete with the best broadband communities anywhere in the country."
- Gainesville, FL -
  - Residents and businesses in the Innovation District will soon have access to a blisteringly fast one-gigabit-per-second broadband connection. The program springs from a partnership between the University of Florida and GRU's GRUCom telecommunications network.

    http://gainesvillebizreport.com/gigabit-broadband-comes-to-innovation-district/
- Chattanooga, TN –



Gigabit in the Press

- Melrose, MN –
  - By Julio Ojeda-Zapata jojeda@pioneerpress.com POSTED: 06/28/2013 12:01:00 AM
  - Got gigabit? The vast majority of Minnesotans cannot get home Internet connections with speeds of 1 gigabit per second -- about 100 times faster than a standard broadband hookup. At least, they cannot do so easily and affordably. But the residents of Melrose, Minn., about 100 miles northwest of the Twin Cities, will get gigabit Internet connections with a call, beginning this week. The city of about 4,000 is declaring itself the state's first "gigabit city."
- Lansing, MI -
  - By Isabella Shaya | Published 07/12/12 4:16pm
  - Through the Greater Lansing University Community Next Innovation Project, or Gig.U, MSU and Greater Lansing are on track to having a one-gigabit-per-second Internet connection available to all students and community members.

Gigabit in the Press

- Illinois

Illinois Gov. Pat Quinn on Friday announced that Evanston is the third grant recipient in the Illinois Gigabit Communities Challenge state grant program.

Evanston will receive $1 million toward a $2.5 million project to extend the city's current fiber optic infrastructure by more than 400 access points. It's a plan designed to attract business while improving medical services, education opportunities and research programs at Northwestern University.

The Illinois Gigabit Communities Challenge is a competition launched by Quinn to award $4 million in prize funding to the most promising ultra high-speed broadband deployment projects in Illinois as part of the Illinois Jobs Now! economic development program.

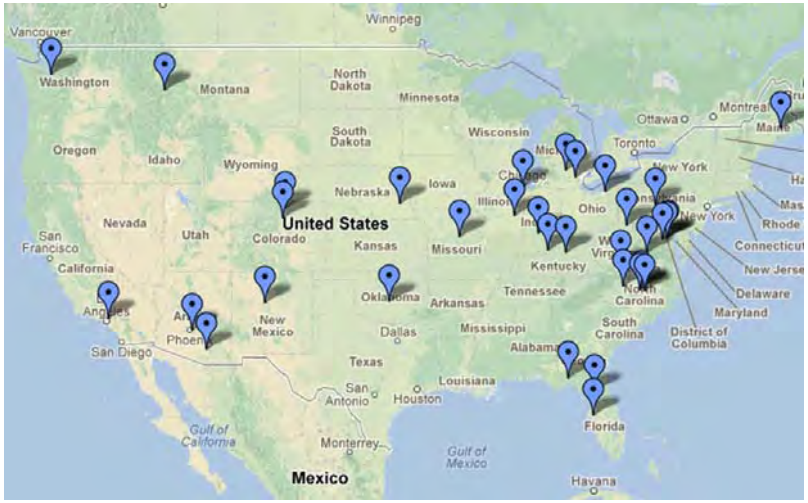
Quinn, along with several city, business and university officials, attended a press conference on the grant Friday at the Chicago Main public library in Evanston.

Gigabit in the Press

- May 24, 2012 -- Blair Levin of Gig.U told the lunch crowd yesterday that Gigabit Squared (a consulting, hands-on project management company) has raised $200 million to fund six gigabit-network projects that are originated and supported by colleges and college communities in the Gig.U program.

Source – Building the Gigabit City

GigU Partners



Gigabit Cities

- Cities
  - Kansas City KS/MO – Google Fiber
  - Chattanooga, TN – Community-owned EPB
  - Lafayette, LA – Lafayette Utility Services Fiber
  - Bristol VA/TN – Bristol Tennessee Essential Services
  - Morristown, TN – Morristown Utilities Service FiberNet
  - Burlington, VT – Burlington Telecom
  - Springfield, VT – Vermontel
  - Omaha, NE – CenturyLink
  - Tullahoma, TN – Tullahoma Utilities Board
  - Minneapolis, MN – US Internet
  - Cedar Falls, IA – Cedar Falls Utilities
  - Seattle, WA – Gigabit Squared

Gigabit Cities - Announced

- Chicago, IL – Gigabit Squared
- San Francisco, CA – SONIC.net
- Austin, TX – Google Fiber
- Provo, UT – Google Fiber
- Lawrence, KS – Wicked Broadband
- Wilson, NC – City-owned Greenlight
- Melrose, MN – Arvig (local ISP)
- Rural Central Missouri – Co-Mo Electric Coop
- Gig-U – Gainesville, FL; Orono, ME; Lansing, MI

…Maybe it is Not so Rosy

January 7, 2014 at 6:00 PM

Unpaid bill signals end of Seattle high-speed internet deal

Posted by Lynn Thompson

Share:

Recommend 18

Comments

Print

About all that's left of Mayor Mike McGinn's promise to bring high-speed internet to Seattle neighborhoods in partnership with Gigabit Squared is the small company's unpaid bill for $52,250.

Erin Devoto, Seattle's chief technology officer, said that as of mid-November, the company's phones were turned off and the city was unable to reach its officers. She turned over the bill for city staff's preliminary engineering work on a broadband network to the City Attorney's Office for collection.

McGinn made bringing high-speed internet to Seattle one of the priorities of his 2009 campaign for mayor. In 2012, he announced a deal with Gigabit Squared to lease the city's unused dark fiber-optic cable and connect 14 Seattle neighborhoods to high-speed internet. Seattle was one of two cities, along with Chicago, where the company promised to invest $200 million.

Both GeekWire and the Puget Sound Business Journal reported in the past week that Seattle's deal with Gigabit Squared was dead.

Devoto said that in her final conference call with company officials in November, they said they hadn't been able to raise the needed capital. She said she plans to brief Mayor Ed Murray on the city's options when he's had a chance to settle in. Murray's office did not return a request for comment.

Devoto said the outstanding bill is a small cost for investing in what was essentially an ambitious start-up effort.

"It's not an easy lift. Very few places have made it work," Devoto said.

PROFILING

Profiling and Ranking

- To determine which cities are prime candidates, we profile and rank cities using
  - General characteristics
  - Demand characteristics
  - Supply characteristics
  - Financial characteristics
  - Business environment characteristics
- Sources of data include:
  - Census and Census ACS
  - Residential and Business Demand datasets (e.g., Experian, D&B, etc..)
  - National Broadband map
  - CDC Wireless survey
  - Third party sources – for example, business environment, etc..
  - CostQuest financial models: akin to what was used for NBP and CACM

Profiling and Ranking

- Variables to consider:
  - CBP Profile
    - Locations per Road Mile
    - Business Characteristics
      - NAICS and Employee Size
    - Household Characteristics
      - Age, Income, Education, Size
    - …other

Profiling and Ranking

- Variables to consider:
  - DEMAND
    - Total Locations
    - Household and business projected growth
    - Large Users (counts)
      - Community Anchor Institutions by type
    - …other

Profiling and Ranking

- Variables to consider:
  - SUPPLY availability (location and speed) for
    - Cable
    - Fixed Wireless
    - Mobile
    - Telco

Profiling and Ranking

- Variables to consider:
  - FINANCIAL
    - Estimated Potential Market Share
    - Estimated Per Sub Net Value Score
    - …other

Profiling and Ranking

- Variables to consider:
  - BUSINESS ENVIRONMENT
    - Cost of Doing Business in State
    - Unemployment tax rates
    - …other

Profile and Ranking: Summary

Gigabit Scoring	City Percentile
Overall for CDP	90%
MSA Average	90%
Profile	90%
Demand	100%
Supply	100%
Other	100%
Biz Environment	90%

Profile and Ranking: Summary

Sta	CDPName	MSA
VA	Lansdowne	Washington-Baltimore-Arlington, DC-MD-VA-WV-PA
TX	Austin city	Austin-Round Rock, TX
TX	Cedar Park city	Austin-Round Rock, TX
TX	Kyle city	Austin-Round Rock, TX
TX	Brushy Creek	Austin-Round Rock, TX
AL	Madison city	Huntsville-Decatur-Albertville, AL
TX	Round Rock city	Austin-Round Rock, TX
FL	Sunny Isles Beach city	Miami-Fort Lauderdale-Port St. Lucie, FL
TX	Little Elm city	Dallas-Fort Worth, TX-OK
VA	Tysons Corner	Washington-Baltimore-Arlington, DC-MD-VA-WV-PA
VA	Cave Spring	Roanoke, VA
TX	Cibolo city	San Antonio-New Braunfels, TX
VA	McNair	Washington-Baltimore-Arlington, DC-MD-VA-WV-PA
AZ	Arizona City	Phoenix-Mesa-Scottsdale, AZ
TX	Jollyville	Austin-Round Rock, TX
FL	Miami Beach city	Miami-Fort Lauderdale-Port St. Lucie, FL
TX	Midlothian city	Dallas-Fort Worth, TX-OK
TX	Mission city	McAllen-Edinburg, TX
TX	San Antonio city	San Antonio-New Braunfels, TX

COSTQUEST GIGABIT CITY MODEL

Gigabit City Model

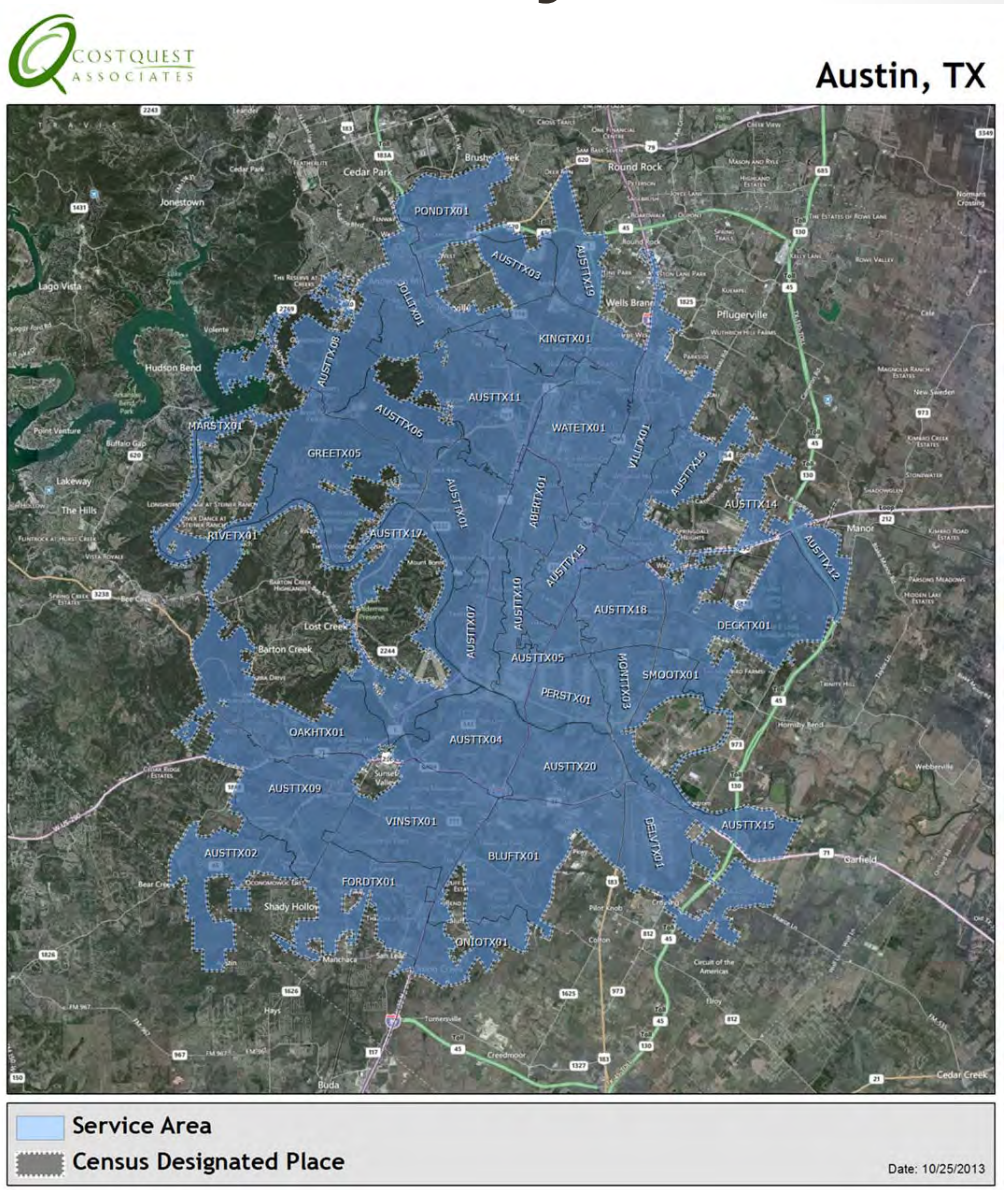
- Model basis
  - National Broadband Plan
  - FCC's revamped USF efforts
  - Property Valuation
  - Pricing support
  - Regulatory support

Gigabit City Model

- Model Approach
  - Identify area of build
  - Identify common neighborhoods
  - Collect Demand and Supply information
  - Create Network model
    - Identify investment for
      - Network to pass
      - Success based capital
  - Estimate financials
    - Revenue
    - Opex
    - Capex
    - Non-recurring
    - Net Contribution

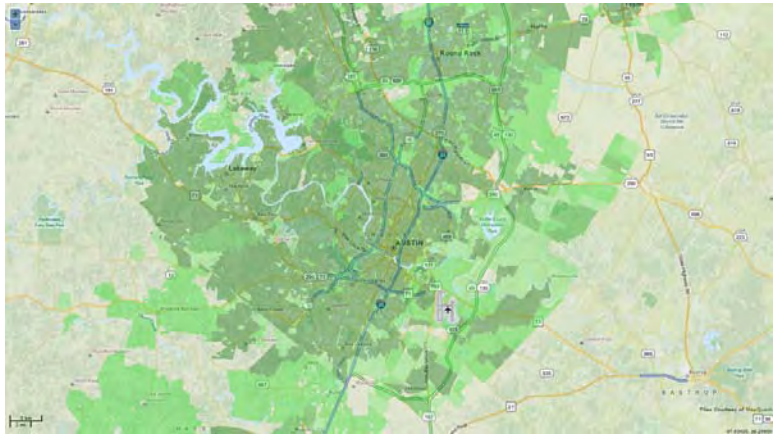
Gigabit City Model: Study Areas

- Identify area to build
  - We used Census Designated Place boundaries (city boundaries)
  - We used zip code data to help create neighborhood service areas

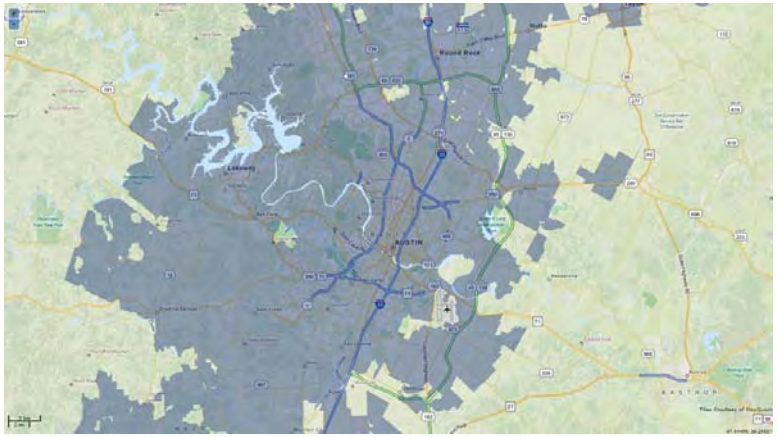


Gigabit City Model: Coverage

Telecom Coverage



Cable Coverage



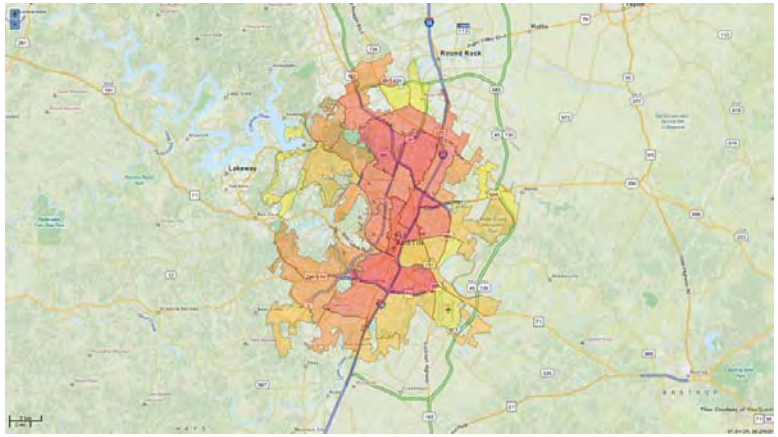
Gigabit City Business Case

- Within each neighborhood, demand and supply information is collected

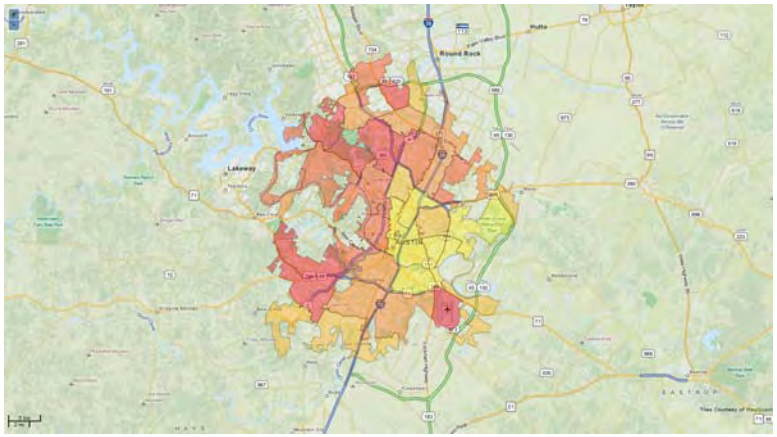
MSA	State	CDPName	CDPServiceArea	CDPServiceAreaName	Zip3	AreaSqMiles	roadmiles	HwyMiles	ResLocations	BusLocations	Buildings	MDU	ResPopulation	ResHouseholds	ResHousingUnits	BusFirms	BusEnterprises
Austin-Round Rock, TX	TX	Austin city	ABERTX01	Abercrombie	787	4.836678132	166.9370306	0	8866	4069	9636	428	21950	10479	10988	4069	437
Austin-Round Rock, TX	TX	Austin city	AUSTTX01	Austin	787	8.268998657	211.2106668	0	9473	4835	10146	444	25364	12507	13118	4835	490
Austin-Round Rock, TX	TX	Austin city	AUSTTX02	Austin	787	7.013577579	106.0519282	0	4290	1100	4620	24	13579	4317	4316	1100	34
Austin-Round Rock, TX	TX	Austin city	AUSTTX03	Austin	787	2.558036561	5.382895268	0	2	18	6	0	17	1	2	18	10
Austin-Round Rock, TX	TX	Austin city	AUSTTX04	Austin	787	8.72136464	254.7628372	0.69481725	16143	6525	17572	1205	43117	22373	23990	6525	778
Austin-Round Rock, TX	TX	Austin city	AUSTTX05	Austin	787	3.200568591	138.4169319	0.322662653	5171	8643	6835	227	14116	6886	8139	8643	1471
Austin-Round Rock, TX	TX	Austin city	AUSTTX06	Austin	787	5.780017597	40.65476495	0	1736	521	1988	37	4826	2231	2363	521	23
Austin-Round Rock, TX	TX	Austin city	AUSTTX07	Austin	787	5.247077917	170.212281	0	8035	3610	8769	608	20308	9776	10535	3610	307
Austin-Round Rock, TX	TX	Austin city	AUSTTX08	Austin	787	7.938318896	76.51707362	0	2879	1035	3167	28	11132	4643	4754	1035	74
Austin-Round Rock, TX	TX	Austin city	AUSTTX09	Austin	787	12.4072785	292.2776959	0	13630	3623	14180	214	39929	16687	16777	3623	223
Austin-Round Rock, TX	TX	Austin city	AUSTTX10	Austin	787	3.793536706	150.4004623	0	11298	4220	12297	720	39020	14963	15747	4220	579
Austin-Round Rock, TX	TX	Austin city	AUSTTX11	Austin	787	11.83852555	276.3829401	0	14385	7444	15816	463	39733	20001	20720	7444	982
Austin-Round Rock, TX	TX	Austin city	AUSTTX12	Austin	786	2.226541739	6.027993717	2.778239399	111	9	119	0	344	96	111	9	1
Austin-Round Rock, TX	TX	Austin city	AUSTTX13	Austin	787	5.408033802	186.4065298	0.408812238	11701	3840	12484	873	33132	15239	16420	3840	519
Austin-Round Rock, TX	TX	Austin city	AUSTTX14	Austin	787	2.801861905	42.58556114	0	1192	319	1315	5	3546	1165	1200	319	26
Austin-Round Rock, TX	TX	Austin city	AUSTTX15	Austin	786	6.455960963	73.02176468	0.049811385	2757	402	3022	79	10600	2795	2951	402	30
Austin-Round Rock, TX	TX	Austin city	AUSTTX16	Austin	787	6.555070643	78.75913233	0	3283	1187	3546	22	9357	4073	4369	1187	181
Austin-Round Rock, TX	TX	Austin city	AUSTTX17	Austin	787	8.793707414	134.0332533	0	4262	3647	4551	193	13362	6019	6350	3647	524
Austin-Round Rock, TX	TX	Austin city	AUSTTX18	Austin	787	6.683940294	177.8669699	0	10143	2310	10761	331	29023	11058	12506	2310	233
Austin-Round Rock, TX	TX	Austin city	AUSTTX19	Austin	786	2.751530806	8.353620782	0	5	44	11	0	29	0	5	44	21
Austin-Round Rock, TX	TX	Austin city	AUSTTX20	Austin	787	6.877910989	130.2815656	0.126482917	11711	2043	12177	395	45392	18318	20568	2043	235
Austin-Round Rock, TX	TX	Austin city	BLUFTX01	Bluff Springs	787	13.94636177	224.2973781	0.428239292	10674	2249	11218	334	42173	12588	13108	2249	276
Austin-Round Rock, TX	TX	Austin city	DECKTX01	Decker	787	9.382058136	86.29655672	1.392523968	3415	432	3548	142	14447	3711	3987	432	39
Austin-Round Rock, TX	TX	Austin city	DELVTX01	Del Valle	787	5.809781428	32.27912964	0	11	128	55	1	108	0	17	128	32
Austin-Round Rock, TX	TX	Austin city	FORDTX01	Ford Oaks	787	10.53013861	253.1779909	0.630061301	13219	2604	14109	392	38708	15404	15826	2604	182
Austin-Round Rock, TX	TX	Austin city	GREETX05	Greenshores	787	11.62356751	93.65289472	0	2729	1326	2919	40	7833	3331	3534	1326	158
Austin-Round Rock, TX	TX	Austin city	JOLLTX01	Jollyville	787	7.421681216	186.285385	0	9238	4217	9914	238	28092	12328	12659	4217	390

Gigabit City Model: Demographics

Locations per Road Mile

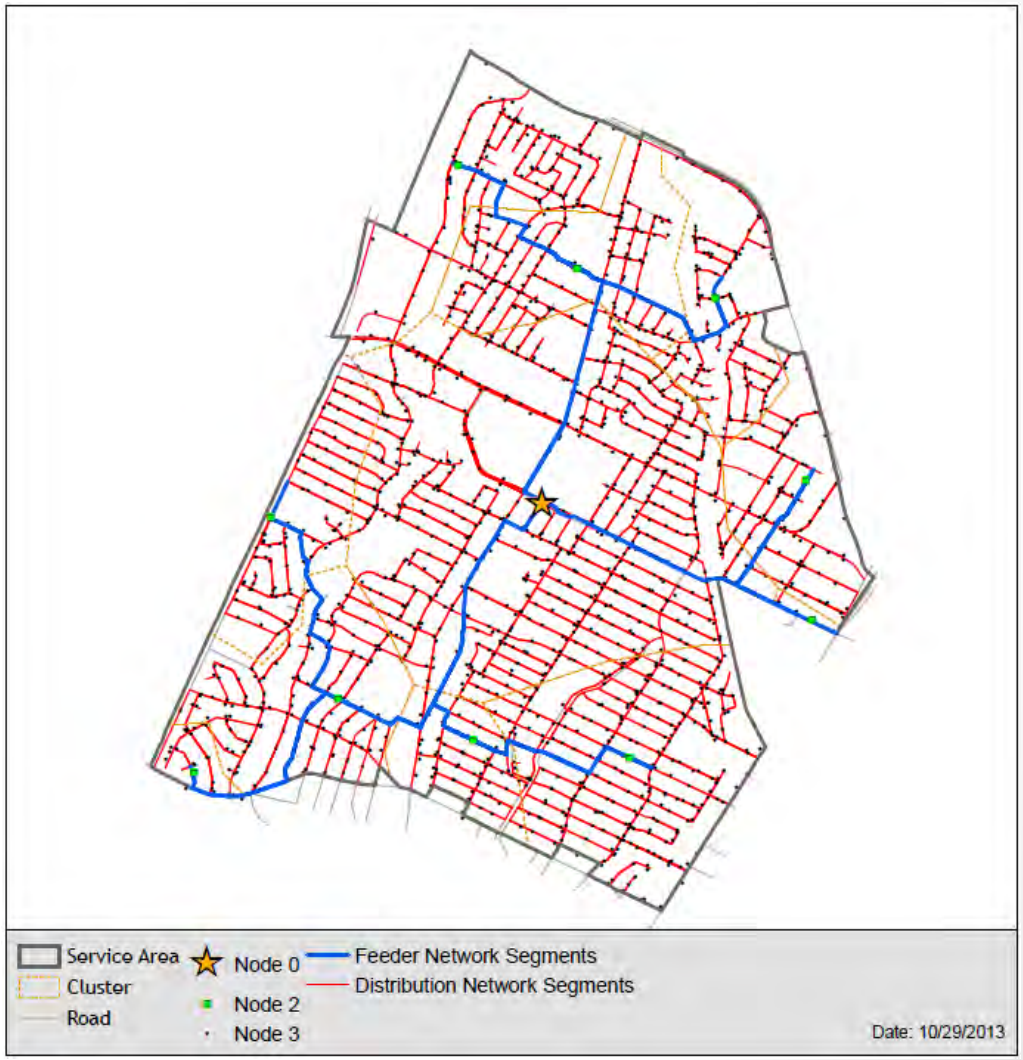


Estimate Take Rates



Gigabit City Model: Network

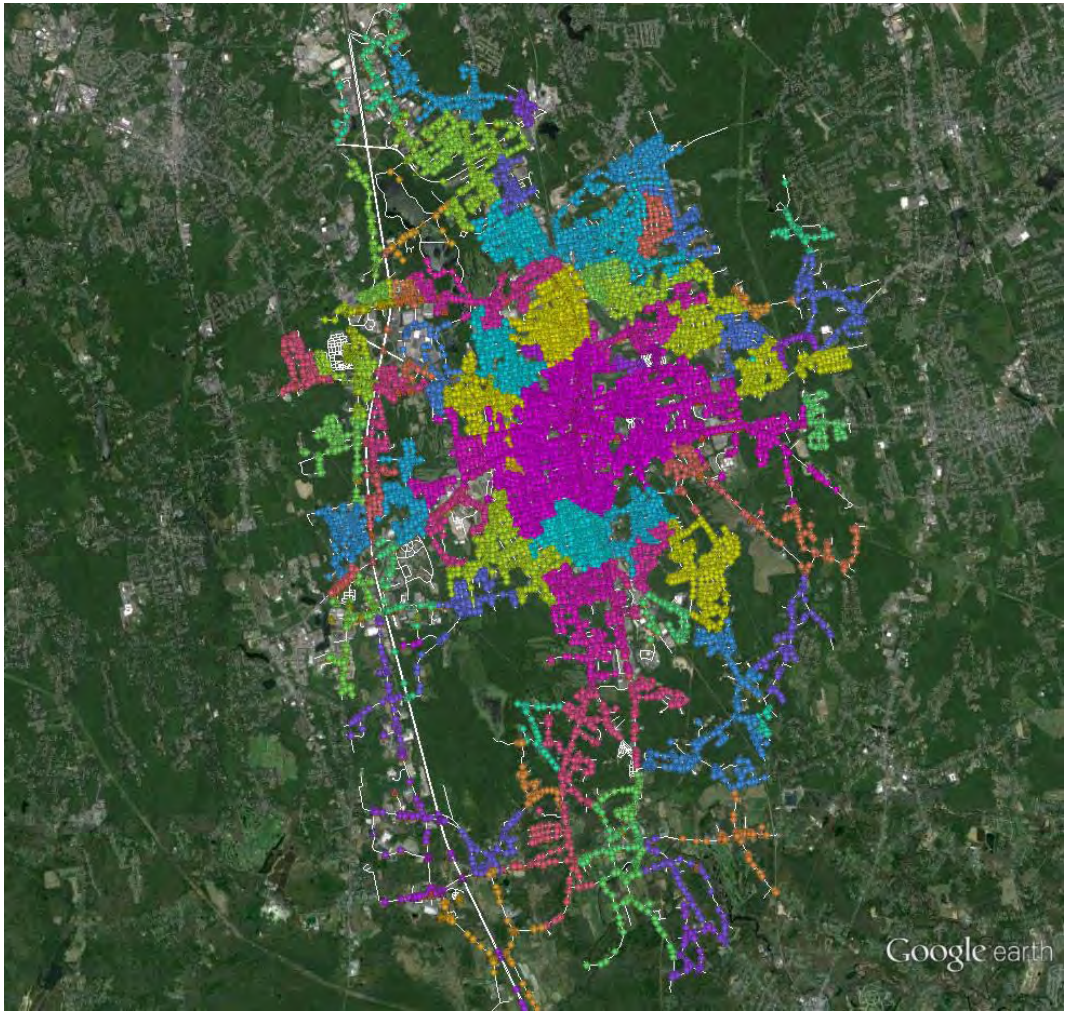
- Using our CostPor network modeling tool, each neighborhood is engineered
  - Capital requirements identified
    - To Pass
    - Success



Access/Distribution

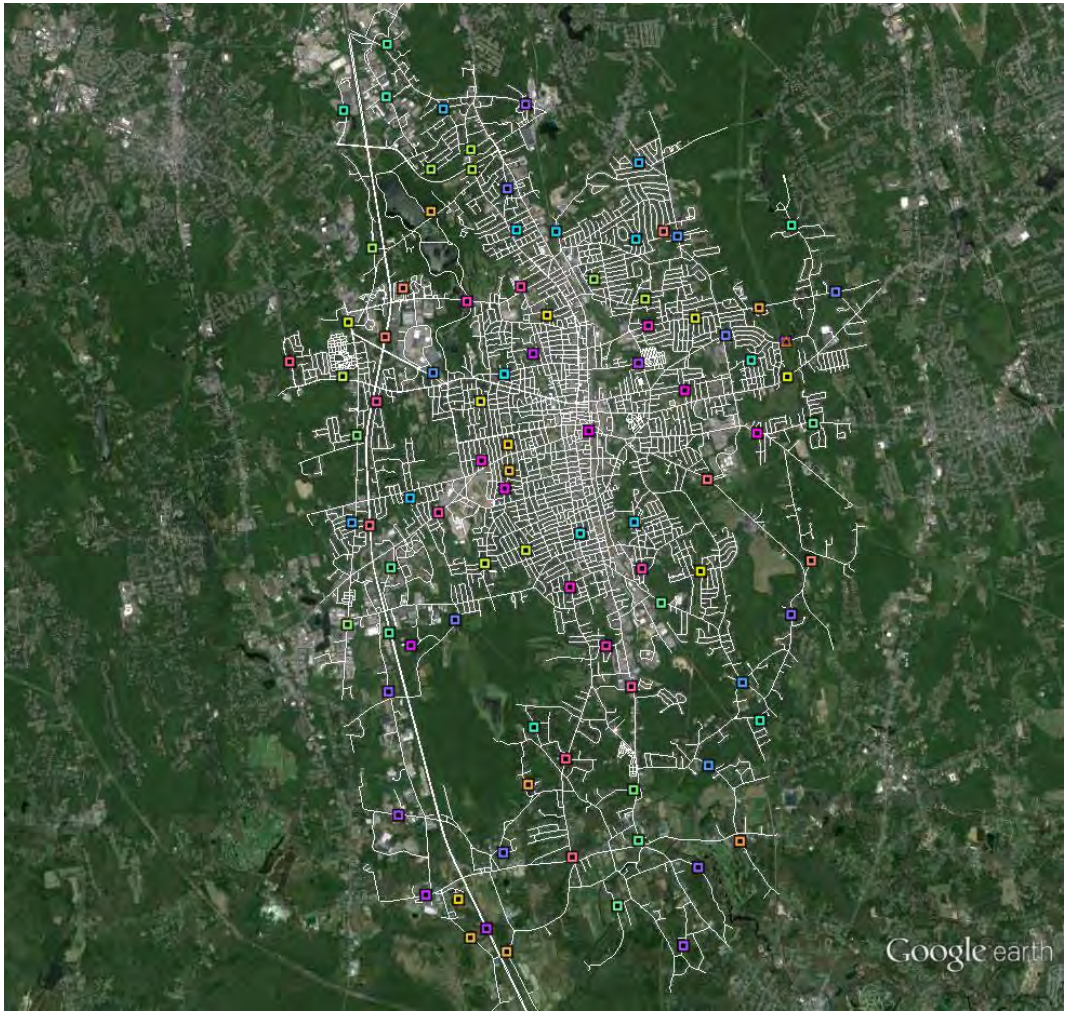
Service Area Footprint – Roads

Access/Distribution



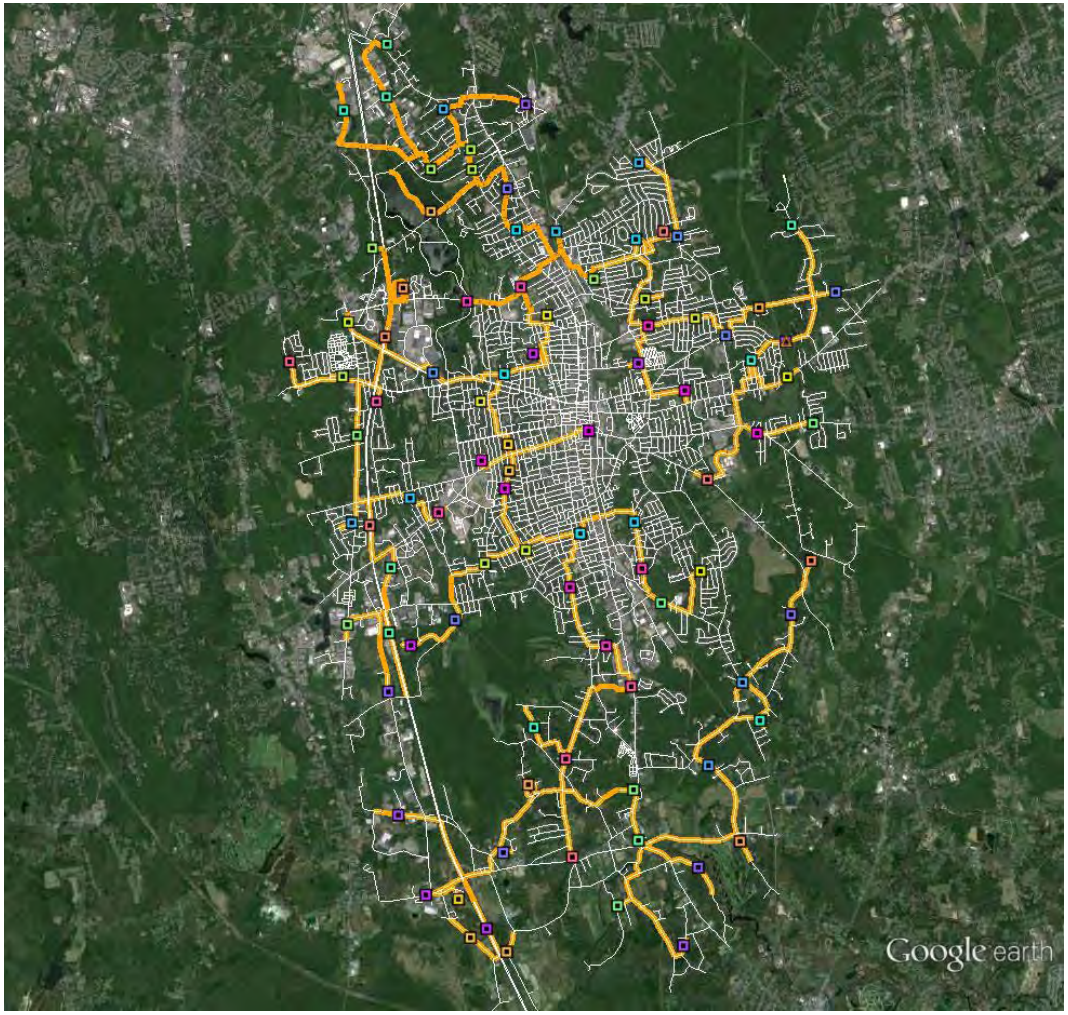
Service Area Footprint – Pedestals for Customers

Access/Distribution



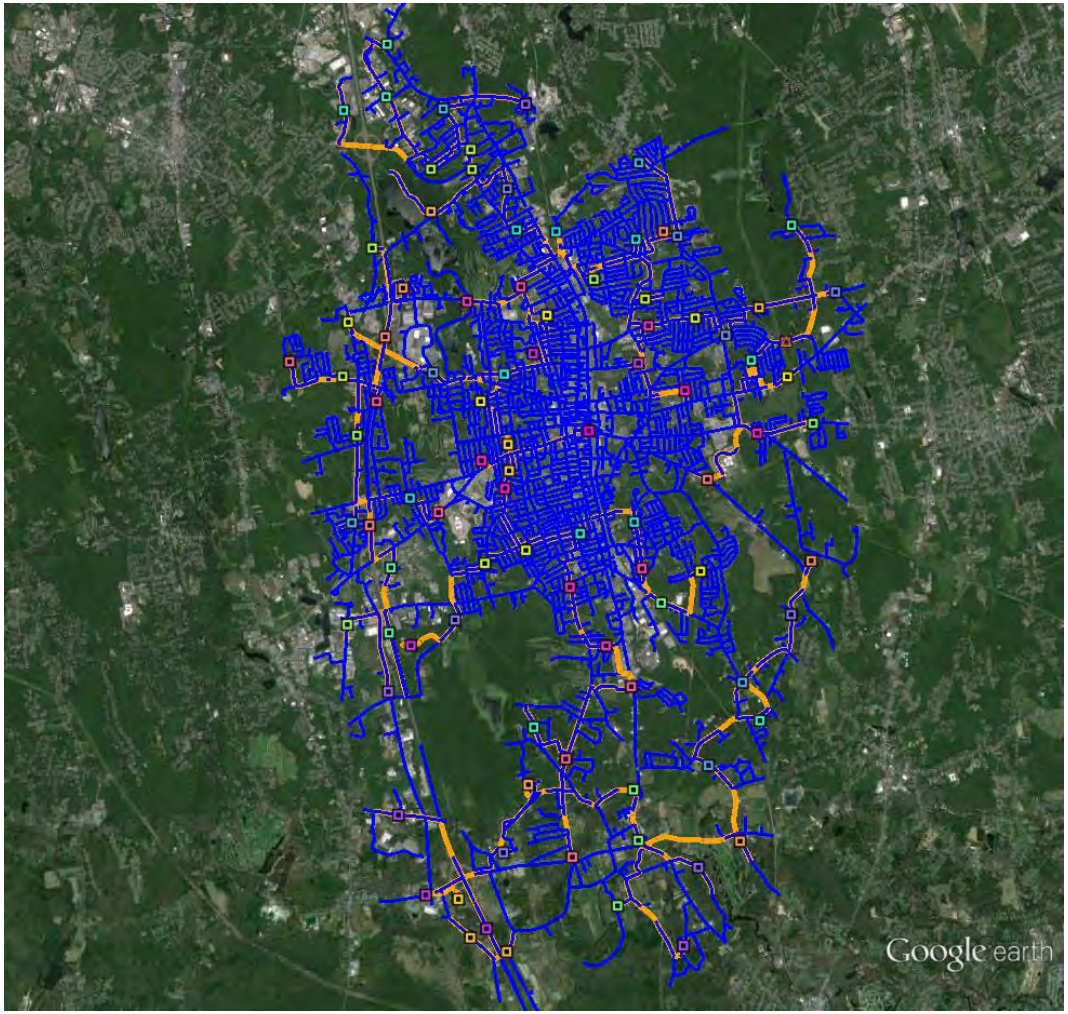
Service Area Footprint – Splitters

Access/Distribution



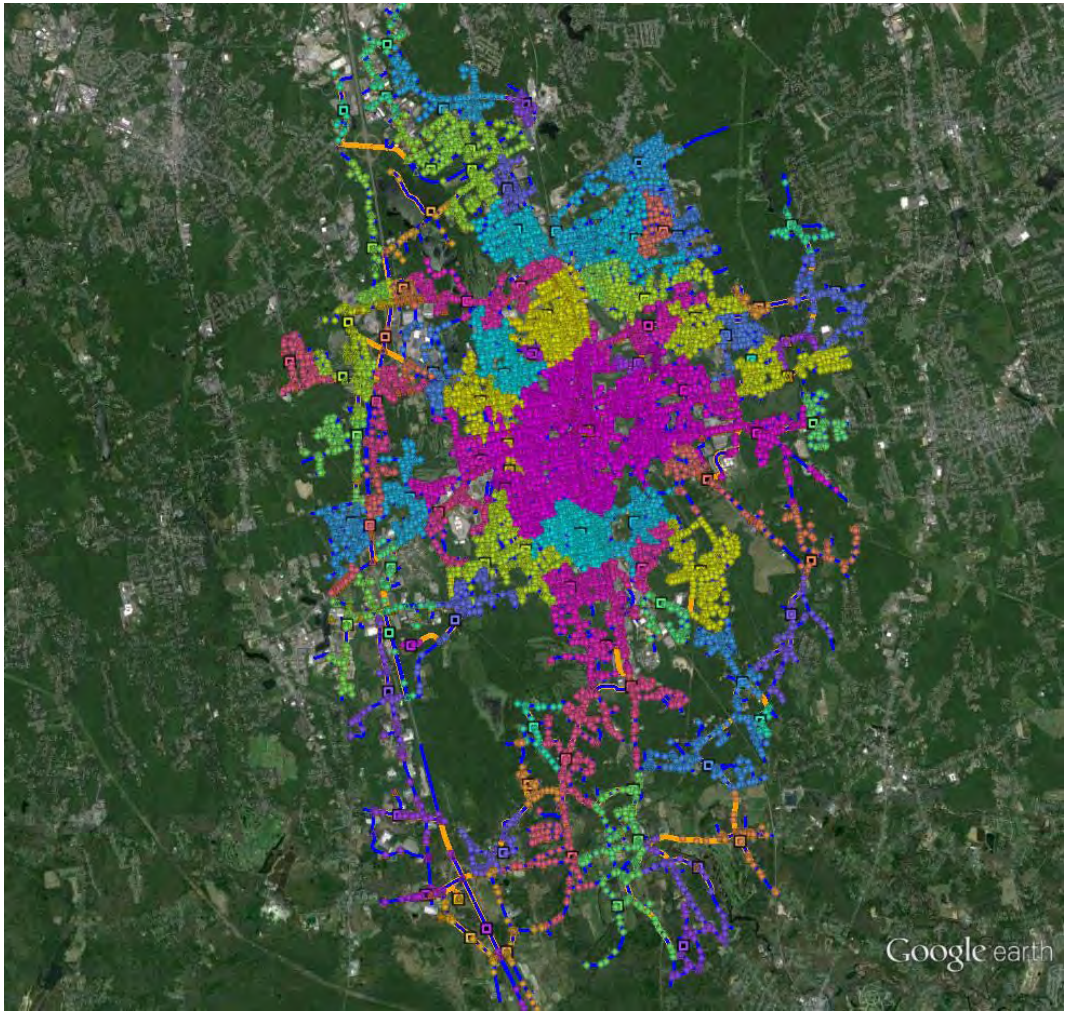
Service Area Footprint – Feeder Routing

Access/Distribution



Service Area Footprint – Distribution Routing

Access/Distribution



Service Area Footprint – FiOS Network

Gigabit City Model: Toggles

- Toggles drive the business case

	Study Toggle	Value		UOM	Description
	CircuitPowerFactor	5%		%	Loading factor to bring in Power investment
	SwitchPowerFactor	5%		%	Loading factor to bring in Power investment
	UseRegionalCostAdjustment	Yes			Should regional cost adjustments be applied
	FLEC to Book Capex adjustment	0%		%	factors that are derived from the books based on Booked Capex
	AssumedAreaDensity	Suburban			Provides basic nature of area -- drives the particular operational cost profile
	AssumedCompanySize	Large			Provides basic nature of Company -- drives the particular operational cost profile
	Poles	Leased			Are poles owned or is space leased
	Conduit	Leased			Are conduits owned or is space leased
	CarrierType	NEW			
	TelcoFiber	No			Will the incumbent telco respond with a full fiber build out?
	CableFiber	No			Will the incumbent cable company respond with a full fiber build out?
	Company	GigabitCity			Company under study
	State	TX			
	City	Austin			
	Length of Study	7		Years	
	Average Useful Life of Assets	20.5		Years	
	DiscountFactor	8.5%		%	
		Res	Bus		
Compared to GB Carrier	Cable Market Equivalent	90.0%	75.0%	%	
	Fixed Wireless Market Equivalent	2.5%	1.0%	%	
	DSL Market Equivalent	25.0%	50.0%	%	
	HSIA Market Equivalent	75.0%	100.0%	%	
	Fiber Market Equivalent	100.0%	125.0%	%	
	Wireless Market Equivalent	5.0%	2.5%	%	

	Market Size				EOY Market Uptake									
					1	2	3	4	5	6	7	8	9	10
	National Business Internet Total Market take rate			95%	30%	75%	85%	90%	95%	100%	100%	100%	100%	100%
Residential Market	Field	Low	High	Total Market										
	AvgHHIncome	-	20,000	40.0%	40%	65%	70%	75%	80%	85%	90%	100%	100%	100%
		20,000	40,000	60.0%	45%	70%	75%	80%	85%	90%	100%	100%	100%	100%
		40,000	75,000	85.0%	45%	70%	75%	80%	85%	90%	100%	100%	100%	100%
		75,000	10,000,000	95.0%	50%	75%	80%	85%	90%	100%	100%	100%	100%	100%

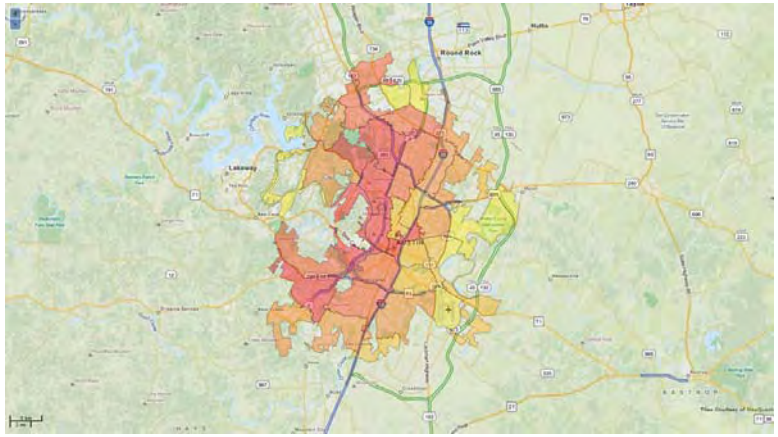
Values are for illustrative purposes

Gigabit City Model: Results

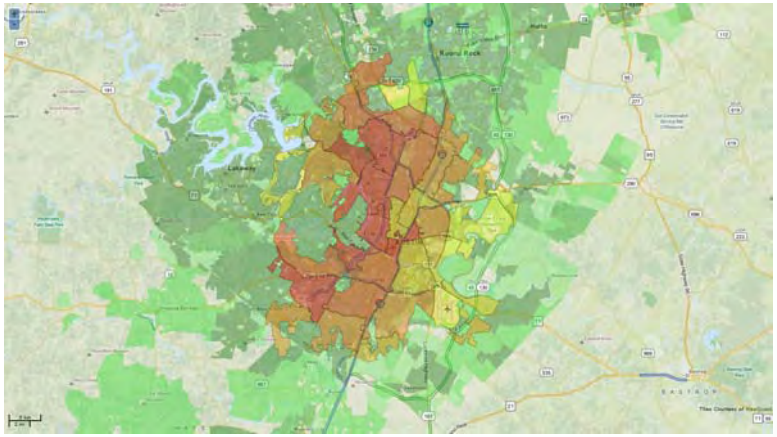
ServiceArea		ABERTX01	AUSTTX01	AUSTTX02	AUSTTX03	AUSTTX04	AUSTTX05	AUSTTX06	AUSTTX07	AUSTTX08	AUSTTX09	AUSTTX10	AUSTTX11	AUSTTX12	AUSTTX13
ShortName		ABERTX01	AUSTTX01	AUSTTX02	AUSTTX03	AUSTTX04	AUSTTX05	AUSTTX06	AUSTTX07	AUSTTX08	AUSTTX09	AUSTTX10	AUSTTX11	AUSTTX12	AUSTTX13
NeighborhoodName		Abercrombie	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin
ResLocations		10,818	13,039	4,341	50	24,218	8,131	2,229	10,635	4,847	16,909	15,846	21,126	111	16,662
BusLocations		1,966	4,885	1,097	80	5,613	6,585	509	3,609	1,134	3,702	4,277	7,518	5	3,949
CAI		14	11	2	1	32	26	1	18	3	11	25	10	–	28
Capital															
Total Capital	$ 419,930,196	$ 12,988,194	$ 16,572,127	$ 5,599,965	$ 277,330	$ 25,383,727	$ 14,092,103	$ 2,771,750	$ 13,118,131	$ 6,499,249	$ 19,031,751	$ 17,151,416	$ 25,017,326	$ 288,107	$ 17,561,233
Customer/Area Profile															
Statistic	TOTAL	Abercrombie	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin
Area	269.96	4.84	8.27	7.01	2.56	8.72	3.20	5.78	5.25	7.94	12.41	3.79	11.84	2.23	5.41
RoadMiles	5,266.53	166.94	211.21	106.05	5.38	254.76	138.42	40.65	170.21	76.52	292.28	150.40	276.38	6.03	186.41
HighwayMiles	8.51	–	–	–	–	0.69	0.32	–	–	–	–	–	–	2.78	0.41
Residences	356,887	10,988	13,118	4,316	2	23,990	8,139	2,363	10,535	4,754	16,777	15,747	20,720	111	16,420
Businesses	95,049	4,069	4,835	1,100	16	6,525	8,643	521	3,610	1,035	3,623	4,220	7,444	9	3,840
Enterprise Businesses	10,545	437	490	34	10	776	1,471	23	307	74	223	579	982	3	519
Locations/RdMile	85.81	90.20	85.00	51.07	3.72	119.78	121.24	70.94	83.10	75.66	69.80	132.76	101.90	19.91	108.69
Locations/SqMile	1,674.11	3,113.09	2,171.12	772.22	7.82	3,498.86	5,243.44	498.96	2,695.79	729.25	1,644.20	5,263.43	2,379.01	53.90	3,746.28
Estimated MDU	10,328	428	444	24	–	1,205	227	37	606	28	214	720	463	–	873
Estimated Business VoiceLine Market	174,579	4,752	7,263	745	345	12,013	24,564	453	5,612	1,264	3,496	14,745	14,776	22	8,408
Estimated Household Size	2.4	2.1	2.0	3.1	#7.0	1.9	2.0	2.2	2.1	2.4	2.4	2.6	2.0	3.6	2.2
Estimated Household Incomve	59,965.2	57,707.3	91,615.4	135,541.9	61,888.0	52,763.9	60,270.0	140,846.5	86,893.7	73,412.1	83,133.2	29,609.9	76,958.0	61,667.0	36,657.8
Total Locations Passed	431,703	14,548	17,342	5,417	19	28,896	15,529	2,752	13,386	5,678	20,310	19,183	27,445	105	19,079
Estimated Res Market Size	135,432	4,068.07	5,799.95	1,776.56	0.60	9,311.51	2,489.71	1,043.44	4,186.45	2,131.32	7,851.47	4,157.16	9,516.54	36.17	4,338.40
Estimated Bus Market Size	41,067	1,739.64	2,109.19	415.56	11.52	2,777.35	3,169.84	225.43	1,619.34	492.74	1,584.25	1,921.57	3,262.15	3.45	1,764.16
Estimated Take %	40.8%	39.9%	45.6%	40.8%	53.8%	41.8%	36.3%	46.1%	43.4%	46.2%	46.5%	31.7%	46.6%	37.8%	32.0%
Levelized Res Take	104,133	3,064	4,662	1,428	0	7,014	1,860	839	3,365	1,605	6,311	3,132	7,649	27	3,268
Levelized Bus Take	32,399	1,372	1,664	328	9	2,191	2,501	178	1,278	389	1,250	1,516	2,574	3	1,392
Levelized Total Res Take	116,946	3,486	5,093	1,560	1	7,980	2,116	916	3,676	1,827	6,894	3,563	8,356	31	3,716
Levelized Total Bus Take	35,805	1,517	1,839	362	10	2,421	2,764	197	1,412	430	1,381	1,675	2,844	3	1,538
Total Annual Revenue	$ 144,725,232	$ 4,818,950	$ 6,728,952	$ 1,853,806	$ 10,838	$ 9,946,939	$ 4,626,588	$ 1,072,047	$ 4,944,171	$ 2,148,162	$ 7,965,971	$ 4,640,610	$ 10,862,223	$ 32,069	$ 4,626,012
Total Annual Opex	$ 70,066,481	$ 2,204,504	$ 2,944,389	$ 911,209	$ 20,545	$ 4,606,994	$ 2,057,722	$ 488,675	$ 2,213,243	$ 1,053,300	$ 3,604,330	$ 2,561,006	$ 4,670,389	$ 28,856	$ 2,627,939
Total Annual CapCost	51,929,677	$ 1,610,837	2,049,558	687,141	33,001	3,169,964	1,749,726	339,913	1,620,689	793,520	2,357,542	2,133,388	3,107,613	34,300	2,185,287
excess earnings Income Tax	$22,729,074	$1,003,608	$1,735,005	$255,456	($42,708)	$2,169,982	$1,019,141	$243,460	$1,110,238	$301,342	$2,004,098	($53,784)	$3,084,221	($31,087)	($187,214)
Total NRC Revenue	$ 23,052,718	$ 757,100	$ 983,627	$ 270,058	$ 1,637	$ 1,569,743	$ 746,032	$ 156,090	$ 723,121	$ 339,925	$ 1,159,334	$ 891,032	$ 1,587,022	$ 5,108	$ 897,198
Total NRC Cost	$ 33,520,957	$ 1,055,474	$ 1,469,196	$ 427,896	$ 1,237	$ 2,300,293	$ 843,674	$ 249,531	$ 1,069,780	$ 512,788	$ 1,666,864	$ 1,092,398	$ 2,391,587	$ 8,234	$ 1,116,869
Install	($10,468,239)	($298,375)	($485,569)	($157,838)	$401	($730,550)	($37,642)	($93,441)	($346,660)	($172,863)	($707,530)	($201,366)	($804,565)	($3,126)	($219,671)
Per Customer Summary	TOTAL	Abercrombie	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin	Austin
Capital Per Line	$ 2,379.22	$ 2,236.37	$ 2,095.31	$ 2,554.60	$ 22,887.82	$ 2,099.74	$ 2,498.80	$ 2,184.42	$ 2,259.49	$ 2,476.79	$ 2,016.99	$ 2,821.54	$ 1,957.74	$ 7,265.60	$ 2,877.67
Total Monthly Revenue	$ 68.33	$ 69.15	$ 70.90	$ 70.47	$ 74.54	$ 68.57	$ 71.32	$ 70.41	$ 70.97	$ 68.22	$ 70.35	$ 63.62	$ 70.84	$ 67.39	$ 63.17
Monthly Capital Costs per line	$ 24.52	$ 23.11	$ 21.59	$ 26.12	$ 226.96	$ 21.85	$ 25.85	$ 22.32	$ 23.26	$ 25.20	$ 20.82	$ 29.25	$ 20.27	$ 72.08	$ 29.84
Monthly Operating Expenses Per Line	$ 33.08	$ 31.63	$ 31.02	$ 34.64	$ 141.29	$ 31.76	$ 30.41	$ 32.09	$ 31.77	$ 33.45	$ 31.83	$ 35.11	$ 30.46	$ 60.64	$ 35.89
Total Monthly Cost per Line	$ 57.60	$ 54.75	$ 52.62	$ 60.76	$ 368.26	$ 53.61	$ 56.26	$ 54.42	$ 55.03	$ 58.65	$ 52.65	$ 64.36	$ 50.72	$ 132.72	$ 65.73
Levelized Monthly Contribution per Line (am	10.73	14.40	18.28	9.71	(293.72)	14.96	15.06	15.99	15.94	9.57	17.70	(0.74)	20.11	(65.33)	(2.56)
Net NRC per Line TOTAL	(59.31)	(51.38)	(61.39)	(72.00)	33.06	(60.43)	(17.31)	(73.64)	(59.71)	(65.88)	(74.98)	(33.13)	(62.96)	(78.83)	(36.00)
Total Customers	176,499	5,808	7,909	2,192	12	12,089	5,640	1,269	5,806	2,624	9,436	6,079	12,779	40	6,103
NPV of Business case over	107,967,781.52	4,927,435.99	8,478,878.66	1,150,215.65	(223,440.15)	10,661,678.81	5,225,344.90	1,151,969.92	5,393,768.17	1,349,838.03	9,666,115.89	(327,552.37)	15,178,154.55	(167,604.96)	(1,020,528.75)
NPV per Customer Per Month	7.28	10.10	12.76	6.25	(219.53)	10.50	11.03	10.81	11.06	6.12	12.20	(0.64)	14.14	(50.32)	(1.99)

Gigabit City Model: Results

NPV per Customer Location



NPV versus Telecom Coverage



Early Findings

- The big drivers of success:
  - Teledensity
  - Level and quality of competition
  - Overall market adoption rates
    - Driven by income
  - Time to achieve market adoption rate
  - ARPU
  - Expected penetration into business market

Early Findings

- The Success of Gigabit City efforts depends on a partnership
  - Competing interests??
    - Cities want to avoid financial redlining
    - Carriers want to turn a profit
  - City to assist with access to key structure items
    - Poles, conduits, right of ways, etc..
  - Company and City need to facilitate increased adoption rates and quicker uptake
    - Pew study indicates take rate in lower income areas is below 40%
    - FiOS adoption took over 7-8 years to reach …
    - Planned rollouts can achieve better financials
      - Roll out in high take areas first to “prime the pump”
        - Succeeding areas will look much better
- Deployment triggers competitors:
  - TWC announced 100mb service in KC
  - AT&T is rolling out Giga-Power in Austin

Kansas City via Sanford Bernstein

COSTQUEST GIGABIT CITY MODEL

Gigabit City Business Case

Google Fiber in Kansas City: Measuring the Business Plan

The Study explored:

Capex Deployment Costs

- The study estimated what Google spent *to pass* (without connecting) the 149 thousand households in its first-phase build out area.
- The estimate is based on a detailed, street-by-street network design analysis of both areas. This network will include an estimated total of 7.2 million plant feet.

Demographics and Demand

- The demographic make-up of the neighborhoods targeted by Google varies significantly, with some neighborhoods with annual median income well above $100K, while others have median income below $40K.
- CostQuest's findings show the relationship between income and demand and how the economic feasibility plays-out in the market.

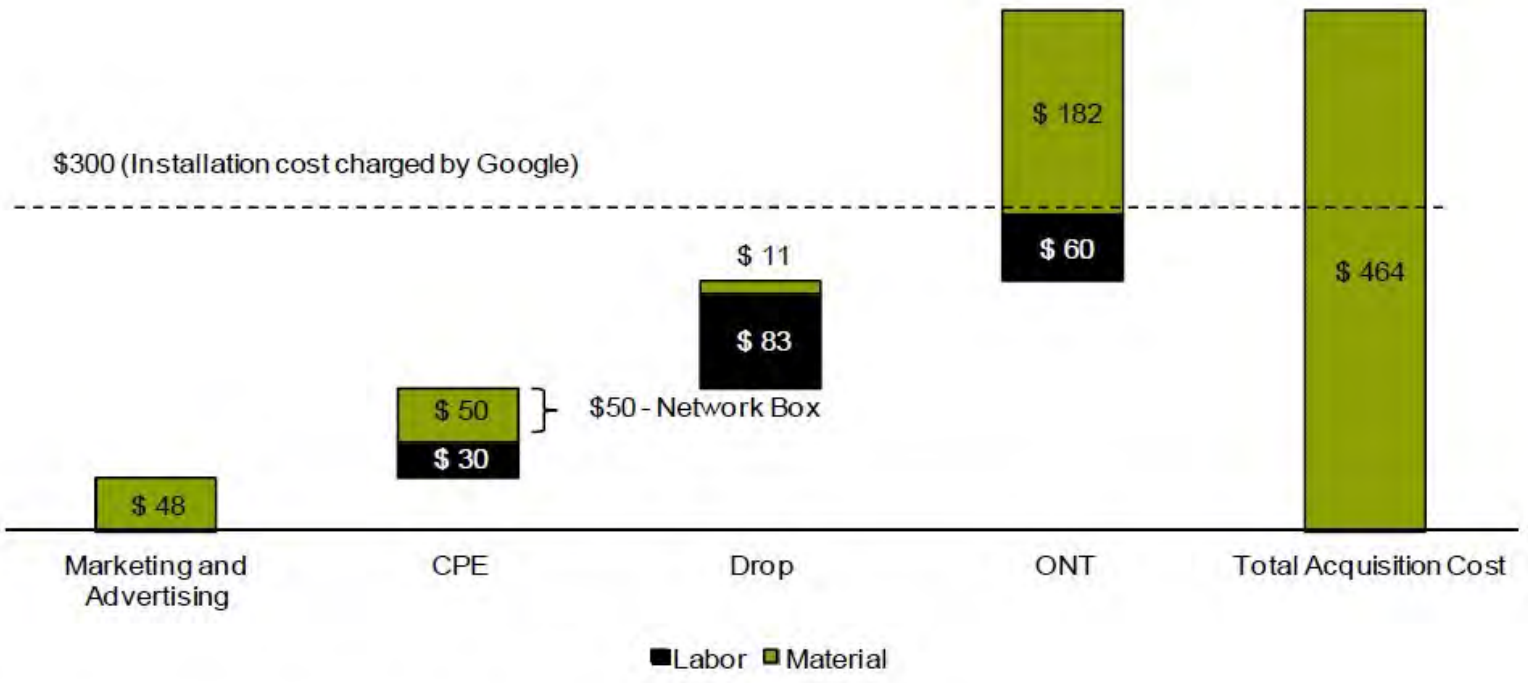
Acquisition and Penetration

- "Day One" and "Year One" penetration rates are estimated and give a baseline for the business model in Kansas City. The upfront cash costs offset by subscriber contribution in the first year show a relatively modest incremental investment for building the installed base.
- Monthly subscriber contribution by service type (double play or broadband only) is estimated and shows how the subscriber mix drives overall market performance.

Gigabit City Business Case

Cash Costs to Acquire and Connect a Broadband Access Customer Will be $ 464

Total Customer Acquisition Cost for Broadband Data Customer ($)



Source: Costquest, Bernstein analysis, fiber.google.com

Gigabit City Business Case

Cash Investment in Kansas City Footprint Could Be Nearly $95 Million in 2013

Components of Cash Investment in Kansas City Fiber Buildout ($ millions)