The definition of "Broadband Demand" then becomes:

Broadband Demand = [U.S. Average $ rate for Type of Data Services Solution] x [Quantity]

Normally, the dimensions of "Broadband Demand" would be in "dollars". However, the rates used for each service are ***nationally averaged rates*** for these services, and are not specific to any given vendor. Hence, while this makes the result a perfectly fine way to compare relative expenditures on bandwidth across any and all records on the D&B national file, and rank order them by these expenditures (as it explicitly avoids vendor specificity), it would be a very problematic variable for customers to interpret literally (as clients would rarely be paying the same as the national average rates), and could easily be mistaken for primary data. To avoid potential confusion, TNST has elected to carry this data as dimensionless, to further emphasize its intended use as a relative ranking criteria, as opposed to the final word on actual spending on broadband services. ***For this same reason, TNST discourages the use of this field as any kind of indicator of the actual spending of a firm on their data services solutions.***

In building the Broadband Demand score, TNST takes a similar approach as it does in modeling access lines...it first models the likely data services solutions at a given firm, and their quantity, and then applies an nationally averaged cost per unit for these services, to generate the total "Site Broadband Demand" (the Broadband Demand specific to the needs of a single location) score.

Normally, the most difficult aspect of tackling this requirement is getting *both* the type and quantity of data services actually used at a client location. However, ***this is exactly what the BusinessWave survey was designed for.*** The respondent firms not only report their types of data services solutions (which contribute to the building of the "BRI-ISDN/Cable Modem/xDSL Probability, "T-1 Probability", "T-3 Probability" scores), but also the quantity they have at the location, their overall expenditures, and even the ratio of the split of "Voice" versus "Data" uses in their applications.

Therefore, what would normally be an extremely messy process if one were limited to only using summarized, national industry data (which would lead, by necessity, to a series of simplifying assumptions, each injecting their own sources of error), becomes a very efficient and straightforward process when using the detailed BusinessWave data instead.

Determining Model Confidence Intervals

One of the things that make the Telecommunications BusinesScores unique in the marketplace is the inclusion of the "upper" and "lower" bounds as separate supplemental variables for every volumetric data element that is produced. This evolved from the general client request that TNST provide additional insights to the general question: "How accurate are these models?" The actual answer is, of course: "It depends."

It depends on many things, not the least of which is the relative sizes of certain business "clusters" (that are used to define groups of similar firms) that occur in the "marketing universe (the D&B national file). The model confidence intervals will be much narrower for firms that represent a larger percentage of the file, yet have relatively little shifts in their behaviors and

firmographics (such as major-name fast food franchise chains). Conversely, the confidence interval will be much wider for firms that represent a much smaller percentage of the D&B file, yet have very wide variations in the behaviors and firmographics. The size of the confidence interval fluctuates between these two extremes for all other records in between, also on a record-by-record basis.

As TNST debated how to answer the seemingly "simple" question of "How accurate are these models?" in a way that was both accurate and understandable, the obvious, simple solution presented itself within the very complexity of the product: If the size of the confidence interval fluctuates wildly on a record-by-record basis... then *why not show this* explicitly, on a record-by-record basis? That way, the confidence interval could be easily demonstrated and observed immediately, even by non-statisticians. And because the models and their derived data elements were created from detail-level data in the BusinesScores survey data, it should be a relatively straightforward exercise to create the "upper" and "lower bounds" at the same time the "most likely" *expected value* is created.

While this can be done, the first reaction to clients who do not understand the underlying data is that the total data range between the "upper" and "lower" estimates looks odd, and wide. The reason for this is that these are direct reflections of the real fluctuations in the underlying data. Because of the nature of telecommunications product behavior, and because of the natural fluctuations in firmographics even among relatively similar firms, the distributions of behavior tend to have wide variations, are asymmetrical, and possess very long "tails".

The process of that TNST follows to create the "upper" and "lower" bounds about the expected values is as follows:

1. TNST calculates an estimate of the "Upper" and "Lower" values for a given volumetric variable by first subtracting the "Actual" value, from the "Predicted" value, for that particular data element.

2. TNST then characterizes the spread of the "residuals", using TNST proprietary distribution functions of the overall behaviors (one of the key, proprietary functionalities of TNST's specialized modeling software). "Residuals" (or errors) in this case represent unexplained (or "residual") variations after fitting a regression model. It is the difference (or "left over") between the ***actual*** *observed value of the variable* and the ***predicted*** *value suggested by the regression model.*

3. Next, TNST truncates both the "bottom 10%" and "top 10%" of the points for each value of the key firmographics driver variables, to produce the "upper" and "lower" limit for the remaining 80% of those variables.

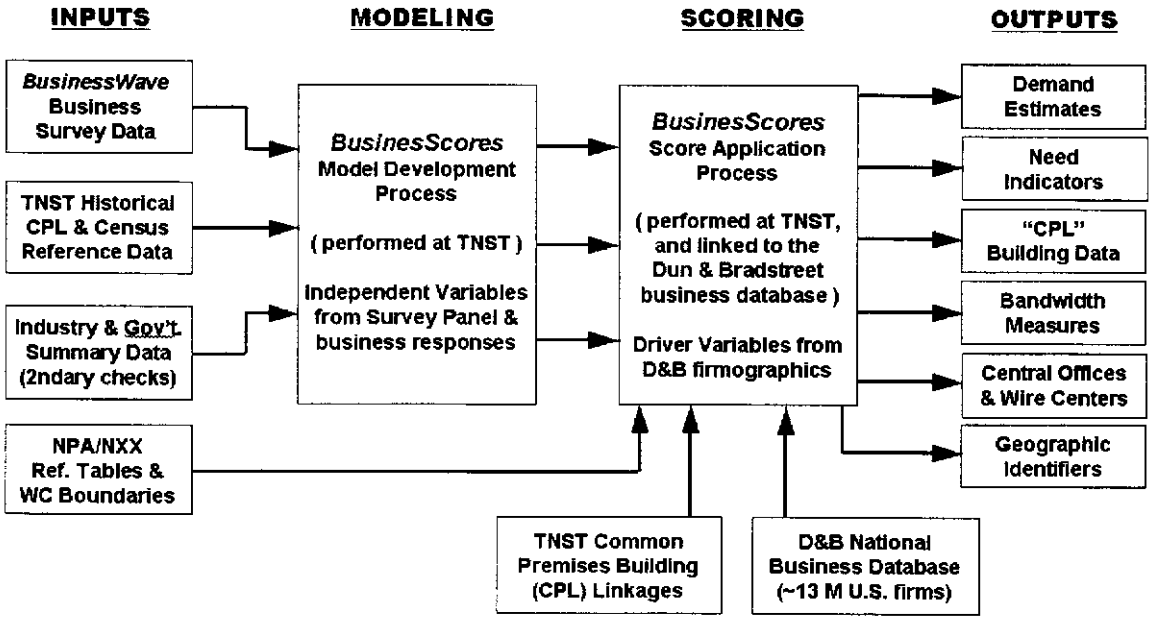
4. The score values at the these limits become, by definition, the "Upper" and "Lower" bounds about the expected ("Most Likely") value, and determine the interval in which, given the firms' firmographic values, the predicted score will be correct approximately 80% of the time.

The figure of "80%" was chosen to be the best general trade-off between general acceptable accuracy as expected by clients and as supported by the BusinessWave sample, and the general desire to keep the confidence interval within reasonable ranges, without having it become unacceptably wide.

The Score Application Process

Once these underlying BusinessWave models have been created (built separately from the D&B firmographic data) and verified, the final Telecommunications BusinesScores data elements are appended to the national D&B file by running the basic, front-end D&B firmographics for each business establishment through each model, and appending the resultant scored values (including the associated upper and lower bounds defining the confidence intervals for continuous variables) to the back-end of each firm record.

The overall production process looks something like this:



The primary model development process is driven by the raw BusinessWave survey data, with its self-reported firmographic information. Also used in the process (but not for the direct modeling) as secondary reference and look-up information are TNST historical CPL data (for tracking building changes), Census reference information (for geocoding and point-coding records), Industry and Government Summary data (such as FCC information, used only as "reality checks" to determine how close the scores perform when aggregated at large geographic levels).

These inputs are used to help create (and/or verify the accuracy of) the BusinessWave models that will ultimately be used to create the BusinesScores data elements.

Once the initial models have passed TNST's validations and quality assurance checks, they are then moved into the BusinesScores application and production process, where the models take the inputs of the key D&B firmographics, compensate for any missing values, and apply the "most likely" scores that the models predict (along with any error bounds) to each D&B business record. The scoring process may also be (depending on the data element being produced) driven by NPA/NXX routing guide information (as a partial feed to the TNST ILEC CLLI code assignment methodology) and Wire Center GIS boundary information (also used in the CLLI assignment methodology, and in the determination of the proximity-based alternative CLLI assignments), as well as TNST CPL reference data, and other TNST address/cross-reference tables (for geocoding and point coding records using their address information.)

The resulting outputs fall into the six BusinesScores categories: **"Demand Estimates"** (such as usage or spending measures), **"Need Indicators"** (such as product "probability" of ownership estimates), **"'CPL' Building Data"** (such as the CPL code and building aggregated demand), **"Bandwidth Measures"** (such as the Broadband Demand Scores), **"Central Offices and Wire Centers"** (containing information on ILEC CLLI codes and the distance to the Central office), and other **"Geographic Identifiers"** (such as LEC Code, ILEC service territory, LATA code, Census geocodes, and point geocoordinates) .

Score Assessment and Validation

In creating the Telecommunications BusinesScores data elements, there are five primary steps that are performed by TNST to describe and ensure their performance, and to maintain the validity of the modeled estimates, as follows:

- ***Tie the scores to reality – at the firm level of detail.*** One cannot overemphasize the importance of having a large, current source of primary data at the same level at which one is applying the modeled estimates. By using the BusinessWave data in the creation of the Telecommunications BusinesScores, one can be sure that all the modeled estimates have a solid grounding in real information at the establishment level. This is also critical in answering client questions about the BusinesScores values... TNST does not have to establish the exact causality of *why* a firm of a certain type has a particular BusinesScores value to be confident that it should fall within a certain pre-determined range. TNST can always cite the actual values of specific, real business firms used in making the modeled assumptions! Without real, primary data, the burden falls directly on the modeler to imbed any and all possible assumptions in one's models, and to ensure that these are all correct. However, without good, primary data, even the validation of these assumptions is extremely difficult, if not impossible.

- ***Create record-by-record error estimates.*** One of the obvious and easiest questions to ask is: "How good are the models?" It is also the hardest to answer in a meaningful way, because the real answer is "It depends". What it depends on is which "micro-niche" in the business universe you are trying to measure. For example, there are far fewer

"Forestry firms with 2500+ employees" than there are "Fast Food franchises with 5+ employees", and these differences could be several orders of magnitude. Hence, when modeling from a representative, cross-sectional of the known "business universe", you will have a much higher concentration of the latter types of firms than the former, so the error associated with the fast food firms will be smaller than that of the forestry firms. Because this is both difficult to describe quantitatively to an end-user, and even more difficult for an end-user to implement by themselves in any replicable way, TNST has taken the additional step of creating upper and lower "error bounds" for all of its demand estimates, for each individually-scored record on the D&B file. These error bounds describe exactly the ranges of the estimates, record-by-record, that should be accurate approximately 80% of the time (there will always be "outliers" in modeled solutions, especially those using telecommunications-oriented business data, which have actual distributions with extremely long "tails".) As TNST models from a large, consistent sample of firm-level data, it is also one of the only firms which can make available this "error-bound" information on a record-by-record basis, and allow the client to use this as a selection criteria.

- ***Create BusinesScores performance tables.*** After Telecommunications BusinesScores values are created, the results of the modeled estimates across the D&B file are captured in a series of "Gains Tables" – exhibits of the *actual* performance of the models versus the *predicted* performance. This way, the bar chart derived from these tables confirms in a visual manner the relationship between the driver firmographics in the model, and the resultant scores. A chart showing a nice, smooth slope indicates a strong relationship between actual vs. predicted values, whereas, charts showing either a "roller-coaster" effect, or a completely flat result across all values are indications of fundamental problems with a model's performance, and its ability to accurately predict the behavior of a given firm (real examples of these Gains Tables and Charts appear in the *Product Validation* portions of **Sections 5-11**, which describe the performance of the data elements in each BusinesScores "Module".)

- ***Use external data only as a "reality check".*** TNST does use external data (such as data from the FCC, US Census Bureau, Bureau of Labor Statistics, and other summary level sources) as secondary "reality checks" *after* the models are built, but this data is used in a very different manner than other firms that use this information as the *source* to create their models. TNST builds its models "bottom-up", meaning that it uses *firm-level data* and models optimized to create *firm-level estimates.* If TNST wishes to look at aggregations of firms (by wire center, ZIP code, county, state, whole US, etc.), it simply sums up the detail on the scored D&B compiled file (subject to the limitations of known missing records in compiled files). TNST then compares its modeled subtotals to similar subtotals from the FCC-published data (after accounting for "business universe" size and timing differences) as another "reality check" for its estimates. Note that TNST *does not* use any FCC data in a "top-down" manner to force the TNST firm level estimates to balance to the FCC totals at an aggregate level. Use of the FCC data in this manner would result in significant *overestimation* at the individual business firm level of detail!

- ***Validate against later "out-of-sample" BusinessWave data.*** One of the techniques that TNST uses to monitor and track the performance of the Telecommunications BusinesScores – and to look at early trend indicators of potential new behavior – is to compare the expected BusinesScores variables against the actual, self-reported values of new, incoming BusinessWave respondents that *were not* part of the original "MultiWave" sample used in the creation of the current version of the product. New records whose "actual" measures fall within the error bounds of the "estimated" BusinesScores value lend evidence to indicate that the models are valid and still applicable to the current environment (although they get updated each year). New records that show evidence of gradual "creep" in the actual values versus the "Most Likely" expected value of the estimates indicate which of the data elements will be most affected by the annual update of the underlying models in the following year.

Due to the fact that many of the new Version 4.0 scores are revisions to previously existing Version 3.x scores, TNST has also had to validate both against past-scored values, and the current predicted versus actual values in the survey data. In comparing to the older versions of the scores, TNST was content to achieve a high degree of correlation between old and new variables where their underlying metrics were identical; but was also more forgiving of those data elements that have lesser correlations, but have also undergone changes in their underlying metrics.

The two general methods that TNST uses to validate the scores against the primary BusinessWave survey data are ***residual analysis*** and ***comparative group behavior*** of the primary driver elements. Since TNST is most interested in the lift and stability provided by the models, one focuses on the ***group behavior***, since one wants the aggregation of businesses of a specific type or cluster to accurately predict the survey results, as closely as possible. The "goodness-of-fit" between the predicted versus actual score values is therefore properly balanced against the underlying reliability of the source data (which in the case of BusinesScores, is both the BusinessWave survey data, *and* the D&B firmographic driver variables used to apply the specific scores to the firm records.) The more points one has for a given business cluster or behavior, the greater the confidence one has in the accuracy of the estimate.

Summary

In summary, the enhanced performance of the Telecommunications BusinesScores modeled estimates is due primarily to:

- ***A large, consistent source of extensive and current primary data, at the firm level of detail (BusinessWave).***
- ***A data source that provides a complete, "holistic" view of a business firm's telecommunications-related behavior and demand, and their associated interrelationships.***
- ***Industry and systems expertise to create a truly objective modeling methodology.***

- ***A "bottom-up" approach that maximizes the accuracy of the estimates at the firm level.***
- ***Extensive and on-going validation of the models and their results.***
- ***Direct measures of the error-bounds linked directly to each D&B firm record.***

These factors, working in conjunction with TNST's close working relationship with its clients and alliance partners (such as Dun & Bradstreet) ensure that the Telecommunications BusinesScores will be one of the most extensive and accurate products of its kind, and will grow to continually meet the ongoing requirements needs of its users in the telecommunications industry.

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ORIGINAL

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EX PARTE OR LATE FILED

Ex Parte Notice

May 18, 2001

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
445 12th Street, SW – TWB-204
Washington, DC 20554

Dear Ms. Salas:

Re: Use of Unbundled Network Elements to Provide Exchange Access Service, CC Docket No. 96-98

Joint Petition of BellSouth, SBC and Verizon
CC Docket No. 96-98

The United States Telephone Association ("USTA") hereby files the attached document entitled "CLEC Network Extension Cost Model" and requests that the document be made a part of the record in the above-referenced proceeding. The CLEC Network Extension Cost Model was cited in the "Reply Declaration of Robert W. Crandall" which was filed as an attachment to USTA's Reply Comments filed April 30, 2001 in the above-referenced proceeding.

Should you have any questions regarding this filing please contact the undersigned counsel for USTA at (202) 326-7371.

Sincerely,

Keith Townsend

Keith Townsend
Director Legal and Regulatory Affairs
And Senior Counsel

cc: (See attached)

No. of Copies rec'd 0+2
List ABCDE

Ex Parte Notice of United States Telecom Association
May 18, 2001

cc: Chairman Michael K. Powell
Commissioner Susan Ness
Commissioner Harold Furchtgott-Roth
Commissioner Gloria Tristani
Kyle D. Dixon
Samuel Feder
Jordan Goldstein
Sarah Whitesell
Dorothy Attwood
Michele Carey
Jodie Donovan-May
Jeremy Miller
Julie Veach
Richard Rubin, AT&T Corp.
Rick Beckner, Sidley & Austin (AT&T Counsel)

CSMG

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Boston, MA 02108
+1 617 999.1000

CLEC Network Extension Cost Model

Prepared for:

The Industry

Prepared by:

Cambridge Strategic Management Group

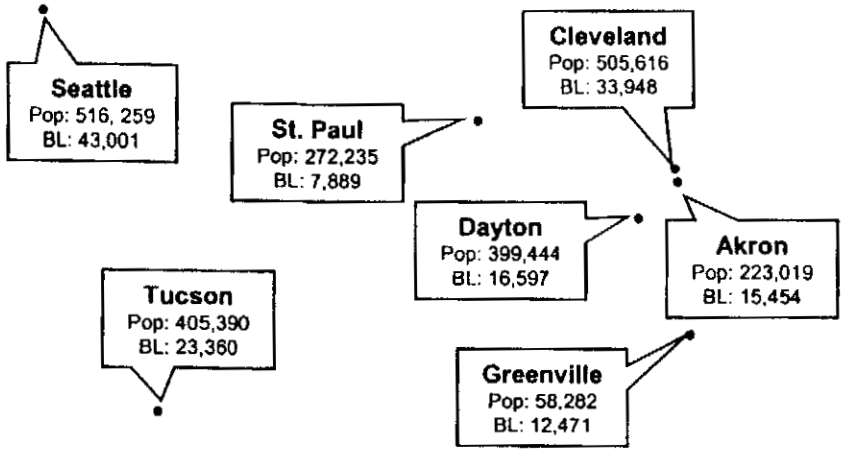
26 April 2001

Today's discussion

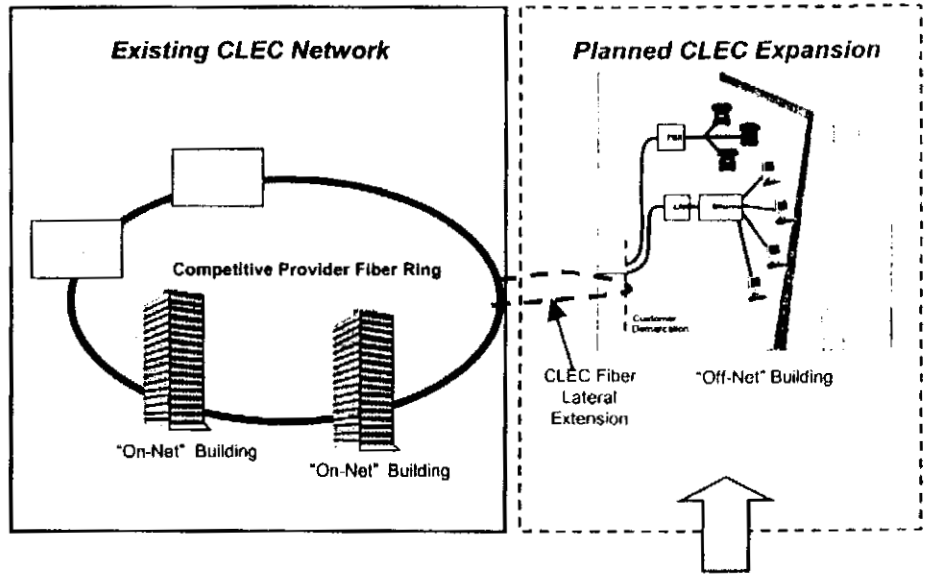
- Background & Introduction
- Current Results
- Model Architecture Design
- Assumptions and Sources

The Industry has asked CSMG and Criterion to determine the proportion of currently "off-net" buildings that can be profitably served by CLECs within a set of seven representative US cities…

Representative Cities
Population and Business Lines



Competitive Provider Network



Source: Criterion and CSMG Wirecenter Database

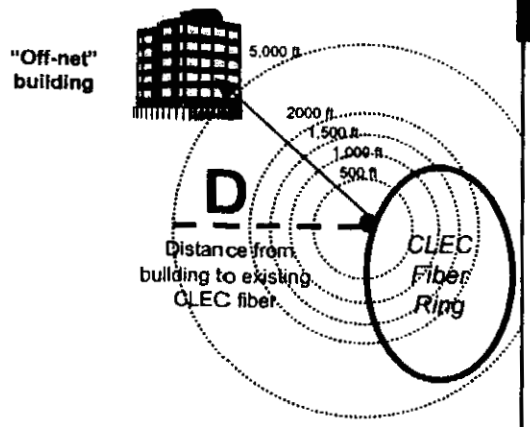
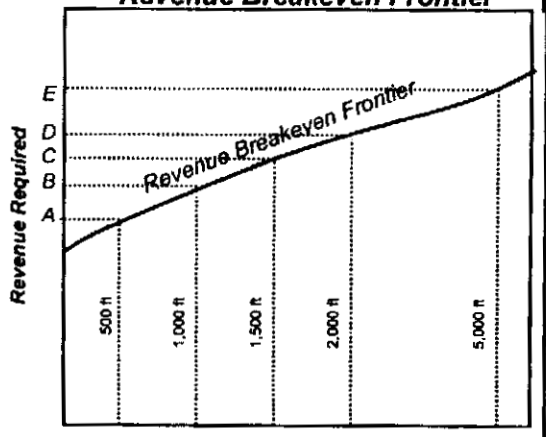
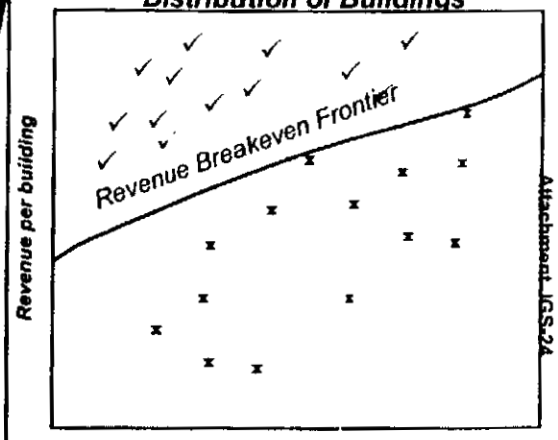
Tier 1 Cities	*Tier 2 Cities*	*Tier 3 Cities*
• Cleveland	• St. Paul	• Akron
• Seattle	• Tucson	• Dayton
		• Greenville

Build Considerations

- Distance
- Trenching & Labor Costs
- Fiber & Electronics Costs
- Addressable Voice & Data Revenue in Target Building

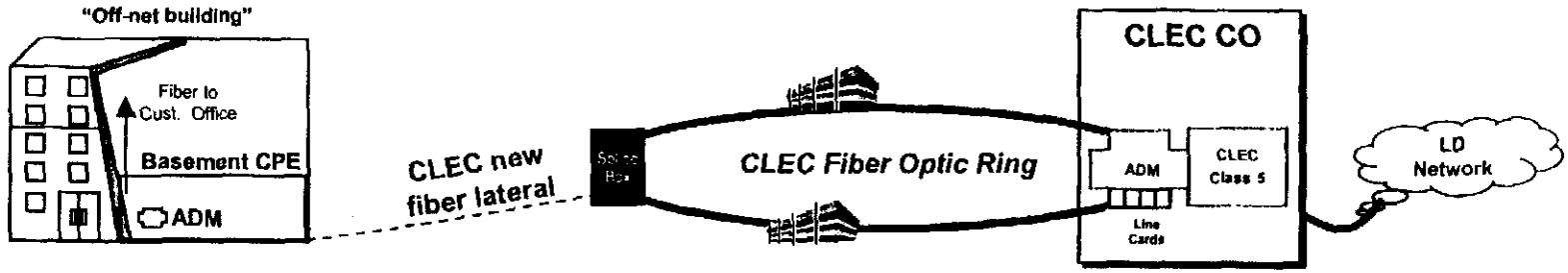
This analysis requires an understanding of both CLEC costs and revenues

This task has been split into the following three steps . . .

	1	2	3
	Estimate costs to extend network to additional building	Calculate revenue breakeven threshold	Develop distribution of buildings within each city
Description	• For a building at a given distance from existing CLEC fiber, what are the total (operating & capital, fixed & variable) costs to build fiber to that building?	• Within each of the seven markets, what is the revenue required from an "off net" building in order to recoup incremental costs and investment for the gamut of distances away from existing CLEC fiber?	• For each building within a given city, what is the revenue a CLEC could expect to receive over time? • Which buildings lie above the revenue frontier based on their distance from fiber and their expected revenues?
Illustration		*Illustrative Revenue Breakeven Frontier* 	*Illustrative Distribution of Buildings* 

In order to carry out Step One for each market, we calculate total costs associated with installing and operating fiber to connect and service an "off-net" building at any given distance from an existing CLEC fiber ring with a SONET architecture

Network Diagram

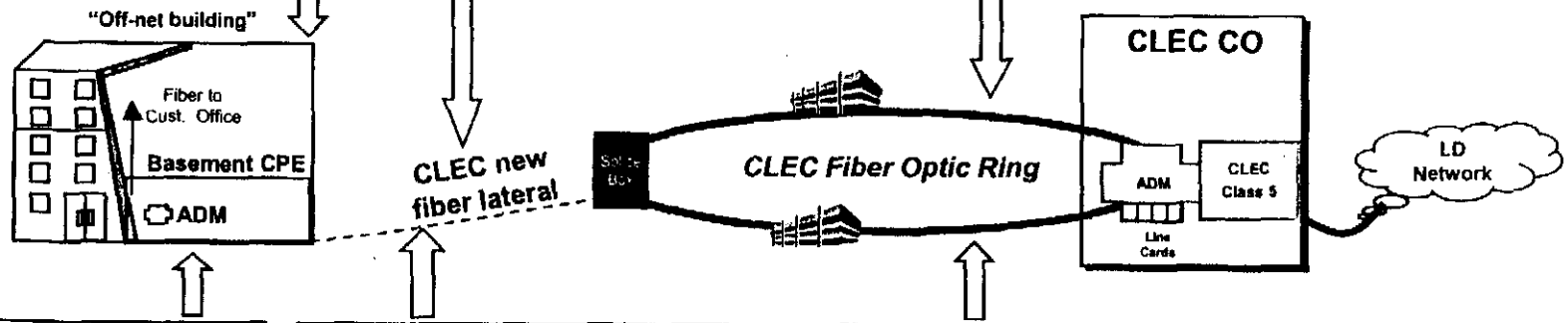


		"Off Net" Building	CLEC Fiber Extension *(Distance Sensitive)*	Incremental Existing Network
Capital Expenditures	General	**Customer Premise Electronics** • Optical ADM • ADM Port Card • Racks, HVAC, UPS, Security	**Fiber Installation** • Fiber cost • Conduit cost	**Network Expenditures** • Splice box on CLEC ring • ATM Port Card in CLEC CO • ADM Port Card in CLEC CO
	City-specific	**Initial Customer Premise Costs** • Labor costs • Initial entrance fee	**Fiber Installation** • Installation cost (aerial and underground) **Licenses and Fees** • Permitting costs	**None**
Operating Expenses	General	**None**	**Outside Plant Operating Costs** • Pole attachment fees • Fiber maintenance	**LD Operating Costs**
	City-specific	**On-going Customer Premise Costs** • Revenue sharing • Franchise agreements • Power supply • Rent • Monitoring	**None**	**SG&A Costs** • Customer care & retention • Billing expense • Bad debt expense • Sales & marketing

For each of these cost components, we have developed detailed input assumptions…

	"Off Net" Building	CLEC Fiber Extension (Distance Sensitive)	Incremental Existing Network
City-specific Costs CapEx OpEx	• Labor costs for set up: $24,000-$33,000 • Initial entrance fee: $250-$400 • Ongoing revenue sharing: 0% of revenue/yr. • Franchise agreements: 0%-5.5% of revenue/yr. • Annual rent: $3,000-$4,800/yr.	• Trenching cost: $17-$30 per foot • Aerial installation cost: $2.50-$3.50 per foot • Permitting Costs at 500 feet: $100-$7,500	No additional city-specific CapEx costs *No additional city-specific OpEx costs*

Network Diagram



General Costs CapEx OpEx			
	• Optical ADM: $25,000 • ADM Port Card: $1,000 per DS3 • Building Set Up: $50,000 – Racks, HVAC, UPS, Security • Electricity Cost: $1,000-$1,500/yr. • Monitoring: $1,200-$1,600/yr.	• Per foot per strand fiber cost: $0.03 for 144 strands • Per foot conduit cost: $1.28 • Per foot pole attachment: $0.03-$0.05/ft./yr. • Per foot fiber maintenance: $0.09-$0.11/yr.	• Splice box on CLEC ring: $1,000 • ATM Port Card in CLEC CO: $1,000 • ADM Port Card in CLEC CO: $1,000 • One-time Sales & Marketing: 2x first month Revenue/yr. • Annual Customer Care Expense: 4% of Revenue/yr. • Annual Billing Expense: 1% of Revenue/yr. • Annual Bad Debt Expense: 1.5% of Revenue/yr. • LD Operating Costs: 80% of LD Revenues

SBC Illinois Ex. 2.0 (Smith Direct-Loops)
Docket No. 03-0596
Attachment JGS-24

Many of the cost inputs vary considerably by city. Here are some examples...

City Specific Costs

"Off Net" Building

- Labor costs for set up: $24,000-$33,000
- Initial entrance fee: $250-$400
- Ongoing revenue sharing: 0% of revenue/yr.
- Franchise agreements: 0%-5.5% of revenue/yr.
- Annual rent: $3,000-$4,800/yr.

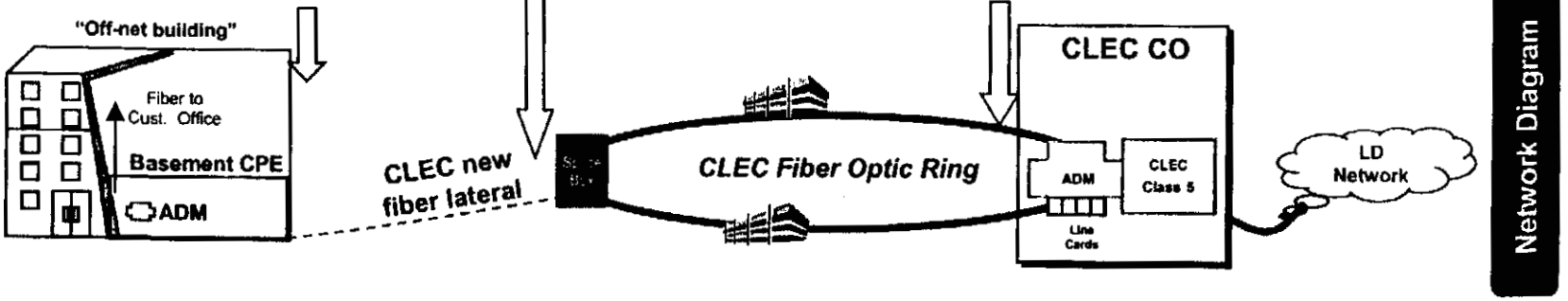
CLEC Fiber Extension
(Distance Sensitive)

- Trenching cost: $17-$30 per foot
- Aerial installation cost: $2.50-$3.50 per foot
- Permitting Costs at 500 feet: $100-$7,500

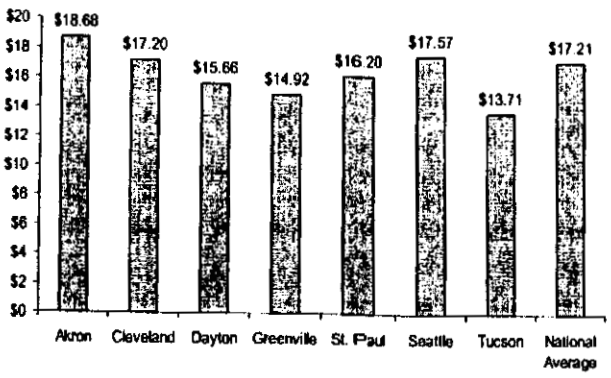
Incremental Existing Network

No additional city-specific CapEx costs

No additional city-specific OpEx costs

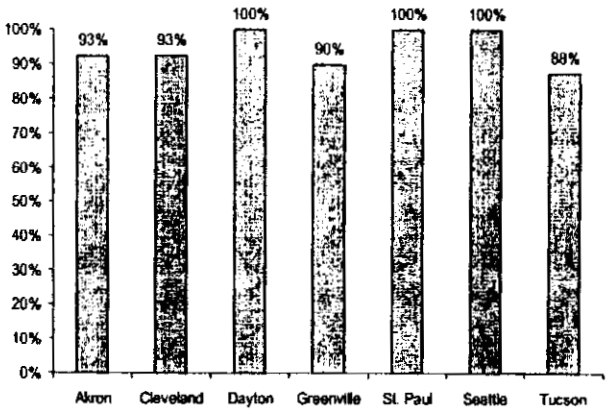


Telecommunications Line Installer and Repairer Hourly Wages



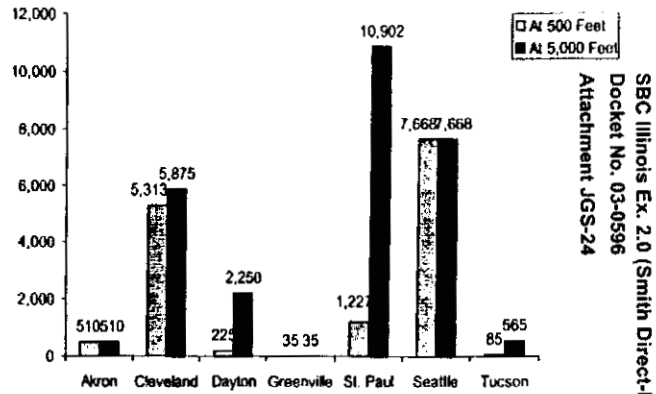
Source: Bureau of Labor Statistics

Percent Terrestrial Build



Source: Conversation with City officials

Terrestrial Trenching Permit Costs

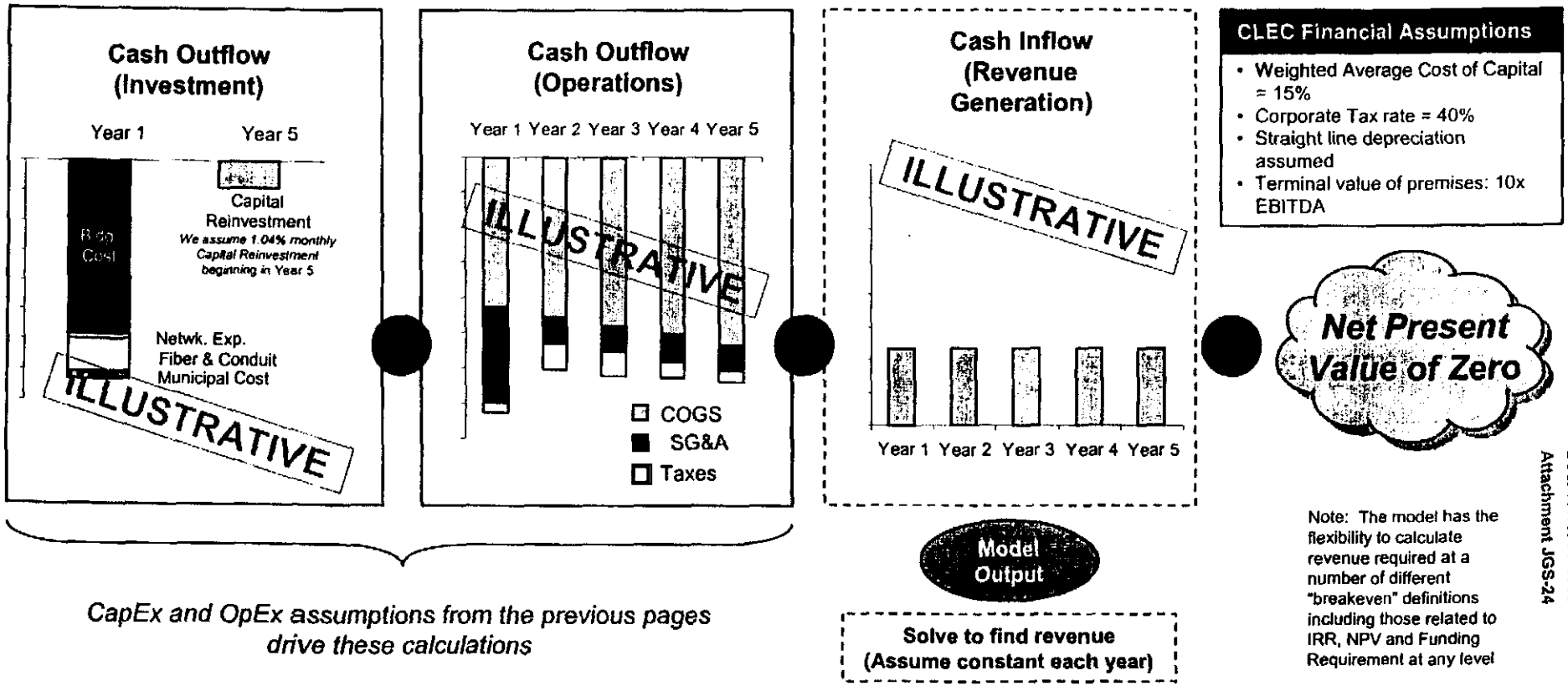


Source: City Officials

SBC Illinois Ex. 2.0 (Smith Direct-Loops)
Docket No. 03-0596
Attachment JGS-24

The model output is the revenue generation required from the "off-net" building in order for the CLEC to "break even" based on expected cash outflows from investment and operations. This result is sensitive to the building's market location and its distance from existing CLEC fiber...

- Since some costs scale with revenue (and usage), the algorithm becomes an iterative process



Note: The model has the flexibility to calculate revenue required at a number of different "breakeven" definitions including those related to IRR, NPV and Funding Requirement at any level

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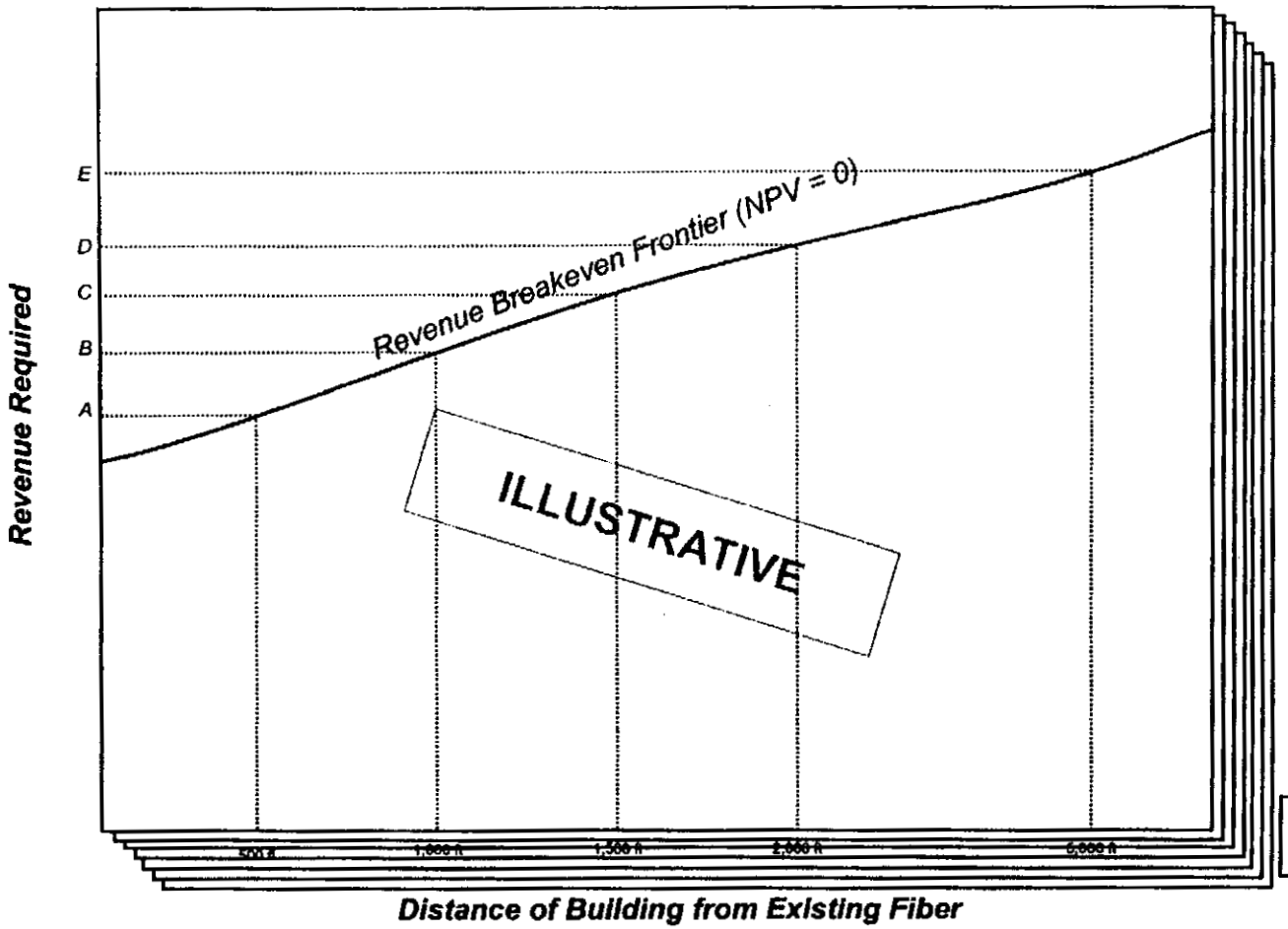
Docket No. 03-0596
Attachment JGS-24

We calculate the model output (revenue generation required by building to ensure breakeven) over a wide range of distances for each of the seven markets to create a revenue breakeven frontier…

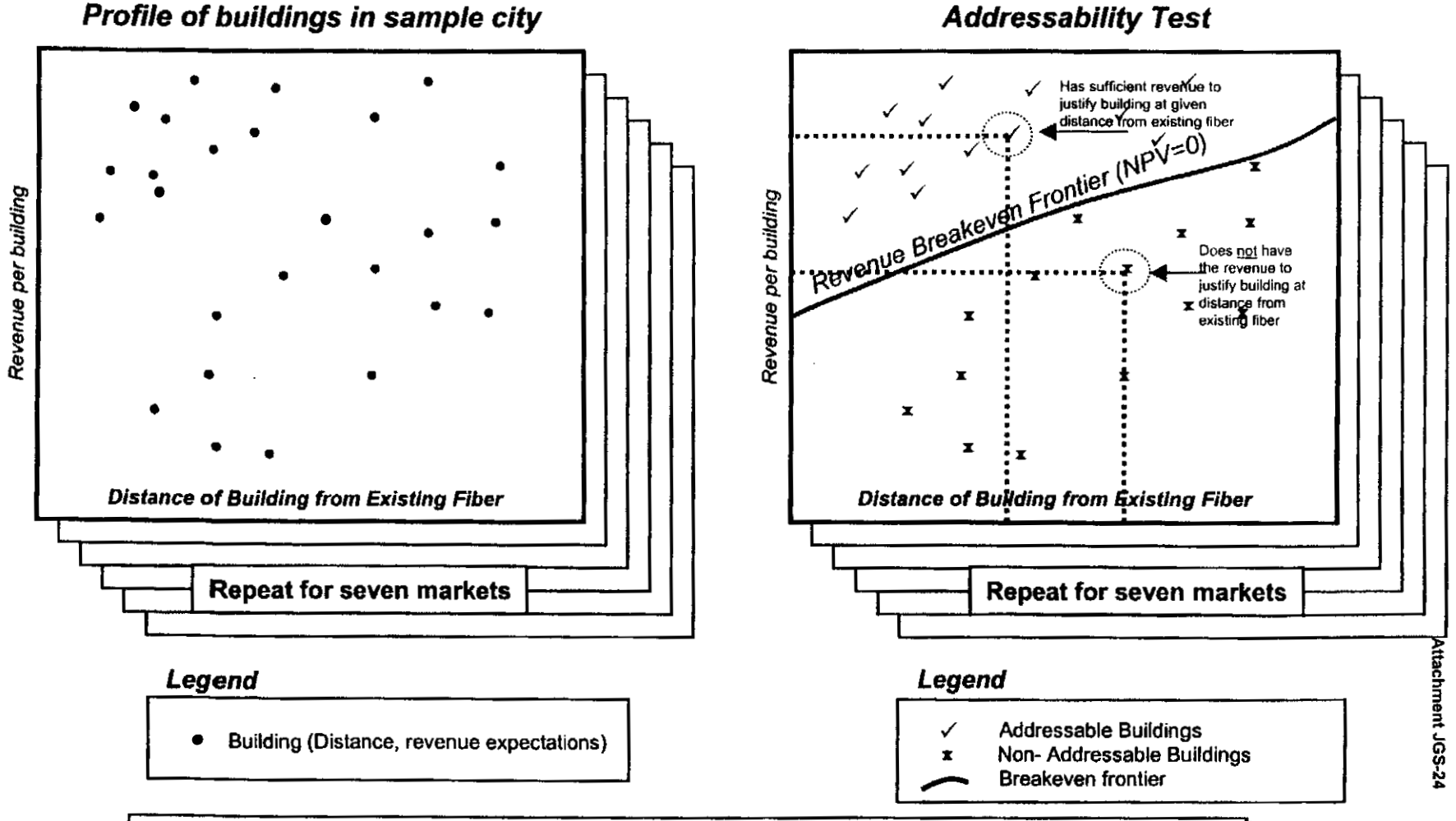
Example Revenue Breakeven Frontier



Our final draft revenue breakeven frontier assumptions are presented today

SBC Illinois Ex. 2.0 (Smith Direct-Loops)
Docket No. 03-0596
Attachment JGS-24

In every city, Criterion has plotted each building's distance from CLEC fiber and expected revenue. These points can then be compared to the revenue-distance breakeven frontier to determine which buildings justify a CLEC investment

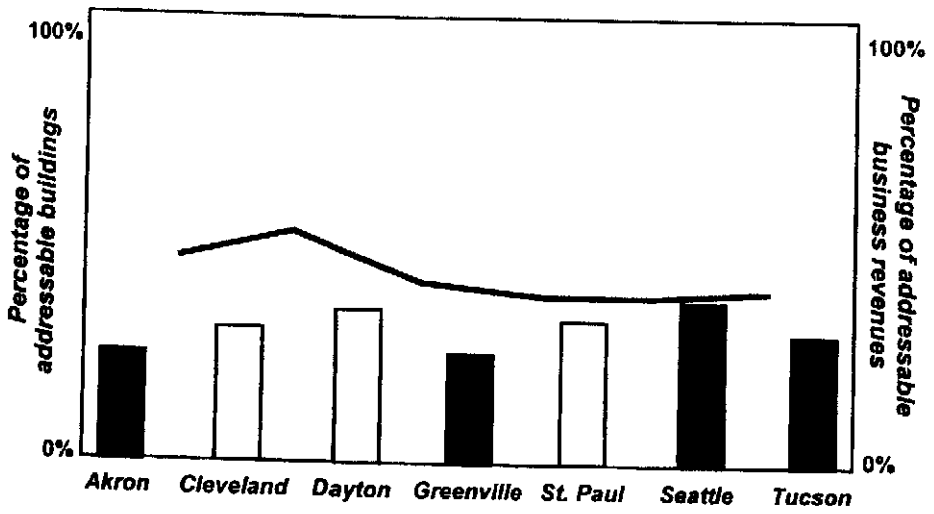


Completed in conjunction with Criterion

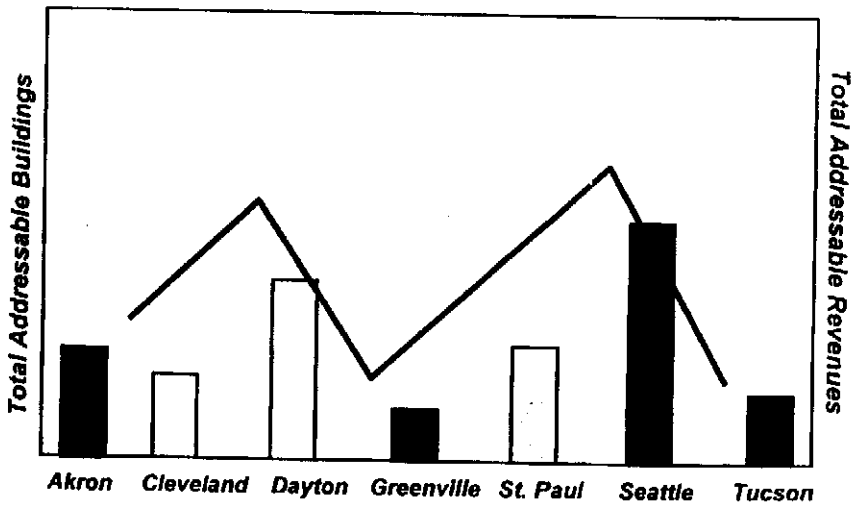
SBC Illinois Ex. 2.0 (Smith Direct-Loops)
Docket No. 03-0596
Attachment JGS-24

The Industry can use this analysis to understand the addressability of buildings and revenues in seven representative US markets

Percentage of addressable "off-net" buildings and revenues in seven markets



Total addressable "off-net" buildings and revenues in seven markets



Completed in conjunction with Criterion

Today's discussion

- Background & Introduction
- Current Results
- Model Architecture Design
- Assumptions and Sources

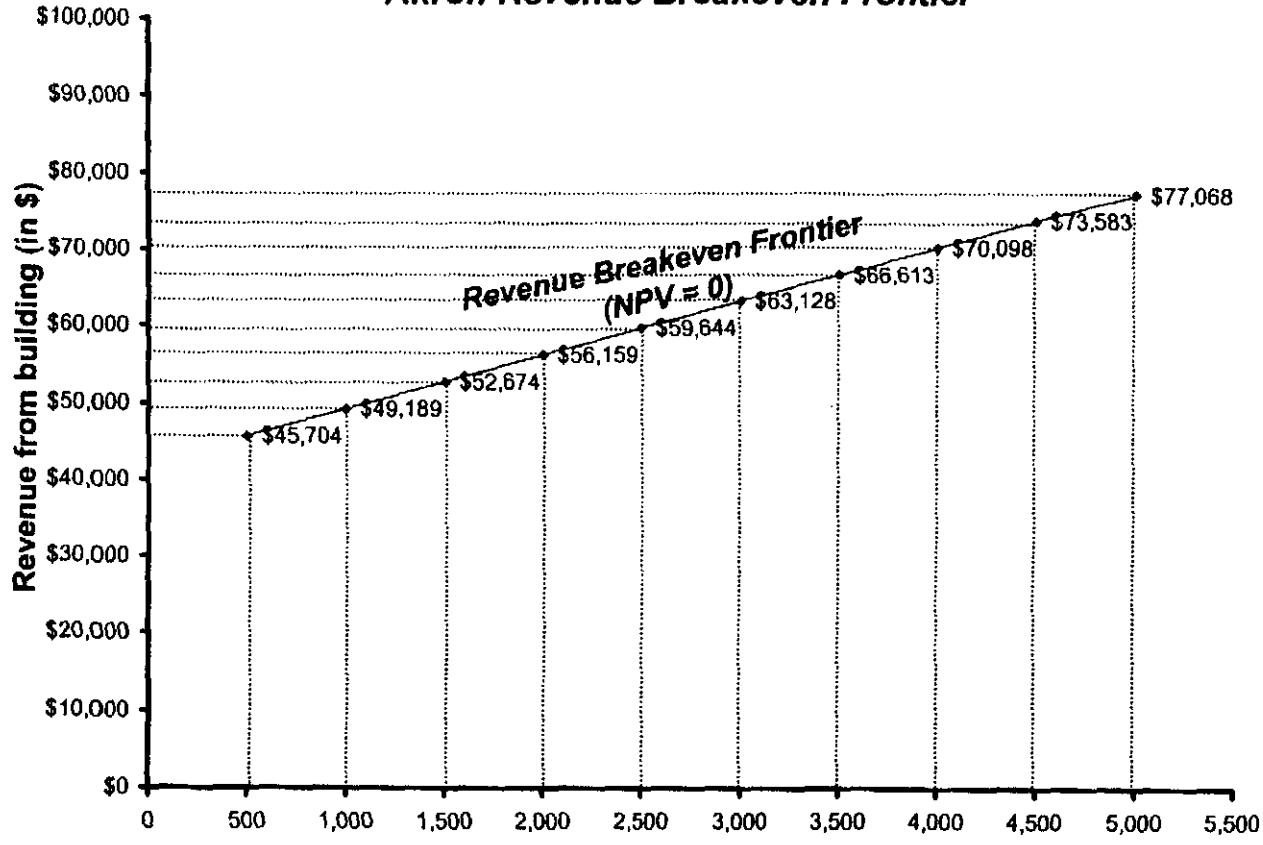
Using a SONET based architecture for every city, we have calculated the revenue breakevens at various distances…

Annual Revenue Breakeven Threshold (NPV = 0) by Distance per Building

Market	500 feet	1,000 feet	1,500 feet	2,000 feet	2,500 feet	3,000 feet	3,500 feet	4,000 feet	4,500 feet	5,000 feet
Akron, Ohio	$45,704	$49,189	$52,674	$56,159	$59,644	$63,128	$66,613	$70,098	$73,583	$77,068
Cleveland, Ohio	$46,988	$51,155	$55,321	$59,488	$63,655	$67,821	$71,988	$76,155	$80,321	$84,488
Dayton, Ohio	$40,476	$43,656	$46,836	$50,015	$53,195	$56,375	$59,555	$62,734	$65,914	$69,094
Greenville, South Carolina	$40,294	$42,970	$45,646	$48,322	$50,998	$53,674	$56,350	$59,026	$61,702	$64,378
St. Paul, Minnesota	$42,800	$46,816	$50,833	$54,850	$58,867	$62,883	$66,900	$70,917	$74,933	$78,950
Seattle, Washington	$47,079	$51,561	$56,044	$60,526	$65,009	$69,491	$73,974	$78,456	$82,938	$87,421
Tucson, Arizona	$44,124	$47,399	$50,677	$53,955	$57,233	$60,509	$63,780	$67,051	$70,322	$73,593

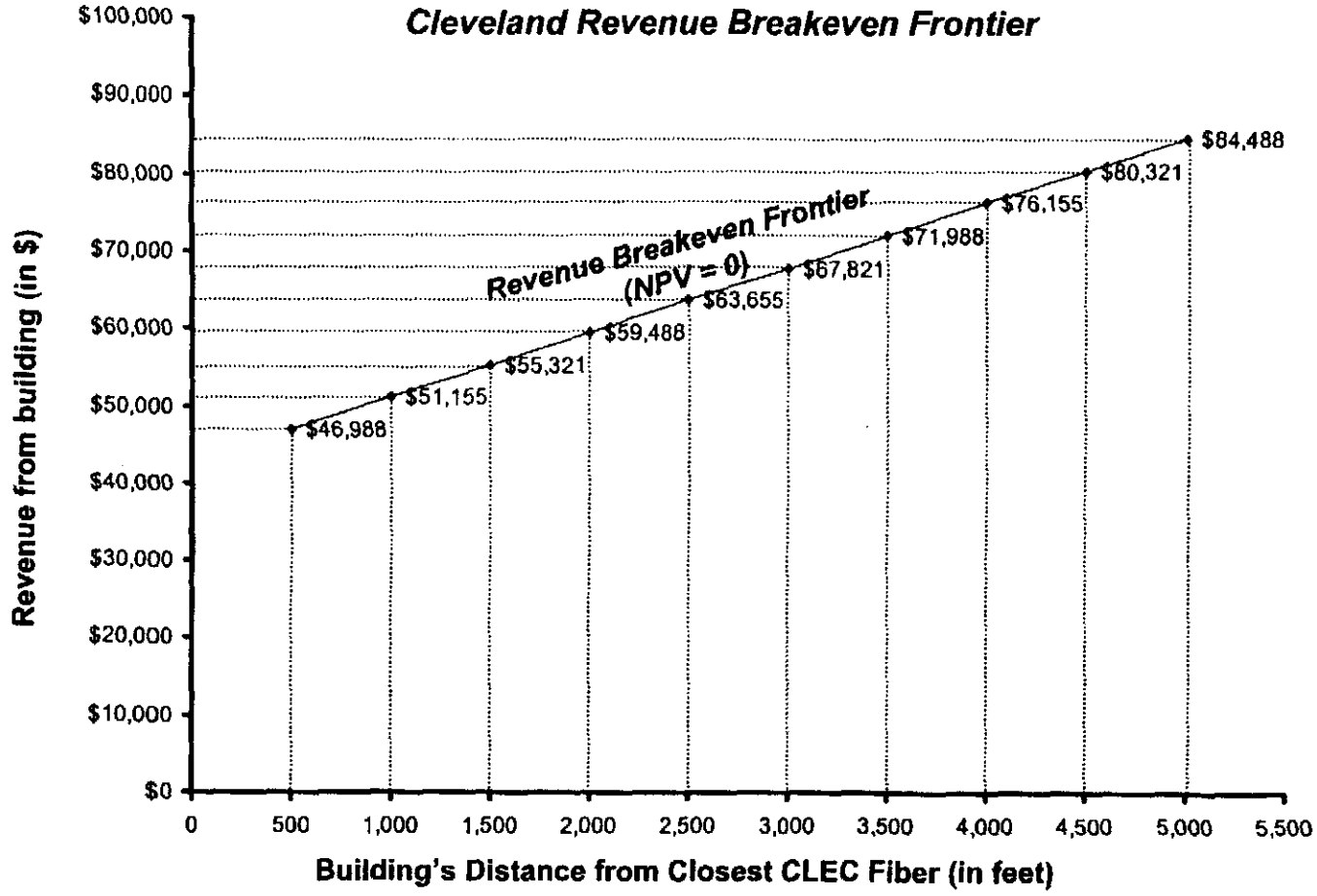
… And used these to develop revenue breakeven frontiers. In Akron, a building 500 feet from fiber requires $46,000 in annual revenues to justify a lateral, while a building at 5,000 feet requires $77,000 annually

Akron Revenue Breakeven Frontier



Market	500 feet	1,000 feet	1,500 feet	2,000 feet	2,500 feet	3,000 feet	3,500 feet	4,000 feet	4,500 feet	5,000 feet
Akron	$45,704	$49,189	$52,674	$56,159	$59,644	$63,128	$66,613	$70,098	$73,583	$77,068

In Cleveland the annual revenue required from an off-net building ranges from $47,000 at 500 feet to $84,000 at 5,000 feet in order to justify the cost of laying fiber



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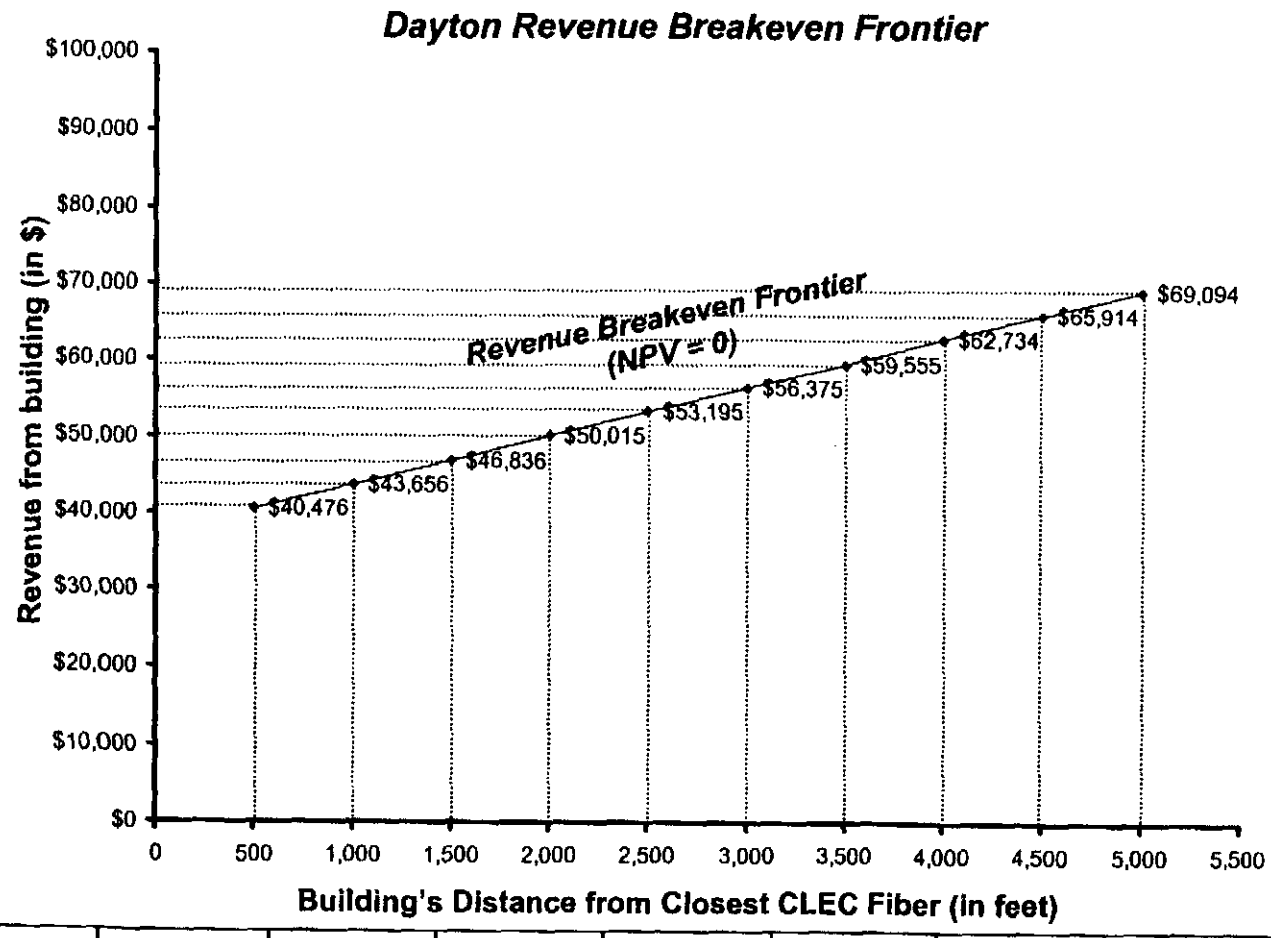
In Dayton, a building 500 feet from fiber requires $40,000 in annual revenues to justify a lateral, while a building at 5,000 feet requires $69,000 annually



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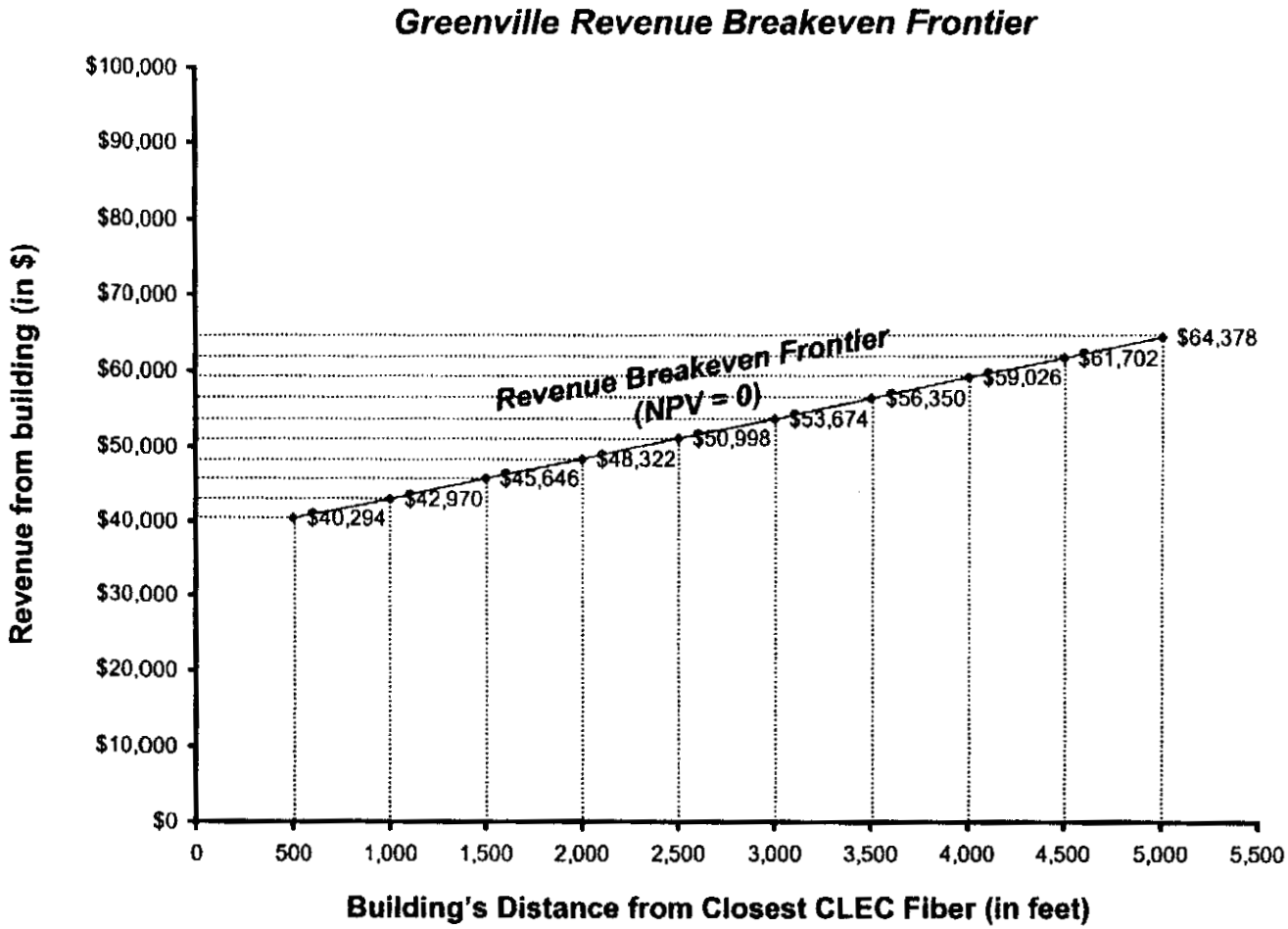
Dayton	$40,476	$43,656	$46,836	$50,015	$53,195	$56,375	$59,555	$62,734	$65,914	$69,094

Of all our cities, Greenville requires the lowest breakeven revenue for any given distance



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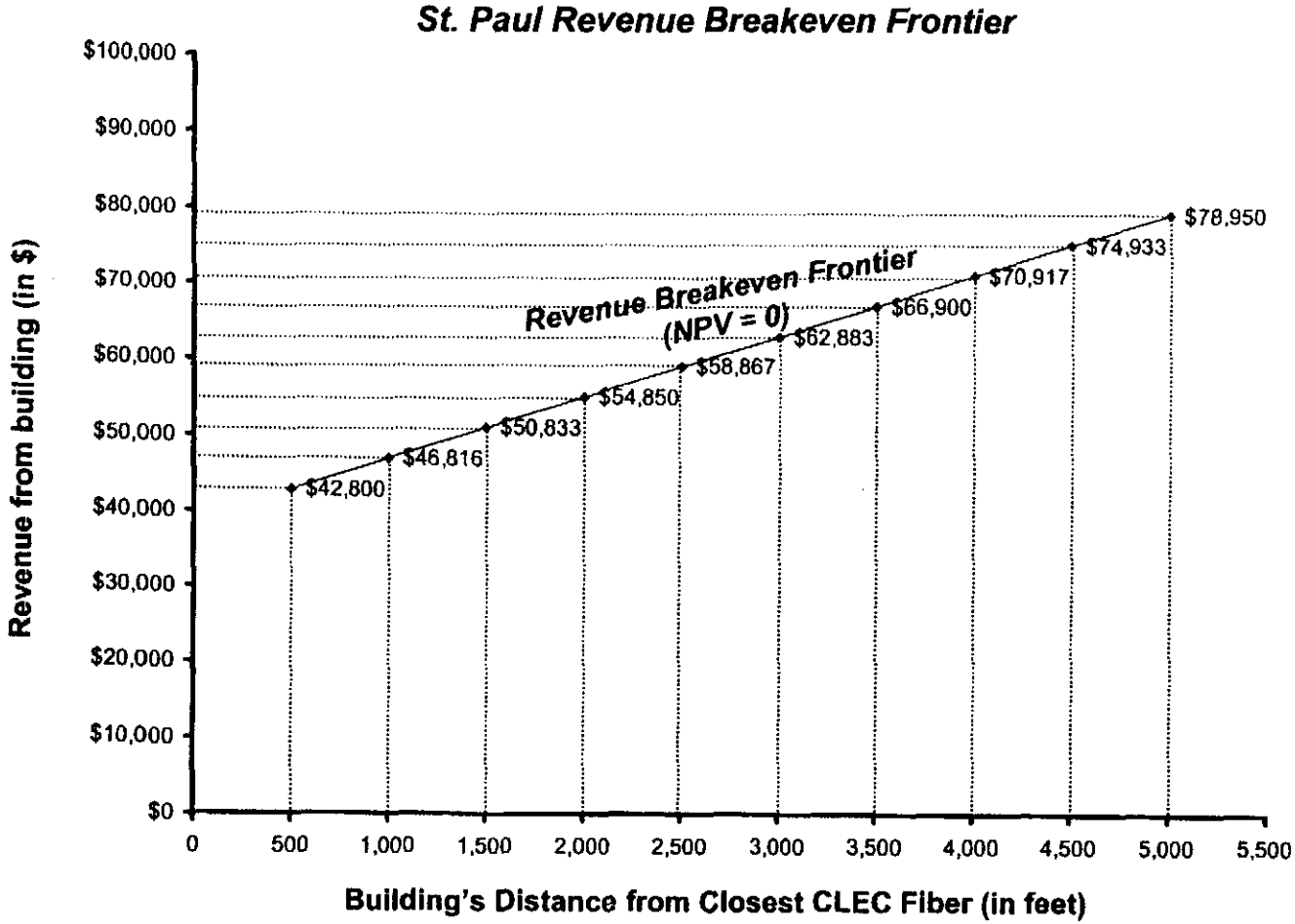
Greenville	$40,294	$42,970	$45,646	$48,322	$50,998	$53,674	$56,350	$59,026	$61,702	$64,378

St. Paul requires $43,000 to $79,000 annually from a building in order to justify the cost of laying fiber



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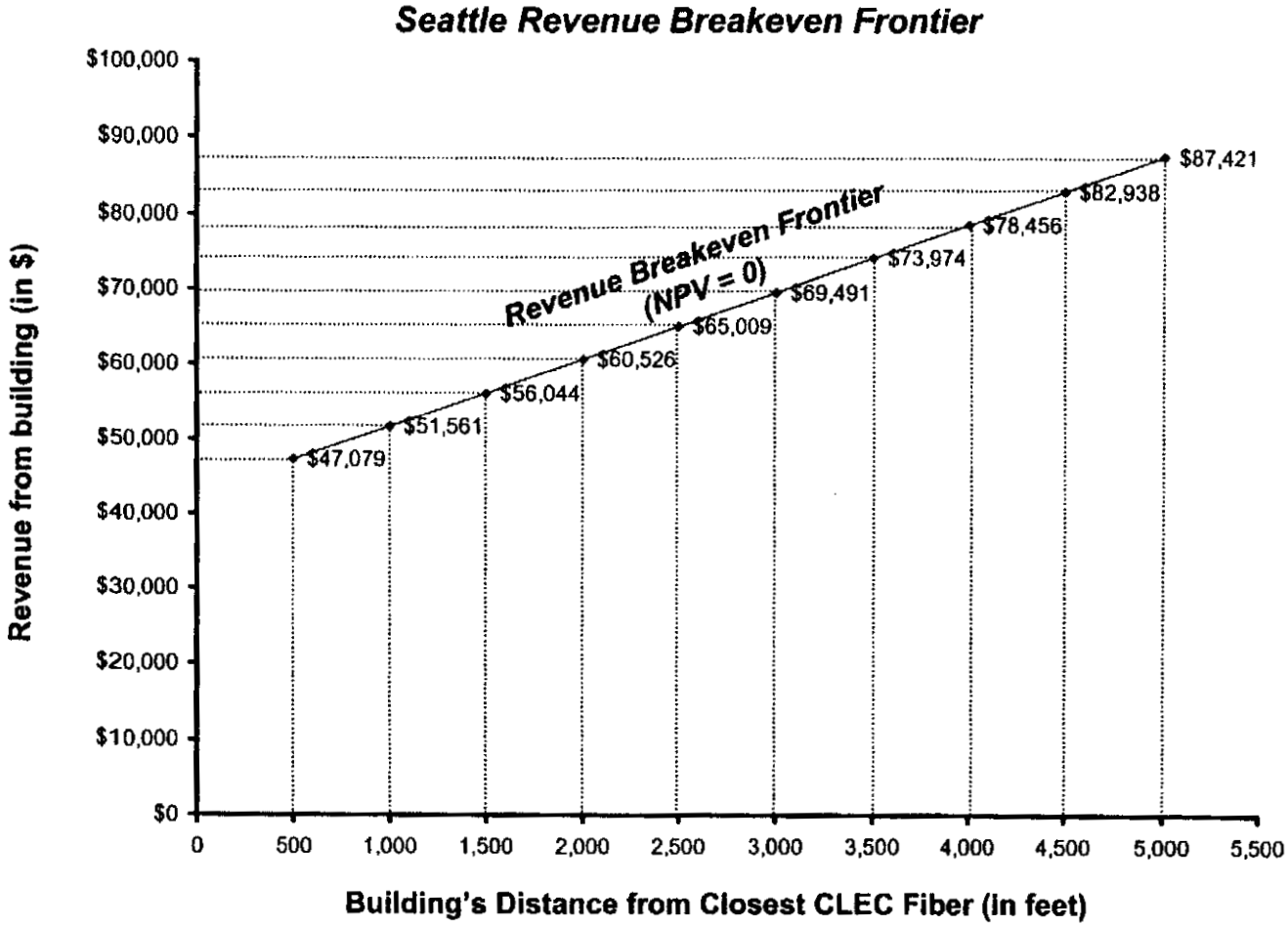
St. Paul	$42,800	$46,816	$50,833	$54,850	$58,867	$62,883	$66,900	$70,917	$74,933	$78,950

Seattle has the highest revenue breakeven frontier of any of the seven cities



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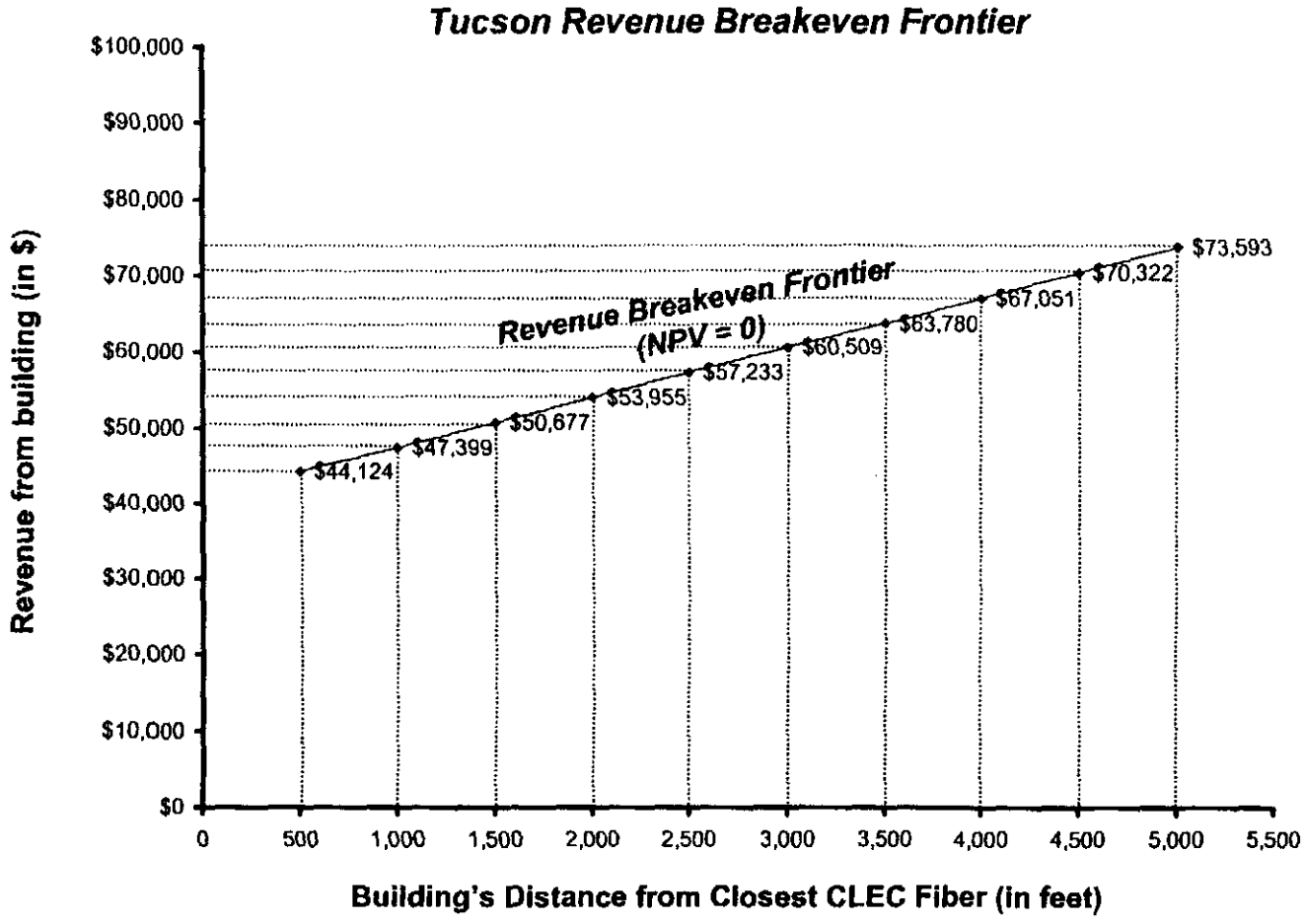
Tucson is in the middle of the range of cities in terms of revenue required from a new building at a given distance from existing CLEC fiber



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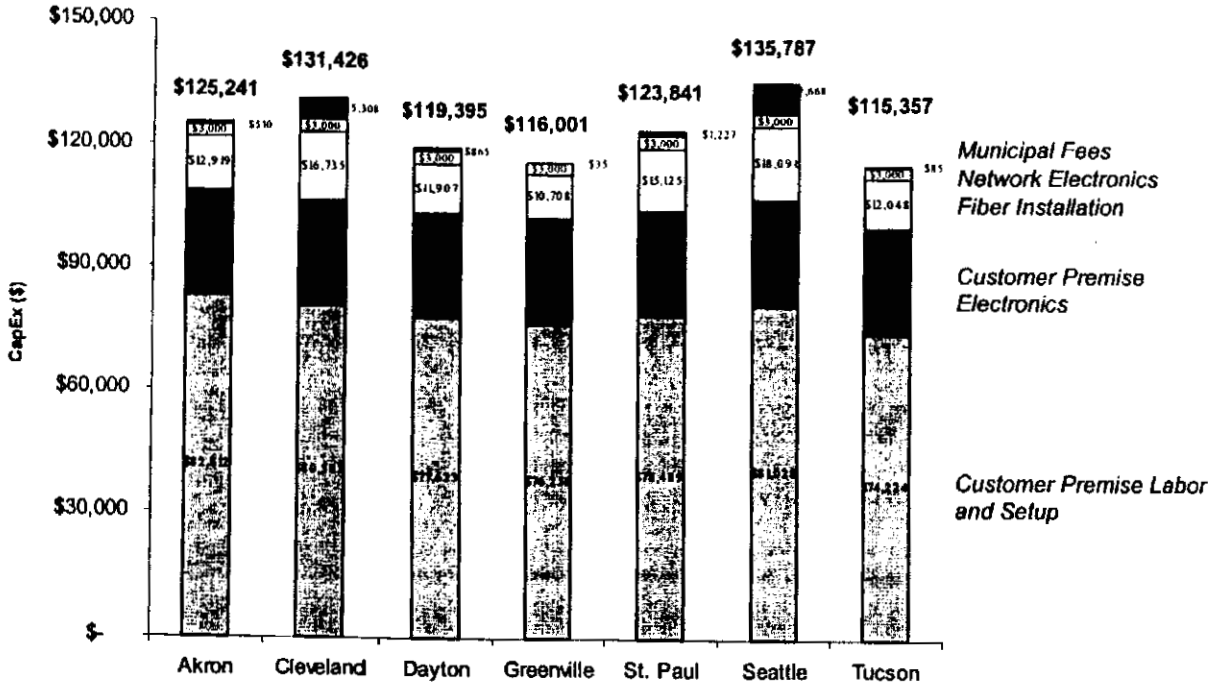
Tucson	$44,124	$47,399	$50,677	$53,955	$57,233	$60,509	$63,780	$67,051	$70,322	$73,593

Year 1 capital expenditures are highest in Seattle and lowest in Tucson primarily because of differences in fiber installation costs

Year 1 CapEx by Market for Building at 500 Feet



Primary Drivers

- Labor costs vary widely from market to market, directly affecting both fiber installation costs and customer premise labor and setup costs
  - Tucson has the lowest labor cost of the seven markets
  - Seattle has the highest labor cost of the seven markets
- Municipal fees fluctuate substantially for each city
  - Tucson has a very low permit cost of $85 at 500 feet
  - Seattle has a high permit cost of $7,668 at 500 feet

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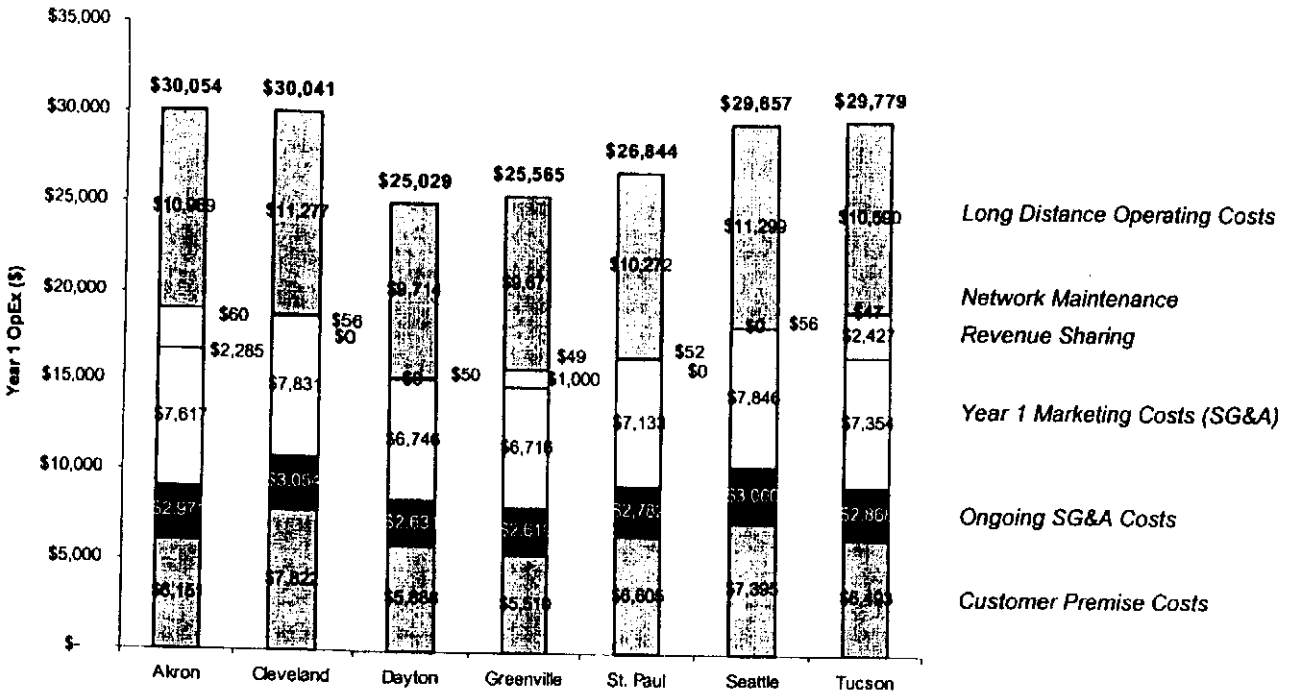
Differences in operating costs are primarily due to differences in customer premise costs

Year 1 OpEx by Market for Building at 500 Feet



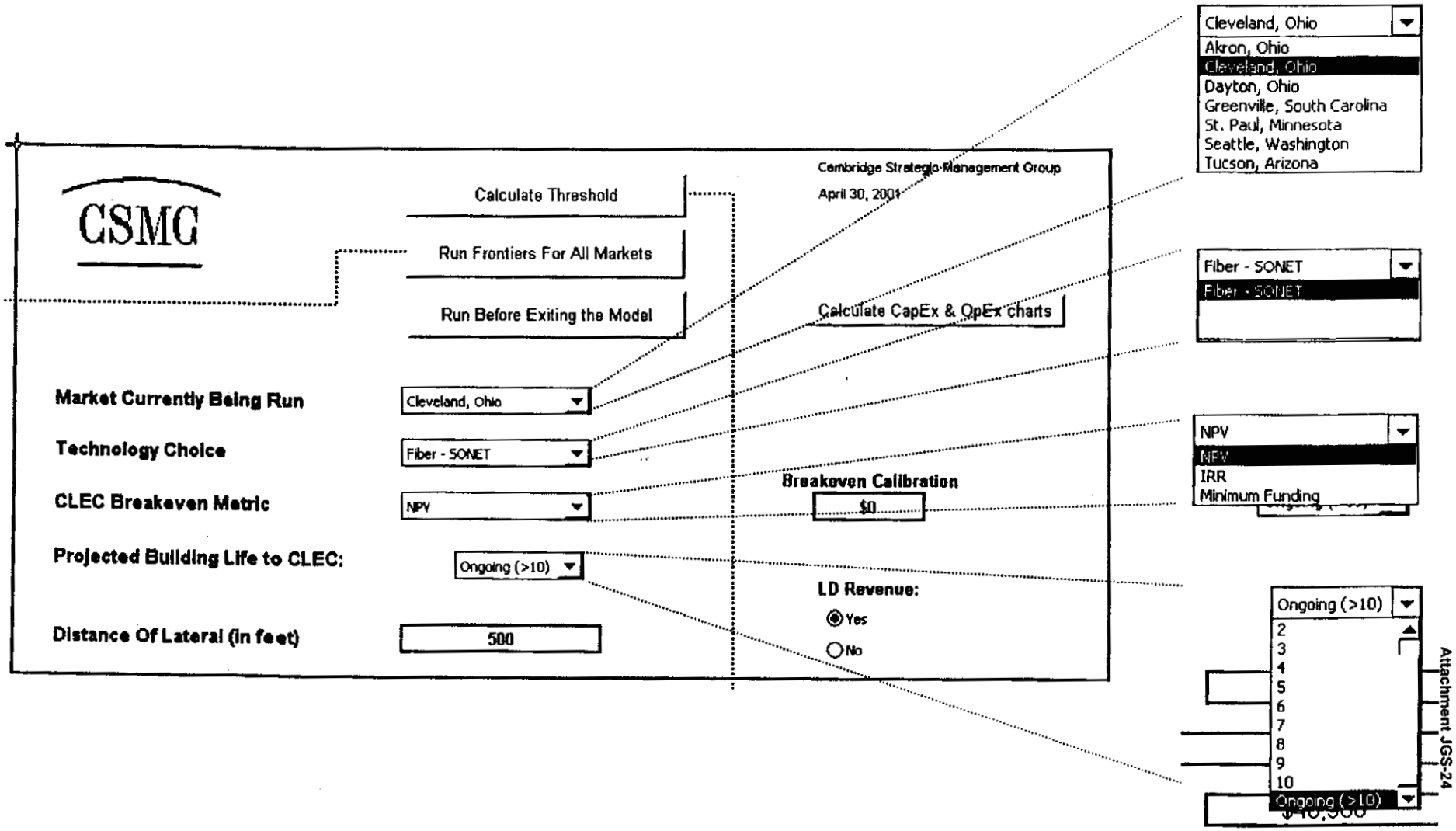
Primary Drivers

- Customer Premise costs have the greatest impact on OpEx differences across markets
  - Variations in rent to building owners account for much of this variation
  - Rents for Tier 1 cities can be 50% more than those for a Tier 3 city due to demand
- Differences in franchise agreements also account for a significant portion of the variation
  - Cleveland, Dayton, St. Paul, and Seattle do not have any franchise agreements (but have higher upfront for permitting costs)
  - Tucson has a very high franchise agreement cost at 5.5% of annual revenues
  - Greenville charges an annual fee of $1,000 in lieu of a percent of revenues

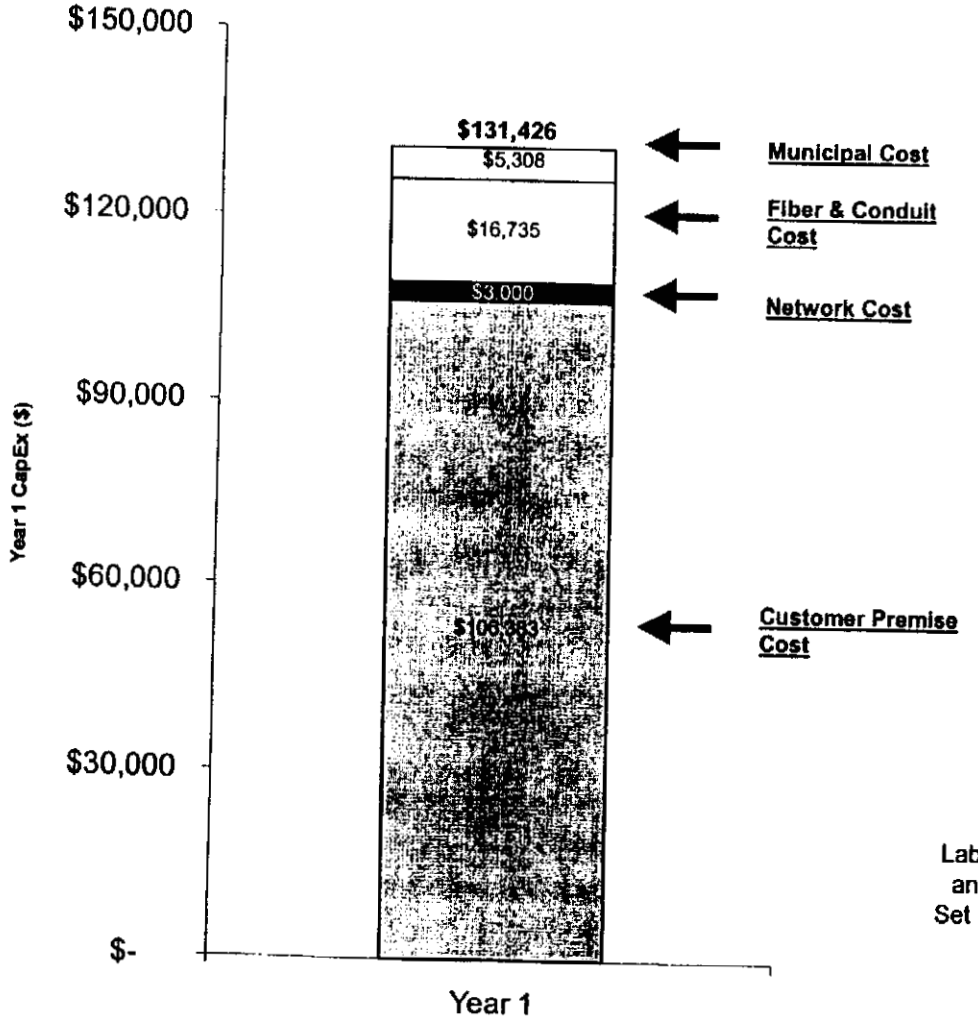
Today's discussion

- Background & Introduction
- Current Results
- **Model Architecture Design**
- Assumptions and Sources

The model builds on a choice of city, a choice of technology, what we define as "breakeven", and a lateral distance



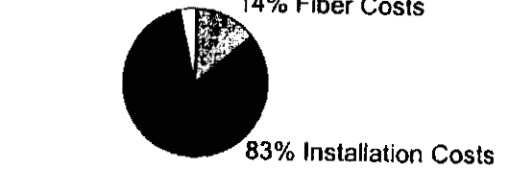
For a building in Cleveland at 500 feet from CLEC fiber, we have the following capital expenditures...



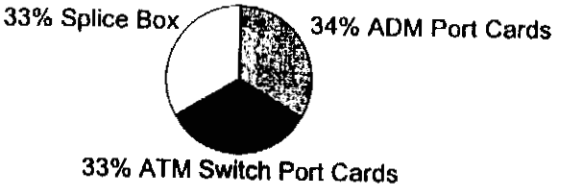
Municipal Cost

- Application Fee
- Per Foot Trenching Fee
- Inspection Fee
- Other

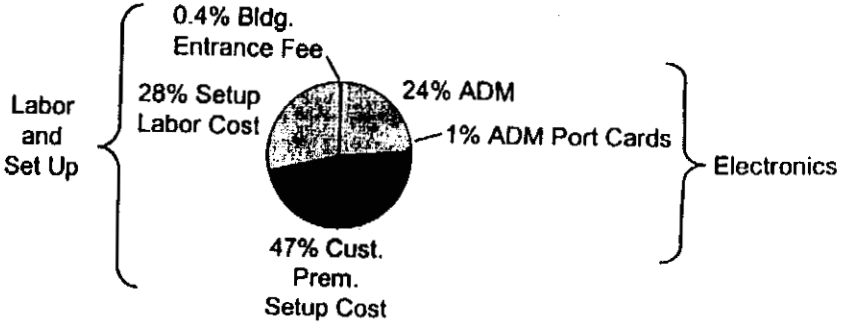
Fiber & Conduit Cost



Network Cost



Customer Premise Costs



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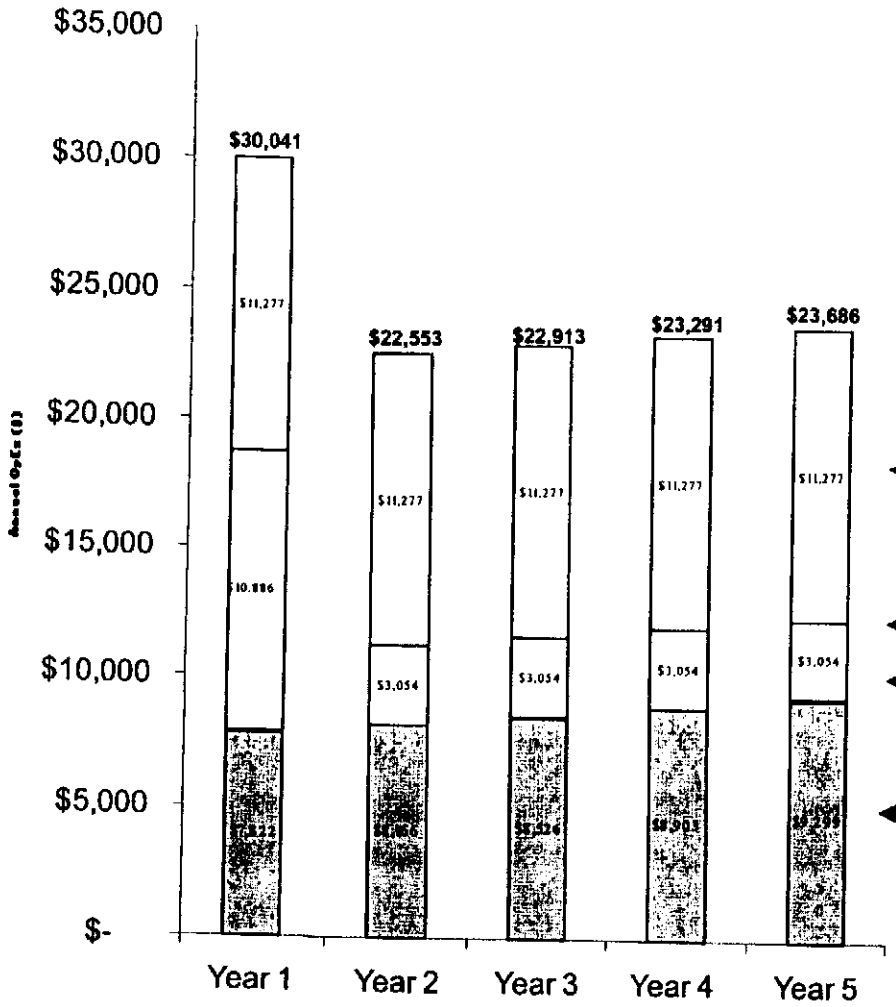
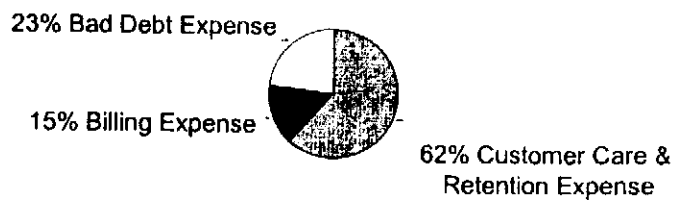
The same Cleveland building results in the following operating expenses through year 5...



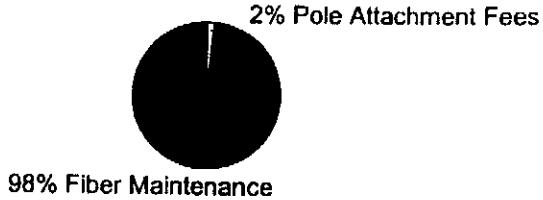
LD Costs

- Customer Care & Retention Expense
- Cost of Goods Sold
- Access
- POP-to-POP Transport
- Other

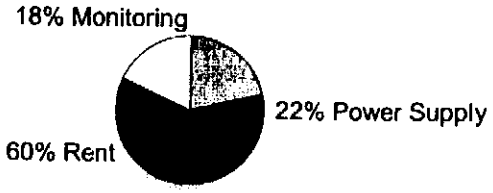
Year 5 SG&A Costs



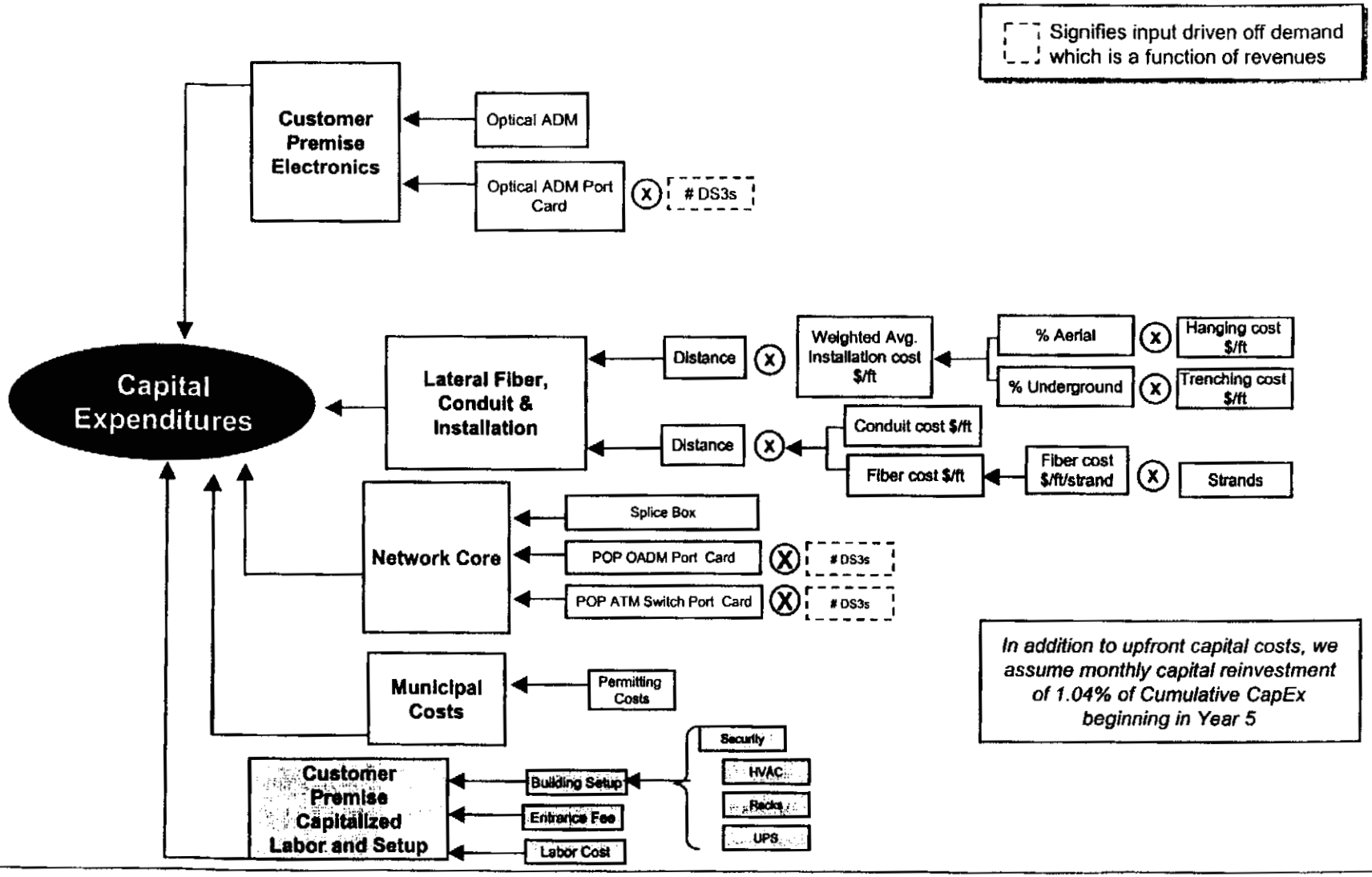
Year 5 Outside Plant Operating Costs



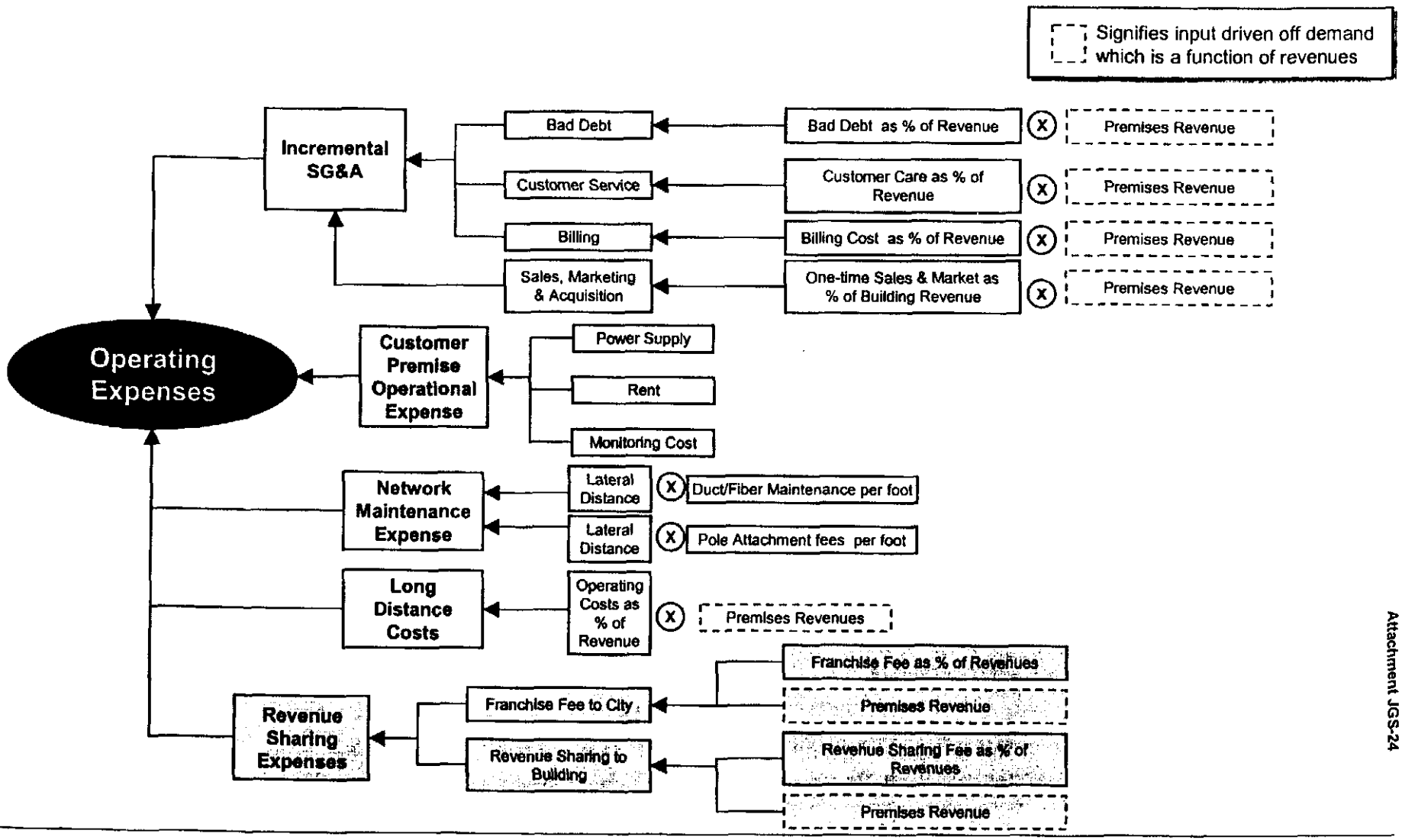
Year 5 Customer Premises Costs



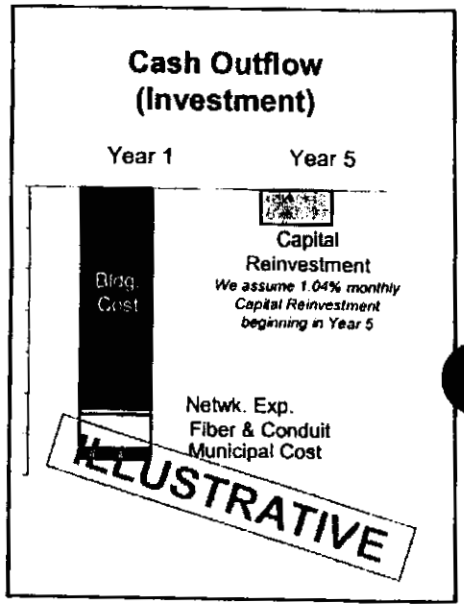
The capital expenditures are driven by five main investment components: building electronics, lateral fiber and conduit, network core, municipal costs, and capitalized labor and setup

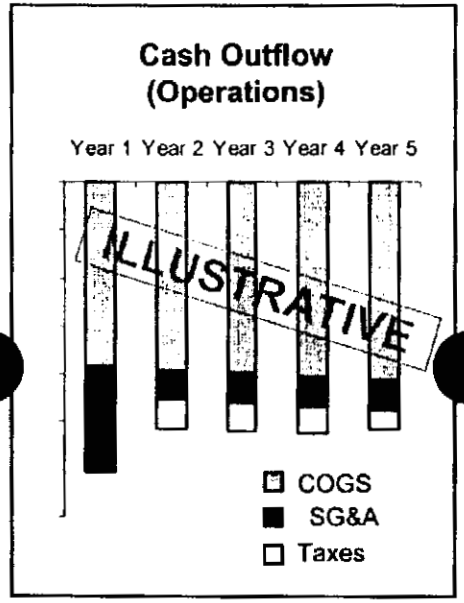


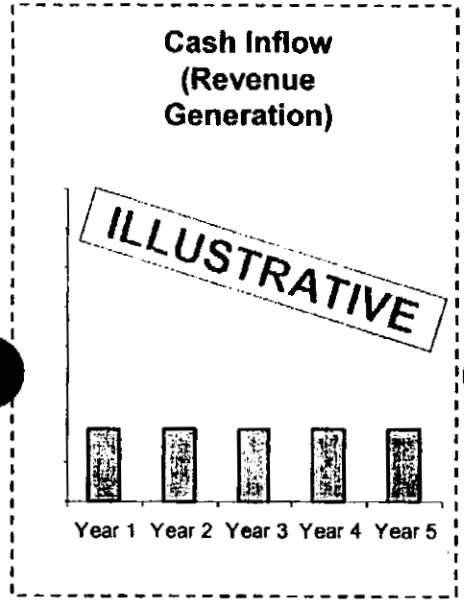
Operating expenses are driven by five components: SG&A, customer premise expenses, maintenance expense, long distance costs and revenue sharing



From the CapEx and OpEx models we develop cash outflows from investment and operations and then solve to find the breakeven revenue that results in net present value of zero

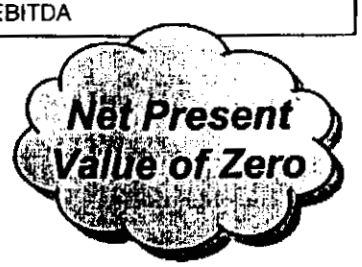






CLEC Financial Assumptions

- Weighted Average Cost of Capital = 15%
- Corporate Tax rate = 40%
- Straight line depreciation assumed
- Terminal value of premises: 10x EBITDA



Our CapEx Model feeds into Cash Outflow from Investment

Our OpEx Model feeds into Cash Outflow from Operations

Model Output

Solve to find revenue (Assume constant each year)

Note: The model has the flexibility to calculate revenue required at a number of different "breakeven" definitions including those related to IRR, NPV and Funding Requirement at any level

SBC Illinois Ex. 2.0 (Smith Direct-Loops)
Docket No. 03-0596
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Today's discussion

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- Current Results
- Model Architecture Design
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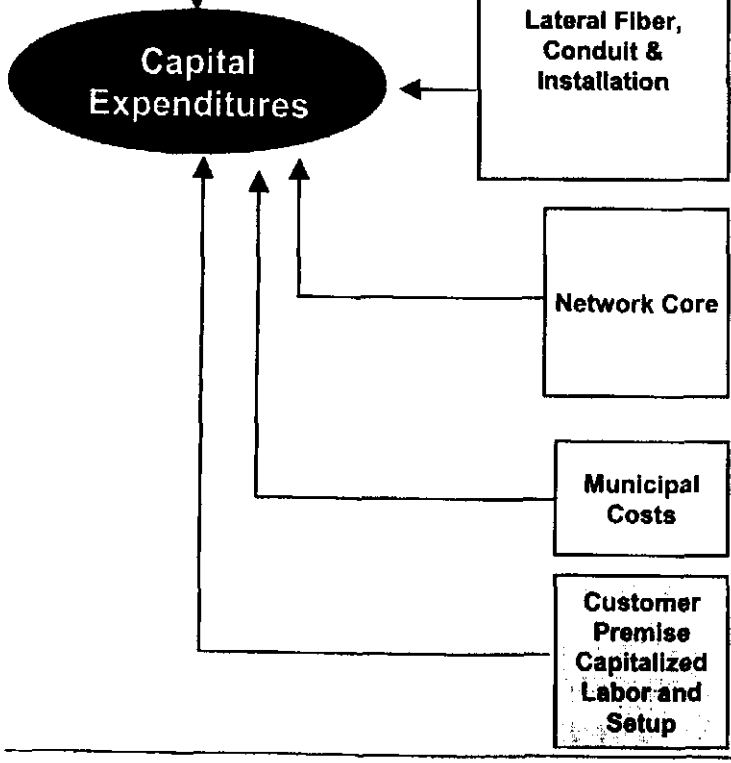
The following are the specific market inputs for capital expenditures…



Customer Premise Electronics	Akron	Cleveland	Dayton	Greenville	St. Paul	Seattle	Tucson
Optical ADM (Cisco 15454 or 15327)	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000
Optical ADM Port Card (per DS-3)	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000

Sources: Interview with facilities-based provider; Interviews with network engineers; CSMG analysis

Lateral Fiber, Conduit & Installation	Akron	Cleveland	Dayton	Greenville	St. Paul	Seattle	Tucson
%Age Underground Conduit	93%	93%	100%	90%	100%	100%	88%
Cost of Fiber (per strand per foot)	$0.03	$0.03	$0.03	$0.03	$0.03	$0.03	$0.03
Number of Strands per cable	144	144	144	144	144	144	144
Cost of Terrestrial Conduit (per duct per foot)	$1.28	$1.28	$1.28	$1.28	$1.28	$1.28	$1.28
Cost of Fiber Trenching (per foot)	$21	$30	$18	$17	$24	$30	$21
Cost of Aerial Fiber Install (per foot)	$3.58	$3.30	$3.00	$2.86	$3.10	$3.37	$2.63
Minimum Cost of Installation	$1,789	$1,648	$1,500	$1,429	$1,552	$1,683	$1,313

Sources: Interviews with city officials for each market; Interview with facilties-based provider; Quotes from equipment vendors; Interviews with fiber installer contractors from various markets; Bureau of Labor Statistics; CSMG analysis

Network Core	Akron	Cleveland	Dayton	Greenville	St. Paul	Seattle	Tucson
Splice Box	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
POP Optical ADM Port Card (per DS-3)	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
POP ATM Switch Port Card (per DS-3)	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000

Sources: Interview with facilities-based provider; Interviews with network engineers; CSMG analysis

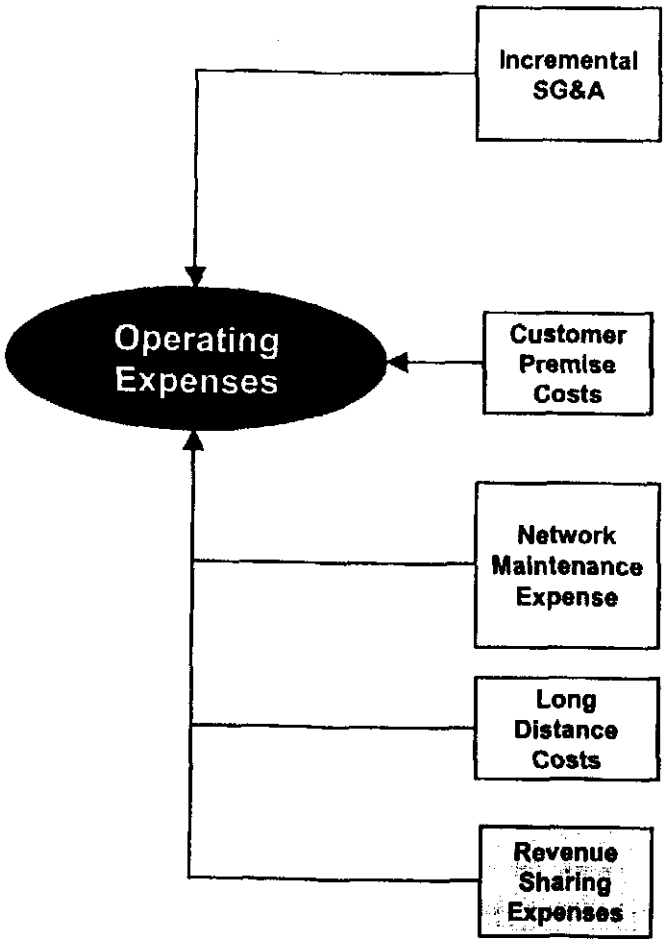
Municipal Costs	Akron	Cleveland	Dayton	Greenville	St. Paul	Seattle	Tucson
Permitting Costs	$510	$5,308	$865	$35	$1,227	$7,668	$85

Sources: Interviews with city officials from each market; CSMG analysis

Customer Premises Capitalized Labor & Setup	Akron	Cleveland	Dayton	Greenville	St. Paul	Seattle	Tucson
Building Setup (Racks, HVAC, Security, UPS, Risers	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000
Labor Cost for Setup	$32,562	$29,983	$27,298	$26,008	$28,239	$30,628	$23,899
Initial Entrance Fee	$250	$400	$325	$250	$250	$400	$325

Sources: Interviews with network engineers; Interview with national building owner/operator; Bureau of Labor Statistics; CSMG analysis

The following are the specific market inputs for operating expenses…



Incremental SG&A Expenses	
Customer Care Expense	4%
Billing Expense	1%
Bad Debt Expense	1.5%
Sales & Marketing Expense (As a multiple of 1st month's revenue)	2.00

Sources: CLEC Annual Reports; CSMG analysis

Customer Premise Costs	Akron	Cleveland	Dayton	Greenville	St. Paul	Seattle	Tucson
Electricity Cost (per bldg. per year)	$1,523	$1,523	$1,523	$1,210	$1,293	$1,064	$1,398
Annual Power Rate Increase	7%	7%	7%	7%	7%	7%	7%
Rent (per bldg.)	$3,000	$4,800	$3,000	$3,000	$3,900	$4,800	$3,900
Annual Rent Increase	4%	4%	4%	4%	4%	4%	4%
Monitoring Cost (per bldg.)	$1,628	$1,499	$1,365	$1,300	$1,412	$1,531	$1,195
Annual Monitoring Cost Increase	3%	3%	3%	3%	3%	3%	3%

Sources: Interviews with fiber installer contractors; Energy Information Association; Interview with national building owner/operator; Bureau of Labor Statistics; CSMG analysis

Network Maintenance Expenses	Akron	Cleveland	Dayton	Greenville	St. Paul	Seattle	Tucson
Fiber Maintenance (per foot)	$0.12	$0.11	$0.10	$0.10	$0.10	$0.11	$0.09
Pole Attachment Fees (per foot)	$0.03	$0.03	$0.03	$0.03	$0.03	$0.04	$0.05

Sources: Bureau of Labor Statistics; Interviews with facilities-based providers; CSMG analysis

Long Distance Costs	Akron	Cleveland	Dayton	Greenville	St. Paul	Seattle	Tucson
Long Distance Revenue as % of total Revenue	30%	30%	30%	30%	30%	30%	30%
Long Distance Cost as % of LD Revenue	80%	80%	80%	80%	80%	80%	80%

Sources: CSMG analysis

Revenue Sharing Costs	Akron	Cleveland	Dayton	Greenville	St. Paul	Seattle	Tucson
Ongoing Revenue Sharing (%age of Revenue)	0%	0%	0%	0%	0%	0%	0%
Franchise Agreements (% of rev. per year)	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.5%
Flat Franchise Agreement ($ per Year)	$0	$0	$0	$1,000	$0	$0	$0

Sources: Interview with national building owner/operator; Interviews with city officials from each market; CSMG analysis

Note that we assume there is no existing conduit available for lease, a relatively conservative assumption. If we run the model assuming a CLEC leases conduit, the revenue breakeven frontiers are substantially reduced, especially at longer distances…

Annual Revenue Breakeven Threshold (NPV = 0) by Distance per Building

Market	500 feet	1,000 feet	1,500 feet	2,000 feet	2,500 feet	3,000 feet	3,500 feet	4,000 feet	4,500 feet
Akron, Ohio	$43,657	$44,624	$45,592	$46,559	$47,527	$48,495	$49,462	$50,430	$51,397
Cleveland, Ohio	$44,126	$45,030	$45,934	$46,838	$47,742	$48,646	$49,550	$50,453	$51,357
Dayton, Ohio	$38,597	$39,533	$40,469	$41,405	$42,341	$43,277	$44,213	$45,149	$46,085
Greenville, South Carolina	$38,867	$39,768	$40,670	$41,571	$42,472	$43,374	$44,276	$45,178	$46,079
St. Paul, Minnesota	$40,219	$41,277	$42,335	$43,393	$44,451	$45,509	$46,568	$47,626	$48,684
Seattle, Washington	$43,925	$44,844	$45,763	$46,682	$47,601	$48,520	$49,440	$50,359	$51,278
Tucson, Arizona	$42,180	$43,164	$44,151	$45,137	$46,124	$47,109	$48,089	$49,068	$50,092