

Streetlight Municipalization: The First Step Towards Building Your Smart City Infrastructure

Tuesday, June 7, 2022

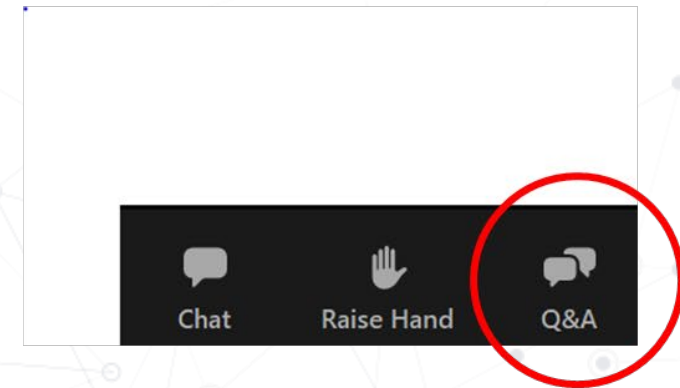


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ENERGY



Welcome!

- Our webinar should take around 45 minutes. We will have time for questions at the end.
- Please use the Q&A button in the center of your screen to submit your questions.
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Introduce Panel



Brandon Dittman

Partner, Kissinger & Fellman P.C

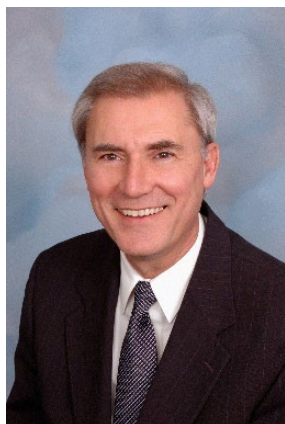
- 9 years experience litigating Public Utilities Commission (PUC) cases in multiple states
- Lead counsel for local government coalition in Proceeding 20AL-0432E
- Representing Golden, Aurora, Eire, Centennial, and Boulder in streetlight acquisition projects.



Paul Vesel

Directory of Intelligent Infrastructure, RealTerm Energy

- 25+ years leading municipal infrastructure and energy efficiency projects
- Led 50 streetlight municipalization projects in 4 states
- Former CEO of Omniwatt and Poderco, renewable energy and energy efficiency companies
- Currently Rocky Mountain regional Director for RealTerm Energy



Dave Zelenok

Local Government Services Manager, HR Green

- 34 years experience in Colorado local government, public works and telecommunications management
- Overseen the operation/maintenance of 30,000 Colorado municipal streetlights
- Installed hundreds of miles of municipal fiber, traffic and smart city infrastructure
- Former President American Public Works Association Colorado Chapter
- Public Works Director - Colorado Springs and Centennial Colorado, engineering faculty at the US Air Force Academy



Municipalization and Taking Ownership of Your Streetlights

- What is **municipalization** – As cities move towards municipalization by taking ownership of their streetlights, there are many benefits:
 - ✓ Converting streetlights from “**must pays**” (liabilities) to new “**revenue sources**”
 - ✓ Significant **savings** moving from utility-owned to **municipally-owned tariff**
 - ✓ Smart LED streetlights with controls and sensors open opportunities for public Wi-Fi, 5G, traffic controls, cameras, air quality sensors, and more
 - ✓ **Improved safety** for its citizens through smart technology
 - ✓ Improved service levels – *taking ownership of your streetlights gives you control over ongoing maintenance*
 - ✓ Energy only tariff that results in **90% reduction in costs**



Municipalization and Smart City Update

Much progress has been made regarding municipalization

- New legal advancements regarding separation
- Smart city infrastructure and network expansion
- More critical mass of cities that have either municipalized or are on the path towards municipalization. There is now a clear roadmap.



Streetlights: From Cost Center to Revenue Generator

Current Situation: (Per 1,000 lights) - Annual cost ~\$250,000
PLUS....

- + Knockdowns (less insurance recoveries)
- + Corrosion replacements
- + Area Lighting & Signals
- + LED, system upgrades and new installations

Limited ability to meet:

- Aesthetic, repair or maintenance levels
 - Energy goals (HPS - 1930's)
 - Opportunities for Innovating (e.g., P3's)
 - System upgrades / Repurposing infrastructure
- Potential to Convert from a “Must Pay” **Cost** to Potential long term **Revenue** Source
 - Related / Broader Issues – Telecommunications, Small Cell, Smart City Initiatives: **Imminent**

Cost savings ~ 55% (\$150,000) potential per 1,000 lights



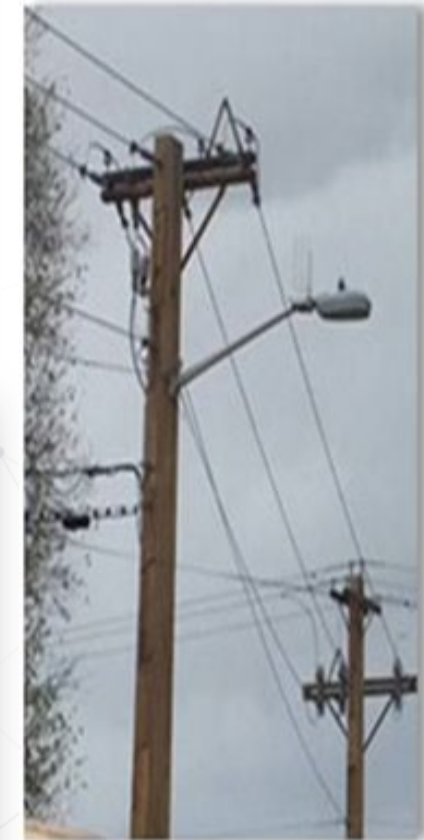
Poorly Maintained Streetlight

Brief History of Municipal Street Light Acquisition in Colorado

- The Colorado Public Utilities Commission (PUC) approves the rules and regulations for streetlighting with concern to Investor-Owned Utilities (IOUs).
- For many years municipalities understood the benefits of streetlight ownership, but there was no rate class for municipally-owned streetlights or mechanism for acquisition.
- Coalition of local governments argue for energy-only rate class in Proceeding No. 09AL-299E.
- "Energy Only" or "ESL" tariff approved in Proceeding No. 11AL-768E.
- Pre-2021, ESL tariff ambiguous on method of electrical "separation" of streetlights.
- Xcel interpreted ESL tariff to require costly method of pull box separation and immediate takedown of streetlights attached to distribution poles .

PUC Proceeding 20AL-0432E

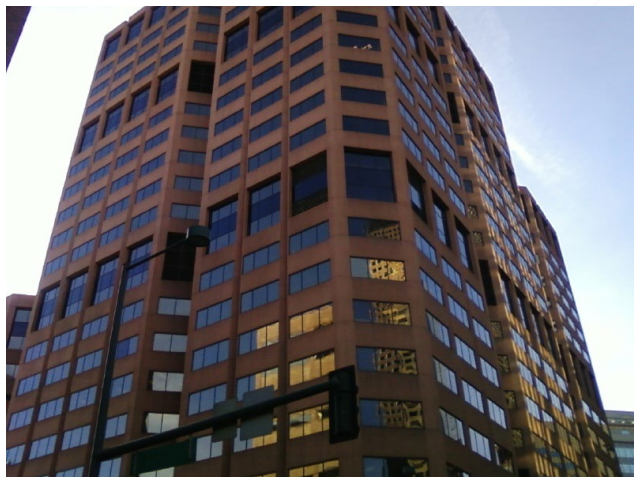
- Local Government Coalition intervenes in an Xcel Phase II Electric Rate Case
- Two Principal Arguments:
 - Pull box method of separation is unnecessary and unreasonable.
 - Requirement that distribution pole attached streetlights be taken down and removed not supported by the tariff and is also unjust and unreasonable.
- Xcel fights hard against Local Government Coalition participation in the rate case and the merits of Local Government Coalition arguments.
- Settlement reached the day before the hearing on the rate case.



Proceeding 20AL-0432E - Settlement



COLORADO
Department of
Regulatory Agencies
Public Utilities Commission



- Settlement Terms

- Initial separation may be accomplished by a fuse.
- Within 15 years of acquisition, all streetlights must be separated by a pull box.
- All new streetlights served under ESL tariff to be separated by a pull box, including replacement streetlights. If maintenance requiring the streetlight to be deenergized is performed, then a pull box will also be installed.
- New schedule for removal of streetlights from distribution poles based on number of streetlights.

Removal Schedule for Streetlights on Distribution Poles

Number of street lights on Company distribution poles	Period (years) to complete removal and relocation from Company distribution poles
0-500	5
501-1,000	8
1,001-2,000	10
2,001-3,000	12
More than 3,000	15

Legal Steps and Documentation for Acquisition by Voluntary Sale (Xcel Energy)

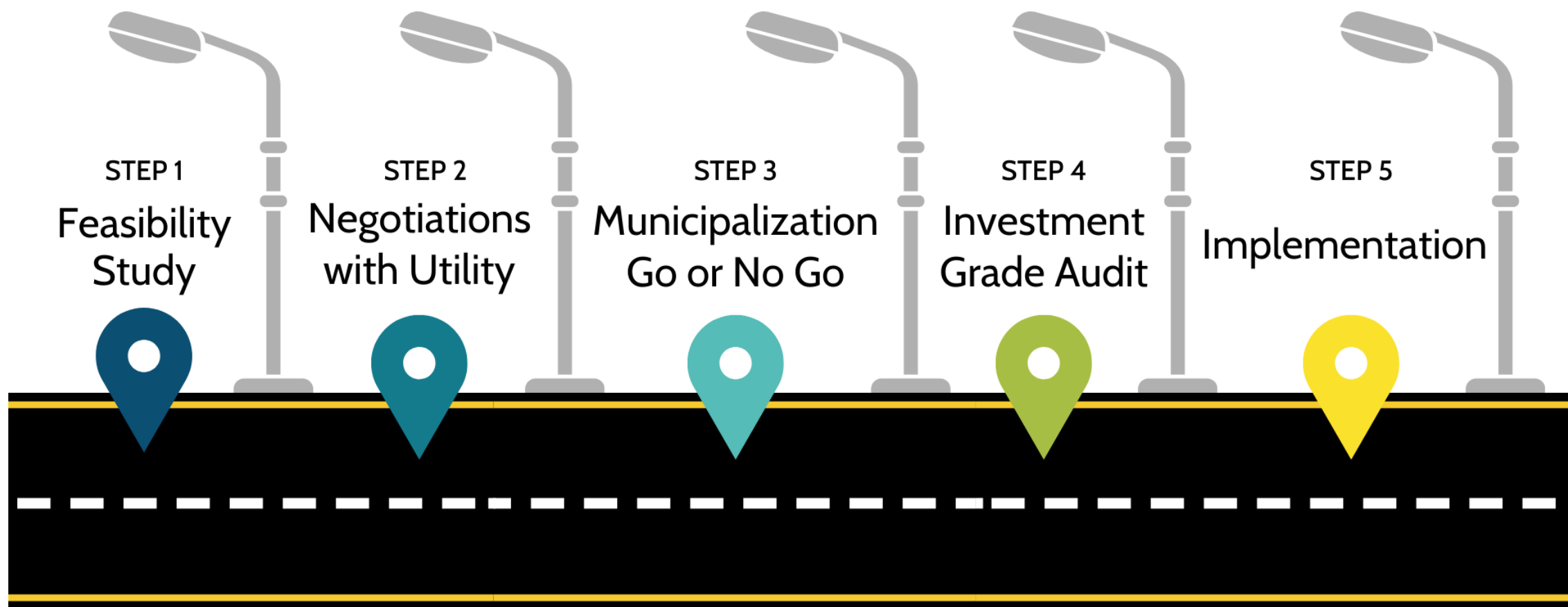
- 1) Notice of Intent to Acquire (may be governed by Franchise Agreement)
- 2) Non-Disclosure Agreement
- 3) Separation Study Scope of Work Agreement
- 4) Letter of Intent
- 5) Purchase and Sale Agreement
- 6) Resolution Approving Purchase and Sale Agreement
- 7) PUC Approval of Acquisition
- 8) Various Agreements for Operation of Municipally-Owned System (Maintenance, Upgrades, etc.)

*Note if acquisition is done via condemnation different steps may apply.





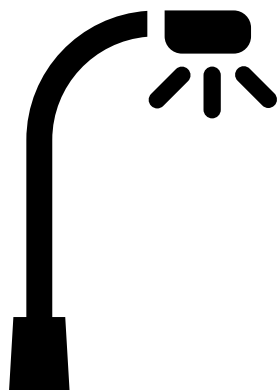
RTE: Roadmap Towards Municipalization



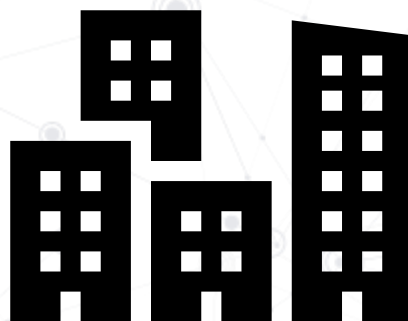


Evaluate Municipalization Opportunity With a Comprehensive Feasibility Study

Elements of feasibility study:



Inventory



Smart City Integration



Economic Analysis





Inventory



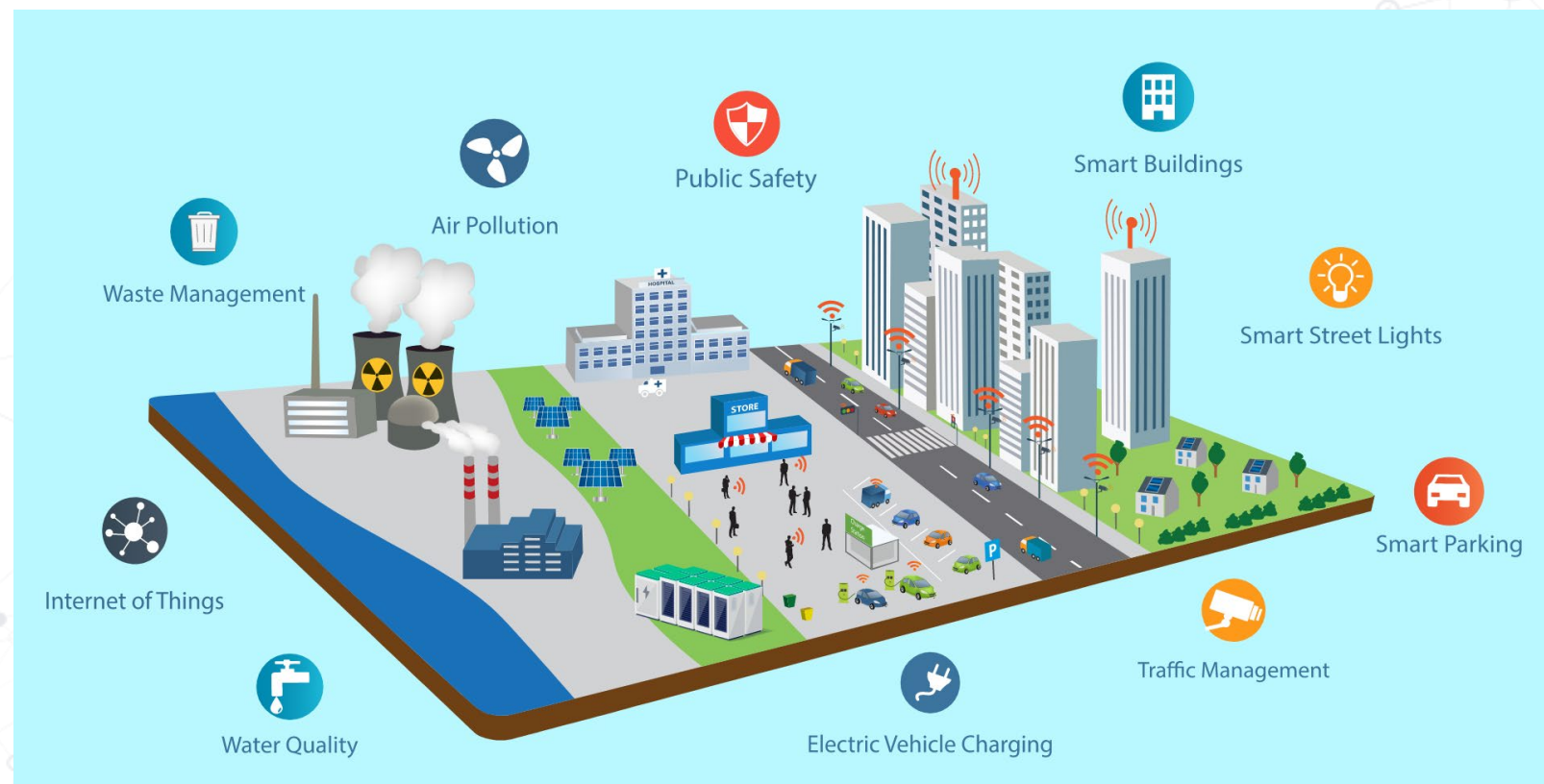
- ✓ Analyze streetlight bills
- ✓ Field audit of representative sample
- ✓ Main data points are:
 - ✓ Fixture types,
 - ✓ Quantities,
 - ✓ Wattages





Smart City Integration

- Discuss service needs
- Streetlight integrated or independent
 - EV Charging,
 - Small cell densification,
 - Public WiFi,
 - Air quality sensors,
 - Cameras, etc.





Economic Analysis

- Project cost
- Savings analysis, both energy and cost
- Operations and Maintenance Analysis
- Financing Options





Municipalization Go or No Go



Step One: Review and discuss feasibility report

Step Two: Discuss financing options

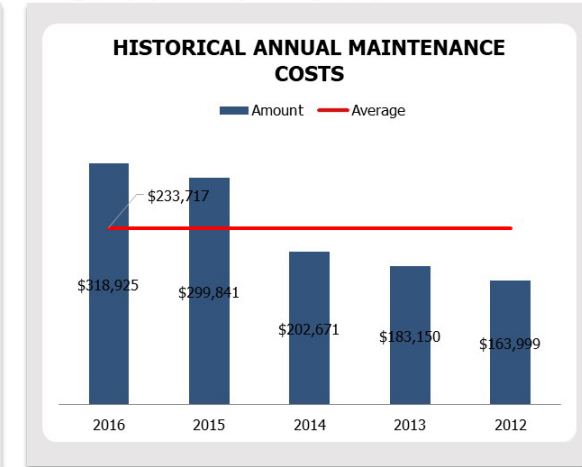
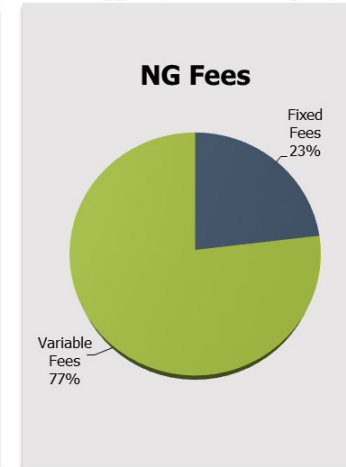
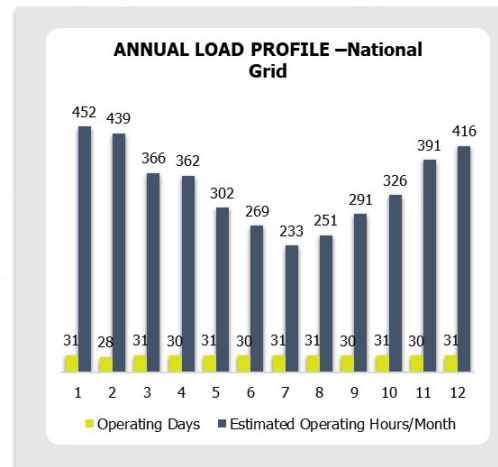
Step Three: Set timeline





Investment Grade Audit (IGA)

- ❑ Complete GIS Audit and Separation Study
- ❑ Competitively bid labor and materials
- ❑ Photometric design based on selected fixtures
- ❑ Refined cost/savings analysis based on conversion





Lessons Learned: Boulder and Thornton

- I. Separation plan and analysis critical to success
- II. Take advantage of separation grace periods
- III. Potential opportunity for future rate case to revisit separation requirements

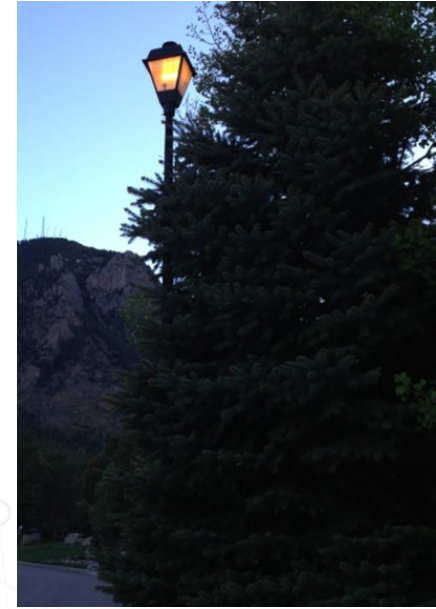


Streetlight Municipalization



Reasons Vary

- Cost Savings
- New Revenue Potential
- Energy Savings / Sustainability
- Smart Cities & Sensors
- Utility Metering & SCADA
- Fiber / “Wireline” Telecom
- Small Cells / Wireless Telecom
- Property Values (~3-8%)
- Aesthetics - Streetscapes
- New Developments
- *“Future - Proofing”*



Why Bother?

- Current Situation: Annual cost ~\$250,000 (Per 1,000 lights)
PLUS....+ Knockdowns (less insurance recoveries)
 - + Corrosion replacements
 - + Area Lighting & Signals
 - + LED, system upgrades and new installations
- Limited ability for Innovating -
 - P3's, GHG reduction, Telecommunications, Smart City Initiatives
- Cost savings (~1,000 lights /10K pop) ~\$100K - \$150K
 - Potential to Convert from a “Must Pay” **Cost** to
 - Potential long term **Revenue Source**



Poorly Maintained Streetlight

Colorado Street Lighting Executive Overview

~\$20+/month typical per light

- Profit / Maintenance, etc. ~\$16 / month
- Power Costs (HPS) ~ \$2 - 4/month
- LED's: reduce power expenses ~ \$1 - 2/month
- Power is often only ~ **10-20%** of total expenses

Many cities now municipalizing lighting

- Paying separately for energy
- Up-front capital & conversion costs
- R.O.I. ~ 3-6 years (varies)
- R.O.I. - LED Conversions alone: ~20+ years

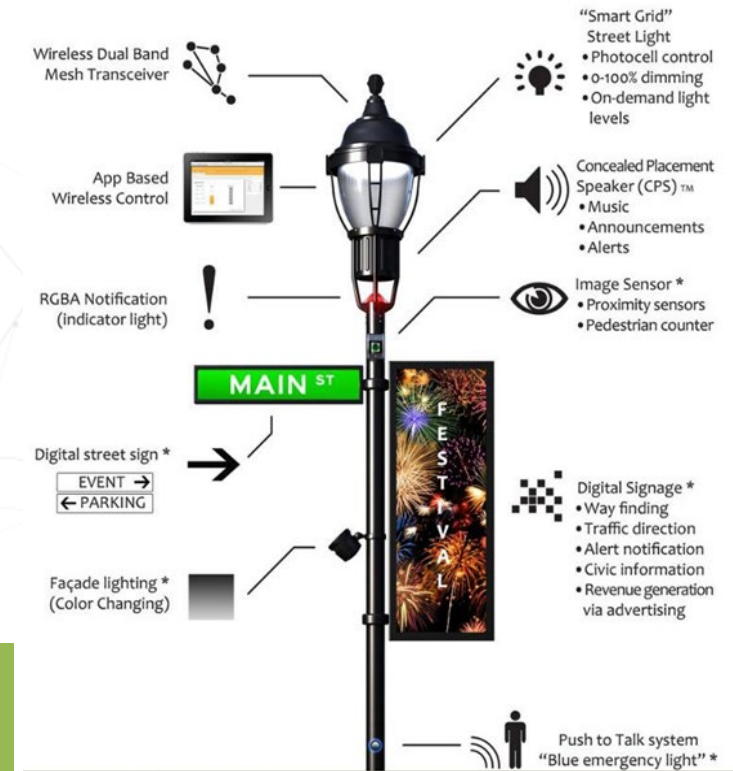
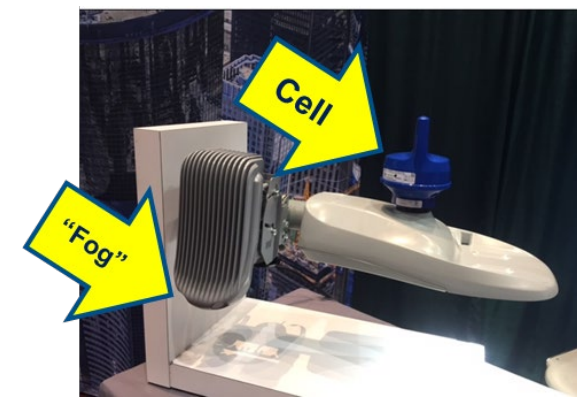


Conduit Can be even more valuable (~\$20-\$100/LF)

It's Just a Streetlight.. Or is it?

- Lighting now PLATFORMS
 - “Smart” (Dimming) Streetlights
 - 5G / Wireless Telecom Antennas
 - Signage / Wayfinding
 - Environmental Sensors
 - Public Address / Video Streaming
 - Change detection / Surveillance
 - Electric vehicle charging ports
 - Visual banners

Effectively ALL PROHIBITED



Graphic by IntelliStreets, Inc.

Pathway to Smart Cities and Intelligent Communities

Streetlight Infrastructure - IDEAL for Interconnecting:

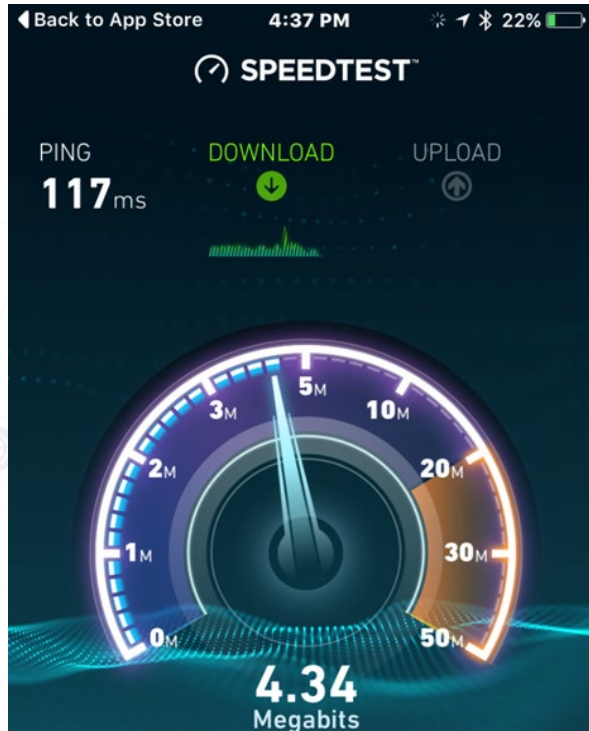
- Utilities, Energy and “GHG” Management
- Traffic Signals, Parking, Roads
- Emergency Management & Operations
- Transit, Mobility, Logistic Systems
- Sensors: Fire, Wearables, Cameras, Drones

Technology Applications are the **enablers**
Communications are the **common thread**



What are Others Doing – and Why? Vail, Colorado

Streetlighting and FREE WiFi



Aspen, Colorado

- Managing private sector 5G wireless deployments
- Focusing on:
 - Health concerns
 - 5G Radiation reviews
 - Aesthetic compliance
- “Plug and Play” locations
- **5G + Fiber + Power + Streetlights**



5G and Small Cell “Densification”

Not all 5G Is Created Equal

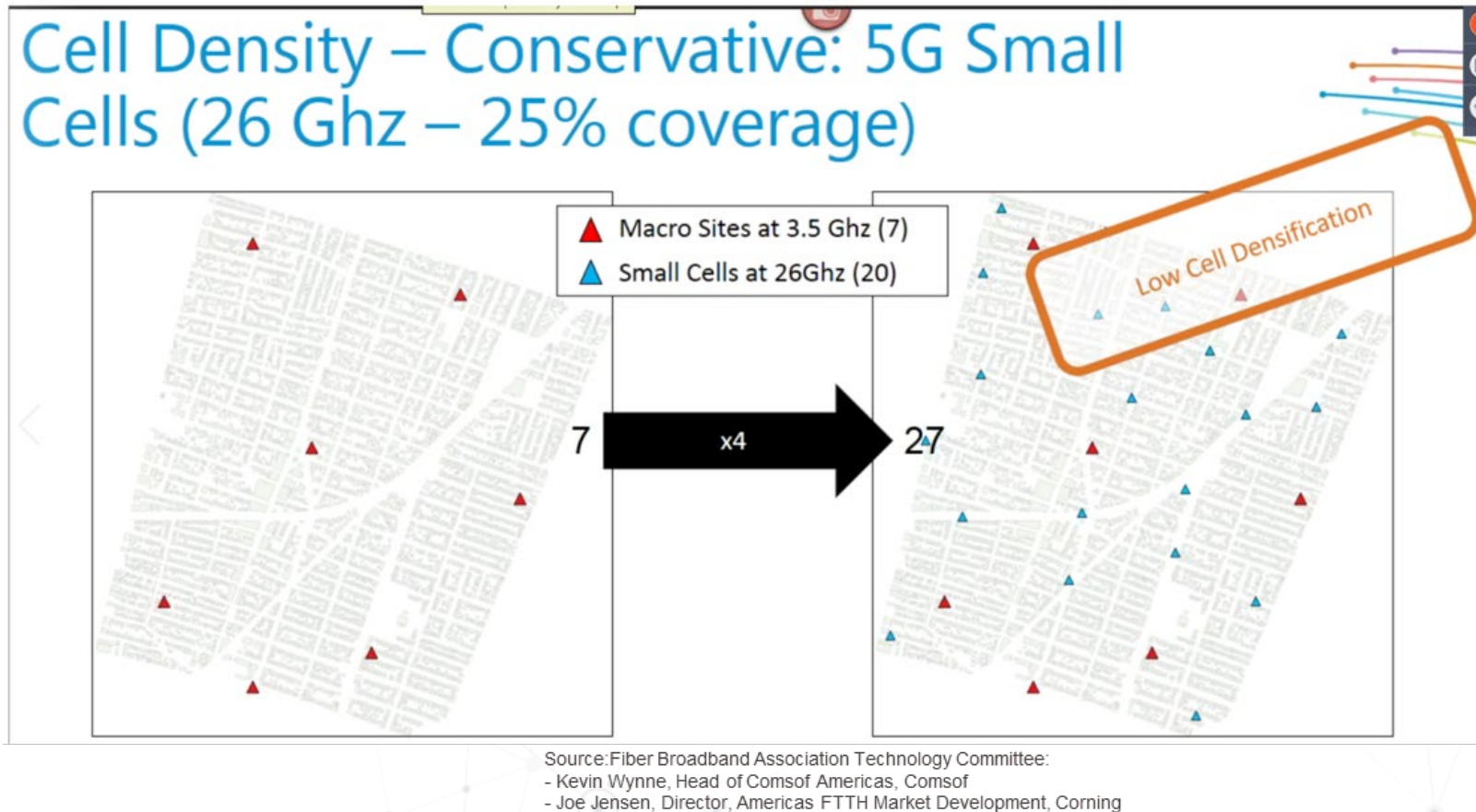
- Carriers ~ 50 mbps - 1,000 mbps
- Vastly Different Frequencies & Towers
- ~ 600 - 50,000 MHz (50 GHz)
- US Laws vs Laws of Physics
- ~ 300 feet (gigabit goal)



- **Small Cell Antennas ~ Every Block**
- Fiber Optic Backbones
- At full deployment (mm wave)...
- **100+** Small cells per Sq Mile
- **2X** small cells as street lights (?)
- **Two street cuts** per tower
 - ~200 cuts per square mile
 - ~ \$1,000 = \$200K/sq mile
- \$270 per tower “FCC Safe Harbor”
 - X 100 = \$27,000/Sq mi/year

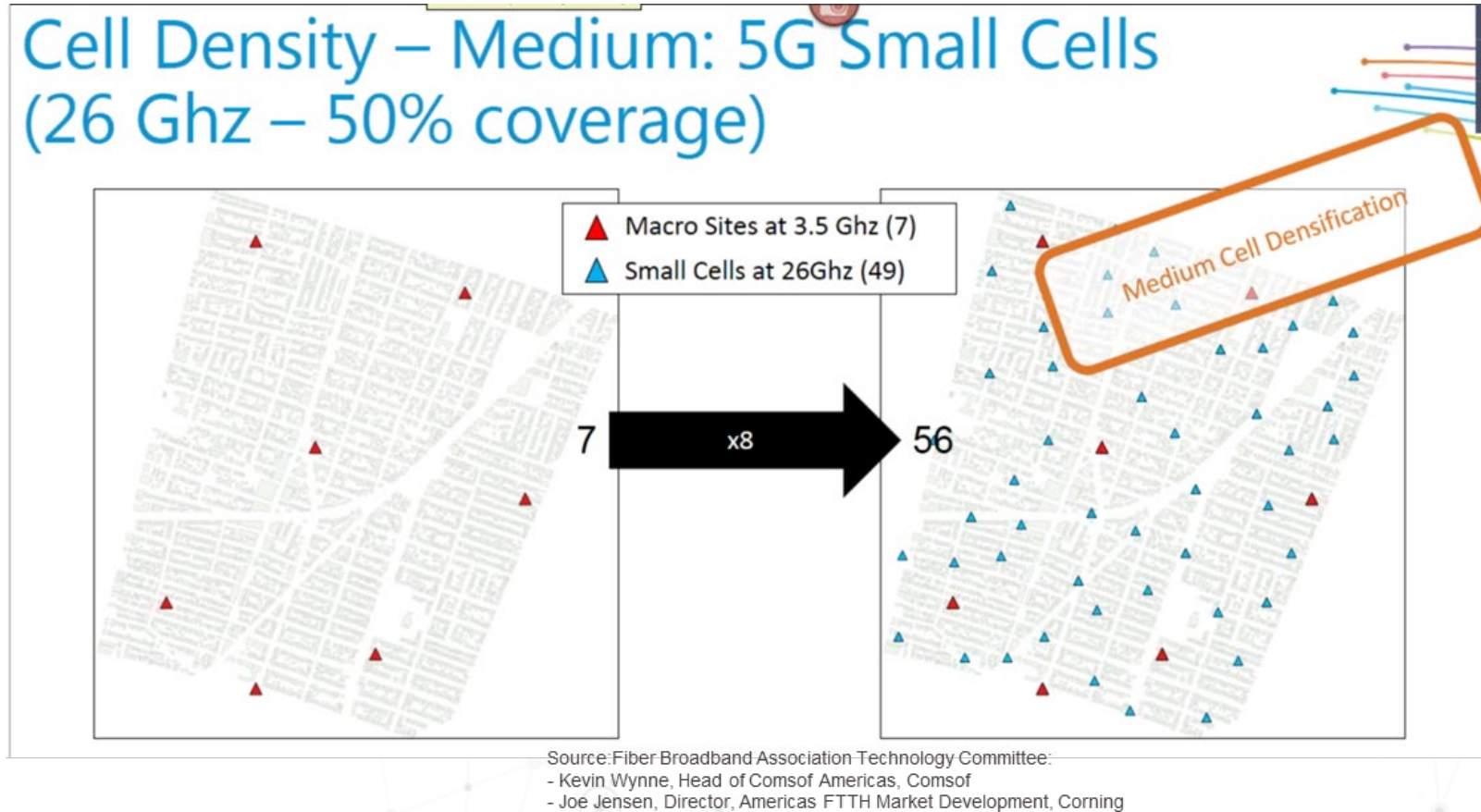
Small Cell “Densification”

5G: Small Cells – Really 300 Feet?



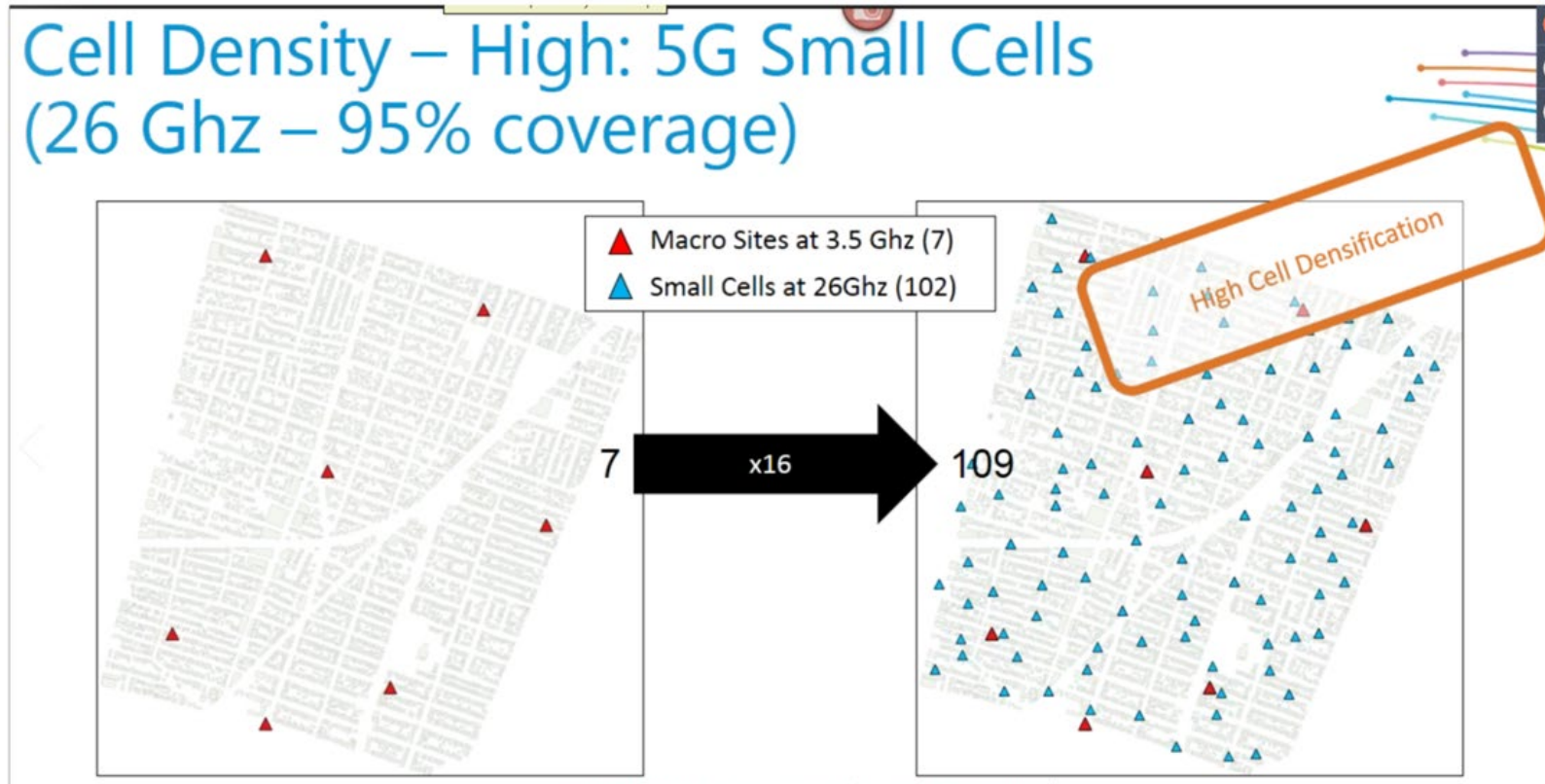
Small Cell “Densification”

5G: Small Cells – Really 300 Feet?



Small Cell “Densification”

5G: Small Cells – Really 300 Feet?



Source: Fiber Broadband Association Technology Committee:
 - Kevin Wynne, Head of Comsof Americas, Comsof
 - Joe Jensen, Director, Americas FTTH Market Development, Corning

Repurposing Your Streetlighting Infrastructure

- Do you own pipes in the ground?
- Do you control how they are placed?
- Do you have room in the **Street Light Conduit** for **fiber optics**?
- Important to understand:
 - Complex **inter-relationships**
 - **Revenue** opportunities
 - How the commercial “fiber game” is really **played**
 - Changes **Daily** – New FCC Rules



Next Steps / How Can We Help?



- Detailed Analysis of Network Infrastructure
- Develop offer
- Engage in negotiations
- Consider Inter-relationships with
 - Small Cells
 - 5G
 - Broadband
 - Fiber
 - Traffic Signals
 - Conduit
 - Asset Management

Source: "Governmental Services", <https://www.hrgreen.com/markets-projects/governmental-services/>

Recap: So, why municipalize?



Create revenue stream opportunities



Increase control of streetlight assets



Improve safety for its citizens



Energy only tariff can reduce costs by 90%



Improve service levels



Open up opportunities for public Wi-Fi, 5G, traffic controls, cameras, air quality sensors, and more



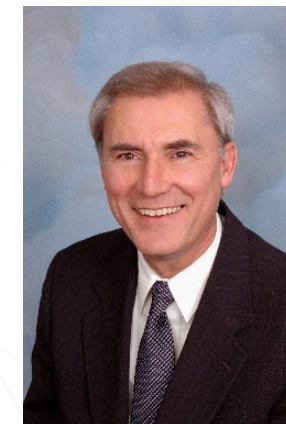
Interested in learning more? Contact Us!



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Hospitality Suite
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especially at our hospitality suite to continue the
conversation!

