

Columbia City Council Work Session Minutes
Monday, November 22 at 6:00 p.m.
City Hall –Council Chambers
701 East Broadway

Council Members present: Mayor McDavid, Jason Thornhill, Gary Kespohl, Daryl Dudley, Laura Nauser and Barbara Hoppe

Absent: Paul Sturtz

The Council held a work session on Monday, November 22, 2010 at 6:00 p.m. in the Council Chambers of City Hall, 701 E. Broadway, Columbia, MO. The purpose of the work session was to provide the community with information regarding the proposed electric transmission project.

Tad Johnson, Water and Light Director, provided an overview of what is being proposed and why. Mr. Johnson explained the history leading up to where we are today. Mr. Johnson introduced staff present and the representatives from the engineering firm, Sega, Inc.

Ryan Williams, Assistant Director of Water and Light, reviewed the details of the project. See attached power point presentation.

Following the staff presentation, Council had an opportunity to ask questions and request additional information:

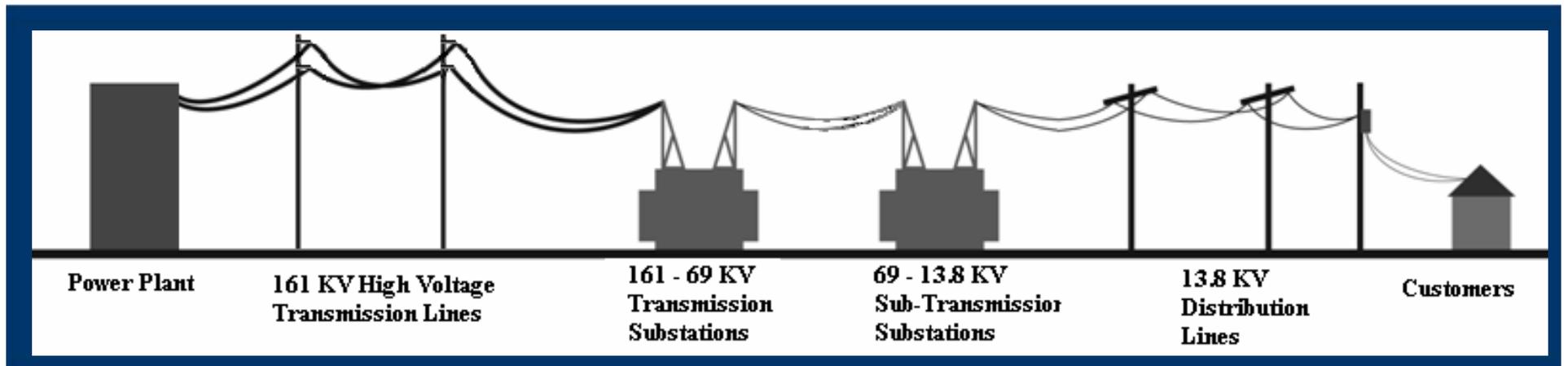
- Less intrusive options to create a redundant loop
- Growth and load projections (City Manager pointed out this is a reliability issue not a growth issue)
- Cost to bury 69KV versus 161KV

The Mayor indicated the public would be fully engaged in the process and future discussions regarding the project.

Meeting adjourned at 7:30 p.m.



City Council Work Session
New Substation & Transmission Lines Review
November 22, 2010

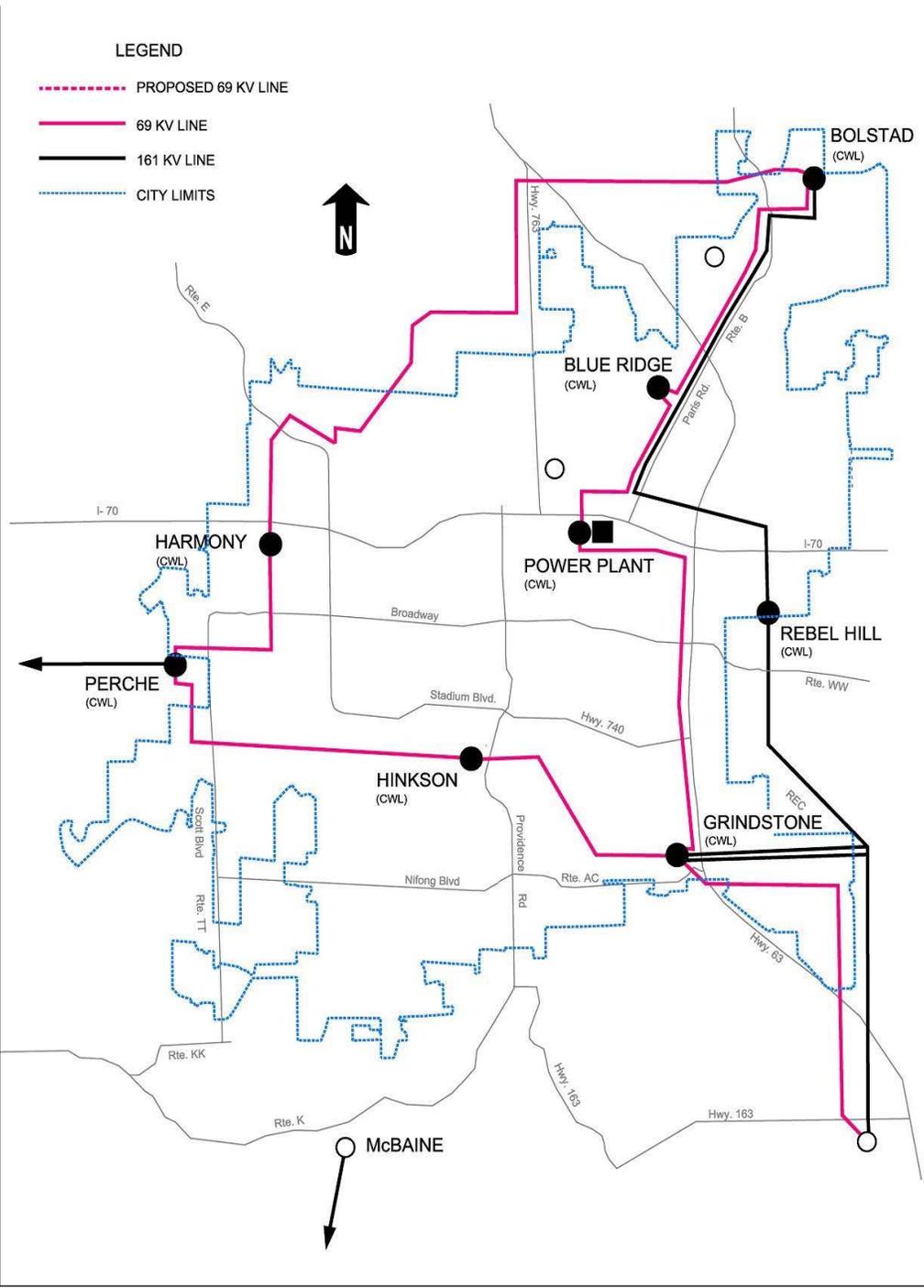


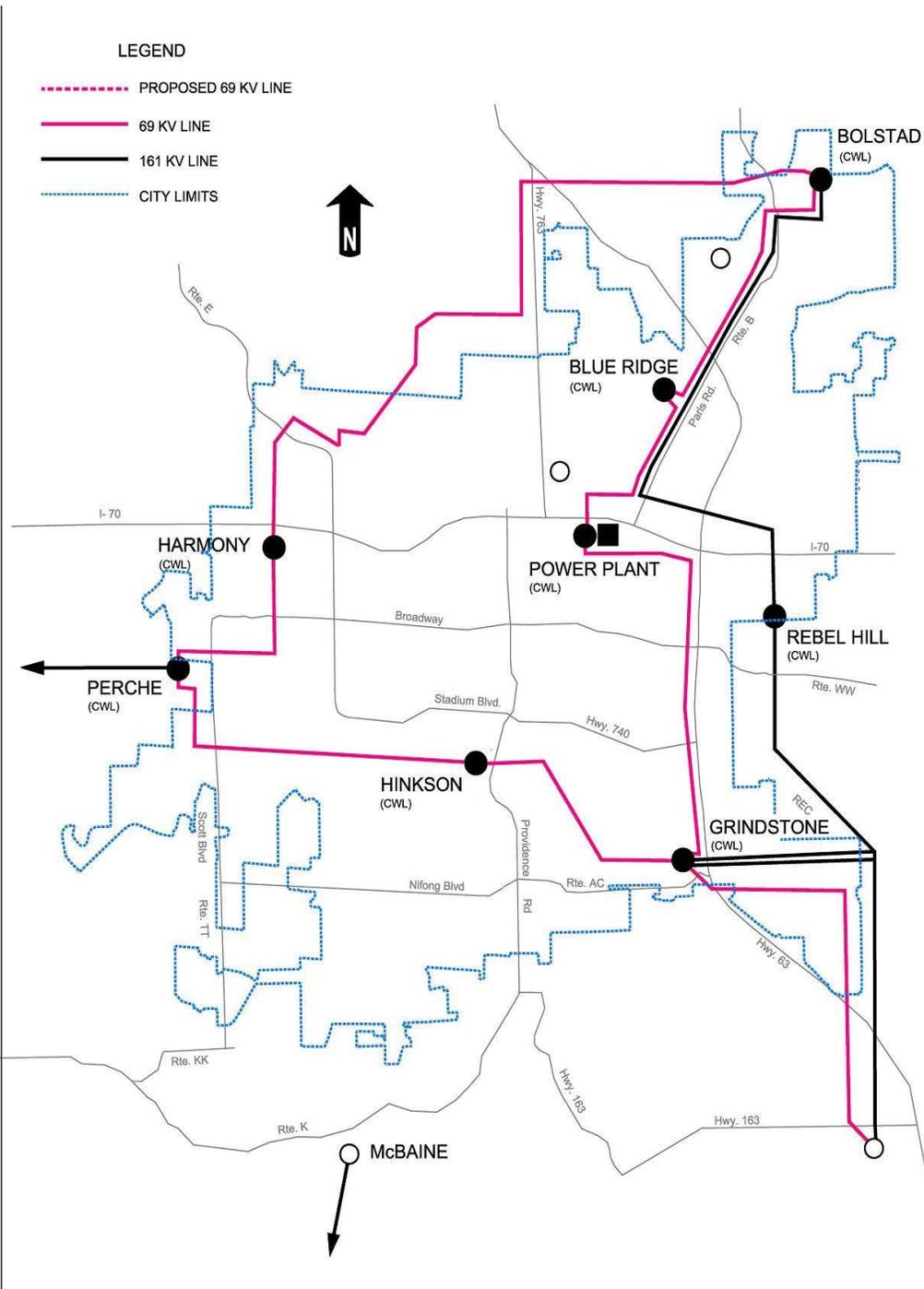
Overview

- **Generation:** Approximately 90% of energy for the Columbia Water and Light (CWL) is imported on transmission.
- **Transmission Substations:** Bolstad, Grindstone, McBaine, Perche Creek & Rebel Hill.
- **Sub-Transmission Substations:** Bolstad, Grindstone, Harmony Branch, Hinkson Creek, Power Plant & Perche Creek

TRANSMISSION OVERVIEW

- Transmission Path on East Side of System
- Transmission Tap on West Side of System
- Transmission Access on South Side of System

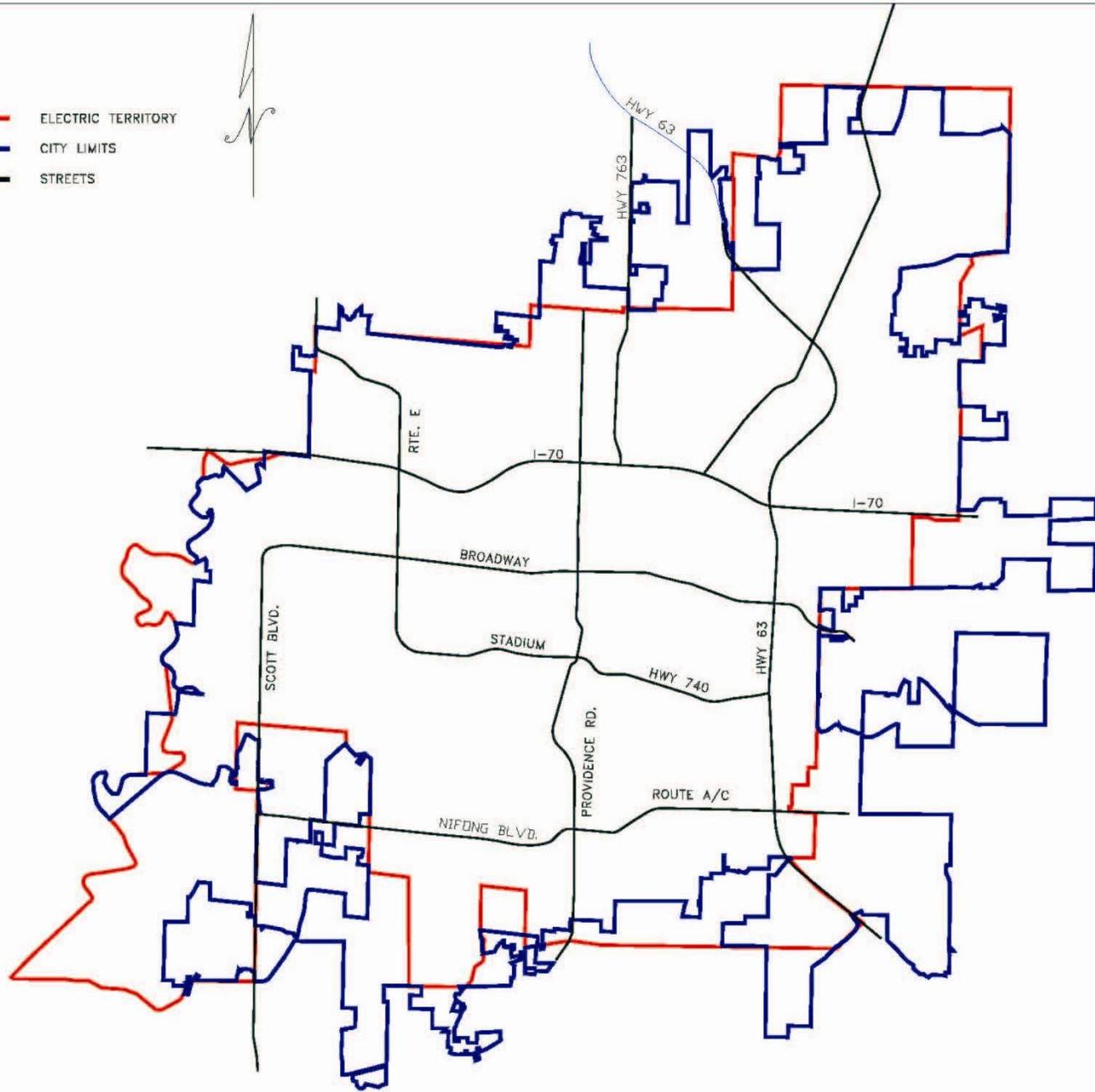


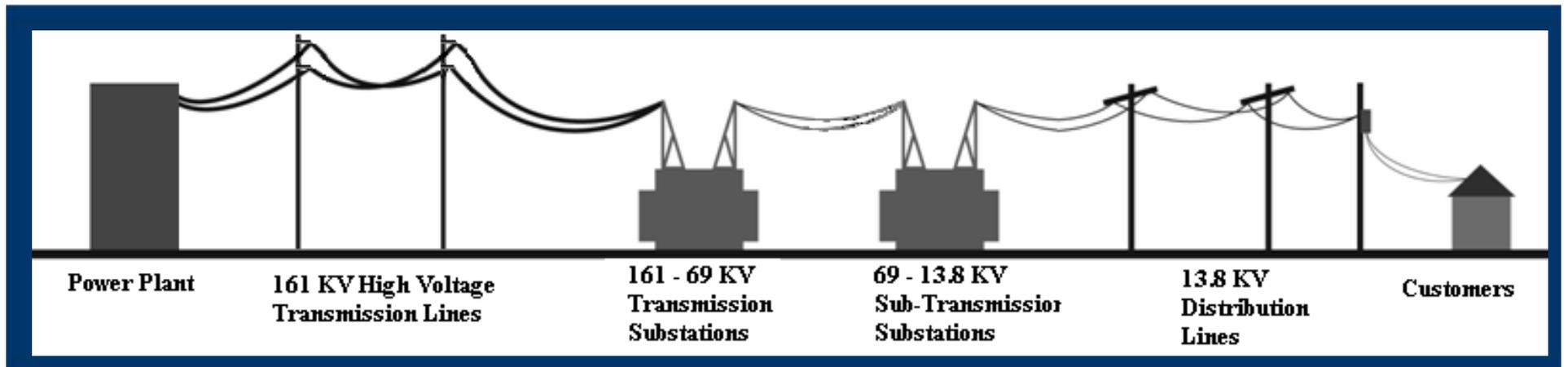


SUB-TRANSMISSION OVERVIEW

- Sub-Transmission Ring tracing Previous City Limits
- Primary Growth Direction to the Southwest

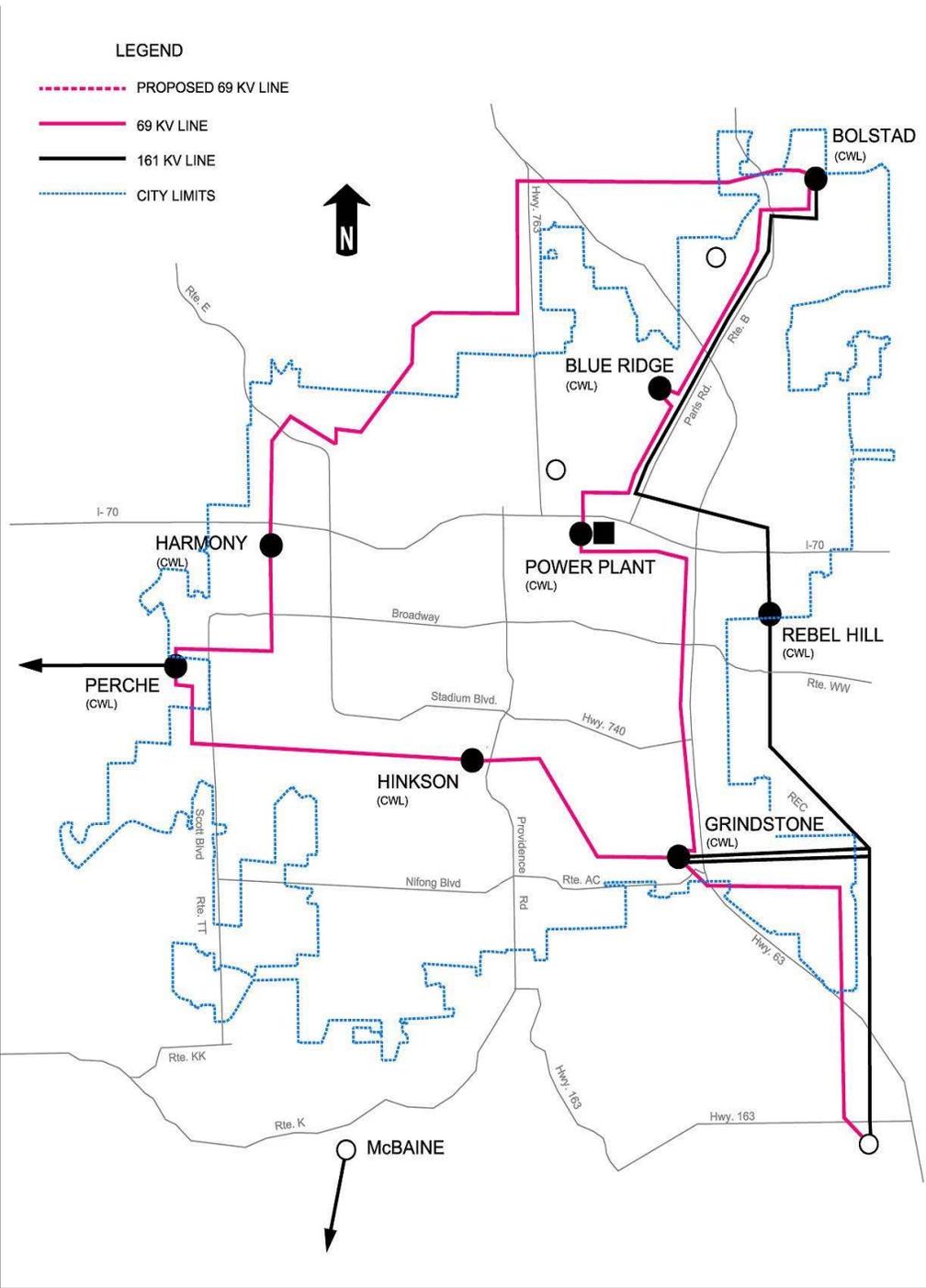
-  ELECTRIC TERRITORY
-  CITY LIMITS
-  STREETS





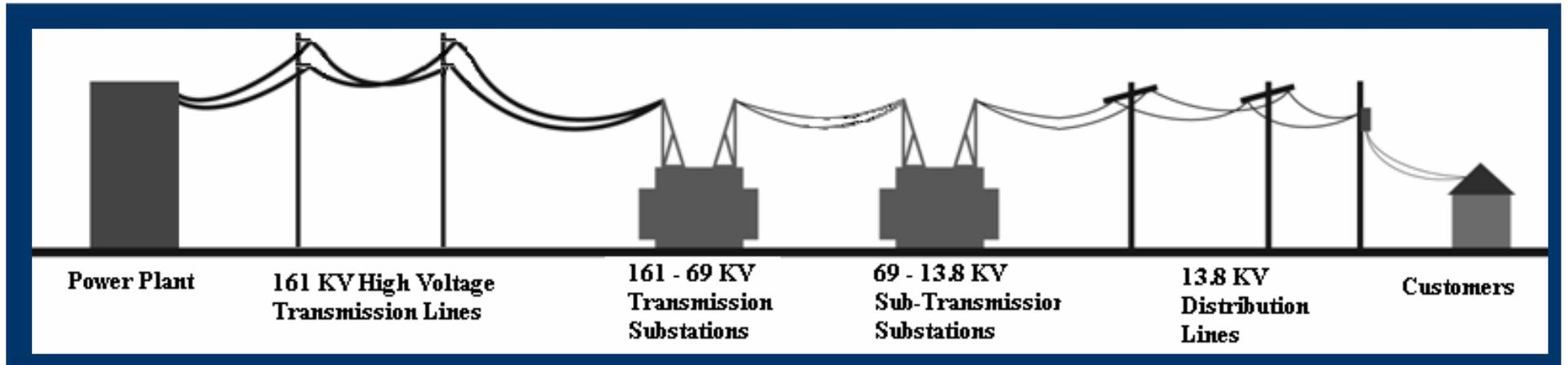
Transmission System: 161 KV power lines

- Federal, NERC, Standards for Transmission:
 - The occurrence of any single transmission outage cannot cause any overloads of other transmission elements
 - The occurrence of any two transmission outages cannot cause cascading outages on the system



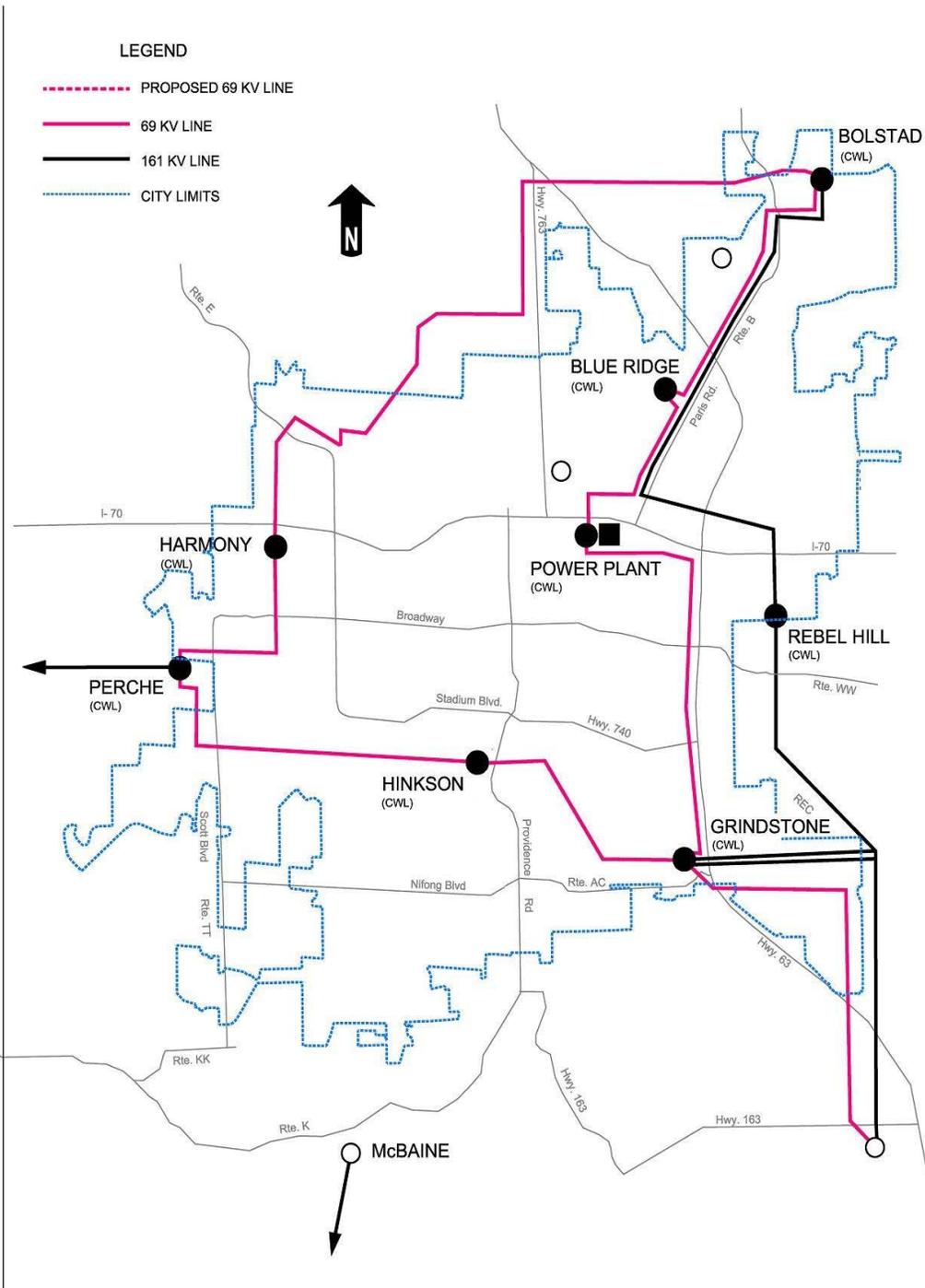
TRANSMISSION STANDARDS

- Need to Convert Transmission Tap on West Side of System to a Transmission Line for Redundancy
- Transmission Connection from Perche to McBaine



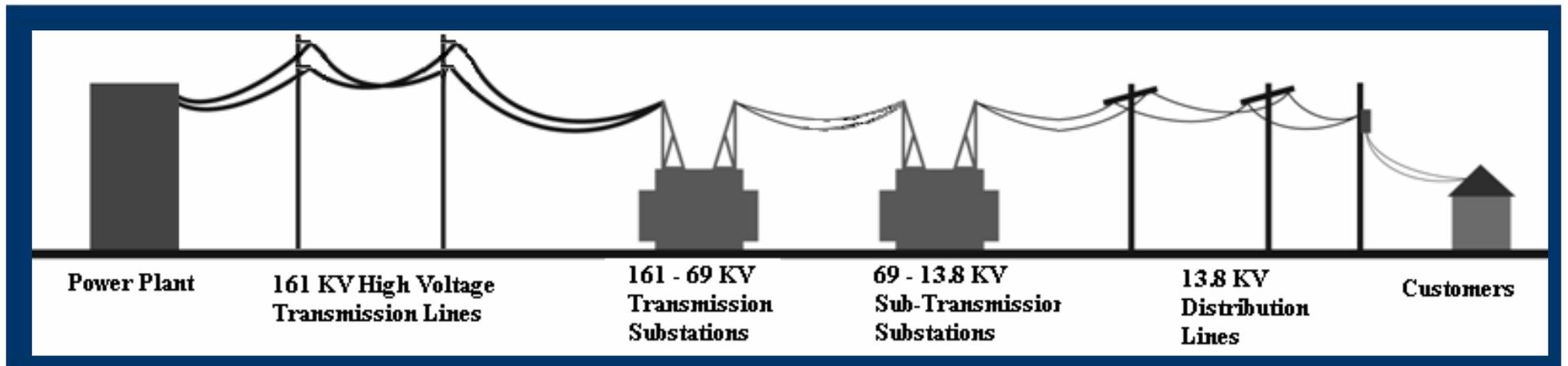
Sub-Transmission System: 69 KV power lines

- In application of Federal Standards to the Sub-Transmission system
 - The occurrence of any single outage cannot cause an overload of other element
 - The occurrence of any two outages cannot cause cascading outages on the system



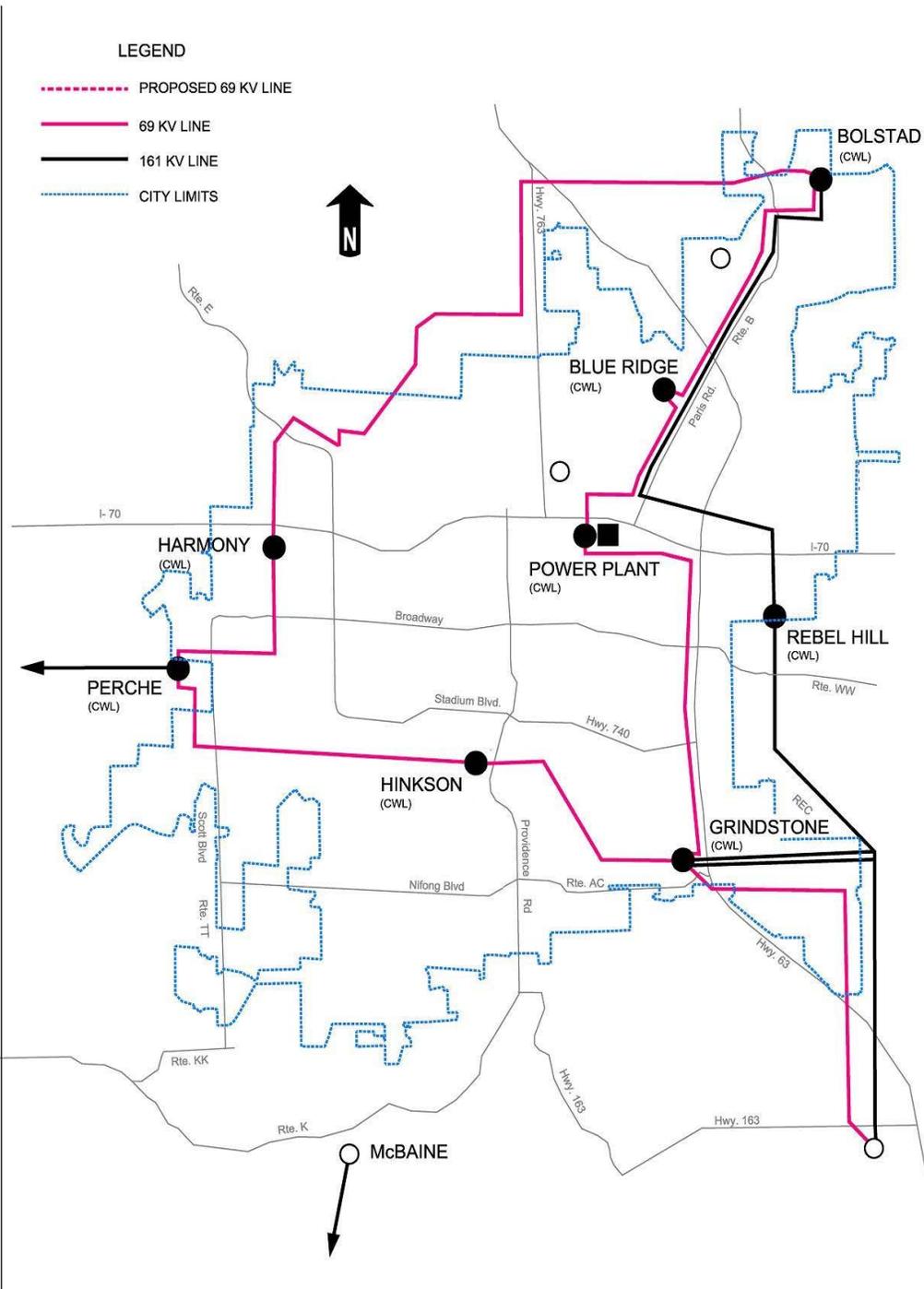
SUB - TRANSMISSION STANDARDS

- Need to Increase Transmission Capacity on Sections of the 69KV Ring
- Need to Add Cross Connection in 69 KV Ring



Substation 13.8 KV System

- Substation Loading Design:
 - The occurrence of any single transformer outage cannot cause an overload of remaining transformers
 - If equally rated transformers, a two can be operated at 50% capacity and a three 66% capacity
 - Minimize the length of feeder circuits for increased reliability



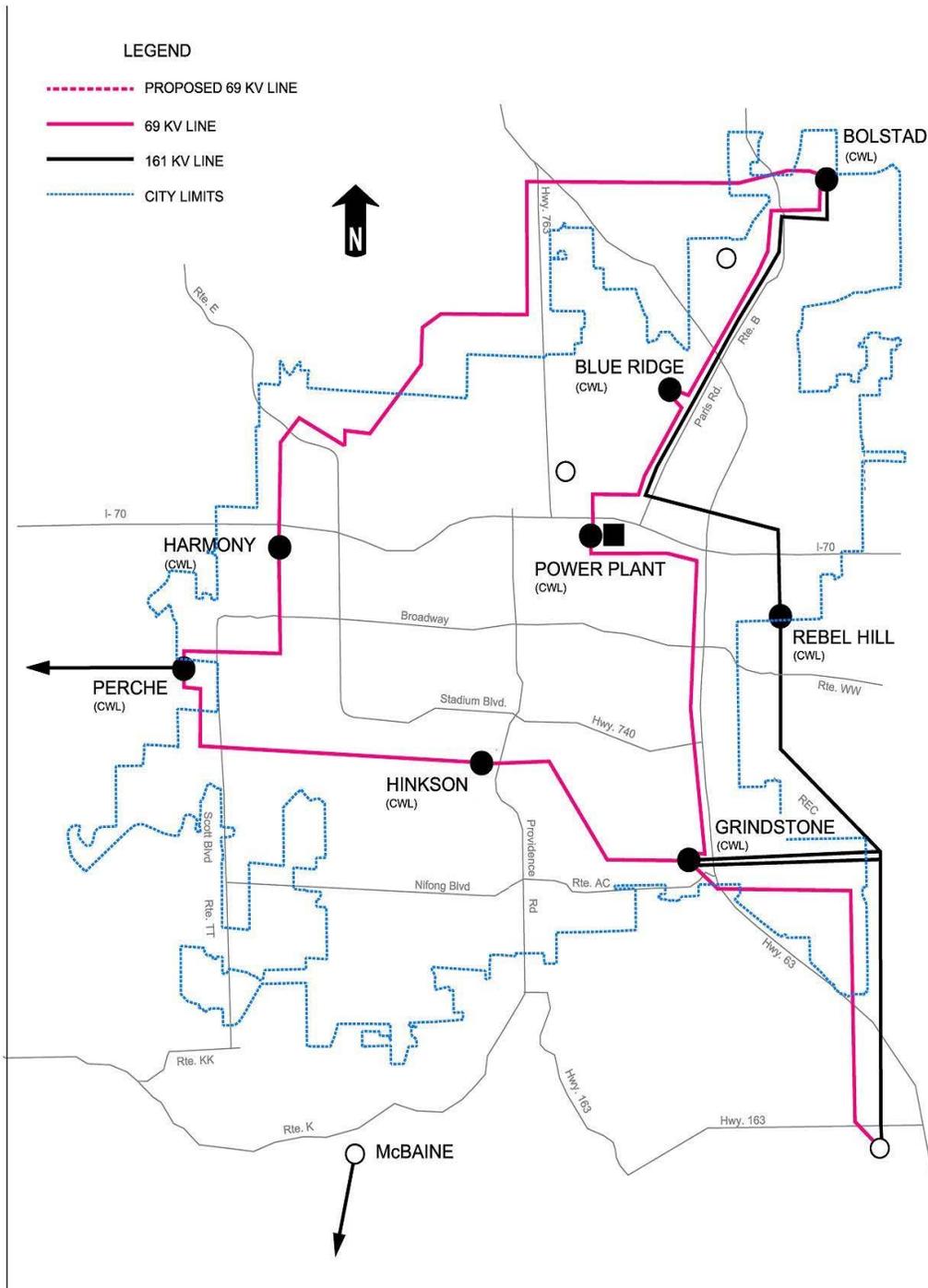
SUBSTATION LOADING DESIGN

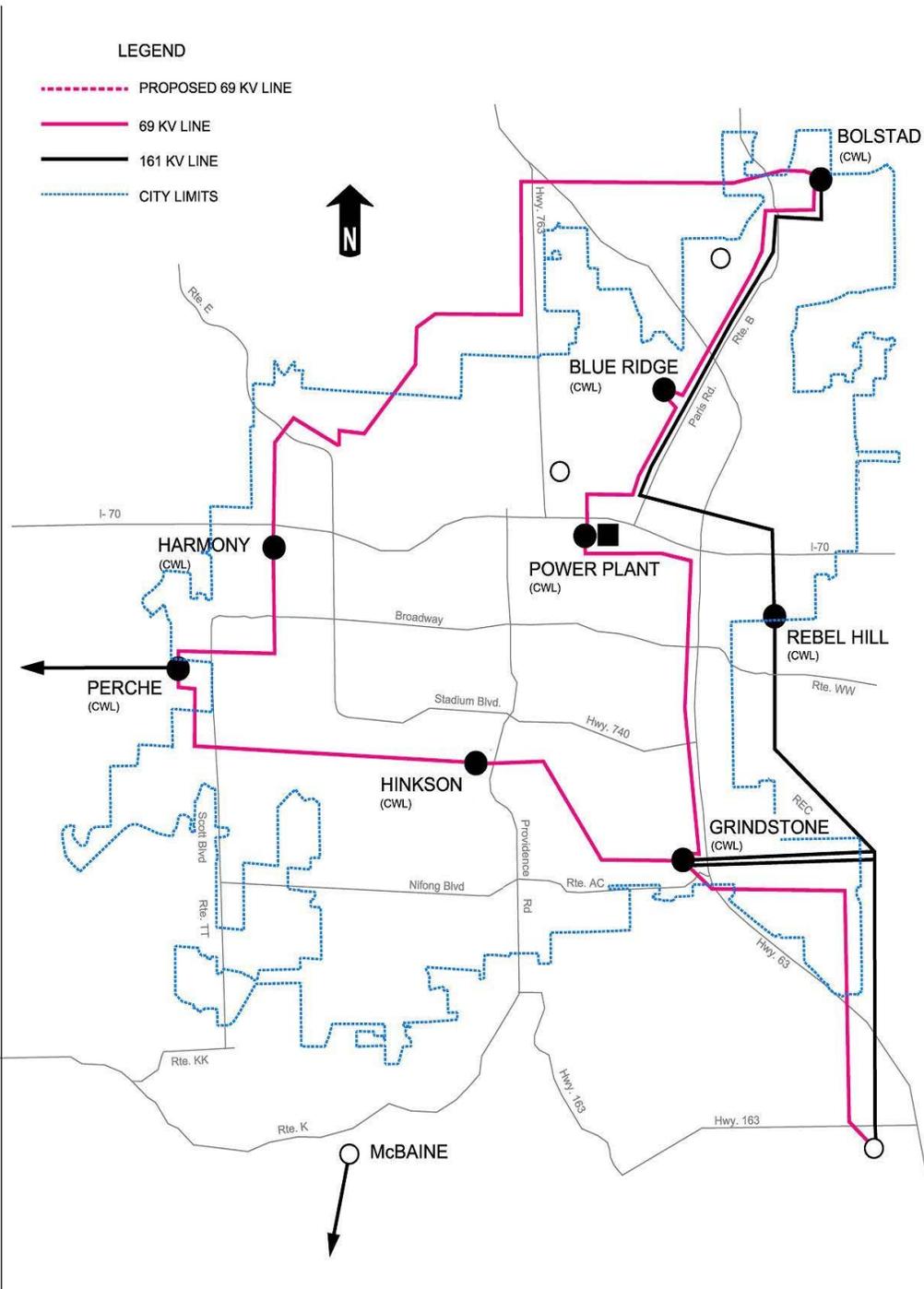
- Add Transformers at Perche, Hinkson Creek and Grindstone Substations
- Add Proposed Substation to Manage Loading on Perche, Hinkson and Grindstone Substations

Overview Summary

Need to:

- Add an additional 161 KV source in the west side of the CWL system
- Increase capacity on the 69 KV Ring
- Add more load serving capability in the south side of the CWL system





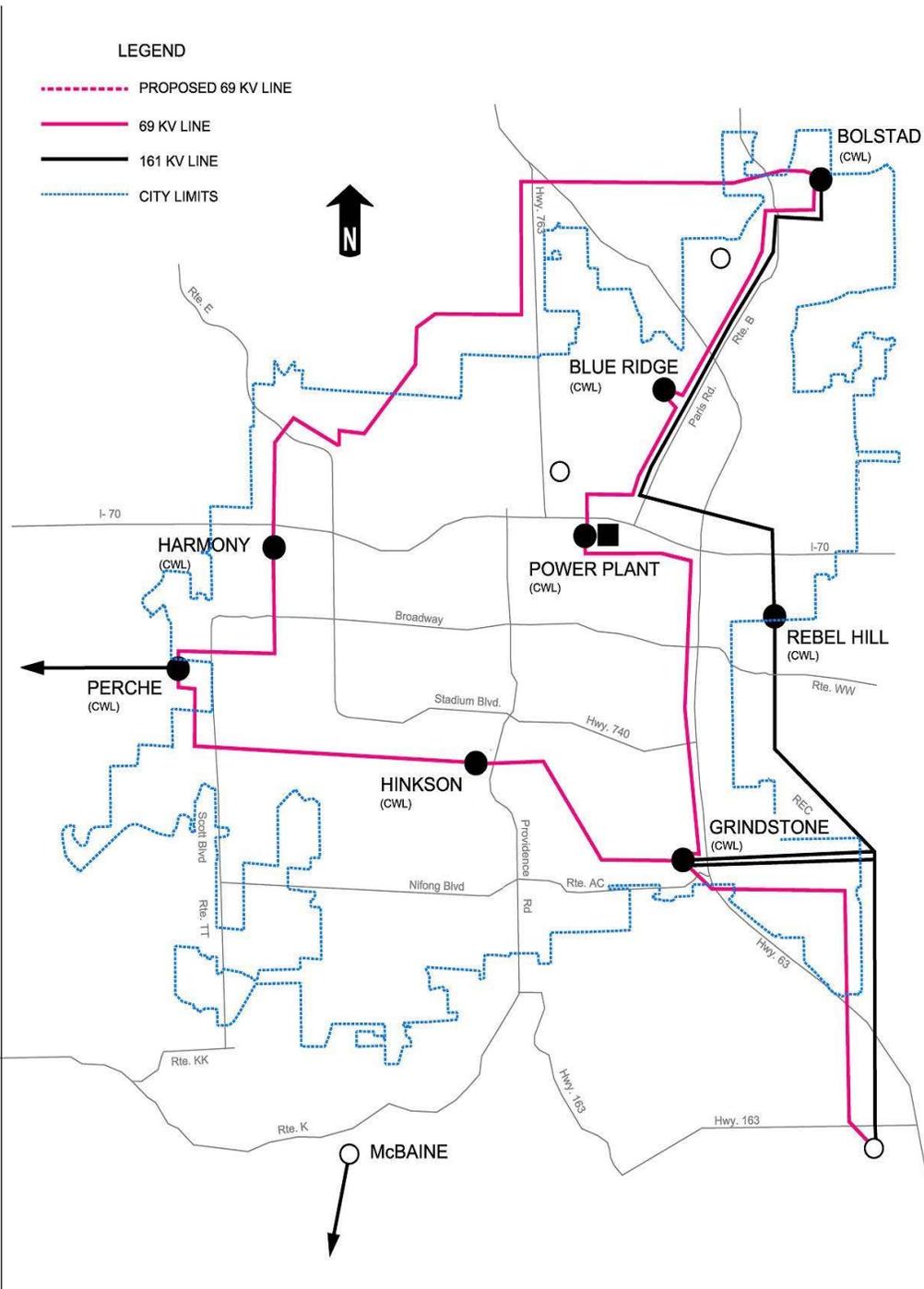
Current Substation Transformer Loading

2007

- 3 @ Grindstone = 41.5%
- 3 @ Hinkson Creek = 67.6 %
- 2 @ Perche Creek = 61.8%

2010

- 3 @ Grindstone = 44.7%
- 3 @ Hinkson Creek = 68.6 %
- 2 @ Perche Creek = 64.4%



Load Growth Options Explored

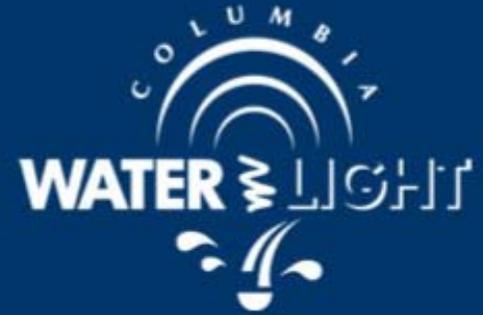
Additional Transformers

- Physical Space at Grindstone and Hinkson Creek is limited
- Express distribution feeders from Perche Creek extremely long

New Substation

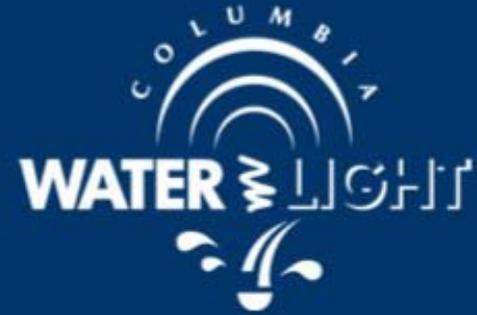
- Located near new load
- Short distribution feeders

Project History

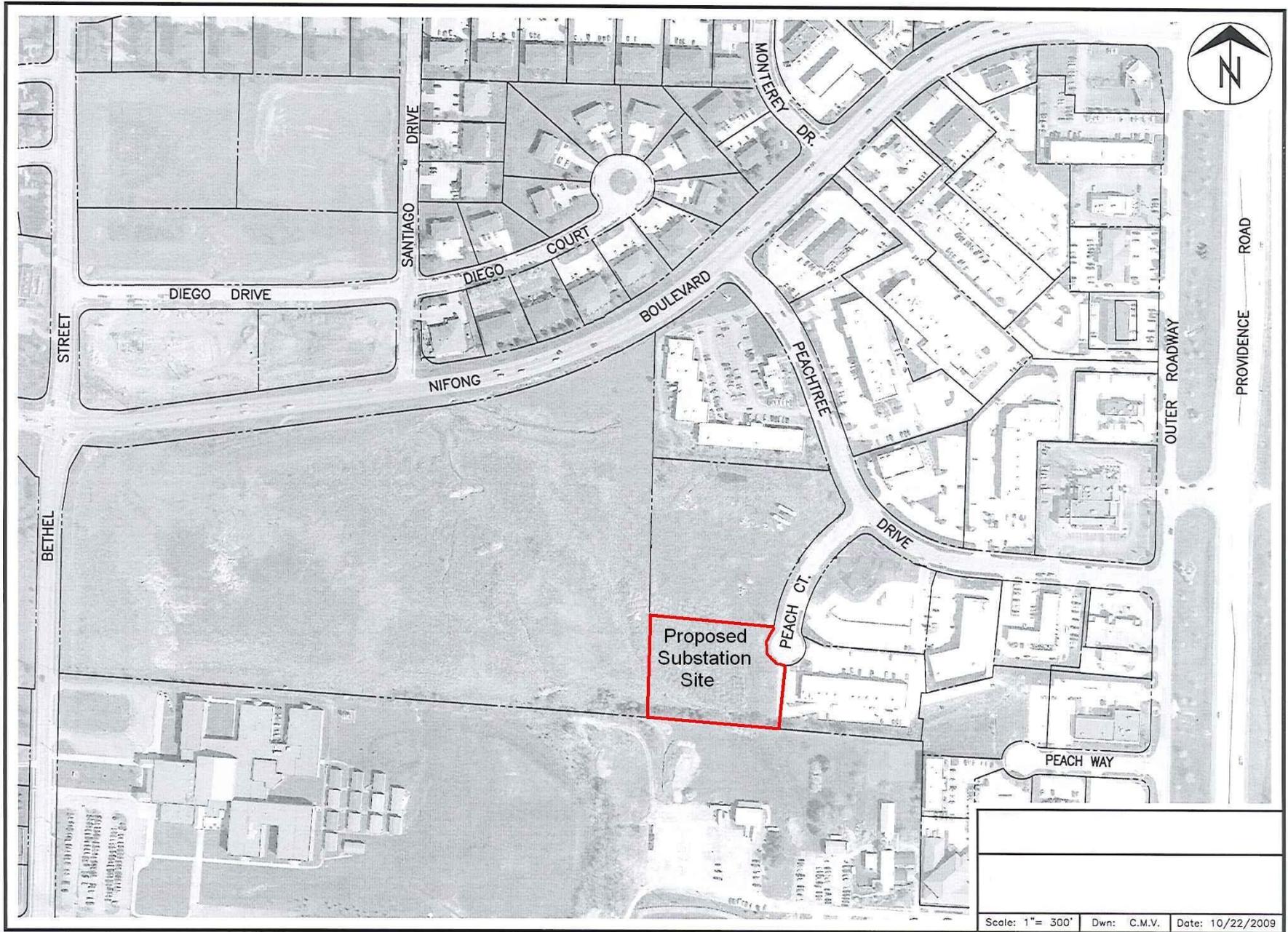


- 2007: Need identified
- 2008: Sega Inc. hired, started with substation
- January 2009: Ten possible sites were identified, and “Interested Parties” meeting was held
- Spring 2009: Interested seller approached city
- Summer 2009: Area owner requested other properties be investigated

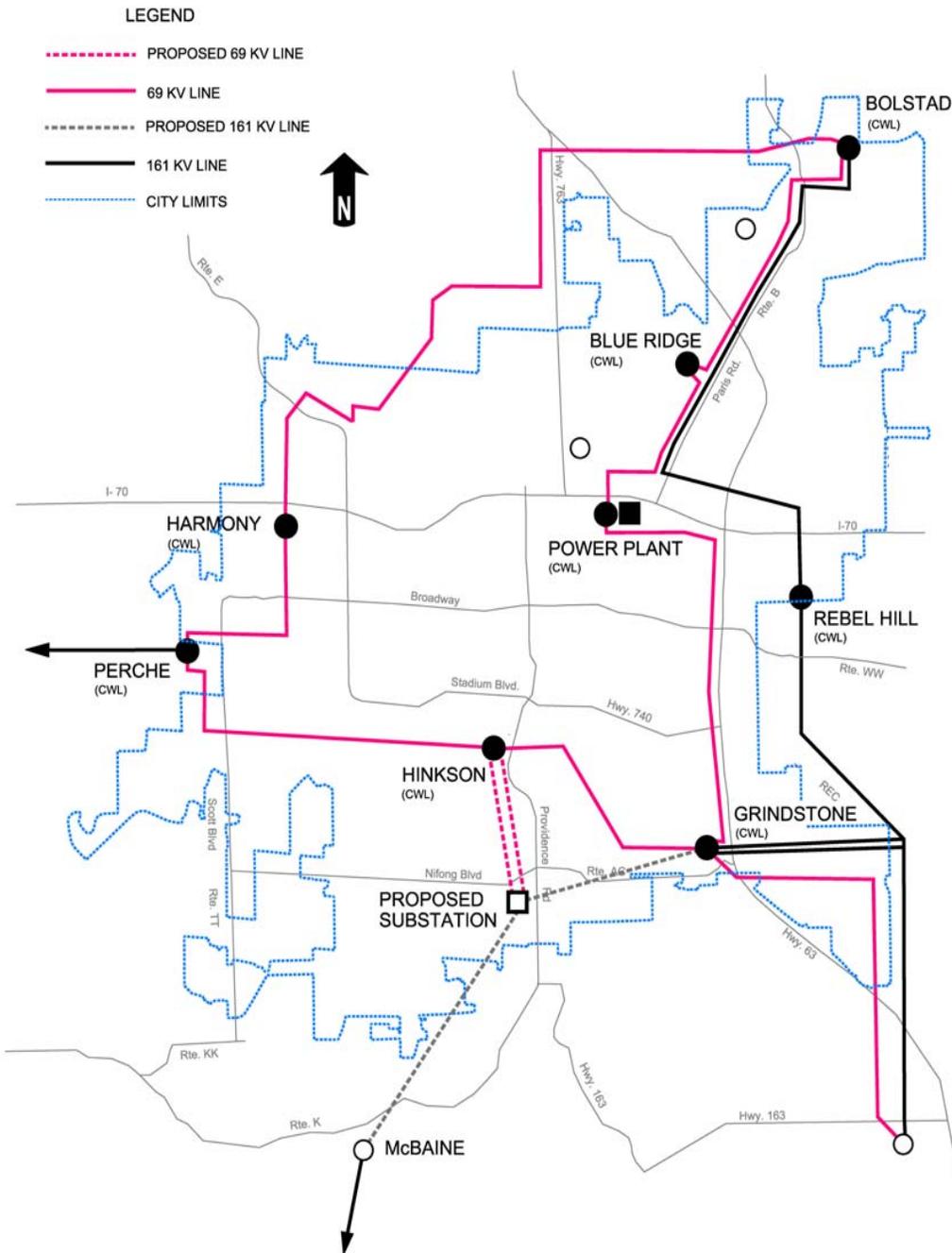
Project History



- September 2009: W&L Advisory Board approved and recommended to City Council to adopt an ordinance to acquire Peach Ct. Site
- February 2010: Pre-Council work session describing factors associated with building a new electric substation and three new, 161 kV transmission lines
- March 2010 : City Council approved Bill B54-10 adopting an ordinance to acquire Peach Ct. site for substation
- July 2010: Peach Ct. site acquired



Scale: 1" = 300' Dwn: C.M.V. Date: 10/22/2009



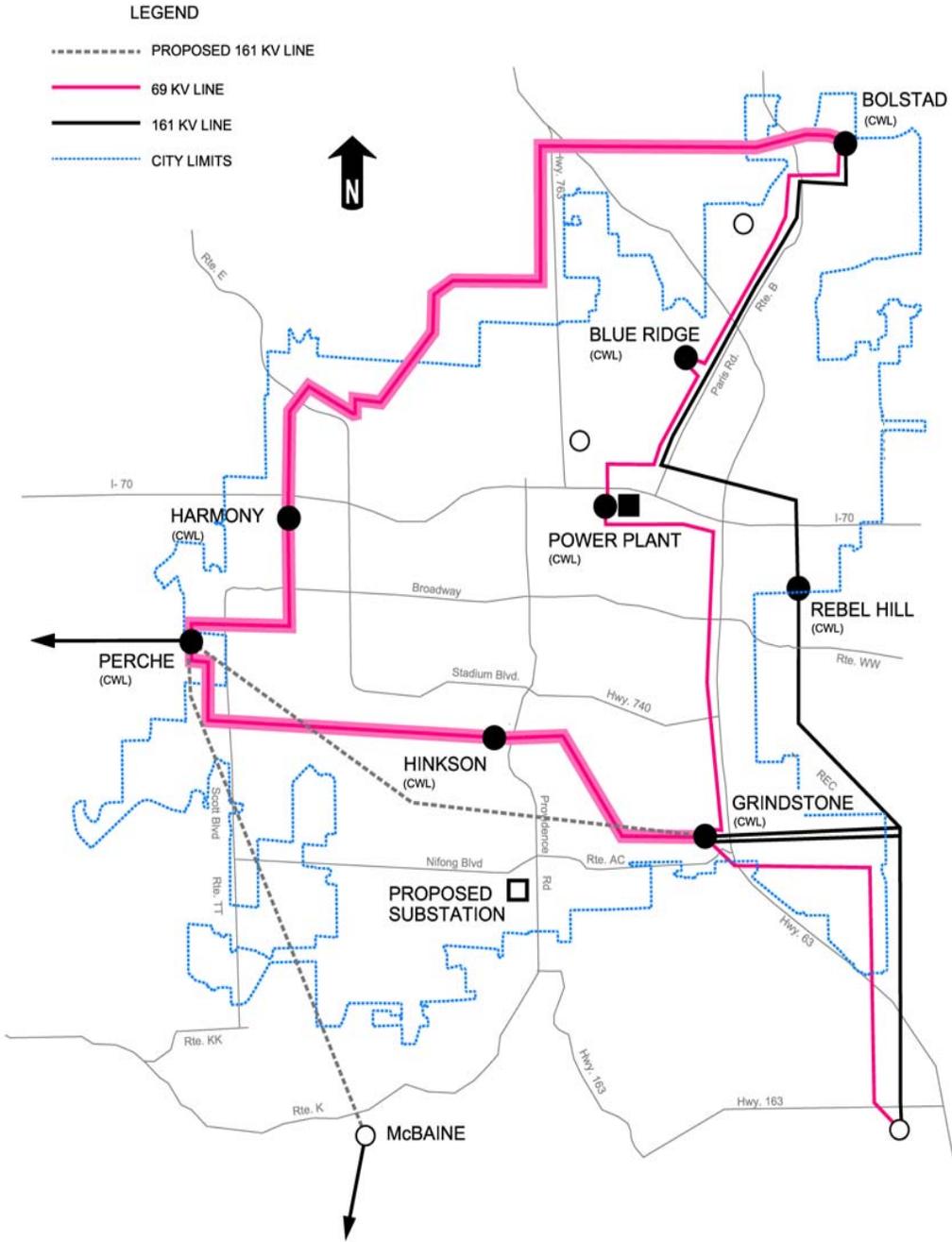
New Substation Supply Options

Add to 69 kV System

- Double circuit line from Hinkson Creek to New Substation

Add to 161 kV system

- Insert on a line from McBaine to Grindstone



69 kV System Options

Add Generation at Perche

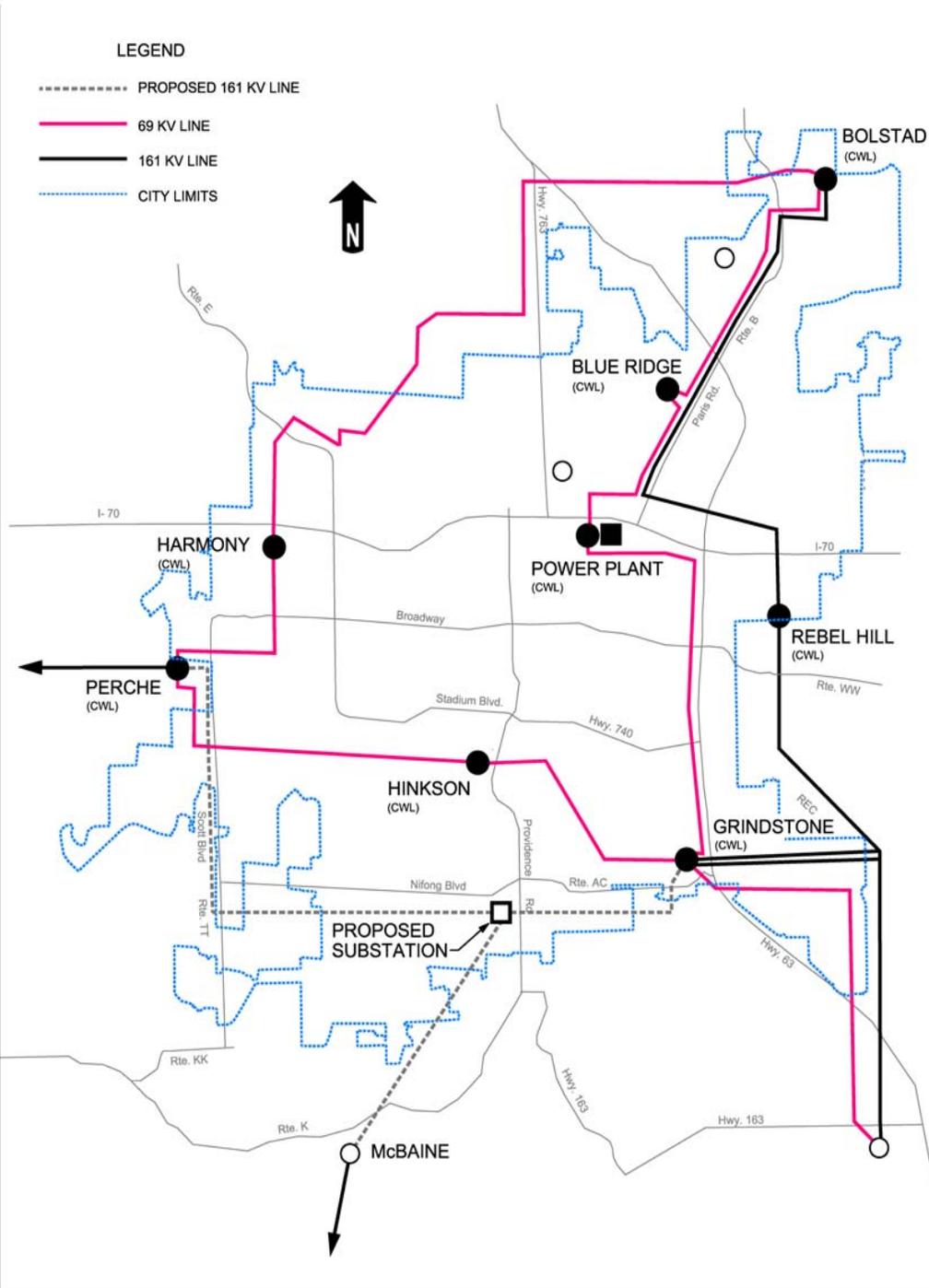
- Fuel supply issues
- Permitting issues

Re-conductor Grindstone to Bolstad through Perche

- New line
- 21 Miles

Additional 161 kV line to Perche Creek

- From McBaine
- From Grindstone



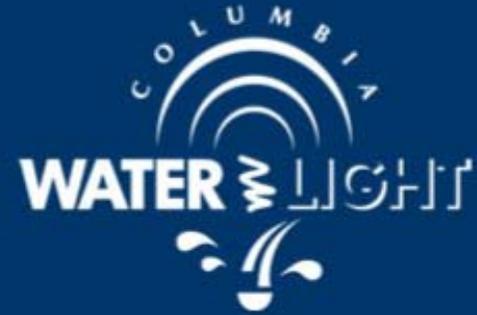
Combined Solution

Supply New Substation with 161 kV Feed and Continue to Perche Creek

- From Grindstone
- From McBaine

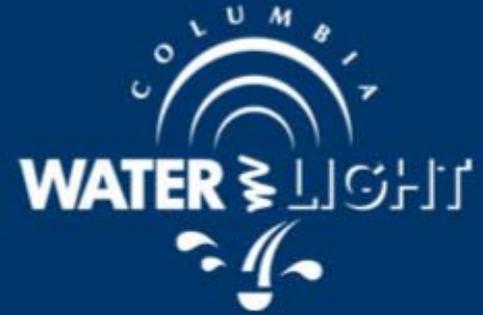
Three possible New Line Segments

Project History Continued



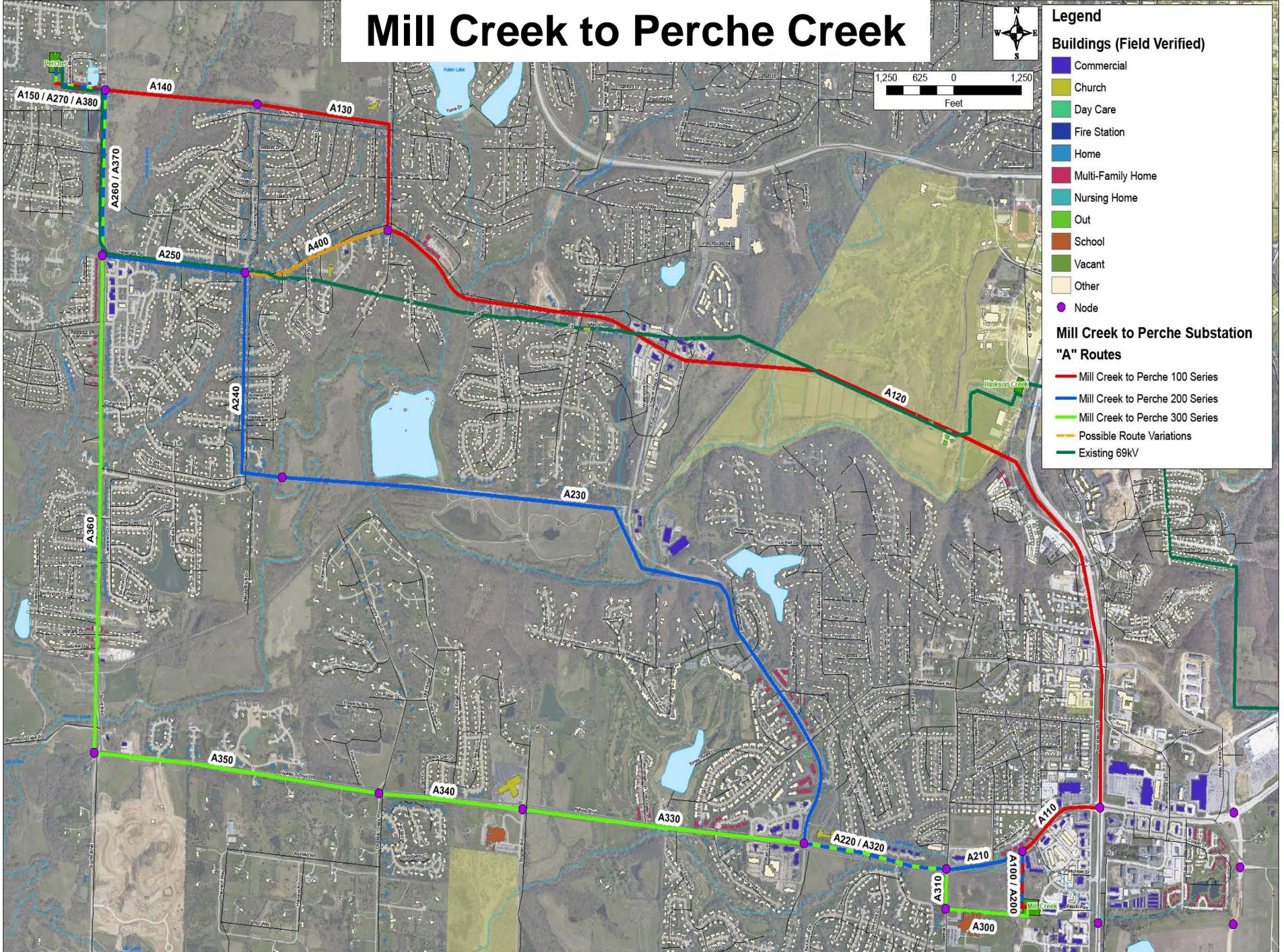
- June 2010: Segal presented staff with three or more alternate routes for each line section
- July 2010: Peach Ct. site acquired
- October 2010: Three open houses were hosted to introduce the transmission line portion of the project to the public, one for each line section
- Currently receiving comments from the public

Routing Criteria

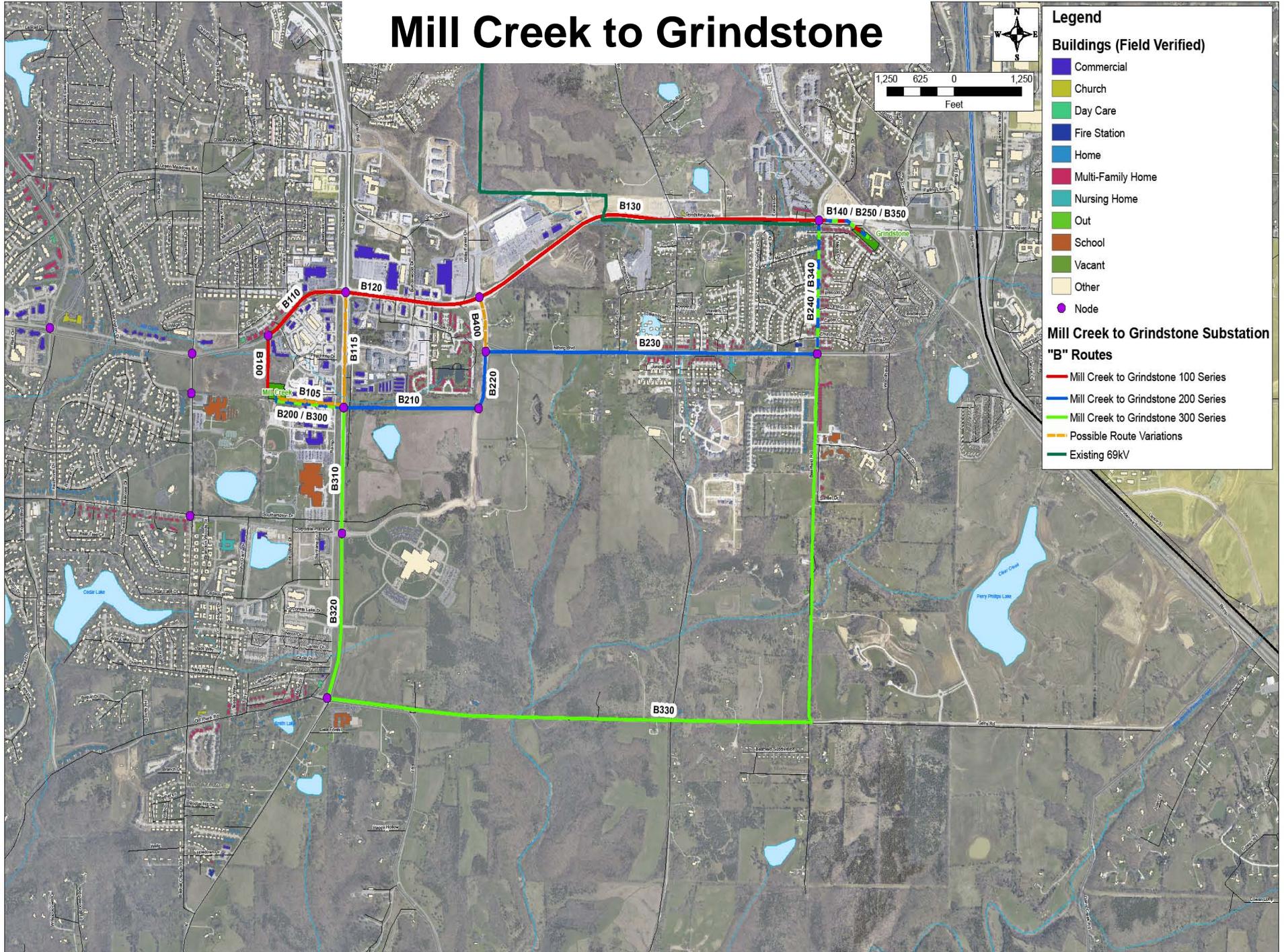


- Streets preferred over backyards and cross country
- Main roads preferred over side streets
- Commercial corridors preferred over residential
- Most direct route preferred (fewest angles in the route)

Mill Creek to Perche Creek



Mill Creek to Grindstone



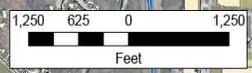
Legend

Buildings (Field Verified)

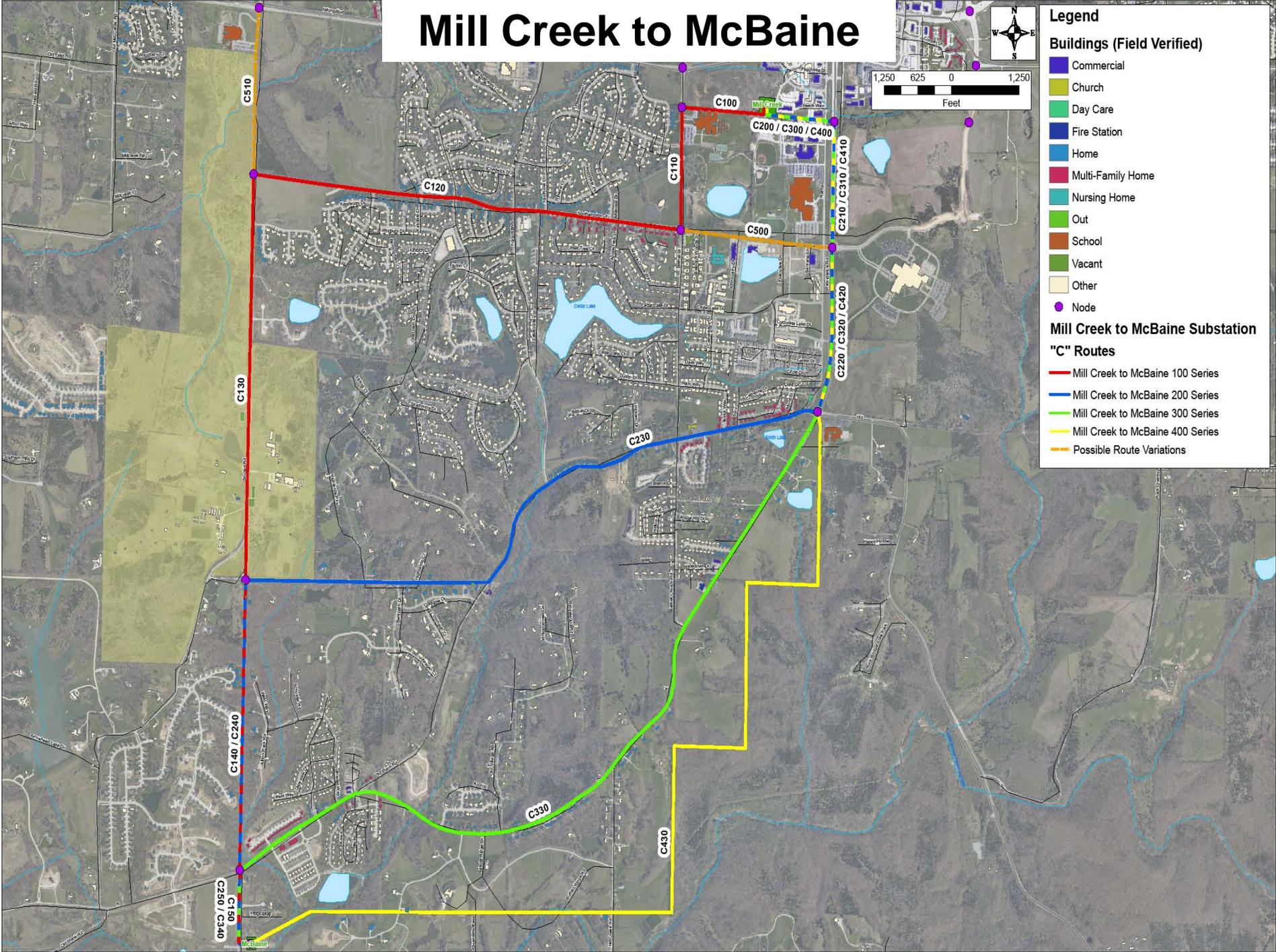
- Commercial
- Church
- Day Care
- Fire Station
- Home
- Multi-Family Home
- Nursing Home
- Out
- School
- Vacant
- Other
- Node

Mill Creek to Grindstone Substation "B" Routes

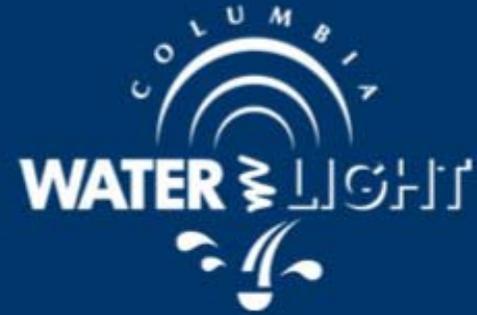
- Mill Creek to Grindstone 100 Series
- Mill Creek to Grindstone 200 Series
- Mill Creek to Grindstone 300 Series
- Possible Route Variations
- Existing 69kV



Mill Creek to McBaine

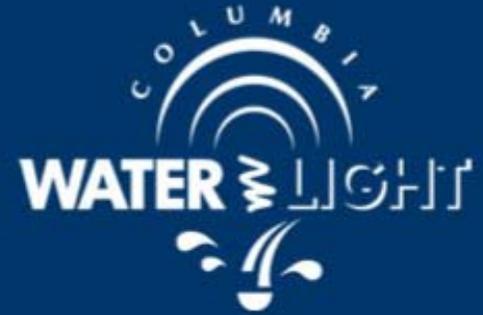


Frequently Asked Questions



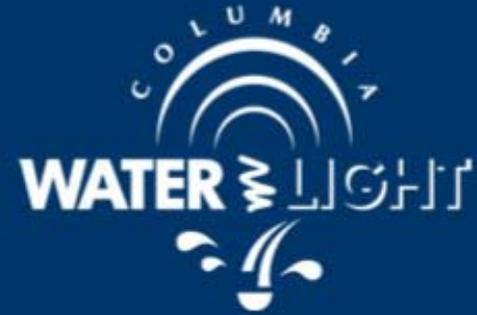
- The funding of this project has not been determined
- Transmission lines can be buried but it is more expensive
- Preliminary construction cost estimates for 15 miles
 - Overhead: \$7.5 to \$11.5 million
 - Underground: \$37.5 to \$56 million

Frequently Asked Questions: EMF



- EMF are electric and magnetic fields which are generated by the flow of electrons
- Generated by many common household items such as light bulbs, hair dryers, cell phones, vacuum cleaners, etc. as well as electric utility lines

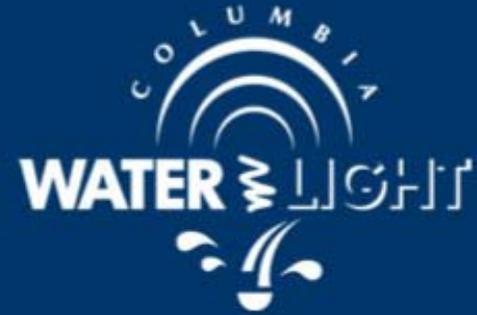
Frequently Asked Questions: EMF



According to the Environmental Protection Agency:

- “Much of the research about power lines and potential health effects is inconclusive.”
- “Despite more than two decades of research to determine whether elevated EMF exposure, principally to magnetic fields, is related to an increased risk of childhood leukemia, there is still no definitive answer.”
- The general scientific consensus is that, thus far, the evidence available is weak and is not sufficient to establish a definitive cause-effect relationship.”

Overview of Route Selection Process Next 1-2 Years



Open House October 2010: Gather comments

Review comments

Revise transmission line route options

Additional public meetings (Tentatively - February 2011)

Review by Water & Light's Advisory Board

Additional Council work sessions

Finalize transmission line routes

Review by Water & Light's Advisory Board

Additional public meetings as needed

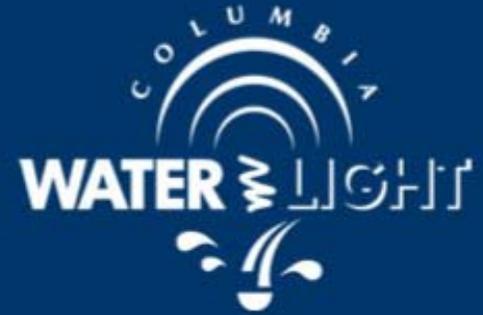
Final route selections:

Final recommendation by Water & Light Advisory Board

Public hearing before the Columbia City Council

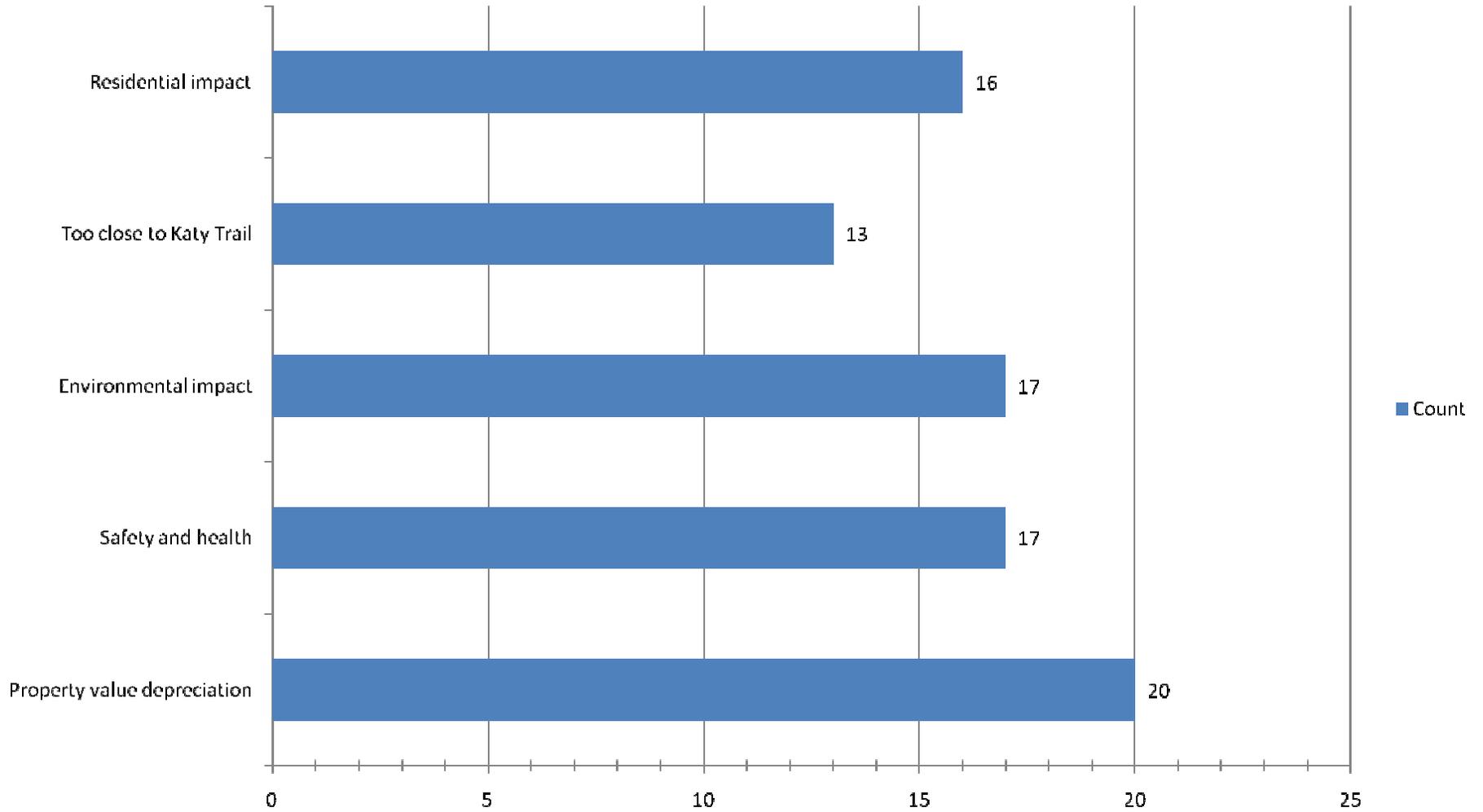
Decision by the Columbia City Council

Public Comments



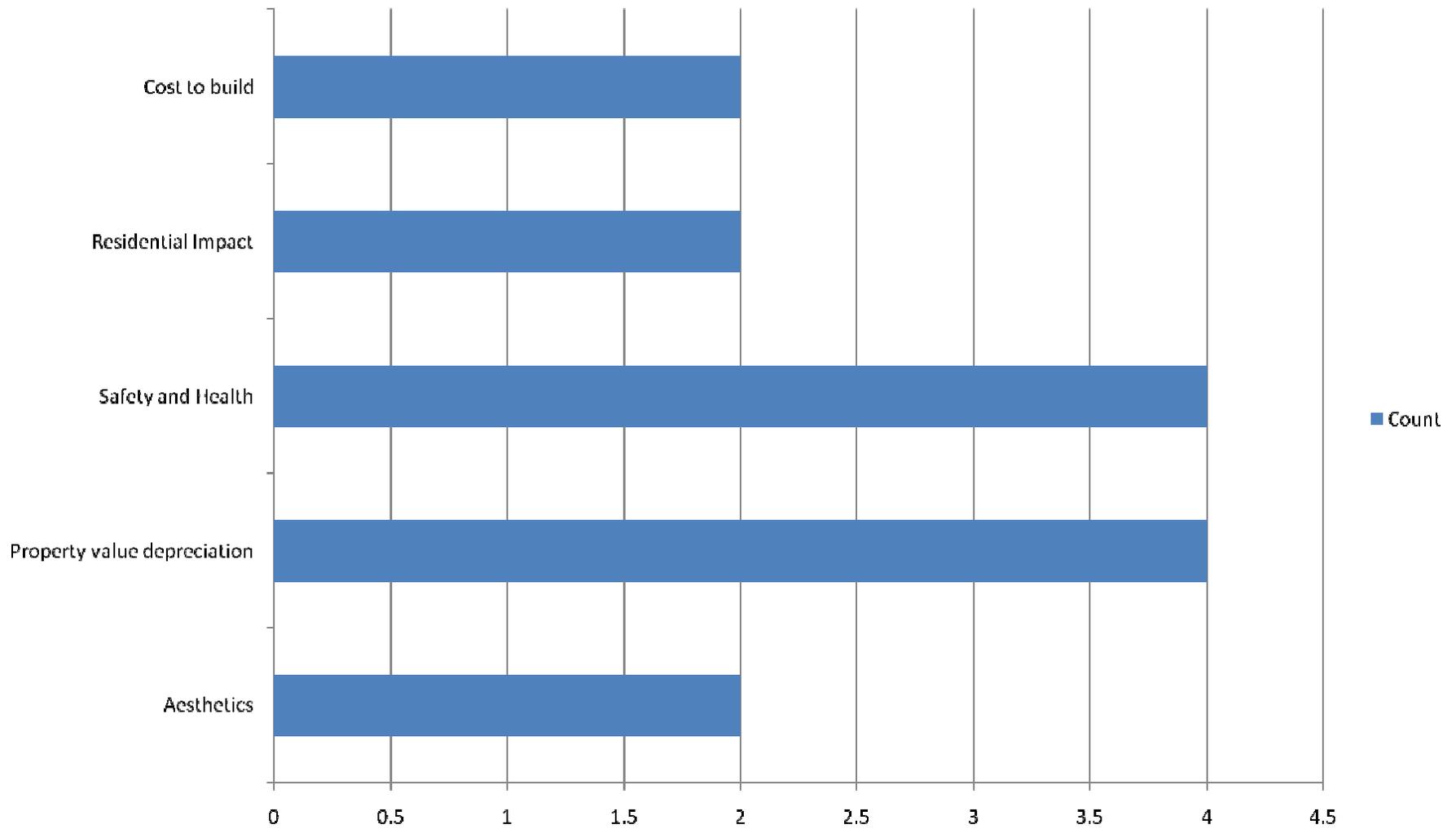
- Over 350 responses have been received to date
- Continue to receive 5 – 10 comments per day through letters, email and web-site.

Top Five Perche Line Concerns



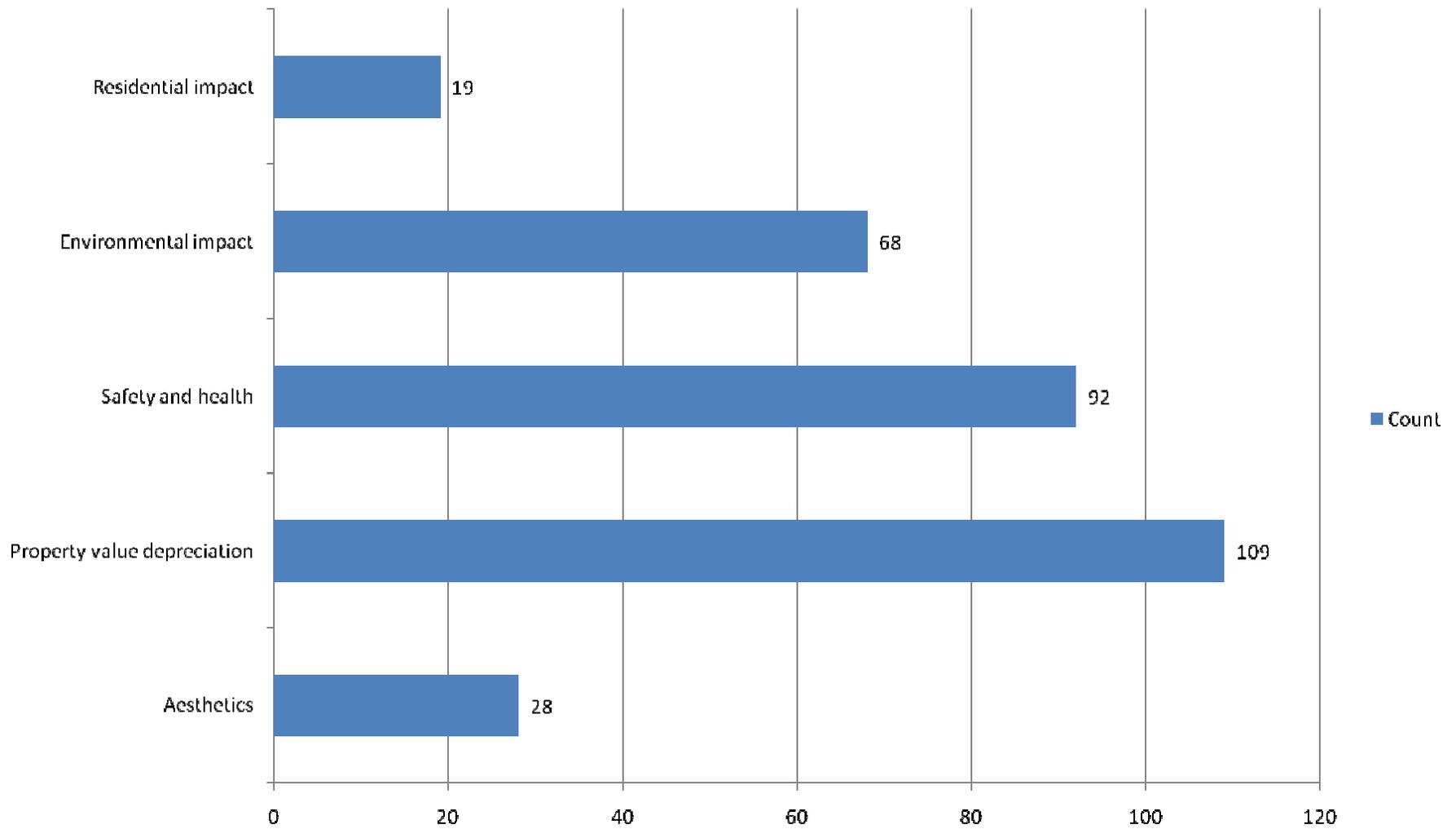
Based on 70 respondents

Top Five Grindstone Line Concerns



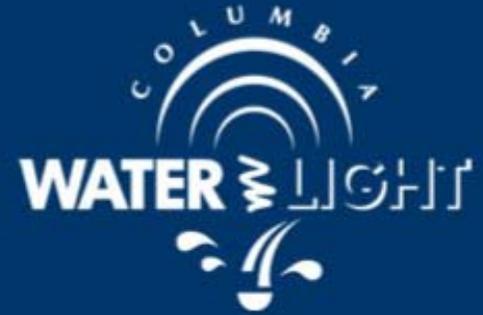
Based on 12 respondents

Top Five McBaine Line Concerns



Based on 141 respondents

Questions



- Web Page:

[http://www.gocolumbiamo.com/WaterandLight/
Electric/ProposedElectricTransmission.php](http://www.gocolumbiamo.com/WaterandLight/Electric/ProposedElectricTransmission.php)

- List Serv:

[http://www.gocolumbiamo.com/Web Mail/](http://www.gocolumbiamo.com/Web_Mail/)

- Comments:

WLmail@GoColumbiaMo.com