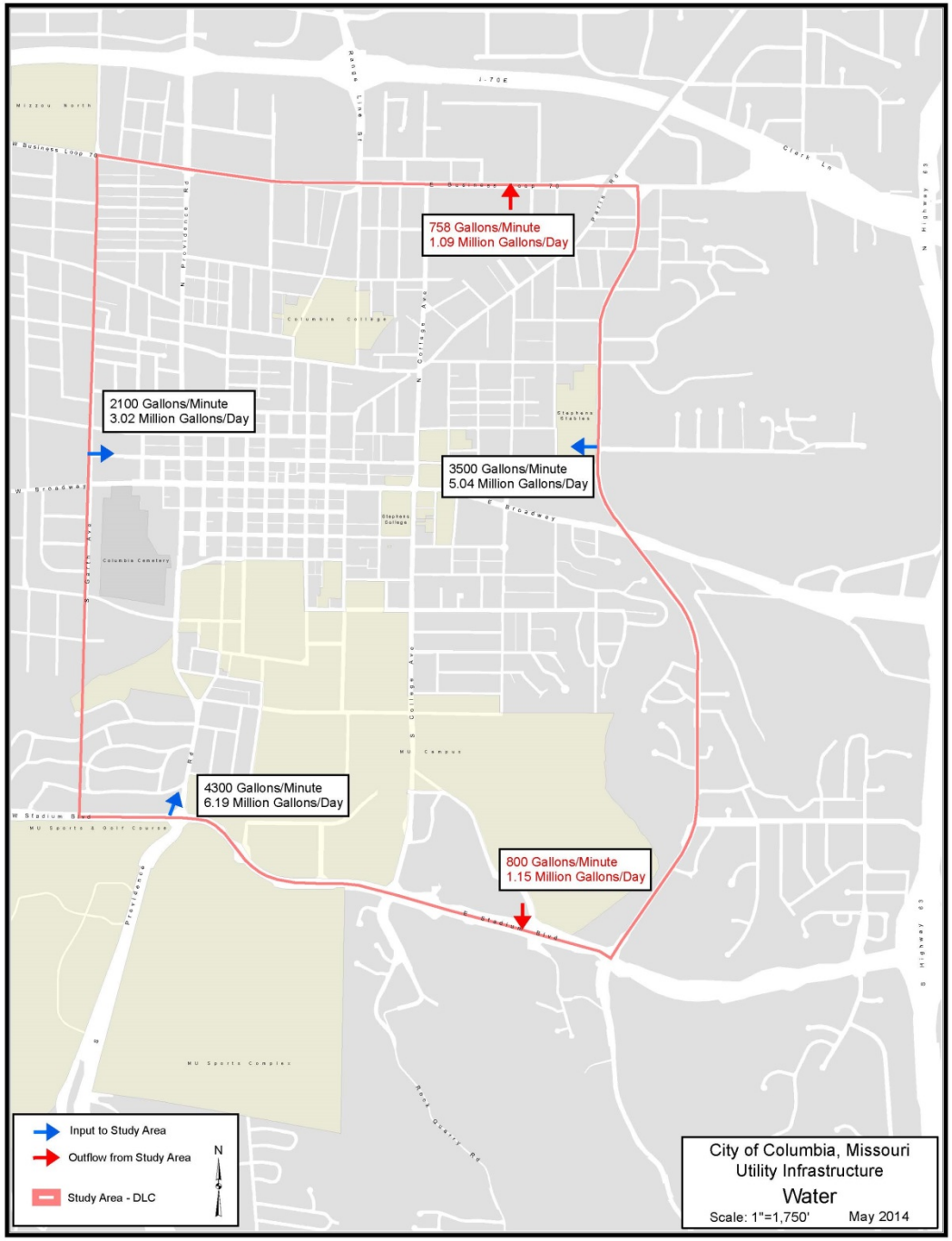
Downtown Leadership Council
Water & Electric Infrastructure

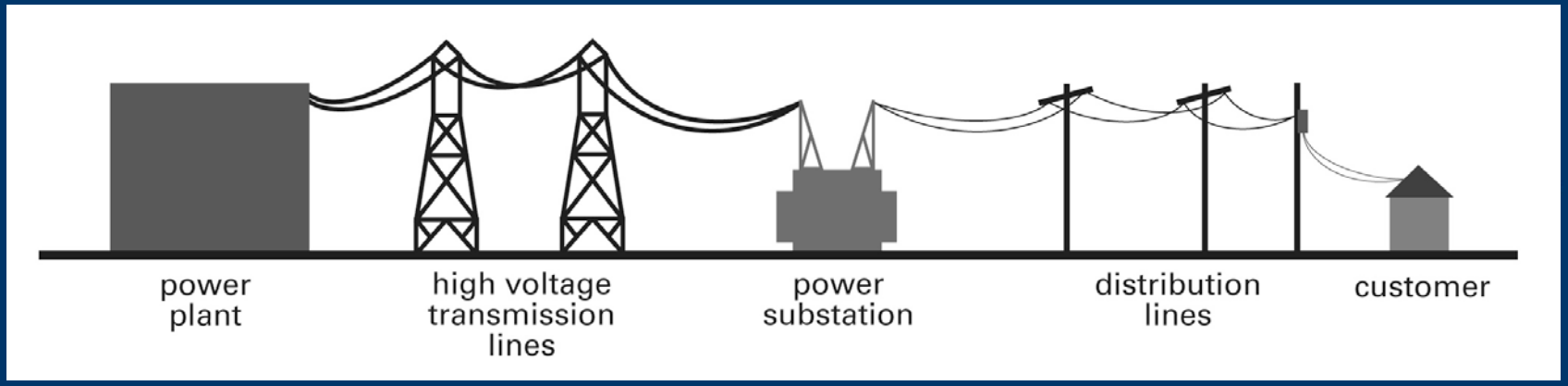


COLUMBIA WATER & LIGHT

Water System

Total Production Capacity = 32 MGD
Total System Average = 14 MGD
Total System Peak = 26 MGD
Reserve Capacity = 6 MGD

Current Demand Downtown = 3 MGD
Net Import Capability = 12 MGD
Spare Water Capacity = 9 MGD



Electric System

Generation System

- Generation resources to balance load, MISO regulations

Transmission System: 161 kV Lines

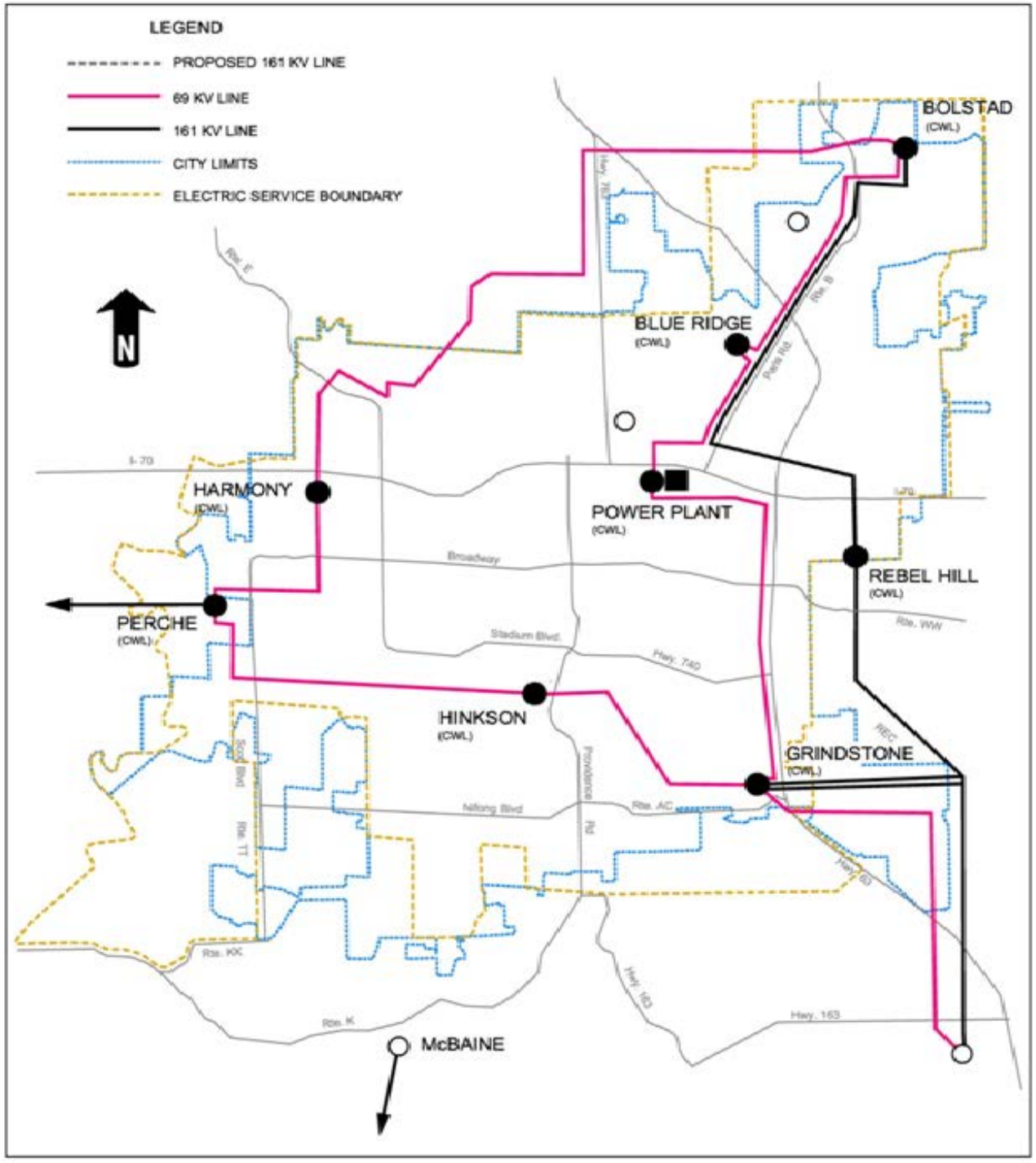
- Power import lines, FERC, NERC, regulations for transmission

Sub-Transmission System: 69 kV Lines

- Operates under regulations for transmission, connection for other utilities
  - City of Fulton & University of Missouri

Distribution System: 13.8 kV Lines

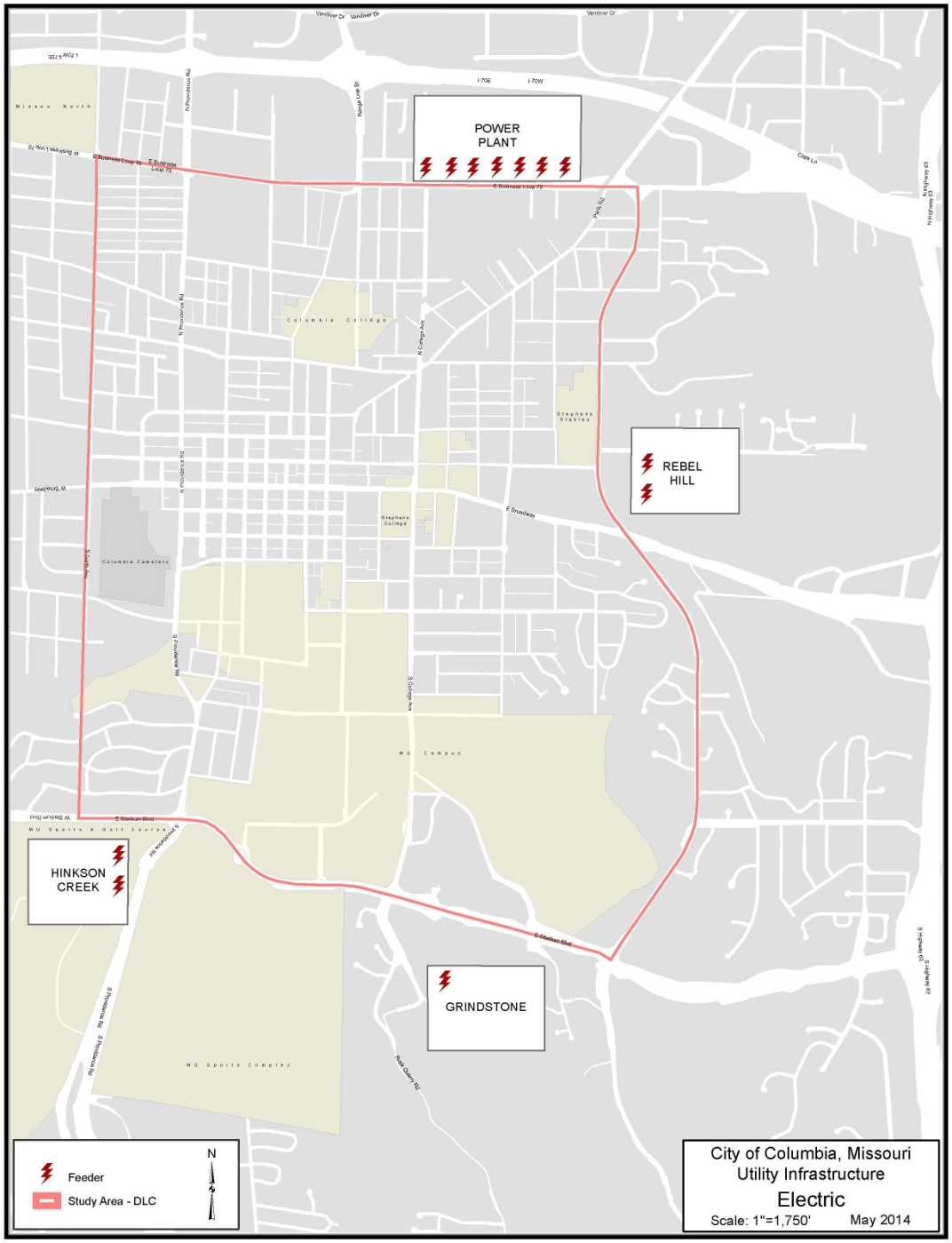
- Substation transformers
- Community distribution feeder lines



COLUMBIA WATER & LIGHT

Electric System

Current Transmission System



COLUMBIA WATER & LIGHT

Electric System

Current Conditions

Load = 62 MW

Available Capacity (N-0) = 72 MW

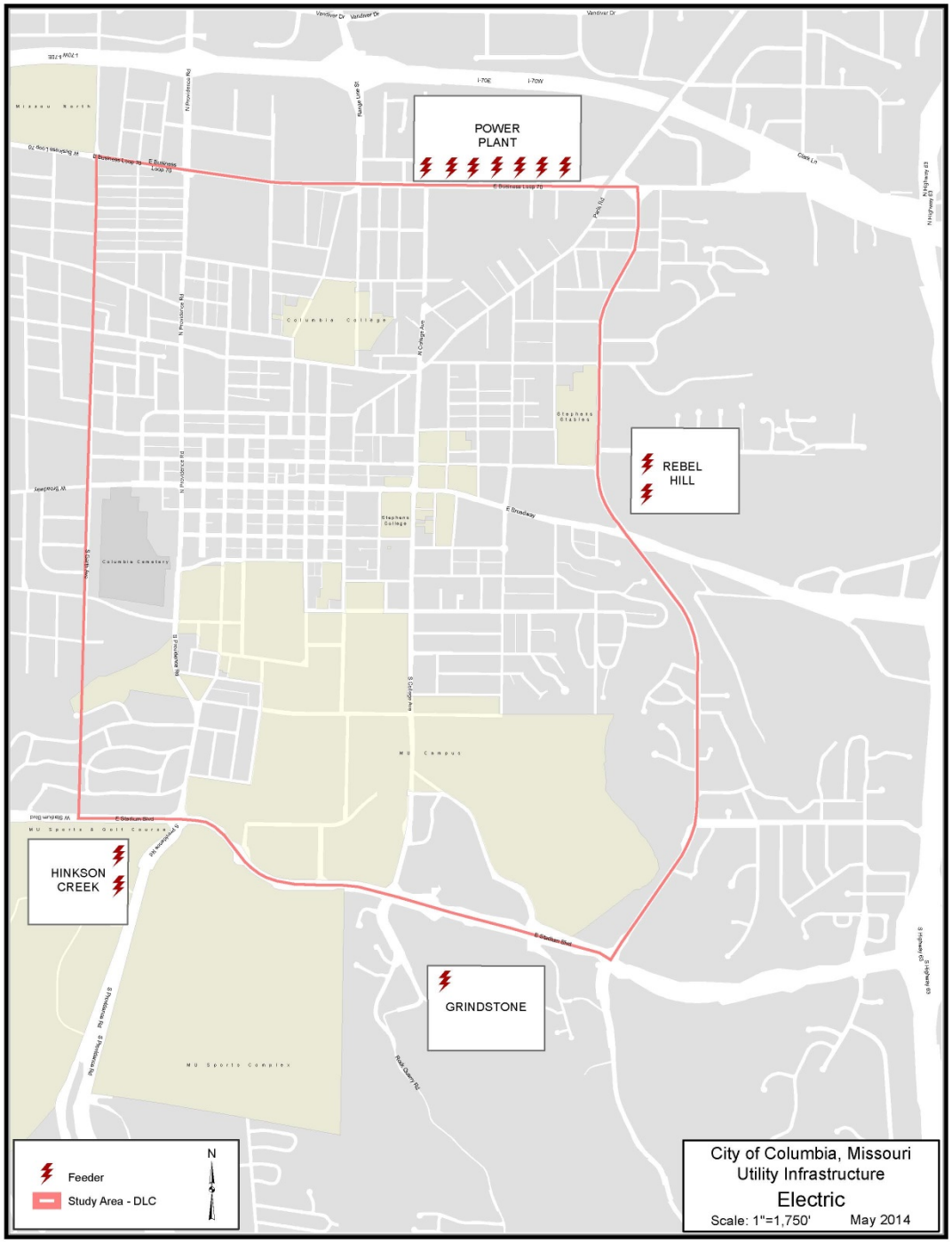
Spare Capacity (N-0) = 10 MW

Loss of Feeder (N-1) = 9 MW

Spare Capacity (N-1) = 1 MW

Loss of Transformer (N-1) = 6 MW

Spare Capacity (N-1) = 4 MW



COLUMBIA WATER & LIGHT

Electric System

New Downtown Load (+5 MW)

Load = 67 MW

Available Capacity (N-0) = 72 MW

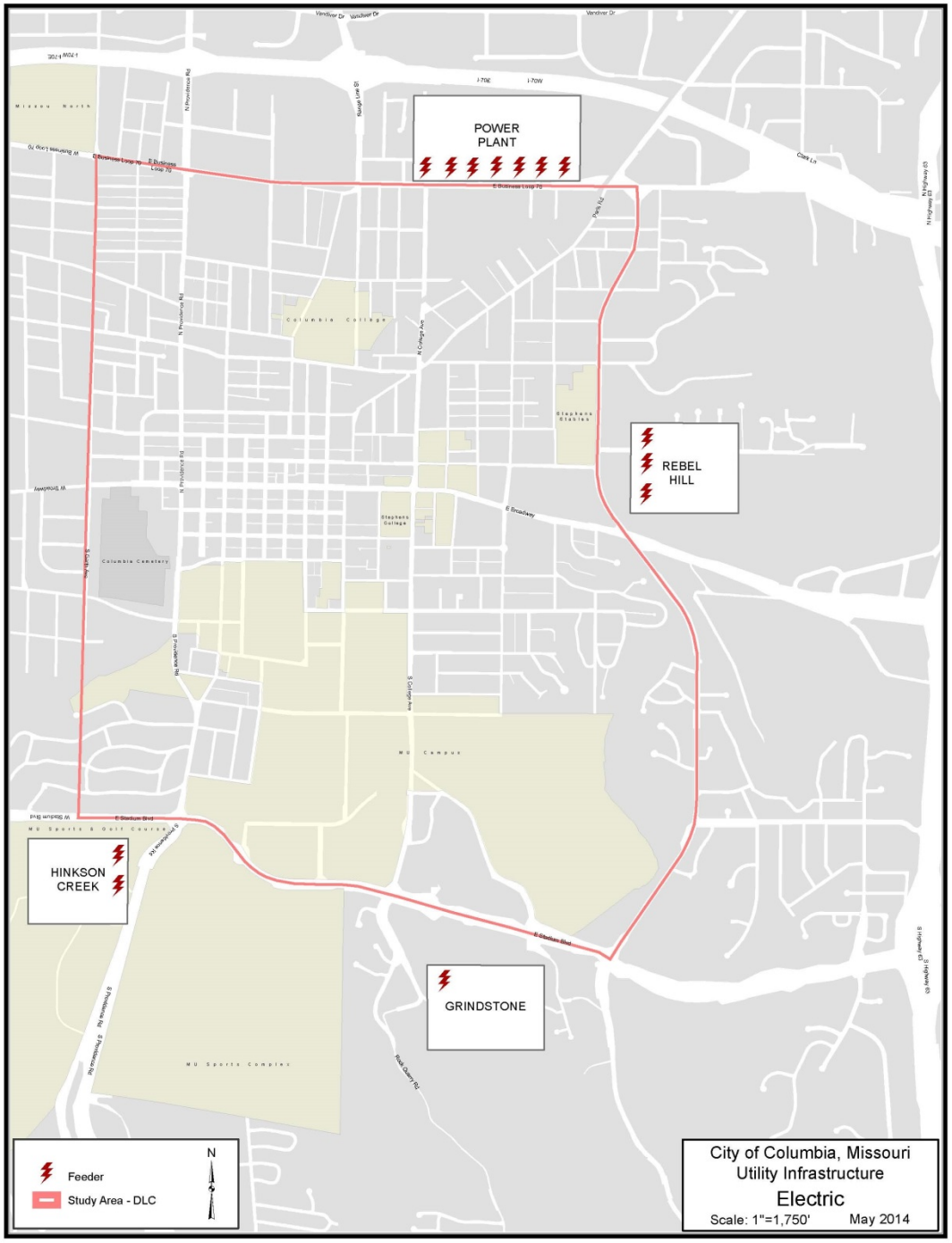
Spare Capacity (N-0) = 5 MW

Loss of Feeder (N-1) = 9 MW

Spare Capacity (N-1) = -4 MW

Loss of Transformer (N-1) = 6 MW

Spare Capacity (N-1) = -1 MW



COLUMBIA WATER & LIGHT

Electric System

Rebel Hill Addition (+5 MW):

Load = 67 MW

Available Capacity (N-0) = 77 MW

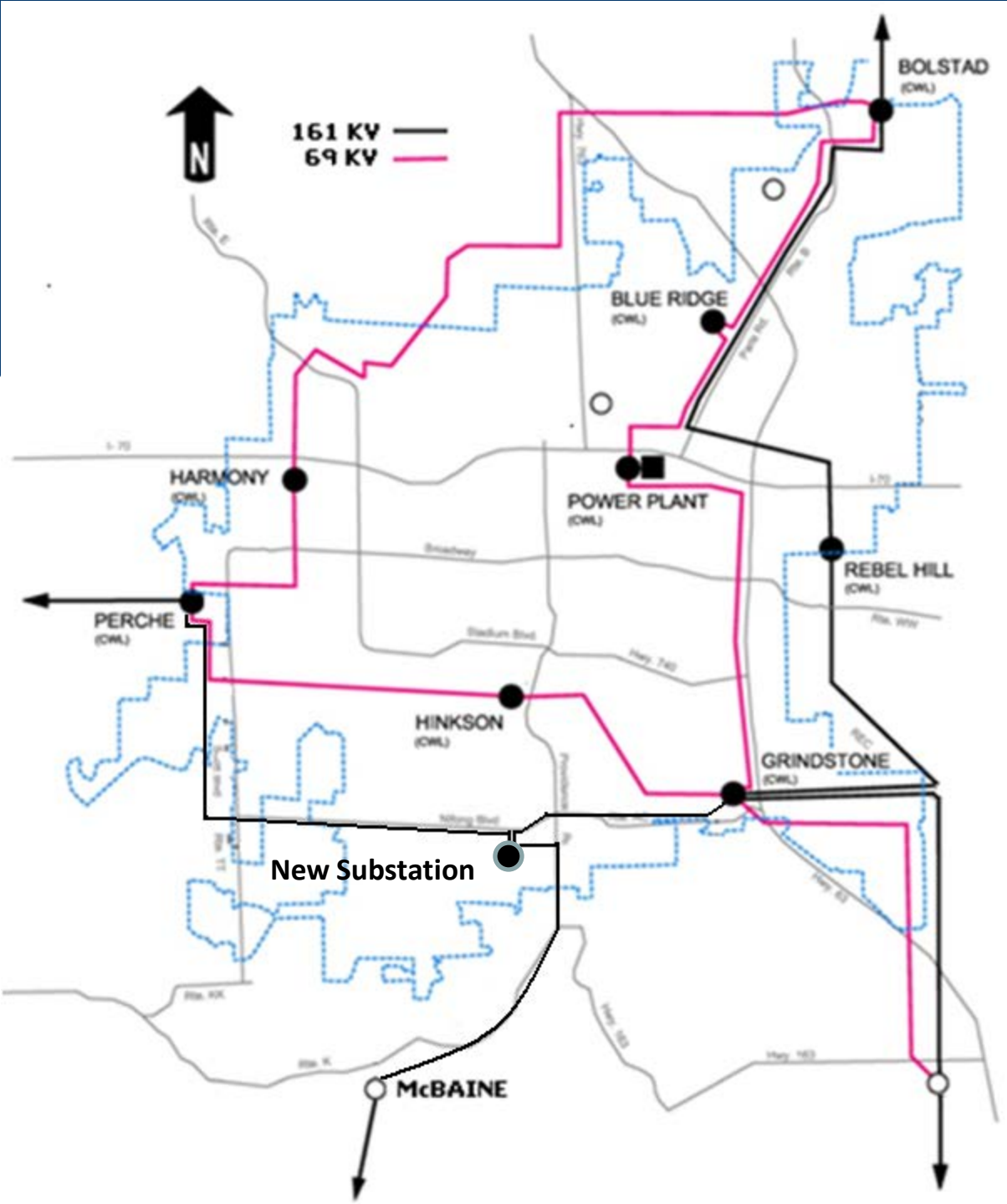
Spare Capacity (N-0) = 10 MW

Loss of Feeder (N-1) = 9 MW

Spare Capacity (N-1) = 1 MW

Loss of Transformer (N-1) = 10 MW

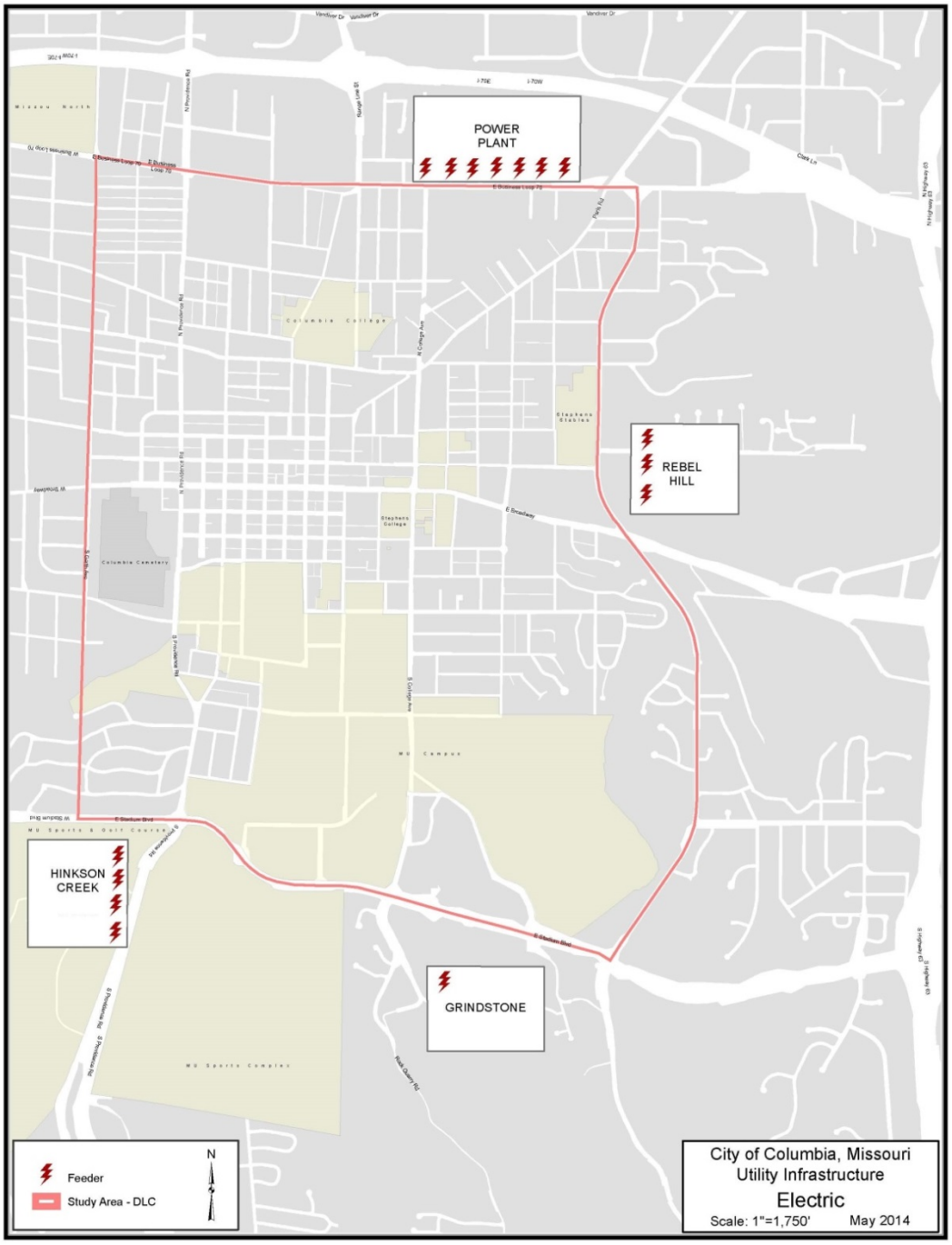
Spare Capacity (N-1) = 0 MW



COLUMBIA WATER & LIGHT

Electric System

Impacts of New Substation



COLUMBIA WATER & LIGHT

Electric System

Hinkson Creek Addition (+14 MW):

Load = 67 MW

Available Capacity (N-0) = 91 MW

Spare Capacity (N-0) = 24 MW

Loss of Feeder (N-1) = 9 MW

Spare Capacity (N-1) = 15 MW

Loss of Transformer (N-1) = 10 MW

Spare Capacity (N-1) = 14 MW

Estimated Impacts of Energy Efficiency on Load Forecasts

- Projected Residential Program Potential
  - Using Existing Programs Cost $1.1M
  - Capacity .56 MW
- Projected Commercial Program Potential
  - Cost $4.5M
  - Capacity 5.4 MW
- Projected Photovoltaic Potential
  - Current Rebate Cost $1M
  - Capacity 2 MW
  - Approximately 20-25% Peak Contribution

Electric & Water Infrastructure

What Future Should Utilities Plan For?