LED Roadway Lighting

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Agenda

- Mankato Front Street Project
- ROAM Wireless Lighting Controls
- Benefits
Mankato Front St. Project Overview

- 2014 Front Street Project
  - Three block reconstruction including storm sewer, surfacing, street lighting, pedestrian improvements, and installation of traffic calming measures.
  - Central Business District
  - Numerous bars and restaurants with significant late night pedestrian traffic.
  - Destination area for late night entertainment.
  - Identified need to increase lighting standards by Property Owners and Public Safety
Mankato Front St. Project Objectives

- New Lighting System
  - 96w Twin and Single LED decorative light fixtures
  - Street designed to operate at 1.2 average foot candles with enhanced light levels exceeding 3.5 foot candles
  - Ability to have wireless on/off with scheduling and dimming controls
  - Remote operation and management

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Mankato Front St. Project Overview

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Mankato Front St. Project Overview

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Courtesy of Gregg Anderson Photography
Mankato Front St. Project Overview

- Controls Selected

( Remote Operations Asset Management )

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ROAM System

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Benefits of Lighting Controls

- Energy Savings
  - Dimming Schedules
  - Individual or group on/off operations
- Featured/Event Lighting
  - Ability to create schedules for unique events or holidays
- Safety and Security
  - Monitor that light fixtures are operating normally
- Maintenance
  - Optimize maintenance repair crews when lights are found in need of repair
Energy Savings – Scheduling

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Scheduling – cont.

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<table>
<thead>
<tr>
<th>Action</th>
<th>When</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lamp On</td>
<td>00:05 after sunset</td>
<td></td>
</tr>
<tr>
<td>Lamp Off</td>
<td>00:05 before sunrise</td>
<td></td>
</tr>
<tr>
<td>Dim Fixture to 100%</td>
<td>01:45</td>
<td></td>
</tr>
<tr>
<td>Dim Fixture to 5%</td>
<td>03:00</td>
<td></td>
</tr>
<tr>
<td>Dim Fixture to 5%</td>
<td>16:00</td>
<td></td>
</tr>
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</table>

Add Lamp Action
Add Dim Action
Event Scheduling

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Grouping

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Safety and Security

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Safety and Security

- Mankato Public Safety Command Center

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### Device Reports – show fixture malfunctions

#### Device Report

<table>
<thead>
<tr>
<th>Node</th>
<th>Dimmer</th>
<th>Pole Id</th>
<th>Lamp</th>
<th>Fixture</th>
<th>Status (Days In Status)</th>
<th>Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>5509D</td>
<td>0005ADDE</td>
<td>F-01</td>
<td>96 LED</td>
<td>GRANVILLE</td>
<td>Normal (30+)</td>
<td></td>
</tr>
<tr>
<td>59D95</td>
<td>0005ACC4</td>
<td>F-02</td>
<td>96 LED</td>
<td>GRANVILLE</td>
<td>Normal (30+)</td>
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<tr>
<td>5A174</td>
<td>0005AD2A</td>
<td>F-03</td>
<td>96 LED</td>
<td>GRANVILLE</td>
<td>Normal (30+)</td>
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<tr>
<td>5A11C</td>
<td>0005ADFC</td>
<td>F-04</td>
<td>96 LED</td>
<td>GRANVILLE</td>
<td>Normal (30+)</td>
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<tr>
<td>4A52F</td>
<td>0005B2SS</td>
<td>F-05</td>
<td>96 LED</td>
<td>GRANVILLE</td>
<td>Normal (30+)</td>
<td></td>
</tr>
</tbody>
</table>

#### Device Report

<table>
<thead>
<tr>
<th>Node</th>
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<th>Pole Id</th>
<th>Lamp</th>
<th>Fixture</th>
<th>Status (Days In Status)</th>
<th>Issues</th>
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<tbody>
<tr>
<td>4BCB8</td>
<td>0002FAFB</td>
<td>23-4</td>
<td>130 LED</td>
<td>LEDgend</td>
<td>Warnings (4)</td>
<td>Cycling DCM No Comm</td>
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<td>0002D72C</td>
<td>58-4</td>
<td>130 LED</td>
<td>LEDgend</td>
<td>Warnings (30+)</td>
<td>DCM No Comm</td>
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</tbody>
</table>

Showing 1 to 2 of 2 entries

- Seven Day History  
- Show On Map  
- Show Hourly Data

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- Neighborly
Maintenance Reports Generated

- Burn Hours

<table>
<thead>
<tr>
<th>Node</th>
<th>Pole Id</th>
<th>Wattage</th>
<th>Location</th>
<th>Burn Hours</th>
<th>KWh</th>
<th>Burn Hours</th>
<th>KWh</th>
<th>Burn Hours</th>
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<tr>
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<td>96</td>
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<td>10.63</td>
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<td>1700.54</td>
<td>56.97</td>
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<td>96</td>
<td>N/A</td>
<td>7.00</td>
<td>0.22</td>
<td>1665.34</td>
<td>57.42</td>
<td>1665.34</td>
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<td>96</td>
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<td>0.31</td>
<td>1755.01</td>
<td>59.12</td>
<td>1755.01</td>
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<td>5A17C</td>
<td>F-04</td>
<td>96</td>
<td>N/A</td>
<td>12.57</td>
<td>0.32</td>
<td>1777.28</td>
<td>62.11</td>
<td>1777.28</td>
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<tr>
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<td>N/A</td>
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<td>0.30</td>
<td>1728.67</td>
<td>57.79</td>
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<tr>
<td>4A3F0</td>
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<td>96</td>
<td>N/A</td>
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<td>4A41B</td>
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<td>1727.00</td>
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Maintenance Reports Generated

- Energy Use

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Maintenance

- Ability to Create Various User Profiles
  - Public Works – Ability to view map and edit primary data for maintenance.
  - Public Safety – Ability to view map and issue override commands only.

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Mankato Front St. Project Achievements

- Challenges
  - Installation Documentation
    - Fixtures are individually addressed so some care in locating fixtures during installation is required.
  - Troubleshooting Outages
    - Understanding of system reports to determine specific problems.
Mankato Front St. Project Achievements

- Successes
  - Energy savings
    - Per fixture wattage was reduced by 48% at full power (96w vs 185w)
    - Fixtures typically operate at 10% of full power (10 watts) overnight achieving per fixture energy savings in excess of 90%.
  - Significant Maintenance Savings
    - All fixture components are rated for 100,000 hours of continuous operation
    - Record fixture burn hours and alerts provided through the system of any malfunctions

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Questions