

Office of Innovation

SmartCOS Smart Streetlights

Presentation to the City Council

February 7, 2022

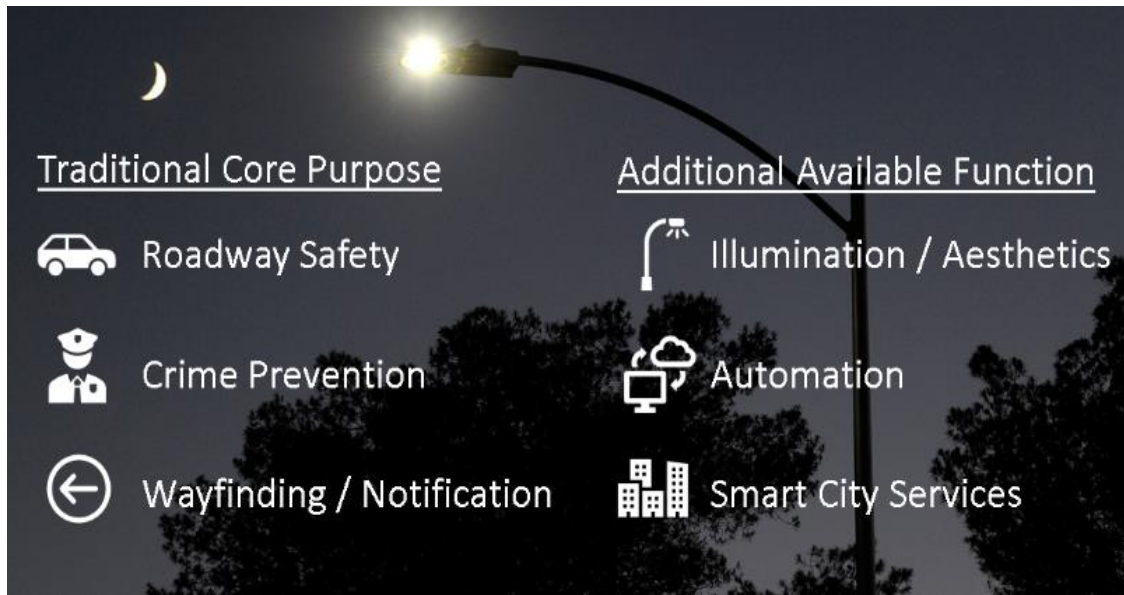








Smart Streetlights



Colorado Springs has more than 27,000 streetlights.

About 18% have been converted to LED.



<u>Traditional Core Purpose</u>	<u>Additional Available Function</u>
 Roadway Safety	 Illumination / Aesthetics
 Crime Prevention	 Automation
 Wayfinding / Notification	 Smart City Services



-  **Up to 70% Energy Savings**
Streetlights are up to 25% of total muni energy bill
-  **Reduced O&M Costs**
O&M savings often exceed energy savings
-  **Enhanced Safety & Security**
Better illumination & control reduces crime and accidents

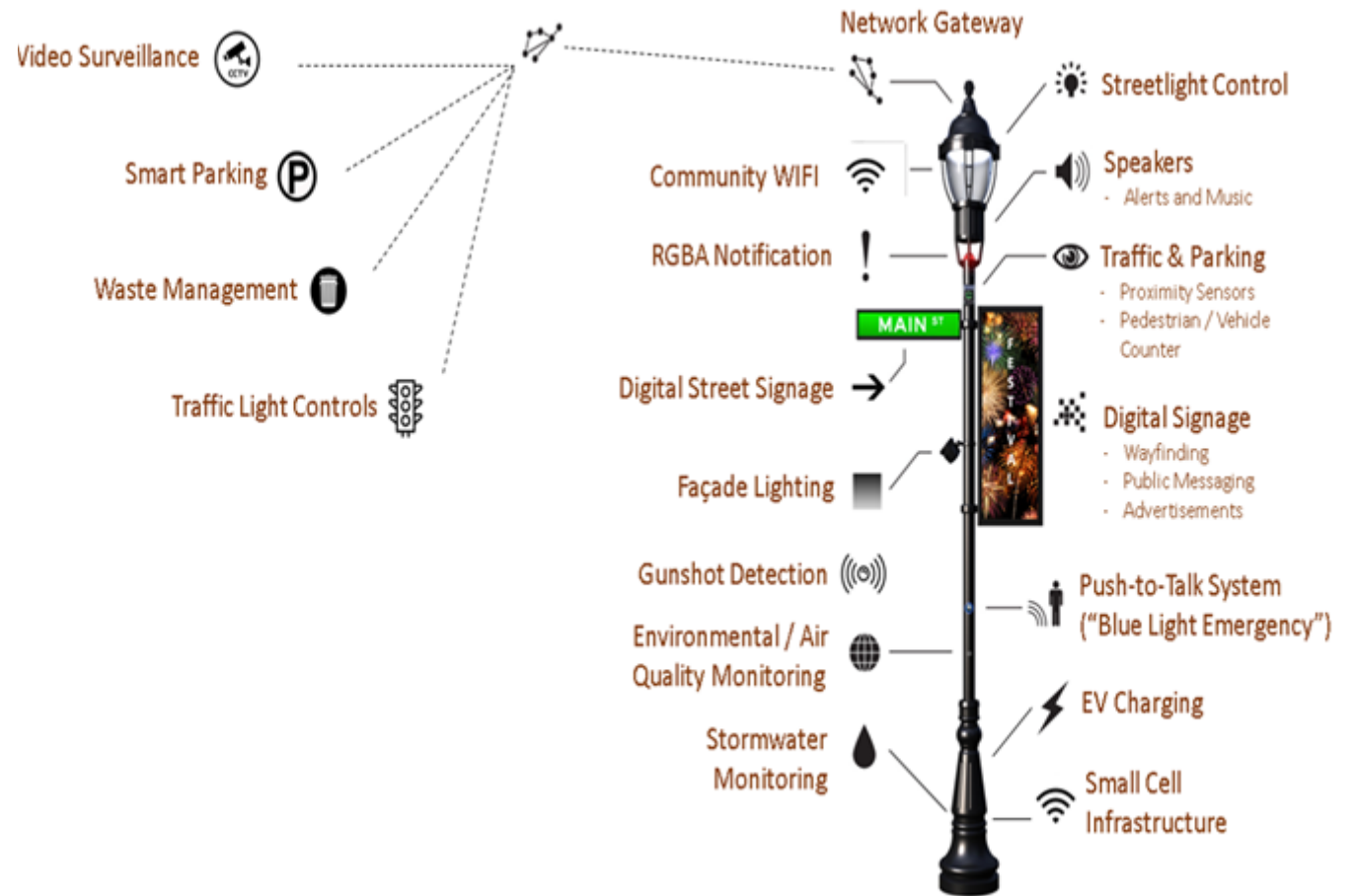
Smart Streetlights



In many cities, streetlights are the most common entry point for smart city applications.

After a review and with approval, Colorado Springs Utilities currently allows municipal attachments to the streetlights including:

- Parking optimization equipment from the City's Parking Enterprise
- Traffic operations equipment from the Public Works Department
- Policing devices from the Colorado Springs Police Department
- Smart city equipment from Office of Innovation



Smart Streetlights



Streetlights

- To pilot solutions that offer enhanced control of streetlights

Weather Sensors

- To pilot solutions that offer more granular measurements of snow accumulations and other weather-related information

Smart Streetlights



Benefits of Streetlight Controllers:

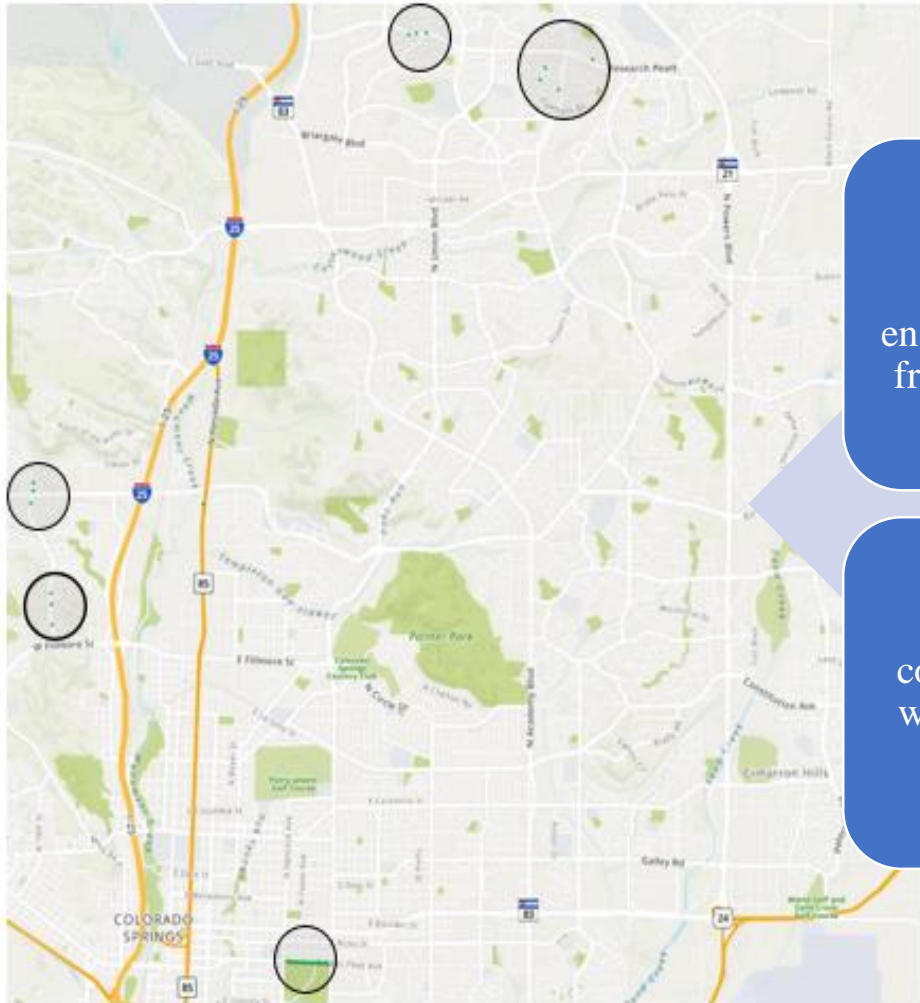
- Dimming allows for energy savings
- Improve response times to complaints
- Enhanced customer service
- Crime reduction
- Reduce installation of light shields
- Decrease traffic accidents
- Asset management
- Consistent lighting quality
- Supporting “Dark Sky” advocates



Benefits of Weather Sensors:

- Provide data to airport and military bases
- Possibility of improving snowplow routes
- Use hyper-local data to determine delays or closures

Streetlight Controller Pilot: Verizon



- Cellular connectivity enables gateway-free installation

- Advanced 4G LTE CAT-M1 IoT technology

- Auto-commissioning with integrated GPS

- Simple plug-and-twist mounting to luminaires via existing NEMA 5- or 7-pin photocontrol socket

- Advanced lighting control with onboard photocell and dimming

- Utility-grade energy measurement with metering Class 0.5 accuracy

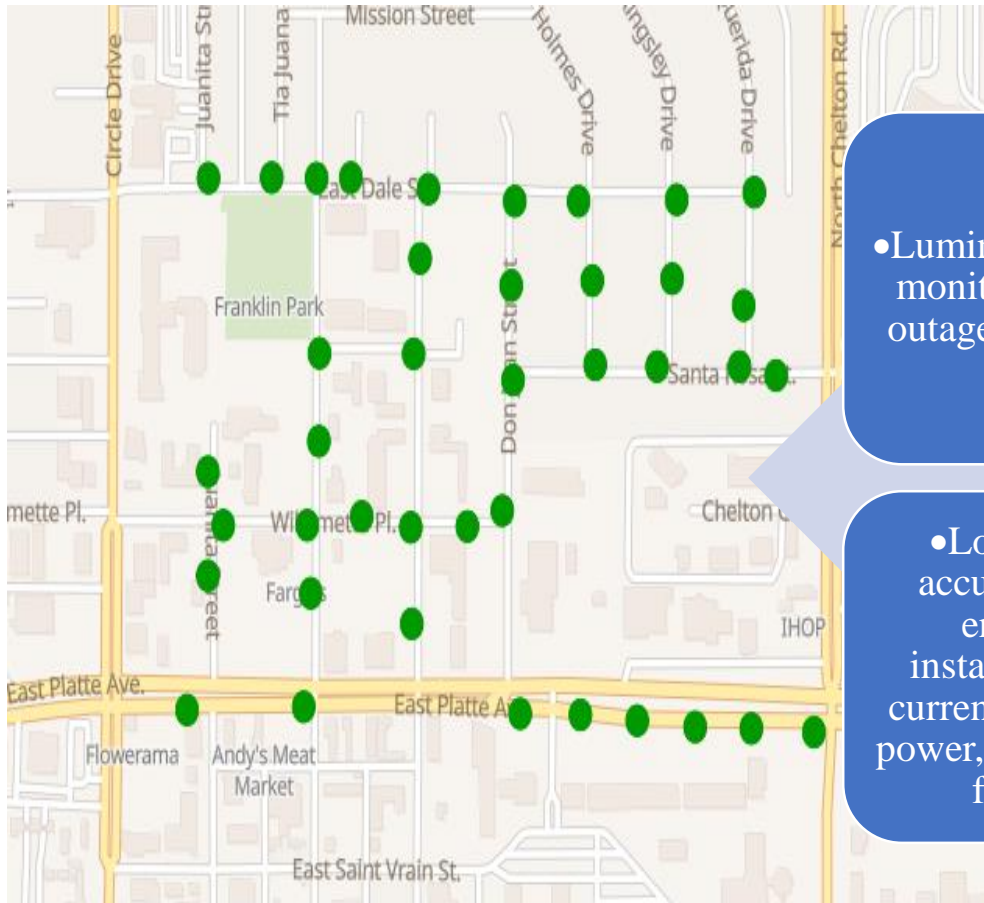
- Measures and reports electrical and sensor data to NetSense platform

- Light Sense node connects to the network using highly secure, certification-based authentication and encryption

Smart Streetlights



Streetlight Controller Pilot: Landis+Gyr



- Luminaire health monitoring and outage detection

- Supercapacitor support for power outages

- Load-side accumulated energy, instantaneous current, voltage, power, and power factor

- GPS location—maps with streetlight visualization

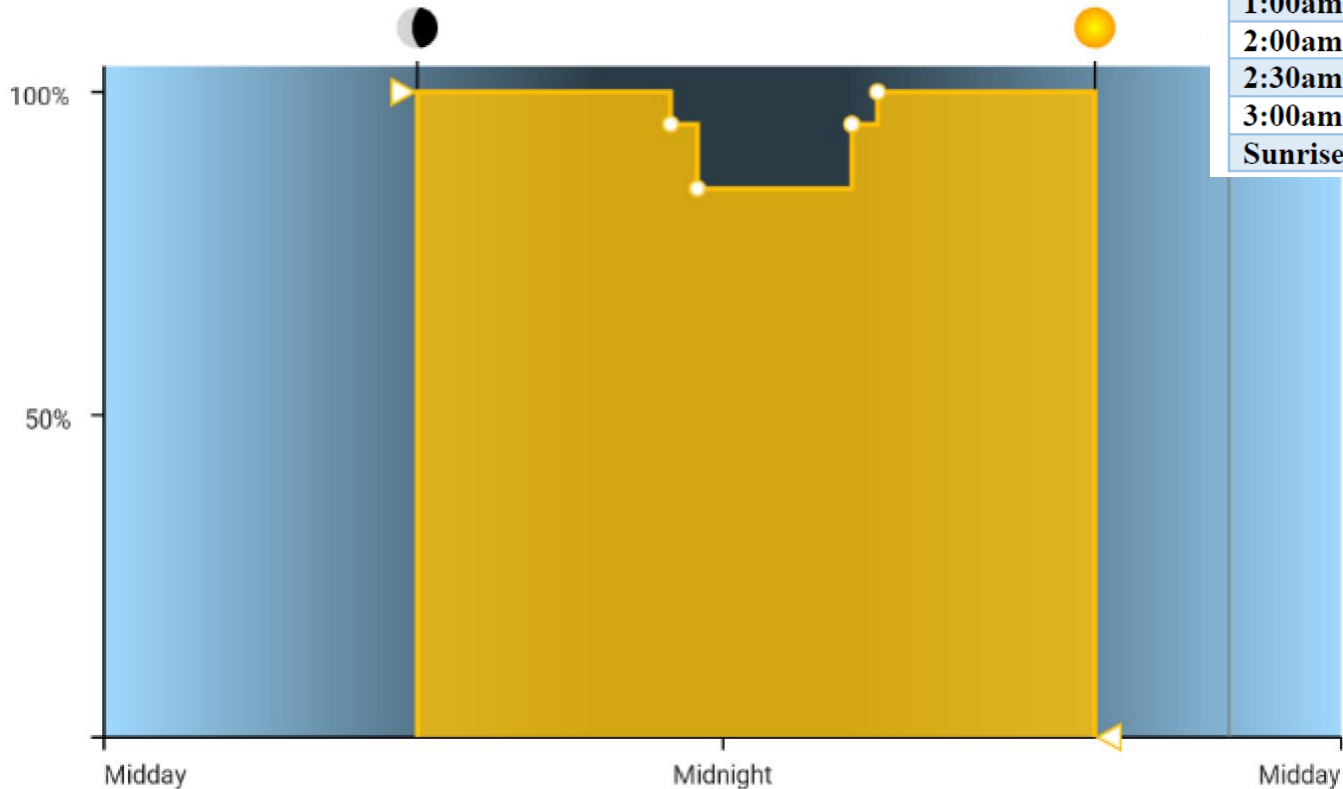
- Pre-programmed dimming schedules

- Constant lumen output: ramp up power over time to maintain lumen efficacy

- Advanced Metering Infrastructure (AMI) Network integration and support

- Robust portal with many customizable options for dimming, notifications, and reports

Dimming Schedules

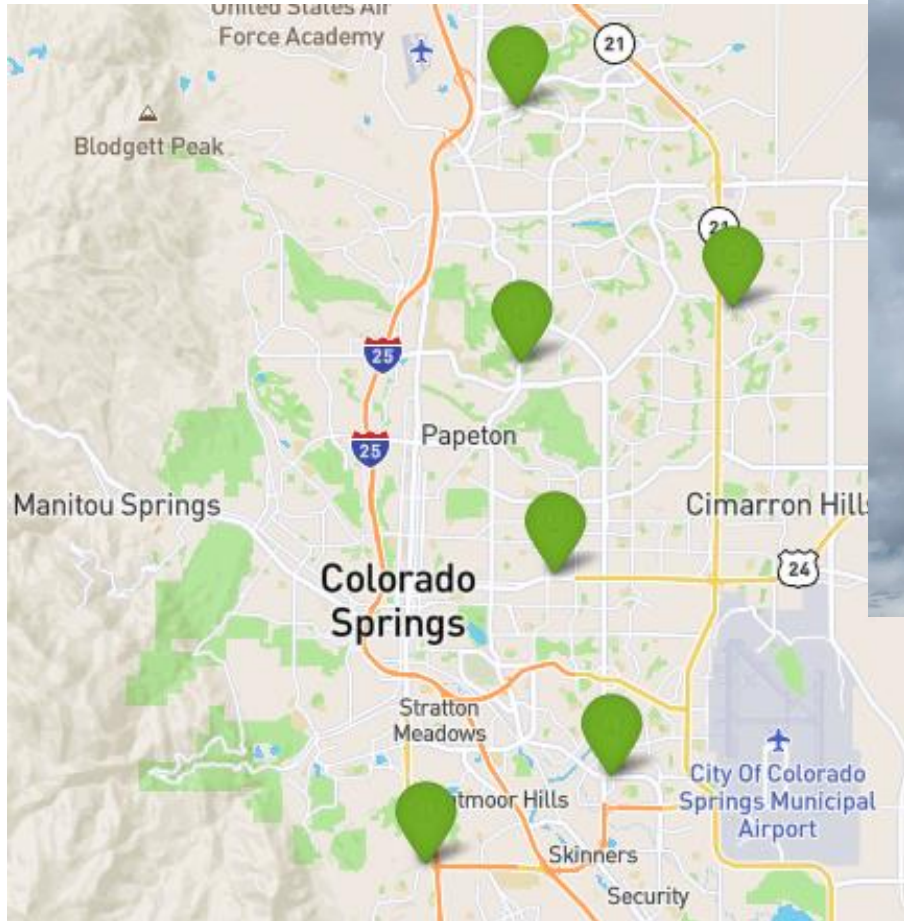


Time	Schedule 1 (% of Max Driver Level)	Schedule 2 (% of Max Driver Level)
Sunset	100%	100%
11:00pm	100%	95%
11:30pm	100%	85%
12:00pm	95%	85%
1:00am	90%	85%
2:00am	100%	85%
2:30am	100%	95%
3:00am	100%	100%
Sunrise	0%	0%

1% energy savings from Schedule 1
3% energy savings from Schedule 2

Much more aggressive dimming schedules could be used to realize more energy savings.

Weather Sensor Pilot: Campbell Scientific



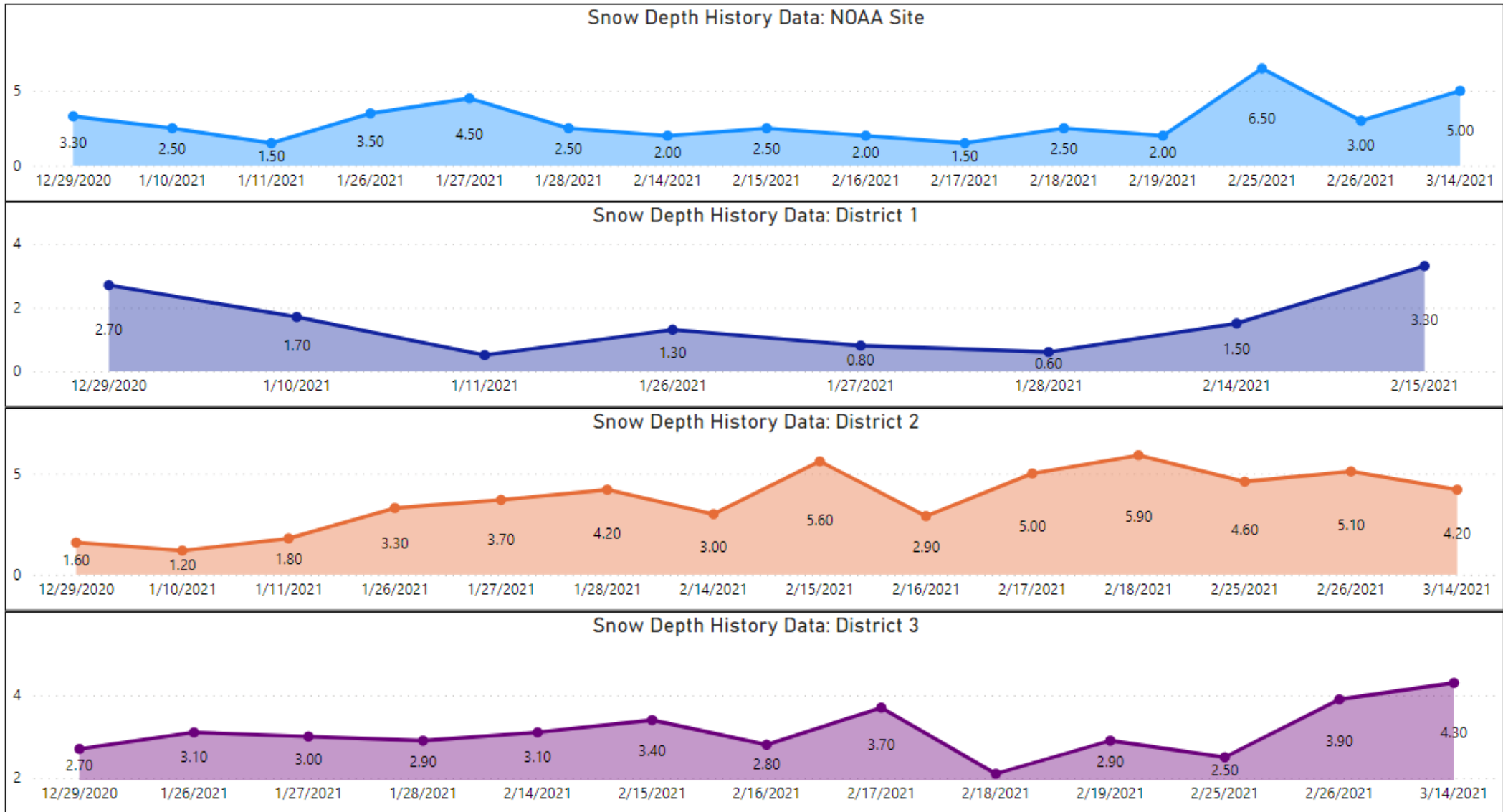
- Detects snow depth, air and surface temperature, humidity, wind speed

- User-friendly portal for data review and analytics, reporting, and notifications

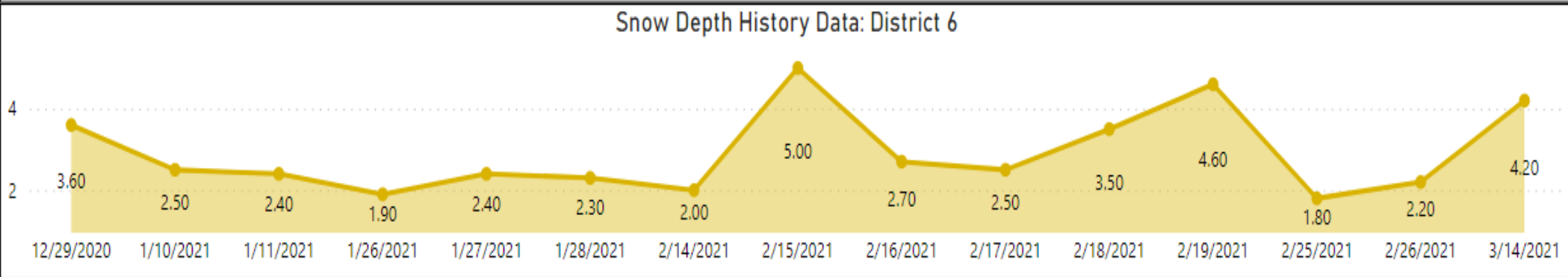
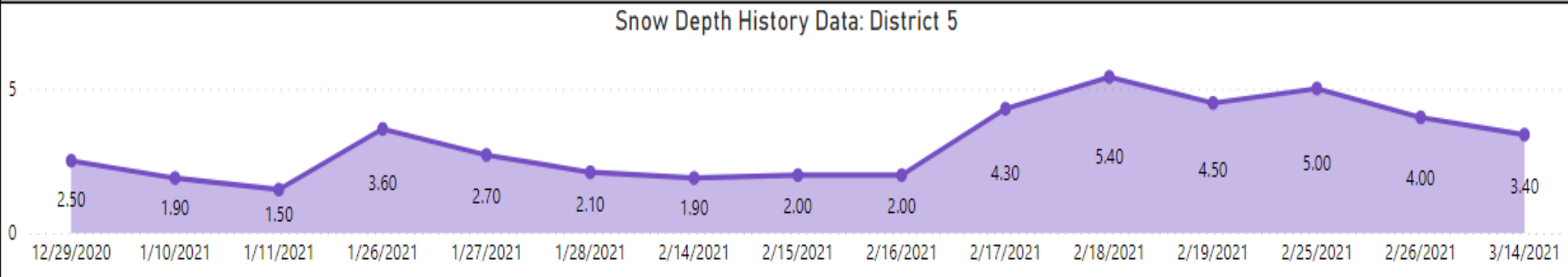
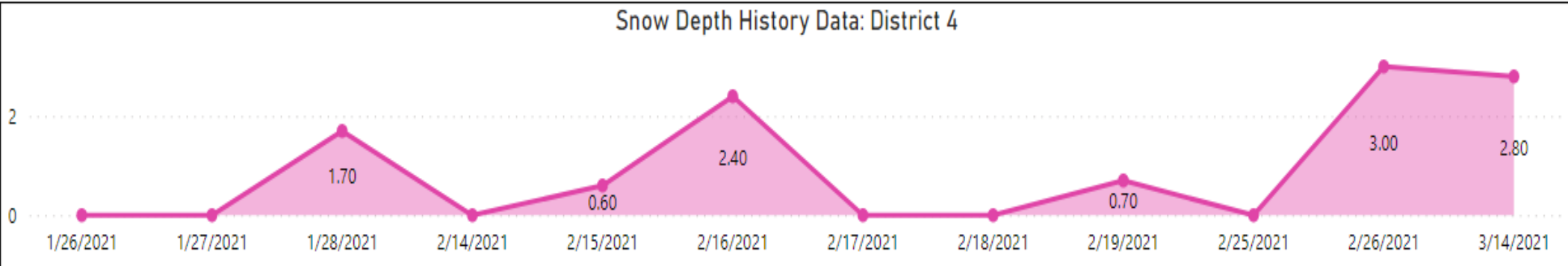
- Hyper-local data collection

- Potential for more efficient snow plowing and related cost savings

Smart Streetlights



Smart Streetlights



Issues Identified:

The streetlight controllers do not meet minimum specifications for surge protection.

a. The streetlight controllers plug into only 77% of existing streetlight fixtures.

a. The cost of the streetlight controllers is prohibitive for scaling the project.

a. To see benefits, changes to operations would need to be implemented.

a. The weather sensors would need to be relocated for more accurate data collection.

a. The City and Utilities should formalize data governance for the data collected.

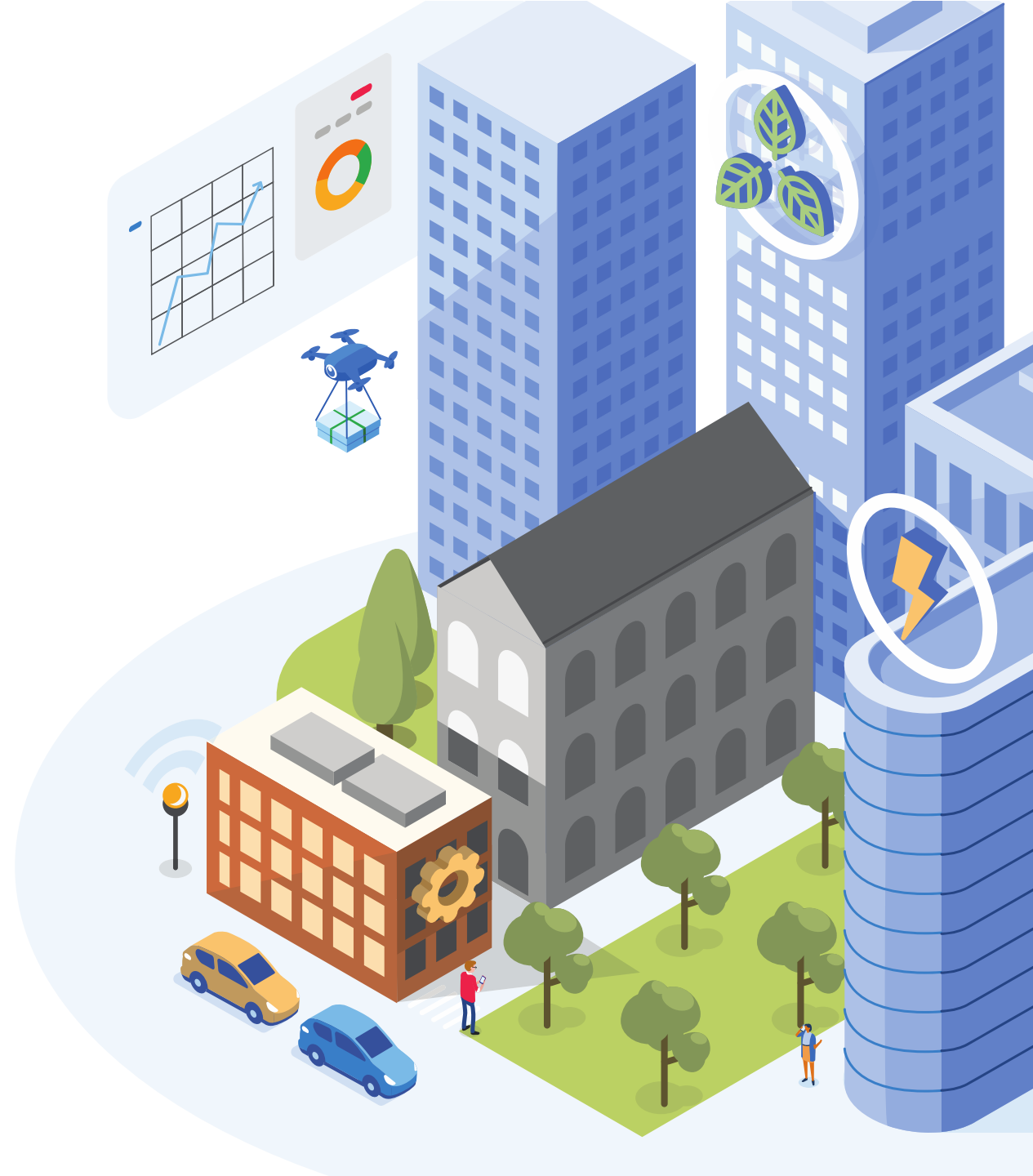
Next Steps:

LED Conversion

- The City and Colorado Springs Utilities will research
- and implement methods to increase the rate of LED
- conversions.

Other Smart Streetlight Use Cases

- The City will research and implement other smart city
- devices that can be attached to streetlights, including
- air quality monitoring, pedestrian and bicycle counting,
- and public Wi-Fi.





Panasonic

Q & A

Thank you

Joshua Pace
Senior Contracting Specialist

Office of Innovation
City of Colorado Springs
Office: (719) 385-5272
Cell: (719) 352-2915

