

# Energy Program Update

**Presented to the Metropolitan Council  
January 28, 2009**

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**Vince Pellegrin, *Metro Transit***  
**Tom Thorstenson, *Metro Transit Facilities***

# Agenda

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- **Energy Collaborations • Willett**
- **Environmental Services (MCES) • Willett**
- **Regional Administration • Willett**
- **Metro Transit • Pellegrin**
- **Metro Transit Facilities • Thorstenson**

# Energy Collaborations

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- **University of Minnesota (Institute for Renewable Energy & Environment)**
- **Xcel Energy (Process Efficiency Program & RE)**
- **Metro Energy Policy Coalition (Counties)**
- **Inter-agency Energy & Environment Team**
- **Chamber of Commerce**

# Environmental Services (MCES)

**Jason Willett**



# MCES Initiatives

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- **Energy Conservation**
- **Renewable Energy**
- **Energy and Carbon Measurement**
- **Energy Finance**

# Energy Conservation

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## ■ Overview

- **Process efficiency, lighting redesign, and facility re-commissioning**
- **Completed 26 energy-related studies identifying:**
  - **40 energy saving opportunities totaling 46 million kWh (\$3 million/year); of those, MCES implemented 16 measures to date = 23 million kWh (\$1.4 million/year)**
- **24 more studies planned in 2009**

# Energy Conservation

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## ■ Completed work

- **Metro: Aeration study**
  - Annual kWh savings = 6,700,000
- **Metro: Enhanced maintenance in aeration process**
  - Annual kWh savings = 4,000,000



# Energy Conservation

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## ■ In process work

- **Metro: Tunnel lighting redesign**
  - 2008 design; 2009 construction
- **Metro: Steam Trap Program**
  - About 15% completed in 2008; remainder scheduled for 2009





# Renewable Energy (RE)

## ■ Completed RE

- Fluidized Bed Incinerators/steam cogeneration of heat and electricity (4 MW)



# Renewable Energy

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## ■ Completed RE

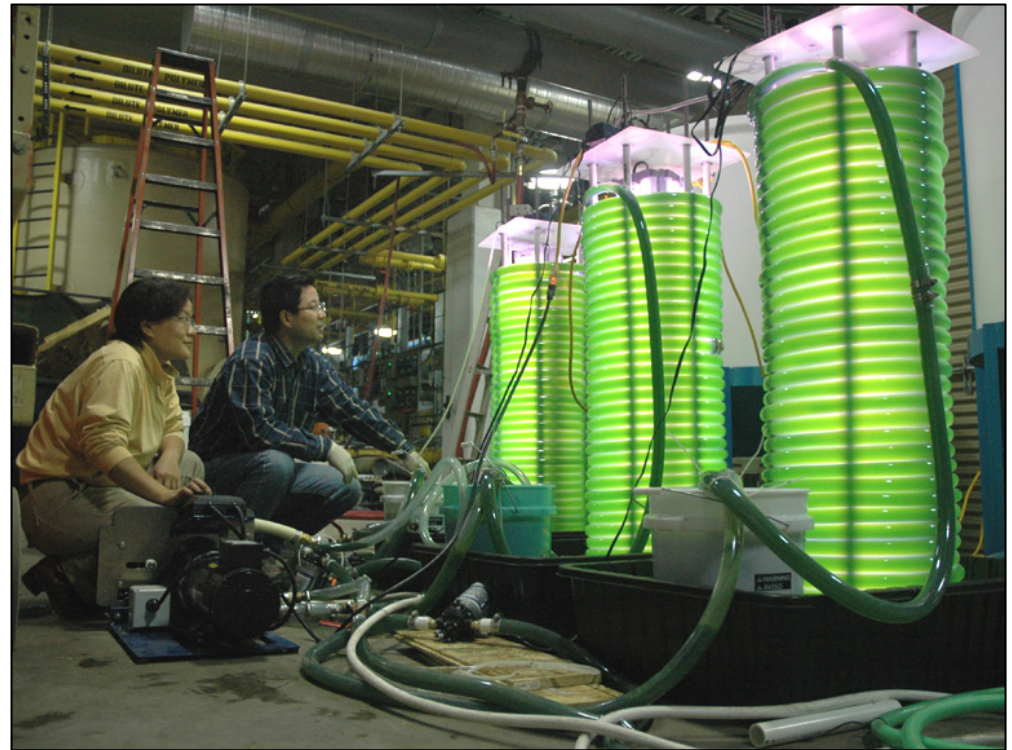
- **Eagles Point:  
Thermal energy  
recovery from  
effluent**



# Renewable Energy

## ■ Identified RE possibilities

- Algae R&D
- Bio-diesel from brown grease



# Renewable Energy

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## ■ Identified RE possibilities

- Metropolitan Counties Energy Coalition (MCEC) Wind Initiative
- Xcel Energy and MCEC Renewable Collaboration, possible solar farm at Blue Lake



# Summary

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## ■ Conservation:

- 66% of goal complete
- Over 100% of goal identified
- More studies underway

## ■ Renewable energy:

- Additional possibilities being investigated

## ■ Financial impact: \$1.4 million/year conserved

- .3 rebates received (2008)
- .3 peak control savings (2008)

**\$2.0 million**

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# Regional Administration

**Jason Willett**

# Regional Administration

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## ■ In process work: **Robert Street Building**

- Received EPA's prestigious Energy Star rating
- Requires energy use >40% average of commercial buildings
- 2008: Annual energy demand savings about \$46K



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# Metro Transit

## Vince Pellegrin





# New Technologies

## ■ Diesel exhaust PM filter

- 85% particulate matter reduction compared to 1995 buses

Diesel Particulate Filter (DPF)



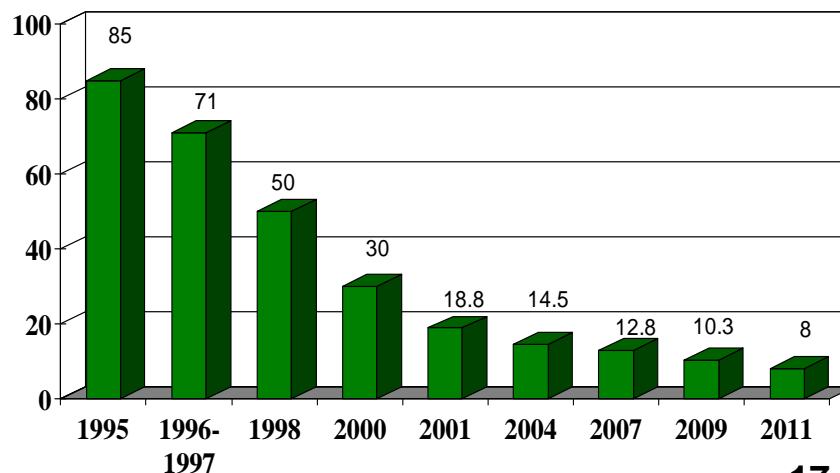
## ■ Urea Injection 2010

- Reduces NOx emissions

## ■ Improved tire design

- Estimated fuel savings 306,000 gal. per year

Fleet PM Emissions



# New Technologies

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- **LED interior lighting**
- **Lighter design**
  - Passenger seating
  - Flooring
  - Wheelchair ramp vs. lift
  - Structure
    - Stainless steel lower
    - Aluminum upper



# New Technologies

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- **Standard drive bus is 3,000 lbs. lighter**
- **Hybrid bus is 1,400 lbs. lighter**



# Biodiesel Experience

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- **Summer–Fall**
  - B10 2007
  - B20 2008
  - No operational issues
- **Winter**
  - B10 2007/2008
  - B10 2008/2009
  - Dispenser filter plugging
- **Cost**
  - Now significantly more than diesel
- **Currently using B2**
- **Testing for cause of filter plugging**



# Hybrid Drive Benefits

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- **67 hybrids in service**
- **28% better MPG**
- **Lower emissions**
- **Quieter operation**
- **Faster acceleration**
- **75 hybrids by 2010**



# Superbus Project

- **Continued Energy Efficiency Development**
- **Audit energy usage**
- **Determine benefits of electrification**
  - HVAC
  - Radiator fan
  - Air compressor

Electric Radiator Fan



Electric HVAC



# Superbus Project

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## ■ Determine best power source

- Bus alternator
- APU

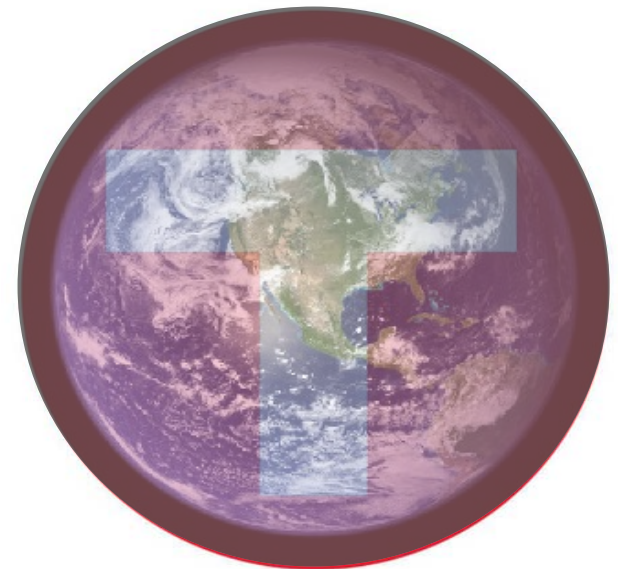
## ■ Potential Benefits

- No idling
- Fuel savings
- Emission reduction
- Improved comfort

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# Metro Transit Facilities

**Tom Thorstensen**





# Facility Energy Costs

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## 2009 Budget

<b>Gas &amp; Electricity</b>	<b>\$3,600,000</b>
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## Target Reductions:

<b>2009</b>	<b>\$200,000</b>	<b>(5%)</b>
<b>2010</b>	<b>\$920,000</b>	<b>(25%)</b>
<b>2011</b>	<b>\$1,100,000</b>	<b>(30%)</b>

# Facility Energy Costs

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## ■ Approach

### — Operations:

- Information, awareness and responsibility
- Monthly consumption and cost

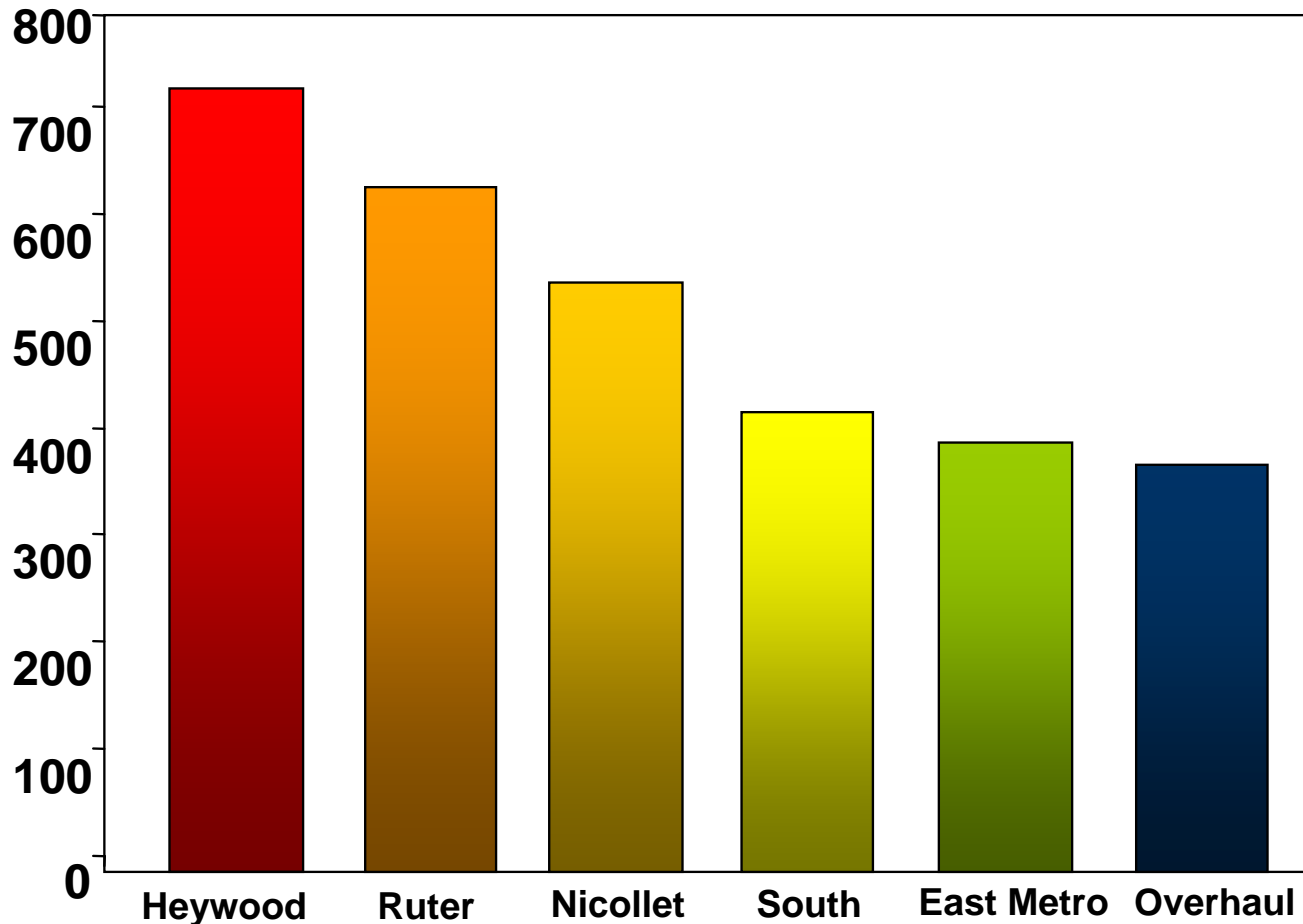
### — Capital improvements:

- Design and construction contracts
- Paybacks of 3 to 4 years

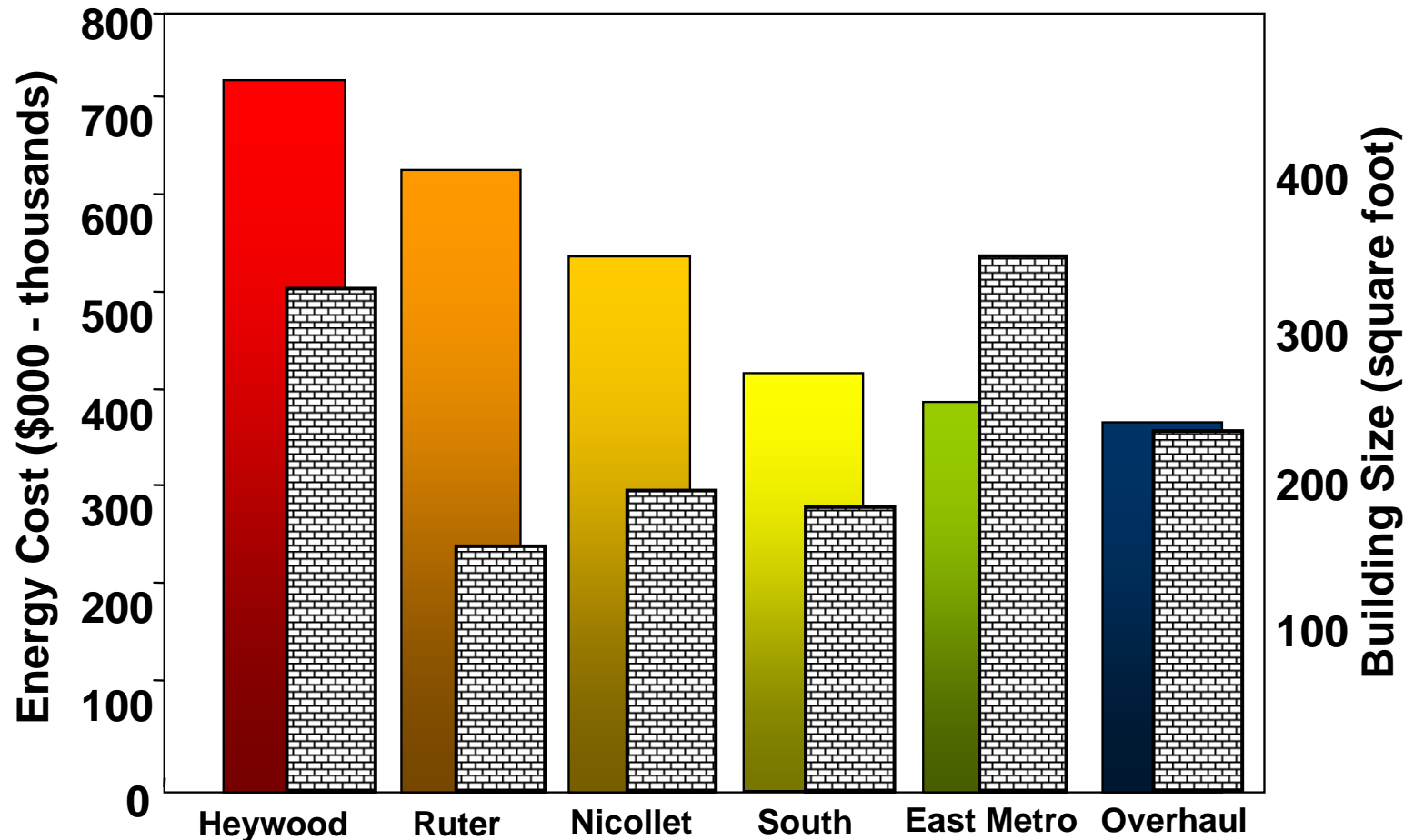
# Energy Cost per Facility

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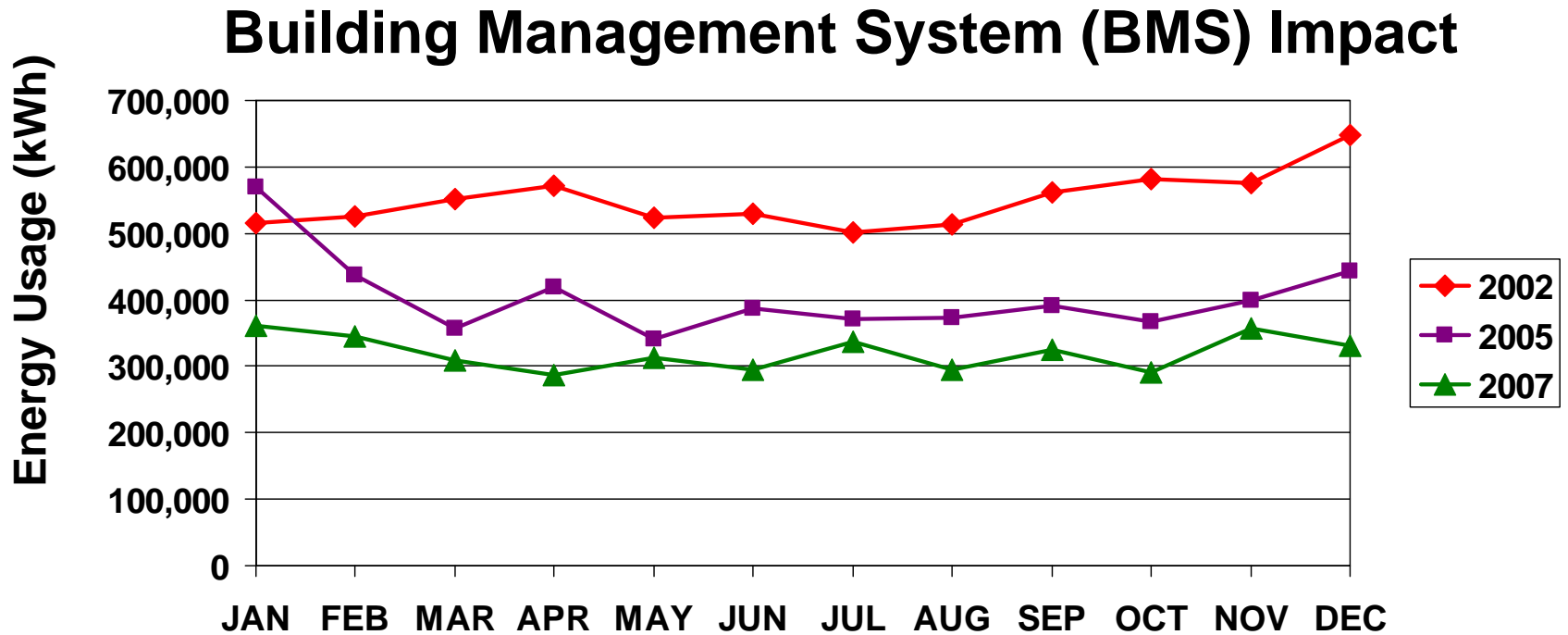
Energy Cost  
(\$000 - thousands)



# Energy Cost and Facility Size



# East Metro Garage Electrical Use



# Energy Conservation Projects

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## **2009 Improvements:**

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<b>Heywood BMS</b>	<b>\$700,000</b>
<b>Lighting, various</b>	<b>\$775,000</b>
<b>Ruter BMS</b>	<b>\$1,000,000</b>

## **2010 & 2011 Improvements:**

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<b>Nicollet BMS</b>	<b>\$400,000</b>
<b>Overhaul Base BMS</b>	<b>\$400,000</b>
<b>South BMS</b>	<b>\$600,000</b>

**Total Capital Contracts: \$3,875,000**