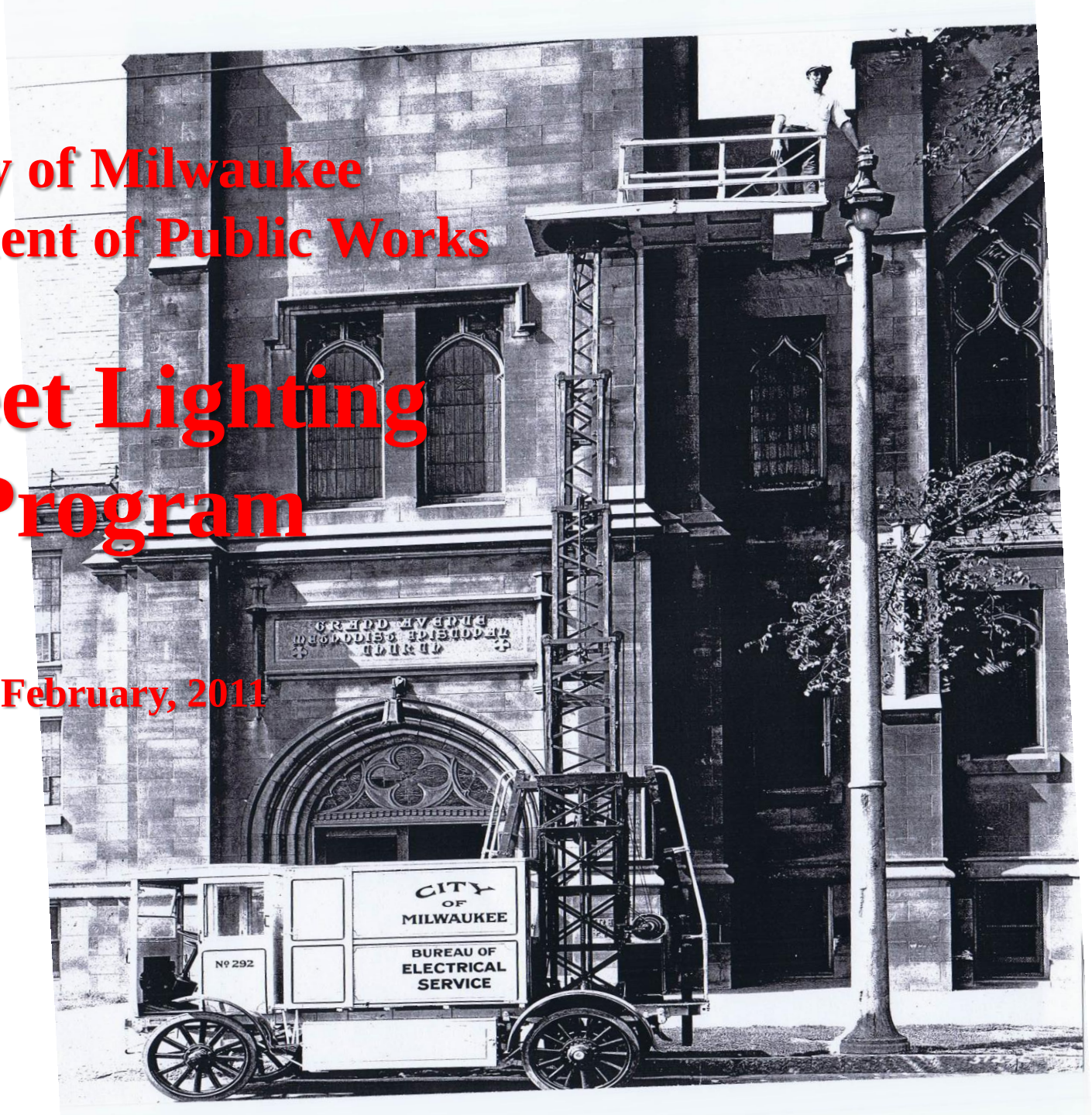
City of Milwaukee
Department of Public Works

Street Lighting Program

February, 2011



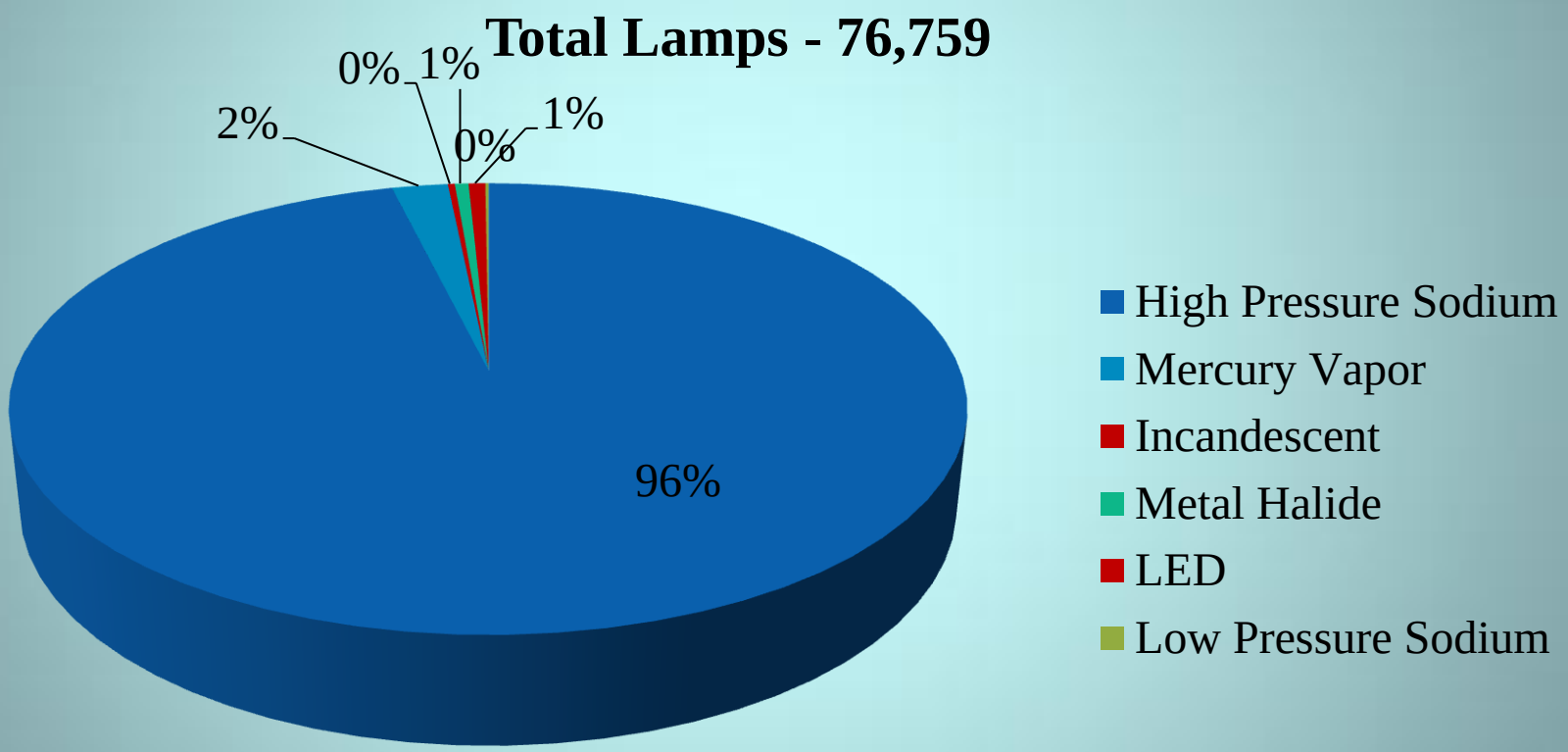
Existing Street Lighting Facilities

Street Lighting Facilities

- 1,300 Miles of Lighted Streets
- 248 Substations and Enclosures
- 67,380 Street Lights
  - 28,227 “Series” Lights
  - 39,153 “Multiple” Lights
- 8,810 Alley Lights
- 569 Specialty Lights
- 76,759 Total Lights Maintained by DPW

Street and Alley Light Lamp Types

(As of January 1, 2011)



Capital Improvement Program Elements

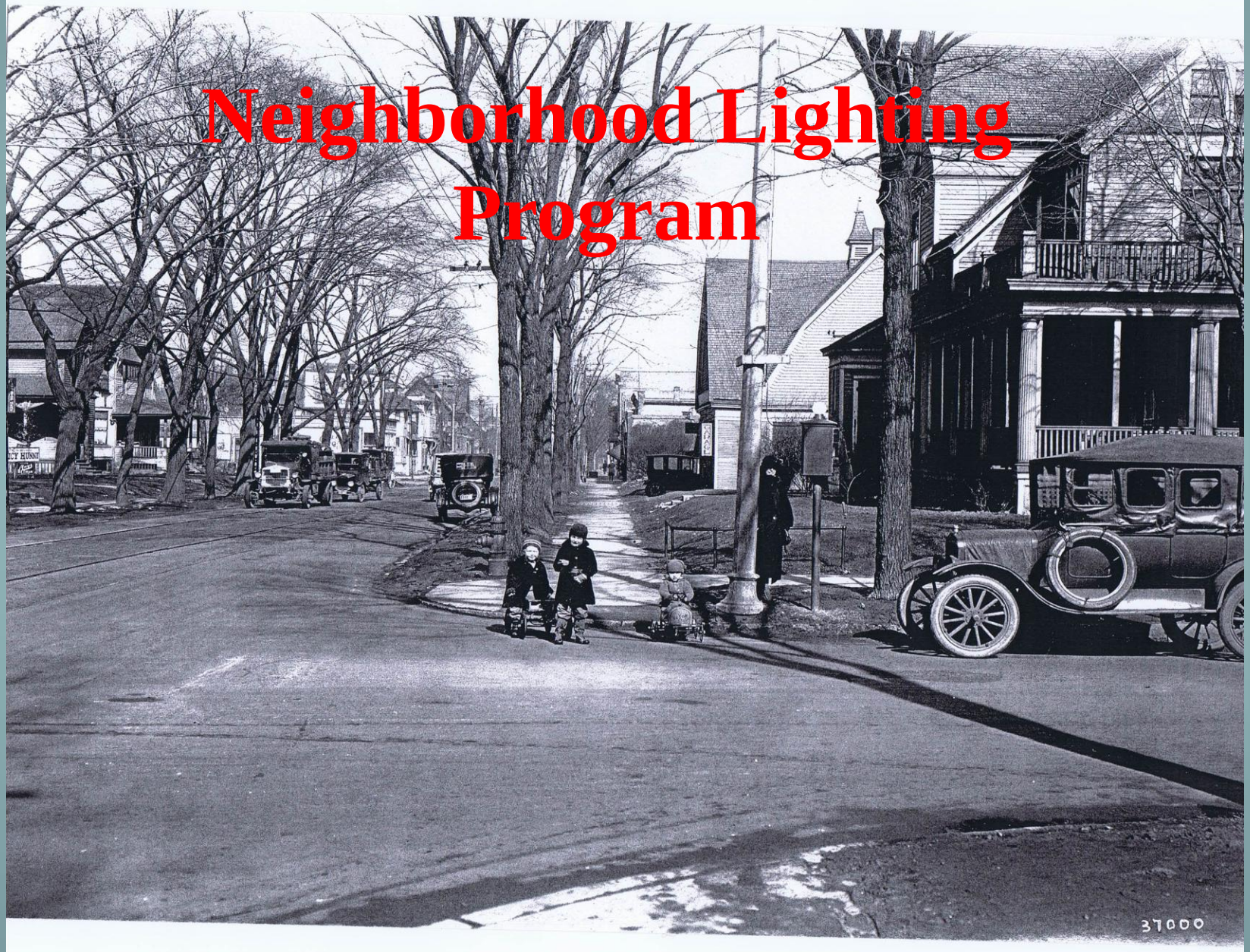
Paving Related Improvements

Paving Related Functions

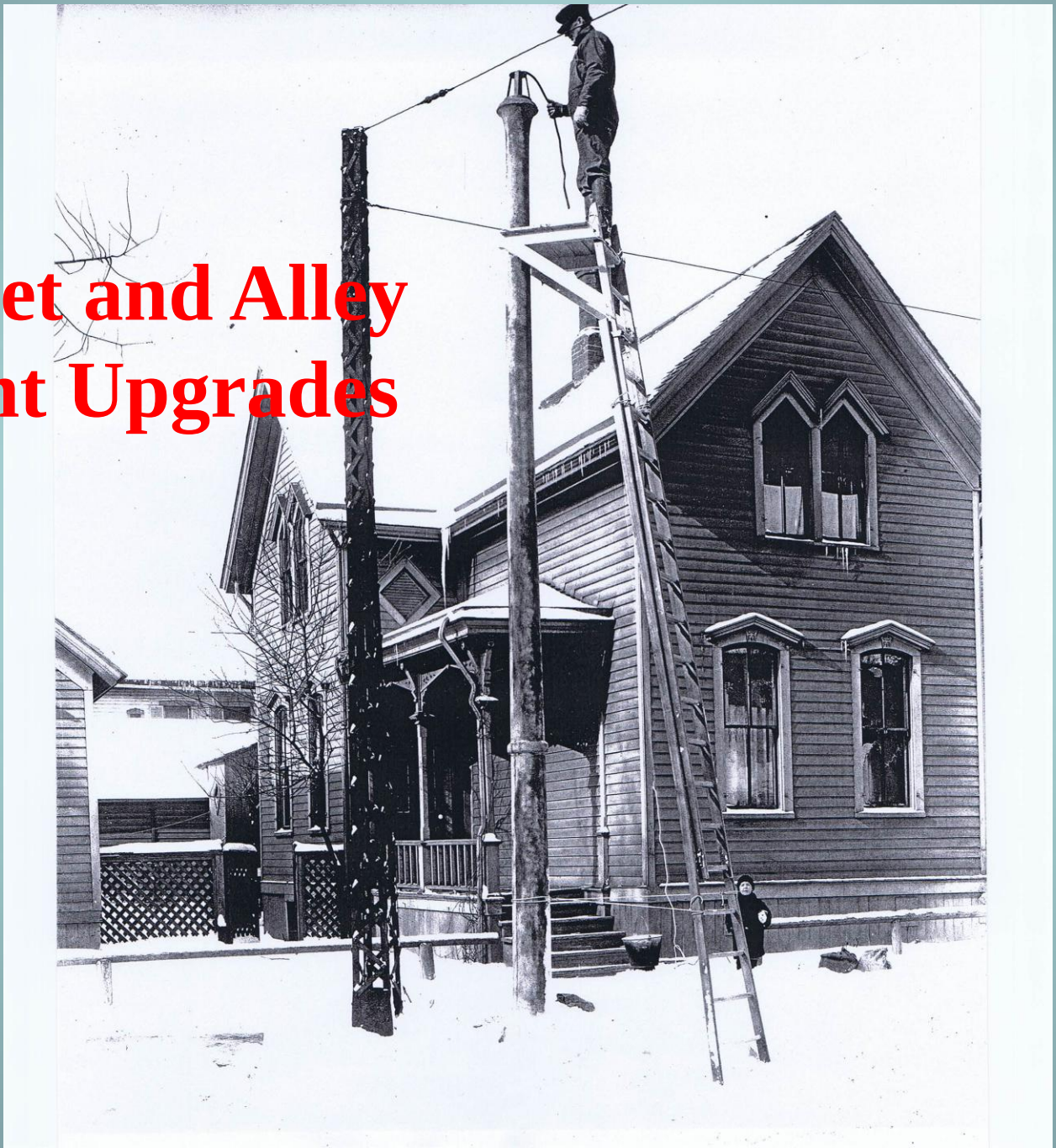
- Cable and Other Underground Equipment Typically Damaged During Curb Removal on Paving Projects

- Work Performed During Paving
  - Place Cable and Other Facilities Overhead Prior To Paving to Maintain Lighting Operation During Construction
  - Protect and Adjust Facilities as Necessary for Equipment Remaining in Place
  - Restore/Upgrade Facilities During Various Stages of a Paving Project

Neighborhood Lighting Program



Street and Alley Light Upgrades



Street and Alley Lighting Upgrades

- Provide New or Additional Alley Lights Based on City Lighting Standards Where Inadequate Lighting Exists

- Ongoing Program to Replace Mercury Vapor Lamps with High Pressure Sodium Lights


Replace Series
Circuitry

Series Circuit Replacement

- Outdated Technology Used Initially in the late 1910's and Early 1920's
- Designed Primarily for Use with Incandescent Lighting
- High Voltage System
- Aging Cable Plant Prone to Failure
- Transition Began to More Modern Multiple Circuitry in the 1950's
- Approximately 58% of Circuitry Converted to Multiple

Total Circuit Failure Report

(Series Circuits Highlighted in Yellow)

January 1, 2010 to December 31, 2010

Station	Circuit	Frequency
T11S	2	28
NM	15	15
T32NW	A	15
SL	3	15
T32NW	C	14
EJ	11	13
T11S	4	13
T28NW	C	12
SL	2	12
ND	22-21	12
SR	7	11
T32C	D	10
NK	9	10
NE	12	10
SR	1	10
SB	1&2	10
NL	8	10
NP	7	10
ND	10	10
NM	9	10
T6S	3&4	9
T44C	D	9
NE	1&2	9
NA	7&8	9
T7S	3	9
ND	7	9

Street Lighting Substations

Substations and Enclosures

- Central Distribution Point of Electrical Energy to Street Lighting Circuits
- Operates Street Lights
- Location and Housing of On-Street Control and Communications Equipment Used to Control On and Off Times

Substation Repair and Enclosure Maintenance

- Replace Deteriorated Enclosures
  - Necessary due to deterioration from Weather and Environmental Conditions
- Replace or Upgrade Major Electrical Components

Master Control System Replacement

- Citywide On and Off Times Controlled by System Operated at Canal Street Shop
- Operated Primarily Via Hardwire Communications System
- On and Off Times Determined Through Photo Cells at Canal Street Shop
- Existing System Based on World War II Era Control and Communications Technology

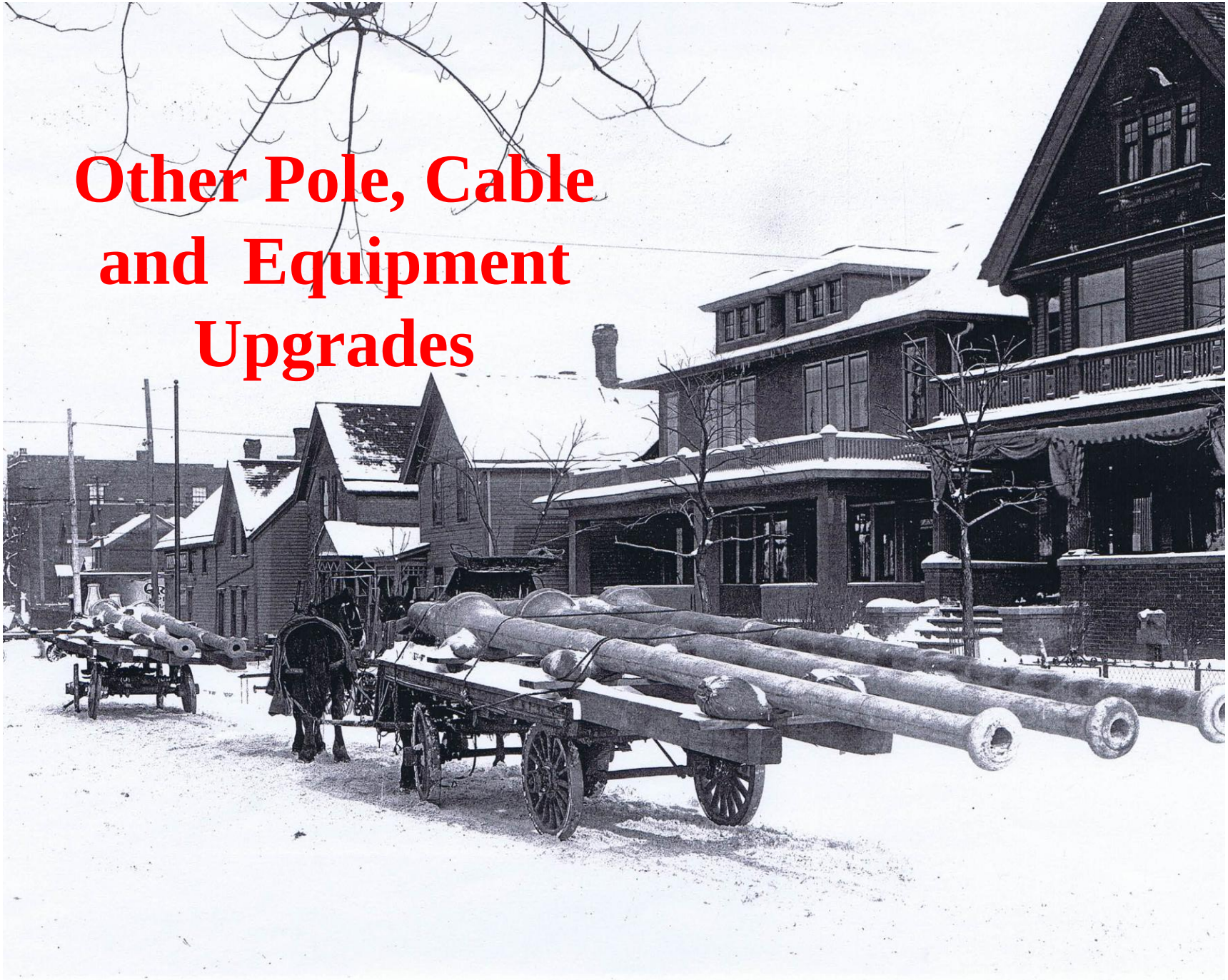
Master Control System Replacement (Cont.)

- Advanced Computer Based Master Control System Currently Being Deployed
  - Utilizes Radio Communications System
  - Controls Street Light On and Off Times
  - Fail Safe System at Each Enclosure to Turn Lights On and Off if Communications System Fails
  - Monitor Operation of Each Street Lighting Circuit
    - Detect Circuit Failures as They Occur
    - Reduce Response Times to Re-light a Circuit
    - Aids in Trouble shooting of Electrical Problems

Master Control System Replacement (Cont.)

- Advanced Computer Based Master Control System Currently Being Deployed
  - Operational at 33 Stations; 18 Stations Anticipated to be Let to Contract Early 2011
  - Design of an Additional 40+ Stations to begin in 2011
  - System Anticipated to be Fully Operational in 2015 Based on Current Six Year Capital Improvement Program

Other Pole, Cable and Equipment Upgrades



Other Pole, Cable and Equipment Upgrades

- Provides Funding to Address Needs Not Funded Under Other Budget Elements

- Replacement of Deteriorated Decorative Steel Poles

  - First Failures Occurred in Late 2007
  - Poles Inspected on Three Year Cycle
  - 2011 Pole Inspection Currently in Progress
  - Over 50 Poles Already Identified as Deteriorated to a Point Requiring Replacement

Uncollectable Pole and Equipment Knockdowns

- Applied to the Cost of Equipment Replacement Resulting From Traffic Accidents, Vandalism or Other Damage when Costs Cannot be Recovered from Parties Responsible For Damage
- First Included in Capital Program in 2004
- Total Expenditures of $388,000 for this Purpose for 2010 to Date

Annual Cost of Uncollectable Pole and Equipment Knockdowns (2004 through 2008)