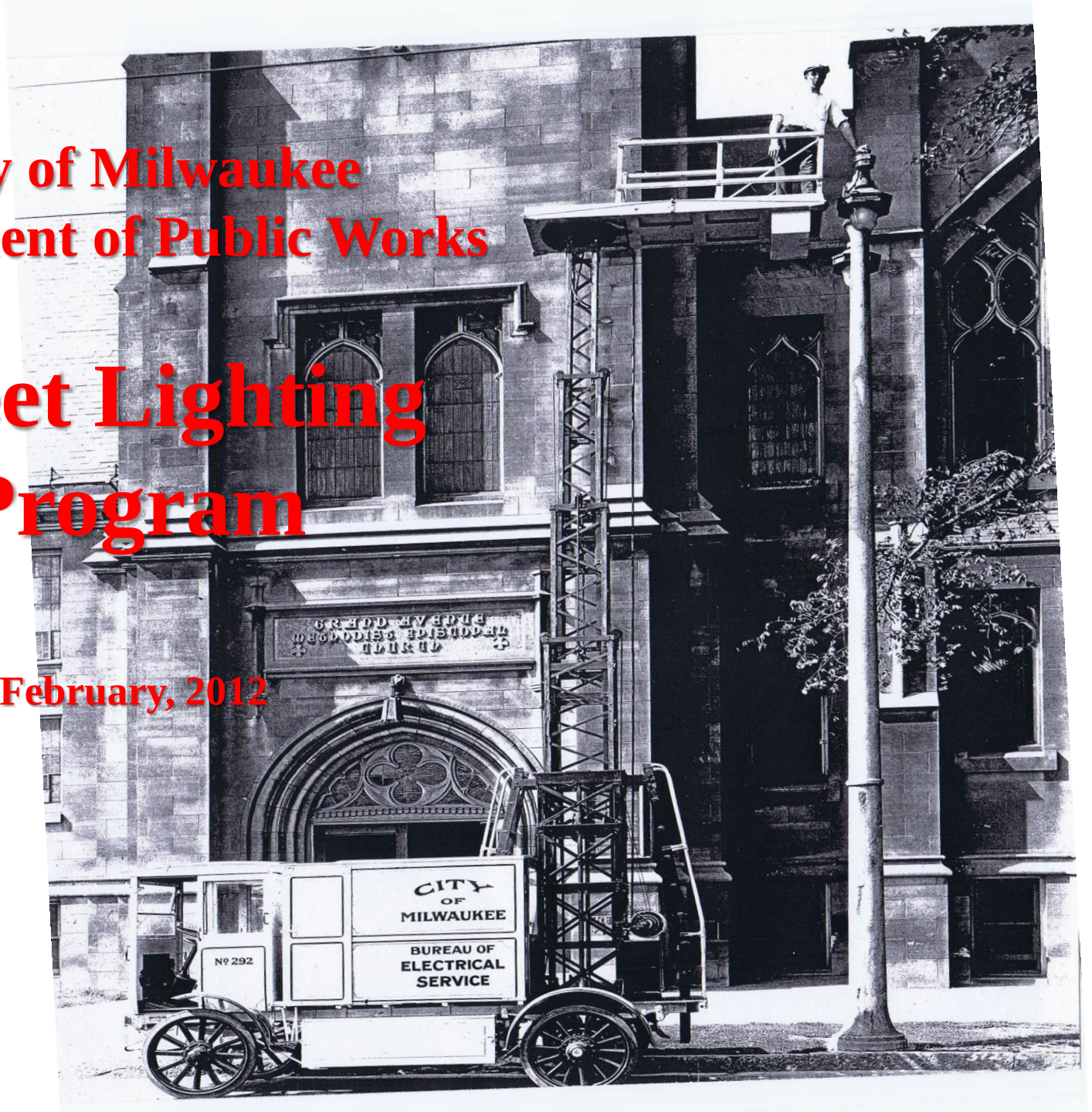
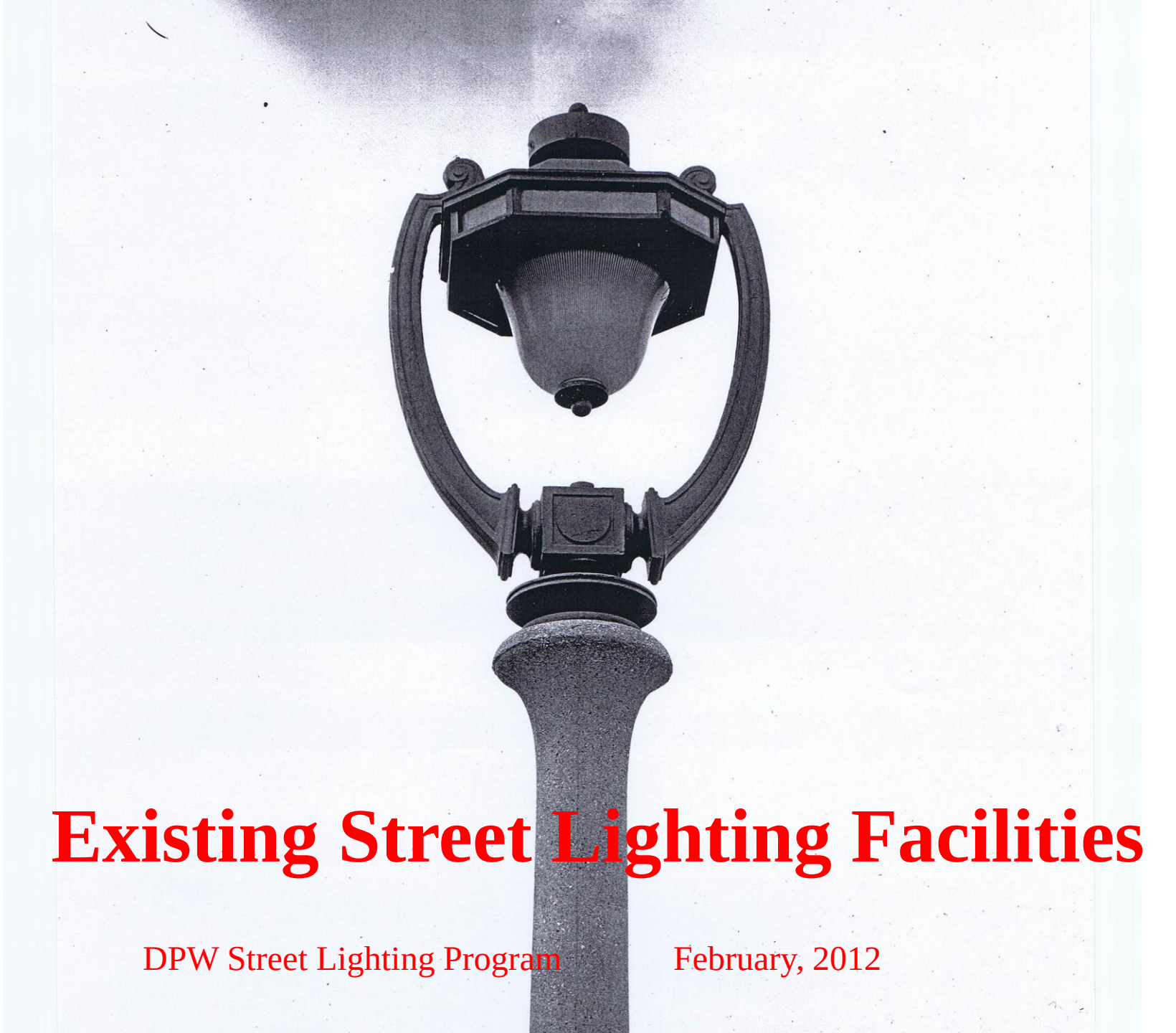
City of Milwaukee
Department of Public Works

Street Lighting Program

February, 2012





Existing Street Lighting Facilities

DPW Street Lighting Program February, 2012

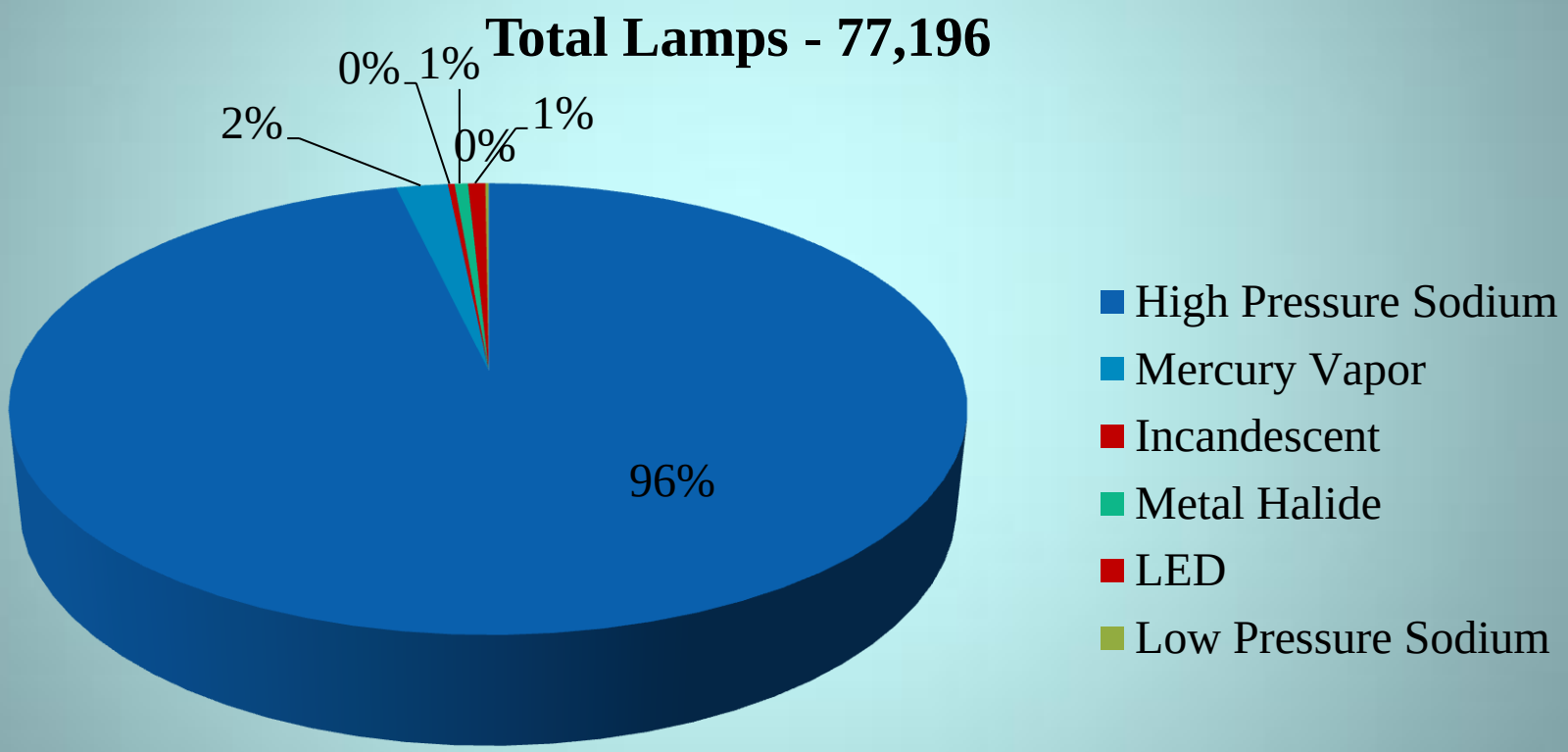
Street Lighting Facilities

(As of January 1, 2012)

- 1,290 Miles of Lighted Streets
- 249 Substations and Enclosures
- 68,381 Street Lights
  - 27,373 “Series” Lights
  - 41,008 “Multiple” Lights
- 8,815 Alley Lights
- 569 Specialty Lights
- 77,196 Total Lights Maintained by DPW

Street and Alley Light Lamp Types

(As of January 1, 2012)



DPW Street Lighting Program

February, 2012

LED Lighting Pilot Projects

- 17 High Pressure Sodium Light Replaced with 19 LED Lights on Indiana Avenue in 2011
- Failure of Power Supply in LED Retrofits in the Historic Third Ward Lighting Fixtures Requires Replacement of 508 LED Units
- LED Lights to be Installed in the Westlawn Area as Part of Reconstruction of That Facility

Capital Improvement Program Elements

Paving Related Improvements

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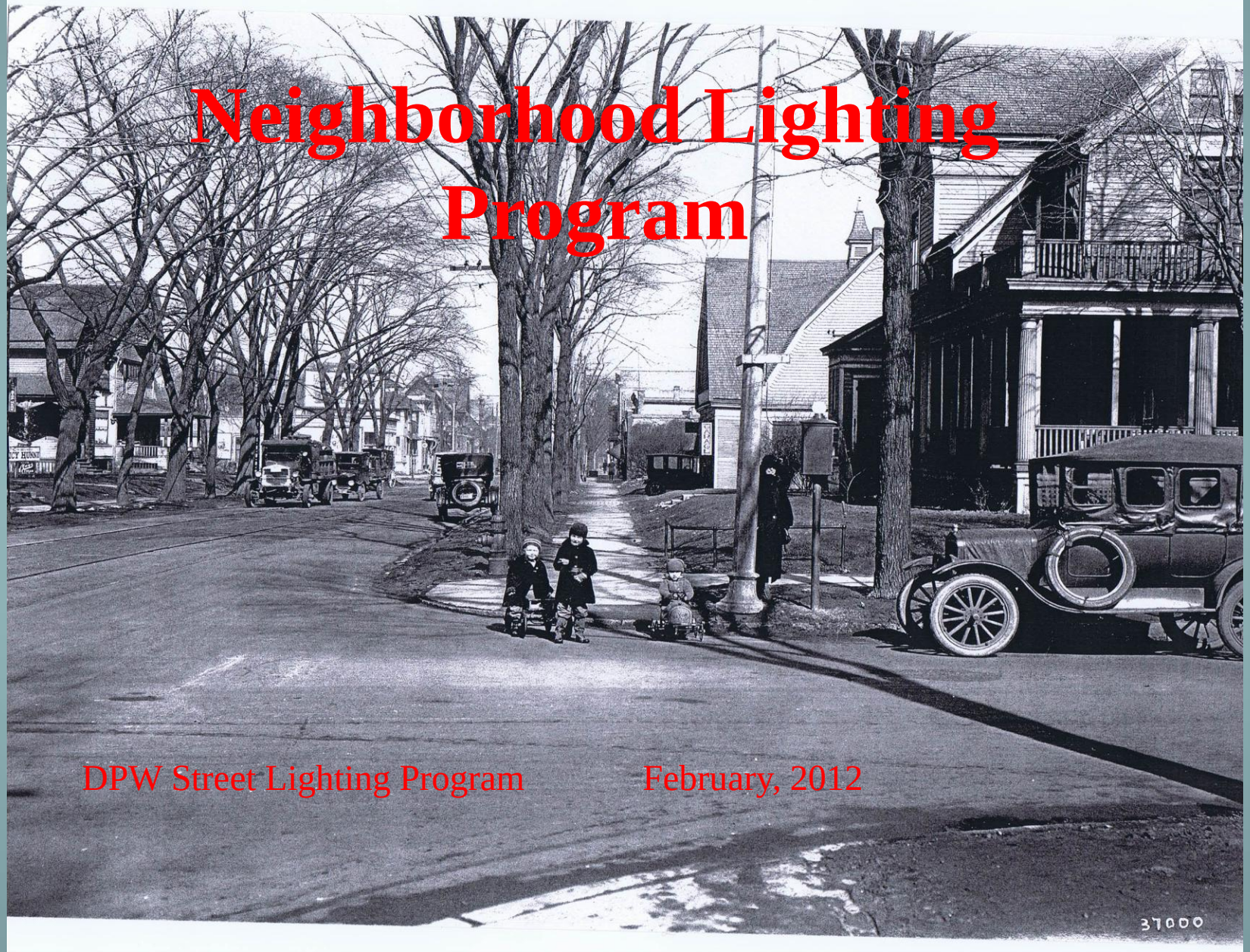
Paving Related Functions

- 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



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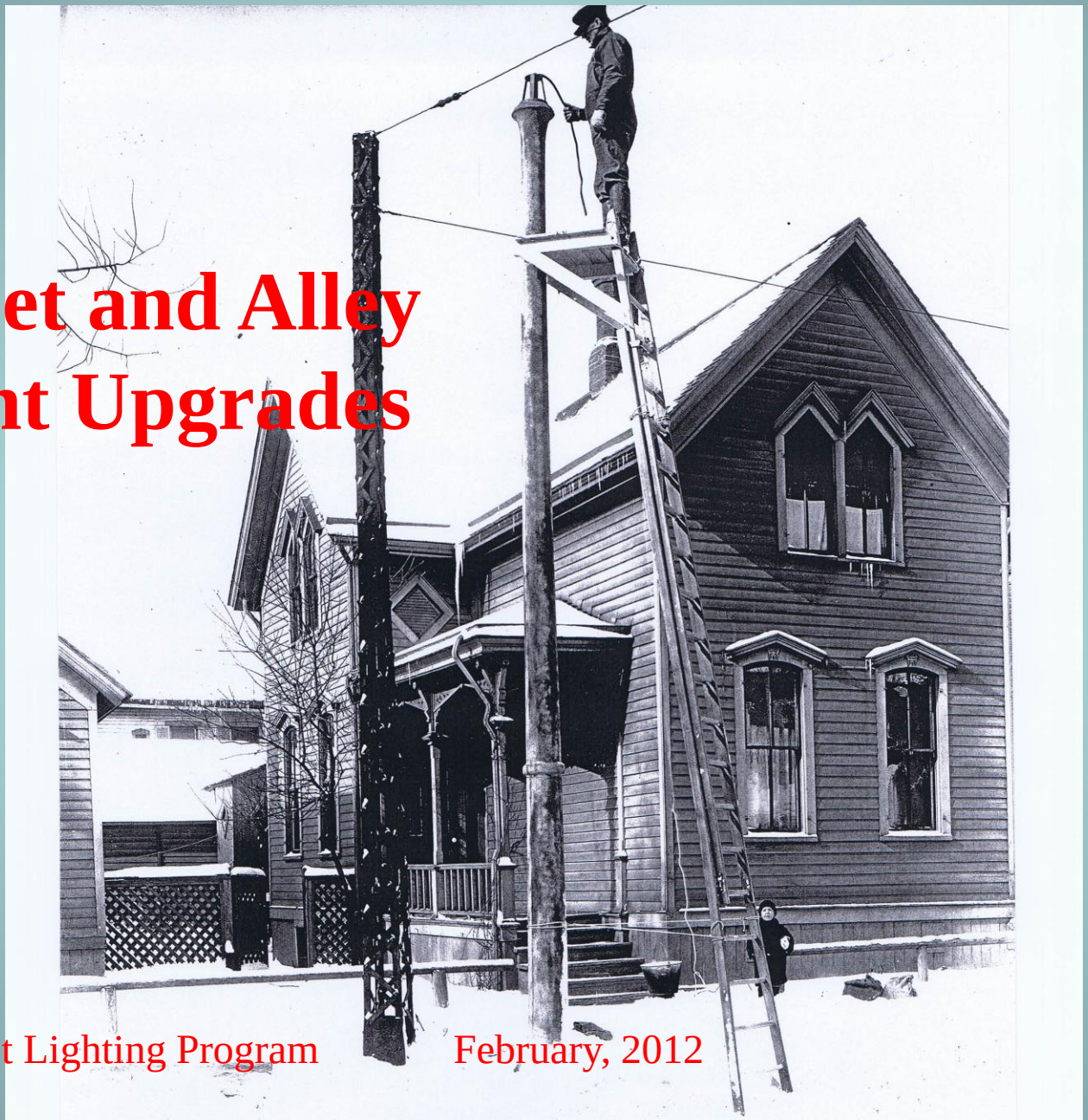
Street and Alley Light Upgrades



DPW Street Lighting Program February, 2012

Street and Alley Lighting Upgrades

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

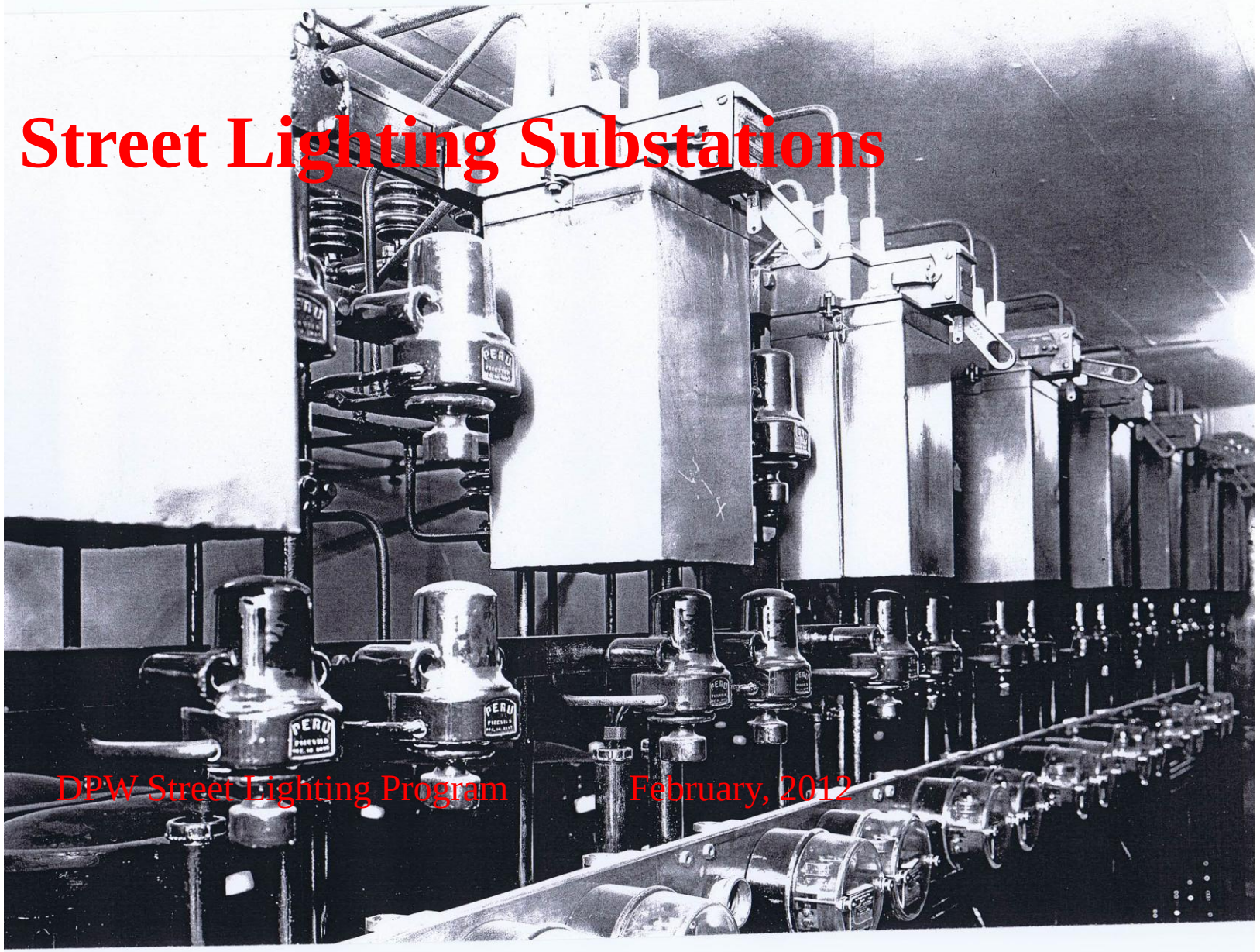
- Ongoing Program to Replace Mercury Vapor Lamps with High Pressure Sodium Lights


Replace Series Circuitry
DPW Street Lighting Program
February, 2012

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 60% of Circuitry Converted to Multiple

Street Lighting Substations



DPW Street Lighting Program February, 2012

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

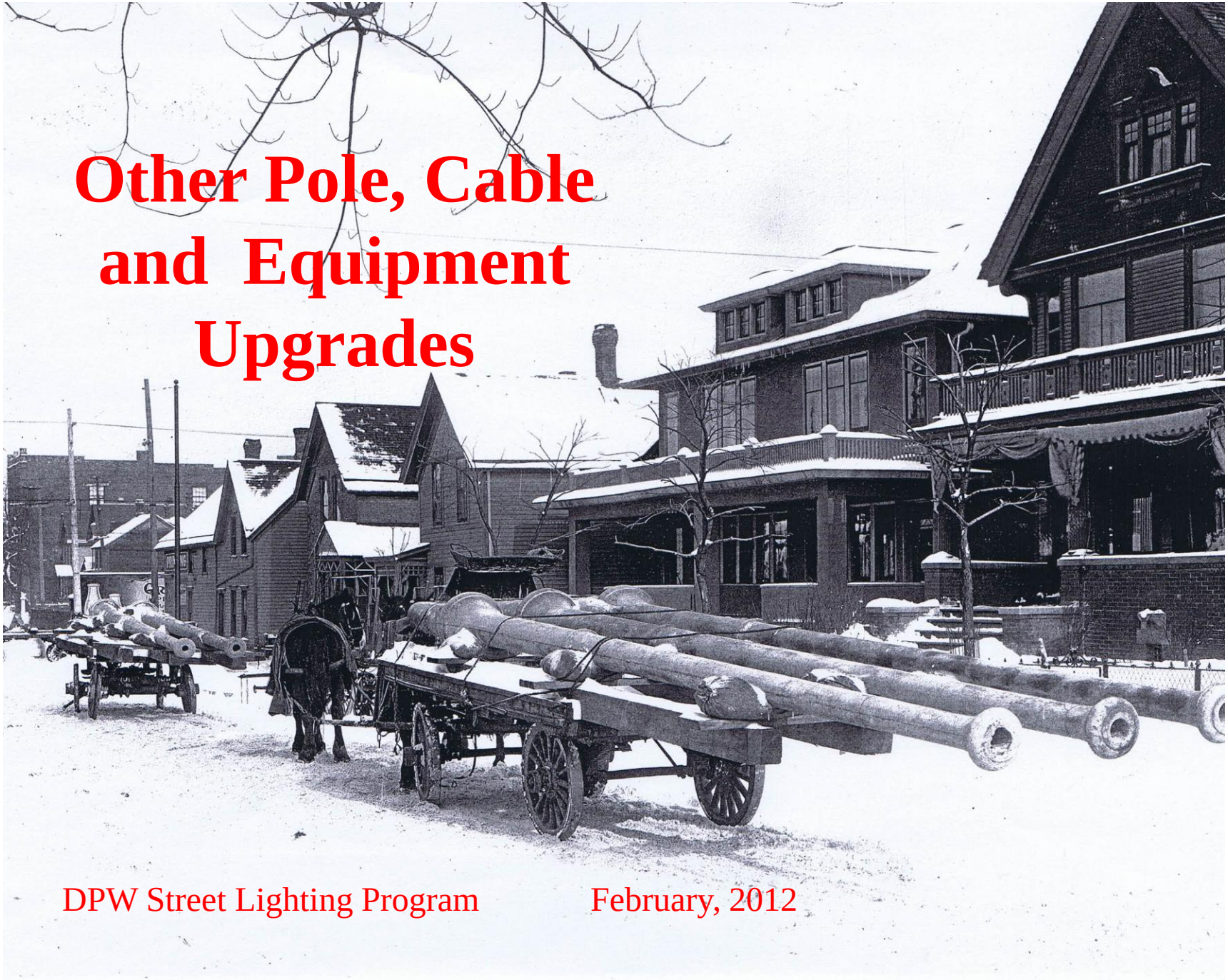
- Citywide On and Off Times Controlled by System Operated at Canal Street Shop
- Operated Primarily Via Hardwire Communications System
- On and Off Times Determined Through Photo Cells at Canal Street Shop
- Existing System Based on World War II Era Control and Communications Technology

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 51 Stations; 22 Stations Anticipated to be Let to Contract in Summer, 2012
  - Design of an Additional 40+ Stations to begin in Late 2012
  - System Anticipated to be Fully Operational in 2016 Based on Proposed Six Year Capital Improvement Program



Other Pole, Cable and Equipment Upgrades

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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 Two Year Cycle
  - Over 80 Poles Identified as Deteriorated to a Point Which Required Replacement in 2011
  - Replacement to begin on Shepherds Crook Style Lighting Fixtures Remaining in Schlitz Park, Dr. Martin Luther King Jr. Drive and in the Vicinity of the Blatz Complex

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 $370,000 for this Purpose for 2011 to Date

Annual Cost of Uncollectable Pole and Equipment Knockdowns (2004 through 2011)