

City of Milwaukee  
Department of Public Works  
February, 2011

# Traffic Control Program



W. North Avenue and 3<sup>rd</sup> Street

# Traffic Control Facilities

- DPW Responsible for Installation, Operation and Maintenance of All Traffic Signals, Signs and Pavement Markings on Streets in the City of Milwaukee
- Shared Responsibility for Traffic Control with Other Jurisdictions at Boundary Locations

# **Capital Program Funding Elements**

# Paving Related Improvements

- Traffic Signing and Signal Upgrades with Various Federal Aid Programs (STP, HSIP, CMAQ, TE, etc.)
- Traffic Signals – (City Capital Improvement Program)
  - Provide Overhead Cable on Roadway Reconstruction Projects
  - Install Temporary Signal Equipment as Necessary
  - Permanent Signal Equipment Restoration (Non - Federal Aid Projects)
- Traffic Signs (City Capital Improvement Program)
  - Replace all Signs On Roadway Reconstruction Projects
  - Replace Outdated Signs on Resurfacing Projects

# Non-Paving Related Improvements

- Projects to Reconstruct, Upgrade or Install New Signs and Signals Prioritized Based on Fund Availability and the Following Needs:
  - Accident Countermeasures
  - Changes in Travel Demand and Patterns
  - Urban Development
  - Citizen Complaints/Requests
  - Technological Advancements
  - Changes in Minimum Standards
    - **Significantly Revised MUTCD Effective in 2010**

# **Existing Traffic Control Facilities**

(As of January 1, 2011)

# Traffic Signals



# Traffic Signals

(As of January 1, 2011)

- 747 Signalized Intersections
  - 738 Intersections Fully Converted to LED Signal Indications
  - 275 Intersections with Fire Preemption Active
  - 17 Time-Based Coordinators
  - 70 Intersections with Pedestrian Countdown Timers
  - 12 Intersections with Audible Pedestrian Signals
- 13 Flashing Beacons



# Traffic Signal Controllers

- All Electro-Mechanical Controllers Replaced with Solid State Controllers beginning in the Early 1980's
- Upgrade Completed in 2007
- Average Useful Life of 20 Years
- Equipment No Longer Supported by Manufacturer
- Technological Advances in Communications Systems not Totally Compatible with Current Equipment
- Controllers Would Need to Be Replaced to Implement Advanced Control Strategies, and Remote System Control and Monitoring

# Traffic Signal TBC's

- Time Based Coordinators (TBC)
  - Used for Synchronization of Traffic Signal Systems
  - Current Equipment is Functionally Obsolete
  - Replacement Units No Longer Manufactured
  - Alternative Replacements Not Compatible with Existing Communications Technology
  - Advanced Systems will Allow Remote Monitoring as well as Signal Coordination
  - May require Equipment and Communications System Upgrade in the Event of Existing Equipment Failure

# Signal Indications



# LED Signal Indications

- Group Replacement of Incandescent Signal Indications with LED Indications Begun in 2004
- Provide Significant Reduction in Energy Consumption and Better Visibility of Signal Indications for Drivers
- Funded Primarily Through Federal Aid Programs for Safety and Paving , as well as Through a Guaranteed Energy Saving Performance Contract
- Average Equipment Service Life Currently Unknown Based On City Experience
- Manufacturer’s Warranty of 6 to 7 Years

# Section 4E.07

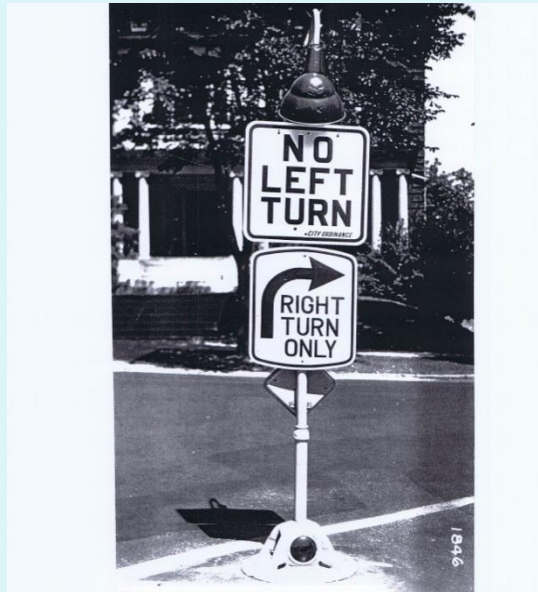
## Countdown pedestrian displays



Source: FHWA

# Countdown Pedestrian Signals

- Display the Amount of Time Remaining in the Flashing Don't Walk Signal Phase Before the Start of Yellow Phase
- First Countdown Indication in the City Installed at Lapham Street and Layton Boulevard in Late 2004
- Currently Mandated for All Signalized Intersections in the 2009 Manual on Uniform Traffic Control Devices
- Funding has Been Secured through the Federal Highway Safety Improvement Program and Surface Transportation Program for Group Replacement of All Pedestrian Indications.

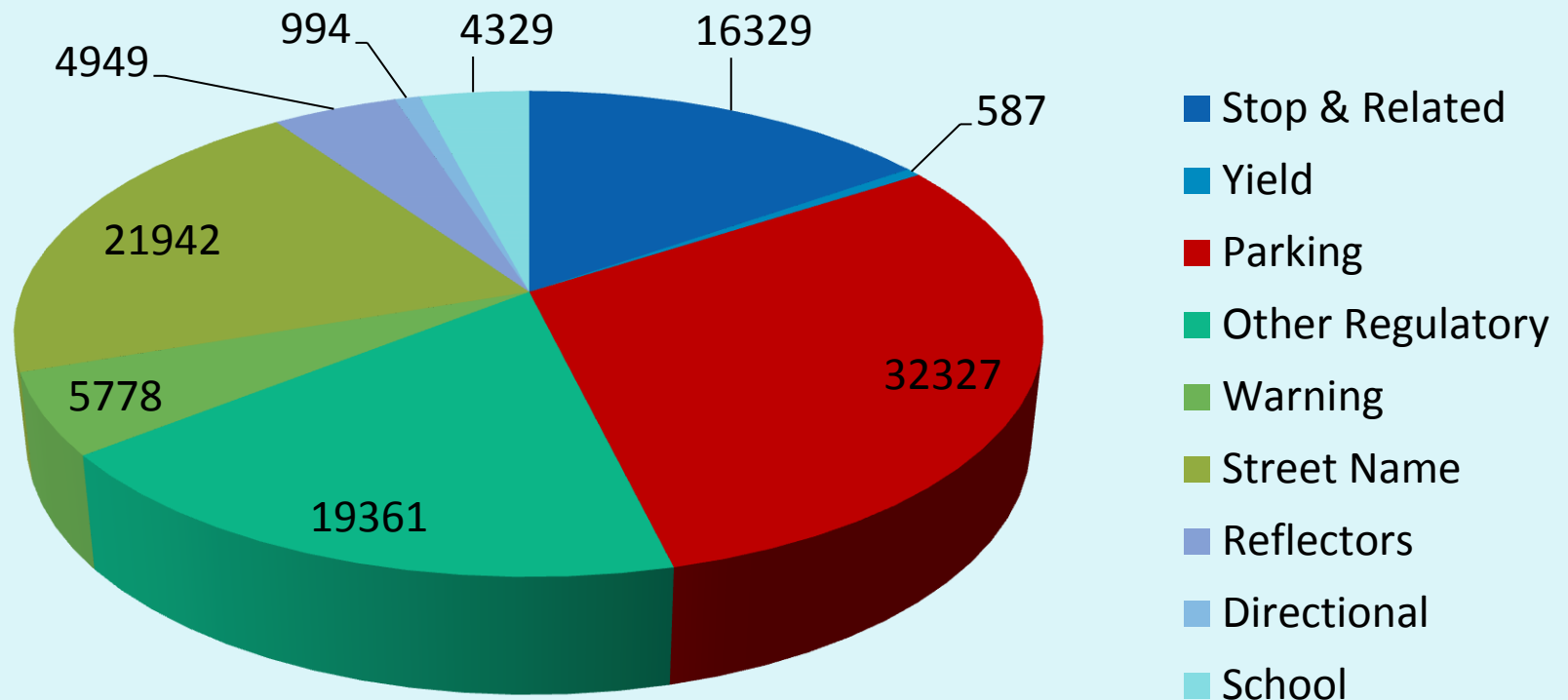


# Traffic Signs

# Traffic Signs by Sign Type

(As of January 1, 2011)

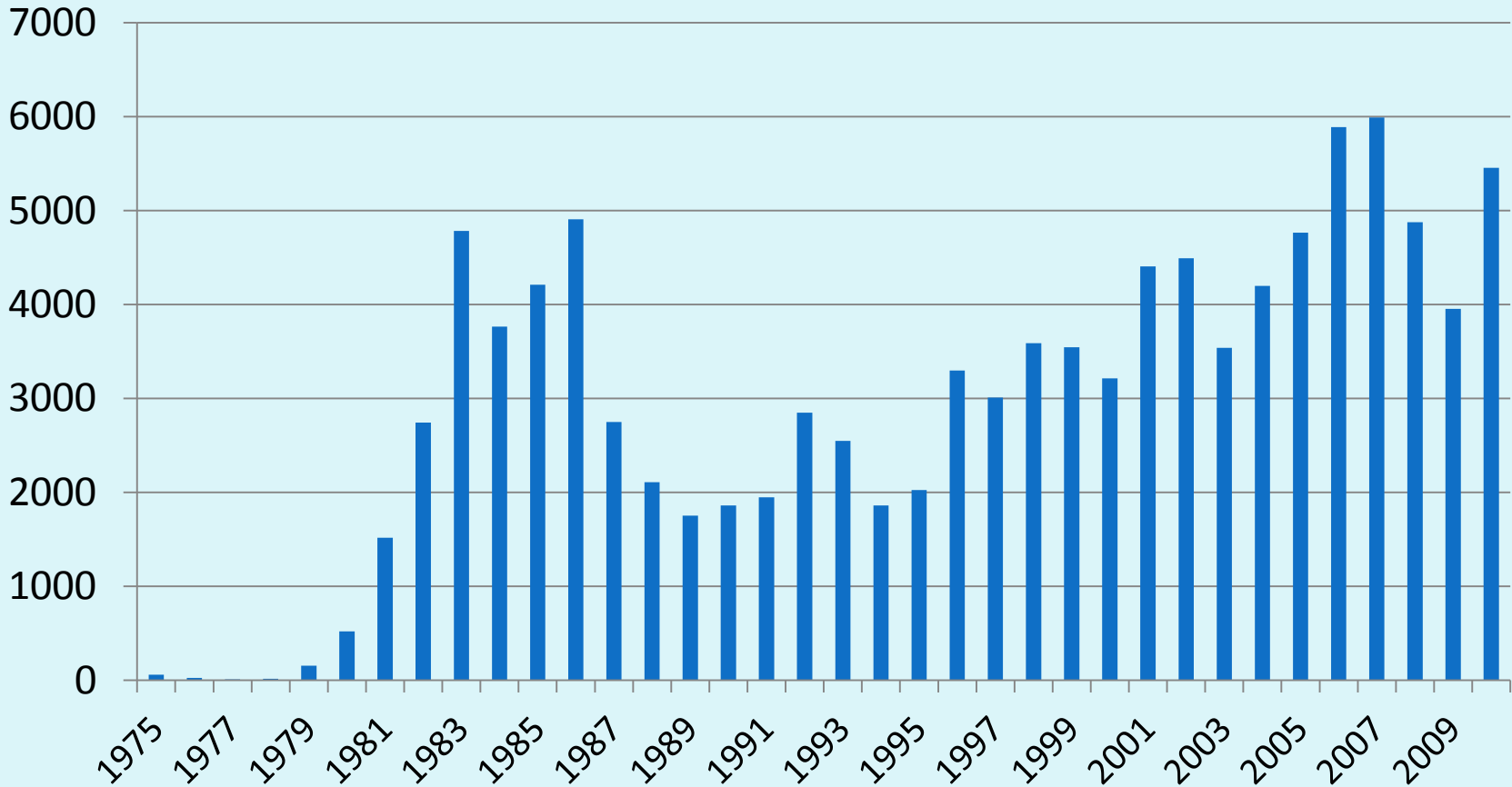
**Total Existing Traffic Control Signs: 106,596**





# Existing Signs by Sign Installation Date

(as of January 1, 2011)



DPW Traffic Control Program






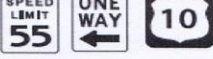
February, 2011

# Manual On Uniform Traffic Control Devices

- All Traffic Control Devices on City Streets Must Conform to the MUTCD Per Wisconsin Statutes
- Sets Forth the Basic Principles Governing Design and Use of Traffic Control Devices
- Provides the Framework for Installation, Operation and Maintenance of Devices
- Provides Uniformity of Traffic Control Devices Throughout the Country

# MUTCD Minimum Sign Retroreflectivity Standards

- US Department of Transportation Mandated by Congress to Implement Sign and Pavement marking Retroreflectivity Standards
- Final Rule on Maintaining Traffic Sign Retroreflectivity was Issued on December 21, 2007
- Sign Retroreflectivity Rule Modified the 2003 Manual on Uniform Traffic Control Devices as Revision 2 of That Edition, and Became Effective on January 22, 2008

Sign color and type	Sheeting types and expected sign life	Phase-in sign date
<b>WHITE on GREEN</b>  Guide signs	Prismatic high intensity 10-12 yrs Fluorescent 12-15 yrs	Jan 22, 2015
 Overhead guide signs	Prismatic high intensity 10-12 yrs Fluorescent 12-15 yrs	Jan 22, 2018
<b>BLACK on YELLOW</b>  Warning signs	Prismatic high intensity 10-12 yrs Fluorescent 12-15 yrs	Jan 22, 2015
<b>BLACK on ORANGE</b>  Warning in Work zone	Prismatic high intensity 10-12 yrs Fluorescent 12-15 yrs	Jan 22, 2015
<b>WHITE on RED</b>  Stop, Yield, Wrong Way Do Not Enter, etc.	Engineer grade 7 yrs High intensity beaded 10 yrs Prismatic high intensity 10-12 yrs Fluorescent 10-15 yrs	Jan 22, 2015
<b>BLACK on WHITE</b>  Speed Limit, One Way U.S. Highway, etc.	Engineer grade 7 yrs High intensity beaded 10 yrs Prismatic high intensity 10-12 yrs Fluorescent 10-15 yrs	Jan 22, 2015
<b>Signs excluded from retroreflectivity maintenance guidelines:</b> Parking, Standing & Stopping signs (R7 & R8 series) Walking, Hitchhiking & Crossing signs (R9 series, R10-1 through R10-4b) Adopt-a-Highway signs All signs with blue or brown background Bikeway signs for exclusive use of bicycles or pedestrians		

# Summary of Expected Sign Life Based on MUTCD Minimum Retroreflectivity Standards, and Mandatory Phase in Times

Simplified version of MUTCD Table 2A-3, shows sign types, materials that meet minimum retroreflectivity levels, and phase-in dates.

# City Program to Meet Minimum Sign Retroreflectivity Standards

- Program to Assess and Manage Signing to Maintain Minimum Requirements to be in Place by January 22, 2012
- Currently, Sign Sheeting Performing Better than that Suggested by FHWA
- Outdoor Test Rack Made Functional in 2010 to Monitor Sheeting Performance for Determination of Need for Sign Replacement
- Retroreflectivity of a Sample Population of Existing Signs to be Field Measured to Determine Need for Group Replacement of Signs in Service

# **Pavement Marking Program**

# Types of Pavement Markings Maintained

- Lane Lines and Center Lines
  - 333 Miles
- Arrows, “Only”, and Bicycle Symbols
  - 298 Locations
- Bike Lanes (Single and Double Lined)
  - 51 Miles
- Crosswalks
  - 1,797 Locations

# Average Useful Life of Pavement Markings

- Painted: 1 Year
- Inlaid Plastic: 5 Years
- Epoxy: 3 Years



# Changes in Minimum Standards

# 2009 Manual on Uniform Traffic Control Devices

Federal Effective Date:  
January 15, 2010

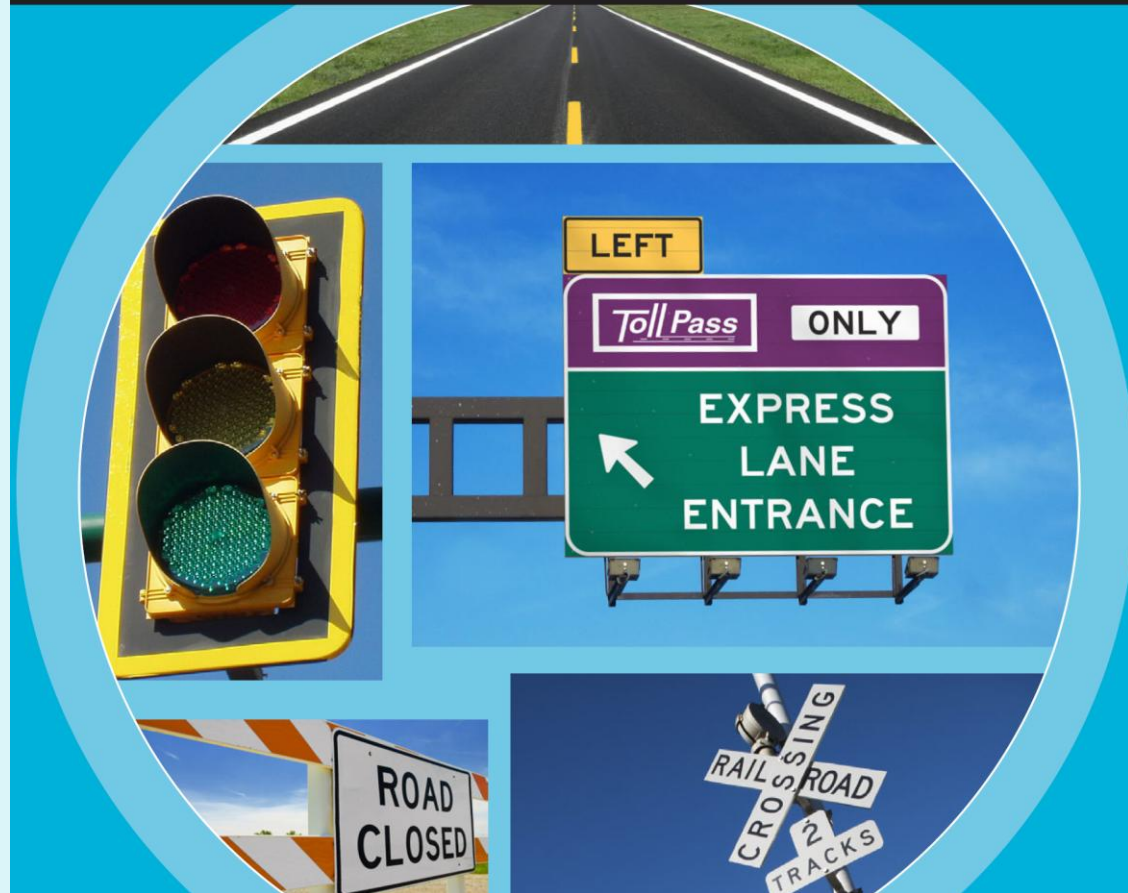
Must Be Adopted into  
State Law Before  
Becoming Effective in  
Wisconsin (Est.  
February, 2011)

Source: FHWA

## Manual on Uniform Traffic Control Devices

for Streets and Highways

2009 Edition



# Effects of MUTCD Changes

- When the MUTCD is Adopted by the State of Wisconsin:
  - All New Equipment Installed Must Comply with New MUTCD Provisions
  - Compliance Dates and Guidelines Established for Replacement or Upgrade of All Non-Compliant Traffic Control Devices and Other Traffic Control Elements

# Critical MUTCD Mandatory Compliance Dates: Traffic Signs

- Retroreflectivity Management Method: January 22, 2012
- Regulatory, Warning and Post Mounted Guide Sign Minimum Retroreflectivity: January 22, 2015
- Street Name and Overhead Guide Sign Minimum Retroreflectivity: January 22, 2018
- “One Way” Signs - Number and Location: December 31, 2019

# Critical MUTCD Mandatory Compliance Dates: Traffic Signals

- Yellow and All Red Clearance Interval Timing Changes: December 31, 2014
- Pedestrian Clearance Interval Changes (Minimum Buffer Interval): December 31, 2014
- Pedestrian Walking Speed: Reevaluation Required When Mandatory Pedestrian Clearance Timing Changes Implemented

# Wisconsin MUTCD Supplement

- Anticipated to be Adopted by the Wisconsin State Legislature in February, 2011
- Legislature Previously Enacted Statutory Provision Requiring Double Forfeitures for Speed Violations in School Zones
- New Requirements for Installation of Mandatory “Fines Double” and “End School Zone” Signs

# U.S. Access Board

- Authority for Establishing Accessibility Requirements Under the Americans With Disabilities Act
- Draft Final Rule for the Public Rights of Way Access Guidelines (PROWAG)
- Final Rule Anticipated in Early 2011
- Anticipated to Have Significant Impact on Access Standards in the Public Right of Way for Persons With Disabilities

# Other Budgetary Impacts



# Uncollectable 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 approximately \$160,000 to date for Damages Experienced in 2010