INVENTORYING AND MAINTAINING SIGNAGE AND OTHER TOWNSHIP ASSETS WITH GIS

Upper Leacock Township
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Lancaster County, Pennsylvania

By: Howard S. Hodder, Jr., MGIS, GISP
AGENDA

- Welcome and Introduction
- “Who” is Upper Leacock Township?
- Uses of GIS Technologies
  - Asset Management
  - Vehicle Tracking / Reporting
  - Utility Infrastructure Mapping
  - Sign Inventory / Maintenance
- Conclusion
- Discussions / Q&A
INTRODUCTION

Howard S. Hodder, Jr., MGis, GISP

- Geographic Information System (GIS) Specialty Service Group Manager
- Bachelor’s degree in Geography from Bloomsburg University
- Master’s degree in GIS from Penn State University (MGIS)
- Certified GIS professional (GISP)
- Extensive experience with both municipal and private GIS application development, GPS data collection, and database development
  - Sanitary Sewer, Storm Water, Sign Inventory / Retroreflectivity, Roadways, Zoning, Asset Management, Emergency Response, etc.
INTRODUCTION

Full service engineering firm – able to fully support the growing and complex needs of our clients – from the initial planning and analysis of financing alternatives through final design, construction administration and operational guidance.

We specialize in providing one-on-one service to each of our clients – responding to your needs, anticipating challenges and delivering precise solutions.

- Geographic Information Systems (GIS)
- Surveying (Conventional and GPS technologies)
- Transportation
- Water, Wastewater, Stormwater Systems
- Land Development
- Electrical Engineering
- Financial Services
- Water Resources/Environmental Studies and Design

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Introduction

Upper Leacock Township, Lancaster County, Pennsylvania
- Total Area: ~18 square miles
**Upper Leacock Township, Lancaster County, Pennsylvania**

- 2010 US Census Information

| Population | | Population by Income |
|------------|------------|
| Total Population | 5,738 | **Population by Income** |
| Living Status | 5,996 | Male: 2,623 |
| Total | 2,936 | Female: 4,620 |
| Owner-occupied | 1,984 | Under 19: 2,356 |
| Population in owner-occupied | 5,945 | 18-24: 8,103 |
| Renter-occupied | 1,771 | 25-34: 1,051 |
| Population in renter-occupied | 2,054 | 35-44: 1,587 |
| Households with | 1,382 | 45-54: 1,330 |
| Individuals under 18 | 1,201 | 55-64: 1,656 |
| Vacant | 139 | 65 & over: 1,980 |
| Vacant for rent | 93 | **Population by Race** |
| Vacant for sale | 9 | White: 7,879 |

- Hispanic or Latino: 528
- Non Hispanic or Latino: 5,170
- Other: 134
- Identified by two or more: 101
### GIS / GPS APPLICATION EXAMPLES

<table>
<thead>
<tr>
<th>Time Frame</th>
<th>Deliverables / Uses</th>
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</thead>
</table>
| Data Collection and System Development Over Multiple Years (2006 – Present) | • Asset Management  
• Vehicle Tracking / Maintenance  
• Utility Infrastructure Inventory / Maintenance  
• Sign Inventory / Maintenance / Retroreflectivity  
• Shared Geodatabase  
• WebGIS Applications  
• Mobile Solutions  
• Document Management  
• MS4 Reporting  
• Pavement Management |
• 11 Vehicles – all pick-up trucks to date, plans to rearrange installs this winter to track plow/cinder trucks
• Allows reporting for vehicle maintenance, MPH, MPG, locations, etc.
• Utilized high precision RTK GPS collection methods for feature data collection
• Over 80% of collection system in low-pressure
• System is collection and conveyance – no formal treatment facilities
• Utilized high precision RTK GPS collection methods for feature data collection
• Water supplies are supplemented by Lancaster City Water sources as required but is very minimal
• Utilized high precision RTK GPS collection methods for feature data collection
• Mapping is essential resource for meeting / exceeding requirements set by DEP/EPA for Municipal Separate Storm Sewer (MS4) reporting
What is Retroreflectivity?

Most signs are covered with a retroreflective sheeting material that consist of either plastic with glass beads, or a pattern of cube corners that act like prisms to redirect light from vehicle headlights back to the source. This sheeting material degrades over time thus reducing the ability to redirect light.

Federal Mandate:

The Federal Highway Administration (FHWA) has issued a new standard to maintain traffic signs to a minimum level of retroreflectivity. There are two basic methods that can be used to maintain sign retroreflectivity at or above the minimum levels: assessment and management. Assessment methods require the evaluation of individual signs. Management methods maintain the sign retroreflectivity without having to assess individual signs.
Regulations / Standards
The Manual on Uniform Traffic Control Devices (MUTCD) requires agencies to establish and implement a sign assessment or management method that will maintain minimum levels of sign retroreflectivity.

*NEW* Revision to 2009 MUTCD - Compliance Dates
On May 14, 2012, a final rule was published in the Federal Register, revising Table I-2 in the Introduction of the 2009 MUTCD to modify the compliance dates for the minimum maintained sign retroreflectivity standard. That rulemaking extended the compliance date for implementation and continued use of an assessment or management method that is designed to maintain traffic sign retroreflectivity at or above the established minimum levels to June 13, 2014 and refined the compliance date to only apply to regulatory and warning signs, and not others.

In addition, the final rule eliminated the target compliance dates for actual replacement of signs, which had previously been required by 2015 for post-mounted guide signs (except street name signs) and 2018 for street name signs and overhead guide signs. Visit the MUTCD website for additional information on this and other changes to the MUTCD.

MUTCD Language - Maintaining Sign Retroreflectivity:
This link takes you to Chapter 2A of the 2009 MUTCD. Scroll down to Section 2A.08 Maintaining Minimum Retroreflectivity on page 30 of the 2009 MUTCD.

MUTCD Final Rule - Federal Register Notice;
Published on Dec. 21, 2007 and effective Jan. 22, 2008, this final rule provided
background and detail explaining the requirements for maintaining sign retroreflectivity. This document describes how the final rule was developed through the rulemaking process for the MUTCD. Note that the compliance dates related to this rulemaking were revised in May 2012.
What are the Suggested Methods?

The methods for maintaining minimum retroreflectivity are separated into two methods, assessment methods and management methods as follows:

1. Assessment Methods:

There are two types of assessment methods:

- **Visual Nighttime Inspection** - A trained sign inspector conducts a visual inspection from a moving vehicle during nighttime conditions.

- **Measured Sign Retroreflectivity** - Signs with retroreflectivity below the minimum levels, either observed or measured (which is done using a retroreflectometer) are required to be replaced.

2. Management Methods:

There are three management methods of maintaining sign retroreflectivity:

- **Expected Sign Life** - Individual signs are replaced before they reach the end of their expected service life, usually 10 years. This is based on a system for tracking sign age,
which keeps track of when a sign was installed or fabricated.

Blanket Replacement – All signs in an area/corridor, or of a given type, are replaced at specified intervals based on the expected sign life.

Control Signs – A control sample of signs is used to represent all of the signs. The retroreflectivity of the control signs are monitored and sign replacement is based on the following types of signs, which may be excluded from these maintenance guidelines:

- Parking, Standing, and Stopping Signs
- Walking/Hitchhiking/Crossing signs
- Adopt-A-Highway signs
- All signs with blue or brown backgrounds
- Bikeway signs that are intended for exclusive use by bicyclists or pedestrians
# RETROREFLECTIVITY LEVELS

<table>
<thead>
<tr>
<th>Sign Color</th>
<th>Beaded Sheeting</th>
<th>Prismatic Sheeting</th>
<th>Additional Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>White on Green</td>
<td>W* G ≥ 7</td>
<td>W* G ≥ 15</td>
<td>III, IV, VI, VII, VIII, IX, X</td>
</tr>
<tr>
<td></td>
<td>W* G ≥ 25</td>
<td>W ≥ 250; G ≥ 25</td>
<td>Overhead</td>
</tr>
<tr>
<td></td>
<td>W* G ≥ 7</td>
<td>W ≥ 120; G ≥ 15</td>
<td>Ground-mounted</td>
</tr>
<tr>
<td>Black on Yellow</td>
<td>Y*; O*</td>
<td>Y ≥ 50; O ≥ 50</td>
<td></td>
</tr>
<tr>
<td>or Black on</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orange</td>
<td>Y*; O*</td>
<td>Y ≥ 75; O ≥ 75</td>
<td></td>
</tr>
<tr>
<td>White on Red</td>
<td>W ≥ 35; R ≥ 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black on White</td>
<td>W ≥ 50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. The minimum maintained retroreflectivity levels shown in this table are in units of cd/lx/m² measured at an observation angle of 0.2° and an entrance angle of 4.0°.
2. For text and fine symbol signs measuring at least 1200 mm (48 in) and for all sizes of bold symbol signs.
3. For text and fine symbol signs measuring less than 1200 mm (48 in).
5. This sheeting type should not be used for this color for this application.
## CONCLUSION

<table>
<thead>
<tr>
<th>Projects</th>
<th>Description</th>
<th>Time Frame</th>
<th>Deliverables / Uses</th>
</tr>
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</table>
| Sanitary Sewer   | ~10,000 Features (Manholes, Grinder Pumps, Inlets, Valves, Tanks, Valves, etc.) | Data Collection and Network Development Over Multiple Years (2005 – Present) | • Asset Management  
• Vehicle Tracking / Maintenance  
• Utility Infrastructure Inventory / Maintenance  
• Sign Inventory / Maintenance / Retroreflectivity  
• Shared Geodatabase  
• WebGIS Applications  
• Mobile Solutions  
• Document Management  
• MS4 Reporting  
• Pavement Management |
| Water            |                                                  |                                                    |                                                                                     |
| Storm Water      | ~1700+ Features (Poles with corresponding signs) |                                                    |                                                                                     |
| Signs            | 11 Vehicles                                      |                                                    |                                                                                     |
| Fleet Management |                                                  |                                                    |                                                                                     |

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**WHAT’S NEXT?**

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Thank you for your time!

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