

46th Street Pilot Street Lighting Project

A Joint Venture:
Hennepin County & City of Minneapolis



Making Hennepin a **COOL|county**

Lighting Project Objectives

- n Improve street lighting for pedestrians, bicyclists, and vehicles using 46th Street and accessing LRT station
- n Monitor street light performance from a safety point of view
- n Analyze lighting products by:
 - n Energy usage
 - n Illumination levels (Compared to City Standards)
 - n On-going operations and maintenance costs
 - n Capital costs
 - n Public and Jurisdictional acceptance



Lighting Project – Potential Benefits

- n Aesthetics
- n Cost savings – energy and maintenance
- n Environmental benefits
- n Improved, consistent lighting
- n Improved neighborhood walkability
- n Maintenance performance
- n Safety enhancements



Lighting Project Specifics

- n 43 LED streetlights from 6 manufacturers
- 12 induction streetlights from 3 manufacturers
 - n Project area divided into segments for each manufacturer
 - n Allows for side-by-side evaluation of light brands
- n Light fixtures selected to maintain uniformity with similar light styles in area
- n City identified Lyndale Avenue S (46th Street to 48th Street) as standard high-pressure sodium (HPS) lighting comparison corridor



The Technology: LED Lights

- n Less power needed to achieve HPS light levels
- n LED compensation – When one LED burns out, remaining LED's compensate for loss
- n LED light can be focused by arranging light modules
- n LED lights have low to non-existent heat outputs
- n LED lights are designed to last up to four times the lifespan of HPS
- n Typical 5-Year warranty
- n Dark sky friendly
- n Proven use in traffic signal lights
- n Minimal light loss over time



The Technology: Induction Lights

- n Better efficacy – Less lumens/watt needed to achieve HPS light levels
- n Electrodeless bulb – Only small mercury tip is environmentally harmful
- n Induction lights have low to non-existent heat outputs
- n Induction lights are designed to last up to three times the lifespan of HPS
- n 10-Year warranty
- n Dark sky friendly
- n Minimal light loss over time



Initial Lighting Comparison

Light Type	High Pressure Sodium (HPS)	Induction	Light Emitting Diode (LED)
Initial Cost	\$	\$\$	\$\$\$
Maintenance Needs			
Energy Used			
Light Color	Yellow	White	White
Lamp Life			
Light Delivery (getting light where you want it)			



Lighting Project Location

- n 46th St - Hiawatha Ave to 46th Ave (43 LED streetlights)
- n 46th St - 34th Ave to Hiawatha Ave (12 induction streetlights)
- n 36th Ave - 46th St to Minnehaha Creek (preliminary planning)



Street Light Layout

n LED

Categorization: Pedestrian

Layout: Soldier – Alt. 30' High Level & 15' Low Level

n Induction

Categorization: Residential

Layout: Staggered 15' Low Level



30' High Level
(Mod. Shoebox)

15' Low Level
(Acorn)



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Funding

- n \$375,000 Hennepin County – Capital Bonds
- n \$50,000 City of Minneapolis – Energy Conservation and Emission Program
- n \$50,000 Local Road Research Board (LRRB)



LRRB Research Project Requirements

- n Provide direct comparison, field test of Induction vs. LED vs. HPS – Every 6 months
- n Quantify actual Induction and LED lifetime costs vs. tested HPS lifetime costs
- n Identify quality products by testing multiple manufacturers



LRRB Research Project Benefits

Provide data on:

- n Operational characteristics
- n Life-cycle costs
- n Public perception and acceptance

....so that the study information can be used by the state, counties, and cities to evaluate use of these technologies in their jurisdictions



Lighting Project Schedule

- n Streetlights turned on – April, 2010
- n Nov. 8, 2010 - Streetlight event/celebration
- n Dec. 6, 2010 - Field test & LRRB Report #1
- n May 26, 2011 - Field test & LRRB Report #2
- n Nov. 26, 2011 - Amperage reading
- n Jan. 30, 2012 - Field test & LRRB Report #3
- n Jun. 2012 - Final field test & LRRB Report



Outreach – So Far

- n Neighborhood meetings
- n Resident mail surveys – before and after
- n Newspaper articles
- n Streetlight event/celebration
- n Miscellaneous presentations
- n Streetlight information signs

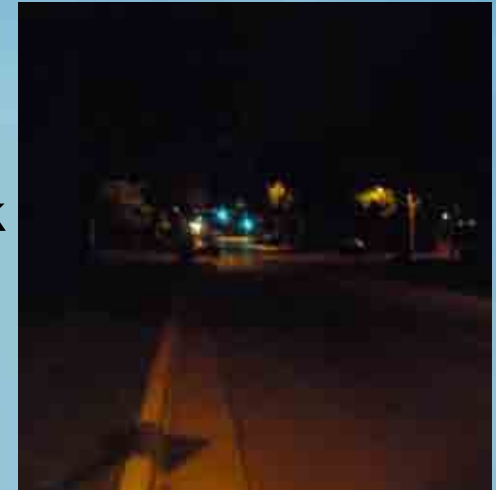


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Lighting Comparisons



HPS vs. LED



HPS Block



Induction Block



LED Block



Findings – So Far

- n Energy payback calculations (Electricity & Maintenance)
 - n LED – 10 to 13 years
 - n Induction – 3 to 4 years
- n Energy use (Amperage & Wattage)
 - n LED – Approx. 2x less energy
 - n Induction – Approx. 2x times less energy



Findings – So Far

- n Light Outputs (Footcandles)
 - n LED – Low level more than HPS/high level less than HPS
 - n Induction – Similar to HPS
- n Dispersal of light is much better with LED
- n Have not experienced maintenance-free operation (4 light failures – 1 to car wreck)



Findings – So Far

- n Light quality varies greatly by product
- n Majority of induction lights (2 of 3 manufacturers) unimpressive
- n Have not experienced severe cold weather impact
- n Streetlights have been generally accepted by the community as an improvement



Findings – So Far

- n Product lines are constantly changing
 - n Have been contacted about several “upgrade” products throughout life of project
- n Some vendors have abandoned support of products



Questions

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