INNOVATIONS IN LIGHTING FOR PEDESTRIAN SAFETY AND WALKABILITY

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Photo credit: NACTO website
Pedestrian fatalities 3+ X more likely at night

Reduction in pedestrian injuries:
- 42-59% (national meta-analysis)
- 12% reduction in Minnesota
Benefits of Lighting for Pedestrians: **Security & Comfort**

- Reduced crime 38% in UK and 7% in US
- Seattle: “low lighting” barrier citizens cited for walking after dark

Image Credit: Santa Monica Office of Sustainability & the Environment
Benefits of Lighting for Sense of Place

- Improved Ambience of Streets and Plazas

Photo credit: Dave Burdett, Map the Novel.com
Low Light Conditions Common

Change in daylight throughout the year

Daylight hours

- Honolulu (21.3 °N)
- Phoenix (33.5 °N)
- Washington, DC (38.9 °N)
- Minneapolis (45.0 °N)
- Seattle (47.6 °N)
- Juneau, Alaska (58.3 °N)

Image credit: WashingtonPost.com
Street (Roadway) Lighting
- Over 20 feet high
- Spaced 100+ feet apart

Pedestrian-Scale Lighting
- 10-18 feet high
- Spaced about 50 feet apart
Las Vegas: Supplemental crosswalk lighting triggered by pedestrian video detection

What’s Possible? **LEDs**

**Halifax, Nova Scotia (South Street) - 68% Energy Savings**

- **Before**
  - 100 Watt Lamp
  - 137 Plug Watts

- **After**
  - 44 Watts
  - SAT-48S (48 LEDs) - 280mA
Illuminates pedestrians in crosswalk but not background.
Not field tested.

Image credit: RPI website
What’s Possible? Communications and the Internet of Things

- Poles transmit civic information via Bluetooth (Wipperfurth, Germany)

Wireless control of lighting networks (San Jose)
What’s Possible? Aesthetics

- Vancouver
- San Jose underpass

Photo credit: http://www.artplaceamerica.org/articles/illuminating-downtown-2/
What’s Possible? Aesthetics and Information

- San Francisco: LightRail

Photo credit: ILLUMINATE (http://illuminatethearts.org/projects/)
Costs of Enhanced Lighting

- CAPITAL COSTS
  - Crosswalk: $11,000 - $42,000
  - Block: $600,000 for 1/3 mile of ped scale lighting in SF

- OPERATING & MAINTENANCE COSTS/Energy
  - $700+ per year per intersection (Minnesota)
Other Potential Issues with Enhanced Lighting

- GLARE

- LIGHT TRESPASS
Prioritizing Areas for Enhanced Lighting

- **COLLECT DATA**
  - Lighting fixtures
  - Crash patterns and locations
  - Crime patterns
  - Citizen preferences

- **SCORE AND MAP PRIORITY AREAS**

Image credit: Seattle Department of Transportation
Prioritizing Areas for Enhanced Lighting

- **BENEFIT/COST ANALYSIS**
  - metrics such as ease of implementation, time frame, funding availability

- **PROGRAM OF IMPROVEMENTS**

- **FUNDING AND IMPLEMENTATION STRATEGY**

Image credit: Seattle Department of Transportation
Additional Areas for Research

- Crash reduction potential of lighting strategies
- Pedestrian preferences
- Cost-effectiveness of lighting improvements versus other pedestrian improvements
- Impact of lighting conditions on the effectiveness of vehicle-mounted crash avoidance technologies.
LIGHTING FOR PEDESTRIANS

Fiat lux!

Photo credit: NACTO website