



NEW JERSEY STATE TRANSPORTATION INNOVATION COUNCIL

www.NJDOTtechtransfer.net/NJ-STIC

1st Quarter Meeting
March 15, 2023



WELCOME

Michael Russo

Assistant Commissioner

NJDOT Planning, Multimodal & Grant Administration

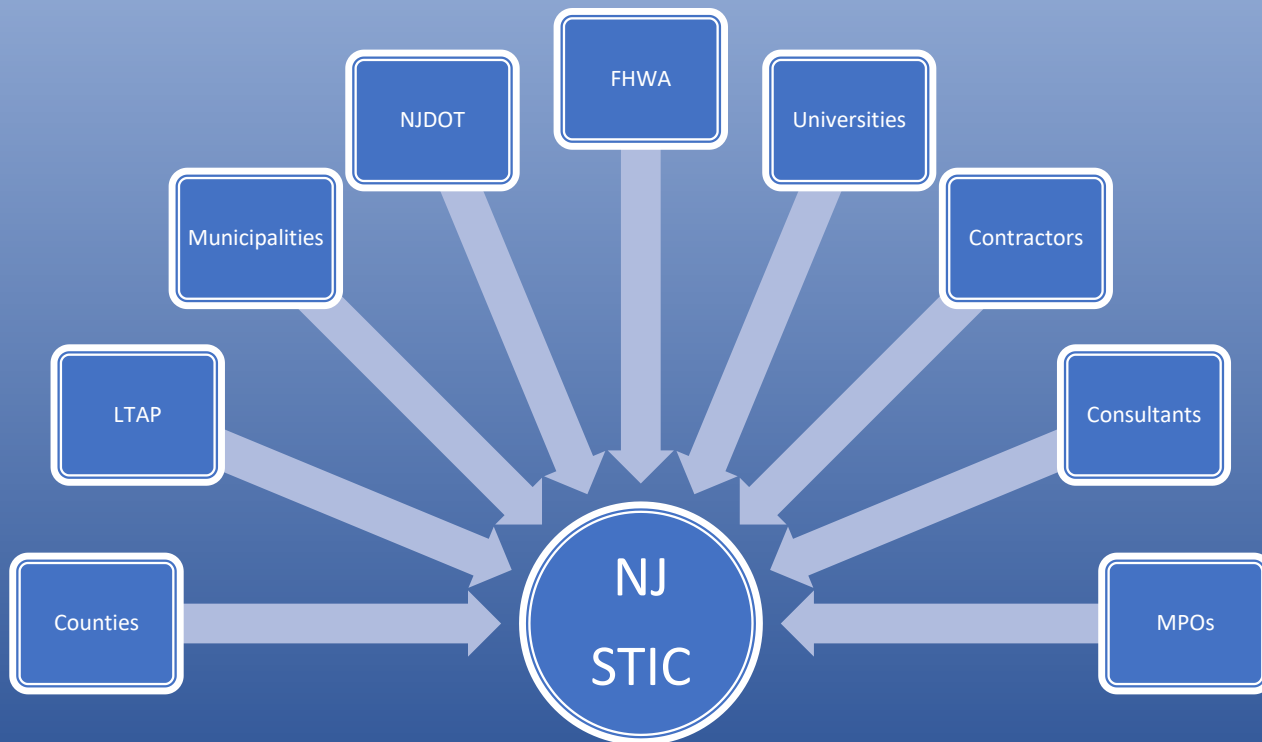


WELCOME ATTENDEES & SPECIAL GUESTS

Nighttime Visibility for Safety

Leigh Ann Von Hagen, *Managing Director*
Greg Woltman, *Project Coordinator*
Alan M. Voorhees Transportation Center
Rutgers University

Charu Jegan, *Supervising Engineer, Electrical*
Andrey Terentiev, *Project Engineer, Electrical*
NJDOT Bureau of Traffic Engineering





CIA TEAM

NEW

Planning & Environment

NJDOT – Andy Swords

FHWA- Sutapa
Bandyopadhyay



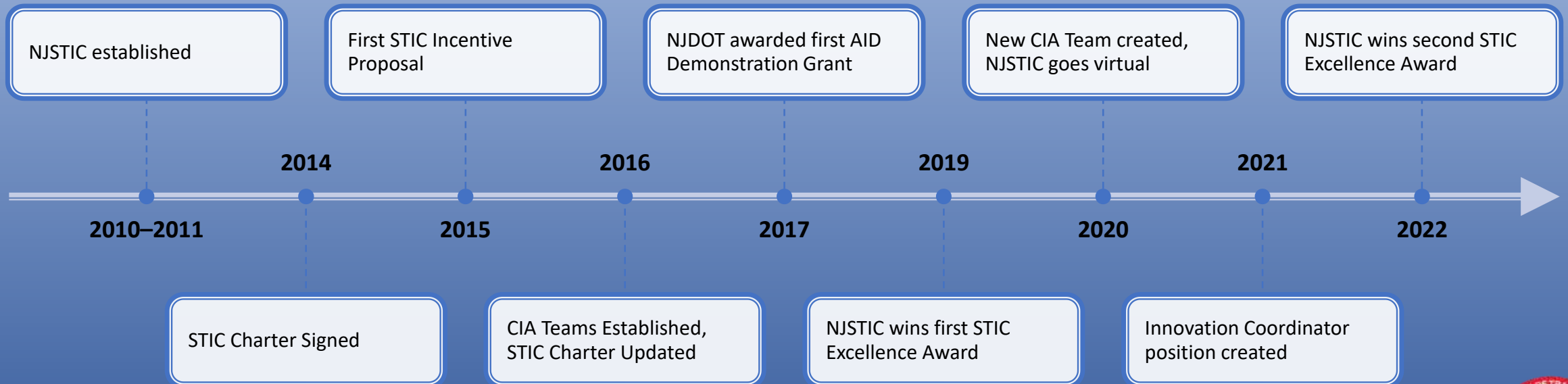
THANK YOU!

HELENE ROBERTS

*Innovation Coordinator
Performance Manager
FHWA-NJ*



NJSTIC: 10+ YEARS OF INNOVATING





FHWA UPDATES



Helene Roberts, P.E.
Innovation Coordinator & Performance Manager
FHWA, NJ Division Office



EDC-7 NJ Caucus

February 22, 2023



Feedback Form for NJ Caucus Participants

On February 22, 2023, the NJ Caucus convened New Jersey transportation professionals, STIC members and friends, and other stakeholders to assess the current implementation status of the EDC-7 innovations within New Jersey and consider potential strategies and technical assistance needs to advance their deployment during this round.

Please complete this online feedback form and provide any other comments about the NJ Caucus and/or next steps for implementation of EDC-7 innovations at the end of this form.



CLICK THE LINK IN THE CHAT

https://rutgers.ca1.qualtrics.com/jfe/form/SV_bfvYhz2xUyEeDye



OBJECTIVES OF THE NJ CAUCUS

Announce which innovations NJ STIC Leadership chose to pursue

Establish a baseline assessment and performance goals for the next 2 years.

Identify activities that can be taken by the implementation team to advance the implementation of the innovation



Every Day Counts
a Nation on the Move



CIA Team	NJDOT	FHWA-NJ	EDC7 Initiative
SAFETY	Dan LiSanti	Amy Kaminski	<ul style="list-style-type: none"> Nighttime Visibility for Safety
MOBILITY & OPERATIONS	Sal Cowan	Ek Phomsavath	<ul style="list-style-type: none"> NextGen TIM: Technology for Saving Lives
PLANNING & ENVIRONMENT	Andy Swords	Sutapa Bandyopadhyay	<ul style="list-style-type: none"> Integrating GHG Assessment and Reduction Targets in Transportation Planning EPDs for Sustainable Project Delivery
INFRASTRUCTURE PRESERVATION	Shivani Patel	Nunzio Merla	<ul style="list-style-type: none"> Enhancing Performance with Internally Cured Concrete (EPIC²)
ORGANIZATIONAL SUPPORT & IMPROVEMENT	Kristal Walker	Christopher Paige	<ul style="list-style-type: none"> Strategic Workforce Development



Innovation Implementation Stages

Not Implemented	The State has not started planning to implement the innovation.
Development Stage	The State is developing an implementation process and building support by participating in webinars and peer exchanges, and collecting guidance and best practices.
Demonstration Stage	The State is testing/piloting the innovation.
Assessment Stage	The State is assessing the performance of the innovation and adjusting any processes for full deployment.
Institutionalized	The state has adopted the innovation as a standard practice and uses it regularly on projects.

EDC7 BASELINE REPORT DUE
APRIL 2023

BREAKOUT ROOMS

CIA Team	NJDOT	FHWA-NJ	EDC7 Initiative
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Feature Presentation

Nighttime Visibility for Safety

Leigh Ann Von Hagen & Greg Woltman

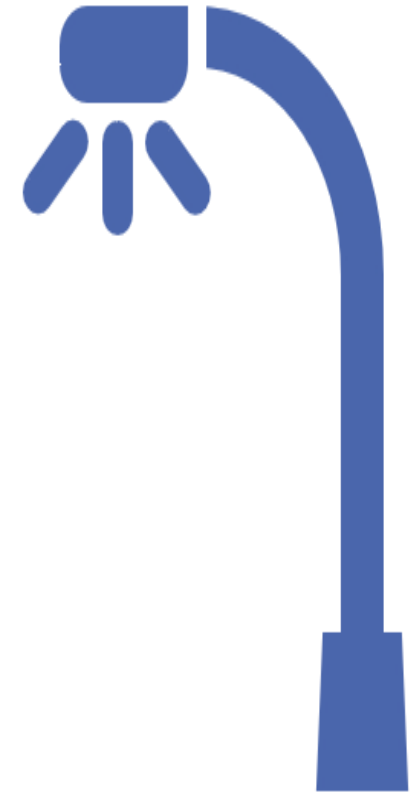
Alan M. Voorhees Transportation Center
Rutgers University

Charu Jegan & Andrey Terentiev

New Jersey Department of Transportation
Bureau of Traffic Engineering

Life-Saving Lighting

Enhancing nighttime visibility for
pedestrian and bicyclist safety



NJ BICYCLE AND PEDESTRIAN RESOURCE CENTER AT THE ALAN M. VOORHEES
TRANSPORTATION CENTER, RUTGERS UNIVERSITY

ROWAN UNIVERSITY

MARCH 15, 2023



RUTGERS

Edward J. Bloustein School
of Planning and Public Policy

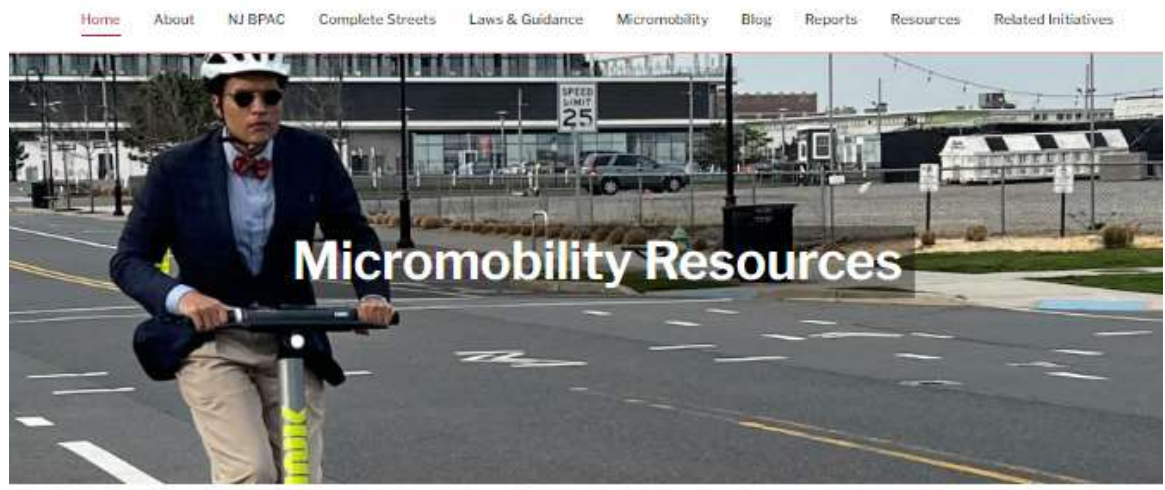
NJ Bicycle and Pedestrian Resource Center (NJ BPRC)



NJ BICYCLE & PEDESTRIAN RESOURCE CENTER
Educate. Encourage. Empower.

Visit: njbikeped.org/

Coordinated on behalf of the New Jersey Department of Transportation through the Bureau of Safety, Bicycle, and Pedestrian Programs (BSBPP), with funding from the Federal Highway Administration (FHWA)



Participate in the Next NJ BPAC Meeting



Learn about the NJ Safe Passing Law



Read the NJ Walks and Bikes Blog



Have a question? Ask Our Help Desk



Sign Up for the NJ Walks and Bikes Newsletter



NJ Bicycle and Pedestrian Resource Center Staff



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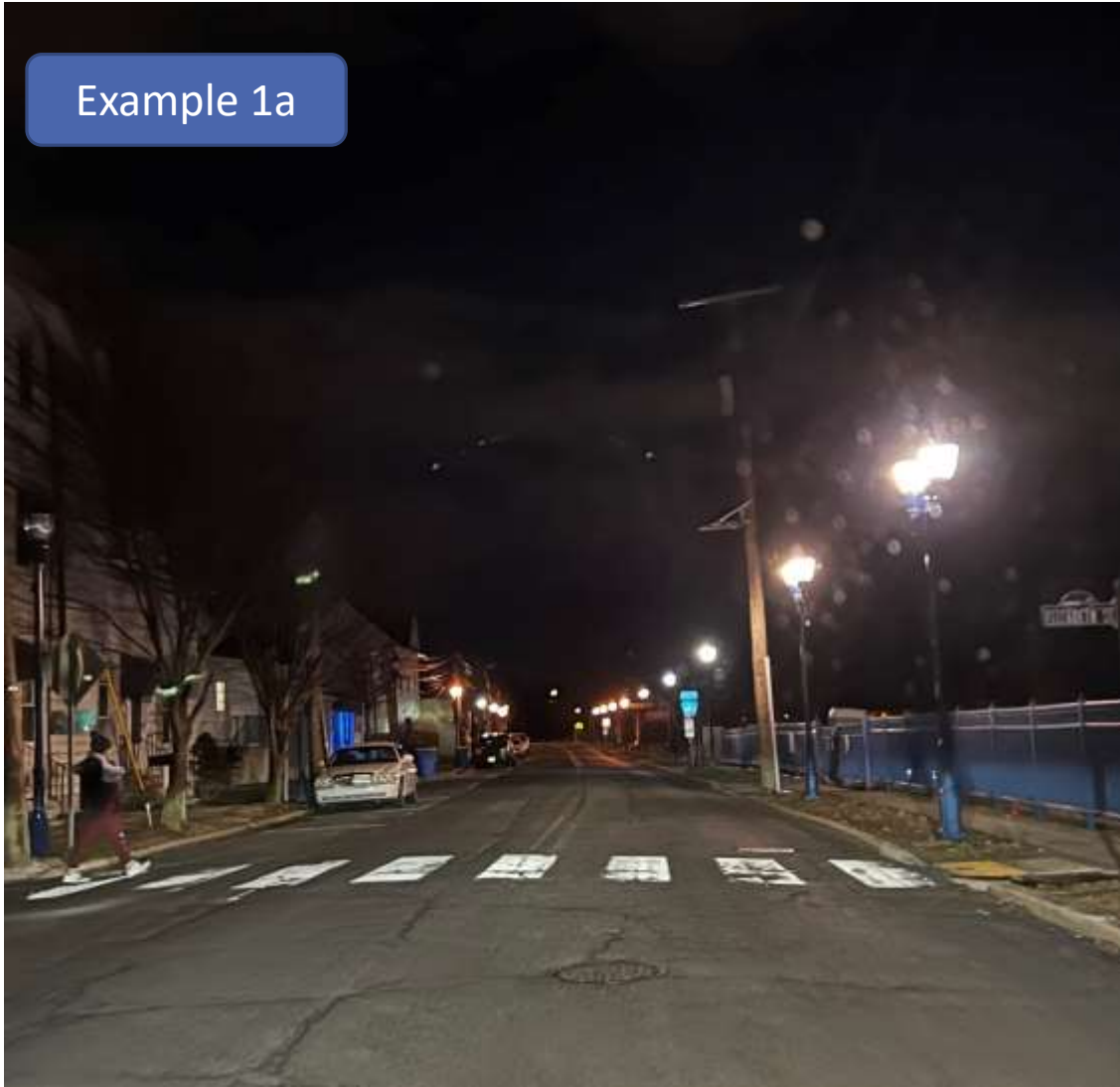
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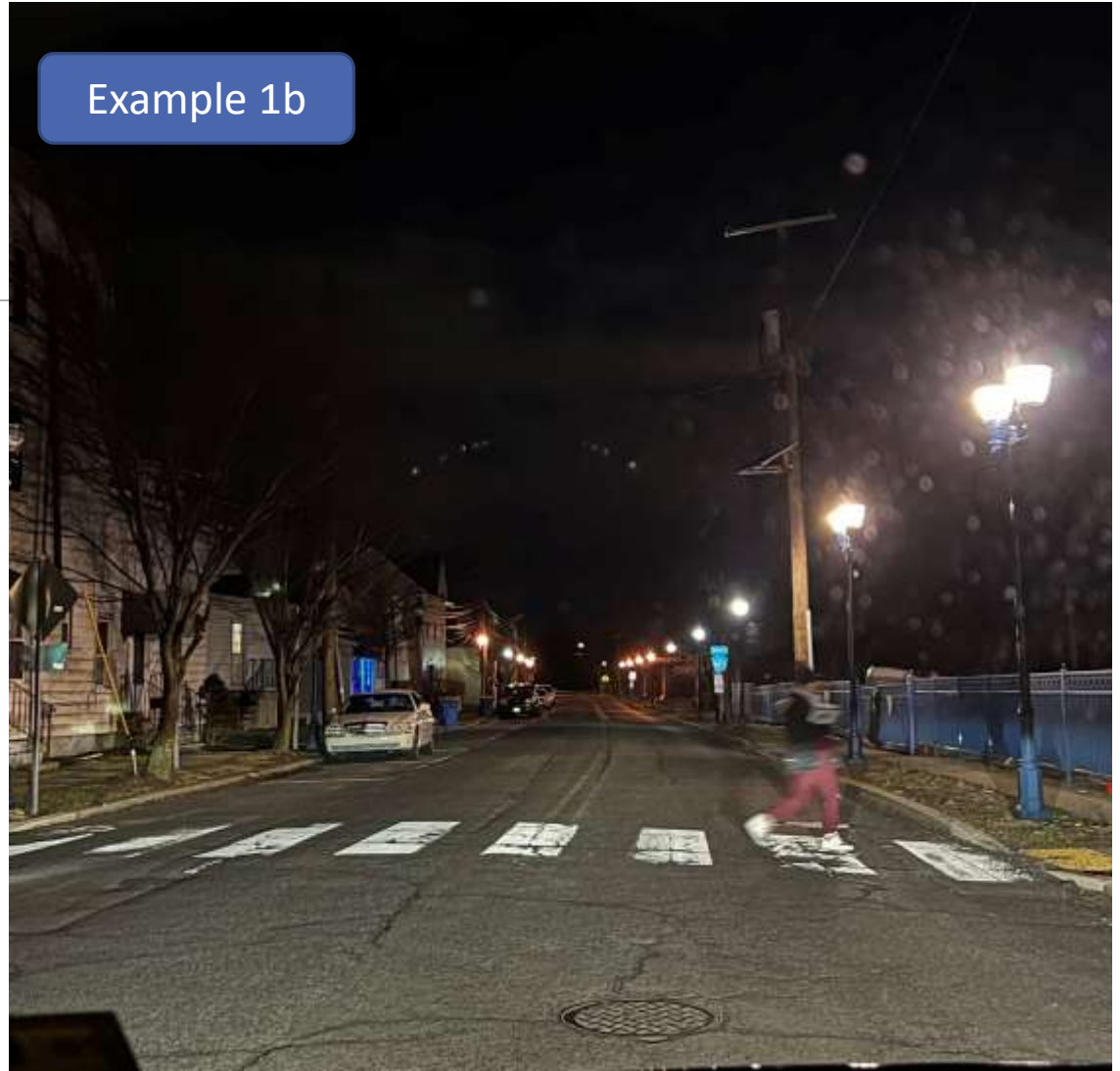
Anahita Kakhani
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Example 1a



Example 1b



South Bound Brook, NJ

About Us

Examples

Earlier Resources

Recent Work

Current Project

Example 1a

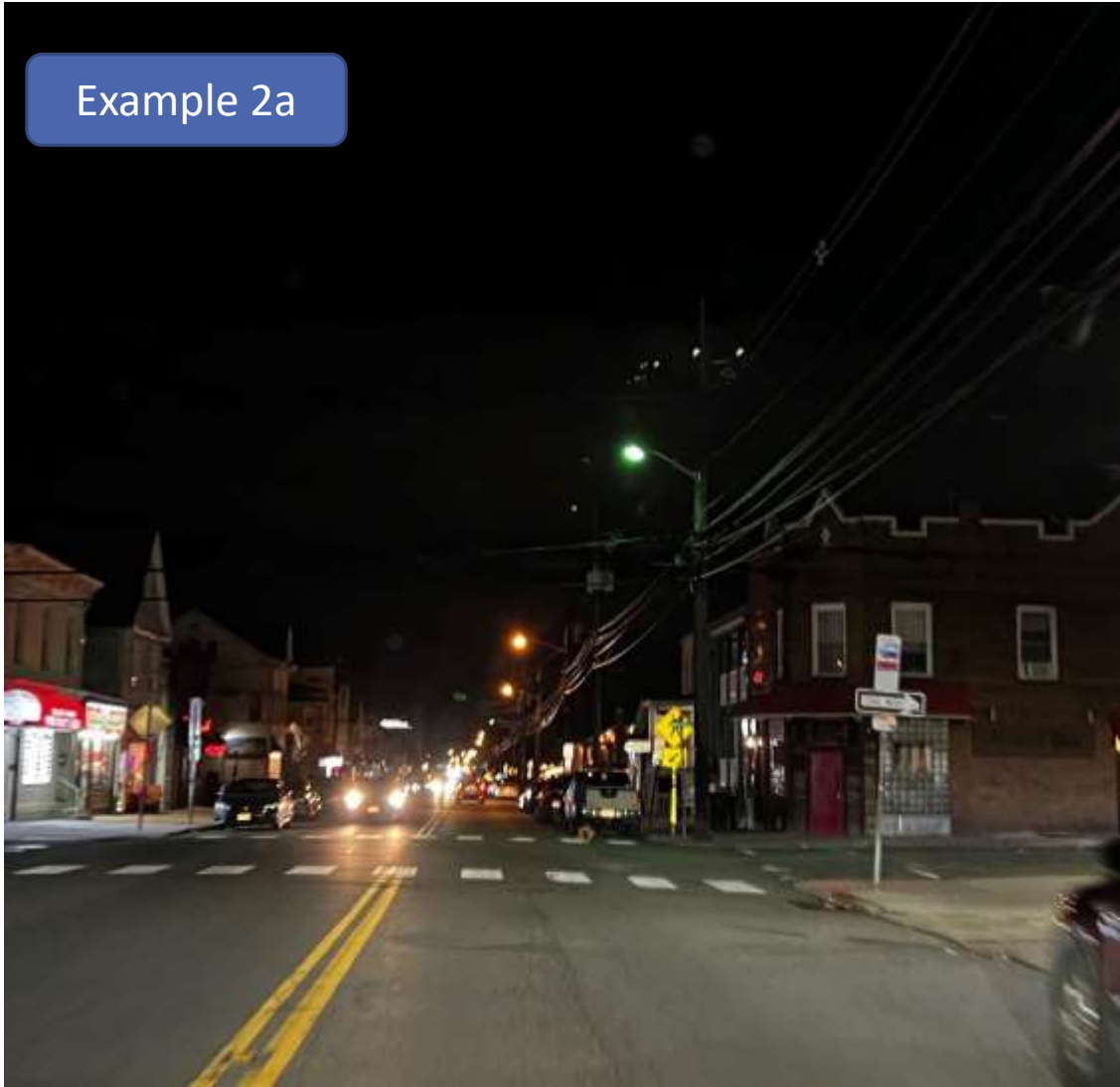


Example 1b

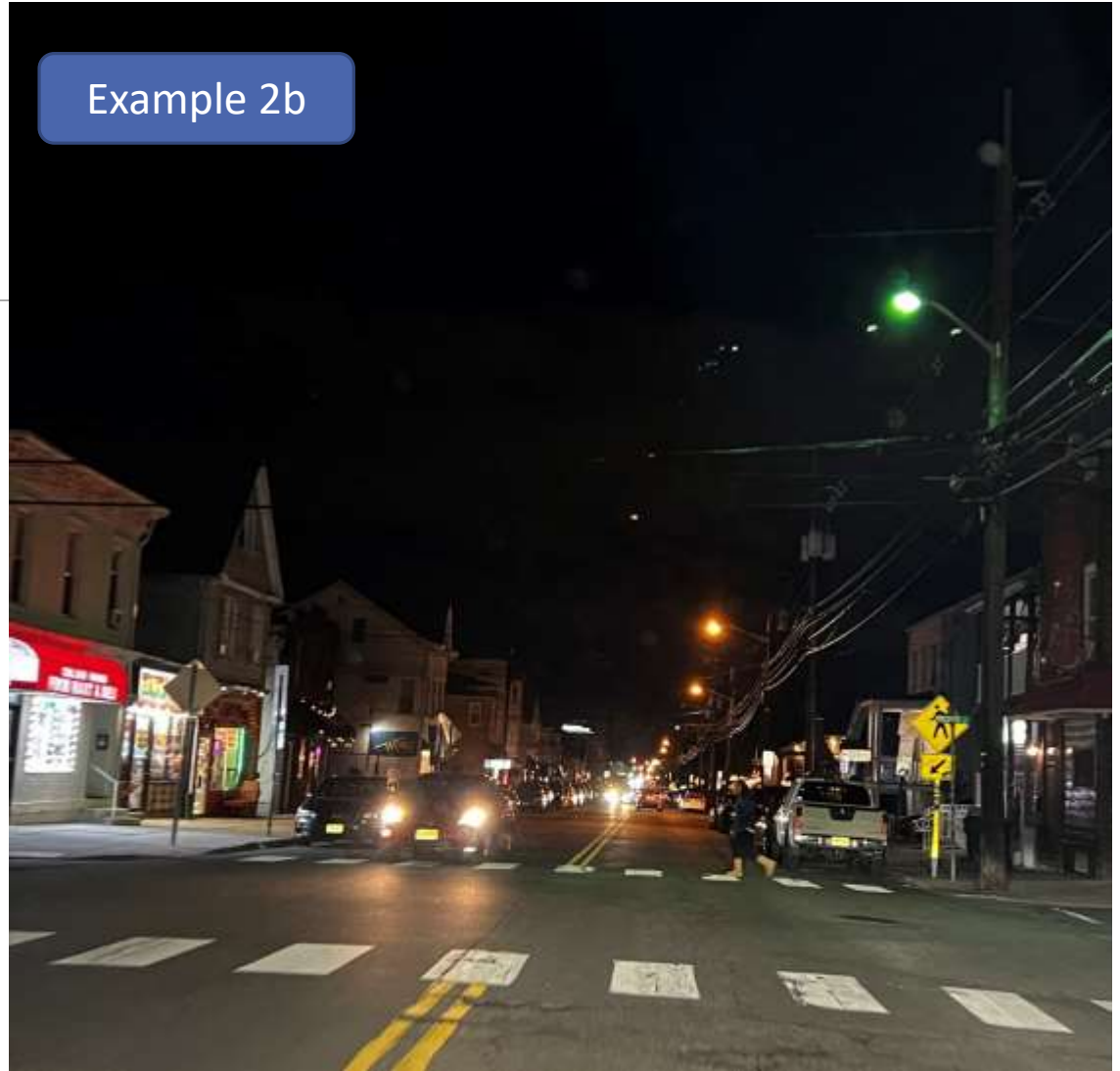


South Bound Brook, NJ

Example 2a



Example 2b



New Brunswick, NJ

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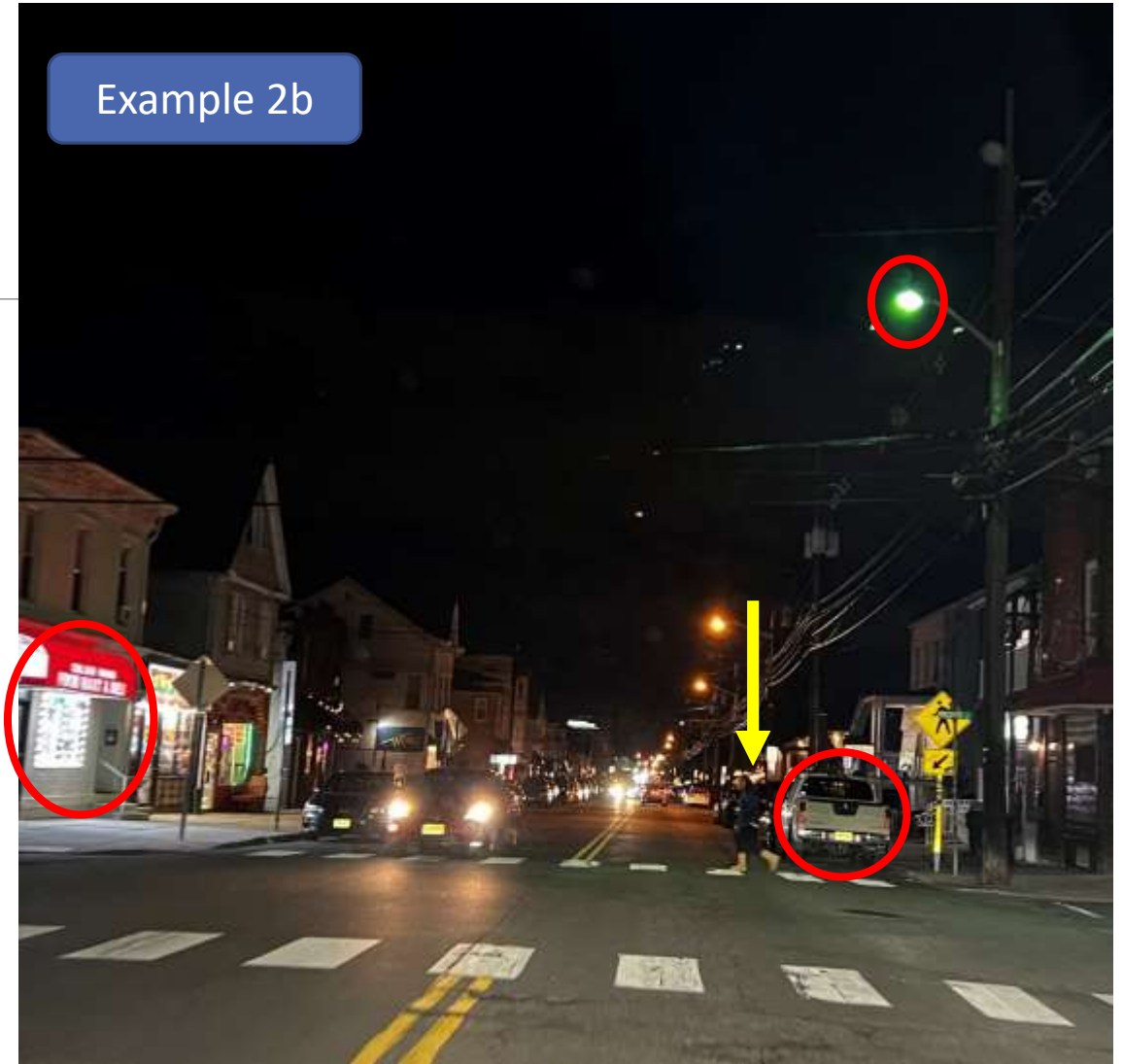
Recent Work

Current Project

Example 2a



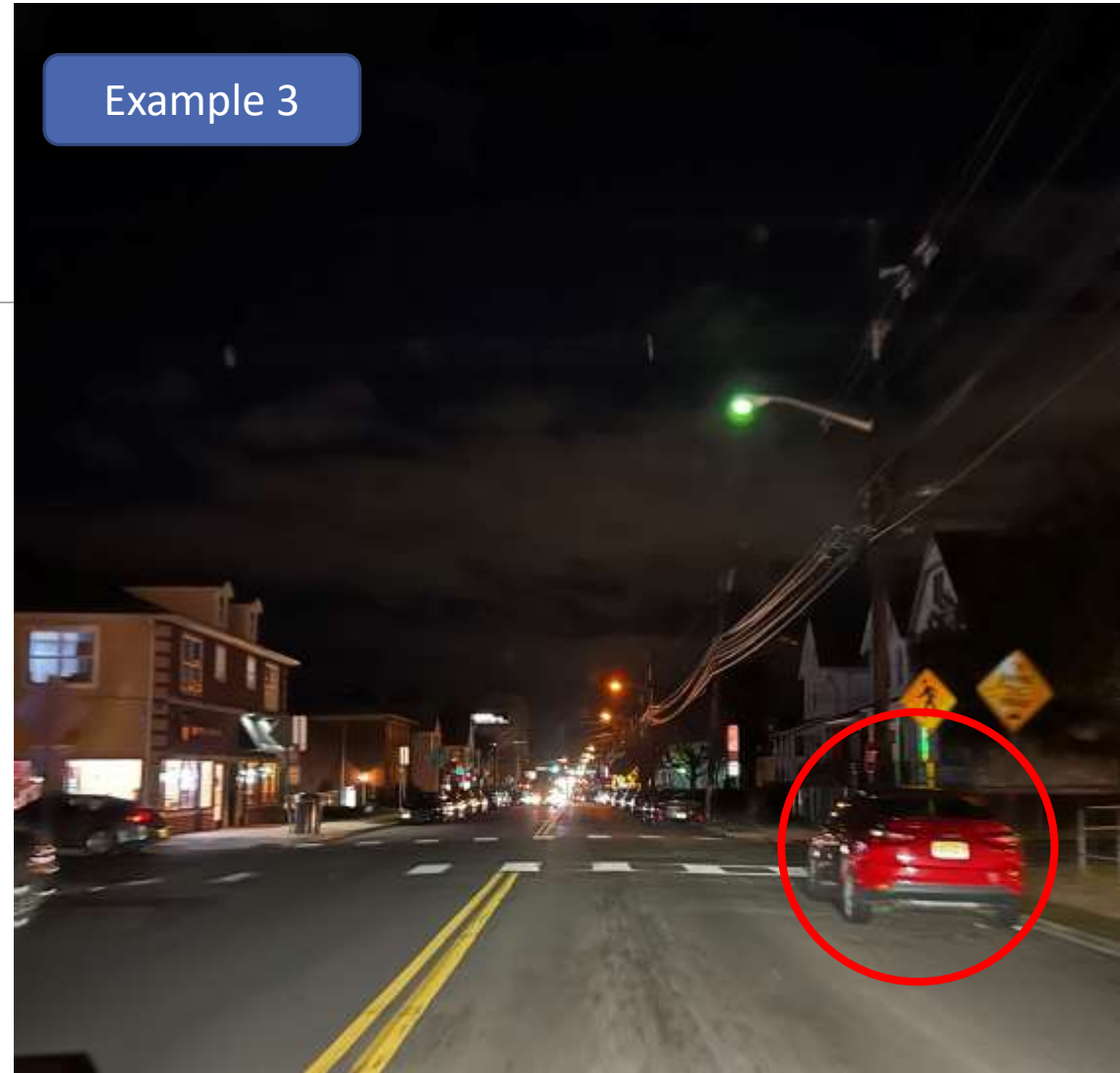
Example 2b



New Brunswick, NJ

Already, we know...

1. Crossing the street as a pedestrian is already difficult in daylight
2. Road lighting does not necessarily serve pedestrians
3. Illegal parking is a compounding factor to poor pedestrian visibility
4. Visibility can change by the foot



New Brunswick, NJ

Prior VTC Work

Integrating pedestrian lighting into all planning and design

Underscores a gap in expertise in pedestrian lighting in most localities

Identifies a lack of relevant planning and design guidance



Pedestrian Lighting in New Jersey: *A Means to Improve Pedestrian Safety*

Prepared by:
Ranjit Walia
Senior Research Specialist

Stephanie DiPetrillo
Project Coordinator

Contributing Authors:
Martin Robins
Senior Policy Fellow

Jeffrey Pearlman
Research Assistant

Prepared for:
NJDOT

Funded by:
FHWA and NJDOT

January 2007

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of Planning and Public Policy

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Prior Work: BPAC Ped Lighting Guide

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Visit: njbikeped.org/safety/

Key Resources

Numerous agencies and organizations have published research and guidance concerning pedestrian-scale lighting best practices. Some are listed below:

New Jersey Department of Transportation Pedestrian Compatible Planning and Design Guidelines
<https://www.state.nj.us/transportation/about/publications/PedComp/pedintro.pdf>

New Jersey Outdoor Lighting Ordinance Guide
https://www.nj.gov/dep/ops/docs/Sample_Lighting_Ordinance.PDF

Voorhees Transportation Center Report on Pedestrian Lighting in New Jersey: A Means to Improve Pedestrian Safety
http://vtc.rutgers.edu/wp-content/uploads/2014/07/Pedestrian_Lighting_NJ_Final_Report.pdf

Pedestrian and Bicycle Information Center
http://www.pedbikeinfo.org/webinars/webinar_details.cfm?id=13

FHWA Informational Report on Lighting Design for Midblock Crosswalks
<https://www.fhwa.dot.gov/publications/research/safety/08053/>

U.S. Department of Energy Report on Pedestrian Friendly Outdoor Lighting
https://www1.eere.energy.gov/buildings/publications/pdfs/ssl/2013_gateway_pedestrian.pdf

Seattle Pedestrian Lighting Citywide Plan
<http://www.seattle.gov/Assets/Documents/Departments/SDOT/About/DocumentLibrary/PedMasterPlan/PedLightingFINAL.pdf>

Chandler (AZ) Report on Crime Prevention Through Environmental Design
<http://www.chandlerpd.com/wp-content/uploads/2010/12/CPTED-Handbook-v4-20170627.pdf>



Pedestrian-Scale Lighting Guide for New Jersey

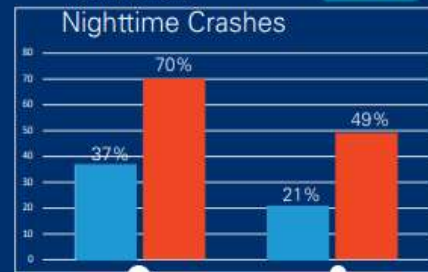
Importance

Pedestrian-scale lighting does more than make a neighborhood look good. Most street lighting in New Jersey was designed with motorists' in mind; assuring there was proper lighting to navigate roads at high speeds. This lighting does not take into account pedestrians. Pedestrian-scale lighting is first and foremost a safety concern, helping to improve pedestrian safety, security and comfort.

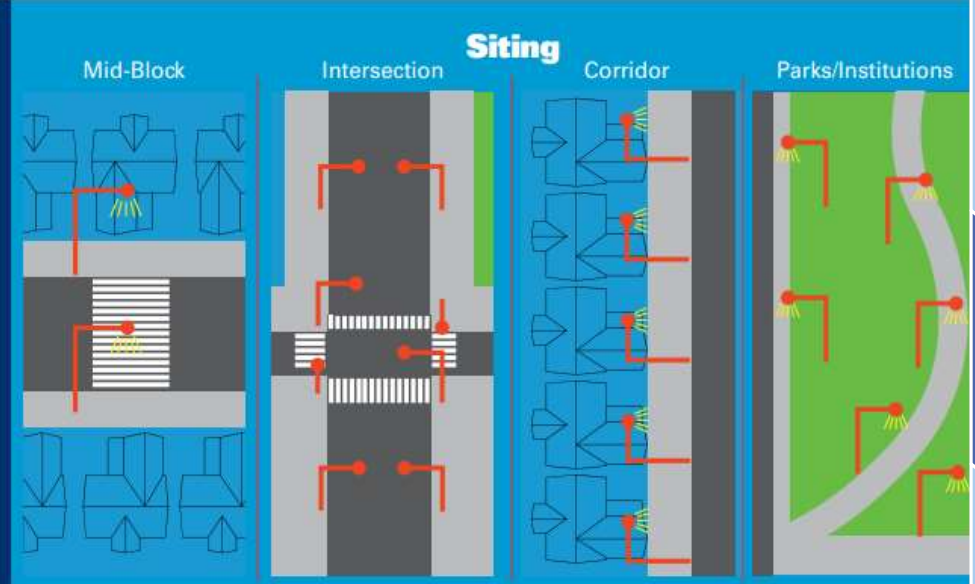
i The presence of adequate pedestrian lighting helps promote visibility between motorists and pedestrians, reducing the frequency of crashes

Crashes

- bike/ped fatalities in New Jersey disproportionately occur at night



i Pedestrian-scale lighting helps illuminate sidewalks and improve pedestrian safety, security and comfort. Properly designed and installed pedestrian-scale lighting can both help define a streetscape and create a sense of place in a community.



Factors to Consider

- Proximity** should light sidewalks and crosswalks without blocking them
- Height** Poles should be shorter than street lights; 12-16 feet
- Spacing** evenly distributed approximately 60 feet apart
- Glare** brighter is not always better; glare factors include fixture and background luminance, and size and angle of the fixture
- Brightness** 20 lux measured at a height of five feet from the road surface
- Direction** fixtures faced downward to direct light onto pedestrians and avoid causing nuisance
- Energy Efficiency** due to light depreciation, initial light levels should be above what is required; adaptive technology can allow to operate at maintained level for longer times

Prior Work: BPAC Ped Lighting Guide

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Visit: njbikeped.org/safety/

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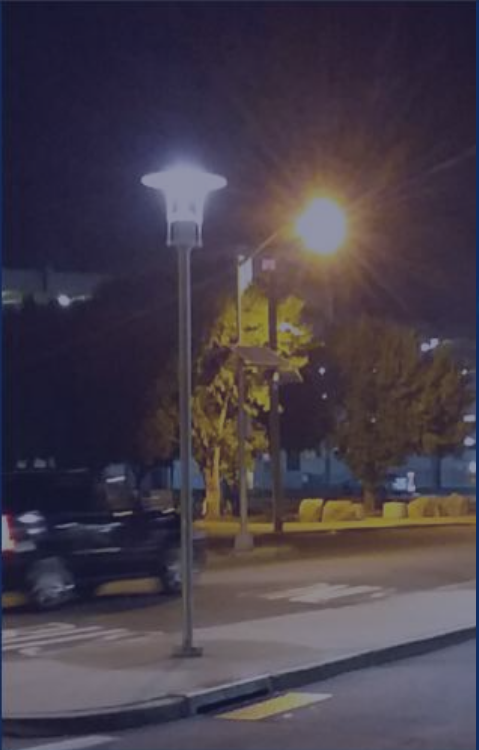
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Seattle Pedestrian Lighting Citywide Plan
<http://www.seattle.gov/Assets/Documents/Departments/SDOT/About/DocumentLibrary/PedMasterPlan/PedLightingFINAL.pdf>

Chandler (AZ) Report on Crime Prevention Through Environmental Design
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Pedestrian-Scale Lighting Guide for New Jersey

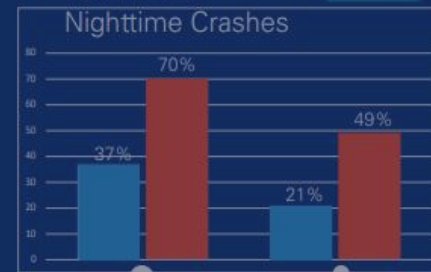
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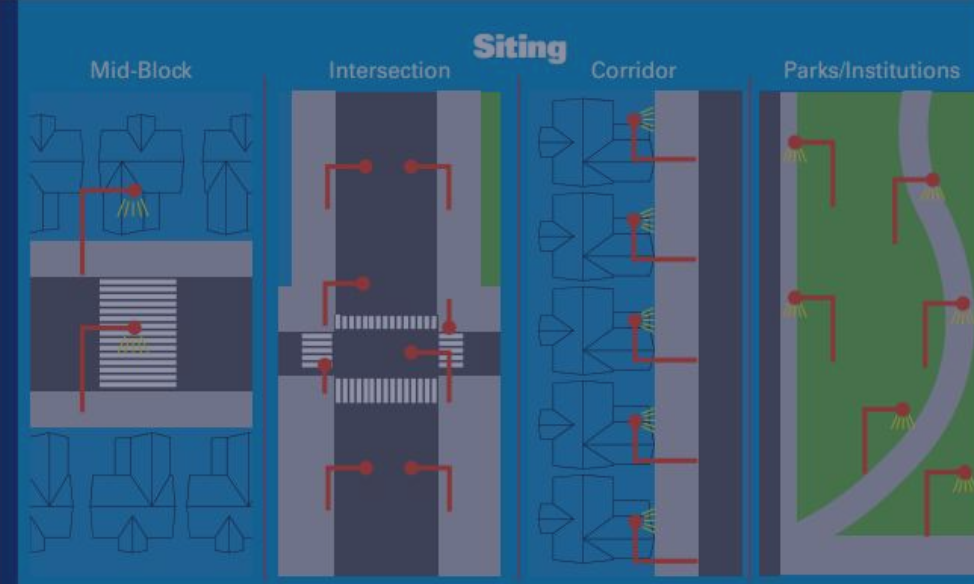
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Factors impacting the fatality of non-motorist involved crashes in New Jersey

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VOORHEES TRANSPORTATION CENTER

RUTGERS UNIVERSITY

1/24/2023

RUTGERS

Edward J. Bloustein School
of Planning and Public Policy



Introduction and research questions

Fatal non-motorist involved crashes account for **1/3rd of all fatal crashes** in New Jersey. Non-motorist involved crashes (either fatal/injury or property damage only) occur disproportionately more in low-income and minority communities.

1. What is the relationship between non-motorist involved crashes, geocoded crashes, and low-income and minority communities?
2. Where are the community hot spots? A hot spot analysis of crashes in New Jersey.
3. What are the risk factors? A regression analysis.



Overburdened communities and geocoded crashes

Overburdened communities are minority, low income, and/or limited English communities. They make up 20.6% of the NJ population.

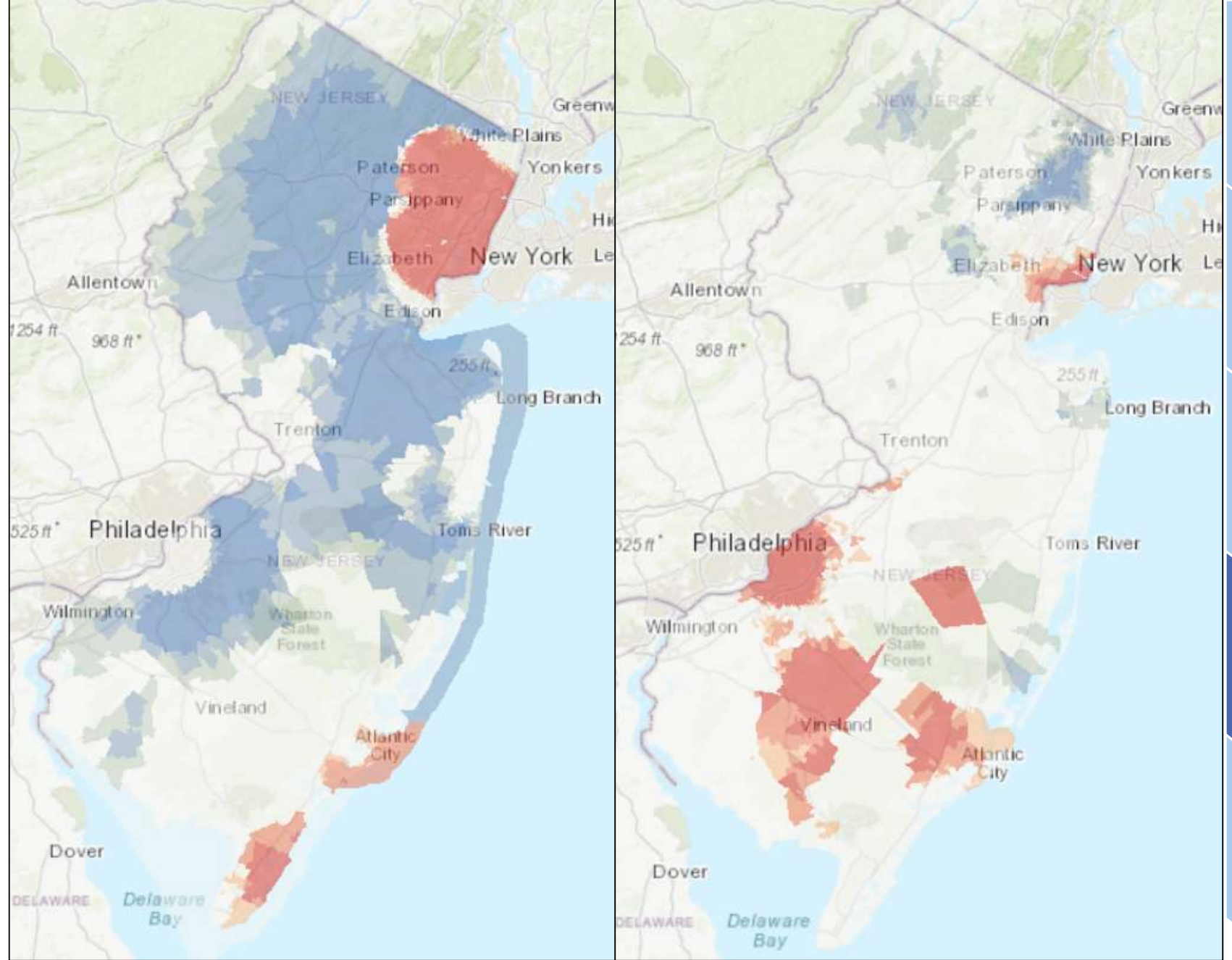
However, 40.3% of all NJ crashes occur in overburdened communities

Geocoded Crashes	NJ	Low income/Minorities	Percentage
Dark Conditions (No lights)	1,111	320	28.8%
Dark Conditions (Lights)	8,620	3,819	44.3%
Daylight	17,404	6,753	38.8%
State Highway Crashes	4,000	921	23.0%
Fatal Crashes	956	258	27.0%
Youth Involved Crashes	5,126	2,047	39.9%
All Crashes	28,643	11,544	40.3%

Hotspots for bike/ped crashes per capita (2016-2020)

All crashes (left)

Fatal Crashes (right)



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Selected results relating to lighting



Compared to daylight, crashes that occurred in dark conditions (no streetlights) were **6-7.5 times** more likely to be fatal.

At night, a crash is **twice as likely** to be deadly if there are no lights available or if they are broken or off.

Pedestrian- and bicyclist-involved crashes: associations with spatial factors, pedestrian infrastructure, and equity impacts

Authors: Hannah Younes, Ph.D., Robert Noland, Ph.D., Leigh Ann Von Hagen, AICP/PP, Sean Meehan

Publication: Journal of Safety Research, JSR-D-22-00872

Date: Volume 86, anticipated release date between April 15-July 1, 2023

New Research Task: Life-Saving Lighting

Joint research task between Rutgers-VTC and Rowan University

Conduct research, including a literature review, on best practices for streetlights to improve roadway safety with a focus on vulnerable roadway users (VRUs).

- Current research connecting lighting design types to reductions in KSI for VRUs
- Existing design guides, memoranda, and presentations with a focus on pedestrian-scale lighting

Produce a non-technical, easy-to-use lighting design guide

- Draw attention to the needs of VRUs during design and implementation of streetscapes
- Recommend a set of luminaire types for street and trail lighting
- Focus on key facts and site conditions to assist designers with choosing appropriate lighting
- Rely on figures, example images, and graphics to help explain benefits of specific design options

Give your feedback on Menti!

What should we focus on to help municipalities incorporate safe lighting for vulnerable roadway users (VRUs)?

VRUs = people walking, bicycling, and using scooters, wheelchairs, and other mobility devices

Go to: www.menti.com

Use the code: **7485 7205**

Thank you!



**NJ BICYCLE & PEDESTRIAN
RESOURCE CENTER**
Educate. Encourage. Empower.

**NEW JERSEY
Safe Routes to School**



www.saferoutesnj.org

Contact:

NJ Bicycle & Pedestrian Resource Center

njbikeped.org

Telephone: (848) 932-3714

Email: bikeped@ejb.rutgers.edu

Contact:

NJ Safe Routes Resource Center

saferoutesnj.org

Telephone: (848) 932-7901

Email: srts@ejb.rutgers.edu



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Rowan 
University

Feature Presentation

Nighttime Visibility for Safety

Charu Jegan & Andrey Terentiev

New Jersey Department of
Transportation

Bureau of Traffic Engineering

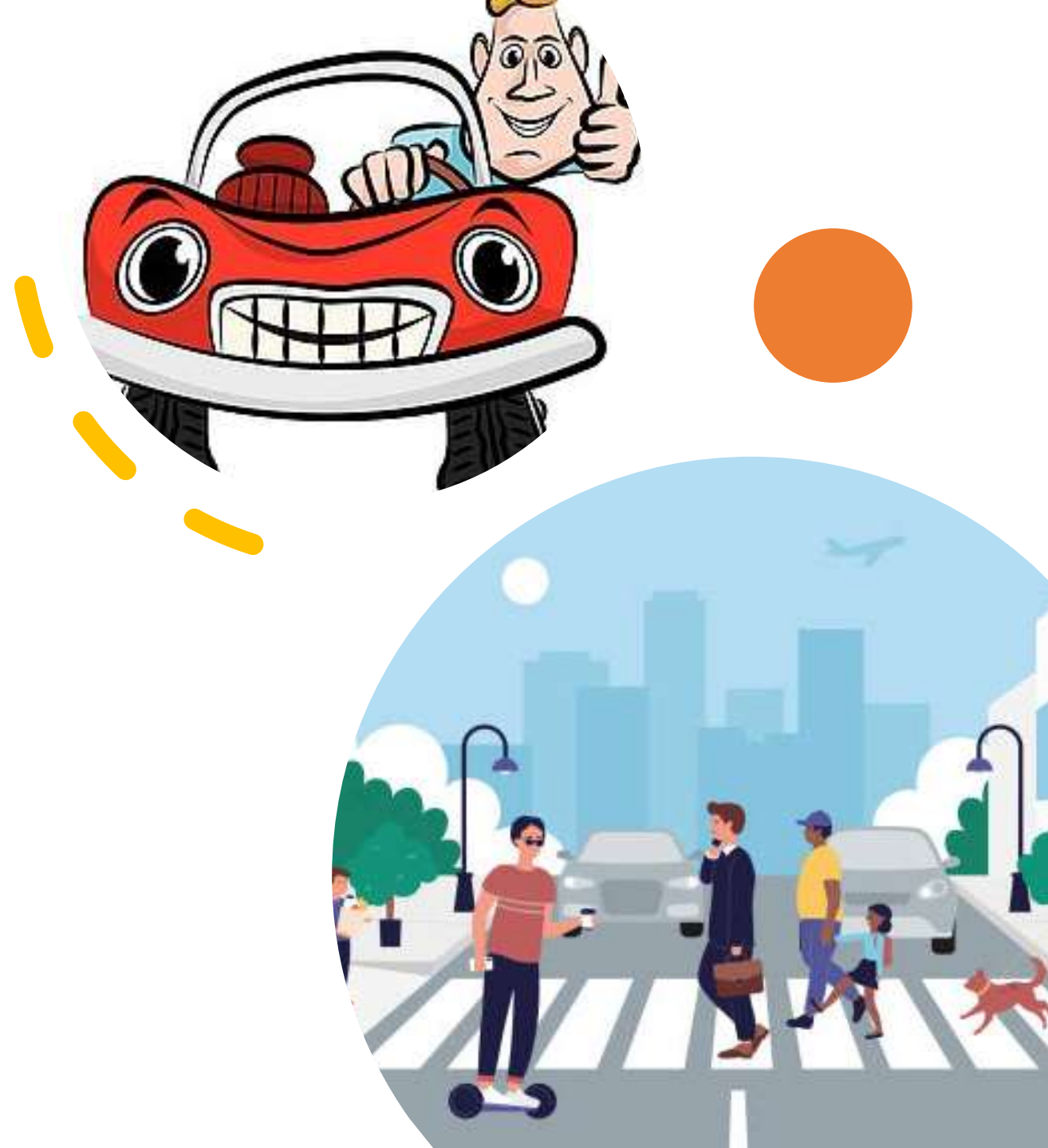


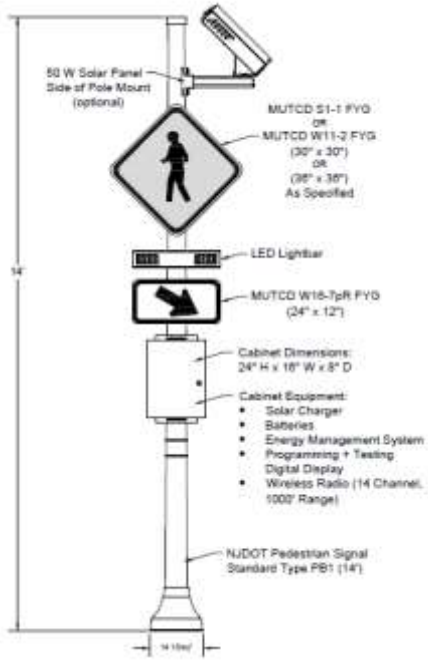
New Jersey Department of Transportation

Bureau of Traffic Engineering

Traffic Safety advancements and nighttime visibility improvements

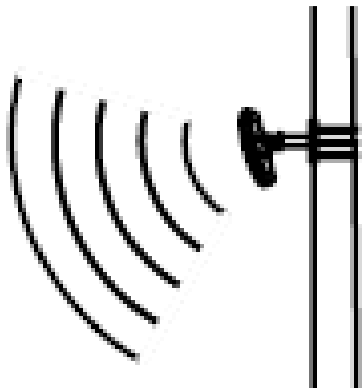
- LED lighting
- ADA accessibility
- Traffic Signal backplates
- RRFB
- Lighting evaluation for vertical illumination





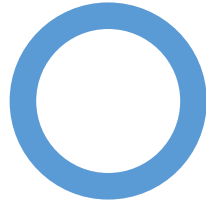
Pedestrian Safety

- ADA compliant traffic signals, push buttons and handicap ramps.
- All signalized intersections are illuminated
- Retro-reflective regulatory and warning signs
- Automatic pedestrian detection using radar and camera systems.
 - No need to touch any buttons
 - Detects all approaches
 - Extends time necessary for pedestrians to cross (LPI)
- Solar powered Rectangular Rapid Flashing Beacons.
 - At non-signalized intersections for safe passage of pedestrians
 - Lighting provided at crosswalks
 - Study to evaluate vertical illumination for crosswalks
 - Benefit-Cost ratio is high



LED Lighting

- Improved visibility for vehicles and pedestrians
- Cost and energy savings.
- Vertical lighting at unsignalized roadway crossings to further improve pedestrian visibility and safety.



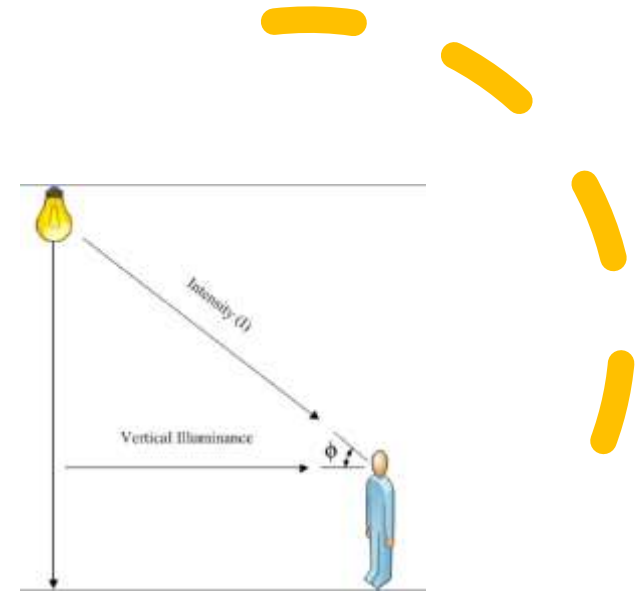
Vertical Illuminance



IT IS THE LIGHT THAT FALLS ONTO
A VERTICAL SURFACE SUCH AS A
PEDESTRIAN AND A BICYCLIST.

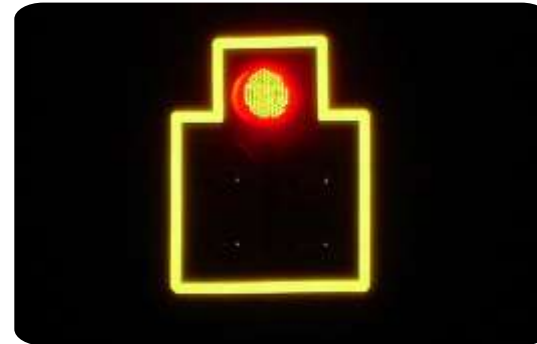


THIS ALLOWS THEM TO BE SEEN
BY MOTORISTS.



Other improvements

- Each road lane has its own traffic signal head for better visibility
- LED module size in traffic signal heads increased to 12"
- Traffic Signal Head Backplates
 - Improve traffic signal head visibility by introducing a controlled-contrast background
- Touchless, motion activated audible pedestrian push buttons





Always Looking to Improve

- Backplate implementation challenges include minimizing installation time, accessing existing signal heads, and structural limitations due to added wind load instances where an entire backplate is added.
- LED's difficulty to illuminate ultra-wide roadways and act as a one-to-one replacement of many existing HPS luminaires.
- Vertical lighting requiring lighting sources for each approach, causing bright light and extra poles.
- Lack of lighting at unsignalized intersections. Must rely on utilities. High installation cost.



REMINDERS & ANNOUNCEMENTS

NJDOT Tech Transfer Website
www.njdottechtransfer.net

NJ STIC Website
www.njdottechtransfer.net/nj-stic/



2023 DESIGN SUMMIT

SAVE THE DATE!

Wednesday, May 17, 2023

Sponsored by NJDOT, FHWA and ACEC/NJ

Forsgate Country Club • Highland Room
375 Forsgate Drive, Monroe Township, NJ

Registration begins at 8:00 a.m.



ACEC New Jersey

AMERICAN COUNCIL OF ENGINEERING COMPANIES





STIC INCENTIVE PROGRAM

NJDOT Tech Transfer Website

<https://www.njdottechtransfer.net/new-jersey-stic-requests/>

Selection Criteria
Eligible Projects/Activities
How to Apply
List of Projects



BUILD A BETTER MOUSETRAP

Deadline: May 1, 2023

Entry Form & Guidance:

<https://cait.rutgers.edu/mousetrap/>



THANK YOU!

www.NJDOTtechtransfer.net/NJ-STIC

Bureau of Research & Innovation
(609) 963-2242