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## Commissioner Diane Gutierrez-Scaccetti

## Don't you just love it when someone makes your life easier?

Here are the fabulous innovations from the Build a Better Mousetrap Competition Winners

People involved in the transportation industry often find better ways to do their jobs. Whether it is a new gadget that improves the quality and safety of a project, or an innovative process that reduces costs and improves efficiency, the people on the front lines are often the source of the innovations that become the latest and best practices.

Each year, the Bureau of Research holds the **New Jersey Build a Better Mousetrap Competition** with the winner entered into the National competition. This competition promotes finding solutions to everyday, on-the-job problems. The 2019 winner – the Marine Navigation Retroreflective Markers program submitted by Gerald Oliveto of the Department's Operations Support and Engineering team – received national recognition when it was awarded AASHTO's 2020 Francis B. Francois Award (see *Transporter Winter 2020*).

In 2020, four ideas were submitted, which is the most since the competition started three years ago. It is proof that NJDOT continues to create new and innovative ways to do their jobs. Hopefully, this trend will continue and there will be even more submissions





Mark Crago Scott Ainsley

next year.

This year the 2020 Build a Better Mousetrap award went to Scott Ainsley and Mark Crago, who work in the NJDOT Operations Training Unit and Freehold Garage,

for their **anti-jackknife early warning system**. Scott and Mark noticed new employees were crashing vehicles and trailers while practicing maneuvers for their Commercial Driver's License test. Each crash cost approximately \$2,100 to repair the damages, including parts and approximately 17 hours of labor. Scott and Mark used creative thinking and about one hour of labor to invent the **anti-jackknife early warning system.** The device alerts trainees of an incorrect maneuver before a crash occurs. The device



Anti-jackknife early warning system

cost \$165 for parts and labor, but the embarrassment it saves trainees is likely priceless. **The unit has not had any crashes since using the anti-jackknife device!** 

Asim Zaman, Senior Engineer, Transportation Operations Systems and Support, submitted the NJDOT Bridge Navigator, a web application that tackles two time-consuming job related tasks. The

first is locating and navigating to state owned bridges. The second is locating and navigating to the nearest fuel station while in the field.

The State maintains more than 2,500 bridges and finding them can be a challenge. Locating a bridge requires searching various databases, and then manually inputting the location into



Asim Zaman

a navigation app. This process becomes even more cumbersome when performed in the field, where certain databases are unavailable, and workspace is at a premium. Similarly, finding the nearest fuel station for your vehicle and navigating to it requires a multi-step process of crosschecking websites and databases to find hours of operation and fuel type.

Asim solved the problem with the **Bridge Navigator** web app that works on all mobile devices. The user enters a structure number or name of the intersecting roadway into the search bar and the app provides location information about the structure (Town, County, Latitude/Longitude) and with one click, it opens up Google maps providing directions to it.

The app is also a fuel station finder. Tap on the search and it provides a list of fuel stations, sorted by their relative straight-line distance, fuel type offered, and station hours. Another click brings up Google maps with directions.

What was the cost to create this mobile app? The software used to create the app and the website where it is hosted, GitHub, are free. The domain name cost \$0.99 per year for registration. The database used is publicly available through Straight-line diagrams but has been extracted and exported to a web friendly format. Developing the app took about 10 hours of Asim's time. The brainpower required to conceive of the app and create it – priceless!



**M.R.T. Grass Diverter** 

Cutting grass is one of the maintenance responsibilities regularly done by Highway Operations Technicians around the state. **Crew 333 members Michael Syanovitz**, HOT 2; **Ronald D'agostino**, HOT 1; and **Todd Curtis**, HOT 1, based in Toms River, noticed the NJDOT riding mowers have a side discharge chute that sends grass and other debris onto the roadway when they mow center medians or curb edges.

The crew, encouraged by their Crew Supervisor William Burk and Highway Operations Central Region Area Supervisor James Nunn, solved the problem by developing the **M.R.T. Grass Diverter**, a metal plate that blocks the chute and redirects the debris to shoot out the back. The team used discarded road signs to seal the side chute, and with about 24 hours of labor, retrofitted two machines. Great team effort Crew 333! **Brendan Rahl**, Senior Traffic Engineer, Highway and Traffic Design, Bureau of Traffic Engineering, transformed a vital but antiquated traffic-engineering database into an easily accessible trove of information with his creation of the **Traffic Signal Explorer** web

application.

The **Traffic Signal Explorer** (video preview of the app) is a comprehensive database of NJDOT's more than 2,800 traffic signals located in the 21 counties of New Jersey. The Bureau of Traffic Engineering is responsible for the design and



Brendan Rahl

operation of this statewide system. Brendan developed the app in a multi-year effort that included verifying all state-managed traffic signals, traffic signal flashers, and sign-based flashing traffic control devices, and then geo-locating them in the database.

The resulting GIS-based New Jersey roadway map consists of more than 240,000 generated map tiles and 9 zoom levels. It categorizes and color codes all state roadways based on jurisdiction, includes state-maintained traffic circles, freeway exits, local land-use categorization (agricultural, industrial and protected areas), railroads, and rivers/streams. All Department-maintained Traffic Signal Assets are searchable and selectable on the map providing relevant information including Bureau-issued Engineering Plan Numbers, signature dates, utility agreement dates, cross streets, milepost, town, and the status of coordination with other connected or coordinated signals up and downstream. Staff engineers can jump to the traffic signal location in Google Street view or Google Maps with a single click. Future updates will include adding Electric Utility territory areas and NJDOT Electrical Maintenance yard jurisdictions to aid coordination among multiple Department divisions.

Prior to the creation of the Traffic Signal Explorer, the information was scattered among several disparate databases that were held in large, printed binders located in the office in Ewing. The available digital database of traffic signal assets was incomplete and often out of date.

Brendan created **Traffic Signal Explorer** as a side project to his current responsibilities so there were no additional labor costs incurred. The app will increase productivity and reduce costs by minimizing administrative work and eliminating the need for staff to be physically on site to analyze Bureau information in book form. Other Department divisions will be able to use the web-app with additional development.