

**Next Gen Transportation:
Preparing Industry for
Tomorrow, Today**

Work Zone Access Management



Work Zone Access Management

- Standards available on how work zones should be planned.
- Standards available on how work zones should be installed.
- No available standard on how to manage roadway work zone access by multiple contractors at the same time to install work zones safely and effectively...

...until now.



Problem Statement

- Work Zone Impacts to Traffic:
 - Reduced Capacity
 - Speed Reduction
 - Unexpected Condition
 - Driver Distraction
 - Increased Signage
 - Merging or Shifted Condition
 - Increased Risk for Crashes



Problem Statement

- Manage roadway access by multiple contractors at the same time to install work zones safely and effectively
- Information overload (NJTA Statistics)
 - Over 1000 construction access requests per week
 - Email
 - Phone call
 - Text message
 - Paper forms

NEW JERSEY TURNPIKE AUTHORITY GARDEN STATE PARKWAY				
REQUEST FOR LANE CLOSINGS				
FOR WEEK BEGINNING MONDAY				
CONTRACT NO.	SUBMITTED BY			
DESCRIPTION	TELEPHONE NO.			
CONTRACTOR	DATE SUBMITTED			
APPROXIMATE	TOTAL	LANE	ESTIMATED	TOTAL
NO. OF	NO. OF	NO. OF	NO. OF	NO. OF
LANES	LANES	NO. OF	LANES	LANES
TO BE	TO BE	TO BE	TO BE	TO BE
CLOSING	CLOSING	CLOSING	CLOSING	CLOSING
PERIOD	PERIOD	PERIOD	PERIOD	PERIOD
START	START	START	START	START
DATE	DATE	DATE	DATE	DATE
TIME	TIME	TIME	TIME	TIME
EST.	EST.	EST.	EST.	EST.
DATE	DATE	DATE	DATE	DATE
TIME	TIME	TIME	TIME	TIME



...all with a single point of failure



Problem Statement

- Validation of MPT adherence for requests:
 - Traffic Manual(s)
 - Standard Drawings
 - Standard Taper Point List
 - Lane Closing Allowable Hours
 - Conflict Criteria
 - Holiday Restrictions
 - Special Event Restrictions

* Special Event Location: PNC Bank Arts Center (6000+)

* Name: Poison/Cheap Trick

* Start Date: 06/23/2018 * Start Time: 07:00 PM

* End Date: 06/23/2018 * End Time: 10:59 PM

Comments:

NEW JERSEY TURNPIKE OUTER ROADWAY LANE CLOSURES: MP 96.1 TO 99.9																				
		# of lanes:		Northbound		Southbound														
		4*		4*		(Nu														
Maintain minimum number of lanes throughout work zone as shown below regardless of total number of lanes, excluding term work efforts.*																				
Number of Lanes that Must Remain Open, SUMMER (May 15 through Sep																				
Hour	Monday - Wednesday		Thursday		Friday		Saturday		PNC#	Roadway	Start MP	Stop MP	Start Date	End Date	Start Time	End Time	Allow Lane Closing?	Allow Roadway Closing?	Allow Shoulder Closing?	Allow HICC?
	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Northbound	Sou												
12 am-1 am	1	1	1	1	1	1	1	1	PNC1	NBI	116	125.5	06/23/2018	06/24/2018	05:00 PM	12:59 AM	No	No	No	No
1 am-2 am	1	1	1	1	1	1	1	1	PNC1	NBO	116	125.5	06/23/2018	06/24/2018	05:00 PM	12:59 AM	No	No	No	No
2 am-3 am	1	1	1	1	1	1	1	1	PNC1	SBI	116	104.2	06/23/2018	06/24/2018	05:00 PM	12:59 AM	No	No	No	No
3 am-4 am	1	1	1	1	1	1	1	1	PNC1	SBO	116	104.2	06/23/2018	06/24/2018	05:00 PM	12:59 AM	No	No	No	No
4 am-5 am	2	1	2	1	1	1	1	1	PNC2	NBI	104.2	116	06/23/2018	06/23/2018	05:00 PM	07:00 PM	No	No	No	No
5 am-6 am	3	2	3	2	3	2	1	1	PNC2	NBO	104.2	116	06/23/2018	06/23/2018	05:00 PM	07:00 PM	No	No	No	No
6 am-7 am	4	2	4	3	4	3	2	2	PNC3	SBI	125.5	116	06/23/2018	06/23/2018	05:00 PM	07:00 PM	No	No	No	No
7 am-8 am	4	3	4	3	4	3	2	2	PNC3	SBO	125.5	116	06/23/2018	06/23/2018	05:00 PM	07:00 PM	No	No	No	No
8 am-9 am	4	3	4	3	4	3	2	2	PNC4	Arts Cent...			06/23/2018	06/24/2018	05:00 PM	12:59 AM	No	No	No	No
9 am-10 am	3	3	4	3	3	3	2	3	PNC5	INT 120 r...			06/23/2018	06/24/2018	05:00 PM	12:59 AM	No	No	No	No
10 am-11 am	3	3	3	3	3	3	3	3	PNC5	MATAWA	119.9	119.9	06/23/2018	06/24/2018	05:00 PM	12:59 AM	No	No	No	No
11 am-12 pm	3	3	3	3	3	3	3	3												
12 pm-1 pm	3	3	3	3	3	3	3	3												
1 pm-2 pm	3	3	3	3	3	4	3	3												
2 pm-3 pm	3	3	3	3	3	4	3	3												

Technology – Significant Features

- Request to Approval workflows
- Granular user roles and permissions
- Data validation for all request types
 - Roadway model(s)
 - Taper Points
 - Time Tables
 - Heavy Traffic Days (Holidays/Special Events)
- Work Zone Conflict Rules
- State Police Involvement (Vehicles, Reporting, Cancellations)
- OpenReach and Public Website integration
- Data and User Administration
 - Reporting
 - Tracking
 - Configurability (Users, Permits, Taper Tables, Time Tables, Holidays/Special Events, etc.)
 - User self-administration
- Reports and Dashboard
- Constructability Planning Tools

Technical Approach

- Web services hosted at Amazon AWS EC2
 - Provides internal and external secured access via modern web browser
 - Supports desktop and mobile devices
 - High performance, High availability
 - All-inclusive environment:
 - Hardware
 - Software
 - Load balancing, auto failover
 - Network I/O
 - Data Storage
 - Inexpensive
 - Rapid Start



Application Demonstration

The screenshot displays the NJTA Lane Closures application interface, which includes several key components:

- Navigation Bar:** Contains menu items such as Manage, Reports, Publish, Query, Admin, Dashboard, Police, Checklist, and Tools. It also shows the user's name (tirothermel@hntb.com) and a refresh button.
- Filtering and Action Bar:** Includes buttons for '+ New', 'Turnpike', 'Parkway', 'Manage', and 'All Approved'. There are also filters for 'Mod Week', 'Filter', and 'Export'.
- Dropdowns:** A series of dropdown menus for 'Day', 'Status', 'Roadway', 'Contract', 'Company', 'District', and 'Lane / Shoulder'.
- Table 1: Parkway Lane Closure Requests**

Day / Date	Flags	Status	Taper	Work Start	Work Stop	Resume	Roadway	Lane / Shoulder	Start	Finish	Work TBC	M
MO (10-...	✓	Approved	BOR			EOR	159SBK...	LT LN	10:00 PM	05:00 AM	Patch work	M
MO (10-...	✓	Approved	152.4	153.1	153.1	153.2	NB	LT LN 2	10:00 PM	06:00 AM	Sawcut...	C
MO (10-...	✓	Approved	150.8	153.1	153.1	153.2	NB	LT LN 1	10:00 PM	06:00 AM	Sawcut...	C
MO (10-...	✓	Approved	153	151.1	151.1	151.0	SB	RT LN 2	12:00 AM	05:00 AM	Sawcut...	C
MO (10-...	✓	Approved	153.5	151.1	151.1	151.0	SB	RT LN 1	10:00 PM	06:00 AM	Sawcut...	C
MO (10-...	✓	Approved	150.7	147.2	146.5	146.4	SB	LT LN 1	10:00 PM	05:00 AM	Patch wo...	M
MO (10-...	✓	Approved	150.7	147.2	146.5	146.4	SB	LT LN 2	12:00 AM	05:00 AM	Patch wo...	M
MO (10-...	✓	Cancel...	145.6	143.2	143.2	143.1	SB	LT LN 1	10:00 PM	06:00 AM	WIC Crs...	C
MO (10-...	✓	Cancel...	144.8	143.2	143.2	143.1	SB	LT LN 2	10:00 PM	06:00 AM	WIC Crs...	C
MO (10-...	✓	Approved	142.7	143.2	143.3	143.4	NB	LT LN 2	12:00 AM	05:00 AM	Raised P...	C
MO (10-...	✓	Approved	142.7	143.2	143.3	143.4	NB	LT LN 1	12:00 AM	05:00 AM	Raised P...	C
MO (10-...	✓	Approved	142.7	143.2	143.3	143.4	NB	LT LN 3	12:00 AM	05:00 AM	Raised P...	C
- Table 2: Turnpike State Police Activity**

Day / Date	Status	Request Type	Install	Start Time	End Time	Pickup	Taper	Work Start	Work Stop
Fr 10-1...	Approved			07:00 AM	09:00 AM		43.2	43.3	43.4
Fr 10-1...	Approved			07:00 AM	09:00 AM		43.4	43.3	43.2
Fr 10-1...	Approved			05:00 AM	10:00 AM		43.4	43.3	43.2
Fr 10-1...	Approved			08:00 AM					43.4
Fr 10-1...	Approved			12:00 AM			885		44.6
Fr 10-1...	Approved			11:00 AM	01:00 PM		891		44.6
Fr 10-1...	Approved			12:00 PM	02:00 PM		892		44.8
Fr 10-1...	Approved			11:00 AM	01:00 PM		893		44.8
Fr 10-1...	Approved			01:00 PM	03:00 PM		895		47.3
Fr 10-1...	Approved			01:00 PM	03:00 PM		896		47.2
Fr 10-1...	Approved			07:00 AM	07:00 AM	895	898		106
Fr 10-1...	Approved			09:00 PM	05:00 AM	893/894	899		0.8
Fr 10-1...	Approved			07:00 AM	05:00 PM		900		0.6
- Table 3: Checklist Table**

Taper	Resume	Roadway	Lane	Start	End	Work TBC	Install	Pickup	Type	Local
1.3	0	PEW	LT LN	04:30 AM	04:45 AM	Blasting/Painting	893/894	893/894	Slowdown	✗
6	6.9	HWE	LT LN	10:00 AM	03:00 PM	Close HWE LT LN (Contra Flow LN) in conjunction with INT 14C Toll Lane 7 and OSEXT LT LN to unload materials into work zone	896	895/897		✗
104.4	104.4	SOT Ramp @ INT 14	SPA Only	12:00 PM	12:15 PM	SPA Only	896	896	Slowdown	✗
1.3	0	PEW	LT LN	07:00 PM	06:00 AM	Blasting/Painting	893/894	893/894		✗
5.1	8.1	HWE	RT LN	08:00 PM	06:00 AM	HICC: Close HWE RT LN in conjunction with INT 14C Toll Lanes 1, 2 and 3 and Ramp B to pour bridge deck	895/897			✗
105	105	B Ramp	RAMP CLOSED							
- OpenReach Form:** A form for submitting lane closure information. It includes fields for 'Scheduled Lane Closure' (Taper, Resume, Roadway, Lane, Start, End, Install, Pickup, Type) and a 'Description' text area. A 'Submit to OpenReach (12:13 PM)' button is at the bottom.

Application – Moving Forward

- Enhanced Dashboard with Performance Measures and Roadway Health
- Automated Work Zone Request and Approval
 - If meets validation check → auto-approve
- Enhanced Communication Tools
- Electronic Contract/Traffic Permit Approval
- More Detailed Roadway Modeling
 - Connector /distributors, service roads
- Integration with Other Software Applications
 - ATMS, DMS/VMS messaging, Accident management
- Smart Work Zone Mapping for Connected Vehicles

Work Zone Access Management Value

- Resolves outdated communications and paper-based methodology
- Searchable Database for record keeping and Work Zone Access audits
- Minimizes exposure to liability of contractors on roadway with expired permits or contracts
- Provides for better communications of work zone request approval/denial status back to contractors
 - Accessible from anywhere on any device
 - Provides real-time feedback to users
- Clean data via validation/verification (taper points, closure times, location, roadway naming, etc.)

Work Zone Access Management Technology

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