PMINJ Chapter
April 21st Monthly Program 2015

Garden State Parkway
Phase 2
Widening Program

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New Jersey Turnpike Authority
Garden State Parkway
Phase 2
Widening Program

Program-Wide Coordination
Program Management Institute 2015
April 21, 2015
Agenda

NJ Turnpike Authority
Funding & project selection

Program Overview
GSP Widening MP 30 to 80

GSP Phase 2
Widening program

PMBOK
Knowledge areas
  - Scope
  - Schedule
  - Costs
  - Communication
  - Risk
New Jersey Turnpike Authority Charter and funding

The Garden State Parkway (GSP) and the New Jersey Turnpike were created by acts of the New Jersey Legislation.

The New Jersey Highway Authority (NJHA) was organized in 1952 to build, own, maintain, and operate the GSP.

The New Jersey Turnpike Authority (NJTA) was organized in 1948, to build, own, maintain, and operate the NJ Turnpike.
New Jersey Turnpike Authority charter and funding

Organization

NJTA and NJHA consolidated in 2003 and now manage both roads—two of the premiere toll roads in the country

More than 1,900 full-time employees including approximately 65 engineering staff and 30 professional engineers

Manages the $7 billion - 10 year Capital Improvement Program (CIP)
New Jersey Turnpike Authority charter and funding

Funding

CIP adopted in 2008

Funded through the sale of revenue bonds

Approval of a two step toll increase on both roadways

Toll increase implemented to fully fund the debt service to those bonds
Project identification

GSP Phase 1 was part of the CIP

NJTA expanded the scope of the GSP because the Turnpike Widening program and other projects in the CIP came in under budget;

- Phases 2 and 3 were added in 2009 and 2011

Other projects are:

- New Jersey Turnpike widening from interchanges 6 to 9
- Interchange improvements
- Facilities improvements
Bonding

NJTA sold its first bonds in 2009, but not for the total amount of the CIP.

The bonding market has not been favorable and NJTA has been tracking its draw down of funds in anticipation of selling more.
Program overview

GSP Interchange 30 to 80 Widening
GSP Interchange 30 to 80 Widening Program Overview

Phases implementation

Interchange 30
Somers Point
Atlantic County

Interchange 80
Toms River
Ocean County

Phase 1
Bass River MP 51.9

Phase 2
Mullica River MP 49.0

Phase 3
Patcong Creek MP 31.0
GSP Interchange 30 to 80 Widening Program Overview

**Typical section – median widening**

- **Existing**
- **Proposed**

4/21/2015
GSP Interchange 30 to 80 Widening Program Overview

Program limits

- **3** Counties
- **14** Municipalities
- **23** New structures
- **51** Modified structures
- **1** Toll plaza improvement
- **7** Acres of wetland impacts
- **297** Acres of T&E and critical wildlife habitat impacts
- **Secondary impacts at Interstate 58 and 69**
GSP Interchange 30 to 80 Widening Program Overview

Cost estimates

Total program cost: $900M

- Construction: $655M
- Utility relocations: $22M
- Construction supervision: $69M
- Design: $94M
- Environmental: $60M
- ROW acquisition: $1M

Patcong River Bridge – NB Structure Stage 1
Mullica River Bridge – East Fascia
## Program costs

<table>
<thead>
<tr>
<th></th>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
<th>Total MP 30-80</th>
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<tr>
<td>Design</td>
<td>$22,000,000</td>
<td>$41,000,000</td>
<td>$31,000,000</td>
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<td>Construction</td>
<td>$185,000,000</td>
<td>$275,000,000</td>
<td>$195,000,000</td>
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<td>Construction management</td>
<td>$20,000,000</td>
<td>$31,000,000</td>
<td>$18,000,000</td>
<td>$69,000,000</td>
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<td>Mitigation &amp; Right-of-Way</td>
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<td>$61,000,000</td>
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<td>Utility relocation</td>
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<td>$22,000,000</td>
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<td><strong>Totals</strong></td>
<td><strong>$227,000,000</strong></td>
<td><strong>$347,000,000</strong></td>
<td><strong>$244,000,000</strong></td>
<td><strong>$900,000,000</strong></td>
</tr>
</tbody>
</table>

Costs associated with the Bass River Bridge, Mullica River Bridge and Patcong Creek Bridge are included in the Phase 2 program.
GSP Interchange 30 to 80 Widening Program Overview

Program history

- **1997**: Preliminary engineering & permitting started
- **2000**: NJ SHPO deemed Parkway is a historic corridor; Project put on hold to assess impact
- **2002**: Project restarted
- **2003**: Preliminary engineering completed; Project put on hold while Authority reviewed long-range funding and priorities
- **2005**: Project was reactivated – design started; Governor made completion of 63 to 80 segment a priority (by 2009); Mullica River deck replacement made a priority
- **2009**: Construction started
### Environmental consideration/permits timeline

<table>
<thead>
<tr>
<th>Permitting process initiated in 2003</th>
<th>Secondary impacts mitigation ongoing</th>
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</thead>
<tbody>
<tr>
<td>All permits secured in November 2008</td>
<td>Reforestation mitigation ongoing</td>
</tr>
<tr>
<td>Wetlands mitigation (for 7.7 acres impacts) completed in 2008</td>
<td>Public access sites ongoing</td>
</tr>
<tr>
<td>Threatened and endangered species mitigation (for 245 acres impacted) completed in 2010</td>
<td></td>
</tr>
</tbody>
</table>
GSP Interchange 30 to 80 Widening Program Overview

Overall schedule

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<td>MP 63-80</td>
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<tr>
<td>MP 30-63 advanced clearing</td>
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<td>MP 30-48 preparation</td>
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<td>Bass River Bridge</td>
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</tbody>
</table>

Environmental permits expire on 4/21/2015.

Constr. in non regulated areas.

Design

Construction
Phase 2 program
GSP Interchange 30 to 63 Widening
GSP Widening Phase 2 MP 30 to 63

Program needs

Funding available in 2009

• Beneficial construction climate
  ▪ Savings in construction costs in Phase I and in the Turnpike Widening

Permit

• Flood Hazard Permit expires June 2013
  ▪ This permit was issued for 5 years with no extension
• Design completion in less than 2 years
• Construction completion in less than 2 years

Mathis Creek construction MP 50.4
GSP Widening Phase 2: MP 30 to 63

Program organization chart

NJTA
Lamis T. Malak, PE
Senior Highway Engineer

Program Manager
Atkins

P200.136
Michael Baker Jr
58 to 63 Widening

P200.135
The RBA Group Inc
52.5 to 58 Widening

P100.130
Hardesty & Hanover
Bass River Bridge

P200.134
Gannett Fleming Inc
48 to 52.5 Widening

P100.132
LSEA
Patcong Creek Bridge

P200.140
T&M Associates
Permit Construction
30.0 to 48.0

Ocean County

Burlington County

Atlantic County

4/21/2015
GSP Widening Phase 2: MP 30 to 63

Program schedule

<table>
<thead>
<tr>
<th>Contract #</th>
<th>Project Name</th>
<th>Phase A</th>
<th>Phase B</th>
<th>Pre-Phase C</th>
<th>Phase C</th>
<th>Pre-Phase D</th>
<th>Phase D</th>
<th>Advertisement Date</th>
<th>Bids Received</th>
<th>Meeting Agenda Finalized</th>
<th>Commission Meeting</th>
<th>Estimated NTP*</th>
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<tr>
<td>P200.136</td>
<td>GSP Widening MP 57.7 to 64.9</td>
<td>19-Mar-10</td>
<td>13-Sep-10</td>
<td>1-Dec-10</td>
<td>7-Feb-11</td>
<td>22-Apr-11</td>
<td>21-Jun-11</td>
<td>5-Jul-11</td>
<td>18-Aug-11</td>
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<td>7-Sep-11</td>
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<tr>
<td>P100.132</td>
<td>Patcong Creek Bridge</td>
<td>1-Dec-09</td>
<td>17-May-10</td>
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<td>20-Aug-10</td>
<td>27-Sep-10</td>
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<td>14-Oct-10</td>
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<td>19-Nov-10</td>
<td>30-Nov-10</td>
<td>15-Dec-10</td>
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<td>P100.130</td>
<td>Bass River Bridge - New Bridge</td>
<td>29-Dec-09</td>
<td>20-Apr-10</td>
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<td>5-Aug-10</td>
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<td>13-Oct-10</td>
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<td>22-Dec-10</td>
<td>7-Jan-11</td>
<td>25-Jan-11</td>
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<td>P200.159</td>
<td>GSP MP 30 to 63 Advance Clearing Plans (Includes Bass River Bridge)</td>
<td>17-May-10</td>
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<td>10-Aug-10</td>
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<td>8-Sep-10</td>
<td>10-Sep-10</td>
<td>26-Oct-10</td>
<td>24-Nov-10</td>
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</table>

Managing to schedule

- All flood hazard permits expired June 2013
- Construction should be completed before permit expiration date
Design oversight
• Set program guidelines
• Provide technical guidance
• Oversee design engineers
• Review all submissions
• Longitudinal utility coordination
• State, county, local coordination
• Coordinate public meetings/hearings
• Environmental consultant coordination
• Conduct geotechnical exploration and testing

Administrative support
• Invoice reviews
• Scope change reviews
• Meeting coordination
Tasks that are under the program manager in Phase 2
( Based on lessons learned in Phase I)

Longitudinal utility engineering
- G4S (formerly Adesta) fiber-optic facilities
- AT&T, Verizon, Sprint fiber-optic facilities

Subsurface exploration
- All borings and lab testing undertaken by PMT

Advanced clearing from MP 30 to 63
- Migratory Bird Treaty Act restrictions on tree clearing

Coordination of MPT & sign layout in Phase A
- Developed program concept for MPT
Drainage structures & grading
MP 30.2 TO 47.3 (P200.140)

- Design engineer – T&M Associates
- Contractor – Midlantic Construction
- Contract award – August 2011
- Construction cost - $8,713,399.00
GSP Widening MP 47.7
51.3 (P200.134)

- Design engineer – Gannett Fleming Inc.
- Contractor – Midlantic Construction LLC
- Contract award – August 2011
- Construction cost - $50,617,232.00
GSP Widening Phase 2: MP 30 to 63

Contracts within phase 2 program

Rehabilitation of GSP Bridge over Mullica River P100.025 MP 48.5 to 49.7

- Design engineer – Parsons Brinckerhoff
- Included in contract P200.134 Widening from MP 47.7 to 51.3
Contracts within phase 2 program

Widening and rehabilitation of Bass River Bridge MP 51.9

- Design engineer – Hardesty & Hanover, LLP
- Contractor – Northeast Remsco
- Contract award – January 2011
- Construction cost - $55,814,955
GSP Widening MP 52.4 – 57.8 (P200.135)

- Design engineer – The RBA Group
- Contractor – Richard E. Pierson
- Contract award – August 2011
- Construction cost - $46,657,170

Greenbush Road Bridge over GSP
Contracts within phase 2 program

GSP Widening MP 57.8 – 64.9 (P200.136)

- Design engineer – Michael Baker Jr. Inc.
- Contractor – Earle Asphalt Co.
- Contract award – August 2011
- Construction cost - $52,063,413

Garden State Parkway over Route 72
Strategic approach to program management

Need for Strategic Approach

- Design and construction of nearly $300 million worth of improvements to an existing highway while maintaining traffic makes the Garden State Parkway Widening a very complex project.

Break down into 4 sections by Authority

Authority retains Program Manager

Control of Budget overruns by adding an “unanticipated services task”

Program Manager assigned Project Managers to oversee individual sections

Identified significant issues

- Schedule
- Consistency
- Traffic Control Design
- Design to Permit
Strategic approach to program management

- Stakeholder coordination
- Aggressive communication with design team
- Scope and budget control monthly reviews
- Workshops, on-board reviews strategic design guidance
- Planned for quality guidance for consistent design, reviews for conformance to standards
- Developed master plan for traffic control during construction
- Team building led by example that end result for Authority was paramount
  - Christmas cookies
  - Donuts and coffee
  - End of project bowl-o-rama

4/21/2015
GSP Widening Phase 2: MP 30 to 63

PMBOK knowledge areas

- Program scope management
- Program cost management
- Program schedule management
- Program communication management
- Program risk management
GSP Widening Phase 2: MP 30 to 63

Key challenges

Schedule
June 13, 2013
- Completion before permits expire

Consistency between adjacent projects
- Consistency reviews, monthly program meetings

Weather
Delay by 2 months
- Used existing 10 year old plans at start to offset delay

Coordination of traffic stages with ongoing Bridge projects
- Significant potential for schedule delays and cost increases

Drainage design vs. permits
- Design should be within permit disturbance limits
Program scope management

Gather other agency requirements (NJDOT, Counties, SESC)

Control scope monthly review

Gathering of scope requirements

- Added Value - Lessons Learned from Phase 1
- As-Built Plans
- Preliminary Design Aerials and Mapping

Detailed scope breakdown and tracking of work breakdown structure tasks template provided by program management team

High level scope breakdown part of response to RFP

GSP Widening Phase 2: MP 30 to 63

Scope of work for final design developed by Authority based on previous projects
Lessons learned from Phase 1

**Design Coordination Needs**
- NJTA staff needs support to manage and coordinate the multiple projects involved in each phase of the Widening program.
- An exclusive website for NJ Turnpike Authority, Program Manager and Section design engineers.

**MPT**
- Coordination required in staging for adjacent contracts. Three roadway Widening contracts and Interchange 67 improvements construction were ongoing simultaneously.
- Identical MPT Pay Items
- Different pay items in adjacent contracts makes RE work complicated.
- Construction Details
- For example - Specific details for construction vehicle access at each stage.
Cost management

Controls
review of work vs. costs

Elimination
- Removed design work that was identified for P200.140
  - Moved the design to Phase 3

Mitigation
- Design engineers collaboration
  Sharing special details to reduce re-work costs (savings on each design)
- PMT developed detailed advisories to minimize changes
- Construction specs include penalty clause

Acceptance
“Unanticipated” line item budget for design
Set aside in funding approval to address change orders
Controls
monthly schedule reviews

Adjusted design submissions
- Allow slack in interim submissions
  - Example Moved the MPT submission to a separate item

Assistance to section design consultant
- On board monthly review and mark-ups to keep design schedule
- Sharing special details to reduce re-work costs (savings on each design)

Contract specifications
- Interim construction dates with penalties
- Ongoing stage construction coordination – design and construction
Program communication management

Website
- One Calendar (all meetings posted)
  - Meeting Minutes (Attached to calendar item)
- Submissions and reviews (ERC)
- Documents – 40,000 on website alone

Communications management manual
- Detailed hierarchy
- Website and ERC Layout

Meetings
- Monthly Progress meetings
  - Program-wide to address common issues - also team bonding
  - Meetings to discuss issues/progress of each design
- Public meetings/ hearings
- Stakeholder meetings & communication
- Design Workshops
Program stakeholder management

NJ DOT and three counties
- Separate kickoff meeting with each agency - predesign
- Major submissions review and comment
- Specifications include agency requirements and contacts

Utilities
- Kickoff meeting with utilities
- Ongoing coordination
- Signed utility agreement listing responsibilities and payment

Federal and state permit agencies
- Ongoing coordination – continued from preliminary design
- Submission final plans to show compliance
- Field meetings to obtain concurrence with design approach
- Additional permits obtained where needed
- Permit modifications requested where needed
NJTA held the following public activities:

Public hearing for the Widening permit application in January 2007

Three public Information centers in March 2007

Public hearing for Mullica River Bridge construction in October 2007

Public hearing for Phase I in October 2008

Public hearing for Phase 2 in September 2010

Public hearing for tree clearing in August 2011
Risk management - schedule risks

Environmental

- Wetlands and Flood Hazard permits expire June 2013 (no extensions)
- Design and construction to adhere to permit impact limitations
  - Tree clearing between November 1 and March 31
  - Snake/turtle incursion protection during dormant period

Commitments to Public

- Authority was committed to opening three lanes south of Interchange 63 by Summer 2013

These constraints dictated the schedule for completion of construction
GSP Widening Phase 2: MP 30 to 63

Risk management - schedule risks

Design Schedule
- Permit impact limitations
- Coordination of design between Widening sections
- Coordination of design with Bridge projects
- Weather

Construction Schedule
- Permit impact restrictions
- Utility relocation
- Coordination between contracts
- Weather

Winter 2009-2010
Snow cover prevents survey

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Risk management – other risks

Utility
- Fiber-optic line relocation
- Gas line restrictions

Coordination between contracts
- Leads to delays
- Leads to delay claims by adjacent contractor (cost)

Unknown unknowns
- Comptroller reviews (+2 months to design)
- Delay of “letting”
- Severe winter delayed survey at start of design

Geotechnical issues
roadway soil conditions

Underlying muck causes long term roadway settlement
GSP Widening Phase 2: MP 30 to 63

Risk management strategies

Convert unknowns to knowns
MPT coordination elimination
- Separate contracts let early – P200.140 & P200.159
  Eliminated permit restrictions for wetlands and tree clearing
- Utility work that can commence early

Mitigation
- Construction specs include liquidated damages clause
  - For delay by one contractor of adjacent contractor’s staged work
  - For failure to open 3rd lane in southbound direction by summer 2013
  - For failure to complete all work within wetlands by permit date

Acceptance
- CE team identified workarounds for utility delays
- Authority extended contract completion dates
Scope Of The Clearing

Clearing in 2011, completed in anticipation of Parkway Widening from Interchange 30 to 63, included:

- Clearing to accommodate third lane and shoulders, water quality swales and Bridge reconstruction
- Clearing to re-establish the roadside clear zone for safety – “CLEAR ZONE” IS AN UNOBSTRUCTED AREA THAT ALLOWS A DRIVER TO STOP OR REGAIN CONTROL OF A VEHICLE THAT HAS LEFT THE ROADWAY
- Consisted of the clearing, removing and disposal of trees, logs, dead trees, and other vegetation including shrubs
GSP Widening Phase 2: MP 30 to 63

Project results – safety achieved

Garden State Parkway - Before clearing

Garden State Parkway - After clearing
Fatal accidents involving trees is most prevalent in the proposed Widening limits than any other area on the GSP.

Fatalities involving trees for the entire GSP during 2001 to 2010 accounted for approximately 30% of all fatalities.
<table>
<thead>
<tr>
<th>Year</th>
<th>Lane Direction</th>
<th>Incidents</th>
<th>Major Delays</th>
<th>Backup Length</th>
<th>Constraints</th>
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<tbody>
<tr>
<td>Summer 2008</td>
<td>Southbound</td>
<td>34</td>
<td>Major Delays</td>
<td>10 miles</td>
<td>All incidents limited to Friday or Saturday</td>
</tr>
<tr>
<td>Summer 2011</td>
<td>Southbound</td>
<td>7</td>
<td>Major Delays</td>
<td>2.9 miles</td>
<td></td>
</tr>
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<td>Summer 2011</td>
<td>Northbound</td>
<td>1</td>
<td>Major Delays</td>
<td>14 miles</td>
<td>Backup linked to an incident at Interchange 88</td>
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Improved evacuation route
- With Contra-flow six-lane evacuation route
- Increased capacity - 50%

Extend GSP service life
- Improved pavement
- Reduction in vehicles per lane – less wear and tear
- Replaced drainage systems
- Improved signage
- Replaced 50+ years old bridges

Protect wildlife
- Installed specially designed permanent terrapin fence
  - Prevents migration across parkway pavement
  - Prevent accidents – people stopped for turtles
Lessons learned

Project planning

• Avoid winter issues by early planning – (e.g.- aerial survey by PMT)

• Develop program specific project reporting spreadsheets

• Start schedule issues early
  ▪ Right-of-way appraisals early to save 4 months
  ▪ SUE investigations under PMT
  ▪ GPR to identify underground utilities that are not known to exist

Project execution

• Use website to track all file exchanges

• Streamline system to provide design guidance communication

• Document monitoring of risks
Lessons learned

What worked

• Program manager to oversee design
• Website based phase submission reviews
• Early and frequent coordination with other agencies
• Approach to team building
  ▪ “Walk the talk” – adversarial approach is out.
  ▪ In difficult issues keep the Authority’s needs as prime
  ▪ Common goal – successful project delivery is a win for all
  ▪ Blame game is out – help when mis-steps occur
• Project Closeout

What did not work

• Document management
  ▪ More than 40,000 files
  ▪ Retrieval is a challenge
  ▪ Better naming and filing system is needed for electronic documents
• 3 separate advisory systems
  ▪ Tech memos, spec guidelines and design advisories
  ▪ Combine all three into one system
  ▪ Develop tracking and versioning
• Document monitoring of risks
  ▪ Past meeting minutes was used
  ▪ Got lucky – formal tracking needed
### Summary – schedule and costs

<table>
<thead>
<tr>
<th></th>
<th>Planned</th>
<th>Actual</th>
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<tbody>
<tr>
<td>Design Completion</td>
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<td>June 2013</td>
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<tr>
<td>Construction</td>
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<tr>
<td>Open 3 lanes</td>
<td>Summer 2013</td>
<td>Limited areas</td>
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<td>Budget</td>
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July 2013
Construction ongoing – 3 lanes southbound open at Interchange 63
Q&A

Garden State Parkway Widening Program
Interchange 30 – 63
GSP Widening Phase 2: MP 63 to 80

Construction progress

Interchange 48
GSP Widening Phase 2: MP 63 to 80

Construction progress

Other roadway construction shots

GSP Bridge over Patcong Creek
Bridge Widening
GSP Widening Phase 2: MP 63 to 80 - Construction Complete

Before and after views

Parkway Southbound MP 57

4/21/2015
GSP Widening Phase 2: MP 63 to 80 - Construction Complete
Before and after views

Parkway Southbound MP 52

BEFORE

AFTER

4/21/2015
GSP Widening Phase 2: MP 63 to 80 - Construction Complete
Before and after views

Parkway Southbound MP 61.2
GSP Widening Phase 2: MP 63 to 80 - Construction Complete
Before and after views

Parkway Northbound Stage Road

4/21/2015
GSP Widening Phase 2: MP 63 to 80
Construction progress

Roadway construction in P200.135 contract
Interchange 63 sign structure erection

4/21/2015
GSP Widening Phase 2: MP 63 to 80
Construction progress

GSP Bridge over Bass River – Pier 1 columns
Water quality basin at MP 53.8 NB