

### COLUMBIA TURNPIKE BRIDGE OVER THE BLACK BROOK LOCAL CONCEPT DEVELOPMENT STUDY

Borough of Florham Park, Morris County, New Jersey



# **PUBLIC INFORMATION CENTER #2** September 11, 2018





# **PROJECT TEAM**











### MEETING PURPOSE

- Provide a summary of the Local Capital Project Delivery Process
- Present a brief summary of the data collection effort
- Present the Project Purpose & Need and Goals and Objectives for the project
- Present the improvement concepts developed for the Columbia Turnpike Bridge
- Obtain input regarding the improvement concepts

# **PROJECT OVERVIEW AND BACKGROUND**

- Columbia Turnpike Bridge is located in Florham Park Borough, Morris County
- Bridge was built in 1929
- Bridge is in need of rehabilitation or replacement
- NJTPA and Morris County Local Concept Development Study was initiated in November 2017
- Local Capital Project Delivery Program provides the opportunity to advance this project with public input, stakeholder and agency collaboration

### **PROJECT LOCATION MAP**



### **AERIAL MAP**



### LOCAL CAPITAL PROJECT DELIVERY PROCESS

Local Concept Development	Local Preliminary Engineering	Final Design/Right of Way Acquisition	Construction			
Data Collection	<ul> <li>Continue Public Outreach Efforts</li> </ul>	<ul> <li>Continue Public</li> <li>Outreach Efforts</li> </ul>	<ul> <li>Continue Public Outreach Efforts</li> </ul>			
<ul> <li>Initiate Public Outreach Efforts</li> </ul>	<ul> <li>Preliminary Design</li> </ul>	• Final Design	Complete Construction			
<ul> <li>Purpose and Need Statement</li> </ul>	<ul> <li>Preliminary ROW Documents</li> </ul>	<ul> <li>Final ROW Documents and ROW Acquisition</li> </ul>	• As-Built Plans			
<ul> <li>Alternatives Development and Analysis</li> </ul>	<ul> <li>Preliminary Engineering Plans</li> </ul>	<ul> <li>Final Contract Plans and PS&amp;E Package</li> </ul>	<ul> <li>Close-Out Documentation</li> </ul>			
<ul> <li>Select Preliminary Preferred Alternative</li> </ul>	<ul> <li>Preliminary Construction Cost Estimate and Schedule</li> </ul>	<ul> <li>Final Utility Relocation Schemes</li> </ul>				
NEPA Classification	<ul> <li>Approved Design Exception Report</li> </ul>	<ul> <li>Secure Environmental Permits</li> </ul>				
<ul> <li>Local Concept Development Report</li> </ul>	<ul> <li>Approved NEPA Environmental Document</li> </ul>	<ul> <li>Environmental Reevaluation</li> </ul>				
	<ul> <li>Local Preliminary Engineering Report</li> </ul>					

### LOCAL CONCEPT DEVELOPMENT PROCESS



# COLUMBIA TURNPIKE BRIDGE DATA

- Year Built: 1929 (widened in 1960)
- Bridge Type: Single Span Bridge with concrete encased steel beams and rolled steel multi-stringers
- Overall Bridge Length = 35 feet
- Bridge Roadway Width = 45'-7"
- Posted Speed Limit = 50 MPH
- 2 lanes in each direction, no outside shoulders
- 4'-11" Sidewalks in each direction
- 2018 AADT = 33,840 vehicles per day

# COLUMBIA TURNPIKE



Columbia Turnpike west approach to bridge, looking east Columbia Turnpike east approach to bridge, looking west

### **BLACK BROOK**





Black Brook and associated freshwater wetlands, looking south (downstream) Black Brook and associated freshwater wetlands, looking north (upstream)

- The bridge is in overall fair condition due to the condition of the superstructure
- Superstructure is in fair condition (rating of 5 out of 10) due to localized section loss and rusting at the beam ends, heavy rust staining and spalls, rust laminations, and diaphragms with section losses and holes
- The bridge is functionally obsolete based on the substandard bridge roadway width
- Sufficiency Rating is 57.5 out of 100 (17<sup>th</sup> Cycle)

## **EXISTING BRIDGE PHOTOS**



Bridge south fascia, looking north



Bridge north fascia, looking south



West approach, looking East



Bridge deck, looking south



Damaged double rail element



Substandard guiderail attachment



Under deck – Original Section (1920)



Under deck – Widened Section (1960)



Abutment bearing seats



East Abutment - Northeast corner

# ENVIRONMENTAL CONSTRAINTS MAP



# SITE CONSTRAINTS



Sewer Pump Station located west of the bridge



*Ely's Aquatic Farm located just west of the bridge* 

# SITE CONSTRAINTS





Office complex located east of the bridge Morristown Airport located west of project limits

### **PROJECT STATUS**

- November 2017 LCD Study initiated
- Spring 2018 Data Collection completed
- Spring 2018 Held Local Officials Briefing #1 and Public Information Center #1
- June 2018 Project Purpose and Need Statement finalized
- Summer 2018 Developed Conceptual Alternatives
- August 30, 2018 Local Officials Briefing #2
- September 11, 2018 Stakeholders Meeting and Public Information Center #2

### **PURPOSE** AND NEED

 The purpose of this project is to address the deficiencies and improve safety and traffic operations through the rehabilitation or replacement of the Columbia Turnpike Bridge over Black Brook and to provide an upgraded structure that meets current standards and maintains a safe means of transportation across the Black Brook for all users.

### PURPOSE AND <u>NEED</u>

- The Columbia Turnpike Bridge over Black Brook supports a vital regional transportation network link for the driving public, schools, and businesses through the Borough of Florham Park connecting to Route 24, I-287, Morristown Municipal Airport (MMU), Fairleigh Dickinson University, the Town of Morristown, the Garden State Parkway, the Oranges and Newark.
- The bridge is Functionally Obsolete due to the substandard roadway/shoulder widths and is in overall fair condition due to the condition rating of the superstructure. The superstructure condition is fair with a rating of 5 out of 10, and the substructure is in satisfactory condition. The bridge currently has a Sufficiency Rating of 57.5.

# GOALS AND OBJECTIVES

- Address bridge structural deficiencies
- Upgrade bridge and approach roadway conditions to meet AASHTO and NJDOT safety standards, including new parapets and guide rail
- Minimize environmental, social and economic impacts in the project area
- Minimize impacts to the Black Brook
- Minimize impacts to existing utilities including water, gas electrical, telephone and fiber optic lines
- Minimize disruptions to traffic operations during construction
- Maintain access to adjacent business at all times during construction
- Minimize the use of detours; if detours are required, utilize the state and county roadway network to the greatest extent feasible
- Provide bicycle and pedestrian compatibility to the approach roadways

# CRITICAL DESIGN PARAMETERS FOR STRUCTURAL ALTERNATIVES

### • STRUCTURAL LIFE CYCLE

- Strong durability, cost effective, and minimal maintenance

### HYDROLOGY & HYDRAULICS

- No flood water increases greater than 0.04'

### • STAGING

- Maintain current traffic capacity on Columbia Turnpike
- Keeping four lanes open

### ROADWAY GEOMETRY

- Address substandard geometries
- Wider bridge to include outside shoulder

### • WILDLIFE PASSAGES

- Eliminating environmental barriers at bridge

# EXISTING BRIDGE SITE





### **EXISTING BRIDGE PLAN & SECTION**



**CROSS SECTION** 

#### **TYPICAL SECTION – SPREAD BOX BEAM ALTERNATIVE**



#### **TYPICAL SECTION – ADJACENT BOX BEAM ALTERNATIVE**



### BRIDGE BEAM ALTERNATIVES STANDARD CONSTRUCTION METHODS

### BRIDGE BEAM ALTERNATIVES ACCELERATED BRIDGE CONSTRUCTION METHODS (ABC)



#### **TYPICAL SECTION – NEXT BEAM ALTERNATIVE**



#### **TYPICAL SECTION – INVERSET ALTERNATIVE**

### HYDRAULIC PROFILE – 52' SPAN ALIGNMENT NEAR EXISTING



### HYDRAULIC PROFILE – 32' SPAN ALIGNMENT NEAR EXISTING



### **STAGING CONCEPT 1** ALIGNMENT NEAR EXISTING (ALTERNATE 1C)



### STAGING CONCEPT 2 ALIGNMENT SHIFTED TO SOUTH (ALTERNATE 2D)





<u>STAGE 2</u>







### STAGING CONCEPT 3 ALIGNMENT SHIFTED TO NORTH (ALTERNATE 3A )











### STAGING CONCEPT 1 - ROADWAY PLAN ALIGNMENT NEAR EXISTING (32' SPAN)





### STAGING CONCEPT 2 - ROADWAY PLAN ALIGNMENT SHIFTED TO SOUTH (32' SPAN)

仑 N



### STAGING CONCEPT 3 – ROADWAY PLAN ALIGNMENT SHIFTED TO NORTH (32' SPAN)

仑 N



### STAGING CONCEPT 1 – ROADWAY PROFILE NEAR EXISTING ALIGNMENT (32' SPAN)



### STAGING CONCEPT 2 – ROADWAY PROFILE ALIGNMENT SHIFTED TO SOUTH (32' SPAN)



### STAGING CONCEPT 3 – ROADWAY PROFILE ALIGNMENT SHIFTED TO NORTH (32' SPAN)



### STAGING CONCEPT 1 – ROADWAY PLAN ALIGNMENT NEAR EXISTING (52' SPAN)





### STAGING CONCEPT 2 – ROADWAY PLAN ALIGNMENT SHIFTED TO SOUTH (52' SPAN)

仑 N



### STAGING CONCEPT 3 – ROADWAY PLAN ALIGNMENT SHIFTED TO NORTH (52' SPAN)

分 N



## WILDLIFE PASSAGES CHALLENGES AND CONFLICTS

- H&H ANALYSIS
  - Analysis shows the 52' span will result in **increased flooding** downstream from any increased span at the bridge due to the basin nature of the topography.

#### EXISTING SPAN OPENING

- Effectively the controlling link for maintaining current storm water levels

#### INCREASED SPAN OPENING

 Accommodates wildlife passages but will result in an increased downstream flood level by 0.1 feet, exceeding the NJ limit of 0.04 feet.

#### ENVIRONMENTAL PERMITTING

- Permit would **NOT** be issued as it violates regulatory requirements

#### • LIABILITY

 Places the County, Borough, and regulatory agencies into a position of liability for potential damages that comes with that design scenario.

#### • SEPARATE WILDLIFE PASSAGES OPENINGS

- H&H analysis shows separate 3'x3' wildlife passage openings limits flood level increase at 0.04 feet.
- Regulatory acceptance is **unknown** at this time for this design scenario.

### PRELIMINARY PLAN AND ELEVATION



PLAN

# DRAFT ALTERNATIVES MATRIX

COLUMBIA TURNPIKE BRIDGE OVER THE BLACK BROOK LOCAL CONCEPT DEVELOPMENT STUDY Beruge of Forham Rvin, Koren Caurle, New Jenny	No Build	Bridge Rehabilitation	Replace In-Kind	Staging Concept 1 New Bridge on near Existing Alignment				Staging Concept 2 New Bridge on Alignment shifted to South				Staging Concept 3 New Bridge on Alignment shifted to North			
Alternative Labeling: Staging Concept - Superstructure Type Prestressed NEXT Beam - A Steel Inverset - B Prestressed Concrete Spread Box Beam - C Descharged Concrete Adjacent Box Box - D				Alternate 1-A	Alternate 1-B	Alternate 1-C	Alternate 1-D	Alternate 2-A	Alternate 2-B	Alternate 2-C	Alternate 2-D	Alternate 3-A	Alternate 3-B	Alternate 3-C	Alternate 3-D
Superstructure Types	Concrete encased multi-stringer w/ Steel Stringer Widening	Concrete encased multi-stringer w/ Steel Stringer Widening	Steel Multigirder	Prestressed NEXT Beam	Steel Inverset	Prestressed Concrete Spread Box Beam	Prestressed Concrete Adjacent Box Beam	Prestressed NEXT Beam	Steel Inverset	Prestressed Concrete Spread Box Beam	Prestressed Concrete Adjacent Box Beam	Prestressed NEXT Beam	Steel Inverset	Prestressed Concrete Spread Box Beam	Prestressed Concrete Adjacent Box Beam
Criteria															
Meets Project Purpose and Need	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maintenance and Protection of Traffic															
Number of lanes provided during construction	4	2	0	4	4	4	4	4	4	4	4	4	4	4	4
Is Detour Required?/Length of detour	No	Yes, Partial	Yes	No	No	No	No	No	No	No	No	No	No	No	No
Roadway															
Controlling Substandard Design Elements Remaining	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0
Improves Lane Widths	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Improves Shoulder Widths	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Improves Stopping Sight Distances at MP 15.38	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Profile Raise at the Bridge	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Traffic Operations & Bicycle/Pedestrian															
Accommodates design year traffic volumes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bicycle/Pedestrian compatibility provided with connectivity to approach															
roadways	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sidewalks provided	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1
Construction Duration															
Duration (Months)															
Stages Required				5	5	5	5	4	4	4	4	3	3	3	3
Right of Way Impacts															
Required ROW (Acres)															
Number of Temporary construction easements															
Number of partial property acquistions															
Number of entire property acquistions															
Access															
# of Access Impacts to adjacent properties during construction															
# of Permanent Access Impacts to adjacent properties															
Structural Design															
Accelerated Bridge Construction Methodologies															
Bridge opening meets design year storm (H&H)															
Seismic Design addressed	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bridge Approach Safety Upgraded	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
75 yr. Bridge Life Cycle	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wildlife Passage Compatible	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Environmental Impacts															
Green Acres & Section 4(f)															
Total Wetlands Impacts (acres)															
Threatened and Endangered Species Habitat															
Floodplain (acres)															
Riparian Zone (acres)															
Historic Resources (# of sites)															
Hazardous Waste/Contaminated Sites															
Seasonal restrictions															
Utilities															
Anticipated relocations	No	No	No												
Costs															
Construction Costs	\$0	\$437,875	\$875,750	\$1,105,920	\$1,152,000	\$1,105,920	\$1,152,000	\$1,105,920	\$1,152,000	\$1,105,920	\$1,152,000	\$1,105,920	\$1,152,000	\$1,105,920	\$1,152,000
Estimated Utility Relocation Cost															
Estimated Right of Way Cost															
Life Cycle Cost (Present Value)															
Detour Costs															
Total Project Cost															

# **PROJECT SCHEDULE**

- 18 month completion schedule
- Major Milestones
  - Purpose and Need Statement July 2018
  - Development of Conceptual Alternatives Aug./Sept. 2018
  - Selection of Preliminary Preferred Alternative Dec. 2018/Jan.
     2019
  - Submission of Draft Local Concept Development Report March 2019
  - Completion of Local Concept Development Phase June 2019

# COMMUNITY INVOLVEMENT SCHEDULE

#### Project Introduction and Purpose & Need

- Local Officials Briefing #1 April 24, 2018
- Public Information Center #1 May 9, 2018

### **Obtain Input on Conceptual Alternatives**

- Local Officials Briefing #2 August 30, 2018
- Stakeholders Meeting September 11, 2018
- Public Information Center #2 September 11, 2018

#### Selection and Presentation of Preliminary Preferred Alternative

- Local Officials Briefing #3 Fall/Winter 2018
- Public Information Center #3 Fall/Winter 2018

# PROJECT WEBSITE AND SOCIAL MEDIA

- PROJECT WEBSITE
  - <u>http://www.columbiaturnpikebridge.com/</u>
- TWITTER
  - @Columbia\_Bridge
  - <u>https://twitter.com/Columbia\_Bridge</u>
- **POWERPOINT PRESENTATION** will be posted on the project website



## **PROJECT CONTACT INFORMATION**

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# THANK YOU

For more information or to contact us:



Visit our website: www.ColumbiaTurnpikeBridge.com

Follow us on Twitter: @Columbia\_Bridge