MEMORANDUM

DATE: January 14, 2010
TO: Richard E. Parker
FROM: Kevin W. Johns
RE: PN 2662
Letchworth State Park
Norfolk Southern Portageville Bridge
Conversion Inquiry

The information contained in this memorandum is in response to OPRHP’s request for a cost analysis regarding a possible conversion of Norfolk Southern’s Portageville Bridge to a pedestrian bridge, the operating and maintenance costs (O&M) as a pedestrian bridge, the expected lifespan of the structure as a pedestrian bridge and the cost to remove the existing bridge.

Please be advised that we have provided the information below based on an overview of the information available concerning the Portageville Bridge and without a detailed engineering assessment. Accordingly, some line items mentioned in your November letter have not been developed in detail. In addition, some items were difficult for us to assess given the many possible options, including lighting, access and trail amenities.

Further, any statements made in this memo indicating use of the bridge as a pedestrian bridge in the future are not statements of guarantee or warranty, but simply reflect a use proposed by OPRHP, and any such pedestrian use in the future would be dependent on a complete inspection and analysis.

Conversion Costs
This cost analysis was performed utilizing the information provided in your letter, attached, in conjunction with some generalized engineering assumptions which will be described in greater detail below. This cost analysis is to be considered applicable for planning and budgeting purposes only and is based on representative costs which could vary depending on the final plan for conversion.
The proposed loading for the converted structure is assumed to be pedestrian load with an HS20 truck to account for construction loads or emergency vehicles. Pedestrian loading and the HS20 truck are significantly less than railroad loading. In the absence of a more rigorous analysis, this cost analysis was performed assuming that the current capacity of the structure would be adequate to support this assumed pedestrian and HS20 truck loading and that no strengthening will be required in any of the main members of the superstructure or towers. Costs were assumed for structural steel repairs related to deterioration that may be discovered during construction and repair of any miscellaneous secondary members.

This cost analysis assumed that the existing ties, rails, and hand railing would be removed and replaced with a new deck with handrails more suitable for pedestrian use. No significant modifications to the supporting structural steel superstructure or towers were assumed.

The new deck was assumed to be precast concrete panels. Costs associated with other deck types such as timber, recycled plastic, steel grating, or cast-in-place concrete will vary; however, the magnitude of the total project cost will most likely remain unchanged.

As requested in the attached letter, costs for trail amenities, such as pedestrian shelters, benches, and power on the bridge have been included. Additionally, costs for sidewalks, parking lots, signage, gates, and fences have been provided in the item for pedestrian accessibility accommodations.

Costs associated with cleaning and painting the bridge or encapsulation of the lead paint are not necessary for the initial conversion of the bridge and, therefore, were not included with this estimate. Painting of the new bridge could take place at a future date at the new owner’s discretion.

Prior to conversion, it is assumed that an in-depth inspection will be performed. Inspection costs were approximated assuming that the track will be in place for use by the inspection team and that an underwater inspection is not necessary.

The project subtotal cost was obtained by dividing the project into the main items shown in the attached Estimate for Conversion to Pedestrian Bridge, quantifying those items, and calculating their associated unit costs. Many of the items shown in the estimate are given the unit of “Lump Sum” (LS), which means that the item is comprised of several smaller items with varying unit costs. For example, the respective costs for pedestrian shelters, benches, and power on the bridge are calculated, quantified, and the sum total of the costs is reported as the lump sum cost for “Trail Amenities.” The following costs were then added to the project subtotal cost:

1. **Mobilization** – Costs for the contractor to mobilize his or her crew and equipment were included as 5% of the total project cost.
2. **Accessibility Difficulties** – Costs incurred resulting from the accessibility difficulties encountered due to the site conditions.
3. **Contingency** – Due to the limited conceptual design used to generate this estimate, a contingency factor of 30% was added to the total project cost.
4. **Engineering Services** – Engineering costs for design of the conversion and construction management services were also included.

Based upon this cost analysis, the approximate total project cost to convert the Portageville Bridge to a pedestrian bridge is $3.1 million.
Operating and Maintenance Costs and Lifespan of Converted Bridge
The O&M and the expected lifespan are directly linked and will be discussed together. The lifespan of the existing bridge as a pedestrian bridge is difficult to estimate, although it can be assumed that a well-maintained structure will exhibit a longer lifespan than a structure that is not maintained. Traditionally railroad bridges have exhibited lifespans that exceed those of highway or pedestrian bridges, which is likely due to the following reasons. Railroads do not use deicing agents on their structures which are highly corrosive and damaging to steel and concrete. In addition, railroad bridges are typically built to be quite robust; therefore, any corrosion section loss in a member is a smaller percentage of the member’s total area as compared to the same effects on a highway or pedestrian bridge. Given that this structure has always been a railroad bridge and will likely exhibit the characteristics described, it is conceivable that it could serve as a pedestrian bridge for several decades to come. With appropriate maintenance it is possible the converted bridge could last as long as a newly built pedestrian bridge.

Estimating the O&M costs with any degree of certainty is a significant task and beyond the scope of this memorandum. Modjeski and Masters is unaware of any required annual maintenance and/or inspections for pedestrian bridges as the National Bridge Inspection Standards do not apply to pedestrian bridges. Therefore, any inspection and maintenance program is at the discretion of the owner which makes the associated costs difficult to determine.

Existing Bridge Removal Costs
As part of the Alternatives Screening Analysis which was performed for the review required under the State Environmental Quality Review Act, the cost to demolish and remove the existing bridge, including the piers, was estimated to be approximately $880,000 plus $440,000 for mobilization, accessibility constraints, and contingency at a total cost of approximately $1.3 million.
## NORFOLK SOUTHERN CORPORATION
### Portageville Bridge
#### Estimate for Conversion to Pedestrian Bridge
##### January 2010

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SUBTOTAL: $1,796,000

Mobilization: 5% $89,800

Accessibility Constraints (See Note A): 10% $188,580

Contingency (See Note B): 30% $622,314

SUBTOTAL: $2,696,694

Engineering Services: $400,000

**Total (See Note C):** $3,100,000

Total Square Footage of Structure = 16400 sf

Cost per Square Foot = $189 /sf

**Note A:** Assume increase for costs associated with accessibility difficulties resulting from the site conditions.

**Note B:** Contingency accounts for uncertainties due to the limited conceptual design used to generate the estimate and miscellaneous items not summarized herein.

**Note C:** Costs are in terms of the date listed at the top of this estimate and are rounded to the nearest $100,000.
Mr. Kevin W. Johns, P. E.
Modjeski and Masters Consulting Engineers
4909 Louise Drive, Suite 201
Mechanicsburg, Pennsylvania 17055

Dear Mr. Johns,

RE: Letchworth State Park
Norfolk Southern Rail Road High Bridge Replacement
High Bridge Conversion Inquiry

Thank you for your recent inquiry as to possible needs, should it be determined that the disposition of the existing High Bridge is a transfer of ownership to a suitable owner, that may be required to re-use the structure as a pedestrian trail bridge. While the future ownership has not been determined, the future owner will need to know and understand what it will take to operate and maintain the rehabilitated structure. Several items, including but not limited to the following have been discussed within The New York State Office of Parks Recreation and Historic Preservation (NYSOPRHP).

These items are:

- What is the current condition of the structure from a load bearing, paint condition and composition (Lead and asbestos) and its ability to withstand future use as a pedestrian structure to withstand the 85-PSF AASHTO pedestrian live load, construction vehicle loads of HS-20 and the ease/ability to accept a new deck surface attachment? Are existing/historical drawings and inspections available and do these inspections include foundation inspection elements? Would a modeled analysis be performed for a proposed alternative?
- What will be the necessary inspection effort required for safety/structural capacity and the frequency of same? Based on retrofit options we will offer later in this letter, what is a reasonable estimate for average annual maintenance and operation costs?
- How would it be proposed to access/depart the bridge given the limited site conditions, especially on the west side, due to the active railroad, topography and existing OPRHP infrastructure in the area? Consideration that Norfolk Southern and OPRHP lands will possibly be impacted should be a consideration.

To summarize some information I have received from David Herring, our Regional Capital Facilities Manager, elements for cost analysis to consider are:

**Deck Demolition:** Remove existing ties, rail and railing, approximately 800-feet.
**New Deck possibilities:** (1) Precast concrete panel elements; (2) Timber deck, recycled plastic or some other system on top of the existing ties; (3) Steel grating and (4) cast-in-place concrete deck

**Railing:** A heavier steel railing that includes some impact resistance that could include some ornamental features.

**Paint:** Is it practical to abate, if necessary, the existing structure to make it safe for the future?

**Steel Repairs/Stabilization:** While the structure continues to carry active rail loadings, are there some necessary stabilization elements that are required as part of this conversion?

**Lighting & Security (phones?):** These elements should be included as part of an alternative.

**Approach Work:** Is fence needed for both the security of the Rail Road as well as protection of our trail users.? ADA access? Ramps/Bridges? Parking? Signage? Gates? Approach Trails (concrete? Cinder? Asphalt?)

**Trail Amenities:** Benches?, Power on Bridge?, Shelters?

**Engineering for rehab:** From our observations of the NYS DOT processes we believe that an in-depth inspection, underwater inspection, load rating would be required prior to design. Then following the federal process preparation of the following environmental documentation (in NYSDOT terms) which includes: Initial Project Proposal, Project Scoping Report (scoping Document) Design report (essentially the EA, EIS or whatever environmental project report is required) and finally development of Contract Documents. The scope would be dependent somewhat on funding.

**Construction Inspection or CM:** We believe this would be necessary for contract advertising, submittals inspection through contract closeout.

**Maintenance & Inspection:** Record document turn over items along with a regular maintenance and inspection schedule.

I believe that this covers your request, please feel free to contact David Herring at (585) 493-3602 or email at david.herring@oprhp.state.ny.us as he can best answer any additional inquiries you may have.

Sincerely,

[Signature]
Richard E. Parker,
Regional Director

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**CC:** Andy Beers     Executive Deputy Commissioner
Tom Alworth     Deputy Commissioner for Natural Resources

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