

Brunswick Layover Environmental Assessment (EA)

**Appendix C: MaineDOT Investigation of Industrial Site Alternative for
Layover Facility**

September 2013

STATE OF MAINE

DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DEVELOPMENT
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INTEROFFICE MEMORANDUM

TO: COMMISSIONER DAVID BERNARDT
FROM: JEFF TWEEDIE
SUBJECT: OPINION OF COST DIFFERENTIAL FOR NNEPRA LAYOVER FACILITY
DATE: FEBRUARY 7, 2013
CC: JOYCE TAYLOR, BILL PULVER, RICH CRAWFORD

Per your request, we have reviewed the potential cost difference of constructing a rail layover facility by the Northern New England Passenger Rail Association (NNEPRA) at the West Brunswick and Industrial Park Sites in Brunswick. The results of our review indicate the rail layover facility will cost approximately \$2.8 million more to construct at the Industrial Park Site than at West Brunswick Site. We also estimate that the time to deliver the project will be increased by approximately 2.5 years.

The details and rationale behind our opinion of the potential cost difference for the facility at the two sites is included in the attached report. If you have any questions regarding the contents of the report please contact us.

NNEPRA: OPINION OF COST DIFFERENTIAL FOR DESIGN AND CONSTRUCTION OF A RAILROAD LAYOVER FACILITY AT TWO DIFFERENT SITES IN BRUNSWICK

Task:

To determine the difference in cost between constructing a railroad layover facility at two site locations in Brunswick. Material provided to the Department consisted of planning reports, preliminary design aspects, and topographic information at one of the sites. The two sites are described as follows:

West Brunswick: Site was a formal rail yard, which is no longer in use. Surrounding properties consist primarily of residential dwellings. Preliminary design has been completed for this location. Property and environmental approvals have been obtained for this location. Project was advertised as design-build, not yet awarded.

Industrial Park: Site is northerly of PanAm rail line at Brunswick Industrial Park. No formal design has been initiated for this location, beyond planning level review. The site is bound to the North by several businesses, two of which are motels.

Compliance with Brunswick sound ordinances is required at both sites; as a result, the details of the layover building design and construction are considered equivalent at both locations. The difference in cost between the two sites will consist of additional design for the Industrial Park Site, additional property rights, variability in material quantities required for construction, site specific design, environmental, & construction features.

Design:

Review of available subsurface conditions, and knowledge of the soils at the location of the Brunswick Platform, indicates the soils to consist of fine sands & silts. Due to the depths of the fill, along with the foundation loading for the layover facility, site specific geotechnical design and construction monitoring is probable in order to develop the industrial Park Site. The cost for completing the geotechnical engineering work from design through construction is estimated at \$180,000.

The West Brunswick Site currently has an existing entrance. In comparing the cost difference between the two sites, an entrance will need to be designed and constructed for the Industrial Site. We estimate the cost for design for the entrance at \$20,000.

The resulting total additional design costs, beyond what is needed for the West Brunswick Site is estimated at **\$200,000**.

Environmental:

Additional costs associated with environmental requirements for the Industrial Park Site was determined to be primarily due to additional fees for permitting the site. The Industrial Park Site is within the watershed area of an Urban Impaired Stream. The stream is also a tributary to the Androscoggin River, which has been determined to be Endangered Species Critical Habitat; as a result, Section 7 Consultation would be required. Permitting requirements for the site would require Site Law and Storm Water Treatment Requirements.

Total cost for the increased permitting effort for the Industrial Park Site is estimated at **\$50,000**.

It should be noted, that the Department is not completely familiar with all aspects associated with permitting a rail layover facility; these aspects may include, but not be limited to: air emission requirements from running stationary trains, and maintaining potential hazardous materials on site used in servicing trains.

Property:

To determine the additional cost due to property impacts for the Industrial Park Site, the area of property to be acquired was determined based on transposing property line information from Town Tax maps, onto the aerial site plan for site.

- The areas to be acquired from each of the parcels were arrived at based on rough scaling from the site plan. The total area of property to be acquired for the site is estimated at 5.6 acres.
- The values used to arrive at the estimated acquisition cost for the areas to be acquired were based solely on municipal assessment records. To note, assessed values for properties in Brunswick are indicated to be at approximately 70% of market value based on the municipality's current "certified ratio". Actual appraisals may result in different value indications for the areas to be acquired.
- In the valuation of the areas to be acquired, no consideration was given to regulatory, topographical, or other conditions specific to the areas to be acquired, or the remainder portions of these properties.
- Consideration was not given to "severance damages," to any of the remaining property not to be acquired. For this site, primary opinion for greatest potential severance damages comes from noise generated at the facility. Given noise restrictions in the area around the site, and the proximity of hospitality businesses, severance damages could potentially greatly increase the acquisition cost for these parcels.

Based on the approach discussed above, the potential additional cost to develop the Industrial Park Site with respect to property acquisitions is estimated at **\$200,000**.

Construction:

To determine the difference in construction cost, baseline stationing was established along the rail mainline. Where necessary, cross-sections were developed by hand to determine quantities. Estimated quantities were input into the Department's estimating software and cost was determined based on Department historic data.

Clearing, MaineDOT item 201.11:

Clearing was measured using the scale on the plan provided. All the area between the existing main line track and 10 feet beyond the site plan for the layover facility was assumed to require clearing. 5.04 acres were calculated with a unit price of \$20,000 per acre including labor, materials, equipment, profit and overhead. Total = \$100,800.

Common Excavation, MaineDOT item 203.20:

Common excavation quantity of 300 CY is a throw in quantity. Given the soils types, it was assumed that some portion of the subgrade in this area will be unsuitable and need to be excavated and have suitable fill brought in. At a unit price of \$20/CY the total for Common Excavation is \$6,000.

Common Borrow, MaineDOT item 203.24:

Common borrow fill was measured using the scale on the plan provided. Cross sections were used to calculate cubic yards of fill needed to bring existing grade to anticipated elevation to construct three sidings and a building. Cross sections were drawn for every 50 feet along the mainline track and extended 10 feet beyond the railroad right-of-way. Fill for the anchorage of a retaining wall was not a part of the common borrow pay item. Areas of cross sections were calculated using matrices and volumes were calculated using the average area between sections multiplied by 50 feet. 42,100 cubic yards were calculated with a unit price of \$12.00 per yard including labor, materials, equipment, profit and overhead. Total = \$505,200.

Cofferdam (Steel Sheet Piling), MaineDOT item 511.07:

Shoring will be required to construct retaining walls, and retain fills near the existing culverts during construction. Shoring was assumed to consist of Steel Sheet Piling. As the sheeting will not be part of the final design, a cofferdam pay item was included in the estimate for this purpose. The sheeting was assumed to be required along the north side slope above the culvert at the east end of the site, with an embedment of 15 feet and a height of 25 feet above grade, and a total span 150 feet. Lump sum price for cofferdam estimated to be \$60,000.

Extension of Existing Box Culvert, MaineDOT item 534.75

Actual culvert information is unknown. An estimate of \$35,000 each to extend two is an Ad Hoc number. Actual cost to extend the culverts could be more or less, depending on treatment chosen. Total = \$70,000.

Plain RipRap, MaineDOT item 610.08

Plain riprap was assumed to cover the ends of the pipes and to protect the foundations of retaining walls. Estimated quantity of 148 CY, at \$70/CY, estimated total is \$10,360.

Prefabricated Concrete Modular Gravity Wall, MaineDOT item 635.14:

The Prefabricated Concrete Modular Gravity Wall was measured using the scale on the plan provided. The retaining wall was placed in areas where gradual grading was not a possibility due to right-of-way lines, and streams. Retaining walls were measured by the square footage of the exposed wall face. Soil shall be backfilled the same horizontal distance as the height of the exposed wall. Backfill will be incidental to the 635.14 pay item. The retaining wall was estimated to have a unit price of \$60.00 per square foot including labor, materials, equipment, profit and overhead. With an estimated quantity of 8,200 SF, Including 5100 CY of select granular borrow for wall backfill, the total is \$492,000.

SITE SPECIFIC CONSIDERATIONS

Review of available subsurface conditions, and knowledge of the soils at the location of the Brunswick Platform, indicates the soils to consist of fine sands & silts. Due to the depths of the fill, along with the foundation loading for the layover facility, soil improvement methods and deep foundations are probable at the site. Soil improvement methods were assumed to consist of preloading with vertical wick drains.

Vertical Drainage Wicks, MaineDOT item 209.29:

Length assumed to be 60', spacing at 3' triangular spacing over 7000 SF, equates to a total length of 60,000 feet. At a unit price of \$0.75 per foot, the total estimated cost is \$45,000.

Steel H-Beam Pile Delivered and In Place, MaineDOT items 501.40 & 501.401; Pile Tips, MaineDOT item 501.90; Pile Splices, MaineDOT item 501.91; and Pile Driving Mobilization, MaineDOT item 501.92:

- Piles were assumed to be required to prevent differential settlement along the layover facility structural concrete slab. Piles were assumed to be HP 12x53, with 8 piles per bay and 3 bays, a total of 24 piles was estimated. Assuming 100 feet per pile a total of 2400 feet is required. At \$60/ft, delivered and in place, the total estimated cost is \$144,000.
- The 24 piles will require 24 driving tips and 120 splices, total cost for tips and splices estimated at \$24,000.
- Pile driving equipment mobilization is paid at lump sum, estimated at \$50,000.

Total for H-Beam Pile items: \$218,000

Dynamic load testing, 501.231:

Verification of pile resistance will be required via Dynamic Load Testing. Dynamic Load Testing is estimated to cost \$4,000 per test, with 3 tests, the total is \$12,000.

Settlement Platforms 656.09 and Hydrometer Piezometers 646.32:

Instrumentation is expected to be required to monitor foundation soil settlement, and shear strength during preloading. This information will be used to determine when the site has stabilized, and it is safe to construct the layover facility. Instrumentation is estimated to consist of settlement platforms and hydrometer piezometers. Estimated total cost for instrumentation is \$5,500.

ACCESS ROAD OPTIONS

Two access road options were examined, one entering from the North via Route 1, the second, entering from the South, through the Industrial Park and crossing the main line tracks. Of the two options, the entrance from the North was determined to be the most cost effective; this was due to the need to construct a formal crossing at the main line tracks to the South. The estimated cost to construct the entrance from the North via Route 1 is \$206,625.

Mobilization, MaineDOT item 659.10:

Mobilization cost for construction contracts is typically taken at 10% of estimate of the other construction pay items. For the cost of the items discussed herein, an additional cost for mobilization is estimated at \$150,000.

Total estimated additional construction cost: **\$2.1 million**

Construction Inspection Oversight:

Construction engineering inspection and oversight (CE) is typically taken at 10% of the total Construction contract. For the additional cost for construction, the estimated additional CE will be taken at 10% of the additional construction cost, estimated at **\$200,000**.

Time:

To develop the Industrial Park Site additional time will be added to the project. A timeline of possible duration for delivery (with emphasis on critical-path items) to get the site refined to a point to construct the layover facility building is as follows:

- Site survey, and establish existing conditions: **3 months**

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- Site plan development & environmental permitting: **9 months**
- Property appraisals & acquisitions, while developing final contract documents: **6 months**
- Advertise for construction and start construction (up to preconstruction meeting): **2 months**
- Clear, construct preload: **2 months**
- Preload surcharge: **6 months**
- Extend pipes, bring to final grade, and drive pile: **2 months**

Total estimated additional time to develop Industrial Park Site: **30 months (2.5 years)**

Summary:

The total aggregate additional cost, ignoring inflation, to develop the Industrial Park Site is estimated to be **\$2,750,000**, Broken down as follows:

- Preliminary Engineering, including environmental permitting (PE): **\$250,000**
- Right-of-Way (ROW): **\$200,000**
- Construction: **\$2,100,000**
- Construction Engineering and inspection (CE): **\$200,000**

Inflation: Considering inflation over the additional 2.5 years at 3%, results in an increase of approximately \$200,000. It should be noted, that any additional cost due to inflation resulting from delay would not be realized over the entire additional aggregate cost of \$2,750,000, as some of the expenditures would be appropriated during the additional 2.5 years required to develop/deliver the project. However, additional cost due to inflation on the construction of the layover facility structure would add additional cost, which is beyond the scope of this assessment.

Limitations:

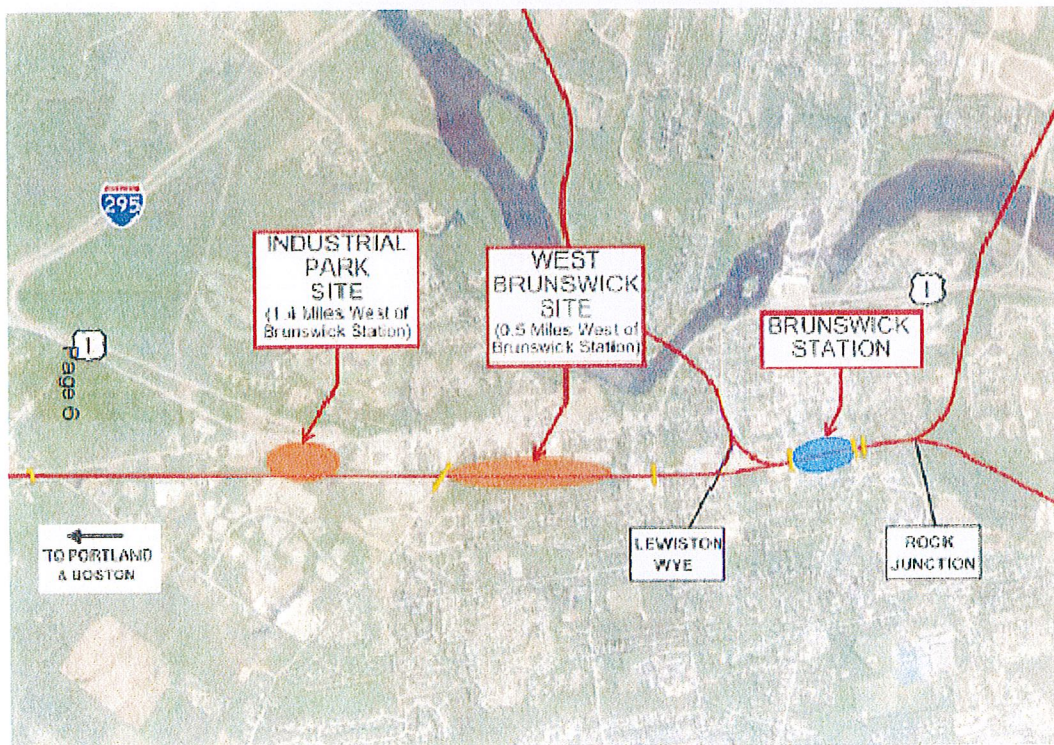
The cost comparison opinion discussed herein is based on limited information at both of the sites. The actual difference in cost may be significantly different than presented herein.

BRUNSWICK LAYOVER

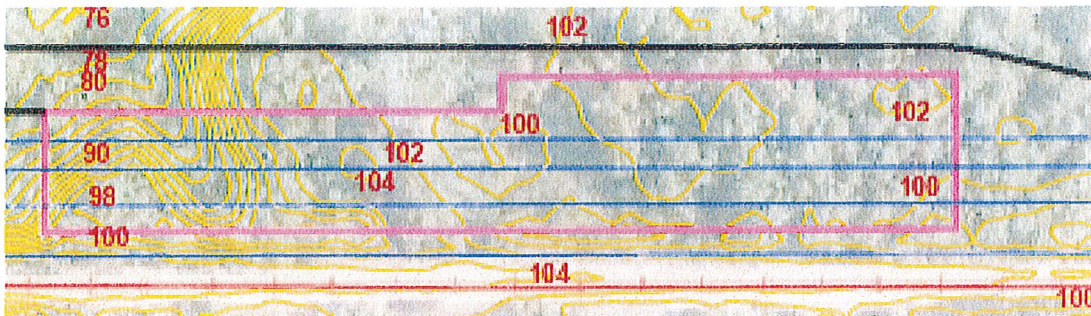
“INDUSTRIAL PARK” SITE OPTION

This location is one of six sites that were initially identified and evaluated as part of the siting analysis performed during the summer of 2011. The site refers to an undeveloped area of land situated immediately to the north of the existing Pan Am Railways railroad main line and south of US Route 1. The Brunswick Industrial Park is located immediately south of the railroad main line. The site is located 1.4 miles west of Brunswick Station and approximately one mile west of the presently-proposed “Brunswick West” NNEPRA layover facility.

Although the “Industrial Park” site did not pass the second tier of screening tests presented in the Downeaster Layover Facility Project Siting Report dated August 18, 2011, subsequent inquiries as to the ability to utilize this site have occasioned the preparation of this “white paper” which provides additional detail as to the issues involved.



It is assumed that development of a layover / maintenance facility at this location would incorporate the same track and building layout as has already been designed for the Brunswick West Layover Facility site. This includes a three track maintenance building with rail access from both ends, an outside holding track parallel to the building, parking, storage and office spaces, as outlined below. The layover facility tracks are depicted in blue, while the Pan Am main line track is depicted in red.



Preparation of the site, creation of roadway access, and the location of utility service connections are dependent on the specific location. Thus, these singular issues, in addition to cost and schedule implications associated with use of the "Industrial Park" site are set forth below.

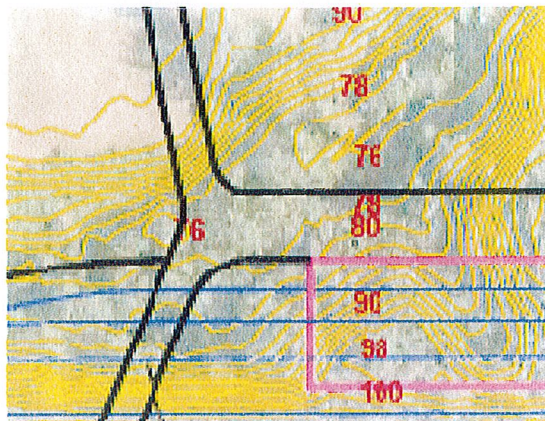
Topography / Environmental Concerns

- Site is Rough and Undeveloped

The site is located on undeveloped wooded terrain that slopes steeply down from the railroad right-of-way and consequently an extensive amount of filling and grading would be required, in addition to clearing the site. The situation is further complicated by the presence of waterways and associated wetlands within the area.

- **Site Has Deep Areas Well Below Railroad Tracks**

A topographical field survey of this site was not available. However using aerial photography and interpretative tools (GoogleEarth), the Parsons Brinckerhoff consultant staff was able to generate approximate elevations on two-foot contours, as depicted on the accompanying drawing. At some locations the site's existing ground level falls nearly 30 feet below the level of the existing railroad track, as shown below by the identified elevations (in red) of the contours at the west end of the site.



- **Substantial Amount of Filling Would be Required**

Based on this analysis, it has been estimated that approximately 78,000 cubic yards of fill material would need to be transported and deposited at the site to provide a base upon which to construct the layover facility. At an estimated cost of \$20 per cubic yard, the required filling would result in an additional project cost of \$1.5 million. Presumably this material would be transported to the site by truck, requiring upwards of 8,000 truck deliveries using standard 10 cubic yard capacity dump trucks.

- **Significant Federal and State Environmental Issues**

A detailed environmental review has not been undertaken and typically would not be performed until a decision was made to proceed with development of this site. Prior consultation with the Town of Brunswick indicates that previous development planning for this site revealed the apparent presence of sensitive habitat areas. Water courses and wetlands of undetermined quality are located within the site. There is no evidence of prior disturbance (development) at the site nor of any site contamination. Given the observed site conditions, a federal environmental process would result in a major expansion of the Environmental Analysis (EA) already prepared for the Brunswick West site.

In addition to the noise concerns described separately herein, the range of resources that would need to be evaluated include: Water resources, floodplains, geology/soils, biological ecosystems, wetlands, threatened or endangered species, fisheries, wildlife habitat, hazardous materials, prime farmland, and a range of human environment issues (transportation, land use, environmental justice, historic resources, cultural resources, and visual).

- **Impacts to Ongoing Maine DEP Remediation Work**

Given the steep slopes and presence of an “unnamed tributary” to the Androscoggin River on the site, water quality and related resources are likely to be of foremost concern. This tributary is a Class B freshwater stream that has been identified by the Maine Department of Environmental Protection (DEP) on the 303(d) list of impaired waters¹. Water quality impairments are related to pollutants in storm water runoff, loss of habitat, and unstable stream slopes. The DEP’s assessment of the waterway calls for improving existing storm runoff deficiencies and preventing further degradation of the waterway.

- **Preparation of Additional Environmental Analysis and Reports**

Should the environmental evaluation not result in a finding of no significant impact (FONSI), NNEPRA would need to either develop still another alternative site that is capable of receiving a FONSI or embark on a more detailed Environmental Impact Statement (EIS) to determine the extent of impacts and potential to address those impacts through mitigation.

- **Uncertain Outcome and Decisions from Environmental Analysis**

In all, the reconsideration of the Industrial Park site would necessitate a major expansion of the federal environmental review process conducted to date, with additional design and planning costs for NNEPRA, uncertain timing and no guarantee of the outcome of the environmental analysis.

Further, federal resource agencies could require that a site with fewer or less severe impacts be developed over a site with impacts of greater significance.

Given the readily apparent concerns with the undeveloped Industrial Park Site, a potential outcome of the environmental analysis could be that the original “Brunswick West” site is the least environmentally damaging practicable alternative. This would essentially preclude the opportunity for federal funding for an Industrial Park Site layover facility.

If, at the conclusion of the environmental analysis process, a finding was made to proceed with the development of the Industrial Park Site, then preparation of the Maine SLODA documentation and permitting processes would be undertaken. Given the waterway and drainage issues associated with this site, the SLODA process will be lengthy and entail significant supporting design activity.

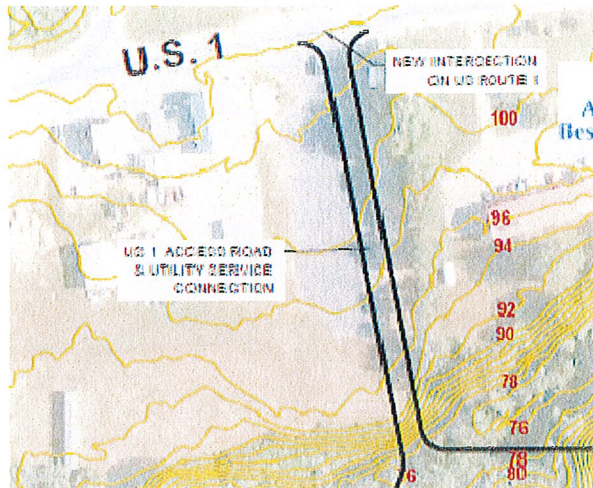
¹ http://www.maine.gov/dep/water/monitoring/tmdl/2012/Appendix_28_Unnamed_Trib_to_the_Andro

Site Design Issues

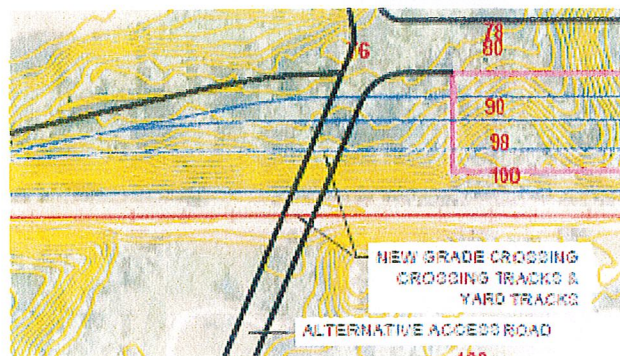
As noted previously, the design already developed for the layover facility track and building at Brunswick West can be utilized at the Industrial Park Site. However, the location of the site will require additional design work to address various site specific issues.

- **Vehicle Access into the Site**

This could be provided on the north from a new intersection on US Route 1, possibly necessitating one or more easements depending on the extent of private property takings.



Alternatively an access road could be provided from the south using access from a now-privately owned parking lot and a new grade crossing of the Pan Am railroad main line. The railroad main line is above the elevation of the parking lot and thus some additional 2,000 cubic yards of filling and grading work would be required for the driveway approach to the crossing. A new grade crossing of the railroad main line would also require approval from Pan Am Railway. Under this alternative the access road would also need to cross the tracks at the west end of the maintenance building

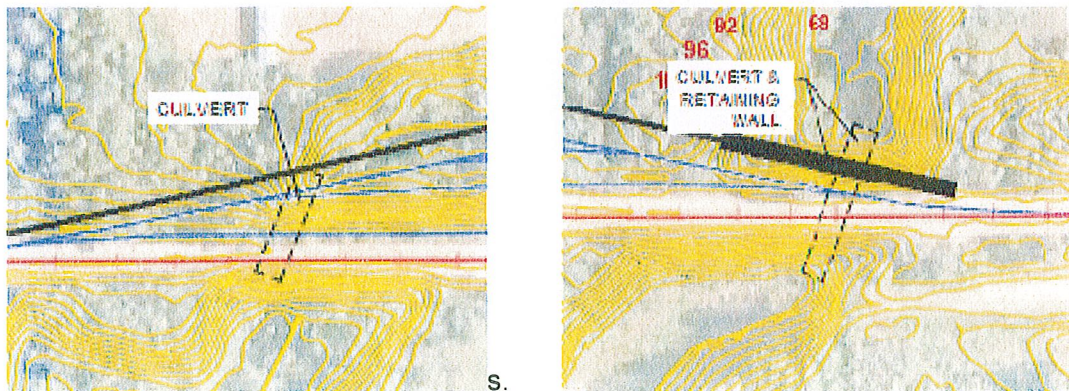


- **Utility Service Connections into the Site**

The undeveloped nature of the site suggests that utility connections (electric, gas, water, sewer, and communications) will need to be developed. These would likely originate on the north from US Route 1 as part of a roadway access, or from south via an under track crossing of the Pan Am Railway right-of-way. The latter situation would typically require easements from Pan Am Railway to cross over/under main line track.

- **Waterway Protection**

The need to preserve drainage and waterway flow through the site would likely require some form of deep culvert(s) of presently unknown dimensions at both ends of the site as depicted below. At the east end of the site, the construction of a retaining wall has also been assumed to avoid filling the streambed. The particulars would be an outcome of the development of mitigation strategies and designs with regulatory agencies such as the US Army Corps of Engineers. As noted above, this is likely to be a problematic process and there is no guarantee that such agencies will approve any development at this site given the availability of other alternative sites.



- **Geotechnical Concerns / Foundations**

Detailed geotechnical data are not presently available for this site. However, given the presence of wetlands and water courses, and the known presence of peat deposits in this area, underlying soil conditions may necessitate construction of foundations using deep piles which would add significantly to the construction cost.

Absent having any specific design details, a figure of \$900,000 should be established to cover the design and construction of these items, including an on-site geotechnical exploration program which would need to be performed on a priority basis.

Real Estate and Abutters

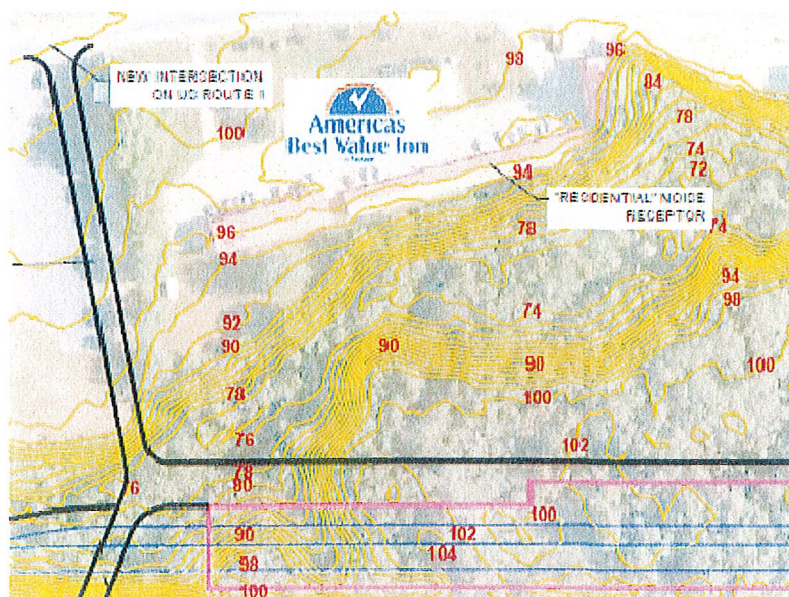
- **Property Takings Required**

The site is generally bordered by undeveloped areas, a mix of commercial and residential uses and a large distribution center. The layover facility site would be composed of multiple real estate parcels. Construction of the layover facility would require acquisition of undeveloped portions of six properties, which are developed with frontage along US Route 1 (Pleasant Street). It is unknown if the present owners would agree to partial takings of the undeveloped portions of their properties. An additional seventh partial taking could be associated with the Pan Am Railways main line, whereby the right-of-way line appears to “jog” onto the site over a length of approximately 200 feet.

- **Potential Residential and Area Noise Impacts**

The greatest concern with impacts to existing property owners and abutters will likely accrue to noise from operation of the layover facility.

A formal noise analysis has not been performed. However, based on a review of aerial mapping it appears that the Econolodge / America's Best Value Inn on Pleasant Street (US Route 1) directly north of the site would represent a worst case noise receptor. This is because hotels / motels are considered residences due to people trying to sleep there overnight. i.e. FTA/FRA Category 2 receptors. There is also a Comfort Inn on Pleasant Street east of the site and a couple of private residences and a Fairfield Hotel on Pleasant Street further west of the site. The other buildings in the area, including the warehouse immediately to the south of the site would be considered FTA Category 3 land-use receptors. Category 3 receptors do have noise limits as well, but they are somewhat more relaxed than for the more sensitive Category 2 receptors.





The other potential noise-related issue of major concern would be if a new grade crossing would need to be built to provide vehicle access on south side of the facility. Unless a quiet zone is established, approaching trains would have to blow their horns approach to this new grade crossing. This would also impact the environs of the presently-proposed Brunswick West site.

The location of the Industrial Park Site to the west of the Brunswick West location would also result in all of the "deadhead" train movements between the layover facility and the Brunswick Station passing by the entire length of the Brunswick West site, creating additional opportunities for noise impacts at that location.

Full takings and relocations of at the six properties that comprise the Industrial Park layover facility site would reduce the number of sites that might be impacted by noise associated with the facility.

Absent having formal property appraisals or discussion with property owners, it is recommended that a figure of \$ 1 million be allocated to property takings encompassing six parcels.

Summary

For Schedule and Budgeting purposes, it is recommended that the following project control adjustments be incorporated as part of further consideration of the Industrial Park Site.

Schedule

- Federal (NEPA) Environmental Analysis and Agency Coordination up to a determination of the Preferred Alternative - Up to Two Years
- Preparation of Maine SLODA Documentation and Permits - One Year

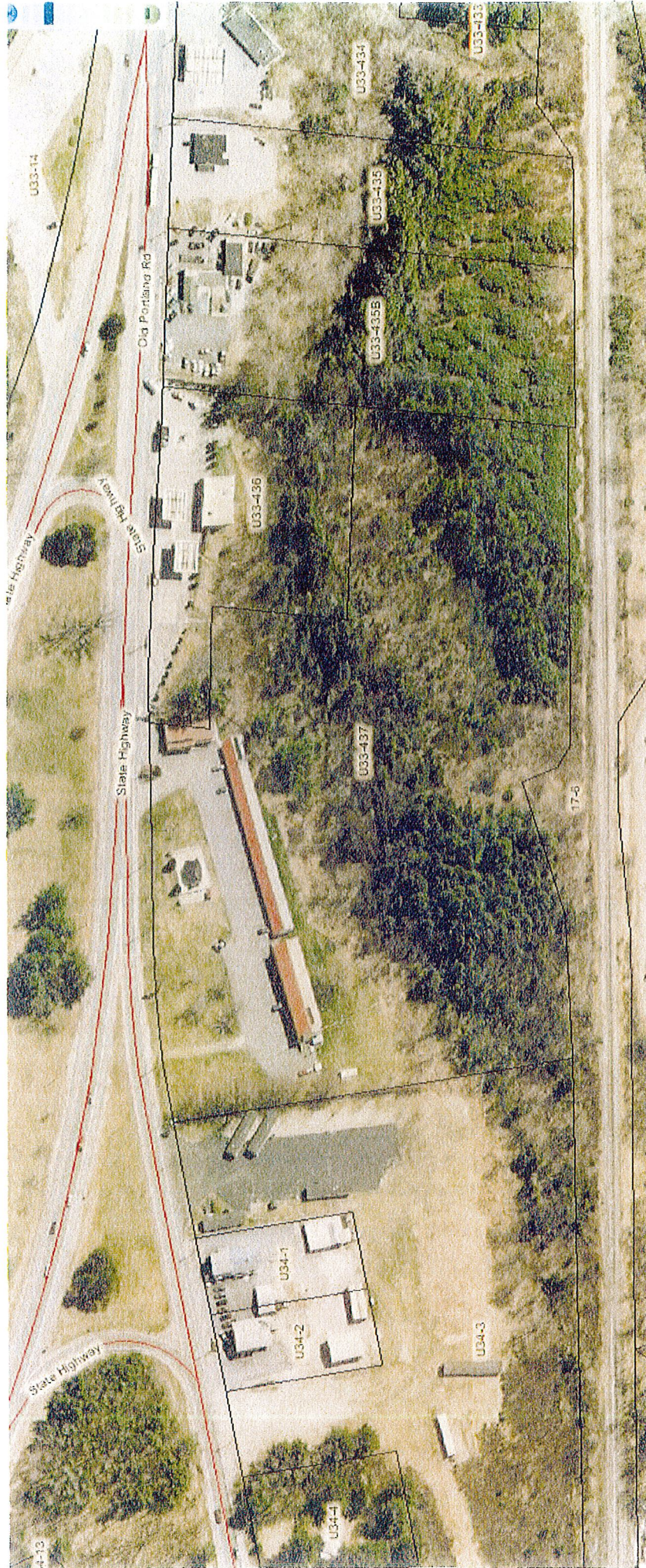
This would be followed by Final Design and Construction activities , which have yet to occur for the Brunswick West site, so the **net impact would be three additional years (or delay) to the project schedule**

Industrial Park Site Additional Cost

Filling of the Site	\$ 1,500,000
Property Acquisition	\$ 1,000,000
Site –Specific Elements	\$ 900,000
EA and SLODA Work	<u>\$ 400,000</u>
Subtotal	\$3.8 million

Delay in Construction of Three Years –
discount rate of 3% applied to current presumed current cost of \$12 million = \$1.1 million

Total Cost Impact \$ 4.9 million



Potential partial taking from Pan Am Railway
Right-of-Way Parcel 17-6

The lots impacted by the industrial site are

- U34-3
- U33-437
- U33-435B
- U33-435
- U33-434