



TBY, INC
Karl Huffaker, P.E.
Krlhuff@aol.com
208-599-4189



December 23, 2013

Background

The following report summarizes the inspection of the Tri City & Olympia Railroad Company (TCRY) branch mainline track for the Port of Benton. The track inspection was done during September 2013. The TCRY provided assistance during this inspection.

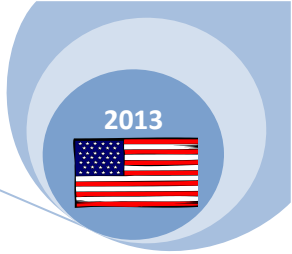
Results of this report will be used to schedule short and long term repairs and maintenance between MP 35.8 & 46.6 (Horn Rapids Road to Richland Junction). The 10.8 miles of branch mainline will be referred to as the "track". The reader should also refer to the attached track alignment map (with mileposts) (**Attachment A**) and the excel spreadsheet and associated pictures (**Attachment B**). Mileposts are used when convenient to show approximate locations. Attachment B gives a more detailed explanation of the track area under discussion.

This report will be used to assist The Port of Benton and TCRY to assess the Class of Track rating.

Existing Track Conditions

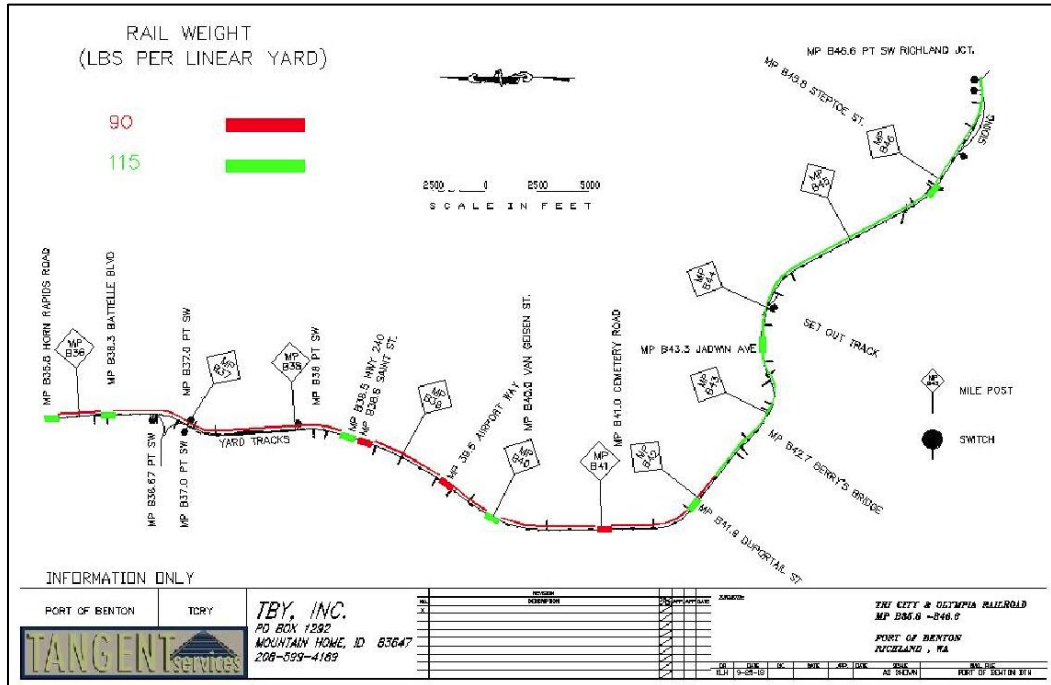
Attachment B (spreadsheet and pictures) will allow the Port to examine existing conditions and discuss possible future budget allocation for the track.

- The entire track consists of combinations of 90# to 115# rail. 90# rail implies 90 lbs per linear yard of rail. Most rail lengths are 39 foot sections. Some of the higher weight rail near MP 44.3 is 78 foot sections. Current industry standards require at least 112# rail. All 90# and 115# existing rail is joint bolted together and staggered so joints on the left rail are not in the same location as joints on the right side rail.



TBY, INC
 Karl Huffaker, P.E.
 Krlhuff@aol.com
 208-599-4189

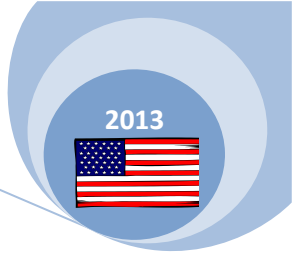
Figure 1: Rail Weight



- There is windblown sand accumulation on the track between Horn Rapids Road and the yard tracks.
- Ties have been replaced throughout the track length. The most aggressive recent tie replacement completed by TCRY was one (1) new tie per eight (8) old ties. The new ties installed by TCRY consisted of a new 7"x 9"X 9' pressure treated ties.
- Existing ballast is primarily smooth river rock (**Figure 2**). This type of rock does not meet standards for railroad construction. Although this type of ballast will usually stabilize a tangent (straight) section of the track without any problems, using this rock on curves will cause alignment problems during repeated train traffic operations and cold/hot temperature changes. Smooth rock does not have the interlocking (stabilizing) ability that fractured rock possesses. This is evident on the track between MP 41.9 & the Berry's Bridge (I-182 overpass) approximately 4000 track feet.
- Rail Anchors. 16 anchors per 39 foot length of rail were observed throughout the track.

Figure 2: Ballast Rock





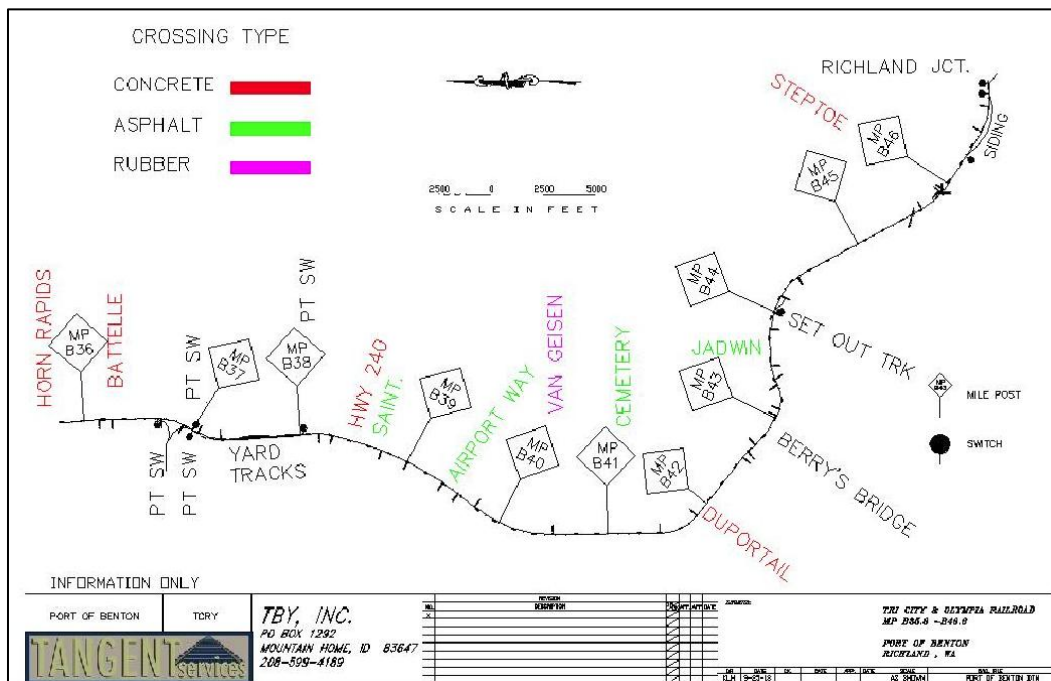
TBY, INC
 Karl Huffaker, P.E.
 Krlhuff@aol.com
 208-599-4189

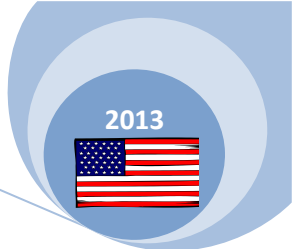
- No visible drainage issues were observed on either side of the track.
- There are ten (10) major crossings on the track. Surface and length are shown below (Table 1). The locations of the crossings are shown on Figure 3.

Table 1: Crossings

No.	Name	Length	Signals	Surface
1	Horn Rapids	85	Yes	Concrete Panel
2	Battelle Blvd	90	Yes	Concrete Panel
3	Hwy 240	60	Yes	Concrete Panel
4	Saint St.	28	No	Asphalt
5	Airport Way	50	Yes	Asphalt
6	Van Giesen St	100	Yes	Rubber Panel
7	Cemetery Rd	40	Yes	Asphalt
8	Duportail St	55	Yes	Concrete Panel
9	Jadwin Ave.	28	Yes	Asphalt
10	Steptoe	115	Yes	Concrete Panel

Figure 3: Crossing Type



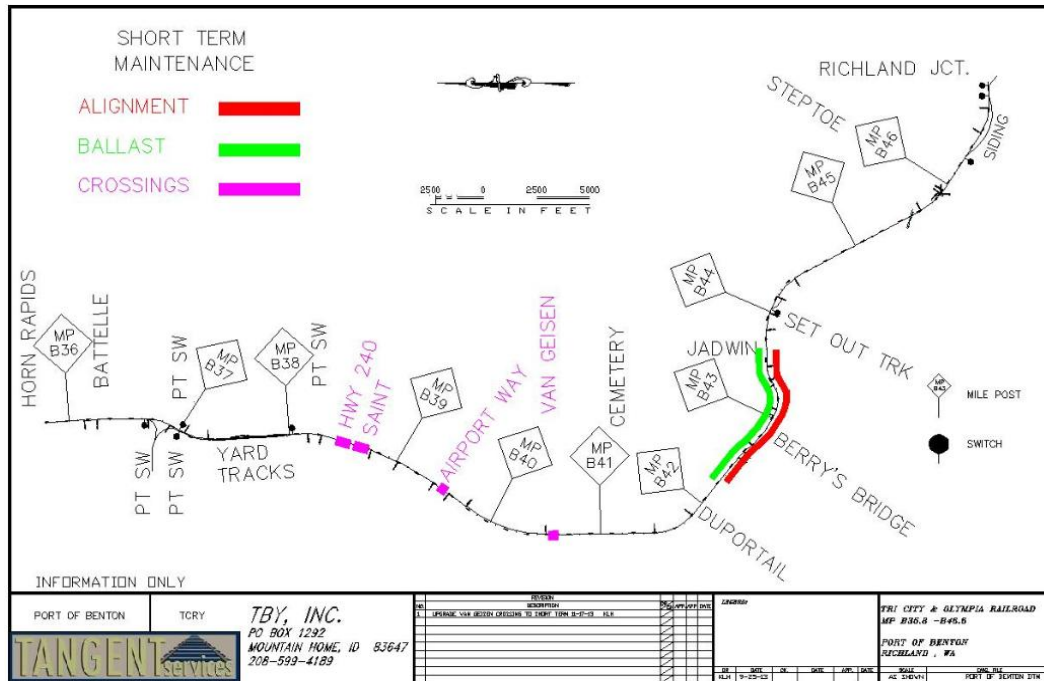


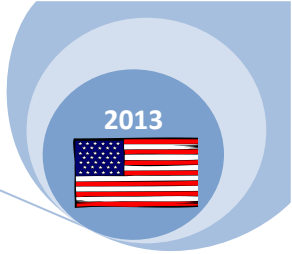
TBY, INC
 Karl Huffaker, P.E.
 Krlhuff@aol.com
 208-599-4189

Recommendations

- Maintenance and repair of the track is similar to a public entity scheduling maintenance on roads. Most cities have a pavement management program that schedules continual maintenance and repair to all roads within their jurisdiction. Similarly, the TCRY railroad should have short and long term maintenance goals that will keep the track at or above the Class intended for the existing type of industry operations. The locations of short and long term maintenance requirements are depicted on **Figure 4** and **Figure 5**.

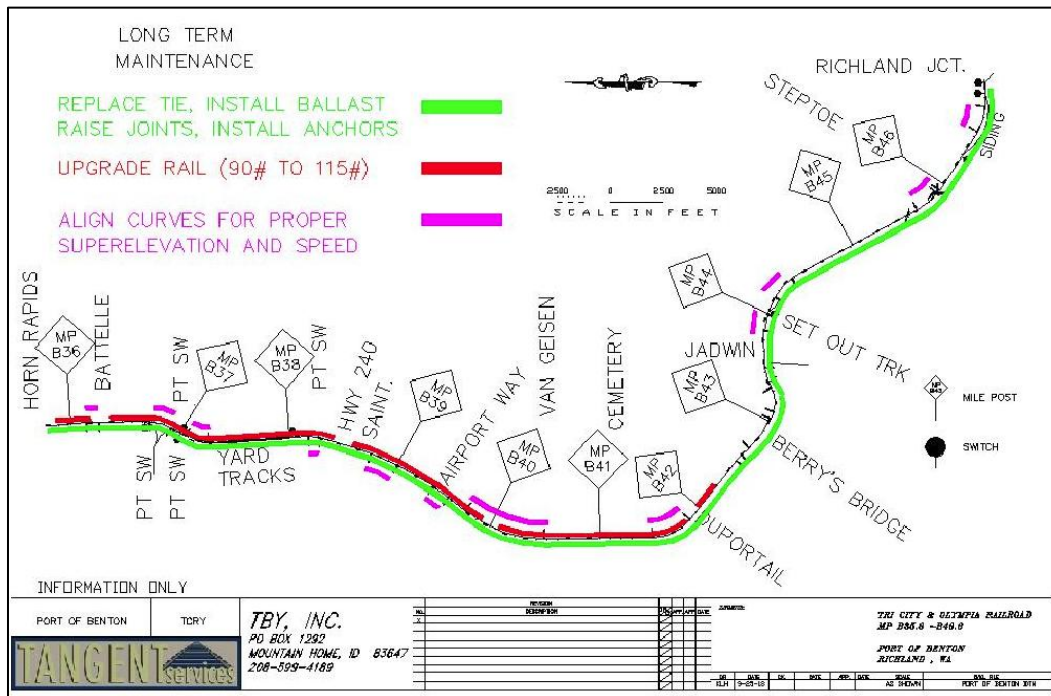
Figure 4: Short Term Maintenance



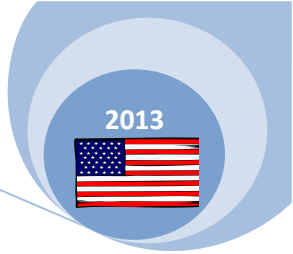


TBY, INC
 Karl Huffaker, P.E.
 Krlhuff@aol.com
 208-599-4189

Figure 5: Long Term Maintenance



- Existing track maintenance noted in our inspection performed by TCRY consisted of tie replacement, removal of sand in yard tracks, some minor patching of asphalt at road crossings. Signal arms that had been damaged and replaced by TCRY, signal maintenance by TCRY signal sub contractor.
- Surfacing of the track with industry standard ballast should be scheduled as a long term project. This project will eventually “force out” the smooth river rock and replace with angular material. Track sections between MP B42 and Berry’s Bridge showed track movement laterally with rail temperature changes, creating tie shift. Ballast surfacing and track lining should be done in this area as noted below (**Table 2**).



TBY, INC
 Karl Huffaker, P.E.
 Krlhuff@aol.com
 208-599-4189

Table 2: Ballast Surfacing and Track Lining

No.	Description	Unit	U.Type	U.Cost	Total Cost
1	Mobilization	1	LS	\$10,000.00	\$ 10,000.00
2	Rock	1550	NT	\$ 25.00	\$ 38,750.00
3	Labor and Equipment	4000	TF	\$ 7.00	\$ 28,000.00
4	Project Management	1	LS	\$ 5,000.00	\$ 5,000.00
					\$ 81,750.00
		Contingency		10%	\$ 8,175.00
		Total before tax -----			\$ 89,925.00
Note: Based on 8" new ballast in track section including shoulder ballast					

- Tie replacement should be continual. Tie replacement will also keep the rail gage correct. Based on the total footage of the line and yard tracks a requirement of 1000 new ties should be replace each year, so in a 40-50 year period all ties and switch ties would be replaced. This could be accomplished at the estimated cost of \$150K per year to install 1000 each new cross ties.
- Curve Alignment. A field survey of the existing curves is the only way to determine the existing degree of curve. Once the field survey information is reviewed, the curve can be aligned to the correct curvature and super elevation (speed) to bring the curve into compliance with the Class of track required. Cross level on Curve #7 (MP B40) measured 1 inch higher on outside rail.
- TCRY must utilize existing rail tampers and ballast regulators parked at their facility. TCRY has a Mark II tamper and Track Regulator. The existing equipment seems to be in working order, but TCRY does not have operator trained to operate the equipment in production mode. Please note that production tamper operators are in high demand in the rail industry and almost all short line operators do not have the track footage to afford a production tamper operator. Track footage north of Berry’s Bridge needs to be machine tamped with fully fractured ballast to hold alignment. This will take several passes to work this new fractured ballast into the track structure. Cost for this work, including new ballast averages \$20-\$25 dollars per foot depending on the number of passes this 4000 track foot length will require. This cost is based on 8” of new ballast to be working into the existing track structure and shoulder ballast to hold track alignment.
- The existing asphalt crossing at Airport Way should be replaced with concrete panels per industry standards. This is a heavily used crossing and the existing asphalt and small rail are deteriorating. An FRA rail defect was noted on the north side of the crossing. The estimated cost to replace with concrete panels is \$1000 per foot.



TBY, INC
Karl Huffaker, P.E.
Krlhuff@aol.com
208-599-4189

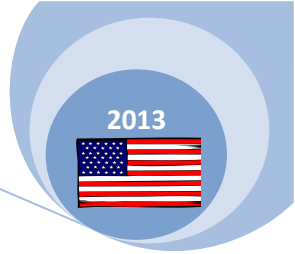
- Highway 240 is also heavily used. The concrete panels are deteriorating, and there is no drainage away from the crossing. The rubber seal gaskets are sliding to either side of the crossing, allowing foreign material to infiltrate the underside of the concrete panels.
- The T-Core (rubber) crossing at Van Geisen is deteriorating. This crossing should also be updated to concrete.
- The Tangent Services report of December 2012 offers additional discussion of the major crossings.

The following items should be used to develop an ongoing track maintenance program.

1. Prepare a condensed profile between MP B35.8 (Horn rapids Road) & MP B46.6 (Richland Jct.)

This condensed profile should have current information on the existing track. This would include rail size and date installed, ballast programs & date, track profiles, curve data, crossings & MP's, bridge information & MP locations, UG utility information, culverts and ROW widths. The condensed profile should be updated whenever a tie, ballast, or rail program is completed.

2. Track Alignment. Curves will dictate Class of Track rating. Curve data including degree of curve, Total Delta, MP location, length, super elevation, and speed. Curves, Ballast, Tamp & Regulate. Set Curve control points.
3. A continuous tie replacement program should include rail gaging and reconditioning tie plate side of wood ties for new spikes. Anchors should be checked for stability and new anchors added as required by Class of Track.
4. TCRY should have a bimonthly maintenance program where anchors are checked; splice joint bolts are tightened and/or replaced if defective, high spikes are driven flush. The location of the maintenance should be documented.
5. Bridge drawings with MP Locations. Inspection reports. Per FRA part 213, Bridge ratings should be done to determine the Class of Track.
6. All Drainage Structures and MP Locations. Inspect and record invert elevation/top of rail. Size and type of culvert.



TBY, INC
Karl Huffaker, P.E.
Krlhuff@aol.com
208-599-4189

7. Points of Switches. Size of Turnouts. MP location. Inspection every 6 months.

Current Condition of the track meets Class 2 track, with improvements to alignment near Berry's Bridge track would meet Class 3 standards. However to maintain this Class 3 standard, a more aggressive tie and ballast program needs to be implemented. All yard tracks are only Class 1.