COUNTY OF ULSTER

Track and Corridor Inspection

November 10, 2015

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The intent of the inspection was to examine corridor conditions for a review of Catskill Mountain Railroad's (CMRR) proposed rail with trail alignment. This joint-use rail with trail concept was strategic as submitted in the CMRR business plan, and the first half-mile above Hurley Mt. Road is already back in service as part of the Polar Express program. Our task as we saw it was to also perform field measurements of cuts and fills for potential evaluation of excavation issues, rather than vertical placement, of a parallel trail. No previous measurements of lineal distances had been done between Hurley Mt. Road and Basin Road to provide evaluation data.

Previous inspection via motorized track car in October had alerted us to two immediate factual conclusions. Construction and engineering standards of the 1913 Ashokan track relocation were far superior to the original corridor construction standards done in 1868[1]. The issues that pertain to the entire corridor for any purpose are cut and fill widths, as the design standards in the B&L trail feasibility and design study indicate a general 12' minimum trail (10' trail with 1' shoulders to drainage), and ideally, a 12' wide trail with shoulders. The comparative standards of the two eras of construction, and the cut geology differences, appeared to be sufficiently diverse to require on-the-ground investigation and field measurements. More importantly, the original 1868 fill slopes appeared far steeper than the more conventional design 2:1 slope standards seen through the upper Ashokan trail study sections, and had narrower top cross sections that appeared to ramp off immediately at the end of 8'6" standard railroad tie lengths with virtually no shoulder.

A reference within the Ulster and Delaware book also mentioned that "*For three miles west of Kingston the grading work was easy through meadows on each side of Esopus Creek, which was crossed by means of a wooden Howe Truss Bridge until a group of low hills had to be traversed through a narrow brook valley, with a two percent grade* ***and a considerable amount of shale rock excavation****…".* Further on the same page, "*…service to Shandaken started September 1 (1870).* ***A considerable traffic in***

[1] Ulster and Delaware Railroad, Gerald Best, Page 22

bluestone developed, this being quarried near West Hurley *from great bluish colored sandstone deposits and cut into slabs which could be used for sidewalks, curbs, gutter linings, and building stone.*".

These historic notes were confirmed on the initial site visit where the predominant geology on the original alignment toward Kingston appeared to be predominantly through shale, with extensive erosion of the cuts, and far more vertical and visible Bluestone cuts at the top of the hill. If this observation was verified, excavation of the looser and less hard shale would be far more feasible in the original cut areas than the obvious blasting through the Bluestone areas. The volumes of eroded shale in most of the original cuts was now spalled down nearly to tie-edge, greatly constricting drainage. Removing this loose shale portion in the ditchlines, in some locations, could possibly allow sufficient clearance in some areas for a trail alignment. Finally, removal of this eroded material would then be balanced against the equal problem of widening cuts in selected areas *to the uphill side only* as an alternative to building new retaining walls on the downhill side as proposed by CMRR. As the amount of potential fill areas are limited and distinct, this was also to be examined in detail.

Our approach analysis and investigation of this specific corridor section was to consider a general alternative that involved essentially an attempt to open the cuts sufficiently to initially allow a 4' recreational use trail, but at generally the same elevation as the existing roadbed, rather than going 'up and over' existing-profile cuts with a much steeper and irregular walking trail alignment as in the CMRR plan. This is partially acknowledging that the drainage in the cuts is already insufficient for the railroad, and is equally insufficient for the full trail clearance envelope as proposed. Rail or trail will require at least some degree of excavation, tree removal, and re-contouring to even allow a trail to be properly constructed and maintained. Any additional widening of the corridor – at the same general elevation as the existing railbed – would not be a wasted effort in widening and stabilizing the corridor at the track level in the event that the track was removed in the future. Material removed from the cuts would be used to widen fills, to whatever extent and location was environmentally feasible. If no fill widening was feasible, the only remaining alternative would be the reinforced retaining wall approach of CMRR. Even if the 4' walking trail was an interim approach for joint occupancy, the resulting work would be of value to the trail project if the track were to be removed at some future time.

The other consideration worthy of on-site examination was the concept of a very limited rail-with-trail placement, restricted only to the portion of the line toward Kingston that is necessary for existing special events moves to the "North Pole" area out of Kingston, with only trail beyond. Conceptually, this could greatly reduce the amount of excavation, environmental issues, and trail co-location to a more manageable concept

and lineal distance. The "North Pole" operation has reportedly required at least some additional track above West Hurley Road to provide sufficient on-board time to actually conduct the program while underway in a moving train. While this is generally assumed to be some point well short of West Hurley, it is also above Hurley Mt. Road, so a 'cost vs. distance' analysis is in order along with a segmented cost analysis.

Inspection began at the Basin Rd. underpass bridge and proceeded east to Hurley Mt. Road. Extents of inspection on railroad track charts is from MP 10 east to MP 5.94. For reference, this is just east of the West Hurley station site of MP 10.2 and the Glenford Dike area at 10.7.

Our initial concept was to examine the feasibility of widening cuts to one side to allow either a 4' walking trail on the widened side, or to consider the relocation of track in the cut areas to one side to widen the remaining distances to allow a trail. Relocation of the track to one side is only a viable tactic when existing railroad tie conditions essentially require a full track reconstruction in any case; general deteriorated tie conditions on the corridor make that worthy of consideration. While the CMRR study had considered a combination of retaining walls and vertical 'climbs' to the top of existing cuts as an alternative, our approach was basically to see if geology and measurements could allow this alternative concept to be feasible and to let an alternative trail width be spot-restricted to areas that could not support a full trail width.

This concept also assumes that existing track conditions, as observed in the field, have re-usable rail (despite its age) but that the remaining track structure is barely sufficient to maintain FRA 1 15mph standards, and to be sustainable, should have better drainage, support ballast, and tie material.

Field Notes and Comments

MP 10 – immediately below Basin Road – the track enters into a long curve within a deep Bluestone cut. This cut is opened wide to 33-35 feet, and appears to verify some historic information that cut areas were deliberately widened in order to provide more fill material in other adjacent areas. This is a very wide cut profile and the rock faces appear very stable. Rock faces are steep, and were likely blasted.

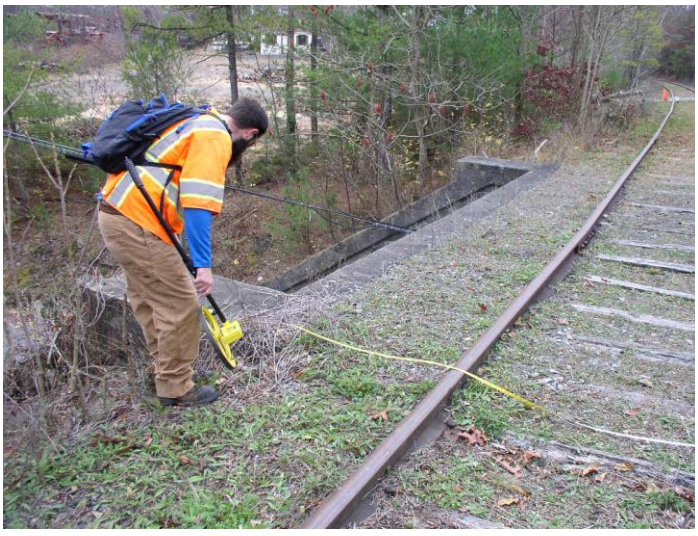
Long Bluestone cut below MP 10 looking east

Rail in this area on the curve was 105# Dudley, comped down to 90#AS (33-foot sections) rolled in 1913, verifying the original reconstruction. Lackawanna 1912 90# rail was also identified.

This cut area was very long - with depths of 25 feet over the majority from west to east, and slowly dropping down to ground level further east. Cut distance was 3300 feet verified with counted rail lengths and essentially verified with valuation maps. Additional excavation in this hard Bluestone would require blasting, but the remarkably wide cut width would allow re-alignment of the track to one side to allow for recreational trail clearance. Blasting of this area is likely not feasible, as it passes directly behind several commercial concerns. Track relocation is the most feasible approach in this zone due to well–excavated distances and existing poor tie conditions with few if any non-defective ties. Tree growth within the cut zone in this area is also heavy and would require grubbing; this is one of the zones far more practical to deal with as a 'railroad' than a vacated corridor for those issues.

The corridor changes from a deep stone cut (visually interesting, quiet) to a commercial zone behind multiple establishments (Beesmer furniture, concrete batch plant, log/firewood processor). It is not particularly scenic but well off the highway corridor and relatively quiet.

MP 9.2 – MP 9 - Generally evolves from relatively flat alignment to a 15' mild fill to a distinct high fill with deep slopes to the south likely in the 100' range terminating in wetland. Fill slopes are in good 2:1 condition but even with realignment fill top is not wide enough to accommodate trail without significant additional fill or retaining wall to at least to the north (lower) side. CMRR concept places trail to north side at this location; this is the only viable concept as fill distances on the south side are completely excessive and drain to a wetland. Fill estimates are an average of 15 feet on a 2:1 slope. Any additional width would require at least some additional fill work



Beesmer Road Bridge

MP9 (Beesmer Road). Bridge is relatively short at 25 feet, ballasted deck, and measures 13' wide at concrete edge. It is assumed this would be allowed in the narrower trail profile for a short section. While

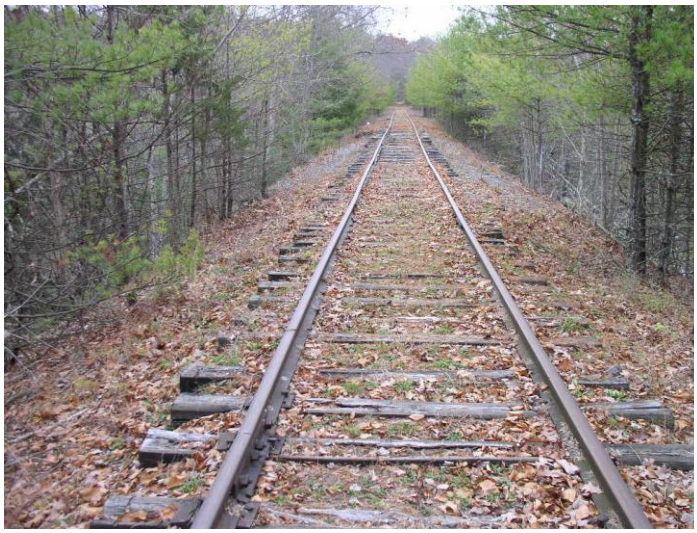
standard trail design would assume a second parallel bridge, the alternative would be for a cross-over at this location. Short distance would allow for a parallel trail bridge as an alternative.

CMRR plan shows crossover at this location to the south side.

The curve entering onto the prior main-line alignment has a far lower mound to the south/west than to the north validating the decision to put the trail to this side.

The character of the engineering and cut/fill construction at the reconnection to the original 1868 alignment is distinct by comparative standards. At the 'junction', and the tangent track, two things are immediately apparent – there has been at least some settlement in the fill (as evidenced by more irregular line and surface of the rail, which is otherwise not evident at all on the corridor) and that the fill profile closes down to a much narrower top section with steeper side slopes.

Below MP 9 the track traverses roughly 2700 feet of fill; with a 30' drop closer to MP9 and deepening to as much as 90 feet (or more) to the deepest portion. Side slopes are steep; likely not completely 1:1 but steeper than 2:1 standard evident on top. Wetlands are evident to both sides of the track and were verified by DEC mapping[2] as "State Regulated Freshwater Wetlands".



Long fill looking east at MP 8.9

Between the relocation at 8.79 and the end of fill roughly at MP8.55, another observation is that the Valuation maps do not show a drainage structure through the fill itself; this indicates that the water flow is essentially stagnant and goes through subsoils for aquifer purposes. This may be the underlying reason for any ongoing settlement issues in the fill; while certainly not severe, the likelihood of further settling remains particularly if the fill structure is disturbed.

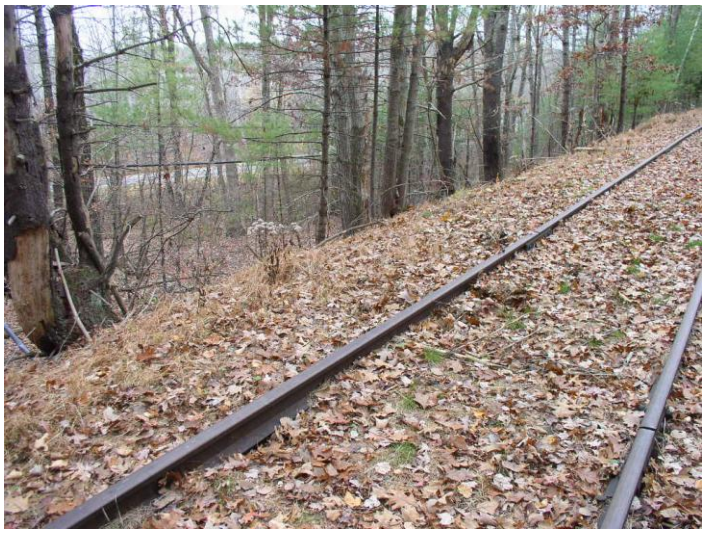
Fill width at the top (and there is some evidence of minor settlement as rail surface has some visible dips of 1-3") averages 12' to edge of shoulder; 8'6" ties. CMRR concept was

[2] WWW.dec.ny.gov: Stony Hollow wetland map

to put the trail on the south side of the track – not noted as retaining wall area but would have to be assumed given the topography at the location.

This 2700' fill across regulated wetlands is also evidenced by a curious situation on the USRA valuation maps – the conventional ROW distance of 66 feet is widened in two successive additional boundary lines outward beyond the original 66' ROW width. There may have been a trestle here at original construction, but it is obvious to build or stabilize the fill, successive wider parcels had to be acquired to clear the base of the expanding footprint. It is also highly likely (but could be confirmed with survey data) that the current base of fill is already at the limits of the ROW at this point and could not be widened without land acquisition.

Trail conversion may hit two specific issues – one being that the trail profile will 'barely' make the 10' width with 1' shoulders to 12' and may require some excavation lower into the fill to gain better width, as well needing as a much of a mile of protective barrier fencing on both sides due to steep drop-off. Any disturbing of the fill material at all – whether through maintenance or construction – runs some risk of visible soil and material disturbance down the slopes into the wetland area. Overall, this is one of the most challenging portions of the entire corridor below West Hurley for <u>any</u> corridor use. It is, however, generally one of the better trail portions from a scenic standpoint – no adjacent development, quiet, and with a view nearly at the canopy level across the wetlands.



Wetlands below embankment at 9.1

At this location the south side continues to drop down into a steep grade into wetlands while the north side remains relatively flat with some minor excavation. CMRR shows the parallel trail to this side and that would be a logical alignment given the circumstances not requiring any additional walls.

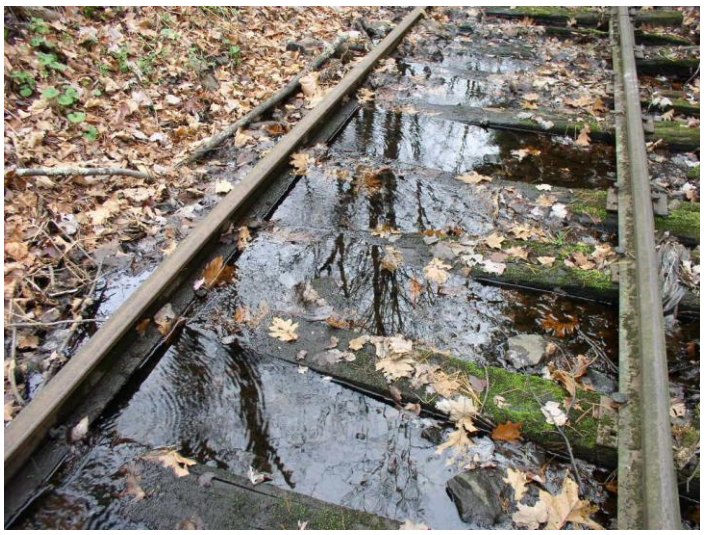
MP 9 also marks where the 'real grade' begins in earnest – the relatively consistent 2% grade down into Kingston is visually evident. The track does not flatten out in any location. As track charts are not available (although historic resources were checked) and the line has not been surveyed as the top portion has, exact grades are not available so there may be shallower or steeper localized spots. Historic records indicate the line was built to 2% and the "Ulster and Delaware" book shows an unofficial profile between MP10 and MP 6

of 2%.[3] The vertical distance is more evident visually on Rt. 28A; the general vertical rise is slightly over 400 feet. In contrast, the section through the Ashokan Reservoir shows maximum grades of .5% (half a percent) over roughly 12 miles – essentially flat and relatively ideal multi-use trail characteristics for all users including those that are mobility restricted.

The track regains the general soil level between MP 8.55 and the Stony Hollow/Rt. 28A crossing and has two historic notes; one being what appears to be an abandoned rail or road grade into the woods that is not documented on any mapping but does have extensive handmade retaining walls, and the presence of what remains of the "Madden House" trackside – reportedly one of the oldest homes in Ulster County and owned by the Historical Society. It is currently stabilized, but only a shell of a building and partially open to the elements.

The Route 28A crossing at MP 8.33 has significant rail vs. highway visibility problems and has no remaining crossbucks, flashers, or other protection. While it could be legally operated by the railroad simply with passive crossbucks, the limited highway visibility and sharp crossing angle present an above-average hazard that would likely require additional grade crossing devices. While not necessarily a County or railroad expense, this is still an unusual and obvious crossing hazard, and not limited to just a railroad hazard - even trail users will have to be cautioned, or slowed with a barrier/bollards, to come to a full stop and look for crossing highway traffic. For trail use, a flashing light or advance warning flashers may be considered as well. In similar situations on other excursion railroads, flagmen are voluntarily stationed at the crossing, or the train may come to a complete stop and flag themselves through. <u>This is not federally required and is a voluntary consideration on the part of the operating railroad</u>.

Immediately east of the 28A crossing is a very narrow, wet, and misaligned track section that is barely passable even by track car. Drainage in this area is now flowing directly through the track structure leaving ties submerged, hanging, grown with moss, and also within a shallow cut area that measures only 14' 6" to 15 feet wide from ditchline to ditchline. This situation is nearly unusable for either rail or trail, and the entire



East of Rt. 28A crossing

[3] <u>Ulster and Delaware;</u> Best, page 171-172

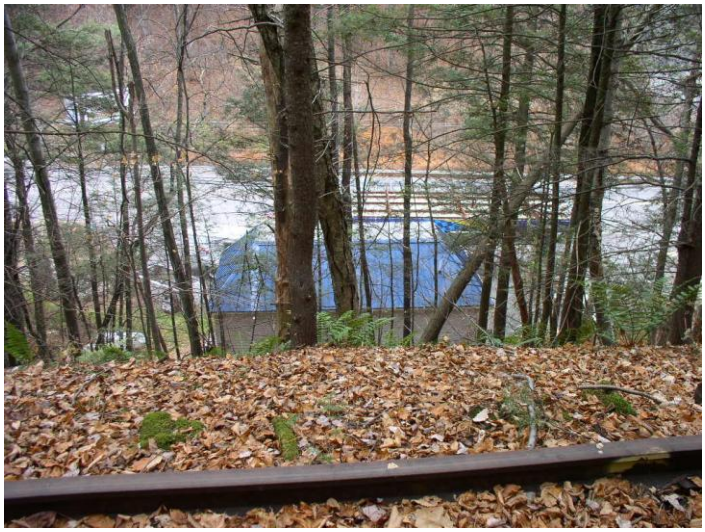
drainage system in this area must be re-engineered. Even for trail usage, the cut must likely be widened and new drainage cut into a wider profile. This zone is basically 300' long with a cut as deep as 10 feet on both sides, and appears to be Bluestone. This is by far the worst drainage situation on the corridor between West Hurley and Kingston, and thankfully, is an isolated and unusual section. CMRR shows a parallel trail profile on the south side; this is only the recommended location due to the proximity of a private residence on the north side of the alignment. Any alignment here will require excavation, and a trail placement will require virtually the same level of remedial work.

Below this zone the railroad begins a general alignment of hillside placement that remains a relatively consistent design feature to Hurley Mt. Road – alternating shale rock cuts and companion steep fills across tributary drainage areas. The original ROW was excavated out of the rock hill face, leaving a narrow shelf that at the track level, is generally shouldering out between 10 and 14 feet. There is no significant subroadbed section as on the relocated portion at the top and the ballast section is consisting of a mix of dirt, cinders, and some light rock that is insufficient to preserve crosstie life. Cross drainage from tributary streams is actually very good, and the original 'culverts' of cut stone noted on the Valuation maps have long outlived any other newer construction method of concrete, steel pipe, or plastic. The cross drainage of this entire zone is actually excellent, considering the age, design, and flood event history it has witnessed.

Alignment here generally appears to allow a parallel south trail placement to approximately MP 8.15 where a fill extends with a 20' drop to the south and an 80' drop to the north; steep slopes downslope to the north preclude any relocation here. Excavation on the hillside to preserve vertical trail location equal to the roadbed appears to be limited to a 300' section of approximate 10' depth. This material would be appropriately used to widen the lower fill to the inside and still stay within the ROW boundary.

CMRR indicates a crossover here at MP 8.1; the alternative would be to move the curve alignment outward and remove shale erosion from the inside of the curve and extend into the hillside. Cut dimensions are significant but enough room is present at this location to do the placement without significant excavation.

CMRR indicated another crossover at MP 7.9; this was purely to change sides to allow usage of the prior double-track width from this point south. MP 7.9 also begins a significant cut on the south side; 562 feet with heights of 25 feet at the deepest point; shale hillside appears to allow excavation as an alternative to what would apparently be retaining wall at this point in the CMRR plan.



7.75 looking toward Honda dealer

MP 7.75 has one of the very highest fill areas on the entire lower line, a 433' fill that extends approximately 110' down on the south side and even further on the north side nearly to the highway level, and an additional parcel off of the ROW was shown on valuation to allow for the fill footprint. This area was shown for retaining wall placement north on the CMRR plan (fill top was measured to a nominal 18' width). The drainage box at the bottom of the valley is shown as 3x4 foot in size, and it already appears extended approximately ten feet uphill without any fill on it – allowing some fill widening without extension. This presents at least some opportunity for fill expansion on the north side to gain space rather than the south side placement assuming extensive new wall construction. This area is directly behind the Honda dealership on Rt. 28.

MP 7.63 has a short section of fill (56') that could also be widened uphill south as opposed to new wall construction on the north; drainage culvert is a 3x3 stone box as shown on Valuation. If the interior placement were followed, the crossover shown at 7.58 would be unnecessary.

As an observation, once the placement of the ROW comes into visual distance of Rt 28, the ambient noise level of passing vehicle traffic – particularly climbing the parallel hill – is sufficiently loud that verbal communication had to be done at a near-shout level. For a trail experience, this is somewhat unusual and comparatively unpleasant, but it is very much a factor here. This was not noticed during the track car inspection due to the actual noise of that vehicle, but it is evident when walking.

MP 7.51 has a shale cut 340' long that could be cleared and cut back to keep the trail to the inside rather than outside on a wall, immediately following is a 200' short fill area with a very narrow top profile of only 11 feet. This is one of the few locations that is actually not wide enough for the preferred trail profile without additional fill, lowering the fill profile (resulting in a steeper grade on one end), or other compromise.

MP 7.39 has another 243' shale cut section to the inside that was assumed to be an 'up and over' to the south or a retaining wall to the north; this appears to be feasible to excavate to gain width. The cut area widens out beyond that point sufficiently to not

need further excavation. Cut areas continue through this zone but are generally far enough back to continue the excavation to track level approach rather than outside retaining wall construction.

Former double-track zone

The 'very best' rail with trail location on the entire railroad begins approximately at MP 7.28 and continues south to MP 6.74; this was an excavated and widened passing siding area with the second track placed to the north side and then removed. CMRR plan shows the trail to this north side; this assumed continuation of this alignment north of this point on retaining wall. At this point there could either be a crossover of the trail to the north side of the ROW, or any heavy track rebuilding could relocate the track over to the north side to allow easy location of the trail continued on the south side without a crossover. This is one location on the entire alignment that allows relatively easy, full-width trail profile with little excavation or filling necessary. For comparison, this amounts to half a mile of relatively easy parallel (and full-12' width) construction that at minimum extends any work to 6.74 to easily be continued to 7.28. For any 'rail with trail' alternative, this should be emphasized as it allows the railroad the track/time distance to MP 7.28 with any further issues only from 6.74 to MP 6 – ¾ of a mile of more difficult co-location issues with a 'free' half-mile at the end with minimal conflict. As in other locations, when the track needs a virtual rebuild from scratch due to tie conditions, relocating the track is a viable alternative to reducing crossovers or gaining additional clearance.

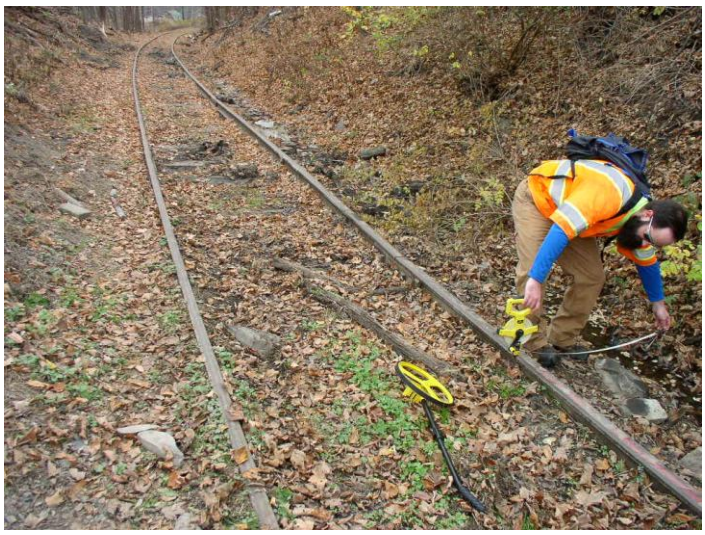
This is at least worthy of mention because the special events nature of the Kingston operation has been criticized by Rail Events as being "too short" in 2014 (requiring finishing the on-board programs while stopped at Kingston because of inadequate track distance to operate on), and some consideration should be given to 'how far could you get….if…' The longest distance for the shortest amount of contentious excavation appears to be the west end of the double-track area at MP 7.28; roughly a mile further up the track than they are currently operating today.

MP 6.74 to MP 6.63 appeared to be some manner of an obstacle on paper, but field inspection showed that the "existing logging road" was actually fully cleared and on the

south side, was potentially on or beside the ROW line, and would present a lower-cost and difficulty alternative for that situation. Full width may be possible and it needs surveyed for precise location in relationship to the ROW line.

A small tire dump area is present at MP 6.6 that will need removed.

The railroad comes nearly out to the Rt. 28 right-of-way at this point, on a steep-shelf with a narrow alignment and generally inadequate width with some portions of only 50' ROW. Two private residences in this area have issues with right-of-way occupancy; the first at MP 6.54 (current north end of trackwork); the rock cut just below this residence is generally shale; the trail could not go to the uphill side due to the proximity of the residence, although drainage in this area is constrained even for a trail.



Eroded shale into drainage at 6.5

It should be noted at this location that the embankment to the north side was being dug out and partially removed simply to attempt to do normal tie replacement, and the characteristics of the embankment were soil with loose shale rock. While the zone was over 250 feet, it did appear to be gently sloped, not over 10 feet high at the worst point, and possible to widen to put the trail to the north side at this location.

Just below this area, CMRR has established their 2015 "North Pole", by clearing and grubbing a very limited area to put the site trackside on the hill portion. Below that is a second private residence and private crossing with a pool fence that is within the ROW, as well as some decorative landscaping to the outside of the fence. This will have to be addressed even with a full-width trail profile

Additional tie and ballast work was underway from this point south. At MP 6.29, the track enters perhaps the second-most difficult portion of any conceptual rail-with trail alignment - a deep, and narrow (nominally 17', narrower in some spots) stepped Bluestone cut that is deep on both sides. The steep rock exceeds 30 feet in some locations on the hillside, is nominally 12 feet on the north side, and measured 520 feet long. Clearances were tight in this area even for rail use and may need adjusted after tie work is completed. Any track-level excavation in this zone would likely have to be

blasted rather than ripped, and neither 'up and over' proposed CMRR alignment appeared viable without steeper climbs. This zone appears to be the narrowest, hardest, and alternative-resistant zone on the lower end of the railroad. It appeared that rail may have been lifted to allow tie replacement here. If any rail-with-trail potential. If any zone provides the definition of 'fatal flaw' for the area to MP 7.2, this may be it.

Bluestone cut near Hurley Mt. Road

The final 'cut zone' before Hurley Mt. Road was between MP 6.2 and MP 6; this consisted of a massive excavated rock wall to the south side, compared to a relatively low mound on the north side; while the south side was virtually impossible to open, the north side was limited to a 200' zone of relatively low and shale-based rock that had relatively few obstacles to reduce to a parallel level grade.

Approaching Hurley Mt. Road in distance

The final note of issue was that the Hurley Mt. Road crossing is assumed to be hand-flagged during rail operations, and has exceedingly poor visibility and is even lacking required crossbucks by NYDOT/FRA regulation as an active rail crossing. This visibility problem will remain for the trail, as any downhill bike traffic has at least the potential to run directly into the path of a vehicle at Hurley Mt. Road without significant advance warning and perhaps Bollard fencing to slow downhill bike traffic.

Crossovers and Barriers

Throughout this discussion, two other related issues are assumed. CMRR's plan featured multiple crossovers. The proposed methodology of those crossovers – rubber

flange filler in a paved pedestrian crossing – is a proven technology and a very high standard for pedestrian crossings. It is in use in such locations as Steamtown, under National Park Service ADA standards, and is a good recommendation for a slow-speed (15mph) non-freight, non-winter train operation. This material effectively removes the flangeway as a tripping hazard, and is particularly valuable when bicycles are anticipated, as most trails are. This would not be an acceptable solution for a rail crossing in most areas, but is actually a valid application in this circumstance. While these crossovers are greatly reduced with our approach (including partial track relocation) they are not entirely eliminated.

AASHTO standards make no distinction whatsoever in parallel rail occupation as it pertains to train frequency, speed, and comparative stopping distances of rail equipment. All these factors are very significant in the real world, and are just as significant as highway vehicle speed compared to adjacent sidewalk and pedestrian placement in the traffic design arena. It is no more appropriate to place a pedestrian trail immediately beside a high-speed, high-volume railroad track without protection than it would be to place a sidewalk on the shoulder of an interstate highway. But it would be equally inappropriate to place full-height barriers on all residential sidewalks with a 15mph speed limit on adjacent vehicle traffic on every street and driveway. Use of barriers is considered entirely optional on many existing trails with parallel rail occupation, and is not an accepted standard in these situations. Experience on these trails has not shown the lack of barriers to be a cause of liability claims to either trail and rail occupants – in low speed and low frequency situations. Other than potential funding issues involved with complying with a given standard in a funding or grant agreement, there is little basis for practical application of these in this situation.

Environmental

The multiple and interlocking levels of environmental jurisdiction greatly impact a definition of 'feasibility' and can sometimes be interpreted as insurmountable. At minimum, they extend the construction timeline and cost of permitting beyond all original estimates. An active railroad enjoys a somewhat better standing (being federally regulated) for maintenance permit purposes than an abandoned one – particularly for drainage maintenance. The specifics in this are beyond the scope of this report, but Stone Consulting has worked with Chenango County NY for over three years in the initial feasibility study, engineering, and permitting of the rail corridor reconstruction across that County, and the involvement of the US Army Corps as the primary, but not exclusive, permitting agency on the rail corridor. Chenango was hit by flood events originally in 2006, and again in 2011, that embargoed the rail line for freight service.

The USAC definition of 'inactive' vs. 'active' has little to do with conventional rail abandonment analysis, and the reversion of drainage ditches to wetland status is the primary concern. Inactive corridors are subject to much higher scrutiny and permitting analysis. Each and every culvert and 'wet spot' had to be evaluated, as well as effective species impacted and potential invasive species impact, in Chenango. This will equally impact trail issues, as the cuts simply have to be widened and cleared for any trail usage as well as rail.

Compounding the situation within Ulster County is the obvious tree growth issues, both within the cuts and impacted by cut widening activity. The entire corridor is apparently on the boundary of the Catskill Park and also adjacent or within portions of the Forest Preserve, subject to tree cutting restrictions. Identified endangered species are present, and the comparative size of the railroad or trail project provides no advantage – it should be noted that the mission-critical replacement of the Letchworth Bridge has been delayed for several years during environmental analysis, and mature tree removal for the new bridge placement could only be done during a specific timeframe. This was on a high-priority project at the state DOT level rather than a trail construction project. The opening or widening of cuts on the uphill side of the lower portion of the corridor would likely impact 'habitat trees', but as an observation, the replacement planting of habitat trees is far less expensive than the construction of retaining wall on the opposite side as an alternative.

Conclusion

The approach to trail usage that was explored – using a 4'-6' recreational trail width only in constrained areas, minimizing retaining-wall zones, removing eroded shale to gain clearance, excavating cuts toward the hillside as a first choice and widening fills to the hillside, some track relocation, and generally working at existing track level rather than 'up and over' walking trails at cuts, reduce, but not eliminate, many of the issues that have deemed this project previously infeasible. Working consistently at the track level, rather than 'up and over' parallel walking paths, keeps the corridor investment where it will benefit the rail and trail projects in the future rather than being a potentially wasted effort on a diverging and hilly parallel path or long runs of retaining wall on the steep downhill slopes to Rt. 28. The 'up and over' approach to take a walking trail above and around a cut zone creates additional walkway barrier zones, and if the track ever is removed at a later time, has essentially been a wasted expenditure. Any investment in the corridor should benefit both approaches as a long-term investment.

Two significant areas remain that are not easily resolved. The first is the narrow Bluestone cut above Hurley Mt. Road and east of the first private crossing - which would likely require blasting to gain any width at all even for a constrained trail width at

track level – but would be adjacent to Rt. 28. The second is the 2700' fill through wetlands on both sides at MP 8.7. No easy solution for either is evident and any additional construction or modification of that fill for parallel trail use, including a constructed retaining wall on the fill slope, risks destabilizing of the slopes and erosion into the wetland.

Of the two, the one worthy of most additional study effort is the lower rock cut; any parallel trail effort here would be limited to Hurley Mt. Road to MP 6.74 – ¾ of a mile of actual lowered-width trail would potentially result in a full 1.2 miles of workable track with trail above Hurley Mt. Road to allow the rail operator more track distance for special events. The hard and clean rock material that is removed from this area could potentially be used to provide the additional fill material anticipated between Hurley Mt. Road and Rt. 209, lowering imported material and transportation costs as it could actually be transported by the side-dump hopper car owned by CMRR less than a mile. This would benefit the already-proposed rail-with trail alignment in that area.

Furthermore, the abundance of drainage and shale erosion drainage problems in this entire four-mile zone result in a very definite recommendation to address these specific problems while the track is still in place and it can be defined as an 'active' railroad corridor for environmental permitting purposes. As 'railroad maintenance' has been performed well into Shokan, any permitted work that can be done before any rail abandonment proceedings qualifies as maintenance; as soon as the rail is lifted it will become an individually-permitted scenario that could conceivably add years to construction timetables. A good example is the Rt. 28A crossing – what is defined as a railroad crossing today will rather quickly be redefined as a wetland if abandoned.

Observations

Overall, the trail proposal between Basin Road and Hurley Mt. Road, while feasible, primarily provides connectivity, and at that, only in one downhill direction for many trail users that consider the climb uphill too steep except for walking. Compared to the Ashokan Reservoir portion proposal, it lacks outstanding scenery, has significant traffic noise, and will be far more difficult to both construct and maintain as a full-width corridor to the desired standards due to original railroad construction issues. The four miles of corridor work steadily uphill to climb roughly 400 feet, and will find the same resistance to average trail users as the biking shoulders on Rt 28A do now in the uphill direction. It is far less likely to produce the similar destination economic impacts as Ashokan section. It will accomplish some degree of regional connectivity that is not currently met by the parallel NY Bike Route 28 paved shoulders, and may be of value for special events as proposed that already partially exist on the Rt. 28 corridor. It lacks the

value of the in-town 'park' resource for Kingston residents that much of the lower trail zones provide.

In contrast, the lower mile and a half of the corridor appears to provide some of the most critical features to retain special rail events out of Kingston – providing minimum operating distance out of Kingston. This issue can be then be theoretically compressed from a rather difficult four or five mile co-location issue (Glenford Dike) down to 1.5 mile portion operating through the double-track area ending at MP 7.28. For at least the first mile and a half, every effort should be investigated for joint rail and trail occupancy as the corridor issues are both specific and more manageable in size.