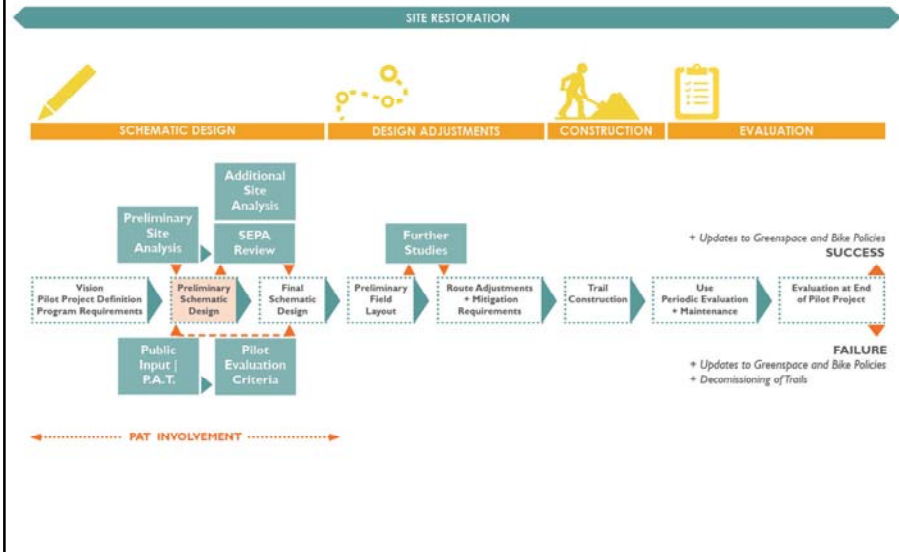
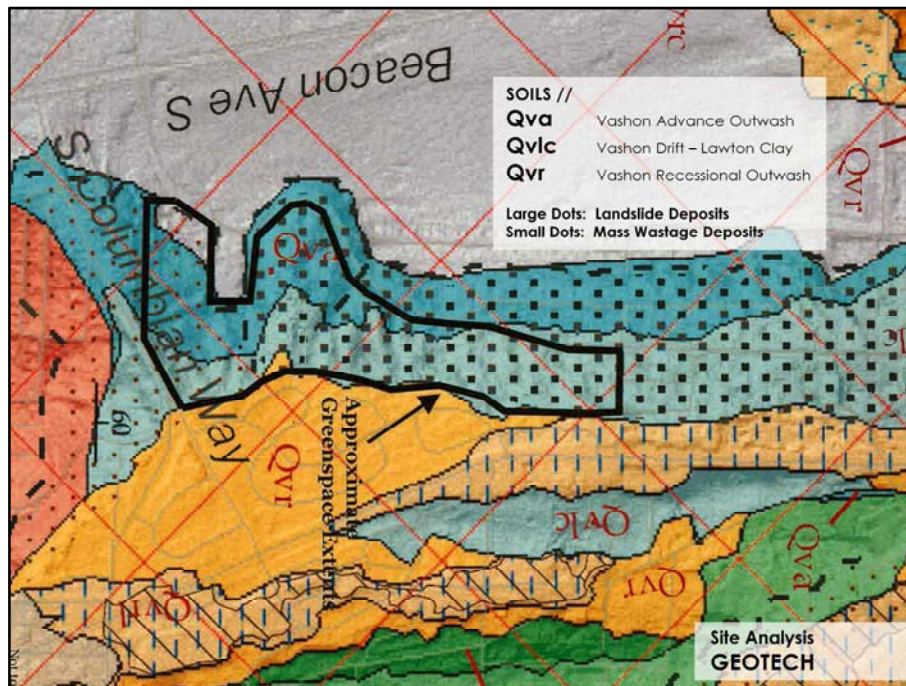


Context, Cheasty—green swathe/topographic and vegetative transition between Beacon Hill and Rainier Valley. Our site is roughly between Columbian Way and the Andover Street right of way.

## CHEASTY TRAILS PILOT PROJECT DESIGN PROCESS





We are going to review some of the preliminary site analysis findings and some of the project criteria as an introduction to showing you the actual preliminary schematic plan, starting with the geotechnical analysis. We have received the results of the Preliminary Geotechnical Evaluation, by Stantec Engineers, which will be posted tomorrow. Their study covers slope, landslide and stormwater issues. This map from the evaluation shows how our site, like so much of Seattle, is composed of Glacial deposits. Basically, two layers are exposed on our site. The contact between differing layers is often the cause of instability.

Conclusions from Geotech Analysis:

**“In general, it is our opinion that an acceptable route for both a perimeter trail and cross trails can be located on the site... ”**

Site Analysis  
GEOTECH

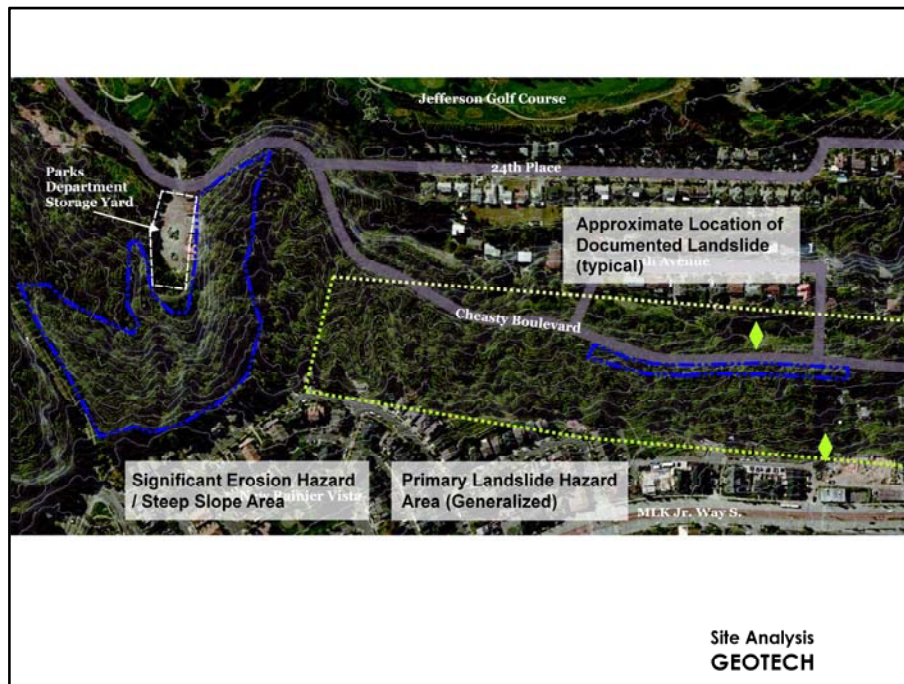
Conclusions from Geotech Analysis, continued:

**“...provided**

- 1. certain site-specific landslide hazard areas are avoided**
- 2. proper analyses are performed after the trail has been laid out in the field based on preliminary design, and**
- 3. adequate precautions based on these analyses are taken to minimize additional erosion”**

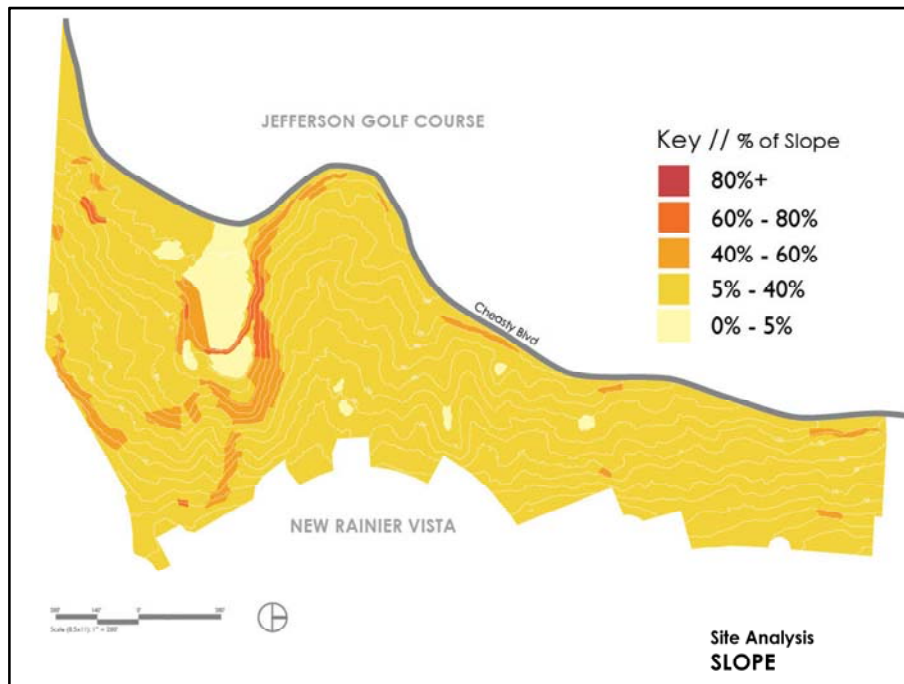
Site Analysis  
**GEOTECH**

As I described in the process, the geotech will walk the trail route after it has been flagged, to make recommendations that may range from “move the trail over 10’ here” to “we need to do borings in this area to figure out where exactly the trail can go”. They will also make recommendations on stormwater and erosion mitigation.

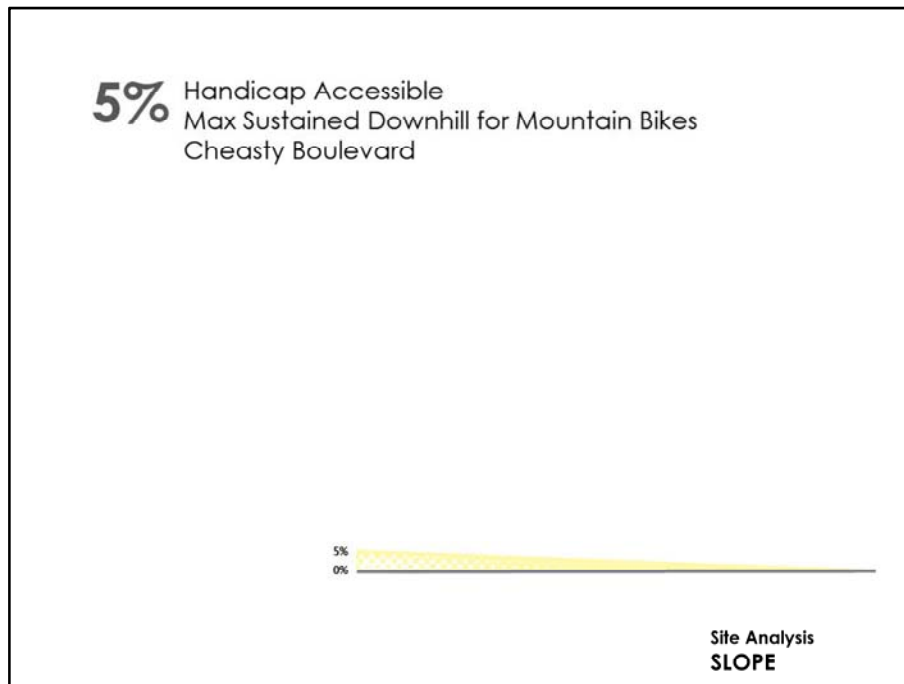


Stantec drew circles around general areas of concern, and pointed out specific documented landslides. They are not saying that trails cannot be built in these locations, but that they are areas where field-determinations for slight route adjustments or further analyses in order to determine the best route, are likely to be made.



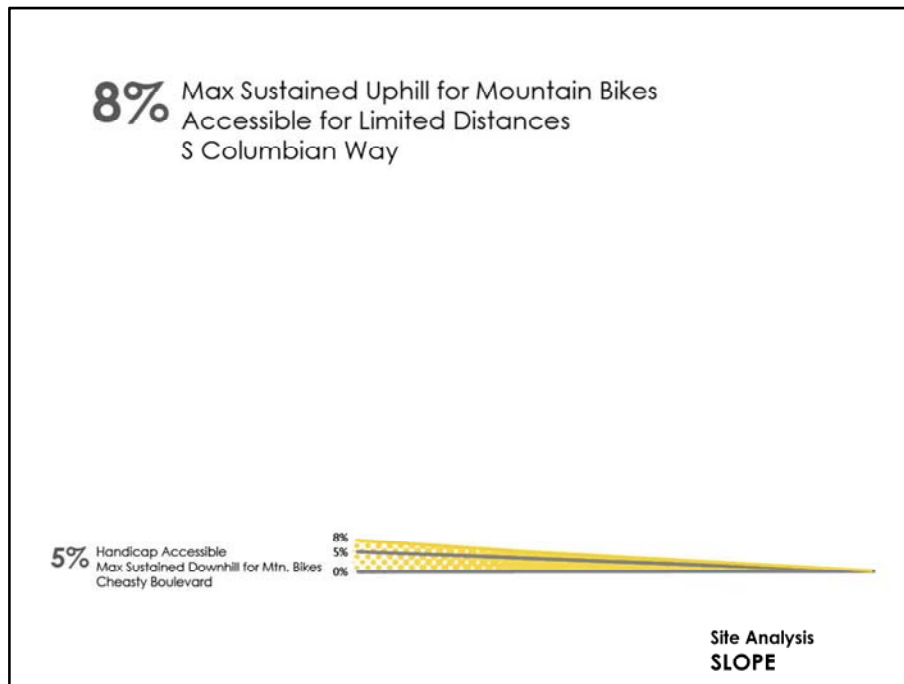


We want to give you a bit of a primer on topography and slope, since these are key drivers of how the schematic trail plan gets laid out. The general landform of our site is a slope with areas of gentle ridges and valleys. The highest point on the site is at elevation 328 and the lowest is at elevation 118. Some of the flat (0-5%) slope areas are opportunities. Most of the site is in the 5%-40% steepness range. 40% is the code definition of a steep slope, so surprisingly, the site has only very limited areas of steep slope. Our steepest areas are in the 60%-80% steepness range, and look like they may have been created artificially when the area for the Parks storage yard was graded.

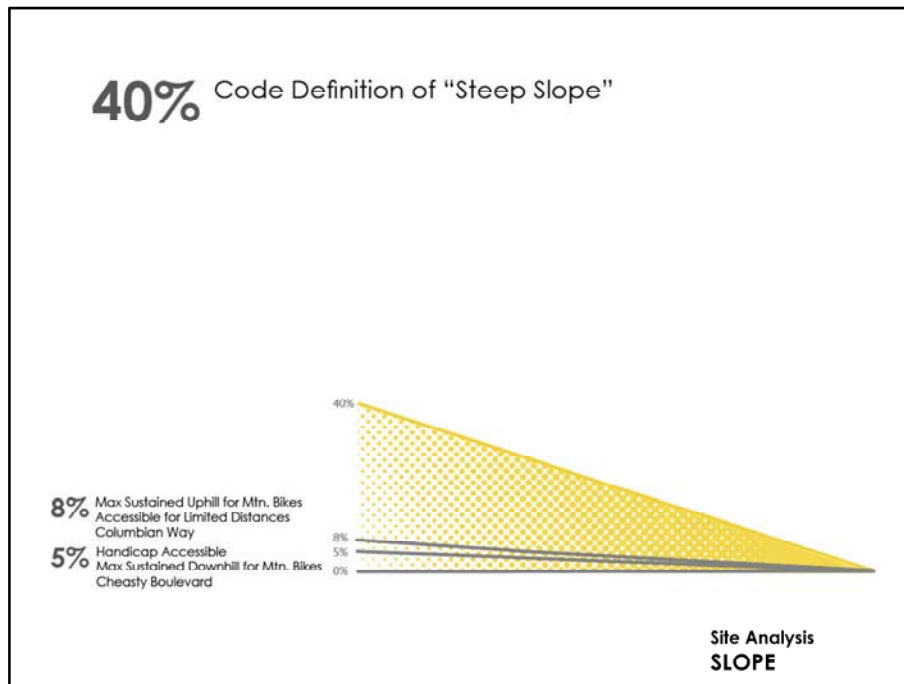


Slope pertains to the site and it pertains to the gradient of trails for pedestrians and mountain bikes. Here are examples of some slopes that are significant in trail building and design. 5% is well-known as a gentle gradient that is considered wheelchair accessible for long distances. To keep mountain bike speeds safe, slow and appropriate for all ages, the maximum sustained downhill trail gradient should be about 5%. Cheasty Boulevard happens to have about a 5% slope.

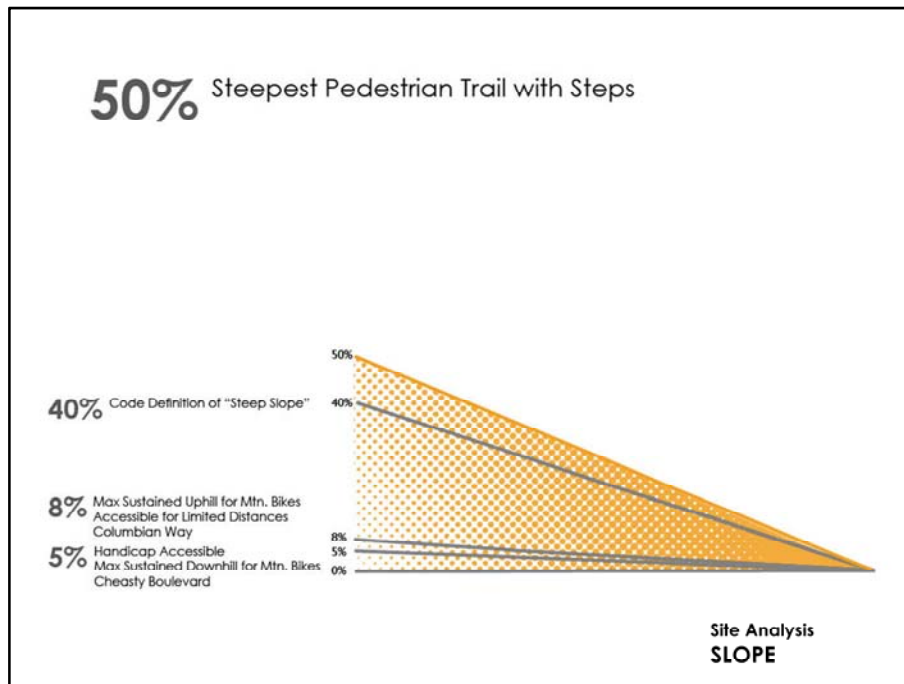




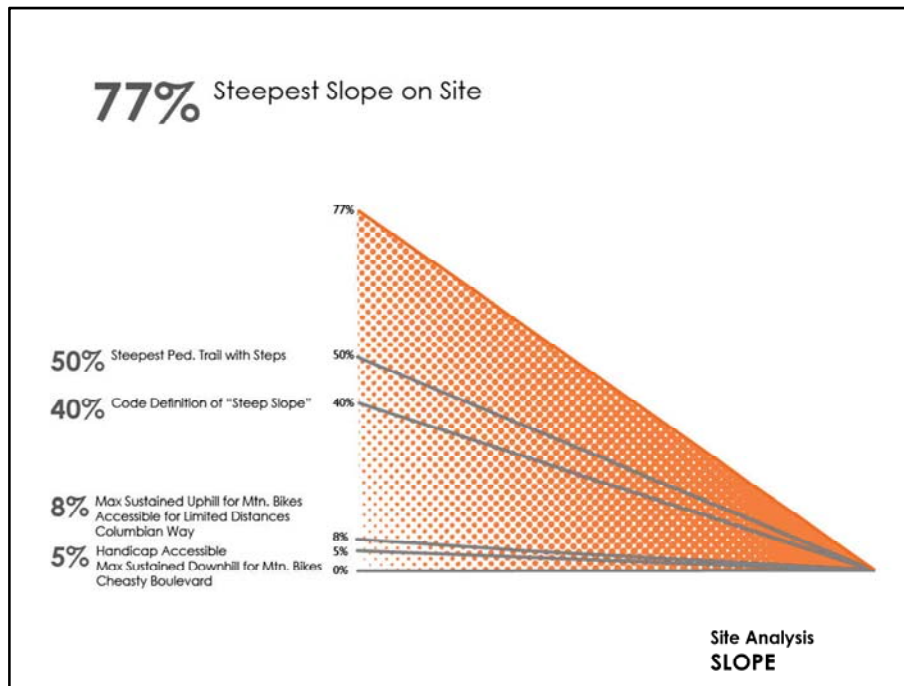
Columbian Way has a slope of about 8%. 8% is considered accessible for limited distances. TO make mountain bike trails fun and manageable for all ages and abilities, 8% is our target slope for sustained uphill climbs. Remember that the loop trail will be strictly one-way for mountain bikes, so the maximum uphill and downhill gradients can be different.



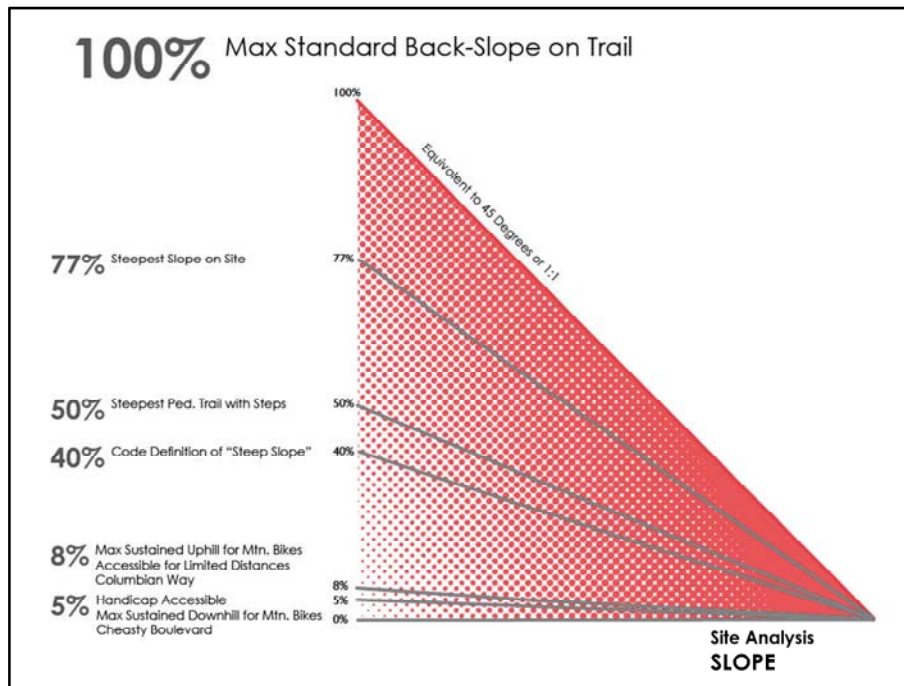
40% is not a particular break point for trail building, but is a point of interest as Seattle Municiple Code defines "Steep Slopes" as slopes that are at least 40% in slope and at least 10' tall.



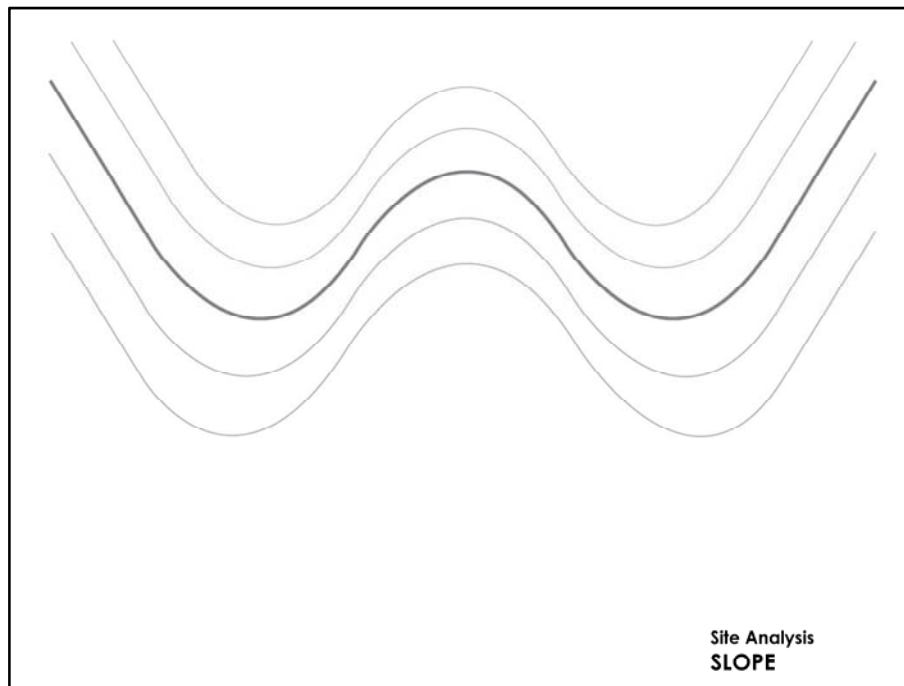
Pedestrian trails are quite good at climbing steep slopes. Seattle Parks has standards for pedestrian trails that slope up to 50%. 0-10% with no steps, 10-20% with "water bars", 20%-50% with timber steps.



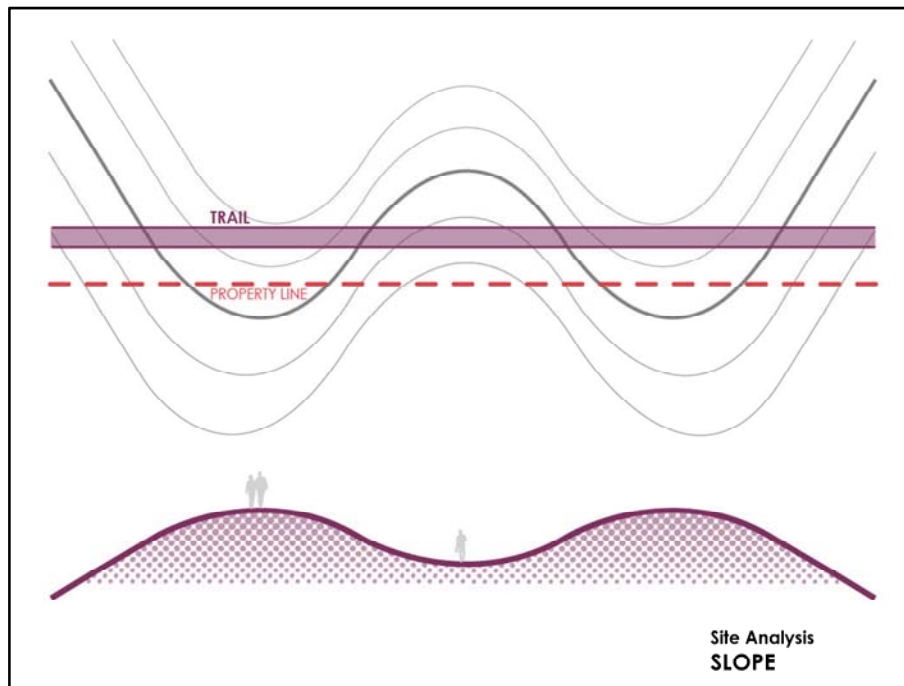
Per the Lidar topography that we are working with, the very steepest slope on our site is 77%



100% sounds like it ought to describe a vertical cliff, but in fact 100% is equivalent to a 45 degree, or 1:1 slope. We have no slopes on site that are this steep. 100% is Seattle Park's standard backslope for a trail that traverses a steep slope.

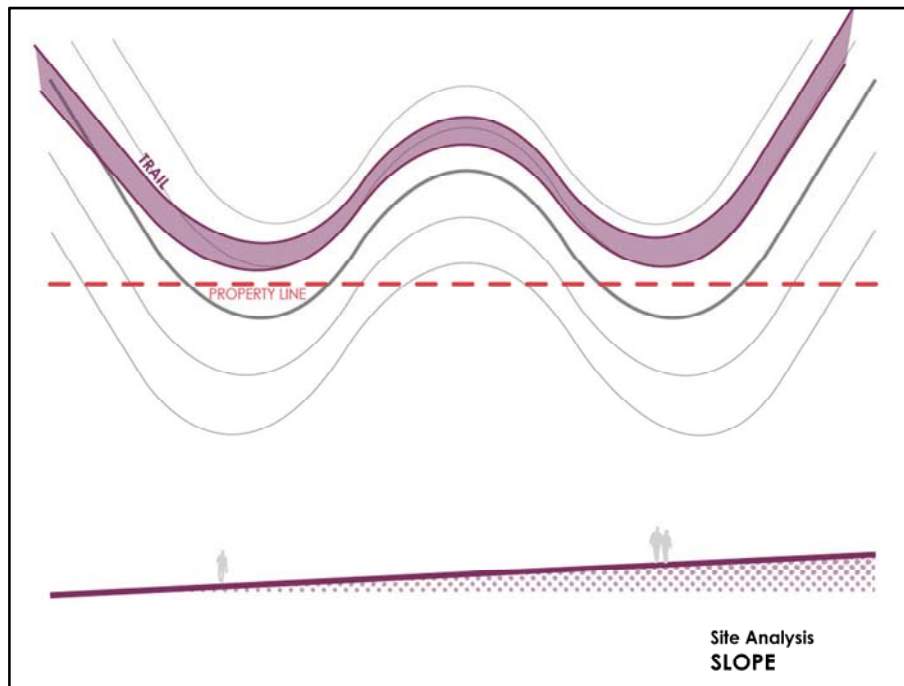


This is a simplified contour plan showing ridges and a valley, similar to our site.

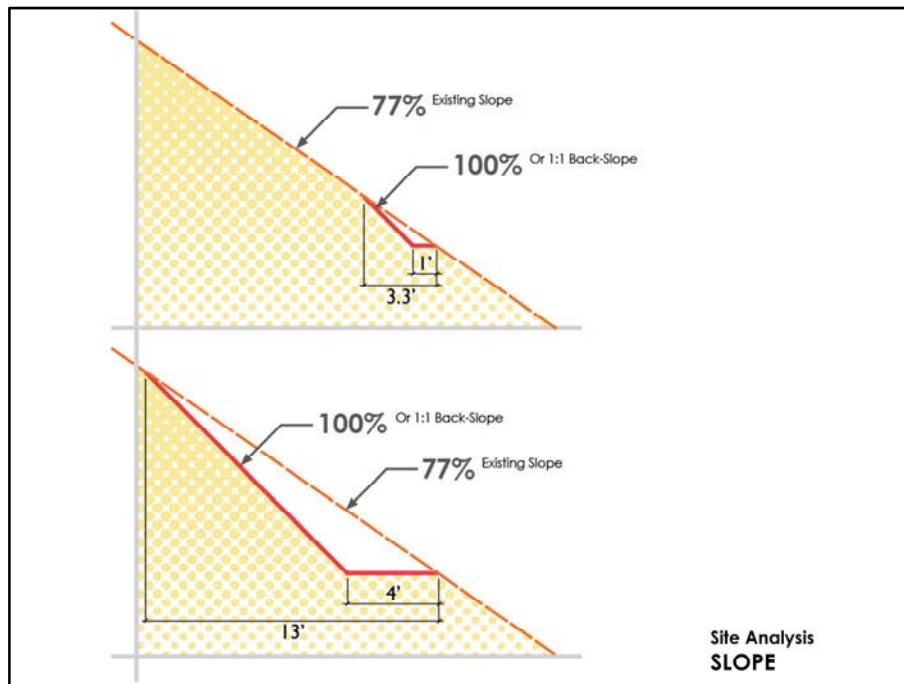


If you had a property line that ran across the ridges and valleys, and if you built a trail to be parallel to the property line, the trail would go up and down the ridges. This is called cutting across the contours. This is pretty easy for a pedestrian trail to do, since they can climb hills at up to a 50% gradient, but may not be possible for a mountain bike trail that can only climb up to 8%, and descend up to 5%.





Another layout would be to follow the contours, which allows a gentle, steady ascent.



While pedestrian paths have more capabilities for climbing steeper slopes, bike paths have more capability for traversing a steep slope. This sectional view shows the potential impact of cutting a trail into the very steepest slope on our site. When you cut a trail into a slope, you have to create a steep “backslope”. A mountain bike trail can be as narrow as 1’ wide. A 1’ wide full-bench trail, with a backslope at the recommended maximum of 100% (or 45 degrees) impacts a swathe about 3 1/3’ wide. A 4’ wide pedestrian path with the same steepness of backslope impacts a 13’ wide swathe. This obviously has a much bigger impact on vegetation and possibly on stability, and explains why we are more willing to traverse steep slopes with a bike trail than with a pedestrian or multi-use trail.



Wetlands along the eastern border of the site were mapped as part of the New Rainier Vista Development. This wet area and this stream were observed and noted in the 2002 VMP, but have not been officially delineated or mapped. What kind of parameters do wetlands impose on trails? Per the Seattle Municipality Code, many kinds of construction projects must abide by certain setbacks from wetlands. However, the code has a specific exemption for “Public projects where the intrusion into the environmentally critical area or buffer benefits the public, such as trails providing access to a creek or wetland area, when located and designed to keep environmental disturbance to a minimum. The applicant shall protect vegetation and trees pursuant to a tree and vegetation plan consistent with best management practices. The plan shall be prepared by a qualified expert with experience related to the type of environmentally critical area or buffer where work will occur. In landslide-prone areas of the plan shall also be approved by a geotechnical engineer or geologist licensed in the State of Washington with experience in analyzing geological hazards related to slope stability and vegetation removal on steep slopes.”



During the desing and construction process, we will meet all of the code requirements just mentioned. The goal of the trail proposal, and a value we heard expressed in earlier PAT meetings is to make sure that the project ends up being a net positive, environmentally. That means restoring and improving wetlands, routing the trail around wetlands where possible, and when crossing wetlands and their setbacks, use details and methods that allow us to tread lightly and maintain habitat function and quality.

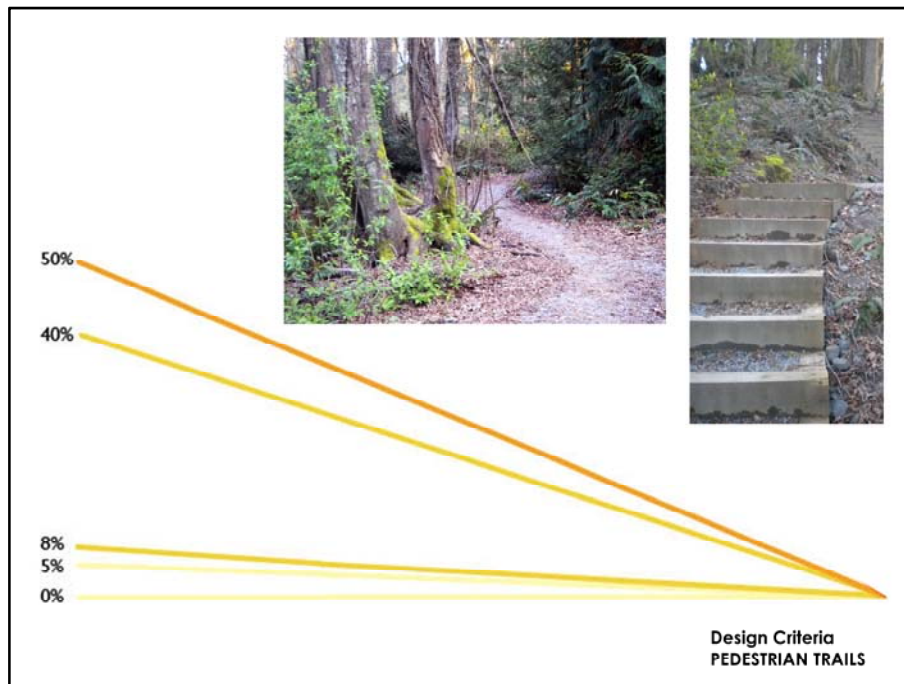


While we don't have definitive up-to-date information on wildlife and vegetation, one assumption that Green Seattle Partnership makes is that removing invasives and restoring native vegetation is good for wildlife habitat. Here is an update on restoration activities in Cheasty Greenspace. To begin to address some questions about wildlife—we had a conversation with Wildlife Biologist/professor at SPU, Mark Jordan. He has done a series of studies on safe-trapping methodologies, with a number of sites in Cheasty. While his studies don't directly inventory wildlife or assess the quality of wildlife habitat, he had some interesting comments about habitat intactness. Intactness is a measure of wildlife's ability to move around without impediment, and also is a statement about having adequate interior, rather than edge space. A pertinent question for this project is whether or not trails create edges and fragment the intactness of habitat. MJ considers CGMV to be an intact patch of habitat, in its current state—mostly restored and with a system of 4' wide gravel trails. Whether or not CGMV, together with the larger lobes of woods on our site could be considered an intact patch, even with Columbian way dividing them, depends on the species. For many species, it is fragmented, but for some birds and larger animals such as deer that might cross at night, it could be considered an intact patch. He does not consider the northern portion of our site to be an intact patch, as it is so narrow and has so much residential edge. These observations don't really help us figure out where to put a trail, but could help lead to thoughtful evaluation criteria.



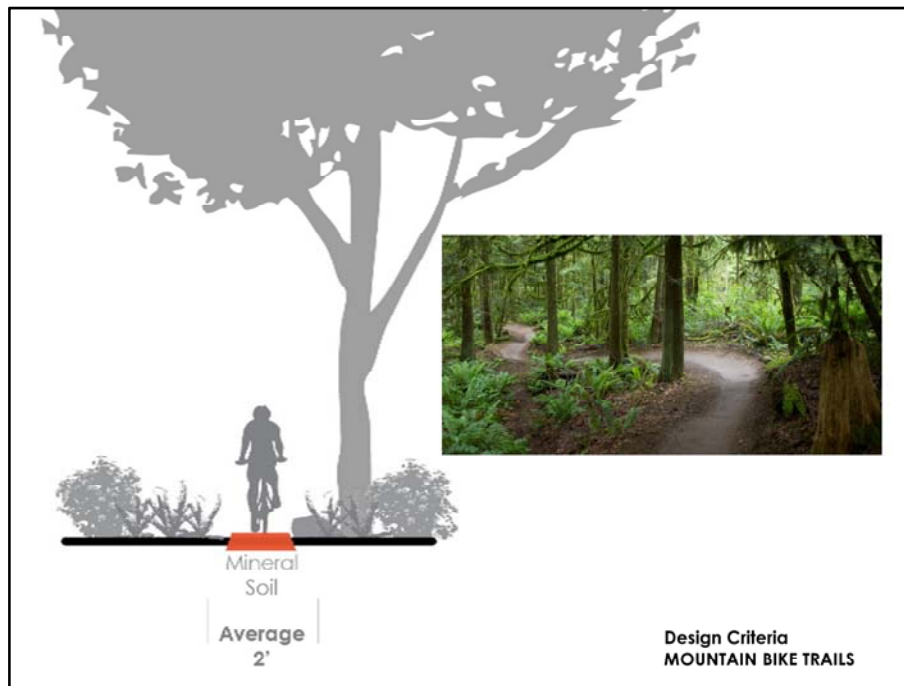


A quick review of trail design basics. Seattle Parks standard for pedestrian trails is a 4' wide crushed rock trail, with selective pruning taking place within 3' of the trail to keep comfortable sightlines open. Walking trails tend to be fairly direct, to discourage walkers from creating shortcuts.

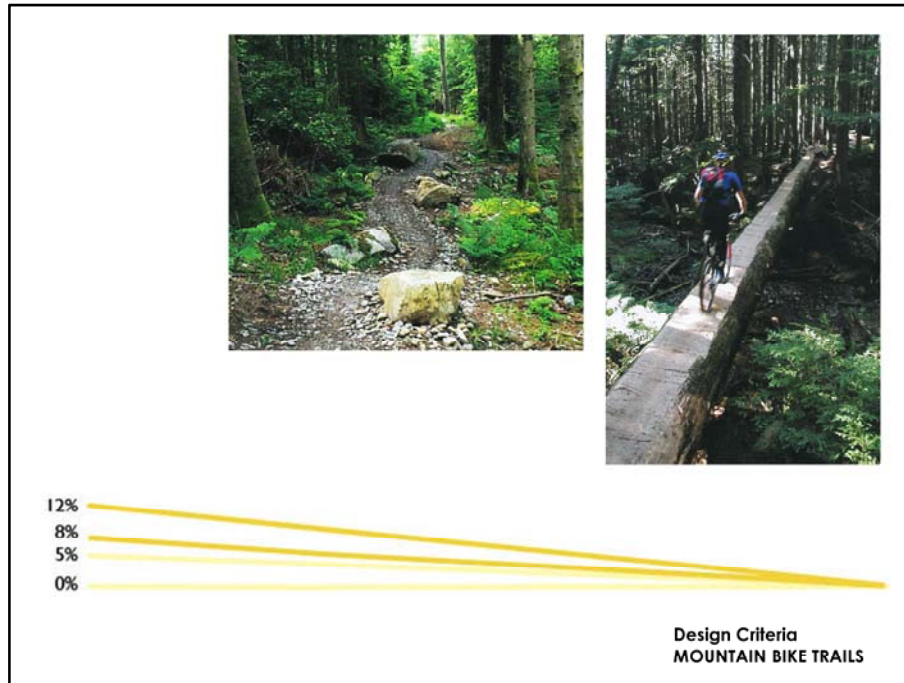


Pedestrian trails range in running slope from 0-10% without steps, from 10%-20% with water bars, and 20-50% with timber stairs.





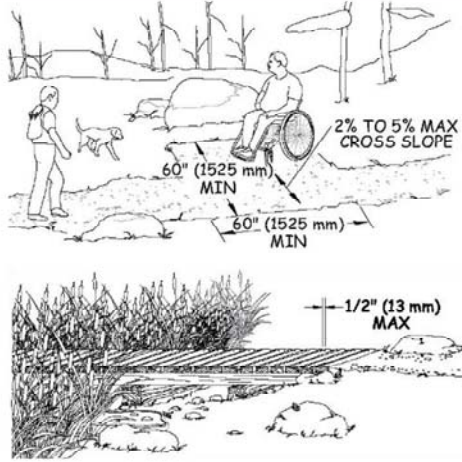
National standards for a forest mountain bike trail are for a 1'-3' wide trail built on the mineral soil surface, like a typical hiking trail. Mountain bike trails tend to have a lot of twists and turns to keep speeds safe and slow, and also have banked turns to control erosion and keep riders on the path.



There are a lot of construction techniques to address different situations, such as using boulders and logs to create pinch points to help keep riding interesting, slow and safe, and using or modifying naturally occurring phenomenon, such as a downed log, to create an interesting trail section, or to cross a sensitive area such as a stream bed.



We want to make sure that people of all abilities can enjoy these trails, and we have found that it is possible to make a substantial portion of the trail wheelchair accessible. The United States Access Board has guidelines for accessibility for trails and developed outdoor spaces, which are a little bit different than those most of you may be familiar with for buildings.





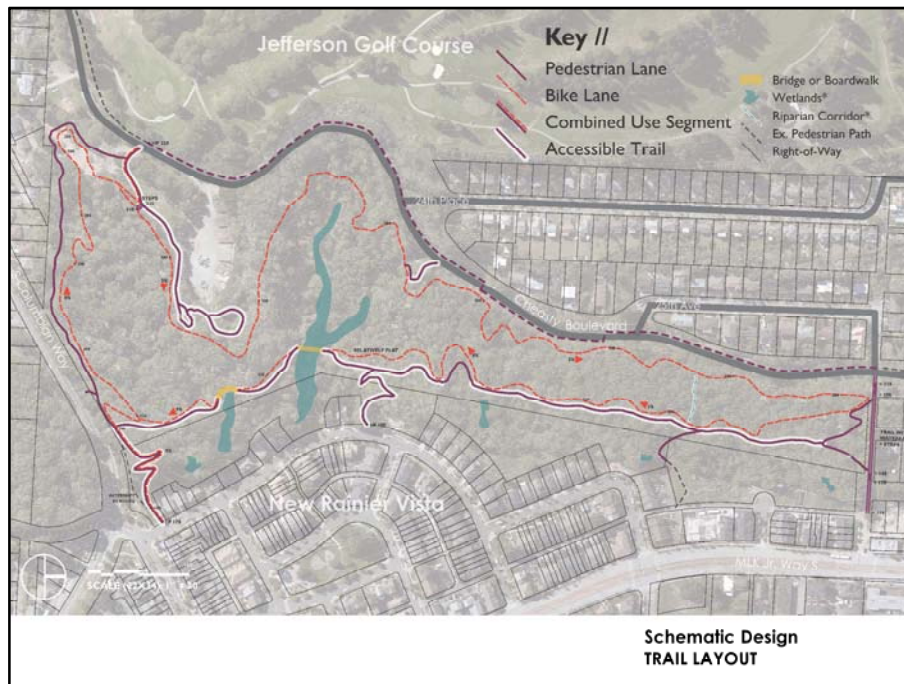
## Design Criteria

### ACCESSIBLE TRAILS



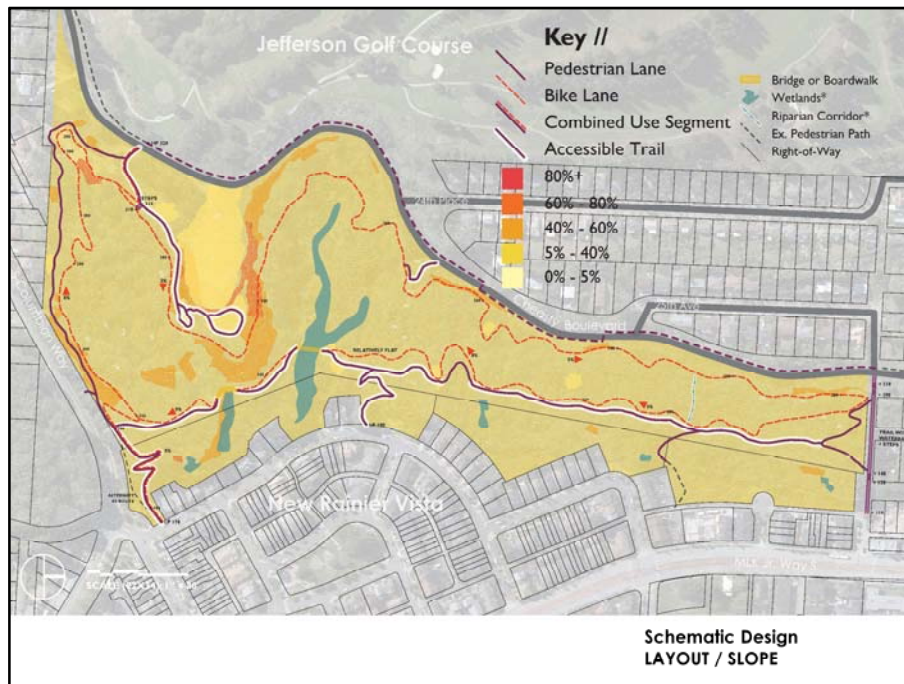
Here's a graphic showing some of the techniques that would be used to manage pedestrian/mountain bike lane intersections for maximum safety. Since the bike lane is strictly a one-way loop, it is fairly easy to choreograph the routes so that riders are climbing at a very slow, controlled speed when they cross the pedestrian path. We can use natural materials such as boulders and logs to create pinch-points in the bike lane, as well as roughening the surface to further slow riders down. Selective trimming would keep vegetation low for open sightlines near the intersection, and there would be signposts alerting walkers and riders to the intersection, and reminding them of the rules of the road.



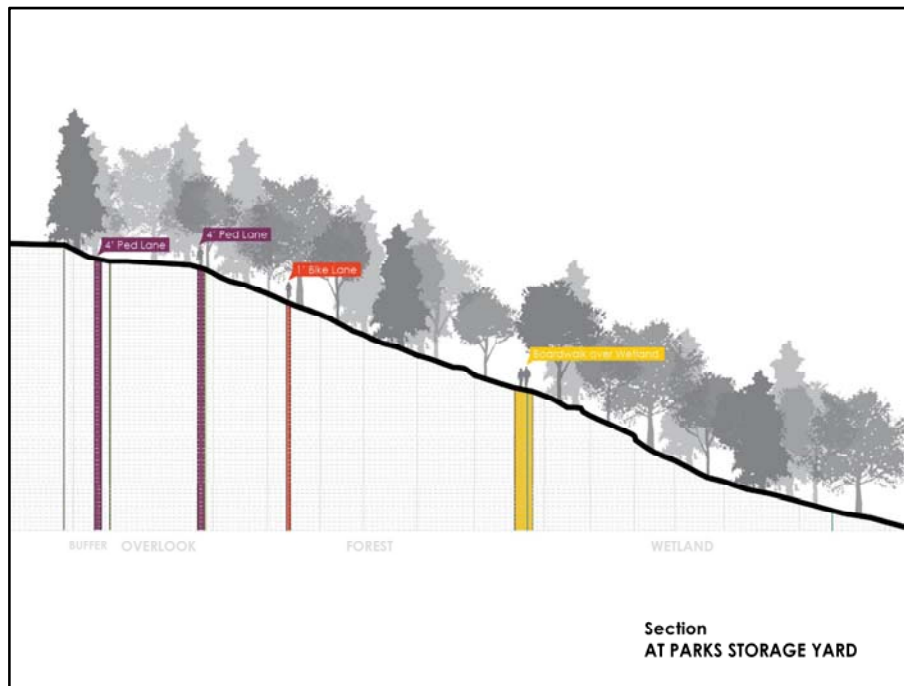


The trail plan is designed to limit impacts of trail construction and to optimize the experience for different users. The bike and ped “lanes” are combined at major entries and when crossing bridges. The bike lane wiggles as it must to achieve the design gradients and accommodate topography, where the pedestrian lane takes a somewhat more direct path where it can. We judged that the steepest slopes north of the Parks yard and along Cheasty Blvd can accommodate the narrow bike trail without undue impact. We felt the impact of the wider pedestrian trail would be unacceptable on these steepest slopes, so therefore the pedestrian includes a long segment on the existing path along Cheasty Boulevard. The accessible path the to flat overlook area west of the Parks Yard would likely be an expensive bit of trail construction, as it must cross a steep slope—it might require something like a boardwalk on pin piles, however, this may be worth accessing the overlook location.

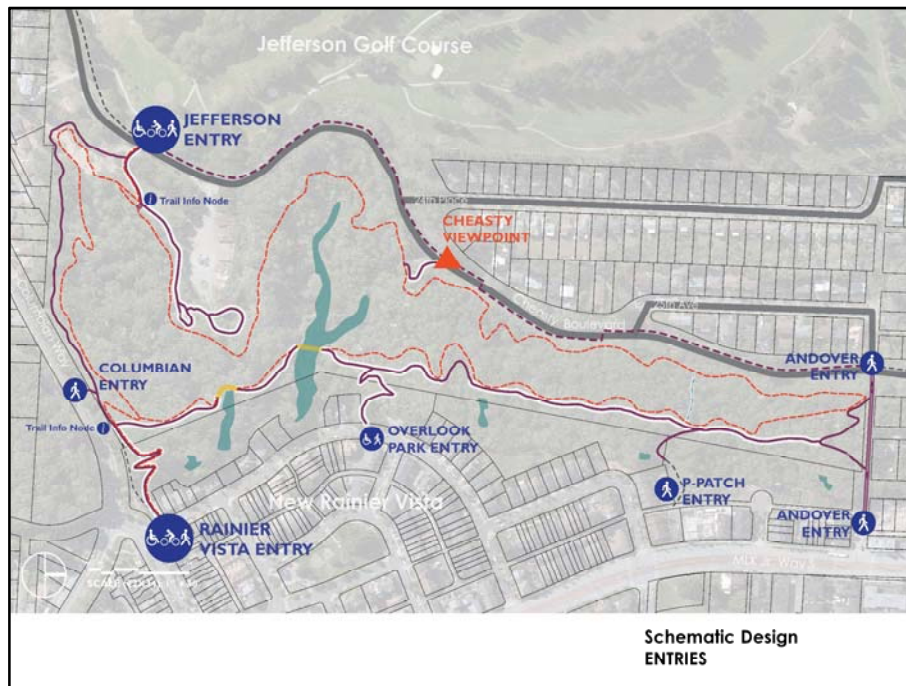




Overlaid on topo map. Field verification needed to ascertain precise locations of steepest areas, and to make any needed adjustments.



Here is a cross-section through the greenspace, through the Parks storage yard at the top and New Rainier Vista at the bottom. It shows the actual slope in this location and the general scale of trees, and how big paths would look in context.



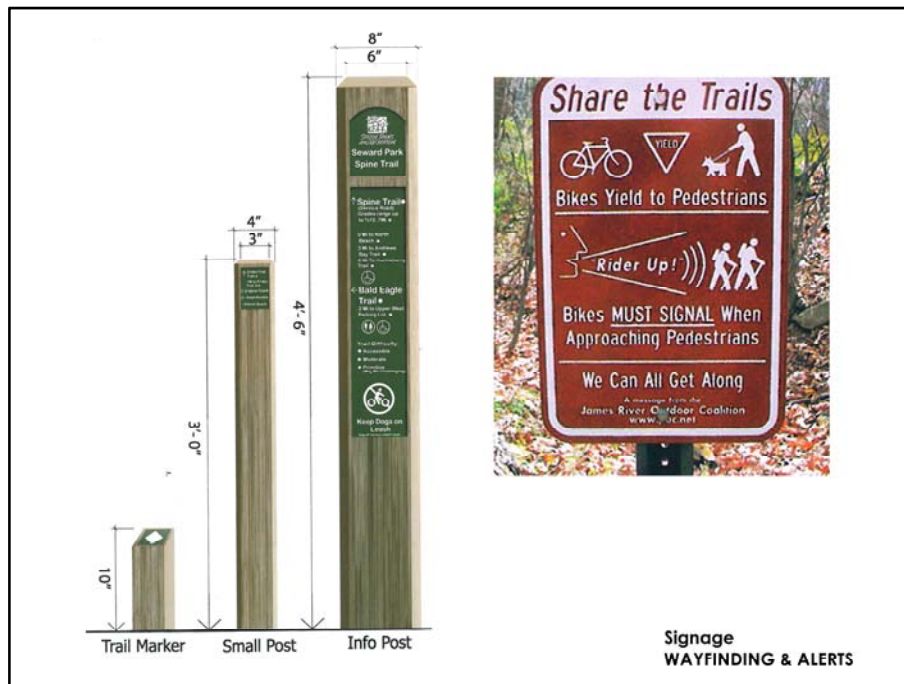


The type of signage and facilities for major entries & info centers



The kiosk info center near the major entries would include detailed mapping park rules and trail rules of the road, and is also an opportunity for interpretive information and announcements, such as for restoration work parties.





Seattle Parks standard wayfinding posts are appropriate for wayfinding along paths in the forest, and would also carry intersection warnings and rules of the road reminders as well as wayfinding info. The large Info post are appropriate signage for major entries and can carry a lot of information.



This is how they look in-situ—not at all dominating in a forest environment, but a very clear and straightforward vehicle for information.





This is a special version of the large info post and small wayfinding posts developed for Seward Park.



End on the vision of restoration, joy, community connections, and engagement with nature that we hope this project will achieve.

discussion