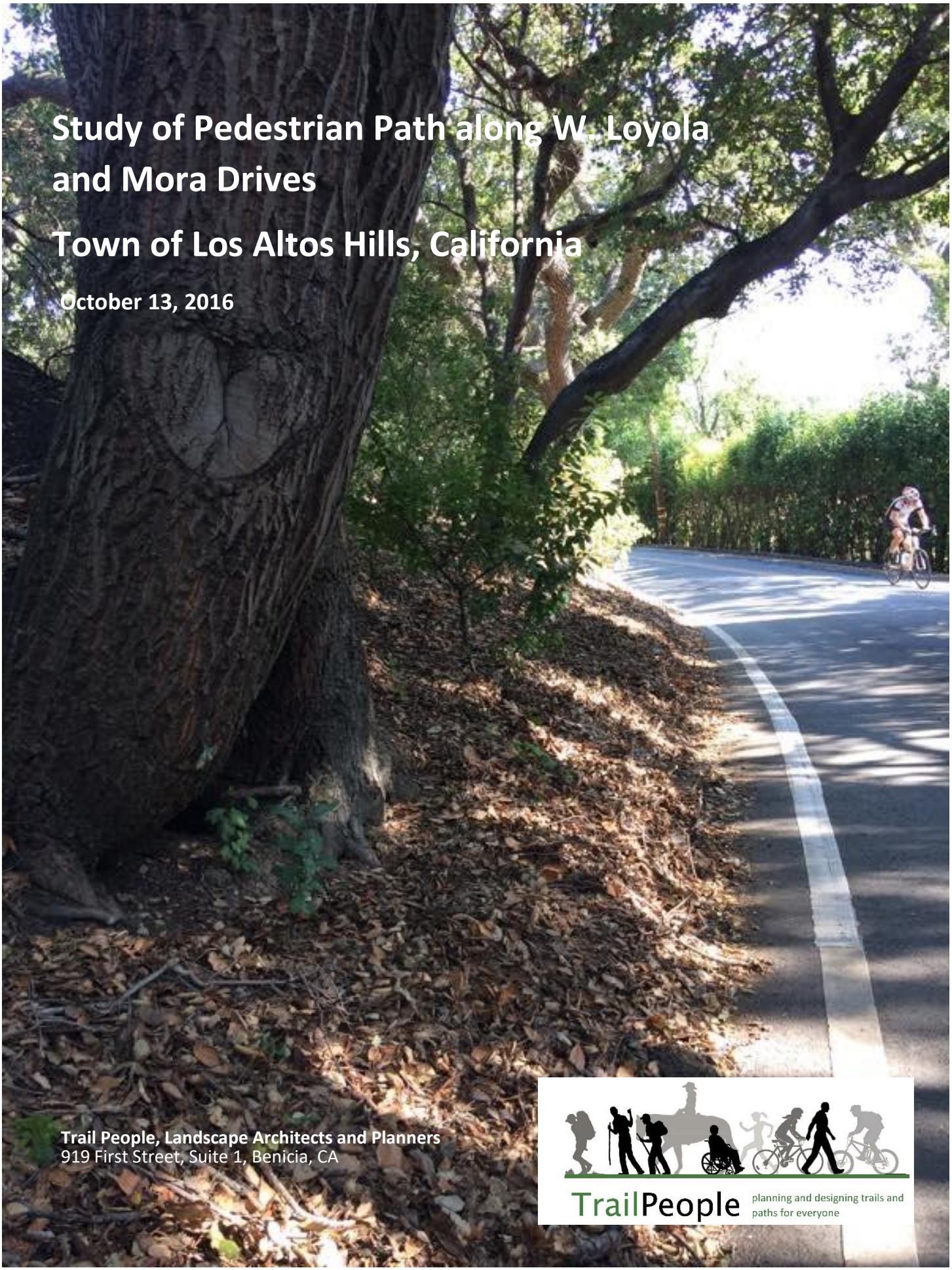
Study of Pedestrian Path along W. Loyola and Mora Drives

Town of Los Altos Hills, California

October 13, 2016



Trail People, Landscape Architects and Planners
919 First Street, Suite 1, Benicia, CA

TrailPeople planning and designing trails and paths for everyone

Study of Pedestrian Path along W. Loyola and Mora Drives, Town of Los Altos Hills

Prepared October 13, 2016 by
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Table of Contents

Introduction and Overview 2
Study Scope and Objectives 2
Existing Conditions 2
Determining Path Study Alignments 4
Mora Drive –..... 4
W. Loyola Drive –..... 4
Methodology..... 5
Data Collection 5
Type of Feature/Obstruction..... 5
Features Inventoried..... 5
Distance from the Fog line 6
Description 6
Slope 6
Inventory Maps 6
Using the Inventory for Cost Estimates 6
Path Construction and Cost Assumptions 7
Project Size and Bidding Assumptions..... 8
Construction Cost Items and Assumptions 8
Constructing Path on Slopes 10

Accommodating Trees on Slopes 14
Pathway Cost Estimates 16
Conclusion 16
Appendix: Path Segment Cost Estimate Details 17

List of Figures

Figure 1: Study Location Map 3
Figure 2: Standard Town Path Detail 7
Figure 3: Pathway Concept on Moderate Slope 10
Figure 4: Town Standard Path Detail for Slopes 12
Figure 5: Alternative Path/Retaining Wall Concept 13
Figure 6: Concept for Path at Oak Tree Roots 15

List of Tables

Table 1: Unit Cost Assumptions 9
Table 2: Total Costs for Each Project Area 16
Table 3: Unincorporated Mora - Minimum Width Path 17
Table 4: Incorporated Mora - Minimum Width Path 18
Table 5: Unincorporated Mora - Standard Width Path 19
Table 6: Incorporated Mora - Standard Width Path 20
Table 7: W. Loyola - Minimum Width Path 21
Table 8: W. Loyola - Standard Width Path 22

List of Photos

Photo 1: Existing Guardrail Along North Side of Mora Drive 4
Photo 2: Path along Reliez Valley Road in Lafayette, CA 13
Photo 3: Path with Downslope Wall along Reliez Valley Road in Lafayette, CA 14

Introduction and Overview

Study Scope and Objectives

This study addresses the feasibility of constructing a pedestrian path along Mora Drive and West Loyola Drive in the southern portion of the Town of Los Altos Hills, CA. The objective of the study was to detail the requirements and feasibility/reasonableness of constructing a path along these routes to meet the Town standards of a 5' wide path with headerboards and decomposed granite or quarry fines surface, as well as the feasibility of an alternative 3' wide path. The study includes an inventory and maps of existing conditions and constraints with identification of those that would need to be removed or modified, and those that would require the design of the path to be modified. It includes a description of potential design treatments and assumptions regarding construction requirements and costs, and planning-level project cost estimates.

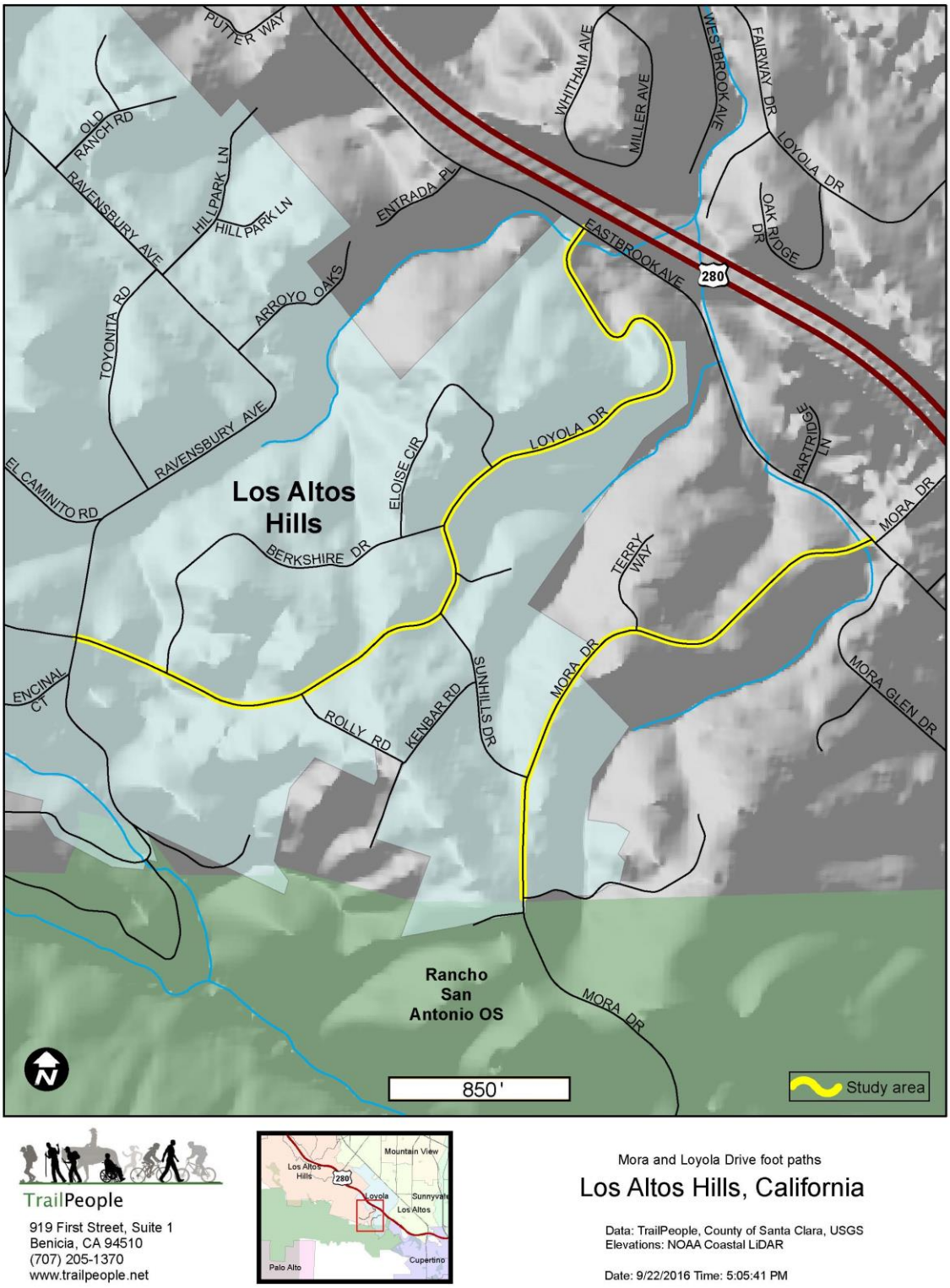
Existing Conditions

The study area is located in the southern part of the Town of Los Altos Hills as well as a portion of unincorporated Santa Clara County (see Figure 1). Under current conditions neither road has a formal pedestrian facility, and walkers use the roadway, creating the potential for conflicts with vehicles, especially where the road is narrow and/or curves sharply. Mora Drive connects to the Rancho San Antonio Open Space Preserve, which is a popular destination for local residents and is also visited by classes from the Waldorf School down the street. The study area is challenging because of obstructions along the roadside, narrow right of way, and steep slopes along both routes.

The Mora Drive study area is an approximately 0.54 mile route that extends from the corner of Mora Drive and Eastbrook Avenue west to the Mora Trail in Ranch San Antonio Open Space Preserve. The Waldorf School of the Peninsula is located on the northeast corner of Mora and Eastbrook. The route is partially within an area recently annexed by the Town. Mora Drive approximately west of Terry Way is within Los Altos Hills; east of Terry Way it is in unincorporated Santa Clara County. The study breaks out the requirements and cost for Incorporated and unincorporated Mora Drive separately.

West Loyola Drive roughly parallels Mora Drive to the north, extending approximately 0.9 miles west from Eastbrook Avenue. The western portion turns to the north. At Ravensbury Avenue West Loyola becomes Camino Hermosa Drive. The entire route is in the Town limits. There are steep winding portions with embankments on both sides, and guardrails on the downhill side.

Figure 1: Study Location Map



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Mora and Loyola Drive foot paths
Los Altos Hills, California

Data: TrailPeople, County of Santa Clara, USGS
Elevations: NOAA Coastal LiDAR

Date: 9/22/2016 Time: 5:05:41 PM

Determining Path Study Alignments

A first step in the study was to determine which side of the road had the most significant constraints, so that the study could focus on the least constrained side. All path study alignments are well within the public road right-of-way, generally as close as possible to the edge of pavement, but leaving at least a one foot buffer between the pavement and the path.

The option was investigated that the path would displace part of the pavement in locations where there was inadequate space for the path, but wide pavement (i.e. 22' or more). We found that in all the locations where the space for the path was very constrained the paving was also narrow; there were no significant opportunities to facilitate the path by reducing pavement width.

Decisions on which side of the roads to focus on were made as follows:

Mora Drive –

Initially, heading east from the open space preserve boundary, the northern side of Mora Drive appears to have more space for a path, however, approximately 200 feet west of Terry Way there is a guardrail on the northern side that runs for 190 feet and protects cars from the steep slope below. Since both sides of the road had their challenges – narrow space between the road and private landscaping, curbs, trees, steep slopes, etc. – the guardrail was the deciding factor in the decision to focus the path study on the south side of Mora Drive.

Photo 1: Existing Guardrail Along North Side of Mora Drive

W. Loyola Drive –

Heading west from Eastbrook, there is a steep downslope along the southern side of W. Loyola Drive, including guardrails running for approximately 580 feet. This extended downslope was determined to be a greater constraint than the upslope on the northern portion of the road. Further along W. Loyola, however, just past Rolly Road, is an existing decomposed granite walking path. Because this path already exists; and because the final stretch of road on the north side of Loyola has a moderately steep downslope, we focused study of the W. Loyola Drive path on the north side of the road between Eastbrook and Rolly Road, then crossing to the south side of the road from Rolly to the terminus at Camino Hermoso. The intersection of Rolly and Mora provides a relatively safe visual and physical clearance for pedestrians to cross from one side to the other.

Methodology

A preliminary inventory was made using Google Earth Street view for both the north and south sides of W. Loyola and Mora Drives. This preliminary inventory not only helped determine what side of the road was best suited for a path and would therefore be inventoried in the field, but also what types of features to include for recording in our data collection form. We used GPS to collect feature and location data.

Features along W. Loyola and Mora Drives were inventoried via a walking audit. Features that were cataloged included objects that had the potential to obstruct and/or constrain the path at specific points, such as mailboxes, signs, trees, and utility poles; and objects that had the potential to obstruct or pinch the path for some distance along the route, such as dense vegetation, walls, fences, slopes, and drainage ditches.

Data collected using GPS in the field and mapped using GIS in order to visualize the location of the features, severity of the slope, and available right-of-way for the potential alignments. The inventory was also used to develop assumptions about the extent of removals, site work and construction required, and assumptions for unit costs for work, as described in greater detailed in a later section.

Data Collection

Based on distance from the edge of the road, or "fog line" the inventory classified objects into three types:

Type of Feature/Obstruction

- **Pinch** – Object is in the path alignment but will not be removed or disturbed; the path will be narrowed or "pinched" (to a minimum of 3' from the standard 5'). This type was assigned to mature trees and utility poles.
- **Remove –** Object is in the path alignment and will be moved or removed/replaced. Objects that fell under this category included traffic signs, mailboxes, and landscaping, including landscaping and native vegetation that serves screening/privacy purposes, which the estimate assumes will be replaced in kind.
- **Other** – this includes objects that do not directly affect the path but were inventoried for context, and some objects that are in the alignment of the path and have a cost impact, but are not obstructions or involving impacts on private improvements in the right of way – such as utility boxes (which can be re-set if necessary) or driveways (which create a savings in path construction – no driveways were too steep for the path to cross).

Features Inventoried

- **Curb –** including asphalt curbs and as an umbrella category for slopes
- **Drain –** including culverts and ditches
- **Driveway –** all driveways regardless of surface, includes asphalt, brick pavers, etc.
- **Fence –** privacy fences and decorative fences
- **Guardrail –** any guardrails along the road
- **Hydrant –** all hydrants
- **Shrubs –** includes planted and natural tall shrubs
- **Landscaping –** including low shrubs, rocks, groundcover, etc.

- **Parking –** areas along the shoulder that appear to be regularly used for parking
- **Sign/Mailbox –** includes traffic signs, mailboxes on posts
- **Tree –** Species of tree was denoted in the description
- **Utility Poles –** telephone poles
- **Utility Boxes –** water, cable, etc
- **Wall/Structure -** includes privacy walls and mailboxes/entryway pillars built using materials such as brick or stucco

Distance from the Fog line

We measured every feature's distance from the fog line (the white stripe on the edge of the roadway). These distances ranged from 0 feet (driveways paved to the edge of the road), to 6 feet. Any obstruction further than 6 feet from the fog line was not inventoried, as 6 feet would provide the space necessary for the standard 5 foot path with a 1 foot setback from the fog line.

Description

Descriptions of the features include type of landscaping, type of sign, length of driveway, type of utility, tree, or drain, and the presence of a slope as well as the length of the slope and the severity.

Slope

Sloped areas were captured under the category of "curb" and denoted as severe or moderate slope. The length of slope (how far along the road it ran) was also recorded All slopes had a starting point recorded in GIS, a total length, a severity (e.g. "moderate," "minimal"), and a photo.

The severity of slope was classified as follows:

> "Severe" slope – any slope within six feet from the fog line where the top of the bank is greater than 3 feet high
>
> "Moderate" slope – any slope within six feet from the fog line where the top of the bank is less than 3 feet high

Relatively flat areas and sections with minimal slope in which the path could be constructed without walls were not recorded; any non-moderate or severe sloped areas on the map are within that category.

Inventory Maps

A series of seven detailed GIS route inventory maps was created for Mora Drive, and a series of ten maps was created to cover W. Loyola Drive. These are provided as a separate product accompanying this report. The maps show all the features/objects inventoried and clarify which of them are "remove" types and "pinch" types, as indicated by "R" and "P" labels, and which of the conflicts are eliminated in the minimal 3' wide path alternative, as indicated by the M symbols. The maps give an indication of the geographic distribution and quantity of the constraints along the route.

Using the Inventory for Cost Estimates

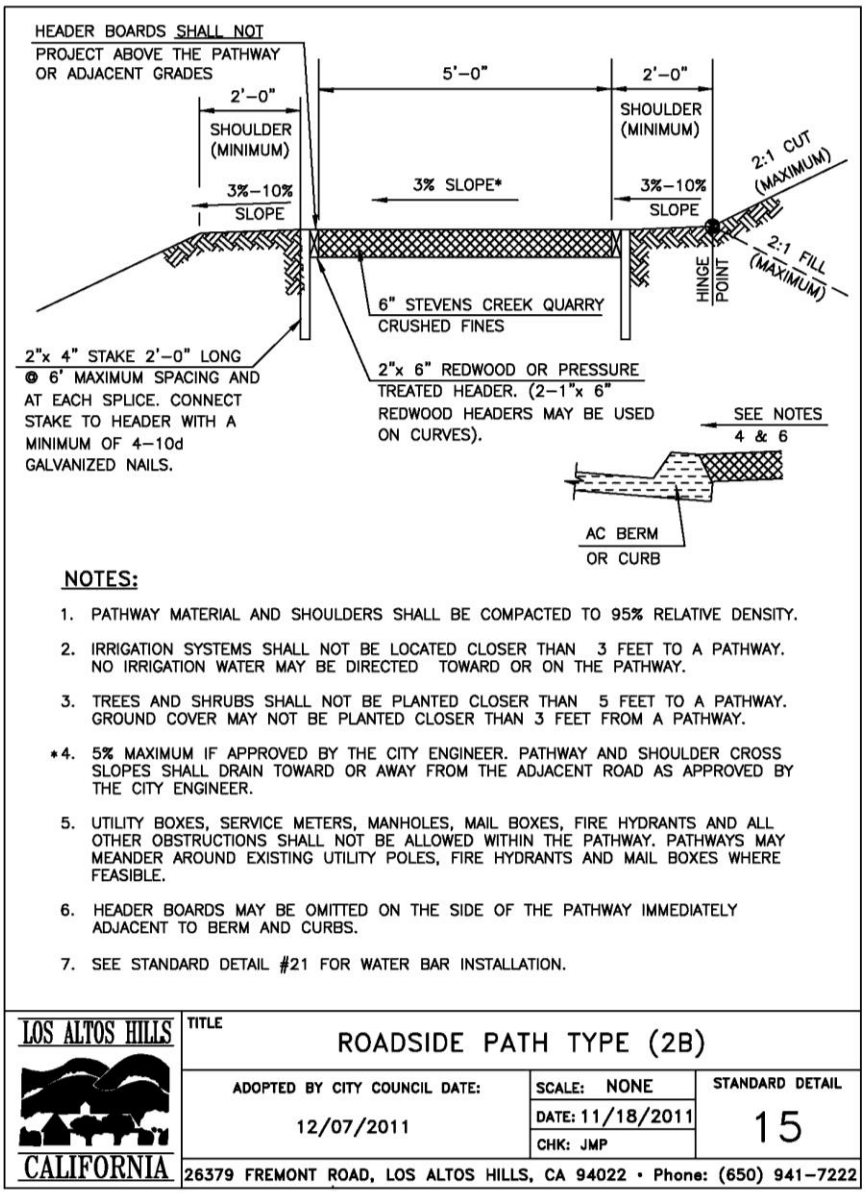
Length and severity of slopes, number and type of features marked for removal/modification, and utilities needing to be reset all added to path construction costs. Driveways, which do not require path construction, were subtracted from the length of the path construction costs.

For the "Minimal" path alternative, the distance from the fog line measurement was used to exclude features and their associated costs that are too far from the fog line to obstruct the 3 foot wide version of the path.

Path Construction and Cost Assumptions

The basic goal of the study is to assess the requirements/feasibility and planning-level cost estimate for constructing a 5' wide quarry fines surfaced path per the Town's standard detail (see Figure 2). As an alternative, the study also considers the feasibility of a "minimal" 3' wide path.

Figure 2: Standard Town Path Detail



Project Size and Bidding Assumptions

The cost estimates reflect the assumption that the projects are bid separately. If projects on the unincorporated part of Mora, the incorporated part of Mora, and/or Loyola are combined, there could be a significant savings due to reduction of project start-up and overhead costs and greater overall construction quantities. Bid prices can vary significantly based on current economic conditions, time of year of bid solicitation, and ability to generate significant bidder interest.

Construction Cost Items and Assumptions

Unit costs for various construction elements and overall construction and project cost factors are detailed in Table 1.

- Items 1 -4 are typical contractor overhead items that are calculated as lump sum items based on Town input and general proportion to the extent of construction work.
- Item 5, Sitework and Removal, reflects costs for dealing with obstructions or constraints for building the path.
- Some of features that were inventoried were determined to not interfere with the path alignment, such as file hydrants, driveways, and parking. They are on the maps for context.
- In the case of driveways, there is a cost savings item in the estimate. This is because the path doesn't need to be constructed across the driveway. However, driveway surfaces may have to be roughened for equestrian purposes, and an allowance is provided for this.
- Some items are assumed to be locations where the 5' path would be reduced in width ("pinch"), rather than remove or relocate the object, for example utility poles. These "pinch points" are identified on the maps but are not assumed to have an impact on costs.
- Where items in the right-of-way are relatively feasible and inexpensive to relocate or remove and replace in-kind, such as signs, mailboxes, fences, decorative walls, landscaping, and shrubs, costs for this are included in the estimate.
- Item 5.3 is a pathway design concept for accommodating trees on slopes, as described in more detail below. It is an addition to the base pathway cost on slopes in Item 9.
- Item 5.10, Drainage Work, is an allowance for locations where there are existing swales or ditches that carry water along the shoulder in a location where the path would be adjacent. This covers regrading and potential measures such as lining the ditch with rock or other erosion control method.
- The construction cost total includes a 30% estimating contingency.
- Allowances for other project costs – survey, design, and construction administration, are included as percentages of the construction cost. Construction administration is assumed to include inspection and compaction testing.

Table 1: Unit Cost Assumptions

UNIT COST ASSUMPTIONS

PLANNING-LEVEL ESTIMATE OF PROBABLE CONSTRUCTION COST - October 2016

REVIEWED BY: RA - TrailPeople PREPARED BY: CO - TrailPeople

Note: Estimate based upon conceptual designs and is to be used for study purposes only.

No.	Description	Unit	Cost per Unit	Cost
1	**Mobilization**	LS		
2	**General Conditions, Bonds and Insurance**	LS		See
3	**Erosion Control - includes all BMPs, SWPPP and Reporting**	LS		Individual
4	**Traffic Control**	LS		Estimates
	Subtotal Contractor's Overhead			
5	**Sitework and Removal** - site preparation for construction			
5.1	Re-setting of utility boxes	EA		$200.00
5.2	Shrub removal and replacement	EA		$20.00
5.3	Path accommodation for tree on slope (raised path with railing + Item 9)	LF		$200.00
5.4	Remove/repair existing low decorative walls	EA		$500.00
5.5	Remove and relocate existing sign or mailboxes (simple - complex counted as walls)	EA		$300.00
5.6	Remove and replace existing wood fence	LF		$100.00
5.7	Landscape removal and restoration (low shrubs, plants, rock, irrigation)	SF		$10.00
5.8	Roughen Driveway	EA		$200.00
5.9	Deduct path cost at driveway (all assumed to be on minimal slope)	LF		-$39.10
5.10	Drainage Work (locations where there are drainage swales and ditches adjacent to path)	LF		$20.00
6	**Path on Minimal Slope - 3' width - total per LF**			**$39.10**
6.1	Clearing and Grubbing - 5' wide = 5 SF x. 0.50 = 2.50/ LF	SF	$0.50	$2.50
6.2	Excavation and Grading - 3' path minimal slope - 5' wide by 0.5' deep = 0.1 CY/LF	CY	$100.00	$10.00
6.3	Redwood, treated, or plastic headersboards and stakes (2 sides)	LF	$5.00	$5.00
6.4	Quarry fines path with base rock, binder, and compaction - 3' wide by 0.5' deep = .06CY/LF	CY	$240.00	$21.60
7	**Path on Minimal Slope - 5' width - total per LF**			**$65.60**
7.1	Clearing and Grubbing - 8' wide = 8 SF x. 0.50 = 4.00/ LF	SF	$0.50	$4.00
7.2	Excavation and Grading - 5' path minimal slope - 8' wide by 1' deep = 0.3 CY/LF	CY	$100.00	$30.00
7.3	Redwood, treated, or plastic headersboards and stakes (2 sides)	LF	$10.00	$10.00
7.4	Quarry fines path with base rock, binder, and compaction - 5' wide by 0.5' deep = .09 CY/LF	CY	$240.00	$21.60
8	**Path on Moderate Slope - 4' width - total per LF**			**$179.00**
8.1	Clearing and Grubbing - 8' wide = 8 SF x. 0.50 = 4.00/ LF	SF	$0.50	$4.00
8.2	Excavation and Grading - 4' path moderate slope - 6' wide by avg. 2' deep = 0.5 CY/LF	CY	$100.00	$50.00
8.3	Treated wood retaining wall 18" high - moderate slope (@ $80/face foot)	LF	$120.00	$120.00
8.4	Redwood, treated, or plastic headersboards and stakes (one side)	LF	$5.00	$5.00
8.5	Quarry fines path with base rock, binder, and compaction - 4' wide by .5' deep = .07 CY/LF	CY	$240.00	$17.76
9	**Path on Severe Slope - 4' width - total per LF**			**$374.00**
9.1	Clearing and Grubbing - 8' wide = 8 SF x. 0.50 = 4.00/ LF	SF	$0.50	$4.00
9.2	Excavation and Grading - 4' path severe slope - 8' wide by avg. 3' deep = 1.0 CY/LF	CY	$50.00	$50.00
9.3	Treated wood retaining wall 4' high - severe slope (@ $80/face foot)	LF	$320.00	$320.00
9.4	Redwood, treated, or plastic headersboards and stakes (one side)	LF	$5.00	$5.00
9.5	Quarry fines path with base rock, binder, and compaction - 4' wide by .5' deep = .07 CY/LF	CY	$240.00	$17.76
	Subtotal Sitework and Path Construction			
	Subtotal Contractor's Overhead (Items 1-4)			
	Contingency			30%
	CONTSTRUCTION TOTAL			
	Surveying			5%
	Engineering - Plans, Specifications, and Estimate			20%
	Construction Admin., Inspection and Testing			20%
	Subtotal Project Design and Adminstration			**45.0%**
	PROJECT TOTAL			

Constructing Path on Slopes

Items 6, 7, 8, and 9 in Table 1 provide the costs for constructing the path on relatively level ground up to severe slope. In the case of minimal slope there is an option (item 6) for constructing a path that is 3' wide rather than 5' wide (Item 7).

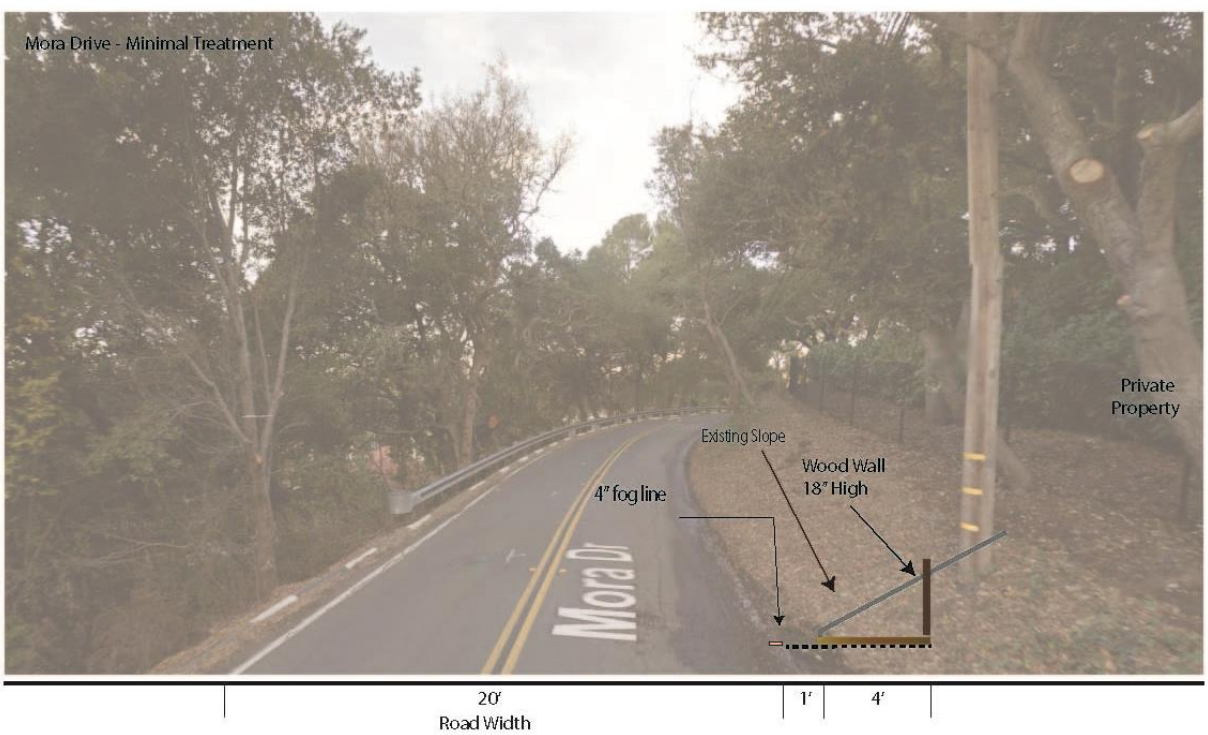
The study assumes design approaches for accommodating the path on slopes - classified into three types:

1. Minimally sloped ground – relatively flat terrain that will require minor grading, but no retaining walls;
2. Moderately sloped ground – will require a retaining wall averaging approximately 18" high (see Figure 3);

Severely sloped ground - will require a significant retaining wall approximately 4' high (see Figure 4 and Figure 5).

A design assumption was made that the "standard" path or the "minimal" path would both be four feet wide where they are constrained by moderate or severe slopes, based on the theory that more than three feet of space would be desirable next to walls or slopes, but that constructing to five feet would entail significantly more cost and impact on adjacent features, such as trees. Four feet was seen as a reasonable compromise between these considerations.

Figure 3: Pathway Concept on Moderate Slope



The Town has a standard detail for a path on a slope that includes a “backfill” or “downslope” retaining wall and a railing – see Figure 34. The deep footings and addition of the railing make this a relatively expensive design to construct.

A conceptual design assumption was made that if the path was closer to road level, created by cutting the slope and retaining it with a wall beyond the path (see Figure 5), the more expensive railing version would not be needed, but that a post and cable railing as illustrated in Photo 2 might suffice.

Figure 4: Town Standard Path Detail for Slopes

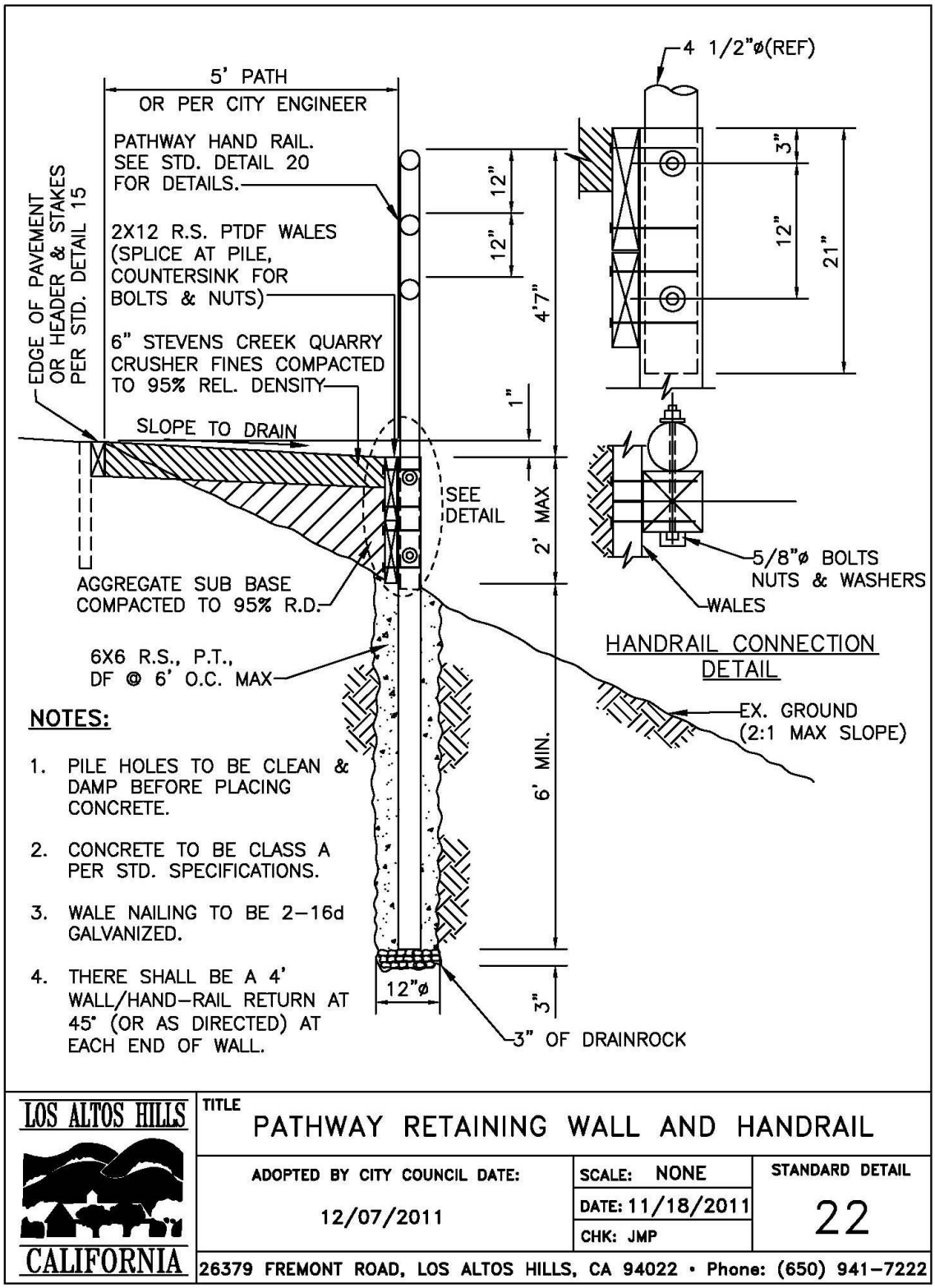


Figure 5: Alternative Path/Retaining Wall Concept

Photos 2 and 3 provide examples of paths from Lafayette, CA similar in design to the type of path considered for W. Loyola and Mora Drives.

Photo 2: Path along Reliez Valley Road in Lafayette, CA

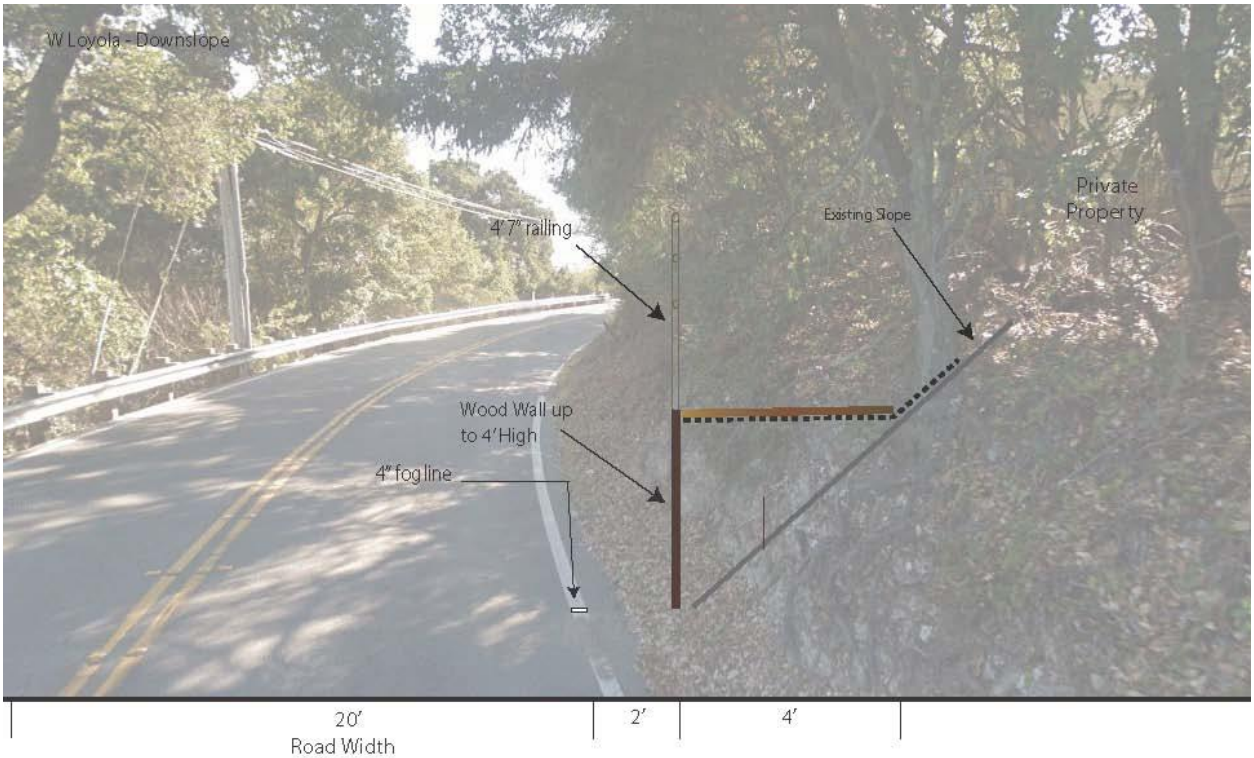
Photo 3: Path with Downslope Wall along Reliez Valley Road in Lafayette, CA

Accommodating Trees on Slopes

There are a number of mature trees in the right-of-way, primarily native oaks. No mature trees are necessary to remove to accommodate the path – at most the path can pinch around them. Some of the oak trees are on steep slopes and are relatively close to the striped edge of the roadway (the "fog line"). These are clustered at the top of the sharp curve at the east end of Loyola Drive.

Where there is sufficient setback a 4' high retaining wall at the back of the path (Figure 5) is assumed to continue past the trees. Where the clearance is tight and it appears that cutting the slope might interfere with the roots of the tree, the path is assumed to be constructed by transitioning to a retaining wall near the road with a railing, and filling behind (Figure 6), similar to Figure 4, Town standard detail No. 22, except that the path is assumed to be 4' wide and the wall up to 4' high. To maintain a maximum gradient of 5%, the transition to/from these raised pathway sections would be a minimum of 80' on either side of the tree. At the sharp curve on Loyola where there is a cluster of trees the raised path detail was assumed to continue throughout the curve.

Figure 6: Concept for Path at Oak Tree Roots



Pathway Cost Estimates

Table 2 provides a summary of the cost of the path segments on Mora in the unincorporated area and incorporated area, and on Loyola, for the "minimal" 3' wide path (4' wide where retaining walls are involved, and the "standard" 5' wide path (also 4' wide where retaining walls are involved). Table 33 through 8 located in the Appendix provide the cost estimate detail for each path segment.

Table 2: Total Costs for Each Project Area

TOTAL COSTS FOR EACH PROJECT AREA

PLANNING-LEVEL ESTIMATE OF PROBABLE CONSTRUCTION COST - October 2016
REVIEWED BY: RA - TrailPeople PREPARED BY: CO - TrailPeople
Note: Estimate based upon conceptual designs and is to be used for study purposes only.

Description	Total Construction Cost	Total Suvey, Design and Admin. Cost	Total Project Cost
Mora Drive Minimum Width Alternative (3' wide path; 4' wide on slopes)			
Segment 1: Mora Drive from Eastbook Drive to Terry Way (unincorporated area) 1,527 LF	$133,166	$59,923	$193,089
Segment 2: Mora Drive from Terry Way to Open Space (incorporated area) - 1,233 LF	$166,051	$74,721	$240,773
Total for Mora Drive Minimum Width Alternative - 2,760 LF			**$433,861**
Mora Drive Standard Width Alternative (5' wide path; 4' wide on slopes)			
Segment 1: Mora Drive from Eastbook Drive to Terry Way (unincorporated area) - 1,527 LF	$183,096	$82,391	$265,487
Segment 2: Mora Drive from Terry Way to Open Space (incorporated area) - 1,233 LF	$200,458	$90,204	$290,663
Total for Mora Drive Standard Width Alternative - 2,760 LF			**$556,150**
W. Loyola Drive Minimum Width Alternative (3' wide path; 4' wide on slopes)			
Loyola Drive from Eastbrook Ave to Ravensbury Ave - 4,776 LF	$806,610	$362,972	$1,169,582
W. Loyola Drive Standard Width Alternative (5' wide path; 4' wide on slopes)			
Loyola Drive from Eastbrook Ave to Ravensbury Ave - 4,776 LF	$990,691	$445,809	$1,436,500
Total for all minimum width segments			**$1,603,443**
Total for all standard width segments			**$1,992,650**

Conclusion

The cost estimates reflect the expense of building the path on steep slopes. This, and the fact that the route is about 2,000 feet longer, bring the total project cost for the W. Loyola Drive path to $1.17 million for the minimal width alternative, and $1.44 million for the standard width alternative.

The Mora Drive path is much less expensive because it is shorter and there is limited construction on slopes.

There is a savings of about 22% on Mora Drive and 19% on W. Loyola Drive for the minimum width path vs. the standard width path. This reflects less disturbance of private improvements in the right-of-way, in exchange for a narrower path.

Overall the costs reflect fairly limited removal or modification of private improvements. No mature trees are removed or utility poles moved because the path width is assumed to be reduced around them even in the standard width alternative.

Appendix: Path Segment Cost Estimate Details

Table 3: Unincorporated Mora - Minimum Width Path

Segment 1: Mora Drive from Eastbook Drive to Terry Way (unincorporated area) 1,527 LF						
Minimum Width Alternative (3' wide path; 4' wide on slopes)						
PLANNING-LEVEL ESTIMATE OF PROBABLE CONSTRUCTION COST - October 2016						
REVIEWED BY: RA - TrailPeople PREPARED BY: CO - TrailPeople						
Note: Estimate based upon conceptual designs and is to be used for study purposes only.						
		QTY			COST	SUB TOTAL
1	**Mobilization**	1	LS		$6,000	
2	**General Conditions, Bonds and Insurance**	1	LS		$2,000	
3	**Erosion Control - includes all BMPs, SWPPP and Reporting**	1	LS		$2,500	
4	**Traffic Control**	1	LS		$8,000	
	Subtotal Contractor's Overhead					**$18,500**
5	**Sitework and Removal - site preparation for construction**					
5.1	Re-setting of utility boxes	0	EA	$200.00	$0	
5.2	Shrub removal and replacement	0	EA	$20.00	$0	
5.3	Path accommodation for tree on slope (raised path with railing + Item 9)	0	LF	$200.00	$0	
5.4	Remove/repair existing low decorative walls	1	EA	$500.00	$500	
5.5	Remove and relocate existing sign or mailboxes (simple - complex	2	EA	$300.00	$600	
5.6	Remove and replace existing wood fence	0	LF	$100.00	$0	
5.7	Landscape removal and restoration (low shrubs, plants, rock, irrigation)	522	SF	$10.00	$5,220	
5.8	Roughen Driveway	9	EA	$200.00	$1,800	
5.9	Deduct path cost at driveway (all assumed to be on minimal slope)	299	LF	-$39.10	-$11,691	
5.10	Drainage Work (locations where there are drainage swales and ditches adjacent to path)	33	LF	$20.00	$660	
	Path Construction					
6	Path on Minimal Slope - 3' width - total per LF	1333	LF	$39.10	$52,120	
8	Path on Moderate Slope - 4' width - total per LF	194	LF	$179.00	$34,726	
9	Path on Severe Slope - 4' width - total per LF	0	LF	$374.00	$0	
	Subtotal Sitework and Path Construction					**$83,935**
	Contingency				30.0%	$30,731
	Total Construction					**$133,166**
	Surveying				5.0%	$6,656
	Engineering - Plans, Specifications, and Estimate				20.0%	$26,633
	Construction Admin., Inspection and Testing				20.0%	$26,633
	Subtotal Project Design and Adminstration					**$59,923**
	Total Project					**$193,089**

Table 4: Incorporated Mora - Minimum Width Path

Segment 2: Mora Drive from Terry Way to Open Space (incorporated area) - 1,233 LF						
Minimum Width Alternative (3' wide path; 4' wide on slopes)						
PLANNING-LEVEL ESTIMATE OF PROBABLE CONSTRUCTION COST - October 2016						
REVIEWED BY: RA - TrailPeople PREPARED BY: CO - TrailPeople						
Note: Estimate based upon conceptual designs and is to be used for study purposes only.						
		QTY			COST	SUB TOTAL
1	**Mobilization**	1	LS		$5,000	
2	**General Conditions, Bonds and Insurance**	1	LS		$1,800	
3	**Erosion Control - includes all BMPs, SWPPP and Reporting**	1	LS		$2,000	
4	**Traffic Control**	1	LS		$6,500	
	Subtotal Contractor's Overhead					**$15,300**
5	**Sitework and Removal - site preparation for construction**					
5.1	Re-setting of utility boxes	1	EA	$200.00	$200	
5.2	Shrub removal and replacement	2	EA	$20.00	$40	
5.3	Path accommodation for tree on slope (raised path with railing + Item 9)	0	LF	$200.00	$0	
5.4	Remove/repair existing low decorative walls	2	EA	$500.00	$1,000	
5.5	Remove and relocate existing sign or mailboxes (simple - complex counted as walls)	0	EA	$300.00	$0	
5.6	Remove and replace existing wood fence	0	LF	$100.00	$0	
5.7	Landscape removal and restoration (low shrubs, plants, rock, irrigation)	99	SF	$10.00	$990	
5.8	Roughen Driveway	9	EA	$200.00	$1,800	
5.9	Deduct path cost at driveway (all assumed to be on minimal slope)	243	LF	-$39.10	-$9,501	
5.10	Drainage Work (locations where there are drainage swales and ditches adjacent to path)	199	LF	$20.00	$3,980	
	Path Construction					
6	Path on Minimal Slope - 3' width - total per LF	1005	LF	$39.10	$39,296	
8	Path on Moderate Slope - 4' width - total per LF	0	LF	$179.00	$0	
9	Path on Severe Slope - 4' width - total per LF	228	LF	$374.00	$85,272	
	Subtotal Sitework and Path Construction					**$123,076**
	Contingency				20.0%	$27,675
	Total Construction					**$166,051**
	Surveying				5.0%	$8,301
	Engineering - Plans, Specifications, and Estimate				20.0%	$33,210
	Construction Admin., Inspection and Testing				20.0%	$33,210
	Subtotal Project Design and Adminstration					**$74,721**
	Total Project					**$240,773**

Table 5: Unincorporated Mora - Standard Width Path

Segment 1: Mora Drive from Eastbook Drive to Terry Way (unincorporated area) - 1,527 LF						
Standard Width Alternative (5' wide path; 4' wide on slopes)						
PLANNING-LEVEL ESTIMATE OF PROBABLE CONSTRUCTION COST - October 2016						
REVIEWED BY: RA - TrailPeople PREPARED BY: CO - TrailPeople						
Note: Estimate based upon conceptual designs and is to be used for study purposes only.						
		QTY			COST	SUB TOTAL
1	**Mobilization**	1	LS		$6,000	
2	**General Conditions, Bonds and Insurance**	1	LS		$2,000	
3	**Erosion Control - includes all BMPs, SWPPP and Reporting**	1	LS		$2,500	
4	**Traffic Control**	1	LS		$8,000	
		Subtotal Contractor's Overhead				**$18,500**
5	**Sitework and Removal - site preparation for construction**					
5.1	Re-setting of utility boxes	1	EA	$200.00	$200	
5.2	Shrub removal and replacement	0	EA	$20.00	$0	
5.3	Path accommodation for tree on slope (raised path with railing + Item 9)	0	LF	$200.00	$0	
5.4	Remove/repair existing low decorative walls	1	EA	$500.00	$500	
5.5	Remove and relocate existing sign or mailboxes (simple - complex counted as walls)	3	EA	$300.00	$900	
5.6	Remove and replace existing wood fence	83	LF	$100.00	$8,300	
5.7	Landscape removal and restoration (low shrubs, plants, rock, irrigation)	1124	SF	$10.00	$11,240	
5.8	Roughen Driveway	9	EA	$200.00	$1,800	
5.9	Deduct path cost at driveway (all assumed to be on minimal slope)	299	LF	-$39.10	-$11,691	
5.10	Drainage Work (locations where there are drainage swales and ditches adjacent to path)	33	LF	$20.00	$660	
	Path Construction					
7	Path on Minimal Slope - 5' width - total per LF	1333	LF	$65.60	$87,445	
8	Path on Moderate Slope - 4' width - total per LF	194	LF	$179.00	$34,726	
9	Path on Severe Slope - 4' width - total per LF	0	LF	$374.00	$0	
		Subtotal Sitework and Path Construction				**$134,080**
				Contingency	20.0%	$30,516
				Total Construction		**$183,096**
				Surveying	5.0%	$9,153
				Engineering - Plans, Specifications, and Estimate	20.0%	$36,619
				Construction Admin., Inspection and Testing	20.0%	$36,619
				Subtotal Project Design and Adminstration		**$82,391**
				Total Project		**$265,487**

Table 6: Incorporated Mora - Standard Width Path

Segment 2: Mora Drive from Terry Way to Open Space (incorporated area) - 1,233 LF						
Standard Width Alternative (5' wide path; 4' wide on slopes)						
PLANNING-LEVEL ESTIMATE OF PROBABLE CONSTRUCTION COST - October 2016						
REVIEWED BY: RA - TrailPeople PREPARED BY: CO - TrailPeople						
Note: Estimate based upon conceptual designs and is to be used for study purposes only.						
		QTY			COST	SUB TOTAL
1	**Mobilization**	1	LS		$5,000	
2	**General Conditions, Bonds and Insurance**	1	LS		$1,800	
3	**Erosion Control - includes all BMPs, SWPPP and Reporting**	1	LS		$2,000	
4	**Traffic Control**	1	LS		$6,500	
	Subtotal Contractor's Overhead					**$15,300**
5	**Sitework and Removal - site preparation for construction**					
5.1	Re-setting of utility boxes	1	EA	$200.00	$200	
5.2	Shrub removal and replacement	2	EA	$20.00	$40	
5.3	Path accommodation for tree on slope (raised path with railing + Item 9)	0	LF	$200.00	$0	
5.4	Remove/repair existing low decorative walls	2	EA	$500.00	$1,000	
5.5	Remove and relocate existing sign or mailboxes (simple - complex counted as walls)	0	EA	$300.00	$0	
5.6	Remove and replace existing wood fence	0	LF	$100.00	$0	
5.7	Landscape removal and restoration (low shrubs, plants, rock, irrigation)	303	SF	$10.00	$3,030	
5.8	Roughen Driveway	9	EA	$200.00	$1,800	
5.9	Deduct path cost at driveway (all assumed to be on minimal slope)	243	LF	-$39.10	-$9,501	
5.10	Drainage Work (locations where there are drainage swales and ditches adjacent to path)	199	LF	$20.00	$3,980	
	Path Construction					
7	Path on Minimal Slope - 5' width - total per LF	1005	LF	$65.60	$65,928	
8	Path on Moderate Slope - 4' width - total per LF	0	LF	$179.00	$0	
9	Path on Severe Slope - 4' width - total per LF	228	LF	$374.00	$85,272	
	Subtotal Sitework and Path Construction					**$151,749**
	Contingency				20.0%	$33,410
	Total Construction					**$200,458**
	Surveying				5.0%	$10,021
	Engineering - Plans, Specifications, and Estimate				20.0%	$40,092
	Construction Admin., Inspection and Testing				20.0%	$40,092
	Subtotal Project Design and Adminstration					**$90,204**
	Total Project					**$290,663**

Table 7: W. Loyola - Minimum Width Path

Loyola Drive from Eastbrook Ave to Ravensbury Ave - 4,776 LF						
Minimum Width Alternative (3' wide path; 4' wide on slopes)						
PLANNING-LEVEL ESTIMATE OF PROBABLE CONSTRUCTION COST - October 2016						
REVIEWED BY: RA - TrailPeople PREPARED BY: CO - TrailPeople						
Note: Estimate based upon conceptual designs and is to be used for study purposes only.						
		QTY			COST	SUB TOTAL
1	**Mobilization**	1	LS		$12,000	
2	**General Conditions, Bonds and Insurance**	1	LS		$4,000	
3	**Erosion Control - includes all BMPs, SWPPP and Reporting**	1	LS		$5,000	
4	**Traffic Control**	1	LS		$18,000	
	Subtotal Contractor's Overhead					**$39,000**
5	**Sitework and Removal - site preparation for construction**					
5.1	Re-setting of utility boxes	9	EA	$200.00	$1,800	
5.2	Shrub removal and replacement	2	EA	$20.00	$40	
5.3	Path accommodation for tree on slope (raised path with railing + Item 9)	490	LF	$200.00	$98,000	
5.4	Remove/repair existing low decorative walls	5	EA	$500.00	$2,500	
5.5	Remove and relocate existing sign or mailboxes (simple - complex counted as walls)	9	EA	$300.00	$2,700	
5.6	Remove and replace existing wood fence	0	LF	$100.00	$0	
5.7	Landscape removal and restoration (low shrubs, plants, rock, irrigation)	1106	SF	$10.00	$11,060	
5.8	Roughen Driveway	18	EA	$200.00	$3,600	
5.9	Deduct path cost at driveway (all assumed to be on minimal slope)	755	LF	-$39.10	-$29,521	
5.10	Drainage Work (locations where there are drainage swales and ditches adjacent to path)	515	LF	$20.00	$10,300	
	Path Construction					
6	Path on Minimal Slope - 3' width - total per LF	3091	LF	$39.10	$120,858	
8	Path on Moderate Slope - 4' width - total per LF	109	LF	$179.00	$19,511	
9	Path on Severe Slope - 4' width - total per LF	1049	LF	$374.00	$392,326	
	Subtotal Sitework and Path Construction					**$633,175**
	Contingency				20.0%	$134,435
	Total Construction					**$806,610**
	Surveying				5.0%	$40,328
	Engineering - Plans, Specifications, and Estimate				20.0%	$161,322
	Construction Admin., Inspection and Testing				20.0%	$161,322
	Subtotal Project Design and Adminstration					**$362,972**
	Total Project					**$1,169,582**

Table 8: W. Loyola - Standard Width Path

Loyola Drive from Eastbrook Ave to Ravensbury Ave - 4,776 LF						
Standard Width Alternative (5' wide path; 4' wide on slopes)						
PLANNING-LEVEL ESTIMATE OF PROBABLE CONSTRUCTION COST - October 2016						
REVIEWED BY: RA - TrailPeople PREPARED BY: CO - TrailPeople						
Note: Estimate based upon conceptual designs and is to be used for study purposes only.						
		QTY			COST	SUB TOTAL
1	**Mobilization**	1	LS		$15,000	
2	**General Conditions, Bonds and Insurance**	1	LS		$5,000	
3	**Erosion Control - includes all BMPs, SWPPP and Reporting**	1	LS		$6,000	
4	**Traffic Control**	1	LS		$20,000	
	Subtotal Contractor's Overhead					**$46,000**
5	**Sitework and Removal - site preparation for construction**					
5.1	Re-setting of utility boxes	15	EA	$200.00	$3,000	
5.2	Shrub removal and replacement	3	EA	$20.00	$60	
5.3	Path accommodation for tree on slope (raised path with railing + Item 9)	490	LF	$200.00	$98,000	
5.4	Remove/repair existing low decorative walls	6	EA	$500.00	$3,000	
5.5	Remove and relocate existing sign or mailboxes (simple - complex counted as walls)	15	EA	$300.00	$4,500	
5.6	Remove and replace existing wood fence	0	LF	$100.00	$0	
5.7	Landscape removal and restoration (low shrubs, plants, rock, irrigation)	1833	SF	$10.00	$18,330	
5.8	Roughen Driveway	18	EA	$200.00	$3,600	
5.9	Deduct path cost at driveway (all assumed to be on minimal slope)	755	LF	-$39.10	-$29,521	
5.10	Drainage Work (locations where there are drainage swales and ditches adjacent to path)	515	LF	$20.00	$10,300	
	Path Construction					
7	Path on Minimal Slope - 5' width - total per LF	3091	LF	$65.60	$202,770	
8	Path on Moderate Slope - 4' width - total per LF	409	LF	$179.00	$73,211	
9	Path on Severe Slope - 4' width - total per LF	1049	LF	$374.00	$392,326	
	Subtotal Sitework and Path Construction					**$779,576**
	Contingency				20.0%	$165,115
	Total Construction					**$990,691**
	Surveying				5.0%	$49,533
	Engineering - Plans, Specifications, and Estimate				20.0%	$198,138
	Construction Admin., Inspection and Testing				20.0%	$198,138
	Subtotal Project Design and Adminstration					**$445,809**
	Total Project					**$1,436,500**