Appendix D: Network Development and Prioritization

Network Development Methodology

The recommended bicycle and pedestrian network for the GoShasta ATP was developed through an iterative process using a combination of GIS-based needs analysis, field assessments, and discussions with the local jurisdictions. The network development process began with an assessment of current gaps in the bikeway network in GIS by mapping the existing bikeway and pedestrian networks across the region. Key gaps in the network were marked for bikeway recommendations. Additionally, based on field and aerial reviews of the roadway network across the region, potential bikeway routes and pedestrian focus areas were identified that connected between key destinations (e.g., schools, colleges, shopping centers, rural communities, and employment centers) as well as evaluating bicycle- and pedestrian-involved crashes to identify locations for recommended improvements to address safety concerns.

Following this initial layout of potential route locations, the type of recommended facility was determined through a secondary analysis of the roadway. For bikeways, the results of the level of traffic stress analysis and the posted speed along a roadway were used to recommend bikeway facilities that would provide a lower-stress bicycling experience while recognizing existing right of way constraints. This review also included recommending changes to the existing bikeway network to improve the bicycling experience along those facilities. For pedestrian facilities, different pedestrian environments were recommended based on the expected volume of pedestrian activity and the people that would likely be using the facility (e.g., students or shoppers).

After laying out the initial bikeway and walking improvement recommendations, the network was reviewed by each local jurisdiction to adjust the recommended network based on local knowledge and the feasibility of implementing different facility recommendations. Based on these comments, the network was revised. This revised network was then shared with the public as part of the community outreach for the plan and additional changes were made to the network based on the public input received after review by the local jurisdictions.

Prioritization Methodology

Implementation of the recommended bike and pedestrian projects included in this Plan will require funding from multiple sources and coordination with various agencies. To facilitate this, this section presents the method used to prioritize the GoShasta ATP recommended network. The prioritization method uses GIS data and public input to score the recommended projects and can be rerun as newer data becomes available. Scoring and measures for the prioritization criteria can be viewed in Table D.1.

After prioritization scores were ascribed to projects, local agencies were given the opportunity to reprioritize projects based on qualitative data. The reorganized project list was used to conduct a cost analysis and to determine the final regional constrained and unconstrained project lists.

Table D.1: GoShasta ATP Prioritization Scoring

Factor	Criteria	Measure	Points
Safety		**Total Points Possible**	**40**
	Crash analysis[1]	Tier 1 - High concentration	20
		Tier 2 - Medium to high concentration	10
		Tier 3 - Medium concentration	5
	Level of Traffic Stress (LOS)[2]	LTS 4	20
		LTS 3	10
Connectivity (bike projects only)		**Total Points Possible**	**30**
	Connects with existing bike facility	Connects with 5 or more existing bike facilities	15
		Connects with any existing bike facilities	10
	Connects with 2 or more proposed bike routes	Connects with 2 or more GoShasta ATP bike routes	5
	Closes a network gap	Closes a gap between two existing bike facilities on the same street	5
	Existing Trunk Lines	Directly connects to the Sacramento River Trail and existing trunk lines	5
Demand		**Distance to closest park, transit stop, or school**	**Total Points Possible** **45**
	Parks	1/2 mile	10
		1 mile	5
	Transit stops	1/4 mile from a transit center	10
		1/4 mile from a bus stop	5
	School	1/4 mile	10
		1/4-1/2 mile	5
		1/2-3/4 mile	2
	Strategic Growth Area (SGA)	Within SGA	15
Equity		**Total Points Possible**	**20**
	Low Resource Communities[3]	Within a Low Resource Community	20
WikiMap Feedback		**Total Points Possible**	**10**
	Supporting comments	Directly refers to a proposed project	10
		GRAND TOTAL	**145**

[1] A kernel density analysis using a half-mile distance band was conducted for bicycle crashes and pedestrian crashes that occurred between 2011 and 2015. Crashes were weighted based on the severity of the most severe injury resulting from the crash. Fatal crashes receive 10 points, serious injuries receive 5 points, minor or possible injury crashes receive 3 points, and no injuries or property damage only receive 1 point. Four tiers are classified using natural breaks with the lowest tier being removed from the analysis.

[2] A Level of Traffic Stress Analysis (See Appendix A) was conducted. Roads determined to have a level of traffic stress of 3 or 4 are generally considered to be uncomfortable for less experienced bicyclists due to traffic speeds, volumes and existing bicycle facilities (or lack of). These roads were included in the prioritization analysis because they are good candidates for improvements that would make them more safe and comfortable for a larger segment of the population.

[3] A Low Resource Community is defined in SRTA's 2015 Regional Transportation Plan (RTP). Low Resource Communities are identified in the Disadvantaged Communities Analysis that was conducted as part of the 2015 RTP.

The first step in the prioritization method consists of generating bike and pedestrian GIS heatmaps using the safety, demand, and equity factors. The heatmaps are developed by overlaying weighted buffers at different distance bands for each prioritization criterion. The buffers are merged together and the individual criterion scores were summed to create a subtotal prioritization score. This subtotal score is applied to the individual segments of the regional recommended network. The individual project segments are merged into larger project segments using the heatmap score, existing bikeway network, roadway network, and the recommended bike facility types as breaks in the project network. The average heatmap score is applied to each project segment during the merge creating a project subtotal. Public input received during the WikiMap exercise is then incorporated into the prioritization scoring by reviewing comments that support specific projects or routes. Projects were awarded points if they received a supportive comment.

Bicycle recommendations are included in a connectivity analysis to award points to projects that improve the bikeway network connectivity. The connectivity score is calculated using GIS to count the number of existing bikeways and recommended bikeways that each project is connected to and applies the corresponding connectivity criteria score. Projects that close a network gap between two existing bike facilities on the same street were given an additional five points and projects that directly connect to the Sacramento River Trail are given five points due to the trail's regional popularity.

A final prioritization score is calculated by summing the subtotal, WikiMap, and connectivity scores (connectivity score is applied only to bike recommendations). Recommended pedestrian spot treatments are prioritized using a similar methodology by taking the average pedestrian heatmap score within a 200-foot buffer.

The result of the prioritization scoring for bicycle projects are illustrated on Figures D.1 to D.7, and the result of the prioritization scoring for the pedestrian projects are illustrated on Figures D.8 to D.14. The prioritized projects can be viewed in Tables D.[number]. *Tables are forthcoming.*

The analysis uses easy to follow socio-economic American Community Survey Census data at the Census Block Group level (13 datasets/identifiers) to identify Low Resource Communities. Census Block Groups with 5 or more identifiers are considered Low Resource Communities.

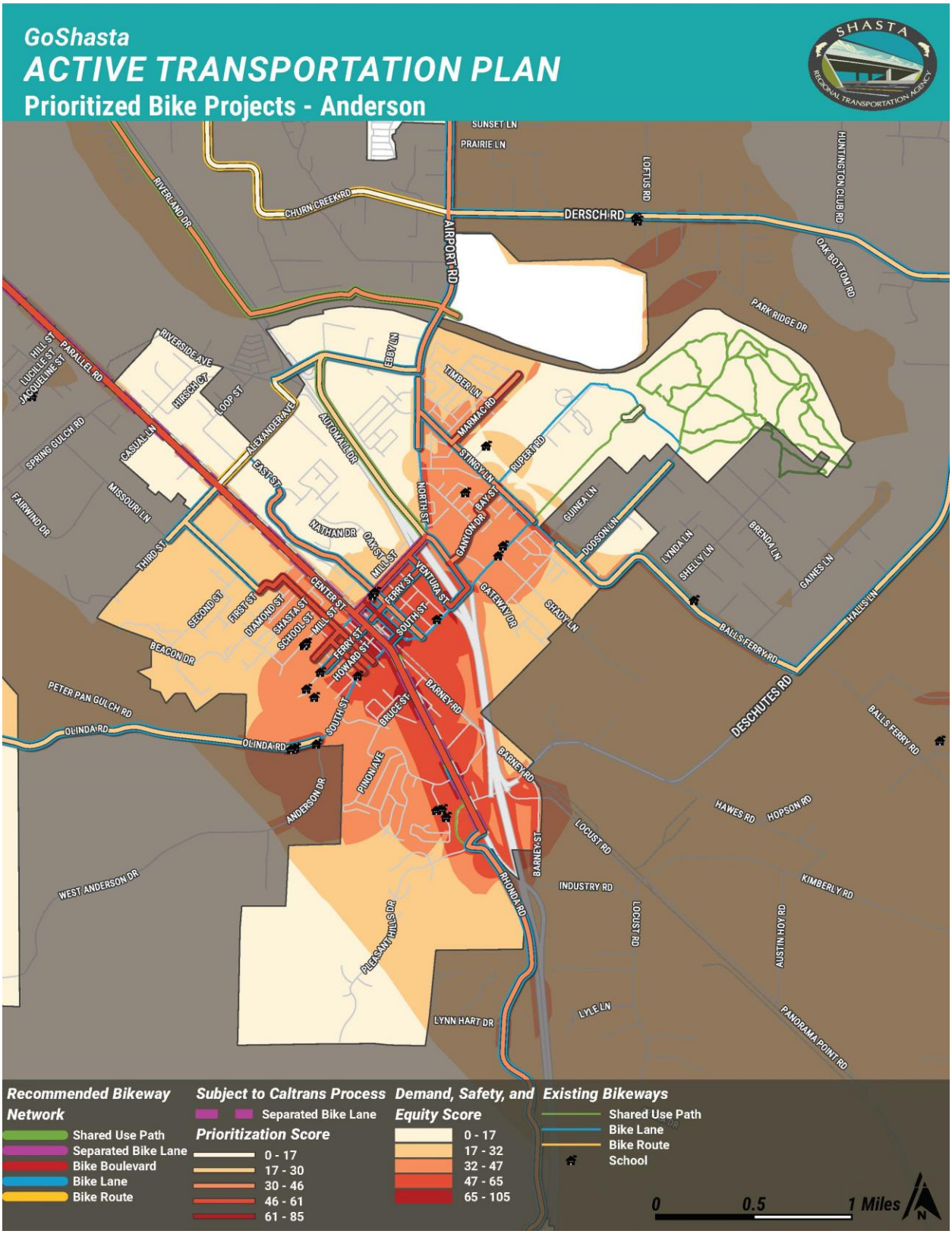

Figure D.1. Prioritized Bike Projects - Anderson

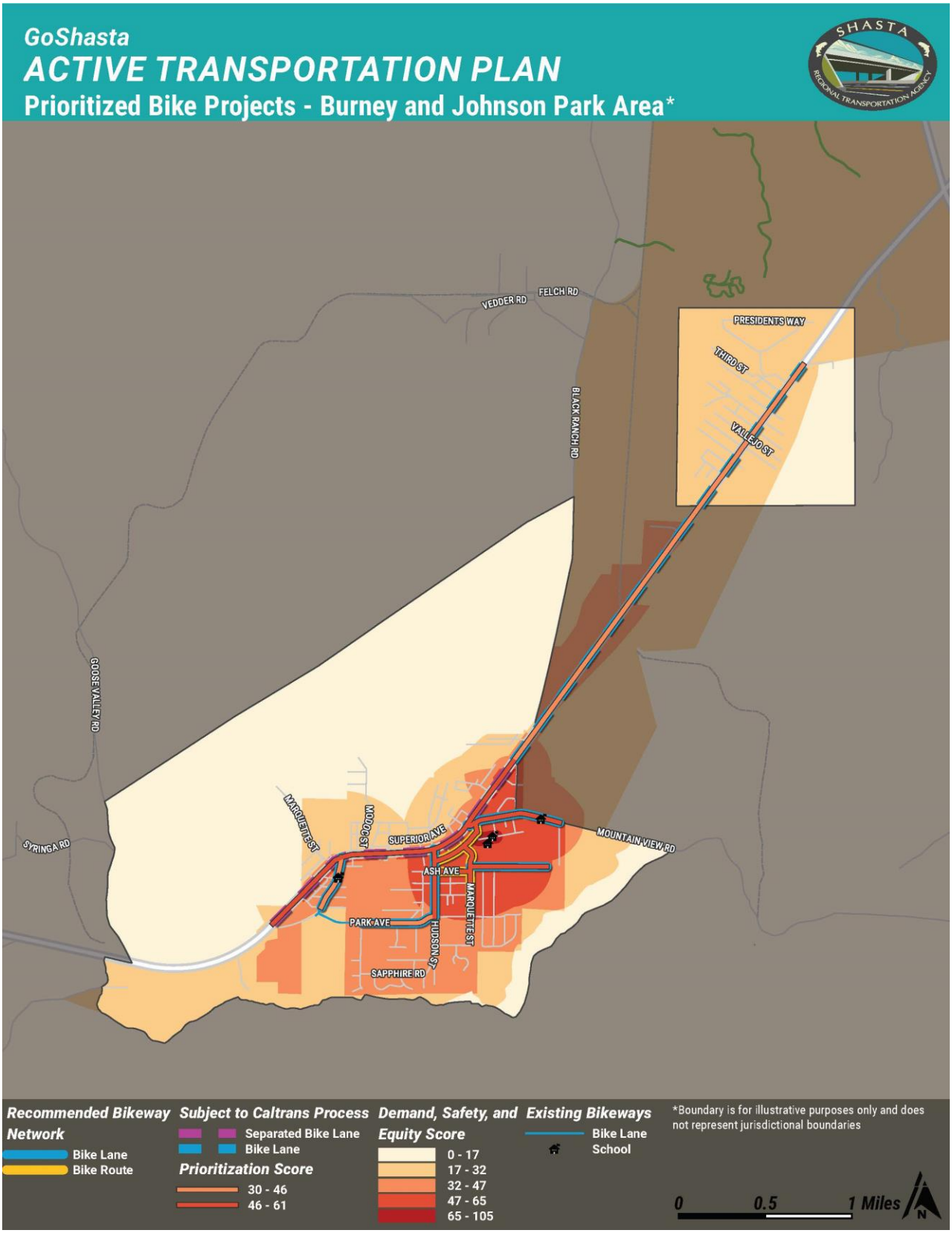

Figure D.2. Prioritized Bike Projects – Burney and Johnson Park Area

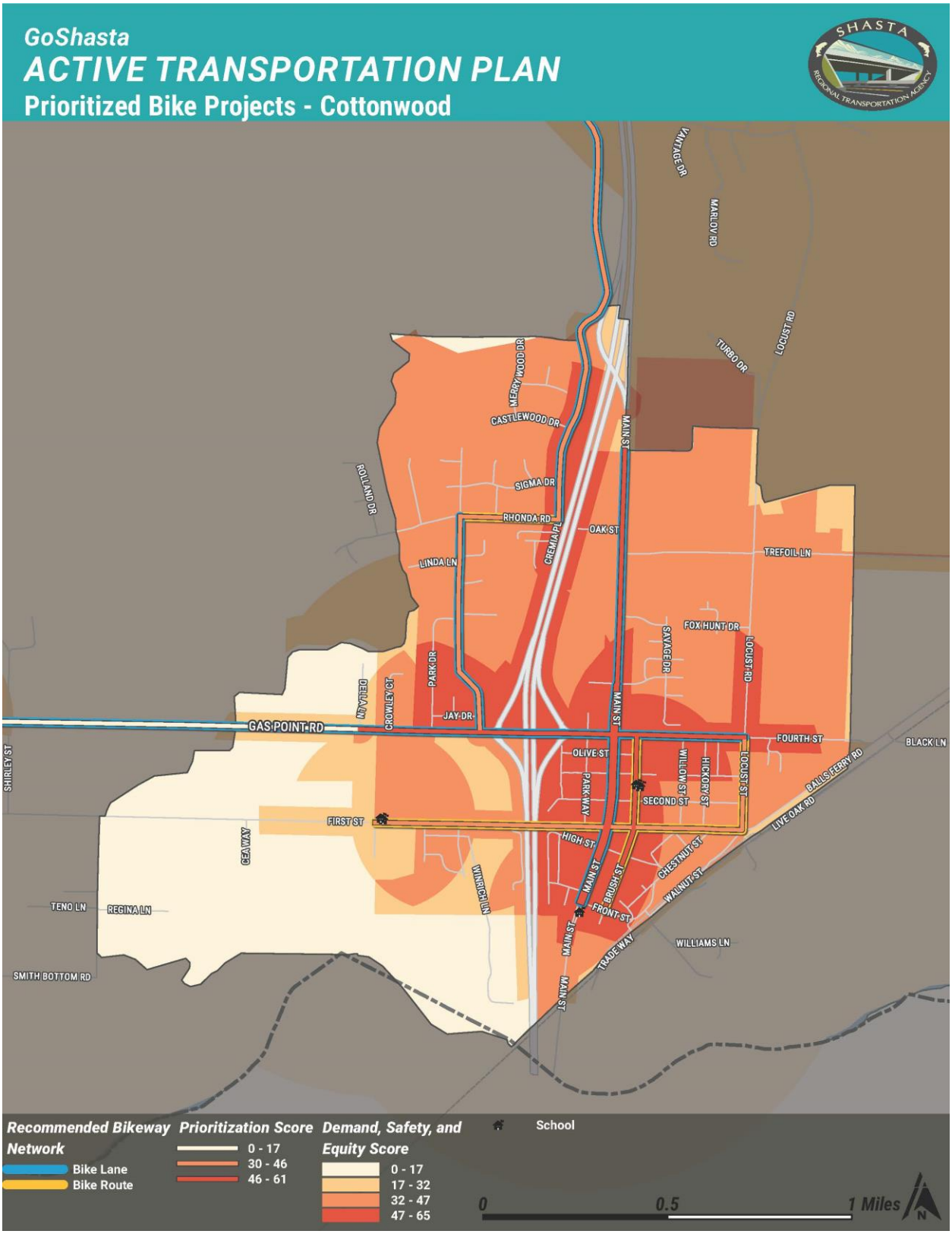

Figure D.3. Prioritized Bike Projects - Cottonwood

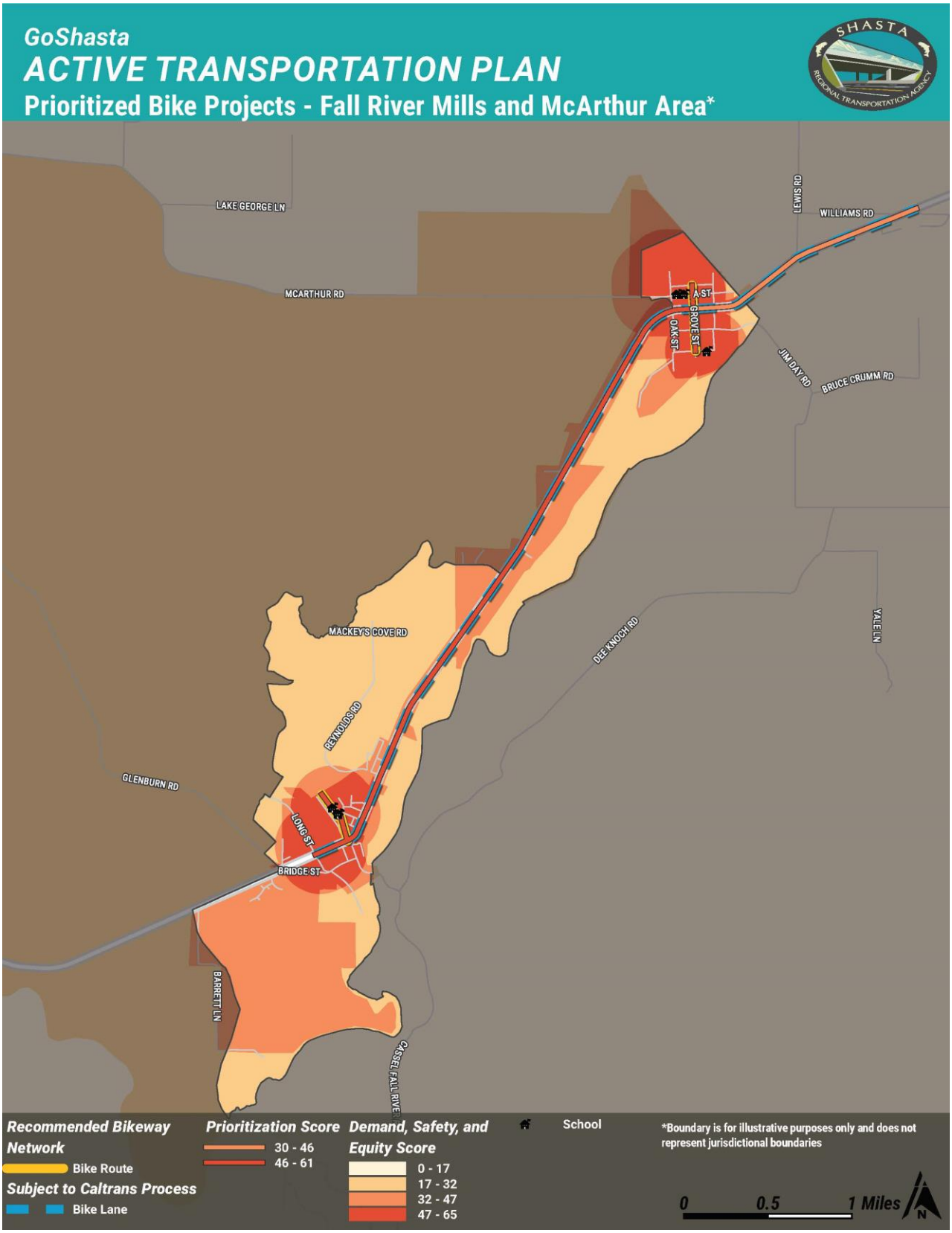

Figure D.4. Prioritized Bike Projects – Fall River Mills and McArthur Area

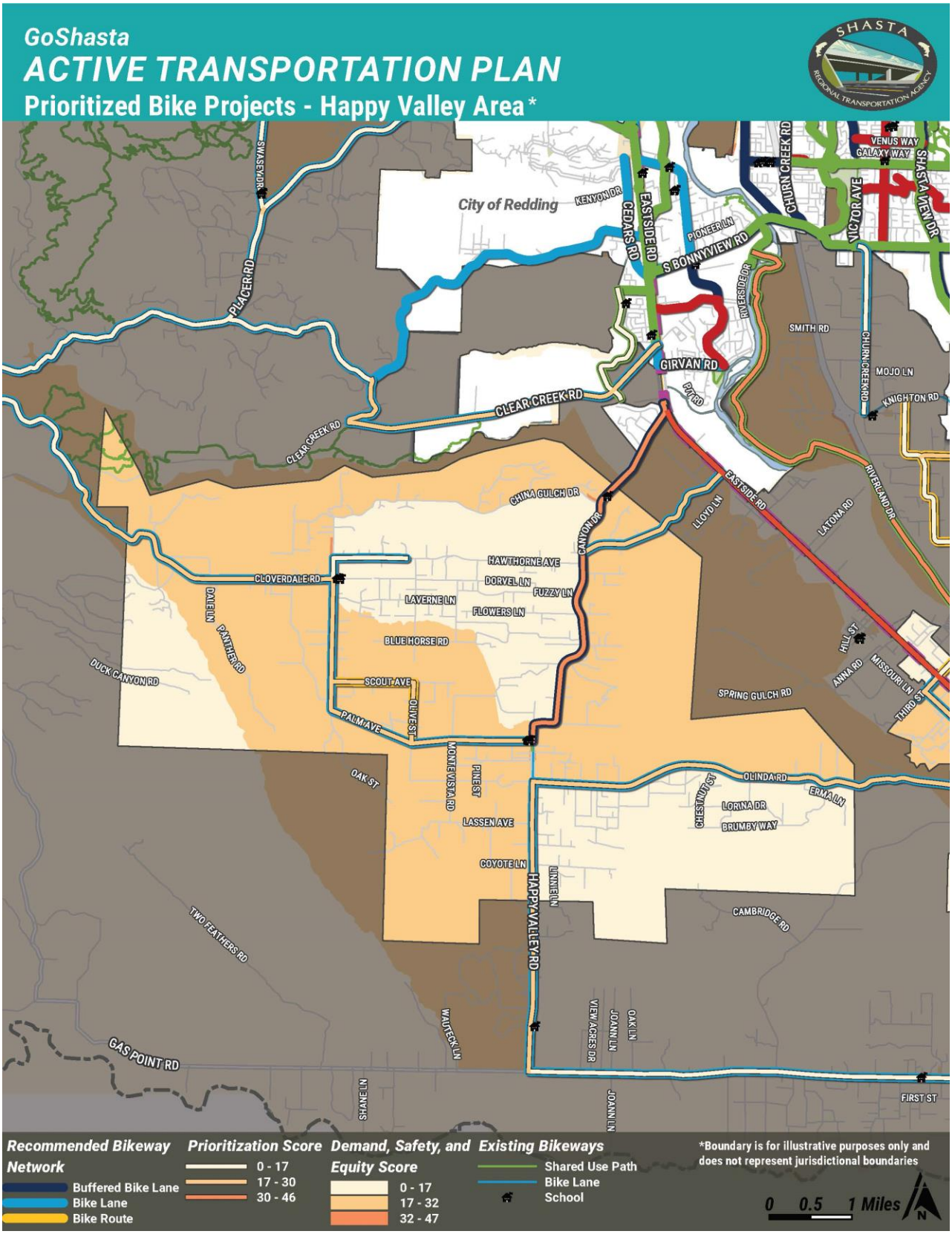

Figure D.5. Prioritized Bike Projects – Happy Valley Area

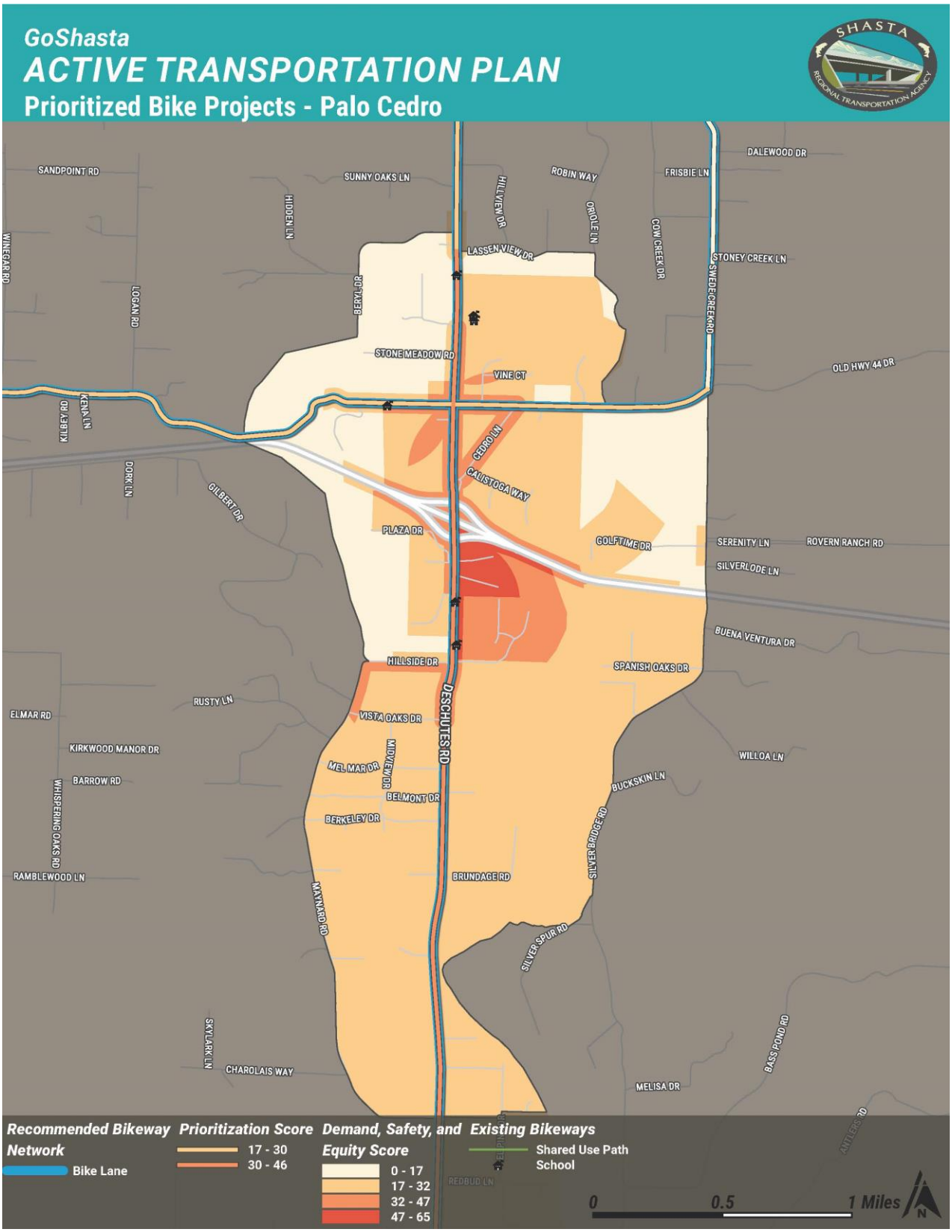

Figure D.6. Prioritized Bike Projects – Palo Cedro

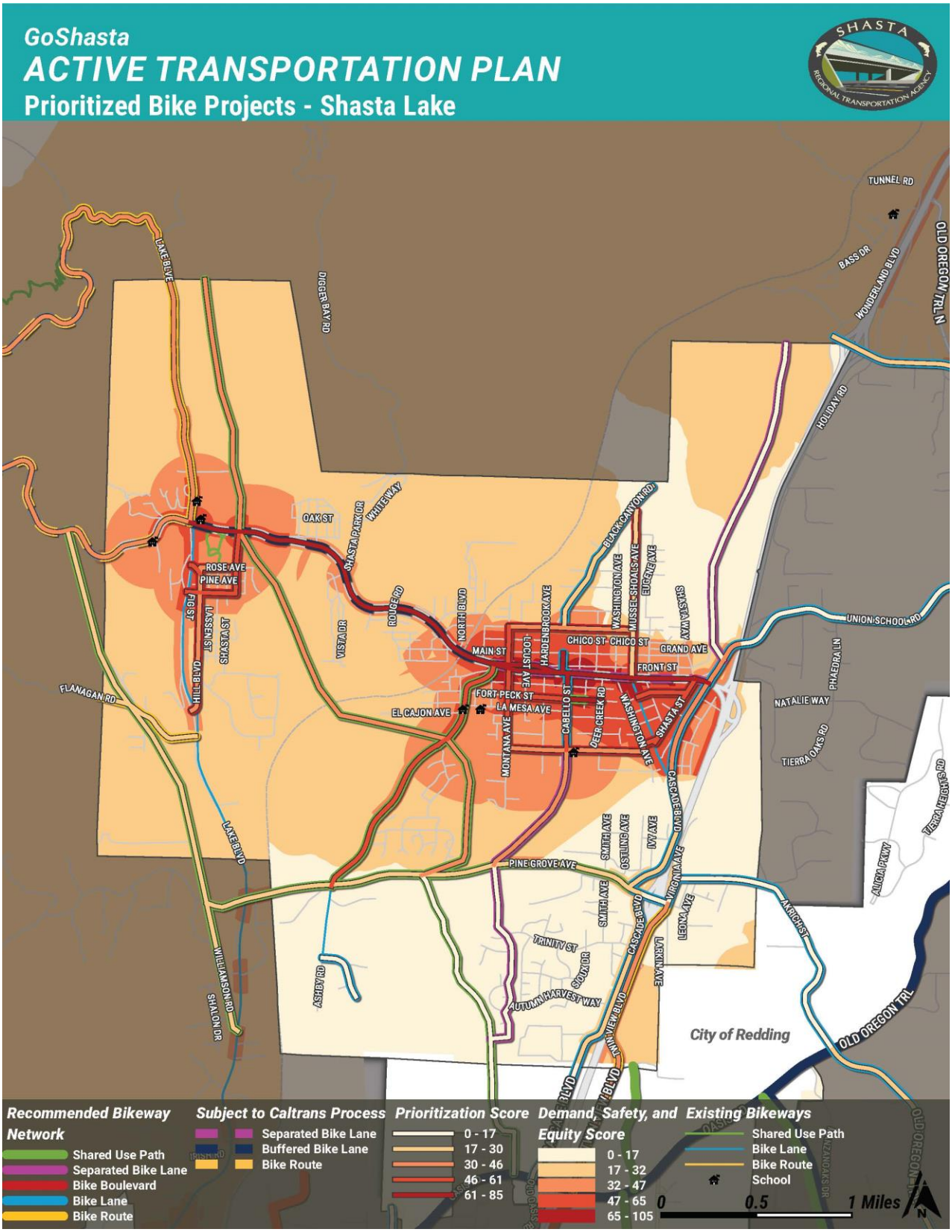

Figure D.7. Prioritized Bike Projects – Shasta Lake

Figure D.8. Prioritized Pedestrian Projects – Anderson

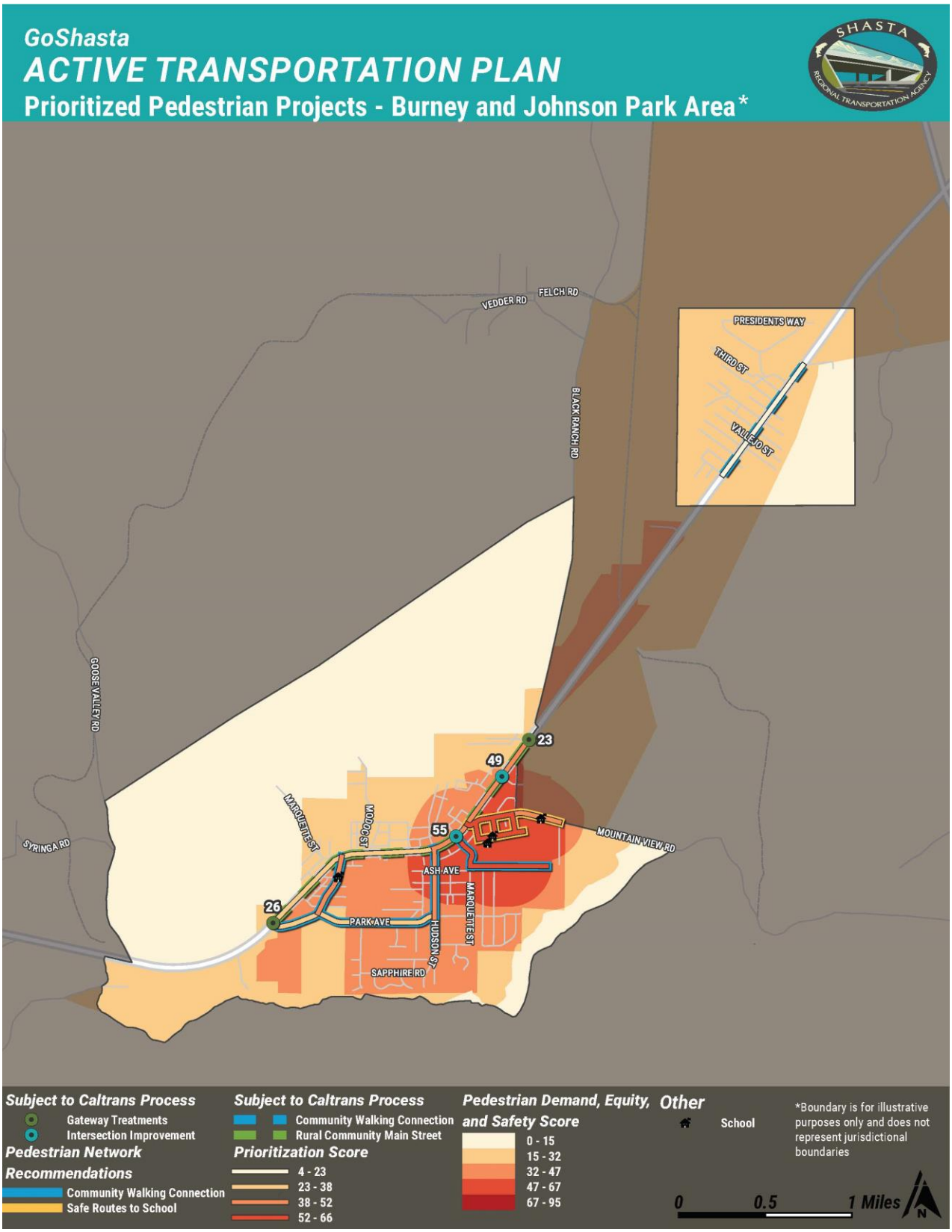

Figure D.9. Prioritized Pedestrian Projects – Burney and Johnson Park Area

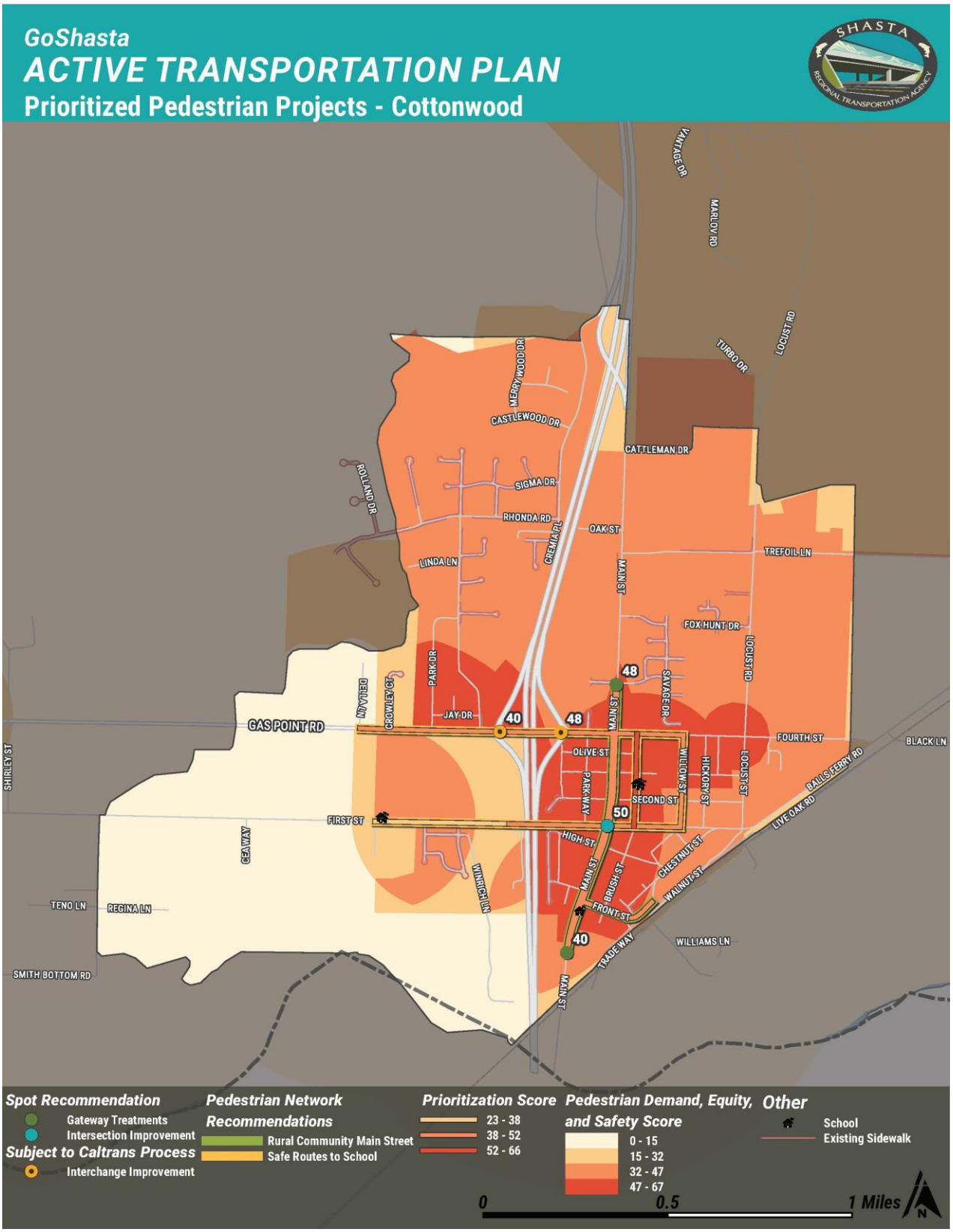

Figure D.10. Prioritized Pedestrian Projects – Cottonwood

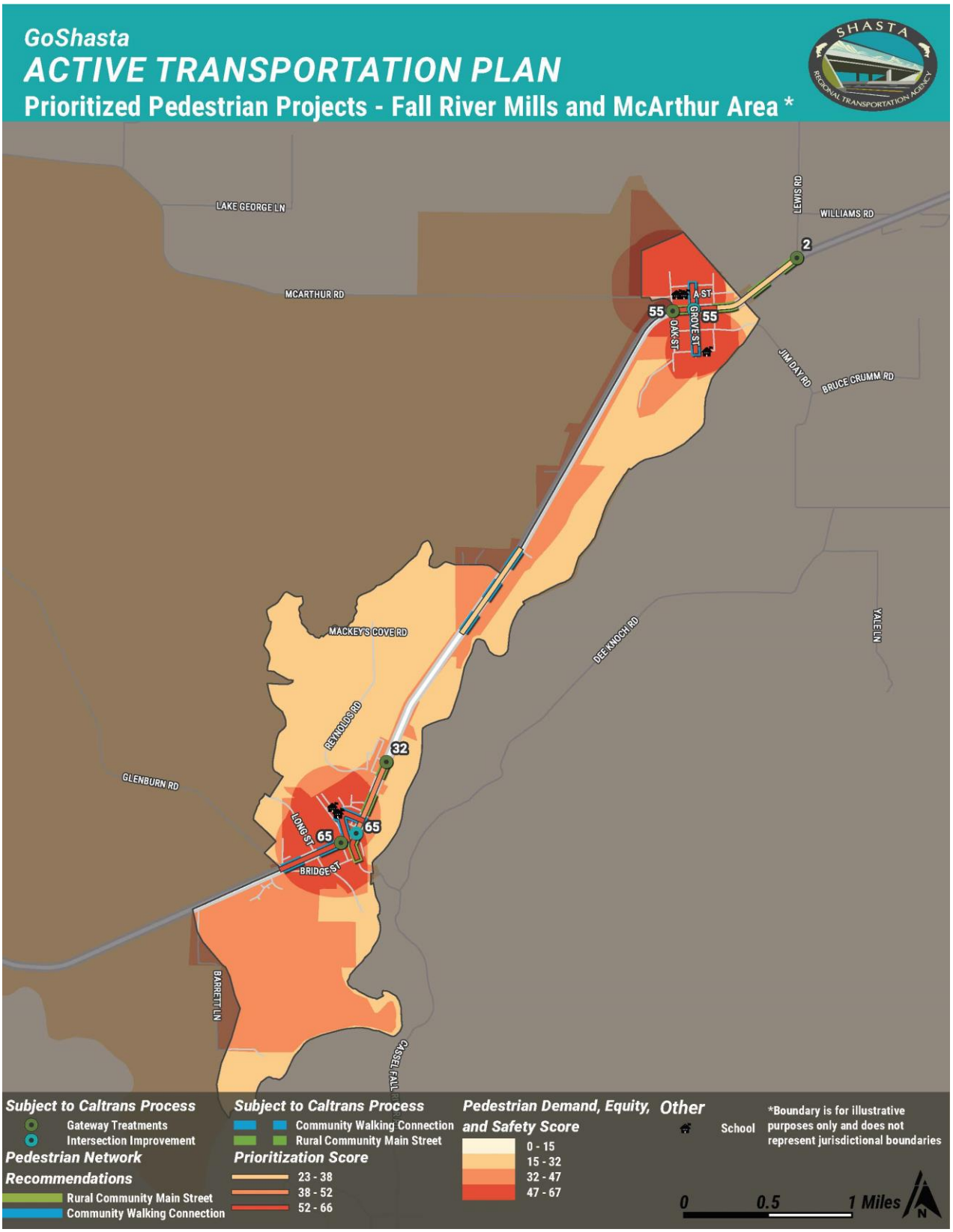

Figure D.11. Prioritized Pedestrian Projects – Fall River Mills and McArthur Area

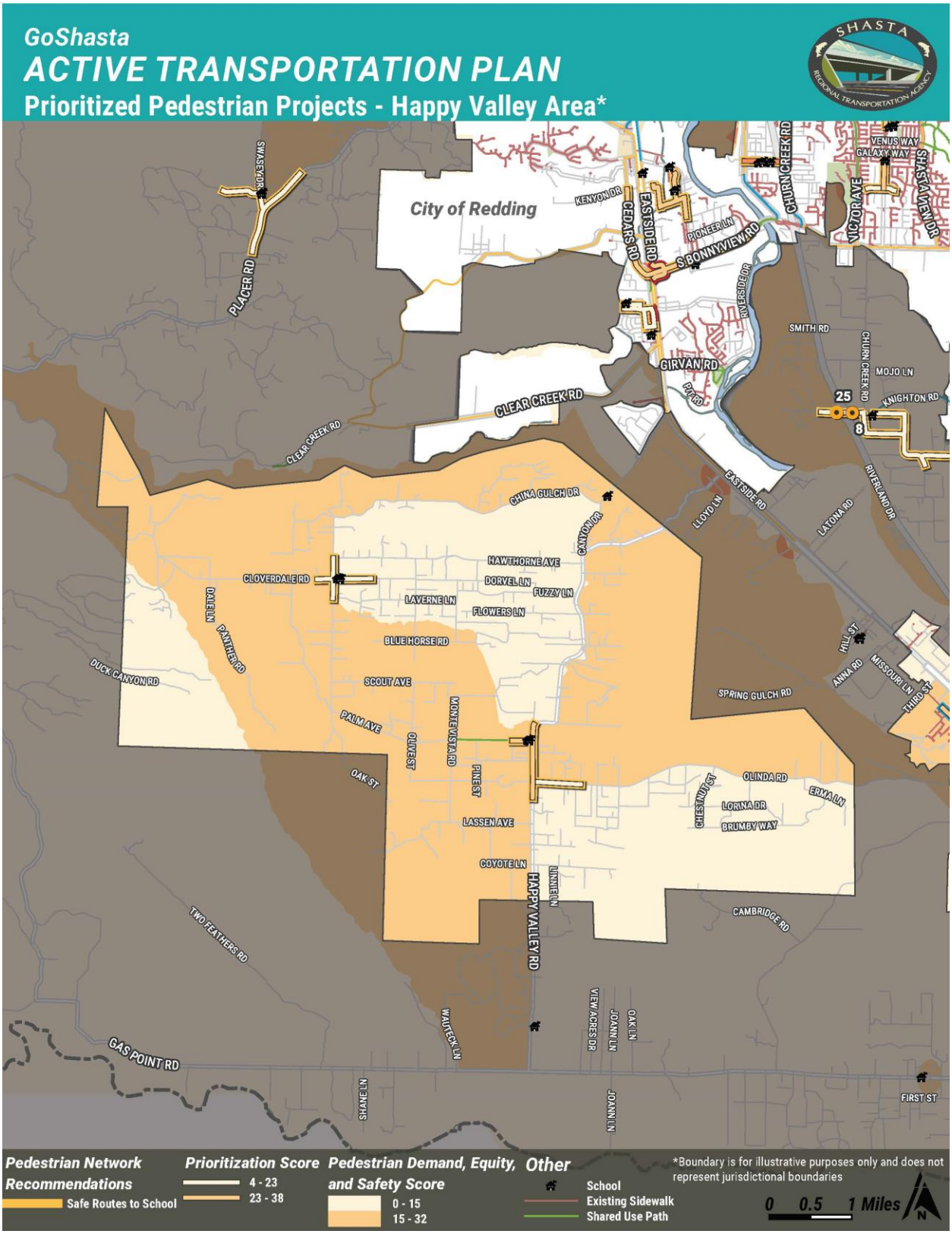

Figure D.12. Prioritized Pedestrian Projects – Happy Valley Area

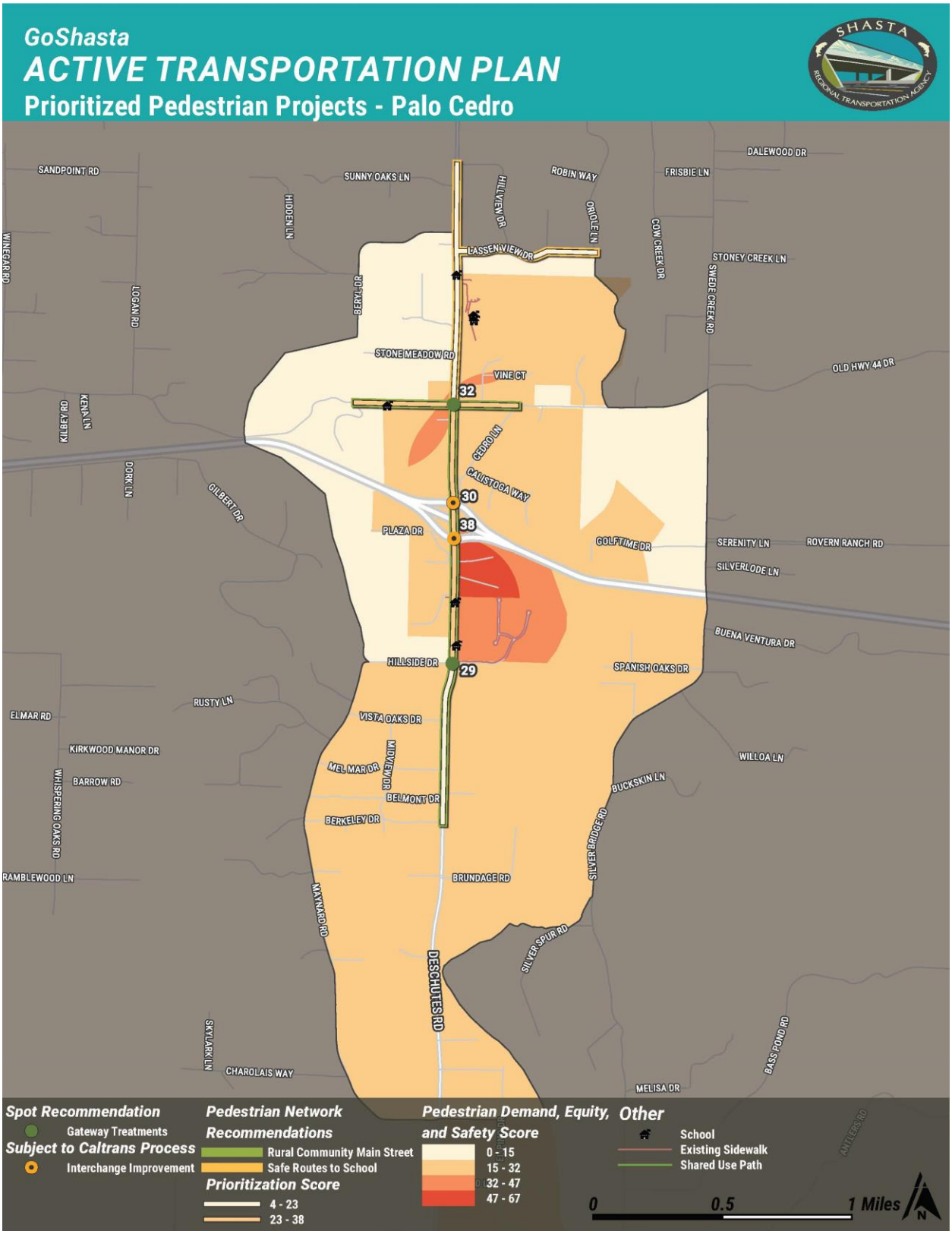

Figure D.13. Prioritized Pedestrian Projects – Palo Cedro

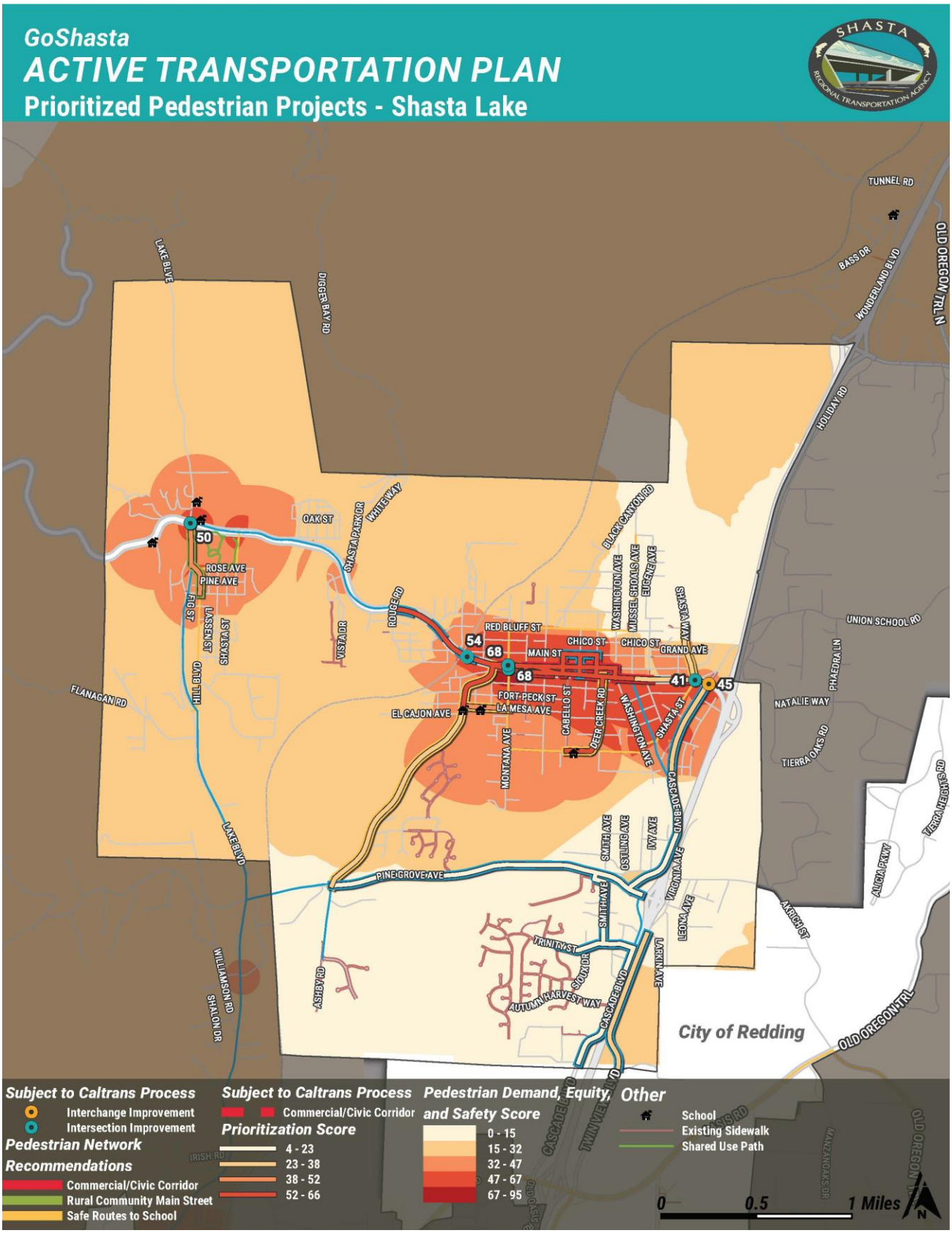

Figure D.14. Prioritized Pedestrian Projects – Shasta Lake