

Fire Mitigation with Trails

BACKGROUND

Mariposa County is one of the founding counties of California. For a majority of its existence, it has been a secluded and heavily forested tourist destination for those on the West Coast. With more focus on affordable transportation and mass tourist transit, this peaceful county has become one of the premier stops for people when embarking on tours of California's natural wonders, Yosemite National Park.

Like every other parts of California, Mariposa County has experienced several extensive wildfires in the past for few decades. With climate change, intensity and frequency of drought in California are expected and, consequently, the danger of wildfire to communities is also predictable. The county is in the 'Very High Wildfire Hazard Potential' area, according to Directrelief.org (2019), and has dealt with wildfire nearly every year, impacting the regional climate, ecosystem, air quality, and economy. To combat the issues, an interdisciplinary studio (LA403) at Cal Poly San Luis Obispo used Geodesign framework working on 'A comprehensive trail system in Mariposa County integrating the existing fire defenses and facilitating economic and community growth.'

MAJOR ISSUES

- Lack of community protection measure against wildfires
- Abundant fuel sources in the area
- Lack of evacuation (transportation) routes

GOALS

- Build on existing fire defense of Mariposa County with newly built programs.
- Facilitate local economy and community growth.
- Create accessible and connected experiences w/in Mariposa County.

REQUIREMENTS

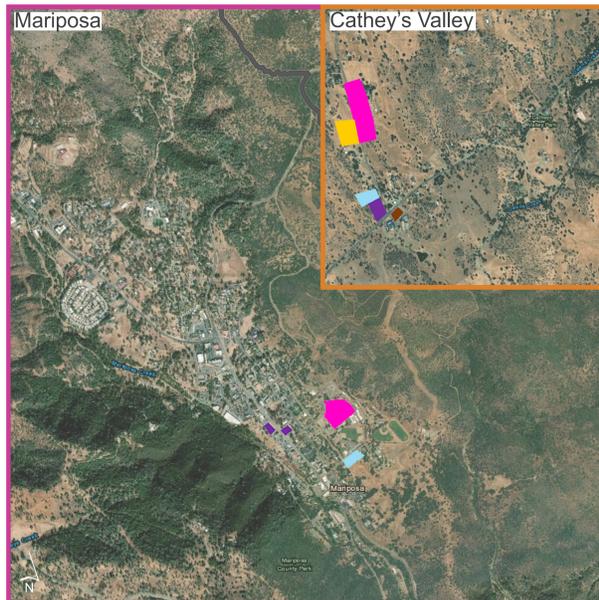
- Improved Fire Preventative Strategies
- Alternative Transportation Methods
- Integrated Tourist Attractions
- Population Growth Accommodation

MAJOR ASSUMPTIONS

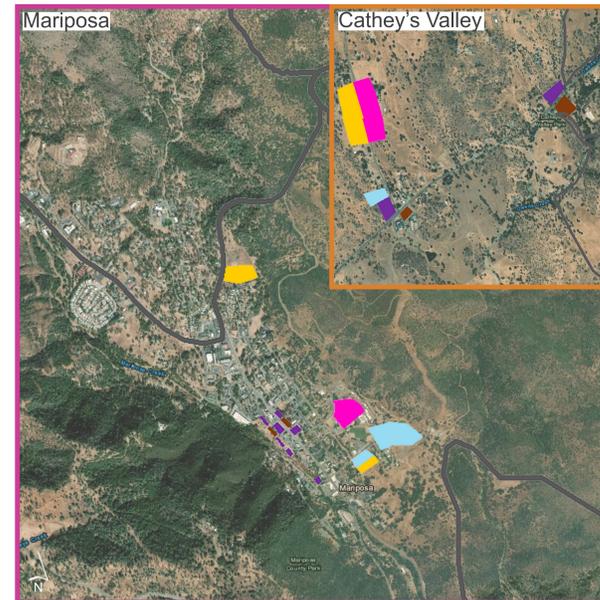
- 25% of all jobs in the town of Mariposa are based in the sales and service industry which is directly related to the tourist economy.
- Population growth in the area will remain at the historical 10-year average of 1% and will shift towards an older average age.
- As many as 4.1 million tourists travel through Mariposa County in a year.

ADOPTED INNOVATIONS

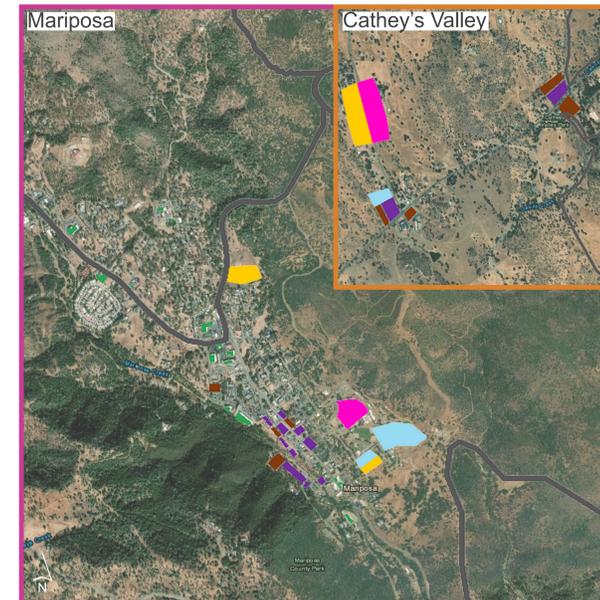
- WAT 2: Water Retention
- WAT 8: Bio-retention
- GRN 2: Resilient Landscape Infrastructure
- GRN 9: Connectivity and Elements
- RES 9: Green Cement
- COM 8: Renewable Energy Sources
- COM 16: Future of Small Businesses
- MIX 7: Sharing Economy
- MIX 16: Sustainable Urban Infrastructure



EARLY ADOPTER 2020



EARLY ADOPTER 2035

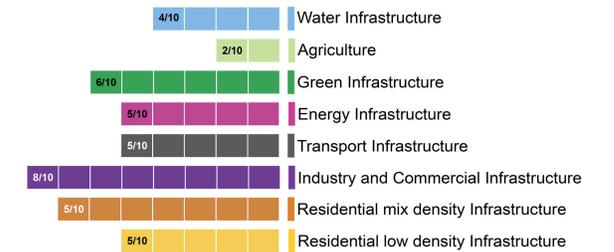


EARLY ADOPTER 2050

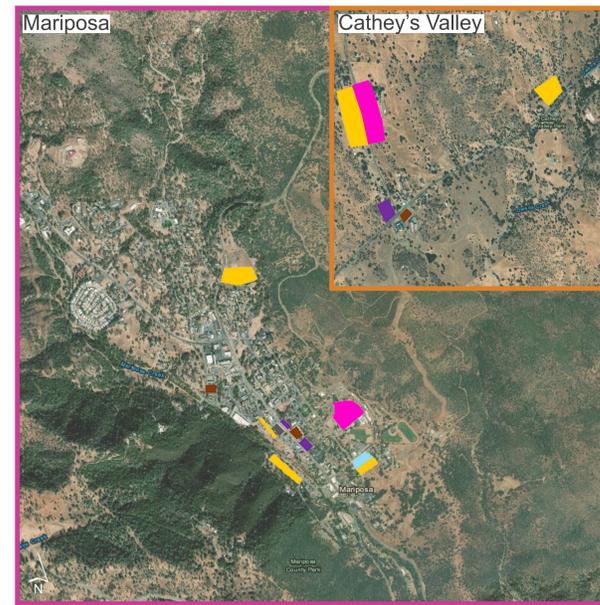
EARLY ADOPTER SUMMARY

Our group suggests immediate "early adopter" strategy that begins with swift resource innovations to secure water and energy that will become increasingly important as more people live and visit the area. With a strong approach towards green, water, and energy infrastructure, we see a clear shift away from the traditional position most communities take with low density housing towards mixed use zoning. With a limited amount of space, combining systems will limit the type of compartmentalization that currently leads poor community development.

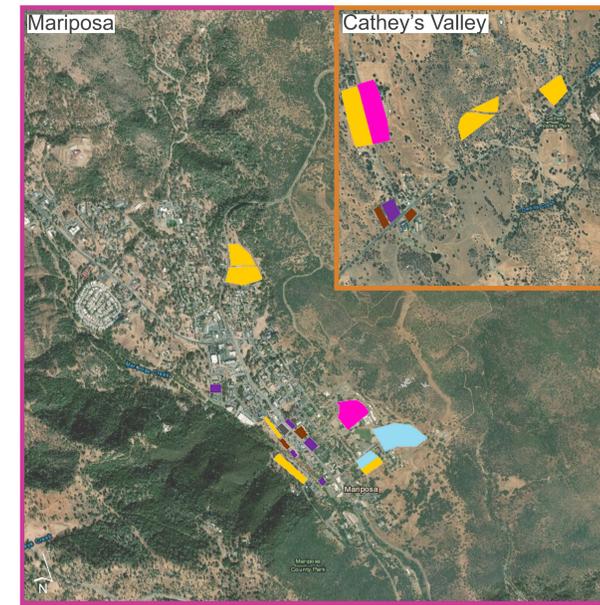
DESIGN PRIORITIES



PROJECT SURROUNDINGS



LATE ADOPTER 2035

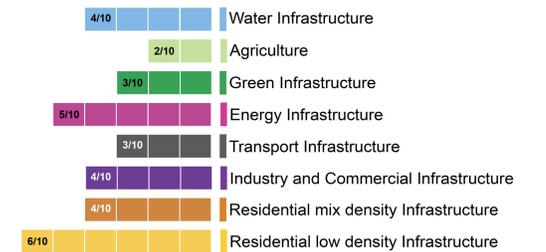


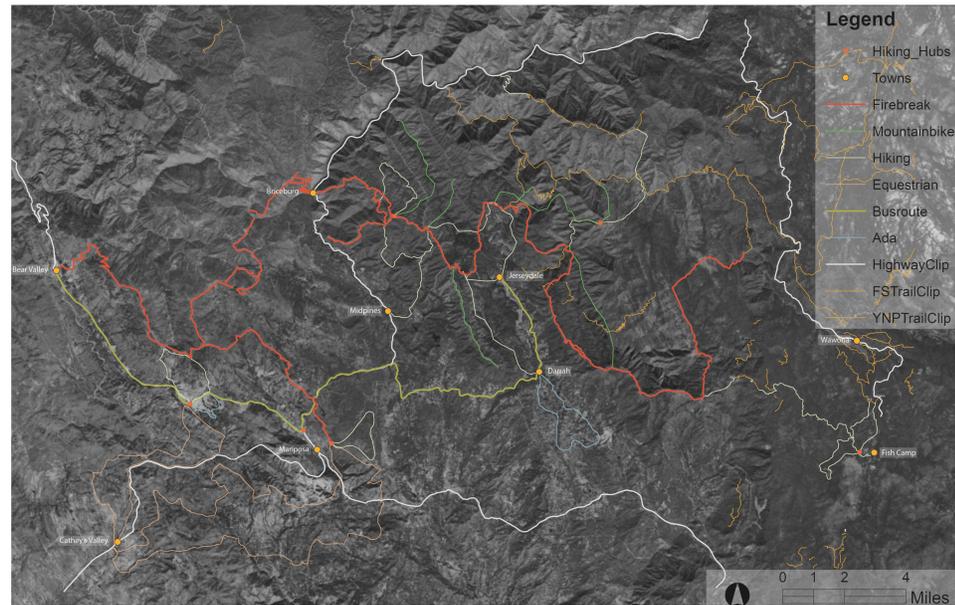
LATE ADOPTER 2050

LATE ADOPTER SUMMARY

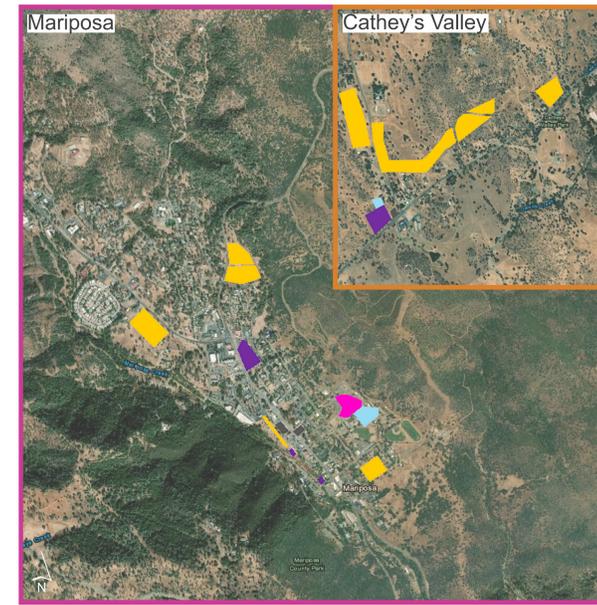
The "late adopter" scenario shows the willingness to shift the focus of development away from more profitable activities and invest in the infrastructure of the area to help springboard future projects that will help diversify the area's activities. While the most pressing concern is the housing crisis, as reflected in the level of impact chart, it is apparent that water, energy, and sustainable technologies are becoming more and more important.

DESIGN PRIORITIES





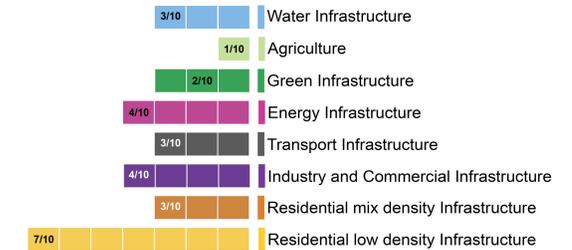
TRAIL MASTER PLAN
Vision Statement: Create a connected trail system in Mariposa County that supports fire protection strategies and helps strengthen the community.
Why? Fire is the most dynamic problem the county faces. Affecting the economic stability, environmental foundation, and the lives of those that call Mariposa County their home.



NO ADOPTER 2050

NO ADOPTER SUMMARY
 In the "no adopter" scenario, no innovations are integrated into the communities in Mariposa. While no direct innovations are applied, certain resources will undoubtedly need to expand to accommodate future resource shortages. Rather than focus on the larger problems at play, future development will focus more on short-term solutions.

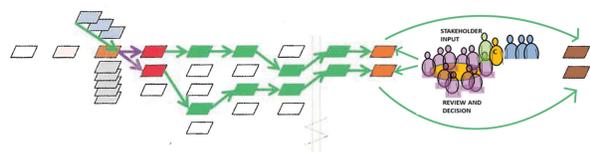
DESIGN PRIORITIES



GEODESIGN FRAMEWORK

Geodesign Method: The Participatory Change Model

1. An interdisciplinary group of students initially researched on the project topic (trails and wildfires) and the local characteristics.
2. Following the Geodesign Framework the team completed the Iteration 1, 2, and 3 up to the change model prior to the meeting with stakeholders.
3. During the stakeholders' meeting, the student group and the stakeholders work together to update the plan.



UN SUSTAINABLE DEVELOPMENT GOALS

Sustainable Development Goals

- 1: No Poverty
- 2: Zero Hunger
- 3: Good Health and Well-being
- 4: Quality Education
- 5: Gender Equality
- 6: Clean Water and Sanitation
- 7: Affordable and Clean Energy
- 8: Decent Work and Economic Growth
- 9: Industry, Innovation and Infrastructure
- 10: Reduced Inequality
- 11: Sustainable Cities and Communities
- 12: Responsible Consumption and Production
- 13: Climate Action
- 14: Life Below Water
- 15: Life on Land
- 16: Peace and Justice Strong Institutions
- 17: Partnerships to achieve the Goal

Legend: Most beneficial (3), Beneficial (1), Neutral (0), Detrimental (-1), Most detrimental (-3)

Early adopter

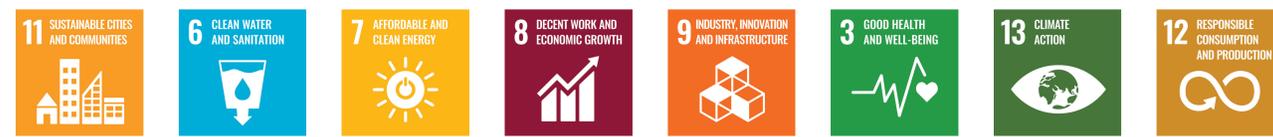
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2	0	3	1	1	3	1	0	1	1	12
3	3	1	3	0	0	0	1	1	0	10
4	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0
6	3	-1	3	3	0	1	-1	3	0	14
7	0	0	1	3	1	0	0	3	0	11
8	-1	1	0	1	3	3	0	3	3	16
9	1	1	0	3	3	3	1	3	0	15
10	0	0	0	0	0	0	0	0	0	0
11	3	3	3	3	1	3	0	3	3	23
12	0	1	1	1	0	0	0	3	0	9
13	0	0	3	3	0	1	1	1	0	10
14	3	-1	1	0	0	0	-1	-1	0	0
15	1	1	3	1	-1	1	3	-3	-1	0
16	0	0	0	0	0	0	0	0	0	0
17	3	1	0	0	-1	0	-3	0	0	12

Late adopter

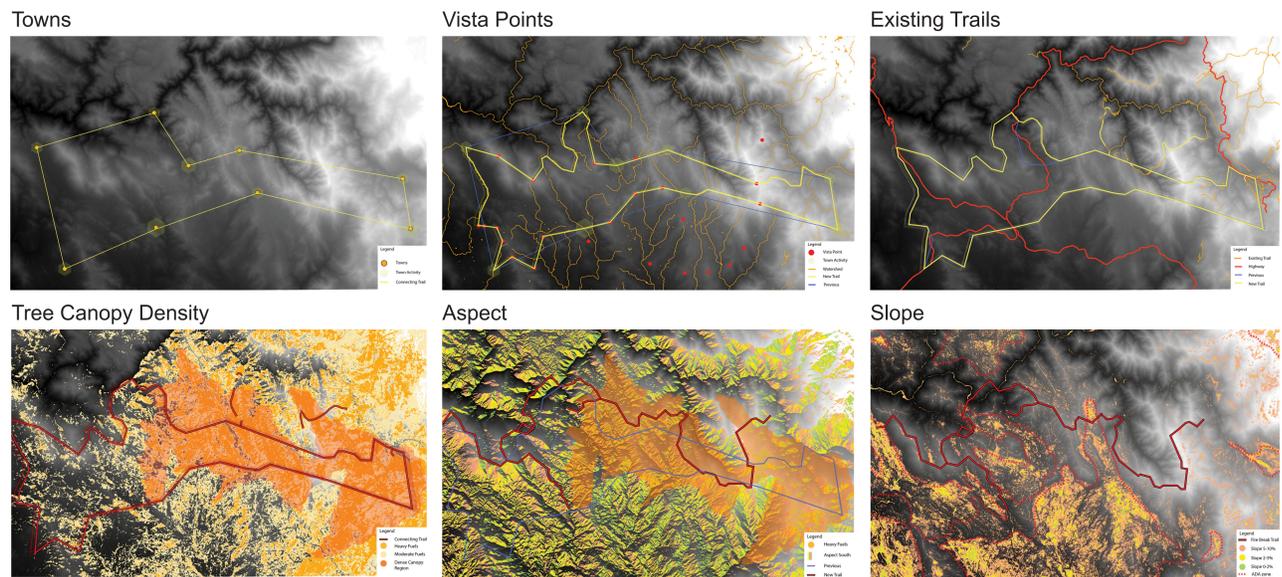
SDG	WAT	AGR	GRN	ENE	IND	INST	RES	TOUR	MIX	SUM
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4	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0
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7	0	0	0	3	1	0	0	1	0	6
8	-1	0	1	1	3	3	0	0	3	11
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11	3	3	0	3	1	3	0	0	3	16
12	0	1	1	1	0	0	0	1	1	6
13	0	1	3	3	0	1	1	0	0	9
14	3	-1	1	0	0	0	1	-1	0	4
15	1	1	1	1	-3	-1	3	-1	0	1
16	0	0	0	0	0	0	0	0	0	0
17	3	1	0	0	0	0	0	0	0	4

Non-adopter

SDG	WAT	AGR	GRN	ENE	IND	INST	RES	TOUR	MIX	SUM
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2	0	3	3	1	1	0	0	-1	-1	3
3	3	1	3	0	0	0	-1	-1	-1	3
4	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0
6	3	-1	1	1	0	0	-2	-1	-3	-3
7	0	0	1	3	1	0	0	-1	0	3
8	-1	0	1	1	3	1	0	0	1	6
9	1	0	0	3	1	1	0	-1	-1	4
10	0	0	0	0	0	0	0	0	0	0
11	3	1	1	3	-1	1	0	0	-1	7
12	0	1	1	1	0	0	0	1	0	5
13	0	1	3	3	0	0	1	0	-1	7
14	3	-1	1	0	0	0	-3	-1	-1	-3
15	1	1	3	1	-1	0	1	-1	-3	1
16	0	0	0	0	0	0	0	0	0	0
17	3	1	0	0	0	0	0	0	0	4



SITE ANALYSIS



DESIGN SOLUTIONS



CONTRIBUTORS

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