

# 2024

## Copper Valley Speed Reduction Proposal

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# DRAFT

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Construction, Inc.**

# 1. Introduction

## Background

Copper Valley is a neighborhood located in Copperopolis, CA. The local community has reported frequent incidents of speeding, particularly in residential areas and surrounding the golf club, posing significant risks to pedestrians and drivers alike. Recognizing the urgent need to address these issues, a proposal has been issued for the development of a comprehensive speed control system.

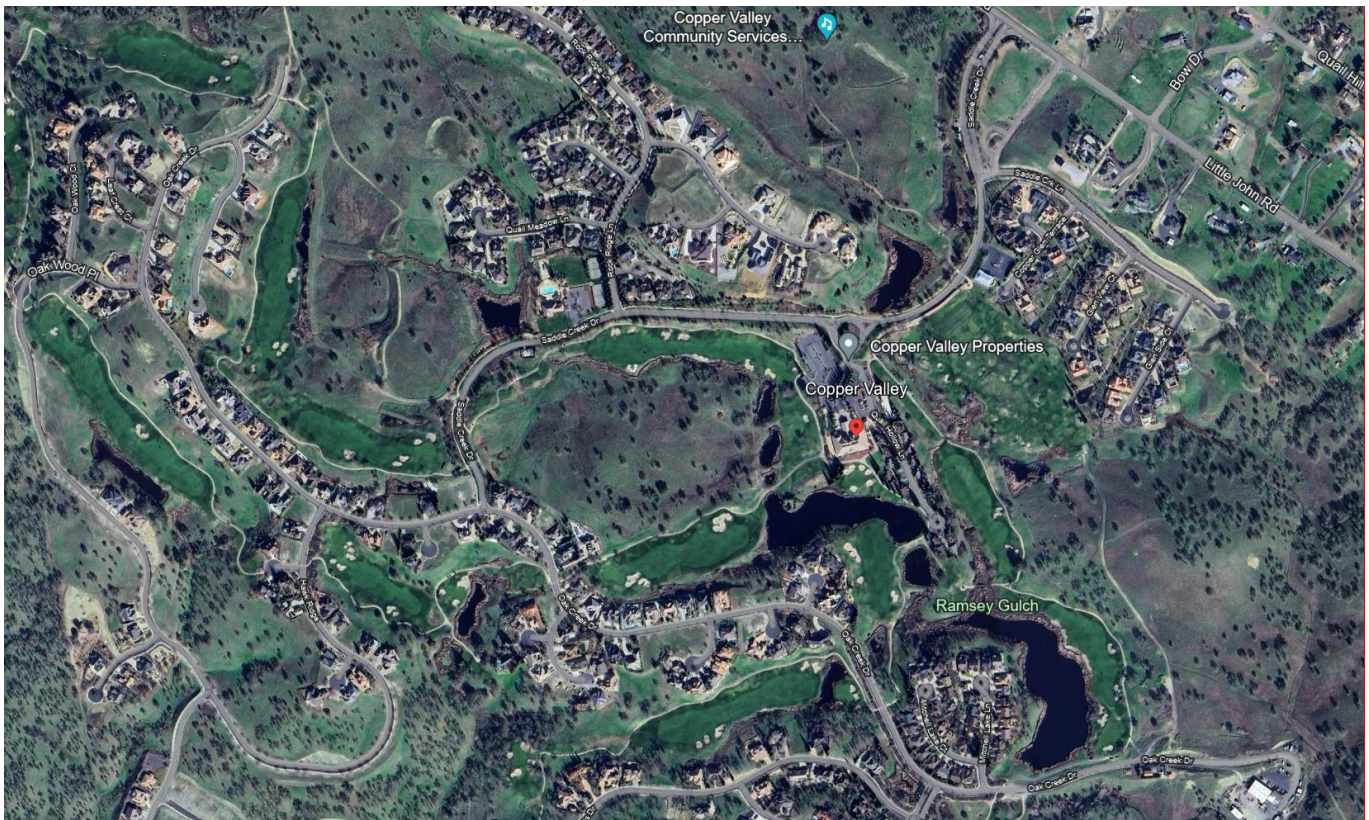


Figure 1. (Google Earth)

Most reports of speeding have occurred along Oak Creek Drive and Saddle Creek Drive. These roadways can be determined as the initial study area. These roadways consist of 2-10.5-foot lanes each.

## Objectives

The primary objectives of the speed control system are to:

- Reduce vehicle speeds in critical areas.
- Enhance safety for pedestrians, cyclists, and drivers.
- Promote compliance with local traffic laws.
- Foster a safer community environment through improved traffic management.

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## Scope

This report outlines the proposed engineering solutions for speed control in Copper Valley. It covers the needs assessment, system design, implementation plan, expected outcomes, challenges, and considerations. Additionally, it includes detailed appendices on system components, timelines, budgets, stakeholders, and references.

## 2. Necessity for Speed Reduction

### Safety Concerns

The safety of residents, especially children and elderly pedestrians, is a major concern. High-speed vehicles pose a serious threat in residential areas where visibility is limited and pedestrian activity is high, especially at pedestrian crossings for golf course users. The need for effective speed control measures is critical to prevent accidents and enhance public safety.

## 3. Components of Speed Reduction System

### Overview of Proposed Solutions

The proposed traffic Calming system integrates traffic management strategies to monitor and regulate vehicle speeds. The primary components include constructing new radar speed signs and physical traffic calming measures, as well as upgrading the current traffic calming measures in place.

#### Traffic Calming measures:

#### Vehicle Speed Feedback Signs

Vehicle speed display signs display a motorist's speed as they approach the sign. They are most effective where there is only one lane of traffic travelling in each direction, where traffic is low, as they are only capable of collecting and displaying the speed of one vehicle at a time (Caltrans). This renders them to be well suited to be installed on the local roads of Copper Valley.



Figure 2. (Trafficalm, 2023 Speed Radar Signs)

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## Pedestrian Crossings and Signs

Pedestrian crossings are located around the neighborhood, many for the users of the golf course. In concern of these pedestrians, these crossings may be upgraded to meet the following criteria:

- Install high visibility crosswalk markings or signings
- Install nighttime lighting
- Ensure that crosswalks have textured surfaces for visually impaired



Figure 3. (Law Soup California, 2022 MUTCD Code W11-2 Signs at Pedestrian Crossing)

Any markings or signings must be placed appropriately at the crossing. These visibility enhancements are used to enhance reaction times and driver compliance at these crossings.

## Speed Humps

A speed hump is a mound in the road that stretches the length across the road. Speed humps are installed with the intent of slowing down motorists by causing discomfort when driving through it. A speed hump typically measures 12 feet in length with a height of 3 to 4 inches as recommended by the California Department of transportation (Caltrans).

As per the National Association of City Transportation Officials (NACTO), they should meet the following criteria:

- Slopes should not exceed 1:10 or be less steep than 1:25.
- Side slopes on tapers should be no greater than 1:6.
- The vertical lip should be no more than a quarter-inch high.

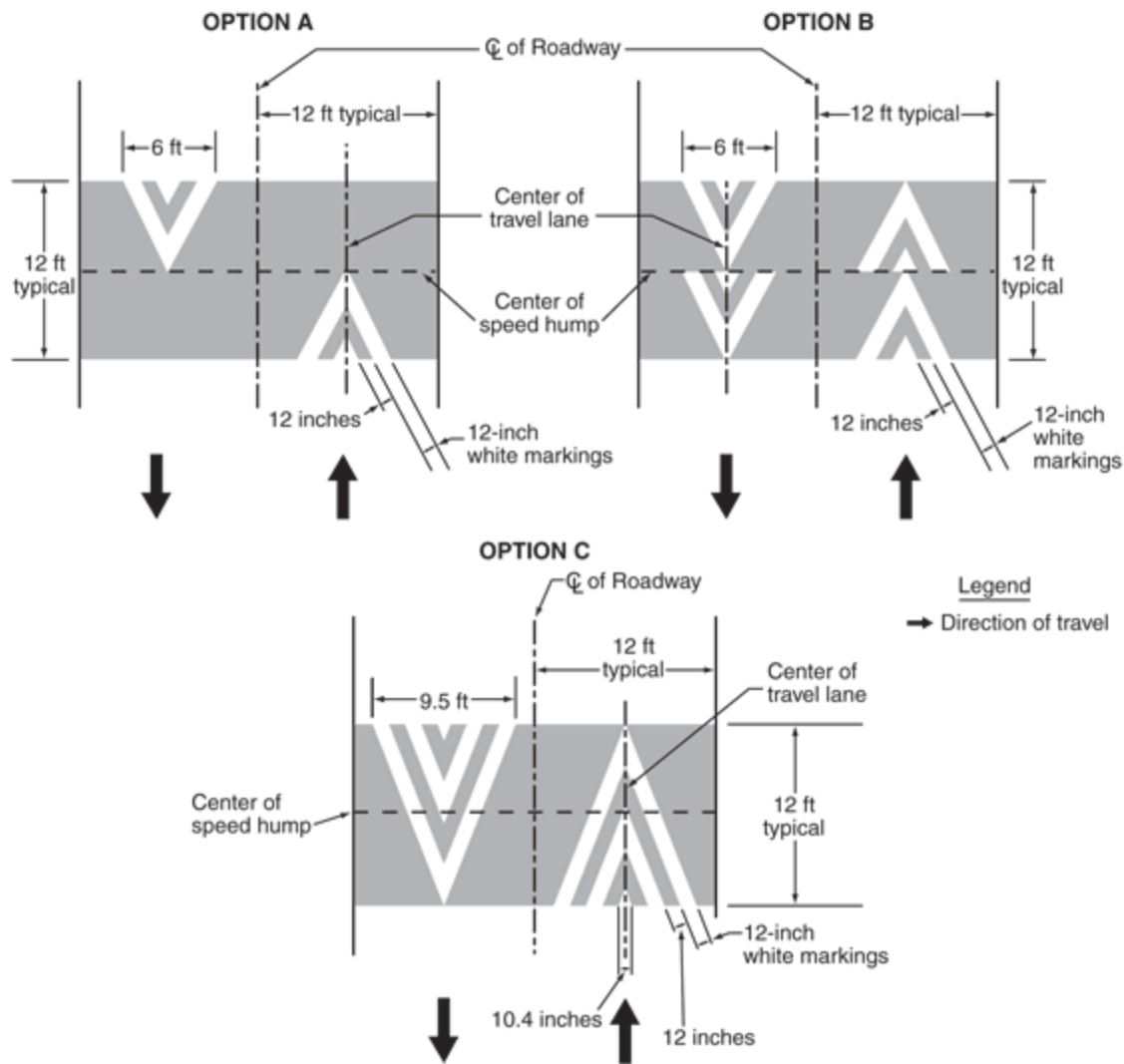


Figure 4. (MUTCD, 2009, Pavement Markings for Speed Humps Without Crosswalks)

It is critical that speed humps are placed appropriately. “Speed humps should be spaced no more than a maximum of 500 feet apart to achieve an 85th percentile speed of 25–35 mph” The Institute of Transportation Engineers (ITE). They should not be constructed in front of driveways or other access areas, near an intersection or near sharp curves where visibility is not sufficient. It is recommended that speed humps should accompanied by a warning sign to alert motorists of upcoming device (MUTCD W17-1).

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## 4. Permit Requirements

### Local Permits

The installation of the traffic control System will require Permits from Copperopolis Town Council as well as Calaveras County Public Works. These include permits for placement of radar speed signs as well as for road modifications done for the installation of any physical traffic calming measures.

### State and Federal Permits

Certain aspects of this project will require state and federal permits. Especially for any road modifications made, ensuring that these modifications comply with state transportation regulations. Federal permits may be required if the project impacts federally funded roadways.

## 5. Step Process of Implementing System

The Implementation of the Traffic Calming System will follow a structured time line. The project will be executed in phases to ensure systemic implementation and effective monitoring. The proposal will undergo a comprehensive evaluation covering its schedule and cost. The proposed Implementation of Plan consists of 7 phases:

### Phase 1 – Define the Area of study

The Area of Study for this report is the neighborhood of Copper Valley in Copperopolis, CA. Neighborhood complaints have identified the worst of the speeding to occur on Saddle Creek Drive and Oak Creek Drive, although they have noted speeding complaints occurring everywhere in the neighborhood. For this proposal, we will focus on Saddle Creek Dr. and Oak Creek Dr. making them the primary area of study.

### Phase 2 – Determine the level of community support for the Traffic Calming System

Once the Study area is defined, community support for the traffic calming system must then be determined. This is generally done by means of creating a petition letter from community residents and property owners where the majority of respondents are in favor of the proposed system.

Discuss with the Neighborhood residents about the traffic the current traffic issues to help further identify the problem and raise awareness.

### Phase 3 – Conduct a Study to identify current Traffic Conditions

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A study must be conducted to identify traffic conditions in the neighborhood. This is critical to identify measures that are to be implemented to enforce traffic calming in the neighborhood. Traffic conditions to be studied include but are not limited to speed of vehicles travelling in neighborhood, the volume of traffic, typical travel routes of the area and emergency travel routes.

A spot speed study may be conducted using a variety of methods. These include:

- Manually operated, hand held devices (radar gun, stop watch)
- Devices that are installed on top of the road (pneumatic road tube)
- Out of Road Devices that are installed overhead or alongside the road (radar recorders)

#### **Phase 4 – Develop an Execution Plan of Traffic Calming measures**

Develop an execution plan of traffic calming measures to be implemented based on the current traffic conditions in the neighborhood. These include the potential traffic calming measures stated under [3.0 Components of Speed Reduction System](#).

#### **Phase 5 – Negotiate Financial Participation**

Funding will have to be provided an entity. Whether the be by the Neighborhood, the Copperopolis Town Council or Calaveras County. With an execution plan in place on how to put in place this system, we can have an idea of the expenditure required, we can then negotiate with these parties to raise project funds.

#### **Phase 6 – Implement Traffic Calming measures**

Once an execution plan has been determined and financial participation has been negotiated with the neighborhood and Public Works, then the neighborhood traffic calming measures designed must be implemented and constructed.

#### **Phase 7 – Perform follow up analysis of whether objectives were met**

A follow up study must be conducted once traffic calming measures have been implemented to evaluate if the objectives of the traffic calming system were met. Steps 4 through 7 may need to be repeated if objectives were not achieved.

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## 6. Spot Speed Study for Copper Valley

### Detailed Plan

#### Location Area

Saddle Creek drive and oak creek drive, Copper Valley CA.

#### Objective

Measure and record the speed and volume of traffic in Copper Valley

### Equipment and Placement

#### Pneumatic Road Tubes

Pneumatic Road tubes should be placed in the middle of a block where a flat roadway is present and there is free flowing traffic. The pneumatic road tubes will be able to calculate the volume of traffic and the speed of motorists at these locations. Placement of these tubes should be where traffic speed is expected to be at a local maximum.



Figure 5. (Orbital Geospatial Services, 2024, Pneumatic Road Tubes or traffic counters for traffic surveys)

#### Placement

Oak Creek Drive – Near the intersection at Hawks Ridge

Saddle Creek Drive - Midway between the roundabout and Rock Ridge Lane

#### Purpose

Measure the volume of traffic and the speeds of motorists in both directions.



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## Set Up

The Tubes are to be placed perpendicular to traffic across the length of the road fixed down with anchor nails.

## Radar Recorders

Radar recorders can be mounted on poles and street lights. They use Doppler radar technology to measure and record the speed of vehicles.



Figure 6. (Melanie Basich, 201815 Things You Should Know About Speed Enforcement Tools)

## Placement

To be mounted on a pole or streetlight near pedestrian crossings along both Oak Creek Drive and Saddle Creek Drive.

## Purpose

To monitor and record vehicle speeds

## Set up

Radar records are to be mounted on poles and street lights with a clear line of vision. Ensure that Radar records are regularly calibrated before and during use.

## Data Collection and Timeline

The duration of the spot speed study should last for two weeks, ensuring data is gathered for both busy and quiet hours during week days as well as weekends. This greater range will ensure a more accurate set of results. The Collected Data will then be analyzed to identify Traffic Conditions. A detailed report can then be created with the study findings as well and Traffic Calming recommendations based on these findings.

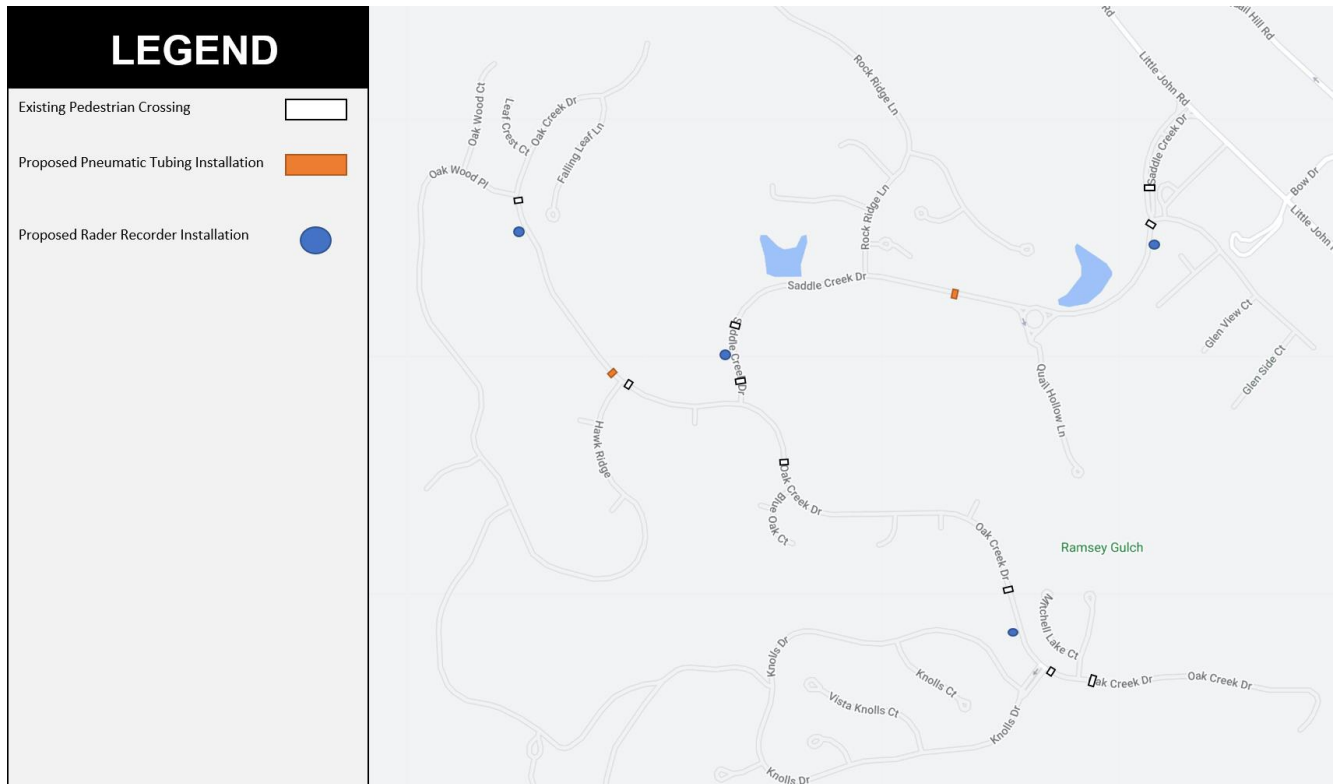


Figure 7. Strip map of Copper Valley including proposed areas for installing Spot Speed Study Equipment

## 7. Cost Estimate

### Equipment Costs:

#### Pneumatic Road Tubes

##### Cost per set

Approx. \$5,000 (Orbital Geospatial Services)

##### Number of sets

2 sets – Oak Creek Drive and Saddle Creek Drive

##### Total

Approx. \$10,000

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## **Radar Recorders**

### **Cost per Set**

Cost per unit vary from \$500 to \$1000 for basic models, to \$4,000 to \$5,000 for more advanced models.

Assuming mid-range radars are installed: \$3,000

### **Number of sets**

4 sets – 2 on Oak Creek Drive, 2 on Saddle Creek Drive

### **Total**

Approx. \$12,000

## **Data Analysis and Report Preparation**

### **Installation costs**

#### **Equipment installation and set up**

Installation of pneumatic Road tubes is usually included in proposal.

Pricing of labor will be required for installing Radar Recorders.

### **Installation**

Staff Required: 1

Hours Required: 12

Hourly Rate: \$150 (Assumed)

Total Cost of Radar Installation: \$1,800

### **Calibrating and Testing**

Staff Required: 2

Hours Required: 16

Hourly Rate: \$150 (Assumed)

Total Cost of Installation: \$2,400



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## Distributor Websites:

Traffic Logix

[Traffic Logix - Transforming Streets with Smart Traffic Solutions](#)

All Traffic Solutions

<https://www.bing.com/ck/a?!&&p=92d07f04c34c1ddbJmltdHM9MTcxODIzNjgwMCZpZ3VpZD0xMzJjNDFiMS0xNDQ5LTZmZiQtM2U4My01NTM0MTVjZDZlMTgmaW5zaWQ9NTIzNQ&ptn=3&ver=2&hsh=3&fclid=132c41b1-1449-6ff4-3e83-553415cd6e18&psq=all+traffic+solutions&u=a1aHR0cHM6Ly93d3cuYWxsdHJhZmZpY3NvbHV0aW9ucy5jb20v&ntb=1>

Jamar Technologies

[Traffic Data Collection Equipment | JAMAR Technologies](#)

Orbital Geospatial Services

[Professional Geospatial Services at Orbital Africa](#)

## 8. Expected Outcomes

### Improved Safety

The implementation of radar speed signs and traffic calming measures is expected to significantly reduce vehicle speeds, particularly in high-risk areas. This will lead to a decrease in traffic accidents and enhance the overall safety of pedestrians, cyclists, and drivers.

### Community Impact

This Traffic Control System will contribute to a safer and more stress-free community. Residents of Copperopolis will experience a reduction in traffic related stress, establishing a more pleasant environment in the neighborhood.

## 9. Other Challenges and Considerations

### Community Acceptance

Gaining community acceptance is essential for the success of the speed control system. Engaging residents through public meetings and feedback sessions will help address concerns and ensure broad support.

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## Maintenance Requirements

Maintenance of any equipment/infrastructure should be considered. Regular maintenance of radar speed signs and traffic calming infrastructure is necessary to ensure long-term functionality and effectiveness. This includes periodic calibration, repairs and updates to the system.

## 10. Conclusion

The proposed speed control system for Copperopolis, California, aims to address critical road safety concerns by reducing vehicle speeds and enhancing the safety of pedestrians, cyclists, and drivers. Through a combination of radar speed signs and traffic calming measures, the system is designed to create a safer and more livable community. The implication plan provided offers a realistic and systemic timeline.

## 11. References

1. "Traffic Calming Guide", California Department of Transportation, 2022. [https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/traffic-calming/final-traffic-calming-guide\\_v2-a11y.pdf](https://dot.ca.gov/-/media/dot-media/programs/safety-programs/documents/traffic-calming/final-traffic-calming-guide_v2-a11y.pdf)
2. "Traffic Calming Program," Alameda County Public Work Agency, 2023. <https://permits.acgov.org/pwa/programs/traffic/index.htm>
3. "Spot Speed," Arizona State University, 2002. <https://popcenter.asu.edu/sites/default/files/learning/speeding/SpotSpeed.pdf>
4. "Speed Study Data Collection," U.S. Department of Transportation, 2024. <https://highways.dot.gov/safety/speed-management/methods-and-practices-setting-speed-limits-informational-report/speed-study>
5. Institution of Transportation Engineers, 2024 <https://www.ite.org/>
6. "Speed Lump Program," The City of Sacramento, 2024. <https://www.coppervalleycsd.org/files/509ed4653/ITEM+7c%29+Speed+Hump+Program+-+City+of+Sacramento.pdf>

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7. Google Earth, 2023

[https://earth.google.com/web/search/Copper+Valley,+Saddle+Creek+Drive,+Copperopolis,+CA/@37.91692587,-120.64449769,257.13578046a,872.38759577d,35y,0.03811543h,0.67530408t,0r/data=CigiJgokCRr1dmi4kJAETmHvP034kJAGVA\\_INFLnF7AIdOKPzXznF7AOgMKATA](https://earth.google.com/web/search/Copper+Valley,+Saddle+Creek+Drive,+Copperopolis,+CA/@37.91692587,-120.64449769,257.13578046a,872.38759577d,35y,0.03811543h,0.67530408t,0r/data=CigiJgokCRr1dmi4kJAETmHvP034kJAGVA_INFLnF7AIdOKPzXznF7AOgMKATA)

8. Urban Street Design Guide, National Association of City Transportation Officials, 2024

<https://nacto.org/publication/urban-street-design-guide/street-design-elements/curb-extensions/chicane/>

## List of Figures

Figure 1. Google Earth [https://earth.google.com/web/@37.91828007,-](https://earth.google.com/web/@37.91828007,-120.64307346,251.31489123a,3224.94044596d,35y,0.0381156h,0.67555339t,-0r/data=OgMKATA)

[120.64307346,251.31489123a,3224.94044596d,35y,0.0381156h,0.67555339t,-0r/data=OgMKATA](https://earth.google.com/web/@37.91828007,-120.64307346,251.31489123a,3224.94044596d,35y,0.0381156h,0.67555339t,-0r/data=OgMKATA)

Figure 2. Trafficalm, 2023 Speed Radar Signs

<https://www.google.com/url?sa=i&url=https%3A%2F%2Ftrafficalm.com%2Fproducts%2Fradar-speed-signs&psig=AOvVaw0xySbWSrYUW0zpGuOYxjNQ&ust=1717102959177000&source=images&cd=vfe&opi=89978449&ved=0CBQQjhqxqFwoTCMj94pLhs4YDFQAAAAAdAAAAABAJ>

Figure 3. Law Soup California, 2022 MUTCD Code W11-2 Signs at Pedestrian Crossing

<https://www.google.com/imgres?q=pedestrian%20crossing%20with%20signs%20california&imgurl=https%3A%2F%2Fi0.wp.com%2Fcal.lawsoup.org%2Fwp-content%2Fuploads%2Fsites%2F18%2F2014%2F10%2Fpedestrian-crossing-walking.jpg%3Fresize%3D300%252C225%26ssl%3D1&imgrefurl=https%3A%2F%2Fcal.lawsoup.org%2Flegal-guides%2Fpedestrian%2F&docid=bYpLOdhk5eUaMM&tbnid=RSICwoHkYDOnNM&vet=12ahUKEwjC2-r347OGAxVKAzQIHQhxA8cQM3oEChOQAA..i&w=300&h=225&hcb=2&ved=2ahUKEwjC2-r347OGAxVKAzQIHQhxA8cQM3oEChOQAA>

Figure 4. MUTCD, 2009, Pavement Markings for Speed Humps Without Crosswalks

[https://mutcd.fhwa.dot.gov/htm/2009/part3/fig3b\\_29\\_longdesc.htm](https://mutcd.fhwa.dot.gov/htm/2009/part3/fig3b_29_longdesc.htm)

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Figure 5. Pneumatic Road Tubes or traffic counters for traffic surveys, Orbital Geospatial Services, 2024  
<https://www.google.com/url?sa=i&url=https%3A%2F%2Forbital.co.ke%2Fpneumatic-road-tubes-and-traffic-counters%2F&psig=AOvVaw1JZzYpR1Yiz3rxpbrVf1MU&ust=1717523234225000&source=images&cd=vfe&opi=89978449&ved=0CBQQjhxqFwoTCMDEI-T-v4YDFQAAAAAdAAAAABAE>

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[15 Things You Should Know About Speed Enforcement Tools | Police Magazine](#)

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