Bicycle Safety
Community and Citizen Proposal
To Improve Unsafe Bicycle Infrastructure
Central West Side, Colorado Springs
January 15 2021

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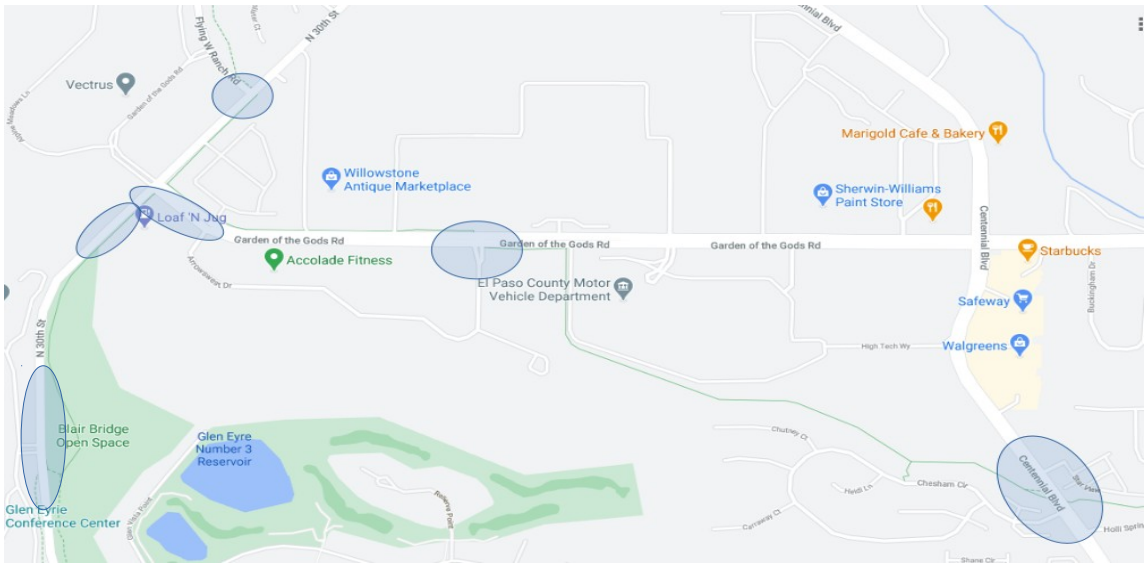
Bio:

1. Appointed position to the Governor's Bicycle Advisory Board, former member, 6 years.
2. Edited the 3-Foot Bicycle Passing bill to improve bicycling safety, testified in the Colorado House & Senate on financial benefits of improving bicycle safety, 3 Foot Passing is now law.
3. Edited the Colorado Driver Handbook, Bicycle section for safety – updates published.
4. Team lead with CDOT & CO State Patrol to create safe "CO Bicycle Event Guidelines".
5. Team lead with CDOT to create the bicycling component in the "20 Year Intermodal Transportation Plan".
6. Proposed Rumble strip standards to CDOT – adapted & implemented. Improves safety for vehicles and bicycles and reduces time and equipment cost during milling.



1. AREAS FOR IMPROVEMENT

Bicycle infrastructure to improve safety and continuity of the trail / road system;

1) begins east of Centennial Blvd., approximately 100 yards east of the Sinton Trail tunnel,
2) heading West to N. 30th St. on the Sinton Trail to Garden of the Gods Rd,
3) west along Garden of the Gods Rd. (both sides north and south),
4) north on N. 30th St. to Flying W. Ranch Rd.,
5) and south on N. 30th Street to Mesa Rd.
6) with safe continuity for transitioning onto the Palmer Mesa Trail.

This proposal "To Improve Unsafe Bicycle Infrastructure, Central West Side, Colorado Springs" is primarily in the area of the city that has a significant number of bicyclists. Most cyclist of all levels enjoy the West side for many reasons. There are some relatively low cost infrastructure solutions to improve the safety of the cyclist in this area.

This area is consistent with the Colorado Springs Bike Master Plan HIGH PRIORITY area.

2. BACKGROUND: Bicycling in Colorado Springs

Colorado Springs is know as “Olympic City USA” and the headquarters of USA Cycling (located on the West side of Colorado Springs). Colorado Springs is where many elite cycling athletes either live or come here to train. Just to name a few: Mari Holden, Olympic silver medalist. Allison Dunlap, World Mountain Bike Champion. Gail Longenecker, International competitor, completed the grueling International event, Le Tour de Femina (the equivalent to the men’s Tour de France). Sarah Hammer-Kroening, 4 time Olympic silver medalist. Mary Clark, para-cyclist won 5 gold medals competing against non-para cyclist in the National Senior Games.

In addition to these elite cyclists, there are many other types of cycling enthusiasts. They include Kids on Bikes, family cyclists (moms and dads with their kids), BMX, mountain bike, gravel bike, electric bikes, para-cyclists, commuter cyclists, armature and advanced road bike riders, local and national elite competitive cyclists, and more.

There are basically three categories of commuter cyclists. 1) People that are concerned about the environment. 2) People that exercise to stay healthy (which reduces the financial burden on the health care system). 3) People that do not own a car.

All of these cyclist contribute substantially to stimulating the economy when they purchase bikes, clothing, eat at restaurants, stay in hotels, and support local businesses, and rely on bike shops for repairs, just to name a few. While an entry level bicycle may cost a few hundred dollars and road bike enthusiasts spends several thousand, an elite bicycle can cost over $10,000. Testimony given to the State House and Senate that lead to the “3-foot passing law” included the awareness of the $1 billion in retail sales (circa 2001), each year, relating to bicycling in the State of Colorado. Bicycle safety and infrastructure are major factors for sustaining and stimulating the economy.

Bicycle infrastructure is critical to the safety and well being of people that ride bikes. Pedestrians and people with disabilities using wheelchairs also benefit from shared designs. Bicycle infrastructure does not need to cost a lot to protect people. Good, safe designs can be implemented during construction. Guidelines should be developed for consistency.

This collective community including cycling, pedestrian, and ADA wheelchair users need properly designed and safe infrastructure.

3. BACKGROUND: Circumstances triggering this proposal

1. The recent death on November 8, 2020, of an experienced bicyclist heading south from Garden of the Gods Rd. on Centennial Blvd. There are numerous bicycle infrastructure hazards in this location that are pointed out in the details of this document.

2. There are far too many bicycle infrastructure hazards in and around the City especially in the area of this proposal. Some examples with details are pointed out in this document. These infrastructure improvements are suggestions to the City and to the various jurisdictions who are responsible for roads, trails, and parks. While it is nice to see the addition of trail systems and their interconnectivity, there is still too little to no attention to the safe transition from one trail system to the next (i.e. road to trail).

3. A proposal has been submitted by a developer for a Master Plan amendment, Zone Change, and Concept Plan to **initially** add 450 high-density, multi-family housing units at 2424 Garden of the Gods Rd. along N. 30th St. Currently, there is an office building with predictable traffic flows that typically go in and out of the property 5 days a week, at the beginning of the business day, fewer at lunch, and at the end of the business day. Adding residential housing, with an estimated addition of 1,100 people in the initial phase will place traffic on the road 7 days a week at unpredictable hours typically ranging from 6:00am to 10:00pm. The Traffic Impact Study for this project did not address bicycle safety. The Study only addressed motor vehicles and bicycles/peds in crosswalks. Most cyclists ride on the road.

4. The roads and trails in the area are already hazardous in their current state. There are too many Crash Points and Near Crash Points where a cyclist and a car can collide that can be mitigated with relatively low cost solutions. The quality of life for the cyclists, pedestrians, and ADA wheelchair users can be enhanced with these improvements. And, the financial burden from crashes on the users of these roads and multi-purpose trail systems can be minimized with safer facilities.

4. Summary of Suggested Bicycle Infrastructure Standards

1. Mountable curbs: No vertical curbs
2. Sweeping turns: No turns greater than 45 degrees.
3. Road Maintenance: Create a plan for sweeping bike lanes. To optimize, identify and focus on problem areas. Sweeping bike lanes does not have to be a 24/7 task. The benefits of sweeping the bike lanes are; 1) the cyclist is much more likely to stay in the bike lane, 2) the flow of motor traffic is less impeded, 3) the frequency and cost of punctured tires is reduced, 4) less damage is sustained to the road when vehicles compress rocks and other debris into the asphalt resulting in the creation of potholes.
4. Continuity and safe transition between trail systems.
5. Appropriate signage – especially in high risk areas.

5. Examples of unsafe bicycle infrastructure

This cyclist was heading north on N. Cascade Ave. and turning right onto the Templeton Gap Trail. As he attempted to negotiate a right turn, he crashed and sustained a 1/3 laceration to his Achilles tendon.

In a previous accident, at this same intersection, a female cyclist, attempting to make the same turn, crashed an broke her wrist.

These were both experienced cyclists. Can you imagine how many more accidents happen at this transition point from road to trail?

This road/trail intersection that is controlled by two jurisdictions. This is an ill-designed transition.

In the current situation, a cyclist heading north on N. Cascade Ave. intending to make a right turn must first steer the bike to the left along the “S” shape connector and is then forced to make an extreme right turn (approximately 135 degrees) onto an uphill surface that is too narrow for a standard size road bike to negotiate.

To improve this situation, the top of the connector should be in a “Y” configuration to create a smooth flow for the cyclist as shown in the third diagram. Cyclist from any direction have a safer experience.

This cyclist was heading south, on N. Nevada Ave north of the intersection of Garden of the Gods Rd. in the perceived bike lane. She briefly looked over her left shoulder to validate her position with the vehicular traffic and immediately focused back on the road when, to her surprise, there were concrete parking barriers just inside of the 4 inch fog line that delineates the vehicle lane from the perceived bike lane. She hit the concrete structures, flew over her handlebars and ended up in the hospital with only a broken hand and a little road rash. She was lucky not to have crashed into the flow of traffic.

To correct this situation, the concrete structures should be moved an appropriate distance from the 4" fog line to ensure continuity of the perceived bike lane.

This road cyclist was heading north on S. 8th St near the intersection of Motor City Dr. She was traveling in the designated bike lane when at the last second, she hit a road hazard that blended in with the road surface. She sustained severe road-rash to her face, arm, and other parts of her body.

In 2016 a meeting with the City's Director of Road Maintenance was held with a collective group of bicycle organizations. At that time, he had 11 dysfunctional street sweepers. He informed the group he was replacing them with 11 new leased sweepers. He confirmed that one street sweeper traveling at 3 MPH could clear all of the bike lanes in Colorado Springs in two weeks. However, he could not commit a plan to keeping the bike lanes cleared. He was concerned the motorists would think he was favoring cyclists. The response to the Director was, if the bike lanes were cleared, the motorists would be happier that the cyclist would be able to stay in the bike lanes.

Damage to bicycles are inconvenient and costly when they run over glass and other debris in the bike lanes. Keeping the bike lanes cleaner makes it safer for the cyclist, less costly to the cyclist, and reduces traffic impediment.

Debris in the road has causes a blow out of the front tire, which resulted in a crash, putting the cyclist in the hospital with a concussion and a broken collarbone.

This example is of an experienced cyclist that was heading south on Centennial Blvd. from the Garden of the Gods Road. He was intending to continue east onto the Sinton Bike Trail. This maneuver typically requires the road bike cyclist to exit the bike lane, cross over the buffered bike lane, and then cross over two traffic lanes, to get into the left turn traffic lane while cars are driving on a 35 MPH posted speed limit. During the busy hours, this maneuver is much more dangerous.

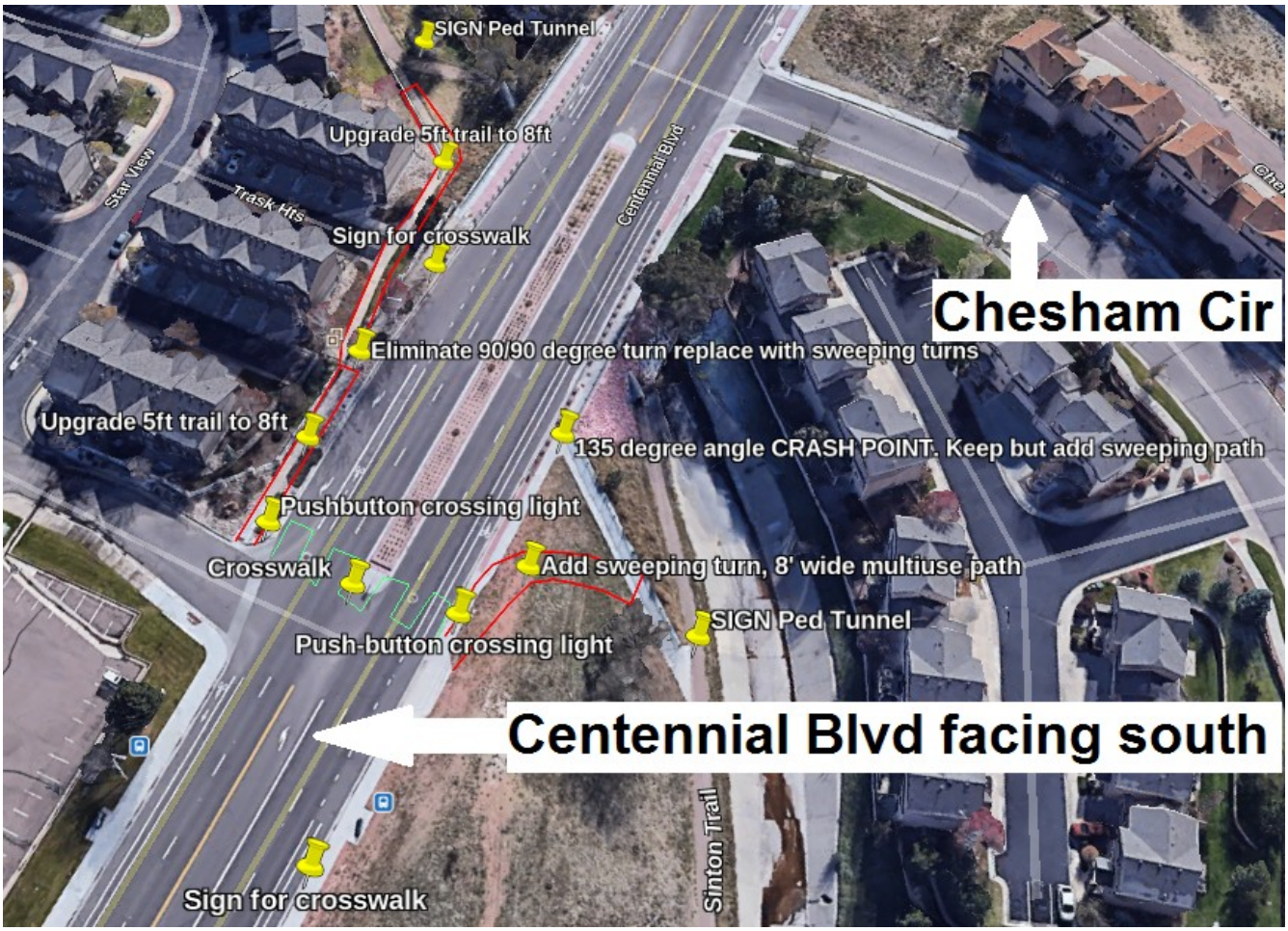
Had there been better bike infrastructure and continuity of the Sinton Bike Trail, this crash may not have happened.

6. SUMMARY: Examples of unsafe bicycle infrastructure

How many crashes and near crashes go unreported?
How much financial damage to equipment and clothing is sustained when a bike crashes?
What is the cost of medical expense from a crash?
Does the cycling / pedestrian / wheelchair users have to wait until there is a fatality until identified hazardous infrastructure improvements are made safer.

7. Proposal for Improvements: Centennial Blvd & Sinton Trail

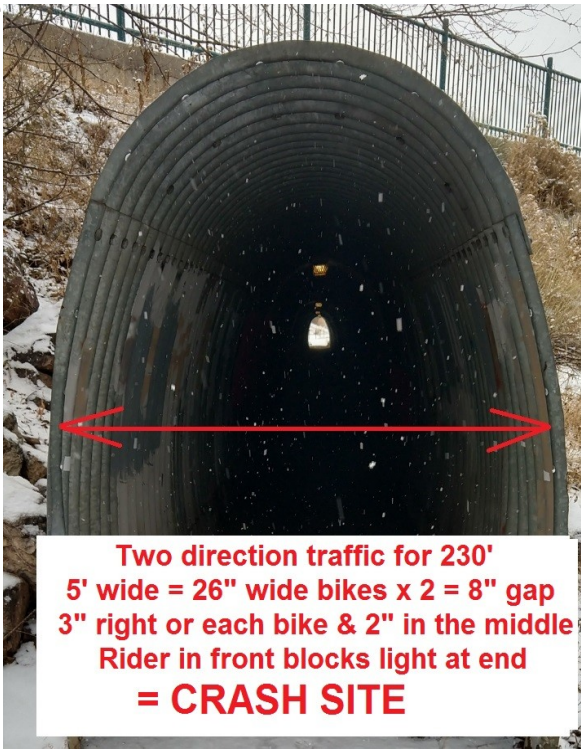
This map is oriented facing south. The location is south of Garden of the Gods Rd. on Centennial Blvd. where the Sinton trail extends from the bottom right of the map to the upper center, heading in an eastward direction.

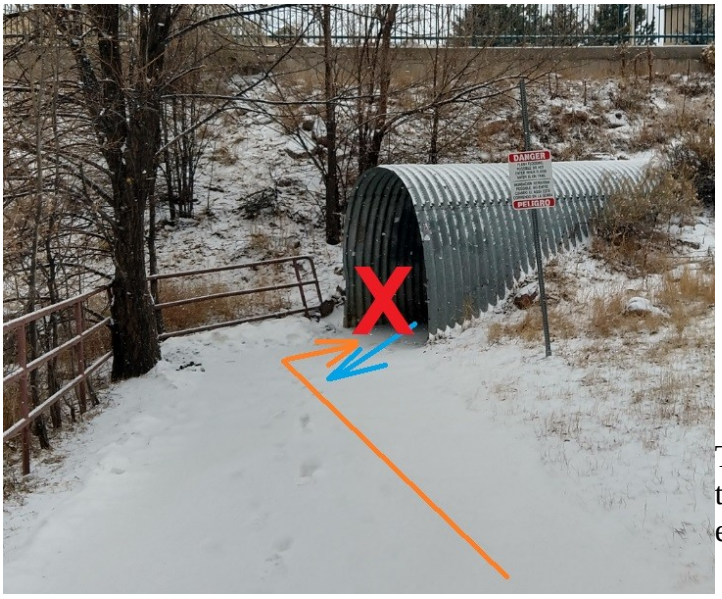


ADD CROSSWALK WITH PUSH-BUTTON CROSSING LIGHT, APPROPRIATE SIGNAGE, REPLACE ALL TURNS GREATER THAN 90 DEGREE WITH SWEEPING TURNS, WIDER MULTI-USE CONNECTING TRAILS, REPLACE VERTICAL CURBS WITH MOUNTABLE CURBS, REPLACE ROCK LANDSCAPING WITH CRUSH STONE, IMPROVE TRANSITION FROM CONNECTOR TRAILS TO MAIN SINTON TRAIL, POST “TUNNEL CROSSING FOR PEDESTRIANS ONLY”.

Unfortunately, this is the location where a cyclist was recently hit by a car as he was heading south on Centennial Blvd. with the intent to cross over to the left to continue on to the Sinton Trail heading east. Having a crosswalk with a push-button light crossing, would be a safer alternative than crossing over the buffered bike lane, two traffic lanes, and into the third, left turn lane especially during busy hours with the posted 35 MPH speed limit.

(The photo on the right is looking east to west) There have been numerous crashes in this tunnel that crosses under Centennial Blvd. (presuming this is the official Sinton Trail route). This is due to many reasons including long, narrow, dark, full of debris and glass that puncture the tires, cyclists not able to take off their sunglasses after entering the tunnel, cyclists that get claustrophobic, cyclists or pedestrians coming from the opposite direction, etc.





The above picture demonstrates that 2 bicyclist traveling in opposite directions do not have enough room. This is a CRASH SITE.

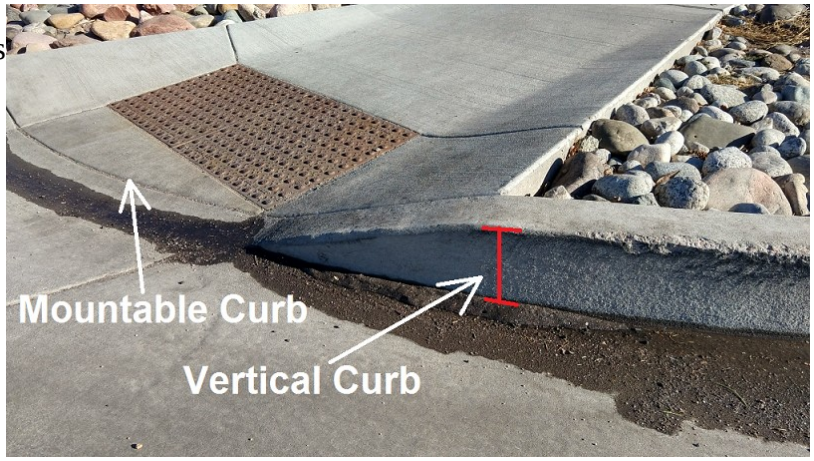
The above picture on the left is also looking east to west. It has a very sharp right turn for the orange cyclist. The orange cyclist must swing to the left before entering the tunnel. The blue cyclists needs to swing slightly to their left to prepare for their sharp left turn. The crash site is marked with a red “X”.

Most tunnels are magnets for the homeless. Other tunnels in the City have homeless people blocking the tunnel including their possessions which are spread out inside the tunnel. Fortunately, this tunnel has not had any indications it is occupied by homeless people.

One could argue for the continued use of tunnels that the cyclists should dismount and walk through the tunnel. This is inconvenient and discourages especially for commuters that are trying to get to their destination in a timely manner. And, it is dangerous for cyclists that wear cleats since they can easily slip on smooth surfaces and/or damage the cleat when walking long distances on rough surfaces. By having a surface crossing, a benefit is it is easier for cyclists to see debris and glass that could cause the tire to puncture.

In its current state, the unofficial (since there are no crosswalks) surface crossing is extremely hazardous. However, for most cyclist, the surface crossing, even though it is hazardous, it is less of a danger than the tunnel. Cyclist and pedestrians, wait on either side of the street as traffic is zooming by in 4 lanes going the 35 MPH posted limit. When traffic is really bad, cyclist and pedestrians cross halfway and wait in the median strip until it is safe enough to make a mad dash to get to the other side.

As seen in the proposed Sinton Trail crossing diagram, there are many more hazardous than most people do not realize. For instance, using mountable curbs vs vertical curbs. The City is starting to use vertical curbs near crossings which are an extreme hazard to cyclists and also inconvenient to ADA wheelchairs. When a cyclist hits a vertical curb, this almost always presents a crash situation. Additionally, hitting a vertical curb will damage the tire, tube, and bend the rim which is an inconvenience and financial burden to the cyclist. To enter these vertical curb transitions, the cyclist must use more advanced skills to align themselves in order to head directly, in a parallel manner, onto the new route. In other works, it is like making a very sharp 90 degree turn. Vertical curbs should be avoided at all cost around bike facilities including intersections and curbs that are parallel to the multi-use trails.



The following is a list of suggested infrastructure at this location which improves safety.

1. Push button crossing lights. If there is no traffic, bikes/pedestrians (peds) can cross without having to wait for a traffic signal. With high volumes of motorists, the bike/peds can safely cross with the push button.

2. Signs to warn the motorists of the bike/ped crossing. Obvious.

3. Painted crosswalks across Centennial. This helps the motorist know where to stop. And the bike/peds, where to cross safely.

4. Mitigate the 135 degree turn on the right side of Centennial Blvd. to the Sinton Trail heading west. The cyclist (pictured earlier) with the lacerated Achilles tendon crashed at a different location with the same hairpin turn configuration. Many experienced cyclist struggle at this 135 degree intersection. Please note, do not remove that path -- bike/peds continuing up (actually south) will continue to use this approach. Add a sweeping path indicated by the red parallel lines from Centennial Blvd. down to the right (actually west) onto the Sinton trail.

5. The narrow sidewalk, next to the apartments, which is currently only wide enough for pedestrians, needs to be widened into a multi-use trail. This allows for bike/ped traffic to proceed in both directions at the same time without disruption.

6. Replace the back-to-back 90 and 90 degree turns next to the apartments with sweeping turns. Pedestrians can make this maneuver but cyclists have a very difficult time -- resulting in crashes and near crashes.

7. Replace the vertical mount curbs for mountable curbs at all street to trail locations (adapt this design for the entire City and trail systems). See the picture above. When there is a vertical mount curb, cyclists (and people in wheelchairs) have to "thread the needle", that is to say, they must align themselves more parallel to the trail they are turning onto. Otherwise, they run the risk of hitting the vertical mount curb, scuffing a hole in the tire and tube, bending the rim, and crashing.

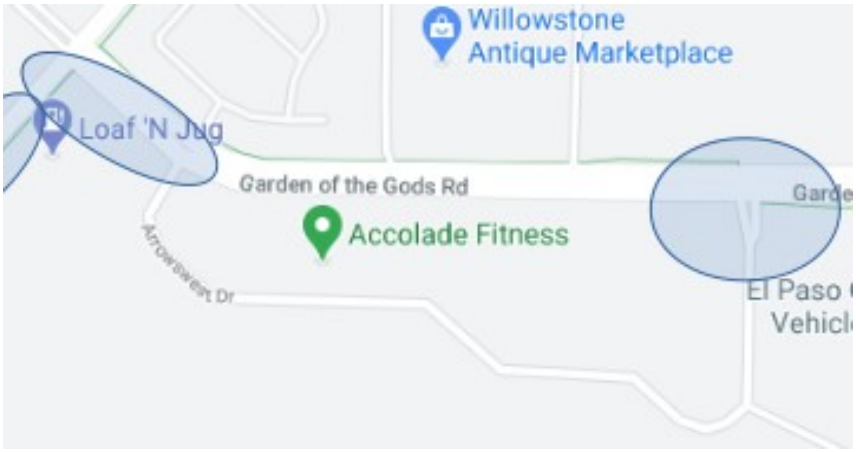
8. Replace the large stones along the multi use paths (see the photo above with the stone) with surface level material (crushed stone, grass, other). If a cyclist veers off into the large stone, they are almost certain to crash.

9. At the top of the picture where the "sidewalk" connects back onto the Sinton trail (heading east), the current transition is hazardous with a large crack to catch the wheel of a bike and large bumps in the pavement. When trying to negotiate the turn and looking right to make sure no one is coming out of the tunnel, it is easy to hit the crack or bump and lose control of the bike.

10. Put signs up at the intersections before the tunnel indicating "This tunnel is for pedestrian use only".

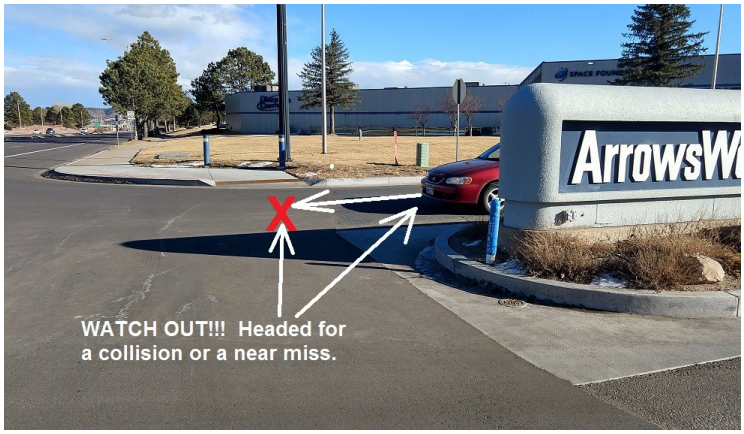
11. Add trail signs at both sides of the Centennial crossing to let unfamiliar bikes/peds know what direction to go to stay on the Sinton trail. All too often there are no directional signs. If a cyclist misses the turn, they end up having to U-turn to get back on course. The U-turn, especially on Centennial Blvd., would be dangerous.

8. Proposal for Improvements: N. 30th St. to Arrow's West on Garden of the Gods Rd.



9. REMOVE OR RELOCATE ARROWSWEST SIGN

This common, near crash site is at the intersection of ArrowsWest Dr. and Garden of the Gods Rd. where the Arrows West sign is located. On the map above, this crossing is in the right blue bubble. NOTE: The current official Sinton Trail is indicated by the green line that crosses over Garden of the Gods Rd. on the north side which then continues west to N. 30th Street.



Many bike clubs and individuals ride on this part of the Sinton Trail from west to east and many times they have close encounters with cars.

When east to west, some cyclist, even though it is wrong, will turn left into the exit lane. It's not clear why they do that but none the less it happens. In this instance, a car that is further from this intersection is quickly approaching which creates a near crash situation.

To correct this, the ArrowsWest sign should either be removed or relocated to a corner making sure it is behind the line of sight of the motorists and cyclists that exit this road onto Garden of the Gods Rd.

10. INSTALL MULTI-USE PATH AND CROSSWALKS

In the picture above, the left blue bubble indicates the location of a missing multi-use trail from the ArrowsWest Dr. exit to N. 30th St. In the picture on the right, the suggested multi-use trail additional is represented by the two parallel red lines. And, a crosswalk as seen at the top of the diagram at the intersection of Garden of the Gods Rd. and ArrowsWest Dr. This will be a beneficial safety enhancement when Red Leg Brewing opens.

Currently, for a trail rider heading West on the Sinton Trail to the Palmer Mesa Trail, the cyclist has to cross over Garden of the Gods Rd., to the north, at the right ArrowsWest Drive cross street and continue West. Once reaching N. 30th St., the cyclist has to cross back over at the intersection at Garden of the Gods Rd. Not only is this inconvenient but it creates two unnecessary street crossings.

By completing the sidewalk that runs along the south side of Garden of the Gods Rd. from the West ArrowsWest Dr. to N. 30th St., the trail riding cyclists eliminates two street crossings, which saves time and is a much safer alternative.

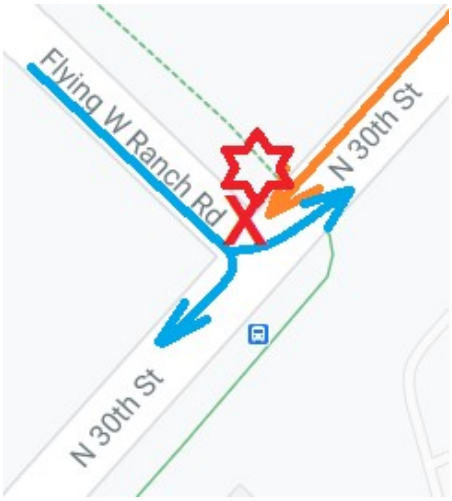
The Sinton Trail that is on the north side of Garden of the Gods Rd. should remain for cyclists that want to turn right onto N. 30th St and head north.

Both ArrowsWest Dr. intersections are currently missing painted crosswalks. These crosswalks should be installed to make it safer and to indicate the continuity of the Sinton Trail.

11. Proposal for Improvements: Mesa Rd. to Flying W. Ranch Rd.

12. HIGH RISK CRASH SITE #1: (NOTE, a High Risk Crash Site also implies a Near Miss Crash Site.) The map on the right is oriented north showing N. 30th St running north and south. Garden of the Gods Rd is intersecting N 30th St. And, Flying W. Ranch Rd is near the top right corner. This maps shows High Risk and Known crash sites.

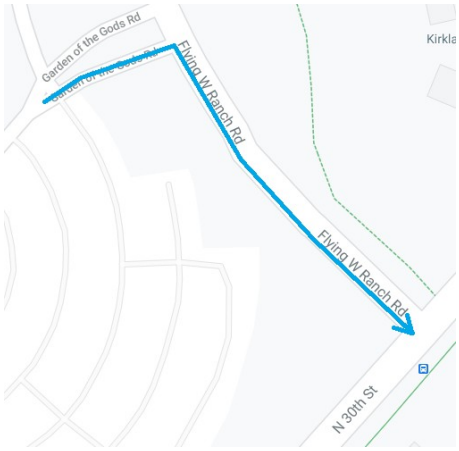
Cars (represented in blue on the map) traveling southeast on Flying W. Ranch Rd. with the intent of making either a left or right turn are entering a High Risk area primarily due to the metal railing as looking left in the photo above. But, also due to the grassy vegetation. The metal railing, especially, camouflage the cyclist. The location of these obstructions are depicted in the image on the right as a red star.



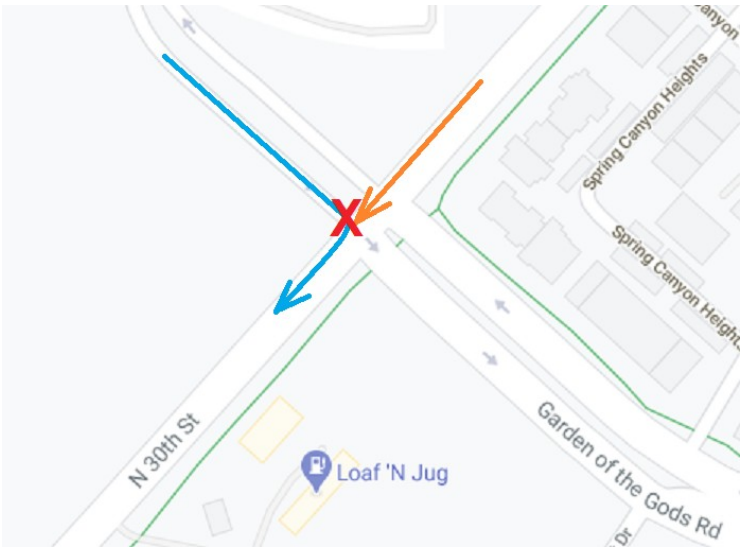
As the orange cyclist is heading southwest on N. 30th St. the blue car that is stopped in the intersection does not see any oncoming motorist or apparent cyclists, that may be camouflaged with the metal railing. The blue driver precedes to make either a left or right turn.

There are residents in this neighborhood that have elected to enter N. 30th Street from Champagne Dr. which is one block north on N. 30th St. just to avoid a potential crash.

Adding high-density multi-family residential units as proposed in the developers 2424 Garden of the Gods Rd. project Concept Plan with an estimated 1,100 additional residents will exacerbate this already High Risk Crash Area. The image on the right shows the path of the proposed residents.



13. HIGH RISK CRASH SITE #2: This map is oriented north at the intersection of Garden of the Gods Rd. and N. 30th St.



Currently this is a low risk crash site since the facility at the 2424 Garden of the Gods Rd. is occupied by office personnel. The traffic created by office workers is mostly 5 days a week and usually high in the morning, moderate around the noon hour, and high at the end of the business day.

A developer submitted a proposal, for the initial phase, to develop 450 high-density, multi-family residential units that could increase the population in this area by 1,100 people.

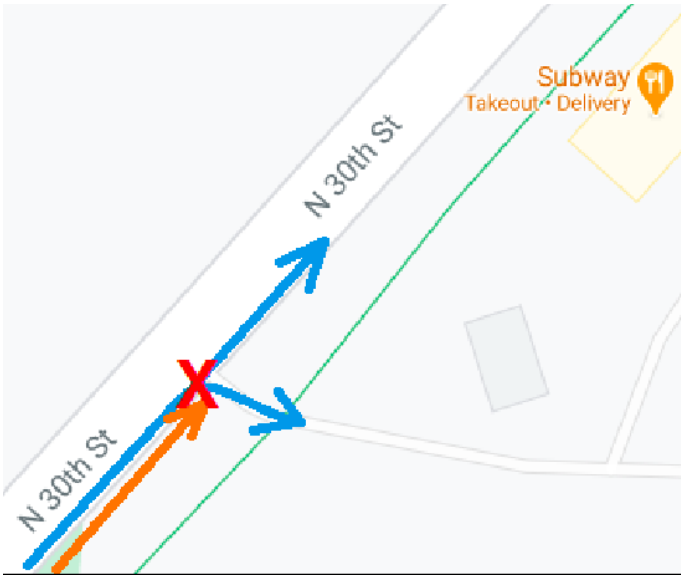
Residential people will increase the traffic in this area. And, most importantly the traffic will extend from 5 days per week to 7 days per week. The predictable busy times of the business day will be extended to as early as 5:30a.m. till 11:00p.m.

The introduction of a large number of residential people will increase the crash risk. The "right turn on red" scenario is the biggest concern. Cyclist are much smaller than cars and are much more difficult to see. An anxious driver could easily overlook the cyclist and proceed to make their right turn. The crash point is indicated by a red "X" in the diagram.

This crash scenario is also caused from a miscalculation of the cyclists speed on the driver's part. The cyclist depicted by the orange line can easily achieve speeds of 20 MPH since this section of the road is slightly downhill and many times the wind is at the riders back. So, on one day, driver A may see a slower cyclist and get frustrated that they are having to wait too long. On a different day the same driver A may see another cyclist, anticipate that they too are traveling slow; but not realizing they are actually going much faster. So the driver decides to proceed to make the right turn. And the crash or near scenario is executed.

14. HIGH RISK CRASH SITE #3:

The map is oriented north. This High Risk Crash Site is located immediately south of the Garden of the Gods Rd. and N. 30th St. The Subway includes the Loaf N Jug.

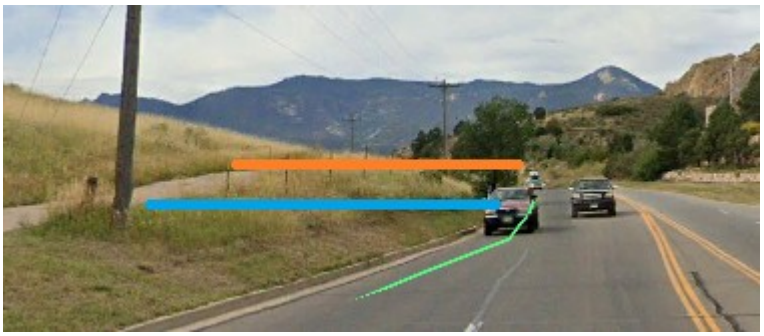


The specific crash site is located at the "Private Driveway" intersection where cars turn in to access the Loaf N Jug.

Since the continuity of bike routes in this area is confusing, mountain bike riders and hikers are commonly seen riding across the land at this posted "Private Property, No Trespassing" location to gain access to and from the Palmer Mesa Trail. While this is not a safety concern, it demonstrates how confusing and disjointed the trail systems are in this area.

There are several situation that create High Risk crashes at this intersection.

1) The bottom right picture (looking south) shows that the Palmer Mesa Trail (on the left) is elevated above the view of the motorist (blue line). The cyclist (orange line) could easily come to the intersection, stop at the existing stop sign and begin to precede through the intersection just as the driver becomes aware of the cyclist.



Note, as the cyclist and the driver precede in parallel, the line of site for the driver is still impaired.

During the St. Patrick's Day bike event with hundreds of cyclists (a very popular event every year with the exception of Covid), the bike martial at this intersection witnessed dozens and dozens of near misses. Even though this event was supported by motorcycle police, they did not have a presence at this intersection.

2) This is one of the few multi-purpose path / street intersections in Colorado Springs that creates a High Risk / Near Miss crash scenario.

NOTE: According to CDOT, this crash scenario is responsible for the most number of pedestrians deaths in a crosswalk.

The driver's view of the pedestrian, or in this case the cyclist is obstructed by the car pillar as shown in the picture on the right. The result is a crash or near miss.

To reduce the risk of a crash or near miss, a warning sign should be installed along with a crosswalk.

The image above is looking north on N. 30th St. It is clearly a mistake to install a "Bike Lane" sign and not provide a bike lane. This is the area on N. 30th Street where the width of the road increases from one lane in each direction to two lanes in each direction. At this point, there should be bike lanes, on both sides, that begin where the road widens and continues to Garden of the Gods Rd.

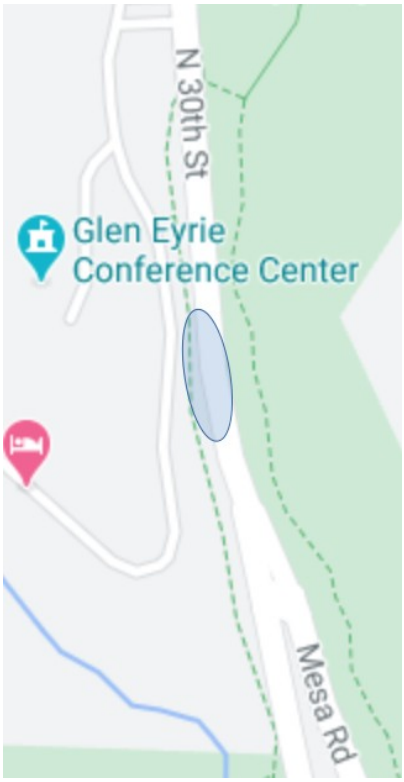
The bike lanes should extended from Garden of the Gods Rd. north to Flying W. Ranch Rd. as shown in the picture on the right with Flying W. Ranch Rd. at the top. And, continued north to Centennial Blvd. This stretch of road has a sufficient amount of traffic to justify the bike lanes.

Adding bike lanes on each side of the road at these locations, increases the driver's awareness of cyclists.

Additionally, because the intersection turning into the Loaf N Jug is so dangerous, special hash striping should be placed in the bike lane at this crosswalk and extended north and north for an appropriate distance.

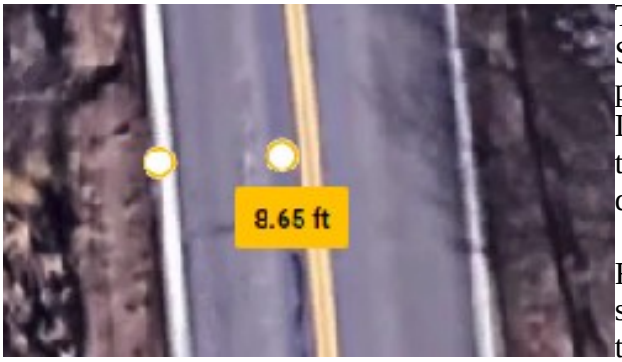
15. KNOWN RISK CRASH SITE #4:

The map on the right shows the area in the light blue oval where the rider crashed. She was heading south on N. 30th St., staying as far to the right as possible, as in the example below. Suddenly, the continuity of the pavement was disrupted. To avoid coming out in the flow of traffic, she crashed and broke her collarbone.



As you can see in the photo to the right, this cyclist is also staying as far to the right as possible. However, are they staying as far to the right as practicable?

The problem with this scenario is the road is too narrow for a cyclist and a car (see the image below of N. 30th St. being 8.65 feet wide). If the cyclists is 26 inches from elbow to elbow, and there is a 3 foot passing law, that's a little over 5 feet. That means the car can only be 3.6 feet wide to pass. And, that is, obviously not the case.



The cyclist is anticipating that the car will pass. Staying too far to the right signals the motorist to try to pass. In Bicycle Colorado's, "Bicycle-Friendly Driver" training, they point out that by riding too far to the right when the lane is too narrow is more dangerous than "taking the lane".

Far too often, inexperienced cyclists believe they must stay as far to the right as "possible" instead of as far to the right as "practicable".

The photo on the right is interesting to say the least. After Vindicator Dr. was resurfaced there was either a lack of quality control or the contractor did not follow the engineering design.

The first fog line (aka 4" white line) was placed 16" away from the curb's edge. This is clearly not enough for a bike lane.

Removing the first fog line before installing the correct fog line would cause too much damage to the road. So the second fog line was added.

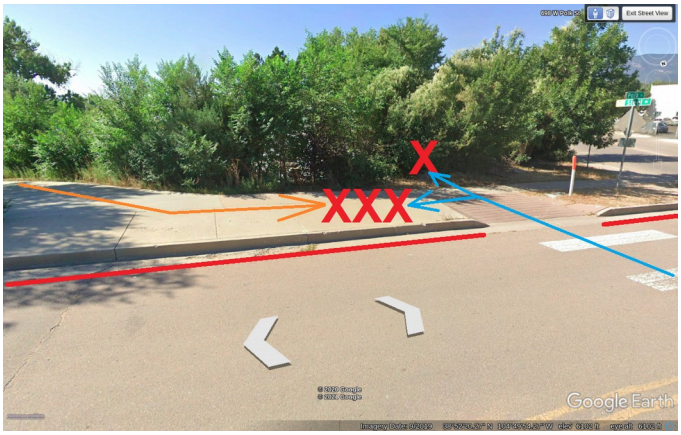
The hazardous condition with this scenario, where the bike lane is too narrow the cyclist is subjected to riding on the fog line. When it rains it creates a hazardous condition. The Olympic Training Center Velodrome has lines painted on the track surface primarily for passing guidelines. Before the velodrome was covered, races would be postponed shortly after it started sprinkling. WHY? Because when there is water between a bicycle tire and the painted surface, it becomes very slippery, which leads to crashes.

Unfortunately, to mitigate the double line situation on Vindicator Dr. would be too costly. Therefore, it is suggested to implement better quality control measures to prevent costly and dangerous mistakes.

Getting back to the unsafe condition on N. 30th St. between Mesa Rd., heading north, to N. 30th St. where it transitions from one lane in each direction to two lanes in each direction. To minimize this hazardous condition, the use of sharrows should be implemented along with locating the "share the road" signs to more suitable locations. And, consider reducing the posted speed limit from 35 MPH to 30 MPH on this short section of road. By reducing the speed, it will set driver expectations.

16. Other High Priority Safety Improvements at W. Polk St. and Steel Dr.

17. REPLACE VERTICAL CURB WITH MOUNTABLE CURB & EXTEND CROSSWALK.



This crash site is located at the intersection of W. Poke St. and Steel Dr., looking south on the Monument Creek Trail.

Not only is this a major bottleneck, it is also a serious crash site and near miss crash site.

The current condition shows vertical curbs with the RED line along the street and curb. The mountable curb for the cyclists (and wheelchairs) is very narrow, forcing the blue cyclist into a perpendicular alignment before the upcoming left turn. As the cyclist is exiting the crosswalk, they must make an immediate 90 degree left turn. This is very difficult for most riders. Cyclists have ended up crashing into the bushes as indicated by the smaller red “X”.

Assuming the blue cyclist makes it through the left turn. There are bushes on the right side that are partially obstructing the view of the oncoming orange cyclist. This crash point is represented by the larger red “X”.

If either of the cyclists are not able to thread their way through this narrow sharp 90 degree turn, the orange cyclist will go off the vertical curb. In most cases, the rider can stay upright. But if their tire is a little low that day, they could end up with a pinch flat.

If the blue cyclist hits the vertical curb, it is almost always a crash situation. If they are lucky, they may only end up with a pinch flat, a scuffed hole in the tire, and a bent rim. Which is worse? Crashing and ending up with a broken wrist, collarbone, and some road rash. Or having to pay a few hundred dollars for a new rim, tube, and tire. This is why vertical curbs should not be anywhere near bicycle infrastructure – including at intersections or along the trails.

To minimize the safety hazards at the W. Poke St. and Steel Dr. intersection, shorten the vertical curb, as indicated, by the red lines running along the road next to the sidewalk. And, replace the removed vertical curb with mountable curbs. Then, extend the crosswalk paint with the first white line the full width of the mountable curb and taper the white lines to the other side of the road to join up with the Monument Creek Trail that is heading north.

18. Conclusion:

The suggestions in this document should be strongly considered for adaption and implementation by all jurisdictions in Colorado Springs that provide parks, trails, and on-street / multi-use paths for cyclists, pedestrians, and ADA wheelchair users.

In addition to reported crashes, there are many unreported crashes, and unreported near misses that have resulted in serious injury or could have ended up as fatalities.

Most of the suggestions in this document are relatively low cost, especially compared to the medical cost and cost to repair damage sustained in a bicycle crash.

As identified in the Colorado Springs Bike Master Plan, this area is already identified as HIGH PRIORITY. Adding high-density, multi-family, residential units will only exacerbate crashes and near crashes.

Appendix A: REPORTED Crashes involving Bicycles 2019-2020

NOTE: This list is a Summary of **REPORTED** Crashes. There are significantly more crashes and near crashes that go unreported.

The first list is of REPORTED crashes involving bicycles near the HIGH PRIORITY area, as identified in the Colorado Springs Bike Master Plan, along Garden of the Gods Rd and N. 30th St., which are in the proposed high-density, multi-family, development area.

NOTE: The crash, highlighted in RED, below resulted in the death of the Mountain Shadows resident.

Seq	Accident Number	Accident Date/Time	Address	GOG or 30th
1	2019-00006612	2/20/2019	530 W GARDEN OF THE GODS RD	Yes
2	2019-00007462	2/27/2019	W GARDEN OF THE GODS RD / W NORTHPARK DR	Yes
3	2019-00021376	6/13/2019	ELKTON DR / CHESTNUT ST	Yes
4	2019-00021487	6/14/2019	3130 N 30TH ST	Yes
5	2019-00022939	6/25/2019	3130 N 30TH ST	Yes
6	2019-00028010	8/2/2019	W GARDEN OF THE GODS RD / W NORTHPARK DR	Yes
7	2019-00046303	12/12/2019	W GARDEN OF THE GODS RD / W I 25	Yes
8	2020-00001991	1/8/2020	W GARDEN OF THE GODS RD / W BUCKINGHAM DR	Yes
9	2020-00008136	2/24/2020	CENTENNIAL BLVD / VINDICATOR DR	Yes
10	2020-00019007	5/28/2020	W GARDEN OF THE GODS RD / W I 25	Yes
11	2020-00022974	7/2/2020	W GARDEN OF THE GODS RD / W RUSINA RD	Yes
12	2020-00025698	7/25/2020	3130 N 30TH ST	Yes
13	2020-00027046	8/5/2020	NORTHPARK DR / GARDEN OF THE GODS RD	Yes
14	2020-00028357	8/16/2020	I 25 / GARDEN OF THE GODS RD	Yes
15	**2020-00038804**	**11/8/2020**	**CENTENNIAL BLVD / HIGH TECH WAY**	**Yes**

The following list is of all REPORTED crashes involving bicycles from 2019-2020.

Seq	Accident Number	Accident Date/Time	Address	GOG or 30th
1	2019-00001137	1/9/2019	W COLORADO AVE / W 15TH ST	
2	2019-00001553	1/12/2019	N ACADEMY BLVD / N CAREFREE CIR	
3	2019-00004485	2/4/2019	3526 N CASCADE AVE	
4	2019-00006612	2/20/2019	530 W GARDEN OF THE GODS RD	Yes
5	2019-00006940	2/22/2019	N TEJON ST / N DEL NORTE ST	
6	2019-00007462	2/27/2019	W GARDEN OF THE GODS RD / W NORTHPARK DR	Yes
7	2019-00008675	3/8/2019	N CIRCLE DR / N UNION BLVD	
8	2019-00009133	3/12/2019	N UNION BLVD / N CONSTITUTION AVE	
9	2019-00010950	3/27/2019	N NEVADA AVE / N COLUMBIA ST	
10	2019-00011692	4/2/2019	WOOTEN RD / GALLEY RD	
11	2019-00012123	4/5/2019	EASTMEADOW DR / CHEYENNE MEADOWS RD	
12	2019-00012211	4/6/2019	VOYAGER PKWY / MIDDLE CREEK PKWY	

Seq	Accident Number	Accident Date/Time	Address	GOG or 30th
13	2019-00012935	4/12/2019	TESLA DR / UINTAH ST	
14	2019-00012948	4/12/2019	4880 N NEVADA AVE	
15	2019-00013585	4/16/2019	S CAREFREE CIR / S AVONDALE DR	
16	2019-00014142	4/20/2019	4100 HIDDEN CIR	
17	2019-00014534	4/23/2019	N CASCADE AVE / N FILLMORE ST	
18	2019-00015282	4/29/2019	S NEVADA AVE / S CUCHARRAS ST	
19	2019-00017573	5/16/2019	S TEJON ST / S RIO GRANDE ST	
20	2019-00017751	5/17/2019	W COLORADO AVE / W ANTLERS PL	
21	2019-00018410	5/22/2019	S ACADEMY BLVD / S CHELTON RD	
22	2019-00018457	5/22/2019	S CIRCLE DR / S MONTEREY RD	
23	2019-00019264	5/28/2019	MT WERNER CIR / EL PASO AVE	
24	2019-00019458	5/29/2019	GALLEY RD / BRANDING IRON DR	
25	2019-00020021	6/3/2019	3536 N CAREFREE CIR	
26	2019-00020753	6/8/2019	E PLATTE AVE / E CIRCLE DR	
27	2019-00021073	6/11/2019	E LAS VEGAS ST / E NEVADA AVE	
28	2019-00021376	6/13/2019	ELKTON DR / CHESTNUT ST	Yes
29	2019-00021403	6/13/2019	S I25 FRONTAGE RD / S LAKE AVE	
30	2019-00021468	6/14/2019	400 N POWERS BLVD	
31	2019-00021487	6/14/2019	3130 N 30TH ST	Yes
32	2019-00022939	6/25/2019	3130 N 30TH ST	Yes
33	2019-00023016	6/25/2019	N CAREFREE CIR / N PETERSON RD	
34	2019-00023285	6/27/2019	3776 AIRPORT RD	
35	2019-00023349	6/28/2019	200 N MURRAY BLVD	
36	2019-00023509	6/29/2019	830 SEQUOIA DR	
37	2019-00023754	7/1/2019	W PIKES PEAK AVE / W 33RD ST	
38	2019-00024387	7/6/2019	S TEJON ST / S FOUNTAIN BLVD	
39	2019-00024809	7/9/2019	E CIMARRON ST / E WEBER ST	
40	2019-00025843	7/17/2019	1440 N CIRCLE DR	
41	2019-00026141	7/19/2019	E FILLMORE ST / E PROSPECT ST	
42	2019-00026167	7/19/2019	S NEVADA AVE / S I 25	
43	2019-00026410	7/21/2019	2436 E WILLAMETTE AVE	
44	2019-00026623	7/23/2019	S NEVADA AVE / S MILL ST	
45	2019-00027041	7/24/2019	3016 N HANCOCK AVE	
46	2019-00026917	7/25/2019	JET WING DR / ASTROZON BLVD	

Seq	Accident Number	Accident Date/Time	Address	GOG or 30th
47	2019-00027003	7/26/2019	AUSTIN BLUFFS PKWY / DUBLIN BLVD	
48	2019-00027047	7/26/2019	W CUCHARRAS ST / W 24TH ST	
49	2019-00027448	7/29/2019	E PIKES PEAK AVE / E CIRCLE DR	
50	2019-00027574	7/30/2019	S CHELTON RD / S MALLARD DR	
51	2019-00028010	8/2/2019	W GARDEN OF THE GODS RD / W NORTHPARK DR	Yes
52	2019-00028293	8/4/2019	MALLARD DR / MAZATLAN CIR	
53	2019-00028394	8/5/2019	2300 E BOULDER ST	
54	2019-00028596	8/6/2019	510 N MURRAY BLVD	
55	2019-00028868	8/8/2019	603 S 8TH ST	
56	2019-00029563	8/13/2019	2922 W COLORADO AVE	
57	2019-00030002	8/16/2019	E ST VRAIN ST / E WAHSATCH AVE	
58	2019-00030128	8/17/2019	E UINTAH ST / E WEBER ST	
59	2019-00030619	8/20/2019	100 N CASCADE AVE	
60	2019-00031588	8/27/2019	2700 E LAS VEGAS ST	
61	2019-00031734	8/28/2019	CRESTFIELD GRV / CRESTA RD	
62	2019-00031775	8/28/2019	1401 RECREATION WAY	
63	2019-00031992	8/30/2019	1590 W FILLMORE ST	
64	2019-00032152	8/31/2019	S TEJON ST / S NAVAJO ST	
65	2019-00032400	9/2/2019	E BOULDER ST / E UNION BLVD	
66	2019-00032565	9/3/2019	N CASCADE AVE / N CACHE LA POUDRE ST	
67	2019-00032673	9/4/2019	S NEVADA AVE / S MOTOR WAY	
68	2019-00032815	9/5/2019	30 E FILLMORE ST	
69	2019-00033732	9/10/2019	TUTT BLVD / CAREFREE CIR	
70	2019-00034135	9/13/2019	1656 CARMEL DR	
71	2019-00034417	9/16/2019	LAKE AVE / VENETUCCI BLVD	
72	2019-00034916	9/19/2019	E DALE ST / E WEBER ST	
73	2019-00035101	9/20/2019	CROSS CREEK DR / COYOTE CREEK DR	
74	2019-00035241	9/21/2019	EAST HILLS RD / DALE ST	
75	2019-00035251	9/21/2019	N ACADEMY BLVD / N ACADEMY CIR	
76	2019-00035282	9/21/2019	S TEJON ST / S MOTOR WAY	
77	2019-00035508	9/23/2019	BARNES RD / PETERSON RD	
78	2019-00035571	9/23/2019	N ACADEMY BLVD / N CAREFREE CIR	
79	2019-00037003	10/3/2019	W FILLMORE ST / W STRAUS LN	
80	2019-00037588	10/8/2019	N CASCADE AVE / N FONTANERO ST	

Seq	Accident Number	Accident Date/Time	Address	GOG or 30th
81	2019-00037625	10/8/2019	CHELTON CIR / CHELTON RD	
82	2019-00037670	10/8/2019	LELARAY ST / EAGLE VIEW DR	
83	2019-00038221	10/12/2019	N NEVADA AVE / N CACHE LA POUDRE ST	
84	2019-00038502	10/14/2019	S MURRAY BLVD / S AIRPORT RD	
85	2019-00041609	10/31/2019	3000 N CASCADE AVE	
86	2019-00041908	11/9/2019	W COLORADO AVE / W 28TH ST	
87	2019-00041948	11/9/2019	KENOSHA DR / SANDSMERE DR	
88	2019-00041954	11/9/2019	W COLORADO AVE / W WALNUT ST	
89	2019-00042754	11/15/2019	N CASCADE AVE / N SHANGRA LA DR	
90	2019-00042815	11/15/2019	E FILLMORE ST / E CASCADE AVE	
91	2019-00043169	11/18/2019	E FILLMORE ST / E HANCOCK AVE	
92	2019-00045018	12/3/2019	RESEARCH PKWY / WOLF RECREATION PT	
93	2019-00046057	12/10/2019	4880 N NEVADA AVE	
94	2019-00046303	12/12/2019	W GARDEN OF THE GODS RD / W I 25	Yes
95	2019-00046371	12/12/2019	CHANNEL DR / RESEARCH PKWY	
96	2019-00047104	12/18/2019	2600 S CHELTON RD	
97	2019-00047885	12/24/2019	S UNION BLVD / S MEMORIAL DR	
98	2019-00048177	12/27/2019	N EL PASO ST / N BOULDER ST	
99	2020-00001991	1/8/2020	W GARDEN OF THE GODS RD / W BUCKINGHAM DR	Yes
100	2020-00002593	1/13/2020	BABCOCK RD / SILVER SPUR AVE	
101	2020-00003518	1/20/2020	GODDARD ST / KELLY JOHNSON BLVD	
102	2020-00004352	1/26/2020	N 19TH ST / N PLATTE AVE	
103	2020-00004465	1/27/2020	AUSTIN BLUFFS PKWY / SIFERD BLVD	
104	2020-00006466	2/11/2020	S ACADEMY BLVD / S FOUNTAIN BLVD	
105	2020-00006999	2/15/2020	1411 S NEVADA AVE	
106	2020-00007407	2/19/2020	S PROSPECT ST / S PIKES PEAK AVE	
107	2020-00008136	2/24/2020	CENTENNIAL BLVD / VINDICATOR DR	Yes
108	2020-00008279	2/25/2020	COMMERCIAL BLVD / FOUR SEASONS DR	
109	2020-00011679	3/24/2020	N WAHSATCH AVE / N SAN MIGUEL ST	
110	2020-00012891	4/5/2020	S ACADEMY BLVD / S ASTROZON BLVD	
111	2020-00015253	4/26/2020	S TEJON ST / S I 25	
112	2020-00016228	5/4/2020	S UNION BLVD / S ST CLAIRE DR	
113	2020-00017248	5/13/2020	830 VINDICATOR DR	
114	2020-00017905	5/19/2020	1960 S CHELTON RD	

Seq	Accident Number	Accident Date/Time	Address	GOG or 30th
115	2020-00018058	5/20/2020	S 23RD ST / S COLORADO AVE	
116	2020-00018521	5/24/2020	CHEYENNE BLVD / HIGHLAND ST	
117	2020-00018634	5/25/2020	E WILLAMETTE AVE / E PLATTE AVE	
118	2020-00018790	5/26/2020	E FILLMORE ST / E TEMPLETON GAP RD	
119	2020-00019007	5/28/2020	W GARDEN OF THE GODS RD / W I 25	Yes
120	2020-00019031	5/28/2020	S NEVADA AVE / S MOTOR WAY	
121	2020-00019183	5/30/2020	E FILLMORE ST / E EL PASO ST	
122	2020-00019573	6/2/2020	E PLATTE AVE / E WAHSATCH AVE	
123	2020-00019637	6/3/2020	JANITELL RD / CIRCLE DR	
124	2020-00019904	6/4/2020	MAZATLAN CIR / MALLARD DR	
125	2020-00019800	6/4/2020	4600 N UNION BLVD	
126	2020-00020102	6/7/2020	1400 SPORTS DR	
127	2020-00020414	6/10/2020	CONSTITUTION AVE / ACADEMY BLVD	
128	2020-00020958	6/15/2020	270 S TEJON ST	
129	2020-00020970	6/15/2020	3945 N ACADEMY BLVD	
130	2020-00021772	6/22/2020	SABLE CHASE DR / MIRAGE DR	
131	2020-00022095	6/25/2020	N ACADEMY BLVD / N MAIZELAND RD	
132	2020-00022400	6/27/2020	VEHR DR / AIRPORT RD	
133	2020-00022974	7/2/2020	W GARDEN OF THE GODS RD / W RUSINA RD	Yes
134	2020-00022973	7/2/2020	E CIMARRON ST / E NEVADA AVE	
135	2020-00023956	7/9/2020	N ACADEMY BLVD / N SAN MIGUEL ST	
136	2020-00024433	7/14/2020	S NEVADA AVE / S CIMARRON ST	
137	2020-00024974	7/19/2020	HOLMES DR / UINTAH ST	
138	2020-00025536	7/24/2020	E MADISON ST / E NEVADA AVE	
139	2020-00025698	7/25/2020	3130 N 30TH ST	Yes
140	2020-00025747	7/26/2020	I 25 / UINTAH ST	
141	2020-00027035	8/5/2020	BETTY DR / VAN TEYLINGEN DR	
142	2020-00027046	8/5/2020	NORTHPARK DR / GARDEN OF THE GODS RD	Yes
143	2020-00027592	8/10/2020	N CIRCLE DR / N PLATTE AVE	
144	2020-00030403	8/10/2020	GARDEN DR / RAMPART RANGE RD	
145	2020-00028044	8/13/2020	N NEVADA AVE / N MOUNT VIEW LN	
146	2020-00028357	8/16/2020	I 25 / GARDEN OF THE GODS RD	Yes
147	2020-00029034	8/21/2020	SHIMMERING CREEK DR / DUBLIN BLVD	
148	2020-00029074	8/22/2020	N CIRCLE DR / N BIJOU ST	

Seq	Accident Number	Accident Date/Time	Address	GOG or 30th
149	2020-00029722	8/27/2020	500 W COLORADO AVE	
150	2020-00029916	8/28/2020	N 24TH ST / N KIOWA ST	
151	2020-00030347	9/1/2020	2500 W WOODMEN RD	
152	2020-00030563	9/2/2020	E PLATTE AVE / E SWOPE AVE	
153	2020-00030827	9/4/2020	N 18TH ST / N PIKES PEAK AVE	
154	2020-00031883	9/13/2020	N ACADEMY BLVD / N LEHMAN DR	
155	2020-00033505	9/24/2020	S 33RD ST / S COLORADO AVE	
156	2020-00033270	9/25/2020	RESEARCH PKWY / LEXINGTON DR	
157	2020-00034270	10/2/2020	VICKERS DR / VISTA RIDGE PT	
158	2020-00035130	10/9/2020	S 8TH ST / S MORENO AVE	
159	2020-00035138	10/9/2020	1205 E LAS VEGAS ST	
160	2020-00035269	10/11/2020	E WOODMEN RD / E AUSTIN BLUFFS PKWY	
161	2020-00036953	10/24/2020	GARDEN LN / BECKERS LN	
162	2020-00038297	11/4/2020	S NEVADA AVE / S LAS VEGAS ST	
163	2020-00038742	11/7/2020	S ACADEMY BLVD / S FOUNTAIN BLVD	
164	2020-00038804	11/8/2020	CENTENNIAL BLVD / HIGH TECH WAY	Yes
165	2020-00043638	12/16/2020	800 S 8TH ST	

Bicycle Safety
End of Report