EXECUTIVE SUMMARY:

In 2016, the City of Boulder received federal Highway Safety Improvement Program (HSIP) funding from the Colorado Department of Transportation (CDOT) for improvements at three intersections: Colorado Avenue and Regent Drive, Baseline Road and 29th Street, and Broadway and Rayleigh Road. Staff pursued HSIP funding to help finance improvements at these intersections in support of the city’s Vision Zero goal to eliminate serious injury and fatal crashes on Boulder’s streets.

The purpose of these projects is to reduce crashes between bicycles, pedestrians, and motor vehicles, and to improve the overall safety and comfort of these locations for users of all transportation modes. Two of the locations, Colorado Avenue and Regent Drive and Baseline and 29th Street, were identified in the 2016 Safe Streets Boulder Report as top collision locations involving motor vehicles, bicyclists, and pedestrians. The third project, the intersection of Broadway and Rayleigh, arose from a collaboration between the city and the National Institute of Standards and Technology (NIST) to address a crash trend involving motor vehicles and cyclists.

Proposed improvements at the Colorado Avenue and Regent Drive intersection (Attachment A) will include elements of a protected intersection to improve safety for bicyclists traveling eastbound through the intersection, as well as a protected eastbound bike lane between Regent...
Drive and 28th Street to improve safety and comfort for cyclists. The project will add an additional right-turn only lane on Colorado Avenue between Regent Drive and US36/28th Street to separate vehicles exiting the University of Colorado Boulder (CU Boulder) campus bound for US-36 South from other traffic. This lane will be bookended by two realigned raised crosswalks to slow turning vehicles where they intersect crosswalks and the protected bike lane.

Improvements proposed for the intersection of Baseline Road and 29th Street (Attachment B) will include curb extensions to shorten the crosswalk distance for cyclists and pedestrians, and a raised crosswalk to raise their profile when crossing the intersection and to slow approaching vehicles. These improvements will have the effect of reorienting southbound vehicles on 29th Street on a more perpendicular approach to Baseline Road, improving sight lines between pedestrians, bicyclists and drivers.

At Broadway and Rayleigh Road, proposed improvements (Attachment C) include the addition of a right-turn only lane (with a right turn bypass lane) into the NIST/Department of Commerce property. The addition of this lane will separate vehicles entering this property from other southbound vehicles on Broadway, which is anticipated to reduce an existing trend of rear-end crashes and driver decision-making. A raised crosswalk in the right-turn bypass lane will slow vehicles as they approach the crosswalk, and the orientation of the approach will improve sight lines for pedestrians, bicyclists and drivers. The addition of a pedestrian refuge island will segment the crosswalk into shorter distances across Rayleigh Road.

The project team implemented a community engagement process which included open house meetings, individual meetings with key stakeholders and community organizations. Project information and comment forms were also provided online. The Board was briefed on the project locations during the January 14, 2019 TAB during the monthly Vision Zero program update.

Staff is seeking feedback from TAB before finalizing the project plans and proceeding with final design in 2019 – 2020. Construction is anticipated to begin in 2020 and take roughly three months to complete.

COMMUNITY ENGAGEMENT:

Staff developed a public participation plan (P2 plan) oriented around a “consult” level of engagement (per the International Association for Public Participation). The Colorado Avenue and Regent Drive and Baseline Road and 29th Street projects were discussed with the community at two public open houses in October 2018 and March 2019 and the Board was briefed on these projects in January 2019 during the monthly Vision Zero program update agenda item. Public discussion of the Broadway and Rayleigh Road project was not held at the October 2018 open house because of a delayed planning timeline but was included at the March 6, 2019 open house meeting along with the other intersection safety projects. Members of the public who could not attend the open houses also had the opportunity to comment on the projects via an online comment form available on the Intersection Safety Improvements webpage.

Stakeholder engagement on these projects has included regular meetings and communication with representatives from CDOT, CU Boulder, NIST, and the Community Cycles Advocacy Committee (CCAC). Based on feedback received from the community and stakeholders, staff
has updated the recommended designs to reflect feedback that aligning with the project goals of improving safety and comfort for all modes of transportation.

**BACKGROUND:**

In 2016, the City of Boulder received HSIP funding from CDOT for improvements at three intersections: Colorado Avenue and Regent Drive, Baseline Road and 29th Street, and Broadway and Rayleigh Road. HSIP is a federal funding program that provides funding to state departments of transportation for projects that help achieve a significant reduction in serious injuries and fatalities. Staff pursued HSIP funding to help finance improvements at these intersections because the program aligns with and supports the city’s Vision Zero goal to eliminate serious injury and fatal crashes on Boulder’s streets.

The purpose of these projects is to reduce crashes between bicycles, pedestrians, and vehicles, and to improve the overall safety and comfort of these locations for users of all transportation modes. Two of the locations, Colorado Avenue and Regent Drive and Baseline and 29th Street, were identified in the 2016 Safe Streets Boulder Report as top collision locations involving motor vehicles, cyclists, and pedestrians. The Colorado Avenue and Regent Drive intersection had the highest rate of crashes involving vehicles in the city between 2012 – 2014, and the second highest rate of crashes involving a bicycle or pedestrian in the city for the same time period. In total, 48 crashes occurred at this intersection between 2012 – 2014. All these crashes involved turning vehicles. These crashes included vehicles turning right directly in front of a cyclist (known as a right-hook), crashes involving right-turning vehicles hitting cyclists in the raised crossing and rear-end crashes in the right-turn bypass lane.

The Baseline Road and 29th Street intersection was identified in the Safe Streets Boulder Report as a top location in the city for crashes involving a bicycle or pedestrian. Between 2012 – 2016, 23 crashes occurred at this intersection; over half of the total crashes and nearly all the crashes that resulted in injuries involved cyclists. Most of the bicycle crashes involved conflicts between southbound-turning vehicles and eastbound cyclists riding on the multiuse path. Nearly all the vehicles involved in the crashes were turning right onto Baseline Road heading westbound.

The project at the intersection of Broadway and Rayleigh arose from a collaboration between the city and NIST to address a crash trend involving motor vehicles and cyclists. NIST commissioned a safety study in 2015 to address safety concerns at the intersection; the report that resulted from this study informed the city’s HSIP application and design process. The city conducted a crash analysis that found a total of 13 crashes occurring at the intersection between 2011 – 2016, five of which involved cyclists. The safety study also found four additional crashes occurring prior to 2011, and 11 reported near misses involving cyclists and vehicles between 2008 – 2013.

Proposed improvements at the Colorado Avenue and Regent Drive intersection (Attachment A) include elements of a protected intersection on the west approach to improve safety for cyclists traveling eastbound through the intersection, as well as a protected eastbound bike lane between Regent Drive and 28th Street to improve safety and comfort for cyclists. The project will add an additional right-turn only lane between Regent Drive and 28th Street to separate vehicles exiting
the CU Boulder campus bound for US-36 South from other traffic. Traffic analysis conducted for the HSIP application found that during peak travel times most right-turning northbound vehicles on Regent Drive subsequently turned right at 28th Street to head southbound on US 36. The combination of the protected bike lane and additional turn lane will minimize conflicts between drivers, pedestrians, and cyclists by moving the conflict points to the raised crosswalks, which will be designed to be traversed by motor vehicles at slow speeds. The project will also convert the existing sidewalk on the southside of Colorado Avenue to a multiuse path.

Improvements proposed for the intersection of Baseline Road and 29th Street (Attachment B) will include curb extensions to shorten the crosswalk for cyclists and pedestrians, and a raised crosswalk to raise their profile when crossing the intersection and to slow approaching vehicles. The curb extensions will narrow the lane widths entering and exiting 29th Street and will also reduce the turning radii from Baseline Road. Paired with a raised crossing that is setback from the edge of the pavement on Baseline Road by 14 feet, vehicles turning onto and from Baseline Road will be required to slow down when traversing the raised crosswalk. The crosswalk setback will also require eastbound cyclists to more slowly approach the crosswalk by breaking the straight path that exists today. These improvements will also have the effect of reorienting southbound vehicles on 29th Street on a more perpendicular approach to Baseline Road, improving sight lines between drivers, cyclists, and pedestrians.

At Broadway and Rayleigh Road, proposed improvements (Attachment C) include the addition of a right-turn only lane (with a right turn bypass lane) into the NIST/Department of Commerce property. The addition of this lane will separate vehicles entering this property from other southbound vehicles on Broadway, which staff anticipates reduce the existing trend of rear-end crashes and improve driver decision-making. The recommended design realigns the multiuse path north of Rayleigh Road to break the straight path of cyclists entering the crosswalk; the safety study commissioned by NIST found cyclists entering the crosswalk at higher speeds, which can exacerbate the frequency and severity of crashes. A raised crosswalk in the right-turn bypass lane will slow vehicles as they approach the crosswalk, which will reduce the potential for fatal and serious crashes at this location. The orientation of the approaches for both vehicles and cyclists will improve sight lines for all users at the intersection. The addition of a pedestrian refuge island will also segment the crosswalk into shorter distances across Rayleigh Road, which can be beneficial to slower moving cyclists and pedestrians if they are caught in the crosswalk between traffic light phases.

For community engagement, staff developed a P2 plan oriented around a “consult” level of engagement (per the International Association for Public Participation). The goal of public participation at the consult level is to obtain feedback on the project analysis, alternatives, and decisions and to report how that feedback is used in making project decisions. The P2 plan included a communications strategy, as well as online engagement via the project webpage and online comment forms, two public open houses, and two presentations to TAB. The Colorado Avenue and Regent Drive and Baseline Road and 29th Street projects were discussed with the community at two public open houses in October 2018 and March 2019. Public discussion of the Broadway and Rayleigh Road project was not held at the October 2018 open house because of a delayed planning timeline. After discussion and coordination with the NIST Board of Directors on specific project elements, the project proceeded with conceptual design in early 2019. This
conceptual design was included at a second open house for the HSIP funded projects (as well as the 30th Street and Colorado Avenue and Foothills Underpass projects) in March 2019. Members of the public who could not attend the open houses also had the opportunity to comment on the projects via an online comment form available on the Intersection Safety Improvements webpage. Stakeholder engagement on these projects includes regular meetings and communication with representatives from CDOT, CU Boulder, NIST, and the CCAC.

Based on feedback received from the community and stakeholders, staff updated the recommended designs to reflect feedback aligning with the project goals of improving safety and comfort for all modes of transportation. Specifically, the Colorado Avenue and Regent Drive recommended design originally called for a “floating” bike lane between the new right-turn lane and existing through lane; after receiving feedback from the public and CU Boulder the design was altered to a curbside protected bike lane that crosses the two right-turn bypass lanes at Regent Drive and 28th Street on the raised crosswalks. For Baseline and 29th, the first recommended design from the October 2018 open house showed separate left and right turn lanes and an at-grade marked crosswalk but was revised to a single outbound lane, include curb extensions, and a raised crosswalk.

Regarding Broadway and Rayleigh Road, feedback from NIST employees, leadership, and the community was mixed on the addition of the right-turn lane (with NIST employees and leadership generally supporting the recommendation and community members questioning its necessity). Some commenters proposed converting the outer lane to a right-turn only lane, while others proposed moving the multiuse path west of the intersection closer to the security gate of the property. In both proposals there are considerable safety and transit mobility challenges that could contribute to crashes and bus delays that staff felt contradicted the goals of the project.

**TAB ACTION REQUESTED**

Staff is seeking feedback from TAB before finalizing the project plans for all three intersections and proceeding with final design in 2019 - 2020 and construction in 2020.

**NEXT STEPS**

Following the May 13 TAB meeting, staff will finalize the recommended designs for the intersections of Colorado Avenue and Regent Drive, Baseline Road and 29th Street, and Broadway and Rayleigh Road. Staff will begin final design in 2019 and work through 2020, with anticipated 3 months of construction in Summer 2020.

**ATTACHMENTS:**
- Attachment A: Colorado Avenue and Regent Drive Recommended Design
- Attachment B: Baseline Road and 29th Street Recommended Design
- Attachment C: Broadway and Rayleigh Road Recommended Design
Colorado Avenue and Regent Drive  
Recommended Design

Proposed Improvements Include:

- Install elements of a protected intersection to improve safety for bicyclists traveling eastbound through the Colorado Avenue and Regent Drive intersection.
- Install a protected bike lane to improve safety for cyclists traveling eastbound on Colorado Avenue toward 28th Street/US 36.
- Add an additional vehicle lane to separate vehicles turning right on to Colorado Avenue from Regent Drive and vehicles turning right on to 28th Street/US 36 from Colorado Avenue from other traffic.
- Add a realigned raised crosswalk and multiuse path in place of the existing southside sidewalk.

- Bicyclists pass through the intersection in a separate crossing, and can continue east in a protected bike lane which connects to the 28th St./US 36 multi-use path.
- Bicyclists or pedestrians can also use a new multiuse path in place of the existing sidewalk or continue to use the existing path connecting to the College Ave. underpass
- Drivers turning right on to Colorado Ave. from Regent Dr. yield to bicyclists and pedestrians in raised crosswalk and continue in a new lane.
Baseline Road and 29th Street
Recommended Design

Proposed Improvements Include:

- Reorient the intersection of Baseline Road and 29th Street to create a right-angle intersection and better sight distances for southbound vehicles approaching Baseline Road from 29th Street.
- Improve safety for pedestrians and cyclists by installing a raised crosswalk across 29th Street, which will slow vehicle speeds and improve the visibility of bicycles and pedestrians.
- Add curb extensions to the east and west sides of 29th Street to shorten the crossing distance for bicycles and pedestrians and calm vehicular traffic.
- Drivers traveling south on 29th Street will traverse a raised crosswalk on approach to Baseline Road.
- The raised crosswalk will be set back from Baseline Road to provide space for turning vehicles to wait for a break in traffic.
- Bicyclists and pedestrians approaching the crosswalk from east or west will be in a better position to be seen by drivers in vehicles approaching Baseline Road.
Proposed Improvements Include:

- Add a right-turn only lane in the southbound direction on Broadway to separate vehicles entering the National Institute of Standards and Technology (NIST) property from other southbound traffic.
- Add a raised crosswalk in a right-turn bypass lane to slow vehicle speeds, improve the visibility of bicycles and pedestrians, and shorten the distance to cross Rayleigh Road for bicycles and pedestrians.
- Reorient the multiuse path to align with the new raised crosswalk and crossing island.