



I-70 & Kipling Interchange Planning Environmental Linkage (PEL) Study Purpose and Need Statement 5/22/12

CDOT in cooperation with local communities and other agencies is preparing this Planning and Environmental Linkage (PEL) Study to identify and assess potential transportation improvements at the interchange of I-70 and Kipling Street (SH 391).

The project study limits include I-70 from Ward Road to Wadsworth Boulevard. On Kipling Street, the project limits are 44th Avenue to 51st Place. The I-70 and Kipling Street interchange provides access to well-established commercial and residential areas, as well as areas identified for urban renewal and new transit-oriented development in Wheat Ridge and Arvada.

PURPOSE OF THE PROJECT

The purpose of the I-70 and Kipling Street interchange project is to reduce congestion, optimize operations, improve safety, and accommodate multimodal connections at the I-70 and Kipling Street interchange.

DEFINITION OF THE PROBLEM

The existing design and configuration of the interchange no longer accommodates travel demands. Kipling Street is an important transportation corridor supporting mobility and economic activity in Jefferson County, including the cities of Wheat Ridge and Arvada. Improvements are needed to:

- Meet current and future traffic demands
- Improve operational efficiency of the interchange
- Improve traveler safety through the interchange
- Accommodate multimodal connections

Capacity and Operations

Higher traffic volumes and more frequent congestion issues occur within the study area on Kipling Street north of the interchange and on I-70 east of the interchange. I-70 carries approximately 147,000 vehicles daily east of the Kipling Street interchange as measured by traffic counts taken in 2010. Existing daily traffic on Kipling Street collected for this project south of I-70 is approximately 42,000 vehicles, while north of I-70 the existing daily traffic is about 48,000 vehicles. By 2035, the average daily traffic (ADT) on I-70 is expected to increase about 25% to approximately 184,000 vehicles east of the Kipling Street interchange and the ADT on Kipling Street is expected to increase about 15% to about 55,000 vehicles north of I-70.

The interchange at I-70 and Kipling Street was constructed in 1967. Although it served the communities and traffic conditions when it was constructed, the tight diamond configuration with closely-spaced frontage road intersections can no longer effectively handle current or future traffic demands. Problems at the interchange have the potential to create indirect operational and capacity issues on other local roadways.

Existing traffic operations in the study area were evaluated to determine the level of congestion during the morning and evening hours of peak traffic use. Existing traffic volumes at the interchange create operating

conditions characterized by restricted movements and recurring back ups. Specific movements that currently exhibit operational problems include the westbound turning movements at the Westbound I-70 off ramp and the AM peak traffic backs up along Kipling Street on the southbound approaches to the interchange.

Approximately 15% of drivers making the right turn from the Westbound I-70 off ramp want to turn left at the Kipling Street and 49th Avenue/North Frontage Road intersection, located 375 feet north of the ramp. There are currently signs that indicate the right turn lane as a continuous acceleration lane, but there are right turning drivers that stop in the continuous flow lane in order to wait for a gap in traffic to get to the northbound left turn at 49th Avenue. This reduces the capacity of the ramp signal and causes traffic to queue up the off ramp and onto the I-70 mainline.

Close spacing between frontage road intersections and interchange ramps does not provide adequate distance between traffic signals for traffic to progress through the interchange. Because of the relatively high overall intersection volumes, turn phases and a long signal cycle length are needed during the peak hours. These required signal operations combined with the over-capacity traffic volume conditions create vehicle queues that spillback through adjacent intersections. Traveling through the four traffic signals with queues backing up through intersections requires drivers to slow their speeds through the interchange area, which further limits the capacity of the entire interchange area and adversely affects through traffic on Kipling Street.

South of I-70, the numerous driveways and unrestricted median encourages uncontrolled turns across Kipling Street that both increase potential for conflicts (and accidents) and disrupt traffic flow. Side-by-side opposing left turn lanes introduce multiple conflict points and create confusion because of the uncertainty of when and where drivers will enter the median lanes. In addition, drivers stopped in the turn lanes block the view of traffic in the through lanes, resulting in drivers making unsafe turns across through traffic. All of these conditions contribute to turbulence in the Kipling Street traffic flow and reduce its capacity.

Safety

The proposed action is needed to improve traveler safety through the interchange.

Traffic Safety

The segment of I-70 at the Kipling Street interchange is above the average expected crash rate for the given average annual daily traffic (AADT). The occurrence of rear end crashes on I-70 in the vicinity of the interchange is closely tied to the heavy peak hour traffic volumes on the freeway. Over a three year period from 2008 through 2010, the majority of crashes on the four interchange ramps occurred on the eastbound on ramp and the westbound off ramp and the majority of the crashes were rear end crashes during the PM peak hour. On the westbound off ramp, the majority of the crashes occurred at or near the free flow right turn lane from the off ramp to northbound Kipling Street when the lead vehicle did not utilize the free flow acceleration lane but instead stopped to yield to traffic on Kipling Street. The following vehicle then struck the lead vehicle.

On Kipling Street, rear end crashes are the predominant crash type followed by approach turn crashes and broadside crashes. Many of the accidents along Kipling Street in the study area occur because of

congestion. The following list describes the accident types that occur more frequently than expected in the study area and the potential cause:

- Rear-end accidents – related to congestion and frequent traffic signal through the corridor
- Approach turn and broadside – related to congested intersections, signal phasing, and signal head visibility
- Sideswipes when both vehicles are moving in the same direction – related to short weaving and lane-changing maneuvers

Pedestrian and Bicycle Safety

High traffic volumes and deficient pedestrian and bicycle facilities create safety concerns for pedestrians and bicyclists traveling through the study area. The interchange presents a particular challenge. The sidewalk on both sides of Kipling Street under the I-70 bridge is uncomfortable to use because of the proximity to the bridge piers and congested traffic lanes. The sidewalk on the west side of Kipling Street under the bridge also has steep sidewalk grades.

Over a three year period from 2008 through 2010, along Kipling Street in the study area, there were three accidents involving pedestrians and three accidents involving bicycles. One of the pedestrian and one of the bicycle accidents occurred at the Kipling Street and 44th Avenue intersection. Two of the accidents involving bicycles occurred at the Kipling Street and South Frontage Road intersection. One of the pedestrian accidents occurred at the Westbound I-70 Ramps intersection.

The lack of access control along Kipling Street contributes to pedestrian and bicycle safety concerns. Along Kipling Street, pedestrians and bicyclists must cross many driveways where turning drivers are focused on entering or exiting Kipling Street and are not attentive to potential pedestrian conflicts.

Multimodal Connections

Automobiles, trucks, pedestrians, bicyclists, and buses travel through the I-70 interchange and Kipling Street lacks adequate facilities to accommodate effective connections. Effective multimodal connections provide links between facilities, such as existing sidewalks and multiuse paths, as well as accommodate efficient connections between modes, such as sidewalks at bus stops or multiuse paths leading to/from a rail station.

Pedestrian and Bicycle Facilities

Local and regional plans identify the need for pedestrian and bicycle improvements to the Kipling Street corridor and its crossing of I-70. These needs will become more critical as the volume of pedestrian and bicycle travel increases after the opening of the Gold Line commuter rail station at Ridge Road.

Most of the existing sidewalks within the study area are attached to the roadway curb, not buffered from travel lanes, and are often too narrow to accommodate both pedestrian and bicycle use. The sidewalk on both sides of Kipling Street under the I-70 bridge is uncomfortable to use because of the proximity to the bridge piers and congested traffic lanes. A segment of sidewalk between 44th Avenue and the South Frontage Road on the east side is attached, narrow asphalt in poor condition. There is no sidewalk on the east side of Kipling Street between 50th Avenue and 51st Place.

Transit Operations

Existing transit service on I-70 and Kipling Street in the study area includes local and express bus routes operated by the Regional Transportation District (RTD). RTD also plans to implement commuter rail transit along Ridge Road as part of the Gold Line commuter rail project, planned for completion in 2015. A commuter rail station with associated transit-oriented development is planned at Ridge Road west of Kipling Street. With the opening of the commuter rail as currently planned, the proposed local bus service will remain the same as today. However, ridership for the bus route on Kipling Street serving the new rail station is expected to increase.

Buses, like other vehicles, will experience increased delays traveling through the interchange I-70 and Kipling Street interchange area as traffic volumes increase. Buses also contribute to congestion by regularly stopping in the outside through-traffic lane, causing a temporary reduction in roadway capacity.

I-70 & Kipling Interchange PEL Study Problem Areas and Traffic Volumes

