Innovations in Transportation
Interchange and Highway Design

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Who is Mark Thomas?

• 92 Years in business
• 12 offices/250 staff
• Working with Caltrans Since 1987
INTERCHANGE INNOVATION

1950’s
INTERCHANGE INNOVATION

1970’s
INTERCHANGE INNOVATION

1980’s
INTERCHANGE INNOVATION
DIVERGING DIAMOND INTERCHANGE

Informational Guide

FHWA SA-14-067
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Department of Transportation
Division of Design
Office of Standards and Procedures

DIVERGING DIAMOND INTERCHANGE

INTRODUCTION
The diverging diamond interchange (DDI) also known as a double crossover diamond (DCD) is proving to be an efficient interchange configuration. The DDI is a valuable alternative to the conventional diamond interchange and other service interchange forms such as partial cloverleaf. The primary difference between a DDI and a conventional diamond interchange is the design of directional movements on either side of the interchange.

The DDI design has been shown to improve the operation of turning movements and the flow from the freeway. It significantly reduces the number of vehicle conflicts, vehicles passing, and vehicles-to-vehicle conflicts compared to a conventional diamond interchange. The primary differences between the DDI and a conventional diamond interchange are the design of directional movements on either side of the interchange. Figure 1 shows the key characteristics of the diverging diamond interchange.

By dividing traffic to the left side of the street between the opposing, left-turn movements are removed from the intersection signal phases. For a signalized DDI, conflicts with two phase intervals compared to those at conventional diamond interchanges. The reduction in phase intervals improves overall throughput on the minor road and left-turning traffic and from the freeway. The DDI almost exactly fits cross street with high through movements or heavy left-turners on or off the freeway ramps.

Figure 1. Key Characteristics of a DDI

Source: FHWA-SA-14-067, Design Information Guide

By dividing traffic to the left side of the street between the opposing, left-turn movements are removed from the intersection signal phases.
RIBBON PATH

SECTION 10

WATT AVENUE

OLD OFF-RAMP

NEW OFF-RAMP

ROUTE 50
During Construction

Bicyclists using pedestrian overcrossing.

Post Construction

Low bicycle usage once new trail was constructed

Bicyclists using New Trail.
US 101/Shoreline Blvd
BUS RAPID TRANSIT LANE
BOS On Shoulder Operation

Proposed Auxiliary Lanes

Bus on Shoulder
SO,
WHAT HAVE WE LEARNED?
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