Integrated Vehicle-Based Safety System

Arbitration of Heavy Truck Driver-Vehicle Interface (DVI) Warnings

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by
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16. Abstract

The Integrated Vehicle-Based Safety Systems (IVBSS) program is a four-year, two phase cooperative research program conducted by an industry team led by the University of Michigan Transportation Research Institute (UMTRI). The program goal is to integrate several collision warning systems into one vehicle in a way that alerts drivers to potential collision threats with an effective driver vehicle interface (DVI), while minimizing the number of excessive warnings presented to the driver. Basic program strategies for meeting this objective include systematically managing and prioritizing all information presented to the driver, minimizing the number of system false alarms, and restricting auditory alarms to higher urgency collision conditions.

This report describes the methods and results associated with the integration and arbitration of DVI messages for the IVBSS heavy-truck program. The goals of message integration and arbitration were to 1) support a timely and appropriate response from the driver; 2) avoid contributing to driver errors, distraction, confusion, or information overload; and 3) support the development of an accurate and functional mental model of the IVBSS by the driver.

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Important Note

The "Methods" presented in this document accurately reflect the procedures used by Battelle to develop integration/arbitration rules for the IVBSS HT DVI. However, it is important to note that the "Results" presented in this document, including the Arbitration Rules Table, the Multiple Threat Permutations and Rule Applications Table (Appendix A), and the Scenario Worksheets (Appendix B), represent the status of these information sources as of June 12th, 2007 (March 9, 2007 for the Worksheets). After this time, the results were converted into a different format, better-suited to engineering and implementation activities (but not suited for explaining the methods described herein). Subsequent updates and modifications were made to the engineering versions, but not to the versions presented in this document. The results tables and worksheets are included in this document to provide an example of the outcomes of the methods described in this report, and should not be used as an up-to-date or reliable source of information about the current status of arbitration materials. The versions of the Arbitration Rules Table and the Multiple Permutations Table that are presented in the latest version of the IVBSS HT DVI Specification (July 13, 2007, version 20) are up-to-date and complete.

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List of Acronyms and Abbreviations

CWS ..... Collision Warning System
DIU ..... Driver Interface Unit
DVI ..... Driver-Vehicle Interface
FCW ..... Forward Collision Warning
IVBSS ..... Integrated Vehicle-based Safety Systems
HT ..... Heavy Truck
LCM ..... Lane Change Merge
LDW ..... Lane Departure Warning
POV ..... Principal Other Vehicle
RT ..... Perception-Reaction Time
SV ..... Subject Vehicle

1 Introduction

This document describes the methods and results associated with the integration/arbitration of Driver-Vehicle Interface (DVI) messages for the Integrated Vehicle-Based Safety Systems (IVBSS) Heavy Truck (HT) Program.

1.1 Goals for the IVBSS HT DVI

The following goals were established for the IVBSS HT DVI:

- Support a timely and appropriate response from the driver.
- Avoid contributing to driver errors, distraction, confusion, or information overload.
- Support the development of an accurate and functional mental model of the IVBSS by the driver.

Due to nature of the driving a heavy truck, and characteristics of HT drivers—such as their training and experience—the IVBSS HT DVI will not issue warnings that explicitly communicate a required vehicular response to the driver (e.g., brake, steer left, steer right, etc.), in response to a hazard. Thus, the HT DVI will only provide descriptive—not prescriptive—information to the driver. The goal of having the arbitration aspects of the DVI "Support a timely and appropriate response from the driver" includes three principles for the DVI that are reflected in the arbitration results:

1. The first principle is that there should not be anything about the warnings that could (from a reasonable person's perspective) communicate to the driver the need to make a response that is inappropriate. For example, it would reflect poor DVI design if a left-side Lane Departure Warning (LDW) alert communicated a message that a reasonable driver under most operating conditions would interpret to mean that the driver needs to keep moving left in order to avoid a hazardous situation.
2. The second principle is that the warning should provide the driver with one piece of information—among the many available to, and hopefully used by, the driver—that helps the driver interpret the nature of the hazardous situation so that he can decide what kind of response is best under the circumstances. In this sense, the HT driver is viewed as a classic "decision-maker," whose decisions are best optimized through the collection and analysis of as much useful information as possible. We assume that the IVBSS has the ability to obtain information that the driver may not have been aware of, and the DVI serves as the means to present this information to the driver.
3. The third principle is that, in some cases, the characteristics of the warning itself (e.g. the location of the display for the Lane Change Merge (LCM) system, or the use of localized sounds to indicate left vs. right) can provide orienting cues to the driver that help the driver better understand the nature or location of the highest-priority hazard.

1.2 General Approach to Arbitration of the DVI Messages

The general approach for the DVI arbitration activity was to generate a set of rules—with appropriate and specific exceptions to these rules—that could be easily implemented as IVBSS software by the HT development team. Simple ratings of message priorities (e.g., based on procedures presented in International Organization for Standardization (ISO) 16951, 2004) were initially generated for the IVBSS message set, but these priorities only supported rule development for a subset of the many permutations possible for the IVBSS message set. More complex rules and exceptions to the rules required taking into account a number of situation-specific factors, including: vehicle kinematics, cues to driver alertness (e.g., LDW), indications of driver awareness of the threat, driver information needs, and crash risks.

The approach taken during the development of the IVBSS HT draft arbitration rules has been to display as much information as possible to the driver as long as the information does not interfere with driver's ability to discern and apply the best safety response to a range of threat scenarios. This approach was defined by the principles summarized below in Table 1, which also form the highest-level rules.

Table 1. High-level rules for DVI Arbitration as a function of degree of display conflict and hazard severity.

Display Conflict	Hazard Severity	
	Low	***High***
No	Display all warnings	Display all warnings as long as they do not have the potential to interfere with the appropriate driver emergency response
Yes	Display the highest priority warning and delay or suppress conflicting warning as appropriate	Display the highest-priority, unacknowledged warning

1.3 Organization of this Document

This document contains two additional technical sections and two appendices:

- Section 2 provides the *Methods* associated with developing and evaluating the arbitration rules for the IVBSS HT DVI.
- Section 3 provides the *Results* from this process, in the form of the actual arbitration rules recommended for implementation in the IVBSS.
- Appendix A provides the *DVI Message Permutation Table* that describes the relationships between IVBSS sensor inputs and DVI outputs for each possible combination of auditory and visual DVI messages.
- Appendix B provides the worksheets that have been used to develop and document the rules for each combination of auditory and visual DVI messages listed in the Permutation Table of Appendix A.

2 Methods

The basic approach for generating the arbitration rules involved a multi-step process (see Figure 1). Although this process was developed and applied in an iterative and often non-linear manner, it can be described as a progression of activities for simplification. A high-level overview of the primary steps in this process is presented below, and the individual activities included in each step are described in the following sections.

1. *Characterize Conflict Situations*: This was the starting point and involved collecting the input information necessary for rule development. The required information included identifying:
    - IVBSS sub-system functionality;
    - Specific visual or auditory display conflicts, and the driving situations represented by those conflicts;
    - All possible combinations of relevant IVBSS subsystem inputs (shown in the DVI Message Permutation Table in Appendix A);
    - The kinematic aspects of these situations; and
    - The driver's expected response options and information requirements.
2. *Develop Initial Rules*: Once this input information was obtained, it was organized into structured worksheets that facilitated the interpretation and understanding of this large array of information. This made it possible to generate priorities for the IVBSS sensor conditions associated with non-conflicting subsystem inputs, as well as for conflicting subsystem inputs that were simpler to assess. An initial set of arbitration rules was generated to reflect these priorities.
3. *Test and Review Rules*: The initial set of arbitration rules was then checked for errors and to determine whether or not certain situations warranted rule exceptions. This involved conducting a deeper analysis of secondary crash risks (i.e., the hazards associated with the lower priority warning) that had the potential to lead to crashes that were more severe than the primary crash risk because of special driving circumstances. These cases were identified as rule exception candidates.
4. *Refine Rules and Exceptions*: This final set of activities is still underway, and involves examining the rule exception candidates from the previous step and determining if exceptions are truly warranted. If they are warranted, the content of those rule exceptions must be specified. The end result of this stage will be a final set of arbitration rules and corresponding rule exceptions that unambiguously resolve DVI message display conflicts.

The activities included in each step described above are discussed in further detail in the following sections.

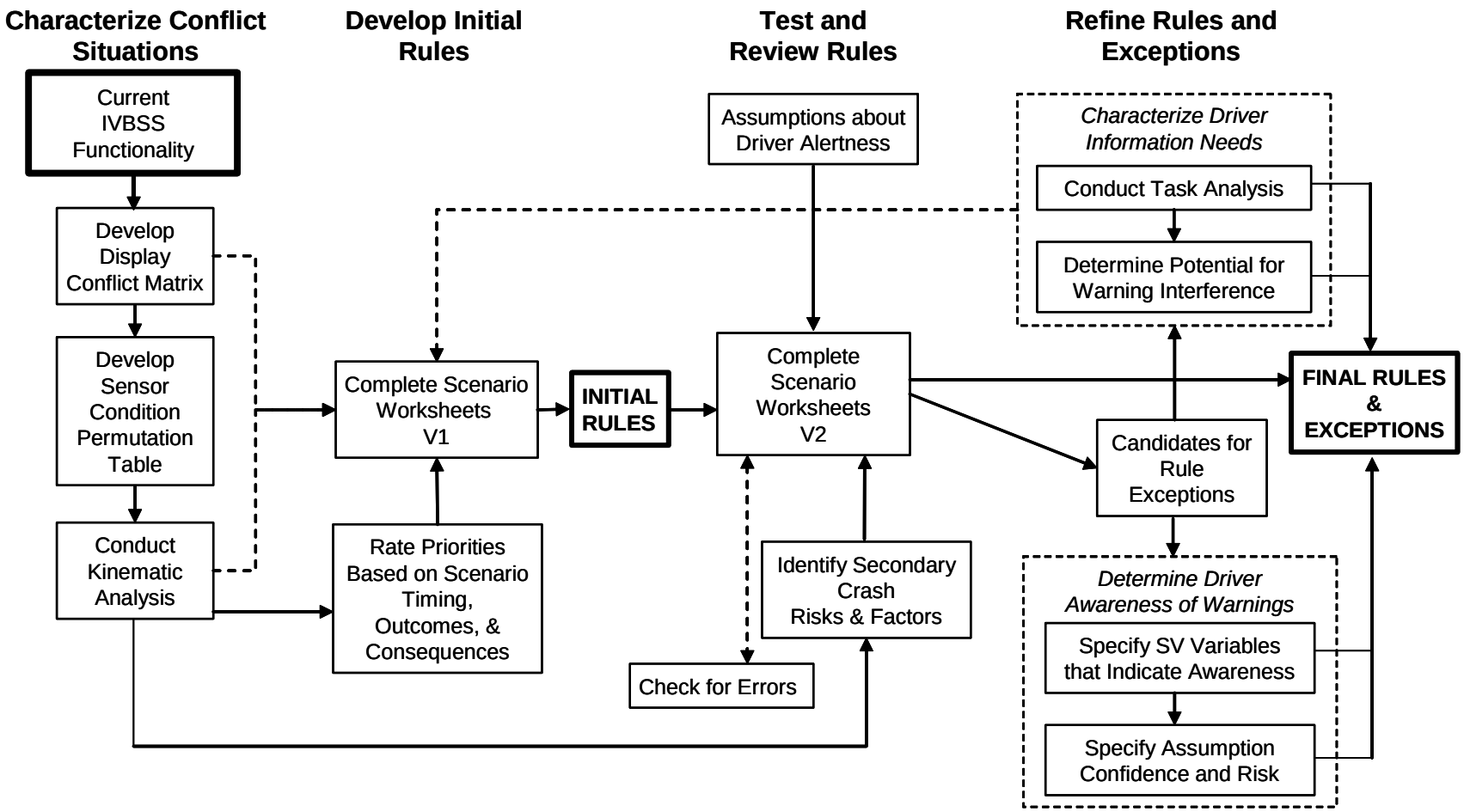


Figure 1. Procedures for arbitration rule development.

2.1 Characterize Conflict Situations

The objective of this step was to use information about system operation, such as warning sensor conditions and warning display presentation, to characterize what the particular warning situation represented.

2.1.1 Current IVBSS Functionality

The starting point for developing the arbitration rules was a clear definition of the conditions under which each of the possible alert conditions could occur. The required information was:

- The full set of alarms for each system.
- The precise driving conditions and sensor inputs that would trigger each alarm condition.
- The DVI components which are expected to present each warning message.

It should be noted that some warning trigger conditions were changed and new warnings were added over the course of the development process. Although this led to additional revisions, it did not impair the overall process because the starting information was relatively complete and included all the required information.

2.1.2 Develop Display Conflict Matrix

A Display Conflict Matrix was developed to identify potential display conflicts. The corresponding matrix shows all possible conflicts between the auditory and visual warning messages included in each subsystem (see Figure 2). It was created by including all possible visual and auditory warning messages from each subsystem along the header row and column. After this, each cell was examined to determine if the two warning messages corresponding with the cell row and column could result in a display conflict. A display conflict was defined as when sensor conditions called for two or more messages to be presented on the same display during an over-lapping time period. Specifically, this could involve messages on the Driver Interface Unit (DIU) or any combination of messages on the auditory channels (left, right, or center) at the same time. Note that concurrent messages on the DIU and the side displays were not considered to be in conflict.

If a conflict was identified, then that cell/combination was indicated by an asterisk symbol. It should be noted that the table shown below in Figure 2 reflects both the identification of conflicts described here as well as the resolution of the conflicts—through rule development—described below in Section 2.2.3 of this document.

	FCW-1 V	FCW-2 V	FCW-3 V	FCW-3 A	FCW-4 V	FCW-4 A	FCW-5 V	FCW-5 A	FCW-6 V	FCW-6 A	FCW-7 V	FCW-7 A	LCM-1 V	LCM-2 V	LCM-3 V	LCM-3 A	LCM-X2 v	LCM-X2 A	LDW L V	LDW L A	LDW R V	LDW R A
FCW-1 V																	*		*		*	
FCW-2 V																	*		*		*	
FCW-3 V																	*		*		*	
FCW-3 A																*		*		*		*
FCW-4 V																	*		*		*	
FCW-4 A																*		*		*		*
FCW-5 V																	*		*		*	
FCW-5 A																*		*		*		*
FCW-6 V																	*		*		*	
FCW-6 A																*		*		*		*
FCW-7 V																	*		*		*	
FCW-7 A																*		*		*		*
LCM-1 V																						
LCM-2 V																						
LCM-3 V																				*		*
LCM-3 A																						
LCM-X2 V																			*		*	
LCM-X2 A																				*		*
LDW L V																						
LDW L A																						
LDW R V																						
LDW R A																						

Color	Rule #	Rule Description
	2	Visual and auditory FCW-5, 6, & 7 override visual and auditory LCM-X2
	2a-2d	Visual LCM-X2 overrides visual FCW-1 & 2 Visual and auditory LCM-X2 overrides visual and auditory FCW-3 Visual and auditory LCM-X2 overrides visual and auditory FCW-4 Visual and auditory LCM-X2 overrides visual and auditory LDW-L/R
	3	Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW
	4	Visual LDW overrides visual FCW-1 & 2
	5-5a	Auditory LCM-3 overrides auditory FCW-3 Auditory LCM-3 overrides auditory FCW-4
	6	Auditory FCW-3 & 4 overrides auditory LDW
	7	Visual FCW-3 & 4 override visual LDW
	8	Auditory FCW-5, 6, & 7 override auditory LCM-3
	9	LCM-3 cancels LDW

Figure 2. Display Conflict Matrix. DUI message conflicts are indicated by an asterisk and the arbitration rule that addresses each conflict is indicated by the cell shading.

2.1.3 Develop DVI Message Permutation Table

In addition to identifying display conflicts, it was also necessary to obtain a sense of what driving conditions drivers would likely be facing when those conflicts occurred. To this end, a DVI Message Permutation Table was developed to describe the relationships between IVBSS sensor inputs and DVI outputs for all possible combinations of sensor inputs (including left and right side messages) and turn signal activation. It was developed by exhaustively identifying each possible permutation of sensor condition, including combinations that do not result in display conflicts. This table (presented in Appendix A) was also used to develop basic information about what driving conditions various sensor combinations represent (e.g., a stopped vehicle ahead plus an adjacent vehicle to the left).

Note that the DIV Message Permutation Table also contains fields that indicate which warning messages are presented in the available displays. This is information that comes from the application of the initial rules and is the result of the process described herein.

2.1.4 Conduct Kinematic Analysis

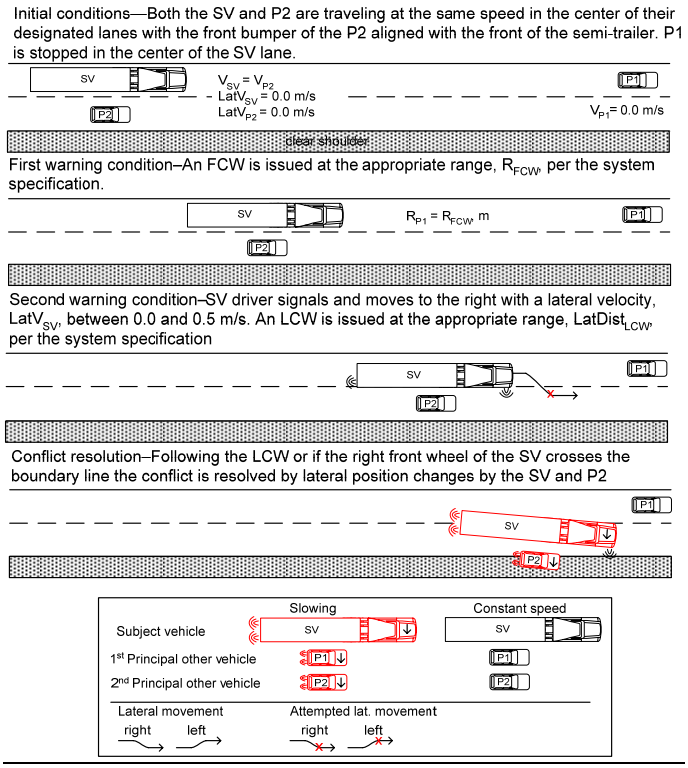
In order to determine the relative priority of warning messages, information about potential crash severity was needed. Aspects of crash severity related to relative speed and available driver perception-reaction times (RT) were determined by conducting kinematic analyses of the Forward Collision Warning (FCW) scenarios. More specifically, kinematics analyses were performed for each forward collision scenario (FCW1 through FCW22) of the IVBSS HT Objective Test Scenarios. Scenarios were categorized by type of hazard: Approach (subject vehicle (SV) approaches principal other vehicle (POV) from behind), Cut-in (POV cuts in front of SV or SV cuts in behind POV), Cut-out (leading POV or following SV moves into adjacent lane), and Oncoming (SV drifts toward oncoming traffic or oncoming POV approaches SV). Following this, the vehicle kinematics was analyzed for each scenario, based on the relative speed, deceleration, and initial position of the SV and POV. Analyses were performed with SV braking for FCW-3, -4, and -5 warnings and with three levels of deceleration. The calculations included delays related to Collision Warning System (CWS) data processing and the time required for the braking system to respond to pressure applied to the brake pedal.

In addition to using this information for determining warning priority, it was also used to obtain a better understanding of what driving situations could be represented by different sensor conditions. For example, the kinematic conditions associated with an FCW-3 warning suggests that it is most likely to occurring during the initial parts of a slow pass of a lead vehicle, or if the driver is asleep or unalerted and closing on the lead vehicle.

2.1.5 Task Analysis

Another activity that was conducted to gain a better understanding of driving conditions in certain conflict situations was a task analysis covering a few key driving scenarios (e.g., combined FCW-6 and LCM-3 to the right). The purpose of the task analysis was to identify drivers' general information needs, the decisions that they would need to make, and actions they would have to take at various points in these driving situations. An example task analysis scenario is shown in Figure 3. This information was also used to identify warning messages that had the potential to interfere with the drivers' optimal evasive response.

Scenario Description



Additional Scenario Assumptions

(added by Battelle specifically for this example)

- SV is too close to P1 to fully stop in time and a lane change is eventually necessary.
- SV is far enough behind that it is not immediately necessary to make an emergency lane exit (e.g., there is some time available to the driver to evaluate different response options)
- SV takes the time to signal
- Oncoming traffic is present in undivided lane to the left of the SV
- Driver is not highly alert (not anticipating P1 & unaware of P2)

Task Analysis Table

Task	Information Processing Subtasks			Comments
	Perceptual	**Cognitive / Decision Making**	**Psycho-Motor**	
1) Identify FC hazard	- Detect presence of P1	- Determine if closing speed demands immediate action - (Identify evasive action-following tasks)	- Look at FC hazard - Initiate braking	Assumes that driver concludes that stopping in time is not possible
2) Evaluate evasive action to right	- Detect presence of P2	- Determine if P2 is in conflict	- Look at side mirrors	This task makes tasks 3&4 necessary
3) Evaluate evasive action to left	- Detect presence of traffic in oncoming lane	- Determine if vehicles are present / in conflict	- Look at oncoming lane	If available, this option is safer for P2
4) Select best response	- None	- Decide that going into right lane is best option	- None	*Warnings must not discourage/interfere with this decision**
5) Activate turn signal	- None	- None (should be an "automatic" response)	- Grasp and activate turn signal	There is a high likelihood that drivers may skip this step
6) Execute evasive maneuver	- Monitor P1	- Determine when vehicle is far enough to the right to clear P1	- Steer to right	
* This motivates the following rule exception: LCM-3 auditory warning should be suppressed if the ideal driver response is to change lanes and run P2 onto a "safe" roadway shoulder				

Figure 3. Example task analysis of a driving scenario.

2.2 Develop Initial Rules

This step involved organizing the information obtained in previous steps into easy-to-read worksheets and then developing the initial arbitration rules based on warning priority.

2.2.1 Rate Priorities Based on Scenario Timing, Outcomes, and Consequences

This activity integrated information from the previous activities to prioritize conflicting warning messages. Key information sources included vehicle kinematics and information about what driving situations various sensor-input combinations could represent (e.g., potentially running an adjacent vehicle into oncoming traffic). Where appropriate, available RT was also factored in to increase the relative priority level of hazards for which drivers have insufficient time available to avoid a potentially serious crash. Relative priorities for simpler situations could often be assessed using the ISO 16951 (2004) procedures described in Campbell, Richard, Brown, and McCallum (2006).

2.2.2 Complete Scenario Worksheets V1

Information from the previously described activities were entered into a two-page "Scenario Worksheet" for each row/case identified in the DVI Message Permutation Table. A sample worksheet with descriptions of the key fields is shown in Figure 4.

The purpose of the worksheets was to collect needed information in one place so that it could be easily viewed and understood during the initial rule development process. These worksheets also serve as a record of the "how and why" of the arbitration process—both as a whole and for individual driving scenarios—and will thus allow the IVBSS team to review the arbitration rules and resulting DVI design decisions in the future as required.

ID # 72

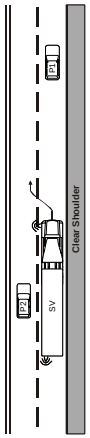
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	FCW-4	LCM-0	LCM-3L		

Individual Sensor Conditions

FCW-4	LCM-3L	LDW-L



Turn Signal

Left

Rules

5a Auditory LCM-3 overrides auditory FCW-4

10 LDW is canceled if same-side turn signal is activated

Comments:

ID # 72

ID#	Primary Crash Risk	Likely Resolution	Severity
72	*The potential crash situation—if any—represented by the hazard associated with the primary warning. (This may not always be the highest priority warning in order to maintain consistency in documentation).*	*The actions that drivers are most likely to take to resolve the situation in the best possible way. It is possible that there may be more than one resolution depending on the situation.*	*Likely severity of primary crash situation if driver fails to respond appropriately.*

Notable Kinematic Conditions/Assumptions:

Kinematic conditions that a) significantly constrain the circumstances in which the situation can occur, b) constrain the driver's response options, and/or c) have a significant bearing on the severity of the situation.

Can situation occur if driver is:		Situation Description
Asleep:	Y/N	*(This column describes what the scenario represents if different assumptions are made about driver alertness).*
Unalert:	Y/N	*Definition: driver is awake, but not paying attention to road/driving task and is completely unaware of hazards present (e.g., LDW represents drifting out of lane).*
Partially Alert:	Y/N	*Definition: driver is aware of easily perceived hazards, such as the forward vehicle, but not less visible hazards, such as side vehicles.*
Fully Alert:	Y/N	*Definition: driver is fully aware of all the immediate hazards. (e.g., LDW represents lane change w/o signal).*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Other types of crashes that can occur, primarily as a result of driver actions in dealing with the primary hazard. Other possibilities are crash types that can occur if the driver does not adequately respond to the primary hazard and the situation changes (e.g., SV drifts over to lane adjacent to oncoming traffic; POVs make an expected response that changes the situation, etc.).	*The additional roadway or situational factors/elements that enable secondary crash risks or make them more likely (e.g., side POV that is next to undivided oncoming lane; shoulder barrier, etc.).*	*Likely severity of secondary crashes.*	

General Comments:

Relevant information that is not captured in the other fields.

Exception

Whether or not an exception is needed.

Figure 4. Example worksheet pages.

2.2.3 Initial Rule Development

The objective of this activity was to generate a small set of rules that, when applied, provided unambiguous arbitration of display conflicts. The starting point for initial rule development was the Display Conflict Matrix. Essentially, rules were added until all cells indicating a conflict were covered by a rule. The cell shading in Figure 2 from Page 6 above shows how the display conflicts are covered by each rule. Four general principles were applied during rule development, including:

1. In a conflict, priority should be given to the message that indicates the most severe hazard (from information about scenario outcomes, available RT, and possible crash consequences developed in the previous activities).
2. The number of general rules should be minimized and, instead, rely on rule exceptions to accommodate specific situations that are not appropriately handled by the main arbitration rules.
3. Warning presentation should avoid interfering with drivers making an optimal evasive response to a hazard situation (based on information from the task analysis).
4. Warning presentation consistency should be maintained where possible (e.g., no unnecessary mixing of warnings, such as an auditory LDW presented with a visual FCW-3).

In addition to the rules that focused on specific conflicts, additional rules were added to provide clear message presentation guidance for all other, less-complex situations (e.g., if no display conflict occurs), and to cover certain key operational assumptions (e.g., turn signal activation cancels LDW).

The resulting full set of rules were presented in the “Integration Rules” table (presented in Section 3 of this document) with a detailed written justification of the rational behind the rule (see Table 5). Also included in this table are estimates of the confidence that the rule comprehensively covers all relevant situations, in addition to a corresponding estimate of the likelihood that further exceptions may be required. Information about which rules apply to each sensor combination scenario and the results of the arbitration (e.g., final display outputs) were added to the Message Permutations Table (Appendix A) and the Scenario Worksheets (Appendix B).

2.3 Test and Review Rules

The objective of testing and reviewing the rules was to identify situations in which exceptions to the main arbitration rules may be required, and—importantly—to check for errors in the Message Permutation Table and Worksheets. This involved the activities described below.

2.3.1 Identify Secondary Crash Risks and Factors

The purpose of this activity was to take the driving situation implied by the sensor conditions and extrapolate it to a broader set of more specific crash situations that could be represented by these conditions. For example, an LDW warning to the left could represent a lane change, a lane departure onto the shoulder on a divided highway, or crossing into oncoming traffic. For each unique secondary crash hazard, the factors required for that hazard to exist, in addition to the potential severity of this crash type, were specified in the Worksheets.

2.3.2 Assumptions about Driver Alertness

The objective of this activity was to assess what the driving situation implied by the sensor conditions would represent if different assumptions were made about the state of driver alertness. This information is helpful for characterizing the nature of primary and secondary crash risks. Four different levels of driver alertness were specified including:

- *Asleep*: Driver is asleep and completely unresponsive to emerging conditions.

- *Unalert*: Driver is awake, but not paying attention to road/driving task and is completely unaware of hazards present (e.g., LDW represents drifting out of lane).

- *Partially Alert*: Driver is aware of easily perceived hazards, such as the forward vehicle, but not less visible hazards, such as side vehicles.

- *Fully Alert*: Driver is fully aware of all the immediate hazards. (e.g., LDW represents a lane change without signal).

2.4 Refine Rules and Exceptions

The objective of this set of activities was to examine exception candidates in greater detail to determine if they truly warrant a rule exception, and if so, to specify the content of these rule exceptions. It should be noted that this component of the arbitration rule development process has not yet been completed, but a summary of on-going activities is provided below. It is expected that these activities will be conducted on an “as-needed” basis, depending on what additional information is required to verify a rule exception candidate. The activities in this step include:

- *Determine the feasibility of implementing rule exceptions*. Some exceptions require additional information about the driving situation (e.g., such as whether or not a solid yellow line is to the left of the vehicle). The reliability and feasibility of incorporating this additional information from IVBSS subsystems must be evaluated. This information acts as a gating mechanism for determining whether or not a particular rule exception is feasible.

- *Evaluate the relative severity and likelihood of occurrence for hazards represented by conflicting messages*. In some situations, the relative severity of potential hazards may be

difficult to prioritize because they are similar. These situations represent the driving conditions that are the most challenging to arbitrate—from the DVI perspective—and thus are taking the most time and effort to resolve. Consequently, this activity involves conducting a more fine-grained analysis of crash consequences, and incorporating data on crash frequency and outcomes from existing crash databases.

- *Characterize driver information needs*. In some conflicts represented by rule exception candidates, driver information needs and available response options can influence warning priority. In addition, some warnings that appear to have a high-priority could potentially interfere with the optimal driver evasive response in some situations (e.g., if the optimal driver response to a serious forward collision threat is to run an adjacent vehicle onto the shoulder, an LCM-3 could interfere with drivers taking this option). These aspects of the scenario can be identified using a task analysis, similar to the one described above.

- *Determine driver awareness of warnings*. Additional information that may be relevant for assigning warning priority is whether or not a driver has demonstrated that he or she has acknowledged the warning. This could lessen the relative priority of the acknowledged warning relative to an unacknowledged warning. Determining warning acknowledgement involves identifying SV variables that are relevant indicators that an evasive response to the initial high-priority hazard has been initiated, such as steering wheel and brake inputs of a certain magnitude. It is also important to account for the level of confidence that the identified variables reliably represent driver acknowledgement, and to evaluate and account for the potential "costs" of these assumptions being false.

3 Results

The methods described above in section 2 have yielded the arbitration rule set contained in Table 2.

Table 2. IVBSS HT DVI Arbitration Rules V 9.0.

Rule[1]		Justification	Confidence[2]	Exceptions[3]
1	No overrides in specified "No Conflict" conditions	Multiple concurrent displays that are not expected to distract or disrupt the driver's perception and processing of important driving information will not be suppressed.	High	Unlikely
	This includes the following display combinations: FCW-1 – LCM-0, FCW-1 – LCM-1, FCW-1 – LCM-2, FCW-1 – LCM-3, FCW-2a – LCM-0, FCW-2a – LCM-1, FCW-2a – LCM-2, FCW-2a – LCM-3, FCW-2b – LCM-0, FCW-2b – LCM-1, FCW-2b – LCM-2, FCW-2b – LCM-3, FCW-3a – LCM-0, FCW-3a – LCM-1, FCW-3a – LCM-2, FCW-3a – LCM-3, FCW-3b – LCM-0, FCW-3b – LCM-1, FCW-3b – LCM-2, FCW-4a – LCM-0, FCW-4a – LCM-1, FCW-4a – LCM-2, FCW-4a – LCM-3, FCW-4b – LCM-0, FCW-4b – LCM-1, FCW-4b – LCM-2, FCW-5 – LCM-0, FCW-5 – LCM-1, FCW-5 – LCM-2, FCW-6 – LCM-0, FCW-6 – LCM-1, FCW-6 – LCM-2, FCW-7 – LCM-0, FCW-7 – LCM-2, LCM-0 – LDW-R/L, and LCM-1 – LDW-R/L.			

[1] Note that "overrides" indicates that the Fusion Engine should suppress the lower priority message(s). It may be the case that this suppression is temporary; i.e., that the message is only delayed. Conditions under which a message should be delayed and not completely suppressed will be defined after further analyses.

[2] "Confidence" reflects our level of certainty that the rule is valid as described

[3] The likelihood that sub-rules will have to be developed to accommodate special circumstances

Rule[1]		Justification	Confidence[2]	Exceptions[3]
2	Visual and auditory FCW-5, 6, & 7 override visual and auditory LCM-X2	In FCW-5, 6, 7 scenarios, the driver must respond quickly, and suppressing the LCM-X2 will eliminate the chance that the LCM-X2 display itself—or the required driver response to acknowledge it—interferes with the driver response to the FCW-5,6, or 7.	Med-High	Possible
2a	Visual LCM-X2 overrides visual FCW-1, FCW-2a, & FCW-2b	Because the SSD failure-mode display is the same as the LCM-0 display, the potential exists for a side-vehicle conflict if the driver interprets the "failed" SSD display as a LCM-0 display. This means that the priority of the LCM-X2 warning should be similar to that of a LCM-3 warning and override the FCW-1, FCW-2a, and FCW-2b especially since the FCW situations do not indicate imminent conflicts.	High	Unlikely
2b	Visual and auditory LCM-X2 overrides visual (and auditory) FCW-3a & FCW-3b	The same logic as the previous rule (2a) applies here. In almost all FCW-3a or FCW-3b situations, even if there is an escalation to the next warning severity level while drivers are responding to the LCM-X2, drivers should have enough time to respond the FCW.	High	Unlikely
2c	Visual and auditory LCM-X2 overrides visual and auditory FCW-4b	The same logic as the previous rule (2a) applies here. Note, however, that if the FCW-4b warning is suppress, there is an increased likelihood that the driver will have insufficient time to respond to an escalation to FCW-5 and still completely avoid a crash. Acknowledging the LCM-X2 can distract the driver, however, drivers have 2.5 seconds to do so before an FCW-4b condition can escalate to a FCW-5. Also, kinematic analysis indicates that under worse-case conditions (high speeds & slow deceleration level), drivers should still have at least 1.5 sec of available RT following the onset of the FCW-5 (driver's first notice if FCW-4b is suppressed) to avoid a potentially serious crash with the lead vehicle (more than 10 mph relative speed). On the other hand, if there is an unidentified LCM conflict, it has a greater potential to lead to higher severity crashes (e.g., driving the side vehicle into oncoming traffic etc), and consequently should be given priority.	High	Possible
2d	Visual and auditory LCM-X2 overrides visual and auditory LDW-L/R	The assumption here is that the LCM-X2 warning will advise drivers to remain in their lane, which implicitly provides warning about the LD. Exceptions are likely if the LD can lead to immediate high-severity conflicts (i.e., with shoulder hazards or oncoming traffic), or if the driver is asleep or unalert and not responding to either the LCM-X2 warning or the LD hazard.	High	Possible

Rule[1]		Justification	Confidence[2]	Exceptions[3]
2e	Visual LCM-X2 overrides visual FCW-4a (there is no auditory component)	Although this situation can be associated with a shorter headway than occurs in the rule 2c situation (possibly as little as 0.6 sec), it is likely that the driver is aware of the FC hazard, because the FCW-4a follows a response to an FCW-4b that halts closing. Also, the SV driver's response to the FCW-4b may involve a lane change, so the LCM-X2 could provide safety-critical information (see rule 2c).	Med-High	Possible
3	Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW	Avoiding conflicts with a FC hazard is the highest priority, and the LDW is most likely to arise from the driver's evasive maneuver.	High	Unlikely
4	Visual LDW overrides visual FCW-1, FCW-2a, and FCW-2b	FCW-1, FCW-2a, and FCW-2b represent low-severity conditions that are not likely to require an immediate driver response, whereas the LD condition may require an immediate driver response if it is associated with encroachment into oncoming traffic or the shoulder.	High	Unlikely
5	Auditory LCM-3 overrides auditory FCW-3b	FCW-3b is uncommon and most likely to occur concurrently with LCM-3 while the driver is passing a lead vehicle that has a slower relative speed. In this case, the driver is likely to be aware of the reduced headway, which reduces the usefulness of the FCW-3b information. In contrast, the LCM conflict has a higher severity, and requires more immediate action to avoid.	High	Unlikely
5a	Auditory LCM-3 overrides auditory FCW-4b	FCW-4b is uncommon and most likely to occur concurrently with LCM-3 while the driver is passing a lead vehicle that has a slower relative speed. In this case, the driver is likely to be aware of the reduced headway, which reduces the usefulness of the FCW-4b information. Note, however, that if the FCW-4b warning is suppress, there is an increased likelihood that the driver will have insufficient time to respond to an escalation to FCW-5 and still completely avoid a crash. Kinematic analysis indicates that under worse-case conditions (high speeds & slow deceleration level), drivers should still have at least 1.5 sec of available RT time following the onset of the FCW-5 (driver's first notice if FCW-4b is suppressed) to avoid a potentially serious crash with the lead vehicle (more than 10 mph relative speed). The LCM conflict has a greater potential to lead to higher severity crashes (e.g., driving the side vehicle into oncoming traffic etc) under these conditions, and consequently should be given priority.	High	Possible

Rule[1]		Justification	Confidence[2]	Exceptions[3]
6	Auditory FCW-3b & 4b overrides auditory LDW	FCW-3b & 4b are uncommon and most likely to occur concurrently with LDW while the driver is 1) passing a lead vehicle that has a slower relative speed, or 2) asleep or distracted and maintaining a higher relative speed. In case 1, it is unlikely that there is a lateral hazard/risk (and the LDW is self-evident to an alert driver), therefore the FCW-3b & 4b auditory warnings provide the most useful information. In case 2, there is an increase in potential for a run-off-road incident, and the LDW may to take precedence in some scenarios.	Med	Likely
7	Visual FCW-3b & 4b override visual LDW	The applicable scenarios in this case are the same as for Rule 6; the purpose of Rule 7 is to maintain overall display consistency with Rule 6. The reason for making Rule 7 separate from Rule 6 is to leave open the possibility of reversing Rule 7 and giving priority to the LDW on the DIU. In particular, FCW headway information is already presented via the auditory warning in addition to being available on the DIU left-side LED bar. In some situations, it may be beneficial to present the LDW on the DIU instead of the FCW. Note that providing LDW information comes at the expense of display consistency. At this time it is unknown if this mixing of messages can lead to driver confusion, so this approach is not currently recommended. However, this is an esoteric issue, since an alert driver making a lane change is unlikely to look at the DIU during this maneuver anyways, and sleeping/distracted drivers need auditory, not visual, warnings to prompt them into a more alert state.	Med	Likely
8	Auditory FCW-5, 6, & 7 override auditory LCM-3	The FCW-5, 6, & 7 capture high-severity hazard situations that drivers must be initially alerted about above all other hazards. Also, LCM-3 auditory warnings should be suppressed if they have the potential to interfere with drivers making an optimal emergency response. However, it may be necessary to provide a LCM-3 auditory warning once the driver has unambiguously acknowledged the FC hazard, and if the side-vehicle hazard poses a fatality risk (e.g., if the side vehicle will be driven into oncoming traffic by the driver's emergency maneuver)	Med-High	Very Likely
9	LCM-3 cancels LDW	Under all the scenarios in which these warnings can occur concurrently, a roadway departure is unlikely to present a hazard because the adjacent space is drivable by an adjacent vehicle. Consequently, only the LCM-3 provides meaningful information.	High	Unlikely
10	LDW is canceled if same-side turn signal is activated	The assumption here is that this situation represents an intentional lane departure, and no LDW should be provided.	High	Possible

Rule[1]		Justification	Confidence[2]	Exceptions[3]
11	If LDW indicates LD in direction of LCM-1, an auditory LCM-3 warning should be thrown under all conditions except FCW-5,6,7 (LDW is also canceled)	This represents LCM-3 conditions even though a turn signal is not activated. In this case, the LCM-1 alert plus auditory should function in the same way as a LCM-3 warning. Rules 5, 8, & 9 would also apply. Note that this particular sensory combination may not be possible because the conditions are the same as the definition for an LCM-3. This rule is included for completeness.	High	Possible
12	DIU display should not be changed while a LCM-3 is in progress, except for FCW-5, 6, or 7 (LCM-3 overrides visual FCW-1,2,3, & 4 and visual LDW-L/R)	A DIU display change produces a conspicuous visual event that has the potential to capture the driver's attention and interfere with the driver immediately attending to the visual LCM-3 information. The defining assumption is that drivers have enough time to recover from the conditions associated with the suppressed warning after they have responded to the LCM-3 situation. Note that whether or not this rule applies to FCW-3 & 4 is still being determined.	Med-High	Possible
13	LDW overrides FCW-3a	Headway is long enough in this situation to provide drivers with sufficient time to respond to an FCW-3b message that would occur if P1 started closing again.	High	Possible
14	LDW overrides FCW-4a	Although the headway (and corresponding safety margin) is relatively small in this situation, the FC is not an immediate threat and the driver is a likely to be aware of it, since the FCW-4a is the result of some response (although not necessarily from the driver) to an earlier FCW-4b warning. Also, a driver's response to the LDW warning should not directly lead to an escalation of the FC threat (the driver would have to accelerate for this to be true). However, responding to the LDW could delay the driver's response to the FC threat if conditions change suddenly. Nevertheless, drivers will still get an FCW-4b warning if this happens, which would override the LDW alert and give the driver the needed information.	Med-High	Possible
15	LDW-X overrides FCW-1 & FCW-2A/B	FCW-1 and FCW-2a/b are low priority warnings, and the interruption from the LDW-X system is unlikely to impact safety. Also, these FCW are likely to occur for a significant proportion of the driving time, so waiting until the FCW-1 & 2 alerts are over would unnecessarily delay the presentation of the LDW failure information.	Med-High	Possible
16	FCW-3A, FCW-3AB, FCW-4A FCW-3A, B, FCW-567 override LDW-X	All these FCW alert conditions represent imminent or evolving crash risks and should have priority over the LDW-X alert, which is not inherently associated with driving risks.	High	Unlikely

Rule[1]		Justification	Confidence[2]	Exceptions[3]
17	LDW-RL overrides FCW-X	The occurrence of an FCW system failure at the same time as an impending FC crash risk is probably a very unlikely event. This means that most of the time, the LDW alert will represent a higher crash risk than forward case, and should have priority.	High	Possible
18	LCM-X2 overrides FCW-X & LDW-X	Of the information represented by each system, information about adjacent vehicles is the most difficult for an SV driver to maintain awareness of because it is not directly available in the forward field of view. Therefore, an alert that the LCM system has failed provides the most useful information to the driver. Note that presenting LCM-X2 failure information is not likely to be as critical under these conditions relative to other LCM-X2 arbitration situations (e.g., co-occurrence with FCW-3b/4b conditions), because it is less likely that the SV driver will be making a lane change in response to the conflicting alert information (in contrast, a lane change is a reasonable response to an FCW-4b alert).	High	Unlikely
19	Auditory FCW-X & LDW-X are overridden by all auditory alerts	All other auditory alerts are triggered during driving conditions that have some degree of associated crash risk, whereas this would only be true with FCW-X and LDW-X situations under exceptional circumstances.	High	Unlikely

* Assumption – LCM-3 warnings only occur in the direction of the turn signal. If the lane change side is clear but there is a POV on the other side, an LCM-3 warning will not occur.

References

Campbell, J.L., Richard, C.M., Brown, J.L., and McCallum, M. (2006). *Crash Warning System Interfaces: Human Factors Insights and Lessons Learned, Final Report*. Prepared for the National Highway Traffic Safety Administration. Seattle, WA: Battelle Center for Human Performance and Safety.

International Organization for Standardization (ISO). (2004). *Road vehicles – Ergonomic aspects of transport information and control systems (TICS) – Procedures for determining priority of on-board messages presented to drivers* (ISO 16951). Geneva, Switzerland.

Appendix A: Multiple Threat Permutations and Rule Applications

Notes: Side-specific sensor conditions are identified with the R (Right) and L (Left) suffixes (R/L means that the logic applies to both sides).

Shaded rows indicate candidate scenarios for rule exceptions. This is based on the possibility that potential hazard situations associated with the messages that are *not* the highest priority messages (i.e., the ones not displayed) may be associated with more severe crashes.

New ID	Old ID	Conflict Source	Sensor Inputs				Rule	Display Outputs			
			Subsystem Alerts			Turn Signal		DIU Visual Display	Left SSD Visual Display	Right SSD Visual Display	Auditory Display
1	1	DIU	FCW-1	LCM-X2 R/L	--	L, R, OFF	2a	LCM-X2	None	None	LCM-X2
2	2	None	FCW-1	LCM-0 R/L	--	L, R, OFF	1	FCW-1	LCM-0	LCM-0	None
3	3	None	FCW-1	LCM-1R	--	OFF	1	FCW-1	LCM-0	LCM-1	None
4	4	None	FCW-1	LCM-1L	--	OFF	1	FCW-1	LCM-1	LCM-0	None
5	5	None	FCW-1	LCM-2R	--	R	1	FCW-1	LCM-0	LCM-2	None
6	6	None	FCW-1	LCM-2L	--	L	1	FCW-1	LCM-2	LCM-0	None
7	7	DIU	FCW-1	LCM-0 R/L	LDW-R	OFF	*4*	LDW-R	LCM-0	LCM-0	LDW-R
8	8	None^	FCW-1	LCM-0 R/L	LDW-R	RIGHT	*1,10*	FCW-1	LCM-0	LCM-0	None
9	9	DIU	FCW-1	LCM-0 R/L	LDW-L	OFF	*4*	LDW-L	LCM-0	LCM-0	LDW-L
10	10	None^	FCW-1	LCM-0 R/L	LDW-L	LEFT	*1,10*	FCW-1	LCM-0	LCM-0	None
11	11	DIU	FCW-1	LCM-1R	LDW-R	OFF	*4,11,12*	FCW-1[#]	LCM-0	LCM-3*	LCM-3*
12	11a.	None	FCW-1	LCM-1R	Unavail	OFF	1	FCW-1	LCM-0	LCM-1	None
13	12	DIU	FCW-1	LCM-1L	LDW-R	OFF	*4*	LDW-R	LCM-1	LCM-0	LDW-R
14	13	DIU	FCW-1	LCM-1R	LDW-L	OFF	*4*	LDW-L	LCM-0	LCM-1	LDW-L
15	14	DIU	FCW-1	LCM-1L	LDW-L	OFF	*4,11,12*	FCW-1[#]	LCM-3*	LCM-0	LCM-3*
16	14a	None	FCW-1	LCM-1L	Unavail	OFF	1	FCW-1	LCM-1	LCM-0	None
17	15	DIU, AUD	FCW-1	LCM-3R	LDW-R	OFF	*9*	FCW-1	LCM-0	LCM-3	LCM-3R
18	15a	None	FCW-1	LCM-3R	Unavail	OFF	1	FCW-1	LCM-0	LCM-3	LCM-3R[†]
19	16	None^	FCW-1	LCM-3R	LDW-R	RIGHT	*1,9,10*	FCW-1	LCM-0	LCM-3	LCM-3R
20	16a	None	FCW-1	LCM-3R	Unavail	RIGHT	1	FCW-1	LCM-0	LCM-3	LCM-3R
21	17	DIU, AUD	FCW-1	LCM-3L	LDW-L	OFF	*9*	FCW-1	LCM-3	LCM-0	LCM-3L
22	17a	None	FCW-1	LCM-3L	Unavail	OFF	1	FCW-1	LCM-3	LCM-0	LCM-3L[†]
23	18	None^	FCW-1	LCM-3L	LDW-L	LEFT	*1,9,10*	FCW-1	LCM-3	LCM-0	LCM-3L
24	18a	None	FCW-1	LCM-3L	Unavail	LEFT	1	FCW-1	LCM-3	LCM-0	LCM-3L

New ID	Old ID	Conflict Source	Sensor Inputs				Rule	Display Outputs			
			Subsystem Alerts			Turn Signal		DIU Visual Display	Left SSD Visual Display	Right SSD Visual Display	Auditory Display
25		DIU	FCW-2a	LCM-X2 R/L	--	L, R, OFF	2a	LCM-X2	None	None	LCM-X2
26	19	DIU	FCW-2b	LCM-X2 R/L	--	L, R, OFF	2a	LCM-X2	None	None	LCM-X2
27		None	FCW-2a	LCM-0 R/L	--	L, R, OFF	1	FCW-2a	LCM-0	LCM-0	None
28	20	None	FCW-2b	LCM-0 R/L	--	L, R, OFF	1	FCW-2b	LCM-0	LCM-0	None
29		None	FCW-2a	LCM-1R	--	OFF	1	FCW-2a	LCM-0	LCM-1	None
30	21	None	FCW-2b	LCM-1R	--	OFF	1	FCW-2b	LCM-0	LCM-1	None
31		None	FCW-2a	LCM-1L	--	OFF	1	FCW-2a	LCM-1	LCM-0	None
32	22	None	FCW-2b	LCM-1L	--	OFF	1	FCW-2b	LCM-1	LCM-0	None
33		None	FCW-2a	LCM-2R	--	R	1	FCW-2a	LCM-0	LCM-2	None
34	23	None	FCW-2b	LCM-2R	--	R	1	FCW-2b	LCM-0	LCM-2	None
35		None	FCW-2a	LCM-2L	--	L	1	FCW-2a	LCM-2	LCM-0	None
36	24	None	FCW-2b	LCM-2L	--	L	1	FCW-2b	LCM-2	LCM-0	None
37		DIU	FCW-2a	LCM-0 R/L	LDW-R	OFF	4	LDW-R	LCM-0	LCM-0	LDW-R
38	25	DIU	FCW-2b	LCM-0 R/L	LDW-R	OFF	*4*	LDW-R	LCM-0	LCM-0	LDW-R
39		None^	FCW-2a	LCM-0 R/L	LDW-R	RIGHT	1,*10*	FCW-2a	LCM-0	LCM-0	None
40	26	None^	FCW-2b	LCM-0 R/L	LDW-R	RIGHT	*1,10*	FCW-2b	LCM-0	LCM-0	None
41		DIU	FCW-2a	LCM-0 R/L	LDW-L	OFF	*4*	LDW-L	LCM-0	LCM-0	LDW-L
42	27	DIU	FCW-2b	LCM-0 R/L	LDW-L	OFF	*4*	LDW-L	LCM-0	LCM-0	LDW-L
43		None^	FCW-2a	LCM-0 R/L	LDW-L	LEFT	1,*10*	FCW-2a	LCM-0	LCM-0	None
44	28	None^	FCW-2b	LCM-0 R/L	LDW-L	LEFT	*1,10*	FCW-2b	LCM-0	LCM-0	None
45		DIU	FCW-2a	LCM-1R	LDW-R	OFF	*4,11,12*	FCW-2a[#]	LCM-0	LCM-3*	LCM-3*
46	29	DIU	FCW-2b	LCM-1R	LDW-R	OFF	*4,11,12*	FCW-2b[#]	LCM-0	LCM-3*	LCM-3*
47		None	FCW-2a	LCM-1R	Unavail	OFF	1	FCW-2a	LCM-0	LCM-1	None
48	29a	None	FCW-2b	LCM-1R	Unavail	OFF	1	FCW-2b	LCM-0	LCM-1	None
49		DIU	FCW-2a	LCM-1L	LDW-R	OFF	*4*	LDW-R	LCM-1	LCM-0	LDW-R
50	30	DIU	FCW-2b	LCM-1L	LDW-R	OFF	*4*	LDW-R	LCM-1	LCM-0	LDW-R
51		DIU	FCW-2a	LCM-1R	LDW-L	OFF	*4*	LDW-L	LCM-0	LCM-1	LDW-L
52	31	DIU	FCW-2b	LCM-1R	LDW-L	OFF	*4*	LDW-L	LCM-0	LCM-1	LDW-L
53		DIU	FCW-2a	LCM-1L	LDW-L	OFF	*4,11,12*	FCW-2a[#]	LCM-3*	LCM-0	LCM-3*

New ID	Old ID	Conflict Source	Sensor Inputs				Rule	Display Outputs			
			Subsystem Alerts			Turn Signal		DIU Visual Display	Left SSD Visual Display	Right SSD Visual Display	Auditory Display
54	32	DIU	FCW-2b	LCM-1L	LDW-L	OFF	*4,11,12*	FCW-2b[#]	LCM-3*	LCM-0	LCM-3*
55		None	FCW-2a	LCM-1L	Unavail	OFF	1	FCW-2a	LCM-1	LCM-0	None
56	32a	None	FCW-2b	LCM-1L	Unavail	OFF	1	FCW-2b	LCM-1	LCM-0	None
57		DIU, AUD	FCW-2a	LCM-3R	*LDW-R*	OFF	*9*	FCW-2a	LCM-0	LCM-3	LCM-3R
58	33	DIU, AUD	FCW-2b	LCM-3R	LDW-R	OFF	*9*	FCW-2b	LCM-0	LCM-3	LCM-3R
59		None	FCW-2a	LCM-3R	Unavail	OFF	1	FCW-2a	LCM-0	LCM-3	LCM-3R[†]
60	33a	None	FCW-2b	LCM-3R	Unavail	OFF	1	FCW-2b	LCM-0	LCM-3	LCM-3R[†]
61		None^	FCW-2a	LCM-3R	LDW-R	RIGHT	*1,9,10*	FCW-2a	LCM-0	LCM-3	LCM-3R
62	34	None^	FCW-2b	LCM-3R	LDW-R	RIGHT	*1,9,10*	FCW-2b	LCM-0	LCM-3	LCM-3R
63		None	FCW-2a	LCM-3R	Unavail	RIGHT	1	FCW-2a	LCM-0	LCM-3	LCM-3R
64	34a	None	FCW-2b	LCM-3R	Unavail	RIGHT	1	FCW-2b	LCM-0	LCM-3	LCM-3R
65		DIU, AUD	FCW-2a	LCM-3L	LDW-L	OFF	*9*	FCW-2a	LCM-3	LCM-0	LCM-3L
66	35	DIU, AUD	FCW-2b	LCM-3L	LDW-L	OFF	*9*	FCW-2b	LCM-3	LCM-0	LCM-3L
67		None	FCW-2a	LCM-3L	Unavail	OFF	1	FCW-2a	LCM-3	LCM-0	LCM-3L[†]
68	35a	None	FCW-2b	LCM-3L	Unavail	OFF	1	FCW-2b	LCM-3	LCM-0	LCM-3L[†]
69		None^	FCW-2a	LCM-3L	LDW-L	LEFT	*1,9,10*	FCW-2a	LCM-3	LCM-0	LCM-3L
70	36	None^	FCW-2b	LCM-3L	LDW-L	LEFT	*1,9,10*	FCW-2b	LCM-3	LCM-0	LCM-3L
71		None	FCW-2a	LCM-3L	Unavail	LEFT	1	FCW-2a	LCM-3	LCM-0	LCM-3L
72	36a	None	FCW-2b	LCM-3L	Unavail	LEFT	1	FCW-2b	LCM-3	LCM-0	LCM-3L
73		DIU	FCW-3a	LCM-X2 R/L	--	L, R, OFF	2b	LCM-X2	None	None	LCM-X2
74	37	DIU, AUD	FCW-3b	LCM-X2 R/L	--	L, R, OFF	2b	LCM-X2	None	None	LCM-X2
75		None	FCW-3a	LCM-0 R/L	--	L, R, OFF	1	FCW-3a	LCM-0	LCM-0	None
76	38	None	FCW-3b	LCM-0 R/L	--	L, R, OFF	1	FCW-3b	LCM-0	LCM-0	FCW-3b
77		None	FCW-3a	LCM-1R	--	OFF	1	FCW-3a	LCM-0	LCM-1	None
78	39	None	FCW-3b	LCM-1R	--	OFF	1	FCW-3b	LCM-0	LCM-1	FCW-3b
79		None	FCW-3a	LCM-1L	--	OFF	1	FCW-3a	LCM-1	LCM-0	None
80	40	None	FCW-3b	LCM-1L	--	OFF	1	FCW-3b	LCM-1	LCM-0	FCW-3b
81		None	FCW-3a	LCM-2R	--	R	1	FCW-3a	LCM-0	LCM-2	None
82	41	None	FCW-3b	LCM-2R	--	R	1	FCW-3b	LCM-0	LCM-2	FCW-3b
83		None	FCW-3a	LCM-2L	--	L	1	FCW-3a	LCM-2	LCM-0	None
84	42	None	FCW-3b	LCM-2L	--	L	1	FCW-3b	LCM-2	LCM-0	FCW-3b
85		DIU	FCW-3a	LCM-0 R/L	LDW-R	OFF	*13*	LDW-R	LCM-0	LCM-0	LDW-R
86	43	DIU, AUD	FCW-3b	LCM-0 R/L	LDW-R	OFF	*6,7*	FCW-3b	LCM-0	LCM-0	FCW-3b

New ID	Old ID	Conflict Source	Sensor Inputs				Rule	Display Outputs			
			Subsystem Alerts			Turn Signal		DIU Visual Display	Left SSD Visual Display	Right SSD Visual Display	Auditory Display
87		None^	FCW-3a	LCM-0 R/L	LDW-R	RIGHT	*1,10*	FCW-3a	LCM-0	LCM-0	None
88	44	None^	FCW-3b	LCM-0 R/L	LDW-R	RIGHT	*1,10*	FCW-3b	LCM-0	LCM-0	FCW-3b
89		DIU	FCW-3a	LCM-0 R/L	LDW-L	OFF	*13*	LDW-L	LCM-0	LCM-0	LDW-L
90	45	DIU, AUD	FCW-3b	LCM-0 R/L	LDW-L	OFF	*6,7*	FCW-3b	LCM-0	LCM-0	FCW-3b
91		None^	FCW-3a	LCM-0 R/L	LDW-L	LEFT	*1,10*	FCW-3a	LCM-0	LCM-0	None
92	46	None^	FCW-3b	LCM-0 R/L	LDW-L	LEFT	*1,10*	FCW-3b	LCM-0	LCM-0	FCW-3b
93		DIU, AUD	FCW-3a	LCM-1R	LDW-R	OFF	*9,11*	FCW-3a	LCM-0	LCM-3*	LCM-3*
94	47	DIU, AUD	FCW-3b	LCM-1R	LDW-R	OFF	*5,9,11*	FCW-3b	LCM-0	LCM-3*	LCM-3*
95		None	FCW-3a	LCM-1R	Unavail	OFF	1	FCW-3a	LCM-0	LCM-1	None
96	47a	None	FCW-3b	LCM-1R	Unavail	OFF	1	FCW-3b	LCM-0	LCM-1	FCW-3b
97		DIU	FCW-3a	LCM-1L	LDW-R	OFF	*13*	LDW-R	LCM-1	LCM-0	LDW-R
98	48	DIU, AUD	FCW-3b	LCM-1L	LDW-R	OFF	*6,7*	FCW-3b	LCM-1	LCM-0	FCW-3b
99		DIU	FCW-3a	LCM-1R	LDW-L	OFF	*13*	LDW-L	LCM-0	LCM-1	LDW-L
100	49	DIU, AUD	FCW-3b	LCM-1R	LDW-L	OFF	*6,7*	FCW-3b	LCM-0	LCM-1	FCW-3b
101		DIU, AUD	FCW-3a	LCM-1L	LDW-L	OFF	*9,11*	FCW-3a	LCM-3*	LCM-0	LCM-3*
102	50	DIU, AUD	FCW-3b	LCM-1L	LDW-L	OFF	*5,9,11*	FCW-3b	LCM-3*	LCM-0	LCM-3*
103		None	FCW-3a	LCM-1L	Unavail	OFF	1	FCW-3a	LCM-1	LCM-0	None
104	50a	None	FCW-3b	LCM-1L	Unavail	OFF	1	FCW-3b	LCM-1	LCM-0	FCW-3b
105		DIU, AUD	FCW-3a	LCM-3R	LDW-R	OFF	*9*	FCW-3a	LCM-0	LCM-3	LCM-3R
106	51	DIU, AUD	FCW-3b	LCM-3R	LDW-R	OFF	*5,9*	FCW-3b	LCM-0	LCM-3	LCM-3R
107		None	FCW-3a	LCM-3R	Unavail	OFF	1	FCW-3a	LCM-0	LCM-3	LCM-3R†
108	51a	AUD	FCW-3b	LCM-3R	Unavail	OFF	5	FCW-3b	LCM-0	LCM-3	LCM-3R†
109		None^	FCW-3a	LCM-3R	LDW-R	RIGHT	*1,10*	FCW-3a	LCM-0	LCM-3	LCM-3R
110	52	AUD^	FCW-3b	LCM-3R	LDW-R	RIGHT	*5,10*	FCW-3b	LCM-0	LCM-3	LCM-3R
111		None	FCW-3a	LCM-3R	Unavail	RIGHT	1	FCW-3a	LCM-0	LCM-3	LCM-3R
112	52a	AUD	FCW-3b	LCM-3R	Unavail	RIGHT	5	FCW-3b	LCM-0	LCM-3	LCM-3R
113		DIU, AUD	FCW-3a	LCM-3L	LDW-L	OFF	*9*	FCW-3a	LCM-3	LCM-0	LCM-3L
114	53	DIU, AUD	FCW-3b	LCM-3L	LDW-L	OFF	*5,9*	FCW-3b	LCM-3	LCM-0	LCM-3L
115		None	FCW-3a	LCM-3L	Unavail	OFF	1	FCW-3a	LCM-3	LCM-0	LCM-3L†
116	53a	AUD	FCW-3b	LCM-3L	Unavail	OFF	5	FCW-3b	LCM-3	LCM-0	LCM-3L†
117		None^	FCW-3a	LCM-3L	LDW-L	LEFT	*1,10*	FCW-3a	LCM-3	LCM-0	LCM-3L
118	54	AUD^	FCW-3b	LCM-3L	LDW-L	LEFT	*5,10*	FCW-3b	LCM-3	LCM-0	LCM-3L
119		None	FCW-3a	LCM-3L	Unavail	LEFT	1	FCW-3a	LCM-3	LCM-0	LCM-3L

New ID	Old ID	Conflict Source	Sensor Inputs				Rule	Display Outputs			
			Subsystem Alerts			Turn Signal		DIU Visual Display	Left SSD Visual Display	Right SSD Visual Display	Auditory Display
120	54a	AUD	FCW-3b	LCM-3L	Unavail	LEFT	5	FCW-3b	LCM-3	LCM-0	LCM-3L
121		DIU	FCW-4a	LCM-X2 R/L	--	L, R, OFF	2c	LCM-X2	None	None	LCM-X2
122	55	DIU, AUD	FCW-4b	LCM-X2 R/L	--	L, R, OFF	2c	LCM-X2	None	None	LCM-X2
123		None	FCW-4a	LCM-0 R/L	--	L, R, OFF	1	FCW-4a	LCM-0	LCM-0	None
124	56	None	FCW-4b	LCM-0 R/L	--	L, R, OFF	1	FCW-4b	LCM-0	LCM-0	FCW-4b
125		None	FCW-4a	LCM-1R	--	OFF	1	FCW-4a	LCM-0	LCM-1	None
126	57	None	FCW-4b	LCM-1R	--	OFF	1	FCW-4b	LCM-0	LCM-1	FCW-4b
127		None	FCW-4a	LCM-1L	--	OFF	1	FCW-4a	LCM-1	LCM-0	None
128	58	None	FCW-4b	LCM-1L	--	OFF	1	FCW-4b	LCM-1	LCM-0	FCW-4b
129		None	FCW-4a	LCM-2R	--	R	1	FCW-4a	LCM-0	LCM-2	None
130	59	None	FCW-4b	LCM-2R	--	R	1	FCW-4b	LCM-0	LCM-2	FCW-4b
131		None	FCW-4a	LCM-2L	--	L	1	FCW-4a	LCM-2	LCM-0	None
132	60	None	FCW-4b	LCM-2L	--	L	1	FCW-4b	LCM-2	LCM-0	FCW-4b
133		DIU, AUD	FCW-4a	LCM-0 R/L	LDW-R	OFF	*14*	LDW-R	LCM-0	LCM-0	LDW-R
134	61	DIU, AUD	FCW-4b	LCM-0 R/L	LDW-R	OFF	*6,7*	FCW-4b	LCM-0	LCM-0	FCW-4b
135		None^	FCW-4a	LCM-0 R/L	LDW-R	RIGHT	*1,10*	FCW-4a	LCM-0	LCM-0	None
136	62	None^	FCW-4b	LCM-0 R/L	LDW-R	RIGHT	*1,10*	FCW-4b	LCM-0	LCM-0	FCW-4b
137		DIU	FCW-4a	LCM-0 R/L	LDW-L	OFF	*14*	LDW-L	LCM-0	LCM-0	LDW-L
138	63	DIU, AUD	FCW-4b	LCM-0 R/L	LDW-L	OFF	*6,7*	FCW-4b	LCM-0	LCM-0	FCW-4b
139		None^	FCW-4a	LCM-0 R/L	LDW-L	LEFT	*1,10*	FCW-4a	LCM-0	LCM-0	None
140	64	None^	FCW-4b	LCM-0 R/L	LDW-L	LEFT	*1,10*	FCW-4b	LCM-0	LCM-0	FCW-4b
141		DIU, AUD	FCW-4a	LCM-1R	LDW-R	OFF	*9,11*	FCW-4a	LCM-0	LCM-3*	LCM-3*
142	65	DIU, AUD	FCW-4b	LCM-1R	LDW-R	OFF	*5a,9,11*	FCW-4b	LCM-0	LCM-3*	LCM-3*
143		None	FCW-4a	LCM-1R	Unavail	OFF	1	FCW-4a	LCM-0	LCM-1	None
144	65a	None	FCW-4b	LCM-1R	Unavail	OFF	1	FCW-4b	LCM-0	LCM-1	FCW-4b
145		DIU	FCW-4a	LCM-1L	LDW-R	OFF	*14*	LDW-R	LCM-1	LCM-0	LDW-R
146	66	DIU, AUD	FCW-4b	LCM-1L	LDW-R	OFF	*6,7*	FCW-4b	LCM-1	LCM-0	FCW-4b
147		DIU	FCW-4a	LCM-1R	LDW-L	OFF	*14*	LDW-L	LCM-0	LCM-1	LDW-L
148	67	DIU, AUD	FCW-4b	LCM-1R	LDW-L	OFF	*6,7*	FCW-4b	LCM-0	LCM-1	FCW-4b

New ID	Old ID	Conflict Source	Sensor Inputs				Rule	Display Outputs			
			Subsystem Alerts			Turn Signal		DIU Visual Display	Left SSD Visual Display	Right SSD Visual Display	Auditory Display
149		DIU, AUD	FCW-4a	LCM-1L	LDW-L	OFF	*9,11*	FCW-4a	LCM-3*	LCM-0	LCM-3*
150	68	DIU, AUD	FCW-4b	LCM-1L	LDW-L	OFF	*5a, 9,11*	FCW-4b	LCM-3*	LCM-0	LCM-3*
151		None	FCW-4a	LCM-1L	Unavail	OFF	1	FCW-4a	LCM-1	LCM-0	None
152	68a	None	FCW-4b	LCM-1L	Unavail	OFF	1	FCW-4b	LCM-1	LCM-0	FCW-4b
153		DIU, AUD	FCW-4a	LCM-3R	LDW-R	OFF	*9*	FCW-4a	LCM-0	LCM-3	LCM-3
154	69	DIU, AUD	FCW-4b	LCM-3R	LDW-R	OFF	*5a,9*	FCW-4b	LCM-0	LCM-3	LCM-3
155		AUD	FCW-4a	LCM-3R	Unavail	OFF	1	FCW-4a	LCM-0	LCM-3	LCM-3R†
156	69a	AUD	FCW-4b	LCM-3R	Unavail	OFF	5	FCW-4b	LCM-0	LCM-3	LCM-3R†
157		None^	FCW-4a	LCM-3R	LDW-R	RIGHT	*1,10*	FCW-4a	LCM-0	LCM-3	LCM-3
158	70	AUD^	FCW-4b	LCM-3R	LDW-R	RIGHT	*5a,10*	FCW-4b	LCM-0	LCM-3	LCM-3
159		None	FCW-4a	LCM-3R	Unavail	RIGHT	1	FCW-4a	LCM-0	LCM-3	LCM-3R
160	70a	AUD	FCW-4b	LCM-3R	Unavail	RIGHT	5	FCW-4b	LCM-0	LCM-3	LCM-3R
161		DIU, AUD	FCW-4a	LCM-3L	LDW-L	OFF	*9*	FCW-4a	LCM-3	LCM-0	LCM-3
162	71	DIU, AUD	FCW-4b	LCM-3L	LDW-L	OFF	*5a,9*	FCW-4b	LCM-3	LCM-0	LCM-3
163		None	FCW-4a	LCM-3L	Unavail	OFF	1	FCW-4a	LCM-3	LCM-0	LCM-3L†
164	71a	AUD	FCW-4b	LCM-3L	Unavail	OFF	5a	FCW-4b	LCM-3	LCM-0	LCM-3L†
165		None^	FCW-4a	LCM-3L	LDW-L	LEFT	*1,10*	FCW-4a	LCM-3	LCM-0	LCM-3
166	72	AUD^	FCW-4b	LCM-3L	LDW-L	LEFT	*5a,10*	FCW-4b	LCM-3	LCM-0	LCM-3
167		None	FCW-4a	LCM-3L	Unavail	LEFT	1	FCW-4a	LCM-3	LCM-0	LCM-3L
168	72a	AUD	FCW-4b	LCM-3L	Unavail	LEFT	5a	FCW-4b	LCM-3	LCM-0	LCM-3L
169	73	DIU	FCW-5	LCM-X2 R/L	--	L, R, OFF	2	FCW-5	None	None	FCW-5
170	74	None	FCW-5	LCM-0 R/L	--	L, R, OFF	1	FCW-5	LCM-0	LCM-0	FCW-5
171	75	None	FCW-5	LCM-1R	--	OFF	1	FCW-5	LCM-0	LCM-1	FCW-5
172	76	None	FCW-5	LCM-1L	--	OFF	1	FCW-5	LCM-1	LCM-0	FCW-5
173	77	None	FCW-5	LCM-2R	--	R	1	FCW-5	LCM-0	LCM-2	FCW-5
174	78	None	FCW-5	LCM-2L	--	L	1	FCW-5	LCM-2	LCM-0	FCW-5
175	79	DIU, AUD	FCW-5	LCM-0 R/L	LDW-R	OFF	*3*	FCW-5	LCM-0	LCM-0	FCW-5
176	80	None^	FCW-5	LCM-0 R/L	LDW-R	RIGHT	*1,3,10*	FCW-5	LCM-0	LCM-0	FCW-5
177	81	DIU, AUD	FCW-5	LCM-0 R/L	LDW-L	OFF	*3*	FCW-5	LCM-0	LCM-0	FCW-5
178	82	None^	FCW-5	LCM-0 R/L	LDW-L	LEFT	*1,3,10*	FCW-5	LCM-0	LCM-0	FCW-5
179	83	DIU, AUD	FCW-5	LCM-1R	LDW-R	OFF	*3,8*	FCW-5	LCM-0	LCM-3*	FCW-5
180	83a	None	FCW-5	LCM-1R	Unavail	OFF	1	FCW-5	LCM-0	LCM-1	FCW-5
181	84	DIU, AUD	FCW-5	LCM-1L	LDW-R	OFF	*3*	FCW-5	LCM-1	LCM-0	FCW-5

New ID	Old ID	Conflict Source	Sensor Inputs				Rule	Display Outputs			
			Subsystem Alerts			Turn Signal		DIU Visual Display	Left SSD Visual Display	Right SSD Visual Display	Auditory Display
182	85	DIU, AUD	FCW-5	LCM-1R	LDW-L	OFF	*3*	FCW-5	LCM-0	LCM-1	FCW-5
183	86	DIU, AUD	FCW-5	LCM-1L	LDW-L	OFF	*3,8*	FCW-5	LCM-3*	LCM-0	FCW-5
184	86a	None	FCW-5	LCM-1L	Unavail	OFF	1	FCW-5	LCM-1	LCM-0	FCW-5
185	87	DIU, AUD	FCW-5	LCM-3R	LDW-R	OFF	*3,8*	FCW-5	LCM-0	LCM-3	FCW-5
186	87a	AUD	FCW-5	LCM-3R	Unavail	OFF	8	FCW-5	LCM-0	LCM-3	FCW-5†
187	88	AUD	FCW-5	LCM-3R	LDW-R	RIGHT	*10,8*	FCW-5	LCM-0	LCM-3	FCW-5
188	88a	AUD	FCW-5	LCM-3R	Unavail	RIGHT	8	FCW-5	LCM-0	LCM-3	FCW-5
189	89	DIU, AUD	FCW-5	LCM-3L	LDW-L	OFF	*3,8*	FCW-5	LCM-3	LCM-0	FCW-5
190	89a	AUD	FCW-5	LCM-3L	Unavail	OFF	8	FCW-5	LCM-3	LCM-0	FCW-5†
191	90	AUD	FCW-5	LCM-3L	LDW-L	LEFT	*10,8*	FCW-5	LCM-3	LCM-0	FCW-5
192	90a	AUD	FCW-5	LCM-3L	Unavail	LEFT	8	FCW-5	LCM-3	LCM-0	FCW-5
193	91	DIU	FCW-6	LCM-X2 R/L	--	L, R, OFF	2	FCW-6	None	None	FCW-6
194	92	None	FCW-6	LCM-0 R/L	--	L, R, OFF	1	FCW-6	LCM-0	LCM-0	FCW-6
195	93	None	FCW-6	LCM-1R	--	OFF	1	FCW-6	LCM-0	LCM-1	FCW-6
196	94	None	FCW-6	LCM-1L	--	OFF	1	FCW-6	LCM-1	LCM-0	FCW-6
197	95	None	FCW-6	LCM-2R	--	R	1	FCW-6	LCM-0	LCM-2	FCW-6
198	96	None	FCW-6	LCM-2L	--	L	1	FCW-6	LCM-2	LCM-0	FCW-6
199	97	DIU, AUD	FCW-6	LCM-0 R/L	LDW-R	OFF	*3*	FCW-6	LCM-0	LCM-0	FCW-6
200	98	None^	FCW-6	LCM-0 R/L	LDW-R	RIGHT	*1,3,10*	FCW-6	LCM-0	LCM-0	FCW-6
201	99	DIU, AUD	FCW-6	LCM-0 R/L	LDW-L	OFF	*3*	FCW-6	LCM-0	LCM-0	FCW-6
202	100	None^	FCW-6	LCM-0 R/L	LDW-L	LEFT	*1,3,10*	FCW-6	LCM-0	LCM-0	FCW-6
203	101	DIU, AUD	FCW-6	LCM-1R	LDW-R	OFF	*3,8*	FCW-6	LCM-0	LCM-3*	FCW-6
204	101a	None	FCW-6	LCM-1R	Unavail	OFF	1	FCW-6	LCM-0	LCM-1	FCW-6
205	102	DIU, AUD	FCW-6	LCM-1L	LDW-R	OFF	*3*	FCW-6	LCM-1	LCM-0	FCW-6
206	103	DIU, AUD	FCW-6	LCM-1R	LDW-L	OFF	*3*	FCW-6	LCM-0	LCM-1	FCW-6
207	104	DIU, AUD	FCW-6	LCM-1L	LDW-L	OFF	*3,8*	FCW-6	LCM-3*	LCM-0	FCW-6
208	104a	None	FCW-6	LCM-1L	Unavail	OFF	1	FCW-6	LCM-1	LCM-0	FCW-6
209	105	DIU, AUD	FCW-6	LCM-3R	LDW-R	OFF	*3,8*	FCW-6	LCM-0	LCM-3	FCW-6
210	105a	AUD	FCW-6	LCM-3R	Unavail	OFF	8	FCW-6	LCM-0	LCM-3	FCW-6†
211	106	AUD	FCW-6	LCM-3R	LDW-R	RIGHT	*10,8*	FCW-6	LCM-0	LCM-3	FCW-6
212	106a	AUD	FCW-6	LCM-3R	Unavail	RIGHT	8	FCW-6	LCM-0	LCM-3	FCW-6
213	107	DIU, AUD	FCW-6	LCM-3L	LDW-L	OFF	*3,8*	FCW-6	LCM-3	LCM-0	FCW-6
214	107a	AUD	FCW-6	LCM-3L	Unavail	OFF	8	FCW-6	LCM-3	LCM-0	FCW-6†

New ID	Old ID	Conflict Source	Sensor Inputs				Rule	Display Outputs			
			Subsystem Alerts			Turn Signal		DIU Visual Display	Left SSD Visual Display	Right SSD Visual Display	Auditory Display
215	108	AUD	FCW-6	LCM-3L	LDW-L	LEFT	*10,8*	FCW-6	LCM-3	LCM-0	FCW-6
216	108a	AUD	FCW-6	LCM-3L	Unavail	LEFT	8	FCW-6	LCM-3	LCM-0	FCW-6
217	109	DIU	FCW-7	LCM-X2 R/L	--	L, R, OFF	2	FCW-7	None	None	FCW-7
218	110	None	FCW-7	LCM-0 R/L	--	L, R, OFF	1	FCW-7	LCM-0	LCM-0	FCW-7
219	111	None	FCW-7	LCM-1R	--	OFF	1	FCW-7	LCM-0	LCM-1	FCW-7
220	112	None	FCW-7	LCM-1L	--	OFF	1	FCW-7	LCM-1	LCM-0	FCW-6
221	113	None	FCW-7	LCM-2R	--	R	1	FCW-7	LCM-0	LCM-2	FCW-7
222	114	None	FCW-7	LCM-2L	--	L	1	FCW-7	LCM-2	LCM-0	FCW-7
223	115	DIU, AUD	FCW-7	LCM-0 R/L	LDW-R	OFF	*3*	FCW-7	LCM-0	LCM-0	FCW-7
224	116	None^	FCW-7	LCM-0 R/L	LDW-R	RIGHT	*1,3,10*	FCW-7	LCM-0	LCM-0	FCW-7
225	117	DIU, AUD	FCW-7	LCM-0 R/L	LDW-L	OFF	*3*	FCW-7	LCM-0	LCM-0	FCW-7
226	118	None^	FCW-7	LCM-0 R/L	LDW-L	LEFT	*1,3,10*	FCW-7	LCM-0	LCM-0	FCW-7
227	119	DIU, AUD	FCW-7	LCM-1R	LDW-R	OFF	*3,8*	FCW-7	LCM-0	LCM-3*	FCW-7
228	119a	None	FCW-7	LCM-1R	Unavail	OFF	1	FCW-7	LCM-0	LCM-1	FCW-7
229	120	DIU, AUD	FCW-7	LCM-1L	LDW-R	OFF	*3*	FCW-7	LCM-1	LCM-0	FCW-6
230	121	DIU, AUD	FCW-7	LCM-1R	LDW-L	OFF	*3*	FCW-7	LCM-0	LCM-1	FCW-7
231	122	DIU, AUD	FCW-7	LCM-1L	LDW-L	OFF	*3,8*	FCW-7	LCM-3*	LCM-0	FCW-7
232	122a	None	FCW-7	LCM-1L	Unavail	OFF	1	FCW-7	LCM-1	LCM-0	FCW-7
233	123	DIU, AUD	FCW-7	LCM-3R	LDW-R	OFF	*3,8*	FCW-7	LCM-0	LCM-3	FCW-7
234	123a	AUD	FCW-7	LCM-3R	Unavail	OFF	8	FCW-7	LCM-0	LCM-3	FCW-7†
235	124	AUD	FCW-7	LCM-3R	LDW-R	RIGHT	*10,8*	FCW-7	LCM-0	LCM-3	FCW-7
236	124a	AUD	FCW-7	LCM-3R	Unavail	RIGHT	8	FCW-7	LCM-0	LCM-3	FCW-7
237	125	DIU, AUD	FCW-7	LCM-3L	LDW-L	OFF	*3,8*	FCW-7	LCM-3	LCM-0	FCW-7
238	125a	AUD	FCW-7	LCM-3L	Unavail	OFF	8	FCW-7	LCM-3	LCM-0	FCW-7†
239	126	AUD	FCW-7	LCM-3L	LDW-L	LEFT	*10,8*	FCW-7	LCM-3	LCM-0	FCW-7
240	126a	AUD	FCW-7	LCM-3L	Unavail	LEFT	8	FCW-7	LCM-3	LCM-0	FCW-7
241	127	DIU	--	LCM-X2 R/L	LDW-R	OFF	2d	LCM-X2	None	None	LCM-X2
242	128	None^	--	LCM-X2 R/L	LDW-R	RIGHT	1,10	LCM-X2	None	None	LCM-X2
243	129	DIU	--	LCM-X2 R/L	LDW-L	OFF	2d	LCM-X2	None	None	LCM-X2
244	130	None^	--	LCM-X2 R/L	LDW-L	LEFT	1,10	LCM-X2	None	None	LCM-X2

New ID	Old ID	Conflict Source	Sensor Inputs				Rule	Display Outputs			
			Subsystem Alerts			Turn Signal		DIU Visual Display	Left SSD Visual Display	Right SSD Visual Display	Auditory Display
245	131	None	--	LCM-0 R/L	LDW-R	OFF	1	LDW-R	LCM-0	LCM-0	LDW-R
246	132	None^	--	LCM-0 R/L	LDW-R	RIGHT	1,10	None	LCM-0	LCM-0	None
247	133	None	--	LCM-0 R/L	LDW-L	OFF	1	LDW-L	LCM-0	LCM-0	LDW-L
248	134	None^	--	LCM-0 R/L	LDW-L	LEFT	1,10	None	LCM-0	LCM-0	None
249	135	AUD	--	LCM-1R	LDW-R	OFF	9	None	LCM-0	LCM-3*	LCM-3*
250	136	None	--	LCM-1L	LDW-R	OFF	*1*	LDW-R	LCM-1	LCM-0	LDW-R
251	137	None	--	LCM-1R	LDW-L	OFF	1	LDW-L	LCM-0	LCM-1	LDW-L
252	138	AUD	--	LCM-1L	LDW-L	OFF	*9*	None	LCM-3*	LCM-0	LCM-3*
253	139	AUD	--	LCM-3R	LDW-R	OFF	*9*	None	LCM-0	LCM-3	LCM-3
254	140	None^	--	LCM-3R	LDW-R	RIGHT	*9,10*	None	LCM-0	LCM-3	LCM-3
255	141	AUD	--	LCM-3L	LDW-L	OFF	*9*	None	LCM-3	LCM-0	LCM-3
256	142	None^	--	LCM-3L	LDW-L	LEFT	*9,10*	None	LCM-3	LCM-0	LCM-3

^ There is no conflict involving an LDW display because the LDW is suppressed by the turn signal activation.

* LCM-3 is the most appropriate warning, even though a turn signal is not activated, because the sensor data indicate that it is the same as an LCM-3 situation. It is unclear whether this sensor combination is even possible, given the definition of the LCM-3 alarm, however, it is included for completeness.

The assumption here is that the FCW-1 display appears before the LCM-3 conditions, otherwise the FCW-1 display would also be suppressed as per rule 12.

† It is unclear if this permutation is possible with the LDW unavailable (can the LCM system still throw an LCM-3?).

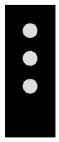
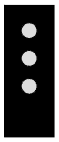
Appendix B: Scenario Worksheets

Note: This Appendix is most useful when printed in double-sided, two-page format.

ID # 1

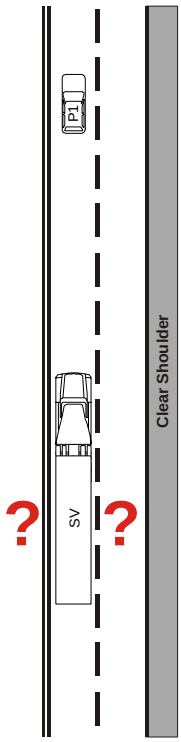
Conflict Source

DIU

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
None	**LCM-X2**	**None**	**LCM-X2**		

Individual Sensor Conditions

FCW-1	LCM-X2 R/L	--



Turn Signal

Left, Right, Off

Rules

2a Visual and auditory LCM-X2 overrides visual and auditory FCW-1 & 2

Comments:

ID # 1

ID#	Primary Crash Risk	Likely Resolution	Severity
1	*Minimal to none*		

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	-	
Unalert:	-	
Partially Alert:	-	
Fully Alert:	-	

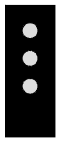
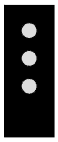
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
	N

ID # 2

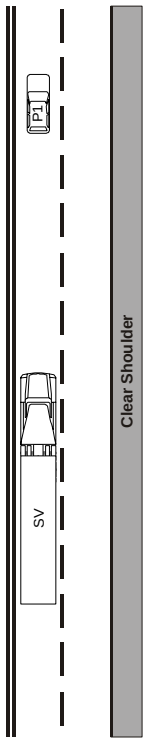
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-1**	**LCM-0**	**None**		

Individual Sensor Conditions

FCW-1	LCM-0 R/L	--



Turn Signal

Left, Right, Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 2

ID#	Primary Crash Risk	Likely Resolution	Severity
2	*Minimal to none*		

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	-	
Unalert:	-	
Partially Alert:	-	
Fully Alert:	-	

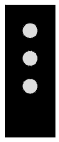
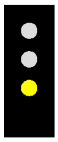
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
	N

ID # 3

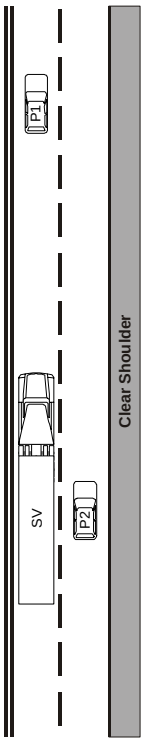
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-1**	**LCM-1**	**None**		

Individual Sensor Conditions

FCW-1	LCM-1R	--



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 3

ID#	Primary Crash Risk	Likely Resolution	Severity
3	Minimal to none		

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	-	
Unalert:	-	
Partially Alert:	-	
Fully Alert:	-	

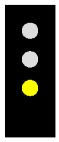
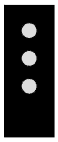
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
	N

ID # 4

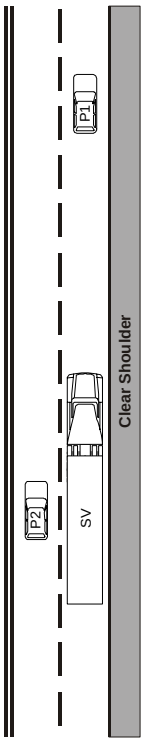
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-1	**FCW-1**	**LCM-0**	**None**		

Individual Sensor Conditions

FCW-1	LCM-1L	--



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 4

ID#	Primary Crash Risk	Likely Resolution	Severity
4	*Minimal to none*		

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	-	
Unalert:	-	
Partially Alert:	-	
Fully Alert:	-	

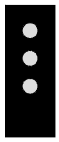
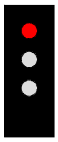
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
	N

ID # 5

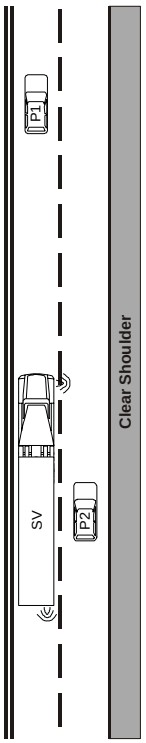
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-1**	**LCM-2**		**None**	

Individual Sensor Conditions

FCW-1	LCM-2R	--



Turn Signal

Right

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 5

ID#	Primary Crash Risk	Likely Resolution	Severity
5	*Minimal to none*		

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	N	*Assumes that a sleeping driver would not have turn signal activated*
Unalert:	Y	*Driver forgot to cancel turn signal*
Partially Alert:	Y	*Driver is unaware of P2 and has not yet started lane change*
Fully Alert:	Y	*Driver is signaling to be let in adjacent lane*

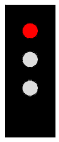
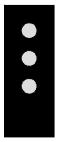
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
Note that there is no conflict specified because LDW/LCM systems indicate that SV is staying in lane at this time	**N**

ID # 6

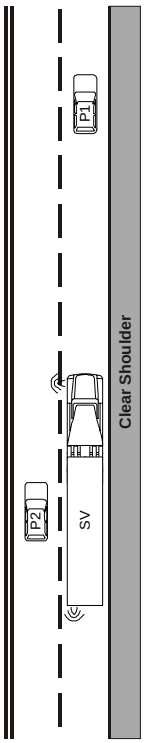
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-2	**FCW-1**	**LCM-0**		**None**	

Individual Sensor Conditions

FCW-1	LCM-2L	--



Turn Signal

Left

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 6

ID#	Primary Crash Risk	Likely Resolution	Severity
6	*Minimal to none*		

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	N	*Assumes that a sleeping driver would not have turn signal activated*
Unalert:	Y	*Driver forgot to cancel turn signal*
Partially Alert:	Y	*Driver is unaware of P2 and has not yet started lane change*
Fully Alert:	Y	*Driver is signaling to be let in adjacent lane*

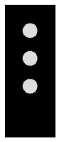
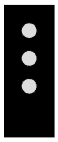
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
Note that there is no conflict specified because LDW/LCM systems indicate that SV is staying in lane at this time	**N**

ID # 7

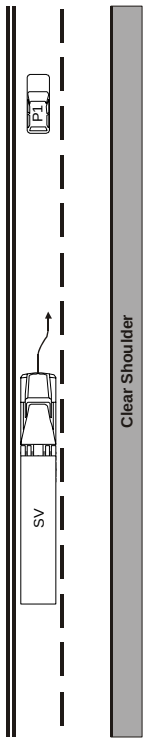
Conflict Source

DIU

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**LDW-R**	**LCM-0**			**LDW-R**

Individual Sensor Conditions

FCW-1	LCM-0 R/L	LDW-R



Turn Signal

Off

Rules

4 Visual LDW overrides visual FCW-1 & 2

Comments:

ID # 7

ID#	Primary Crash Risk	Likely Resolution	Severity
7	*SV run off road*	*SV stays in current lane*	*Medium*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting off the road*
Unalert:	Y	*Driver is drifting off the road*
Partially Alert:	Y	*Driver is changing lanes without signal*
Fully Alert:	Y	*Driver is changing lanes without signal*

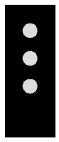
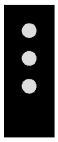
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
	N

ID # 8

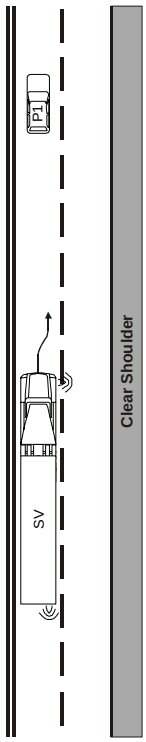
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-1**	**LCM-0**	**None**		

Individual Sensor Conditions

FCW-1	LCM-0 R/L	LDW-R



Turn Signal

Right

Rules

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 8

ID#	Primary Crash Risk	Likely Resolution	Severity
8	*Minimal to none*		

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes*
Fully Alert:	Y	*Driver is changing lanes*

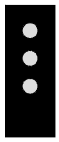
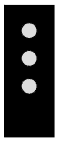
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
	N

ID # 9

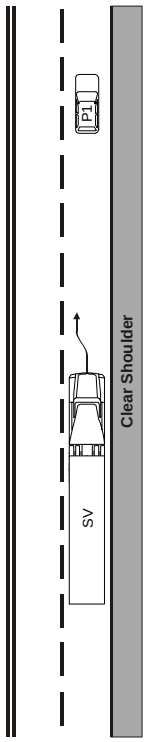
Conflict Source

DIU

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**LDW-L**	**LCM-0**	**LDW-L**		

Individual Sensor Conditions

FCW-1	LCM-0 R/L	LDW-L



Turn Signal

Off

Rules

4 Visual LDW overrides visual FCW-1 & 2

Comments:

ID # 9

ID#	Primary Crash Risk	Likely Resolution	Severity
9	*SV runs off road into oncoming traffic*	*SV stays in current lane*	*High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signal*
Fully Alert:	Y	*Driver is changing lanes without signal*

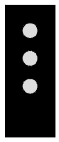
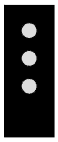
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
	N

ID # 10

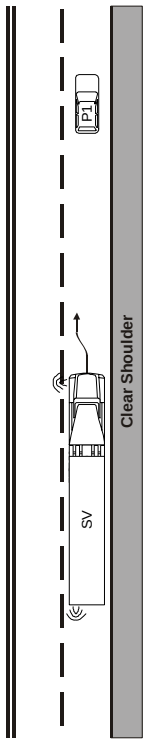
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-1**	**LCM-0**	**None**		

Individual Sensor Conditions

FCW-1	LCM-0 R/L	LDW-L



Turn Signal

Left

Rules

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 10

ID#	Primary Crash Risk	Likely Resolution	Severity
10	*Minimal to none*		

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes*
Fully Alert:	Y	*Driver is changing lanes*

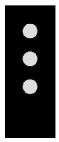
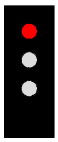
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
	N

ID # 11

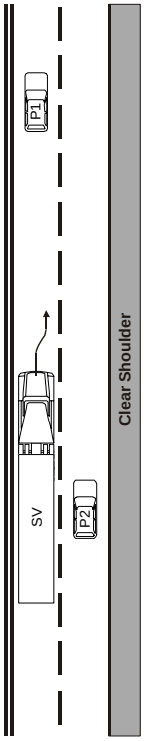
Conflict Source

DIU

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-1#**	**LCM-3***			**LCM-3R***

Individual Sensor Conditions

FCW-1	LCM-1R	LDW-R



Turn Signal

Off

Rules

4 Visual LDW overrides visual FCW-1 & 2

11 If LDW indicates LD in direction of LCM-1, an auditory LCM-2 warning should be thrown under all conditions except FCW-5,6,7

12 DIU display should not be changed while a LCM-3 is in progress, except for FCW-5,6, or 7

Comments:

The assumption here is that the FCW-1 display appears before the LCM-3 conditions, otherwise the FCW-1 display would also be suppressed as per rule 12.

* LCM-3 is the most appropriate warning, even though a turn signal is not activated, because the sensor data indicate that it is the same as an LCM-3 situation. It is unclear whether this sensor combination is even possible, given the definition of the LCM-3 alarm, however, it is included for completeness.

ID # 11

ID#	Primary Crash Risk	Likely Resolution	Severity
11	*Conflict with P2 (running P2 off road or crashing with P2)*	*SV stays in current lane*	*Med-High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

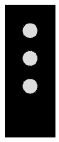
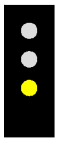
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV	**N**

ID # **11a**

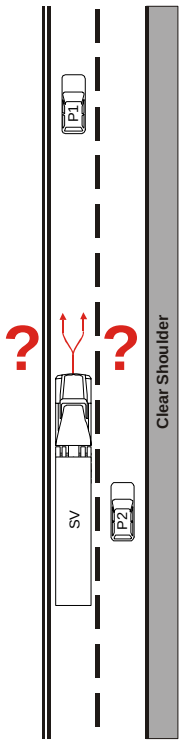
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-1**	**LCM-1**		**None**	

Individual Sensor Conditions

FCW-1	LCM-1R	Unavail



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # **11a**

ID#	Primary Crash Risk	Likely Resolution	Severity
11a	*Minimal to none*		

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	-	
Unalert:	-	
Partially Alert:	-	
Fully Alert:	-	

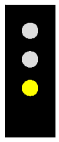
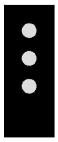
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
Assume that driver knows about LDW unavailability LCM system indicates that SV is remaining in its current lane	**N**

ID # 12

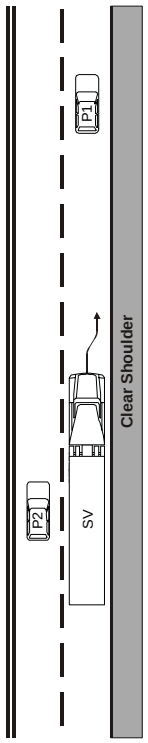
Conflict Source

DIU

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-1	**LDW-R**	**LCM-0**			**LDW-R**

Individual Sensor Conditions

FCW-1	LCM-1L	LDW-R



Turn Signal

Off

Rules

4 Visual LDW overrides visual FCW-1 & 2

Comments:

ID # 12

ID#	Primary Crash Risk	Likely Resolution	Severity
12	*SV run off road*	*SV stays in current lane*	*Medium*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signal*
Fully Alert:	Y	*Driver is changing lanes without signal*

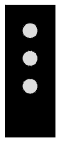
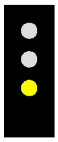
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
	N

ID # 13

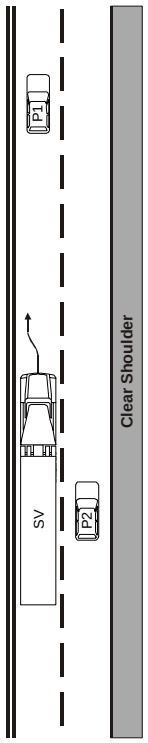
Conflict Source

DIU

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**LDW-L**	**LCM-1**			**LDW-L**

Individual Sensor Conditions

FCW-1	LCM-1R	LDW-L



Turn Signal

Off

Rules

4 Visual LDW overrides visual FCW-1 & 2

Comments:

ID # 13

ID#	Primary Crash Risk	Likely Resolution	Severity
13	*SV runs off road into oncoming traffic*	*SV stays in current lane*	*High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signal*
Fully Alert:	Y	*Driver is changing lanes without signal*

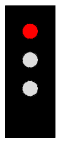
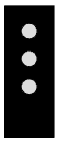
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
	N

ID # 14

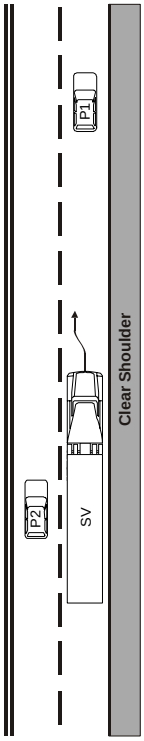
Conflict Source

DIU

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3*	**FCW-1#**	**LCM-0**	**LCM-3L***		

Individual Sensor Conditions

FCW-1	LCM-1L	LDW-L



Turn Signal

Off

Rules

4 Visual LDW overrides visual FCW-1 & 2

11 If LDW indicates LD in direction of LCM-1, an auditory LCM-2 warning should be thrown under all conditions except FCW-5,6,7

12 DIU display should not be changed while a LCM-3 is in progress, except for FCW-5,6, or 7

Comments:

* LCM-3 is the most appropriate warning, even though a turn signal is not activated, because the sensor data indicate that it is the same as an LCM-3 situation. It is unclear whether this sensor combination is even possible, given the definition of the L

The assumption here is that the FCW-1 display appears before the LCM-3 conditions, otherwise the FCW-1 display would also be suppressed as per rule 12. -2, and the LDW provides no meaningful information.

ID # 14

ID#	Primary Crash Risk	Likely Resolution	Severity
14	*Conflict with P2 (running P2 into oncoming traffic, off the road, or crashing with P2)*	*SV stays in current lane*	*High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

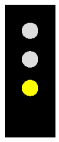
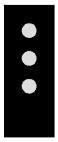
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV	**N**

ID # 14

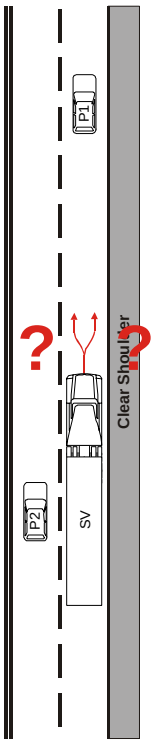
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-1	**FCW-1**	**LCM-0**		**None**	

Individual Sensor Conditions

FCW-1	LCM-1L	Unavail



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 14a

ID#	Primary Crash Risk	Likely Resolution	Severity
14a	*Minimal to none*		

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	-	
Unalert:	-	
Partially Alert:	-	
Fully Alert:	-	

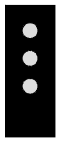
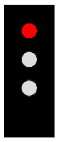
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
Assume that driver knows about LDW unavailability LCM system indicates that SV is remaining in its current lane	**N**

ID # 15

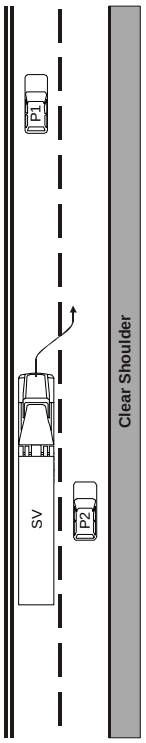
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-1**	**LCM-3**			**LCM-3R**

Individual Sensor Conditions

FCW-1	LCM-3R	LDW-R



Turn Signal

Off

Rules

9 LCM-3 cancels LDW

Comments:

ID # 15

ID#	Primary Crash Risk	Likely Resolution	Severity
15	*Conflict with P2 (running P2 off road or crashing with P2)*	*SV stays in current lane*	*Med-High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

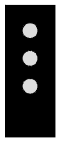
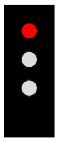
General Comments:
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV

Exception
N

ID # **15a**

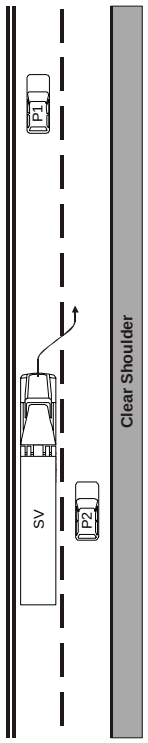
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-1**	**LCM-3**			**LCM-3R†**

Individual Sensor Conditions

FCW-1	LCM-3R	Unavail



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

† It is unclear if this permutation is possible with the LDW unavailable (can the LCM system still throw an LCM-3?)

ID # **15a**

ID#	Primary Crash Risk	Likely Resolution	Severity
15a	*Conflict with P2 (running P2 off road or crashing with P2)*	*SV stays in current lane*	*Med-High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

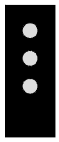
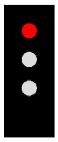
General Comments:
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV

Exception
N

ID # 16

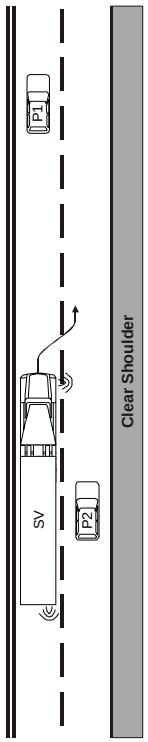
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-1**	**LCM-3**			**LCM-3R**

Individual Sensor Conditions

FCW-1	LCM-3R	LDW-R



Turn Signal

Right

Rules

9 LCM-3 cancels LDW

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 16

ID#	Primary Crash Risk	Likely Resolution	Severity
16	*Conflict with P2 (running P2 off road or crashing with P2)*	*SV stays in current lane*	*Med-High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

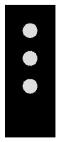
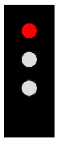
General Comments:
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV

Exception
N

ID # **16a**

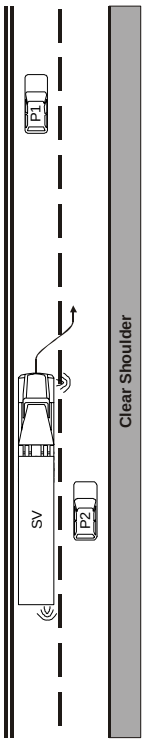
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-1**	**LCM-3**			**LCM-3R**

Individual Sensor Conditions

FCW-1	LCM-3R	Unavail



Turn Signal

Right

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # **16a**

ID#	Primary Crash Risk	Likely Resolution	Severity
16a	*Conflict with P2 (running P2 off road or crashing with P2)*	*SV stays in current lane*	*Med-High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

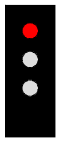
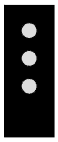
General Comments:
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV

Exception
N

ID # 17

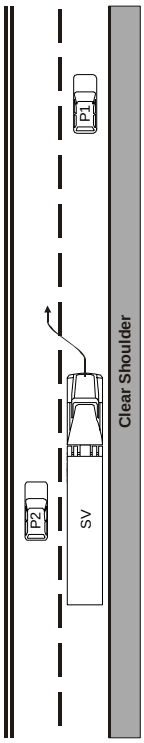
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-1**	**LCM-0**	**LCM-3L**		

Individual Sensor Conditions

FCW-1	LCM-3L	LDW-L



Turn Signal

Off

Rules

9 LCM-3 cancels LDW

Comments:

ID # 17

ID#	Primary Crash Risk	Likely Resolution	Severity
17	*Conflict with P2 (running P2 into oncoming traffic, off the road, or crashing with P2)*	*SV stays in current lane*	*High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

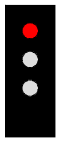
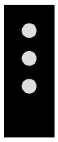
General Comments:
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV

Exception
N

ID # **17a**

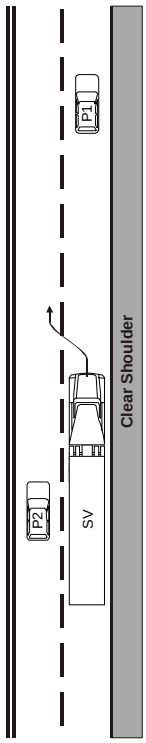
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-1**	**LCM-0**	**LCM-3L**†		

Individual Sensor Conditions

FCW-1	LCM-3L	Unavail



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

† It is unclear if this permutation is possible with the LDW unavailable (can the LCM system still throw an LCM-3?)

ID # **17a**

ID#	Primary Crash Risk	Likely Resolution	Severity
17a	*Conflict with P2 (running P2 into oncoming traffic, off the road, or crashing with P2)*	*SV stays in current lane*	*High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

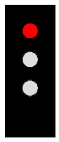
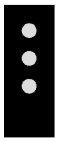
General Comments:
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV

Exception
N

ID # 18

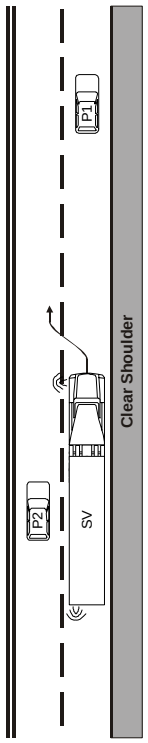
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-1**	**LCM-0**	**LCM-3L**		

Individual Sensor Conditions

FCW-1	LCM-3L	LDW-L



Turn Signal

Left

Rules

9 LCM-3 cancels LDW

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 18

ID#	Primary Crash Risk	Likely Resolution	Severity
18	*Conflict with P2 (running P2 into oncoming traffic, off the road, or crashing with P2)*	*SV stays in current lane*	*High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

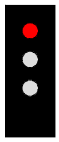
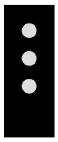
General Comments:
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV

Exception
N

ID # 18a

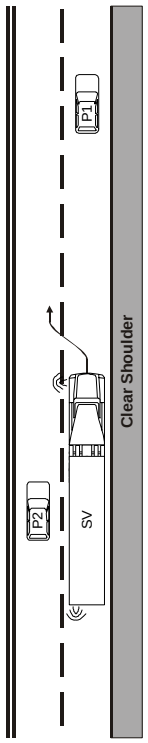
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-1**	**LCM-0**	**LCM-3L**		

Individual Sensor Conditions

FCW-1	LCM-3L	Unavail



Turn Signal

Left

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # **18a**

ID#	Primary Crash Risk	Likely Resolution	Severity
18a	*Conflict with P2 (running P2 into oncoming traffic, off the road, or crashing with P2)*	*SV stays in current lane*	*High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

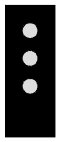
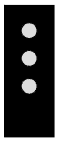
General Comments:
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV

Exception
N

ID # 19

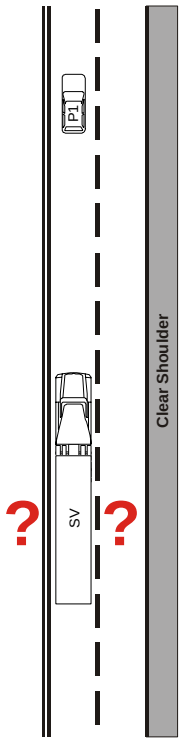
Conflict Source

DIU

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
None	**LCM-X2**	**None**	**LCM-X2**		

Individual Sensor Conditions

FCW-2	LCM-X2 R/L	--



Turn Signal

Left, Right, Off

Rules

2a Visual and auditory LCM-X2 overrides visual and auditory FCW-1 & 2

Comments:

ID # 19

ID#	Primary Crash Risk	Likely Resolution	Severity
19	*Minimal to none*		

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	-	
Unalert:	-	
Partially Alert:	-	
Fully Alert:	-	

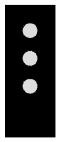
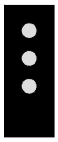
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
	N

ID # 20

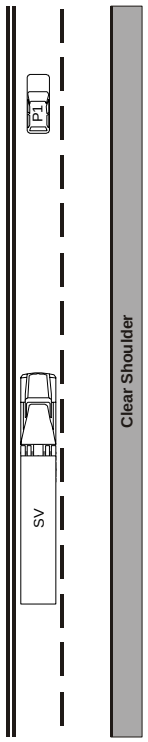
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-2**	**LCM-0**	**None**		

Individual Sensor Conditions

FCW-2	LCM-0 R/L	--



Turn Signal

Left, Right, Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 20

ID#	Primary Crash Risk	Likely Resolution	Severity
20	*Minimal to none*		

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	-	
Unalert:	-	
Partially Alert:	-	
Fully Alert:	-	

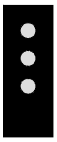
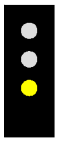
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
	N

ID # 21

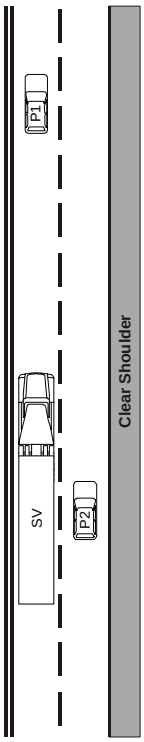
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-2**	**LCM-1**	**None**		

Individual Sensor Conditions

FCW-2	LCM-1R	--



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # **21**

ID#	Primary Crash Risk	Likely Resolution	Severity
21	*Minimal to none*		

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	-	
Unalert:	-	
Partially Alert:	-	
Fully Alert:	-	

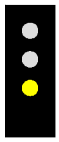
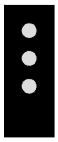
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
	N

ID # 22

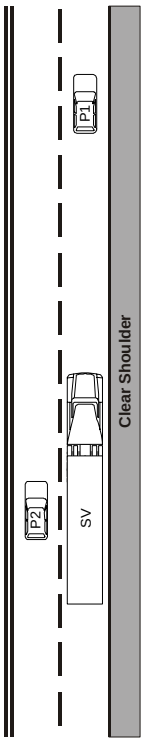
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-1	**FCW-2**	**LCM-0**	**None**		

Individual Sensor Conditions

FCW-2	LCM-1L	--



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 22

ID#	Primary Crash Risk	Likely Resolution	Severity
22	*Minimal to none*		

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	-	
Unalert:	-	
Partially Alert:	-	
Fully Alert:	-	

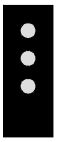
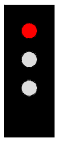
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
	N

ID # 23

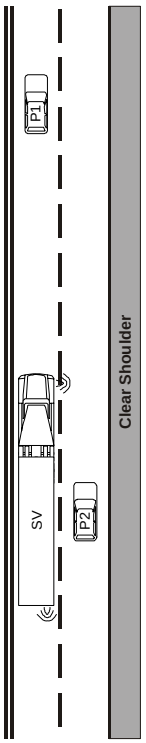
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-2**	**LCM-2**		**None**	

Individual Sensor Conditions

FCW-2	LCM-2R	--



Turn Signal

Right

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 23

ID#	Primary Crash Risk	Likely Resolution	Severity
23	*Minimal to none*		

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	N	*Assumes that a sleeping driver would not have turn signal activated*
Unalert:	Y	*Driver forgot to cancel turn signal*
Partially Alert:	Y	*Driver is unaware of P2 and has not yet started lane change*
Fully Alert:	Y	*Driver is signaling to be let in adjacent lane*

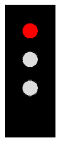
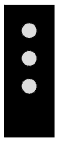
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
Note that there is no conflict specified because LDW/LCM systems indicate that SV is staying in lane at this time	**N**

ID # 24

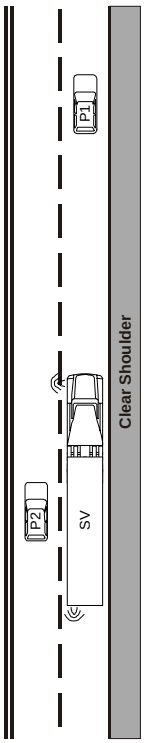
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-2	**FCW-2**	**LCM-0**		**None**	

Individual Sensor Conditions

FCW-2	LCM-2L	--



Turn Signal

Left

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 24

ID#	Primary Crash Risk	Likely Resolution	Severity
24	*Minimal to none*		

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	N	*Assumes that a sleeping driver would not have turn signal activated*
Unalert:	Y	*Driver forgot to cancel turn signal*
Partially Alert:	Y	*Driver is unaware of P2 and has not yet started lane change*
Fully Alert:	Y	*Driver is signaling to be let in adjacent lane*

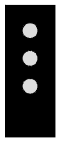
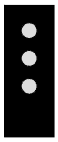
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
Note that there is no conflict specified because LDW/LCM systems indicate that SV is staying in lane at this time	**N**

ID # 25

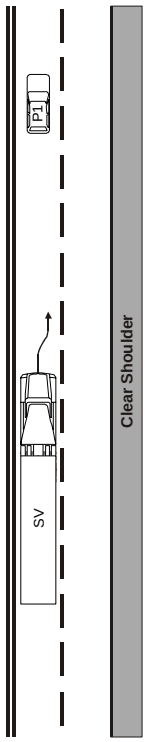
Conflict Source

DIU

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**LDW-R**	**LCM-0**			**LDW-R**

Individual Sensor Conditions

FCW-2	LCM-0 R/L	LDW-R



Turn Signal

Off

Rules

4 Visual LDW overrides visual FCW-1 & 2

Comments:

ID # 25

ID#	Primary Crash Risk	Likely Resolution	Severity
25	*SV run off road*	*SV stays in current lane*	*Medium*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting off the road*
Unalert:	Y	*Driver is drifting off the road*
Partially Alert:	Y	*Driver is changing lanes without signal*
Fully Alert:	Y	*Driver is changing lanes without signal*

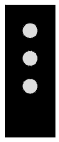
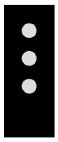
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
	N

ID # 26

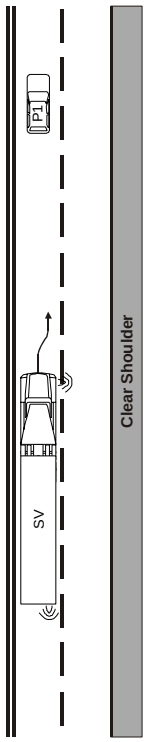
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-2**	**LCM-0**	**None**		

Individual Sensor Conditions

FCW-2	LCM-0 R/L	LDW-R



Turn Signal

Right

Rules

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 26

ID#	Primary Crash Risk	Likely Resolution	Severity
26	*Minimal to none*		

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes*
Fully Alert:	Y	*Driver is changing lanes*

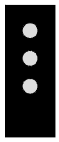
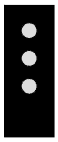
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
	N

ID # 27

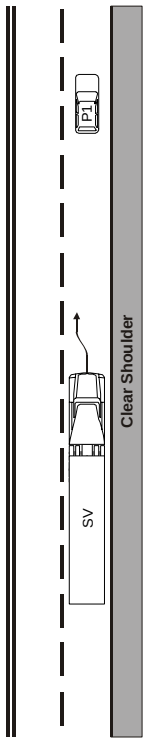
Conflict Source

DIU

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**LDW-L**	**LCM-0**	**LDW-L**		

Individual Sensor Conditions

FCW-2	LCM-0 R/L	LDW-L



Turn Signal

Off

Rules

4 Visual LDW overrides visual FCW-1 & 2

Comments:

ID # 27

ID#	Primary Crash Risk	Likely Resolution	Severity
27	*SV runs off road into oncoming traffic*	*SV stays in current lane*	*High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signal*
Fully Alert:	Y	*Driver is changing lanes without signal*

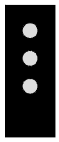
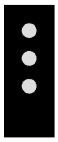
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
	N

ID # 28

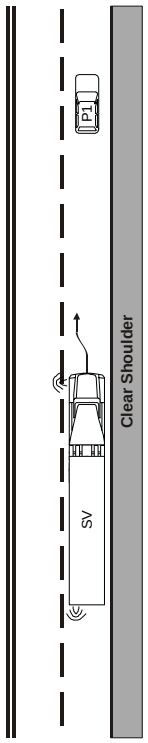
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-2**	**LCM-0**	**None**		

Individual Sensor Conditions

FCW-2	LCM-0 R/L	LDW-L



Turn Signal

Left

Rules

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 28

ID#	Primary Crash Risk	Likely Resolution	Severity
28	*Minimal to none*		

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes*
Fully Alert:	Y	*Driver is changing lanes*

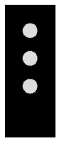
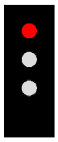
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
	N

ID # 29

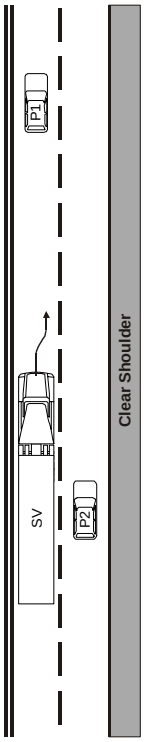
Conflict Source

DIU

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-2#**	**LCM-3***			**LCM-3R***

Individual Sensor Conditions

FCW-2	LCM-1R	LDW-R



Turn Signal

Off

Rules

4 Visual LDW overrides visual FCW-1 & 2

11 If LDW indicates LD in direction of LCM-1, an auditory LCM-2 warning should be thrown under all conditions except FCW-5,6,7

12 DIU display should not be changed while a LCM-3 is in progress, except for FCW-5,6, or 7

Comments:

The assumption here is that the FCW-1 display appears before the LCM-3 conditions, otherwise the FCW-1 display would also be suppressed as per rule 12.
* LCM-3 is the most appropriate warning, even though a turn signal is not activated, because the sensor data indicate that it is the same as an LCM-3 situation. It is unclear whether this sensor combination is even possible, given the definition of the L

ID # 29

ID#	Primary Crash Risk	Likely Resolution	Severity
29	*Conflict with P2 (running P2 off road or crashing with P2)*	*SV stays in current lane*	*Med-High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

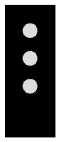
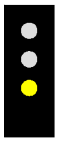
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV	**N**

ID # **29a**

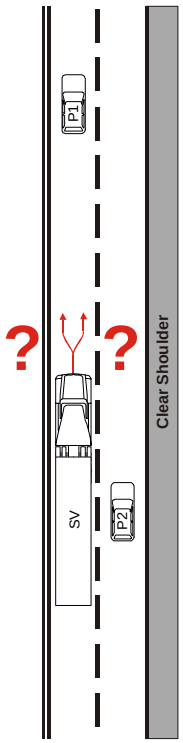
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-2**	**LCM-1**		**None**	

Individual Sensor Conditions

FCW-2	LCM-1R	Unavail



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # **29a**

ID#	Primary Crash Risk	Likely Resolution	Severity
29a	*Minimal to none*		

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	-	
Unalert:	-	
Partially Alert:	-	
Fully Alert:	-	

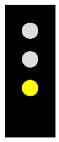
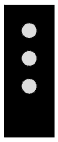
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
Assume that driver knows about LDW unavailability LCM system indicates that SV is remaining in its current lane	**N**

ID # 30

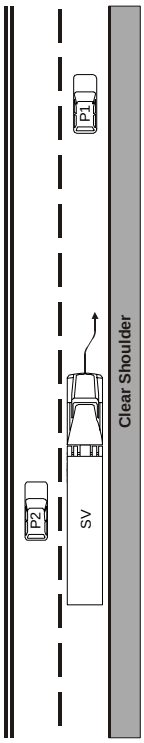
Conflict Source

DIU

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-1	**LDW-R**	**LCM-0**			**LDW-R**

Individual Sensor Conditions

FCW-2	LCM-1L	LDW-R



Turn Signal

Off

Rules

4 Visual LDW overrides visual FCW-1 & 2

Comments:

ID # 30

ID#	Primary Crash Risk	Likely Resolution	Severity
30	*SV run off road*	*SV stays in current lane*	*Medium*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signal*
Fully Alert:	Y	*Driver is changing lanes without signal*

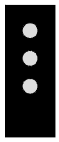
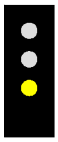
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
	N

ID # 31

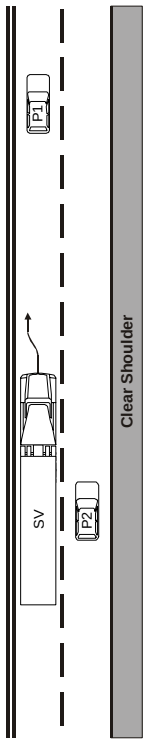
Conflict Source

DIU

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**LDW-L**	**LCM-1**	**LDW-L**		

Individual Sensor Conditions

FCW-2	LCM-1R	LDW-L



Turn Signal

Off

Rules

4 Visual LDW overrides visual FCW-1 & 2

Comments:

ID # 31

ID#	Primary Crash Risk	Likely Resolution	Severity
31	*SV runs off road into oncoming traffic*	*SV stays in current lane*	*High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signal*
Fully Alert:	Y	*Driver is changing lanes without signal*

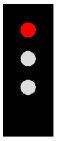
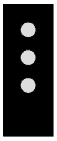
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
	N

ID # 32

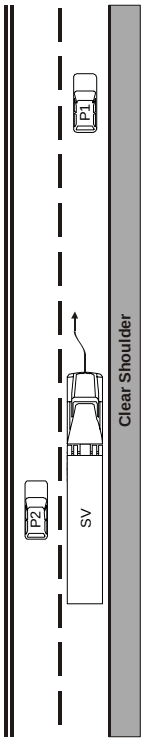
Conflict Source

DIU

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3*	**FCW-2#**	**LCM-0**	**LCM-3L***		

Individual Sensor Conditions

FCW-2	LCM-1L	LDW-L



Turn Signal

Off

Rules

4 Visual LDW overrides visual FCW-1 & 2

11 If LDW indicates LD in direction of LCM-1, an auditory LCM-2 warning should be thrown under all conditions except FCW-5,6,7

12 DIU display should not be changed while a LCM-3 is in progress, except for FCW-5,6, or 7

Comments:

* LCM-3 is the most appropriate warning, even though a turn signal is not activated, because the sensor data indicate that it is the same as an LCM-3 situation. It is unclear whether this sensor combination is even possible, given the definition of the L

The assumption here is that the FCW-1 display appears before the LCM-3 conditions, otherwise the FCW-1 display would also be suppressed as per rule 12. -2, and the LDW provides no meaningful information.

ID # **32**

ID#	Primary Crash Risk	Likely Resolution	Severity
32	*Conflict with P2 (running P2 into oncoming traffic, off the road, or crashing with P2)*	*SV stays in current lane*	*High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

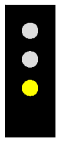
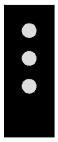
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV	**N**

ID # 32a

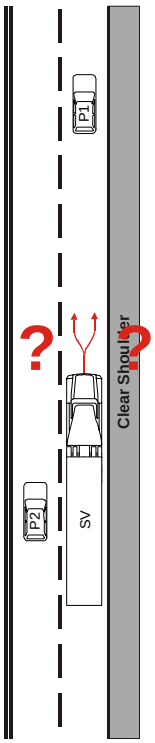
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-1	**FCW-2**	**LCM-0**		**None**	

Individual Sensor Conditions

FCW-2	LCM-1L	Unavail



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # **32a**

ID#	Primary Crash Risk	Likely Resolution	Severity
32a	*Minimal to none*		

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	-	
Unalert:	-	
Partially Alert:	-	
Fully Alert:	-	

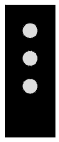
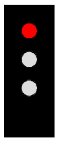
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
Assume that driver knows about LDW unavailability LCM system indicates that SV is remaining in its current lane	**N**

ID # 33

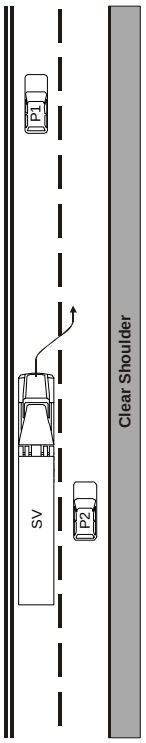
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-2**	**LCM-3**			**LCM-3R**

Individual Sensor Conditions

FCW-2	LCM-3R	LDW-R



Turn Signal

Off

Rules

9 LCM-3 cancels LDW

Comments:

ID # **33**

ID#	Primary Crash Risk	Likely Resolution	Severity
33	*Conflict with P2 (running P2 off road or crashing with P2)*	*SV stays in current lane*	*Med-High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

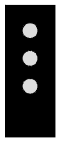
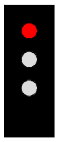
General Comments:
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV

Exception
N

ID # **33a**

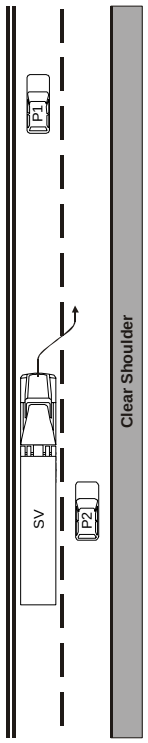
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-2**	**LCM-3**			**LCM-3R†**

Individual Sensor Conditions

FCW-2	LCM-3R	Unavail



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

† It is unclear if this permutation is possible with the LDW unavailable (can the LCM system still throw an LCM-3?)

ID # **33a**

ID#	Primary Crash Risk	Likely Resolution	Severity
33a	*Conflict with P2 (running P2 off road or crashing with P2)*	*SV stays in current lane*	*Med-High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

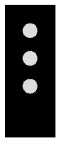
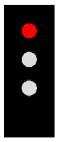
General Comments:
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV

Exception
N

ID # 34

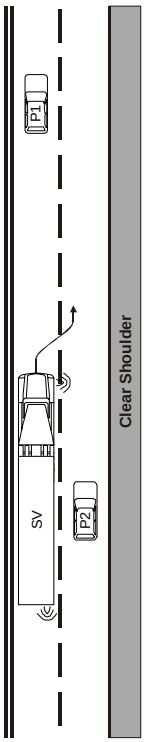
Conflict Source

DIU^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-2**	**LCM-3**			**LCM-3R**

Individual Sensor Conditions

FCW-2	LCM-3R	LDW-R



Turn Signal

Right

Rules

9 LCM-3 cancels LDW

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 34

ID#	Primary Crash Risk	Likely Resolution	Severity
34	*Conflict with P2 (running P2 off road or crashing with P2)*	*SV stays in current lane*	*Med-High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

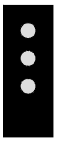
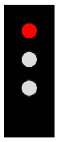
General Comments:
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV

Exception
N

ID # **34a**

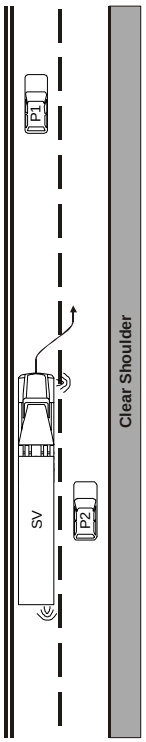
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-2**	**LCM-3**			**LCM-3R**

Individual Sensor Conditions

FCW-2	LCM-3R	Unavail



Turn Signal

Right

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # **34a**

ID#	Primary Crash Risk	Likely Resolution	Severity
34a	*Conflict with P2 (running P2 off road or crashing with P2)*	*SV stays in current lane*	*Med-High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

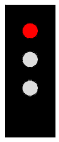
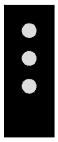
General Comments:
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV

Exception
N

ID # 35

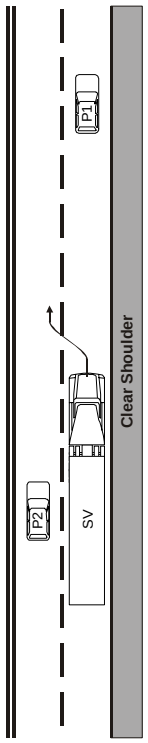
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-2**	**LCM-0**	**LCM-3L**		

Individual Sensor Conditions

FCW-2	LCM-3L	LDW-L



Turn Signal

Off

Rules

9 LCM-3 cancels LDW

Comments:

ID # **35**

ID#	Primary Crash Risk	Likely Resolution	Severity
35	*Conflict with P2 (running P2 into oncoming traffic, off the road, or crashing with P2)*	*SV stays in current lane*	*High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

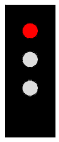
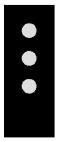
General Comments:
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV

Exception
N

ID # **35a**

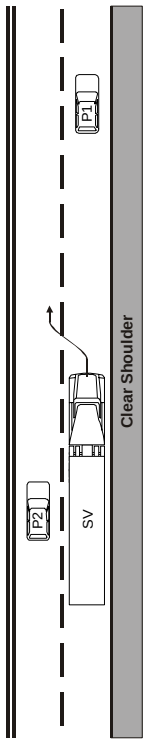
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-2**	**LCM-0**	**LCM-3L†**		

Individual Sensor Conditions

FCW-2	LCM-3L	Unavail



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

† It is unclear if this permutation is possible with the LDW unavailable (can the LCM system still throw an LCM-3?)

ID # **35a**

ID#	Primary Crash Risk	Likely Resolution	Severity
35a	*Conflict with P2 (running P2 into oncoming traffic, off the road, or crashing with P2)*	*SV stays in current lane*	*High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

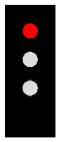
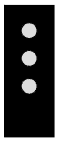
General Comments:
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV

Exception
N

ID # 36

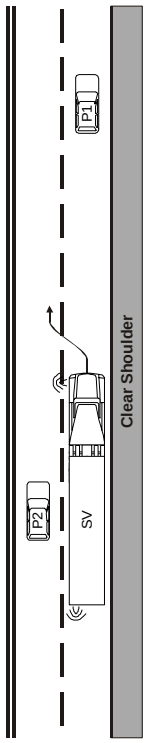
Conflict Source

DIU^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-2**	**LCM-0**	**LCM-3L**		

Individual Sensor Conditions

FCW-2	LCM-3L	LDW-L



Turn Signal

Left

Rules

9 LCM-3 cancels LDW

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # **36**

ID#	Primary Crash Risk	Likely Resolution	Severity
36	*Conflict with P2 (running P2 into oncoming traffic, off the road, or crashing with P2)*	*SV stays in current lane*	*High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

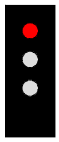
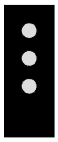
General Comments:
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV

Exception
N

ID # 36a

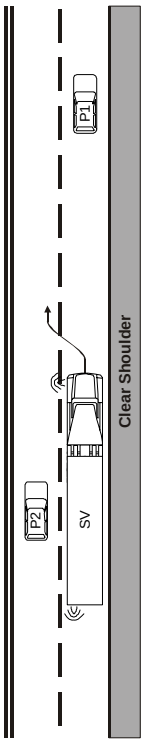
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-2**	**LCM-0**	**LCM-3L**		

Individual Sensor Conditions

FCW-2	LCM-3L	Unavail



Turn Signal

Left

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # **36a**

ID#	Primary Crash Risk	Likely Resolution	Severity
36a	*Conflict with P2 (running P2 into oncoming traffic, off the road, or crashing with P2)*	*SV stays in current lane*	*High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

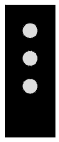
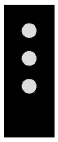
General Comments:
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV

Exception
N

ID # 37

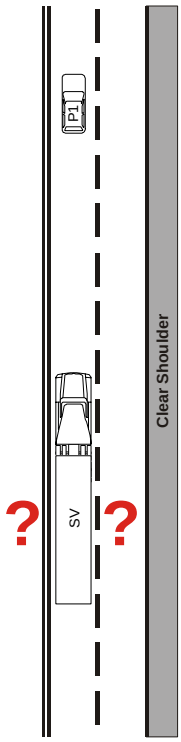
Conflict Source

DIU

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
None	**LCM-X2**	**None**		**LCM-X2**	

Individual Sensor Conditions

FCW-3	LCM-X2 R/L	--



Turn Signal

Left, Right, Off

Rules

2b Visual and auditory LCM-X2 overrides visual and auditory FCW-3

Comments:

ID # 37

ID#	Primary Crash Risk	Likely Resolution	Severity
37	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	-	
Unalert:	-	
Partially Alert:	-	
Fully Alert:	-	

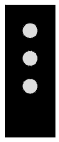
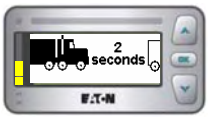
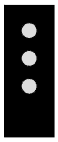
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			LDW system indicates no intention to change lanes

General Comments:	Exception
This is a very low probability event Turn signal active or LDW warning case may warrant exception because they indicate intention to change lanes	?

ID # 38

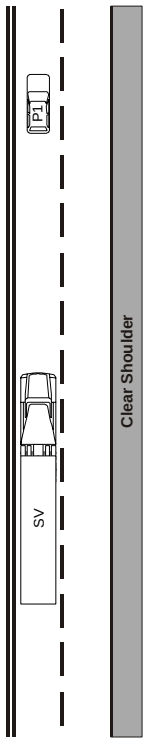
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-3**	**LCM-0**		**FCW-3**	

Individual Sensor Conditions

FCW-3	LCM-0 R/L	--



Turn Signal

Left, Right, Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 38

ID#	Primary Crash Risk	Likely Resolution	Severity
38	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1*
Unalert:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1*
Partially Alert:	Y	*Driver is tailgating*
Fully Alert:	Y	*Driver is tailgating*

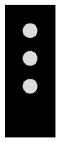
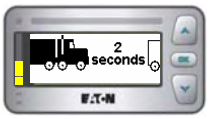
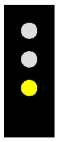
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
	N

ID # 39

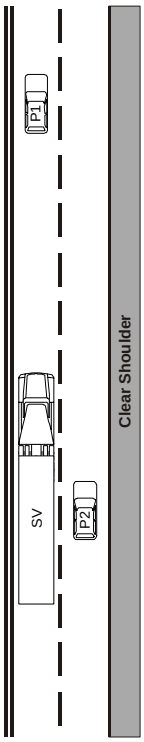
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-3**	**LCM-1**		**FCW-3**	

Individual Sensor Conditions

FCW-3	LCM-1R	--



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 39

ID#	Primary Crash Risk	Likely Resolution	Severity
39	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1*
Unalert:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1*
Partially Alert:	Y	*Driver is tailgating*
Fully Alert:	Y	*Driver is tailgating*

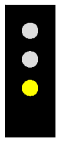
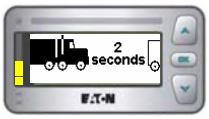
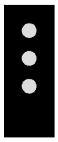
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
	N

ID # 40

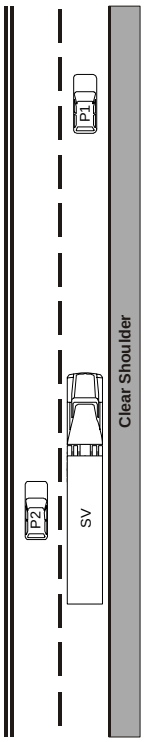
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-1	**FCW-3**	**LCM-0**		**FCW-3**	

Individual Sensor Conditions

FCW-3	LCM-1L	--



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 40

ID#	Primary Crash Risk	Likely Resolution	Severity
40	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1*
Unalert:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1*
Partially Alert:	Y	*Driver is tailgating*
Fully Alert:	Y	*Driver is tailgating*

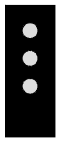
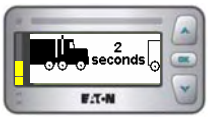
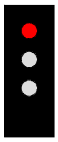
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
	N

ID # 41

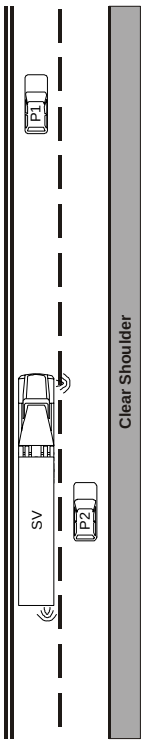
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-3**	**LCM-2**		**FCW-3**	

Individual Sensor Conditions

FCW-3	LCM-2R	--



Turn Signal

Right

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 41

ID#	Primary Crash Risk	Likely Resolution	Severity
41	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	N	*If signal was recently activated, then driver is unlikely to be asleep*
Unalert:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1. Driver forgot to cancel earlier turn signal*
Partially Alert:	Y	*P1 is closing and driver is about to make a lane change, but driver is unaware of P2*
Fully Alert:	Y	*P1 is closing and driver is signaling to be let into adjacent lane*

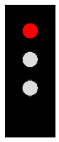
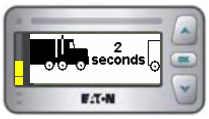
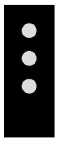
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
Note that there is no secondary conflict specified because LDW/LCM systems indicate that SV is staying in lane at this time	**N**

ID # 42

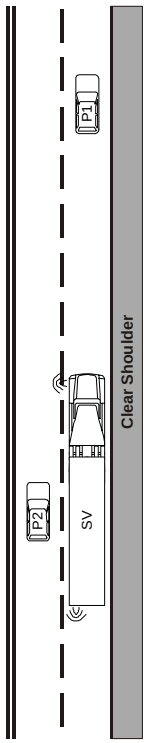
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-2	**FCW-3**	**LCM-0**		**FCW-3**	

Individual Sensor Conditions

FCW-3	LCM-2L	--



Turn Signal

Left

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 42

ID#	Primary Crash Risk	Likely Resolution	Severity
42	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	N	*If signal was recently activated, then driver is unlikely to be asleep*
Unalert:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1. Driver forgot to cancel earlier turn signal*
Partially Alert:	Y	*P1 is closing and driver is about to make a lane change, but driver is unaware of P2*
Fully Alert:	Y	*P1 is closing and driver is signaling to be let into adjacent lane*

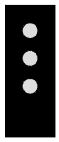
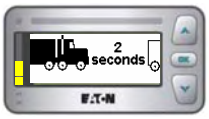
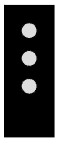
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
Note that there is no secondary conflict specified because LDW/LCM systems indicate that SV is staying in lane at this time	**N**

ID # 43

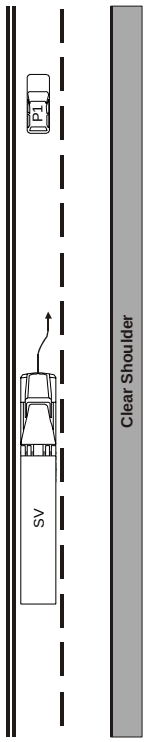
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-3**	**LCM-0**		**FCW-3**	

Individual Sensor Conditions

FCW-3	LCM-0 R/L	LDW-R



Turn Signal

Off

Rules

6 Auditory FCW-3 & 4 overrides auditory LDW

7 Visual FCW-3 & 4 override visual LDW

Comments:

ID # 43

ID#	Primary Crash Risk	Likely Resolution	Severity
43	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Partially Alert:	Y	*Driver is changing lanes without signaling*
Fully Alert:	Y	*Driver is changing lanes without signaling*

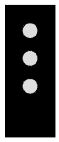
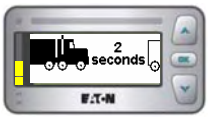
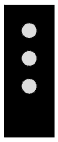
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV Run-off-road to the right	*Restricted or unsafe shoulder*	*Med*	Unlikely unless driver is asleep or unalert
SV Run-off-road to the right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	Unlikely unless driver is asleep or unalert

General Comments:	Exception
If the road edge was determined to be to the right of the SV, then LDW should perhaps have priority	**N?**

ID # 44

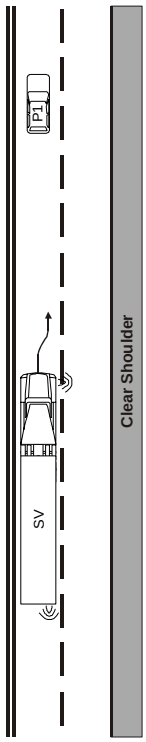
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-3**	**LCM-0**		**FCW-3**	

Individual Sensor Conditions

FCW-3	LCM-0 R/L	LDW-R



Turn Signal

Right

Rules

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 44

ID#	Primary Crash Risk	Likely Resolution	Severity
44	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes*
Fully Alert:	Y	*Driver is changing lanes*

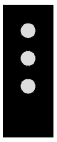
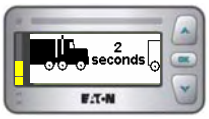
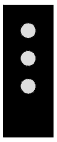
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
	N

ID # 45

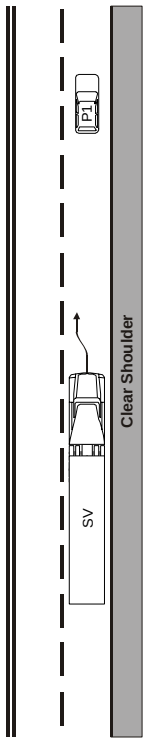
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-3**	**LCM-0**		**FCW-3**	

Individual Sensor Conditions

FCW-3	LCM-0 R/L	LDW-L



Turn Signal

Off

Rules

6 Auditory FCW-3 & 4 overrides auditory LDW

7 Visual FCW-3 & 4 override visual LDW

Comments:

ID # 45

ID#	Primary Crash Risk	Likely Resolution	Severity
45	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Partially Alert:	Y	*Driver is changing lanes without signaling*
Fully Alert:	Y	*Driver is changing lanes without signaling*

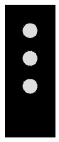
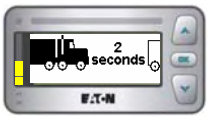
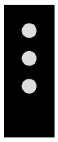
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV Run-off-road to the left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep or unalert
SV Run-off-road to the left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	Unlikely unless driver is asleep or unalert

General Comments:	Exception
If the road edge/center-line was determined to be to the left of the SV, then LDW should have priority	**N?**

ID # 46

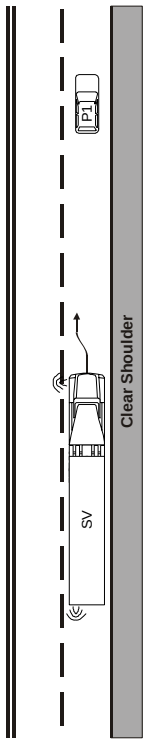
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-3**	**LCM-0**		**FCW-3**	

Individual Sensor Conditions

FCW-3	LCM-0 R/L	LDW-L



Turn Signal

Left

Rules

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 46

ID#	Primary Crash Risk	Likely Resolution	Severity
46	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes*
Fully Alert:	Y	*Driver is changing lanes*

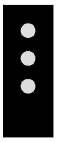
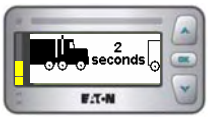
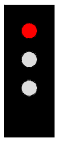
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
	N

ID # 47

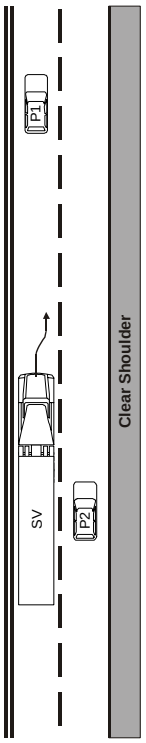
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-3**	**LCM-3***			**LCM-3R***

Individual Sensor Conditions

FCW-3	LCM-1R	LDW-R



Turn Signal

Off

Rules

5 Auditory LCM-2 overrides auditory FCW-3 & 4

11 If LDW indicates LD in direction of LCM-1, an auditory LCM-2 warning should be thrown under all conditions except FCW-5,6,7

Comments:

* LCM-3 is the most appropriate warning, even though a turn signal is not activated, because the sensor data indicate that it is the same as an LCM-3 situation. It is unclear whether this sensor combination is even possible, given the definition of the L

ID # 47

ID#	Primary Crash Risk	Likely Resolution	Severity
47	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

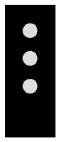
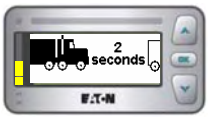
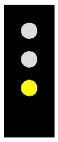
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
	N

ID # 47a

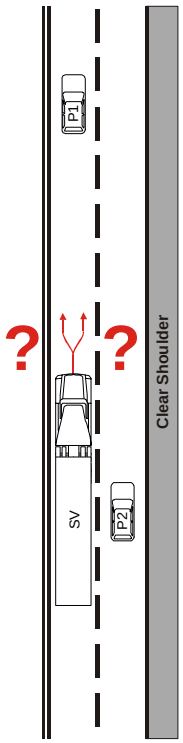
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-3**	**LCM-1**		**FCW-3**	

Individual Sensor Conditions

FCW-3	LCM-1R	Unavail



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # **47a**

ID#	Primary Crash Risk	Likely Resolution	Severity
47a	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1*
Unalert:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1*
Partially Alert:	Y	*Driver is tailgating*
Fully Alert:	Y	*Driver is tailgating*

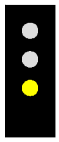
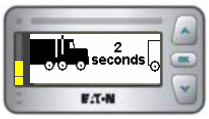
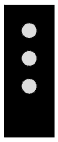
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
Note that there is no secondary conflict specified because the LCM system indicates that SV is staying in lane at this time	**N**

ID # 48

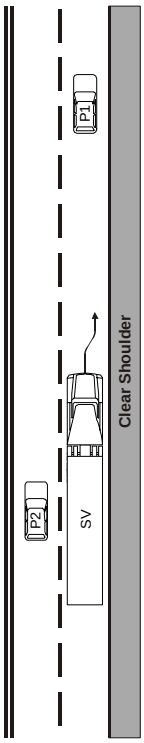
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-1	**FCW-3**	**LCM-0**		**FCW-3**	

Individual Sensor Conditions

FCW-3	LCM-1L	LDW-R



Turn Signal

Off

Rules

6 Auditory FCW-3 & 4 overrides auditory LDW

7 Visual FCW-3 & 4 override visual LDW

Comments:

ID # 48

ID#	Primary Crash Risk	Likely Resolution	Severity
48	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Partially Alert:	Y	*Driver is changing lanes without signaling*
Fully Alert:	Y	*Driver is changing lanes without signaling*

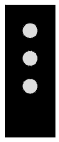
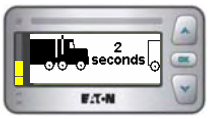
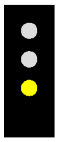
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV Run-off-road to the right	*Restricted or unsafe shoulder*	*Med*	
SV Run-off-road to the right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	

General Comments:	Exception
	N

ID # 49

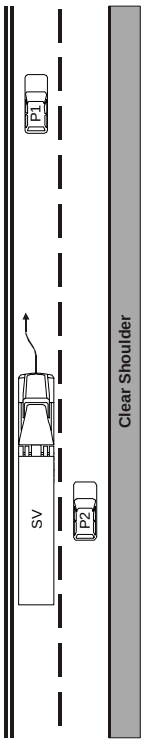
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-3**	**LCM-1**		**FCW-3**	

Individual Sensor Conditions

FCW-3	LCM-1R	LDW-L



Turn Signal

Off

Rules

6 Auditory FCW-3 & 4 overrides auditory LDW

7 Visual FCW-3 & 4 override visual LDW

Comments:

ID # 49

ID#	Primary Crash Risk	Likely Resolution	Severity
49	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Partially Alert:	Y	*Driver is changing lanes without signaling*
Fully Alert:	Y	*Driver is changing lanes without signaling*

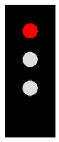
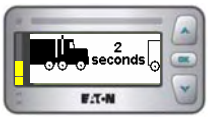
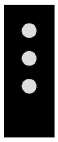
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV Run-off-road to the left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep or unalert
SV Run-off-road to the left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	Unlikely unless driver is asleep or unalert

General Comments:	Exception
If the road edge/center-line was determined to be to the left of the SV, then LDW should have priority	**N?**

ID # 50

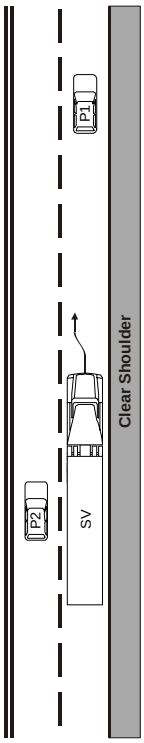
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3*	**FCW-3**	**LCM-0**	**LCM-3L***		

Individual Sensor Conditions

FCW-3	LCM-1L	LDW-L



Turn Signal

Off

Rules

5 Auditory LCM-2 overrides auditory FCW-3 & 4

11 If LDW indicates LD in direction of LCM-1, an auditory LCM-2 warning should be thrown under all conditions except FCW-5,6,7

Comments:

* LCM-3 is the most appropriate warning, even though a turn signal is not activated, because the sensor data indicate that it is the same as an LCM-3 situation. It is unclear whether this sensor combination is even possible, given the definition of the L

ID # 50

ID#	Primary Crash Risk	Likely Resolution	Severity
50	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

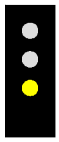
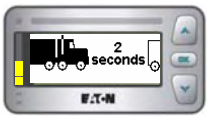
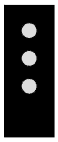
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
	N

ID # 50a

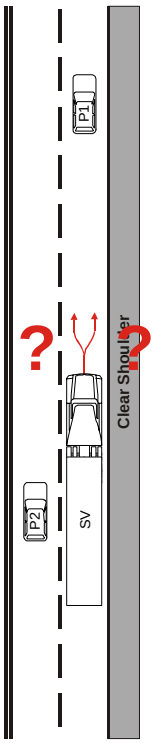
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-1	**FCW-3**	**LCM-0**		**FCW-3**	

Individual Sensor Conditions

FCW-3	LCM-1L	Unavail



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # **50a**

ID#	Primary Crash Risk	Likely Resolution	Severity
50a	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1*
Unalert:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1*
Partially Alert:	Y	*Driver is tailgating*
Fully Alert:	Y	*Driver is tailgating*

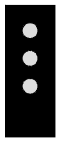
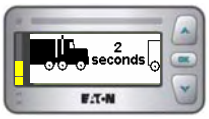
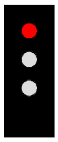
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
Note that there is no secondary conflict specified because the LCM system indicates that SV is staying in lane at this time	**N**

ID # 51

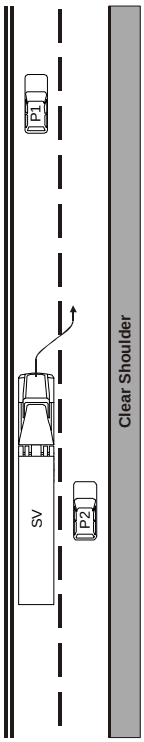
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-3**	**LCM-3**			**LCM-3R**

Individual Sensor Conditions

FCW-3	LCM-2R	LDW-R



Turn Signal

Off

Rules

5 Auditory LCM-2 overrides auditory FCW-3 & 4

9 LCM-3 cancels LDW

Comments:

ID # 51

ID#	Primary Crash Risk	Likely Resolution	Severity
51	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

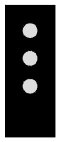
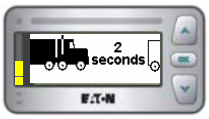
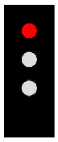
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
	N

ID # 51a

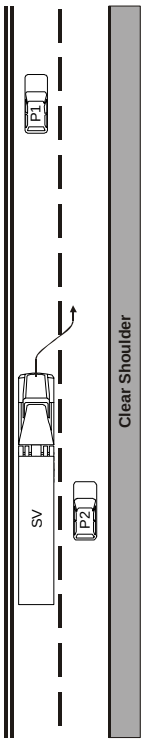
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-3**	**LCM-3**			**LCM-3R†**

Individual Sensor Conditions

FCW-3	LCM-3R	Unavail



Turn Signal

Off

Rules

5 Auditory LCM-2 overrides auditory FCW-3 & 4

Comments:

† It is unclear if this permutation is possible with the LDW unavailable (can the LCM system still throw an LCM-3?)

ID # **51a**

ID#	Primary Crash Risk	Likely Resolution	Severity
51a	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

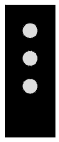
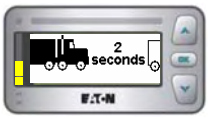
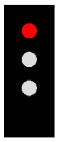
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
	N

ID # 52

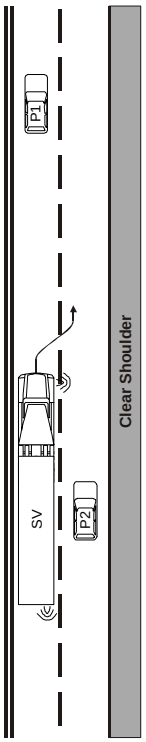
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-3**	**LCM-3**			**LCM-3R**

Individual Sensor Conditions

FCW-3	LCM-3R	LDW-R



Turn Signal

Right

Rules

5 Auditory LCM-2 overrides auditory FCW-3 & 4

10 LDW is canceled if same-side turn signal is activated

Comments:

ID # 52

ID#	Primary Crash Risk	Likely Resolution	Severity
52	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

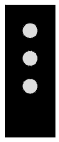
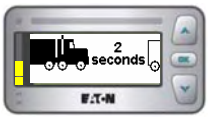
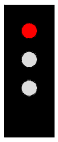
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
	N

ID # 52a

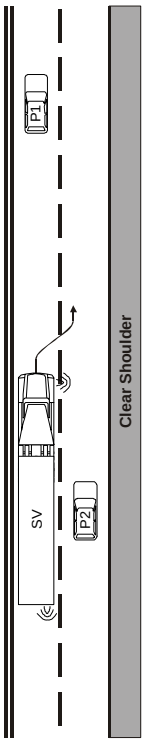
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-3**	**LCM-3**			**LCM-3R**

Individual Sensor Conditions

FCW-3	LCM-3R	Unavail



Turn Signal

Right

Rules

5 Auditory LCM-2 overrides auditory FCW-3 & 4

Comments:

ID # **52a**

ID#	Primary Crash Risk	Likely Resolution	Severity
52a	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

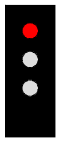
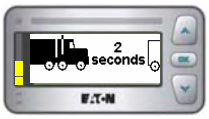
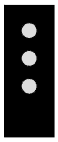
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
	N

ID # 53

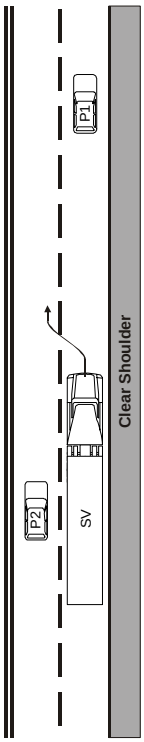
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-3**	**LCM-0**	**LCM-3L**		

Individual Sensor Conditions

FCW-3	LCM-3L	LDW-L



Turn Signal

Off

Rules

5 Auditory LCM-2 overrides auditory FCW-3 & 4

9 LCM-3 cancels LDW

Comments:

ID # 53

ID#	Primary Crash Risk	Likely Resolution	Severity
53	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

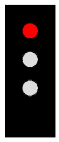
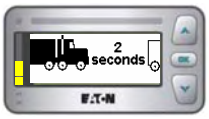
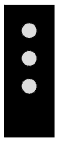
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
	N

ID # 53a

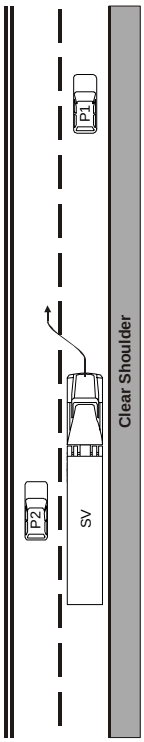
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-3**	**LCM-0**	**LCM-3L†**		

Individual Sensor Conditions

FCW-3	LCM-3L	Unavail



Turn Signal

Off

Rules

5 Auditory LCM-2 overrides auditory FCW-3 & 4

Comments:

† It is unclear if this permutation is possible with the LDW unavailable (can the LCM system still throw an LCM-3?)

ID # **53a**

ID#	Primary Crash Risk	Likely Resolution	Severity
53a	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

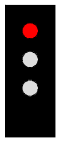
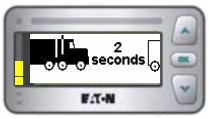
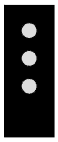
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
	N

ID # 54

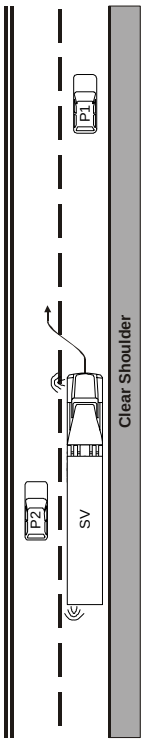
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-3**	**LCM-0**	**LCM-3L**		

Individual Sensor Conditions

FCW-3	LCM-3L	LDW-L



Turn Signal

Left

Rules

5 Auditory LCM-2 overrides auditory FCW-3 & 4

10 LDW is canceled if same-side turn signal is activated

Comments:

ID # 54

ID#	Primary Crash Risk	Likely Resolution	Severity
54	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Partially Alert:	Y	*Driver is changing lanes and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

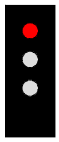
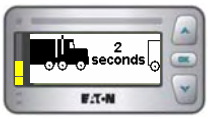
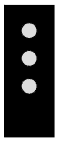
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
	N

ID # 54a

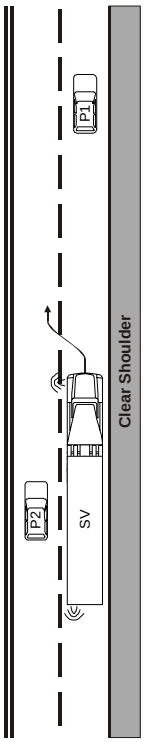
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-3**	**LCM-0**	**LCM-3L**		

Individual Sensor Conditions

FCW-3	LCM-3L	Unavail



Turn Signal

Left

Rules

5 Auditory LCM-2 overrides auditory FCW-3 & 4

Comments:

ID # 54a

ID#	Primary Crash Risk	Likely Resolution	Severity
54	*Minimal/no chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-3 is typically at least 5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Partially Alert:	Y	*Driver is changing lanes and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

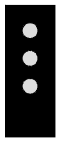
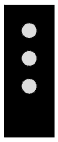
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
	N

ID # 55

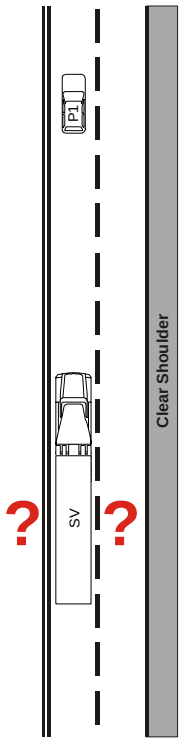
Conflict Source

DIU

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
None	FCW-4	None		FCW-4	

Individual Sensor Conditions

FCW-4	LCM-X2 R/L	--



Turn Signal

Left, Right, Off

Rules

2c Visual and auditory LCM-X2 overrides visual and auditory FCW-4

Comments:

ID # 55

ID#	Primary Crash Risk	Likely Resolution	Severity
55	*Small chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	-	
Unalert:	-	
Partially Alert:	-	
Fully Alert:	-	

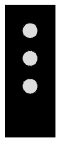
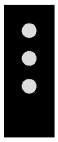
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			LDW system indicates no intention to change lanes

General Comments:	Exception
This is a very low probability event Turn signal active or LDW warning case may warrant exception because they indicate intention to change lanes	?

ID # 56

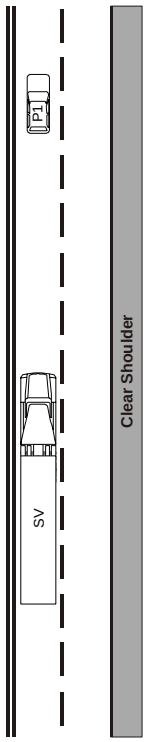
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-4**	**LCM-0**		**FCW-4**	

Individual Sensor Conditions

FCW-4	LCM-0 R/L	--



Turn Signal

Left, Right, Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 56

ID#	Primary Crash Risk	Likely Resolution	Severity
56	*Small chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1*
Unalert:	N	*FCW-3 would have alerted the driver*
Partially Alert:	Y	*Driver is tailgating*
Fully Alert:	Y	*Driver is tailgating*

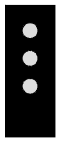
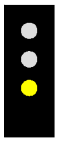
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
	N

ID # 57

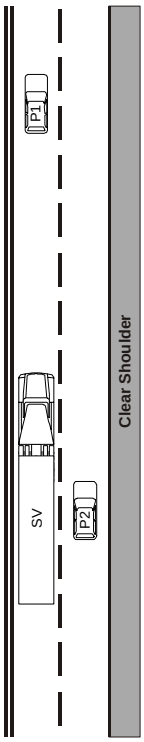
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-4**	**LCM-1**		**FCW-4**	

Individual Sensor Conditions

FCW-4	LCM-1R	--



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # **57**

ID#	Primary Crash Risk	Likely Resolution	Severity
57	*Small chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1*
Unalert:	N	*FCW-3 would have alerted the driver*
Partially Alert:	Y	*Driver is tailgating*
Fully Alert:	Y	*Driver is tailgating*

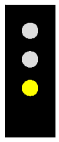
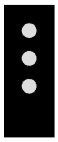
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
	N

ID # 58

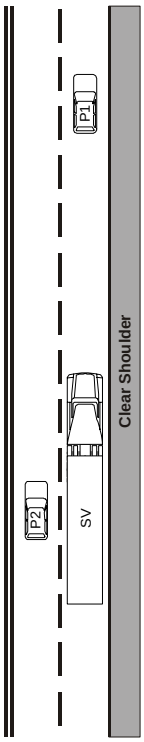
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-1	**FCW-4**	**LCM-0**		**FCW-4**	

Individual Sensor Conditions

FCW-4	LCM-1L	--



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 58

ID#	Primary Crash Risk	Likely Resolution	Severity
58	*Small chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1*
Unalert:	N	*FCW-3 would have alerted the driver*
Partially Alert:	Y	*Driver is tailgating*
Fully Alert:	Y	*Driver is tailgating*

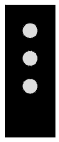
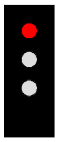
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
	N

ID # 59

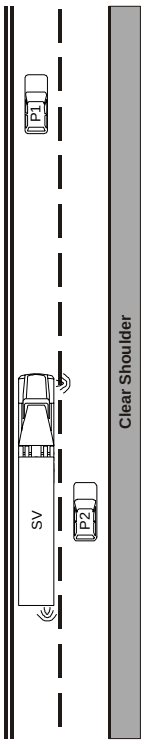
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-4**	**LCM-2**		**FCW-4**	

Individual Sensor Conditions

FCW-4	LCM-2R	--



Turn Signal

Right

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 59

ID#	Primary Crash Risk	Likely Resolution	Severity
59	*Small chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	N	*If signal was recently activated, then driver is unlikely to be asleep*
Unalert:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1. Driver forgot to cancel earlier turn signal* *FCW-3 suppressed?*
Partially Alert:	Y	*P1 is closing and driver is about to make a lane change, but driver is unaware of P2*
Fully Alert:	Y	*P1 is closing and driver is signaling to be let into adjacent lane*

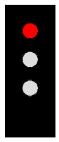
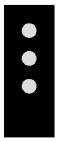
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
Note that there is no secondary conflict specified because LDW/LCM systems indicate that SV is staying in lane at this time	**N**

ID # 60

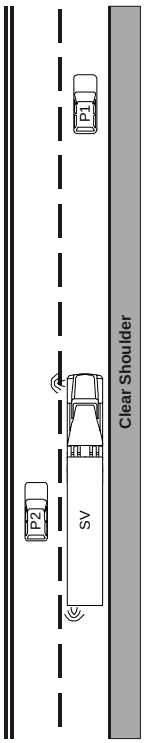
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-2	**FCW-4**	**LCM-0**		**FCW-4**	

Individual Sensor Conditions

FCW-4	LCM-2L	--



Turn Signal

Left

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 60

ID#	Primary Crash Risk	Likely Resolution	Severity
60	*Small chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	N	*If signal was recently activated, then driver is unlikely to be asleep*
Unalert:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1. Driver forgot to cancel earlier turn signal* *FCW-3 suppressed?*
Partially Alert:	Y	*P1 is closing and driver is about to make a lane change, but driver is unaware of P2*
Fully Alert:	Y	*P1 is closing and driver is signaling to be let into adjacent lane*

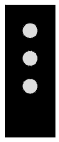
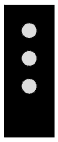
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
Note that there is no secondary conflict specified because LDW/LCM systems indicate that SV is staying in lane at this time	**N**

ID # 61

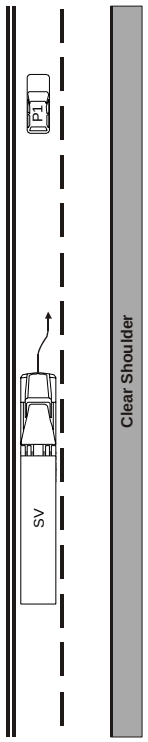
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-4**	**LCM-0**		**FCW-4**	

Individual Sensor Conditions

FCW-4	LCM-0 R/L	LDW-R



Turn Signal

Off

Rules

6 Auditory FCW-3 & 4 overrides auditory LDW

7 Visual FCW-3 & 4 override visual LDW

Comments:

ID # 61

ID#	Primary Crash Risk	Likely Resolution	Severity
61	*Small chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	N	*FCW-3 would have alerted the driver*
Partially Alert:	Y	*Driver is changing lanes without signaling*
Fully Alert:	Y	*Driver is changing lanes without signaling*

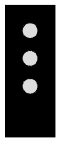
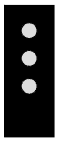
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV Run-off-road to the right	*Restricted or unsafe shoulder*	*Med*	Unlikely unless driver is asleep or unalert
SV Run-off-road to the right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	Unlikely unless driver is asleep or unalert

General Comments:	Exception
If the road edge was determined to be to the right of the SV, then LDW should perhaps have priority	**N?**

ID # 62

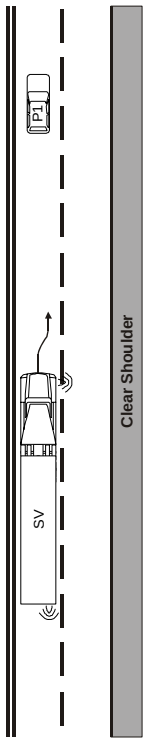
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-4**	**LCM-0**		**FCW-4**	

Individual Sensor Conditions

FCW-4	LCM-0 R/L	LDW-R



Turn Signal

Right

Rules

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 62

ID#	Primary Crash Risk	Likely Resolution	Severity
62	*Small chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes*
Fully Alert:	Y	*Driver is changing lanes*

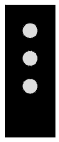
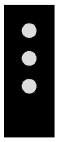
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
	N

ID # 63

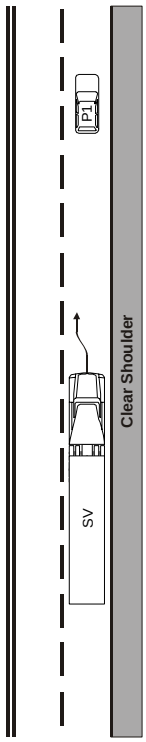
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-4**	**LCM-0**		**FCW-4**	

Individual Sensor Conditions

FCW-4	LCM-0 R/L	LDW-L



Turn Signal

Off

Rules

6 Auditory FCW-3 & 4 overrides auditory LDW

7 Visual FCW-3 & 4 override visual LDW

Comments:

ID # 63

ID#	Primary Crash Risk	Likely Resolution	Severity
63	*Small chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	N	*FCW-3 would have alerted the driver*
Partially Alert:	Y	*Driver is changing lanes without signaling*
Fully Alert:	Y	*Driver is changing lanes without signaling*

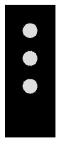
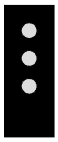
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV Run-off-road to the left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep or unalert
SV Run-off-road to the left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	Unlikely unless driver is asleep or unalert

General Comments:	Exception
If the road edge/center-line was determined to be to the left of the SV, then LDW should have priority	**N?**

ID # 64

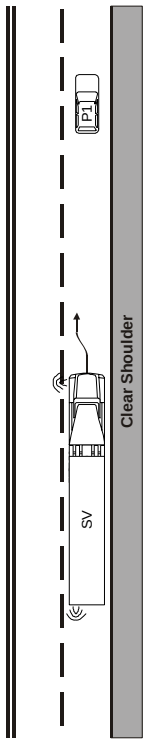
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-4**	**LCM-0**		**FCW-4**	

Individual Sensor Conditions

FCW-4	LCM-0 R/L	LDW-L



Turn Signal

Left

Rules

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 64

ID#	Primary Crash Risk	Likely Resolution	Severity
64	*Small chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes*
Fully Alert:	Y	*Driver is changing lanes*

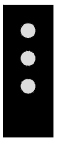
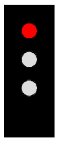
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
	N

ID # 65

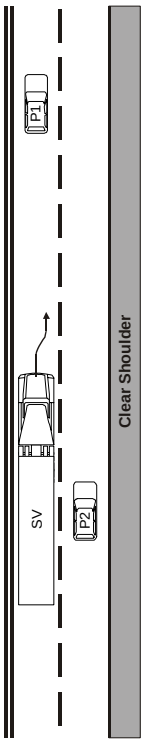
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-4**	**LCM-3***			**LCM-3R***

Individual Sensor Conditions

FCW-4	LCM-1R	LDW-R



Turn Signal

Off

Rules

5a Auditory LCM-3 overrides auditory FCW-4

11 If LDW indicates LD in direction of LCM-1, an auditory LCM-2 warning should be thrown under all conditions except FCW-5,6,7

Comments:

* LCM-3 is the most appropriate warning, even though a turn signal is not activated, because the sensor data indicate that it is the same as an LCM-3 situation. It is unclear whether this sensor combination is even possible, given the definition of the L

ID # 65

ID#	Primary Crash Risk	Likely Resolution	Severity
65	*Small chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	N	*FCW-3 would have alerted the driver*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

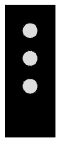
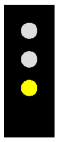
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
	N

ID # 65a

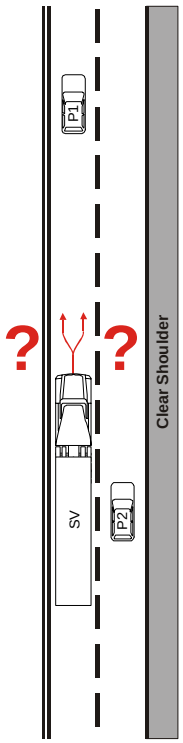
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	FCW-4	LCM-1		FCW-4	

Individual Sensor Conditions

FCW-4	LCM-1R	Unavail



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # **65a**

ID#	Primary Crash Risk	Likely Resolution	Severity
65a	*Small chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1*
Unalert:	N	*FCW-3 would have alerted the driver*
Partially Alert:	Y	*Driver is tailgating*
Fully Alert:	Y	*Driver is tailgating*

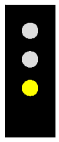
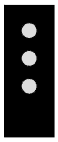
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
Note that there is no secondary conflict specified because the LCM system indicates that SV is staying in lane at this time	**N**

ID # 66

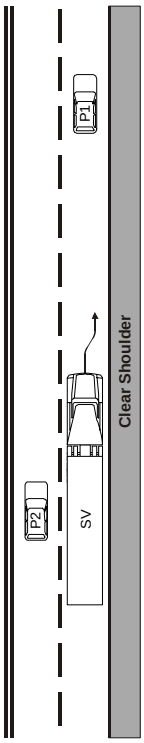
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-1	**FCW-4**	**LCM-0**		**FCW-3**	

Individual Sensor Conditions

FCW-4	LCM-1L	LDW-R



Turn Signal

Off

Rules

6 Auditory FCW-3 & 4 overrides auditory LDW

7 Visual FCW-3 & 4 override visual LDW

Comments:

ID # 66

ID#	Primary Crash Risk	Likely Resolution	Severity
66	*Small chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	N	*FCW-3 would have alerted the driver*
Partially Alert:	Y	*Driver is changing lanes without signaling*
Fully Alert:	Y	*Driver is changing lanes without signaling*

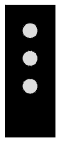
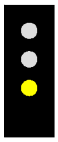
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV Run-off-road to the right	*Restricted or unsafe shoulder*	*Med*	
SV Run-off-road to the right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	

General Comments:	Exception
	N

ID # 67

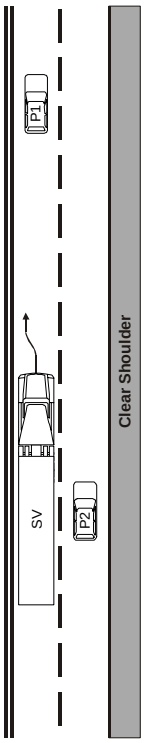
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-4**	**LCM-1**		**FCW-3**	

Individual Sensor Conditions

FCW-4	LCM-1R	LDW-L



Turn Signal

Off

Rules

6 Auditory FCW-3 & 4 overrides auditory LDW

7 Visual FCW-3 & 4 override visual LDW

Comments:

ID # 67

ID#	Primary Crash Risk	Likely Resolution	Severity
67	*Small chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	N	*FCW-3 would have alerted the driver*
Partially Alert:	Y	*Driver is changing lanes without signaling*
Fully Alert:	Y	*Driver is changing lanes without signaling*

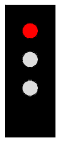
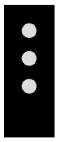
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV Run-off-road to the left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep or unalert
SV Run-off-road to the left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	Unlikely unless driver is asleep or unalert

General Comments:	Exception
If the road edge/center-line was determined to be to the left of the SV, then LDW should have priority	**N?**

ID # 68

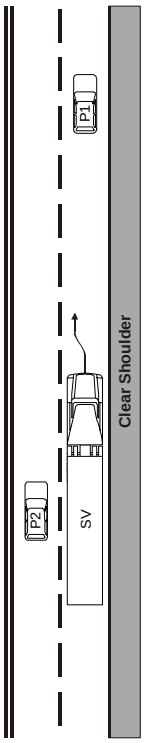
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3*	**FCW-4**	**LCM-0**	**LCM-3L***		

Individual Sensor Conditions

FCW-4	LCM-1L	LDW-L



Turn Signal

Off

Rules

5a Auditory LCM-3 overrides auditory FCW-4

11 If LDW indicates LD in direction of LCM-1, an auditory LCM-2 warning should be thrown under all conditions except FCW-5,6,7

Comments:

* LCM-3 is the most appropriate warning, even though a turn signal is not activated, because the sensor data indicate that it is the same as an LCM-3 situation. It is unclear whether this sensor combination is even possible, given the definition of the L

ID # 68

ID#	Primary Crash Risk	Likely Resolution	Severity
68	*Small chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	N	*FCW-3 would have alerted the driver*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

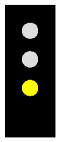
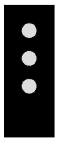
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
	N

ID # 68a

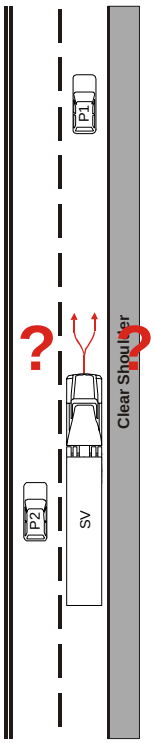
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-1	**FCW-4**	**LCM-0**		**FCW-4**	

Individual Sensor Conditions

FCW-4	LCM-1L	Unavail



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # **68a**

ID#	Primary Crash Risk	Likely Resolution	Severity
68a	*Small chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1*
Unalert:	N	*FCW-3 would have alerted the driver*
Partially Alert:	Y	*Driver is tailgating*
Fully Alert:	Y	*Driver is tailgating*

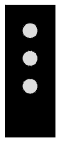
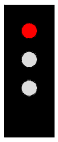
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
Note that there is no secondary conflict specified because the LCM system indicates that SV is staying in lane at this time	**N**

ID # 69

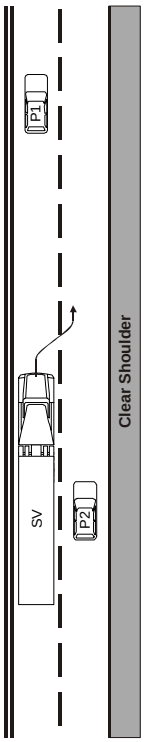
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-4**	**LCM-3**			**LCM-3R**

Individual Sensor Conditions

FCW-4	LCM-3R	LDW-R



Turn Signal

Off

Rules

5a Auditory LCM-3 overrides auditory FCW-4

9 LCM-3 cancels LDW

Comments:

ID # 69

ID#	Primary Crash Risk	Likely Resolution	Severity
69	*Small chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	N	*FCW-3 would have alerted the driver*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

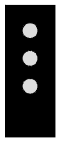
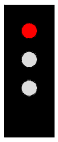
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
	N

ID # 69a

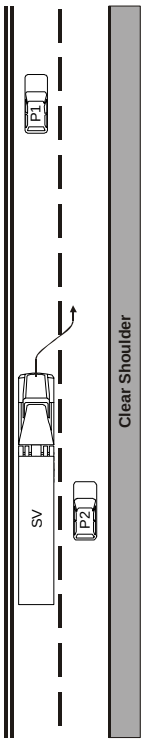
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-4**	**LCM-3**			**LCM-3R†**

Individual Sensor Conditions

FCW-4	LCM-3R	Unavail



Turn Signal

Off

Rules

5 Auditory LCM-2 overrides auditory FCW-3 & 4

Comments:

† It is unclear if this permutation is possible with the LDW unavailable (can the LCM system still throw an LCM-3?)

ID # **69a**

ID#	Primary Crash Risk	Likely Resolution	Severity
69a	*Small chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	N	*FCW-3 would have alerted the driver*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

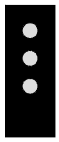
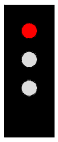
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
	N

ID # 70

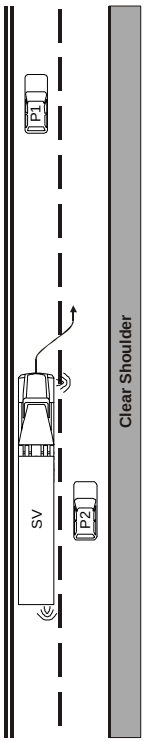
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-4**	**LCM-3**			**LCM-3R**

Individual Sensor Conditions

FCW-4	LCM-3R	LDW-R



Turn Signal

Right

Rules

5a Auditory LCM-3 overrides auditory FCW-4

10 LDW is canceled if same-side turn signal is activated

Comments:

ID # 70

ID#	Primary Crash Risk	Likely Resolution	Severity
70	*Small chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*FCW-3 would have alerted the driver*
Partially Alert:	Y	*Driver is changing lanes and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

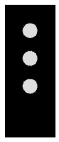
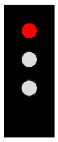
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
	N

ID # 70a

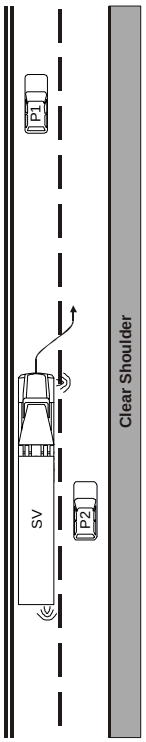
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-4**	**LCM-3**			**LCM-3R**

Individual Sensor Conditions

FCW-4	LCM-3R	Unavail



Turn Signal

Right

Rules

5 Auditory LCM-2 overrides auditory FCW-3 & 4

Comments:

ID # **70a**

ID#	Primary Crash Risk	Likely Resolution	Severity
70a	*Small chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*FCW-3 would have alerted the driver*
Partially Alert:	Y	*Driver is changing lanes and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

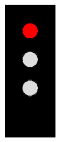
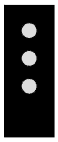
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
	N

ID # 71

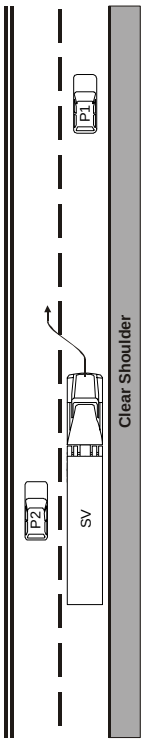
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-4**	**LCM-0**	**LCM-3L**		

Individual Sensor Conditions

FCW-4	LCM-3L	LDW-L



Turn Signal

Off

Rules

5a Auditory LCM-3 overrides auditory FCW-4

9 LCM-3 cancels LDW

Comments:

ID # 71

ID#	Primary Crash Risk	Likely Resolution	Severity
71	*Small chance of rear end conflict with P1*	*SV slows*	*Low*

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	N	*FCW-3 would have alerted the driver*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

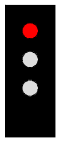
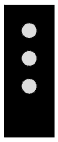
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
	N

ID # 71a

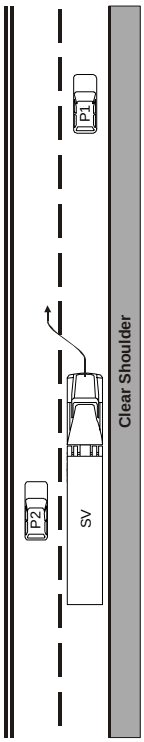
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-4**	**LCM-0**	**LCM-3L†**		

Individual Sensor Conditions

FCW-4	LCM-3L	Unavail



Turn Signal

Off

Rules

5a Auditory LCM-3 overrides auditory FCW-4

Comments:

† It is unclear if this permutation is possible with the LDW unavailable (can the LCM system still throw an LCM-3?)

ID # 71a

ID#	Primary Crash Risk	Likely Resolution	Severity

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	N	*FCW-3 would have alerted the driver*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

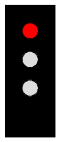
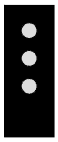
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
	N

ID # 72

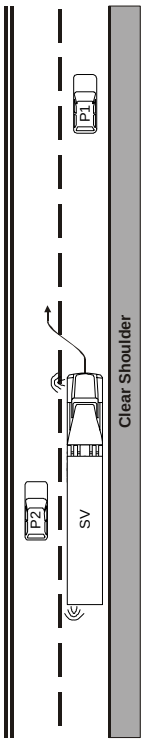
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-4**	**LCM-0**	**LCM-3L**		

Individual Sensor Conditions

FCW-4	LCM-3L	LDW-L



Turn Signal

Left

Rules

5a Auditory LCM-3 overrides auditory FCW-4

10 LDW is canceled if same-side turn signal is activated

Comments:

ID # 72

ID#	Primary Crash Risk	Likely Resolution	Severity

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	N	*FCW-3 would have alerted the driver*
Partially Alert:	Y	*Driver is changing lanes and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

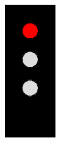
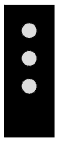
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
	N

ID # 72a

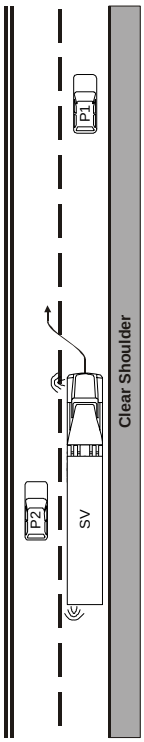
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-4**	**LCM-0**	**LCM-3L**		

Individual Sensor Conditions

FCW-4	LCM-3L	Unavail



Turn Signal

Left

Rules

5a Auditory LCM-3 overrides auditory FCW-4

Comments:

ID # 72a

ID#	Primary Crash Risk	Likely Resolution	Severity

Notable Kinematic Conditions/Assumptions:
- Duration of FCW-4 is typically at least 2.5 seconds *- Collisions are unlikely under most conditions, including worst-case scenarios (min 3 secs until crash—includes FCW-5 duration)*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and SV is slowly closing in on P1 and drifting out of the lane*
Unalert:	N	*FCW-3 would have alerted the driver*
Partially Alert:	Y	*Driver is changing lanes and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

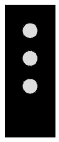
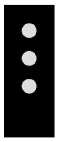
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
	N

ID # 73

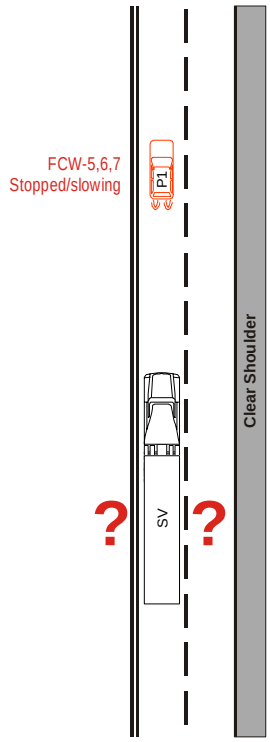
Conflict Source

DIU

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-5**	**LCM-0**		**FCW-5**	

Individual Sensor Conditions

FCW-5	LCM-X2 R/L	--



Turn Signal

Left, Right, Off

Rules

2 Visual and auditory FCW-5, 6, & 7 override visual and auditory LCM-X2

Comments:

ID # 73

ID#	Primary Crash Risk	Likely Resolution	Severity
73	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*Driver did not respond to FCW-3 & 4, or they were suppressed*
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

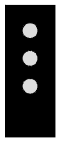
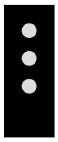
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			LDW system indicates no intention to change lanes

General Comments:	Exception
This is a very low probability event LDW to right might be associated with potential P2 conflict involving oncoming traffic	**N?**

ID # 74

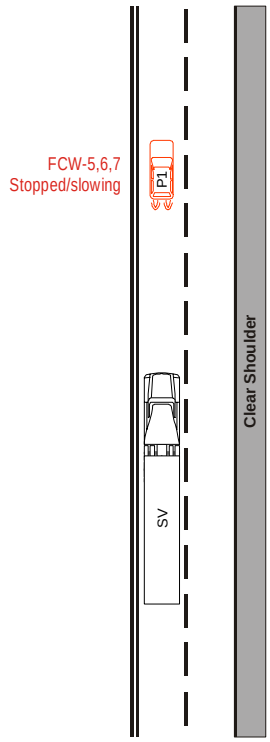
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-5**	**LCM-0**		**FCW-5**	

Individual Sensor Conditions

FCW-5	LCM-0 R/L	--



Turn Signal

Left, Right, Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 74

ID#	Primary Crash Risk	Likely Resolution	Severity
74	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*Driver did not respond to FCW-3 & 4, or they were suppressed*
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

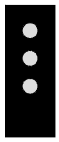
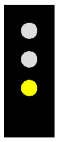
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
	N

ID # 75

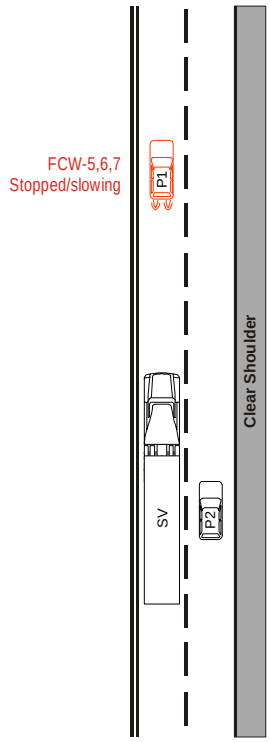
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-5**	**LCM-1**		**FCW-5**	

Individual Sensor Conditions

FCW-5	LCM-1R	--



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 75

ID#	Primary Crash Risk	Likely Resolution	Severity
75	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*Driver did not respond to FCW-3 & 4, or they were suppressed*
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

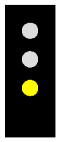
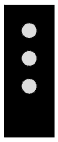
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
	N

ID # 76

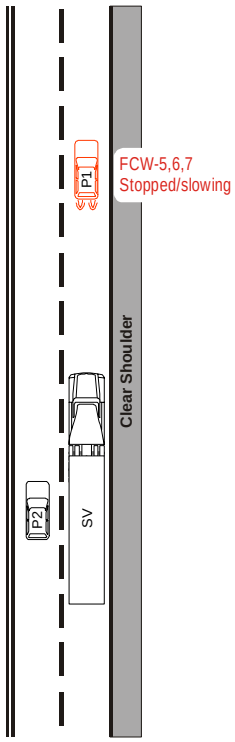
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-1	**FCW-5**	**LCM-0**		**FCW-5**	

Individual Sensor Conditions

FCW-5	LCM-1L	--



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 76

ID#	Primary Crash Risk	Likely Resolution	Severity
76	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*Driver did not respond to FCW-3 & 4, or they were suppressed*
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

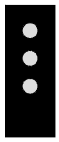
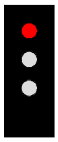
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
	N

ID # 77

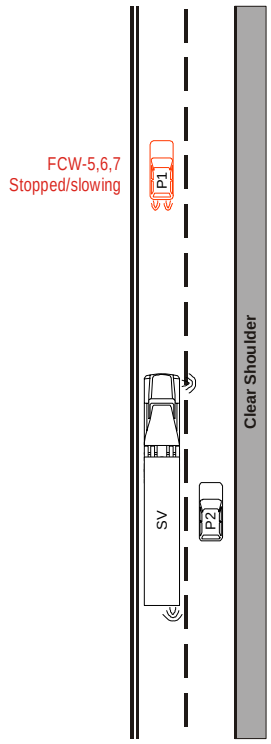
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	FCW-5	LCM-2		FCW-5	

Individual Sensor Conditions

FCW-5	LCM-2 R	--



Turn Signal

Right

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 77

ID#	Primary Crash Risk	Likely Resolution	Severity
77	*Rear end conflict with P1*	*SV stops in time or exits lane to right*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*1) Driver did not respond to FCW-3 & 4 and is about to initiate lane change to avoid P1 conflict (assumes that driver is/was unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict).* *2) Driver previously attempted lane change (which may have suppressed FCW-3 & 4); P1 slowed as driver was attending to P2 hazard.**
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

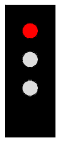
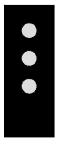
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
Note that there is no secondary conflict specified because LDW/LCM systems indicate that SV is staying in lane at this time ** In this case, the driver would already be aware of P2*	**N**

ID # 78

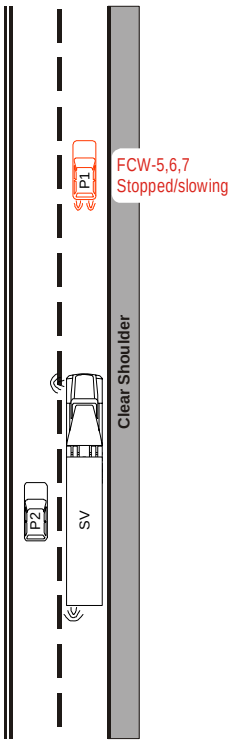
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-2	FCW-5	LCM-0		FCW-5	

Individual Sensor Conditions

FCW-5	LCM-2L	--



Turn Signal

Left

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 78

ID#	Primary Crash Risk	Likely Resolution	Severity
78	*Rear end conflict with P1*	*SV stops in time or exits lane (to left)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*1) Driver did not respond to FCW-3 & 4 and is about to initiate lane change to avoid P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic).* *2) Driver previously attempted lane change (which may have suppressed FCW-3 & 4); P1 slowed as driver was attending to P2 hazard.**
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

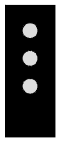
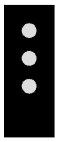
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
Note that there is no secondary conflict specified because LDW/LCM systems indicate that SV is staying in lane at this time ** In this case, the driver would already be aware of P2*	**N**

ID # 79

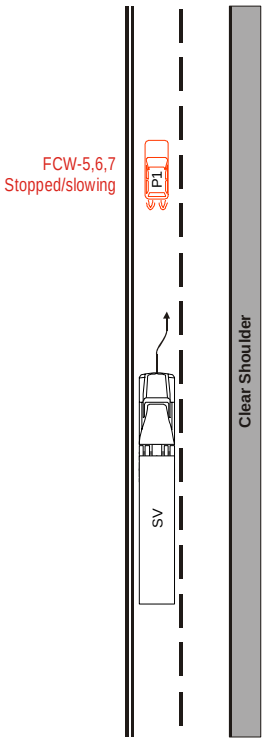
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-5**	**LCM-0**		**FCW-5**	

Individual Sensor Conditions

FCW-5	LCM-0 R/L	LDW-R



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

Comments:

ID # 79

ID#	Primary Crash Risk	Likely Resolution	Severity
79	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*Driver did not respond to FCW-3 & 4, or they were suppressed and driver is currently changing lanes to avoid P1 conflict*
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

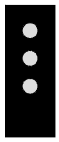
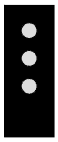
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV Run-off-road to the right	*Restricted or unsafe shoulder*	*Med*	
SV Run-off-road to the right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	

General Comments:	Exception
	N

ID # 80

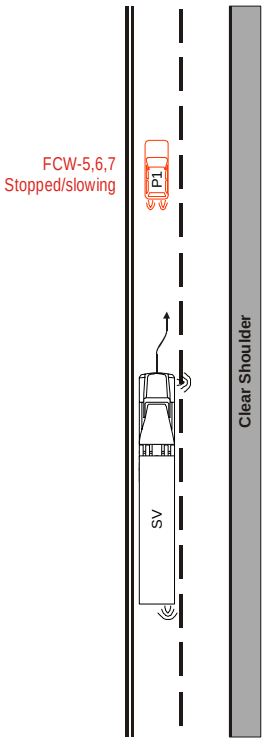
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-5**	**LCM-0**		**FCW-5**	

Individual Sensor Conditions

FCW-5	LCM-0 R/L	LDW-R



Turn Signal

Right

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 80

ID#	Primary Crash Risk	Likely Resolution	Severity
80	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*Driver did not respond to FCW-3 & 4, or they were suppressed and driver is currently changing lanes to avoid P1 conflict*
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

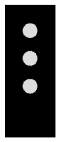
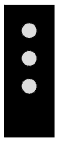
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
A Run-off-road event is discounted because turn signal activation would suggest that there is a viable lane to the right	**N**

ID # 81

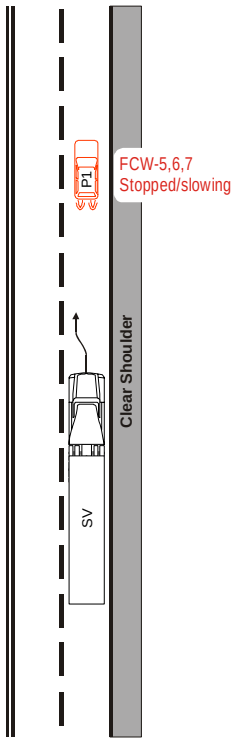
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-5**	**LCM-0**		**FCW-5**	

Individual Sensor Conditions

FCW-5	LCM-0 R/L	LDW-L



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

Comments:

ID # 81

ID#	Primary Crash Risk	Likely Resolution	Severity
81	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*Driver did not respond to FCW-3 & 4, or they were suppressed and driver is currently changing lanes to avoid P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic)*
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

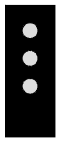
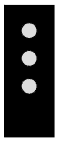
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV Run-off-road to the left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep
SV Run-off-road to the left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	

General Comments:	Exception
Assumes that SV going to right is not the best option	**N?**

ID # 82

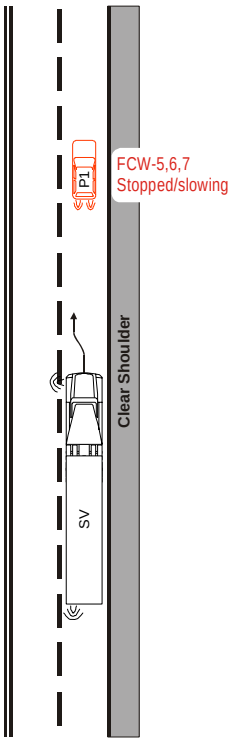
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-5**	**LCM-0**		**FCW-5**	

Individual Sensor Conditions

FCW-5	LCM-0 R/L	LDW-L



Turn Signal

Left

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 82

ID#	Primary Crash Risk	Likely Resolution	Severity
82	*Rear end conflict with P1*	*SV stops in time or exits lane (to left)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*Driver did not respond to FCW-3 & 4, or they were suppressed and driver is currently changing lanes to avoid P1 conflict*
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

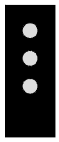
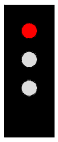
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
A Run-off-road event is discounted because turn signal activation would suggest that there is a viable lane to the left	**N**

ID # 83

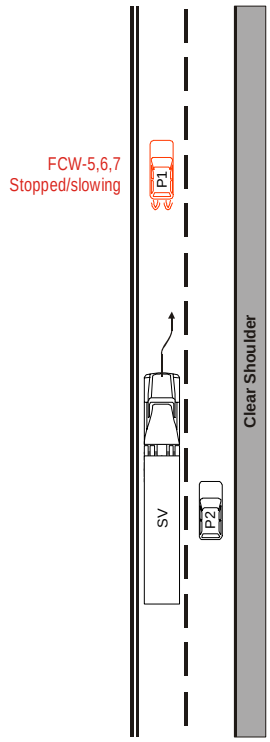
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-5**	**LCM-3***		**FCW-5**	

Individual Sensor Conditions

FCW-5	LCM-1R	LDW-R



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

* LCM-3 is the most appropriate warning, even though a turn signal is not activated, because the sensor data indicate that it is the same as an LCM-3 situation. It is unclear whether this sensor combination is even possible, given the definition of the L

ID # 83

ID#	Primary Crash Risk	Likely Resolution	Severity
83	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*Driver did not respond to FCW-3 & 4, or they were suppressed and driver is currently changing lanes to avoid P1 conflict (assumes that driver is unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict)*
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

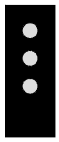
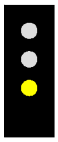
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
Assumption is that SV drivers will always try to avoid primary crash (as per test conditions). This assumption warrants validation based on expert judgment and/or kinematics	**N**

ID # 83a

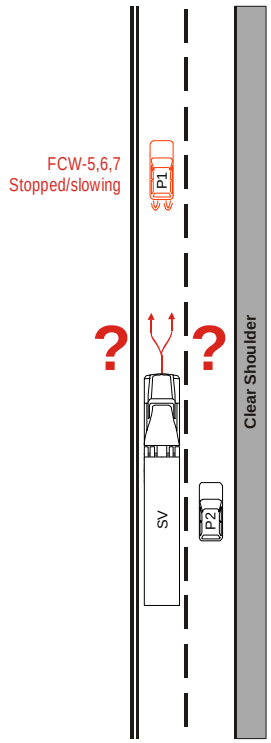
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	FCW-5	LCM-1		FCW-5	

Individual Sensor Conditions

FCW-5	LCM-1R	Unavail



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # **83a**

ID#	Primary Crash Risk	Likely Resolution	Severity
83a	*Rear end conflict with P1*	*SV stops ;in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*Driver did not respond to FCW-3 & 4, or they were suppressed*
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

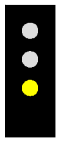
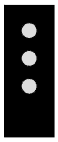
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
Note that there is no secondary conflict specified because the LCM system indicates that SV is staying in lane at this time	**N**

ID # 84

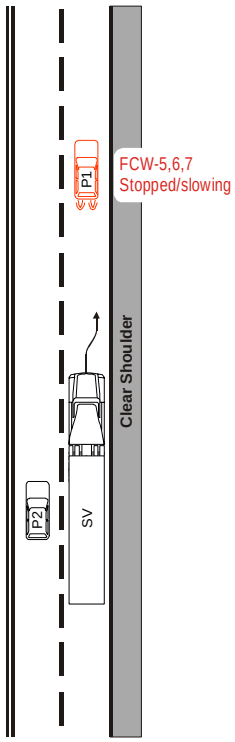
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-1	**FCW-5**	**LCM-0**		**FCW-5**	

Individual Sensor Conditions

FCW-5	LCM-1L	LDW-R



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

Comments:

ID # 84

ID#	Primary Crash Risk	Likely Resolution	Severity
84	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*Driver did not respond to FCW-3 & 4, or they were suppressed and driver is currently changing lanes to avoid P1 conflict*
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

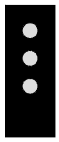
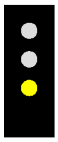
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV Run-off-road to the right	*Restricted or unsafe shoulder*	*Med*	
SV Run-off-road to the right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	

General Comments:	Exception
	N

ID # 85

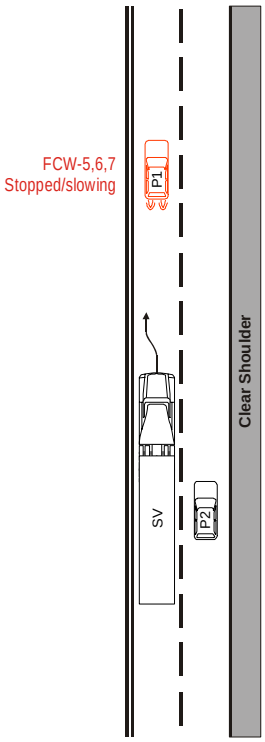
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-5**	**LCM-1**		**FCW-5**	

Individual Sensor Conditions

FCW-5	LCM-1R	LDW-L



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

Comments:

ID # 85

ID#	Primary Crash Risk	Likely Resolution	Severity
85	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*Driver did not respond to FCW-3 & 4, or they were suppressed and driver is currently changing lanes to avoid P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic)*
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

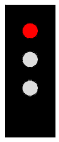
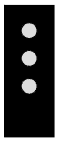
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV Run-off-road to the left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep
SV Run-off-road to the left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	

General Comments:	Exception
	N?

ID # 86

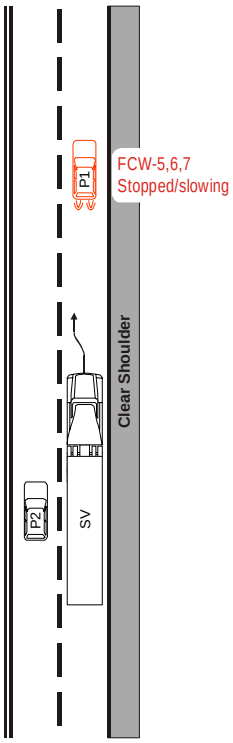
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3*	**FCW-5**	**LCM-0**		**FCW-5**	

Individual Sensor Conditions

FCW-5	LCM-1L	LDW-L



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

* LCM-3 is the most appropriate warning, even though a turn signal is not activated, because the sensor data indicate that it is the same as an LCM-3 situation. It is unclear whether this sensor combination is even possible, given the definition of the L

ID # 86

ID#	Primary Crash Risk	Likely Resolution	Severity
86	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*Driver did not respond to FCW-3 & 4, or they were suppressed and driver is currently changing lanes to avoid P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic)*
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

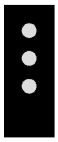
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep or has no concern for potential for P2 conflict
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
Assumes that SV going to right is not a viable option	**N?**

ID # 86a

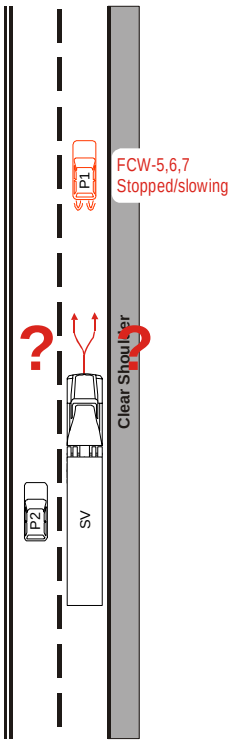
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-1	**FCW-5**	**LCM-0**		**FCW-5**	

Individual Sensor Conditions

FCW-5	LCM-1L	Unavail



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # **86a**

ID#	Primary Crash Risk	Likely Resolution	Severity
86a	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*Driver did not respond to FCW-3 & 4, or they were suppressed*
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

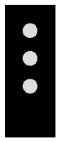
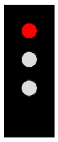
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
Note that there is no secondary conflict specified because the LCM system indicates that SV is staying in lane at this time	**N**

ID # 87

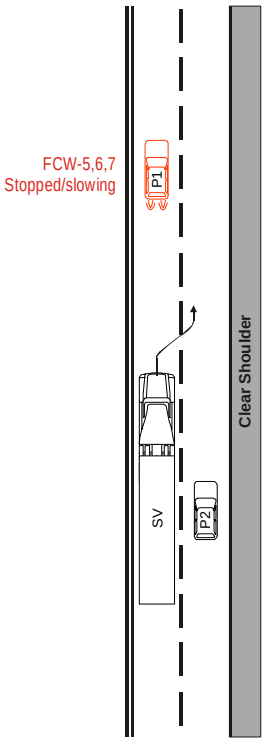
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-5**	**LCM-3**		**FCW-5**	

Individual Sensor Conditions

FCW-5	LCM-3R	LDW-R



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

ID # 87

ID#	Primary Crash Risk	Likely Resolution	Severity
87	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*Driver did not respond to FCW-3 & 4, or they were suppressed and driver is currently changing lanes to avoid P1 conflict (assumes that driver is unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict)*
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

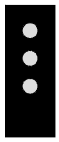
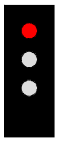
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
Assumption is that SV drivers will always try to avoid primary crash (as per test conditions). This assumption warrants validation based on expert judgment and/or kinematics	**N**

ID # 87a

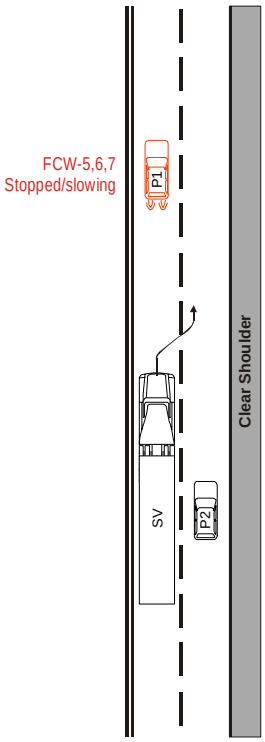
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-5**	**LCM-3**		**FCW-5†**	

Individual Sensor Conditions

FCW-5	LCM-3R	Unavail



Turn Signal

Off

Rules

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

† It is unclear if this permutation is possible with the LDW unavailable (can the LCM system still throw an LCM-3?)

ID # **87a**

ID#	Primary Crash Risk	Likely Resolution	Severity
87a	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*Driver did not respond to FCW-3 & 4, or they were suppressed and driver is currently changing lanes to avoid P1 conflict (assumes that driver is unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict)*
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

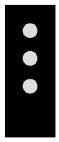
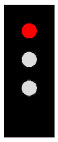
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
Assumption is that SV drivers will always try to avoid primary crash (as per test conditions). This assumption warrants validation based on expert judgment and/or kinematics	**N**

ID # 88

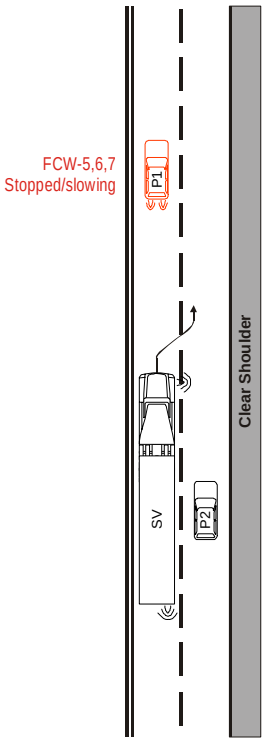
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-5**	**LCM-3**		**FCW-5**	

Individual Sensor Conditions

FCW-5	LCM-3R	LDW-R



Turn Signal

Right

Rules

10 LDW is canceled if same-side turn signal is activated

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

ID # 88

ID#	Primary Crash Risk	Likely Resolution	Severity
88	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*1) Driver did not respond to FCW-3 & 4 and is currently changing lanes to avoid P1 conflict (assumes that driver is/was unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict). Turn signal is activated to warn potential P2.* *2) Driver previously attempted lane change (which may have suppressed FCW-3 & 4); P1 slowed as driver was attending to P2 hazard.**
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

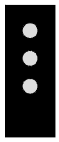
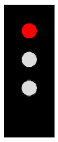
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
** In this case, the driver would already be aware of P2*	**N**

ID # 88a

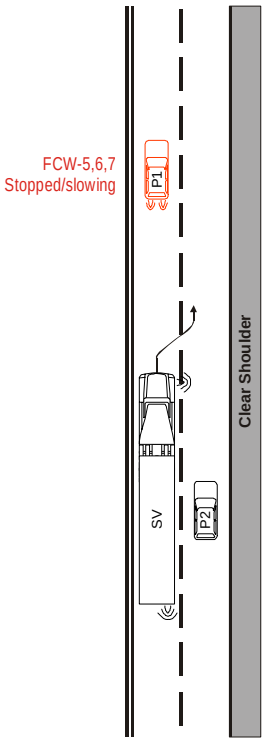
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-5**	**LCM-3**		**FCW-5**	

Individual Sensor Conditions

FCW-5	LCM-3R	Unavail



Turn Signal

Right

Rules

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

ID # **88a**

ID#	Primary Crash Risk	Likely Resolution	Severity
88a	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*1) Driver did not respond to FCW-3 & 4 and is currently changing lanes to avoid P1 conflict (assumes that driver is/was unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict). Turn signal is activated to warn potential P2.* *2) Driver previously attempted lane change (which may have suppressed FCW-3 & 4); P1 slowed as driver was attending to P2 hazard.**
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

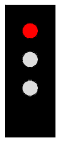
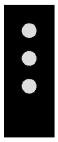
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
** In this case, the driver would already be aware of P2*	**N**

ID # 89

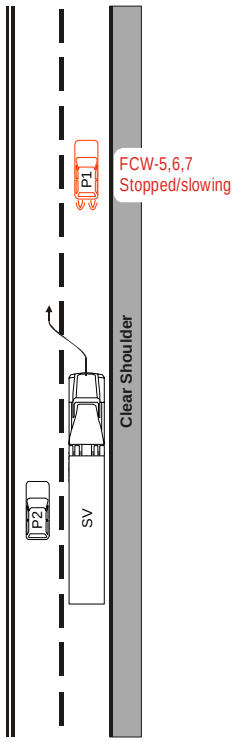
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-5**	**LCM-0**		**FCW-5**	

Individual Sensor Conditions

FCW-5	LCM-3L	LDW-L



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

ID # 89

ID#	Primary Crash Risk	Likely Resolution	Severity
89	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*Driver did not respond to FCW-3 & 4, or they were suppressed and driver is currently changing lanes to avoid P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic)*
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

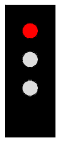
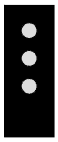
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep or has no concern for potential for P2 conflict
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
Assumes that SV going to right is not a viable option	**N?**

ID # **89a**

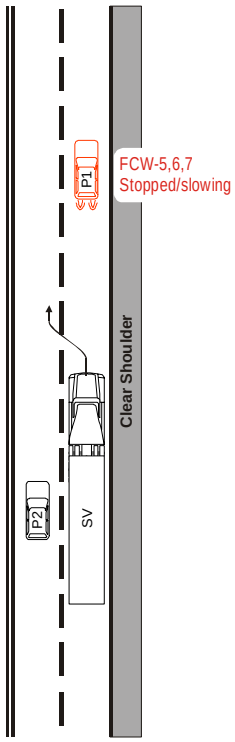
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-5**	**LCM-0**		**FCW-5†**	

Individual Sensor Conditions

FCW-5	LCM-3L	Unavail



Turn Signal

Off

Rules

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

† It is unclear if this permutation is possible with the LDW unavailable (can the LCM system still throw an LCM-3?)

ID # **89a**

ID#	Primary Crash Risk	Likely Resolution	Severity
89a	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*Driver did not respond to FCW-3 & 4, or they were suppressed and driver is currently changing lanes to avoid P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic)*
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

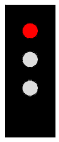
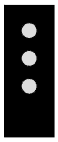
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep or has no concern for potential for P2 conflict
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
Assumes that SV going to right is not a viable option	**N?**

ID # 90

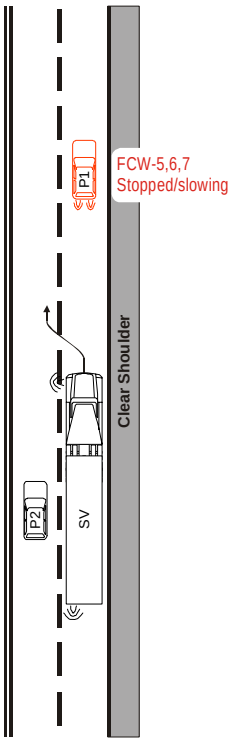
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	FCW-5	LCM-0		FCW-5	

Individual Sensor Conditions

FCW-5	LCM-3L	LDW-L



Turn Signal

Left

Rules

10 LDW is canceled if same-side turn signal is activated

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 90

ID#	Primary Crash Risk	Likely Resolution	Severity
90	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*1) Driver did not respond to FCW-3 & 4 and is currently changing lanes to avoid P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic). Turn signal is activated to warn potential P2.* *2) Driver previously attempted lane change (which may have suppressed FCW-3 & 4); P1 slowed as driver was attending to P2 hazard.**
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

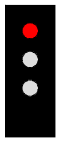
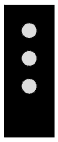
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep or has no concern for potential for P2 conflict
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
Assumes that SV going to right is not a viable option ** In this case, the driver would already be aware of P2*	**N?**

ID # 90a

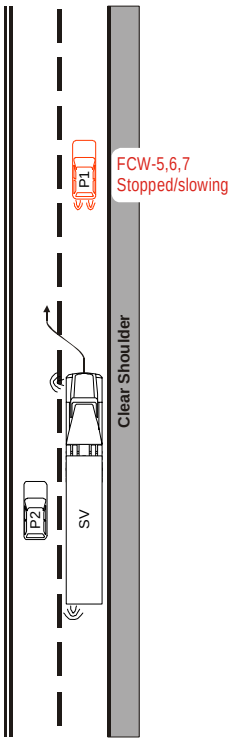
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	FCW-5	LCM-0		FCW-5	

Individual Sensor Conditions

FCW-5	LCM-3L	Unavail



Turn Signal

Left

Rules

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

ID # **90a**

ID#	Primary Crash Risk	Likely Resolution	Severity
90a	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- Available RT from onset of FCW-5 for completely avoiding a collision ranges from 0.7 sec in worst cases to 1.6 in best, and 1.4 to 1.9 sec for collisions up to 10 mph relative speed. *- The FCW-5 is almost always preceded by both an FCW-3 and an FCW-4*

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*FCW-3 & 4 would have alerted driver*
Partially Alert:	Y	*1) Driver did not respond to FCW-3 & 4 and is currently changing lanes to avoid P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic). Turn signal is activated to warn potential P2.* *2) Driver previously attempted lane change (which may have suppressed FCW-3 & 4); P1 slowed as driver was attending to P2 hazard.**
Fully Alert:	N	*FCW-3 & 4 would have provided warning of evolving conditions*

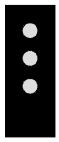
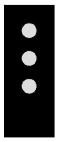
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep or has no concern for potential for P2 conflict
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
Assumes that SV going to right is not a viable option ** In this case, the driver would already be aware of P2*	**N?**

ID # 91

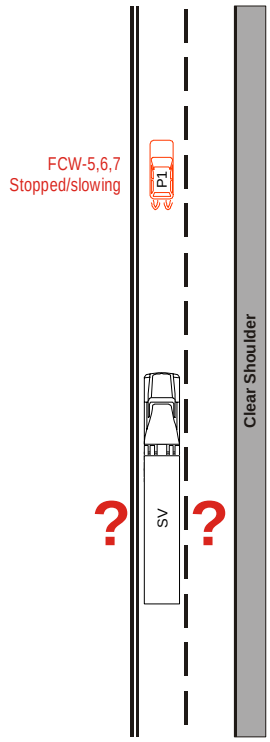
Conflict Source

DIU

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-6**	**LCM-0**		**FCW-6**	

Individual Sensor Conditions

FCW-6	LCM-X2 R/L	--



Turn Signal

Left, Right, Off

Rules

2 Visual and auditory FCW-5, 6, & 7 override visual and auditory LCM-X2

Comments:

ID # 91

ID#	Primary Crash Risk	Likely Resolution	Severity
91	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions*
Unalert:	Y	*Driver did not see stationary P1 vehicle/object*
Partially Alert:	Y	*Driver did not see stationary P1 vehicle/object*
Fully Alert:	N	*A fully alert driver should see the stationary P1 vehicle/object*

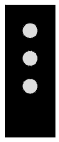
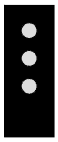
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			LDW system indicates no intention to change lanes

General Comments:	Exception
This is a very low probability event LDW to right might be associated with potential P2 conflict involving oncoming traffic	**N?**

ID # 92

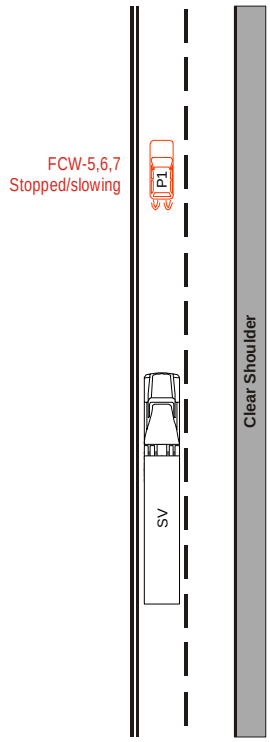
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-6**	**LCM-0**		**FCW-6**	

Individual Sensor Conditions

FCW-6	LCM-0 R/L	--



Turn Signal

Left, Right, Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 92

ID#	Primary Crash Risk	Likely Resolution	Severity
92	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions*
Unalert:	Y	*Driver did not see stationary P1 vehicle/object*
Partially Alert:	Y	*Driver did not see stationary P1 vehicle/object*
Fully Alert:	N	*A fully alert driver should see the stationary P1 vehicle/object*

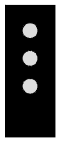
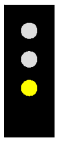
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
	N

ID # 93

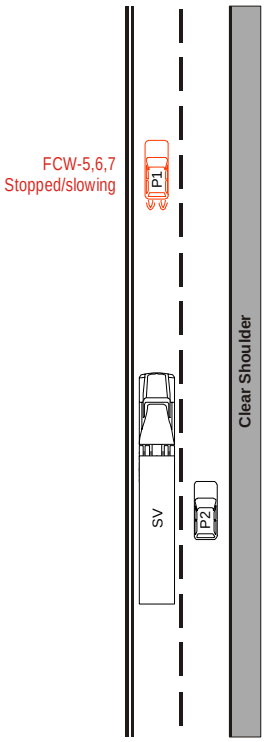
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-6**	**LCM-1**		**FCW-6**	

Individual Sensor Conditions

FCW-6	LCM-1R	--



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 93

ID#	Primary Crash Risk	Likely Resolution	Severity
93	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions*
Unalert:	Y	*Driver did not see stationary P1 vehicle/object*
Partially Alert:	Y	*Driver did not see stationary P1 vehicle/object*
Fully Alert:	N	*A fully alert driver should see the stationary P1 vehicle/object*

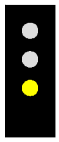
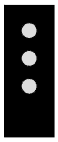
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
	N

ID # 94

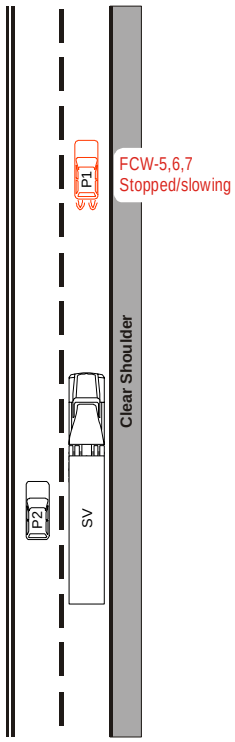
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-1	**FCW-6**	**LCM-0**		**FCW-6**	

Individual Sensor Conditions

FCW-6	LCM-1L	--



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 94

ID#	Primary Crash Risk	Likely Resolution	Severity
94	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions*
Unalert:	Y	*Driver did not see stationary P1 vehicle/object*
Partially Alert:	Y	*Driver did not see stationary P1 vehicle/object*
Fully Alert:	N	*A fully alert driver should see the stationary P1 vehicle/object*

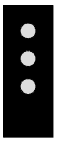
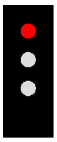
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
	N

ID # 95

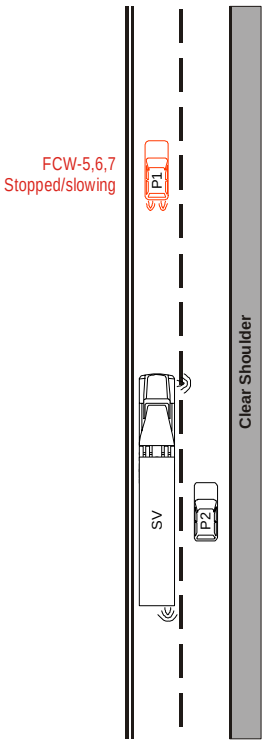
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-6**	**LCM-2**		**FCW-6**	

Individual Sensor Conditions

FCW-6	LCM-2R	--



Turn Signal

Right

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 95

ID#	Primary Crash Risk	Likely Resolution	Severity
95	*Rear end conflict with P1*	*SV stops in time or exits lane to right*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	Y	*Driver previously forgot to cancel turn signal, and currently does not see stationary P1 vehicle/object*
Partially Alert:	Y	*1) Driver did not see stopped P1 vehicle/object and is about to initiate lane change to avoid P1 conflict (assumes that driver is/was unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict).* *2) Driver may have previously attempted a lane change and did not see stationary P1 vehicle/object because of this.**
Fully Alert:	N	*A fully alert driver should see the stationary P1 vehicle/object*

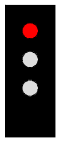
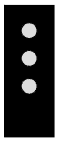
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
Note that there is no secondary conflict specified because LDW/LCM systems indicate that SV is staying in lane at this time ** In this case, the driver would already be aware of P2*	**N**

ID # 96

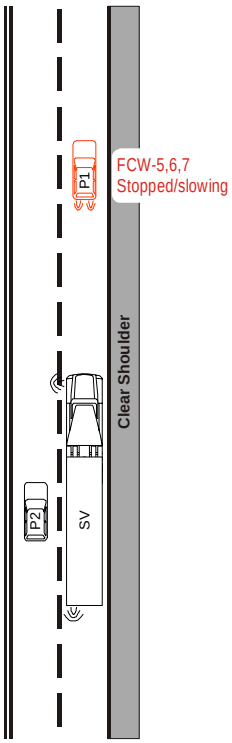
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-2	FCW-6	LCM-0		FCW-6	

Individual Sensor Conditions

FCW-6	LCM-2L	--



Turn Signal

Left

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 96

ID#	Primary Crash Risk	Likely Resolution	Severity
96	*Rear end conflict with P1*	*SV stops in time or exits lane (to left)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	Y	*Driver previously forgot to cancel turn signal, and currently does not see stationary P1 vehicle/object*
Partially Alert:	Y	*1) Driver did not see stopped P1 vehicle/object and is about to initiate lane change to avoid P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic).* *2) Driver may have previously attempted a lane change and did not see stationary P1 vehicle/object because of this.**
Fully Alert:	N	*A fully alert driver should see the stationary P1 vehicle/object*

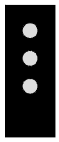
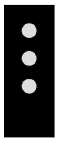
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
Note that there is no secondary conflict specified because LDW/LCM systems indicate that SV is staying in lane at this time ** In this case, the driver would already be aware of P2*	**N**

ID # 97

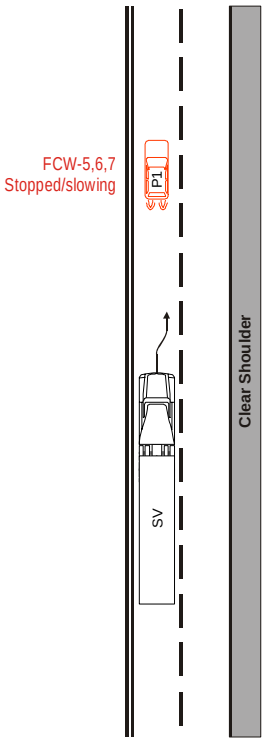
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-6**	**LCM-0**		**FCW-6**	

Individual Sensor Conditions

FCW-6	LCM-0 R/L	LDW-R



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

Comments:

ID # 97

ID#	Primary Crash Risk	Likely Resolution	Severity
97	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	Y	*Driver did not see stationary P1 vehicle/object and 1) the vehicle is drifting out of the lane or 2) the driver is currently changing lanes to avoid the P1 conflict*
Partially Alert:	Y	*Driver did not see stationary P1 vehicle/object and is currently changing lanes to avoid the P1 conflict*
Fully Alert:	N	*A fully alert driver should see the stationary P1 vehicle/object*

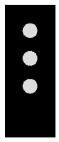
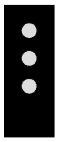
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV Run-off-road to the right	*Restricted or unsafe shoulder*	*Med*	
SV Run-off-road to the right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	

General Comments:	Exception
	N

ID # 98

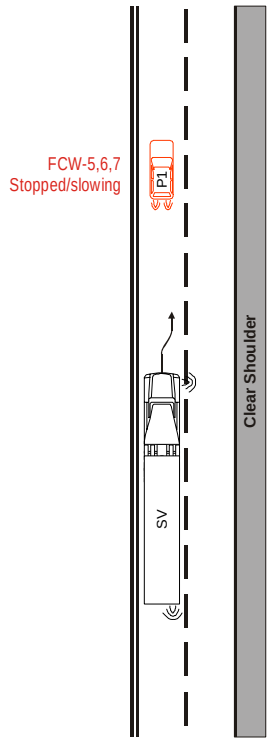
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-6**	**LCM-0**		**FCW-6**	

Individual Sensor Conditions

FCW-6	LCM-0 R/L	LDW-R



Turn Signal

Right

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 98

ID#	Primary Crash Risk	Likely Resolution	Severity
98	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver did not see stationary P1 vehicle/object and is currently changing lanes to avoid the P1 conflict*
Fully Alert:	N	*A fully alert driver should see the stationary P1 vehicle/object*

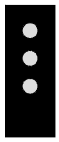
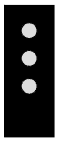
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
A Run-off-road event is discounted because turn signal activation would suggest that there is a viable lane to the right	**N**

ID # 99

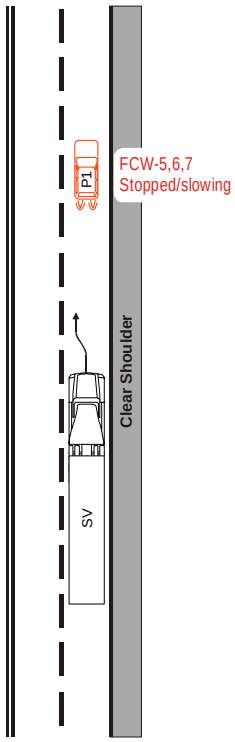
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-6**	**LCM-0**		**FCW-6**	

Individual Sensor Conditions

FCW-6	LCM-0 R/L	LDW-L



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

Comments:

ID # 99

ID#	Primary Crash Risk	Likely Resolution	Severity
99	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	Y	*Driver did not see stationary P1 vehicle/object and 1) the vehicle is drifting out of the lane or 2) the driver is currently changing lanes to avoid the P1 conflict*
Partially Alert:	Y	*Driver did not see stationary P1 vehicle/object and is currently changing lanes to avoid the P1 conflict*
Fully Alert:	N	*A fully alert driver should see the stationary P1 vehicle/object*

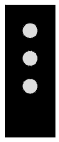
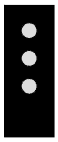
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV Run-off-road to the left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep
SV Run-off-road to the left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	

General Comments:	Exception
Assumes that SV going to right is not the best option	**N?**

ID # 100

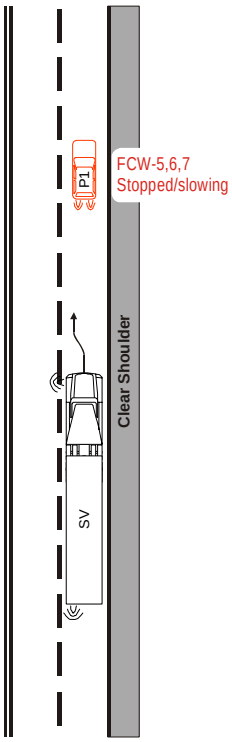
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-6**	**LCM-0**		**FCW-6**	

Individual Sensor Conditions

FCW-6	LCM-0 R/L	LDW-L



Turn Signal

Left

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 100

ID#	Primary Crash Risk	Likely Resolution	Severity
100	*Rear end conflict with P1*	*SV stops in time or exits lane (to left)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver did not see stationary P1 vehicle/object and is currently changing lanes to avoid the P1 conflict*
Fully Alert:	N	*A fully alert driver should see the stationary P1 vehicle/object*

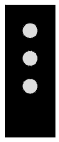
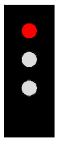
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
A Run-off-road event is discounted because turn signal activation would suggest that there is a viable lane to the left	**N**

ID # **101**

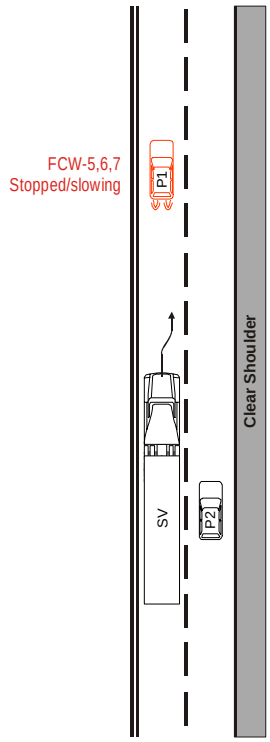
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-6**	**LCM-3***		**FCW-6**	

Individual Sensor Conditions

FCW-6	LCM-1R	LDW-R



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

* LCM-3 is the most appropriate warning, even though a turn signal is not activated, because the sensor data indicate that it is the same as an LCM-3 situation. It is unclear whether this sensor combination is even possible, given the definition of the L.

ID # 101

ID#	Primary Crash Risk	Likely Resolution	Severity
101	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	Y	*Driver did not see stationary P1 vehicle/object and 1) the vehicle is drifting out of the lane or 2) the driver is currently changing lanes to avoid the P1 conflict (assumes that driver is unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict)*
Partially Alert:	Y	*Driver did not see stationary P1 vehicle/object and is currently changing lanes to avoid the P1 conflict (assumes that driver is unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict)*
Fully Alert:	N	*A fully alert driver should see the stationary P1 vehicle/object*

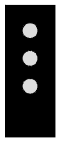
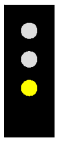
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
Assumption is that SV drivers will always try to avoid primary crash (as per test conditions). This assumption warrants validation based on expert judgment and/or kinematics	**N**

ID # **101a**

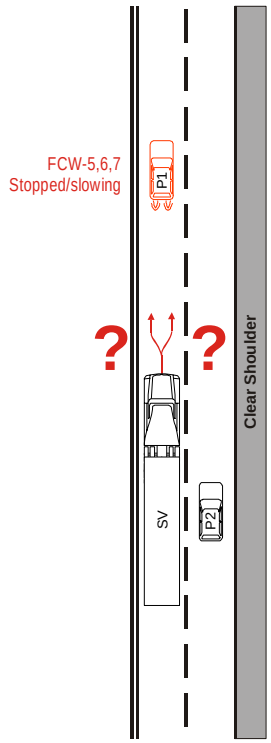
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-6**	**LCM-1**		**FCW-6**	

Individual Sensor Conditions

FCW-6	LCM-1R	Unavail



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 101a

ID#	Primary Crash Risk	Likely Resolution	Severity
101a	*Rear end conflict with P1*	*SV stops ;in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions*
Unalert:	Y	*Driver did not see stopped P1 vehicle/object*
Partially Alert:	Y	*Driver did not see stopped P1 vehicle/object*
Fully Alert:	N	*A fully alert driver should see the stopped P1 vehicle/object*

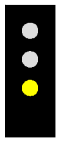
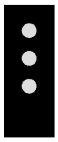
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
Note that there is no secondary conflict specified because the LCM system indicates that SV is staying in lane at this time	**N**

ID # 102

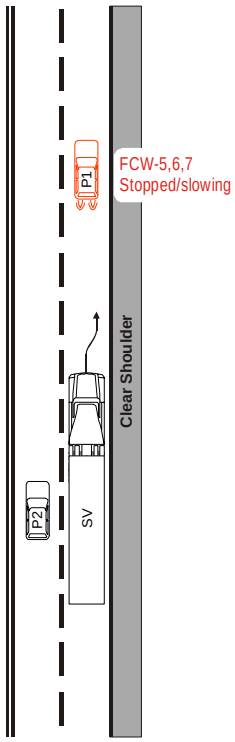
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-1	**FCW-6**	**LCM-0**		**FCW-6**	

Individual Sensor Conditions

FCW-6	LCM-1L	LDW-R



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

Comments:

ID # 102

ID#	Primary Crash Risk	Likely Resolution	Severity
102	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	Y	*Driver did not see stationary P1 vehicle/object and 1) the vehicle is drifting out of the lane or 2) the driver is currently changing lanes to avoid the P1 conflict*
Partially Alert:	Y	*Driver did not see stationary P1 vehicle/object and is currently changing lanes to avoid the P1 conflict*
Fully Alert:	N	*A fully alert driver should see the stationary P1 vehicle/object*

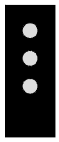
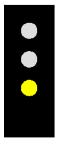
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV Run-off-road to the right	*Restricted or unsafe shoulder*	*Med*	
SV Run-off-road to the right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	

General Comments:	Exception
	N

ID # 103

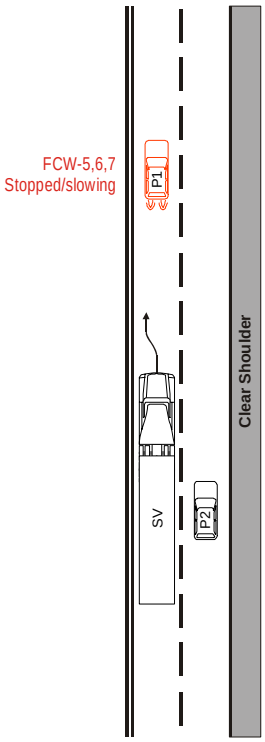
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-6**	**LCM-1**		**FCW-6**	

Individual Sensor Conditions

FCW-6	LCM-1R	LDW-L



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

Comments:

ID # 103

ID#	Primary Crash Risk	Likely Resolution	Severity
103	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	Y	*Driver did not see stationary P1 vehicle/object and 1) the vehicle is drifting out of the lane or 2) the driver is currently changing lanes to avoid the P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic)*
Partially Alert:	Y	*Driver did not see stationary P1 vehicle/object and is currently changing lanes to avoid the P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic)*
Fully Alert:	N	*A fully alert driver should see the stationary P1 vehicle/object*

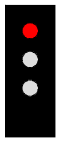
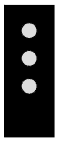
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV Run-off-road to the left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep
SV Run-off-road to the left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	

General Comments:	Exception
	N?

ID # 104

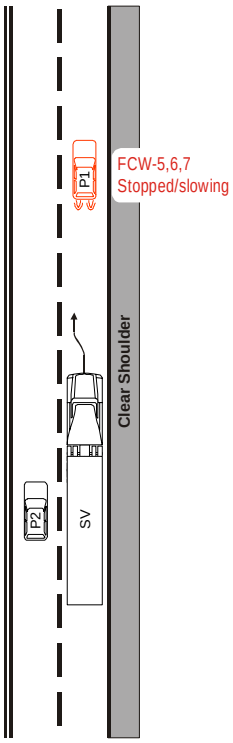
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3*	**FCW-6**	**LCM-0**		**FCW-6**	

Individual Sensor Conditions

FCW-6	LCM-1L	LDW-L



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

* LCM-3 is the most appropriate warning, even though a turn signal is not activated, because the sensor data indicate that it is the same as an LCM-3 situation. It is unclear whether this sensor combination is even possible, given the definition of the L

ID # 104

ID#	Primary Crash Risk	Likely Resolution	Severity
104	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	Y	*Driver did not see stationary P1 vehicle/object and 1) the vehicle is drifting out of the lane or 2) the driver is currently changing lanes to avoid the P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic)*
Partially Alert:	Y	*Driver did not see stationary P1 vehicle/object and is currently changing lanes to avoid the P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic)*
Fully Alert:	N	*A fully alert driver should see the stationary P1 vehicle/object*

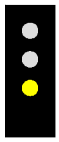
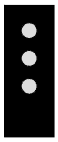
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep or has no concern for potential for P2 conflict
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
Assumes that SV going to right is not a viable option	**N?**

ID # **104a**

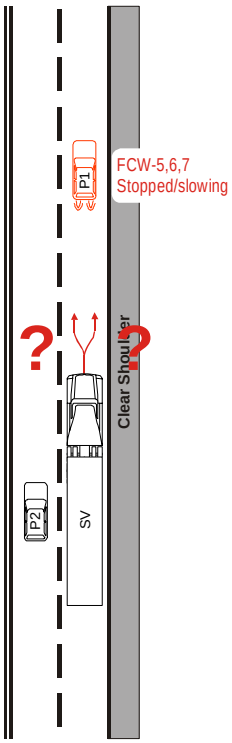
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-1	**FCW-6**	**LCM-0**		**FCW-6**	

Individual Sensor Conditions

FCW-6	LCM-1L	Unavail



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # **104a**

ID#	Primary Crash Risk	Likely Resolution	Severity
104a	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions*
Unalert:	Y	*Driver did not see stopped P1 vehicle/object*
Partially Alert:	Y	*Driver did not see stopped P1 vehicle/object*
Fully Alert:	N	*A fully alert driver should see the stopped P1 vehicle/object*

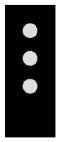
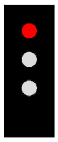
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:	Exception
Note that there is no secondary conflict specified because the LCM system indicates that SV is staying in lane at this time	**N**

ID # 105

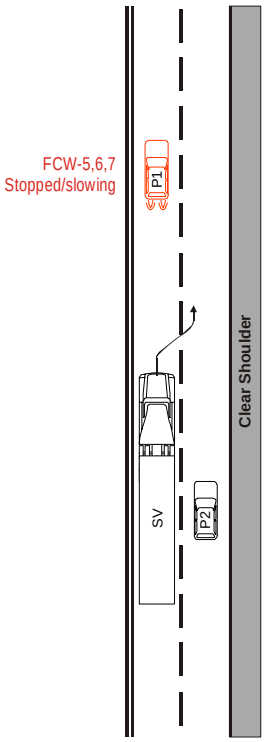
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-6**	**LCM-3**		**FCW-6**	

Individual Sensor Conditions

FCW-6	LCM-3R	LDW-R



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

ID # 105

ID#	Primary Crash Risk	Likely Resolution	Severity
105	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	Y	*Driver did not see stationary P1 vehicle/object and 1) the vehicle is drifting out of the lane or 2) the driver is currently changing lanes to avoid the P1 conflict (assumes that driver is unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict)*
Partially Alert:	Y	*Driver did not see stationary P1 vehicle/object and is currently changing lanes to avoid the P1 conflict (assumes that driver is unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict)*
Fully Alert:	N	*A fully alert driver should see the stationary P1 vehicle/object*

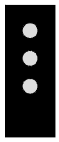
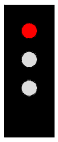
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
Assumption is that SV drivers will always try to avoid primary crash (as per test conditions). This assumption warrants validation based on expert judgment and/or kinematics	**N**

ID # 105a

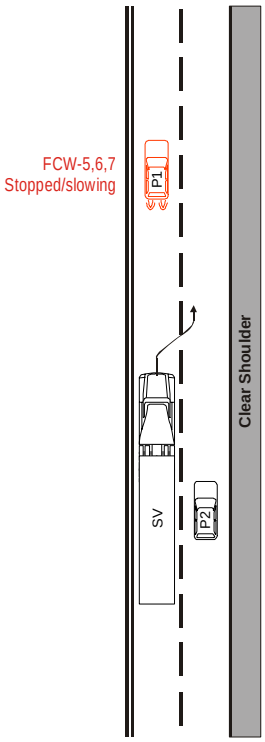
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-6**	**LCM-3**		**FCW-6†**	

Individual Sensor Conditions

FCW-6	LCM-3R	Unavail



Turn Signal

Off

Rules

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

† It is unclear if this permutation is possible with the LDW unavailable (can the LCM system still throw an LCM-3?)

ID # 105a

ID#	Primary Crash Risk	Likely Resolution	Severity
105a	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	Y	*Driver did not see stationary P1 vehicle/object and 1) the vehicle is drifting out of the lane or 2) the driver is currently changing lanes to avoid the P1 conflict (assumes that driver is unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict)*
Partially Alert:	Y	*Driver did not see stationary P1 vehicle/object and is currently changing lanes to avoid the P1 conflict (assumes that driver is unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict)*
Fully Alert:	N	*A fully alert driver should see the stationary P1 vehicle/object*

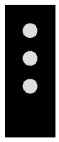
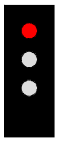
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
Assumption is that SV drivers will always try to avoid primary crash (as per test conditions). This assumption warrants validation based on expert judgment and/or kinematics	**N**

ID # 106

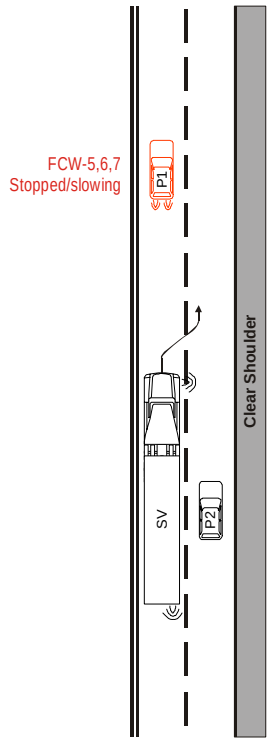
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-6**	**LCM-3**		**FCW-6**	

Individual Sensor Conditions

FCW-6	LCM-3R	LDW-R



Turn Signal

Right

Rules

10 LDW is canceled if same-side turn signal is activated

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 106

ID#	Primary Crash Risk	Likely Resolution	Severity
106	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*1) Driver did not see stopped P1 vehicle/object and is changing lanes to avoid P1 conflict (assumes that driver is/was unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict).* *2) Driver may have previously attempted a lane change and did not see stationary P1 vehicle/object because of this.**
Fully Alert:	N	*A fully alert driver should see the stationary P1 vehicle/object*

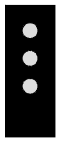
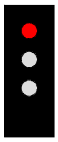
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
** In this case, the driver would already be aware of P2*	**N**

ID # 106a

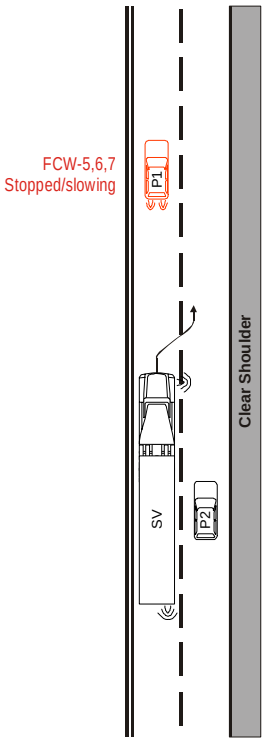
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-6**	**LCM-3**		**FCW-6**	

Individual Sensor Conditions

FCW-6	LCM-3R	Unavail



Turn Signal

Right

Rules

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

ID # **106a**

ID#	Primary Crash Risk	Likely Resolution	Severity
106a	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*1) Driver did not see stopped P1 vehicle/object and is changing lanes to avoid P1 conflict (assumes that driver is/was unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict).* *2) Driver may have previously attempted a lane change and did not see stationary P1 vehicle/object because of this.**
Fully Alert:	N	*A fully alert driver should see the stationary P1 vehicle/object*

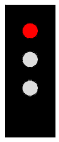
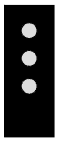
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
** In this case, the driver would already be aware of P2*	**N**

ID # **107**

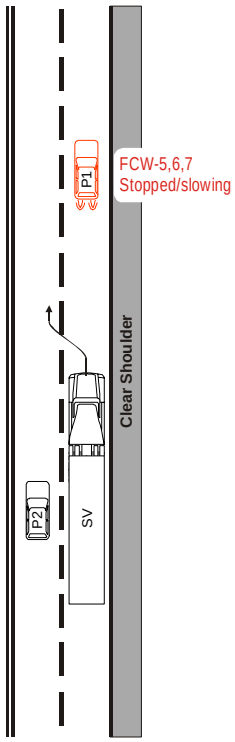
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-6**	**LCM-0**		**FCW-6**	

Individual Sensor Conditions

FCW-6	LCM-3L	LDW-L



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

ID # 107

ID#	Primary Crash Risk	Likely Resolution	Severity
107	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	Y	*Driver did not see stationary P1 vehicle/object and 1) the vehicle is drifting out of the lane or 2) the driver is currently changing lanes to avoid the P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic)*
Partially Alert:	Y	*Driver did not see stationary P1 vehicle/object and is currently changing lanes to avoid the P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic)*
Fully Alert:	N	*A fully alert driver should see the stationary P1 vehicle/object*

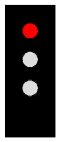
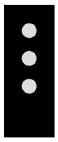
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep or has no concern for potential for P2 conflict
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
Assumes that SV going to right is not a viable option	**N?**

ID # **107a**

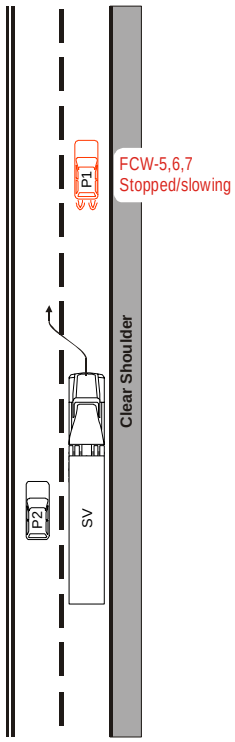
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-6**	**LCM-0**		**FCW-6†**	

Individual Sensor Conditions

FCW-6	LCM-3L	Unavail



Turn Signal

Off

Rules

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

† It is unclear if this permutation is possible with the LDW unavailable (can the LCM system still throw an LCM-3?)

ID # **107a**

ID#	Primary Crash Risk	Likely Resolution	Severity
107a	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	Y	*Driver did not see stationary P1 vehicle/object and 1) the vehicle is drifting out of the lane or 2) the driver is currently changing lanes to avoid the P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic)*
Partially Alert:	Y	*Driver did not see stationary P1 vehicle/object and is currently changing lanes to avoid the P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic)*
Fully Alert:	N	*A fully alert driver should see the stationary P1 vehicle/object*

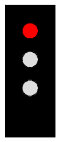
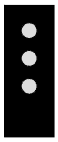
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep or has no concern for potential for P2 conflict
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
Assumes that SV going to right is not a viable option	**N?**

ID # 108

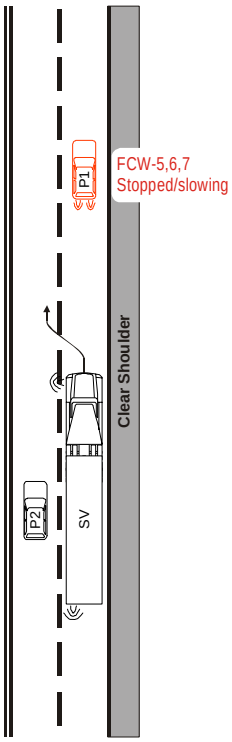
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	FCW-6	LCM-0		FCW-6	

Individual Sensor Conditions

FCW-6	LCM-3L	LDW-L



Turn Signal

Left

Rules

10 LDW is canceled if same-side turn signal is activated

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

ID # 108

ID#	Primary Crash Risk	Likely Resolution	Severity
108	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*1) Driver did not see stopped P1 vehicle/object and is changing lanes to avoid P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic).* *2) Driver may have previously attempted a lane change and did not see stationary P1 vehicle/object because of this.**
Fully Alert:	N	*A fully alert driver should see the stationary P1 vehicle/object*

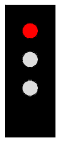
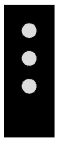
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep or has no concern for potential for P2 conflict
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
Assumes that SV going to right is not a viable option ** In this case, the driver would already be aware of P2*	**N?**

ID # 108a

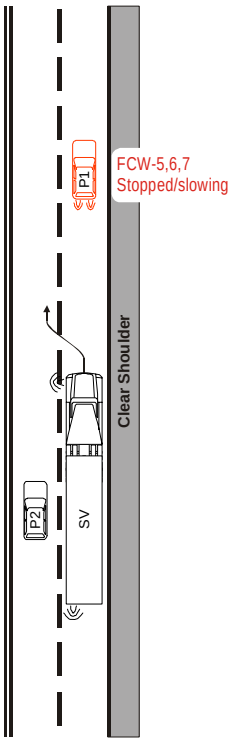
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	FCW-6	LCM-0		FCW-6	

Individual Sensor Conditions

FCW-6	LCM-3L	Unavail



Turn Signal

Left

Rules

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

ID # **108a**

ID#	Primary Crash Risk	Likely Resolution	Severity
108a	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-6 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*1) Driver did not see stopped P1 vehicle/object and is changing lanes to avoid P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic).* *2) Driver may have previously attempted a lane change and did not see stationary P1 vehicle/object because of this.**
Fully Alert:	N	*A fully alert driver should see the stationary P1 vehicle/object*

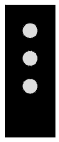
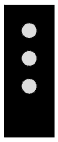
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep or has no concern for potential for P2 conflict
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
Assumes that SV going to right is not a viable option ** In this case, the driver would already be aware of P2*	**N?**

ID # 109

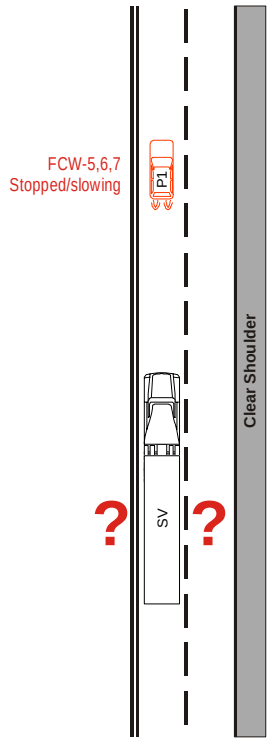
Conflict Source

DIU

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-7**	**LCM-0**		**FCW-7**	

Individual Sensor Conditions

FCW-7	LCM-X2 R/L	--



Turn Signal

Left, Right, Off

Rules

2 Visual and auditory FCW-5, 6, & 7 override visual and auditory LCM-X2

Comments:

ID # 109

ID#	Primary Crash Risk	Likely Resolution	Severity
109	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions*
Unalert:	Y	*Driver did not see slowing/slow P1 vehicle ahead*
Partially Alert:	Y	*Driver did not see slowing/slow P1 vehicle ahead, or P1 slowed unexpectedly*
Fully Alert:	N	*P1 vehicle slowed unexpectedly*

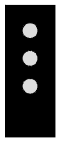
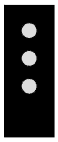
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			LDW system indicates no intention to change lanes

General Comments:	Exception
This is a very low probability event LDW to right might be associated with potential P2 conflict involving oncoming traffic	**N?**

ID # 110

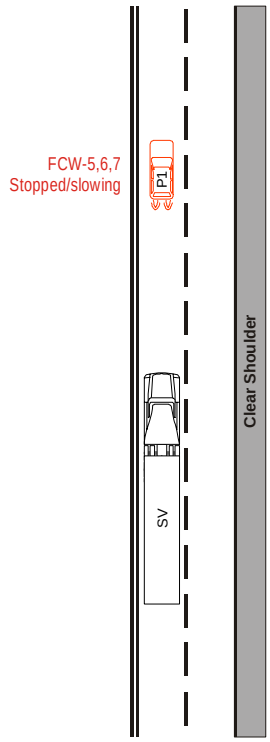
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-7**	**LCM-0**		**FCW-7**	

Individual Sensor Conditions

FCW-7	LCM-0 R/L	--



Turn Signal

Left, Right, Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 110

ID#	Primary Crash Risk	Likely Resolution	Severity
110	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions*
Unalert:	Y	*Driver did not see slowing/slow P1 vehicle ahead*
Partially Alert:	Y	*Driver did not see slowing/slow P1 vehicle ahead, or P1 slowed unexpectedly*
Fully Alert:	N	*P1 vehicle slowed unexpectedly*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

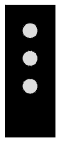
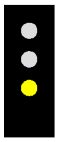
General Comments:

Exception
N

ID # 111

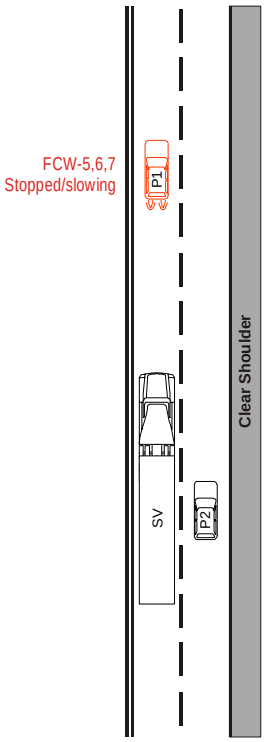
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-7**	**LCM-1**		**FCW-7**	

Individual Sensor Conditions

FCW-7	LCM-1R	--



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 111

ID#	Primary Crash Risk	Likely Resolution	Severity
111	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions*
Unalert:	Y	*Driver did not see slowing/slow P1 vehicle ahead*
Partially Alert:	Y	*Driver did not see slowing/slow P1 vehicle ahead, or P1 slowed unexpectedly*
Fully Alert:	N	*P1 vehicle slowed unexpectedly*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

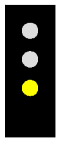
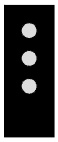
General Comments:

Exception
N

ID # 112

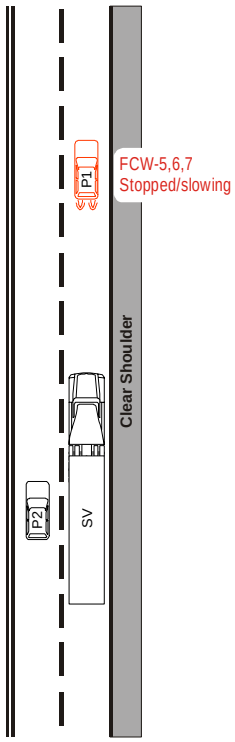
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-1	**FCW-7**	**LCM-0**		**FCW-6**	

Individual Sensor Conditions

FCW-7	LCM-1L	--



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 112

ID#	Primary Crash Risk	Likely Resolution	Severity
112	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions*
Unalert:	Y	*Driver did not see slowing/slow P1 vehicle ahead*
Partially Alert:	Y	*Driver did not see slowing/slow P1 vehicle ahead, or P1 slowed unexpectedly*
Fully Alert:	N	*P1 vehicle slowed unexpectedly*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

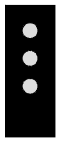
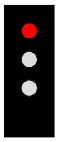
General Comments:

Exception
N

ID # 113

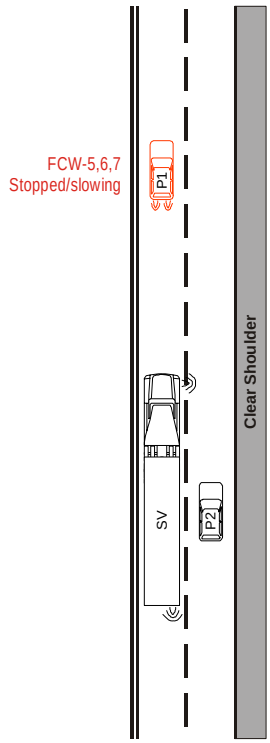
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	FCW-7	LCM-2		FCW-7	

Individual Sensor Conditions

FCW-7	LCM-2R	--



Turn Signal

Right

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 113

ID#	Primary Crash Risk	Likely Resolution	Severity
113	*Rear end conflict with P1*	*SV stops in time or exits lane to right*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	Y	*Driver previously forgot to cancel turn signal, and currently does not see slowing/slow P1 vehicle ahead*
Partially Alert:	Y	*1) Driver did not see or expect slowing/slow P1 vehicle and is about to initiate lane change to avoid P1 conflict (assumes that driver is/was unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict).* *2) Driver may have previously attempted a lane change and did not see slowing/slow P1 vehicle ahead because of this.**
Fully Alert:	Y	*1) P1 vehicle slowed unexpectedly; the driver has determined that a conflict with P2 is the best option, and is signaling his/her intensions to change lanes.* *2) Driver was signaling intention to change lanes and P1 vehicle slowed unexpectedly*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

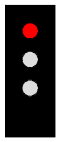
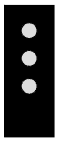
General Comments:
Note that there is no secondary conflict specified because LDW/LCM systems indicate that SV is staying in lane at this time ** In this case, the driver would already be aware of P2*

Exception
N

ID # 114

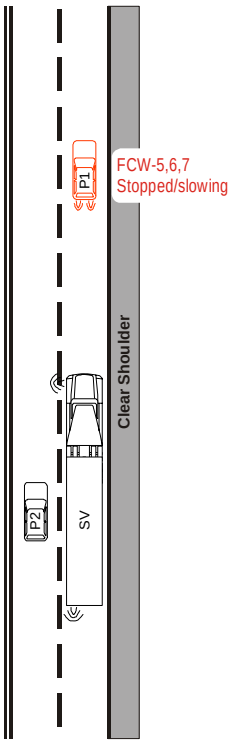
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-2	FCW-7	LCM-0		FCW-7	

Individual Sensor Conditions

FCW-7	LCM-2 L	--



Turn Signal

Left

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 114

ID#	Primary Crash Risk	Likely Resolution	Severity
114	*Rear end conflict with P1*	*SV stops in time or exits lane (to left)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	Y	*Driver previously forgot to cancel turn signal, and currently does not see slowing/slow P1 vehicle ahead*
Partially Alert:	Y	*1) Driver did not see or expect slowing/slow P1 vehicle and is about to initiate lane change to avoid P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic).* *2) Driver may have previously attempted a lane change and did not see slowing/slow P1 vehicle because of this.**
Fully Alert:	Y	*1) P1 vehicle slowed unexpectedly; the driver has determined that a conflict with P2 is the best option, and is signaling his/her intensions to change lanes.* *2) Driver was signaling intention to change lanes and P1 vehicle slowed unexpectedly*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

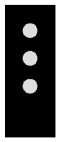
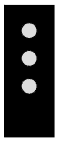
General Comments:
Note that there is no secondary conflict specified because LDW/LCM systems indicate that SV is staying in lane at this time ** In this case, the driver would already be aware of P2*

Exception
N

ID # 115

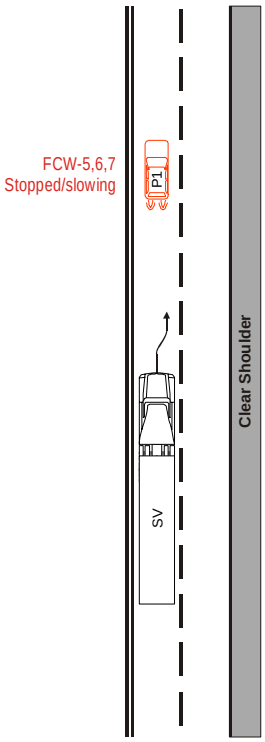
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-7**	**LCM-0**		**FCW-7**	

Individual Sensor Conditions

FCW-7	LCM-0 R/L	LDW-R



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

Comments:

ID # 115

ID#	Primary Crash Risk	Likely Resolution	Severity
115	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	Y	*Driver did not see slowing/slow P1 vehicle ahead and 1) the vehicle is drifting out of the lane or 2) the driver is currently changing lanes to avoid the P1 conflict*
Partially Alert:	Y	*Driver did not see or expect slowing/slow P1 vehicle ahead and is currently changing lanes to avoid the P1 conflict*
Fully Alert:	Y	*P1 vehicle slowed unexpectedly and driver decided that going to the right is the best option*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV Run-off-road to the right	*Restricted or unsafe shoulder*	*Med*	
SV Run-off-road to the right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	

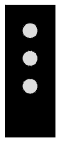
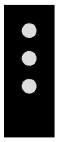
General Comments:

Exception
N

ID # 116

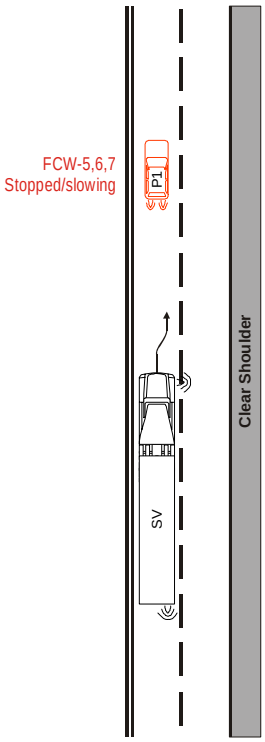
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-7**	**LCM-0**		**FCW-7**	

Individual Sensor Conditions

FCW-7	LCM-0 R/L	LDW-R



Turn Signal

Right

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 116

ID#	Primary Crash Risk	Likely Resolution	Severity
116	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver did not see or expect slowing/slow P1 vehicle and is and is changing lanes to avoid the P1 conflict*
Fully Alert:	Y	*P1 vehicle slowed unexpectedly and driver is changing lanes to avoid the P1 conflict*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

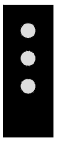
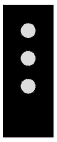
General Comments:
A Run-off-road event is discounted because turn signal activation would suggest that there is a viable lane to the right

Exception
N

ID # 117

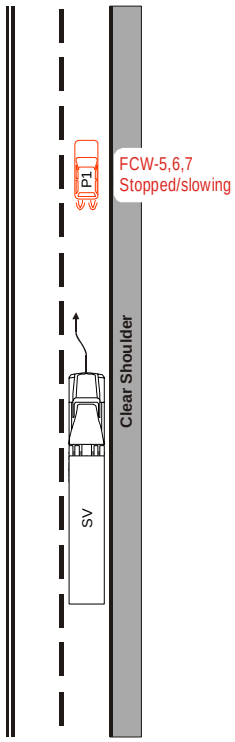
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	FCW-7	LCM-0		FCW-7	

Individual Sensor Conditions

FCW-7	LCM-0 R/L	LDW-L



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

Comments:

ID # 117

ID#	Primary Crash Risk	Likely Resolution	Severity
117	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	Y	*Driver did not see slowing/slow P1 vehicle ahead and 1) the vehicle is drifting out of the lane or 2) the driver is currently changing lanes to avoid the P1 conflict*
Partially Alert:	Y	*Driver did not see or expect slowing/slow P1 vehicle ahead and is currently changing lanes to avoid the P1 conflict*
Fully Alert:	Y	*P1 vehicle slowed unexpectedly and driver decided that going to the left is the best option*

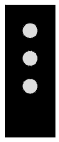
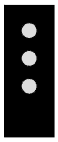
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV Run-off-road to the left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep
SV Run-off-road to the left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	

General Comments:	Exception
Assumes that SV going to right is not the best option	**N?**

ID # 118

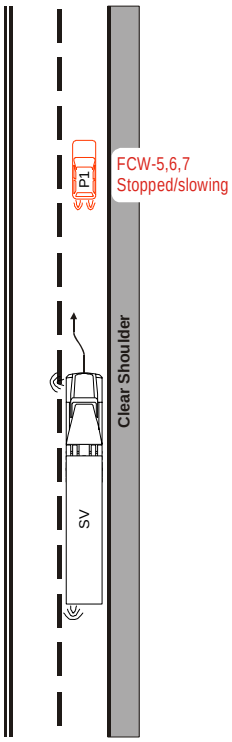
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-7**	**LCM-0**		**FCW-7**	

Individual Sensor Conditions

FCW-7	LCM-0 R/L	LDW-L



Turn Signal

Left

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 118

ID#	Primary Crash Risk	Likely Resolution	Severity
118	*Rear end conflict with P1*	*SV stops in time or exits lane (to left)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver did not see or expect slowing/slow P1 vehicle and is and is changing lanes to avoid the P1 conflict*
Fully Alert:	Y	*P1 vehicle slowed unexpectedly and driver is changing lanes to avoid the P1 conflict*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

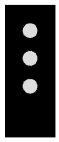
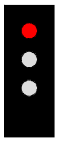
General Comments:
A Run-off-road event is discounted because turn signal activation would suggest that there is a viable lane to the left

Exception
N

ID # 119

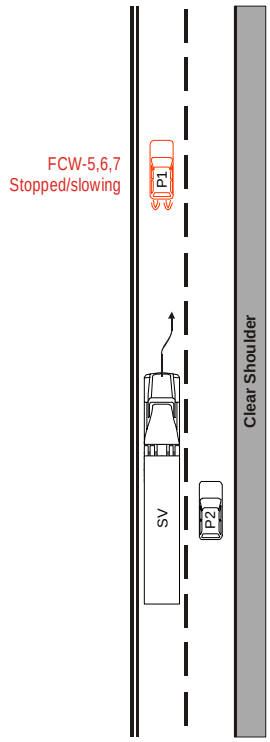
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-7**	**LCM-3***		**FCW-7**	

Individual Sensor Conditions

FCW-7	LCM-1R	LDW-R



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

* LCM-3 is the most appropriate warning, even though a turn signal is not activated, because the sensor data indicate that it is the same as an LCM-3 situation. It is unclear whether this sensor combination is even possible, given the definition of the L

ID # 119

ID#	Primary Crash Risk	Likely Resolution	Severity
119	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	Y	*Driver did not see slowing/slow P1 vehicle ahead and 1) the vehicle is drifting out of the lane or 2) the driver is currently changing lanes to avoid the P1 conflict (assumes that driver is unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict)*
Partially Alert:	Y	*Driver did not see or expect slowing/slow P1 vehicle ahead and is currently changing lanes to avoid the P1 conflict (assumes that driver is unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict)*
Fully Alert:	Y	*P1 vehicle slowed unexpectedly and the driver has determined that a conflict with P2 is the best option*

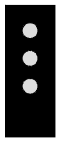
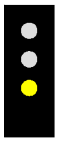
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
Assumption is that SV drivers will always try to avoid primary crash (as per test conditions). This assumption warrants validation based on expert judgment and/or kinematics	**N**

ID # 119a

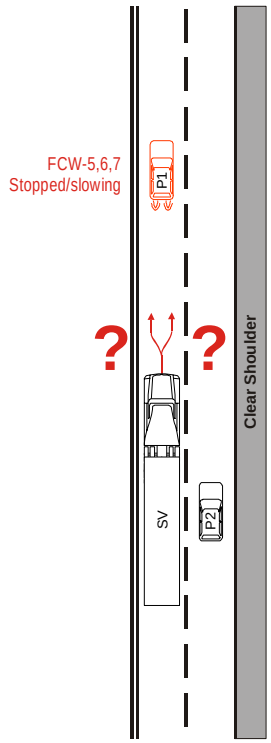
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	FCW-7	LCM-1		FCW-7	

Individual Sensor Conditions

FCW-7	LCM-1R	Unavail



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 119a

ID#	Primary Crash Risk	Likely Resolution	Severity
119a	*Rear end conflict with P1*	*SV stops ;in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions*
Unalert:	Y	*Driver did not see slowing/slow P1 vehicle ahead*
Partially Alert:	Y	*Driver did not see slowing/slow P1 vehicle ahead, or P1 slowed unexpectedly*
Fully Alert:	N	*P1 vehicle slowed unexpectedly*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

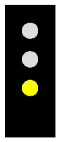
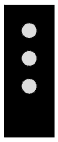
General Comments:
Note that there is no secondary conflict specified because the LCM system indicates that SV is staying in lane at this time

Exception
N

ID # 120

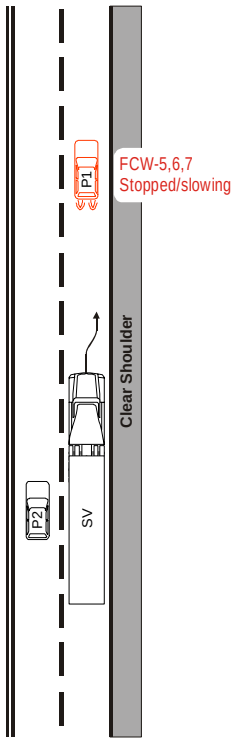
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-1	**FCW-7**	**LCM-0**		**FCW-6**	

Individual Sensor Conditions

FCW-7	LCM-1L	LDW-R



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

Comments:

ID # 120

ID#	Primary Crash Risk	Likely Resolution	Severity
120	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	Y	*Driver did not see slowing/slow P1 vehicle ahead and 1) the vehicle is drifting out of the lane or 2) the driver is currently changing lanes to avoid the P1 conflict*
Partially Alert:	Y	*Driver did not see or expect slowing/slow P1 vehicle ahead and is currently changing lanes to avoid the P1 conflict*
Fully Alert:	Y	*P1 vehicle slowed unexpectedly and driver decided that going to the right is the best option*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV Run-off-road to the right	*Restricted or unsafe shoulder*	*Med*	
SV Run-off-road to the right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	

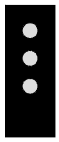
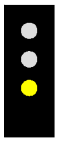
General Comments:

Exception
N

ID # 121

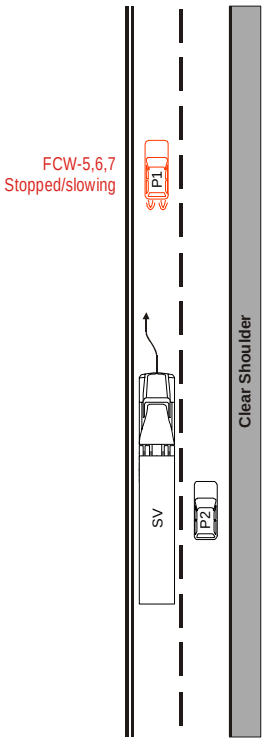
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-7**	**LCM-1**		**FCW-7**	

Individual Sensor Conditions

FCW-7	LCM-1R	LDW-L



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

Comments:

ID # 121

ID#	Primary Crash Risk	Likely Resolution	Severity
121	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	Y	*Driver did not see slowing/slow P1 vehicle ahead and 1) the vehicle is drifting out of the lane or 2) the driver is currently changing lanes to avoid the P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic).*
Partially Alert:	Y	*Driver did not see or expect slowing/slow P1 vehicle ahead and is currently changing lanes to avoid the P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic).*
Fully Alert:	Y	*P1 vehicle slowed unexpectedly and driver decided that going to the left is the best option*

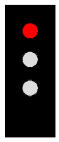
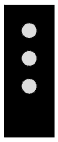
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV Run-off-road to the left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep
SV Run-off-road to the left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	

General Comments:	Exception
	N?

ID # 122

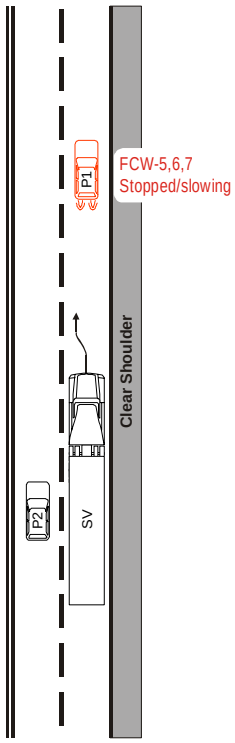
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3*	**FCW-7**	**LCM-0**		**FCW-7**	

Individual Sensor Conditions

FCW-7	LCM-1	LDW-L



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

* LCM-3 is the most appropriate warning, even though a turn signal is not activated, because the sensor data indicate that it is the same as an LCM-3 situation. It is unclear whether this sensor combination is even possible, given the definition of the L

ID # 122

ID#	Primary Crash Risk	Likely Resolution	Severity
122	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	Y	*Driver did not see slowing/slow P1 vehicle ahead and 1) the vehicle is drifting out of the lane or 2) the driver is currently changing lanes to avoid the P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic)*
Partially Alert:	Y	*Driver did not see or expect slowing/slow P1 vehicle ahead and is currently changing lanes to avoid the P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic)*
Fully Alert:	Y	*P1 vehicle slowed unexpectedly and the driver has determined that a conflict with P2 is the best option*

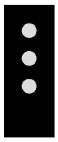
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep or has no concern for potential for P2 conflict
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
Assumes that SV going to right is not a viable option	**N?**

ID # 122a

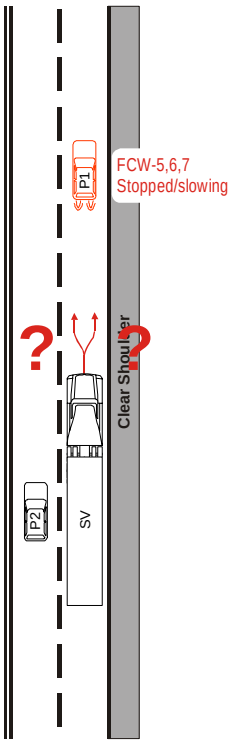
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-1	**FCW-7**	**LCM-0**		**FCW-7**	

Individual Sensor Conditions

FCW-7	LCM-1L	Unavail



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 122a

ID#	Primary Crash Risk	Likely Resolution	Severity
122a	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions*
Unalert:	Y	*Driver did not see slowing/slow P1 vehicle ahead*
Partially Alert:	Y	*Driver did not see slowing/slow P1 vehicle ahead, or P1 slowed unexpectedly*
Fully Alert:	N	*P1 vehicle slowed unexpectedly*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

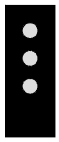
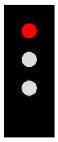
General Comments:
Note that there is no secondary conflict specified because the LCM system indicates that SV is staying in lane at this time

Exception
N

ID # 123

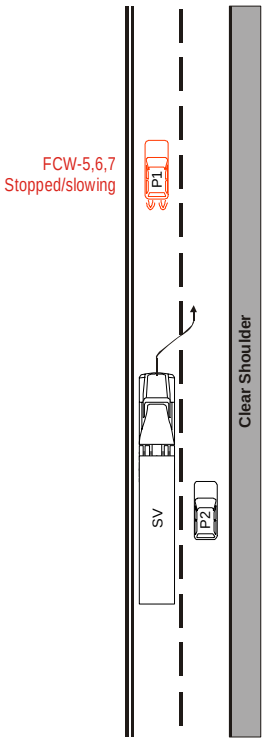
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-7**	**LCM-3**		**FCW-7**	

Individual Sensor Conditions

FCW-7	LCM-3R	LDW-R



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

ID # 123

ID#	Primary Crash Risk	Likely Resolution	Severity
123	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	Y	*Driver did not see slowing/slow P1 vehicle ahead and 1) the vehicle is drifting out of the lane or 2) the driver is currently changing lanes to avoid the P1 conflict (assumes that driver is unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict)*
Partially Alert:	Y	*Driver did not see or expect slowing/slow P1 vehicle ahead and is currently changing lanes to avoid the P1 conflict (assumes that driver is unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict)*
Fully Alert:	Y	*P1 vehicle slowed unexpectedly and the driver has determined that a conflict with P2 is the best option*

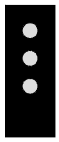
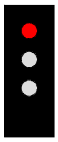
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
Assumption is that SV drivers will always try to avoid primary crash (as per test conditions). This assumption warrants validation based on expert judgment and/or kinematics	**N**

ID # 123a

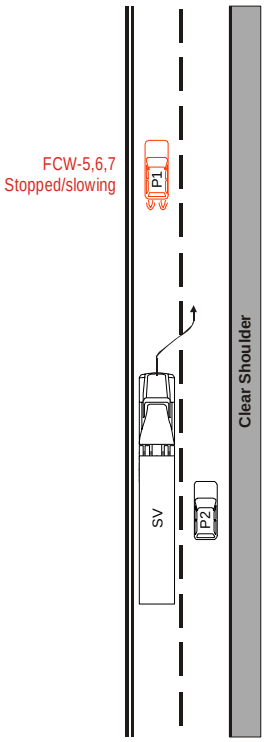
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**FCW-7**	**LCM-3**		**FCW-7†**	

Individual Sensor Conditions

FCW-7	LCM-3R	Unavail



Turn Signal

Off

Rules

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

† It is unclear if this permutation is possible with the LDW unavailable (can the LCM system still throw an LCM-3?)

ID # 123a

ID#	Primary Crash Risk	Likely Resolution	Severity
123a	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	Y	*Driver did not see slowing/slow P1 vehicle ahead and 1) the vehicle is drifting out of the lane or 2) the driver is currently changing lanes to avoid the P1 conflict (assumes that driver is unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict)*
Partially Alert:	Y	*Driver did not see or expect slowing/slow P1 vehicle ahead and is currently changing lanes to avoid the P1 conflict (assumes that driver is unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict)*
Fully Alert:	Y	*P1 vehicle slowed unexpectedly and the driver has determined that a conflict with P2 is the best option*

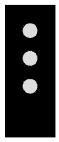
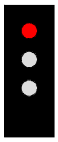
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
Assumption is that SV drivers will always try to avoid primary crash (as per test conditions). This assumption warrants validation based on expert judgment and/or kinematics	**N**

ID # 124

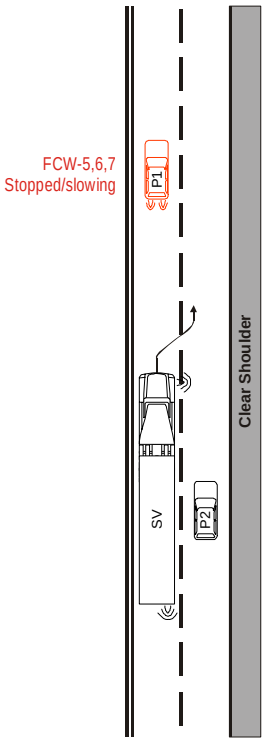
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	FCW-7	LCM-3		FCW-7	

Individual Sensor Conditions

FCW-7	LCM-3R	LDW-R



Turn Signal

Right

Rules

10 LDW is canceled if same-side turn signal is activated

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

ID # 124

ID#	Primary Crash Risk	Likely Resolution	Severity
124	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*1) Driver did not see or expect slowing/slow P1 and is changing lanes to avoid P1 conflict (assumes that driver is/was unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict).* *2) Driver may have previously attempted a lane change and did not see slowing/slow P1 vehicle because of this.**
Fully Alert:	Y	*P1 vehicle slowed unexpectedly; the driver has determined that a conflict with P2 is the best option, and is signaling his/her intensions to change lanes.*

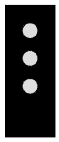
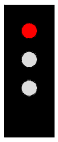
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
** In this case, the driver would already be aware of P2*	**N**

ID # 124a

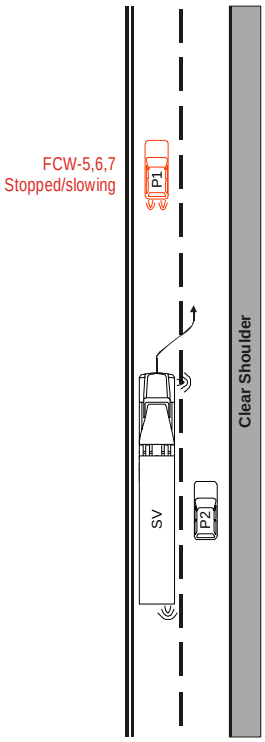
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	FCW-7	LCM-3		FCW-7	

Individual Sensor Conditions

FCW-7	LCM-3R	Unavail



Turn Signal

Right

Rules

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

ID # 124a

ID#	Primary Crash Risk	Likely Resolution	Severity
124	*Rear end conflict with P1*	*SV stops in time or exits lane (to right)*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*1) Driver did not see or expect slowing/slow P1 and is changing lanes to avoid P1 conflict (assumes that driver is/was unaware of P2 or that driver thinks that a potential P2 conflict is preferable to a P1 conflict).* *2) Driver may have previously attempted a lane change and did not see slowing/slow P1 vehicle because of this.**
Fully Alert:	Y	*P1 vehicle slowed unexpectedly; the driver has determined that a conflict with P2 is the best option, and is signaling his/her intensions to change lanes.*

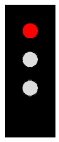
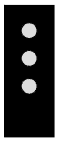
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 onto shoulder on right	*Restricted or unsafe shoulder*	*Med*	
SV runs P2 onto shoulder on right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move onto shoulder in time to avoid crash*	*High*	

General Comments:	Exception
** In this case, the driver would already be aware of P2*	**N**

ID # 125

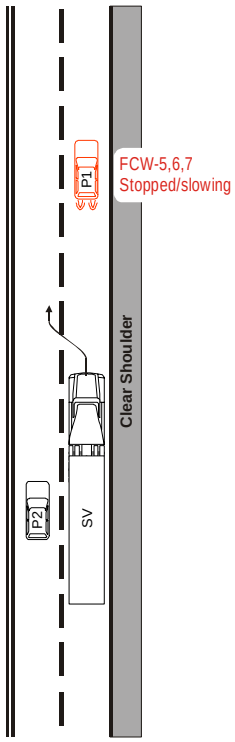
Conflict Source

DIU, AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-7**	**LCM-0**		**FCW-7**	

Individual Sensor Conditions

FCW-7	LCM-3L	LDW-L



Turn Signal

Off

Rules

3 Visual and auditory FCW-5, 6, & 7 override visual and auditory LDW

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

ID # 125

ID#	Primary Crash Risk	Likely Resolution	Severity
125	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	Y	*Driver did not see slowing/slow P1 vehicle ahead and 1) the vehicle is drifting out of the lane or 2) the driver is currently changing lanes to avoid the P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic)*
Partially Alert:	Y	*Driver did not see or expect slowing/slow P1 vehicle ahead and is currently changing lanes to avoid the P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic)*
Fully Alert:	Y	*P1 vehicle slowed unexpectedly and the driver has determined that a conflict with P2 is the best option*

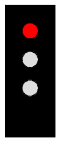
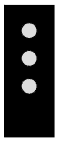
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep or has no concern for potential for P2 conflict
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
Assumes that SV going to right is not a viable option	**N?**

ID # **125a**

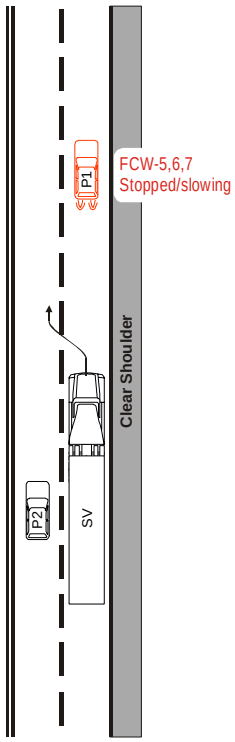
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-7**	**LCM-0**		**FCW-7†**	

Individual Sensor Conditions

FCW-7	LCM-3L	Unavail



Turn Signal

Off

Rules

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

† It is unclear if this permutation is possible with the LDW unavailable (can the LCM system still throw an LCM-3?)

ID # **125a**

ID#	Primary Crash Risk	Likely Resolution	Severity
125a	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is unresponsive to emerging conditions and the vehicle is drifting out of the lane*
Unalert:	Y	*Driver did not see slowing/slow P1 vehicle ahead and 1) the vehicle is drifting out of the lane or 2) the driver is currently changing lanes to avoid the P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic)*
Partially Alert:	Y	*Driver did not see or expect slowing/slow P1 vehicle ahead and is currently changing lanes to avoid the P1 conflict (assumes that driver decides that going to the left is the best option—e.g., no oncoming traffic)*
Fully Alert:	Y	*P1 vehicle slowed unexpectedly and the driver has determined that a conflict with P2 is the best option*

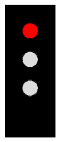
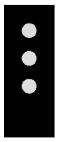
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep or has no concern for potential for P2 conflict
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
Assumes that SV going to right is not a viable option	**N?**

ID # 126

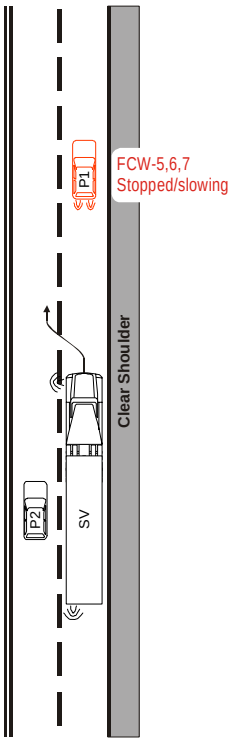
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-7**	**LCM-0**		**FCW-7**	

Individual Sensor Conditions

FCW-7	LCM-3L	LDW-L



Turn Signal

Left

Rules

10 LDW is canceled if same-side turn signal is activated

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

ID # 126

ID#	Primary Crash Risk	Likely Resolution	Severity
126	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*1) Driver did not see or expect slowing/slow P1 and is changing lanes to avoid P1 conflict (assumes that driver decides that going to the left is the safest option—e.g., no oncoming traffic).* *2) Driver may have previously attempted a lane change and did not see slowing/slow P1 vehicle because of this.**
Fully Alert:	Y	*P1 vehicle slowed unexpectedly; the driver has determined that a conflict with P2 is the best option, and is signaling his/her intensions to change lanes.*

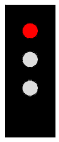
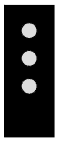
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep or has no concern for potential for P2 conflict
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
Assumes that SV going to right is not a viable option ** In this case, the driver would already be aware of P2*	**N?**

ID # 126a

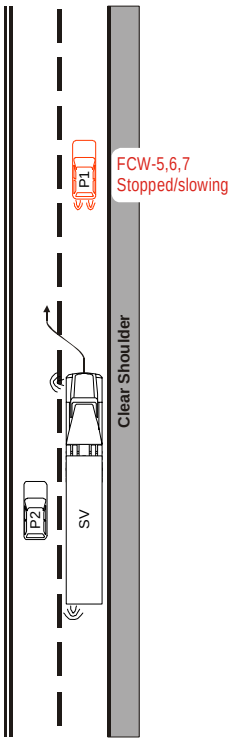
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**FCW-7**	**LCM-0**		**FCW-7**	

Individual Sensor Conditions

FCW-7	LCM-3L	Unavail



Turn Signal

Left

Rules

8 Auditory FCW-5, 6, & 7 override auditory LCM-2

Comments:

ID # 126a

ID#	Primary Crash Risk	Likely Resolution	Severity
126a	*Rear end conflict with P1*	*SV stops in time or exits lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
- The highest level warning prior to an FCW-7 is almost always and FCW-1 or FCW-2

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*1) Driver did not see or expect slowing/slow P1 and is changing lanes to avoid P1 conflict (assumes that driver decides that going to the left is the safest option—e.g., no oncoming traffic).* *2) Driver may have previously attempted a lane change and did not see slowing/slow P1 vehicle because of this.**
Fully Alert:	Y	*P1 vehicle slowed unexpectedly; the driver has determined that a conflict with P2 is the best option, and is signaling his/her intensions to change lanes.*

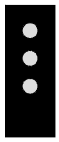
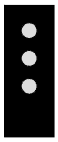
Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV runs P2 into oncoming traffic on left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep or has no concern for potential for P2 conflict
SV runs P2 onto shoulder on left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	
SV causes P2 to crash into SV	*P2 driver is unable to move out of the way in time to avoid crash*	*High*	

General Comments:	Exception
Assumes that SV going to right is not a viable option ** In this case, the driver would already be aware of P2*	**N?**

ID # 127

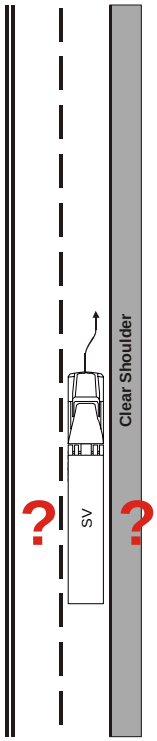
Conflict Source

DIU

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
None	**LCM-X2**	**None**		**LCM-X2**	

Individual Sensor Conditions

--	LCM-X2 R/L	LDW-R



Turn Signal

Off

Rules

2d Visual and auditory LCM-X2 overrides visual and auditory LDW-L/R

Comments:

ID # 127

ID#	Primary Crash Risk	Likely Resolution	Severity
127	*Potential conflict with undetected P2 on right*	*SV stays in current lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signal*
Fully Alert:	Y	*Driver is changing lanes without signal*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV Run-off-road to the right	*Restricted or unsafe shoulder*	*Med*	
SV Run-off-road to the right	*Hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	

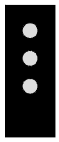
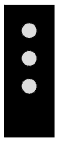
General Comments:
The manual response required to cancel the LCM-X2 may also encourage drivers to stay in their current lane

Exception
N

ID # 128

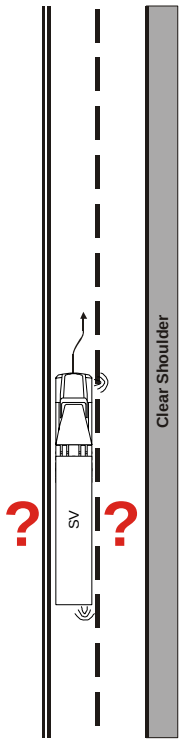
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
None	**LCM-X2**	**None**	**LCM-X2**		

Individual Sensor Conditions

--	LCM-X2 R/L	LDW-R



Turn Signal

Right

Rules

1 No overrides in specified “No Conflict” conditions

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 128

ID#	Primary Crash Risk	Likely Resolution	Severity
128	*Potential conflict with undetected P2 on right*	*SV stays in current lane*	*Med - High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes*
Fully Alert:	Y	*Driver is changing lanes*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

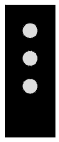
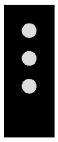
General Comments:
A Run-off-road event is discounted because turn signal activation would suggest that there is a viable lane to the right *The manual response required to cancel the LCM-X2 may also encourage drivers to stay in their current lane*

Exception
N

ID # 129

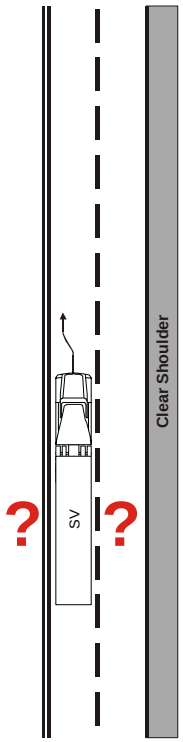
Conflict Source

DIU

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
None	**LCM-X2**	**None**	**LCM-X2**		

Individual Sensor Conditions

--	LCM-X2 R/L	LDW-L



Turn Signal

Off

Rules

2d Visual and auditory LCM-X2 overrides visual and auditory LDW-L/R

Comments:

ID # 129

ID#	Primary Crash Risk	Likely Resolution	Severity
129	*Potential conflict with undetected P2 on left (running them into oncoming traffic)*	*SV stays in current lane*	*High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signal*
Fully Alert:	Y	*Driver is changing lanes without signal*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
SV Run-off-road to the left	*Oncoming traffic to the left*	*High*	Unlikely unless driver is asleep or unalert
SV Run-off-road to the left	*Unsafe shoulder or hazards present on shoulder (e.g., stopped vehicles, barriers, etc)*	*Med - High*	

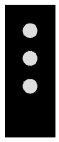
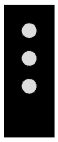
General Comments:
The manual response required to cancel the LCM-X2 may also encourage drivers to stay in their current lane *An alternative approach may be to simply present the warning that is the most effective in getting drivers to stay in their current lane, given that potential conflicts with oncoming traffic are possible with both LCs and LDs*

Exception
N?

ID # 130

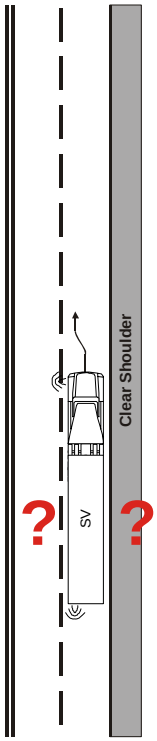
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
None	**LCM-X2**	**None**	**LCM-X2**		

Individual Sensor Conditions

--	LCM-X2 R/L	LDW-L



Turn Signal

Left

Rules

1 No overrides in specified “No Conflict” conditions

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 130

ID#	Primary Crash Risk	Likely Resolution	Severity
130	*Potential conflict with undetected P2 on left (running them into oncoming traffic)*	*SV stays in current lane*	*High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes*
Fully Alert:	Y	*Driver is changing lanes*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

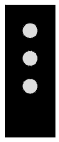
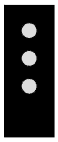
General Comments:
A Run-off-road event is discounted because turn signal activation would suggest that there is a viable lane to the right *The manual response required to cancel the LCM-X2 may also encourage drivers to stay in their current lane*

Exception
N

ID # 131

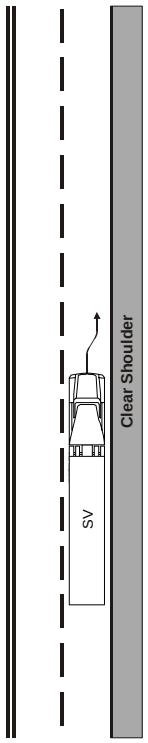
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**LDW-R**	**LCM-0**			**LDW-R**

Individual Sensor Conditions

--	LCM-0 R/L	LDW-R



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 131

ID#	Primary Crash Risk	Likely Resolution	Severity
131	*SV run off road*	*SV stays in current lane*	*Medium*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signal*
Fully Alert:	Y	*Driver is changing lanes without signal*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:

Exception
N

ID # 132

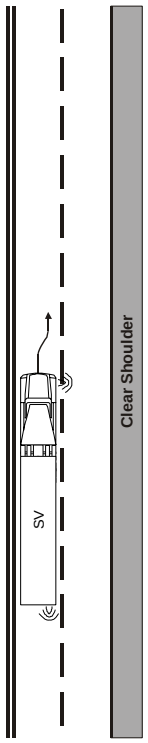
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
LCM-0	None	LCM-0	None		

Individual Sensor Conditions

--	LCM-0 R/L	LDW-R



Turn Signal

Right

Rules

1 No overrides in specified “No Conflict” conditions

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 132

ID#	Primary Crash Risk	Likely Resolution	Severity
132	*Minimal to none*		

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes*
Fully Alert:	Y	*Driver is changing lanes*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

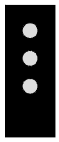
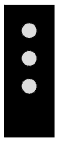
General Comments:

Exception
N

ID # 133

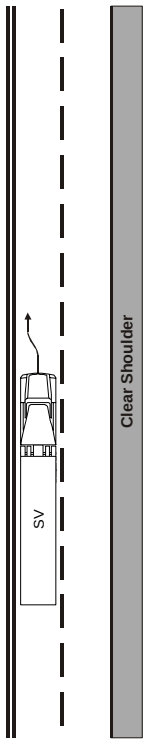
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**LDW-L**	**LCM-0**	**LDW-L**		

Individual Sensor Conditions

--	LCM-0 R/L	LDW-L



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 133

ID#	Primary Crash Risk	Likely Resolution	Severity
133	*SV runs off road into oncoming traffic*	*SV stays in current lane*	*High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signal*
Fully Alert:	Y	*Driver is changing lanes without signal*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

General Comments:

Exception
N

ID # 134

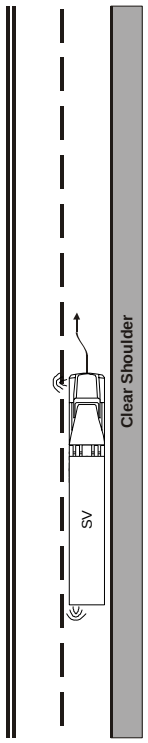
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
LCM-0	None	LCM-0	None		

Individual Sensor Conditions

--	LCM-0 R/L	LDW-L



Turn Signal

Left

Rules

1 No overrides in specified “No Conflict” conditions

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 134

ID#	Primary Crash Risk	Likely Resolution	Severity
134	*Minimal to none*		

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes*
Fully Alert:	Y	*Driver is changing lanes*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

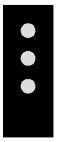
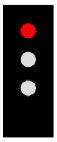
General Comments:

Exception
N

ID # 135

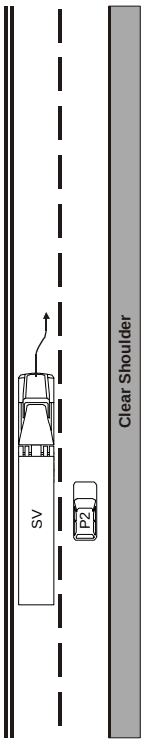
Conflict Source

AUD

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**None**	**LCM-3***			**LCM-3R***

Individual Sensor Conditions

--	LCM-1R	LDW-R



Turn Signal

Off

Rules

9 LCM-3 cancels LDW

Comments:

* LCM-3 is the most appropriate warning, even though a turn signal is not activated, because the sensor data indicate that it is the same as an LCM-3 situation. It is unclear whether this sensor combination is even possible, given the definition of the L

ID # 135

ID#	Primary Crash Risk	Likely Resolution	Severity
135	*Conflict with P2 (running P2 off road or crashing with P2)*	*SV stays in current lane*	*Med-High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

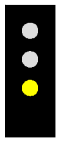
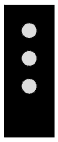
General Comments:
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV

Exception
N

ID # 136

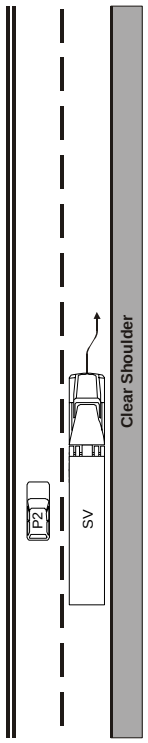
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-1	**LDW-R**	**LCM-0**			**LDW-R**

Individual Sensor Conditions

--	LCM-1L	LDW-R



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 136

ID#	Primary Crash Risk	Likely Resolution	Severity
136	*SV run off road*	*SV stays in current lane*	*Medium*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signal*
Fully Alert:	Y	*Driver is changing lanes without signal*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

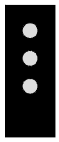
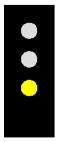
General Comments:

Exception
N

ID # 137

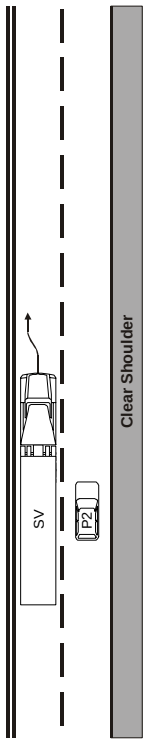
Conflict Source

None

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**LDW-L**	**LCM-1**	**LDW-L**		

Individual Sensor Conditions

--	LCM-1R	LDW-L



Turn Signal

Off

Rules

1 No overrides in specified “No Conflict” conditions

Comments:

ID # 137

ID#	Primary Crash Risk	Likely Resolution	Severity
137	*SV runs off road into oncoming traffic*	*SV stays in current lane*	*High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signal*
Fully Alert:	Y	*Driver is changing lanes without signal*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments

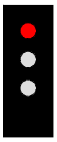
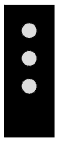
General Comments:

Exception
N

ID # 138

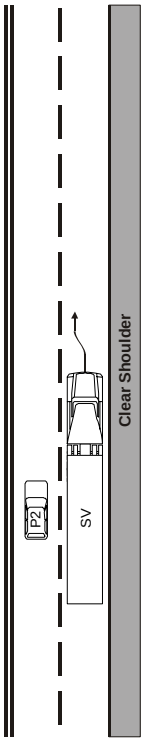
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3*	**None**	**LCM-0**	**LCM-3L***		

Individual Sensor Conditions

--	LCM-1L	LDW-L



Turn Signal

Off

Rules

9 LCM-3 cancels LDW

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

* LCM-3 is the most appropriate warning, even though a turn signal is not activated, because the sensor data indicate that it is the same as an LCM-3 situation. It is unclear whether this sensor combination is even possible, given the definition of the L

ID # 138

ID#	Primary Crash Risk	Likely Resolution	Severity
138	*Conflict with P2 (running P2 into oncoming traffic, off the road, or crashing with P2)*	*SV stays in current lane*	*High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

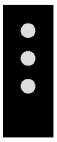
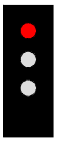
General Comments:
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV

Exception
N

ID # 139

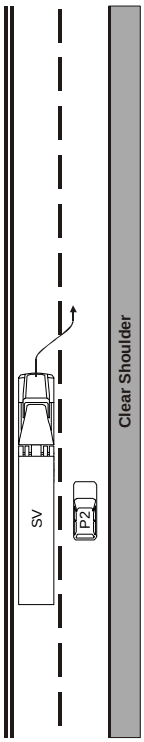
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**None**	**LCM-3**			**LCM-3R**

Individual Sensor Conditions

--	LCM-3R	LDW-R



Turn Signal

Off

Rules

9 LCM-3 cancels LDW

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 139

ID#	Primary Crash Risk	Likely Resolution	Severity
139	*Conflict with P2 (running P2 off road or crashing with P2)*	*SV stays in current lane*	*Med-High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

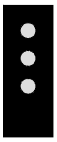
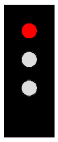
General Comments:
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV

Exception
N

ID # 140

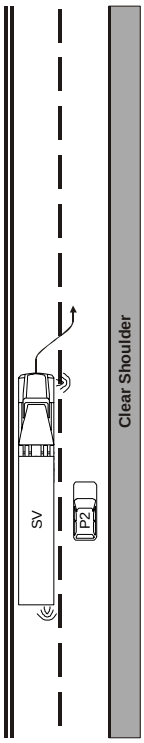
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-0	**None**	**LCM-3**			**LCM-3R**

Individual Sensor Conditions

--	LCM-3R	LDW-R



Turn Signal

Right

Rules

9 LCM-3 cancels LDW

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 140

ID#	Primary Crash Risk	Likely Resolution	Severity
140	*Conflict with P2 (running P2 off road or crashing with P2)*	*SV stays in current lane*	*Med-High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

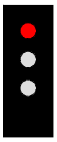
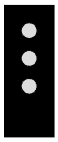
General Comments:
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV

Exception
N

ID # 141

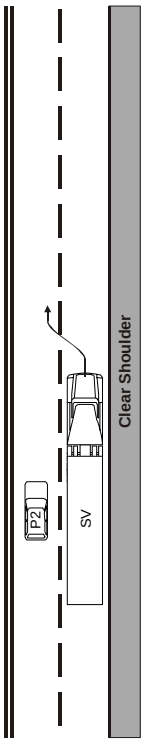
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**None**	**LCM-0**	**LCM-3L**		

Individual Sensor Conditions

--	LCM-3L	LDW-L



Turn Signal

Off

Rules

9 LCM-3 cancels LDW

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # **141**

ID#	Primary Crash Risk	Likely Resolution	Severity
141	*Conflict with P2 (running P2 into oncoming traffic, off the road, or crashing with P2)*	*SV stays in current lane*	*High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	Y	*Driver is drifting out of lane*
Unalert:	Y	*Driver is drifting out of lane*
Partially Alert:	Y	*Driver is changing lanes without signaling and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

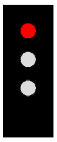
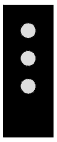
General Comments:
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV

Exception
N

ID # 142

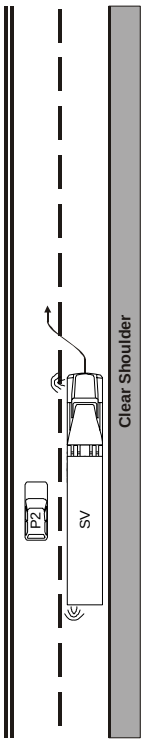
Conflict Source

None^

Left-SSD	DIU	Right-SSD	Left-Auditory	Center-Auditory	Right-Auditory
					
LCM-3	**None**	**LCM-0**	**LCM-3L**		

Individual Sensor Conditions

--	LCM-3L	LDW-L



Turn Signal

Left

Rules

9 LCM-3 cancels LDW

10 LDW is canceled if same-side turn signal is activated

Comments:

^This is not a conflict situation because the LDW that would also share the DIU is suppressed by the turn signal activation.

ID # 142

ID#	Primary Crash Risk	Likely Resolution	Severity
142	*Conflict with P2 (running P2 into oncoming traffic, off the road, or crashing with P2)*	*SV stays in current lane*	*High*

Notable Kinematic Conditions/Assumptions:
None

Can situation occur if driver is:		Situation Description
Asleep:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Unalert:	N	*It is assumed to be highly unlikely that drifting off road (asleep/ unalert) would concur with having a turn signal activated*
Partially Alert:	Y	*Driver is changing lanes and is unaware of P2*
Fully Alert:	N	*Alert driver would avoid conflict with P2*

Secondary Crash Possibilities	Secondary Crash Factors/elements	Severity	Comments
Minimal to none			

General Comments:	Exception
A run-off-road crash for the SV is discounted because the presence of P2 suggests that there is a viable lane adjacent to the SV	**N**