U.S. Department of Transportation
National Highway Traffic Safety Administration

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DOT HS 811 793 July 2013

Objective Tests for Forward-Looking Pedestrian Crash Avoidance/Mitigation Systems

Annual Report

CAMP
Crash Imminent Braking Consortium

Ford GM Continental DELPHI Mercedes-Benz

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Suggested APA Format Citation:

Carpenter, M. G., Feldmann, M., Moury, M. T., Skvarce, J. R., Struck, M., Zwicky T. D., & Kiger, S. M. (2013, July). *Objective tests for forward-looking pedestrian crash avoidance/mitigation systems: annual report*. (Report No. DOT HS 811 793). Washington, DC: National Highway Traffic Safety Administration.

Technical Report Documentation Page

1. Report No. DOT HS 811 793	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle Objective Tests for Forward-Looking Pedestrian Crash Avoidance/Mitigation Systems: Annual Report		5. Report Date July 2013 6. Performing Organization Code
7. Authors Michael G. Carpenter, Michael Feldmann, M. Todd Moury, Jeffry R. Skvarce, Matthias Struck, Timothy D. Zwicky, and Steven M. Kiger		8. Performing Organization Report No.
9. Performing Organization Name and Address Crash Avoidance Metrics Partnership on behalf of the Crash Imminent Braking Consortium 27220 Haggerty Road, Suite D-1 Farmington Hills, MI 48331		10. Work Unit No. (TRAIS) 11. Contract or Grant No. DTNH22-05-H-01277
12. Sponsoring Agency Name and Address National Highway Traffic Safety Administration 1200 New Jersey Avenue SE. Washington, DC 20590		13. Type of Report and Period Covered Annual Report May 9, 2011 through April 30, 2012 14. Sponsoring Agency Code
15. Supplementary Notes		

16. Abstract

This report summarizes the first year of activities for the Objective Tests for Forward Looking Pedestrian Crash Avoidance/Mitigation (PCAM) Systems Project. The principal activities described in the report include the definition of pedestrian crash scenarios, identification of requirements for test equipment and pedestrian mannequins, and test equipment fabrication. Coordination activities with other PCAM-related programs in the European Union are also summarized in the report. The project was initiated in May 2011 and is scheduled to conclude in June 2013.

17. Key Word Pedestrian Safety, Crash Avoidance, Crash Mitigation, Active Safety Systems, Active Braking, Objective Test Methods, Pedestrian Mannequin	18. Distribution Statement Document is available to the public from the National Technical Information Service www.ntis.gov

19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 25	22. Price

Form DOT F 1700.7 (8-72) Reproduction of completed page authorize

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List of Acronyms

BASt	Federal Highway Research Institute of the Republic of Germany (Bundesanstalt für Straßenwesen)
CAMP	Crash Avoidance Metrics Partnership
CIB	crash-imminent braking
DBS	dynamic brake support
DGPS	differential global positioning system
DOT	Department of Transportation
FARS	Fatality Analysis Reporting System
FYL	functional years lost
GES	General Estimates System
GHz	gigahertz
NASS	National Automotive Sampling System
LIDAR	light detection and ranging
NHTSA	National Highway Traffic Safety Administration
PCAM	Pedestrian Crash Avoidance/Mitigation
ROAD	Real-World Operational Assessment Data
TMT	technical management team
vFSS	Advanced Forward-Looking Safety Systems (Project)
VRTC	Vehicle Research and Test Center

1 Introduction

This document presents the First Annual Report for the Forward Looking Pedestrian Crash Avoidance/Mitigation Systems Project. The period covered by the report is from project inception on May 9, 2011, through April 30, 2012.

The goal of the PCAM Project is to develop and validate minimum performance requirements and objective test procedures for forward-looking PCAM systems intended to address in-traffic, pedestrian crash scenarios. Two categories of test procedures were developed to evaluate the intended performance of PCAM systems. Functional tests evaluate the intended performance of PCAM systems, that is, whether a PCAM system correctly activates when system activation is warranted. Operational tests assess the propensity of a PCAM system to trigger false (unintentional) activations where no system activation is desired. Minimum performance requirements for both types of tests will be developed for PCAM systems.

The project is being conducted by the Crash Avoidance Metrics PartnershipCrash Imminent Braking Consortium, which consists of Continental, Delphi Corporation, Ford Motor Company, General Motors and Mercedes-Benz. The project is sponsored by the National Highway Traffic Safety Administration through NHTSA Cooperative Agreement No. DTNH22 05 H 01277, Work Order No. 0006. The PCAM Project is scheduled to run 26 months through June 2013.

2 Summary of Activities and Accomplishments

2.1 Project Management (Task 1)

Task 1 is the project management task that runs throughout the project. During the first year of the project, the principal investigator managed all the technical activities involving the five project participants under the PCAM Project. These activities focused mainly on project start-up activities and the activities within Tasks 2 through 4. Weekly meetings were held by the technical management team to coordinate and ensure timely work progress was being achieved.

2.2 Define Pedestrian Crash Scenarios and Pedestrian Target Requirements for Testing (Task 2)

Task 2 was initiated at project inception and completed in July 2011. Task 2 included four subtasks:

- Define pedestrian crash scenarios (led by the Volpe National Transportation Systems Center);
- Examine pedestrian scenarios observed in the data acquired during the CIB Real-world Operational Assessment Data Trip;

- Review pedestrian detection sensors and active braking technologies (including a milestone review for the PCAM TMT and NHTSA to jointly agree on candidate technologies for study); and
- Define preliminary target (i.e., pedestrian mannequin) characteristics.

The initial work in Task 2 concentrated on examining the available national pedestrian crash data and the associated pre-crash parameters. The focus for this analysis was on those pedestrian crashes for which active safety PCAM systems could potentially provide safety benefits and finding those crash conditions which could be used in developing the representative test scenarios used in the project. This ensured that the PCAM Project test scenarios and related parameters are applicable to real-world pedestrian crashes and are capable of assessing the relative performance of assorted PCAM systems. For the purpose of this project, pedestrian crash scenario ranking was based on an estimate of the functional years lost associated with the pre-crash scenarios developed from the National Automotive Sampling System General Estimates Systemcrash database. FYL was developed to attempt to aggregate years of life lost for fatalities and the years of functional capacity lost from nonfatal injuries (Miller et al., 1991).

The pedestrian crash scenario analysis was completed by Volpe on July 14, 2011. Volpe's crash data analysis was supplemented by a review of pedestrian observations recorded in the CIB ROAD Trip. The CIB ROAD Trip was a data collection effort conducted as part of the previously completed CAMP CIB Project (Carpenter et al., 2011a). In this effort, two CIB Project vehicles equipped with video cameras, GPS instrumentation, CIB sensors and data acquisition systems were driven throughout the United States during a six-week period from July 24 through September 3, 2009. Although the original purpose of this effort was to acquire data for use in developing test methods for CIB systems, it was noted that the pedestrian encounters contained in this data could provide quantifiable details associated with pedestrian and driver actions that do not exist in the GES crash data. Such information could be helpful in defining representative test methods for the PCAM functional scenarios.

Volpe's analysis of the 2005–2009 GES crash database estimated that approximately 300,000 pedestrian crashes are contained within 67 pre-crash scenarios defined for the PCAM Project (excluding any cases classified as "vehicle/pedestrian no action," "other action," or "unknown action"). An analysis of the Fatality Analysis Reporting System data was also conducted in a similar manner. Since FARS contains limited vehicle-pedestrian maneuver information, FARS proved to be of restricted utility in determining critical parameters for representative test crash scenarios (e.g., detailed pedestrian and/or driver actions immediately preceding the crash). Consequently, no further action was taken with this data. The remaining pre-crash scenarios were sorted by Volpe's estimate of FYL. Twenty of the 67 scenarios, containing an estimated 139,000 crashes, accounted for 98 percent of the FYL for all pedestrian crashes and 67 percent of the estimated pedestrian fatalities in GES. These 20 scenarios were then grouped into four sub-groups based on the pre-crash scenario characteristics. The scenarios described by these four sub-groups, illustrated in Figure 1, represent the candidate PCAM Project test scenarios and are the primary focus of the activities in the remainder of the project. A description of each sub-group is provided immediately following Figure 1. Note that the percentages shown for each scenario sub-group pertain to the sample of data associated with the 20 crash scenarios and not the complete sample drawn from the GES database.

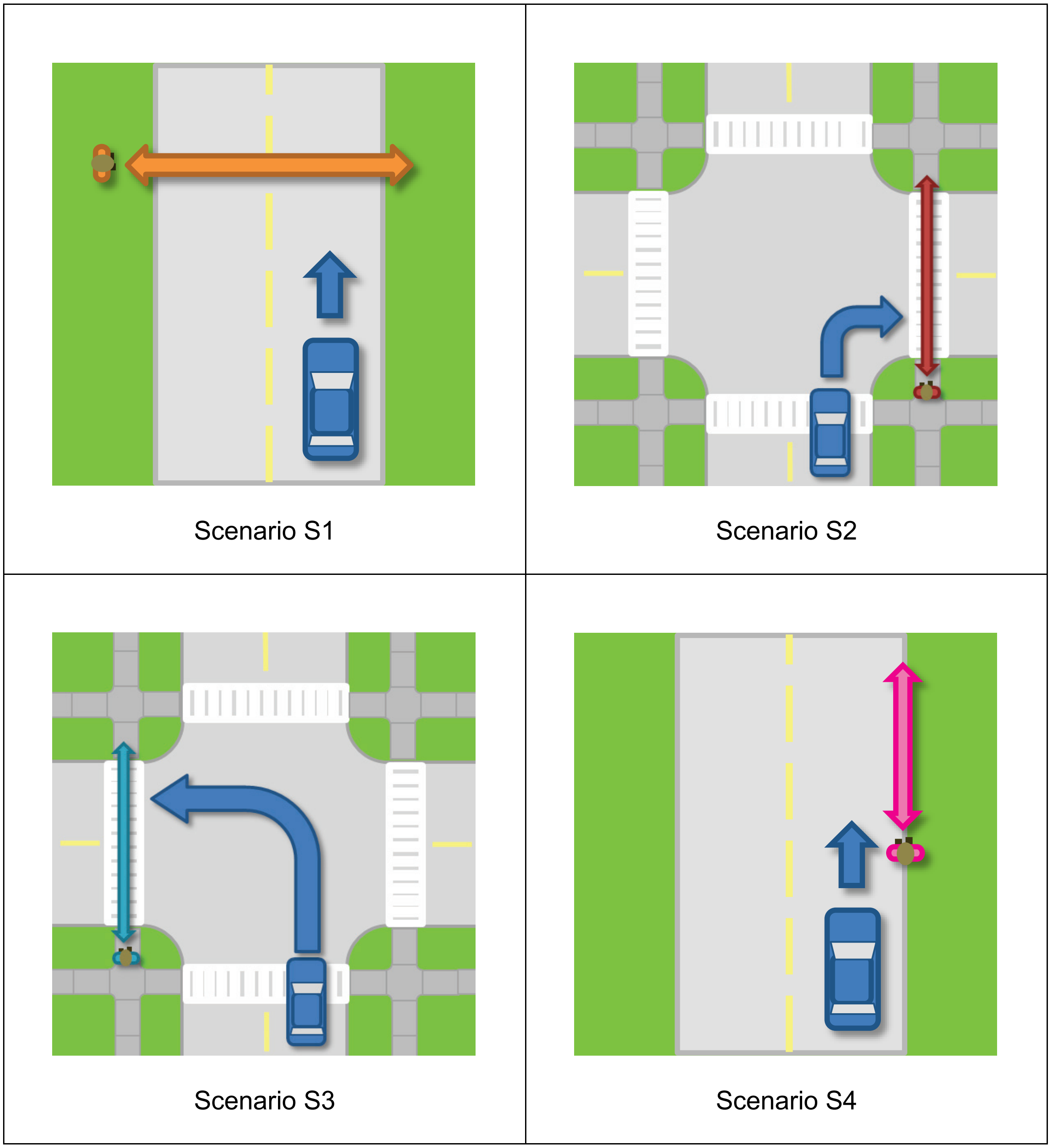


Figure 1: Illustration of Four Scenario Sub-Groups Identified

S1 - Vehicle traveling straight with pedestrian crossing perpendicular to the vehicle path from either the left or right side (87% of the estimated FYL and 88% of the estimated fatalities).

S2 - Vehicle turning right at an intersection with pedestrian crossing perpendicular to the turning vehicle's path from either the left or right side (less than 1% of the estimated FYL and less than 1% of the estimated fatalities).

S3 - Vehicle turning left at an intersection with pedestrian crossing perpendicular to the turning vehicle's path from either the left or right side (less than 2% of the estimated FYL and none of the estimated fatalities).

S4 - Vehicle traveling straight with pedestrian moving in line with the vehicle path either toward or away from the vehicle (approximately 11% of the estimated FYL and 12% of the estimated fatalities).

The final step in analyzing the above crash scenarios involved identifying the most frequently occurring specific roadway, environment, speed and other factors recorded for the crashes. CIB ROAD Trip information was again used to supplement the GES crash data by providing measureable details associated with driver and pedestrian actions. Table 1 contains an overview of the resulting conditions that were incorporated into the development of the preliminary test scenarios.

Table 1: Preliminary PCAM Test Parameters

Test Scenarios	Pedestrian Direction				Light Condition		Obstructions		Test Vehicle Speeds			Mannequin Speeds			PCAM Functions	
	Left	Right	Toward	Away	Day	Night	No	Yes	5 mph	10 mph	25 mph	0 mph	Walk	Dart	CIB	DBS
S1	X	X			X	X	X	X		X	X		X	X	X	X
S2	X	X			X		X		X				X		X	
S3	X	X			X		X		X				X		X	
S4			X	X	X	X	X			X	or 30	X	X		X	

Note: CIB = Crash-Imminent Braking — Crash-imminent braking refers to autonomous brake activation initiated by the PCAM system when a potential pedestrian crash is likely and the driver has not responded

DBS = Dynamic Brake Support — Dynamic brake support refers to supplemental brake activation initiated by the PCAM system when a potential pedestrian crash is likely and the driver has initiated insufficient brake pedal input to avoid the crash.

Once the preliminary pedestrian crash scenarios for the project were defined and rank-ordered by FYL, the PCAM TMT compared the expected capabilities of the pedestrian sensors and active braking technologies included in the project test vehicles to these test scenarios and parameters. The project assumes the use of existing PCAM test vehicles provided by the consortium participants. A milestone review was held via conference call on July 27, 2011, during which the PCAM TMT and NHTSA agreed that the technologies included in the selected vehicles met the objectives of the project. Table 2 shows the pedestrian sensing and PCAM braking-related technologies included on each vehicle.

Table 2: Descriptions of PCAM Project Test Vehicles

	Project Vehicle 1	Project Vehicle 2	Project Vehicle 3
Sensing	Fusion of Mid-/Long-Range Radar and Mono Vision Camera System	Fusion of Mid-/Long-Range Radar and Stereo Vision Camera System	Stereo Vision Camera System
PCAM Functions	Dynamic Brake Support Crash Imminent Braking	Dynamic Brake Support Crash Imminent Braking	Dynamic Brake Support Crash Imminent Braking

Table 3 compares the expected capabilities and limitations of these systems to the preliminary test scenarios. This table indicates the primary capabilities of the PCAM system technologies on the vehicles are directed towards scenarios S1 and S4. These two scenarios involve straight roadway conditions with pedestrians moving either across the road or longitudinally along the shoulder, respectively. Limited capabilities are expected from the vehicles for scenarios S2 and S3, both of which involve vehicles turning towards pedestrians crossing at an intersection. In these cases, the limitations are due to the restricted field of view of the PCAM system sensors. Other potential limiting factors for all preliminary scenarios include obstructed view of the pedestrian, lighting (night/day), vehicle speed, pedestrian speed, timing of vehicle turns, start of mannequin movement, lane width in both directions, and location of pedestrians.

Table 3: PCAM Test Vehicle Capabilities Versus Preliminary Crash Scenarios

	Scenario Sub-Group		
Vehicle	**S1**	**S2 and S3**	**S4**
Project Vehicle 1	Yes	Limited	Yes
Project Vehicle 2	Yes	Limited	Yes
Project Vehicle 3	Yes	Limited	Yes

The remaining subtask, “Define Preliminary Target Characteristics,” was completed in July 2011. A summary of the target (i.e., pedestrian mannequin) characteristics developed for the project is presented in Section 2.3.2. The results of Task 2 were presented to representatives from NHTSA and the Volpe Center in a milestone review on July 27, 2011 which summarized the pedestrian crash data analysis work. NHTSA later confirmed agreement with the Task 2 results characterization.

2.3 Initially Develop Test Apparatus, Pedestrian Mannequin Targets and Preliminary Test Plans (Task 3)

This project required the development and construction of pedestrian mannequins, as well as an apparatus to support and move the mannequins in a repeatable manner. This work was the focus of the activities conducted in Task 3.

While initial test apparatus and mannequin designs were conceived in parallel with Task 2, the majority of Task 3 work initiated on July 13, 2011 with a two-day meeting at VRTC. This meeting provided opportunities for an initial contact with the project's test apparatus and mannequin supplier, preliminary apparatus and mannequin design concept development, and an evaluate review of test track options (including a discussion of test track capabilities and potential facility limitations). In addition to these topics, the TMT met with NHTSA VRTC to resolve some open topics regarding the selection of vehicles needed for the project baseline testing.

2.3.1 Baseline Test Vehicle Selection

The NHTSA VRTC is responsible for procuring the vehicles or systems required for baseline testing. To support NHTSA, five candidate vehicles were recommended by the PCAM TMT in the event that some vehicles might not be available at the time of testing. Priority was given to production-representative vehicles, followed by consideration for vehicles from companies involved in the Federal Highway Research Institute of the Republic of Germany projects in order to help promote the cooperative work between NHTSA and BASt.

The recommended vehicles include the following:

- A current production vehicle available in the United States with pedestrian detection and full auto braking capability. Full auto braking refers to a CIB system that can autonomously request maximum braking levels in response to a potential pedestrian threat. Information available from the manufacturer indicated the system includes LIDAR, radar, and vision sensors (i.e., cameras) and can avoid impacts with pedestrians at speeds up to 22 mph in daylight.
- A pre-production, U.S.-specification vehicle which has been retrofitted by the manufacturer with a stereo-vision-camera-based active safety system that is currently in production in Japan and planned for introduction in other markets in 2012. The braking capabilities of this vehicle were not available to the PCAM Project.

In addition, three other organizations expressed an interest in participating in the baseline testing. The PCAM TMT recommended to NHTSA that they continue discussions with these organizations to determine whether some of these vehicles could be accommodated in the test plans. The specific features of each system were not available at this time. It should also be noted, however, that two of the three organizations who expressed interest in participating in the baseline tests are also part of the BASt's projects in Europe.

2.3.2 Test Facility Review and Apparatus Concept Development

Discussions with the test equipment supplier were initiated and began with a review of the candidate test scenarios (identified in Task 2) and the various test parameters that needed to be considered in developing the test equipment and mannequins. Potential test track facilities were then reviewed to familiarize the supplier with the available test space and discuss capabilities and limitations of these test track options. Preliminary concepts were then reviewed and discussed. Three apparatus concepts were identified, including two overhead gantry-style designs and one sled arrangement for moving the test mannequins. The PCAM Project timing and the supplier's project plan were then reviewed to ensure all parties were aware of project timing needs.

The next steps identified from this meeting included delivery of concept sketches and comparative cost/benefits for the three concepts by the supplier, as well as a schedule of weekly design reviews between the PCAM TMT, NHTSA VRTC and the test equipment supplier.

Requirements for the PCAM test apparatus and pedestrian mannequins were completed in July 2011. Designs were also finalized for this equipment and a purchase order was issued to an equipment supplier for fabrication of the equipment and mannequins.

The following points summarize the requirements developed for the pedestrian mannequins:

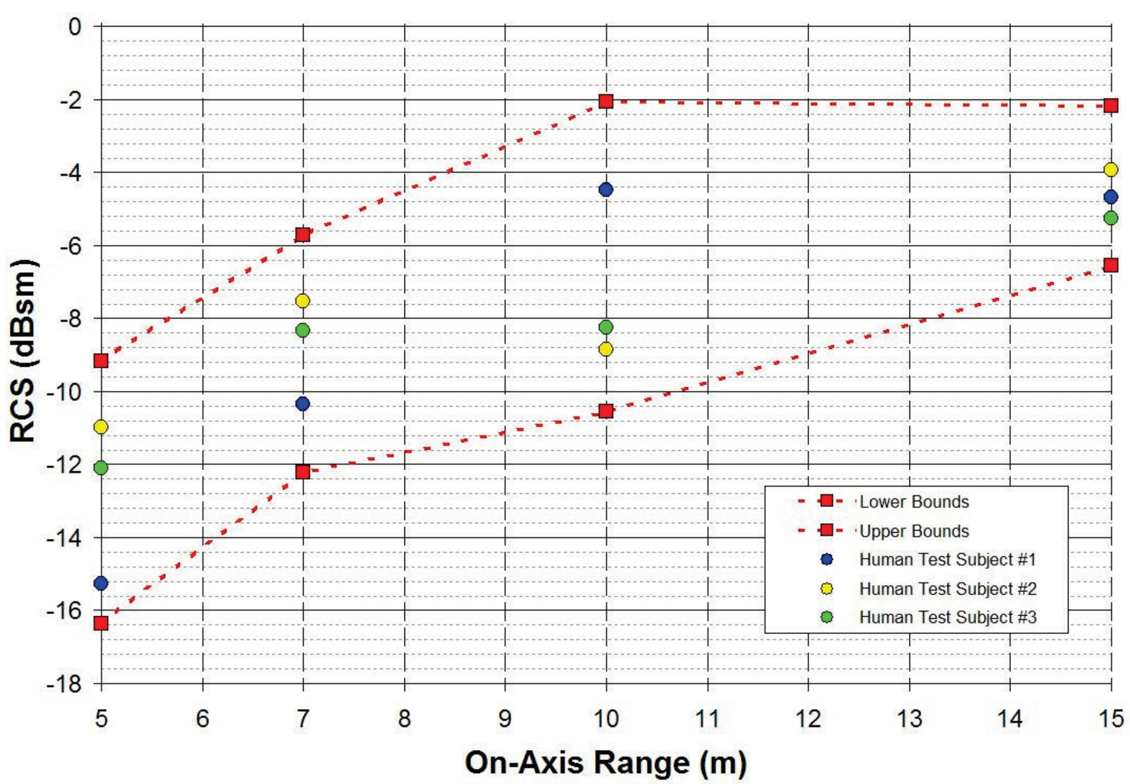
- Mannequins must be "strikeable" to maintain target presence up to point of impact with the test vehicle. The mannequins must remain functional and not damage test vehicles after impacts up to 60 km/h (about 37 mph). To enable these capabilities, the mannequin mass must be less than 25 lbs. using low-density, soft construction with no hard points of contact. A quick test reset time (less than 5 minutes) is also required after the mannequin is struck. Test mannequins must be functional in an outdoor test environment.
- Two mannequin sizes were selected. All PCAM test method development will be conducted using a mannequin representative of a 50th percentile adult male. A smaller mannequin representative of an 8-year-old child will be used for demonstration purposes only. At time of award, the project scope was limited to the development of a 50th percentile adult male mannequin based on existing sensor response data for that sized pedestrian. In addition, limited testing with one child mannequin will be included to demonstrate that the test methods and equipment are adaptable to other mannequin sizes. However, no sensor response data from actual child sized pedestrians is available to fully develop this mannequin. The same is true for other mannequin sizes such as the 5th percentile female or 95th percentile male. Additional research by NHTSA would be needed if other pedestrian mannequin sizes are desired.
- Mannequins must be physically representative of a 3-D human. The mannequins shall include a head, a torso, two arms and two legs, be easily clothed with appropriate clothing for the mannequin size, and should allow a wig and/or hat to be affixed to the head. The surface of the mannequin should

not be highly reflective or shiny and neutral in color. General mannequin dimensions are presented in Table 4.

Table 4: Selected PCAM Mannequin Measurements

Characteristic	50th Percentile Adult Male	8-Year-Old Male Child
Height	65-70 inches	50.5 inches
Chest	36 inches	25 inches
Waist	31 inches	26 inches
Hips	36 inches	30.5 inches

- Test mannequins should have appropriate PCAM sensor response characteristics for the technologies included in this project. Radar response characteristics for the 50 percent adult mannequin are based on human data documented in Volume 2 of the CIB Final Report (Carpenter et al., 2011b). Figure 2 contains an example of actual radar response data for an adult human along with acceptance limits for the adult mannequin based on a 76/77 GHz radar sensor.



Note: Data based on a 76/77 GHz radar

Figure 2: Example Radar Reflectivity Acceptance Limits for Adult Mannequin in Backward Orientation

The general requirements developed for the test apparatus include the following items:

- The equipment must be functional in an outdoor test environment, utilize strikeable mannequins, and must allow set-up and removal of the equipment from test site.
- The apparatus design should prevent interference with vehicle sensors. Techniques such as visual camouflaging of the apparatus, using components which direct radar returns away from the test vehicle, and using radar absorbing foams covering exposed apparatus components may be needed, depending on the specific design features of the test equipment and its proximity to the roadway during use. Testing may be required to establish the need to apply treatments to the test apparatus.
- The test apparatus motion must accommodate the pedestrian crash scenario movements defined for the project, including lateral and longitudinal mannequin movement to represent pedestrians perpendicularly crossing the vehicles path and pedestrians walking in-line (i.e., parallel) with the vehicle path, respectively.

In addition to the above general requirements, the test apparatus must also provide a minimum envelope of 40 feet of linear mannequin movement with a minimum vertical clearance of 14 feet. The equipment will be suspended over the roadway from a pair of equipment lifts positioned to allow adequate clearance from the travel lanes. This provides flexibility for testing the expected scenarios without requiring a permanent support structure. The apparatus must also incorporate the mannequin position ground truth system which is capable of reporting the mannequin absolute and relative positions to 2 cm and 3 cm, respectively. The test apparatus should also enable the mannequin “shoe sole” to remain within 1 inch of the road surface and control mannequin movement in the presence of wind up to 15 mph from any direction. The test apparatus movement control will utilize a 48-volt DC motor integrated into a drive and control system which is capable of storing and executing at least 32 separate mannequin motion profiles and receiving a “trigger” command (i.e., a start command) which initiates execution of one of the stored motion profiles. The trigger message will be sent to the apparatus control system by the test vehicle based on the output from the onboard differential global positioning system. The movement control will also incorporate safety interfaces such as limit switches and manual stop switches that limit the range of motion, requested velocity/acceleration, etc.

Fabrication of the test apparatus and mannequins started in October 2011. The supplier delivered the test equipment in December 2011, thus, completing the activities in Task 3. Figures 3, 4 and 5, illustrate the pedestrian mannequins and test apparatus developed for the project.

Figure 3: Illustrations of Pedestrian Mannequins: Adult Mannequin (Left and Center Photos) and 8-Year-Old Child Mannequin (Right Photo)

Figure 4: Adult Mannequin in Test Configuration

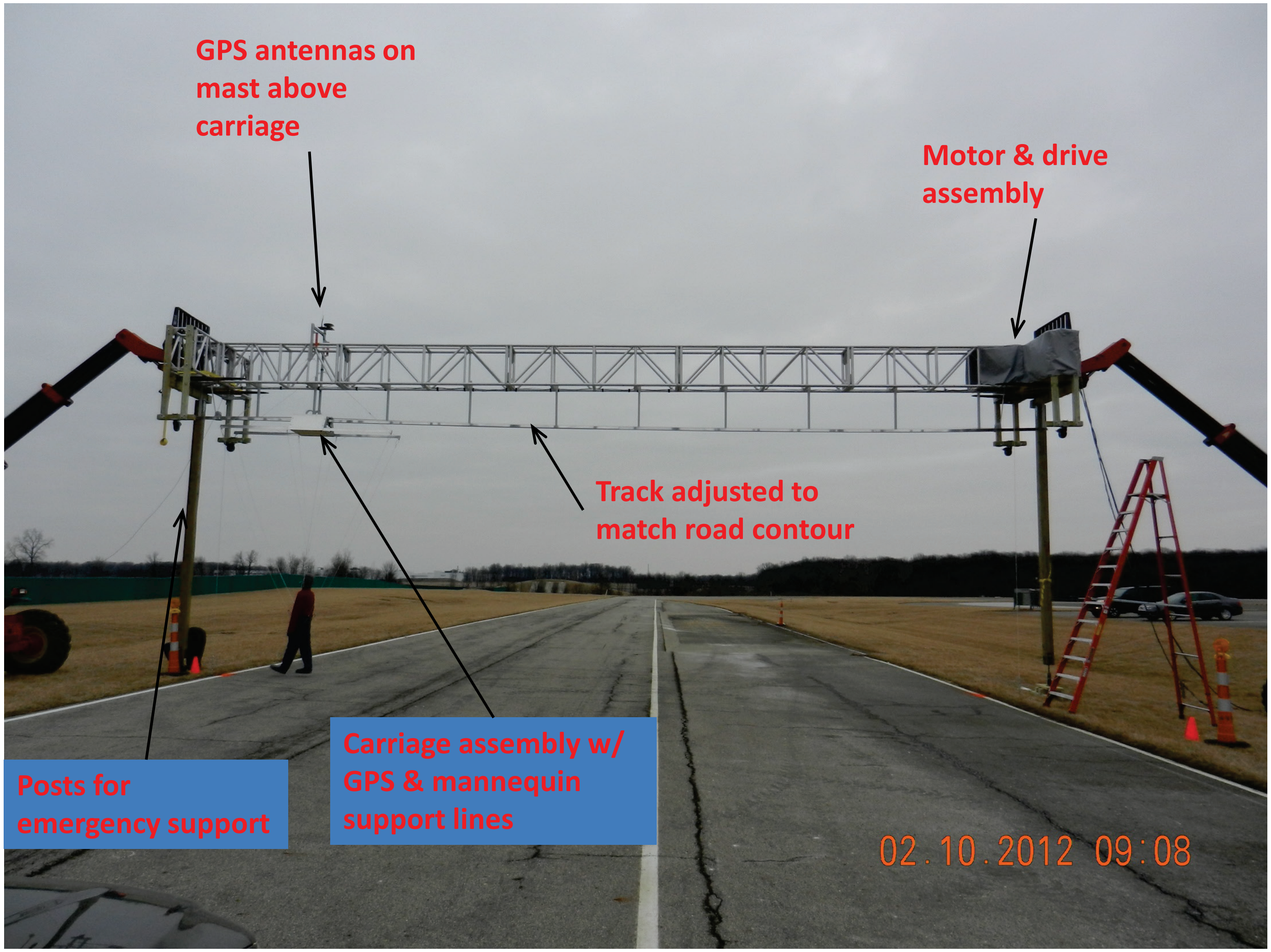


Figure 5: Illustration of Test Apparatus at Test Site

2.4 Evaluate Objective Test Methods (Task 4)

The goals of Task 4 are to develop objective test procedures and evaluate their capability of differentiating the relative performance of the selected PCAM systems. These test procedures will assess both functional performance for desired activations as well as false positive/negative tests for operational scenarios. The test procedures will be revised during the execution of Task 4 in response to the collected data and information obtained during data analysis. To support this effort, three testing phases will be conducted during Task 4. These are:

- Baseline Testing – These tests were conducted from February to April 2012 on a closed test track to initially develop and refine the test methods and test equipment.
- PCAM ROAD Trip – This data collection effort will obtain data regarding real-world pedestrian encounters on public roadways that will be used to develop the *operational* tests in the PCAM testing methodology. The operational tests will assess the propensity of a PCAM system to trigger false (unintentional) activations where no system activation is desired. The data needed to formulate the operational test scenarios will be collected using project vehicles equipped with pedestrian sensors and data recording systems. The PCAM ROAD Trip will be conducted from May to August 2012 during the second year of project execution. This activity is distinct from the CIB ROAD Trip data analysis (discussed in Section 2.2). The CIB ROAD Trip was conducted during the previous CAMP CIB Project and was found to contain pedestrian observational data that was not available in the U.S. crash databases. These details were obtained through analysis done during the PCAM Project and used to aid in preparation of *functional* test scenarios prior to the baseline testing.
- Validation Testing – These final tests will be conducted on a closed test track and will verify the suitability of the test methods and test equipment for assessing PCAM system performance. This work is planned for the period September to November 2012, during the second year of the project.

Task 4 was initiated in July 2011. Efforts in Task 4 during the first year of project execution focused primarily on the following activities:

- Evaluation of the test apparatus and pedestrian mannequins constructed in Task 3, and programming of the baseline testing mannequin motion profiles into the apparatus control system;
- Planning for and execution of the baseline tests (completed in April 2012); and
- Preparation of the project test vehicles for the PCAM ROAD Trip and validation testing that will be conducted later this year.

2.4.1 Evaluation of Test Equipment and Mannequins

To evaluate the test apparatus prior to baseline testing, the TMT temporarily assembled the structure at CAMP's facility in Farmington Hills, Michigan. This allowed assessments of the test apparatus structure, assembly and disassembly procedures and tools, drive system operations, and control algorithms. Minor software updates needed were identified and communicated to the control system supplier to improve the graphical user interfaces, test profile definitions, and system braking control. These updates were made remotely by the supplier via a direct internet connection to the system control panel using the CAMP computer network. Hardware modifications were also identified and implemented by the TMT. These included modifications to improve the system's brake performance and changes to improve the alignment of the drive belt at the belt tensioner. All changes were subsequently communicated to the apparatus supplier and were incorporated in updated system design documentation. Lastly, within the baseline testing, preliminary mannequin motion profiles were created for each of the four pedestrian crash scenarios illustrated in Figure 1.

2.4.2 Planning for and Execution of Baseline Tests

Once the pedestrian profiles were created, a preliminary baseline test matrix was developed jointly by the PCAM TMT and the NHTSA VRTC personnel. This matrix included all of the initial test parameters identified earlier in Table 1, as well as additional tests based on the proposed test methods in the European research project on Advanced Forward-Looking Safety Systems. The matrix included all four test scenarios (S1 to S4) with the mannequin moving in either possible direction for each scenario. Other test condition parameters that were manipulated include daytime versus nighttime tests, obstructed and unobstructed pedestrians, test vehicle and mannequin speeds, and CIB versus dynamic brake support system functionality. Test conditions that were varied within the S1 to S4 test scenarios were chosen based on whether a particular parameter (e.g., day versus night) was shown to have significant effects in that scenario during the crash data analysis in Task 2. All of the selected test combinations were conducted using the 50th percentile adult mannequin. Selected test combinations were also conducted using the child mannequin solely for the purpose of demonstrating that the test method and equipment are adaptable to different (smaller) sized mannequins. Data analysis for this test phase will extend into the second year of the project. In addition, test method and equipment refinements will be undertaken to improve test repeatability, mannequin characterization, test setup consistency and other factors to reduce the sources of unwanted variation in the tests. The most significant of the issues identified during baseline testing were related to the variability of mannequin travel speed and position during a test run resulting from factors such as:

- Propulsion system speed variability;
- Equipment triggering timing; and
- Mounting and attachment of the mannequin to the overhead trolley, especially as it relates to stability in windy conditions.

2.4.3 Preparation of Project Test Vehicles

The remaining activities conducted within Task 4 during the first year of the project featured preparation of the PCAM project test vehicles. These vehicles will be used for the PCAM ROAD Trip and validation test phases both of which are scheduled for later in the project. The vehicle preparation work started in July 2011. Each vehicle is currently undergoing sensing and algorithm updates to address the needs of the PCAM project. Following the updates, final system verification tests will be conducted by the participating companies before delivering the vehicles to the PCAM Project in May 2012.

2.5 Provide Support for NHTSA's Benefits Estimation Activities (Task 5)

It is the responsibility of NHTSA to determine a methodology to estimate the potential safety benefits of PCAM systems. In Task 5, the PCAM Project will provide testing data requested by NHTSA to support their benefits estimation activity. During the first year of the project, there were no significant activities in this task. The activities in Task 5 are expected to start during the second year of the project as the data collection work (described in the Task 4 summary) nears completion.

2.6 Coordinate Globally With Related PCAM Activities (Task 6)

During the course of the project, NHTSA has indicated a desire to harmonize, if possible, test methods for CIB and PCAM systems between the United States and Europe. In April 2010 and prior to the start of the PCAM Project, NHTSA executed a Memorandum of Cooperation with BASt which outlined a framework for conducting the harmonization activities. In Task 6, the PCAM Project, guided by the NHTSA framework, will hold a series of working meetings to discuss harmonization of the pedestrian crash scenarios of interest and the test methods to assess system performance within these scenarios. In this context, the term test methods should be understood to include testing, such as the features of the test apparatus, pedestrian mannequin target characteristics, candidate sensing technologies, required data and the test procedures used for evaluating system performance. NHTSA has the primary and lead role in organizing the coordination activities that will be conducted in this task.

NHTSA and BASt jointly organized and arranged the initial coordination meeting in Task 6. The meeting was held on November 10-11, 2011, in Cologne, Germany. Representatives from the PCAM participating companies attended the meeting and provided an overview of the project. During this meeting, the PCAM Project participants and representatives from the BASt-sponsored projects discussed and exchanged views on the pedestrian crash data analysis, additional data used to supplement the regional pedestrian crash data (such as the CIB ROAD Trip data), and proposed test scenarios and data collection activities.

A second coordination meeting was held at the NHTSA offices in Washington, DC, during the week of January 24, 2012. The objectives of this meeting were to further discuss pedestrian crash data analysis methods, proposed test plans, data acquisition methods, and potential benefits estimation methods.

A third coordination meeting has been proposed for September 2012 at the NHTSA VRTC in East Liberty, Ohio. This meeting would take place in the second year of the project, during the execution of the PCAM validation tests. This meeting is also expected to include a review and demonstration of the PCAM test equipment and methods developed.

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July 2013

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9700-071113-v3