U.S. Department of Transportation
Federal Highway Administration

May 27, 2020

1200 New Jersey Ave., SE
Washington, D.C. 20590

In Reply Refer To:
HSST-1/WZ-402

Mr. Felipe Almanza
TrafFix Devices Inc.
160 Avenida La Pata
San Clemente California 92673

Dear Mr. Almanza:

This letter is in response to your February 4, 2020 request for the Federal Highway Administration (FHWA) to review a roadside safety device, hardware, or system for eligibility for reimbursement under the Federal-aid highway program. This FHWA letter of eligibility is assigned FHWA control number WZ-402 and is valid until a subsequent letter is issued by FHWA that expressly references this device.

Decision

The following device is eligible within the length-of-need, with details provided in the form which is attached as an integral part of this letter:

- TrafFix High Impact Barricade

Scope of this Letter

To be found eligible for Federal-aid funding, new roadside safety devices should meet the crash test and evaluation criteria contained in the American Association of State Highway and Transportation Officials'(AASHTO) Manual for Assessing Safety Hardware (MASH). However, the FHWA, the Department of Transportation, and the United States Government do not regulate the manufacture of roadside safety devices. Eligibility for reimbursement under the Federal-aid highway program does not establish approval, certification or endorsement of the device for any particular purpose or use.

This letter is not a determination by the FHWA, the Department of Transportation, or the United States Government that a vehicle crash involving the device will result in any particular outcome, nor is it a guarantee of the in-service performance of this device. Proper manufacturing, installation, and maintenance are required in order for this device to function as tested.

This finding of eligibility is limited to the crashworthiness of the system and does not cover other structural features, nor conformity with the Manual on Uniform Traffic Control Devices.

Eligibility for Reimbursement

Based solely on a review of crash test results and certifications submitted by the manufacturer, and the crash test laboratory, FHWA agrees that the device described herein meets the crash test and evaluation criteria of the AASHTO's MASH. Therefore, the device is eligible for reimbursement under the Federal-aid highway program if installed under the range of tested conditions.

Name of system: TrafFix High Impact Barrier
Type of system: Work Zone
Test Level: MASH Test Level 3 (TL3)
Testing conducted by: KARCO
Date of request: February 4, 2020

FHWA concurs with the recommendation of the accredited crash testing laboratory on the attached form.

Full Description of the Eligible Device

The device and supporting documentation, including reports of the crash tests or other testing done, videos of any crash testing, and/or drawings of the device, are described in the attached form.

Notice

This eligibility letter is issued for the subject device as tested. Modifications made to the device are not covered by this letter. Any modifications to this device should be submitted to the user (i.e., state DOT) as per their requirements.

You are expected to supply potential users with sufficient information on design, installation and maintenance requirements to ensure proper performance.

You are expected to certify to potential users that the hardware furnished has the same chemistry, mechanical properties, and geometry as that submitted for review, and that it will meet the test and evaluation criteria of AASHTO's MASH.

Issuance of this letter does not convey property rights of any sort or any exclusive privilege. This letter is based on the premise that information and reports submitted by you are accurate and correct. We reserve the right to modify or revoke this letter if: (1) there are any inaccuracies in the information submitted in support of your request for this letter, (2) the qualification testing was flawed, (3) in-service performance or other information reveals safety problems, (4) the system is significantly different from the version that was crash tested, or (5) any other information indicates that the letter was issued in error or otherwise does not reflect full and complete information about the crashworthiness of the system.

Standard Provisions

- To prevent misunderstanding by others, this letter of eligibility designated as FHWA control number WZ-402 shall not be reproduced except in full. This letter and the test documentation upon which it is based are public information. All such letters and documentation may be reviewed upon request.

- This letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented system for which the applicant is not the patent holder.

- This FHWA eligibility letter is not an expression of any Agency view, position, or determination of validity, scope, or ownership of any intellectual property rights to a specific device or design. Further, this letter does not impute any distribution or licensing rights to the requester. This FHWA eligibility letter determination is made based solely on the crash-testing information submitted by the requester. The FHWA reserves the right to review and revoke an earlier eligibility determination after receipt of subsequent information related to crash testing.

Sincerely,

Michael S. Griffith
Director, Office of Safety Technologies
Office of Safety

Enclosures

Request for Federal Aid Reimbursement Eligibility of Highway Safety Hardware

Submitter	Date of Request:	February 04, 2020	◉ New ○ Resubmission
	Name:	Robby Ramirez	
	Company:	TrafFix Devices, Inc.	
	Address:	160 Avenida La Pata San Clemente CA, 92673	
	Country:	United States	
	To:	Michael S. Griffith, Director FHWA, Office of Safety Technologies	

I request the following devices be considered eligible for reimbursement under the Federal-aid highway program.

Device & Testing Criterion - Enter from right to left starting with Test Level !-!-! !-!-!

System Type	Submission Type	Device Name / Variant	Testing Criterion	Test Level
'WZ': Crash Worthy Work Zon	◉ Physical Crash Testing ○ Engineering Analysis	High Impact Barricade	AASHTO MASH	TL3

By submitting this request for review and evaluation by the Federal Highway Administration, I certify that the product(s) was (were) tested in conformity with the AASHTO Manual for Assessing Safety Hardware and that the evaluation results meet the appropriate evaluation criteria in the MASH.

Individual or Organization responsible for the product:

Contact Name:	Robby Ramirez	Same as Submitter ☒
Company Name:	TrafFix Devices, Inc.	Same as Submitter ☒
Address:	160 Avenida La Pata San Clemente CA, 92673	Same as Submitter ☒
Country:	United States	Same as Submitter ☒

Enter below all disclosures of financial interests as required by the FHWA `Federal-Aid Reimbursement Eligibility Process for Safety Hardware Devices' document.

TrafFix Devices Inc. and Applus IDIADA KARCO Engineering LLC share no financial interests between the two organizations. This includes no shared financial interest but not limited to:
i. Compensation including wages, salaries, commissions, professional fees, or fees for business referrals
ii. Consulting relationships
iii. Research funding or other forms of research support;
iv. Patents, copyrights, licenses, and other intellectual property interests;
vi. Business ownership and investment interests.

PRODUCT DESCRIPTION

Help

(•) New Hardware or Significant Modification ( ) Modification to Existing Hardware

The TrafFix Devices, Inc. High Impact Barricade is a temporary work-zone traffic control device consisting of two (2) plastic leg assemblies and four (4) impact resistant plastic panels.

The plastic leg assemblies are composed of two (2) plastic legs that are bolted together at the top. The top joint uses a metal bushing and washer to keep the barricade legs securely in place. The legs have a mounting pattern that will accept multiple size panels. The mounting pattern allows the panels to be held at heights that are compliant to the Manual on Uniform Traffic Control Devices (MUTCD). The panels are mounted to the leg assemblies by through bolting or riveting. There are molded-in male and female stacking lugs to keep the barricades firmly in place when in shipping and storage.

The plastic panels are 24.0 in (610 mm) wide and 0.5 in. (13 mm) thick. The panel's edges are raised to protect the reflective sheeting during transportation and stacking. The barricade uses either 8.0 in. (203 mm) or 12.0 in. (305 mm) tall top panels with reflective sheeting. The bottom panels can either be 6.0 in. (152 mm) or 8.0 in. (203 mm) tall. A San-Fil Panel is an 8.0 in. (203 mm) tall panel filled with sand for ballast and weighs approximately 15 lbs (6.8 kg) when filled. If a bottom San-Fil panel is not used, a sand bag bar is inserted in the lower legs and a sand bag is placed over the bar for ballast. The barricade can be used with or without ballast.

A warning light was mounted during crash testing. The barricade can be used with or without a warning light. The MASH tested and passed High Impact Barricade was not modified from the NCHRP 350 version. Since the product was not changed from the NCHRP 350 version existing inventory can be considered MASH compliant.

CRASH TESTING

By signature below, the Engineer affiliated with the testing laboratory, agrees in support of this submission that all of the critical and relevant crash tests for this device listed above were conducted to meet the MASH test criteria. The Engineer has determined that no other crash tests are necessary to determine the device meets the MASH criteria.

Engineer Name:	Bruno Haesbaert	
Engineer Signature:	Bruno Haesbaert Digitally signed by Bruno Haesbaert Date: 2020.02.07 10:50:06-08'00'	
Address:	9270 Holly Road, Adelanto, CA 92301	Same as Submitter ☐
Country:	United States of America	Same as Submitter ☐

A brief description of each crash test and its result: Help

Required Test Number	Narrative Description	Evaluation Results
3-70 (1100C)	Designed to evaluate the ability of a small vehicle to activate any breakaway, fracture, or yielding mechanism. Per MASH Test 3-70 is considered optional for work-zone traffic control devices weighing less than 220 lbs (100 kg). The as-tested barricade weighed approximately 29.6 lbs. (13.4 kg).	Non-Relevant Test, not conducted

Required Test Number	Narrative Description	Evaluation Results
3-71 (1100C)	Test report number P39095-01, conducted on 04/05/19. Test 3-71 involves an 1100C test vehicle impacting the temporary work-zone traffic control device at a critical impact angle of 0° and 90°. The test is designed to evaluate occupant compartment penetration, vehicle stability, and occupant risk criteria. The test vehicle wasa commercially available 2009 KiaRio with a test inertial weight of 2,418.4 lbs (1097.0 kg). The test vehicle impacted the first barricade oriented at 90° at aspeed of 61.17 mph (98.44 km/h). There was no penetration into the occupant compartment and no vehicle instability was induced. The vehicle cleared the device in a controlled manner and continued to impact the second barricade oriented at 0° at aspeed of 59.65 mph (96.00 km/h). The barricade wasactivated in a predictable manner and did not penetrate the occupant compartment. The TrafFix High Impact Barricade did not induce vehicle instability, block the drivers vision, and did not create a debris field that would present undue hazards to other traffic, pedestrians, or personnel in a work zone. The occupant compartment was not penetrated and the deformation limits were not exceeded. The TrafFix Devices High Impact Barricade met all the requirements for MASH Test 3-71.	PASS

3-72 (2270P)	Test report number P39095-02, conducted on 04/05/19. Test 3-72 involves a 2270P test vehicle impacting the temporary work-zone traffic control device at a critical impact angle of 0° and 90°. The test is designed to evaluate occupant compartment penetration, vehicle stability, and occupant risk criteria. The test vehicle wasa commercially available 2014 RAM 1500 with a test inertial weight of 4,990.1 lbs (2,263.5 kg). The test vehicle impacted the first barricade oriented at 90° at aspeed of 64.19 mph (103.31 km/h). There was no penetration into the occupant compartment and no vehicle instability was induced. The vehicle cleared the device in a controlled manner and continued to impact the second barricade oriented at 0° at aspeed of 61.97 mph (99.73 km/h). The barricade was activated in a predictable manner and did not penetrate the occupant compartment. The TrafFix High Impact Barricade did not induce vehicle instability, block the drivers vision, and did not create a debris field that would present undue hazards to other traffic, pedestrians, or personnel in a work zone. The occupant compartment was not penetrated and the deformation limits were not exceeded. The TrafFix Devices High Impact Barricade met all the requirements for MASH Test 3-72.	PASS

Full Scale Crash Testing was done in compliance with MASH by the following accredited crash test laboratory (cite the laboratory's accreditation status as noted in the crash test reports.):

Laboratory Name:	Applus IDIADA KARCO	
Laboratory Signature:	Bruno Haesbaert Digitally signed by Bruno Haesbaert Date: 2020.02.07 10:51:58 -08'00'	
Address:	9270 Holly Road, Adelanto, CA 92301	Same as Submitter ☐
Country:	United States of America	Same as Submitter ☐
Accreditation Certificate Number and Dates of current Accreditation period :	TL-371: July 2019 - July 2022	

Submitter Signature*: Robert Ramirez Digitally signed by Robert Ramirez Date: 2020.02.07 15:43:53 -08'00'

Submit Form

ATTACHMENTS

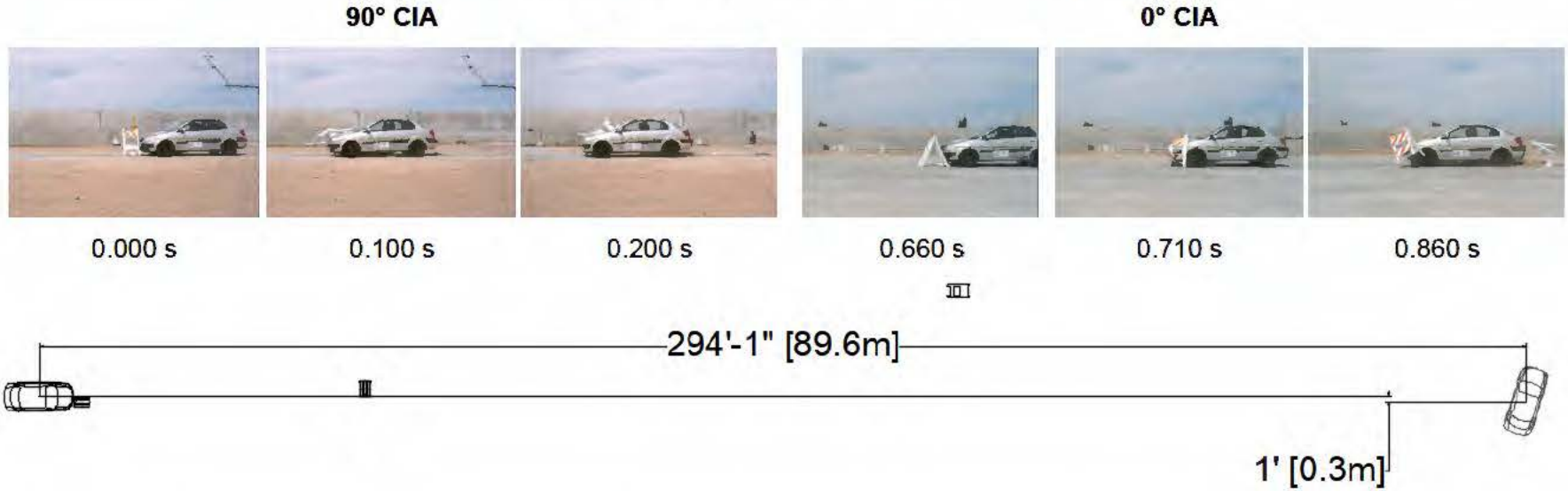
Attach to this form:

1) Additional disclosures of related financial interest as indicated above.
2) A copy of the full test report, video, and a Test Data Summary Sheet for each test conducted in support of this request.
3) A drawing or drawings of the device(s) that conform to the Task Force-13 Drawing Specifications [Hardware Guide Drawing Standards]. For proprietary products, a single isometric line drawing is usually acceptable to illustrate the product, with detailed specifications, intended use, and contact information provided on the reverse. Additional drawings (not in TF-13 format) showing details that are relevant to understanding the dimensions and performance of the device should also be submitted to facilitate our review.

FHWA Official Business Only:

Eligibility Letter		
Number	Date	Key Words

MASH 2016 Test 3-71 Summary



GENERAL INFORMATION

Test Agency	Applus IDIADA KARCO
Test No	P39095-01
Test Designation	3-71
Test Date	4/5/19

TEST ARTICLE

Name / Model	High Impact Barricade
Type	Work-Zone Device
Device Height	3.5 ft. (1.1 m)
Key Elements	Plastic, fiberglass, metal
Road Surface	Clean Concrete

TEST VEHICLE

Type / Designation	1100C
Year, Make, and Model	2009 Kia Rio
Curb Mass	2,398.6 lbs (1,088.0 kg)
Test Inertial Mass	2,418.4 lbs (1,097.0 kg)
Gross Static Mass	2,582.7 lbs (1,171.5 kg)

Impact Conditions

Impact Velocity Device 1	61.17 mph (98.44 km/h)
Impact Velocity Device 2	59.65 mph (96.00 km/h)
Device 1 Angle	90.0°
Device 2 Angle	0.0°
Device 1 Kinetic Energy	302.5 kip-ft (410.1 kJ)
Device 2 Kinetic Energy	287.7 kip-ft (390.0 kJ)

Exit Conditions

Device 1 Exit Velocity	60.09 mph (96.70 km/h)
Device 2 Exit Velocity	59.22 mph (95.30 km/h)
Vehicle Resting Position	294.1 ft. (89.6 m) Downstream 1.0 ft. (0.3 m) Left
Vehicle Stability	Satisfactory
Maximum Roll Angle	N/A*
Maximum Pitch Angle	N/A*
Maximum Yaw Angle	N/A*

* Not Applicable, device weighs less than 220 lbs (100 kg)

Occupant Risk

Longitudinal OIV	N/A*
Lateral OIV	N/A*
Longitudinal RA	N/A*
Lateral RA	N/A*
THIV	N/A*
PHD	N/A*
ASI	N/A*

Test Article Deflections

Debris Field (longitudinal)	117.8 ft. (35.9 m)
Debris Field (lateral)	29.5 ft. (9.0 m)

Vehicle Damage

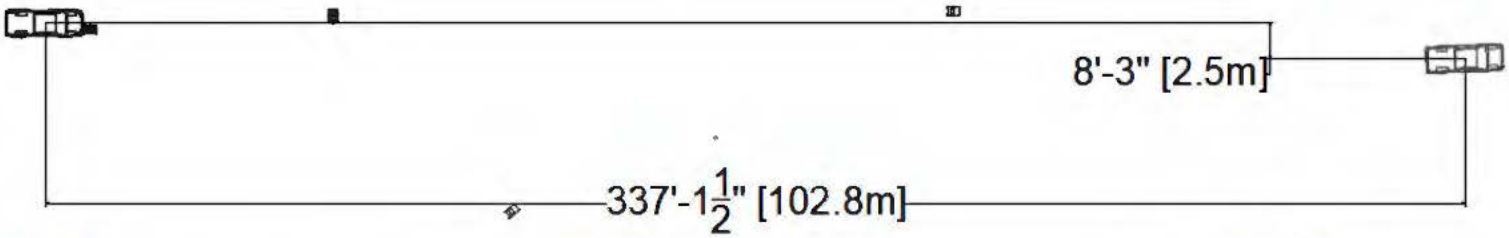
Vehicle Damage Scale	12-FD-1
CDC	12FDEW1
Maximum Deformation	No measureable deforma ion

Figure 2 Summary of Test 3-71

MASH 2016 Test 3-72 Summary

90° CIA **0° CIA**

0.000 s 0.100 s 0.200 s 0.660 s 0.850 s 0.950 s



GENERAL INFORMATION

Test Agency	Applus IDIADA KARCO
Test No	P39095-02
Test Designation	3-72
Test Date	4/5/19

TEST ARTICLE

Name / Model	High Impact Barricade
Type	Work-Zone Device
Device Height	3.5 ft. (1.1 m)
Key Elements	Plastic, fiberglass, metal
Road Surface	Clean Concrete

TEST VEHICLE

Type / Designation	2270P
Year, Make, and Model	2014 RAM 1500
Curb Mass	4,922.8 lbs (2,233.0 kg)
Test Inertial Mass	4,990.1 lbs (2,263.5 kg)
Gross Static Mass	4,990.1 lbs (2,263.5 kg)

Impact Conditions

Impact Velocity Device 1	64.19 mph (103.31 km/h)
Impact Velocity Device 2	61.97 mph (99.73 km/h)
Device 1 Angle	90.0°
Device 2 Angle	0.0°
Device 1 Kinetic Energy	687.4 kip-ft (932.0 kJ)
Device 2 Kinetic Energy	640.6 kip-ft (868.6 kJ)

Exit Conditions

Device 1 Exit Velocity	63.5 mph (102.2 km/h)
Device 2 Exit Velocity	62.0 mph (99.7 km/h)
Vehicle Resting Position	337.1 ft. (102.8 m) Downstream 8.3 ft. (2.5 m) Right
Vehicle Stability	Satisfactory
Maximum Roll Angle	N/A*
Maximum Pitch Angle	N/A*
Maximum Yaw Angle	N/A*

* Not Applicable, device weighs less than 220 lbs (100 kg)

Occupant Risk

Longitudinal OIV	N/A*
Lateral OIV	N/A*
Longitudinal RA	N/A*
Lateral RA	N/A*
THIV	N/A*
PHD	N/A*
ASI	N/A*

Test Article Deflections

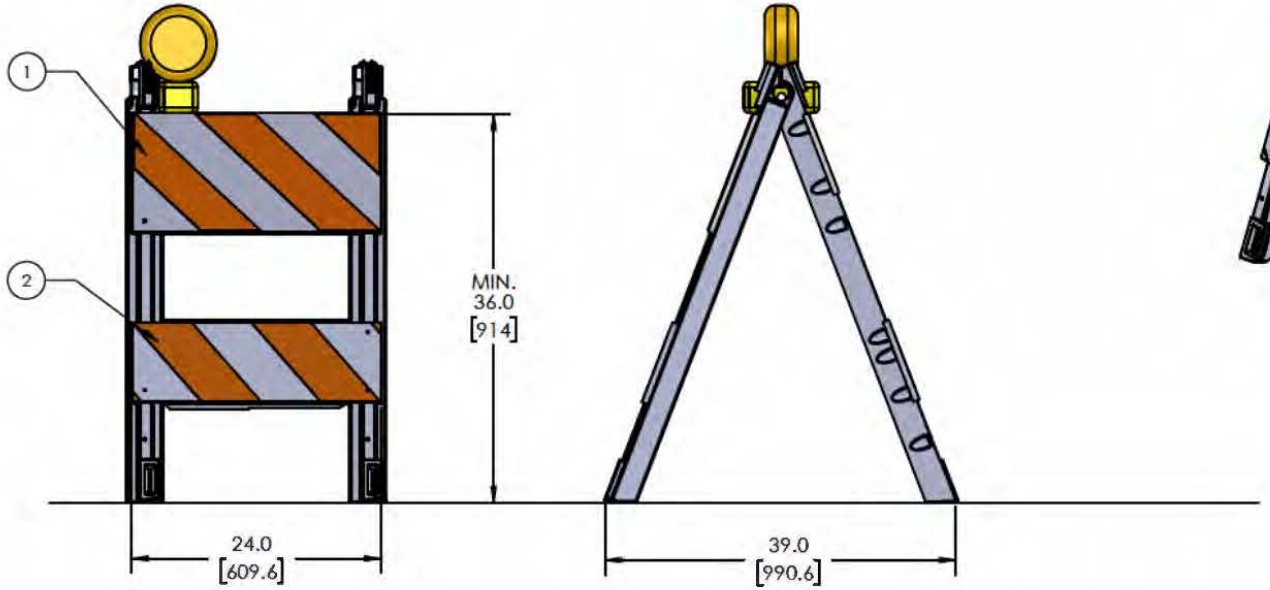
Debris Field (longitudinal)	100.5 ft. (30.6 m)
Debris Field (lateral)	44.5 ft. (13.6 m)

Vehicle Damage

Vehicle Damage Scale	12-FD-1
CDC	12FDEW1
Maximum Deformation	No measureable deformation

Figure 2 Summary of Test 3-72

ITEM NO.	DESCRIPTION
1	TOP PANEL
1A	12" X 24" PANEL
1B	8" X 24" PANEL
2	BOTTOM PANEL
2A	6" X 24" PANEL
2B	8" X 24" PANEL
2C	8" X 24" SAN-FIL



2. Units: Inches [mm]
1. Finish: White
NOTES: Unless Otherwise Specified

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES[mm].
TOLERANCES:
FRACTIONAL X/X ± 1/16 [1.6mm]
DECIMAL X.X ± .063
X.XX ± .032
X.XXX ± .015
DEGREES ± 0.5°

DRAWN BY RLR	DATE 09/16/19	
CHECKED BY FA	DATE 09/16/19	
APPROVED BY FA	DATE 09/16/19	

TrafFix Devices Inc.
160 Avenida La Pata
San Clemente, CA 92673
(949) 361-5663
FAX (949) 361-9205
www.traffixdevices.com

TITLE:
High Impact Barricade

SIZE	DRAWING NO.	REV
B	500-212	A

SHEET 1 OF 1