



Tire Track Imprint Evidence Test No. 20-5351/5 Summary Report

Each sample pack contained either digitally produced photographs (20-5351) or directly downloadable digital images (20-5355) of four questioned tire track imprints, photographs of a suspect tire, and test imprints made with that tire. All participants also received an additional set of inked exemplars as a digital supplemental image set. Participants were requested to compare the imprints from the crime scene with the suspect tire and report their findings. Data were returned by 57 participants: 30 for 20-5351 and 27 for 20-5355 and are compiled into the following tables:

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This report contains the data received from the participants in this test. Since these participants are located in many countries around the world, and it is their option how the samples are to be used (e.g., training exercise, known or blind proficiency testing, research and development of new techniques, etc.), the results compiled in the Summary Report are not intended to be an overview of the quality of work performed in the profession and cannot be interpreted as such. The Summary Comments are included for the benefit of participants to assist with maintaining or enhancing the quality of their results. These comments are not intended to reflect the general state of the art within the profession.

Participant results are reported using a randomly assigned "WebCode". This code maintains participant's anonymity, provides linking of the various report sections, and will change with every report.

Manufacturer's Information

Each sample pack contained either photographs or digital images of a suspect tire, inked exemplars of a suspect tire, and questioned tire track imprints. Participants also received a second set of inked exemplars as a digital download supplemental on the CTS portal. The suspect tire was photographed in segments (K1-K7), with the start and end of each segment indicated by a red line and assigned a letter (A-G). The inked exemplars were segmented and captured in the same manner. Two photographs contained images of four questioned tire track imprints (Q1-Q4). Participants were asked to compare the suspect tire and inked exemplars with the questioned imprints to determine if any associations or identifications could be established.

SAMPLE PREPARATION -

The previously driven tires used in production of the test were gently cleaned to remove any loose debris from the surface prior to inking.

KNOWN EXEMPLARS (K1-K7, K1_2-K7_2): Inked exemplar imprints were created by pushing a vehicle containing the suspect tire across an inked surface and then white containerboard. The suspect tire was removed from the vehicle and photographed in segments after known exemplars and questioned imprints were collected.

QUESTIONED IMPRINTS (Q1-Q4): Questioned imprints were created by pushing a vehicle containing the suspect or elimination tire across an inked surface and then the substrate. All production materials were repositioned and the process repeated as necessary to capture all tire track imprints in question.

VERIFICATION -

Laboratories that conducted the predistribution examination of the images associated all questioned imprints (Q1-Q4) with the suspect tire. All predistribution labs also associated each questioned imprint with the expected tire segments.

SAMPLE PACK ASSEMBLY -

Once sample preparation, verification, and final image production were complete, each photo set was placed into a pre-labeled sample pack envelope, sealed with evidence tape, and initialed with "CTS." Digital download media were provided in a zipped file uploaded to the CTS portal.

Imprint	Tire Brand	Tire Specs	DOT Info	Segment(s)
Q1	Firestone	195/65 R15 91H M&S	DOT W2AE FH1 5017	G-B
Q2	Firestone	195/65 R15 91H M&S	DOT W2AE FH1 5017	F-B
Q3	Firestone	195/65 R15 91H M&S	DOT W2AE FH1 5017	B-D
Q4	Firestone	195/65 R15 91H M&S	DOT W2AE FH1 5017	C-E

Summary Comments

This test was designed to allow participants to assess their proficiency with tire track imprint examination. Test material consisted of two photographs containing four questioned tire track imprints (Q1-Q4), photographs of the suspect (known) tire divided into segments (K1-K7), and photographs of inked exemplar imprints made with the tire (K1_2-K7_2). Participants were requested to determine if any of the questioned imprints were made by the known tire, utilizing a seven-point conclusion scale. All four of these imprints (Q1-Q4) were made by the known tire (Refer to the Manufacturer's Information for preparation details).

Of the 57 reporting participants, 50 (88%) reported the expected associations between the known tire and the four questioned imprints. There were seven outliers who reported some degree of non-association between the known tire and one or more questioned imprint(s); however, the necessary consensus threshold was achieved for each individual imprint.

For the following statistical tabulations, all responses of association (A-D) with the expected tire were tallied together, and all responses of non-association (F-G) were tallied together. For Item Q1, all 57 participants (100%) reported an association between the known tire and the questioned imprint (conclusion A-D). For Item Q2, 53 participants (93%) found an association between the known tire and the questioned imprint. Four participants reported a non-association between the known tire and the questioned imprint. For Item Q3, 56 participants (98%) reported an association between the questioned imprint and the known tire. One participant reported an exclusion for the known tire. Finally, for Item Q4, 52 participants (91%) found an association between the known tire and the questioned imprint. Five participants excluded this tire as the source.

For all participants who reported an association between the known tire and the questioned imprints, all identified one or more of the expected tire segments for each item (Q1 – G-A, A-B; Q2 – F-G, G-A, A-B; Q3 – B-C, C-D; Q4 – C-D, D-E). No participants who reported the associations named an outlier segment as the source of any questioned imprint. One participant who excluded the known tire as the source of questioned imprints Q2 and Q4 (outlier responses) did report the expected tire segments.

In response to previous feedback received for this test, CTS introduced a digital supplemental image set that contained a second set of inked exemplars from the suspect tire. This was intended to bolster participant confidence in their conclusions by giving them an opportunity to verify wear patterns and randomly acquired characteristics (RACs) found in the sample set images. These materials were made available to all participants on the CTS web portal. Based on consensus percentages, it appears that this supplemental was overall beneficial to participant analysis.

Examination Results

Indicate the results of your comparisons of the suspect tire with the questioned imprints.

TABLE 1a ("No Parking" Sign)

Questioned Imprints						
WebCode- Test	Conclusion	<u>Q1</u> Segment(s)	WebCode- Test	Conclusion	<u>Q2</u> Segment(s)	
2CEKKY- 5351	A	A-B	2CEKKY- 5351	A	F-A	
2QZZNY- 5351	A	A-B	2QZZNY- 5351	A	F-G	
3C9QEX- 5355	A	A-B	3C9QEX- 5355	A	F-A	
3GJ4WW- 5355	A	G-B	3GJ4WW- 5355	A	F-A	
3TX22Z- 5351	A	G-B	3TX22Z- 5351	A	F-B	
4339GZ- 5351	A	A-B	4339GZ- 5351	A	F-A	
6M83QH- 5355	A	A	6M83QH- 5355	A	F-A	
78LACV- 5351	A	A-B	78LACV- 5351	A	G-A	
7QXYQT- 5351	A	G-B	7QXYQT- 5351	A	F-B	
7Z7QVG- 5355	A	G-B	7Z7QVG- 5355	A	F-A	
9426TQ- 5351	A	A-B	9426TQ- 5351	A	F-A	
9FQ4KT- 5351	A	G-B	9FQ4KT- 5351	F	F-A	
9PFPPR- 5351	A	A-B	9PFPPR- 5351	A	G-A	
BMP6ZD- 5355	B	A-B	BMP6ZD- 5355	B	F-A	
CA86FP- 5351	A	A-B	CA86FP- 5351	C	G-A	

TABLE 1a ("No Parking" Sign)

Questioned Imprints						
WebCode- Test	Conclusion	<u>Q1</u> Segment(s)	WebCode- Test	Conclusion	<u>Q2</u> Segment(s)	
CCY4UN- 5351	B	G-B	CCY4UN- 5351	B	F-A	
EN7TLN- 5355	A	G-B	EN7TLN- 5355	A	F-B	
F4AMRN- 5351	A	A-B	F4AMRN- 5351	A	G-B	
F7G6QJ- 5351	A	A-B	F7G6QJ- 5351	A	F-A	
FYL3N9- 5355	A	A-B	FYL3N9- 5355	B	F-A	
GY2L96- 5355	A	A-B	GY2L96- 5355	A	F-A	
J3BKGG- 5355	A	A-B	J3BKGG- 5355	A	F-B	
JDABZ4- 5351	A	A-B	JDABZ4- 5351	B	G-A	
JJYV4J- 5355	A	A-B	JJYV4J- 5355	A	F-A	
JLKDL4- 5351	A	G-B	JLKDL4- 5351	A	F-A	
KBJAUF- 5351	A	A-B	KBJAUF- 5351	A	F-B	
KC9XR2- 5351	A	G-B	KC9XR2- 5351	A	F-A	
LBT2Z2- 5351	A	A	LBT2Z2- 5351	G		
LF9AN2- 5351	A	G-B	LF9AN2- 5351	A	F-A	
LU9BZ3- 5355	A	A-B	LU9BZ3- 5355	A	F-A	
M4T2ZY- 5351	A	A-B	M4T2ZY- 5351	A	F-B	

TABLE 1a ("No Parking" Sign)

Questioned Imprints						
WebCode- Test	Conclusion	<u>Q1</u> Segment(s)	WebCode- Test	Conclusion	<u>Q2</u> Segment(s)	
M689LG-5355	D	A-B	M689LG-5355	C	F-A	
M97JHG-5355	A	G-B	M97JHG-5355	A	F-A	
MCJJE8-5355	A	A-B	MCJJE8-5355	A	F-A	
ME8VDD-5355	A	A-B	ME8VDD-5355	A	F-B	
MKDRYY-5355	A	A-B	MKDRYY-5355	A	F-A	
MQLTHG-5351	B	G-A	MQLTHG-5351	B	F-A	
NLL4EE-5351	A	A-B	NLL4EE-5351	A	F-A	
NW89LE-5355	B	A-B	NW89LE-5355	A	F-A	
Q6B2UC-5355	A	A-B	Q6B2UC-5355	A	F-B	
QAKFBB-5351	A	A-B	QAKFBB-5351	G		
QB2C4B-5355	A	A-B	QB2C4B-5355	A	F-A	
QTW6P9-5351	A	A-B	QTW6P9-5351	A	G-A	
R2ADPA-5351	A	A-B	R2ADPA-5351	F		
RQN9HB-5351	A	A-B	RQN9HB-5351	A	F-B	
TAYKN7-5355	A	A-B	TAYKN7-5355	A	F-A	
U4MWMA-5355	A	A-B	U4MWMA-5355	A	F-B	

TABLE 1a ("No Parking" Sign)

Questioned Imprints						
WebCode- Test	Conclusion	<u>Q1</u> Segment(s)	WebCode- Test	Conclusion	<u>Q2</u> Segment(s)	
U6XYBU- 5355	A	G-B	U6XYBU- 5355	A	F-B	
UH9CQ9- 5355	A	A-B	UH9CQ9- 5355	A	F-A	
V3BGT9- 5355	A	A-B	V3BGT9- 5355	A	F-B	
VCC6K7- 5355	A	G-B	VCC6K7- 5355	A	F-B	
WWHYR3- 5351	A	A-B	WWHYR3- 5351	A	F-B	
X3K786- 5355	A	A-B	X3K786- 5355	A	F-G	
YAGMX2- 5355	A	A-B	YAGMX2- 5355	A	F-B	
YKWA9M- 5351	A	A-B	YKWA9M- 5351	A	F-B	
YZCFH2- 5351	A	A-B	YZCFH2- 5351	A	F-A	
ZTQ3UL- 5351	A	A-B	ZTQ3UL- 5351	A	G-A	

Response Summary				Participants: 57			
<u>Q1 Conclusion</u>		<u>Segment(s), by frequency</u>		<u>Q2 Conclusion</u>		<u>Segment(s), by frequency</u>	
Identification (A)	52 (91.2%)	A-B	41 (71.9%)	Identification (A)	46 (80.7%)	F-A	29 (50.9%)
High Degree of Ass'n. (B)	4 (7.0%)	G-B	13 (22.8%)	High Degree of Ass'n. (B)	5 (8.8%)	F-B	16 (28.1%)
Association (C)	0 (0.0%)	A	2 (3.5%)	Association (C)	2 (3.5%)	G-A	6 (10.5%)
Limited Ass'n. (D)	1 (1.8%)	G-A	1 (1.8%)	Limited Ass'n. (D)	0 (0.0%)	F-G	2 (3.5%)
Inconclusive (E)	0 (0.0%)			Inconclusive (E)	0 (0.0%)	G-B	1 (1.8%)
Non-Ass'n. (F)	0 (0.0%)			Non-Ass'n. (F)	2 (3.5%)		
Exclusion (G)	0 (0.0%)			Exclusion (G)	2 (3.5%)		

Examination Results

Indicate the results of your comparisons of the suspect tire with the questioned imprints.

TABLE 1b (Cardboard Box)

Questioned Imprints						
WebCode- Test	Conclusion	<u>Q3</u> Segment(s)	WebCode- Test	Conclusion	<u>Q4</u> Segment(s)	
2CEKKY- 5351	A	B-D	2CEKKY- 5351	A	C-E	
2QZZNY- 5351	A	B-C	2QZZNY- 5351	A	C-D	
3C9QEX- 5355	A	B-D	3C9QEX- 5355	A	C-E	
3GJ4WW- 5355	A	B-D	3GJ4WW- 5355	A	C-E	
3TX22Z- 5351	A	B-D	3TX22Z- 5351	A	C-E	
4339GZ- 5351	A	B-D	4339GZ- 5351	A	C-E	
6M83QH- 5355	A	B-C	6M83QH- 5355	A	C-D	
78LACV- 5351	A	C-D	78LACV- 5351	A	C-D	
7QXYQT- 5351	A	B-D	7QXYQT- 5351	A	C-E	
7Z7QVG- 5355	A	B-D	7Z7QVG- 5355	A	C-E	
9426TQ- 5351	A	B-D	9426TQ- 5351	A	C-E	
9FQ4KT- 5351	A	B-D	9FQ4KT- 5351	G	C-E	
9PFPPR- 5351	G		9PFPPR- 5351	A	C-E	
BMP6ZD- 5355	A	B-D	BMP6ZD- 5355	A	C-E	
CA86FP- 5351	A	B-C	CA86FP- 5351	C	C-D	

TABLE 1b (Cardboard Box)

Questioned Imprints						
WebCode- Test	Conclusion	<u>Q3</u> Segment(s)	WebCode- Test	Conclusion	<u>Q4</u> Segment(s)	
CCY4UN- 5351	B	B-D	CCY4UN- 5351	B	C-E	
EN7TLN- 5355	A	B-D	EN7TLN- 5355	A	C-E	
F4AMRN- 5351	A	B-D	F4AMRN- 5351	G		
F7G6QJ- 5351	A	B-D	F7G6QJ- 5351	A	C-E	
FYL3N9- 5355	A	B-D	FYL3N9- 5355	A	C-E	
GY2L96- 5355	A	B-D	GY2L96- 5355	A	C-E	
J3BKGG- 5355	A	B-D	J3BKGG- 5355	A	C-E	
JDABZ4- 5351	A	B-D	JDABZ4- 5351	A	C-E	
JJYV4J- 5355	A	B-D	JJYV4J- 5355	A	C-E	
JLKDL4- 5351	A	B-D	JLKDL4- 5351	A	C-E	
KBJAUF- 5351	A	B-D	KBJAUF- 5351	A	C-E	
KC9XR2- 5351	A	B-D	KC9XR2- 5351	A	C-E	
LBT2Z2- 5351	A	C	LBT2Z2- 5351	A	D	
LF9AN2- 5351	A	B-D	LF9AN2- 5351	A	C-E	
LU9BZ3- 5355	A	B-D	LU9BZ3- 5355	A	C-E	
M4T2ZY- 5351	A	B-D	M4T2ZY- 5351	A	C-E	
M689LG- 5355	B	B-D	M689LG- 5355	B	C-E	

TABLE 1b (Cardboard Box)

Questioned Imprints						
WebCode- Test	Conclusion	<u>Q3</u> Segment(s)	WebCode- Test	Conclusion	<u>Q4</u> Segment(s)	
M97JHG-5355	A	B-D	M97JHG-5355	A	C-E	
MCJJE8-5355	A	B-D	MCJJE8-5355	A	C-E	
ME8VDD-5355	A	B-D	ME8VDD-5355	A	C-E	
MKDRYY-5355	A	B-D	MKDRYY-5355	A	C-E	
MQLTHG-5351	A	B-D	MQLTHG-5351	A	C-E	
NLL4EE-5351	A	B-D	NLL4EE-5351	A	C-E	
NW89LE-5355	A	B-D	NW89LE-5355	A	C-E	
Q6B2UC-5355	A	B-D	Q6B2UC-5355	A	C-E	
QAKFBB-5351	A	B-D	QAKFBB-5351	G		
QB2C4B-5355	A	B-D	QB2C4B-5355	A	C-E	
QTW6P9-5351	A	C-D	QTW6P9-5351	G		
R2ADPA-5351	A	C-D	R2ADPA-5351	G		
RQN9HB-5351	A	B-D	RQN9HB-5351	A	C-E	
TAYKN7-5355	A	B-D	TAYKN7-5355	A	C-E	
U4MWMA-5355	A	B-D	U4MWMA-5355	A	C-E	
U6XYBU-5355	A	B-D	U6XYBU-5355	A	C-E	
UH9CQ9-5355	A	B-D	UH9CQ9-5355	A	C-E	

TABLE 1b (Cardboard Box)

Questioned Imprints						
WebCode-Test	Conclusion	Q3 Segment(s)	WebCode-Test	Conclusion	Q4 Segment(s)	
V3BGT9-5355	A	B-D	V3BGT9-5355	A	C-E	
VCC6K7-5355	A	B-D	VCC6K7-5355	A	C-E	
WWHYR3-5351	A	B-D	WWHYR3-5351	A	C-E	
X3K786-5355	A	B-C	X3K786-5355	A	C-D	
YAGMX2-5355	A	B-D	YAGMX2-5355	A	C-E	
YKWA9M-5351	A	B-D	YKWA9M-5351	A	C-E	
YZCFH2-5351	A	B-D	YZCFH2-5351	A	C-E	
ZTQ3UL-5351	A	C-D	ZTQ3UL-5351	A	C-E	

Response Summary				Participants: 57			
Q3 Conclusion		Segment(s), by frequency		Q4 Conclusion		Segment(s), by frequency	
Identification (A)	54 (94.7%)	B-D	47 (82.5%)	Identification (A)	49 (86.0%)	C-E	47 (82.5%)
High Degree of Ass'n. (B)	2 (3.5%)	B-C	4 (7.0%)	High Degree of Ass'n. (B)	2 (3.5%)	C-D	5 (8.8%)
Association (C)	0 (0.0%)	C-D	4 (7.0%)	Association (C)	1 (1.8%)	D	1 (1.8%)
Limited Ass'n. (D)	0 (0.0%)	C	1 (1.8%)	Limited Ass'n. (D)	0 (0.0%)		
Inconclusive (E)	0 (0.0%)			Inconclusive (E)	0 (0.0%)		
Non-Ass'n. (F)	0 (0.0%)			Non-Ass'n. (F)	0 (0.0%)		
Exclusion (G)	1 (1.8%)			Exclusion (G)	5 (8.8%)		

Examination Results

TABLE 1c - Complete Results

Response Summary				Participants: 57			
Q1 Conclusion		Segment(s), by frequency		Q2 Conclusion		Segment(s), by frequency	
Identification (A)	52 (91.2%)	A-B	41 (71.9%)	Identification (A)	46 (80.7%)	F-A	29 (50.9%)
High Degree of Ass'n. (B)	4 (7.0%)	G-B	13 (22.8%)	High Degree of Ass'n. (B)	5 (8.8%)	F-B	16 (28.1%)
Association (C)	0 (0.0%)	A	2 (3.5%)	Association (C)	2 (3.5%)	G-A	6 (10.5%)
Limited Ass'n. (D)	1 (1.8%)	G-A	1 (1.8%)	Limited Ass'n. (D)	0 (0.0%)	F-G	2 (3.5%)
Inconclusive (E)	0 (0.0%)			Inconclusive (E)	0 (0.0%)	G-B	1 (1.8%)
Non-Ass'n. (F)	0 (0.0%)			Non-Ass'n. (F)	2 (3.5%)		
Exclusion (G)	0 (0.0%)			Exclusion (G)	2 (3.5%)		
Q3 Conclusion		Segment(s), by frequency		Q4 Conclusion		Segment(s), by frequency	
Identification (A)	54 (94.7%)	B-D	47 (82.5%)	Identification (A)	49 (86.0%)	C-E	47 (82.5%)
High Degree of Ass'n. (B)	2 (3.5%)	B-C	4 (7.0%)	High Degree of Ass'n. (B)	2 (3.5%)	C-D	5 (8.8%)
Association (C)	0 (0.0%)	C-D	4 (7.0%)	Association (C)	1 (1.8%)	D	1 (1.8%)
Limited Ass'n. (D)	0 (0.0%)	C	1 (1.8%)	Limited Ass'n. (D)	0 (0.0%)		
Inconclusive (E)	0 (0.0%)			Inconclusive (E)	0 (0.0%)		
Non-Ass'n. (F)	0 (0.0%)			Non-Ass'n. (F)	0 (0.0%)		
Exclusion (G)	1 (1.8%)			Exclusion (G)	5 (8.8%)		

Conclusions

TABLE 2

(WebCode)- Test	Conclusions
2CEKKY- 5351	The partial, questioned footwear impressions, Q1 through Q4, correspond in tire tread design, general condition of wear and several individual characteristics and were made by the known tire K1.
2QZZNY- 5351	The Q1 impression and the Item K1 tire, segment A-B, share agreement of class and randomly acquired characteristics. The K tire was identified as making this impression. The Q2 impression and the Item K1 tire, segment F-G and G-A, share agreement of class and randomly acquired characteristics. The K tire was identified as making this impression. The Q3 impression and the Item K1 tire, segment B-C and C-D, share agreement of class and randomly acquired characteristics. The K tire was identified as making this impression. The Q4 impression and the Item K1 tire, segment C-D and D-E, share agreement of class and randomly acquired characteristics. The K tire was identified as making this impression.
3C9QEX- 5355	The local Department submitted four questioned impressions along with a known exemplar for comparison. Item 1-4.1 Impression Q1: Upon analysis, the above listed item was found to possess detail, with sufficient quality and quantity of detail for comparison for identification purposes. I compared the impression listed as Q1 to the known exemplars and concluded that Q1 shares size and tread design along with wear and accidental characteristics of segment A-B K1. Item 1-4.2 Impression Q2: Upon analysis, the above listed item was found to possess detail, with sufficient quality and quantity of detail for comparison for identification purposes. I compared the impression listed as Q2 to the known exemplars and concluded that Q2 shares size and tread design along with wear and accidental characteristics of segments F-G (K6) and G-A (K7). Item 1-5.1 Impression Q3: Upon analysis, the above listed item was found to possess detail, with sufficient quality and quantity of detail for comparison for identification purposes. I compared the impression listed as Q3 to the known exemplars and concluded that Q3 shares size and tread design along with wear and accidental characteristics of segments B-C (K2) and C-D (K3). Item 1-5.2 Impression Q4: Upon analysis, the above listed item was found to possess detail, with sufficient quality and quantity of detail for comparison for identification purposes. I compared the impression listed as Q4 to the known exemplars and concluded that Q4 shares size and tread design along with wear and accidental characteristics of segments C-D (K3) and D-E (K4).
3GJ4WW- 5355	The recovered tire is a Firestone Firehawk passenger tire, 195/65R15 91H M&S, bearing DOT number W2AE FH1 5017. The DOT number indicates these tires were manufactured during the 50th week of 2017. The tire exhibits some wear. Searches ¹ were performed using the provided tire sidewall information. All of the questioned impressions have a similar general tread design. The full width tire impressions have a five-rib, four-groove asymmetrical design. The impressions from the scene were compared to the submitted tire and test impressions of that tire. Q1 – Q4 correspond in physical size, tread design, wear, and multiple randomly acquired characteristics to the known tire and therefore, were made by that tire.
3TX22Z- 5351	In this test we used TrasoScan system and Lucia Forensic 7.40 program. We compared photographs of the tire (K1-K7) and their imprints (K1_2-K7_2) with photographs of questioned imprints (Q1-Q4). Comparisons concerned the physical size and shape of the tire, the tires design and random individual identifying characteristics. From the performed comparative analysis we observed that on the surface of the tires, being the comparative material, there were present some individual identifying characteristics. Similar individual characteristics were also found in the evidence material marked Q1, Q2, Q3 and Q4 and therefore, we assigned grade A to them.

TABLE 2

(WebCode)- Test	Conclusions
4339GZ- 5351	It was determined that the imprints, Q-1 through Q-4, were made by the recovered tire, K-1 through K-7.
6M83QH- 5355	The Q1-Q4 imprints correspond with portions of the recovered tire in physical size and design, general condition of wear, specific areas of wear, and a number of randomly acquired features. Therefore, the recovered tire is the source of the Q1-Q4 imprints.
78LACV- 5351	[No Conclusions Reported.]
7QXYQT- 5351	The known tire depicted in images K1-K7 was the source of, and made, the questioned impressions; Q1, Q2, Q3 and Q4.
7Z7QVG- 5355	Item #1 (segments G-B) has been identified as the source of impression Q1. Item #1 (segments F-A) has been identified as the source of impression Q2. Item #1 (segments B-D) has been identified as the source of impression Q3. Item #1 (segments C-E) has been identified as the source of impression Q4.
9426TQ- 5351	The Item K1-K7 photos depict tire tread segments from a recovered Firestone brand tire. The Item K1_2-K7_2 and K1_3-K7_3 photos depict test impression segments from the same recovered tire. Examination of Items Q1-Q2 revealed two overlapping partial tire impressions on a sign displaying black and red graphics. The two tire impressions were found to display pattern features suitable for further analysis. Examination of Items Q3-Q4 revealed two side-by-side partial tire impressions on tan cardboard. The two tire impressions were found to display pattern features suitable for further analysis. Comparative analysis between the Item Q1 questioned impression and known tires/test impressions revealed correspondence of class characteristics (tread pattern, physical size, and general condition of wear). In addition, the correspondence of multiple randomly acquired characteristics was observed between Item Q1 and segment A-B of the known tire/test impressions. It was concluded that the recovered Firestone tire was the source of, and made, the Item Q1 impression. Another tire being the source of the impression is considered a practical impossibility. Comparative analysis between the Item Q2 questioned impression and known tires/test impressions revealed correspondence of class characteristics (tread pattern, physical size, and general condition of wear). In addition, the correspondence of multiple randomly acquired characteristics was observed between Item Q2 and segments F-G/G-A of the known tire/test impressions. It was concluded that the recovered Firestone tire was the source of, and made, the Item Q2 impression. Another tire being the source of the impression is considered a practical impossibility. Comparative analysis between the Item Q3 questioned impression and known tires/test impressions revealed correspondence of class characteristics (tread pattern, physical size, and general condition of wear). In addition, the correspondence of multiple randomly acquired characteristics was observed between Item Q3 and segments B-C/C-D of the known tire/test impressions. It was concluded that the recovered Firestone tire was the source of, and made, the Item Q3 impression. Another tire being the source of the impression is considered a practical impossibility. Comparative analysis between the Item Q4 questioned impression and known tires/test impressions revealed correspondence of class characteristics (tread pattern, physical size, and general condition of wear). In addition, the correspondence of multiple randomly acquired characteristics was observed between Item Q4 and segments C-D/D-E of the known tire/test impressions. It was concluded that the recovered Firestone tire was the source of, and made, the Item Q4 impression. Another tire being the source of the impression is considered a practical impossibility.
9FQ4KT- 5351	Q1)Physical configuration such as size of tire and shape of pattern of the recovered tire is compatible to the questioned imprints. Specific wear point of tire is matched with questioned imprints, so it is concluded as 'A'. Q2)Physical configuration such as size of tire and shape of

TABLE 2

(WebCode)- Test	Conclusions
	<p>pattern of the recovered tire is compatible to the questioned imprints. But specific torn point of the tire is not found in the questioned imprints, so it is concluded as 'F'. Q3) Physical configuration such as size of tire and shape of pattern of the recovered tire is compatible to the questioned imprints. And wear pattern and torn pattern of the tire can be found in the questioned imprints, so it is concluded as 'A'. Q4) Physical configuration such as size of tire and shape of pattern of the recovered tire is compatible to the questioned imprints. But specific torn point of the tire is not found in the questioned imprints, so it is concluded as 'G'.</p>
9PFPPR-5351	<p>I examined K1-K7 with Q1-Q4. K1-K7 was excluded from having made Q3. Segments A-B was determined to have made Q1. Segments G-A was determined to have made Q2. Segments C-E was determined to have made Q4.</p>
BMP6ZD-5355	<p>The questioned imprints Q1 and Q2 were likely to be made by the recovered tire. The questioned imprints Q3 and Q4 were made by the recovered tire.</p>
CA86FP-5351	<p>Items Submitted: Items K1 – K7: Photographs of the recovered tire (segments), lighted from above. Items K1_2 – K7_2: Photographs of known imprints made with the recovered tire (segments). Item Q1: Photograph of questioned imprint found on a “No Parking” sign in the adjacent road. Item Q2: Photograph of questioned imprint found on a “No Parking” sign in the adjacent road. Item Q3: Photograph of questioned imprint found on a piece of cardboard in the adjacent road. Item Q4: Photograph of questioned imprint found on a piece of cardboard in the adjacent road. Examination: The questioned imprint labeled Q1 and the known tire K1, segment A-B, share agreement of class and randomly acquired characteristics of sufficient quality and quantity. It is the opinion of this examiner, that Q1 was made by K1 segment A-B. The questioned imprint labeled Q2 shares the same general class characteristics, wear, and noise treatment as K1 segment G-A. There were no visible corresponding random identifying characteristics seen. It is the opinion of this examiner, that Q2 could have been made by K1 segment G-A or any other tire with the same overall general class characteristics and wear. The questioned imprint labeled Q3 and the known tire K1, segment B-C, share agreement of class and randomly acquired characteristics of sufficient quality and quantity. It is the opinion of this examiner, that Q3 was made by K1 segment B-C. The questioned imprint labeled Q4 shares the same general class characteristics, wear, and noise treatment as K1 segment C-D. There were no visible corresponding random identifying characteristics seen. It is the opinion of this examiner, that Q2 could have been made by K1 segment C-D or any other tire with the same overall general class characteristics and wear.</p>
CCY4UN-5351	<p>Impressions Q1 - Q4 are similar in tread design, dimension (including pitch sequence), wear and randomly acquired characteristics to the known tire. However, the randomly acquired characteristics are not of sufficient quality and quantity to permit a conclusion that the tire was the source of the impressions. Other tires with the same class characteristics observed in the impressions are included in the population of possible sources only if they have the same wear and randomly acquired characteristics observed in the questioned impressions.</p>
EN7TLN-5355	<p>The questioned imprints were compared to the imprints of the recovered tire. Every item Q1 to Q4 shared enough details and individual characteristics to make identifications. – A. Identification</p>
F4AMRN-5351	<p>The partial tire impressions in the photographs labeled Q1-Q3 were identified as having been made by the known tire. The partial tire impression in the photographed labeled Q4 was excluded from having been made by the known tire based on class characteristic differences (wear and tread size).</p>

TABLE 2

(WebCode)- Test	Conclusions
F7G6QJ- 5351	<p>The photographs (Items K1-K7) and known imprints (Items K1_2 – K7_2) of the recovered tire were compared to the photographs of the questioned imprints (Items Q1-Q2 and Q3-Q4) from the adjacent road. A statistical assessment of significance of associations is not possible, but the following categories are intended to provide context for the level of association reported. A Category 1 conclusion (identification) indicates that the compared samples exhibit characteristics demonstrating that the questioned impression was created by the known item. The size, shape, and tread design are the same. In addition there are randomly acquired characteristics, significant in size, clarity, and/or number that are the same. A Category 2 conclusion (class association) indicates that the compared samples exhibit characteristics demonstrating that the questioned impression could have been created by the known item, but associations within this category cannot definitively establish that the compared samples came from the same source. There are varying degrees of associations within this category depending on the types of characteristics observed. Category 2A: The questioned impression and known item share characteristics not expected to be encountered in the general population. The size, shape, and tread design are the same, as well as wear patterns and/or some small randomly acquired characteristics that are the same. Category 2B: The questioned impression and known item share characteristics that have been manufactured. The size, shape, and tread design are the same. A Category 3 (inconclusive) conclusion indicates that the compared samples do not exhibit enough characteristics to associate or eliminate the questioned impression and known item. The questioned impression and known item may share characteristics that have been manufactured or the general shape and tread design are the same, and further comparisons are not possible due to the quality of the impression or documentation of the impression. A Category 4 (elimination) conclusion indicates that the compared samples exhibit characteristics demonstrating that the questioned impression could not have been made by the known item. The impression in the Item Q1 image was similar in size, shape, and tread design to the recovered tire impression (Section A-B). In addition, there were several randomly acquired characteristics that were consistent with those in the recovered tire (Section A-B). This impression was made by this tire (Category 1, CTS Conclusion A). The impression in the Item Q2 image was similar in size, shape, and tread design to the recovered tire impression (Section F-G-A). In addition, there were several randomly acquired characteristics that were consistent with those in the recovered tire (Section F-G-A). This impression was made by this tire (Category 1, CTS Conclusion A). The impression in the Item Q3 image was similar in size, shape, and tread design to the recovered tire impression (Section B-C-D). In addition, there were several randomly acquired characteristics that were consistent with those in the recovered tire (Section B-C-D). This impression was made by this tire (Category 1, CTS Conclusion A). The impression in the Item Q4 image was similar in size, shape, and tread design to the recovered tire impression (Section C-D-E). In addition, there were several randomly acquired characteristics that were consistent with those in the recovered tire (Section C-D-E). This impression was made by this tire (Category 1, CTS Conclusion A). Identifications are not absolute and a statistical significance cannot be assigned.</p>
FYL3N9- 5355	<p>The tyre K (Segment A-B) and impression Q1 share agreement of class characteristics (size, tread design and general wear), and randomly acquired characteristics, of sufficient quality and quantity, that in my opinion, I consider the likelihood of another tyre being the source of impression Q1 as negligible. The tyre K (Segment F-A) and impression Q2 share agreement of class characteristics (size, tread design and general wear), and some randomly acquired characteristics, that were insufficient for identification. Other items with the same class and randomly acquired characteristics are included as possible sources of Q2. The tyre K (Segments B-D) and impression Q3 share agreement of class characteristics (size, tread design and general wear), and randomly acquired characteristics, of sufficient quality and quantity, that in my opinion, I consider the likelihood of another tyre being the source of impression Q3 as negligible. The tyre K (Segment C-E) and impression Q4 share agreement of class characteristics (size, tread design and general wear), and randomly acquired characteristics, of sufficient quality and quantity, that in my opinion, I consider the likelihood of another tyre being the source of</p>

TABLE 2

(WebCode)- Test	Conclusions
GY2L96-5355	impression Q4 as negligible.
J3BKGG-5355	[No Conclusions Reported.]
JDABZ4-5351	1) Impressions Q1, Q3 and Q4 were identified as having been made by the submitted tire. 2) Impression Q2 could have been made by the submitted tire based on class and some individual characteristics; however, insufficient detail precludes a more conclusive determination.
JJYV4J-5355	Q1- in the A-B interval. Q2- in the G-A and F-G interval. Q3- in the C-D and B-C interval. Q4- in the D-E and C-D interval.
JLKDL4-5351	Laboratory examinations were conducted and the finding of this examiner is that questioned imprints Q1 through Q4 were identified as having been made by the recovered tire.
KBJAUF-5351	Q1 was identified as being made by segment A to B (K1) of the known tire. This identification is based on sufficient agreement of randomly acquired characteristics (individual characteristics) and all discernible class characteristics. Q2 was identified as being made by segment F to B (K6, K7, K1) of the known tire. This identification is based on sufficient agreement of randomly acquired characteristics (individual characteristics) and all discernible class characteristics. Q3 was identified as being made by segment B to D (K2, K3) of the known tire. This identification is based on sufficient agreement of randomly acquired characteristics (individual characteristics) and all discernible class characteristics. Q4 was identified as being made by segment C to E (K3, K4) of the known tire. This identification is based on sufficient agreement of randomly acquired characteristics (individual characteristics) and all discernible class characteristics.
KC9XR2-5351	Methods used: Visual comparison with overlay. Q1- There is correspondence of design, physical size of design, degree and location of wear, as well as three Randomly Acquired Characteristics (RAC's) which correspond in size, shape, location, and orientation between questioned Impression Q1 and the known tire. This is an identification on the SWGTREAD scale. The known tire was the source of, and made, the questioned impression Q1. Another tire being the source of the impression is considered a practical impossibility. Q2- There is correspondence of design, physical size of design, degree and location of wear, as well as seven Randomly Acquired Characteristics (RAC's) which correspond in size, shape, location, and orientation between questioned Impression Q2 and the known tire. This is an identification on the SWGTREAD scale. The known tire was the source of, and made, the questioned impression Q2. Another tire being the source of the impression is considered a practical impossibility. Q3- There is correspondence of design, physical size of design, degree and location of wear, as well as eight Randomly Acquired Characteristics (RAC's) which correspond in size, shape, location, and orientation between questioned Impression Q3 and the known tire. This is an identification on the SWGTREAD scale. The known tire was the source of, and made, the questioned impression Q3. Another tire being the source of the impression is considered a practical impossibility. Q4- There is correspondence of design, physical size of design, degree and location of wear, as well as seven Randomly Acquired Characteristics (RAC's) which correspond in size, shape, location, and

TABLE 2

(WebCode)- Test	Conclusions
LBT2Z2- 5351	orientation between questioned Impression Q4 and the known tire. This is an identification on the SWGTREAD scale. The known tire was the source of, and made, the questioned impression Q4. Another tire being the source of the impression is considered a practical impossibility.
LF9AN2- 5351	I conducted a comparison between the sample inked tyre impressions and the four unknown impressions Q1, Q2, Q3 and Q4. The results of my comparisons were as follows: The tyre which made the sample inked impressions was also responsible for creating the impressions Q1, Q3 and Q4. The tyre which made the sample inked impressions did not create the impression Q2.
LU9BZ3- 5355	Impressions Q1, Q2, Q3, and Q4, are similar in class characteristics and wear to the known tire. Impressions Q1, Q2, Q3, and Q4 have randomly acquired characteristics that are present on the known tire. The known tire made impressions Q1, Q2, Q3, and Q4.
M4T2ZY- 5351	In the opinion of the examiner, the particular known tyre was the source of, and made, the questioned impressions Q1, Q2, Q3 and Q4. The chance of another tyre being the source of the impressions is considered negligible.
M689LG- 5355	Laboratory examinations were conducted between the submitted standards and impressions Q1 through Q4. It is the finding of this examiner that impressions Q1, Q2, Q3 and Q4 were made by the submitted Firestone tire.
M689LG- 5355	ITEM Q1: We established tread design compatibility, pitch sequences, and general tread wear with the AB segment. We don't detect any acquired characteristics. In addition, we have as a major limiting factor that we don't have the entire width of the tread. It is therefore a limited association of class characteristics. ITEM Q2: The examination established tread design compatibility, pitch sequences and general tread wear with the FG and GA segments. The absence of acquired characteristic limits us to the association of class characteristics. ITEM Q3: The Q3 tire print corresponds to the BC and CD segments, both in terms of their class characteristics and their acquired characteristics (presence of a cut and scratch). As the imprint is in 2D, measurement of the depth of the sculptures isn't possible, limiting the identification to a high degree of association. ITEM Q4: This tire print corresponds to the CD and DE segments, both in terms of their class characteristics and their acquired characteristics (presence of a cut and scratch). As the imprint is in 2D, measurement of the depth of the sculptures isn't possible, limiting the identification to a high degree of association.
M97JHG- 5355	Q1: The questioned tire imprint marked Q1 found on a -No Parking- sign in the adjacent road was found to have been made by the recovered tire from the suspect vehicle. Q2: The questioned tire imprint marked Q2 found on a -No Parking- sign in the adjacent road was found to have been made by the recovered tire from the suspect vehicle. Q3: The questioned tire imprint marked Q3 found on a piece of cardboard in the adjacent road was found to have been made by the recovered tire from the suspect vehicle. Q4: The questioned tire imprint marked Q4 found on a piece of cardboard in the adjacent road was found to have been made by the recovered tire from the suspect vehicle.
MCJJE8- 5355	As a result of the comparison that was made for tire track imprint of Q1, Q2, Q3 and Q4; it is identified these followings below are coherent. Q1: BETWEEN A-B. Q2: BETWEEN F-G/G-A (BETWEEN F-A). Q3: BETWEEN B-C/C-D (BETWEEN B-D). Q4: BETWEEN C-D/D-E (BETWEEN C-E).
ME8VDD- 5355	Items Q1-Q2 (No parking sign) and Items Q3-Q4 (cardboard) were examined for the presence of tire impressions. Four tire impressions, Items Q1, Q2, Q3, and Q4, were observed on the items. The four tire impressions found were compared to the photographs of the known tire in

TABLE 2

(WebCode)- Test	Conclusions
	<p>Items K1-K7 and to the tire exemplars, Items K1_2-K7_2 and K1_3-K7_3, made from the tire in Items K1-K7. Items Q1-Q2, Q3-Q4, K1-K7, K1_2-K7_2, and K1_3-K7_3 were examined visually and all comparisons were performed using ACE-V methodology. Tire Impression Results: Item Q1: Item Q2: Item Q3: Item Q4: The impressions listed above are similar in size, shape, tread design, and individualizing characteristics to the tire in Items K1-K7 and to the exemplars made from the tire, Items K1_2-K7_2 and K1_3-K7_3. Comparison results: The impressions are identified as being made by the tire in Items K1-K7.</p>
MKDRYY- 5355	<p>The USB drive contained digital photographs of four tire impressions (Q1-Q4), the suspected tire, and the impressions made with that tire (K1-K7). The photos were enhanced and compared to each other using Adobe® Photoshop® CC. The submitted tire and the questioned impressions share agreement of class and of randomly acquired characteristics of sufficient quality and quantity. In the opinion of the examiner, the submitted tire was identified as the source of all four questioned impressions: --section between A and B was the source of impression Q1. --section between F and A, centered around G, was the source of impression Q2. --section between B and D, centered around C, was the source of impression Q3. --section between C and E, centered around D, was the source of impression Q4.</p>
MQLTHG- 5351	<p>The tire from which the images (Items K1 thru K7) and the inked imprints (Item K1_2 thru K7_2) were obtained and the impressions depicted in Item Q1 and Item Q2 share a high degree of association based on an agreement of class characteristics (tread design and size), wear, and randomly acquired characteristics. This tire impression was found to strongly correspond in class characteristics and some randomly acquired characteristics with the questioned impressions. However, the correspondence was insufficient for an identification. This tire or other tires with the same class characteristics observed in the impression could be the source of the questioned impressions only if they display the same wear or randomly acquired characteristics. The tire from which the images (Items K1 thru K7) and the inked imprints (Item K1_2 thru K7_2) were obtained is identified as having made the impressions depicted in Item Q3 and Item Q4 based on an agreement of class characteristics (tread design and size), wear, and randomly acquired characteristics of sufficient quality and quantity. This tire was the source of the questioned impressions. Another item being the source is considered a practical impossibility.</p>
NLL4EE- 5351	<p>RESULTS AND CONCLUSIONS: Item Q1: The tire impression in the A-B segment of the test impressions was similar in size, shape and tread design with the questioned impression. There were several randomly acquired characteristics and wear patterns that were consistent between both impressions. The questioned impression is identified to the A-B segment (Item K1_2) of the test impressions. (CTS Code: A; [Laboratory] Category 1) Identifications are not absolute and a statistical significance cannot be assigned. Item Q2: The tire impressions in the F-A segments of the test impressions were similar in size, shape and tread design with the questioned impression. There were several randomly acquired characteristics and wear patterns that were consistent between these impressions. The questioned impression is identified to the F-A segments (Items K6_2 and K7_2) of the test impressions. (CTS Code: A; [Laboratory] Category 1) Identifications are not absolute and a statistical significance cannot be assigned. Item Q3: The tire impressions in the B-D segments of the test impressions were similar in size, shape and tread design with the questioned impression. There were several randomly acquired characteristics and wear patterns that were consistent between these impressions. The questioned impression is identified to the B-D segments (Items K2_2 and K3_2) of the test impressions. (CTS Code: A; [Laboratory] Category 1) Identifications are not absolute and a statistical significance cannot be assigned. Item Q4: The tire impressions in the C-E segments of the test impressions were similar in size, shape and tread design with the questioned impression. There were several randomly acquired characteristics and wear patterns that were consistent between these impressions. The questioned impression is identified to the C-E segments (Items K3_2 and K4_2) of the test impressions. (CTS Code: A; [Laboratory] Category 1) Identifications are not absolute and a statistical significance cannot be assigned. A Category 1 conclusion (identification) indicates that the compared</p>

TABLE 2

(WebCode)- Test	Conclusions
	<p>samples exhibit characteristics demonstrating that the questioned impression was created by the known item. The size, shape, and tread design are the same. In addition there are randomly acquired characteristics, significant in size, clarity, and/or number that are the same. A Category 2 conclusion (class association) indicates that the compared samples exhibit characteristics demonstrating that the questioned impression could have been created by the known item, but associations within this category cannot definitively establish that the compared samples came from the same source. There are varying degrees of associations within this category depending on the types of characteristics observed. Category 2A: The questioned impression and known item share characteristics not expected to be encountered in the general population. The size, shape, and tread design are the same, as well as wear patterns and/or some small randomly acquired characteristics that are the same. Category 2B: The questioned impression and known item share characteristics that have been manufactured. The size, shape, and tread design are the same. A Category 3 (inconclusive) conclusion indicates that the compared samples do not exhibit enough characteristics to associate or eliminate the questioned impression and known item. The questioned impression and known item may share characteristics that have been manufactured or the general shape and tread design are the same, and further comparisons are not possible due to the quality of the impression or documentation of the impression. A Category 4 (elimination) conclusion indicates that the compared samples exhibit characteristics demonstrating that the questioned impression could not have been made by the known item.</p>
NW89LE-5355	<p>Items Q1 through Q4 were compared to the tire segments in Item K1-K7. IDENTIFICATION (This is the highest degree of association expressed by an impression examiner. In the opinion of the examiner, the particular known tire was the source of, and made, the questioned impression. Another tire being the source of the impression is considered a practical impossibility.) The known tire track imprint from the recovered vehicle (Item K1) was identified as having made the tire imprint on the "No Parking" sign (Item Q2) and both imprints from the piece of cardboard (Item Q3 and Item Q4) both recovered from the road adjacent to the scene. HIGH DEGREE OF ASSOCIATION (The questioned impression and known tire must correspond in the class characteristics of design, physical size and general wear. In the opinion of the examiner, the characteristics observed exhibit strong associations between the questioned impression and known tire; however, the quality and/or quantity were insufficient for an identification. Other tires with the same class characteristics observed in the impression are included in the population of possible sources only if they display the same wear and/or randomly acquired characteristics observed in the questioned impression.) The known tire track imprint from the recovered vehicle (Item K1) was showed a high degree of association to the tire imprint on the "No Parking" sign (Item Q1) that was recovered from the road adjacent to the scene.</p>
Q6B2UC-5355	<p>The four partial tire impressions (Q1 through Q4) were made by the tire in the submitted images (K1 through K7).</p>
QAKFBB-5351	<p>Q1 and Q3: The marks shows agreement in pattern, pitch, wear and fine detail to the submitted tyre, such that, in our opinion the tyre is responsible for the marks. Q2 and Q4: The marks show differences in the spatial arrangement of the pattern elements such that the tyre is not responsible for the marks.</p>
QB2C4B-5355	<p>Q1 was identified to K1, segment A-B. Q2 was identified to K1, segments F-G, G-A (F-A). Q3 was identified to K1, segments B-C, C-D (B-D). Q4 was identified to K1, segments C-D, D-E (C-E).</p>
QTW6P9-5351	<p>The Items Q1, Q2, Q3, and Q4 questioned tire impressions were analyzed, compared, and evaluated with Items K1 through K7 known tire impressions. The Item Q1 questioned tire impression corresponds in tread design, physical size, general and specific wear, and three (3) randomly acquired characteristics with the Item K1 Segment A-B. The Item Q2 questioned tire</p>

TABLE 2

(WebCode)- Test	Conclusions
	<p>impression corresponds in tread design, physical size, general and specific wear, and one (1) randomly acquired characteristic with the Item K7 Segment G-A. The Item Q3 questioned tire impression corresponds in tread design, physical size, general and specific wear, and two (2) randomly acquired characteristics with the Item K3 Segment C-D. The Item Q4 questioned tire impression was not made by the known tire impressions K1 through K7. Item Q4 contained one (1) randomly acquired characteristic that was not present in impressions K1 through K7. Item Q4 also did not correspond in physical size with impressions K1 through K7. Based upon the above factors, it is the opinion of this examiner that: Item Q1 questioned tire impression was made by K1 Segment A-B known tire. Item Q2 questioned tire impression was made by K7 Segment G-A known tire. Item Q3 questioned tire impression was made by K3 Segment C-D known tire. The known tire impressions K1 through K7 were excluded as being the source of questioned tire impression Q4. The identifications and exclusion contained within this report have been verified by a second qualified latent print examiner.</p>
R2ADPA-5351	<p>In my opinion, the findings: 1. Provides conclusive support for the proposition that the tyre recovered directly from the suspect vehicle has made the two tyre marks, labelled Q1 (on a 'No Parking' sign) and Q3 (on a piece of cardboard), both recovered in the road, running adjacent to the area of interest. 2. Provides conclusive support for the proposition that the tyre recovered directly from the suspect vehicle has not made the other tyre mark, labelled Q4 (on a piece of cardboard), recovered in the road, running adjacent to the area of interest. 3. Provides moderate support for the proposition that the tyre recovered directly from the suspect vehicle has not made the other tyre mark, labelled Q2 (on a 'No Parking' sign), recovered in the road, running adjacent to the area of interest.</p>
RQN9HB-5351	<p>Photographs of known imprints made with the recovered tire (Firestone 195/65R15 91H M&S, DOT W2AE FH1 5017) involved in the scene which are recovered by Photograph of questioned imprints found on a -No Parking- sign in the adjacent road and Photograph of questioned imprints found on a piece of cardboard in the adjacent road.</p>
TAYKN7-5355	<p>Q1TT1 - Item K1 (segment A-B of the Item K known tire) has been identified as being the source of the Q1TT1 impression. Q1TT1 is excluded to the Items K2 - K7 (segments C-A of Item K) known tire. Q2TT1 - Items K6-K7 (segments F-A of the Item K known tire) have been identified as being the source of the Q2TT1 impression. Q2TT1 is excluded to the Items K1 - K5 (segments A-F of Item K) known tire. Q3TT1 - The Items K2-K3 (segments B-D of the Item K known tire) have been identified as being the source of the Q3TT1 impression. Q3TT1 is excluded to the Items K1 (segment A-B of Item K) and K4-K7 (segments D-A of Item K) known tire. Q4TT1 - The Items K3-K4 (segments C-E of the Item K known tire) have been identified as being the source of the Q4TT1 impression. Q4TT1 is excluded to the Items K1-K2 (segments A-C of Item K) and K5-K7 (segments E-A of Item K) known tire.</p>
U4MWMA-5355	<p>The evidence in items 1D and 1E (CTS # Q1-Q4) was visually examined for impression evidence. Four (4) questioned imprints of value were determined to be present in items 1D and 1E (CTS # Q1-Q4). All four (4) of the questioned imprints of value in items 1D and 1E (CTS # Q1-Q4) were visually examined and compared against the recovered tire in item 1A (CTS # K1 through K7) and the known imprints in item 1B (CTS # K1_2 through K7_2). The four (4) questioned imprints of value in items 1D and 1E (CTS # Q1-Q4) were determined to have been made by the recovered tire in item 1A (CTS # K1 through K7). Item 1C (CTS # K1_3 through K7_3) was not used for comparison purposes.</p>
U6XYBU-5355	<p>The results of the examination extremely strongly support that the imprints ITEM Q1-Q4 was made with the recovered tire ITEM K (Level +4).</p>

TABLE 2

(WebCode)- Test	Conclusions
UH9CQ9- 5355	The questioned imprints Q1-Q4 shares agreement of class characteristics and randomly acquired characteristics of sufficient quality and quantity with the recovered tire (Firestone 195/65R15 91H M&S) and the known imprint (Q1: segments A-B; Q2: segments F-A; Q3: B-D; Q4: C-E), which were made with the tire. The recovered tire was the source of, and made, the questioned imprints Q1-Q4. Another item of tire being the source of the imprint is considered a practical impossibility.
V3BGT9- 5355	The evidence in items 1D (CTS# Q1-Q2) and 1E (CTS# Q3-Q4) was visually examined for impression evidence. Four (4) partial tire track impressions of value (Q1, Q2, Q3, and Q4) were determined to be present on the evidence in items 1D (CTS# Q1-Q2) and 1E (CTS# Q3-Q4). The four (4) partial tire track impressions of value (Q1, Q2, Q3, and Q4) in items 1D (CTS# Q1-Q2) and 1E (CTS# Q3-Q4) were visually examined and compared against the tire in item 1A (CTS# K1-K7) and the known imprints in items 1B (CTS# K1_2-K7_2) and 1C (CTS# K1_3-K7_3). The four (4) partial tire track impressions of value (Q1, Q2, Q3, and Q4) in items 1D (CTS# Q1-Q2) and 1E (CTS# Q3-Q4) were determined to have been made by the tire in item 1A (CTS# K1-K7).
VCC6K7- 5355	Results of Laboratory Examination: Item 1 contained images depicting four questioned tire track impressions, one known tire and corresponding tire impressions from that tire. The four questioned impressions labeled Q1 through Q4 were compared to the images of the known tire and known tire impressions. A complete evaluation of a questioned impression and a known tire includes looking at correspondence in tread design, physical size and shape of design present, wear characteristics, and any distinctive characteristics randomly acquired on the tread of the known tire that are represented in the questioned impression. The Q1 through Q4 questioned tire impressions corresponded in tread design, size of tread, noise treatment, randomly acquired characteristics, and in some cases distinctive wear (schallamach pattern) to the known tire. Therefore, the tire depicted in Item 1 is the source of the questioned tire impressions (Type I Association/Identification). Item 2 was created by the scientist and will be retained in the Trace Evidence Section. Interpretation: The following descriptions are meant to provide context to the opinions reached in this report. Not every type of conclusion may be applicable in every case or for every material type. Type I Association: Identification. Source identification is reached when the discernible class and individual characteristics have corresponding detail and the examiner would not expect to see the same arrangement of details repeated in another source. This includes when two items fit or realign together in a manner that is not expected to be replicated. Type II Association: Association with distinct characteristics. Items correspond in all measured physical properties, chemical composition and/or microscopic characteristics and share distinctive characteristic(s). Although the examiner would not expect to see these distinctive characteristic(s) repeated in another source, it lacked sufficient characteristics for a source identification. Type III Association: Association with conventional characteristics. Items correspond in all measured physical properties, chemical composition and/or microscopic characteristics. However, it is possible for another sample to be indistinguishable from the submitted evidence; therefore, an individual source cannot be determined. Type IV Association: Association with limitations. An association of decreased evidential value in which items correspond in all measured physical properties, chemical composition and/or microscopic characteristics, but there is a limitation to the exam. Limitations could include items commonly encountered in the relevant population, the inability to perform a complete analysis, or limited information. Inconclusive. No conclusion could be reached regarding an association or an exclusion between the items. Exclusion with Limitations. The item exhibits differences to the comparison sample that suggests that it did not originate from the same source. However, there are limiting factors, such as possible natural or manufactured source variations. Exclusion. The items exhibit differences in physical properties and/or chemical composition to the comparison sample that demonstrate they did not originate from the same source.

TABLE 2

(WebCode)- Test	Conclusions
WWHYR3- 5351	<p>The known tire depicted in exhibit TIEP, segment A-B, was the source of, and made, the questioned impression designated Q1 in exhibit TIEP. This identification is based on correspondence of class and randomly acquired characteristics. Another tire being the source of the questioned impression is considered a practical impossibility. The known tire depicted in exhibit TIEP, segments F-G, G-A, and A-B, was the source of, and made, the questioned impression designated Q2 in exhibit TIEP. This identification is based on correspondence of class and randomly acquired characteristics. Another tire being the source of the questioned impression is considered a practical impossibility. The known tire depicted in exhibit TIEP, segments B-C and C-D, was the source of, and made, the questioned impression designated Q3 in exhibit TIEP. This identification is based on correspondence of class and randomly acquired characteristics. Another tire being the source of the questioned impression is considered a practical impossibility. The known tire depicted in exhibit TIEP, segments C-D and D-E, was the source of, and made, the questioned impression designated Q4 in exhibit TIEP. This identification is based on correspondence of class and randomly acquired characteristics. Another tire being the source of the questioned impression is considered a practical impossibility.</p>
X3K786- 5355	<p>As a result of the comparison operations of the incident scene tracks (questioned tracks) classified as Q1, Q2, Q3 and Q4 in the result table and the comparative tire track sections (known substances) classified with the letters "A, B, C, D, E, F, G"; It has been observed that these traces are compatible. In terms of class and individual characteristics; it was determined that the tire obtained from the suspect vehicle was used in the theft incident.</p>
YAGMX2- 5355	<p>Items Q1-Q2 (No Parking sign) and Q3-Q4 (cardboard) were examined for the presence of tire impressions. Four tire impressions, Items Q1, Q2, Q3, and Q4, were observed on the two items. The tire impressions found (Items Q1, Q2, Q3, and Q4) were compared to the photographs of the known tire in Item K1-K7 and to the tire exemplars Items K1_2-K7_2 and K1_3-K7_3 created from the tire in Item K1-K7. Items Q1-Q2, Q3-Q4, K1-K7, K1_2-K7_2, and K1_3-K7_3 were examined visually and all comparisons were performed using ACE-V methodology. Tire Impression Results: Item Q1: Item Q2: Item Q3: Item Q4: The impressions listed above are similar in size, shape, tread design, and individualizing characteristics to the tire in Item K1-K7 and the exemplars created from the tire, Items K1_2-K7_2 and K1_3-K7_3. Comparison results: The impressions are identified as being created by the tire in Item K1-K7.</p>
YKWA9M- 5351	<p>During the comparison of Item 001-Q1, I observed that this questioned tire imprint had the same tread design as the known tire and that it aligned at segments A through B. I also observed similar wear patterns between the questioned and known tire imprints, and numerous corresponding randomly acquired characteristics. As a result, I concluded that Item 001-Q1 was produced by the known recovered tire. During the comparison of Item 001-Q2, I observed that this questioned tire imprint had the same tread design as the known tire and that it aligned at segments F through B. I also observed similar wear patterns between the questioned and known tire imprints, and numerous corresponding randomly acquired characteristics. As a result, I concluded that Item 001-Q2 was produced by the known recovered tire. During the comparison of Item 001-Q3, I observed that this questioned tire imprint had the same tread design as the known tire and that it aligned at segments B through D. I also observed similar wear patterns between the questioned and known tire imprints, and numerous corresponding randomly acquired characteristics. As a result, I concluded that Item 001-Q3 was produced by the known recovered tire. During the comparison of Item 001-Q4, I observed that this questioned tire imprint had the same tread design as the known tire and that it aligned at segments C through E. I also observed similar wear patterns between the questioned and known tire imprints, and numerous corresponding randomly acquired characteristics. As a result, I concluded that Item 001-Q4 was produced by the known recovered tire.</p>

TABLE 2

(WebCode)- Test	Conclusions
YZCFH2- 5351	<p>A statistical assessment of significance of associations is not possible, but the following categories are intended to provide context for the level of association reported. A Category 1 conclusion (identification) indicates that the compared samples exhibit characteristics demonstrating that the questioned impression was created by the known item. The size, shape, and tread design are the same. In addition there are randomly acquired characteristics, significant in size, clarity, and/or number that are the same. A Category 2 conclusion (class association) indicates that the compared samples exhibit characteristics demonstrating that the questioned impression could have been created by the known item, but associations within this category cannot definitively establish that the compared samples came from the same source. There are varying degrees of associations within this category depending on the types of characteristics observed. Category 2A: The questioned impression and known item share characteristics not expected to be encountered in the general population. The size, shape, and tread design are the same, as well as wear patterns and/or some small randomly acquired characteristics that are the same. Category 2B: The questioned impression and known item share characteristics that have been manufactured. The size, shape, and tread design are the same. A Category 3 (inconclusive) conclusion indicates that the compared samples do not exhibit enough characteristics to associate or eliminate the questioned impression and known item. The questioned impression and known item may share characteristics that have been manufactured or the general shape and tread design are the same, and further comparisons are not possible due to the quality of the impression or documentation of the impression. A Category 4 (elimination) conclusion indicates that the compared samples exhibit characteristics demonstrating that the questioned impression could not have been made by the known item. The impression in the Item Q1 image was similar in size, shape, and tread design to the known tire segments A to B. In addition, there were several randomly acquired characteristics that were consistent with those in the known tire segments A to B. This impression was made by this tire (Category 1). Identifications are not absolute and a statistical significance cannot be assigned. The impression in the Item Q2 image was similar in size, shape, and tread design to the known tire segments F to G to A. In addition, there were several randomly acquired characteristics that were consistent with those in the known tire segments G to A to B. This impression was made by this tire (Category 1). Identifications are not absolute and a statistical significance cannot be assigned. The impression in the Item Q3 image was similar in size, shape, and tread design to the known tire segments B to C to D. In addition, there were several randomly acquired characteristics that were consistent with those in the known tire segments B to C to D. This impression was made by this tire (Category 1). Identifications are not absolute and a statistical significance cannot be assigned. The impression in the Item Q4 image was similar in size, shape, and tread design to the known tire segments C to D to E. In addition, there were several randomly acquired characteristics that were consistent with those in the known tire segments C to D to E. This impression was made by this tire (Category 1). Identifications are not absolute and a statistical significance cannot be assigned.</p>
ZTQ3UL- 5351	<p>Comparison examinations were conducted. It is the finding of this examiner that impressions Q1 through Q4 were made by the submitted tire.</p>

Additional Comments

TABLE 3

(WebCode)- Test	Additional Comments
3GJ4WW- 5355	1 A search of the laboratory's tire reference collection (Tread Design Guides) and internet.
7QXYQT- 5351	A copy of the SWGTREAD standard range of conclusions would be included in the report.
FYL3N9- 5355	In my opinion: The number, size, shape (general complexity) of RACs in Q1, Q3 and Q4 combined with the presence of substantial wear similarities and correlation of design features, was sufficient to make an identification of the known tyre to these scene impressions. Whilst there was correlation in class characteristics and wear, and also some correlation in less complex RACs between Q2 and the tyre, the presence of differences that may be difficult to explain, and interference of the overlapping impressions and background substrate resulted in a conclusion of a high degree of association rather than an identification.
JJYV4J- 5355	As a result of the comparison made with the comparative tire tracks taken from the suspect tire and the suspect tire and the tire tracks Q1, Q2, Q3, Q4; it has been observed that they are compatible in terms of class characteristic and individual characteristic traces. It is concluded that the traces (Q1, Q2, Q3, Q4) in question were created by the suspect tire.
KBJAUF- 5351	There was one particular possible randomly acquired characteristic that would have been easier to confirm if the photographs of the tires included side lighting and not just overhead lighting, but this was not enough to change my conclusions.
KC9XR2- 5351	Inclusion of replicate known impressions was appreciated
LF9AN2- 5351	This test was not at all similar or helpful to casework. First, the segments are WAY too big making it near impossible to make overlays since the photos are bigger than the transparencies that we carry. The segments were also divided in the middle of elements, which made it especially hard to line up. Also, the segments were so large that the photos of the known tires were hard to use to determine identifying marks because there was so much curvature towards the ends. I would of preferred more segments that were manageable in size. It may not seem like a problem, but this forced me to make overlays of my questioned impression after visual examination for comparison. I would NEVER do this in case work. After I had a general idea I had to make three overlays for some of the segments of the known tires for comparison. It just made this proficiency take 3-4x longer than it normally would of and I felt like it really wasn't the proper way to work a case.
MCJJE8- 5355	It is concluded that all imprints (Q1, Q2, Q3 and Q4) were made by the tire sent with.
R2ADPA- 5351	The tyre marks labelled Q1 and Q3 each record several linking features that correspond to damage and wear on a particular area of the tyre, recovered directly from the suspect vehicle. The tyre mark, labelled Q2, also records significant areas of fine detail that corresponds to wear in a particular area of the tyre (segment G-A). However, there is a significant feature in the tyre mark on the 'No Parking Sign', that does not correspond to any damage present on this tyre. The tyre mark, labelled Q4, although similar in tread pattern to that seen in images of the suspect tyre, does not align to any areas present on it.
U6XYBU- 5355	The appearance of the tire was very specific and detailed. Though the submitted pictures of the tire (K1-K7) were of good quality, having access to the actual tire would have been valuable and helpful in confirming the observed details.
WWHYR3- 5351	For Q2, comparison was completed using K6 (segment F-G) and K7 (segment G-A), however due to the large overlap of K7 (segment G-A) with K1 (segment A-B), it was noted that the impression spans all three segments, F-G, G-A, and A-B.

TABLE 3

(WebCode)- Test	Additional Comments
X3K786- 5355	Q1, in the AB segment. Q2, in the FG-GA-AB segment. Q3, in the BC-CD segment. Q4, in the CD-DE segment.

-End of Report-
(Appendix may follow)

Test No. 20-5351: Tire Track Imprint Evidence

DATA MUST BE SUBMITTED BY **Nov. 23, 2020, 11:59 p.m.** TO BE INCLUDED IN THE REPORT

Participant Code: U1234A

WebCode: 87MLBC

The Accreditation Release section can be accessed by using the "Continue to Final Submission" button above. This information can be entered at any time prior to submitting to CTS.

Scenario:

Police are investigating the theft of outdoor furniture and a grill from a homeowner's backyard. Tire track imprints were recovered on several items found in the road that runs adjacent to the area of interest, and it is believed that they may have been left by the suspect vehicle. A day after this incident, a vehicle matching the appearance of one seen on home security camera footage was located approximately three miles from the site. Investigators were able to recover one tire directly from the vehicle. You are asked to compare the imprints recovered at the scene with photographs of the tire and known imprints made with the tire. The recovered tire contains the following information on the sidewall: Firestone 195/65R15 91H M&S, DOT W2AE FH1 5017.

Known, inked imprints (K1_2 through K7_2 and K1_3 through K7_3) have been labeled with an arrow to indicate directionality of movement. These inked imprints were made by placing the vehicle in neutral, and then pushing it across inking material and a continuous piece of white containerboard.

CTS has introduced a digital download supplemental for the Tire Track Imprint Evidence test series. This supplemental contains an additional set of known inked exemplars (K1_3-K7_3), accessible through a link on the CTS customer portal data entry form (see below). While the photo packet contains all materials necessary to complete the test as presented, the supplemental is intended to bolster participant confidence in their conclusions.

For this test, you are not limited to conducting only on-screen comparisons and may employ any other method you wish. However, because of differences in printing technology, CTS cannot guarantee the quality of images you print from the digital media.

Items Submitted (Sample Pack TIEP - Photographs):

Items K1-K7: Photographs of the recovered tire (segments), lighted from above.

Items K1_2-K7_2: Photographs of known imprints made with the recovered tire (segments).

Items K1_3-K7_3: Digital supplemental images of known imprints made with the recovered tire (segments).

Items Q1-Q2: Photograph of questioned imprints found on a -No Parking- sign in the adjacent road.

Items Q3-Q4: Photograph of questioned imprints found on a piece of cardboard in the adjacent road.

To verify a complete and accurate download, the hash value for the downloaded .ZIP file is as follows:

20-5351.5_Supplemental Exemplars.zip MD5 hash value: 8f7694e6e4668e0ffbaccf08dd8aeb370

20-5351.5_Supplemental Exemplars.zip SHA1 hash value: 9710f93b70a68aef34437d1f90c6eeea6580d37a

Instructions:

Select from the following list of conclusions and insert the appropriate letter in the spaces provided. If the wording below differs from the normal wording of your conclusions, adapt these conclusions as best you can and use your preferred wording in your written conclusions. These conclusions are adapted from the SWGTREAD Range of Conclusions standard.

A. Identification - Questioned and known items share agreement of class and randomly acquired characteristics of sufficient quality and quantity. Highest degree of association.

B. High degree of association - Correspondence of class characteristics, in addition to unusual wear and/or one or more randomly acquired characteristics between the questioned and known item.

C. Association of class characteristics - Correspondence of design and physical size and possibly general wear between the questioned and known item.

D. Limited association of class characteristics - Some similar class characteristics between the questioned and known item with significant limiting factors.

E. Inconclusive* - Questioned item lacks sufficient detail for a meaningful conclusion in comparison to the known item. (adapted from SWGTREAD "Lacks sufficient detail" conclusion).

F. Indications of non-association - Questioned item exhibits dissimilarities in comparison to the known item.

G. Exclusion - Questioned and known items exhibit sufficient differences of class and/or randomly acquired characteristics. Highest degree of non-association.

*Should the response "E" be used, please document the reason in the Additional Comments section of this data sheet.

1.) Indicate the results of your comparisons of the recovered tire with the questioned imprints by writing the letter of your conclusion next to each questioned imprint in the table.

If an identification or positive association is made (A-D), indicate to which segment(s) of the tire the association has been made (indicate the letters at the beginning and end of the corresponding segments).

Example:

<u>Imprint</u>	<u>Segment(s)</u>
Q1:	<input type="text" value="B"/> <input type="text" value="C-E"/>

<u>Imprint</u>	<u>Segment(s)</u>
Q2:	<input type="text" value="A"/> <input type="text" value="G-H"/>

No Parking Sign		Cardboard Box	
<u>Imprint</u>	<u>Segment(s)</u>	<u>Imprint</u>	<u>Segment(s)</u>
Q1:	<input type="text"/>	<input type="text"/>	<input type="text"/>
Q2:	<input type="text"/>	<input type="text"/>	<input type="text"/>

2.) What would be the wording of the Conclusions in your report?

Please note: Any additional formatting applied in the free form spaces below will not transfer to the Summary Report and may cause your information to be illegible. This includes additional spacing and returns that present your responses in lists and tabular formats.

3.) Additional Comments

RELEASE OF DATA TO ACCREDITATION BODIES

The Accreditation Release is accessed by pressing the "Continue to Final Submission" button online and can be completed at any time prior to submission to CTS.

CTS submits external proficiency test data directly to ASCLD/LAB, ANAB, and/or A2LA. Please select one of the following statements to ensure your data is handled appropriately.

- This participant's data is intended for submission to ASCLD/LAB, ANAB, and/or A2LA. (Accreditation Release section below must be completed.)
- This participant's data is **not** intended for submission to ASCLD/LAB, ANAB, and/or A2LA.

Have the laboratory's designated individual complete the following steps **only if your laboratory is accredited in this testing/calibration discipline** by one or more of the following Accreditation Bodies.

Step 1: Provide the applicable Accreditation Certificate Number(s) for your laboratory.

ANAB Certificate No.
(Include ASCLD/LAB Certificate here)

A2LA Certificate No.

Step 2: Complete the Laboratory Identifying Information in its entirety.

Authorized Contact Person and Title

Laboratory Name

Location (City/State)