Smart Roadside Initiative Gap Analysis

Trends in Trucking Technology Utilization Webinar Summary

www.its.dot.gov/index.htm
Final Report — April 2014
FHWA-JPO-14-133

U.S. Department of Transportation

Produced by FHWA Office of Operations Support Contract DTFH61-11-D-00012
ITS Joint Program Office
Research and Innovative Technology Administration
U.S. Department of Transportation

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Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
FHWA-JPO-14-133		

4. Title and Subtitle	5. Report Date
Smart Roadside Initiative Gap Analysis – Trends in Trucking Technology Utilization Webinar Summary	April 2014
	6. Performing Organization Code
7. Author(s)	8. Performing Organization Report No.
Katie Fender, Amanda Weber	
9. Performing Organization Name And Address	10. Work Unit No. (TRAIS)
American Transportation Research Institute 950 North Glebe Road Arlington, VA 22203	11. Contract or Grant No. DTFH61-11-D-00012
12. Sponsoring Agency Name and Address	13. Type of Report and Period Covered
U.S. Department of Transportation ITS Joint Program Office-HOIT 1200 New Jersey Avenue, SE Washington, DC 20590	Final Report
	14. Sponsoring Agency Code HOIT

15. Supplementary Notes

16. Abstract

The American Transportation Research Institute (ATRI) held the "Trends in Trucking Technology Utilization" webinar on January 23, 2014 in order to obtain industry feedback on technologies related to the Smart Roadside Initiative (SRI). During the webinar, ATRI provided a brief description of a variety of technologies. Motor carriers were then given the draft "Gap Analysis" findings and asked to comment on the results through a series of poll questions. The questions comprised both closed and open-ended questions.

A copy of the presentation and recording of the webinar are available for download at www.freightmobility.com./ Presentations.

17. Key Words	18. Distribution Statement
Smart Roadside Initiative, Connected Vehicle, Motor Carrier Technology Utilization, Commercial Truck Technology	No restrictions.

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

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Chapter 1: Smart Roadside Initiative Gap Analysis – State of the Practice

The American Transportation Research Institute (ATRI) held the "Trends in Trucking Technology Utilization" webinar on January 23, 2014 in order to obtain industry feedback on technologies related to the Smart Roadside Initiative (SRI). During the webinar, ATRI provided a brief description of a variety of technologies. Motor carriers were then given the draft "Gap Analysis" findings and asked to comment on the results through a series of poll questions. The questions comprised both closed and open-ended questions.

Over 130 individuals participated in the event, with 33 of those representing motor carriers. The participating fleets included:

- Small carriers (less than 20 power units);
- Medium carriers (21 to 999 power units); and
- Large carriers (1,000+).

Among the participants' titles, the most common were:

- President;
- Operations Manager;
- Safety Director; and
- Equipment/Vehicle Manager.

Of the remaining participants, the majority represented industry suppliers or vendors (62 percent), followed by "other" industry stakeholders (29 percent) and Federal or State DOTs (9 percent). The "other" stakeholder group included insurance providers, brokerage firms, universities, and consulting firms.

A copy of the presentation and recording of the webinar are available for download at www.freightmobility.com./Presentations.

Survey Results

A summary of the responses to each poll question is included below. Only attendee responses that were identified as representing a motor carrier are included in the analysis.

Question 1, # 1: A four percent lane departure warning system (LDWS)[1] utilization rate was found in 2009. Since that time, do you believe that utilization rates have:

Table 1-1. Changes in Lane Departure Warning System Utilization Rates

Response	Number	Percent
Remained the same (four percent)	3	16%
Increased slightly	10	53%
Increased moderately	5	26%
Increased significantly	1	5%
Decreased	0	0%
TOTAL	19	100.0%

Source: American Transportation Research Institute based on findings from webinar.

The majority of respondents believed that LDWS utilization rates have increased slightly over the past five years (53 percent), followed by increased moderately (26 percent) and remained the same (16 percent). None of the participants thought that LDWS use has decreased.

Question 1, # 2: What percent of your fleet currently is equipped with LDWS?

Nineteen carriers responded to this open-ended question. Nearly half (47 percent) reported that none of their trucks were equipped with LDWS while 16 percent indicated that all of their vehicles were equipped with the technology. The remaining respondent's fleets had LDWS installed only on a small portion of vehicles, typically less than five percent of the trucks.

Question 2, # 1: An eight percent roll stability system (RSS)[2] utilization rate was found in 2009. Since that time, do you believe that utilization rates have:

[1] LDWS monitors the position of a truck within a road lane and warns the driver when the vehicle departs or is about to depart the roadway. LDWS can be added aftermarket or installed by the truck manufacturer. The lane departure warning can be a sound, such as a rumble strip noise or alarm, a feeling, such as shaking of the steering wheel, or a visible indicator, such as a flashing alarm signal.
[2] RSS monitor the vehicle's stability and traction to reduce the risk of skidding and rollover by automatically adjusting the throttle and applying the appropriate braking functions. VSS are usually installed in the truck by the manufacturer but can also be added aftermarket.

Table 1-2. Changes in Roll Stability System Utilization Rates

Response	Number	Percent
Remained the same (eight percent)	1	5%
Increased slightly	6	32%
Increased moderately	5	26%
Increased significantly	7	37%
Decreased	0	0%
TOTAL	19	100.0%

Source: American Transportation Research Institute based on findings from webinar.

The majority of carriers reported that RSS use has increased significantly since 2009 (37 percent), followed closely by increased slightly (32 percent) and increased moderately (26 percent). Similar to the LDWS findings, no respondents believed that RSS use has decreased in the past five years.

Question 2, # 2: What percent of your fleet currently is equipped with RSS?

Twenty carriers answered this question, with 30 percent of those respondents indicating that all of their trucks were equipped with RSS while 20 percent did not currently use RSS.

Question 3, # 1: A three percent forward collision warning system (FCWS)[3] utilization rate was found in 2009. Since that time, do you believe that utilization rates have:

[3] FCWS monitors the area in front of the truck and warns the driver when the potential exists for a frontal collision. The system uses radar signals and formulas to calculate the distance and speed of the forward vehicle or object in relation to the vehicle equipped with the FCWS to determine if the driver needs to be warned of a potential collision. With the warning, the driver can adjust the speed of the vehicle to avoid the collision.

Table 1-3. Changes in Forward Collision Warning System Utilization Rates

Response	Number	Percent
Remained the same (three percent)	1	6%
Increased slightly	7	39%
Increased moderately	4	22%
Increased significantly	6	33%
Decreased	0	0%
TOTAL	18	100.0%

Source: American Transportation Research Institute based on findings from webinar.

Thirty-nine percent of motor carriers indicated that FCWS use has increased slightly over the past five years, 33 percent believed that their use has increased significantly and 22 percent believe that their use has increased moderately. Again, no carriers reported that FCWS use has decreased.

Question 3, # 2: What percent of your fleet currently is equipped with FCWS?

Seventeen carriers provided a response to this open-ended question. Eighteen percent reported that all of their trucks have FCWS installed while 35 percent stated that none of their vehicles are equipped with the system.

Question 4, # 1: Anecdotal reports indicate that adaptive cruise control (ACC[4]) currently has not been widely adopted by the industry. Do you believe this finding is accurate?

Table 1-4. Do you Believe that Adaptive Cruise Control has not been Widely Adopted by the Trucking Industry?

Response	Number	Percent
Yes, ACC is not widely used now but utilization will increase	18	86%
Yes, ACC is not widely used now and utilization will stay the same	1	5%
No, ACC is widely used now	2	10%
TOTAL	21	100.0%

Source: American Transportation Research Institute based on findings from webinar.

[4] ACC is an extension of conventional cruise control systems but also enables the truck to adjust its speed automatically in order to maintain the desired distance/spacing relative to another moving vehicle in the same lane. ACC systems do not perform emergency maneuvers such as hard braking. ACC are often sold as a package with collision mitigation technologies (LDWS, FCWS, etc.).

The majority of respondents agreed with ATRI's finding that ACC currently is not widely used in the trucking industry, with 86 percent believing that utilization rates will increase in the future and five percent reporting that ACC use will remain low.

Question 4, # 2: What percent of your fleet currently is equipped with ACC?

Twenty-two carriers responded to this question and more than half (59 percent) used ACC on at least one of their trucks. Fourteen percent had ACC installed on all of their vehicles, 9 percent used the system on 50 to 99 percent of their trucks and 36 percent had ACC installed on 1 to 49 percent of their fleet. Forty-one percent of the respondents did not use ACC.

Question 5, # 1: While tire pressure monitoring system (TPMS)[5] use in the trucking industry currently is limited, these systems are gaining popularity since they can improve safety, reduce fuel use and extend tire life according to industry reports. Do you believe these findings are accurate?

Table 1-5. Do you Believe Tire Pressure Monitoring Systems are Gaining Popularity?

Response	Number	Percent
Yes, TPMS use is limited and utilization will increase	16	80%
No, TPMS use is limited but utilization will stay the same	4	20%
No, TPMS is widely used now	0	0%
TOTAL	20	100.0%

Source: American Transportation Research Institute based on findings from webinar.

The majority of carriers agreed with ATRI's finding that TPMS use currently is limited but will increase in the future (80 percent). None of the responding carriers believed that TPMS is widely used in the trucking industry currently.

Question 5, # 2: What percent of your fleet currently is equipped with TPMS?

Supporting the findings in Part 1 of this question, the majority of the 17 responding carriers do not currently use a TPMS on their fleet (59 percent). Eighteen percent have TPMS installed on all of their trucks while the remaining 23 percent have it installed on a portion of their fleet (between 1 and 75 percent of their trucks).

[5] TPMS detect tire air pressure information and relays the information to the driver and/or fleet manager. The data is collected via sensors attached to the tire, wheel or valve stem. Some systems are integrated with a pressure equalizer system, which monitors and inflates the tire to a prespecified pressure as needed.

Question 6, # 1: In 2003, 65 percent of large carriers (100+ tractors) used an embedded "on-board communication device."[6] Since 2003, do you believe that utilization rates among large carriers have:

Table 1-6. Changes in On-board Communication Device Utilization Rates

Response	Number	Percent
Remained the same (65%)	1	5%
Increased slightly	4	20%
Increased moderately	4	20%
Increased significantly	11	55%
Decreased	0	0%
TOTAL	20	100.0%

Source: American Transportation Research Institute based on findings from webinar.

The majority of carriers reported that embedded onboard communication device use by large carriers has increased significantly since 2003 (55 percent). An equal number of respondents indicated that use of this type of system has increased slightly or moderately (20 percent). No carriers believed that onboard communication system use by large carriers has decreased.

Question 6, # 2: What percent of your fleet currently is equipped with an embedded onboard communication device?

Nearly all of the 18 respondents to this open-ended question have an embedded onboard communication device installed in each of their trucks (83 percent). One carrier stated that they do not currently use this technology and two carriers reported that less than 5 percent of their fleet is equipped with an onboard communication device.

Question 7, # 1: Sixty-seven percent of fleet managers reported in 2012 that most or all of their drivers use a smartphone[7] as part of their job. Since that time, do you believe that utilization rates among drivers have:

[6] Onboard cellular and satellite-based communication systems provide drivers with the ability to wirelessly exchange information between the vehicle and the company's terminal. In addition to providing voice and text communication services, many new systems offer route management, safety and compliance applications, vehicle maintenance management and predictive analytics. In this instance, this category refers to "embedded systems," rather than hand-held devices.

[7] Smartphones are mobile phones that offer advanced computing and connectivity capabilities than traditional mobile phones. Many of the original smartphones functioned as a PDA, allowing users to access, draft and send emails. Newer models often include cameras, video players and GPS navigation systems.

Table 1-7. Changes in Driver Smartphone Utilization Rates

Response	Number	Percent
Remained the same (67%)	1	6%
Increased slightly	2	11%
Increased moderately	6	33%
Increased significantly	8	44%
Decreased	1	6%
TOTAL	18	100.0%

Source: American Transportation Research Institute based on findings from webinar.

Forty-four percent of respondents believed that drivers' use of smartphones for work-related reasons has increased significantly in the past 2 years, followed by increased moderately (33 percent) and increased slightly (11 percent). Only one respondent believed that drivers' use of smartphones has decreased.

Question 7, # 2: What percent of your drivers use a smartphone as part of their job?

While 21 motor carriers responded to this open-ended question, 14 percent reported that they did not know how many of their drivers use a smartphone as part of their job. Thirty-eight percent of the participants reported that none of their drivers use a smartphone for work-related activities while one carrier indicated that all of their drivers use smartphones for their job.

Question 8, # 1: Transponder[8] use in the trucking industry appears to be growing as more preclearance systems become automated. Do you believe these findings are accurate?

Table 1-8. Do you Believe Transponder Use for Preclearance Systems is Growing in the Trucking Industry?

Response	Number	Percent
Yes, preclearance transponder use is growing	18	90%
No, preclearance transponder use has stagnated	2	10%
No, preclearance transponder use is declining	0	0%
TOTAL	20	100.0%

Source: American Transportation Research Institute based on findings from webinar.

[8] Preclearance transponders are devices that allow trucks to bypass weigh stations by electronically verifying a truck's legal weight, safety rating and credentials. Examples of these systems include PrePass and NORPASS.

The majority of respondents agreed with ATRI's finding that preclearance use in the trucking industry is growing (90 percent). Only 10 percent of the carriers believe that preclearance transponder use has stagnated and none of the participants indicated that the use of these devices is decreasing.

Question 8, # 2: What percent of your fleet currently is equipped with preclearance transponders?

Of the 19 carriers that provided an answer, 37 percent reported that all of their trucks were equipped with a preclearance transponder, 31 percent had transponders in a portion of their vehicles (between 5 and 98 percent) and 32 percent did not use these devices.

Question 9, # 1: Anecdotal reports indicate that 5.9 DSRC[9] (dedicated short-range communications) have limited market penetration in the industry. Do you believe this finding is accurate?

Table 1-9. Do you Believe that 5.9 GHz DSRC has Limited Market Penetration in the Industry?

Response	Number	Percent
Yes, 5.9 DSRC use is limited now but utilization will increase	6	55%
Yes, 5.9 DSRC use is limited now and utilization will stay the same	5	45%
No, 5.9 DSRC is widely used now	0	0%
TOTAL	11	100.0%

Source: American Transportation Research Institute based on findings from webinar.

While all of the respondents agreed with ATRI's finding that 5.9 DSRC use currently is limited, 55 percent believed that utilization will increase in the future and 45 percent stated that its use will remain limited. None of the motor carriers believed that 5.9 DSRC use is widely used now.

Question 9, # 2: What percent of your fleet currently is equipped with 5.9 DSRC?

All 17 carriers that responded to this question reported that they did not currently use 5.9 DSRC technologies.

Question 10, # 1: In 2012, 54 percent of carriers reported using GPS-based navigation systems.[10] Since that time, do you believe that utilization rates have:

[9] Connected vehicle applications use vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) short-range wireless communications to detect potential hazards in a truck's path.

[10] Navigation and mapping software use a combination of GPS signals, digital map data, and navigation algorithms to direct drivers to the specified destination. Depending on the system, directions can be provided visually on a screen and/or through spoken directions. Many current navigation systems also calculate vehicle speed, direction, and distance/time to destination. These systems can be installed in-cab, accessed through a standalone device or a smartphone application.

Table 1-10. Changes in GPS-based Navigation System Utilization Rates

Response	Number	Percent
Remained the same (54%)	0	0%
Increased slightly	3	13%
Increased moderately	12	50%
Increased significantly	9	38%
Decreased	0	0%
TOTAL	24	100.0%

Source: American Transportation Research Institute based on findings from webinar.

The majority of respondents indicated that GPS-based navigation system use has increased in the past 2 years, either moderately (50 percent) or significantly (38 percent). None of the respondents believed that navigation system use has decreased.

Question 10, #2: What percent of your fleet is equipped with a GPS-based navigation system?

Sixteen carriers provided an answer to this open ended question. Thirty-eight percent reported that all of their trucks were equipped with a navigation system while 31 percent indicated that they did not use this type of device.

Question 11, # 1: A 2007 study found that 24 percent of carriers had adopted a dispatching system.[11] Since that time, do you believe that utilization rates have:

Table 1-11. Changes in Carrier Dispatching System Utilization Rates

Response	Number	Percent
Remained the same (24%)	0	0%
Increased slightly	3	15%
Increased moderately	4	20%
Increased significantly	13	65%
Decreased	0	0%
TOTAL	20	100.0%

Source: American Transportation Research Institute based on findings from webinar.

[11] Dispatching software allows carriers to schedule trips efficiently based on equipment and driver availability, customer locations, delivery windows, and other factors. Dispatch systems can also manage related elements such as drivers' HOS compliance, pay, and fuel tax reporting. Dispatching programs are often used in combination with routing software to determine the most efficient dispatching.

Nearly two-thirds of the motor carriers thought that dispatching system use has increased significantly since 2007 (65 percent). Twenty percent believed that it has increased moderately and 15 percent reported that is has increased slightly. None of the respondents stated that it has remained the same or decreased since 2007.

Question 11, # 2: Do you currently use dispatching software?

Over three-quarters of the 19 responding carriers currently use dispatching software (79 percent).

Question 12, # 1: In 2003, nearly 4 out of 10 large carriers (100+ tractors) reported using tractor tracking devices[12] on the majority of their trucks. Since that time, do you believe that utilization rates for large fleets have:

Table 1-12. Changes in Tractor Tracking Device Utilization Rates Among Large Carriers

Response	Number	Percent
Remained the same (40%)	1	4%
Increased slightly	0	0%
Increased moderately	5	22%
Increased significantly	17	74%
Decreased	0	0%
TOTAL	23	100.0%

Source: American Transportation Research Institute based on findings from webinar.

The majority of participants reported that the use of tractor-tracking devices by large fleets has increased significantly (74 percent) or moderately (22 percent) since 2003. None of the carriers believed that utilization rates have decreased.

Question 12, # 2: What percent of your tractors are equipped with a tracking device?

Twenty-two carriers provided information for this question. Seventy-seven percent reported that all of their tractors were equipped with a tracking device. Nine percent indicated that a portion of their fleet is equipped with this system and 14 percent do not use this technology.

Question 13, # 1. While trailer tracking systems[13] were very popular in the late 1990s and early 2000s, their use has stagnated over the past decade. Do you believe this finding is accurate?

[12] Tractor GPS and RFID tags provide information to fleet managers regarding the vehicle location and can be used to aid in the routing and dispatch of the tractor. GPS and the less-common RFID tags function regardless of the weather, time of day or location of the tractor. Dispatch can be alerted if a truck is running late or deviates from a particular route. GPS devices track a tractor's position through latitude and longitude calculations while active/passive RFID tags use radio waves to wirelessly send data to a reader.

Table 1-13. Changes in Trailer Tracking System Utilization Rates

Response	Number	Percent
Yes, trailer tracking system use has stagnated over the past decade	3	18%
No, trailer tracking systems are more commonly used now than they were 10 years ago	12	71%
No, trailer tracking systems are less commonly used now than they were 10 years ago	2	12%
TOTAL	17	100.0%

Source: American Transportation Research Institute based on findings from webinar.

The majority of respondents disagreed with ATRI's finding that trailer tracking system use has stagnated over the past decade, with 71 percent reporting that they are more commonly used now.

Question 13, # 2: What percent of your trailers are equipped with a tracking device?

Contrary to the previous finding that trailer tracking device use has increased over the past decade, the majority of the nine responding carriers do not currently use trailer tracking devices (66 percent). Twenty-two percent of the respondents reported that all of their trailers were equipped with such devices while the remaining 12 percent used the devices only on a portion of their fleet.

Question 14, # 1: Freight status monitoring system[14] use is very limited and core users tend to be carriers that haul high-value goods or that operate in areas where cargo theft is very high. Do you believe that this finding is accurate?

[13] Trailer tracking systems also use GPS (or GPS variations) or RFID. Trailer tracking allows a carrier to locate a trailer, track its movement, set up a geo-fence boundary and alert dispatch if the trailer goes outside of this border, as well as receive notification when the doors of the trailer are opened, when the trailer has been hitched/unhitched to/from the tractor, and when the trailer no longer has cargo. Notification can also be sent if the trailer is picked up by the wrong tractor or carrier.

[14] Freight status indicators or cargo monitoring systems cover a wide variety of technologies and devices which are customized to the type of freight that is being tracked. Depending on the system, these devices can track the cargo location to aid in asset management, monitor the cargo conditions (i.e. pressure or temperature) and show if the cargo has been tampered with.

Table 1-14. Do you Believe that Freight Status Monitoring System Use Remains Limited?

Response	Number	Percent
Yes, freight status monitoring system use is limited but will increase	3	23%
Yes, freight status monitoring system use is limited and will remain limited	9	69%
No, freight status monitoring systems are commonly used	1	8%
TOTAL	13	100.0%

Source: American Transportation Research Institute based on findings from webinar.

Over two-thirds of motor carriers reported that the use of freight status monitoring systems currently is, and likely to remain, limited.

Question 14, # 2: Motor Carriers Only: Do you currently use a freight status monitoring system?

Of the 17 respondents to this question, only two carriers reported using a freight status monitoring system.

Question 15, # 1. A 2005 study found that the majority of carriers accessed driver/vehicle data manually (by connecting a laptop to the digital log in the truck) and infrequently (less than once per week).

Do you believe the findings on access method are accurate?

Table 1-15. Do you Believe that Most Carriers Still Access Driver and Vehicle Data Manually?

Response	Number	Percent
Yes, driver/vehicle data are still accessed manually	4	21%
No, driver/vehicle data is now accessed remotely	15	79%
TOTAL	19	100.0%

Source: American Transportation Research Institute based on findings from webinar.

The majority of respondents believed that carriers now access driver/vehicle data remotely rather than manually (79 percent).

Do you believe the findings on access frequency are accurate?

Table 1-16. Do you Believe that Most Carriers Still Access Driver/Vehicle Data Less than Once per Week?

Response	Number	Percent
Yes, driver/vehicle data are still accessed less than once per week	4	20.0%
No, driver/vehicle data is now accessed more than once per week	16	80.0%
TOTAL	20	100.0%

Source: American Transportation Research Institute based on findings from webinar.

Similar to the previous finding, the majority of respondents reported that driver/vehicle data is now accessed more often than in the past (80 percent), most likely due to the ability to transmit information wirelessly.

Question 15, # 2: How to you access driver/vehicle data and how frequently do you do it?

Thirteen carriers provided information for this open-ended question. Of those, the majority access driver and/or vehicle data remotely (69 percent) although three carriers noted that they also occasionally manually download the information as well. Similarly, the majority of respondents access driver/vehicle data at least daily (54 percent).

Question 16. In general, how do you view the truck platooning initiative?[15]

Table 1-17. How do you View the Truck Platooning Initiative?

Response	Number	Percent
Extremely favorably	2	11%
Slightly favorably	4	21%
Neutral / no opinion	6	32%
Slightly unfavorably	1	5%
Extremely unfavorably	6	32%
TOTAL	19	100.0%

Source: American Transportation Research Institute based on findings from webinar.

[15] Truck caravan or platooning technologies seek to create semi-autonomous road trains, where several trucks are controlled by a lead vehicle through wireless communications and ACC. These technologies allow the trucks to driver very close together which significantly decreases aerodynamic drag and improves fuel efficiency.

Although this question received a wide range of responses, answers were skewed toward an unfavorable view the truck platooning initiative. Thirty-two percent of the carriers expressed an extremely unfavorable view of this initiative while an equal number reported a neutral opinion.

Question 17. In general, how do you view the real-time truck parking availability program?[16]

Table 1-18. How do you View the Real-time Truck Parking Availability Program?

Response	Number	Percent
Extremely favorably	10	53%
Slightly favorably	6	32%
Neutral / no opinion	2	11%
Slightly unfavorably	1	5%
Extremely unfavorably	0	0%
TOTAL	19	100.0%

Source: American Transportation Research Institute based on findings from webinar.

Not surprisingly, motor carriers reported a generally favorable opinion of the real-time truck parking availability program. The majority viewed the program extremely favorably (53 percent), followed by slightly favorably (32 percent).

Question 18. In general, how do you view the real-time weather notification initiative?[17]

Table 1-19. How do you View the Real-time Weather Notification Initiative?

Response	Number	Percent
Extremely favorably	11	65%
Slightly favorably	6	35%
Neutral / no opinion	0	0%
Slightly unfavorably	0	0%
Extremely unfavorably	0	0%
TOTAL	17	100.0%

Source: American Transportation Research Institute based on findings from webinar.

[16] To help address the national truck parking shortage, Federal funds have been made available through several different programs. SAFETEA-LU, for example, authorized $25M for a pilot program to address the shortage of long term truck parking on the NHS.

[17] FHWA's Road Weather Management Program, in conjunction with the ITS Joint Program Office established the Clarus Initiative in 2004 to reduce the impact of adverse weather conditions on surface transportation users.

Nearly two-thirds of the respondents have an extremely favorable view of the real-time weather notification initiative. None of the motor carriers expressed a negative opinion of the program.

Question 19. In general, how do you view the roll-over notification initiative?[18]

Table 1-20. How do you View the Roll-over Notification Initiative?

Response	Number	Percent
Extremely favorably	11	65%
Slightly favorably	4	24%
Neutral / no opinion	1	6%
Slightly unfavorably	0	0%
Extremely unfavorably	1	6%
TOTAL	17	100.0%

Source: American Transportation Research Institute based on findings from webinar.

Similar to the views of the real-time weather notification initiative, the majority of carriers expressed an extremely favorable opinion of the roll-over notification initiative (65 percent). Only one respondent indicated an extremely unfavorable view of the program.

Key Findings

The following key findings emerged from webinar participant responses:

- RSS use has increased significantly in the past five years and 30 percent of the respondent's fleets are equipped with this type of system.
- Over the past five years, FCWS use has increased moderately with the majority of the participants using this technology on at least one of their trucks.
- More than half (59 percent) of the respondents used ACC on at least one of their trucks. Carrier's believed that ACC use will increase in the future.
- Embedded onboard communication device use is high among carriers, with the majority (83 percent) of respondents using this equipment on all of trucks.
- The majority of motor carriers access driver/vehicle data remotely (69 percent) and at least daily (54 percent).

[18] A trucking industry-funded initiative is currently developing a real-time in-cab notification system for drivers. Utilizing the roll-over location database, drivers will receive a warning when they are approaching a high-risk area.

- More than two-thirds of the respondents use preclearance transponders on at least one of their trucks and the majority (90 percent) believed that transponder use will increase in the future.
- None of the motor carriers currently use 5.9 DSRC devices. Respondents were split on whether 5.9 DSRC use will increase in the future (55 percent) or will remain limited (45 percent).
- Over three-quarters of the respondents currently use dispatching software (79 percent).
- In general, motor carriers view the following programs/initiatives extremely favorably:
  - Real-time truck parking availability program (53 percent);
  - Real-time weather notification initiative (65 percent); and
  - Roll-over notification initiative (65 percent).
- In general, motor carriers view the truck platooning initiative unfavorably (32 percent extremely unfavorably and 32 percent neutral/no opinion).

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FHWA-JPO-14-133

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