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APPENDIX A – Survey Questionnaire

NCHRP Project 20-05/Topic 39-02

The Transportation Research Board's National Cooperative Highway Research Program has commissioned a study on improving safety of mobile lane closures. The goal of the research is to improve the safety of mobile work zones by synthesizing successful practices employed by transportation agencies during mobile lane closures. As someone with experience in this area, we would like to have your input on this subject.

Given that the topic is relatively broad, the questionnaire is designed so that it can be shared among two/three respondents from each State DOT. For example, one person may be responsible for traffic engineering and another one - for maintenance. We hope to receive a consolidated response from your state. If you are the first respondent, please respond to the topics you are most familiar with and forward the partly filled in questionnaire to the second respondent from your DOT indicated in the covering e-mail letter sent to you.

Please be assured that the survey is conducted to get the most objective state-of-the-practice across United States and Canada, not to evaluate or compare the performance of one agency over other.

Section I: Contact Information

Respondent 1

1) Name:	
2) Position:	
3) Organization & State:	
4) Phone:	
5) E-mail:	

Respondent 2

6) Name:	
7) Position:	
8) Organization:	
9) Phone:	
10) E-mail:	

Respondent 3 (if applicable)

11) Name:	
12) Position:	
13) Organization:	
14) Phone:	
15) E-mail:	

16) May we contact you for further information if needed?

	yes	no	n/a
Respondent 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Respondent 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Respondent 3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

17) How familiar are you with mobile lane closures?

	Not familiar	Somewhat familiar	Familiar	Very familiar	n/a
Respondent 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Respondent 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Respondent 3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section II: Regulatory and Guiding Documents

We define **mobile lane closures** as **Temporary Traffic Control (TTC)** required for mobile operations while all other operations require stationary TTC. Therefore, clear differentiation between mobile and short duration operations is important. Section 6G.02 "Work Duration" of US MUTCD gives following broad definition of short duration and mobile operations: "D. Short duration is work that occupies a location up to 1 hour. E. Mobile is work that moves intermittently or continuously". Our understanding is that mobile operations involve work that is done while moving continuously, at low speeds (typically, around 25 km/h), or intermittently with periodic brief stops, related to the mobile activity, which do not exceed a few minutes in duration. Operations that move at very low speed (5 km/h) are virtually short duration lane closures. In that, paving operations will be short virtually duration lane closures and will require stationary TTC.

What is the definition of mobile lane closures in your jurisdiction?

18) What documents are primary references in regulating mobile lane closures in your jurisdiction?

- US MUTCD
- State /Provincial MUTCD
- Locally developed typical TTC plans and procedures/specifications
- Other (please specify)

If you use locally developed TTC plans or other guiding documents, please provide URL in the comment field. If no URL is available, we will kindly appreciate if you could send the copy to the contact provided at the end of the questionnaire

19) What of the following is taken into account by the TTC plans for mobile lane closures used in your jurisdiction?

- roadway type (please specify in the comment field - road classification used etc)
- location of work (shoulder v. traffic lane)
- roadway geometry
- topography
- traffic volume
- posted speed limit
- lighting conditions (day/night)
- weather
- equipment
- staff / manpower
- type of work performed
- Other (please specify)

If you selected other or have other comments, please specify:

20) Do you believe that your organization's definition of mobile lane closures may be misinterpreted by the maintenance personnel? E.g., may (or have) it lead to the improper application of TTC plans (e.g., mobile vs. stationary applications etc)?

- yes
- no
- not sure

If you selected yes, please elaborate:

21) What types of TTC are used for the following types of work in your jurisdiction:

	None	Mobile lane closure	Short duration lane closure (stationary TTC)	Mobile or short duration (stationary TTC) depending on conditions
Line painting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Installing/removing raised pavement markings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shoulder texture (rumble strips)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pothole patching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spot edge repair	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Sweeping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Snow plowing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mowing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Herbicide spraying	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Core sampling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Storm water catch basin cleanup	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Installation and removal of temporary traffic control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In-line (lateral) rumble strips	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22) If short duration lane closures are used instead of mobile lane closures for any of the works outlined above, please elaborate if there are special conditions (e.g., workers on foot, duration of stops etc) required to be present for short duration closures to be used. Also, if the practice changed recently why did it change?

23) What documents provide further guidance on mobile lane closures in your jurisdiction? If you select other, could you please specify the document(s), provide URL or send the document to the contact provided at the end of the questionnaire?

- FHWA Traffic Control Handbook for mobile operations at night
- FHWA Utility Work Zone Safety Guidelines and Training
- FHWA Traffic Control Devices and Practices to Improve the Safety of Mobile and Short Duration Maintenance Operations
- NCHRP Report 476: Guidelines for Design and Operation of Nighttime Traffic Control for Highways Maintenance and Construction
- FHWA Positive Protection Brochure
- None
- Other (please specify)

If you selected other, please specify and provide URL if available:

24) Is there a need for new guiding documents or update on existing documents on mobile lane closures?

- yes
- no
- not sure

If yes, please elaborate:

25) Does your jurisdiction use quick reference tables or computerized decision making tools to ensure proper selection and application of TTC plans for mobile lane closures?

- yes
- no

If yes, please specify the document(s) and include URL. If no URL is available, we will kindly appreciate if you could send the electronic copy to the contact provided at the end of the questionnaire

Section III: Practices

III-A. Institutional Arrangements

26) Who is responsible for implementing TTC plans for mobile lane closures in your jurisdiction?

- agency's engineer
- general supervisors (not necessarily engineers) of the in-house maintenance crews
- general supervisors (not necessarily engineers) of the contracted maintenance personnel
- contractor traffic control supervisor
- general supervisors (not necessarily engineers) of the utility companies
- Other (please specify)

If you selected other, please specify:

27) Is it your experience that this arrangement works satisfactory?

- yes
- no
- not sure

Additional comments:

28) Is there arrangement for an independent agency's supervision/inspection of the implementation of TTC plans for mobile lane closures in your jurisdiction and their compliance with adopted TTC plans?

- yes
- no

If yes, please elaborate:

29) If you answered yes on the above question (arrangement for an independent agency's supervision/inspection is in place), is it your experience that this arrangement works satisfactory?

- yes
- no
- not sure

Additional comments:

30) Is there a set of safety rules established for the use by work crews specifically for the mobile operations in your organization?

- yes
- no

If you answered "yes" on the above question, please specify the document(s) and include URL. If no URL is available, we will kindly appreciate if you could send the copy to the contact provided at the end of the questionnaire

31) Is there a set of guidelines for locating workers within mobile work zones, including spacing from shadow vehicles?

- yes
- no

If you answered "yes" on the above question, please specify the document(s) and include URL. If no URL is available, we will kindly appreciate if you could send the electronic copy to the contact provided at the end of the questionnaire

32) Do workers undergo traffic control and safety training for the mobile operations?

- yes, formal training
- yes, informal training
- no

33) If the training is formal, are training sessions documented and kept on file?

- yes
- no

Additional comments:

34) If the training is informal, how it is administered?

- on the job training
- Other (please specify)

If you selected other, please specify:

35) What components are included in the safety training for mobile operations program?

- new employee orientation
- detailed technical training for the responsibilities assigned
- jobsite refresher training
- meetings to analyze jobsite occurrences and incidents
- Other (please specify)

If you selected other, please specify:

36) What is the typical routine preparation of workers to perform the mobile lane closures on the day-to-day basis?

- tailgate meeting
- chain-of-command
- communications
- Other (please specify)

If you selected other, please specify:

37) Are there any issues with the use of PPE (Personal Protective Equipment) in the mobile lane closures? (e.g., compliance with standards, garment maintenance/disposal etc)

- yes
- no

If you currently have or previously had issues with the use of PPE in the mobile lane closures, please specify the issues and measures taken to overcome them. How effective are these measures?

III-C: Equipment and technology

38) What service vehicles are used to warn motorists and protect workers in the mobile lane closures on freeways? (please tick multiple boxes if appropriate) ?

- Mandatory
under all
conditions
- Use depends on
traffic volume
- Use depends on
posted speed
limit
- Use depends on
work
- Never used

Sign vehicle (advance warning vehicle)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shadow vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Additional shadow vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ramp vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please provide most important comments on the above information, e.g., was the practice changed lately or is it going to change, what changed, why, is the new practice effective, etc.

39) What service vehicles are used to warn motorists and protect workers in the mobile lane closures on divided multilane highways (non freeways)? Please tick multiple boxes if appropriate

	Mandatory under all conditions	Use depends on traffic volume	Use depends on posted speed limit	Use depends on work	Never used
Sign vehicle (advance warning vehicle)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shadow vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Additional shadow vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please provide most important comments on the above information, e.g., was the practice changed lately or is going to change, what changed, why, is the new practice effective, etc:

40) What service vehicles are used to warn motorists and protect workers in the mobile lane closures on undivided multilane highways (non freeways)? Please tick multiple boxes if appropriate.

	Mandatory under all conditions	Use depends on traffic volume	Use depends on posted speed limit	Use depends on work	Never used
Sign vehicle (advance warning vehicle)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shadow vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Additional shadow vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pilot vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please provide most important comments on the above information, e.g., was the practice changed lately or is going to change, what changed, why, is the new practice effective, etc:

41) What service vehicles are used to warn motorists and protect workers in the mobile lane closures on two lane highways? Please tick multiple boxes if appropriate

	Mandatory under all conditions	Use depends on traffic volume	Use depends on posted speed limit	Use depends on work	Never used
Sign vehicle (advance warning vehicle)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shadow vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Additional shadow vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pilot vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please provide most important comments on the above information, e.g., was the practice changed lately (or is it going to change), what changed, why, is the new practice effective, etc.

42) What lights are typically used on service vehicles?

- rotating incandescent amber lights

- strobe lights
- both rotating incandescent amber lights and strobe lights
- Other (please specify)

If you selected other, please specify:

Was the above practice changed lately (or is it going to change), what changed, why, is the new practice effective, etc.

43) Do service vehicles use four-way emergency flashers in addition to rotating incandescent amber lights or strobe lights?

	Used under all conditions	Used under certain conditions	Never used
Sign vehicle (advance warning vehicle)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shadow vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Work vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pilot vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you selected "under certain conditions", please elaborate:

Was the above practice changed lately (or is it going to change), what changed, why, is the practice effective, etc.

44) Which service vehicles use TMAs (Trailer Mounted Attenuators) and under which conditions?

	Mandatory under all conditions	Mandatory under certain conditions	Never in use
Sign vehicle (advance warning vehicle)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shadow vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Work vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pilot vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

if you selected "under certain conditions", please elaborate:

Was the above practice changed lately (or is it going to change), what changed, why, is the practice effective, etc.

45) What type of communication between service vehicles is typically in use?

- two-way radio
- cell phone
- both two-way radio and cell phone
- none
- Other (please specify)

If you selected other, please specify:

46) In addition to seat belts, do you use other safety protection devices for the driver and occupants of service vehicles?

- shoulder harnesses
- head restraints

- high-back seats
- shoulder harnesses and head restraints
- shoulder harnesses and high-back seats
- none
- Other (please specify)

If you selected other, please specify:

47) What TMAs (type and manufacturer) are in use and how would you evaluate the level of satisfaction with TMAs in use? (please specify in the table)? Typically, satisfaction is defined by all aspects of use: protection capabilities (based on in-service data or anecdotal evidence), maintenance aspects, reliability, convenience etc)

	High	Medium	Low	Not sure
TMA:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TMA:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TMA:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TMA:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TMA:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Additional comments:

48) Do you indicate the number of vehicles in a work convoy on a sign mounted on a first shadow vehicle?

- always
- under certain conditions (please specify)
- no
- Other (please specify)

If you selected certain conditions or other, please specify. Also, was the above practice changed lately (or is it going to change), what changed, why, is the practice effective, etc:

49) Are channelizing devices ever used for delineating the work space if workers are on foot in mobile work zones to provide positive protection (including innovative devices such as robotic highway safety markers, Balsi beam etc)?

- yes
- no

If yes please specify the devices, equipment to automatically deploy/remove (if any) and level of satisfaction with the device/equipment

	High	Medium	Low	Not sure
Channelizing device:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Channelizing device:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Channelizing device:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Channelizing device:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Channelizing device:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

50) Do you use equipment to reduce exposure of workers or completely eliminate workers on foot in the mobile work zones (such as automatic crack sealing, patching, installing RPMs, debris collection vehicles etc)?

- yes
- no

If yes please specify the devices and level of satisfaction with the use

	High	Medium	Low	Not sure
Device:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Device:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Device:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Device:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Device:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

51) Do you use work zone safety intrusion alarms (such as infrared, microwave, pneumatic etc) for mobile work zone operations?

- yes
- no

If yes, please specify the intrusion alarms and level of satisfaction with the use

	High	Medium	Low	Not sure
Intrusion alarm:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intrusion alarm:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intrusion alarm:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intrusion alarm:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intrusion alarm:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

52) Are work platforms in use on work vehicles for jobs or tasks requiring workers on foot in a work zone during mobile operations?

- yes
- no

If yes, please specify the work platforms and level of satisfaction with the use

	High	Medium	Low	Not sure
Work platform:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Work platform:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Work platform:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Work platform:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Work platform:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

53) Are flaggers ever used for mobile work zones on two-lane roads?

- yes
- no

54) Are automatic flaggers, flagger assistance devices (AFAD) or flashing stop/slow paddles ever used for mobile work zones on two-lane roads?

- yes
- no

If yes please specify the devices and level of satisfaction with the use

	High	Medium	Low	Not sure
Device:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Device:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Device:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

55) What types of work lights (task lights) are used to light the work zone or flagger (if any) in mobile operations at night and what is the level of satisfaction with the use?

	High	Medium	Low	Not sure
Work light:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Work light:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Work light:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

56) Are temporary signs (e.g., "Road Work Ahead" with "Next X Miles") ever installed on the ground to warn motorists about mobile operations?

- yes
- no

If yes please specify the devices and level of satisfaction with the use:

	High	Medium	Low	Not sure
Conventional signs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trailer-mounted changeable message signs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Portable all-terrain sign and stand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

57) Do you use mobile speed displays mounted on a shadow vehicle?

- yes
- no

If yes, please specify the devices and level of satisfaction with the use:

	High	Medium	Low	Not sure
Device:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Device:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Device:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

58) If mobile operations are conducted on two-way, two-lane roadways with unimproved shoulders, is traffic prohibited from passing the work convoy?

- yes
- no

59) If yes, how are motorists informed about the prohibition?

- state traffic rules
- vehicle-mounted signage
- Other (please specify)

If you selected other, please specify:

60) If passing is allowed and mobile operations are conducted on centerline or on the traffic lane on two-lane roadways with improved shoulders, what passing arrangements are in place and what is the level of satisfaction with the arrangement?

	High	Medium	Low	Not sure
Passing allowed to the left and prohibited to the right (on shoulder)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Passing allowed to the right (on shoulder) and prohibited to the left	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Passing allowed both to the left and to the right	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

61) Do you use any special devices to explain passing arrangements on two-lane roadways with improved shoulders?

- yes
- no

If yes, please specify the devices/arrangements

62) Do you use real time Advanced Traveler Information Systems (ATIS) and/or Highway Advisory Radio (HAR) to improve safety and mobility of mobile lane closures?

- yes, ATIS
- yes, HAR
- yes, both ATIS and HAR
- no

If you use ATIS, please specify the systems and level of satisfaction with the use

	High	Medium	Low	Not sure
ATIS:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ATIS:
 ATIS:

If you use ATIS and/or HAR, please elaborate on what procedures/criteria are in place to warrant the use of ATIS/HAR for mobile operations

63) Do you ever inform public about mobile operations using mass media (within ATIS or otherwise)?

- yes
- no

If yes, please elaborate on what procedures are in place to select mobile operations for public announcement in mass media information, compose a message etc.

Section IV: Field experiences with mobile lane closures

64) What is the level of compliance with TTC plans and procedures for mobile lane closures in your jurisdictions?

- high
- medium
- low
- not sure/no information available

65) Please list typical non-compliances, measures taken (if any) to increase compliance and their effectiveness:

	High	Medium	Low	Not sure
Non-compliance & measure(s) taken	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Non-compliance & measure(s) taken	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Non-compliance & measure(s) taken	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Non-compliance & measure(s) taken	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Non-compliance & measure(s) taken	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

66) How is the safety of mobile lane closures analyzed in your organization?

- not analyzed
- statistical analysis of collision data
- qualitative analysis of collision data
- traffic conflict analysis
- field observations
- near miss reports
- collision reconstruction
- interviews with work crews
- Other (please specify)

If you selected other, please specify:

67) If collision data is not analyzed, what is the main reason?

- analysis is not incorporated in the agency's routine practice
- no access to collision data
- insufficiency or low quality of collision data
- inadequate staff resources
- other (please specify)

If you selected other, please specify:

68) What are typical safety issues with mobile lane closures, measures taken to increase safety and their effectiveness?

	High	Medium	Low	Not sure
Issue and measure(s) taken:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Issue and measure(s) taken:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Issue and measure(s) taken:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Issue and measure(s) taken:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Issue and measure(s) taken:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Additional comments:

Section V: Technology and research needs

69) In your opinion, what technology/devices should be developed / further improved /widely adopted to increasing safety of mobile lane closures? What is the priority?

	High	Medium	Low	Not sure
Technology/device:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Technology/device:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Technology/device:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Additional comments:

70) In your opinion, what aspects of the mobile lane closures should be further researched/addressed to increase safety? What is the priority?

	High	Medium	Low	Not sure
Aspect:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aspect:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aspect:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Additional comments:

71) Are you aware of any technology/device developments or research projects in progress which could address the above needs? If yes, please indicate the project and provide URL in the comment field or e-mail/mail available materials to the contact provided at the end of this questionnaire

- yes
- no

Comments:

Section VI: Final Comments

72) Please furnish us with contact information for a point of contact to whom any follow-up questions can be addressed if necessary

- respondent of this questionnaire
- Other (please specify)

If you selected other, please specify:

73) We are also interested to survey utility companies performing mobile lane closures. Could you recommend a recipient from a utility company performing mobile lane closures in your jurisdiction? If yes, please provide the contact information .

Contact:

74) Please provide us with any other information that you believe would be helpful to this study. Also, if you have any other useful documentation such as CDs with video, we will kindly appreciate if you could send the copy to the contact provided at the end of the questionnaire

74) We would like to share with you the report developed from your survey responses. If you are interested, please provide the email addresses where you would like the report sent.

- do not send
- please send using e-mail address of the recipient of this survey
- please send using other e-mail address (please specify below)

E-mail:

Thank you for your assistance in completing this survey. Your responses will help provide insights into the existing practices and ways to improve safety of mobile lane closures. If you have any questions regarding the survey, please contact Ali Hadayeghi, ahadayeghi@synectics-inc.net, (905) 817-1704. You can e-mail any documentation that you might feel will be helpful to this study to ahadayeghi@synectics-inc.net, or mail it to the following address:

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APPENDIX B – List of Respondents

List of Survey Respondents

US States

1. Alaska
2. Arizona
3. California
4. Connecticut
5. Florida
6. Georgia
7. Illinois
8. Iowa
9. Maryland
10. Massachusetts
11. Michigan
12. Minnesota
13. Mississippi
14. Missouri
15. Montana
16. Nebraska
17. Nevada
18. New Hampshire
19. New York
20. North Dakota
21. Oregon
22. Pennsylvania
23. Texas
24. Utah
25. Virginia
26. Washington
27. West Virginia
28. Wisconsin

Canadian Provinces

29. Nova Scotia
30. Ontario
31. Alberta

APPENDIX C – Glossary

Glossary

Term	Definition
AHMCT	Advanced Highway and Construction Technology
AVL	Automatic Vehicle Locating
Buffer Space	Area within the activity area free of equipment, material and personnel used to provide lateral and/or longitudinal separation of traffic from the work space or an unsafe condition.
Buffer Vehicle	See Shadow Vehicle
DOT	Department of Transportation
FHWA	Federal Highway Administration
LIDG	Lateral Intrusion Deterrence Gap
MUTCD	Manual on Uniform Traffic Control Devices
OTM	Ontario Traffic Manual
PCMS	Portable Changeable Message Signs
Shadow Vehicle	A vehicle positioned in a stationary work zone or in a mobile work operation, to provide protection for workers against errant vehicles (also referred to as buffer vehicle).
SHRP	Strategic Highway Research Program
TMA	Truck Mounted Attenuator
TTC	Temporary Traffic Control
VMS	Variable Message Sign
Work Platform	Aerial lift or elevated platforms used for work on hardware located at a height inaccessible for normal work operations

APPENDIX D – Bibliography

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