

FOCUS GROUPS ON CONSTRUCTION
ISSUES

FALL 2000



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In the fall of 2000, the Oregon Department of Transportation (ODOT) contracted with the University of Oregon Survey Research Laboratory (OSRL) to conduct a series of focus groups with various stakeholders about issues related to highway construction. To this end OSRL Associate Director, Stephen Johnson, and ODOT research coordinator, Andrew Griffith, met with six stakeholder groups from around the State of Oregon.

The six groups comprised two groups of general motorists, one from Eugene and one from Bend, a group of school bus drivers from Beaverton, a group of business representatives from Portland, a group of fire and emergency service personnel from Eugene, and a group of truck drivers from Portland. Each group met for from one and a half to two hours. The groups varied in size from five to eight. Each session was recorded and some participants were paid for their time.

General Issues

Each group started by asking participants a general question about their “overall thoughts about highway construction and highway work zones.” For the general public a wide variety of responses were elicited, including:

- comments about why work zones are sometimes empty of workers;
- The desire for a work zone warning at a further distance from the zone;
- The desire for consistent work hours and times when the zone is not being worked on;
- Concerns about danger issues in work zones; apprehensive thoughts upon entering work zones; and
- A variety of issues around work zone signs (see the section on signs).

For school bus drivers the general work zone issues were entirely different. School bus drivers were concerned about two general issues:

- The effect of construction on maintaining their schedules and routes; and
- The problems they encounter inside a work zone. Construction delays or detours effect school bus routes and schedules.

Consequently, school bus drivers wanted information about construction projects in close to real time and wanted detour information long before they arrived in a work zone. School bus drivers also had concerns about the nature of temporary traffic lanes and the difficulties they sometimes impose on drivers who have an extra wide vehicle that they can not easily turn. As one driver put it, “the orange barrels are always too close together for my bus.”

For business representatives, the general concerns about work zones were primarily related to issues of access and egress from their businesses and problems related to receiving and sending deliveries. Here too, maintaining schedules was an issue, with strong concerns about alternative routes and construction information.

For fire and emergency vehicle operators, the work zone issues were also unique and covered two primary areas. First, how to respond to an emergency call when the work zone was between the fire station and the normal response route. Second, how to adequately respond to emergencies that occur inside the work zone.

Truck drivers commented on issues that were similar to those raised by school bus drivers. They also worried about the speed of cars in construction zones, the frequency with which cars cut in front of them, and believed there should be a greater law enforcement presence inside the zone. Truck drivers also expressed fear of hitting construction workers within the work zone. Further, several of the drivers noted that they had seen workers inadvertently move into the actual traffic lane while working.

Comfort level and safety in work zones

Most of the motorists acknowledged they generally feel some discomfort when traveling through work zones and a heightened anxiety level. They also are more concerned about their safety in traveling through the work zone. Among their concerns are:

- Fears of being tailgated;
- Apprehension about driving close to concrete barriers (especially if there are any curves);
- Concerns about when a merge is really going to take place; and
- A desire for more temporary traffic signals and pilot cars (to make them feel safer).

School bus drivers did not have the same safety concerns as motorists. School bus drivers were not worried about being tailgated, as one respondent said, “we win those.” In fact, some drivers expressed an increased sense of safety in work zones because the speeds were slower and because they could usually control the lane(s) well enough to prevent cars from cutting in front of them.

For fire and emergency personnel, discomfort did increase in work zones, primarily because of the urgent need to respond to an emergency call. However, other work zone issues also bothered these drivers, such as:

- The difficulty in seeing traffic delineation devices (tubular and conical markers, barrels, etc.) for lane marking and signs (especially true for the rear driver in articulated fire equipment);
- The discomfort caused to patients in emergency vehicles because of uneven road surfaces; and
- The fear that they would not be able to easily reach an accident site actually within the work zone or to get out of such sites after reaching them.

For truck drivers, discomfort and anxiety were greatly increased within work zones. Even though speeds were generally slower inside the work zones, drivers complained that speeds were not slow enough and that motorists were an increased hazard to them inside the work zone. For example, when two travel lanes (in the same direction) are being reduced to one, the truck drivers noted that many motorists try to pass a truck no matter what the conditions in order avoid being behind the truck. They also mentioned an another similar problem dealing with a lane closure involving two travel lanes in the same direction. The truck drivers expressed a continual frustration with vehicles failing to merge into a single lane until the last moment, thus bottlenecking traffic at the end of the taper.

What drivers do differently in workzones

Not only do motorists feel increased anxiety in work zones, but also many of them claimed to change some of their driving behavior when entering and traveling through work zones. Most drivers claimed that their state of “alertness” increased in work zones and that they paid much more attention to the road and other vehicles. Some drivers tried to limit other distractions while in work zones, by doing such things as turning down/off radios or stereos or by stopping conversations in their vehicle. Others increased their attention to cars behind them and either turned on hazard lights or “tapped” on their brakes to alert drivers behind them. Almost all drivers reported slowing down and one driver reported keeping an eye out for places they might be able to get off the road (i.e. the ditch) if an emergency occurred.

School bus drivers had a set of very specific behaviors they altered in work zones. All of the drivers reported turning on hazard lights and stated that this was a work regulation for that school district (Beaverton). Drivers also reported that they go very slow in work zones and always driver slower then the posted speed. They also tried to leave a large distance in front since busses stop slowly and want to avoid a quick stop, even from a slow speed, that would throw children out of their seats. In addition, school bus drivers try to control the traffic behind them by using their size to make sure cars do not feel that they might be able to pass them or cut in. To accomplish this, they may start driving in the middle of two merging lanes slightly before the merge actually ends, or they may move slightly onto the road shoulder is it is wide enough to allow cars to pass them. Fire and emergency vehicle drivers also reported altered behavior in a work zone. They too try to control traffic behind them by their use of

the lane. Additionally, if they are on an emergency and have lights and sirens engaged they might actually turn them off in a work zone to prevent cars from stopping in front of them, when there is no shoulder to pull off onto.

The main changes in behavior reported by truck drivers were an increase in alertness, an increase in the distance between them and vehicles ahead of them, and a watchful eye for workers. Very few drivers reported using “brake tapping” or emergency lights to alert following traffic, feeling that their size and general lighting was sufficient.

Signs in work zones

Drivers of all types had some issue about the signs used in work zones. For motorists the signs seem to generally work, although there were a few complaints. In particular, respondents would like information on when the work zone is “active.” Everyone had experienced driving past signs that indicated an active work zone (i.e., flagger ahead) and then never seeing a flagger. In addition, everyone wanted as much advanced warning as possible, especially if there was the possibility of a detour where a decision needed to be made about route choice.

For the professional drivers, advanced warning of construction zones was especially critical. School bus drivers wanted as much time to decide either to detour (if possible), or to slow their speed gradually. Fire and emergency drivers also wanted time to decide about detours. In addition, fire and emergency drivers had concerns about some sign placements and sign heights. In particular, many fire trucks have restricted vision to the ground and on occasion, found sign placement to be below their sight level.

Truck drivers had relatively few complaints about signs and thought the signage was generally good. However, some drivers thought work zones could have more signs and that sometimes the distance between the alert signs and actual work was too great. Truck drivers also wanted better illumination or reflectivity of signs when it was dark.

Lane changes in work zones

Work zones frequently require drivers to change lanes or to merge. All drivers had issues how these lane changes take place. A universal concern was with the length of a merge zone and how the merge was indicated (signage). The issue for drivers here was not so much the length of the merge zones, but that it is difficult for them to know how long they have to merge before the end of the taper. Further, there was a general frustration expressed by all groups regarding how other drivers tend to misuse the merge zone and end up cutting into the appropriate lane at the last opportunity. As noted earlier, truck drivers were particularly upset over this “cutting in” behavior.

Some fire and emergency drivers had suggestions for alternative ways that merging might take place inside cities. Examples include:

- A short merge lane that makes drivers decide between the single merged lane and an alternative lane that ends in a turn. This would require the use of barriers to prevent drivers from reentering the merge lane.
- A series of one-block merge lanes with turns permitted at each intersection. The goal being to force drivers to merge quickly or to turn out of the work zone.

They seemed particularly concerned that merge zones be set up in a way that they still allowed right and left turns (when possible) to make access to emergency sites possible.

Drivers also had concerns with specific types of lane markings. For example, school bus drivers much prefer tubular markers or cones to any other types of delineation device, since they can “drive over them” if they need to when making a turn or in case of an emergency within the work zone. One motorist wanted shorter tubular markers or cones, claiming the “tall” ones intimidate him. Almost all drivers disliked the concrete barriers, although some professional drivers liked them because they prevented motorists from trying to pass them within the work zone. Truck drivers were probably the most supportive of the concrete barriers and felt that as long as the lane width was sufficient (at least 10 feet), these provided the best type of lane delineation.

Drivers of all types wanted better marking for the temporary lanes created for changing direction and merging – in most cases the request was for solid white lines marking the lane on both sides. In addition, truck drivers felt that too often removed striping in work zones left a “ghost” mark that was hard to distinguish from the temporary striping, especially at night or under rainy conditions.

Driving through work zones at night

Drivers uniformly disliked work zones more when it was dark. The lack of visibility in work zones raised issues about the difficulty of seeing signs, lanes, barriers, and construction personnel at night. Drivers generally felt that flaggers were very hard to see at night and their signs were often impossible to read. One driver did mention that seeing a flagger wearing fluorescent gloves greatly improved that person’s visibility. Drivers also complained about the difficulty of seeing the edge of roadway if it did not have a solid white “fog” line.

Depending on the nature of the work zone and the type of illumination used, drivers were split on their feelings about work zones where construction was taking place at night under artificial lights. Some drivers had experienced work zones where the lighting made the work zone seem as safe to them as during the day. Other drivers had experienced lighting conditions, which interfered with their ability to see, was a distraction, or affected their night vision when they left the work zone. Truck drivers in particular, had this complaint. They had noted that the work zone lighting, the construction vehicles lights, and even the lighted message signs at times, caused temporary impairment of their vision.

Drivers also had some difficulties seeing signs, tubular markers, cones or barriers at night. Many felt that the construction signs and tubular markers and cones are often in poor condition and not as reflective as they would like. Similar concerns were raised about the

reflectivity of barriers. For fire and emergency drivers, the sign issues they raised earlier about seeing signs from the height they sit to drive were reemphasized here with the comment, “it is worse at night.”

Truck drivers mentioned an additional problem with highway markings at night that was not directly related to construction. According to them, on Oregon freeways at exit ramp curves, there is a break in the fog stripe at the entrance to the curve. The fog striping is continued on the freeway on the other side of the exit ramp. This configuration made it very difficult for them to know exactly where the exit was under conditions of poor visibility. These same drivers claimed that California did not break the striping, but instead had the fog line transition into the entire exit ramp, and that this was much easier to find in the rain and fog when visibility was poor.

Detours and delays

Detours and delays were the most controversial issue raised by each of the groups interviewed. No driver wants either a detour or a delay, but all understand that they are a necessary part of road construction. The main concern raised about detours was adequate signage for any detour. This concern over signs included not only the sign before the work zone announcing the detour, but also the signage along the path of the detour. Drivers wanted as much advanced warning about detours as possible and information about options if any existed. Drivers also mentioned that frequently the path of the detour is not easy to follow and that signs often are not placed at all critical decision points along the detour.

Drivers were asked how long a delay was acceptable to them, with widely varying responses. Motorists were willing to accept delays in the 5-10 minute range, without expressing concerns that they would be upset or angry. Delays up to 15 minutes or longer were acceptable to many motorists as well, although in these cases information about the length of the delay played a big role in their willingness to accept this length of time.

School bus drivers were unhappy with delays of any sort because the passengers were harder to control. As one bus driver put it, “you don’t want to sit in a bus full of children.”

Fire and emergency drivers were not able to accept a construction delay of any duration. Inside their response zone, the fire and emergency vehicles are distributed and operated in a manner that tries to guarantee a maximum response time of 4 minutes. Consequently, any delay was unacceptable. These drivers also expressed concern about a delay preventing them from responding to an emergency that might occur inside a work zone.

For business owners and managers, the importance of construction delays depended on the nature of their business. For those owners with retail shops affected by a work zone, delays were just an additional difficulty that they felt might reduce traffic to their business. For owners who had a delivery fleet and a delivery schedule to maintain, delays were a hindrance, but usually not a devastating impact to their business.

For truck drivers, delays of 10-15 minutes were acceptable. Longer delays bothered them, either because they had schedules to keep or because they were losing money, especially since they are frequently paid by the mile.

A challenge on detours and delays

In some cases construction projects face a decision about closing roads or bridges completely and forcing drivers to detour, or operating the work zone with partial lane closures and delays. In order to get some idea on driver preferences on this issue, we asked participants to listen to a possible scenario around a bridge closure and then choose which alternative they preferred. In addition, we asked participants to pretend that this scenario would really effect their daily driving, and not be something that they were exposed to only once, as they might be doing vacation driving. For school bus and emergency and fire drivers, we asked that they pretend that this was something they encountered during their professional driving workday and not as private motorists. For business owners and managers, we asked that they pretend that this affected their business, and not their personal driving.

The scenario involved the rehabilitation of a bridge in need of roadbed replacement and strengthening to earthquake standards. There were two options for this construction. The first was the typical approach of partial closures and allowable delays of up to 15 minutes, with construction scheduled to last 6 months. The second option was a complete closure and a 20-mile detour, with construction shortened to one month.

For motorists, the almost universal response was to prefer to detour, even if driving 20 miles would take longer then the average delay time and impose additional personal costs through increased fuel and vehicle maintenance. The ideas of “being in control” and “predictability” outweighed cost considerations.

For school bus drivers, the detour was also the universal choice. However, for these drivers the reason was the improved predictability of a known detour, versus the unknown time of a delay. The school bus drivers could adjust their schedule to a very large degree if they knew what was going to happen so that they could schedule around the delay, but they preferred no stopping delays at all, in part, because of the issue of child control discussed earlier.

For fire and emergency drivers, the issue of delay vs. detour turned on what options existed for them. For example, if the closure of a bridge meant that they might have to redeploy equipment to another station or part of town. If this were done, they might prefer delays and then reassign equipment affected by the delays to a “2nd vehicle” status for emergencies when their vehicles had to cross the work zone. Alternatively, they might prefer the closure option, depending on alternative routes and the actual feasibility of redeployment. The bottom line for these drivers was, “it depends.” And, what it depends on is the effect of the decision on their ability to respond to an emergency in a timely manner.

For business owners and managers, the answer to the decision posed was completely dependent on the estimated impacts to their business. Some business owners felt that any closure of a road that isolated there business was unacceptable, while others felt that they

would rather sustain a short loss than months of severely reduced sales. Those businesses that were primarily delivery orientated preferred closures to delays as long as it didn't prevent them from sending trucks out from their business. Here again, the idea of predictability with detours vs. the unpredictability of delays was the dominant factor.

For truck drivers, the detour was by far the favored alternative. They felt less anxious on the road than waiting inside a work zone. Further, they felt they saved little in gas when stopped because they had to keep their engines running anyway. In addition, the idea of having some control was considered important.

As one form of check on the strength with which these opinions were held, we asked participants if the fact that bridge closure might cost more than the longer construction schedule with delays, and potentially effect the ability of the state to complete as many projects, would cause them to change their opinion. A few motorists changed opinions under this challenge, reasoning that they wanted tax money to buy as much as possible. However, for all other groups, the additional costs were not seen as an important factor, with the argument frequently given this cost should just be a part of the normal budgeting process.

Information about highway construction

All the groups were asked if they had access to, and used any form of information to learn about highway construction. Most groups made very little use of the information sources available. Most drivers were aware of telephone access for road conditions, although some complained about difficulty getting through to the message. Some drivers used other sources, including AAA, local television, newspapers, ODOT's cable access television station (in Bend only), and a limited amount of Internet use, including "Trip Check" on ODOT's web site. School bus drivers had by far the most comprehensive system of gathering construction information and distributing it to drivers. On a daily basis they used ODOT sources, web cameras, local government sources and as well as making contact with contractors and ODOT, City and County project managers (as appropriate). This information was used to plan alternative routes, change travel schedules, and occasionally reorganize daily activities. In addition, the busses were in communication with their dispatcher and with each other, and updated one another on a real time basis about changes in road conditions, including construction.

Fire and emergency drivers were somewhat similar, although their sphere of activity was smaller than the school bus drivers. Fire and emergency personal also kept themselves updated on construction and road conditions, although they did not seem to have as comprehensive a system as the school bus drivers.

For businesses, the information sources and the communication methods varied from company to company. However, even the best-informed companies were less informed than the school bus drivers and fire and emergency drivers. Some companies had however participated in construction planning stakeholder meetings and did have channels of communication related to specific projects.

The truck drivers were all hooked to a central office communication system using satellite and phone messaging that included both voice and written material. However, given the huge geographic area covered by the trucking company (13 western states), they did not try to keep up with all construction projects and rarely used the system to give construction alerts.

All groups were also asked for additional ideas about how communication about construction might be improved. In general few new ideas were mentioned. However, motorists in Bend wanted target mailings to those people living near state highways planned for construction projects and more information in the newspaper. Truck drivers also had suggestions, wanting local construction site radio information, increased information at truck stops and at state border welcome centers. Truck drivers also noted that the ODOT 1-800 line did not work from California, and was not helpful to interstate truckers on the I-5 corridor because of this.

Questions unique to businesses

Businesses were questioned about the effects of construction on their business. As one might guess, these effects varied enormously with the type of the business and their past experience with work zones. For some businesses, the presence of a work zone had severe financial impacts because of reduced customers and a loss in revenue. This was mostly true for retail businesses. For wholesale and service businesses, the impact was more related to scheduling of work hours and deliveries and work zones generally had little financial impact on the business. For all types of business, the nature of the types of temporary entries and exits played a large role in what how they perceived the impact to their business. Here again, this was particularly true for retail businesses and for a large shopping center. In the same vein, the presence of signs directing traffic to their business at appropriate positions at the entrance to the work zone and inside the work zone was also seen as very important.

Their largest concerns around work zones included:

- The hours that construction takes place (in general preferring work outside of their normal business hours);
- Signage issues, such as those mentioned above; advanced notice of times when construction would actually take place in the work zone; and
- The desire for flaggers to be well informed about the project and business accesses, and able to pass on information that information to motorists traveling into the work zone.

While businesses would prefer construction outside of their normal business hours, they also understood that this was not something that could reasonably take place. They did however, voice the hope that when construction required actual road closures (especially roads that did not have easy alternative routes, such as bridges and major highways), this work could take place at night.