National Association of
City Transportation Officials

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NACTO's 3/15/19 Webinar — Unanswered Questions

"Rethinking Large Vehicles on City Streets"

Thank you for tuning in to our webinar! As we were not able to answer all of your questions during the event, we have compiled responses to all unanswered questions. If you have any further questions, comments, or concerns, do not hesitate to reach out to events@nacto.org

Questions for Alex/Jonah (Volpe Center/USDOT)

1. How can WB-62 be paired with smart right turns in suburban environments to accommodate pedestrians and cyclists; while keeping the intersection footprint unchanged?
    a. WB-62 is a long tractor-trailer – so the initial question is whether it needs to access many suburban streets. Is this a regular occurrence? The swept path of any vehicle, and especially large vehicles, is examined using a software program to define the requirements for roadway geometry. If the analysis demonstrates that a large vehicle cannot make a right turn without mounting the curb, and if the existing "intersection footprint" (e.g. curb locations) cannot be modified, then local policy approaches may be considered to accommodate that vehicle's access. For example, routes can be designated that allow the vehicle to make *left* turns through these smaller intersections so it is not forced to mount the curb, or the vehicle can be allowed to make a right turn from the oncoming travel lane when safe to do so, if that would allow it to perform a wider turn. This would keep pedestrians on the sidewalks out of harm's way. However, these strategies do not directly address the safety of pedestrians and cyclists *within* the roadway. Other precautions and vehicle technologies play a role in addressing those VRUs' safety.

2. What tools were used to identify blind spots for trucks? Programs beyond AutoTurn?
    a. The two percentages shown in the webinar (on slide 11) represent how much of the volume directly in front and to right of the truck cab is visible to a median height male driver. The calculation is performed using a program and web-based app developed by Olin College of Engineering in collaboration with Volpe and the Santos Foundation for Traffic Safety. The Visibility in Elevated Wide Vehicles (VIEW) app analyzes a calibrated panoramic photograph from the driver eye position. The tool and documentation may be found and freely used at: https://blindspotcalculator.herokuapp.com/ If additional funding permits, future iterations of the tool could allow a wide range of truck and other vehicle blind spot volumes to be cost-effectively measured and compared to inform safety-based purchasing and operational decisions by fleets.

3. Do you have statistics on the percent of VMT driven by large vehicles? Seems that they'd account for more than 7% of total VMT, since they're driven much more than personal vehicles.

a. As noted, large trucks travel are driven more on average than personal vehicles such as passenger cars and light trucks. According to the Bureau of Transportation Statistics, in 2017 large trucks accounted for about 9% of VMT: https://www.bts.gov/content/us-vehicle-miles

Questions for Chris (Seattle DOT)

1. What is the purpose of e-trikes vs. small e-vehicles?
    a. Improved mobility. The use of an e-trike under a certain wattage (varies by state) allows for a supplementary-powered bicycle to use bicycle lanes and access pedestrian facilities (sidewalks) as necessary to perform deliveries. They can park more easily and in more places, which reduces delivery and dwell time while also removing a large vehicle making turns and adding to congestion.

2. Regarding the common carrier locker pilot: What were the characteristics of the locker? Who used it? How was it used? Where was it used? What was the outreach and evaluation process? What was the length of the pilot?
    a. The locker was provided by Parcel Pending with multiple box sizes and internet operability to allow for communications from delivery company to package recipient. The test was performed in our downtown building – The Seattle Municipal Tower – a 65 story tower. The outreach was internal through the building management and the evaluation was through the University of Washington over a 30 day period. The executive summary can be found at this link https://depts.washington.edu/sctlctr/sites/default/files/SCTL_Executive_Summary_v8.pdf

3. Have you used any cities for case studies (Paris)? What have you taken and/or rejected from these case studies?
    a. I attended the 2018 POLIS conference which showcased a number of studies from the EU. While I don't specifically recall Paris, some of the themes throughout cities studying goods movement are a low amount of base data to work with. One test that initially showed promise was the use of urban consolidation hubs to bundle disparate goods going to the same place and thereby reduce truck movement in urban areas. While the outcomes were positive, the consolidation hubs were not self-sustaining and required an ongoing subsidy to keep shippers/delivery companies involved. The determination was that the business case could not be made to shippers who had to financially account for an additional step in the supply chain while also losing direct control over their product. As a side note, the public/private/academic model we are using in Seattle with the University of Washington is better established in the EU and has lent additional credibility to the research paths we've taken.

4. Could you briefly go over the regulations around the e-trikes, speeds, lanes they can use, and where they are allowed to park?
    a. The e-trikes meet Washington state requirements (these vary by state and sometimes local jurisdiction) as an assisted bicycle. There are wattage maximums and speeds – in Washington state it's 1,000 watts and 20 miles per hour maximum. Bicycles are allowed

to travel as vehicles in Seattle, but they are also allowed to access sidewalks to park so long as they do not reduce sidewalk space to under 4' to meet ADA requirements. The UPS E-Trike is just under 5' wide, so they can fit in standard bicycle lanes.

Questions for All

1. Have any of you experimented with Dome Mirror or Conflict Sensor placement in Urban Intersections. Any tricks to intuitively induce oversteering when making right turns?
    a. **Seattle**: No on dome mirror/conflict sensors. Oversteering usually comes with experience. I admit I hadn't considered what factors may influence a truck driver to do so, but it does imply incursion into other lanes in multilane locations, a phased signal at the intersection or a lower volume road. Now I'm going to be thinking about this.

2. Is there any policy plan or recommendation for the regulation for working with private fleets? Particularly from the Volpe Research and any recommendations for USDOT policy?
    a. **Volpe**: These NACTO reports describe best practices identified through research conducted by the Volpe Center. Please note these do not represent official USDOT policy or recommendations.
    Seattle: One of the goals of using a private/public/academic collaboration is to better understand the 'sweet spots' where we can all benefit. If we ask rather than tell an industry what to do, we hope to have better and more enthusiastic cooperation.

3. Regarding rethinking the design of commercial vehicles and "right sizing the fleet" - wheelbase, wheelcut, steering axle configuration width, driver seat height (i.e., weights and dimensions). Weight and dimension limits for heavy commercial vehicles balance productivity, safety, and infrastructure wear and tear (bridge load limits, pavement impact). Have these been considered when assessing the viability of right-sized HCVs? For example, while a shorter wheelbase also has a direct relation to maximum allowable axle group weights, bridge load limits, pavement impact, and ultimately payload. Similarly, how does a high vision, cab-forward truck design impact steer axle weight? Steer axles tend to be the most aggressive from a pavement impact perspective.
    a. **Volpe**: These NACTO reports highlight best practices in vehicle design and technologies culled from domestic, European, and Asian markets. The vehicles described in the reports, and the technologies they incorporate, are in use in those markets. In the example of fire apparatus, the European example vehicles have fewer axle groups but are also lower gross weight than their respective U.S. counterparts. Straight trucks of both shorter and longer wheelbase configurations were identified with equal GVWR and thus approximately equal payload. However, additional research would be needed to address questions about the comparative specifications of high vision, cab-forward truck designs in dimensions such as steer axle weight, pavement wear, bridge loads, etc.

    Seattle: The NACTO goals were to identify and support emerging technologies that were poised to improve safety when incorporated in large vehicles. The consideration of pavement impact wasn't included in the evaluation. ESAL and axle loading have state-by-state limits as well as federal limits, so truck designers end up working within those parameters. It should also be noted that there is about a 15-year life-cycle when talking about the average delivery fleet, so it would definitely benefit us to review and update axle-spacing requirements.

4. Have you pushed any of these ideas on public transit and private industry and/or taken ideas from these areas?
    a. **Volpe**: The concepts described in these reports for large vehicle optimization in urban environments include modifications to traditional vehicle design, features, and technology integrations. These concepts may be applicable to any vehicle, including transit vehicles, which often incorporate a higher vision cab design. Specific applicability of any given concept would need to be properly vetted in the context of a vehicle's operational requirements.
    Seattle: Private industry is concerned with safety, but the impact to a long life-cycle for large vehicles is that it takes time to for even the most enthusiastically accepted improvements to significantly incorporate itself into the general truck fleet. But we have to start encouraging and educating somewhere. (Chris Eaves)

5. I have been working with grocery stores who are making more locations in urban cores with smaller footprints. However, their deliveries are still occurring by larger trucks. The supply chain has not yet adapted, as these large trucks typically make 8-10 deliveries per truckload. How/when will this evolve?
    Seattle: Typically, a logistics company will try to make the greatest number of deliveries with the fewest miles/equipment. Trucks are loaded to their greatest extent (trucks typically hit max weight before they hit max volume – referred to as weighing out before cubing out) to delivery as time/energy efficiently as possible.
    Large chains can potentially move to off-hours deliveries to minimize congestion impacts to the network, but the greatest opportunity lies at the design stage where the local jurisdiction can move that all deliveries take place on the property footprint.

6. A major benefit for the Dutch with these smaller vehicles is using police/fire/ambulances in their 'cycle tracks', much like these services use parks right now. What do you think about adopting this approach here in NA?
    a. **Volpe**: The benefits of using smaller vehicles for emergency response (e.g. motorcycles or van-size rapid rescue trucks instead of full size fire apparatus) could yield decreased response times due to those smaller vehicles' ability to travel through narrower spaces in urban environments. In locations where bicycle lanes are located adjacent to motor vehicle travel lanes, and/or locations where access to separated, protected bicycle lanes is possible, smaller vehicles could potentially take advantage of the reliable access such facilities provide.

7. Tesla has a feature on its cars that render anything around the vehicle on the screen as you're driving. Are you familiar with this? Can it be installed on trucks?
    a. **Volpe**: Yes, there are commercially available 360-degree fusion camera systems that produce a bird's-eye view on a central display, and these have been installed aftermarket on large trucks.