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National Highway Traffic Safety Administration (NHTSA)
Docket Management Facility
U.S. Department of Transportation
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West Building, Ground Floor,
Room W12-140
Washington, DC 20590-0001

Submitted electronically via www.regulations.gov

RE: New Car Assessment Program, [Docket No. NHTSA-2021-0002]

Thank you the opportunity the comment on National Highway Traffic Safety Administration (NHTSA), New Car Assessment Program [Docket No. NHTSA-2021-0002] request for comments (RFC).[1] The Center for Auto Safety (CAS), founded in 1970, is an independent, member supported, non-profit consumer advocacy organization dedicated to improving vehicle safety, quality, and fuel economy.

CAS supports NHTSA's proposed update to the New Car Assessment Program(NCAP), although we must note that the scope of the proposed update is far more limited than optimal. NCAP has a number of other areas that need to be addressed, crash avoidance technology ratings being but one. Faced with more choices than ever, consumers need better tools to discriminate between the offerings of various automakers, yet they are met with a wall of 4 and 5 stars that are not sufficient to identify vehicles with superior safety performance. If NCAP ratings remain a participation trophy, then they cannot promote design excellence or safety improvements, and offer subpar assistance to consumers seeking distinguishing information to support their vehicle purchase. Improvements to crashworthiness testing are also overdue, as are corresponding developments to ensure that NCAP helps protect people of all shapes and sizes, and in every vehicle position.

The irreplaceable consumer information provided by the NCAP program now lags behind other international and private assessments of new car safety. Further development of NCAP's test procedures and increasing use of progressive ratings performance thresholds can maximize the program's value for consumer education while incentivizing manufacturers to build increasingly safer vehicles.

[1] DEPARTMENT OF TRANSPORTATION - National Highway Traffic Safety Administration, [Docket No. NHTSA-2021-0002] New Car Assessment Program request for comments, https://www.federalregister.gov/documents/2022/03/09/2022-04894/new-car-assessment-program

Enumerated Question Comments:
(The following enumerated question responses use the same acronyms as the RFC).

1) As noted in the current RFC, there are many variables associated with passing safety and no compelling evidence that automatic passing warnings adequately integrate enough of those variables into their sensing and logic to improve overall highway safety. There is a danger that introduction of limited capability passing warnings into LDW systems could encourage unsafe automation complacency by drivers. NHTSA should continue evaluation of automatic passing warning systems and the particular type of warning given to drivers/occupants until overall attributable highway safety improvements are well established. Alternatively, passing warning systems that are only capable in certain situations might be considered sufficiently safe if validated for those conditions and include logic and human interface technology that adequately warn drivers/occupants that an incipient passing maneuver is outside of the verified safe automated envelope and should therefore only be executed under manual control. NCAP credit should only be awarded if overall highway safety improvements including consideration of intended use and warnings if conditions are inconsistent with automated warning are verified.
2) If a vehicle's LDW and LKS systems are user selectable, then NCAP should test them independently. When present as discrete functionality they will necessarily use differing sensors and/or logic necessitating separate tests. Both LDW and LKS would necessarily have safety-critical functionality and testable parameters that could be compared with minimum standards and compared to other vehicle's similar functionality reportable as NCAP results to enable consumer comparisons.
3) The Agency should specify that an LDW alert must be provided when the LKS is activated to reengage the driver. An LDW alert could provide effective warning that an LKS has failed or the vehicle has encountered a situation that exceeds the LKS capabilities. Either case would be a hazardous condition that needs immediate driver response. An LDW alert would be a desirable component of the driver's LKS failure warning.
4) No response
5) The Euro NCAP maximum excursion limit of 0.3 m (1.0 ft.) over the lane marking (as defined with respect to the inside edge of the lane line) for a vehicle being driven at 72 kph (44.7mph) for LKS technology is unacceptable. The excursion limit should be reduced to zero to account for roads with limited or no shoulder width at the modest speed proposed for the test. Lane markings are established to promote safety, and in many cases denote the road edge. Bridges and tunnels frequently mark roadway edges with no shoulder by painted lines. Excursions of any extent may cause a crash either with other vehicles on the other side of the lane marking, vulnerable road users (VRUs) including pedal bicyclists in an adjacent bike lane, or by exiting the road. Non-zero excursions experienced in NCAP testing are therefore unacceptable. The same standard (no excursion) for lane marking exceedance should be imposed for road edge detection tests.
6) Use of a 200 m (656.2 ft.) curve radius, rather than just a 1,200 m (3,937.0 ft.), is acceptable for inclusion in a NHTSA LKS test procedure, but use of both is essential. They are not acceptable alternatives. It is important that an LKS is not designed for a unique test and is instead designed for a wide variety of road conditions including multiple

curve radii. While only experience will assure that vehicle LKS are being adequately designed for the wide range of conditions they will encounter, it is prudent for NHTSA to include at least both noted curve radii in initial tests since it would assure a wider range of compliant designs and impose no additional production cost on manufacturers.

7) NHTSA should use both single lines and double lines in its LSS protocol since both may be commonly encountered on US roads. In particular, in many parts of Europe bike lanes are separated from automobile lanes by physical barriers. Such physical barriers delimiting bike lanes are not common in the US; double lines are much more common. The trends of increasing bicycle fatalities in the United States in recent years demand a response from NHTSA that includes tests representative of bicycle lanes such as double lines.
8) NHTSA should consider adding Euro NCAP's road edge detection test to its NCAP program to begin addressing crashes where lane markings may not be present. Crashes are common for vehicles departing the roadway where lane markings are not present. The test should be added for LDW and LKS technologies since there many circumstances where LDW and LKS technologies are activated using only a single or no lane markings and road departure on an unmarked side needs to be avoided.
9) NHTSA should consider a combination of the two Euro NCAP unintended departure ranges, lateral velocities from 0.2 to 0.6 m/s (0.7 to 2.0 ft./s), for inclusion in the Agency's LKS evaluation. Using the higher lateral velocities in the NCAP tests will provide an additional safety margin. However, while use of Euro NCAP as a starting point for NHTSA's NCAP is useful, additional research is warranted to determine if the European protocol is the best available for the US highway and vehicle needs.
10) NHTSA may be able to correlate better LKS system performance at higher lateral velocities on straight roads with better curved road performance, but comparative test results will be needed to confirm the correlation strength. Curved road construction is not the same as straight road construction and may include banking and sight line restrictions different from straight roads that impact LKS performance. The significance of these differences needs verification. The Agency may not a priori assume a vehicle that does not exceed the maximum excursion limits at higher lateral velocities on straight roads will have superior curved road performance compared to a vehicle that only meets the excursion limits at lower lateral velocities on straight roads. There are additional factors such as sight line restrictions, road construction differences, and underlying additive lateral acceleration between straight and curved road performance that may affect the relative performance in unexpected ways. The Agency cannot assume the steering intervention while the vehicle is negotiating a curve is sustained long enough for a driver to reengage. The ability of a driver to reengage will depend as a minimum on the speed, curve geometry, ADAS warnings provided, and driver response. There are too many variables and potential pitfalls for reliance on an assumption. Evaluating the ability of a driver to reengage should be an NCAP test objective.
11) It isn't clear that after an LKS correction, that any excursion would be safe or should be allowed beyond the edge of the lane on the other side. In particular, that other edge may be the edge of the roadway on a bridge, or tunnel wall, the edge of a restricted bicycle lane, or an unmarked highway edge with no shoulder, i.e., no safe excursion margin. Regardless of the excursion margin for the initial LKS correction, no excursion of the other lane edge may be safely allowed. The introduction of a second lane line is irrelevant to the necessity to maintain the vehicle within the safe roadway after an LKS correction. Even if,

especially if, some vehicles cannot avoid excursion past the edge of a lane, tests that verify their incapacity provide valuable proof of that safety defect to consumers.

12) Some LKS testing is better than no LKS testing. Testing at higher speeds should provide superior insight into the LKS performance. Ideally, LKS test speeds would be increased until safe performance limits are established. The LKS safe speed limits should be included in the NCAP test results provided to consumers, not merely compliant test results at an unrepresentatively slow speed. While underway, the driver should be notified with adequate warning if the vehicle is approaching a boundary of the LKS safe operational limits whether due to speed, curvature, environmental conditions, or a fault, since LKS operation outside of those limits is unsafe.
13) If the most challenging test conditions can be verified to encompass all other meaningful test points and conditions, then they could safely be used to reduce the number of tests. But it's important to note that this is always the case for any test protocol because no test protocol can comprise all potential operating conditions. There is also a danger that reducing the number of test points will encourage manufacturers to design to the test rather than design to a broad operating envelope that happens to include the NHTSA NCAP test points. This question and proposed test restrictions need to be evaluated narrowly rather than broadly considering an individual test in the context of the conditions and potential risks associated with feature(s) and vehicle under test.
14) The number of LKS test trials and pass rate for each LKS test condition should be determined by an objective coupled reliability and confidence. The reliability and confidence can be determined by use of a binomial distribution. Establishing these criteria would also allow the public to know just how reliable the tested feature really is, and would be much more meaningful than a binary pass/fail criterion.
15) Aspects of the proposed LDW or LKS test procedures that need additional discussion are the test protocol environmental conditions. Depending on the technology used, the LDW and LKS may be critically dependent upon the presence of rain, ice, fog, other precipitation, low sun angles, ambient light, road conditions, etc., as well as speed, line of sight, scene congestion, and traffic density. To avoid inappropriate use of LDW and LKS, consumers need to understand the safe operational limits. Vehicles should provide warnings to the driver if safe operational boundaries are being approached or exceeded. NCAP testing should provide verification of these data and parameters to the public.
16) BSW testing should be conducted both with and without the turn signal indicator activated. Driver need for BSW is unrelated to whether the turn signal indicator is activated. Presence of a vehicle in the blind spot may influence a driver's decision to initiate a lane change maneuver. And, even though unwise, many drivers will initiate a lane change without signaling. A BSW alert or alarm may help avoid an unsafe maneuver independently of the turn signal indicator status. The Agency should not modify the BSW test procedure to stipulate activation of the turn signal indicator. The test vehicle should be required to provide an effective audible or haptic warning that another vehicle is in its blind zone since the marginal production cost of such warning is de minimus. BSW visual warning should continually flash when the turn signal indicator is engaged, at a minimum, to provide a distinction from the blind spot status when the turn signal is not in use since a flashing warning is more visible to the driver and consequently is more effective. Ideally, for suitably equipped vehicles, the BSW should be combined with LDW to provide an aggressive warning and correction if the blind spot is occupied while the vehicle is crossing

into a hazardous encounter regardless of the turn signal indicator status. The marginal production cost of a combined warning given the existence of both LDW and BSW is de minimus.

17) The Straight Lane Pass-by Test provides information about comparative BSW performance supporting consumer comparison among vehicles. The test is unrepresentative of real-world conditions while performed at unrealistically low speeds and only on straight dry pavement during daylight hours. Critical information could be provided by test modifications to include higher speed, curved roads, precipitation, and unfavorable lighting conditions as well as inclusion of motorcycles that, as noted, have a disproportionately high death rate due to automobile incursions into their travel lanes.
18) No response
19) It is too soon to consider using the most challenging tests to replace a broader spectrum of tests. The history of reliance on manufacturer tests and assurance of safety in lieu of NCAP tests is not encouraging. Manufacturers might decide to design to a particular test rather than a broad spectrum of test conditions Only broad spectrum tests can adequately verify consumer safety. It's necessary for the Agency to perform all test scenarios and test conditions to adequately address real-world safety.
20) A Blind Spot Intervention (BSI) false positive test is necessary. False positive BSI could potentially cause unnecessary or even dangerous driver reactions. Frequent BSI false positives could encourage a driver to lose confidence in or disable the BSW, nullifying a valuable safety feature. Maximizing safety implies the need to maximize consumer confidence and use of a vehicle's safety features, a consequence of and rationale for the BSI false positive test.
21) The BSW test procedure includes 7 repeated trials for test condition. The number of trials and failures should be decided by NHTSA's determination of acceptable reliability/confidence couples using a binomial distribution or alternative objective statistical test. The objective reliability and confidence levels NHTSA and an informed public demand is not currently known but considering the low 50% confidence attributable to even a modest 90% reliability available by passing seven of seven trials, no test failures in the series can be allowed.

Trials	Failures	reliability/confidence	reliability/confidence	reliability/confidence
7	0	46.9%/99%	59.0%/95%	90.6%/50%
7	1	35.1%/99%	42.1%/95%	65.9%/50%
7	2	20.3%/99%	29.0%/95%	86.2%/50%

22) It is unreasonable to perform only BSI tests in conjunction with activation of the turn signal. LDW systems may be inoperative in both directions when a turn signal indicator is activated. It is conceivable that a driver's attention to an anticipated lane change may cause inattention to lane keeping in the other direction. That could endanger both the driver's vehicle and any other vehicle, object, or VRU in the opposite direction. NHTSA tests should not be based on idealized good driving practices but should instead include plausible driving errors. A BSI might well have more aggressive counter-maneuvers than that same vehicle's LKS. NCAP tests encompass both underlying functionality as well as resultant maneuvers. Because the underlying logic is different separate tests are needed. The means by which NHTSA can determine which logic is activated to discriminate

between BIS and LDS will vary from vehicle to vehicle based on both logic implementation and responsive maneuvers.

23) It is in the consumer's best interest that NCAP testing determine the PAEB performance limits, enabling consumer selection of the best performing vehicle. The proposed test constraints do not allow needed identification of superior vehicles that also meet the minimal standards. An improved NCAP test would determine the upper speed limit of a vehicle's PAEB performance and identify those vehicles that both meet the NHTSA minimum requirements and also exceed minimum requirements. This would incentivize manufacturers to maximize VRU protection rather than merely design for the test.
24) Limiting the NCAP test to only certain scenarios or conditions to minimize test burden has not been shown to adequately address safety. Without empirical test support for the sufficiency of an alternative limited scope NCAP safety test scenarios and conditions should not be reduced. Test conditions S1f and S1g (false positive tests) should be adopted for NCAP testing. In real life, VRUs (particularly children, compromised adults or animals who might be irresolute or wander) may first stop and then suddenly continue or reverse their direction. Appropriate vehicle response to VRU proximity as per S1f and S1g provides additional safety margins in such cases. S1f and S1g test compliance provide additional VRU protection and meaningful information to consumers about the safety of a particular vehicle's PAED at no additional production cost.
25) Testing with advanced lighting systems such as semiautomatic beam switching and/or adaptive driving beam headlight systems are appropriate if such systems are not user-selectable by the operator. If optional, then the vehicle testing should be limited to low beams only, i.e., the least illuminating system available to the operator that determines the worst-case performance of a vehicle. The worst-case illumination is the most useful condition for vehicle PAEB capability evaluation and comparative characterization.
26) Performing PAEB testing under dark conditions with a vehicle's upper beams as a light source may be performed but is not a substitute for baseline evaluation of PAEB performance under minimal worst-case low beam illumination. The worst-case illumination is the only acceptable condition for PAEB capability evaluation and ranking.
27) Passing 3 of 5 trials provides little confidence in safe performance. Using a binomial distribution for pass/fail tests, passing 5 of 5 tests provides only 86% reliability with 50% confidence, a very low bar. Passing 3 of 5 trials provides only 46.5% reliability with 50% confidence. 5 trials with 5 successes provides marginal a reliability/confidence couple. One or more failures to avoid contact in 5 trials must be considered an NCAP test failure.
28) "No contact" with a pedestrian mannequin is the only acceptable criterion for the proposed PAEB test conditions. A vehicle that contacts a mannequin under the stylized and relatively benign NCAP test conditions cannot be considered safe because real world VRUs and environmental conditions are much more diverse, uncontrolled, and therefore more challenging than NCAP evaluation test conditions. The point of the NCAP PAEB tests is protection of the public, not maximizing the pass rate.
29) Any PAEB testing is better than no PAEB testing. Allowing retest under any conditions is only appropriate if the additional testing supports confirming objective PAEB reliability and confidence at least equal to the (low) reliability and confidence established by passing 5 of 5 trials. Passing 5 of 5 tests provides 86% reliability and 50% confidence. This is a low bar. NHTSA should allow retest after mannequin contact only if the vehicle configuration is changed in response to the failed test trial, and then require that in a new

test series 1) the newly configured vehicle pass the nominal number of trials and 2) that the reconfiguration be retrofitted to previously built units and applied to subsequent vehicle production.

30) A vehicle should only be awarded a check mark if it passes all test conditions. As noted in the response to questions 21, 27, and 29 passing all currently required tests is not a high bar. Considering the enormous numbers of encounters between vehicles and VRUs that will occur, any deviation from passing all tests is unacceptable. NHTSA should consider optional PAEB tests that would allow manufacturers to get credit for capabilities that exceed the nominal test standards rather than giving credit to vehicles that cannot pass all tests. For example, in addition to the minimal standard of no contact, NCAP could measure the distance between stopped vehicle and mannequin under all test conditions. That safety margin could be used for comparative evaluation. This would allow consumers to identify and avoid vehicles that merely met the minimal standard vs. the truly outstanding performers.
31) An appropriate timeframe for including S2 and S3 scenarios into the Agency's NCAP is as soon as possible.
32) The Agency should adopt articulated mannequins into the PAEB test procedure. The articulated mannequins improve verisimilitude and critically thereby improve confidence that consumers should have in NCAP test results. Establishing an empirical basis for consumer confidence in vehicle safety is the fundamental purpose of NCAP testing.
33) No Response
34) NHTSA should include environmental conditions, highway signage, crosswalk painting and construction, and a wide variety of mannequin types and sizes in this pedestrian protection NCAP upgrade. High priority should be given to child-sized mannequins and to pedal bicyclists. Pedal bicyclists have suffered rapidly increasing fatalities in recent years. Collisions between motor vehicles and pedal bicyclists are a disproportionate hazard to the bicyclists with a very high injury and death rate.[2]
35) The PAEB testing is clearly focused on pedestrians. Pedestrians are not the only VRUs. NHTSA should investigate the applicability of PAEB testing to other VRUs and include those other needs. Evaluating and adapting the PAEB testing applicability to children and pedal bicyclists should be a high priority.
36) NCAP should adopt the Euro NCAP pedal bicyclist test standards immediately. The pedal bicyclist injury and fatality rates are too high and are increasing. Delaying implementation of cyclist component into NCAP testing because of a potential future upgrade would be a classic example of letting better be the enemy of good.
37) NHTSA's consideration of test procedures in addition to Euro NCAP can take place in parallel with implementation of Euro NCAP tests. There is no acceptable rationale for delaying implementation of pedal bicycle tests in NCAP testing.
38) In real world situations, FCW activation should be a rare occurrence. If FCW is activated frequently enough to encourage operator deactivation then it is either poorly designed or the operator should not be driving. Any effective implementation, visual, haptic, audio, or some combination is acceptable. The least sensitive use setting is the most appropriate for NCAP testing. The least sensitive setting provides worst-case protection. --- Worst-case protection is the most important information for consumers who are comparing the safety

[2] 2020 Fatality Data Show Increased Traffic Fatalities During Pandemic, NHTSA 6/3/21, https://www.nhtsa.gov/press-releases/2020-fatality-data-show-increased-traffic-fatalities-during-pandemic

of vehicle designs. --- Consolidating FCW and CIB testing would only be appropriate if both subsystems use identical physical components such as sensors and brakes, and use identical logic and parameters in their execution, in other words, only if FCW is a portion of the overarching CIB system, is executed every time the CIB is activated, and the capabilities from the user perspective can be separately appreciated and evaluated. --- The number of trials used to evaluate the FCW and CIP systems should be based on objective reliability and confidence criteria, in no case fewer tests than required for other safety-critical systems. No failures should be allowed in a test series given that low reliability and confidence bar that NHTSA has established for other component tests as discussed in comments 21, 27, and 29. --- NCAP should not limit the number of test scenarios unless it can establish that the reduction in test scenarios has no negative impact on safety. --- Test scenarios should be determined based on representative speeds. NCAP test results are supposed to provide consumer confidence in tested vehicle safety including comparisons among vehicles in the fleet. NHTSA should not limit NCAP to awarding participation trophies. Tests that are designed to maximize compliance rather than optimizing safety are not acceptable. NHTSA should test at the highest speeds possible that are compatible with test safety to determine safe operating limits, publish the limits, and provide comparative rankings at speed based on successful FCW and CIB activation so that consumers can determine which vehicles maximize safety, not merely those that meet minimum standards.

39) Any CIB test are better than no CIB tests. The best test strategy would clearly show which vehicles provide superior performance as well as which vehicles meet minimum standards. NHTSA should test at the highest speeds possible that are compatible with test safety, and should publish comparative rankings at speed based on successful FCW and CIB activation so that consumers can determine which vehicles maximize safety, not merely those that meet minimum standards. --- A performance criterion of "no contact" is appropriate for CIB and DBS test conditions, because that is the desired outcome of any CIB or DBS activation. As test speeds increase, ability to maintain "no contact" may also be a useful criterion for comparing different vehicles' safety envelopes and margins.

40) The Agency should not remove the DBS test scenarios from NCAP since DBS can provide additional safety margin and its presence or absence may be a way for consumers to evaluate the comparative safety of different vehicles. If present, its capabilities should be evaluated along with other safety features. --- If the Agency also adopted higher test speeds for the LVD CIB test, it should also conduct the LVD DBS test at those speeds. There is a high probability of DBS activation in that scenario. Since an overall objective of the NCAP tests is evaluating vehicle safety in an LVD scenario, it is important to evaluate all of the automated vehicle safety components that may contribute to a safe outcome. DBS clearly falls into this category. --- Independent analysis of human driver responses to an FCW alert should be the basis of the brake application time. A standardized time will allow comparison among vehicles and therefore provide useful information for consumer comparison among different vehicle types. Driver DBS initiation latency is also testable.

41) NHTSA's assessments should be based on objective reliability and confidence criteria. If NHTSA testing progresses based on single tests until a failure is encountered, then NHTSA should regressively test at lower speeds to determine the speed at which acceptable "no contact" performance is achieved to confirm the safe operational limit. NCAP tests should determine the maximum "no contact" speed and use that as a comparative parameter among vehicle offerings. A single test at any speed is not sufficient to determine safe

performance at that speed. As noted above at 21), passing 7 trials at any speed is a low safety bar, providing only 91% reliability with 50% confidence. No fewer successful trials, and no failures, should be acceptable at any speed.

42) An appropriate pass rate is 100%, since the number of trials proposed is insufficient to establish high confidence in safe performance even with no failures.

43) It is not appropriate to remove the false positive STP assessments from NCAP's AEB evaluation matrix in the NCAP update. False positive AEB activations in production vehicles have been reported that need to be better understood and eliminated.[3] One of the test purposes is confirming the capability of safety-critical capabilities. It is inappropriate to assume such capability without test confirmation. There are many reasons for a presumptively competent capability to fail, ranging from design or production issues to manufacturing defects and supply chain problems. Assumed safety is never a best practice.

44) It is most appropriate to test safety-critical systems in the least favorable foreseeable circumstances. Without a doubt, user selectable incapacity of regenerative braking is a foreseeable circumstance. The proposed settings of choosing regenerative braking "off" are appropriate for the PAEB test.

45) Additional AEB tests that confirm AEB sufficiency in a wider range of conditions such as diverse environment conditions or lead vehicle maneuvers, or encourage AEB improvements that reduce rear end crashes by AEB equipped vehicles have merit. Rear end crashes are common. Improving rear end crash avoidance by AEB improvement as induced by NCAP tests is a strong rationale for expanding NCAP AEB tests.

46) An important modification of NCAP's current FCW, CIP, and DBS test procedures is a protocol that establishes the margins of their safe operating envelope such as speed or environmental conditions so that consumers can at be aware of safe operational limits, and ideally that the vehicle operating system provide effective warnings to the operator if safe operational limits are exceeded. For example, some vehicles currently provide interactive warnings if ice is likely to be encountered due to environmental conditions. It is certainly within the capacity of vehicles to provide similar warnings if the maximum safe speed of some ADAS component or minimum safe following distance of lead vehicles is violated. NCAP testing could provide confirmation of such warnings to the benefit of consumers and safety of other road users, including pedestrians and other VRUs.

47) No response

48) Yes, the Agency should pursue research in the future to assess AEB system performance under less than ideal environmental conditions. Nighttime, wet roadways, solar and lunar glare, and ice are common conditions that can compromise AEB. These are strong candidates for additional tests, but final determination of precedence needs to consider collision data and AEB technology bases. Purely optical systems have different challenges than radar coupled AEB. To maximize value to consumers NHTSA should consider the market penetration of the varying technologies and their responses to environmental conditions to prioritize expansion of AEB test environmental conditions.

49) Testing at higher speeds should be a high priority for NHTSA. As noted in the RFC, use of the GVT surrogate vehicle would allow the Agency to perform tests at higher speeds, thus increasing safety benefits, and that, as future upgrades for NCAP are planned, the GVT can

[3] Center for Auto Safety Calls on NHTSA to Investigate Malfunctioning Automatic Emergency Braking System on 2017-2018 Nissan Rogue Vehicles, https://www.autosafety.org/center-for-auto-safety-calls-on-nhtsa-investigate-malfunctioning-automatic-emergency-braking-system-on-2017-2018-nissan-rogue-vehicles/

be used to evaluate more challenging crash scenarios, such as those required for other ADAS technologies (Intersection Safety Assist and Opposing Traffic Safety Assist). There is a strong case for NHTSA adoption of the GVT in preference to the SSV.

50) Assuming that Revisions E, F and G all refer to the GVT, there is no apparent reason why the Agency should accept data based on the (obsolete) Revision E.

51) No response

52) A full scale ADAS rating system should be adopted that allows consumers to readily understand which vehicles do not meet minimum standard, which vehicles do meet minimum standards, and which vehicles provide superior performance to maximize safety and incentivize continuous improvement. All of the raw NCAP data should be published and available to interested parties. In addition, there should be a symbolic summary presented on the Monroney label that would provide in a simple format top level information consumers need, incentivize manufacturers to meet all minimum criteria, and further incentivize continued improvement to achieve a blue ribbon (superior) rating. A simple system could also accommodate future NCAP upgrades if based on both absolute and relative safety performance by NHTSA criteria. For example:

> Red or Yellow Rectangle – one or more NCAP criterion not met
> Green Ribbon – all NCAP criteria are met
> Blue Ribbon – All NCAP criteria met and in top decile among comparable vehicles

53) A full scale ADAS rating system should be adopted that allows consumers to readily understand which vehicles provide superior performance and those that do not to incentivize continuous improvement. A summary is important to include because consumers at the point of sale may not be aware of or able to access the details provided in a published list alone, and may not be able to use such a list to compare different vehicles. Lists are supplemental and not acceptable alternatives to summaries.

54) It isn't clear how different tests ratings in an overall evaluation could be unbiased. If all tests are necessary to evaluate vehicle safety, then all should have equal weight. As noted above in comments 21), 27) and 29), the current pass criteria for many of the tests do not provide a high bar for reliability and confidence. If any weighting is used, it should be based on the frequency that a safety critical feature is actually employed in real world driving, not on success passing a test. All tests should be passed without allowed failures.

55) No response

56) Translating points/ratings earned during ADAS testing conducted under NCAP to a reduction in crashes, injuries, deaths, etc., including which real-world data metric would be most appropriate cannot be predicted without validated baseline data. Ideally, an advanced version of current event data recorders (EDR) would be deployed on all vehicles with ADAS, with actuation and performance of ADAS features recorded in the advanced EDR. Using that data, it should be straightforward to determine which ADAS features were active and/or inadequate to prevent any individual event. Comparison of ADAS-equipped vehicle safety performance with historical data using NHTSA's existing databases should identify comparative safety benefits.

57) As discussed in response to questions 52) and 53) above, an overall rating system is necessary and, should complement, not replace, the existing list approach.

58) Effective communication of ADAS ratings is needed. Whether using a points-based ADAS rating system or a star rating system or a symbolic system as discussed in response to

question 52) is secondary to whether the rating system discriminates between those vehicles that met test standards vs. those that did not, and also identifies those offerings that were comparatively superior to the recipients of a participation trophy. Award for comparative excellence is the best way to assure that all manufacturers continue to improve their safety technology by public recognition of their superiority.

59) NHTSA should consider advancing the technology and body types included in the ATDs used in crash tests, and should consider developing NCAP tests that incorporate ATD's into every seating position.
60) NHTSA should continue its consideration of other governments' NCAP programs and private automobile testing programs to assure its own excellence. For too long NHTSA's NCAP program has languished while others forged ahead, notably Euro NCAP. This NCAP upgrade is a welcome departure from NHTSA's recent NCAP history.
61) No response
62) No response
63) NCAP tests could include systems that immobilize a vehicle if the driver is intoxicated. NCAP tests could also verify safe immobilization of a vehicle if a driver sleeps or becomes inattentive to the driving task for any reason. NHTSA might also investigate whether frequency or severity of corrective ADAS actions correlates with driver incapacity warranting vehicle immobilization (e.g., a combination of driver inattention, LKS and AEB within a few seconds) using sensors not dedicated to the task of detecting incapacity.
64) Vehicles that provide outstanding performance relative to the fleet median or mean should receive additional recognition both as a way of acknowledging their superior performance and as a way of incentivizing future investment in ADAS safety technology to achieve similar future recognition. There should be an easily recognizable and commercially exploitable difference between participation, which is meaningful, and exceptional safety performance that is elective and commendable.
65) No response
66) No response
67) In-vehicle and HMI design characteristics most helpful to include in an NCAP rating that focuses on ease of use would be based on ADAS features default settings. This relates to ease of use. NCAP ratings of driver notification sufficiency when safe operational limits are exceeded are important. This relates to HMI. Other HMI features usability such as haptic, visual, or audible warnings for CIP also relate to desirable HMI features.
68) No response
69) No response
70) NCAP tests could include systems that immobilize a vehicle if the driver is intoxicated. NCAP tests could also verify safe immobilization of a vehicle if a driver sleeps or becomes inattentive to the driving task for any reason. NHTSA might also investigate whether frequency or severity of corrective ADAS actions correlates with driver incapacity warranting vehicle immobilization (e.g, a combination of driver inattention, LKS and AEB within a few seconds).
71) All NCAP procedures need to be described in objective terms. Test outcomes must be agnostic with respect to the underlying technology. Pass criteria should be based on acceptable reliability and confidence standards that NHTSA must develop.

72) NCAP could evaluate technology for detection of alcohol induced impairment. It could also evaluate technologies that safely immobilize a vehicle when alcohol intoxication or other operational impairment is detected.
73) It's unknown whether ADAS functions that stand in for police activity would be accepted by the public. Alcohol consumption is a major factor in crashes. So is excessive speed. Regulations for both vary by state and locale. Yes, there are certainly privacy concerns related to ADAS standing in for police. It would be beneficial to have available ADAS limits on unsafe driving behavior and NCAP could evaluate the capability.
74) NCAP should consider credit for a seat belt reminder system with a continuous or intermittent audible signal that does not cease until the seat belt is properly buckled (i.e., after the 60 second FMVSS No. 208 minimum). Seat belts have a long effective history of protecting vehicle occupants as documented in the RFC, and components that encourage seat belt use are therefore intrinsically beneficial. Additional research is required to determine adequate and most effective seat belt reminder systems.
75) There is an opportunity for including a seatbelt interlock assessment in NCAP. It is possible for NHTSA to develop objective criteria for evaluating any of the several means of implementing an interlock. It isn't clear that any one system is superior to all others.
76) It isn't clear that any one seat belt interlock system is superior to all others. Seat belt use is always beneficial so any means of encouraging use is a beneficial safety endeavor. The best NCAP rating would be based on lowest risk implementation unless NHTSA determines that only one technology should be implemented.
77) If seat belt interlocks are included, then they should be included for all seating positions. A consideration is that some occupants (especially children) may unbuckle their seat belt while the vehicle is in motion. Vehicle and occupant safety overall should not be compromised by an overly aggressive response to any one occupant unbuckling their seat belt while in motion. The driver must be provided with a suitable warning before an interlock takes effect, reversible if the seat belt is promptly rebuckled.
78) No response
79) No response
80) NHTSA should take into consideration systems, such as intelligent speed assist systems, which acknowledge current speed limits and warn the driver or adjust the maximum traveling speed accordingly. Such systems are valuable means of managing vehicle speed and enforcing speed-related safety. There should be a differentiation between warning and intervention type intelligent speed assist systems in this consideration. Implementation of mandatory speed management may become court ordered as part of law enforcement. The difference between system warning and system mandatory speed limit conformance could be a meaningful consideration in such an order. It could also be a factor in beginning driver safety. Systems that allow for some small amount of speeding over the limit before intervening (which is by definition illegal, regardless of how common it might be) should be treated differently than systems that are specifically keyed to a road's speed limit since the inputs, logic, and outputs, and safety risk caused by illegal speed would be also be different Any system that allows driver override of speed limits versus systems that do not should be treated differently, since the safety risks associated with override are different (and higher) from that associated with automatic conformance to posted speeds. NHTSA should not be in the business of using NCAP to validate, certify or endorse ADAS that encourages or enables illegal driving behavior.

81) Speed assist functionality should include appropriate responses to adverse environmental conditions such as wet or icy roads that reduce control authority, low solar or lunar inclination and related phenomenon that reduce sensor effectivity, or any other fault or error that reduces operational safety margins.
82) No response
83) Drivers should receive prompt and effective warnings whenever an ADAS-equipped vehicle is approaching a safe operating envelope boundary. With increasing speed (especially while driving in adverse environmental conditions), safe operating envelope boundaries for a wide range of ADAS functionality related to sensing, steering, and braking may become smaller or vanish. NCAP should verify that drivers receive effective warnings whenever driver actions or ADAS functionality in one aspect endangers the vehicle because of ADAS behavior in another aspect. For example, if a driver were to set their automatic speed control at a speed higher than verified LKW, CIB, AEB capability limits, the driver should receive a persistent warning of that conflict to avoid unwitting reliance on incapacitated ADAS functionality.
84) Any system for alerting an exiting driver to the presence of a child in a back seat is better than no alert. Door logic is not the only available technology that can enable such an alert, and it has not been shown to be sufficiently capable or superior to others such as weight or proximity sensors. NHTSA should mandate an effective child back seat sensor/warning system and verify utility via NCAP. It cannot yet be confirmed that a door logic solution alone is sufficient. NHTSA should consider systems that directly detect the presence of a child rather than indirectly infer a presence.
85) No response
86) No response
87) No response
88) Approaches most effective at providing meaningful vehicle safety ratings would separate crashworthiness from ADAS features and present both separately in an easily digestible format. Combining crashworthiness with ADAS NCAP evaluations would diminish the value of the NCAP ratings. It would mix apples and oranges and yield a bland fruit salad. Equally important is that a rating system distinguish and identify superior performers from the merely adequate.
89) The use of additional injury criteria/body regions that are not part of the existing 5-star ratings system is appropriate for use in a points-based calculation of future star ratings. NHTSA should expand the ATD types used in crash tests to include a broader range of adult female and male body types, senior body types, and children in various positions in test vehicles. Use of additional injury criteria and diverse body types may identify vehicles that are particularly well suited for certain body types or vehicles that are particularly ill suited for certain other body types. A silver rating for exceptional protection of elderly is important. This currently unavailable information would be valuable to consumers.
90) The 5-star rating system, or any other rating system used by NHTSA, should measure a vehicle's performance in both relative and absolute terms. For example, merely passing all minimum crash test standards should earn no more than 3 of 5 stars, and by overall performance in the upper quartile could a vehicle earn 4 stars, and only by performance in the top decile could a vehicle earn 5 stars. Such a rating system that combines absolute and relative performance would consistently reward companies that invest in advancing the safety state of the art to produce superior safety, and would identify vehicles that do not

meet minimum standards. Similarly, assessment of ADAS features could be posted in both absolute and relative terms, identifying vehicles that do not pass all tests, those that do pass all tests, and those that are superior performers as, for example, also discussed in the response to question 52, above.

91) A candidate system for calculating fleet performance would grant a numerical value for passing each pass/fail test, and adding points based on margin of safety demonstrated in parametric tests. The points granted for pass/fail tests would be set so that they were compatible with the parametric tests. The unbiased result would earn higher numerical results for the best performers, allowing NHTSA to identify superior safety performers.

92) The vehicle fleet average should be updated annually for each model year. The objective behind annual updates is encouragement of the most rapid safety improvements achievable. The appalling number of traffic fatalities is growing annually, not diminishing. There is no time to waste.

93) Updates or changes in the rating system should be reflected in updated Monroney labels, and published to NHTSA's website, available graphically and in publicly available downloadable tabular form.

94) The highest priority for the 5 star rating system is to allow the public to discriminate the best safety performers from the fleet average. The difference to a consumer between a 4.5 star fleet average and a 4.6 star outstanding performer may not be meaningful. The difference between 3 stars and 5 stars probably is meaningful. Half stars should not be used unless the NCAP ratings are normalized to fleet average such that outstanding offerings clearly emerge from the pack by at least a whole number increment. It is most important that outstanding safety performance is identified and rewarded with a clear distinction from the fleet average, and that consumers are able to easily discriminate and identify the best performers from the worst. One possibility is awarding a minimum three stars to pass all tests, minimum 4 stars to vehicles in the upper fleet quartile, and 5 stars to the top fleet decile. This would be clear to consumers and provide deserved recognition to superior safety performers.

95) The highest priorities for any rating system are to allow the public to identify unacceptable vehicles and discriminate the best safety performers from the fleet average. It isn't clear that a decimal format would be an improvement to the 5-star system once ratings are properly normalized. It is clear that without proper normalization the rating system would rapidly become meaningless and become, even more than currently, a participation trophy rather than an effective ranking. Adopting an alternative numerical ranking system is no guarantee of providing the needed clear competitive vehicle safety ranking.

96) The Agency should continue to include rollover resistance evaluations in its future overall ratings. Including rollover resistance evaluations assures that effective systems are included and also could contribute to an overall safety ranking that discriminates superior performers from the fleet average, encouraging continued improvements in rollover resistance technology, a desirable outcome of NCAP tests.

97) NHTSA should accept self-reported test data only from laboratories that are certified to comply with the same quality standards as are NHTSA contracted test laboratories. NHTSA should publish standards that enable labs to comply and third-party organizations, and potentially itself, to audit and certify more laboratories. Increased access to qualified test facilities encourages development and deployment of advanced safety technologies motivated by NCAP testing.

98) NHTSA should develop objective reliability/confidence standards for evaluating ADAS technologies. As noted above in responses to questions 21), 27) and 29), the current reliability/confidence standards based on binomial statistical criteria, are low bars for acceptable safety. In any case, establishment of minimum reliability/confidence standards would allow developers to continue alternative test protocols that allow for failures yet still comply, or conversely help them to decide to abandon developments that can never comply based on their own test experience. Increasing the required reliability of ADAS components and performance compared with current test standards would both justifiably increase consumer confidence and provide an improved basis for safety predictions of even more advanced driving technologies such as highly automated vehicles that incorporate tested technologies.
99) Consumers who we have interacted with do not typically research the safety of their potential vehicle purchase by going from dealership to dealership and comparing Monroney labels. The Monroney label is inherently limited in size, includes many non-NCAP areas, and cannot possibly convey the depth of comparative information provided by the agency's website. It isn't clear why NHTSA suggests that the information on the website and the Moroney label could or would be different other than updated test results that may cause a conflict due to Moroney label publication deadlines. Annotation on the web site of any such updates would clarify the reason for any discrepancies and eliminate the source of any consumer confusion. There should be no reason for confusion regardless of the information on the website because the information on the Monroney label must be traceable to that on the web site, with explanations to help eliminate any possible confusion. The web site and Monroney label should be complementary, not contradictory or exclusive.
100) No response
101) No response
102) No response
103) The most important information for consumers is how the vehicle performed in all NCAP safety tests, and its performance relative to the fleet. NHTSA should update fleet-comparative NCAP ratings to make that information more readily apparent to consumers.

Conclusion

CAS appreciates the opportunity to provide supporting comments for the proposed NCAP update. While there is a much work that remains to be completed to return the NCAP program to its former leadership role in international safety testing and consumer education, the current proposed update is an important and needed advancement, providing consumers with unbiased safety evaluations of crash avoidance technology. The Center is hopeful that this NCAP update, in combination with other near-term improvements to the program, will provide increased consumer awareness of currently available safety features and incentivize industry investment in better crash avoidance and crashworthiness testing and technology. There is no time to waste for NCAP to help combat the now intolerably high number of avoidable traffic deaths.