Table of Contents

After Highway Bill Markup, Still No Path Forward on Finding Revenue ........................................ 1
Senate Adjourns for 5 Weeks After Clearing Budget Deal, Nominees ........................................... 5
Senators Press FAA Officials on MAX Certification Procedure and UAS Rules ........................... 7
Senate EPW Committee Approves 5-Year Highway Bill ................................................................. 10
All States Would Get Uniform Percentage Funding Increases Under Senate Bill, FHWA Says ... 13
Fuel Efficiency Standards - California vs. the Feds (How We Got Here, and What Comes Next) ........................................................................................................................................................................... 16
As 2020 Deadline Looms, Railroads Face PTC Implementation Challenges ................................. 24
Transportation Policy History - Archive of ETW Articles ............................................................... 27
Summary of S. 2302, America’s Transportation Infrastructure Act of 2019. As Reported from Committee ........................................................................................................................................................................... 30
After Highway Bill Markup, Still No Path Forward on Finding Revenue

By Jeff Davis

The July 30 markup of the highway reauthorization bill by the Senate Environment and Public Works Committee left stakeholders with a positive feeling that morning, but by the end of the day, the specter of politics as usual had put a damper on emotions.

At around 5 p.m. on July 30, Senate Finance Committee chairman Chuck Grassley (R-IA) met with Environment and Public Works chairman John Barrasso (R-WY), the principal author of the highway bill, as well as Finance member John Cornyn (R-TX), who has been trying to take a leading role in increasing the size of the federal infrastructure investment. The meeting was to pitch Grassley, whose panel controls taxes and federal trust funds, on Barrasso’s proposals for filling the $110 billion revenue gap needed to pay for his proposed bill (if mass transit is given the same proportional share of funding it was given in the FAST Act of 2015, as shown in the following table):

<table>
<thead>
<tr>
<th>End-of-FY2025 HTF Shortfalls</th>
<th>CBO May 2019 Baseline</th>
<th>Est. Reath.</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EOY Balance</td>
<td>Plus Cash Cushion</td>
<td>Baseline Subtotal</td>
</tr>
<tr>
<td>HTF Highway Account</td>
<td>53</td>
<td>4</td>
<td>57</td>
</tr>
<tr>
<td>HTF Mass Transit Account</td>
<td>21</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td>TOTAL, HTF</td>
<td>74</td>
<td>5</td>
<td>79</td>
</tr>
</tbody>
</table>

*Assumes transit spending will rise by the annual amounts that highway amounts will rise by as a percentage of total contract authority in the bill.

After the meeting, Grassley told reporters that a gasoline tax increase was “off the table” and that, as far as any other “pay-fors” go, when the Senate returns in September, “we’re going to start the conversation with [Majority Leader Mitch] McConnell because if I’m going to exert a lot of both political capital as well as a lot of work to finance this, I want to make sure that we get it up on the floor.”

(Quote taken from E&E News Daily.)
Barrasso did not say what his $110 billion, five-year revenue plan was, but it is hard to raise a lot of money from highway users quickly without increasing the existing motor fuel excise tax rates, because those taxes are incredibly easy for the IRS to administer (levied as they are at the wholesale tank farm) and, being taxes already in existence, can simply be ratcheted upwards with a minimum of extra paperwork. Levying new taxes on any class of highway user would take much longer to implement.

Practically speaking, what Grassley said is not really news – any legislation going to the floor was always going to need the permission of the Majority Leader. But for Grassley to publicly pass the buck to McConnell at this stage of the game brings the inevitable partisan political calculations to the forefront before some had expected.

Since the enactment of the FAST Act in December 2015, one thing has been crystal clear: Highway Trust Fund authorizations are going to expire on September 30, 2020, which is just five weeks before Election Day. This is likely why Barrasso has moved a reauthorization bill through his committee months ahead of schedule – because every day that brings the election closer makes Members of Congress, and the President, a little bit more politically risk-averse.

As such, every day that passes without action on a multi-year reauthorization bill makes it more likely that the most politically risk-averse option (a short-term HTF extension from October 1, 2020 through early summer 2021) will be enacted, because an extension of that duration can be enacted without a “pay-for” and will stick the next Congress, and possibly the next President, with the next Highway Trust Fund insolvency that is scheduled for mid-to-late summer 2021.

It’s also important to note that Grassley did not commit to paying for the next bill with highway user taxes. The last two authorization laws have relied on general fund bailouts to support about 20 percent of Trust Fund spending (in lieu of increasing user tax rates to fill the revenue gap). This violates the user-pay, user-benefit framework under which the Highway Trust Fund was created (and which was cited to give the Trust Fund its many exemptions from the budget rules that constrict most other federal programs). But the system of general fund bailouts has had a singular advantage: it has postponed a day of reckoning on the highway vs transit revenue split that will have to be faced if the Trust Fund is ever made solvent based on user taxes once again.

**Highway vs transit imbalance.**

First, let’s look at the actual excise tax receipts deposited in each account of the Trust Fund every year for the last decade. (Net excise tax receipts only, so this does not include bailout transfers, or interest paid on balances (since interest can only exist over this period due to the bailouts) and does not count a hundred million dollars per year or so, on average, in safety penalties deposited in the Highway Account.)
The fluctuation is due to the fact that the three taxes on the trucking industry (sales tax on new trucks and trailers, sales tax on new truck tires, and annual heavy truck usage tax) are only deposited in the Highway Account, not the Mass Transit Account, and these taxes fluctuate with the business cycle, especially the tax in new truck and trailer sales. During the Great Recession, trucking companies postponed big purchases, so Highway Account tax receipts dropped by a greater percentage than Mass Transit Account tax receipts, and while things are going well (as they have lately), trucking companies buy more new trucks and trailers, so Highway Account receipts form a greater proportion of the total.

But throwing out the Great Recession years as anomalous, the Mass Transit Account gets between 12.5 and 13.0 percent of the actual excise taxes paid into the Trust Fund.

Now, let’s look at the new spending commitments to be drawn from the Trust Fund, approved by Congress in legislation, for those same ten years:

### HTF Net Excise Tax Receipts (No Bailouts, Interest, or Penalties)

<table>
<thead>
<tr>
<th></th>
<th>HA</th>
<th>MTA</th>
<th>HTF Total</th>
<th>MTA Pct.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY09</td>
<td>30.126</td>
<td>4.809</td>
<td>34.936</td>
<td>13.8%</td>
</tr>
<tr>
<td>FY10</td>
<td>30.150</td>
<td>4.811</td>
<td>34.961</td>
<td>13.8%</td>
</tr>
<tr>
<td>FY11</td>
<td>31.961</td>
<td>4.922</td>
<td>36.883</td>
<td>13.3%</td>
</tr>
<tr>
<td>FY12</td>
<td>35.143</td>
<td>5.003</td>
<td>40.146</td>
<td>12.5%</td>
</tr>
<tr>
<td>FY13</td>
<td>31.800</td>
<td>4.648</td>
<td>36.448</td>
<td>12.8%</td>
</tr>
<tr>
<td>FY14</td>
<td>34.066</td>
<td>4.965</td>
<td>39.031</td>
<td>12.7%</td>
</tr>
<tr>
<td>FY15</td>
<td>35.740</td>
<td>5.049</td>
<td>40.789</td>
<td>12.4%</td>
</tr>
<tr>
<td>FY16</td>
<td>36.032</td>
<td>5.162</td>
<td>41.194</td>
<td>12.5%</td>
</tr>
<tr>
<td>FY17</td>
<td>35.699</td>
<td>5.286</td>
<td>40.985</td>
<td>12.9%</td>
</tr>
<tr>
<td>FY18</td>
<td>37.265</td>
<td>5.322</td>
<td>42.587</td>
<td>12.5%</td>
</tr>
<tr>
<td><strong>10-Year</strong></td>
<td><strong>337.983</strong></td>
<td><strong>49.978</strong></td>
<td><strong>387.960</strong></td>
<td><strong>12.9%</strong></td>
</tr>
</tbody>
</table>
Even though the Mass Transit Account only gets between 12 and 13 percent of Trust Fund tax receipts in non-recession years, Congress now gives transit more than 17 percent of Trust Fund total Trust Fund spending authority.

As long as the Trust Fund is being kept solvent by bailouts from the general fund, this systemic imbalance doesn’t matter – Congress is free to borrow money from the bond market, or confiscate money from the Federal Reserve, and distribute that money however it likes, as needed at the time, to keep both accounts solvent.

But if Congress really does make an effort to put the Trust Fund back on the self-sufficient, user-tax model that was in use from 1956 through 2008 (and section 1525 of the bill approved by the EPW Committee expresses the sense of the Senate that this should happen), something will have to be done about this systemic imbalance. One of three things, or a combination of these things, must happen:

- The Mass Transit Account must be given a greater share of new tax revenues than the 20 percent of new revenues given to the Account by the 1982, 1990 and 1993 tax increases, or
- The current fuel tax system (whereby the Mass Transit Account gets a fixed 2.86 cents per gallon of the current gasoline and diesel tax rates) must be amended to give transit a greater share, or
- Funding for mass transit out of the Highway Trust Fund must be reduced down to a level that can be sustained by the actual tax revenues being deposited in the Mass Transit Account.

There is no fourth option.
A week after the House of Representatives left town for the remainder of the summer, the U.S. Senate followed suit today, after clearing the bipartisan two-year budget deal and over 60 nominees (including two National Transportation Safety Board nominees). The chamber will be in recess until Monday, September 9.

**Budget deal.** The last pre-recess votes related to the two-year budget and debt limit bill (H.R. 3877) passed by the House last week. First, the Senate voted to reject an amendment by Rand Paul (R-KY) (SA 932) that would have made a debt limit increase contingent on Congress passing a balanced budget amendment to the Constitution and sending it to the states, and would also have set new spending caps on mandatory and discretionary spending. That amendment was rejected by a roll call vote of 23 yeas, 70 nays.

Then there was an opportunity for any Senator to raise a point of order under the Budget Act against the (budget-busting) legislation, but it was clear that there well more than the necessary 60 votes to waive budget discipline for this particular bill, and having a lopsided vote in favor of ignoring the budget Act is considered worse than just ignoring the budget violation. The Senate then voted to invoke cloture and shut off debate on H.R. 3877 by a vote of 67 to 27 (60 being necessary), and then passed the bill by an almost-identical vote of 67 to 28.

On final passage, the “no” votes were almost all Republicans – amongst Democrats, Senators Bennet (CO), Carper (DE), Klobuchar (MN), Manchin (WV), and Tester (MT) voted “no.”

The bill now heads to the President’s desk for signature, and the staff of the Senate Appropriations Committee will now start to draft fiscal 2020 appropriations bills that the committee can consider in September. Appropriations chairman Richard Shelby (R-AL) told a reporter this week that a three-bill “minibus” consisting of the Defense, Labor-HHS-Education, and Energy and Water Development bills may be the first to go to the Senate floor.

**Nominees confirmed.** As is customary before the Senate takes a long recess, just before adjournment, Majority Leader Mitch McConnell (R-KY) stood at his desk for about a half-hour and read through a long
stack of unanimous consent agreements for the Senate to confirm packages of nominees – over 60 in all. Most were to various federal boards and non-regulatory commissions, ambassadors to foreign countries, and non-Article III judges. But the Senate also confirmed two National Transportation Safety Board nominations during today’s session. Robert Sumwalt, the current chairman, was confirmed for another three-year term as chairman (he was going to have to step down on August 3 had the Senate not confirmed him for another term – he was confirmed two years ago to a two-year term, but sec. 1112 of last year’s FAA reauthorization law extended terms as chair to 3 years moving forward). And current board member Jennifer Homendy was confirmed for a new five-year term on the Board that will begin after her current term expires on December 31, 2019.

**September schedule.** The House and Senate will return to Washington the week of September 9. The House’s agenda is not yet clear, but before leaving town today, Majority Leader McConnell locked in a series of nominations for consideration on the Senate floor the week they return. Cloture votes will be held in the following order:

1. Kelly Craft, U.N. Ambassador
2. Elizabeth Darling, HHS Commissioner for Children, Youth and Families
3. Stephen Darling, Director of the State Department Office of Foreign Missions
4. Dale Cabaniss, Director of the Office of Personnel Management
5. James Byrne, Deputy Secretary of Veterans Affairs
6. Michelle Bowman, Federal Reserve Governor
7. Thomas Feddo, Assistant Secretary of the Treasury for Investment Security
8. Jennifer Nordquist, U.S. Executive Director of the World Bank

Once again, none of the long-delayed transportation nominees on the Senate Executive Calendar (Thelma Drake for Federal Transit Administrator, pending since March 12; Diana Furchtgott-Roth for Assistant Secretary of Transportation, pending since April 3; Heidi King for NHTSA Administrator, also pending since April 3) made the Majority Leader’s cut to go through the cloture process and be confirmed by a simple majoritarian exercise.
In the wake of recent reporting in *The New York Times* and *Wall Street Journal* regarding the certification process for the Boeing 737 MAX and the extent of Boeing’s involvement in the regulatory process, the Senate Appropriations Subcommittee on Transportation, Housing, and Urban Development held a hearing on oversight of the FAA on July 31.

Witnesses included:

- **Carl Burleson**, Acting Deputy Administrator
- **Ali Bahrami**, Associate Administrator for Aviation Safety
- **Winsome Lenfert**, Deputy Associate Administrator for Airports
- **Angela Stubblefield**, Deputy Associate Administrator for Security/Hazardous Materials Safety

The first round of statements and questioning largely focused on allegations of relaxed FAA oversight of the 737 MAX certification and the agency’s role in integrating Unmanned Aircraft Systems (UAS) into the nation’s airspace.

Burleson’s opening statement largely highlighted recent FAA measures to better integrate UAS and commercial space activities into U.S. airspace and reduce congestion at the nation’s airports. Among these measures are the **Low Altitude Authorization and Notification Capability (LAANC)** data-sharing platform, which provides UAS airspace authorization within seconds and allows air traffic controllers to see where and when drones are in operation, and the **Terminal Flight Departure Manager**, a new interface beginning operational testing this summer that will use more robust schedule data to develop a virtual departure queue at airports, reducing idling and improving traffic management.

On the other hand, Bahrami’s opening statement focused almost entirely on the controversy surrounding the MAX certification process. Bahrami forcefully defended the FAA’s handling of the MAX investigation and asserting that the agency is “…following a thorough process, not a prescribed timeline” to return the MAX to service. He also emphasized the FAA’s role in developing new training requirements, supporting investigations and audits, and initiating a Technical Advisory board review of Boeing’s MCAS update.

The MCAS system (short for Maneuvering Characteristics Augmentation System), was designed to help the redesigned MAX handle more smoothly during high-speed maneuvers by automatically adjusting the
plane’s nose using data from the angle of attack sensor. In both of the MAX incidents, faulty data from one of the angle of attack sensors suggested the plane’s nose was higher than it actually was, prompting MCAS to push the plane’s nose down.

Both subcommittee chairman Susan Collins (R-ME) and ranking minority member Jack Reed (D-RI) pressed witnesses about the July 27 New York Times article reporting that FAA managers appeared more concerned with Boeing’s production timeline than the safety of the MAX, and that Boeing certified up to 96% of its own work as a result of the agency delegating routine certification tasks.

Burleson noted that the reporting “offered a perspective” but defended the MAX’s five-year certification process and delegation processes, claiming that the FAA has never allowed “self-certification” and that the agency’s longstanding practice of delegation has contributed to its exceptional safety record. Burleson further defended the FAA as having been fully knowledgeable throughout the certification process and involved in determining the extent of delegation from the beginning of the certification. However, Burleson acknowledged the agency’s willingness to consider a new balance of delegation as it assesses both past and future certification procedures.

Bahrami was further questioned about conflicting reports surrounding the FAA’s initial emergency directive after the crash of Lion Air Flight 610. Reed cited a July 31 Wall Street Journal article reporting that the FAA’s internal analysis after the Lion Air crash found a high likelihood of a similar emergency occurring in the near future. In response, the FAA issued an emergency directive notifying pilots of the risks of the malfunctioning angle of attack sensor and reminding them how to counteract the malfunction by following procedures for a similar issue, a runaway stabilizer, that causes an aircraft’s nose to be pushed down.

According to the report, the FAA believed the directive would be a sufficient response as it awaited a more permanent fix from Boeing within 10 months. Senator Reed noted that this report contradicts past FAA statements that seemed to suggest that the notification was a sufficient response to the MCAS malfunction and that no long-term fix was needed.

Bahrami defended the FAA’s handling of the Lion Air accident, noting that preliminary investigations found pilot action to be a contributor to the crash, which prompted the FAA to issue its directive until further fixes were developed. When pressed on why the FAA did not disclose the need for a permanent fix, Bahrami explained that the FAA must strike a delicate balance between adequately resolving safety issues in the wake of an accident and avoiding disclosure of sensitive information from investigators about the potential causes due to the FAA’s agreements with the National Transportation Safety Board (NTSB).

Sen. Joe Manchin (D-WV), invoking his experience as a pilot, further berated the MAX certification process, asking why pilots only had to receive as little as one hour of iPad training to fly the MAX despite major changes to the underlying dynamics of the aircraft as compared to earlier planes in the 737 family.

Noting one of the MAX’s major selling points that current 737 pilots would require minimal retraining; Manchin characterized the MAX as a largely redesigned aircraft despite sharing the same airframe as the previous generation 737. As reported by The New York Times, the MCAS system was originally intended to operate in the background under limited circumstances and only minimally affect the MAX’s pitch.
However, even after Boeing overhauled the MCAS system to enable its use in low-speed maneuvers instead of just high-speed ones, it was not required to submit a formal review of the new system nor inform pilots about MCAS, leading Boeing not mentioning the system in the pilot’s manual.

In response, Bahrami defended the decision not to require further training, explaining that decisions about training are not made by one individual, but rather through the Flight Standardization Board. During aircraft redesigns, pilots convene through this group to compare changes in the new model to the past model, then review the training syllabus to decide what changes are necessary. Bahrami further noted that this Board felt the existing computer-based training for the MCAS was sufficient for MAX pilots, noting the need to ensure sufficient training without overwhelming pilots with excessively technical information. In defending this decision, Bahrami explained that the MCAS was supposed to work transparently in the background but acknowledged that given what is now known about the MCAS, the agency should have included more information about the system.

While the MAX certification was at the forefront of Wednesday’s hearing, other members of the subcommittee raised other concerns. Sen. Patty Murray (D-WA) raised the issue of sexual assault on airplanes and the lack of information victims have regarding how best to report these incidents.

When asked if the agency had any updates on the progress of the In-Flight Sexual Misconduct Task Force which the USDOT was required to create to establish better practices, Burleson explained that the agency was awaiting guidance from the task force on how to best adopt recommendations and noted the Attorney General has been working across agencies to determine how best to determine metrics for data collection and reporting. In response, Murray urged the FAA to act swiftly and ensure actions outside of the task force are being taken to help victims as it awaits recommendations.

Sen. John Hoeven (R-ND) asked for an update on the timeline for the FAA’s development of a remote identification rule for UAS. Stubblefield acknowledged frustration with the timeline and explained several factors affecting how quickly the agency could develop the rule, including the fact that UAS did not have authority over all UAS in U.S. airspace until Congress restored its authority last October.

Additionally, the FAA has been working with industry groups to establish industry standards as well as the necessary infrastructure to communicate information to law enforcement and other actors to ensure proper execution of the rule. Despite these factors, Stubblefield said the agency is working to finalize the rule this year.

As the grounding of the 737 MAX enters its fifth month, its repercussions have continued to ripple across the industry. Southwest Airlines recently halted operations at Newark Liberty Airport in the wake of declining earnings and increased costs associated with the plane’s grounding. European budget airline Ryanair similarly put the brakes on its future expansion plans amid similar operational constraints; as Boeing itself mulls a temporary shutdown of MAX production if the grounding persists. While Boeing has eyed a return to service by October 2019, agency officials have emphasized there is no timeline or target on when to expect the MAX to return to the skies.
Senate EPW Committee Approves 5-Year Highway Bill

By Jeff Davis

This morning, the Senate Environment and Public Works Committee approved, by a 23 to 0 vote, a five-year highway program reauthorization bill containing $287 billion in Highway Trust Fund contract authority and authorizing an additional $5.7 billion in general fund appropriations. The bill, the America’s Transportation Infrastructure Act, is S. 2302.

- The 8,800-word Eno staff summary of the bill as reported is here.
- The bill text as introduced is here.
- The text of the bipartisan amendment in the nature of a substitute for the bill, which was then made base text for further amendment, is here.
- The text of the five amendments to the substitute adopted in the markup session is here.
- A two-page table showing all funding authorizations made by the bill, as reported, is here.
- A series of tables showing estimated state-by-state formula funding under the bill is here.

Bipartisanship was on full display at the hearing – the only votes taken were unanimous, and everyone who spoke was in support of the legislation. And a litany of stakeholder groups were cited as being in full support of the legislation.

And, shortly before the markup started, the legislation was blessed from on high, via tweet:

No pay-for. Of course, the biggest unanswered question is still “how to pay for all this” – the $287.3
billion in HTF contract authority for FHWA is only part of surface transportation legislation that will have contributions from other committees as well. If the same proportions are used for this bill that were used in the FAST Act of 2015, where FHWA got 80.1236 percent of the contract authority, mass transit 17.4004 percent, and NHTSA and FMCSA 2.4760 percent, then FTA would get $49 billion of contract authority over five years and NHTSA and FMCSA would share $7.0 billion. ETW estimates that the outlays from that contract authority would boost the amount of additional tax revenues (or bailout transfers) needed to keep the Highway Trust Fund solvent through the end of FY 2025 from the CBO May 2019 baseline of $79 billion up to around $110 billion, as follows:

### Additional HTF Revenues/Bailouts Needed by Sept 30, 2025 (Billion $$)

<table>
<thead>
<tr>
<th>End-of-FY2025 HTF Shortfalls</th>
<th>CBO May 2019 Baseline</th>
<th>Est. Reath.</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>End-of-year Balance</td>
<td>Plus Cash</td>
<td>Baseline</td>
</tr>
<tr>
<td>HTF Highway Account</td>
<td>53</td>
<td>4</td>
<td>57</td>
</tr>
<tr>
<td>HTF Mass Transit Account</td>
<td>21</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td>TOTAL, HTF</td>
<td>74</td>
<td>5</td>
<td>79</td>
</tr>
</tbody>
</table>

*Assumes transit spending will rise by the annual amounts that highway amounts will rise by as a percentage of total contract authority in the bill.

But EPW chairman John Barrasso (R-WY) and ranking minority member Tom Carper (D-DE) each made a point of saying that they would work with the Finance Committee to restore the user-pay system, which means new tax revenues on highway users. (Barrasso has been explicit that electric vehicles need to be brought into the user-pay system as soon as possible). And section 1525 of the bill expresses the “sense of the Senate” that “(1) the Highway Trust Fund shall achieve long-term solvency through user fees; and (2) any spending beyond current Highway Trust Fund revenues and balances during the reauthorization period under this Act shall be fully offset.”

**Big Four.** Bills like this are best understood as “Big Four” bills – the legislation was developed in such a way that unanimity between four key Senators on all provisions was necessary: EPW chairman John Barrasso (R-WY), EPW ranking minority member Tom Carper (D-DE), Transportation and Infrastructure Subcommittee chairman Shelley Moore Capito (R-WV), and subcommittee ranking member Ben Cardin (D-MD). They designed the base bill, they decided which of their colleagues’ proposals to include in the substitute amendment, they decided which of the proposed amendments to the substitute would be allowed to pass by a voice vote, and they told their colleagues that it would not be in their interest to exercise their rights to offer other amendments at the markup that would face unified Big Four opposition.

After the substitute version of the bill was circulated to EPW members late Friday afternoon, the only further amendments that passed “Big Four” muster were the five that were accepted by voice vote at the markup:

- **Carper #1** – amends the authorizations in sec. 1101 of the substitute to further subdivide funding under the competitive side of the PROTECT grant program.
- **Inhofe-Boozman #1** – amends sec. 1110 of the substitute to make marine highway projects (including inland waterway projects) eligible for INFRA grants.
- **Duckworth #2 (revised)** – adds a new section to the substitute requiring FHWA to study existing
and future impacts of self-driving vehicles on the roads.

- **Merkley #3 (revised)** – amends sec. 1528 of the substitute to require priority be given to pollinator-friendly wildflowers.
- **Van Hollen #3 (revised)** – amends sec. 3001 of the substitute to increase funding for the VMT pilot programs from $25 million per year to $30 million per year (with the increase split 50-50 between the state pilots and the national pilot).

Looking at the legislation as a Big Four endeavor explains some of the disparate parts:

- **Barrasso** – You might be surprised to see $250 million in the bill to provide for better large animal crossings of highways, but there are lot of elk, antelope, moose, and bison running around Wyoming. (Cardin made a point of saying that the last time he was in Wyoming, he drove around a blind curve and almost hit a bison.) Barrasso made a point of talking about this issue at the [July 10 hearing](#). And there are a whole host of Indian provisions in the bill (title IV ROADS Act, section 1524 of the bill giving oil, gas and water lines on Indian reservations NEPA categorial exclusions, and big funding authorizations for roads and bridges on Indian lands) make sense when you realize that there is a 3,000-square-mile Indian reservation in the middle of Wyoming. Also, there is an odd provision in the bill’s changes to the INFRA grant program giving priority to states that have a population density of fewer than 80 residents per square mile and have 3 or fewer Interstate exchanges of two different routes of the Interstate System in each state, which is Wyoming all over.
- **Carper** – His primary focus was on climate change and resiliency issues, and the new bill goes much farther in that regard than any previous surface transportation legislation. Also, sec. 1408 of the bill on diesel emissions reductions was taken directly from Carper’s bill S.747.
- **Capito** – She managed to get the Appalachian Regional Commission reauthorization included in the bill as sec. 1506. And that odd provision in title II of the bill that allows unused TIFIA contract authority balances to be traded to Appalachian states also bears her fingerprints.
- **Cardin** – Many elements of Cardin’s bill (S.1098) to beef up the Transportation Alternatives program made it into the bill, and the community connectivity program in section 1508 was a priority of his as well.

What didn’t make it in. Several members discussed amendments that they had filed behind the scenes that did not meet the Big Four unanimity test. Two Senators (Joni Ernst (R-IA) and Mike Rounds (R-SD)) said they had proposed amendments to require the electric vehicle and alternative fuel charging/fueling infrastructure grant program funded by the bill to also include biofuel refueling stations (and, for Rounds, propane as well), but this did not pass Big Four muster.

And Sen. Mike Braun (R-IN) discussed two amendments that did not receive clearance: a Buy America amendment that would codify President Trump’s executive order on the subject and eliminate blanket BA waivers for highway programs, and an amendment giving priority in the INFRA grant program for applicants who are requesting a low INFRA grant share (Braun was miffed that Indiana did not get any INFRA funding in the latest round despite only asking for a 20 percent INFRA grant share of whatever the project was).

There is currently no schedule for other Senate committees (Banking for mass transit, Commerce for safety and rail, and Finance for da money) to act on surface transportation reauthorization legislation.
All States Would Get Uniform Percentage Funding Increases Under Senate Bill, FHWA Says

By Jeff Davis

The Federal Highway Administration has completed its initial funding analysis of S. 2302, the Senate highway reauthorization bill, as amended and reported from committee. The analysis shows that every state will receive annual funding that will average a 19.0 percent funding increase versus their FY 2020 FAST Act total.

This is because the new bill (the America’s Transportation Infrastructure Act) would lock in the current shares of total formula funding that are still, basically, the shares from FY 2009, the last year of the SAFETEA-LU law. (The Senate bill would use FY 2020 as the base share, which is tied to the FY 2015 shares, which were in turn chained to the FY 2012 shares (SAFETEA-LU FY 2009 formula plus state share of earmarks - the only variable is if any state has to be adjusted to get 95 percent of its estimated Highway Trust Fund Highway Account tax contribution dollars back out in the form of new formula apportionments, and so far, Texas is the only state that has triggered that adjustment). For example, Alabama, at the top of the alphabetical list, was guaranteed 1.9373 percent of formula funding under the FAST Act (and MAP-21), and will receive that under the new ATI Act.

### Annual Highway Formula Funding Levels - FY 2020 FAST Act vs. FY 2021-2025 Averages Under the Proposed ATI Act

*Contract authority for apportioned programs and allocated-via-formula programs (excluding ferries). Source: FHWA.*

<table>
<thead>
<tr>
<th>State</th>
<th>FY20 FAST Act</th>
<th>FY21-25 ATIA Average</th>
<th>Annual Avg. vs FY20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>840.2</td>
<td>1.9373%</td>
<td>999.8</td>
</tr>
<tr>
<td>Alaska</td>
<td>555.3</td>
<td>1.2804%</td>
<td>660.8</td>
</tr>
<tr>
<td>Arizona</td>
<td>810.3</td>
<td>1.8683%</td>
<td>964.2</td>
</tr>
<tr>
<td>Arkansas</td>
<td>573.4</td>
<td>1.3221%</td>
<td>682.3</td>
</tr>
<tr>
<td>California</td>
<td>4,064.7</td>
<td>9.3722%</td>
<td>4,836.8</td>
</tr>
<tr>
<td>Colorado</td>
<td>592.2</td>
<td>1.3655%</td>
<td>704.7</td>
</tr>
<tr>
<td>State</td>
<td>1967</td>
<td>1977</td>
<td>Change</td>
</tr>
<tr>
<td>------------------</td>
<td>-------</td>
<td>--------</td>
<td>----------</td>
</tr>
<tr>
<td>Connecticut</td>
<td>556.2</td>
<td>1.2825%</td>
<td>661.9</td>
</tr>
<tr>
<td>Delaware</td>
<td>187.3</td>
<td>0.4319%</td>
<td>222.9</td>
</tr>
<tr>
<td>Dist. of Col.</td>
<td>176.7</td>
<td>0.4074%</td>
<td>210.3</td>
</tr>
<tr>
<td>Florida</td>
<td>2,098.2</td>
<td>4.8380%</td>
<td>2,496.8</td>
</tr>
<tr>
<td>Georgia</td>
<td>1,429.9</td>
<td>3.2971%</td>
<td>1,701.6</td>
</tr>
<tr>
<td>Hawaii</td>
<td>187.3</td>
<td>0.4319%</td>
<td>222.9</td>
</tr>
<tr>
<td>Idaho</td>
<td>316.8</td>
<td>0.7304%</td>
<td>376.9</td>
</tr>
<tr>
<td>Illinois</td>
<td>1,574.5</td>
<td>3.6304%</td>
<td>1,873.6</td>
</tr>
<tr>
<td>Indiana</td>
<td>1,055.2</td>
<td>2.4331%</td>
<td>1,255.7</td>
</tr>
<tr>
<td>Iowa</td>
<td>544.3</td>
<td>1.2549%</td>
<td>647.6</td>
</tr>
<tr>
<td>Kansas</td>
<td>418.5</td>
<td>0.9650%</td>
<td>498.0</td>
</tr>
<tr>
<td>Kentucky</td>
<td>735.8</td>
<td>1.6966%</td>
<td>875.6</td>
</tr>
<tr>
<td>Louisiana</td>
<td>777.3</td>
<td>1.7922%</td>
<td>924.9</td>
</tr>
<tr>
<td>Maine</td>
<td>204.4</td>
<td>0.4714%</td>
<td>243.3</td>
</tr>
<tr>
<td>Maryland</td>
<td>665.5</td>
<td>1.5345%</td>
<td>791.9</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>672.6</td>
<td>1.5509%</td>
<td>800.4</td>
</tr>
<tr>
<td>Michigan</td>
<td>1,166.0</td>
<td>2.6885%</td>
<td>1,387.5</td>
</tr>
<tr>
<td>Minnesota</td>
<td>722.1</td>
<td>1.6651%</td>
<td>859.3</td>
</tr>
<tr>
<td>Mississippi</td>
<td>535.6</td>
<td>1.2350%</td>
<td>637.3</td>
</tr>
<tr>
<td>Missouri</td>
<td>1,048.4</td>
<td>2.4174%</td>
<td>1,247.5</td>
</tr>
<tr>
<td>Montana</td>
<td>454.4</td>
<td>1.0477%</td>
<td>540.7</td>
</tr>
<tr>
<td>Nebraska</td>
<td>320.1</td>
<td>0.7381%</td>
<td>380.9</td>
</tr>
<tr>
<td>Nevada</td>
<td>402.1</td>
<td>0.9272%</td>
<td>478.5</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>183.0</td>
<td>0.4219%</td>
<td>217.7</td>
</tr>
<tr>
<td>New Jersey</td>
<td>1,105.7</td>
<td>2.5496%</td>
<td>1,315.8</td>
</tr>
<tr>
<td>New Mexico</td>
<td>406.7</td>
<td>0.9377%</td>
<td>483.9</td>
</tr>
<tr>
<td>New York</td>
<td>1,858.9</td>
<td>4.2862%</td>
<td>2,212.0</td>
</tr>
<tr>
<td>North Carolina</td>
<td>1,155.0</td>
<td>2.6632%</td>
<td>1,374.4</td>
</tr>
<tr>
<td>North Dakota</td>
<td>274.9</td>
<td>0.6340%</td>
<td>327.2</td>
</tr>
<tr>
<td>Ohio</td>
<td>1,484.5</td>
<td>3.4228%</td>
<td>1,766.4</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>702.4</td>
<td>1.6195%</td>
<td>835.8</td>
</tr>
<tr>
<td>Oregon</td>
<td>553.5</td>
<td>1.2763%</td>
<td>658.7</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>1,817.0</td>
<td>4.1896%</td>
<td>2,162.2</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>242.2</td>
<td>0.5584%</td>
<td>288.2</td>
</tr>
<tr>
<td>South Carolina</td>
<td>741.6</td>
<td>1.7099%</td>
<td>882.4</td>
</tr>
<tr>
<td>South Dakota</td>
<td>312.3</td>
<td>0.7201%</td>
<td>371.6</td>
</tr>
<tr>
<td>Tennessee</td>
<td>935.8</td>
<td>2.1578%</td>
<td>1,113.6</td>
</tr>
<tr>
<td>Texas</td>
<td>3,822.7</td>
<td>8.8142%</td>
<td>4,548.8</td>
</tr>
<tr>
<td>Utah</td>
<td>384.6</td>
<td>0.8867%</td>
<td>457.6</td>
</tr>
<tr>
<td>Vermont</td>
<td>224.8</td>
<td>0.5182%</td>
<td>267.5</td>
</tr>
<tr>
<td>Virginia</td>
<td>1,127.0</td>
<td>2.5985%</td>
<td>1,341.0</td>
</tr>
</tbody>
</table>
The above table, and two other tables showing state-by-state annual aggregate totals and state-by-state average funding by program, can be downloaded in PDF format [here](#).

The FHWA analysis makes clear one key difference between the eight formula programs that currently exist that would be continued by the FAST Act, which are apportioned to states via the formula in 23 U.S.C. §104, and the three new formula programs (safety, carbon emission reduction, and PROTECT grants), which are technically allocated (not apportioned) but would be given to states in the same percentage shares as the apportioned funding under §104. Funding apportioned under §104 (averaging $49.9 billion per year under the bill) is not reduced by FHWA via the application of the annual obligation limitation – instead, states get the full gross amount of contract authority each year that is then fungible with their prior-year balances, and the state then has to fit all of that under its annual obligation limitation distribution.

The three new programs are subject to the “lop-off” procedures under the annual obligation limitation (sec. 120 of the annual DOT appropriations bill and, if there is no appropriations bill, sec. 1102 of the highway bill. After making room for certain administrative expenses and prior-year unobligated balances of allocated programs (like TIFIA and INFRA) “off the top” of the obligation limitation, all the other allocated programs (except the §202 tribal transportation program) then have their contract authority reduced by a certain percentage to match the amount of remaining obligation limitation. In FY 2019, this was a 9.9 percent reduction to TIFIA, INFRA, the other federal lands programs, etc. FHWA estimates that the three new formula programs would be reduced by 8.5 percent each year because that is the three-year lop-off average for FYs 2017-2019. This would reduced the total contract authority for these three new formula programs from the $1.886 billion per year provided in the bill to $1.726 billion per year.

However, all is not lost. That excess contract authority still makes it back to states – the obligation limitation process also provides that, within 30 days of the application of the obligation limitation, FHWA then must give that lopped-off contract authority back to states, in the form of a lump sum that each state can use for any project eligible under the Surface Transportation Block Grant Program in 23 U.S.C. §133(b). In FY 2019, states collectively received an extra $252 million in this fashion (see the FHWA notice [here](#)), which was then fungible with the rest of their FY 2019 apportionments and prior-year carryover balances.

However, because the three new programs are not apportioned directly under §104, somewhere between 8 and 10 percent of the contract authority for those programs will effectively be transferred to the Surface Transportation Block Grant Program. (However, it should be noted that because the three new programs are not apportioned under §104, they are also exempt from the general transfer authority in 23 U.S.C. §126, which gives states general authority to transfer up to half of their new apportionments for any apportioned program to any other apportioned program.)
California and four major automakers (BMW, VW, Ford, and Honda) signed a voluntary agreement that appears to preempt the Trump administration’s attempt to roll back the Obama-era fuel efficiency standards (a measure of miles driven per gallon of fuel consumed). The California agreement introduces yet another proposed successor to the Obama-era federal fuel efficiency standards, which already include the eight proposed alternatives detailed by the Trump administration in the Safer Affordable Fuel Efficient vehicles program (SAFE), and the continuation of the original Obama-era Greenhouse Gas (GHG) and Corporate Average Fuel Economy (CAFE) standards. Whichever plan is eventually chosen will have a profound effect on the largest sector of GHG emissions in the U.S.

Complicating the issue of modifying federal fuel efficiency standards is the convoluted calculation methods that often lead to misrepresentation of the fuel economy standards. While they appear to be very straightforward, the actual calculations and rules comprise nearly 600 pages in the federal register and are a series of regulatory contradictions and are not nearly as harmonized as they could be. Before we dive into the potential implications of a fuel economy change, we should explore the evolution, calculations, and complications of the former, current, and proposed standards.

**History of fuel efficiency standards**

Fuel efficiency standards were first put in place following the Organization of Petroleum Exporting Countries oil embargo of 1973. Congress passed into law the Energy Policy and Conservation Act of 1975 (EPCA), which gave the Department of Transportation (DOT) the authority to set fuel efficiency standards for passenger cars and light trucks. The original intention of the fuel efficiency standards was to reduce reliance on foreign sources of oil by substantially increasing fuel efficiency.

That authority was always delegated to the National Highway Traffic Safety Administration (NHTSA). While it may seem strange that a safety agency is responsible for fuel economy, at the time (and likely still today) the easiest way to raise fuel economy would be through reducing vehicle weight, which would have affected crumple zones and the just-established safety ratings. At the time Congress likely
did not want to split automobile regulatory authority among multiple agencies and NHTSA could moderate the balance.

Between 1973 and 1983, fleet fuel efficiencies more than doubled from 13.4 mpg to 27.5 mpg, surpassing the original passenger car standard of 18.0 mpg. The standards remained largely the same since then until Congress passed the *Energy Independence and Security Act* (EISA) in 2007, which amended EPCA to require substantial, continuing increases in fuel economy and reinforced George W. Bush’s executive order. When the Obama administration took office about a year later, they then set their own more stringent CAFE standards with the goal of creating a harmonized and consistent fuel economy and GHG standards for model years 2012-2016.

While NHTSA has the authority to regulate and enforce fuel economy standards, the EPA also has *de facto* ability to set fuel efficiency standards given its authority regulate mobile source pollutants, such as GHG, under Title II of the Clean Air Act (CAA). The CAA also grants states like California the authority to set their own more stringent emissions standards considering their unique geography and weather patterns. This state-level waiver effectively creates a third regulatory framework for vehicle manufactures to satisfy given California’s large share of the automobile market. The California waiver is one of the more contentious issues within the current administration, and there exist arguments both ways on its current and past legality.

The three-way regulatory environment made compliance difficult for automakers, so when the CAFE standards were revived under the Obama Administration, one of the goals was to harmonize the three fuel efficiency standards. The harmonized National Program involved three legal authorities for regulating fuel efficiency standards; NHTSA for the CAFE standards, EPA under section 202 of the CAA, and the California Air Resources Board (CARB) with their waiver granted under section 177 of the CAA. Under Phase I of the National Program, NHTSA would be responsible for setting the fuel efficiency standards and the EPA established global warming pollution standards that corresponded to the CAFE standards.

CARB accepted compliance of the weaker national standards with the understanding that California would become more stringent in Phase II, which would apply to model years 2017-2025. Because of the original statutory authority, GHG standards can essentially be set indefinitely; however, NHTSA can only make final rules on fuel efficiency for 5 consecutive model years. Because of this, the current CAFE standards are only final through model year 2021, with the standards for 2022-2025 proposed (referred to as augural) but not finalized meaning they have no enforceability. Because of the different time scales a midterm review was ordered to assess the feasibility of the augural standards. The review was completed shortly before Obama left office and indicated that the augural standards were appropriate. These finding were challenged by the Trump administration which used a separate review as justification for proposing SAFE.

**Calculating and Harmonizing the CAFE, GHG, and CARB standards**

Phase II of the National Program complicated the language around the CAFE standards. Phase II set a 2025 standard of 163 grams/mile of CO$_2$ emissions, which would correspond to the widely circulated fuel economy standard of 54.5 miles per gallon (mpg) for combined cars and light duty trucks. However, 54.5 mpg assumes that the standards would be met by fuel efficiency improvements alone, without including any alternative compliance measures, and is actually a conversion of the EPA’s GHG standards even though it is erroneously reported as the CAFE standard. Phase II introduced a number
of alternative compliance measures that could partially reduce that fuel economy standard by approximately 6 mpg.

- **Credit averaging, banking, and trading** – Allows credits to be earned from over-complying with the set standards. These credits can then be traded between manufacturers, banked for future use (up to 5 years), or applied to a previous imbalance.
- **Air conditioning (A/C) improvement credits** – Provides credits up to 18.8 grams/mile or 24.4 gram/mile for light duty trucks. These credits can account for approximately 6 mpg of the fuel efficiency standards. Credits incentivize switching to non-hydrofluorocarbon (HFC) coolants for the air conditioning systems along with technologies that prevent leakage.
- **Off-cycle credits** – Provides credits for efficiency improvements that would not be represented in the two cycle EPA tests. Examples include solar panels on the roof for charging electric vehicles, or aerodynamic improvements. These credits are for the types of real world improvements that would be better represented in the multi-phase EPA tests.
- **Incentives for electric vehicles, plug-in hybrid electric vehicles, fuel cell vehicles, and compressed natural gas vehicles** – Allows for a multiplier meaning alternative fuel vehicles count as more than one vehicle for compliance purposes. Electric and fuel fell started at 2.0 and would slowly phase down to 1.5, while plug in and natural gas had a 1.6 phasing to 1.3 multiplier.
- **Incentives for use of advanced technologies including hybridization for full-size pickup trucks** – gave various credits to promote fuel saving technologies in larger vehicles, up to 10g CO₂ per mile.

Under the final rule, NHTSA estimates that with the alternative compliance measures, the average combined fuel economy standard in 2025, would be closer to 49.2 mpg. This number is still overstated from actual on-road fuel economy because of the EPA’s outdated two-phase (city and highway) testing for compliance. This testing model tends to overestimate fuel economy on average by 28%, though up to 42% in comparison to their five-phase testing that they use for “sticker mpg”. In another layer of complexity, the combined fleet average is based off of 2008 and 2010 fleet sales mixtures, which are quite different from the current split today (approximately 50/50 in 2008 and 2010 compared to approximately 70/30 light trucks to cars today).

Going deeper into the complex regulatory structure, the CAFE standards further vary for each vehicle based on size, beyond the passenger car and light truck dichotomy. In order to incentivize automakers to meet the standards in ways other than shrinking the size of a car, the CAFE standards vary based on the area of the undercarriage (calculated as the length from axle to axle and width between the tires). Based on this area, a particular car model must meet a given mpg standard per model year (See Figure 1 below for the curve example). So, in reality, each auto manufacturer has its own average fuel economy based on the weighted average of a manufacture’s fleet sold that year. This creates a more complex regulatory structure but gives manufacturers some flexibility on which vehicles to focus fuel efficiency increases for maximum return based on the footprint/mpg curve.

**Figure 1. Passenger Car Fuel Curves (2012-2025)**
Part of the reason automakers were supportive of the stringent standards set by the Obama Administration, was the goal of creating one national standard. However, due to statutory authority, NHTSA is unable to accommodate all of the exceptions put forward by the EPA (see Table 1). Because of the statutory authority given to NHTSA to regulate fuel economy standards, it would take a legislative act to change some of these authorities to truly harmonize the two set of standards.

Table 1: Differences between CAFE and GHG standards

<table>
<thead>
<tr>
<th>Issue</th>
<th>NHTSA (CAFE)</th>
<th>EPA (GHG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-compliance</td>
<td>Fines can be paid to satisfy compliance issues</td>
<td>Fines do not cover compliance, civil enforcement</td>
</tr>
<tr>
<td>Credit Banking</td>
<td>Credits can be banked for 5 years</td>
<td>Credits can be banked for 5 years, however, those earned from MY 2010-16 can be carried forward through MY 2021</td>
</tr>
<tr>
<td>Credit Transfers</td>
<td>Transfer credits between fleet categories are capped. Any credits that are traded or transferred are subject to an adjustment factor</td>
<td>No limits on credits transferred or adjustment factor</td>
</tr>
</tbody>
</table>

Source: NHTSA, CAFE 2017-25 Fact Sheet
Credits are available for ethanol and methanol fueled vehicles. Electricity used to charge electric vehicles is converted to equivalent gallons of gasoline, and only 15% of that value is counted for compliance. AFV are subject to a multiplier counting them as more than a single vehicle, ranging from 1.3 - 2.0 depending on vehicle type. Emissions from battery only electric vehicles are counted as zero (no upstream accounting).

Source: [https://fas.org/sgp/crs/misc/R45204.pdf](https://fas.org/sgp/crs/misc/R45204.pdf)

**Plan Comparisons**

Of the eight proposed alternatives to CAFE in SAFE, two would phase out the A/C efficiency and off-cycle provisions (Alternatives 3 and 7 are the same as 2 and 6 but with phase out provisions). All of the alternatives would eliminate the compliance credits for A/C refrigerant leakage, nitrous oxide, and methane emissions reductions. Even considering all of these credit removals (possibly requiring 6 mpg of actual fuel efficiency gains), Alternative 3 is still lower than the CARB and CAFE standards in all respects and Alternative 7 would have a lower car mpg and would almost equal the light truck standard.

The CAFE standards average a 5% increase in fuel economy between each model year. 2026 numbers are the same as 2025. The CARB values increase by 3.7% each year. While this is lower than CAFE, they become more or less equal because of the CARB increases continuing through 2026. SAFE Alternative 1 (PA1) would freeze the fuel efficiency standards at 43.7 and 31.3 mpg for cars and light trucks respectively through 2026. SAFE Alternative 2 (PA2) increases by 0.5% each year. Alternative 4 (PA4) increases by 1% for cars and 2% for light duty trucks. Alternative 5 (PA5) has the same increases as PA4, but they are delayed by one year, beginning in model year 2022 instead of 2021. Alternative 6 (PA6) increases by 2% for cars and 32% for light duty trucks. Alternative 8 (PA8) has the same increases as PA6, but they are delayed by one year, beginning in model year 2022 instead of 2021.

**Table 2: Yearly MPG Standards**

<table>
<thead>
<tr>
<th></th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
</tr>
</thead>
<tbody>
<tr>
<td>*CAFE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cars</td>
<td>48.8</td>
<td>51.7</td>
<td>54.2</td>
<td>56.6</td>
<td>59.2</td>
<td>62.1</td>
<td>62.1</td>
</tr>
<tr>
<td>Trucks</td>
<td>33.0</td>
<td>35.7</td>
<td>37.5</td>
<td>39.5</td>
<td>41.5</td>
<td>43.8</td>
<td>43.8</td>
</tr>
<tr>
<td>**CARB</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cars</td>
<td>48.6</td>
<td>51.4</td>
<td>54.2</td>
<td>56.3</td>
<td>58.4</td>
<td>60.7</td>
<td>63.0</td>
</tr>
<tr>
<td>Trucks</td>
<td>32.9</td>
<td>35.5</td>
<td>37.3</td>
<td>38.7</td>
<td>40.3</td>
<td>41.8</td>
<td>43.4</td>
</tr>
<tr>
<td>***SAFE(1)</td>
<td>Cars</td>
<td>43.7</td>
<td>43.7</td>
<td>43.7</td>
<td>43.7</td>
<td>43.7</td>
<td>43.7</td>
</tr>
<tr>
<td></td>
<td>Trucks</td>
<td>31.3</td>
<td>31.3</td>
<td>31.3</td>
<td>31.3</td>
<td>31.3</td>
<td>31.3</td>
</tr>
<tr>
<td>***SAFE(2)</td>
<td>Cars</td>
<td>43.7</td>
<td>43.9</td>
<td>44.1</td>
<td>44.4</td>
<td>44.6</td>
<td>44.8</td>
</tr>
<tr>
<td></td>
<td>Trucks</td>
<td>31.3</td>
<td>31.5</td>
<td>31.6</td>
<td>31.8</td>
<td>31.9</td>
<td>32.1</td>
</tr>
<tr>
<td>***SAFE(4)</td>
<td>Cars</td>
<td>43.7</td>
<td>44.1</td>
<td>44.6</td>
<td>45.0</td>
<td>45.5</td>
<td>45.9</td>
</tr>
<tr>
<td></td>
<td>Trucks</td>
<td>31.3</td>
<td>31.9</td>
<td>32.6</td>
<td>33.2</td>
<td>33.9</td>
<td>34.6</td>
</tr>
<tr>
<td>***SAFE(5)</td>
<td>Cars</td>
<td>43.7</td>
<td>45.8</td>
<td>46.2</td>
<td>46.7</td>
<td>47.1</td>
<td>47.6</td>
</tr>
<tr>
<td></td>
<td>Trucks</td>
<td>31.3</td>
<td>32.8</td>
<td>33.5</td>
<td>34.1</td>
<td>34.8</td>
<td>35.5</td>
</tr>
<tr>
<td>***SAFE(6)</td>
<td>Cars</td>
<td>43.7</td>
<td>44.6</td>
<td>45.5</td>
<td>46.4</td>
<td>47.3</td>
<td>48.2</td>
</tr>
<tr>
<td></td>
<td>Trucks</td>
<td>31.3</td>
<td>32.2</td>
<td>33.2</td>
<td>34.2</td>
<td>35.2</td>
<td>36.3</td>
</tr>
<tr>
<td>SAFE</td>
<td>Cars</td>
<td>43.7</td>
<td>45.8</td>
<td>46.7</td>
<td>47.6</td>
<td>48.6</td>
<td>49.5</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td></td>
<td>Trucks</td>
<td>31.3</td>
<td>32.8</td>
<td>33.8</td>
<td>34.8</td>
<td>35.9</td>
<td>36.9</td>
</tr>
</tbody>
</table>

Notes: *Cafe standards are converted from EPA GHG standard (8887 g CO$_2$ per gallon) **Carb numbers are estimates based on preliminary information of a final combined standard equal to original CAFE. Numbers were extrapolated back from final, using average increase of 3.7% ***Unclear where the original starting values for the SAFE proposal originate from as they do not correspond to any previous value in the federal register.

Using the calculated MPG values above, as a thought experiment, I modeled each scenario to determine potential GHG emissions over the lifetime of the fleet (Figure 2).

**Figure 2**
To put the numbers in context, the SAFE proposals would likely contribute 5600 to 6200 teragrams (Tg) of greenhouse emissions over the lifetime of the combined fleets (estimates of annual U.S. GHG contributions are approximately 5500 Tg from all sectors). In contrast, the CARB proposal and Obama CAFE standards each contribute around 5000 Tg, between 12-25% less than the SAFE alternatives, but still a significant contribution. As noted before, Alternatives 3 and 7 of SAFE could raise the standards of Alternatives 2 and 6 by approximately 6 mpg, making Alternative 6 more comparable to the CARB and CAFE standards.

Current fleet sales have a large effect on potential GHG emissions. Under current vehicle sale scenarios (70% light duty truck/SUV and 30% cars) projected contributions are 10% higher than an even 50/50 split and 15% higher than the CAFE standards projected mix (58.5% cars and 41.5% light duty truck/SUV). Current transportation sector GHG contributions are just over 1500 Tg from on road sources and 1100 Tg from all light-duty vehicles.

Despite the bickering and potential litigation around the SAFE and CARB standards, the disparity in their potential emissions is not that vast, especially if you consider Alternatives 7 and 8 of the SAFE standards. Instead of focusing massive amounts of effort on which proposal to choose, there is clearly room to compromise and negotiate. Bringing CARB, the Trump administration, and automakers together could result in a compromise that accomplishes GHG reductions similar to the original Obama CAFE standards. They could also take this opportunity to accomplish something all parties strive for – a truly harmonized fuel economy standard that allows for clear standard compliance.
As 2020 Deadline Looms, Railroads Face PTC Implementation Challenges

By Aaron Somo

August 1, 2019

The Senate Committee on Commerce, Science, and Transportation convened for a hearing on July 31 regarding the current status of positive train control (PTC) implementation and next steps. In this hearing, witnesses did little to instill confidence that railroads and commuter rail agencies will meet the December 2020 deadline for PTC implementation which was delayed by Congress from its initial 2018 deadline (which had in turn been extended by Congress from the original 2015 deadline).

Amid many questions concerning meeting the 2020 deadline, the Director of Physical Infrastructure for the Government Accountability Office, Susan Fleming, gave a seemingly hopeful response saying that she is “cautiously optimistic” on the matter. Her response did little to appease the committee chairman, Roger Wicker (R-MS), who responded saying, “…it sounds like there are going to be some disappointments at the end of 2020.”

Achieving system interoperability presents the most significant challenge in the implementation process according to the Federal Railroad Administration (FRA) Administrator, Ronald Batory. Although railroads agreed to standardize their PTC systems by using interoperable electronic train management systems (IETMS), Batory claimed that “…there was solicitation of the FRA to agree to alternate systems,” from commuter rail agencies.
In short, allowing multiple PTC systems created several obstacles to viable interoperability. Although reports indicate that 87 percent of railroad lines subject to the PTC mandate have enabled PTC, Fleming states that only 17 percent are on interoperable systems and 31 percent are in the early stages of interoperability testing. Batory also stated that, in hindsight, allowing for alternate systems “…was a leadership error in the commuter agency arena.”

BNSF Railway was well ahead of schedule on PTC implementation according to Assistant Vice President of Network Control Systems, Chris Matthews, who reported that all 88 of their subdivisions, under federal mandate, currently operates with PTC systems – as well as 9 non-mandated subdivisions.

Focusing on commuter rail, the committee members hailed Metra and its CEO, Jim Derwinski, as a model for the industry. Batory praised Metra for choosing to standardize their commuter rail PTC systems alongside freight railroads as they were one of the few organizations to do so.

Praises aside, the outlook of the hearing seemed bleak. The participants agreed that many PTC suppliers face heavy strain in trying to keep up with the demand for PTC systems and that funding challenges have led to compressed schedules to meet the 2020 deadline.

Vice President of Strategy and Growth for Wabtec Corporation, Robert Bourg, highlighted issues with increasing insurance rates that railroads are forced to pay, stating that high costs proved difficult to plan around and said that costs strain company funds. Jim Derwinski advised that Congress consider longer funding periods to better enable long term planning, for both PTC-related projects and future
projects as well.

Members of the panel ensured the committee that they are doing their utmost to speed up PTC implementation and meet the mandated deadline, but the challenges ahead loom large. Ronald Batory made it clear that the FRA plans to enforce maximum civil penalties on any organization that fails to complete implementation on time.
Transportation Policy History - Archive of ETW Articles

By Jeff Davis

For the transportation policy wonk's August recess reading.... someone asked me the other day if all of the long-form transportation history articles I have written for ETW were collected in one place. They were not, so now they are.

Multi-Part Series:

A Conversation With Alan Boyd, the First U.S. Secretary of Transportation

- Part 1 (February 5, 2016)
- Part 2 (February 11, 2016)
- Part 3 (February 18, 2016)

Creation of the U.S. Department of Transportation

- Documentary History (links to dozens of original source documents and oral histories). Followed by 50 Years Ago Today articles:
  - LBJ Sends Transportation Message to Congress (March 2, 2016)
  - House of Representatives Debates, Amends, Passes Department of Transportation Act (August 30, 2016)
  - President Johnson Signs Bills Creating NHTSA (September 9, 2016)
  - LBJ Signs Law Creating USDOT (October 14, 2016)
  - The First Transportation Appropriations Act (October 17, 2017)

ISTEA at 25

- Part 1 - The Bush Administration’s Legislative Proposal (December 23, 2016)
- (future parts are on hold pending a trip to the George HW Bush Library (FOIA request still in the works) and the opening of the Moynihan papers)
What’s the Purpose of Mass Transit? (Urban Development, or Transportation)?

- Part 1 - Proposals for federal urban transportation policy, 1958-1962 (June 28, 2018)
- Part 2 - The 1964 transit act, the creation of HUD, and the creation of DOT (July 6, 2018)
- Part 3 - The 1967-1968 debate on moving transit from HUD to DOT (July 11, 2018)
- Part 4 - The 1971 Nixon proposal for a Department of Community Development (July 18, 2018)

Mending or Ending the Highway Trust Fund - The Great Debate of 1978

- Part 2 - Mass transit and the Senate, the 1978 highway-transit bill, lessons learned (September 21, 2018)

The Gas Tax at 100

- Federal Gasoline Tax Debate, 1864-1918 (February 22, 2019)
- Oregon Enacts America’s First-Ever Motor Fuel Tax, February 25, 1919 (February 25, 2019)

Pre-1960s Attempts to Create a U.S. Department of Transportation

- Part 2 - The Federal Transportation Agency of 1946 (April 9, 2019)
- Part 3 - The Hoover Commission Task Forces (Robert Moses vs. the Brookings Institution) (May 3, 2019)
  (more to come, shortly)

The First Time the Highway Trust Fund Went Broke

  (part 2 forthcoming in early September 2019)

Individual Articles or Papers:

- History of the Tolling Ban on Federal-Aid Highways (May 6, 2014) (Reprinted from Transportation Weekly)
- The Tradition of HTF Bill “Triggers” (July 22, 2015)
- Volatile Revenues for Transportation Trust Funds: A Cautionary Tale (September 9, 2015)
- Trump City: The Earmark that Changed the Rules (September 10, 2015)
- What Can DC Metro’s Past Tell Us About Its Future? (Book review of The Great Society Subway by Zachary Schrag) (May 12, 2016)
A History of Infrastructure Bank Proposals (August 3, 2016)


30 Years of Debate on Air Traffic Control Corporatization (May 4, 2017)

History of Mass Transit Discretionary Grants and How They Have Been Funded (August 9, 2017)

Ten Years of Highway Trust Fund Bankruptcy: Why Did It Happen, and What Have We Learned? (September 5, 2018)

Summary of S. 2302, America’s Transportation Infrastructure Act of 2019. As Reported from Committee

By Jeff Davis

Updated August 1

Assembled by Paul Lewis, Alice Grossman, Christopher Oster, and Jeff Davis of the staff of the Eno Center for Transportation.

The bill was amended and ordered reported by the Senate Environment and Public Works Committee on July 30, 2019. The bill was first amended with a complete substitute version of the bill (text [here]) offered by chairman Barrasso. The big addition in the substitute was a new title IV containing the text of S. 1211, the AUTOS Act as reported by the Committee on Indian Affairs on June 19. The substitute also added new sections 1129 (nationally significant federal lands and tribal projects program), 1130 (tribal high priority projects program), 1311 (preliminary engineering rule repeal), 1525 (sense of Senate on HTF user self-sufficiency and offsets), 1526 and 1527 (stormwater issues), 1528 (invasive plants), 1529 (over-the-road bus tolling equity) and 1530 (bridge terminology), and made some other changes reflected in the revised summary below.

The committee then agreed to five amendments to the substitute (text [here]) en bloc by voice:

- **Carper #1** – amends the authorizations in sec. 1101 of the substitute to further subdivide funding under the competitive side of the PROTECT grant program.
- **Inhofe-Boozman #1** – amends sec. 1110 of the substitute to make marine highway projects (including inland waterway projects) eligible for INFRA grants.
- **Duckworth #2 (revised)** – adds a new section to the substitute requiring FHWA to study existing and future impacts of self-driving vehicles on the roads.
- **Merkley #3 (revised)** – amends sec. 1528 of the substitute to require priority be given to pollinator-friendly wildflowers.
- **Van Hollen #3 (revised)** – amends sec. 3001 of the substitute to increase funding for the VMT pilot programs from $25 million per year to $30 million per year (with the increase split 50-50
between the state pilots and the national pilot).

Those amendments are also reflected in the summary below.

This summary is organized thematically, with twelve topics in the following order: overall funding totals, core formula programs, bridges, freight, resilience, carbon emission reductions, planning and performance management, project delivery, safety, innovative finance and tolling, research and technology, and miscellaneous.

Overall funding totals.

Millions of dollars of Highway Trust Fund contract authority (assumes restoration of July 2020 rescission, per sec. 1509 of the bill, for FY 2020) or authorizations for subsequent general fund appropriations.

<table>
<thead>
<tr>
<th></th>
<th>FY 2020</th>
<th>FY 2021</th>
<th>FY 2022</th>
<th>FY 2023</th>
<th>FY 2024</th>
<th>FY 2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formula CA</td>
<td>43,449.8</td>
<td>49,824.2</td>
<td>50,798.7</td>
<td>51,819.9</td>
<td>52,885.8</td>
<td>53,951.7</td>
</tr>
<tr>
<td>Other CA</td>
<td>3,654.3</td>
<td>5,503.2</td>
<td>5,423.7</td>
<td>5,585.1</td>
<td>5,783.5</td>
<td>5,890.9</td>
</tr>
<tr>
<td>GF Auths.</td>
<td>100.0</td>
<td>1,357.5</td>
<td>1,314.5</td>
<td>1,326.5</td>
<td>1,353.5</td>
<td>1,380.5</td>
</tr>
</tbody>
</table>

A separate two-page PDF table (download it here) shows program-by-program authorization levels for each year of the bill.

This being a bill within the jurisdiction of the Environment and Public Works Committee, it does not have any “pay-fors” to provide additional revenues for the Highway Trust Fund to stave off the default that is coming in 2021, nor does extend the life of the Trust Fund. That will be the job of the Finance Committee. But sec. 1525 of the bill expresses the “sense of the Senate” that “(1) the Highway Trust Fund shall achieve long-term solvency through user fees; and (2) any spending beyond current Highway Trust Fund revenues and balances during the reauthorization period under this Act shall be fully offset.” And sec. 1501 of the bill repeals 23 U.S.C. §105 (which was language added by the FAST Act to allow any money deposited in the Trust Fund subsequent to the FAST Act to be immediately put out to states as formula contract authority).

Also, as shown below, the draft bill suspends the 95 percent “rate of return” guarantee on HTF Highway Account contributions for “donor states” for any new taxes that are raised after July 1, 2019, meaning anything that the Finance Committee cooks up to fund this bill. So, the EPW leadership may have a portfolio of new user taxes in mind, and EPW leadership may be intent on ending the donor-donee debate for the next generation of highway user taxes.

Core formula programs.

Although overall contract authority in the bill grows by 17 percent ($8.0 billion) in the first year of the new bill, funding for existing “core” formula programs (including ferries) only increases by 10 percent ($4.5 billion) over FAST in the first year. $1.9 billion per year in new formula programs are created, while non-formula contract authority programs increase by 45 percent ($1.7 billion) over FAST in the first year. The new formula programs, like the existing ferry boat program, are not part of the apportionment process below in 23 U.S.C. §104 – they are distributed separately (though the state
share of each new program is the same as the §104 formula shares described below).

The new bill retains the FAST Act formula distribution method with some changes.

**FAST Act of 2015**

**State totals** – each state is guaranteed the same percentage share of total formula funding it received in FY 2015 (which was FY 2009 plus the 2012 earmark adjustment and the 2014 Texas gas tax adjustment), except that each year’s shares are then adjusted to ensure each state gets at least 95 percent of the dollars it paid into the HTF Highway Account in the last year for which totals are available.

**Programmatic distribution within a state** – The freight program is taken off the top ($1.15 billion in FY16, rising to $1.50 billion in FY20), as are CMAQ and metropolitan planning at the state’s FY 2009 relative share of each. The remaining formula funding is split: 63.7% NHPP, 29.4% STBGP, and 7.0% HSIP. $850 million per year of STBGP is reserved for transportation alternatives (rising starting in FY18, to $1.02 billion in FY 2020).

**ATI Act of 2019**

**State totals** – each state is guaranteed the same percentage share of total formula funding it received in FY 2020 (which was FY 2009 plus the 2012 earmark adjustment and the 2014 and 2020 Texas gas tax adjustments), except that each state’s shares are adjusted (1) to ensure that each state gets at least 95 percent of the dollars it paid into the HTF Highway Account in the last year for which totals are available associated with taxes in existence on July 1, 2019, (2) that each state’s dollar apportionment is at least 2 percent greater than the FY 2020 apportionment, and (3) that each state’s dollar apportionment is at least 1 percent higher than the previous year’s.

**Programmatic distribution within a state** – Same as FAST, except the freight program is larger ($1.63 billion in FY21, rising to $1.78 billion in FY25), and the transportation alternatives set-aside of STBGP is bigger ($1.20 billion in FY21, rising to $1.30 billion in FY 2025).

Tables showing estimated state-by-state formula funding under the bill can be downloaded here.
The bill makes a few changes to the existing core formula programs:

- **National Highway Performance Program.** 1105 of the bill amends 23 U.S.C. §119 to make increasing the resilience of highways and bridges to sea level rise, extreme weather, etc. a goal of the program and allows states to use up to 15% of annual NHPP apportionments for resilience projects (see more in the “Resilience” section below).

- **Surface Transportation Block Grant Program.** 1109 of the bill amends 23 U.S.C. §133 in a variety of ways:
  - The amount of annual set-aside within the program for transportation alternatives, on a national basis, rises from $850 million in FY 2020 to $1.20 billion in FY 2021 under the bill and thence upwards to $1.30 billion in FY 2025, and the amount of each state’s apportionment of that TA set-aside that must be sub-allocated by population rises to 57.5 percent under the bill (the amount of the non-TA program that is sub-allocated by population stays at the FY 2020 rate of 55 percent).
  - New language is added allowing states to use up to 7 percent of their TA funding to go towards state overhead to help locals apply for funding, and new language is added so that the average non-federal share of TA projects in a state cannot be less than the non-federal share authorized under 23 U.S.C. §120(b).
  - Construction of majority-privately-owned ferry facilities that serve a “substantial public transportation benefit” and construction of wildlife crossing structures are made STBGP-eligible.
  - The bill also makes STBGP-eligible the following:
    - “Projects that use natural infrastructure alone or in combination with other eligible projects to enhance resilience of a transportation facility otherwise eligible for assistance under this section,”
    - “Projects and strategies designed to reduce the number of wildlife-vehicle collisions, including project-related planning, design, construction, monitoring, and preventative maintenance,” and
    - “Rural barge landing, dock, and waterfront infrastructure projects” (and a new §133(j) is added to limit a state to using not more than 5 percent of its STBGP apportionment for such projects and defines such project eligibility).

- **Congestion Mitigation and Air Quality Program.** 1115 of the bill amends 23 U.S.C. §149 to make the following new kinds of projects CMAQ-eligible, if functionally connected to the Federal-aid system and if the Secretary determines it is likely to contributed to CAA attainment or maintenance: modernization or rehab of a lock and dam, or marine highway corridor, connector or crossing projects (including inland waterway corridors) - but a state may use no more than 10 percent of its annual CMAQ apportionment on such projects. And §149(m) (operating assistance) is amended to strike “no imposed time limitation” and instead specify that there may be time limitation on operating assistance in urbanized areas above 200,000 in population. Also, sec. 1520 of the bill requires a new GAO study of the CMAQ program and its effectiveness.

- **Highway Safety Improvement Program.** 1111 of the bill amends 23 U.S.C. §148 to make “leading pedestrian intervals” an eligible type of project and by adding a new §148(a)(10) to allow states to “flex” up to 25 percent of its HSIP funding to safety projects authorized under other sections of title 23 (see the “Safety” section below for more information).

- **National Highway Freight Program.** 1114 of the bill amends 23 U.S.C. §167 to: (1) increase the limitation on the state maximum designation of critical rural freight corridors from 150 miles to 300 miles for any states, for states that had a lower-than-average population
density in the 2010 Census, the greater of 600 miles or 25 percent of the primary highway freight system mileage in the state; (2) increase the limitation on the state maximum designation of critical urban freight corridors from 75 miles to 150 miles; (3) increasing the maximum percentage of a state’s annual NHFP share that can be used on freight or intermodal rail projects from 10 percent to 30 percent; and (4) making lock and dam modernization or marine highway projects NHFP-eligible, if functionally connected to the National Highway Freight Network and if the Secretary certifies it will reduce on-road source emissions.

- Metropolitan Planning Program. (Changes to this program are discussed in the “Planning and Performance Management” section below.)

**Bridges.**

The biggest new program under the bill is created by sec. 1119, which creates a new “Bridge Investment Program” in a new 23 U.S.C. §124 (on pages 90-121 of the draft bill), which is funded (unusually) 50-50 by $3.3 billion over the life of the bill (an average of $653 million per year) in Highway Trust Fund contract authority and an identical $3.3 billion over five years in authorizations for discretionary appropriations from the general fund. The program is non-formula and will be competitive, with states and other eligible entities applying to the Secretary of Transportation for grants. For large bridge projects (over $100 million in cost), the bill creates a new multi-year funding commitment process akin to the “full funding grant agreement” process used for Federal Transit Administration new starts.

The new bridge investment program is structured as follows:

- **Eligible projects** - Projects to replace, rehabilitate, preserve or protect bridges on the National Bridge Inventory, or a bundle of such projects, or a project to replace or rehabilitate culverts to improve flood control (though the bill caps the culvert projects at no more than 5 percent of annual grant totals) and improve habitat connectivity.
- **Classes of projects** - Large projects have eligible project costs over $100 million, and other projects are less than that. Of the HTF half of the funding, not less than 50 percent, in aggregate, shall be used for large projects.
- **Eligible applicants** - Applications can be filed by states, groups of states, local governments, political subdivisions of all of the above, special purpose districts, federal land agencies, tribal governments, or other multi-state or multi-jurisdictional groups.
- **Program goals** - The goals of the program are to improve movement of people and freight over bridges, to improve bridge conditions, and to provide financial assistance leveraging federal and non-federal contributions to fund projects.
- **Grant sizes** - For large projects, grants shall be adequate to fully fund the project (in combination with other funding sources) and not less than $50 million, and for other projects, adequate to fully fund the project (in combination with other funding sources) and not less than $2.5 million.
- **Federal share** - Grants for large projects cannot exceed 50 percent of project costs and grants for other projects cannot exceed 80 percent of project costs (though, in combination with other sources of federal funding, total federal funding is capped at the 23 U.S.C. §120 sliding scale for on-system bridges and 80 percent for off-system bridges).
- **Shovel-ready** - All projects must be reasonably expected to begin construction within 18 months after the date of initial funding obligation and must have preliminary engineering completed.
- **Application process** - For projects under $100 million, the Secretary is directed to create a
template for applicants to use and to access National Bridge Inventory data, then issue the first
NOFO 60 days after the template is complete and issue subsequent NOFOs no less than 60 days
after the annual appropriations bill is enacted. For larger projects, the Secretary shall establish
an annual submission date for large bridge projects for evaluation.

- **Application criteria** - In addition to the ratings system, the Secretary must consider average daily
  person/freight throughput, number and percentage of the bridges in the state in the same
  condition, the extent to which cost savings are included using bundling, geographic diversity, the
  risk of the bridge getting worse in the next 3 years, and whether or not the bridge meets current
design and seismic standards.

- **Sharing the wealth** - The bill requires the Secretary to give priority to projects in states that have
  made unsuccessful applications for the program in the past (if the state applied at least twice per
  year and has not yet received at least two grants, they get priority). (This seems focused on small
  projects, not large projects, given the other requirements and different process for large projects,
below.)

- **Large project ratings** - The Secretary is required to evaluate large bridge projects on the basis of:
  (A) need to improve the bridge consistent with program goals; (B) an amalgam of closure costs
  avoided via improvement, bundling benefits, safety benefits, person and freight mobility benefits,
economic benefits, resilience benefits, seismic/scour protection benefits, environmental benefits,
nonvehicular/transit benefits, and lower maintenance costs, and (C) benefit-cost analysis and
  distill all that into a 5-point ratings scale for each of A, B and C (much like the Federal Transit
  Administration new start evaluation process). In order to be considered for a grant, a large bridge
  project must get a least a “medium” rating in each of categories A, B and C.

- **Annual large bridge project report** - When the President submits his budget every year, FHWA
  must submit a report to Congress listing large bridge project applications received, their ratings,
  and recommended grant amounts. (Again, like FTA new starts.)

- **Multi-year funding agreements** - The bill establishes a process for multi-year funding agreements
  for large bridge projects, akin to FTA new starts. Each annual report must recommend scheduled
  payments for previous multi-year agreements, proposed payments for new grants (both one-year
  and multi-year), a description of how that year’s anticipated HTF contract authority will be
  distributed, and, for each project recommended for a new multi-year agreement, a proposed
  schedule of annual payouts. The Secretary is prohibited from recommending new multi-year HTF
  commitments unless the Secretary determines that “the project can be completed using funds
  that are anticipated to be available from the Highway Trust Fund in future years.” For general
  funds, the Secretary may not make a multi-year commitment unless (a) some GF money has
  already been appropriated for the project and (b) the Secretary determines the project can be
  completed using GF money anticipated to be available in future years. The Secretary is directed
to “assume the availability of funds in future years for multiyear grant agreements that extend
beyond the period of authorization based on the amount made available for large projects under
the program in the last fiscal year of the period of authorization.” Like a transit FFGA, the multi-
year agreement must lock in a maximum amount of federal dollars going to the project.

- **Advance payment** - The bill allows multiyear agreements to be used to repay costs incurred in
  advance by grant recipients and allows Letters of No Prejudice.

- **Tribal set-aside** - an average of $20 million per year of the HTF share of the program is set aside
  for Indian tribe bridges.

**Freight.**

The FAST Act of 2015 created two new title 23 programs dealing with freight mobility: a formula
program and a discretionary grant program (the latter now called INFRA). The bill makes four changes in the freight formula program (repeated from the “Core formula programs” section above) – (1) increases the limitation on the state maximum designation of critical rural freight corridors from 150 miles to 300 miles for any states, for states that had a lower-than-average population density in the 2010 Census, the greater of 600 miles or 25 percent of the primary highway freight system mileage in the state; (2) increases the limitation on the state maximum designation of critical urban freight corridors from 75 miles to 150 miles; (3) increases the maximum percentage of a state’s annual NHFP share that can be used on freight or intermodal rail projects from 10 percent to 30 percent; and (4) makes lock and dam modernization or marine highway projects NHFP-eligible, if functionally connected to the National Highway Freight Network and if the Secretary certifies it will reduce on-road source emissions.

Section 1110 of the bill makes some significant, and somewhat odd, changes to the $5.5 billion Nationally Significant Freight and Highway Projects Program (currently called INFRA by the Administration), which is currently codified at 23 U.S.C. §117. The bill expands project eligibility to include wildlife crossings, border crossings, technology, marine highways, and highways that “support the movement of energy equipment” (which might be a nod to the highway demands of fracking supplies).

The biggest changes to the INFRA program are a growing list of set asides and minimum apportionments:

- The maximum amount INFRA can spend on non-highway freight is capped at 30 percent, or $1.65 billion over five years, which is increased significantly from the $500 million/5-year cap in FAST.
- INFRA will have a $500 million minimum (in aggregate) for Critical Rural Interstate Projects. These must be spent only on Interstate exchange projects on the State Freight Plan in states that have a population density of fewer than 80 residents per square mile and have 3 or fewer Interstate exchanges of two different routes of the Interstate System in each state. 22 states have population densities under 80 per square mile, with West Virginia being the densest of those states. The “3 or fewer” requirement makes some low density states that also have large metropolitan areas ineligible, like Minnesota or Arizona.
- INFRA has a related program with a $500 million minimum (in aggregate) for Critical Urban State Projects. Eligible states are only the eight that have population densities greater than 400 per square mile. Projects must be on the state freight plan. (Ed. Note: not sure about the 22 other states that do not fall in the “Urban State” and the “Rural Interstate” set asides)
- The bill requires 15 percent (increased from 10 percent) of the funding be reserved for small projects ($5 million or less), and 30 percent of the small projects need to be in rural areas (there is no rural set aside in the small projects set aside in the FAST Act).
- The bill creates a new INFRA “state incentives pilot program“ with $150 million annually set aside to encourage greater use of non-federal funds. Within this set aside, the federal share cannot exceed 50 percent of total project costs. 10 percent of this program is reserved for small projects, and 25 percent for rural areas.

The bill creates more reporting requirements for INFRA. USDOT is required to conduct debriefs with applicants and submit an annual report that includes more detail than required previously, including detail on the process for selection, factors that went into selection, and the justification for the final selection.
In addition, sec. 1405 of the bill:

- Amends 49 U.S.C. §70102 (national freight plans) to add resilience strategies, U.S. economic growth and competitiveness strategies, and strategies to reduce local environmental losses from freight activity to the national freight plan;
- Amends 49 U.S.C. §70202 (state freight plans) to add CMV parking assessments, the impacts of freight on local environment and wildlife habitat loss, the impact of extreme weather and natural disasters on freight mobility, and mitigation of freight railroad impact on communities to the state freight plans, and to require that states carry out (under their freight plans) enhanced reliability or redundancy of freight, and rapid restoration and access restoration of freight transportation. Also requires that each state assess state capability to provide adequate parking and rest facilities for CMVs (and the location of any such areas in the state), the volume of CMV traffic in the state. Adds a new subsection requiring the Secretary of Transportation to approve state freight plans if they comply with the requirements of this section.
- Requires FHWA to conduct studies of power supply for electrical freight infrastructure, and safely integrating freight into intelligent transportation systems.

And section 1127 of the bill amends 49 U.S.C. §70201 (state freight advisory committees) to add MPOs, local governments, state environmental agencies, state air resources boards, and state economic development agencies to the freight advisory committees and establishing qualifications for advisory committee members.

**Resilience.**

The bill makes several changes to title 23 to promote resilience projects:

- Sec. 1105 of the bill amends 23 U.S.C. §119 to provide that a state may use up to 15 percent of its annual National Highway Performance Program funding to add “protective features” to a federal-aid highway or off-system bridge, “if the protective feature is designed to mitigate the risk of recurring damage, or the cost of future repairs, from extreme weather events, flooding, or other natural disasters” and defines “protective features.”
- Sec. 1106 amends 23 U.S.C. §125 to allow emergency relief funding to be used to pay for “economically justifiable” protective feature installation to structures being reconstructed with ER funds, and sec. 1523 of the bill also requires FHWA to amend the ER manual to add resilience references.
- Sec. 1107 of the bill amends 23 U.S.C. §120 to increase the federal cost share of protective features to 100 percent to give states a financial motive to prioritize such work.
- Sec. 1109 of the bill amends 23 U.S.C. §133 to allow Surface Transportation Block Grant Program funding to be used for “Projects that use natural infrastructure alone or in combination with other eligible projects to enhance resilience of a transportation facility otherwise eligible for assistance under this section.”
- Sec. 1407 of the bill creates a new PROTECT grant program in 23 U.S.C. §179 to provide resilience improvements to communities. This program has two components – a formula grant program (given $786 million in HTF contract authority per year under the bill), which will be distributed to states in the same share that each state receives of the core formula apportioned total, and which may be used for construction activities to enable existing surface transportation infrastructure assets to withstand weather events or natural disasters or improve resiliency from
the impact of changing conditions, or to increase coastal evacuation route capacity, or for hardening at-risk coastal infrastructure. The federal share of project cost under the formula program is 80 percent from the program, but other federal programs can be used for the other 20 percent. This section also creates a competitive portion of the same grant program (funded at $200 million per year of HTF contract authority). The federal share can be increased by 7 percent if the state or eligible entity has developed a resilience improvement plan.

**Carbon emission reductions.**

A whole subtitle of the bill (Subtitle D of Title I) is related to climate change, including:

- Sec. 1401 of the bill establishes a new grant program in the existing [23 U.S.C. §151](#) to make grants for deployment of EV, hydrogen, and natural gas charging and fueling infrastructure along designated alternative fuel corridors, which will receive an average of $200 million in HTF contract authority per year under the bill, and the federal cost share of any project cannot exceed 80 percent. The grant program is discretionary (selected by the Secretary) under a series of criteria laid down by this section.

- Sec. 1402 of the bill establishes a new grant program to conduct studies and make grants to fund projects that reduce idling at port facilities, including advancement of port electrification. The program receives an average of $74 million per year in HTF contract authority, and the federal cost share of any project cannot exceed 80 percent.

- Sec. 1403 of the bill establishes a new formula grant programs to encourage reduced carbon emissions under 23 U.S.C. §177, which will receive an average of $600 million per year in HTF contract authority under the bill. States receive shares of the money equal to their shares of total formula apportionments for that year. Half of each year’s formula money must fund activities to reduce transportation emissions (specifically defined in the section), and the other half can be used for any STBGP-eligible project if the state is developing or implementing carbon reduction strategies. The federal share of projects is the sliding scale under [23 U.S.C. §120](#), except that for states that are developing or implementing carbon reduction strategies, the federal share can be 100 percent. 65 percent of program funding is to be sub-allocated by population.

- Sec. 1403 of the bill also creates a carbon reduction performance program in a new 23 U.S.C. §178. The Secretary will make grants to states or local governments that can prove performance in reducing transportation emissions, or at least reduced the growth of transportation emissions, either on an absolute or per capita basis. The program will receive $100 million per year of HTF contract authority under the bill. Grants may be no smaller than $5 million and no larger than $30 million. The federal cost share of any project may be up to 100 percent.

- Sec. 1404 of the bill creates a new congestion relief program under the existing [23 U.S.C. §129](#) whereby the Secretary will make discretionary grants to urbanized areas of more than 1 million in population to advance innovative, integrated, and multimodal solutions to congestion relief. The program will receive $40 million per year in HTF contract authority, and the federal share of project cost will not exceed 80 percent. Minimum grant award size is $10 million. Notwithstanding other provisions of law, the Secretary shall allow the tolling of Interstate lanes as part of projects carried out with these grants, if the maximum toll rates for any vehicle class are not more than 5 times the rate of any other vehicle class and are not charged on the basis of state residency.

- In addition, sec. 1510 of the bill creates a new federal interagency working group (organized through the White House CEQ) with the goal of transitioning the federal vehicle fleet to hybrid-electric vehicles, plug-in EVs, and alternative fuel vehicles to the maximum extent practicable.
Planning and performance management.

The bill begins to rethink MPO boundaries, composition, and coordination. It establishes a whole new section on human capital planning, grants exemptions to the MAP-21 performance requirements to low population density states, and introduces requirements to compare travel forecasting to ground truth data.

- Sec. 1201 of the bill amends elements of MPO composition and regional and statewide transportation planning geographic and temporal boundary definitions in 23 U.S.C. §134. MPOs still must consist of local elected officials, officials of agencies that administer public transportation, and state officials. The bill amends this requirement to ensure that the MPO “consider the equitable and proportional representation of the population” when choosing these representatives. The section clarifies the language that a metropolitan planning area (defined by designation of the Governor and MPOs) should have only 1 MPO, but that an urbanized area as defined by the census may have more than 1 MPO if allowed by the governor and existing MPO(s) in that area. It also adds language to encourage MPOs designated within the same urbanized area to share and ensure consistency between data used in the planning process and specifies that MPOs are not required to develop any unified planning documents. The section amends both §134 and §135 to also allow States and MPOs to explicitly use social media and other web-based tools and platforms for stakeholder and public participation in the transportation planning process.
- Sec. 1202 of the bill would require that in their long range transportation plans (LRTPs), MPOs will have to consider everything beyond four years into the future as the “outer years.” This is a change from the previous definition of after 10 years as being outer years in a plan that must address at least 20 years into the future with less specific funding source identification requirements for the outer years.
- Sec. 1203 of the bill adds a new 23 U.S.C. §176 entitled “Human Capital Plans.” The section encourages states to develop a voluntary 5-year human capital plan addressing short- and long-term workforce needs to be updated every five years. Plans shall include policies, strategies, and performance measures to address workforce needs and challenges by coordinating with agencies and organizations such as educational institutions, industry, organized labor, and workforce boards. Plans will cover both recruitment and retention and may be incorporated into LRTPs if the state desires.
- Sec. 1204 of the bill requires the Secretary to develop an 8-year “accessibility data pilot program” intended to create available data sets and open source methodologies that can aid pilot participants (MPOs, States, or rural transportation planning organizations) in designing programs to measure levels of access to jobs, health care, child care, education, affordable housing, and food sources as well as improve multimodal connectivity. The program would also support assessment of accessibility facilitated or hindered by new investments and require a report from the Secretary on program results. Funding for the program is to be taken from FHWA administrative expenses (no specific amount is authorized).
- Sec. 1205 of the bill establishes a Prioritization Process Pilot Program for states and MPOs with populations above 200,000 people that supports data-driven approaches to transportation planning. The program would support initiatives that use quantitative measures to score projects in regards to goals and objectives with costs and public participation taken into account. The program is funded with $10 million per year in HTF contract authority, and no individual grant can exceed $2 million.
- Sec. 1206 of the bill amends the performance measure and target requirements as established in MAP-21 and continued in the FAST Act (and codified in 23 U.S.C. §150) to provide exemptions for
“low population density states”. Exempt states and MPOs within that state would not have measurement and target reporting requirements for interstate and NHS performance, traffic congestion performance, and freight movement performance for four years upon a granted exemption, which can be renewed. Low population states are defined as states that have a population density than the entirety of the United States (based on the latest Census) and does not contain an urbanized area of over 200,000 people. The state also must not have “excessive” delays on NHS roads in their state. The Secretary would also have to report MAP-21 required performance measures of congestion, passenger and freight reliability, and other performance measures deemed relevant for states granted exemptions.

- Sec. 1207 of the bill requires the Secretary to conduct studies comparing actual observed travel data and travel demand forecast data from a representative sample of states and MPOs every five years. Studies should examine traffic count, mode share, public transit ridership, and vehicle occupancy data and inform future planning and forecasting at the regional and statewide level.
- Sec. 1208 of the bill requires states and MPOs to allocate at least 2.5 percent of specified planning funds (sec 505 title 23, and sec 104(d) of title 23), to carry out activities related to complete streets including adoption of a complete street plan or policy, developing of a complete streets prioritization plan, address travel demand through means other than highway expansion, and support of TOD.

Project delivery.

Subtitle C of title I of the bill focuses on project delivery and assessment.

- Sec. 1301 of the bill establishes guidelines for efficient environmental reviews along with establishing the One Federal Decision process (codifying much of Executive Order 13807). It would require the Secretary to provide a report on environmental review best practices. It would require the establishment of a performance accountability system for tracking major projects, which would include at a minimum the environmental reviews process schedule, whether the established schedule is being met, and time taken to complete the environmental review process. The One Federal Decision principle would bundle the decision with all federal agencies that have oversight, including (but not limited to) DOT, DOD, BLM, DOE, and DOI.
- Sec. 1302 of the bill changes the frequency of work zone process reviews to occur not more than once every five years.
- Sec. 1303 of the bill addresses the filing of transportation management plans. It orders the Secretary to amend 23CFR630.1012 so that, in general, only projects that would require a lane closure of more than three consecutive days would be considered a significant project and require the filing of a transportation management plan.
- Sec. 1304 of the bill concerns the development of guidelines for implementing intelligent transportation systems. The Secretary would be instructed to develop guidelines for implementation that use existing flexibilities in the systems engineering analysis methodology.
- Sec. 1305 of the bill extends alternative contracting methods for projects on federally managed land and tribal areas. This would allow these projects to use contracting methods of project bundling, bridge bundling, design build contracting, two-phase contracting, long term concession agreements, or any methods that have been or could be tested under an experimental program.
- Sec. 1306 of of the bill amends sec. 1420 of the FAST Act, which currently says that the Secretary “may” exercise all existing flexibilities, and changes it to the Secretary “shall” exercise all existing flexibilities.
- Sec. 1307 of the bill would create a template for improving Federal-State stewardship and
oversight agreements.

- Sec. 1308 of the bill would create guidelines for accepting and using information obtained from non-federal entities through geomatic techniques. These include but are not limited to remote sensing, land surveying, cartography, geographic information systems, global navigation satellite systems, and photogrammetry. The guidelines would also include standards for data quality.
- Sec. 1309 of the bill creates a new 23 U.S.C. §331 that includes projects for public safety within an operation right-of-way. Eligible projects would now include new turn lanes that assist public safety and preventative maintenance and preservation on highways, and highway safety improvement projects.
- Sec. 1310 of the bill creates a new 23 U.S.C. §332 that mandates yearly DOT reports on projects via the FAST-41 Dashboard. They would need to include median time between submission and decision making, a list of new categorical exemptions, and a list of all regulatory requirements that have been removed or reduced. When available, a summary of the removed and reduced regulations cost savings to States, units of triable or local governments, and the public should be included.
- Sec. 1311 of the bill would amend 23 U.S.C. §102 by striking (b) (“Engineering cost reimbursement”) which currently requires states to repay FHWA for preliminary engineering costs that don’t proceed to on-site construction or right-of-way acquisition within 10 years after federal funds are first made available.

Safety.

In addition to the changes in the Highway Safety Improvement Program made by sec. 1111 of the bill (amending 23 U.S.C. §148 to make “leading pedestrian intervals” an eligible type of project and by adding a new §148(a)(10) to allow states to “flex” up to 25 percent of its HSIP funding to safety projects authorized under other sections of title 23), section 1108 of the bill maintains the existing rail-highway grade crossing set-aside at the current $245 million per year but increases the federal cost share of such projects from 90 percent to 100 percent. It also allows states to use R-HC funds for projects to reduce pedestrian injuries and fatalities from trespassing on railroad right-of-way and expresses the sense of Congress that DOT should coordinate efforts to reduce pedestrian trespass.

Sec. 1124 of the bill creates two new safety grant programs:

- A formula safety incentive program is established in a new 23 U.S.C. §172 and funded with $500 million per year in HTF contract authority, to be distributed to states in the same shares as the state’s overall share of core formula funding. 65 percent of a state’s funding must then be sub-allocated by population. Half of the funding must be used by states or MPOs for highway safety improvement projects or strategies and, for states, the projects/strategies must be on the state strategic plan. The federal cost share for such projects is the sliding scale in 23 U.S.C. §120. States may use a vulnerable road user safety assessment to target the use of this half of the funding. The other half of the funding can be used for any STBGP-eligible type of project if the state can prove it is making progress on its vulnerable road user safety assessment, at a 100 percent federal share, or else it has to be spent the way the other half is spent, on traditional HSIP items.
- A fatality reduction performance program is established in a new 23 U.S.C. §173 and is funded with $100 million per year in HTF contract authority. States or local governments where the rolling 3-year average fatality and serious injury rates per 100 million VMT and per capita and the average per capita fatalities have all grown more slowly or declined compared to the prior
averages can apply to USDOT for grants to reward this achievement. The Secretary shall select winners in any of these performance categories: reducing per capita serious injuries and fatalities, reducing rates of serious injuries and fatalities per VMT, having among the lowest per capita serious injuries and fatalities, having among the lowest per-VMT serious injury and fatality averages, or innovative safety efforts. Grants awards may not be less than $5 million and may not be more than $30 million. Grants can be used for any eligible title 23 activity at a 100 percent federal share.

Sec. 1124 also requires USDOT to create a vulnerable road user research plan. Sec. 1125 of the bill creates a wildlife crossing safety pilot program, funded with an average of $50 million per year in HTF contract authority, which will make competitive grants to government entities for projects to reduce the number of wildlife-vehicle collisions and improve habitat connectivity for terrestrial and aquatic species. At least 60 percent of the funding must go towards projects in rural areas.

Also, sec. 1120 of the bill amends SAFETEA-LU’s Safe Routes to School program to make routes to high schools eligible, sec. 1502 of the bill creates a new pedestrian protection program for competitive grants for bollard installation projects (to be funded with up to $5 million per year in general fund appropriations), sec. 1516 of the bill requires FHWA to study data-driven infrastructure traffic safety improvements, and sec. 1521 of the bill orders DOT to implement certain recommendations of GAO’s June 2016 report on DOT oversight of guardrails and other roadside hardware.

**Innovative finance and tolling.**

Title II of the bill makes some significant changes to the TIFIA program in terms of eligibility and addressing the unobligated and unallocated TIFIA funds in the FAST Act. The legislation does not change the core mission and purpose, but clearly gets at Congress’s frustration that the TIFIA deal flow is not great enough to spend all of its money.

TIFIA eligibility is expanded to three new areas: (1) transit oriented development near major transit stations so long as it is “public infrastructure” that include private investment. The TOD eligibility specifically calls out commercial and residential development near transit, but it cannot use more than 15 percent of the total TIFIA funding. (2) Airport projects, not to exceed 15 percent of total TIFIA funding. And (3) acquisition of plant and wildlife areas as a means to mitigate environmental impacts of transportation projects.

The bill adds some language on improving processing timelines and other attempts to streamline and expedite delivery. The bill also requires DOT to report on the results of the airport eligibility addition.

Sec. 1507 of the bill creates new requirements for public-private partnerships (P3s) that use federal funds. For large finance-build-operate-maintain projects (over $100 million), the project sponsor is required to submit to the Secretary a compliance review of the private sector partner. The review includes certifying compliance or notifying violations in a public report. Section 1507 also requires P3s that use federal funding or financing through TIFIA to conduct a Value for Money analysis.

Sec. 1123 of the bill creates an unusual way to address the TIFIA carryover balance, which they define as the funds made available to the TIFIA program but unobligated and unallocated by USDOT, by taking any remaining balance and making it available to projects on the Appalachian Development Highway System. Through a complicated series of exchanges and transfers, the bill takes the unallocated balance and requires that U.S. DOT make it available on a competitive process to complete Appalachian
projects, with the federally-funded share up to 100 percent of project costs.

When it comes to tolling, there are a few references in the bill. Sec. 1118 of the bill amends 23 U.S.C. §129(c) to allow toll revenues to allow the procurement of transit vehicles used exclusively as an integral part of an intermodal ferry trip. Sec. 1404 of the bill establishes a pilot program to allow the exchange of toll credits between states - the Secretary may select not more than 10 states that have excess unused toll credits to sell, shall set up a website for states to post the amount of toll credits they have, and then supervise the sale or transfer of such toll credits to recipient states. And sec. 1529 of the bill amends 23 U.S.C. §129(a) to require all tolling authorities to report to USDOT on the rates, terms and conditions charged to over-the-road buses and how those differ from those charged to mass transit vehicles, and demands that the outside auditors of those toll authorities to report compliance annually.

**Research and technology.**

The bill increases funding for the FHWA “research title” of the bill (including the Bureau of Transportation Statistics) from $420 million in HTF contract authority in FY 2020 to $532 million in FY 2021, rising to an eventual $540 million in FY 2025. Those existing programs, by and large, are codified in chapter 5 of title 23, and the Senate bill only makes limited changes to chapter 5.

Sec. 3005 of the bill amends 23 U.S.C. §503 by: (1) adding wildlife-vehicle collision reduction to the list of things that must be studied under §503(b)(2)(C); (2) making study of extreme weather events, and of energy/broadband deployment revenue potential in highway rights-of-way to the research activities under §503(b)(3)(C); (3) making non-marked-ready technologies eligible for study under §503(b)(6) and (7) and in (c)(1); (4) rewriting §503(b)(8)’s requirements for the biennial Conditions and Performance Report to add requirements for freight movement, ITS, resilience, and backlog analysis; (5) adding a new §503(b)(9) allowing FHWA to develop interactive modeling tools and databases; (6) adding a requirement for a new high-friction surface treatment application study; (7) making the annual report under §503(c)(3) every 3 years and adding many new requirements; (8) adding a new §503(c)(5) requiring DOT to establish and implement a program to promote, implement, deploy, demonstrate, showcase, support and document the application of advanced digital construction management systems (funded with a new $20 million per year set-aside); (9) amending §503(c)(4) to change that program from one that provides grants to “develop model deployment sites” for advanced transportation technologies to one that makes grants “to deploy, install, and operate” such technologies and adds account-based transaction payment tech and trip-sharing incentivization tech to the eligibility list (and adds a 20 percent rural set-aside); (10) adding a new §503(c)(6) creating a new Center of Excellence on New Mobility and Automated Vehicles.

Sec. 3006 of the bill amends 23 U.S.C. §504 to: (1) add pre-apprenticeships, apprenticeships, OTJ training opportunities, industry outreach and partnership programs, and vocational schools to the eligible workforce training activities under §504(e); (2) rewriting the transportation education development program under §504(f) to make grants to non-higher-education institutions and state DOTs eligible and to allow them to implement (not just develop) curricula and education programs (and add reporting requirements); and (e) adding a new §504(f) to allow FHWA to use §504 funds to carry out workforce and technical development activities under other sections of title 23 for non-DOT employees.

There are also a number of research studies and pilot programs extended or initiated by the bill, including:
Sec. 3001 of the bill authorizes a new grant program for testing road usage fees and other user-based alternative HTF revenue systems, funded by a $30 million per year research program set-aside. Half of the money shall go to state pilot projects (similar to those authorized by sec. 6020 of the FAST Act, with a 70 percent federal cost share), and the other half of the money will go towards a national research program. With regards to the national program, it must be coordinated with a new Federal System Funding Alternative Advisory Board and “shall include voluntary participation by drivers or owners of commercial vehicles from a diversity of States and vehicle classes.” There is a savings clause stating that “nothing in this subsection authorizes the Secretary to impose a Federal road usage fee” except in testing on voluntary participants for testing purposes only.

Sec. 3002 of the bill extends the performance management data support program under section 6028(c) of the FAST Act for five more years.

Sec. 3003 of the bill requires DOT to establish a data integration pilot program to develop geolocated models to coordinate weather conditions, road conditions, work zone and other incidents, and information from first responders. A general fund authorization of $2.5 million per year is provided.

Sec. 3004 of the bill establishes a new emerging technology research pilot program. A general fund authorization of $5 million per year is provided.

Sec. 3005(e) of the bill creates a new Open Challenge and Research Initiative Pilot Program (funded with $15 million per year of HTF contract authority) for governments, UTCs, nonprofits, and other entities to study open highway challenges and research proposals linked to identified or potential research needs.

Sec. 3007 of the bill amends 23 U.S.C. §515 to add people familiar with wildlife-vehicle collisions to the advisory committee and amends 23 U.S.C. §516 to make animal detection systems eligible for ITS research funding.

Sec. 1512 of the bill requires DOT to engage the Transportation Research Board to conduct a study of long-term improvements to roadway infrastructure that would benefit the largest segments of users and to examine how best to achieve uniformity in roadway infrastructure to allow the safe deployment of AVs and ADS.

Sec. 1513 of the bill requires DOT to engage the Transportation Research Board to conduct a study of vehicle-to-infrastructure connectivity technologies.

Sec. 1522 of the bill requires DOT to carry out a study of the effect of permeable pavements on flood control.

A new section added by amendment and not yet numbered orders FHWA to study existing and future impacts of self-driving vehicles to transportation infrastructure, mobility, the environment, and safety.

**Miscellaneous.**

Miscellaneous items not included above:

- *Emergency relief updates* - sec. 1106 of the bill amends the emergency relief program in 23 U.S.C. §125 to (1) provide that ER funding cannot go to repair or reconstruct a bridge that had already been permanently closed due to imminent danger of collapse before the natural disaster; (2) amends the definition of “comparable facility” in §125(d)(2) to make economically justifiable resilience costs included in “comparable”; and (3) makes protective features eligible expenses (with detailed definitions).

- *Scenic byways* - sec. 1116 of the bill requires DOT to make another round of scenic byways
designations.

- **Alaska Highway** - sec. 1117 of the bill completely rewrites 23 U.S.C. §218 to allow reconstruction of the Alaska Highway (in Canada) at a 100 percent federal share.

- **Nationally significant fed lands and tribal projects** - sec. 1129 of the bill reauthorizes the nationally significant federal lands and tribal projects program, which receives a general fund authorization of $100 million per year.

- **Tribal high priority projects** - sec. 1130 of the bill reauthorizes the tribal high priority projects program.

- **Forest roads remediation** - sec. 1504 of the bill amends the Forest Roads and Trails Act of 1964 to establish a Forest Service Legacy Roads and Trails Remediation Program, which receives a general fund authorization of $50 million per year.

- **Bicycle evacuation pilot** - sec. 1505 of the bill creates a new Disaster Relief Mobilization Pilot Program to “provide grants to local communities to develop disaster preparedness and disaster response plans that include the use of bicycles.” The bill provides a general fund authorization of $1 million per year to carry out this program, and maximum grant size shall be $125 thousand.

- **ARC reauthorization** - sec. 1506 of the bill reauthorizes the Appalachian Regional Commission.

- **Community connectivity pilot** - sec. 1508 of the bill creates a new community connectivity pilot program, funded with an average of $24 million per year in HTF contract authority. There are actually two programs: the first will provide competitive grants to governments or nonprofits of up to $2 million to study the possibility of relocating transportation facilities that create barriers to community connectivity (limited access highways, viaducts, etc). The second will provide capital construction grants to carry out such projects. The minimum size for a construction grant is $5 million and the pilot program share may not exceed 50 percent.

- **Cybersecurity** - sec. 1511 of the bill requires FHWA to develop a tool to assist transportation authorities in identifying, detecting, protecting against, responding to, and recovering from cyber incidents.

- **Off-road recreational fuel taxes** - sec. 1514 of the bill requires the Secretary, at least every 5 years, to assess the best available estimate of the amount of taxed gasoline used by non-highway recreational users (dirtbikes, ATVs, etc) in order to determine the proper funding level for the recreational trails program, the existence of which is justified by such HTF tax payments.

- **Buy America** - sec. 1515 of the bill requires DOT to publish Buy America waiver notices 15 days before issuance.

- **High priority corridors** - sec. 1517 of the bill adds five new high priority corridors to the list of designations in section 1105(c) of ISTEA (one in NC, one in KY, and three in MS) and also provides some future Interstate designation, route re-numbering, and requires a GAO report on weight limits on the NC and KY segments.

- **Interstate weight limits** - sec. 1518 of the bill amends 23 U.S.C. §127 to add two more Kentucky highways to the Kentucky weight exemption list in §127(l) and also to provide weight limit waivers for certain North Carolina roads if subsequently designated as Interstate.

- **Interstate rest area commercial use ban** - sec. 1519 of the bill grandfathers the Wendell H. Ford Highway in Kentucky from the ban on commercial activity in rest areas if that highway is subsequently designated as an Interstate.

- **Indian land oil/gas/water lines** - sec. 1524 of the bill gives a NEPA categorical exclusion to right-of-way notices for some kinds of oil, gas and water lines on Indian lands.

- **Stormwater runoff** - sec. 1526 of the bill requires DOT and EPA to request a Transportation Research Board study of stormwater runoff best practices, and sec. 1527 of the bill requires FHWA to update its stormwater best management practices report annually.

- **Invasive plants** - sec. 1528 of the bill requires DOT to carry out a program to fund activities to
eliminate or control invasive plants. $50 million per year in general fund authorizations are provided for this program. An amendment added at markup emphasizes promotion of pollinator-friendly wildflowers.