

Dear Committee:

Thank you for the opportunity to submit testimony on SENATE BILL 155 AN ACT CONCERNING COMMUTER RAIL INFRASTRUCTURE IMPROVEMENTS.. My name is Robert Hale, and I am a frequent transit rider.

I am testifying in *opposition* to this bill as currently written.

In its latest form, this bill is **insufficient to force the cultural change** that is necessary in the state's transportation apparatus. Too many transportation officials have resisted all modernization efforts. The result is an inferior and overpriced transit system for Connecticut. Operating dollars deliver less service than elsewhere in the industrial world. Capital projects contain excess scope that an optimized operation would not require. Even capital projects that do deserve to advance are executed at costs that are an order of magnitude over those experienced on [similar projects](#) in the rest of the world.

Operational optimization

There is significant room to clean up how the railroads in this state are operated and maintained. For example, the fastest express trains between New Haven and New York made the journey in 1h20 in the 1960s, and zone local trains making every stop between New Haven and Stamford took 1h50 a few years ago. Those services take 1h45 and 2h10 today, respectively. Even though 1h05 express and 1h25 zone local trip times have been shown to be [feasible on the existing alignment with existing trains](#), CT 2030 promises to merely match historical trip times. While intuition might suggest that slowed runtimes increase safety, the numbers fail to support this prediction. Last year, American [passenger railroads](#) (many of which have slowed their operations like Metro-North recently) had 1,505 significant accidents per billion train miles, an increase from earlier in the decade and well above the [UIC average](#).

The times between endpoints are not the only place to look for speedups. It is commonplace around the world to turn a passenger train at a terminal in three to four minutes. In contrast, even at rush hour, trains linger at terminals such as Grand Central and New Haven for upwards of twenty minutes.

Crucially, reduced runtimes would benefit the railroad as well as the customers. The DOT and its contractor, Metro North Rail Road, have trouble grasping a key fact about rail operations: since the variable cost scales with man-hours, faster runtimes enable the same workforce to generate more revenue. They also reduce the cars needed to furnish a given level of service. Between line speeds, acceleration, and turnarounds, it should be possible to reduce round trip run times by 10 percent relatively quickly and even more as efforts progress. That means a ten percent cut to the baseline requirement of M8 railcars, which amounts to forty to fifty units. That should be enough to free up enough M8s to equip all branch lines with enough equipment to run at least hourly service.

A key DOT talking point—that ongoing maintenance is a unique constraint requiring constant service slowdowns and extraordinary additional resources—does not stand up to scrutiny. In 2017, Metro-North spent around \$350,000 per route mile on [maintaining its infrastructure](#), slightly higher than [Italy](#), the [Netherlands](#), the [U.K.](#), and [France](#). The difference is that European rail managers furnish frequent service all day and perform activities such as [track replacement](#), [ballast regulation](#), and [catenary replacement](#) at night. In contrast, even with the daytime slowdown that is accepted as normal around New York, just 7500 ties out of around 500,000 and 6 miles of rail out of 300 were replaced on the whole New Haven Line in all of 2019.

Finally, onboard crew sizes are excessive. In contrast to New York-area regional trains, whose multiple conductors help fuel some of the [highest](#) fares in the world, trains elsewhere in the world need an engineer and perhaps one conductor. Tickets are validated by the passengers and checked randomly by a small force of civilian inspectors under **proof-of-payment ticketing**. This system is already in place on the Hudson-Bergen Light Rail system, whose ridership density is an order of magnitude over that of the regional rail. Patrick O'Hara, who writes the blog [The LIRR Today](#), estimates that LIRR stands to save over \$200 million a year by adopting this system. Metro-North, a similar operation, stands to save about the same, a greater good than preserving several hundred needless conductor jobs. Eliminating positions would undoubtedly sting employees, but retraining them for other jobs in the rail company or transitioning them out of the organization may soften the blow and has ample [precedent](#).

Picking the right capital projects

A plan for the Waterbury Branch released about a month ago has laudable goals, but proposes redundant investments. For one, it suggests acquisition of seven trainsets that can use diesel from Waterbury to Bridgeport and electric power from a third rail and from a wire to reach Grand Central. The problem with stuffing so many capabilities into one machine is the cost: \$16 million per set. Consider also that the plan proposes \$50 million per station for three stations. Learning how to build new branch line stations cheaply—for \$5 million apiece instead of \$50 million—would free up tens of millions of dollars to string wire. Electrification of the 27-mile Waterbury Branch at normal first-world costs is a \$50-100 million investment. European electric multiple units cost \$1.5 million to \$2.5 million per 85 foot car or up to \$10 million per set, far cheaper than US-specification dual-mode locomotives with coaches. These are legal in the US since the [FRA published updated crashworthiness regulations a year ago](#). Moreover, tighter runtimes and turnarounds on the main line may well free up enough M8s to furnish at least hourly service on the branch lines with no further equipment acquisition beyond that already in progress.

The emission reduction is arguably the least of the benefits of electric rolling stock. Since electric equipment has far fewer moving parts than diesel, it is more reliable. Moreover, electric trains trounce diesels at acceleration and braking, saving around a minute on the time needed to make a stop at typical speeds of 60-80 mi/h. Better acceleration also translates to better recovery from the speed restrictions imposed by curves and switches. On an inevitably sinuous route like the Danbury or Waterbury branches, acceleration and braking rate differences between diesels and electrics likely translates to several minutes of saved time per round trip.

The station at Bridgeport, which is the state's largest city, currently has two tracks out of four served by a platform. That means that only train per direction can be at a platform at a time. This constraint is a common source of delays. A wider station area with island platforms serving all four tracks would allow up to four trains to platform at once, increasing transfer efficiency and redundancy. That project does not come without challenges. It requires widening the right-of-way, half of which is on an embankment and half of which is on a bridge in the Pequonnock River. Above the tracks runs a transmission line, and piers holding up the I-95 also bracket the railroad. Reconfiguration is likely to be unusually difficult, and it would preserve an S-curve that slows all trains significantly.

In Bridgeport, the best solution is likely to bite the bullet and reroute the rail line straight through the city roughly paralleling State Street. A few hundred million dollars, which is a fraction of the money that DOT sees fit to spend on widening I-95, should acquire the property necessary for the new right-of-way, and the construction should total low hundreds of millions of dollars provided best practices in project delivery are followed. The payoff would be substantial. Every one of the 150 odd mainline trains passing through the city would save several minutes since they would no longer need to slow well over a mile

from the station. Moreover, this project would present an opportunity to move the station to a more central location than its current setting. Sale of the existing alignment once it is no longer needed could help offset the cost and spur development. *Crucially, new stations at Devon or Barnum Avenue add no value to the transportation network—both would be located in sparsely populated areas—and should not advance farther.*

All capital dollars must start going a lot farther

While some rail projects that the state has in the pipeline are quite justifiable, all of them are severely overpriced. As many American [leaders](#) continue to shortchange rail, it is tempting to charge ahead with any plan, but the legislature must resist. CT 2030 will, if approved in its current form and entrusted to CTDOT's current managers, send the state back into the same debt hole out of which it has begun to climb, for crumbs' worth of transit improvements.

For example, although the speed improvements promised under CT2030 for the New Haven Line trunk are modest, the costs, totaling \$20 million per route mile, are not. The CT 2030 plan estimates \$7.6 million per mile to upgrade signals for the promised trip times. In Denmark, by contrast, \$2.2 million a mile is buying the entire [network](#) new signal hardware, communications-based train control (the technology used on the New York City Subway), and positive train control (PTC) to facilitate modern speeds and acceleration/braking rates. Moreover, whereas track work is pegged at \$3.9 million per track mile, \$1.2 million per track mile is buying a total [reconstruction](#) of the double-track legacy line between Sagunto and Castellon in eastern Spain. Once rebuilt, the line, in place since the 1860s, will allow a maximum speed of 135 mi/h. The work is being done at night or on weekends to avoid disrupting the 150 trains that run each weekday. One 4-to-5-hour night window is enough to replace one-third mile of ties; all the tie replacement planned on the New Haven Line for 2019 would have taken two weeks of nighttime work at that rate.

Worse still, bridge construction costs are completely out of control. The Walk Bridge replacement is now estimated at \$510 million for a 550-foot span. That is \$5 billion per mile; the tunnels and systems on the highly overpriced Second Avenue Subway cost \$500 million per mile. Moreover, the chosen design bakes in an increased maintenance cost for a movable span all for one customer upstream. SEPTA, no paragon of international efficiency, replaced the [Crum Creek viaduct](#) for \$400 million per mile. At that cost, there would be a generous cushion for relocating any firm that relies on over-height boats.

Even for simpler station builds, CTDOT estimates are excessive. New stations at Enfield and Windsor Locks, along non-electrified track, the plan estimates \$50 million and \$65 million respectively, while similar projects in the [Barcelona suburbs](#), where crews have to work around electrification, cost around \$1.5 million each.

Connecticut can't afford to keep overspending

The CT 2030 plan anticipates \$300-400 million of yearly toll revenue. Even this funding is unlikely to materialize soon, and at least until 2021, increased federal funding is unlikely. More debt is a nonstarter for this state. That means that Connecticut can afford at best to continue spending what it has spent, which means about \$5 billion of transportation spending from now until 2030. Compare that with the projected cost of CT 2030 of \$25 billion. To pretend that there will continue to exist enough funds to sustain an order-of-magnitude capital cost premium is delusional.

Fortunately, \$500 million per year will be enough to maintain existing highways and build the mass transit projects prescribed in CT2030 if they are done at internationally acceptable costs. A survey of

historical New York subway construction costs suggests that [bloated price tags](#) have only materialized in the last thirty years. This means the causes are unlikely to stem from labor organization, high population density, high costs of living, or environmental laws (all of which were firmly in place by the 1980s), to name a few commonly cited excuses. No, the primary cause is political factors that caused decision makers to lose sight of the big picture. The good news is that enough pressure can change that. In order to do that, Senate Bill 155 should be amended to include something like the following:

The Department of Transportation is ordered to perform a comparison of costs in the New York and Connecticut areas to those incurred in other metro areas, *with particular preference for non-Anglophone regions of the world that have hitherto escaped analysis*. The Department shall solicit an official response to its inquiry from at least one group of qualified individuals with experience working on rail construction projects in a *non-Anglophone country*.