Many urbanists, environmentalists, and transit enthusiasts love rail. Los Angeles voters in particular have repeatedly expressed the wish for more rail, approving county sales tax increases by overwhelming margins in 2008 and 2016, along with prior measures in 1980 and 1990, in part to fund a nation-leading, multi-billion dollar rail transit build out (a history I documented in the 2014 book Railtown). Many other cities around the country also either have mature rail systems or are in the process of building new ones.

But what if this nineteenth century mode of transit propulsion is about to be made obsolete? Specifically, self-driving, battery-powered platoons of electric buses have the ability to achieve all of the same benefits of fixed rail transit, but at a fraction of both the capital and operating cost. If we can place 8 or 10 buses in a row (platooning means they would drive in sync as if hitched together, based on self-driving sensors), have them all accelerate electrically and brake together, be separated by just a few inches, and be operated by just a single lead driver or computer, isn't this essentially just a long train?

It's a question I look forward to posing in a conversation I'm moderating with LA Metro CEO Phil Washington at an upcoming Council of Infill Builders "LA Infill" conference, co-sponsored and hosted by UCLA Law on Wednesday, July 24th.

Here are some of the typical benefits of rail and how self-driving, platooning electric buses (e-buses, or automated rapid transit, ART) could compare:

- **Capacity**: a 10-car train can pack a lot of people, often making the ride more cost-effective to operate per passenger than single trains and buses. But platooning e-buses of up to 10 or more in a row could carry the same capacity as a crowded rail car and could be designed to look and function exactly like rail cars.
- **Fast electric acceleration**: rail is a smoother ride than diesel or gas-powered buses, with fast electric propulsion. But e-buses provide the same acceleration benefits.
- **Fast and reliable service**: rail transit in dedicated rights-of-way (required for heavy rail transit with power provided by a third rail and not overhead) provides the benefit of avoiding car traffic and intersections to deliver people faster and more reliably to their destinations than bus or light rail (overhead powered), which are stuck in traffic when not in a dedicated lane. But if platooning e-buses run in the same dedicated rights-of-way as rail, they can travel just as quickly and reliably.
- **Transit-oriented development**: it's unfortunately become controversial in California to try to house more people near major transit stops (nearby homeowners and their NIMBY allies don't like it), but rail can help stimulate real estate investment to encourage the thriving, walkable neighborhoods that California needs to reduce overall driving miles and address its housing shortage. Fixed rights-of-way for

platooning e-buses would provide the same market signal to developers.

Meanwhile, the e-bus platoons could provide potentially significant additional benefits over rail:

1. **Serious cost savings**: with e-buses, transit agencies don't need to lay tracks or have overhead or down-below wiring to power trains. They don't need substations along the way. The e-buses would be battery powered (as they already are, through companies like BYD and Proterra), so they could recharge in central, convenient places. Yes, that process requires new charging infrastructure and software to manage it. But it's much less expensive than hardwiring an entire rail route — and then maintaining that wiring over time. The self-driving feature also means reduced operating costs.
2. **Faster build times**: transit agencies could build e-bus dedicated lines much more quickly without all the wiring infrastructure and tracks required of rail transit. Construction of tunnels and overpasses still take time, but transit agencies would basically just need to put down pavement and striping. Already, bus rapid transit lines can be built in about a fifth of the time as rail (and at a fifth of the cost), meaning a city can get a lot more transit, a lot more quickly, with the platooning e-bus option.
3. **Operational flexibility**: the platooning e-buses would be free to travel on surface streets as needed in off-peak hours, giving transit agencies more flexibility to move buses around to meet demand from low-density areas outside of the right-of-way during hours with less ridership on the main line.

To be sure, there are potential downsides. First, there is some technological uncertainty, as platooning is still being tested. Second is the cost and range of batteries for buses, though electric buses are already becoming widely deployed, battery prices are falling dramatically, and energy density is improving. The e-buses also offer significant and offsetting savings on operations and maintenance based on the cheaper fuel they need and the fewer parts they have to replace. A third concerns is that more charging infrastructure for the e-buses would be needed, but that infrastructure is often simpler to install than overhead power lines or third rails.

Finally, transit advocates would need to emphasize that the prospect of platooning e-buses should not be used as an excuse to kill or postpone new rail transit proposals in the works today. Urban residents still need the infrastructure that goes with a separate right-of-way for rail, even if the technology ultimately changes. They need tunnels, grade separation, elevated lines, dedicated lanes, and overpasses and underpasses to keep rail out of street traffic. Even if platooning e-buses become widespread soon, that dedicated right-of-way construction will still be put to good use, albeit with ripped out tracks and overhead lines.

But as transit agencies think about other types of rail upgrade projects, like converting the Orange Line bus rapid transit in the San Fernando Valley in Los Angeles into light rail, maybe they should pause and assess the state of platooning e-bus technology. That Orange Line project in particular is costly, and the dedicated right-of-way already exists to convert to electric buses. If rail construction is underway in 2020 or 2021 just as platooning e-buses become market-proven, it will be a waste of money.

I look forward to discussing this issue and more with LA Metro CEO Washington on July 24th at UCLA Law. Tickets are still available for those interested in attending. Ultimately, even for those who will always love steel wheels on rail, it's hard not to see the appeal of what new clean technology might do to expand and improve transit across the globe.