

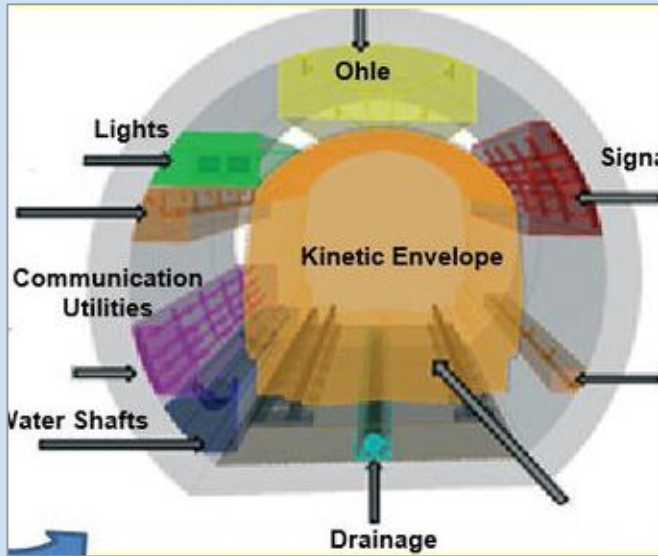
Open Tunnel Alliance



***A Competitive
Autonomous
Transportation
System***

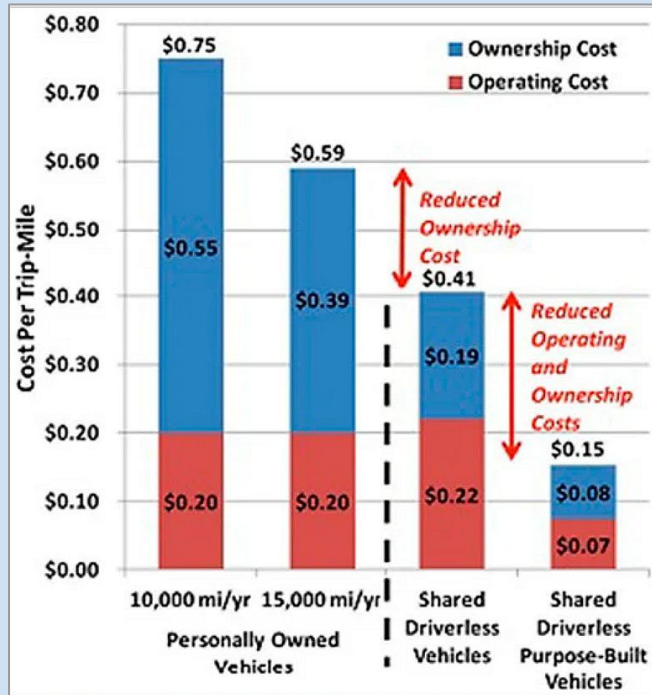
***Open specifications
provide open access***

What *is* the Open Tunnel Alliance



- An set of standards used by *different* autonomous vehicles
- Enables street-based robotaxis to use tunnels
- Specifies physical dimensions, functions & base requirements

PURPOSE of the Open Tunnel Alliance



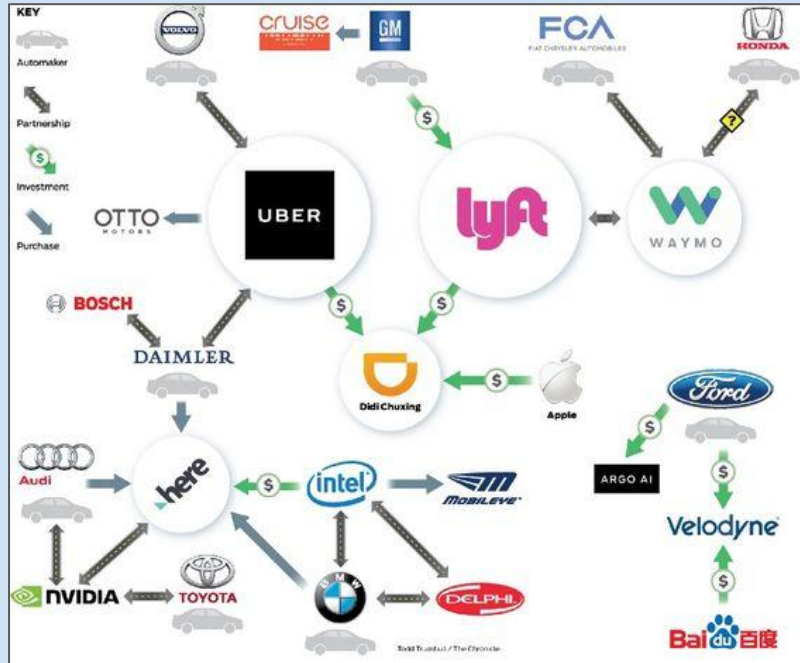
- Provides a *competitive* environment
- Enables cities to bid on different tunnel elements, i.e. size, function & cost
- Enables *different* robotaxis to use a “standard” tunnel
- Lowers cost. Increases competition.

The Open Tunnel Alliance: *NEED*



- Currently *ONLY Musk's* vehicles can use their tunnel
- Accommodates competitive 6-12 passenger EV shuttles
- Largest tunnels accommodate autonomous trucks
- Open specifications enable *interoperability & competition*

Autonomous Shuttles have ARRIVED



- GM & Honda's Cruise
- Ford & VW with Argo
- Lyft and Motional
- Amazon's Zoox
- Google's Waymo
- Aurora & Volvo trucks
- Waymo & Daimler trucks

Musk Tunnels planned for NV & FL

Las Vegas: 29 mile network of tunnels with 51 stations.
Transport as many as 57,000 passengers per hour.

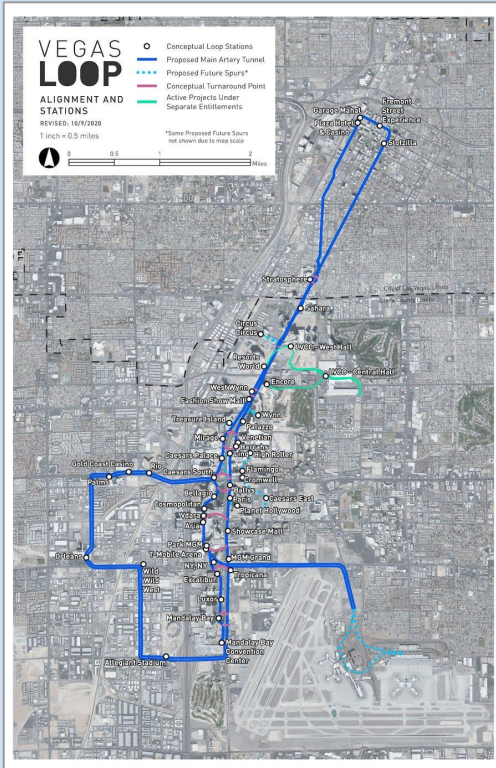
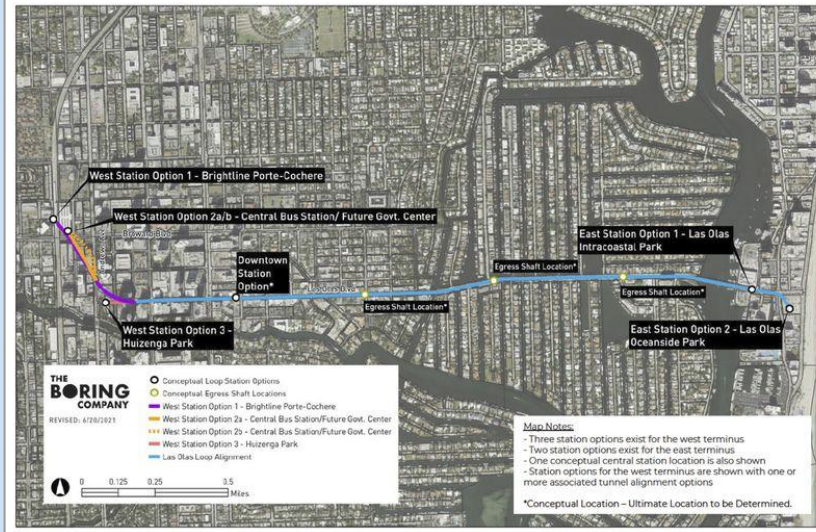


Figure 1 – Proposed Las Olas Loop Alignment and Station Options



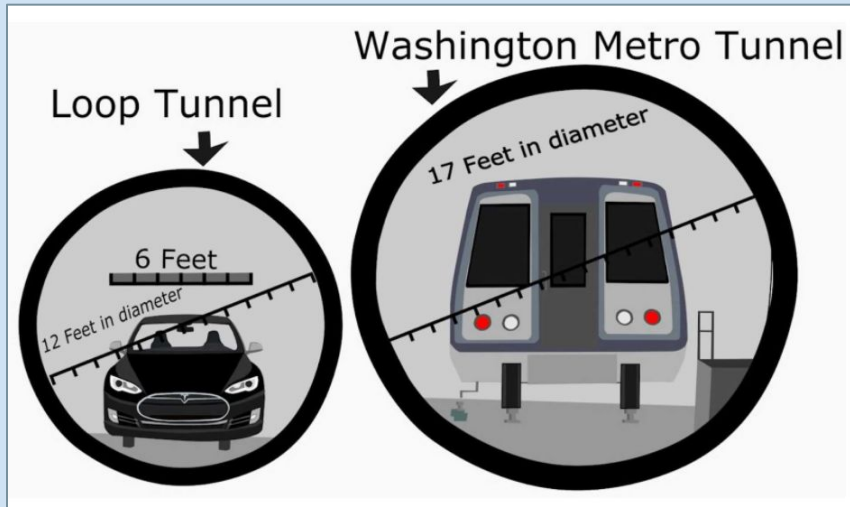
Ft. Lauderdale
Two, 2.7 mile tunnels with cars traveling 50-70mph.
Cost estimated at \$5 one way.

Disadvantages of Musk Tunnels



- **ONLY Tesla vehicles allowed**
- **Tunnel travel only**
- **Street shuttles have no access**
- **Monopoly control**
- **No competitive bidding**

Open Tunnel GOALS



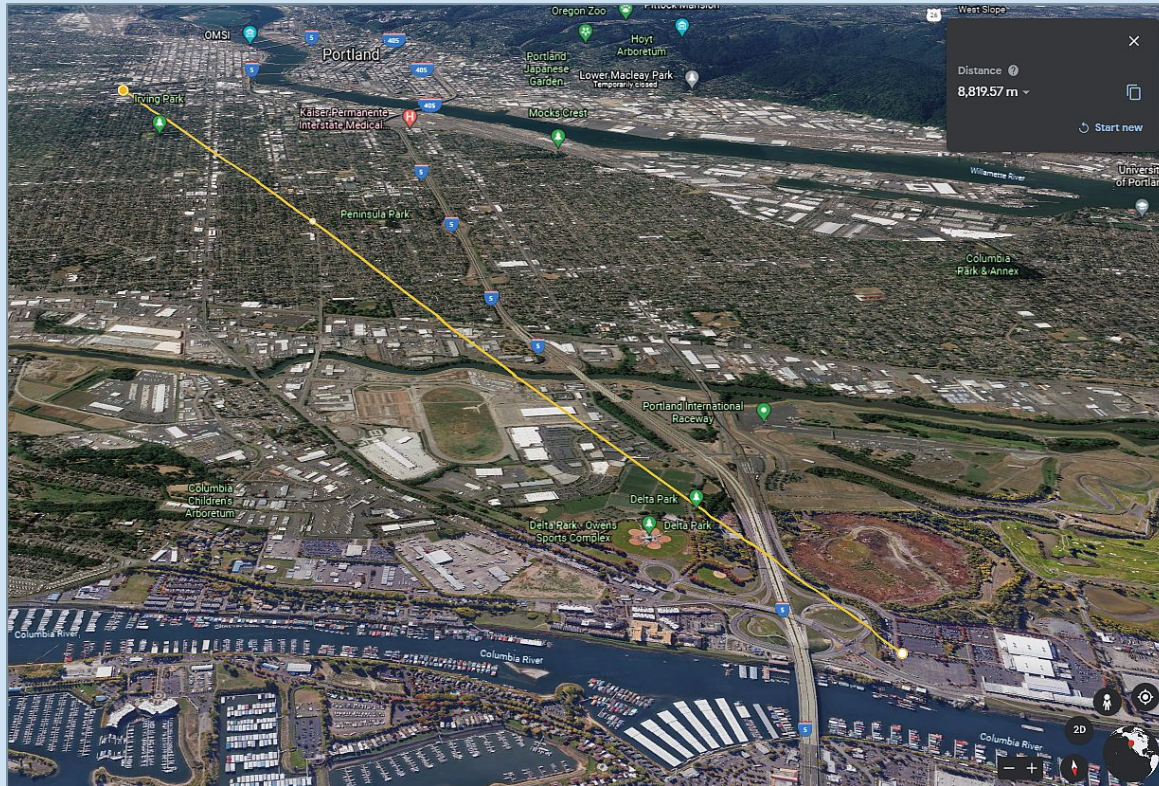
- **Open.** Industry standards define ALL specifications for tunnel interoperability
- **Modular.** ANY vehicle that meets the interface spec may operate
- **Interoperable.** Different robotaxis can use different sized tunnels
- **Competitive.** More providers enable lower cost

Proposed *Portland Tunnel*



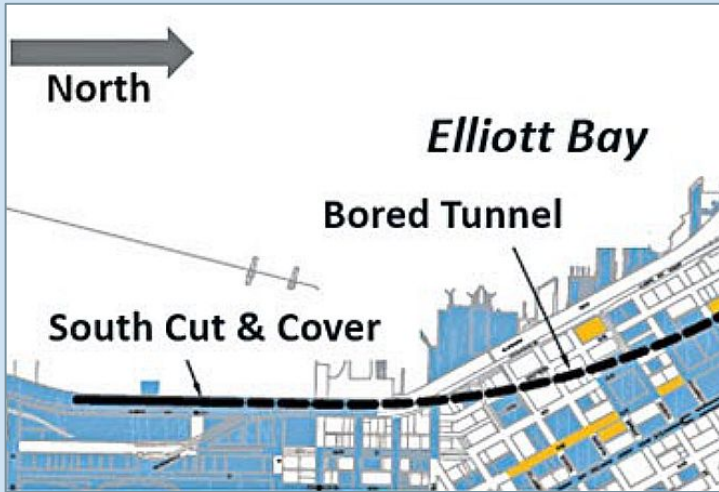
- Tunnel between Expo Center & Lloyd Center
- Vancouver connection direct via bridge or BRT
- No stops (like Max). No I-5 congestion (like BRT)
- No tolls. Faster. Cheaper.

Portland Tunnel Alignment



- Expo to Lloyd Center Tunnel approx 10 miles
- At \$20M/mile, two tunnels cost about \$200M to drill.
- Est. \$800M total for tunnel with 3 terminals and 20 vehicles.
- No stops. No tolls. No Congestion.
- Faster. Cheaper.

Advantages of Tunnel over IBR



- Half price (~\$2B). Est. \$1.2B for new bridge, plus \$800M for EV Tunnel
- Reduced Congestion
- No stops (like Max). No I-5 congestion (like BRT)
- Robotaxis can deliver you direct to final destination.

Autonomy is Real

The US autonomous car market is consolidating with Waymo, Tesla, GM, Ford, Honda, Nissan, Daimler, Amazon, Uber and Lyft leading the pack.



More than 1,400 self-driving cars and trucks are being tested by more than 80 companies across 36 US states. Lyft and Aptiv have provided 100,000 commercial robotaxi rides, with 98% of these paying passengers giving five stars to their self-driving ride experience.

Conclusion



- Autonomous transportation systems are here.
- No pollution. No congestion.
- Cheaper. Faster.
- No tolls. No mileage fees.
- The Open Tunnel Alliance provides robust competition.

The DOTs and Transit agencies hate this idea. Let's talk. A solution that benefits everyone is the goal.

Thank you!

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