Webinar 5 - The Future of Transportation
FAQ

The following are responses to questions that were raised on the Telosa "Future of Transportation" Webinar on May 31, 2023. Given the time constraints, there were a series of questions that the speakers (Marc Lore, Adam Goldstein, Jeff DeCoux and Carl Eppich) were not able to address during the webinar. Please see below:

I. General Questions

1. **Is Telosa wanting to be a petri dish for different ways to structure society e.g. hybrid government that works in tandem with AI governments? Of course human empathy is incredibly important here.**

   We definitely do not want to be Petri dish in the sense that we are not willing to put the quality of life of the citizens at jeopardy under any circumstances. At the same time, we will run pilot programs and do some limited experimentation with different programs all of which will be focused on increasing engagement and enhancing the physical, social, economic and political conditions for the citizens. We are very open to new ideas and new ways of doing things, but only when those creative concepts can be tested in an open, fair and inclusive way.

2. **Do you agree that it is deeply important to integrate empathy and pro-human mechanics into any AI system?**

   You are absolutely correct. Everything we do in Telosa is focused on people - creating a higher quality of life and greater opportunity. All of our technology choices, whether it is AI or traffic sensors will be implemented with people in mind and consistent with our values of being open, fair and inclusive.

3. **No one has been able to figure out how to make a Hyperloop subway curve. Neom uses a straight line Hyperloop, really a single track back and forth. Are you working on this issue?**

   Some liberties were taken with inclusion of a "Hyperloop" type of transit service in the conceptual design renderings for Telosa. These are not necessarily required transit specifications for Telosa, but meant to inspire what "could be." In Phase I, II and III of Telosa, we will not have the critical mass of people to justify a hyperloop for intra-city travel. Therefore, we are not spending time focusing on subway curve issues. By the time we do have the critical mass, the technical problems and solutions are assumed to be solved OR a different kind of high-speed surface transit service would be provided other than a Hyperloop type concept.

   At the same time, depending on the final location, a Hyperloop could be a fantastic way to connect Telosa to population centers. This will allow us to transport people and goods in and out of the city in a timely and efficient way. As we have all learned over the past few years, well-run supply chains are essential. This would also solve the problem of not allowing gas-powered cars on the streets within Telosa while providing visitors with a fast, clean way of getting to and from Telosa for business and entertainment.

4. **Automation economies by AI may potentially emerge in the next 10 years. How does Equitism interact in a universal basic income economy? I imagine your vision for Equitism may be boosted x10**

The way that AI will be most useful in accelerating Equitism is that the Foundation will be able to utilize it as a tool to help deliver more effectively on our four building blocks of prosperity - Housing, Education, Health/Wellness and Jobs/Re-training. AI can create greater efficiencies, cost savings, productivity and income. This will help us build a strong foundation to help the citizens of Telosa thrive and flourish and create an urban environment and dynamic economy that many other people will want to be a part of.

5. **What are your thoughts on another option: Pneumatic garbage transport. NYC's Roosevelt Island has done this since the 1970s and Hudson Yards move garbage pods underground too.**

   This is a wonderful suggestion that has been on our radar. We are in the process of looking at many different pneumatic waste systems that move the waste and materials from buildings and street-level receptacles underground to be processed. This will help keep Telosa's streets cleaner and make the whole city more hygienic. It will also have a very positive effect on the quality of life and health of the residents and visitors.

II. Questions Answered by Carl Eppich, Telosa Mobility Advisor

1. **Please confirm that no serious transportation system relies on the farebox for Capital or O&M costs.**

   Ideally the transit systems would not *rely* on "farebox" receipts. In the current stage of planning for Telosa it is too early to know what types of vehicles or transit services and overall design will be the right solutions for the city. The transit system(s) will evolve as the city grows and so the types, scale, and technologies should evolve over time. As you likely know there are tradeoffs with trip value association or dissociation (and costs) for users. Demand pricing for example (or discounting) would be powerful if all MaaS modes had costs associated with them (yes, more traditional mass public transit AND public personal transit AV/TNCs).

   From our Telosa Community:
   It depends more on how much of the surrounding area around stations are charged a fee for proximity. Singapore pays for its modern trains that way. See "Wheels of Fortune" by Fred Harrison.

2. **Canals with boats are nice. Can we have them in the SW desert?**

   Maybe. Open surface water bodies in a desert are really wasteful with significant loss from evaporation. At best they are inefficient as far as water conservation. Much of the current planning for Telosa includes a goal of a mostly closed water cycle with a heroic percentage water recapture goal through a green and traditional hybrid infrastructure design that maximizes capturing, conserving, and recirculating water throughout the city. So water evaporation budgets would be developed for open water features. Shading and overall waterbody/features scale would minimize evaporation and other means of loss. Water for city-wide transportation in Telosa is doubtful, but there could be some strategic connections and recreational applications.

3. **Interesting idea to "hide" freight services underground, definitely tourist-friendly, but is it community-friendly? If you work in the freight industry, you will probably feel a little de-humanized by being confined to tunnels where you "won't be seen" all day... that may be a bit extreme of me to say, but food for thought...**

We are assuming a high level of autonomous freight delivery. Most of the human workers behind the freight and utilities aspects of the city will be as systems (computer) workers and mostly be "daylighted" like most office jobs of today. Obviously for instances where humans are required for maintenance, repair, and field troubleshooting, those people in those occupations are well aware that their work is in areas not daylighted. The overall freight and service delivery proposition for Telosa is assumed to be highly automated and autonomous.

From our Telosa Community:
I believe the general idea is to take away the human labor from freight activities so nobody has to go underground and work there all day. Basically like making it something autonomous

4. **It might be worth considering making the square grid into an equilateral triangular grid. Triangular walkways allow more direct travel which makes most trips take less time than in a rectangular grid. Everything would feel closer.**

   That is certainly an interesting concept, however historically and with good reason, settlements, towns, and cities have found more efficiencies for multiple modes of travel (on feet or wheeled vehicles) more compatible in square grids or modified grids. Triangles lead to 6 way intersections with 3 street crossings (instead of 2) and a widely expanded conflict of turning movements from the various approaches and departure lanes. Given that Telosa will accommodate many modes at relatively fast speeds in pedestrian realms at the street level (pedestrians at 2 mph up to bikes/eBikes and smaller vehicles at 10-25 mph), reducing conflict points while maintaining compatible safe speeds for vulnerable user traffic is a primary design principle.

   For a nice diagram of a variety of intersection design conflict areas and their sizes, see: https://www.researchgate.net/figure/Conflict-areas-at-intersections-Figure-E2---3-from-GDS85-Traffic-conflict-areas-are_fig9_326542995

5. **It sounds like the higher speed transportation is planned to be some kind of Personal Rapid Transit. Are you currently designing a PRT system?**

   Yes, a higher-speed PRT system was presented and is in consideration for development. If it were the right mobility service for Telosa, it would likely be through a partnership.

6. **What measures are being taken in the planning, landscape and architecture to mitigate urban heat, climate change driven rising temperatures and sustainable use of water?**

   Keeping in mind no specific location has been identified currently, regardless of a selected location, Telosa's overall layout plan will be oriented to minimize mid-day sun on streets, contribute to reversing climate change (through regenerative features, designs, and systems, etc.), and have a conservation first water recycling plan and program.

7. **How open are the developers of Telosa towards new, advanced and sustainable building materials?**

   Very open. Minimizing carbon and overall materials in construction and maintenance, as well as their resilience and sustainability are part of our mission, vision, and strategies. We are planning for a city

that "...sets a global standard for urban living, expands human potential, and becomes a blueprint for future generations".

8. **We could build a fantastic car free city using proven & existing technology. I don't know why you would want to introduce this much technical risk by introducing autonomous vehicles, for example, when there is already so much political & financial risk.**

   In the near term Telosa will be built with just that and maybe less - existing and proven technology. However in order to meet the mission and overall livability, sustainability, and mobility goals the planning and overall city design will anticipate and be realized with the many, not all, innovations presented. Much like the early automobile, certain technologies and mobility offerings will be proven and safe in time, with little or no risk compared to the capabilities of today. So the planning for Telosa anticipates and assumes these proven capabilities in its overall long-term build out.

9. **For both people and commercial goods moving in/out of Telosa, is the plan to primarily leverage rail infrastructure?**

   Considering the massive quantities and weight of the raw materials required to build Telosa, heavy rail or its technical successor will be the most efficient and sustainable mode to provide building materials, raw or value added, and/or assembled elsewhere. Commercial goods to support the workers and residents, especially as the city grows towards 1 million would also be transported most efficiently by rail, as would a significant permanent resident population.

   Energy efficiency of rail: https://www.csx.com/index.cfm/about-us/the-csx-advantage/fuel-efficiency/#:~:text=According%20to%20the%20AAR%2C%20moving,gas%20emissions%20for%20our%20planet.

   Telosa could be an early adopter of autonomous electric rail car(s) technology which aligns with our sustainability goals. For example, see: https://arstechnica.com/cars/2022/01/moving-more-with-less-freight-startup-bets-on-autonomous-electric-rail-cars/

III. Questions Answered by Adam Goldstein at Archer Aviation

1. **What is the operational cost per mile of the Evtol compared to a helicopter?**

   We have not disclosed this information publicly, but at a high level we are targeting to offer the service to consumers in the U.S. at pricing that is competitive with ground based ride share. This is achievable as these aircraft are significantly less expensive to build and maintain than helicopters thanks to their electric powertrain, which have significantly less parts, and require far less maintenance, than a traditional combustion engine.

2. **1000 lbs. load capacity for the Evtol is PLUS your 4 passengers, or including those passengers?**

   Midnight's ~1,000lbs of payload is the total payload available to carry its pilot, passengers and any cargo.

3. **When you say "low-noise" what kind of decibels are we talking about?**

The design of Midnight is such that the noise that reaches the ground when it is operating at its cruising altitude should measure around 45 A-weighted decibels (dBA), almost 100 times quieter than that of a helicopter. The noise from standard city traffic measures from approximately 62 dBA (for a **single car**, 50 feet away, traveling 30 mph) to **85 dBA** (for city traffic) at 30-50 feet away.

4. **Is Archer going to be aimed for private citizens? Or for, emergency services? Or both?**

   Archer's Midnight eVTOL aircraft is designed to accommodate a variety of use cases. Our initial primary focus is on providing an electric air taxi service to private citizens in dense urban communities, but the aircraft can also be used for cargo and emergency services. Additionally, the U.S. Department of Defense has shown interest in Midnight because of its payload of ~1,000 lbs. for use in non-kinetic applications such as rescue operations and supply-chain logistics.

5. **Has Archer worked on a plan to close the cycle and charge their aircraft with truly sustainable energy, so you can guarantee it is clean mobility? Or does that still have to be planned and developed?**

   We are working with our partners to try to ensure the power sources we're pulling from when recharging our aircraft draw from sustainable energy sources. However, as we likely won't own the infrastructure this is not fully within our control, but we are committed to using our influence to help ensure the sources we rely on transition to sustainable sources of energy.

IV. Questions Answered by Jeff DeCoux at Autonomy Institute

1. **What is a PINNS?**

   PINNS stands for Public Infrastructure Network Nodes (PINNs) will be as foundational as transformers on the electrical grid or traffic lights to roadways. A more direct comparison can be made to the "rack-mounting system invented in 1922 by Bell Labs. This standard has been the foundation of the last 100 years of technology buildout within our offices, data centers, cell towers, and just about every location using critical technology. The success of our nation depends on a new national buildout of Intelligent Infrastructure at the edge of our sidewalks, highways, and communities. These deployments will be predominantly paid for by private industry in collaboration with municipal and community leadership.

   https://www.linkedin.com/pulse/just-two-words-autonomy-institute

   https://autonomy.institute/public-infrastructure-network-nodes-pinn/

   https://www.linkedin.com/pulse/public-infrastructure-network-nodes-jeffrey-decoux-2c

2. **What are your thoughts of transportation being developed in an agile way? In 2+ years, AI enabled architecture and urban planning will drastically reduce complexity etc. Cities may be able to build, learn and pivot in phases like a startup.**

   We need a "New Mobility" approach that focuses on renewable energy and on-demand, multi-modal transportation. Key components include express and autonomous buses, micro-transit, electric cars, and micro-mobility, all operating in a demand-based environment. The text also discusses the

challenges of public transit during the COVID-19 pandemic and highlights the benefits of remote work, renewable energy, and electrification. To reduce traffic congestion, prioritize Intelligent Infrastructure.

https://www.linkedin.com/pulse/21st-century-mobility-solutions-autonomy-institute/

3. **What protocols - both technical and conceptual - are being developed to protect privacy amidst this digitally intensive environment? Any lessons from Toronto and Sidewalk labs project?**

   Sovereign Data Exchanges are critical at the community level. Sidewalk led as a commercial company owning ALL data and created a data model in conflict with the community.

   https://autonomy.institute/city-data-exchanges-and-pinn-clusters/

   https://www.linkedin.com/pulse/data-utility-commission-autonomy-institute/

4. **We could build a fantastic car free city using proven & existing technology. I don't know why you would want to introduce this much technical risk by introducing autonomous vehicles, for example, when there is already so much political & financial risk.**

   Not sure how to answer this as it starts with a false claim. In an idle community there are technologies that could sustain a community in past decades, but not today. Based on current and growing trends of societies since the advent of the industrial age, the flow within a city is far too great. Unless you have all supply chain, energy, water, and other sustainment services underground and force a portion of society to live in the dark.

5. **What type of systems integrators will be required at an urban level to integrate all the smart portions of infrastructure?**

   Urbanautic Engineers of course. Urbanautics is the study and practice of designing and operating massively connected autonomous and intelligent systems in the urban environment for the public good.

   Digital networks have reformed our information, media, communications, and commerce landscape in the last 25 years. Over the next 25 years, digital networks will merge with physical objects like buildings, cars, UAVs, helper robots, and traffic routing systems. Extending these digital networks into public and private spaces has profound human and civic implications. Autonomous capabilities will allow these devices to analyze the environment, make decisions, and take actions on their own. Cities will become amalgamations of autonomous robotics and data networks engaging with people.

