

**Testimony of Ginger Goodin
Submitted to the Texas House of Representatives
Transportation Committee
September 18, 2020**

Chairman Canales and members—thank you for the opportunity to provide information to the committee on Interim Inquiry 2, which focuses on future transportation issues that could arise in Texas as a result of the COVID-19 pandemic. I am submitting this testimony in my capacity as a senior research engineer at the Texas A&M Transportation Institute (TTI).

In my testimony on Interim Inquiry 1, I laid out the transportation impacts for Texas that TTI is beginning to observe through ongoing tracking and active research studies. In this testimony, I highlight those trends, identify possible outcomes, and raise questions for continued exploration and monitoring. Ongoing work to monitor trends and address knowledge gaps will be particularly important in helping the state’s transportation system become better prepared for similar events in the future.

This testimony was adapted from a white paper written by Mr. Greg Winfree, TTI agency director, and Dr. Joe Zietsman, TTI assistant agency director and director of the Center for Advancing Research in Transportation Emissions, Energy, and Health.¹

Background

The transportation sector in Texas was already in a transition phase before COVID-19. The industry had begun moving toward connected and autonomous transportation, shared mobility, and electrification. The global outbreak of COVID-19 has resulted in several modes of transportation practically coming to a standstill, with significant impacts on all aspects of transportation. In the early stages of this crisis, our transportation networks and systems looked very different. Over time, as COVID-19 restrictions eased, transportation demand began to grow but has not returned to the levels we experienced prior to stay-at-home orders.

As the economy rebuilds, it is expected that certain aspects of our transportation sector will look similar to pre-COVID conditions, but others may be significantly different. Therefore, two major questions now require attention from policy makers:

- How will the state’s transportation sector be different in the future?
- What are the main research and policy questions as a result of such changes?

Additional research questions are presented below as identified by TTI and described in this testimony.

Changing Travel Demand and Modal Choices

There will likely be a lasting shift in work culture. The shift in location of work as a result of the pandemic has greatly affected traffic patterns and volumes in all areas of the state. Some businesses may decide to permanently have their employees work from home. In this case, the first important trend is a large shift to telecommuting. This would considerably diminish commute hours (vehicle miles

traveled), which in turn reduces congestion, traffic crashes, vehicle emissions, noise, and several other transportation-related negative impacts.

The changes in work culture may be a factor in Texas's sharp increase in home sales, a potential indicator of the long-term adoption of behaviors like telecommuting or home relocation, which can lead to changing patterns of land use in dense urban areas as individuals move to suburban communities or beyond. With increases in dispersed land development patterns, robust transit service becomes more challenging to provide. In dispersed development, personally owned passenger vehicles become the most viable transportation mode, resulting in greater roadway infrastructure needs and higher burdens on low-income travelers for the personal costs to own a vehicle.

Transit agencies in Texas have been significantly impacted by reductions in travel demand. Transit authorities responded to health advisories by applying social distancing policies, reducing service, adjusting operation schedules, and implementing enhanced cleaning of vehicles and facilities. These changes were particularly difficult for these agencies in terms of both ridership and revenue losses.

Another important metric impacted by reductions in travel demand is the downward trend in vehicle crashes due to reduction in traffic volumes and crash exposure. However, fatalities have not seen a significant decline, and multi-vehicle fatal crashes doubled in urban areas of the state due to higher speeds on uncongested roadways.

While work, education, and shopping trips have declined, the opposite is true for the movement of goods, especially in stronger consumer demand for e-commerce deliveries. Truck trips in Texas have not declined at the same level as passenger vehicles. In addition, freight trips are becoming shorter and more frequent with the growth of e-commerce. All the past transportation-related demand issues associated with an increase in last-mile delivery of e-commerce goods will likely be magnified due to COVID-19.

Research Questions:

- To what extent will telecommuting be the norm, and what will the resulting impact be on our travel volume and patterns?
- How will the state's travel demand change by mode in the short, medium, and long term?
- What is the impact on alternative modes such as micromobility, transportation network companies, and non-family carpooling? What are the roles of these modes going forward?
- What will the ongoing impacts of reduced travel be on issues such as traffic safety, vehicle emissions, congestion, road maintenance, noise, and public health?
- Is the increase in home sales primarily occurring in suburban and exurban areas, and if so, what would a shift in spatial demand mean for the ways in which our transportation systems are planned and developed in the future?
- What policies are needed to ensure that our public transportation is available, reliable, affordable, and safe?
- Will e-commerce maintain its current trajectory, and if so, what does that mean for delivery demand and its impact on our transportation network?

Equity and Environmental Justice

The COVID-19 outbreak is not dissimilar to natural disasters in Texas, such as extreme weather events. Certain populations of society, such as the elderly, disabled, and low-income communities, are much more vulnerable during a pandemic. Some in these demographic groups could be essential service

employees and captive public transportation users. As transit riders, they become more susceptible to contracting and spreading any disease through the transportation system. Reduced and canceled public transportation services during a pandemic make it difficult for these groups to access critical services such as food and health care.

Research Questions:

- What are the equity and environmental justice issues highlighted during the pandemic, and what role can our transportation system play to help address these issues?
- How do we ensure vulnerable sectors of society have access to employment and critical services such as food and health care?

Supply Chain Resiliency

The pandemic has disrupted the demand for goods in a very short period of time, and that demand continues to evolve in Texas. Global supply chains have been interrupted, which has led to reduced inventory production and delivery in many industry sectors. As the pandemic severity ebbs and flows at the local level, supply chain issues have also highlighted concerns with shortages of food, cleaning and personal health care supplies, the redistribution of medical supplies and resources, and the transportation of medical supplies and personnel to treatment sites. TTI researchers are tracking the demand changes and noting how companies are diversifying their supply chains and building in resiliency.

COVID-19 has revealed a critical vulnerability of modern supply chains: the dependency on single sources for raw material and intermediate inputs. It is anticipated that U.S. and Texas industries will adapt supply chains to diversify sourcing, which will impact international freight flows and transportation infrastructure requirements. Many industries are reported to be exploring near-shoring or re-shoring strategies that would, for example, reduce Asian trade. TTI's research shows that if 25 percent of the current U.S. imports from China, North Korea, and Vietnam are near-shored to Mexico, then the volume of imports from Mexico through Texas's international truck and rail border crossings will increase by more than 50 percent.

Research Questions:

- What are the critical issues identified with global supply chains, and what is the role of our transportation system in addressing them?
- What are the critical issues identified with local supply chains for getting food and medical supplies to those in need, and how does our transportation system play a supporting role?
- What investment would be needed to address a significant increase in our cross-border traffic?
- How can furloughed or underutilized transportation assets such as planes, trucks, roadways, and buses be used to respond to and mitigate an ongoing pandemic?
- What are the short-term and long-term transportation-related issues due to the growth in e-commerce during a pandemic, and how can these issues be addressed?
- How can supply chains be made less vulnerable during pandemics? What will a resilient transportation system look like?
- What roles and responsibilities could our many public transportation agencies, private-sector companies, and military transportation resources have in response, mitigation, and recovery?

Economic Implications

The world has taken drastic actions to curtail the spread of COVID-19. These actions have far-reaching consequences, including direct economic impacts. This exacerbates the revenue issues transportation agencies in Texas already face due to the move toward more fuel-efficient vehicles including hybridization and electrification. Reduced travel also results in a reduction in paid parking, tolls, fines, and other revenue-generating sources.

The COVID-19 pandemic has significantly impacted state transportation revenues. In Texas, the State Highway Fund is primarily funded by a few main sources, which include fuel taxes, oil and gas severance taxes (Proposition 1), and some sales and use taxes (Proposition 7). Each of these funding sources have been impacted by the pandemic through decreased travel, changes in spending habits, and sharp cuts in oil and gas production. The changes in revenue from these sources will inevitably impact state transportation funding in upcoming years.

The following transportation-related industries in Texas are struggling severely during COVID-19: airlines and airports, aircraft manufacturers, cruise lines, public transit, and private for-hire vehicles (e.g., taxis, Uber, and Lyft). Seaports and the trucking industry, however, seem to remain robust during these times.

Research Questions:

- What are the possible impacts on transportation revenue, and what other revenue-generating options can be identified?
- What types of transportation industry sectors remain robust during a pandemic, and what types do not? How can vulnerable transportation industries be supported during such times?

Spreading of Disease

Our interconnected world, linked by transportation networks, plays a major role in the spread of a pandemic such as COVID-19. The virus originated in a single community, but due to the global nature of transportation, the virus spread to other parts of the world where it impacts local communities. And the cycle is repeated, many times over. In the context of disease spread, transportation can be viewed as a disease vector because it can spread diseases through:

- Infected travelers carrying disease to new geographic areas.
- Transportation modes where travelers are in proximity or confined spaces (e.g., airlines and transit).
- Infected surfaces in shared vehicles.

Research Questions:

- What is transportation's role in the spread of a pandemic such as COVID-19?
- How can we model the spread of a pandemic, as well as evaluate the effectiveness of various mitigating options and policies?
- What behavioral and structural changes can be made to passenger interactions while in transit to reduce the spread of disease?
- How can public transportation vehicles and facilities be kept free from pathogens to protect operators and passengers?

Public Health and Sustainability

Public health has become a major focus during COVID-19, as has transportation's role in public health. Transportation has many linkages or relationships with public health, such as physical activity, noise, access to health care, vehicle crashes, and air pollution. Reduced traffic due to COVID-19 has resulted in significant health benefits from increased physical activity (e.g., walking and biking) that can be traced back to the various linkages between health and transportation. However, over many decades, transportation has caused negative impacts such as poor air quality in certain areas, and people residing in these areas are now much more susceptible to the health complications of COVID-19. The health impact of transportation during a pandemic is therefore very important and should be studied carefully.

One clear example during the COVID-19 outbreak is a dramatic improvement in air quality due to the significant drop in travel. If these reduced levels remain, then we will see significant health benefits. In addition to well-studied and documented health benefits due to improved air quality, new research² shows that there is a strong correlation between fine particulate matter (PM 2.5) levels and COVID-19 death rates. The higher death rates are due to preexisting respiratory conditions prevalent in areas with high PM 2.5 levels. This will make us think differently about air quality during a pandemic and beyond.

Research Questions:

- How are the linkages or pathways between health and transportation in Texas impacted during and after a pandemic such as COVID-19?
- How can we capitalize on the renewed emphasis on improved air quality and active living?
- What elements of a people-focused approach to mobility should be adopted to improve sustainability and public health during a pandemic?

Transportation Innovation

Innovation in transportation has been a hallmark of the last decade—the main innovations include vehicle automation, connected transportation, shared mobility, electrification, and dockless mobility. The advancement of these innovations has mainly been driven by private industry sectors that have capitalized on the internet, smartphones, and computer technologies, as well as entrepreneurial innovation. COVID-19 pandemic conditions may provide increased opportunities for the public sector to emerge as a stronger partner in transportation innovation. There will also be a focus on new innovations based on the lessons learned during COVID-19. The need for innovation cannot be underestimated and should not be neglected as part of a solution.

Research Questions:

- Do transportation innovations have the same importance to travelers and freight suppliers in Texas after the pandemic as before?
- Does a post-pandemic world impact the roles of our public agencies and private-sector entrepreneurs in advancing and delivering transportation innovations?
- What will the continued adoption of transportation disruptors (e.g., connected transportation, autonomous vehicles, shared use, and electrification) look like for Texas in the new societal reality?
- Are there other, more appropriate disruptive transportation technologies that we should rather consider during and as a result of pandemics?

Conclusion

People and their behaviors will be permanently altered as a result of COVID-19. Transportation, as a result, will also never be the same. How much it will change will not be known for a while. This should compel the state to continue observing trends, projecting and developing scenarios about what could happen in the future, and developing ways to prepare ourselves for a better future. TTI can support this endeavor.

Thank you for the opportunity to provide this committee with information from TTI. Please contact me if you require any further information.

Contact Information:

Ginger Goodin, P.E.
Senior Research Engineer
G-Goodin@tti.tamu.edu
(512) 407-1114

Kirbie Ferrell
Government Affairs Coordinator
K-Ferrell@tti.tamu.edu
(979) 317-2289

-
- ¹ G. Winfree and J. Zietsman, *COVID-19 and the Future of Transportation: Nine Factors to Consider for a More Resilient, Sustainable, and Socially Equitable Transportation System*, 2020, <https://www.carteeh.org/wp-content/uploads/2020/05/Impact-of-COVID-19-on-Transportation.pdf>.
 - ² X. Wu and R. C. Nethery, *COVID-19 PM2.5: A National Study on Long-Term Exposure to Air Pollution and COVID-19 Mortality in the U.S.*, April 2020, <https://projects.iq.harvard.edu/covid-pm/home>.