



UTAH PHYSICIANS
for a HEALTHY ENVIRONMENT

January 13, 2023

**To: Utah Department of Transportation
Comments on the proposed I-15 expansion between Farmington and Salt Lake City**

Utah Physicians for a Healthy Environment (UPHE) is one of the largest civic organizations of health care professionals in the Western US, with over 450 physicians and 3,000 members of the lay public. We appreciate the opportunity to comment on the Utah Dept. of Transportation (UDOT) proposal to spend \$1.6 billion widening the I-15 freeway 18 miles from North Salt Lake to Farmington.

The headline of a New York Times article on Jan. 9, 2023 reads, “Widening Highways Doesn't Fix Traffic. So Why Do We Keep Doing It?”¹ In trying to answer that question the article points out that state departments of transportation were established for the exclusive purpose of building highways for vehicles, and given far more money than cities that were usually tasked with mass transit. But the world has changed dramatically since UDOT was formed in 1975. The pollution, public health, and sociologic mistakes made by the car-centric city planning of 40 and 50 years ago are now easily recognizable and constantly written about. The climate crisis is an indisputable reality now, an existential threat to modern civilization and to most of the world’s human inhabitants. And it will only become more so in the future. These are just some of the reasons why it is long overdue that UDOT re-evaluate its identity, its mission, and its relationship to the public. It should begin that much needed “make-over” immediately, starting with abandoning the proposal to widen I-15. Below we list multiple reasons.

Freeway Expansions Have Failed to Improve Traffic Congestion in Other Cities

The phenomenon of “induced demand” was recognized as early as the 1960s and given terms like, The Law of Peak-Hour Expressway, and The Fundamental Law of Road Congestion.^{2,3,4} The phenomenon has now been repeatedly documented, meaning that increasing freeway capacity increases use of the freeway such that over time, often only a short time, the benefit of reduced congestion is eliminated by increased overall use. For example, a 2019 study found “aggregate vehicle miles traveled increase in exact proportion with lane-mileage, and that congestion relief from capacity expansion vanishes within five years of capacity expansion.”⁵ For every 1% increase in road capacity, traffic increases 1%.⁴

The Katy Freeway in Houston, Tx is a prime example. In 2008, \$2.7 billion was spent widening it to 26 lanes, the widest freeway in the world. In just two years, commuter times worsened for 85% of drivers.⁶ By three years after construction, morning commutes had increased 25%, and afternoon commutes had increased 55%. “I’m surprised at how rapid the increase has been,” said Tim Lomax, a traffic congestion expert at the Texas A&M Transportation Institute, a think-tank friendly to freeways. “Naturally, when you see increases like that, you’re going to have people make different decisions.”⁶

The Rocky Mountain Institute (RMI) found that “from 1993 to 2017, new freeway lane-miles in the largest 100 urbanized areas increased 42%, while the population rose 32%--yet congestion increased 144%.” RMI has produced a formula that projects the increase in vehicle miles traveled (VMT) created by freeway expansion. Using their formula, the distance of the expansion and the number of lanes added, we can calculate that the project would increase VMT between 529 and 794 million, while burning 43 million gallons of gas, every year.⁷

\$1.6 billion is an enormous sum on what all the evidence suggests will be only a temporary fix. UDOT undoubtedly is well aware of this phenomenon so it begs the obvious question, “Why is it using traffic congestion as justification for this project?”

Freeways Create Urban Sprawl: UDOT’s Value System Doesn’t Reflect the Public’s Value System

Freeways create physical, social, and economic barriers in cities that isolate, exploit, and degrade parts of the community. That is a primary reason why many cities are tearing them down, instead of expanding or building more of them. Throughout the world, cities are revitalizing their downtown areas by removing freeways. The double decker Embarcadero Freeway in San Francisco, the Cheonggyecheon Freeway in Seoul, Korea, Harbor Drive in Portland, Park East Freeway in Milwaukee, Rio Madrid in Madrid, the Alaskan Way in Seattle, the Clairborne Expressway in New Orleans, and the Inner Loop in Rochester, NY are just a few of many examples.

Freeway expansions, like original freeway construction, reduce local neighborhood quality of life, especially in central cities. Indeed, as with this project, construction usually involves physically demolishing residences and businesses. One study found that neighborhoods next to a freeway experience 18% lower overall amenities.⁸ While the negative impact diminished with increasing distance from the freeway, the effect didn’t disappear until 2.4 miles from the freeway. “One-third of the effect of freeways on central city population decline can be attributed to freeway disamenities.”⁸

The book, *Highway Robbery: Transportation Racism & New Routes to Equity* by Robert Bullard explains that freeways “physically isolate residents from their institutions and businesses, disrupt once stable communities, displace thriving businesses, contribute to urban sprawl, subsidize infrastructure decline, create traffic gridlock, and subject residents to elevated risks from accidents, spills, and explosions from vehicles carrying hazardous chemicals and other dangerous materials.”

Freeways, and obviously expansion of freeways, are monuments to environmental injustice. Freeways have long been recognized as contributing to “white flight” to the suburbs, leaving minority and low-income neighborhoods to bear the brunt of freeways’ collateral damage, including air pollution, noise, and public health consequences. Much has been written about the inherent racism in the original citing of freeways, dividing intact neighborhoods of color, and disconnecting them from business districts. Politically impotent neighborhoods have long been the target of freeway construction plans because they represent “the path of least resistance.” The proposed expansion of I-15 will only aggravate that effect in North Salt Lake.

Like original freeway construction, the project will create real economic victims, by, among other things, diminishing property values for businesses and residents nearby. For those

residents who are physically displaced, their compensation is often insufficient to attain housing in unaffected parts of a city.

On the other hand, freeway removal has been shown to increase property values. For example, removing the .8 mile elevated Park East Freeway in Milwaukee and restoring the street grid cost \$25 million. But the removal transformed 24 acres into prime downtown real estate. Ensuing development in those acres has led to more than \$1 billion in new downtown investments. Between 2001 and 2006, the average assessed land value per acre in the freeway footprint grew by over 180%, compared to a citywide increase of 25%.⁹ Peter Park, former Milwaukee planning director, says, “There are no examples of a neighborhood that improved when a highway was cut through or over it. But every in-city highway removal has improved economic, environmental, and social opportunities for the local community.”⁹

Lincoln Institute of Land Policy Associate Program Director Jessie Grogan, says, “No longer are cities being planned for cars and commuters from the suburbs; instead, their multiple roles as commerce centers, homes, and places of recreation and tourism are being acknowledged and encouraged.”⁹ But with this proposal UDOT is ignoring this trend in other cities.

UDOT is forcing a value system and an urban planning template upon Wasatch Front residents that prioritizes reducing commuter time above all other considerations, including the destruction of some neighborhoods merely to enhance convenience in other neighborhoods. Time and again UDOT proposals and projects sacrifice every other quality of life consideration, including those that literally define certain communities: like the sacrifice of natural vistas and aesthetics with its Little Cottonwood Canyon Gondola, and the proposed bypass route in the north fields of Heber Valley, and the physical danger to pedestrians and cyclists of widening and straightening Wasatch Blvd so that cars can increase their speeds. If you were to ask the average Wasatch Front resident, “Should Utah follow the Los Angeles blueprint for urban sprawl?” it is almost certain virtually no one would say yes. Yet that is exactly what UDOT is pursuing.

Car-centric development imposes other down-stream demands, like the proliferation of parking lots that dominate urban landscapes. To what extent has UDOT considered the effect of this proposal on demands for more parking and car storage in downtown Salt Lake City and elsewhere along that stretch of freeway? To the extent that newly created parking demand cannot be met, how does that influence UDOT’s forecast for future freeway traffic?

Fertilizing more and more urban sprawl with more and more freeway building requires issuing bonds, taking on debt, cutting services, and increasing taxes so we can keep on doing more of them same.

Expanding Freeways Contributes to the Climate Crisis,

Virtually every scientific and government body in the entire world, from health organizations to our own Defense Dept., has warned the climate crisis is the biggest threat to humans and modern civilization in recorded history. The devastating impact that the climate crisis is having on life in Utah will only get worse. Undeniably this project will add to that in multiple ways. As a state tax payer funded agency, UDOT should be representing the interests of the people they are supposed to serve, and mitigating the climate crisis should be their number one priority. If every relevant decision-making body throughout the world takes the position that their country or state’s pet project only contributes a miniscule amount to the climate disaster, then we proceed as we are

now, courting “death by a thousand cuts.” That attitude is the height of irresponsible public policy, especially when the supposed benefits are so marginal and so temporary.

This proposal is a massive source of carbon emissions, both in the freeway construction itself, and the resultant urban sprawl and the increase in VMT that it will promote. Transportation is the nation’s largest source of greenhouse gases in the US, responsible for 29% of emissions. Cement manufacturing itself is the third largest source of global, human caused greenhouse gases, contributing somewhere between 5 and 10% to the total. Furthermore, concrete is not permanent, needing repair and replacement typically after a few decades, especially when used on road and bridges, as UDOT well knows.

Freeways are essentially fossil fuel infrastructure, and like other freeway expansions, this project will lock in increases in greenhouse gases for the next 40 to 50 years at a minimum, at a time when we can least afford to let that happen. Recent studies found that residents of suburbia have the largest carbon footprint compared to urban and rural residents.^{10,11,12} The most obvious reason is because of the increased CO2 emissions inherent in the travel on that freeway.

Replacing our lakes and rivers with rivers of concrete for greater vehicle convenience will only accelerate the climate crisis.

Did UDOT’s Future Traffic Density Modeling Omit Important Trends?

UDOT must consider changing commuter trends, and how that factors into Utah’s future. In the post pandemic economy, more and more workers are able to work from home. Studies suggest that remote work is here to stay, for around 25% of the work force.¹³ The CEO of Ladders, Marc Cenedella, says it’s “the largest societal change in America since the end of WWII.”¹⁴ Thirty-five percent of workers now have the option of working from home five days a week, and 58% have that option at least one day a week.¹⁵ Furthermore, when workers are given that flexibility, 87% of the them take it.

While the pandemic has been a set-back for mass transit ridership, millennials still aren’t driving as much as older generations. A 2022 study from researchers at Austin, Tx found they are driving 8-9% less than older generations, and that they are likely to continue driving less as they get older.¹⁶ Millennials are the largest share of the country’s population and will soon be the largest consumer group, along with Generation Z (those born between 1995 and 2010).¹⁷ Millennials are more rejecting of the personal car culture in general. Fifty-three percent of millennials have indicated they would likely partake in a car-sharing service and 55% indicated they are making an active effort to drive less.¹⁸ This change in behavior should be encouraged; expanding interstates does just the opposite.

Gen Z now makes up 21% of the US population. Attitudes among Gen Z could have significant implications for future traffic modeling. For Gen Z, consumption means having access to products and services, not necessarily owning them. They are less interested in “owning” a car.¹⁹ Three quarters of them state that “sustainability” is more important to them than brand names, and they prefer environmentally friendly products.²⁰ They are highly engaged on the issue of the climate crisis.²¹ They are less likely to have a driver’s license, they own fewer cars than any previous generation, and transportation consumes a larger share of their income than any previous generation.²² Getting married, owning a home, and having children are milestones that

influence car ownership, but are all being pushed further and further back in the lives of younger generations.

We always hear that Utah is one of the fastest growing states in the nation. But Utah's growth is now primarily net migration,²³ and that means people are making a deliberate choice to move here. Yet other trends will likely come into play soon that will have a negative feed-back effect on growth, including the high price of real estate, the housing shortage, traffic congestion, and all the negative publicity of our environmental problems, like air quality, the drought, and the shrinking of the Great Salt Lake. If this megadrought continues, and the scientific community predicts it is has become the new normal,²⁴ then water availability alone will limit Utah's growth potential.

All of these trends would affect future traffic. Did UDOT consider any of this in their modeling?

Freeways are Major Contributors to Air Pollution in Multiple Ways and Increase Urban Heat

Never ending expansion of freeways is a major contributor to our notorious Wasatch Front air pollution problem. In a study of the impacts of a freeway expansion in Houston, researchers estimated that the expansion would increase highly toxic benzene emissions in the freeway corridor, 175%.²⁵ Freeway generated pollution includes every major pollution type; the toxic gases like NOx, VOCs, and carbon monoxide, precursors of ozone, primary and secondary particulate pollution, toxic chemicals like PAHs, and heavy metals like lead that still contaminate road dust throughout the highway network. While freeway pollution concentrates in the corridor, it can extend a mile in either direction, especially downwind. Freeway corridors have especially high concentrations of ultrafine particulate pollution (UPM),²⁶ the most toxic subset of particulate pollution, as much as 25 times higher concentrations as background levels.²⁷

All of the proven health consequences related to air pollution are more frequent in populations that live close to busy roads. A few examples illustrate the broader point. Children living within 300 meters of high traffic roads are six times more likely to develop cancer.²⁸ Proximity to busy roads is a risk for poor pregnancy outcomes, such as reduced birth weight, low birth weight syndrome,²⁹ shorter gestation,³⁰ placental abruption,³¹ and birth defects.³² More air pollution during intrauterine development and childhood negatively and permanently alters brain anatomy in children.³³ Living near a busy road increases a person's risk of dementia,³⁴ stroke,³⁵ and premature death by 20%.³⁶

UDOT cannot dismiss pollution concerns with a response that newer gasoline engines and electrification of the vehicle fleet in the future will significantly reduce freeway generated pollution.

“Port fuel injection” gasoline engines are being replaced by “direct injection” engines in pursuit of reducing CO2 emissions. These newer engines have higher compression ratios and lower charge temperatures which improve overall fuel efficiency with less CO2 emissions. Unfortunately, they also produce much more UPM.³⁷ UPM is by far the most toxic subset of PM pollution, made worse by the fact that UPM contributes very little to the mass of PM that is captured on government PM2.5 monitors. This increased hazard is not adequately reflected in the EPA's monitoring network.

Another way to look at this issue is that the real villain in PM is not the mass of PM_{2.5}, but the number of nanoparticles in that mass. Newer, more efficient direct injection engines produce five times more nanoparticles than older port fuel injection engines.³⁸ To that extent, newer engines are even greater public health hazards.

Battery powered cars are not a panacea either. Research from 2020 showed that mechanical friction, i.e. primarily tire wear, and brake pad dust, suspension of road dust and friction wear from other car parts, account for 60% of primary PM_{2.5} generated by vehicles.³⁹ Newer research paints an even more disturbing picture. “Comparing real-world tailpipe particulate mass emissions to tire wear emissions, both in ‘normal’ driving, the latter is actually around 1,850 times greater than the former.”⁴⁰ Considering only airborne PM, the number changes to around 400 times greater, still an astonishing number.⁴⁰

Particulate pollution from tire wear and suspension of road dust increase with the speed of the vehicle, as does fuel consumption. These effects reduce the otherwise health and air quality benefits of reducing congestion.

Non-combustion PM will even increase as electric vehicles are generally heavier, and increase further still as batteries become larger to meet the demand of greater driving range. “Non-exhaust emissions are expected to be responsible for the vast majority of PM emissions from road traffic in future years.”⁴¹ Dust from the expanding Great Salt Lake will only increase the road dust component of non-tail pipe emissions in the Wasatch Front going forward. Faster freeway speeds, one of the avowed UDOT objectives for this project, increase non-tail pipe emissions dramatically. Although the research on this issue is still early, indications are that non-tail pipe nanoparticles are largely aromatics, are probably equally toxic and equally carcinogenic as those emitted from fuel combustion.⁴¹

Asphalt itself is a significant source of pollution, and not only for a few days after initial paving. Semi-volatile organic compounds that form toxic aerosols continue to be emitted, albeit to a lesser extent, for perhaps as long as the life of the surface, especially during conditions of hot sunshine. Researchers estimated that in Southern California, this was a greater source of molecular precursors of particulate pollution than is emitted from their gasoline and diesel cars.⁴²

Freeways also increase urban temperatures. The transportation sector is a major contributor to the urban heat island effect. Obviously automobile fuel combustion generates heat, and the road surfaces, especially asphalt, absorb and retain even more heat. Paved areas can experience heat enhancement compared to atmospheric temperatures of as much as 22° F. Heat islands have collateral impacts, such as increasing demand for air conditioning, and the increase in energy consumption that goes with it. Electricity demand can increase up to 9% for each 2° F increase in temperature.⁴³ Because ozone formation is catalyzed by heat, and much of the increased electricity demand is met by fossil fuel combustion, and because the heat increases asphalt emissions as noted above, the heat island effect is also responsible for increased air pollution and further increase in greenhouse gas emissions.

As temperatures during the summer steadily increase due to the climate crisis, the urban heat island effect will increase, as will the contribution to it from freeway expansion.^{44,45} In turn, the heat island effect makes highways vulnerable to the consequences of heat extremes, such as increased maintenance costs secondary to pavement deterioration and buckled rails and bridge joints.

We always hear that Utah is one of the fastest growing states in the nation. But Utah's growth is now primarily net migration,⁴⁶ and that means people are making a deliberate choice to move here. Yet other trends will likely come into play soon that will have a negative feed-back effect on growth, including the high price of real estate, the housing shortage, traffic congestion, and all the negative publicity of our environmental problems, like air quality, the drought, and the shrinking of the Great Salt Lake. If this megadrought continues, and the scientific community predicts it is has become the new normal,⁴⁷ then water availability alone will limit Utah's growth potential. How much if any of this has UDOT taken into account for their traffic projections?

Freeways are Not the Solution and they are a Poor Return on Investment

With this overwhelming body of evidence and objective data that shows how deeply devastating interstate expansion will be, we must consider transit alternatives. There are far better, more cost effective solutions than more asphalt, more cars, more pollution, more traffic.

Less money spent, more stable jobs created, and a better quality of life for all could result if UDOT would invest in mass transit alternatives. According to an article from the *American Economic Association*, "Using a simple choice model, we predict that transit riders are likely to be individuals who commute along routes with severe roadway delays. These individuals' choices thus have high marginal impacts on congestion. We test this prediction with data from a strike in 2003 by Los Angeles transit workers. Estimating a regression discontinuity design, we find that average highway delay increases 47 percent when transit service ceases. We find that the net benefits of transit systems appear to be much larger than previously believed."⁴⁸

Compared to mass transit infrastructure, freeway expansion is poor return on investment. UTA could move the same number of people for a fraction of the cost. For every \$1 billion invested in public transportation, 50,000 jobs are created and sustained across industries, offering a 5 to 1 economic return.⁴⁹

In contrast, much of the research on the economic benefits of building highway infrastructure, in the United States and foreign countries, show that the gain in economic benefit is not sustained over time, but is merely a one-time boost. The original interstate system reaped the benefits of new transportation and trade networks, but new spending now does not create new networks and therefore doesn't produce new economic gains beyond the temporary construction jobs involved. Thus there is no overall economic gain, merely a redistribution of economic activity to the suburbs and away from city centers.⁵⁰

In another study of the recent American Recovery and Reinvestment Act, researchers found that spending on public transportation generated 31% more jobs per dollar than the construction of new roads and bridges.⁵¹ Other studies found that number is much higher, 70%.⁵² Freeways obligate cities and states to long term, costly maintenance commitments compared to mass transit alternatives. They become long term "economic losers."⁵³

Conclusion

In conclusion, Utah Physicians for a Healthy Environment strongly advise UDOT to abandon this project. We encourage the state to divert this amount of money to many more worthy projects that would provide real benefit to Utah residents, such as buying out alfalfa farmers and

allowing more water to reach the Great Salt Lake, providing shelter and services for the homeless, and funding mass transit.

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