



# MOBILITY IN HEALTHCARE


## AN ENGINE FOR EQUITY AND SAVINGS

**Feonix – Mobility Rising White Paper**

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[feonixmobilityrising.org](https://feonixmobilityrising.org)

# EXECUTIVE SUMMARY

**5.8** Million  
Americans  
**DELAY**   
**Medical Care**  
**ANNUALLY**  
due to lack of transportation

***An estimated 5.8 million Americans delay medical care annually due to lack of transportation.*** Missed appointments, the failure to fill prescriptions, and delayed detection of disease lead to significantly worsened health among the transportation-disadvantaged.

Lack of transportation is a barrier not only to individual care, but to achieving health equity, as it contributes to race, income, and geography-based health disparities. Transportation barriers also lead to incredible downstream costs for the healthcare system. In fact, one study estimates that missed appointments cost the U.S. healthcare system \$150 billion dollars a year. These missed appointments lead to the misuse of emergency transportation services and a greater need for more intensive treatments due to initial inadequate care.

The lack of affordable, efficient transportation options has long been cited as a concern for rural residents but is rarely the focus of health services research. As a social determinant of health, access to high-quality, affordable transportation is fundamental to mental, physical, and emotional well-being for low-income populations.

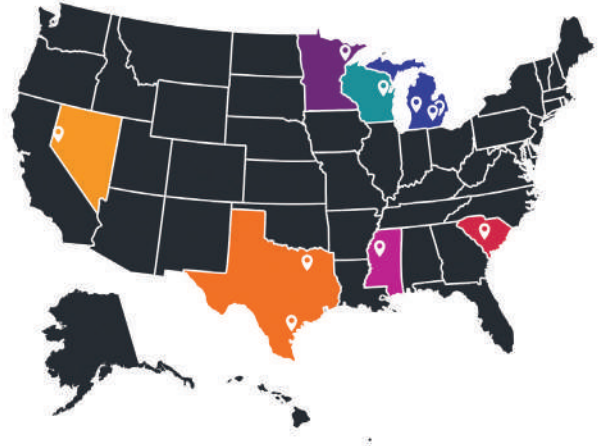
Community organizations, local and state agencies, and insurance providers have launched innovative Non-Emergency Medical Transportation (NEMT) models around the country as an effort to provide health equality for all. However, the overall investment in NEMT is small as it has historically accounted for less than 2% of all Medicaid expenditures while the unmet need for NEMT remains great.

Thus, for both patients and healthcare providers, the road to receiving and administering adequate, equitable healthcare is mired with unnecessary and financially draining roadblocks. These can and must be eliminated by greater investment in mobility solutions.



# ABOUT FEONIX – MOBILITY RISING

Established in 2018, Feonix – Mobility Rising is a registered 501(c) (3) non-profit organization that strives to be a leader in identifying improved mobility solutions for rural and urban communities. In each community partnership and deployment, we provide world class mobility management, accessibility and equal access assurance, training, and technology support, as well as guide local leaders as they develop community-led strategies to address long-term mobility challenges that threaten cherished communities. Overall, Feonix – Mobility Rising creates mobility solutions, technology, educational programs, and global communities around the common goal of transportation for all.



# FEONIX BY THE NUMBERS

**900**  
ZIP CODES



**92**  
COMMUNITIES



**309,834**  
MILES DRIVEN



**9,266**  
EMPLOYMENT  
TRIPS



**13,656**  
MEDICAL TRIPS



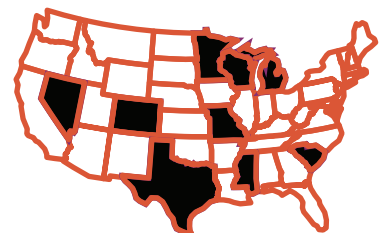
**27,328**  
TOTAL TRIPS



**10,425**  
POUNDS OF  
GROCERIES



**9**  
STATES



*Numbers projected through December 31st, 2021*



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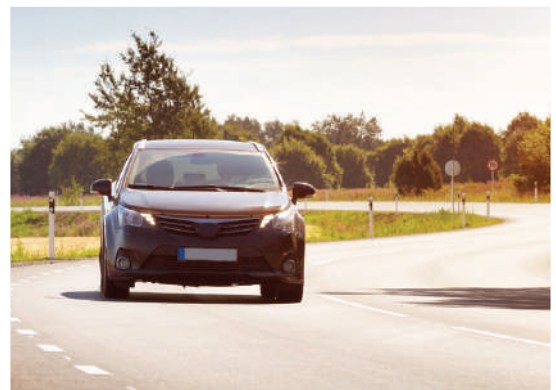
# INTRODUCTION

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Transportation is a vital component for individual health and to the United States healthcare system.

Yet, transportation barriers are one of the most commonly cited reasons for missed or delayed medical appointments, the failure to pursue regular and preventative care, unfilled prescriptions, and more. <sup>2, 6, 16, 31, 41-42</sup>

In fact, an alarming 5.8 million Americans delay medical care annually due to the lack of transportation because of the challenges they face in simply getting to and from medical care centers. <sup>41</sup>



**“Transportation policy is health policy...**

**You can’t get medical treatment if you literally can’t physically get to where you need to go.”**

– U.S. Transportation Secretary Pete Buttigieg <sup>13</sup>



# ESSENTIAL TRANSPORTATION



# ESSENTIAL TRANSPORTATION

**Every year, anywhere from 25% to 55% of missed medical appointments in the U.S. are due to transportation challenges.** Therefore the need for accessible mobility solutions cannot be understated. <sup>2, 6, 31, 41-42</sup>

Despite the many benefits of public transportation, sparse access to affordable transportation is an ongoing issue for underserved populations. The development of effective models to address this problem remains a crucial priority.

Improving access to public transportation requires the participation of numerous sectors and jurisdictions. Difficulty in accessing affordable and efficient public transportation is a major concern for urban and rural residents, yet the issue has never been the focus of health services research.

Such difficulties prevent low-income populations from accessing employment opportunities, educational opportunities, and basic health care.

Non-Emergency Medical Transportation (NEMT) refers to a transportation model that ensures patients get to and from their medical appointments without furthering the negative impact on their health. These trips are nonemergency only, meaning there is no immediate threat to the health or life of the participant, and no elements of life support are required in the vehicle during the trip. NEMT enables healthcare providers to enable patients to access preventative care, rehabilitative services, improve recovery time, and reduce other expenses that may be associated with hospitalization.



NEMT rides can include a variety of transportation modes such as a standard sedan, wheelchair accessible van, public transit, or rides coordinated through ride-sharing services. Transportation options can vary in all regions from urban to rural, and transportation is always the least costly and most appropriate mode, which is determined on a case-by-case basis for each participant.

Community-based organizations, local and state agencies, and even private insurance providers around the nation have launched innovative transportation models to address this issue. Models range from directly providing free rides for patients to coordinating patient rides with private and public transit providers to help patients develop personalized transportation plans.<sup>16</sup>





# **NOT JUST A SOCIAL NEED – A PUBLIC HEALTH THREAT**

# NOT JUST A SOCIAL NEED – A PUBLIC HEALTH THREAT

What happens to the health of those 5.8 million Americans facing serious transportation barriers to healthcare?

Transportation barriers are a significant contributor to poor clinical outcomes such as less health care utilization, delayed or lack of regular preventative medical care, lack of specialty care, failure to fill prescriptions and increased medication noncompliance, underimmunization, compromised early detection of disease, and more.<sup>16, 19</sup>

**Table 2: Transportation Barriers and Clinical Outcomes**

	Not a Problem	A Minor Problem	A Moderate Problem	A Serious Problem
Less health care utilization	5%	13%	42%	34%
Lack of regular, preventive medical care	0%	19%	33%	40%
Lack of Specialty care	2%	10%	30%	51%
Delayed care for health conditions of illnesses	3%	13%	29%	51%
More Emergency Department visits	5%	15%	26%	40%
Failure to fill prescriptions	5%	24zzz%	37%	26%

*Taken from Rides to Wellness Community Scan Project Spring 2017, Health Outreach Partners, (2017)*

*The percentage of health centers reporting transportation as a “moderate” or “serious” problem contributing to listed clinical outcomes. Data reflects the results of a survey administered to 199 HRSA-funded health centers, each seeing an average of over 45,000 patients a year (amounting to about 8.96 million patients total)*

Consequently, the health of those who face transportation barriers to healthcare is considerably worse than the rest of the U.S. population. Not only is the occurrence of chronic conditions such as asthma, hypertension, heart disease, chronic obstructive pulmonary disease, diabetes, end-stage renal disease, and mental health illness higher in transportation-disadvantaged persons, but the percentage of transportation-disadvantaged people experiencing more than one chronic illness at once – and the severity of these conditions – is also considerably higher.<sup>19</sup>

## Dominant Health Conditions Among Adults

Condition	Target Population Prevalence (Percentage)	Non-Target Population Prevalence (Percentage)	Ratio of Prevalences
Arthritis	13%	42%	34%
Asthma	19%	33%	40%
COPD	10%	30%	51%
Cancer	13%	29%	51%
Depression	15%	26%	40%
Diabetes	13%	42%	34%
Heart Disease	19%	33%	40%
High Cholesterol	10%	30%	51%
Hypertension	13%	29%	51%
Pain/Aching Joints	15%	26%	40%

*Adapted from Cost Benefit Analysis of Providing Non-Emergency Medical Transportation, Hughes-Cromwick et al., 2005. "Target population" refers to transportation-disadvantaged persons who lack access to healthcare due to lack of transportation.*

*"Non-target population" refers to persons who do not lack access to healthcare due to lack of transportation.*

In some cases, alleviating transportation barriers to healthcare is a matter of life and death. **A 2018 MTAC study found that an estimated 10% of end-stage renal disease, diabetic wound, and substance abuse disorder Medicaid patients report that they “would die” or “would probably die” without access to transportation for their medical needs.** <sup>34</sup>

Conversely, access to reliable and affordable transportation is associated with greater health care utilization, overall improved medical outcomes, and greater likelihood of primary care visits by populations such as patients with HIV, the pediatric population, and frequent users of emergency departments. <sup>22</sup>

Transportation access among Medicaid beneficiaries, for instance, raises the average number of dialysis treatments per month from 4.1 to the recommended 12 for end-stage renal disease patients, and the average wound care treatments per month from 1.3 to 5.5 for diabetic patients. <sup>34</sup>

Ownership of a car can double patients' chances of keeping their medical appointments, while programs providing transportation aids such as bus tickets and mileage reimbursements can almost double the length of patient participation in continuous care treatments. <sup>31,40</sup>

Inadequate transportation is a common determinant of whether or not patients seek out and receive the medical care they need and, consequently, of the health outcomes patients experience. Transportation, then, is not just a social need; it is a necessary component to the health of all Americans.

**“The best investment in health isn’t always in healthcare. How are we shoring up the transportation system so that we are helping people to access care in ways that are validating and keep them independent?... Investing in transportation networks and Uber and Lyft and taxis — all those things really support their independence.”**

– Kisha Davis, MD & MPH, Medicaid and CHIP Payment and Access Commission Commissioner Kisha Davis and Regional Medical Director at Aledade, a Maryland-based company that helps physicians run accountable care organizations <sup>11</sup>

Numerous studies have shown, for instance, that lower-income populations are more vulnerable to healthcare transportation barriers than higher-income populations [17]. In 2017, families with annual incomes less than \$35,000 were about 4.4 times more likely to report delaying care due to transportation barriers than families whose annual incomes are between \$35,000 and \$75,000, and about 8 times more likely to report such barriers than families with incomes between \$75,000 and 100,000. <sup>41</sup>

In general, transportation costs such as vehicle ownership, insurance, public transit fares, etc., are often an overwhelming burden for low-income households. Data from the Bureau for Labor Statistics reveals that families with an annual income between \$5,000 and \$30,000 spend 24% of their income on transportation.<sup>17</sup> Further contributing to the problem is the fact that low-income households are significantly more likely to not own cars, which often means that they must rely on less reliable means of travel such as rides from family and friends.

**“...it’s important for people to understand that [health disparities] are the effects of systemic policies and intergenerational denial of access to resources.”**

– Dr. Marcella Nunez-Smith, co-chair of President Biden’s COVID-19 Advisory Board and leader of the COVID-19 Equity Task Force <sup>29</sup>



Transportation barriers also disproportionately affect racial and ethnic minorities. <sup>7, 14-16, 19, 30, 36</sup> In 2017, non-Hispanic Black people and Hispanic people were 2 and 1.8 times more likely to report delaying medical care due to transportation barriers than non-Hispanic White people, respectively. <sup>41</sup> In a nation plagued by racialized health disparities, it is extremely important to ensure that our healthcare system does not overlook the need for vital transportation services.

**“Race and place  
matter a lot for health  
outcomes in our  
country.”**

– Dr. Marcella Nunez-Smith

Lack of adequate transportation is also a community-level problem that disproportionately affects rural areas. <sup>5, 8, 12, 16, 18, 23, 27</sup> Often, rural patients face both farther distances to care, and more limited public transportation options than patients in urban areas, increasing their burden of travel and therefore the likelihood of transportation-related challenges to healthcare access. <sup>32, 36</sup> Such disparities will only be exacerbated by the rural hospital closure crisis, in which rural communities across the country are losing hospitals at an accelerated rate, with a total loss of 34 facilities in the last 24 months and 120 total since 2010. <sup>38</sup>

**“I know that, at its best, transportation makes the American Dream possible, getting people and goods to where they need to be... At its worst, misguided policies and missed opportunities can reinforce racial, economic and environmental injustice, dividing or isolating neighborhoods, undermining government’s basic role to empower everyone to thrive.”**

– Pete Buttigieg <sup>43</sup>



Investing in transportation is a vital component to undoing the health disparities plaguing our country and furthering our national struggle towards equity.

What are the financial impacts of those 5.8 million missed and delayed healthcare appointments?

By not investing enough in transportation, our healthcare system is essentially paying – or really, bleeding – money for these worsened and inequitable health outcomes.

Numerous studies have provided various estimates for the financial loss incurred due to missed appointments, ranging from \$200 per missed appointment at some healthcare facilities to an annual revenue shortfall of up to 14% at others.<sup>16, 25</sup>

**“When it comes to rural [health], geography plays a significant role. The geographic distance to providers – the distance that providers and patients have to travel to actually seek care – creates a barrier to care. Provider shortages create a barrier to access along with adequate health insurance coverage. Those are three significant factors that impede access to care in a rural context, and this is important because this impacts not only the health status of rural Americans but also directly impacts mortality in a rural context.”**

– Alan Morgan, CEO of the National Rural Health Association <sup>24</sup>





# RIDE NOW, SAVE LATER

# RIDE NOW, SAVE LATER

One study has estimated that in sum, missed appointments and the resulting delays cost the U.S. healthcare system \$150 billion each year.<sup>35</sup> The worsened health outcomes produced by transportation barriers also produce higher but preventable healthcare costs. Recall, for instance, that without accessible transportation solutions, end-stage renal disease (ESRD) Medicaid patients attend an average of only 4.1 out of the 12 recommended dialysis treatments a month due to transportation barriers. The financial burden of this transportation-led lack of care is alarming, given that the total cost of ESRD patients who are admitted to the hospital due to missed treatments is about \$9,000 greater.<sup>10</sup>

For hospitals, the financial strain of transportation-led, worsened health outcomes is exacerbated by the Hospital Readmission Reduction Program (HRRP), which subjects hospitals to financial penalties for high rates of Medicare patient readmissions related to heart attacks, heart failure, pneumonia, chronic lung disease, coronary artery bypass graft surgery, and hip or knee replacements.<sup>4</sup>

Recalling that the occurrence of conditions such as heart disease, hypertension, chronic obstructive pulmonary disease, diabetes, high cholesterol, arthritis, and pain/aching joints – conditions related to those included under the HRRP – are higher among patients who face transportation barriers to care (table 2), the costs of inadequate transportation become all the more clear; whether it be through the cost of readmission itself or through downstream costs due to programs like the HRRP, transportation barriers to care financially drain our healthcare system.

The highly cost-incurring nature of transportation barriers also means, however, that mobility investment holds great potential for incredible savings.<sup>39</sup> Numerous other studies have demonstrated the cost-saving potential of transportation investment.

Annually, providing transportation to patients can save:	
\$2,753	per patient with heart disease 19
\$927	per patient with diabetes 19
\$333	per patient with asthma 21
\$41,706	per patient with end-stage renal disease 34
\$9,504	per patient with diabetic wounds 34
\$2,528	per patient with SUD 21





## Further:

- ▶ In South-Central Missouri, HealthTran – a pilot program launched by the Missouri Foundation of Health that coordinates transportation for patients across ten counties – spent \$139,000 on 3,366 nonmedical emergency rides and saw an overall revenue increase of \$1,300,000 in Medicare reimbursement for services provided to HealthTran patients/These savings amount to about \$10 in reimbursement for every \$1 spent on transportation.<sup>16</sup>
- ▶ In Illinois, the Rural Medical Transportation Network’s EMS Patient Navigator Program – which educates patients on proper use of EMS – led to a 59% reduction in patients making 9-1-1 calls to an EMS agency for non-emergency situations. This reduction resulted in \$348,440 in savings for the agency.<sup>16</sup>
- ▶ In Buffalo, NY (one of the poorest cities in the US, whose premature birth rate is the highest in the state and 19% higher than the national average), if the newly-implemented transportation program Go Buffalo Mom results in birth of 10 healthy babies as opposed to preterm births, savings will be \$600,000 – more than twice the program’s initial investment.<sup>16</sup>



- ▶ In Portland, Oregon, an increase of one extra treatment per dialysis patient resulting from Ride Connection’s Dialysis and Transportation pilot program is estimated to result in 31,730 less hospitalizations and \$240 million in savings for patients and the healthcare system per year.<sup>16</sup>



- ▶ In Minnesota, Hitch Health launched a pilot with Hennepin Healthcare in 2018 that paid for the transportation of patients who were likely to miss appointments due to transportation, resulting in a 27% reduction of no-shows and clinic savings of \$270,000.<sup>3</sup>

**Overall, investing in mobility solutions is just as important and beneficial for our economy as it is for our bodies and our national struggle for equity.**

– Dr. Marcella Nunez-Smith



# **TRANSPORTATION AND HEALTHCARE ACCESS: *POPULATION-SPECIFIC EVIDENCE***

# POPULATION-SPECIFIC EVIDENCE

Transportation's relationship with healthcare access, equity, and savings affects patients across a diverse range of conditions and populations.

Below are the stories of how transportation relates to healthcare for only some of the many patient populations affected by transportation barriers.

## Cancer Patients

Patients with cancer often need healthcare services monthly or even weekly for several years.<sup>45</sup>

- ▶ The odds of patients underusing chemotherapy treatments are almost 7 times greater if they do not have vehicle access than if they do.<sup>53</sup>
- ▶ Greater travel burdens (measured by distance from care) are associated with more advanced disease at diagnosis, inappropriate treatment, worsened prognosis, and generally worsened quality of life.<sup>18, 45</sup> For example, for patients with colon cancer traveling more than 50 miles to receive care, the odds of their cancer having metastasized at the time of diagnosis were 1.5 the odds of patients traveling less than 12.5 miles.<sup>52</sup>
- ▶ In-depth cost-effectiveness analysis comparing investment in NEMT for breast cancer and colon cancer treatments to Quality Adjusted Life-Years reveals that as long as the cost per trip is less than \$16,000 and \$27,988 for each respective treatment, it is cost effective to provide NEMT.<sup>19</sup>

For more resources on the relationship between transportation and cancer care, refer to references 15, 18, 23, 36, and 44-57.



## Dialysis Patients

Patients with kidney failure need regular dialysis treatments, which take about four hours and are typically needed three times a week.<sup>58</sup>

- ▶ **Without NEMT, ESRD patients report expecting to attend an average of only 4.1 treatments a month.**<sup>34</sup>
- ▶ 1 missed treatment is associated with 1.4-fold greater risk in hospitalization, and 2.2-fold greater risk of death in subsequent 30 days.<sup>59</sup>
- ▶ **One extra dialysis treatment per patient is estimated to produce 31,730 fewer hospitalizations per year, leading to \$240 million in savings for patients and the healthcare system.**<sup>16</sup>

For more resources on the relationship between transportation and dialysis treatment, refer to references 10, 14, and 58-74.





## Prenatal Care Patients

Pregnant women are recommended to attend upwards of 12 prenatal care visits, which help lower rates of neonatal mortality, infant death, and longterm disability.<sup>87</sup>

- ▶ Anywhere from 8-52.4% of women have trouble keeping appointments due to transportation barriers.<sup>76, 83, 85-86</sup>
- ▶ The odds of women not receiving prenatal care during the first trimester is 1.68 greater when they face transportation barriers than when they do not.<sup>76</sup> A result of only 10 more women delivering healthy as opposed to preterm babies due the program will result in \$600,000 of savings (more than twice the program's initial investment).<sup>16</sup>

For more resources on the relationship between transportation and prenatal care, refer to references 19 and 75-92.



## Substance Use Disorder Patients

The length of time of treatment for Substance Use Disorder (SUD) depends on the individual, but usually a minimum of three months was needed to significantly reduce or stop substance use.<sup>21</sup>

- ▶ According to an MTAC survey, SUD patients attended an average of 16.4 SUD treatments per month with NEMT, but expected to attend only 4.3 without it<sup>[21]</sup>. Further, the likelihood of initiating SUD treatment is halved for every additional 10 minutes of driving time.<sup>102, 104-105</sup>
- ▶ NEMT extends the average length of continuous care from 12.8 weeks up to 21.7<sup>[40]</sup>. Given that retention in treatment programs is perhaps the most important predictor of successful recovery, NEMT is a vital component to successful SUD care.<sup>97</sup>
- ▶ Those who attend only 3-6 treatments per month incur \$123 more per month in total medical costs than those who attend 15+ treatments per month, while the ROI for providing NEMT per 10,000 members per month is more than \$2.1 million.<sup>21, 34</sup>

For more resources on the relationship between transportation and SUD care, refer to references 7, 12, 21, 40 and 93-107



## Older Adults

Elderly populations often experience higher rates of chronic disease, limited mobility and ability to drive, and a higher need for frequent care.<sup>16</sup>

- ▶ Anywhere from 16% to 21.1% of older adult respondents in various studies report transportation challenges as barriers to healthcare.<sup>117, 125</sup> 21% of adults over 65 do not drive any longer, and they report taking 15% fewer trips to healthcare facilities than did older adults who still drive.<sup>110</sup>
- ▶ The Care Mobility Awards Program is a transportation program aimed at seniors who are more likely to end up readmitted in a hospital because they are unable to follow the recommended course of treatment.<sup>16</sup> If just 1% of the hospital readmissions are avoided due to the program, the potential savings are \$160,032.<sup>16</sup>

For more resources on the relationship between transportation and SUD care, refer to references 32, 36, 49, 57, and 108- 126.



## Veterans

Almost 3 million (about 33%) of enrollees in the Veterans Affairs healthcare system live in rural communities, and this population has higher prevalence of chronic diseases and conditions, general poorer health, and higher poverty.<sup>27</sup>

- ▶ An estimated 23.6% of rural veterans rely on friends, family, or Disabled American Veterans (DAV) van service for transportation to healthcare, while anywhere from 18% to 94% of various sub-populations of veterans report facing transportation barriers to receiving treatment for a variety of health issues.<sup>5, 50, 65, 132, 141</sup>
- ▶ Transportation barriers themselves can negatively affect veterans' physical and mental health. One OEF/OIF veteran suffering from PTSD describes this phenomenon well: "Having to deal with public transportation, it's kind of hard for me so it kind of takes a little motivation like, 'Okay I've got to get myself ready' like...You know and then once I get there, I'm not very in my full mental capability. I'm still stressed so when I get to the VA I'm like, 'Alright, I just want to go. I don't want to be here.'<sup>135</sup>
- ▶ The Veterans Health Association estimated that the 18% of all scheduled appointments not being kept or not being cancelled in time leads to an annual financial loss of \$540 million.<sup>128</sup>

For more resources on the relationship between transportation and care for veterans, refer to references 5, 8, 27, 36, 50, 57, and 126-141





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