# Evaluating Transportation Affordability

Affordability is an important emerging transportation planning issue. This article describes why and how transportation agencies can better respond to user demands for more affordable travel options. It is a companion to the author's 2022 ITE Journal article, "Evaluating Transportation Equity: Guidance for Incorporating Distributional Impacts in Transport Planning."<sup>14</sup>

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for dability is an important but often overlooked transportation planning issue. Surveys indicate that many people want more affordable travel options, but few transportation agencies have clearly defined affordability goals or tools for evaluating how specific planning decisions affect these goals. This article offers practical guidance for evaluating transportation affordability impacts in planning and policy analysis. Affordability refers to the costs of goods relative to incomes, and households' ability to purchase necessities such as food, housing and healthcare. *Transportation affordability* refers to households' ability to access basic goods and activities while leaving enough money to purchase other necessities.

Unaffordable transportation is inefficient and unfair: it forces lower-income families to forego desired travel, use inconvenient, uncomfortable, and sometimes dangerous travel options, or spend more than they can afford on travel. People with disabilities, low-income households, racial minorities, and rural residents are particularly likely to bear excessive transportation burdens.<sup>1</sup> Affordable transportation ensures that everybody can enjoy opportunity and independence.

#### **Defining and Measuring Affordability**

There are various ways to define and measure affordability. Experts recommend that households spend no more than 45 percent of their budgets on housing and transportation combined, in recognition that families often face trade-offs between housing and travel costs. A cheap home is not truly affordable if located in an isolated area where transport is expensive, and households can rationally pay more for homes in accessible areas where they can minimize travel costs.<sup>2</sup> A typical family that spends 30 percent of its budget on housing can afford to spend up to 15 percent on transportation. Of course, every household has unique needs and abilities; some can spend more than these limits, but others can afford less, and even people who usually rely on higher-cost modes can benefit from having more affordable options that they or other household members can use when necessary.

Figure 1 compares U.S. household transportation expenditures by cost category and income class. Although fuel expenditures,





This graph compares transportation expenditures by cost category for each income quintile. Percentage values in the red rows indicate fuel expenditures as a portion of total transportation costs. Most of these costs are fixed, so once a household purchases a vehicle it has few ways to save money.

Figure 1. Transportation Costs by Income Class.<sup>5</sup>

indicated in red, tend to receive the most attention, they are a modest portion of total transportation costs. Most vehicle costs (70-80 percent) are fixed, not significantly affected by the amount a vehicle is driven, so once a household purchases a vehicle it has few ways to reduce its total vehicle expenses.<sup>3,4</sup>

Figures 2 and 3 show the portion of household spending devoted to housing and transportation (H+T) by income quintile. Most lowand moderate-income households spend significantly more than considered affordable, indicated by the dashed line.



This figure compares housing and transportation expenditures by income quintile. Most low- and moderate-income households spend significantly more than is considered affordable (45 percent, indicated by dashed line), leaving insufficient money to spend on other goods.

Figure 2. H+T Expenditures by All Households<sup>5</sup>

These cost burdens are particularly high for low-income vehicle-owning households, which typically spend more than 20 percent of their budgets on transportation and more than 60 percent on housing and transportation combined, as illustrated in Figure 3. Lower-income motorists tend to bear particularly high



Most low- and moderate-income vehicle-owning households spend more on housing and transportation than is considered affordable.

Figure 3. H+T Expenditures by Vehicle-Owning Households.<sup>5</sup>

vehicle loan and insurance rates, and the older vehicles they drive are vulnerable to mechanical failures and crashes.

Various factors can affect transportation affordability. Walking, bicycling, e-bikes, public transit and telework (telecommunications that substitute for physical travel) have much lower costs than automobiles, as illustrated in Figure 4. As a result, transportation cost burdens increase with motor vehicle ownership and use.



Walking, bicycling and public transit are more affordable than automobile travel. Most vehicle costs are fixed so motorists perceive minimal savings if they reduce their annual mileage. (Low-VMT car = <6,000 annual miles. Average Car = 13,500 annual miles. High-VMT car > 18,000 annual miles.)

Figure 4. Typical Annual Costs by Mode.<sup>4</sup>

Households located in multimodal areas tend to spend much less on transportation than in automobile-dependent regions. Households in regions where more than 20 percent of commutes are by non-auto modes spend significantly less on transportation than in more automobile-oriented regions where less than 10 percent of commutes are by non-auto modes, as illustrated in Figure 5.



Transportation affordability increases with a region's non-auto commute mode share.

Figure 5. Transportation Spending Versus Mode Shares.<sup>5, 6</sup>

Similar patterns are found *within* urban regions. The *H*+*T Affordability Index* calculates housing and travel costs in specific neighborhoods. Results are presented in color-coded maps that show average transportation and housing costs as illustrated in Figure 6.



This H+T Index map shows household transportation costs in the Nashville region. The most affordable areas, shown in green, tend to be central, multimodal neighborhoods where residents can rely on affordable modes.

Figure 6. Housing and Transportation (H+T) Affordability Index.<sup>2</sup>

Transportation affordability increases with Walk Score, as shown in Figure 7. This indicates that more compact development tends to increase transportation affordability.



The portion of household spending devoted to transportation tends to decline with Walk Score ratings, an indicator of neighborhood density and mix.

Figure 7. Transportation Spending Versus Walk Score<sup>5, 15</sup>



Transportation affordability tends to increase with regional fuel prices.

Figure 8. Transportation Spending Versus Fuel Price<sup>5, 16</sup>

An interesting finding is that transportation affordability tends to *increase* with fuel prices, as illustrated in Figure 8, apparently because higher prices encourage more multimodal transport planning.

Of course, planners must consider other costs, including travel time. Although the affordable modes—walking, bicycling and public transit—tend to be slower than driving, commute duration data indicate that residents of central, multimodal neighborhoods spend less time traveling than in outer suburbs, despite their reliance on slower modes. The figure below shows this for Nashville, TN; most other urban regions have similar patterns. This indicates that compact, multimodal development can reduce both time and money costs.



Average commute duration (minutes per commute) is generally much shorter in central, multimodal neighborhoods than in automobile-dependent urban fringe areas. This figure illustrates this effect in Nashville, Tennessee. Similar patterns are seen in most urban regions.

Figure 9. Commute Duration.<sup>7</sup>

#### **Toward More Comprehensive Affordability Analysis**

Currently, few transportation agencies have clearly defined affordability goals or performance indicators. If considered at all, affordability is evaluated based on individual expenses such as fuel costs, tolls, parking fees, or transit fares. Planning analysis seldom considers how individual decisions affect total household transportation expenses, or how to increase overall affordability.

Some other types of organizations have developed tools for evaluating transportation affordability, including the Center for Neighborhood Technology's The *H+T Affordability Index*, the U.S. Department of Housing and Urban Development's *Location Affordability Index*, academic researchers, and advocates for transit-oriented development.<sup>2,8-12</sup> These tools account for total transportation and housing costs, and can provide more complete guidance for affordability planning.

The following box describes guidelines for comprehensive analysis of transportation affordability.

## Affordability Analysis Guidelines

- Use comprehensive analysis that considers all costs, including indirect costs such as residential parking.
- Consider both housing and transportation costs together.
- · Consider vehicle ownership as well as operating costs.
- Give special consideration to affordability for people with disabilities, low incomes and other unique needs.
- Identify latent demand for affordable transport options.

#### **Strategies for Increasing Transportation Affordability**

There are many possible ways that transportation agencies can help increase affordability, some of which are better than others overall.

Some vehicle affordability strategies simply shift costs to other sectors. For example, low fuel taxes and road tolls increase general taxes to pay roadway costs not funded by user fees. No-fault insurance reduces crash victim compensation. "Free" parking increases housing costs (for residential parking) and the price of goods (for customer parking).

Some vehicle cost reduction strategies only provide modest savings. For example, cutting fuel taxes in half, or no-fault insurance that reduces average premiums 20 percent, can each save a typical motorist about \$200 annually. Unbundling parking, so residents only pay for the parking spaces they use, and car sharing rather than owning a low annual mileage car, can save many hundreds of dollars per year. Shifting from owning two cars, to one car and two e-bikes, or moving from a sprawled area that requires two high-mileage vehicles to a compact community that only requires one car, can provide many thousands of dollars in annual savings, as shown in Figure 10.



Most vehicle cost reduction strategies achieve relatively modest savings. Strategies that reduce vehicle ownership and unnecessary parking costs tend to provide the largest affordability gains.

Figure 10. Estimated Savings from Transportation Affordability Strategies.<sup>14</sup>

This suggests that the most effective and equitable transportation affordability strategies improve lower-cost travel modes, create more compact and multimodal communities, and increase affordable housing in accessible neighborhoods where it is easy to reach common services and activities without driving. In addition to increasing affordability, these strategies help achieve other planning goals including more independent mobility for non-drivers, congestion reduction, infrastructure cost savings, traffic safety, public health, community livability, and environmental protection.

There is evidence of significant latent demand for more affordable options. Although few motorists want to forego driving altogether, surveys indicate that many want to spend less time and money driving by living in more compact communities and relying more on walking, bicycling and public transit, provided those options are convenient, comfortable and affordable.<sup>13</sup>

The box on the right is a list of multimodal affordable transportation strategies. These tend to have synergistic effects; they become more effective and beneficial as more strategies are integrated. For example, improving walking and bicycling conditions, increasing development density and mix, increasing public transit services, and reforming parking policies all become more effective and cost effective if implemented together.

#### Conclusions

Transportation affordability is an important emerging issue. Many households spend more than they can afford on transportation, leaving insufficient money for other necessities.

Although there are many possible ways to reduce household travel expenses, some simply shift costs to other sectors, reducing affordability overall. The best approach is to improve affordable modes and create compact, multimodal communities where residents can minimize their motor vehicle use and associated costs. Transportation agencies can support these strategies with more multimodal planning, parking policy reforms, and by working with other organizations to increase affordable housing in compact, neighborhoods.

This is a timely issue. Many people want more affordable, efficient, and equitable travel options than what currently exist in their communities, and improving these options provides many co-benefits. Practitioners can apply more comprehensive analysis and identify practical ways to achieve affordability goals. **itej** 

Note: this article summarizes the author's comprehensive report with the same title.

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## Multimodal Affordability Strategies

- Improve and encourage affordable modes including walking, bicycling, e-bikes, public transit, Mobility as a Service (MaaS), and telework.
- Spend at least the portion of transportation budgets on affordable modes as their potential mode shares.
  For example, transportation agencies should spend up to 20% of their budgets on walking and bicycling improvements if that would give them a 20% mode share, or more if justified to achieve strategic goals and make up for past underinvestments.
- Support vehicle sharing (carsharing and Mobility as a Service) so households can reduce their vehicle ownership.
- Implement Smart Growth policies that create compact, multimodal neighborhoods.
- Increase affordable housing in multimodal neighborhoods.
- Apply complete streets policies to ensure that all streets accommodate affordable modes.
- Reform parking policies. Unbundle and cash out free parking so non-drivers are no longer forced to subsidize parking facilities they do not need.
- Implement TDM incentives, such as parking cash out, parking unbundling and commuter transit benefits, that reward travelers who use non-auto modes.
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Walk Score. www.walkscore.com
Gas Buddy. www.gasbuddy.com



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Answer to "Where in the World?" on page 9: Bob Kerrey Pedestrian Bridge spanning the Missouri River between Council Bluffs, Iowa, and Omaha, Nebraska. Photo submitted by Steve Kuciemba (F).