

Transport Policy and Well-Being: Curing a New Pathology of the Urban Traveler

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What are the components of a well-functioning society? This is a simple question with a tremendously intricate set of possible answers. Let's explore it by contemplating what should be regarded as a vital public good: the provision of shelter and health services? What about formal education and safe environments? These are all reasonable considerations. But if we may be so bold to ask one more question, where on this utopian priority list does transportation fall?



cc Kristoffer Trolle

An increasing number of studies in recent decades have addressed the factors impacting health and well-being of urban residents while systematically examining how public policy interventions could address associated deficiencies [1]. Mobility, or people's travel patterns, is rarely considered in these analyses. Instead, transportation has traditionally been viewed as a derived demand, affording opportunities to participate in essential activities (work/school, shopping, engagement in leisure, etc.) that fuel the vibrant cadence of our lives. Viewing travel as an experience that enables physical and psychological needs to be met, rather than something that is undesirable in itself, unlocks new potential for enriching the quality of life of residents. Thus, by delving into and emphasizing the connections between mobility and well-being, the idea of "happiness optimization" emerges as a new guiding principle in transport policy design.

In modern-day urban planning, there exists a myriad of concepts and metrics designed to promote and assess the use of active transport modes in everyday travel. For example, the well-known Walk Score—for the United States, Canada, and Australia—is a quantitative indicator of how pedestrian-friendly a city or neighborhood is. For people who seek a "happier [and] healthier" lifestyle and for policymakers who

desire to create places offering better commutes [2], the Walk Score methodology provides not only a ranking and geographic comparison of walkability, but also transit- and bike-friendliness. Another notable metric is the biannual Copenhagenize Index, which evaluates bicycle travel. The appeal lies in its infusion of "human-oriented" design principles with traditional engineering and planning practices [3]. An article published by the BBC in 2013 also encapsulates a growing desire to shift cities away from automobile dominance—in favor of healthier mobilities—by highlighting several efforts from around the world that aim to provide citizens with the necessary digital and infrastructural resources to learn, and engage in, new travel behaviors [4].

Nonetheless, the transformation of U.S. cities, in accordance with a shift of the American Dream away from the domineering "house + land + vehicle" ownership paradigm, is an onerous task that requires active citizen participation in a revamped planning process. The expansive mosaic of suburbia is rooted in a transportation network that caters to the automobile, thus hampering movements supporting compact development and more efficient public transportation systems. These elements are certainly necessary to make investment in walking and cycling infrastructure feasible.



According to the 2014 American Community Survey, the estimated breakdown of the daily work commute by transport mode is:

- 86.2%** by private vehicle, including motorcycle (89.1% of these trips were made by single drivers)
- 5.1%** by public transportation
- 2.8%** by walking
- 0.6%** by bicycle

The numbers, of course, vary with geographic context: restricting the search to residents of Cook County (IL), the breakdown is respectively 71.2% (87.6%), 18.1%, 4.4%, and 1.0%. It is therefore clear, even when only considering this one trip purpose, that a high rate of private vehicle use is still prevalent—and it is due to urban sprawl. Although considerable debate exists on how (or if) we should effectively and appropriately manage sprawl (see [5] for a brief overview), research has shown that it not only limits physical mobility options, but also upward socioeconomic mobility. This is because communities with limited economic and infrastructural resources experience greater implicit constraints on their access to opportunities elsewhere [6].

Under free market ideologies and principles of individualism, one might argue that transportation investments should adhere to the will of the rational and self-interested consumer (as defined by microeconomics)

rather than seeking to influence travel behaviors for the sake of socially-beneficial initiatives. Indeed, car use makes sense for purposes of convenience and minimizing travel time, especially when coupled with the excitement surrounding cleaner fuels, autonomous vehicle capabilities, and novel shared-ride programs. However, amidst the growing recognition of “irrational and inconsistent thinking” governing our choices (thanks to behavioral economics), there are equally strong arguments to be made that:

- 1) altruism and community-mindedness are legitimate inputs in our decision-making processes and, accordingly,
- 2) urban planning should aim to introduce fairer land-use patterns and transportation infrastructure development.

In light of this train of thought, we present an array of research efforts to illustrate the ways in which mobility contributes to physical and psychological well-being. Not only are there clear environmental and community benefits from mobilities engendering higher levels of walking and cycling, but also possibilities for invaluable individual gains.

Physical Well-Being

Numerous campaigns and organizations exist to improve the overall physical health of the U.S. population. Leading examples include the Let’s Move campaign, sponsored by Michelle Obama [7], and PHIT America, an organization launched in 2013 [8]. Both programs aim to combat the “inactivity epidemic” and high obesity rates in our country by explicitly calling for family and community involvement in promoting physically active lifestyles, predominantly in children. A similar strategy is critical for policymakers to consider in promoting the adoption of active transport modes; objectives focused on analyzing and changing habitual behavior (especially car travel) are still prominent in transportation research. In addition to the relatively low political importance of transportation issues—for instance, deteriorating infrastructure—funding shortages plague governments on all scales across our nation.



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Yet, a significant amount of research illustrates the favorable impact of investment in active transport modes. A comprehensive literature review [9] shows that public transit does, in fact, induce significantly higher levels of physical activity in its users compared to non-users; however, achieving this requires individuals to hold positive perceptions of travel to and from train stations and bus stops. To better understand the associated health benefits, the authors call for a refinement in data collection methods as well as well-being indicators that consistently measure potential health cost savings. These become more feasible as GPS and mobile technologies become more advanced. A related study conducted in Canada demonstrates the importance of coordinated land-use and transit planning in promoting pedestrian travel: walking trips are more frequent and exhibit greater variance in trip purpose when destinations are more accessible within a “comfortable” travel range [10]. This finding is consistent with the philosophies of transit-oriented development. Researchers and policymakers must exhibit caution, though, since it is tempting to exaggerate the potential physical health benefits of engaging in active transport. This warning is echoed by Schauder and Foley [11], where analysis of the National Health and Nutritional Examination Survey (NHANES) III reveals that weight loss and reduction in cholesterol levels, due to increased travel as a pedestrian or cyclist, are noticeable (yet small) only in individuals that otherwise have physically inactive lifestyles.

What this means is that, when designing behavioral interventions, it is of utmost importance to be cognizant of the notorious self-selection problem. In other words, policies must ensure that, if there is to be an increase in the number of trips made via active transport modes, this increase should focus on converting travelers who are not habitual pedestrians or cyclists. The bigger picture of physical well-being extends beyond individual considerations. Another extensive literature review examines numerous methodologies for conducting a Health Impact Assessment resulting from a mode switch to active transport. The authors illuminate the risks these travelers face regarding safety (traffic

“**achieving [higher levels of physical activity] requires individuals to hold positive perceptions of travel...**”

accidents at intersections) and air/noise pollution (exposure to vehicle emissions) [12]. Although cost-benefit analyses tend to indicate that the potential physical health benefits for individuals outweigh the above costs, the uncertainties behind the estimation of these benefits are of great concern. Accordingly, we must also consider physical health as pertaining to the natural environment in order to strengthen our argument. As Nakamura and Hayashi suggest through their categorization scheme, there are numerous incarnations of low-carbon transport policies in existence [13].

- 1) **AVOID** (behavior-preventing) strategies rely on land-use control and compact urban development.
- 2) **SHIFT** (behavior-changing) strategies promote diversification through hierarchical transport systems, such as pedestrian and cycling infrastructure as feeder mechanisms for public transport, in addition to car traffic exclusion zones and road pricing schemes.
- 3) **IMPROVE** (behavior-refining) strategies endorse hybrid and electric vehicle creation, taxes on vehicle emissions, and the advancement of real-time information systems through connected vehicle-to-vehicle and vehicle-to-infrastructure sensing technologies.

A combination of these approaches must rely on effective communication, social marketing, and policy implementation to successfully stimulate the desired improvements in the quality of life, while effectively addressing climate change concerns [14]. It is evident from the discussion so far that designing for healthy mobility is an integral part of redesigning the urban fabric as a whole, but there is still a need to delve deeper into the often-overlooked mental and emotional components of well-being to fully comprehend the significance of its role.

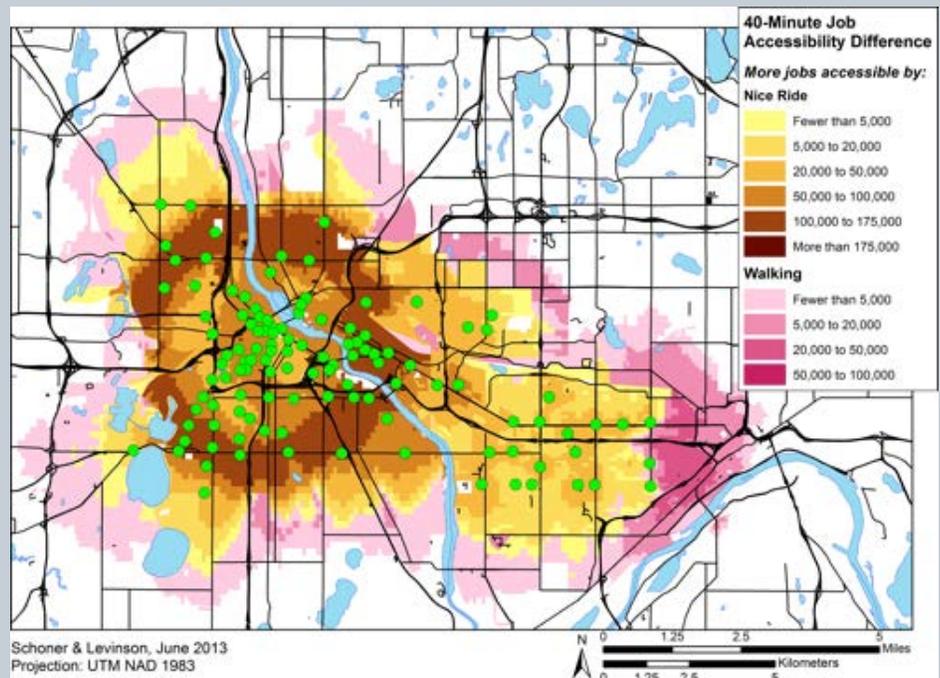


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SECTION HIGHLIGHT: Minneapolis, Minnesota

In the 2015 version of the Copenhagenize Index, Minneapolis is the sole U.S. city that appears in the Top 20 rankings. The accolades do not stop here, though. The League of American Bicyclists gave Minneapolis a gold rating for bicycle-friendliness, one of only thirteen U.S. cities with a population of at least 100,000 to achieve this ranking in 2015 [15]. Furthermore, the city has the second highest share of bicycle commuters (behind Portland, OR) among the 70 largest U.S. cities based on 2014 American Community Survey data [16]. Another source of praise is *Bicycling Magazine*, which placed Minneapolis as the number three city for cyclists in 2014, behind Chicago (2nd) and New York City (1st) [17]. Thus, due to its four-season climate, Minneapolis is an exceptional model for any U.S. city seeking to improve its active transport network. Researchers should view Minneapolis (and its metro area) as an opportunity to develop more holistic travel behavior models that emphasize the latent factors, particularly those related to well-being, underpinning decision-making processes.

Pictured here is a map showing improved job accessibility due to Nice Ride Minnesota, the bike-sharing system for Minneapolis. Minneapolis is a medium-sized city, however, the potential insight from analyzing healthy mobility patterns is relevant to cities of all sizes.



<http://streets.mn/wp-content/uploads/2014/04/40min1.png>

Mental and Emotional Well-Being

Mobility and transportation are necessary to bridge distances and access employment, activities, and essential services. This accessibility has been a fundamental element in understanding well-being from a physical perspective. However, mobility also enables individuals to participate in social and community life, as well as to gain autonomy. From this perspective, mobility also relates to psychosocial desires. Despite the growing emphasis on the importance of psychological well-being in the broader public debate, little attention is devoted to how the transportation system is capable of contributing to greater levels of life satisfaction.



cc Eric Mueller

The daily commute is a fundamental activity with strong implications for well-being. Numerous studies have revealed commuting to be among the most negative of daily activities. Travelers generate paradoxical outcomes because they are *chronically underestimating* the (everyday) disadvantage of a longer commute, while *overestimating* the (long-run) rewards from a higher income or nonurban residence [18]. One explanation stems from a cognitive “mistake” in that we tend to overlook how choices related to residential location will influence daily travel. The so-called commuting paradox is based on the finding that people who live farther from their work, thereby having longer commutes, on average have lower life satisfaction. If commuting leads to reduced well-being, an inquiry into the underlying mental and emotional causes is important.

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Research has shown that mobility is related to well-being in numerous ways. Firstly, increased mobility correlates with a lower risk of social exclusion, which has strong ties to well-being [19]. Additionally, Vella-Brodrick and Stanley found that transportation enhanced well-being by satisfying human needs such as environmental mastery and social interaction [20]. Equally notable are the variations in negative affect dependent on mode use. Active commuters are less likely to report a commute as being stressful [21]. Drivers, on the other hand, are the most likely to report feeling stressed.



cc Garry Knight

Similarly, particular stressors vary by transport mode, which could carry over into other life domains. Driving is consistently found to be the most stressful mode, chiefly because drivers must budget considerable buffer times to deal with unexpected delays; the mean buffer time is 21 minutes [22].

Promoting mental and emotional health relates fundamentally to enabling the type of favorable environmental conditions that allow people to adopt and maintain healthy lifestyles [23]. The above findings highlight several indirect links between the quality of the transportation system and quality of life. This suggests that initiatives for improving transport systems should be considered as another critical component of enhancing well-being. Doing so will allow people to participate in and contribute to society, access resources, and interact with others.

Travel Behavior Pathology: Causes and Solutions

Transportation research has traditionally focused almost exclusively on objective indicators of mobility, such as travel time, safety, and physical access to transport. In this article, we argue that mobility provides a much broader value in terms of allowing people to enrich essential life dimensions and permit physical and psychological needs to be met. To illustrate, Susilo et al. [26] investigate travel satisfaction using five thematic categories that could assist urban and transportation planners with anticipating the needs of travelers. These categories (with an example subcategory) are: individual attributes (mobility behavior); attitudes (travel-related opinions); contextual variables (subjective well-being); foundational aspects of travel (past experience); and travel experience factors (travel time productivity). A

key finding from this research is that high levels of travel satisfaction tend to be positively correlated with multimodal environments; that is, a larger transport mode choice set allows travelers to experience variety and, thus, trips themselves are no longer construed merely as means to an end.

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Improving well-being should be the ultimate goal in transport policymaking, with measures related to accessibility and increased mobility as part of the designer's toolbox. From this frame of reference, the idea of "healthier cities" takes on a new meaning. Scholars from various disciplines view the city as an organism because of the immense number of complex elements whose interactions form a continuously-growing organic entity. Organisms, however, embody the struggle between preservation and ruin, a phenomenon that is perceptible throughout the natural world. One outcome arising from our desire to grasp this struggle is the field of pathology, originally defined as the causal study of disease. Pathologists investigate and determine possible threats to standard biological functioning through extensive medical diagnostics, in addition to devising solutions to counter the effects of such threats. Psychologists and sociologists have adopted this concept to study abnormalities in human behavior, often rooted in disrupted mental and emotional states. Pathological behaviors are historically popular topics in urban settings. Research from the Chicago School of Urbanism has argued that the vast collection of stimuli and the proximity to disparities in cities (due to high population density levels) could lead to unbearable cognitive tension and potential overload. With the increasing recognition that cognitive and psychosocial factors are essential for groundbreaking transportation research, a similar paradigm is necessary for studying the interaction between well-being and transport policy.

“Improving well-being should be the ultimate goal in transport policymaking.”

Therefore, we propose that researchers and policymakers should collaborate to rigorously define and develop the concept of travel behavior pathology for the urban traveler. This would allow for the creation of both (1) specific analytical tools to help identify transportation problems that pose a threat to any aspect of well-being and (2) treatment procedures to effectively build proactive and reactive solutions for avoiding, shifting, or improving particular behaviors. Accordingly, we recognize the need to advance causal models and frameworks in developing a "happiness threshold" in order to make sense of the dynamic forces that constitute the urban landscape.

SECTION HIGHLIGHT: Sweden



<https://www.takvandring.com/wp-content/uploads/2014/03/C.jpg>

Pictured here is an example of *takvandring*, an extension of the “walkable cities” concept in which travelers traverse the rooftops of buildings in Stockholm, the capital of Sweden.

Significant progress in incorporating well-being concepts with transport policy can be found in Sweden, which is recognized for its comprehensive and human-oriented planning practices. For example, research based out of Karlstad University has examined the role of subjective well-being (SWB) as a fundamental principle in travel behavior modeling.

Ettema et al. [24] outline the important distinction between the anticipated overall benefit of a decision and the actual benefit experienced as a result of the decision made. While traditional models inherently capture the former, they perform poorly in encapsulating the latter. Hence the use of SWB in the analysis of travel behavior offers hope for gaining deeper insights that could improve travel demand forecasts and policymaking practices. It consists of a cognitive component that is associated with life satisfaction and goal-directed behavior enabled by travel, in addition to an affective component that consists of both positive and negative emotional factors (since they are not direct antitheses of one another). As demonstrated in Ettema et al. [25], the construction of rigorous measures for SWB is a hot research topic, and this is not restricted to the field of transportation.

This, however, posits a great challenge, for it is extremely difficult to tease out directional causality in any research design. An example of this is found in Widener and Hatzopoulou [27], which provides a proof of concept regarding the impact of various transportation factors on personal health, including the effects of infrastructure on travel behavior. Given the limitations in our collective knowledge and awareness, it is clear that the time is ripe to consider the inclusion of well-being, in addition to traditional aims and indicators. Ideally, this will result in a unified front to plan, design, and construct transportation systems that generate happy and healthy mobilities, for both individuals and communities. As a result, these

efforts would make a meritorious contribution to the shift towards environmentally-friendly and socially-equitable cities.

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