

Economic Analysis: HB17-1242

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Colorado's transportation infrastructure is in disarray. Drivers pay an estimated extra \$6.8 billion per year due to increased vehicle maintenance, vehicle collisions, and congestion resulting from deficient or undermaintained roads.ⁱ In February of this year, CDOT Executive Director Shailen Bhatt estimated that an annual investment of \$2.4 billion is needed simply to avoid a steady decline of Colorado's transportation system.ⁱⁱ Both parties have acknowledged the need for transportation funding as a top priority of the 2017 session.ⁱⁱⁱ

This problem does not have a market solution. Because public roads do not incur additional costs for additional users and are unable to exclude those who do not contribute, individual citizens do not have private incentives to provide transportation. Even in cases where transportation is excludable—as in the case of toll roads—individual contributions can only provide transportation in high-density areas, leaving residents of rural and low-density without an effective market mechanism.

HB17-1242 provides an effective funding mechanism to bolster transportation infrastructure. By raising the sales tax from 2.9% to 3.52%, this legislation provides a long-term funding solutions to Colorado's transportation needs. This tax increase will generate an estimated \$675 million per year: \$350 million going toward payments on a \$3.5 billion bond package, \$100 million toward transit projects, and \$275 million directly to local governments for top CDOT priorities. The top priorities include widening Interstate-25 through Denver and Interstate-70 into the mountains.

While providing an essential public good, the sales tax increase serving as the revenue stream will partially decrease consumption and distort the labor market. Increasing the sales tax distorts the labor market by changing the relative benefit of labor. In economic theory, the individual faces a trade-off on the margins between leisure and labor—or, more accurately, a tradeoff between leisure and the consumption enjoyed through increased labor. By increasing the relative price of consumption, a sales tax increases the cost of consumption. This leads to dual effects. Consumers for whom the preference for leisure is high will choose to spend less time, as the relative cost of labor has increased. This will lead to less consumption. Consumers for whom the preference for consumption is high will spend more time working to maintain consumption levels. In both these cases, the sales tax has created a market distortion.

Figure 1. Comparison to Neighboring States

State	Sales Tax Rate
Colorado (Current)	2.9%
Colorado (Proposed)	3.52%
Wyoming	4%
New Mexico	5.125%
Nebraska	5.5%
Utah	5.95%
Kansas	6.3%
Arizona	6.6%

However, there is little evidence to suggest that the proposed sales tax increase is out of the ordinary. Both Colorado’s current rate of 2.9% and the proposed rate of 3.52% would be the lowest of all 45 states imposing a

general sales tax. This rate is significantly lower than Colorado’s geographic neighbors (see Figure 1). States who have recently enacted similar transportation funding mechanisms have started from a significantly higher base. For example, Arkansas’s 2012 legislation raised sales tax from 6% to 6.5% to cover a transportation bond package. Similarly, Virginia’s 2013 transportation legislation increased statewide sales tax from 5% to 5.3%. Colorado’s increase from 2.9% to 3.52% therefore remains significantly below the rates imposed by other states.

There is also some concern that a bond issuance will increase real interest rates, thereby discouraging private investment. The issuance of a bond increases demand for loanable funds, allowing lenders to charge higher interest rates for private creditors as the volume of loan-seekers rises relative to the available pool of loanable funds. This process is referred to as government financing “crowding out” private investment.

While this effect occurs to an extent with all government bond issuances, there is evidence that current economic circumstances will minimize its negative consequences. As evidenced by the persistently low real interest rates, there is currently a large supply of loanable funds.^{iv} There are several explanations for low real interest rates, such as low rates of inflation and investor confidence or an influx of savings from emerging Asian economies.^v These circumstances indicate that an increase in government bonds is unlikely to significantly dampen private investment.

Additionally, studies of whether the “crowding out” theory is reflected empirically have been largely inconclusive.^{vi} Some studies have indicated that government debt financing for investment projects—as in the case HB17-1242—may have a positive effect on private investment by raising investor confidence.^{vi} Although interest rate considerations would be more meaningful during a recessionary period, it is unlikely that the bond issuance will significantly hamper private investment.

However, there may be negative social externalities associated with some CDOT priorities. The most notable example is the proposed expansion of Interstate-25 and Interstate-70. There is a well-developed body of research suggesting that highway expansions increase the volume of highway commuters, thereby increasing the absolute volume of traffic and keeping constant levels of rush-hour congestion.^{vii} This effect, known as “induced demand” is driven by changes in how commuters perceive the benefits of increased highway capacity.

Under assumptions of limited capacity, many commuters will choose to leave earlier in the day to avoid congestion, carpool or take public transit, or opt for an alternative route to avoid the highway. As an expansion alters perceived costs of taking the highway, some of these same commuters may abandon alternatives in favor of a highway commute. In this way, expansion efforts have the unintended effect of increasing and concentrating traffic on the highway.^{viii}

This increased volume of highway commuters has strong environmental consequences for communities surrounding the highways. A 2010 study by the Health Effects Institute found that residents living or working within 0.3 miles of a highway were at increased risk of childhood asthma, dementia, pulmonary disease, and premature death from cardiovascular diseases.^{ix} Per EPA toxic release data, some of the most polluted zip codes in Colorado are those located along Interstate-70 and Interstate-25.^x By prioritizing the Interstate-70 and Interstate-70 expansions, this legislation inadvertently expands negative consequences for their most proximate neighbors.

From an economic perspective, the best alternative would be to divert funds from the highway expansion to the \$100 million currently earmarked for transit projects. Transit has been shown to be especially effective at reducing traffic in the Denver Metro area, even relative to other cities of comparable size. Recent research in the *Journal of Transport Geography* found that Denver's lightrail and FasTracks corridors lowered the rate of increase in traffic on highways within their influence zone.^{xi} Much of this success can be attributed to the placement of transit stations close to the highest concentrations of residential units, office space, and retail units.^{xii}

There are several positive externalities associated with both a decrease in traffic and increase in transit. For example, a decrease in traffic volume leads to shorter commutes

and fewer collisions.^{xiii} According to TRIP, a Washington D.C. transportation research group, each Denver driver spends an average of 49 hours in traffic, and drivers statewide pay \$1.6 billion in collision repairs.^{xiv} Likewise, transit produces positive environmental externalities, such as less carbon dioxide and fewer airborne particulates, leading to lower pollution and fewer cases of respiratory or cardiovascular disease.^{xv}

There is substantial evidence that this legislation addresses the need for a critical public good with responsible and timely funding mechanisms. This legislation is justified on these grounds alone. To maximize positive social externalities, however, it is highly recommended that the legislature shift this funding in favor of transit projects and away from highway expansions.

ⁱ “Denver Transportation by the Numbers.” *TRIP*. Tripnet.org, 1 Mar. 2017. Web.

ⁱⁱ Bhatt, Shailen. “Testimony before the Senate Environment and Public Works Committee.” 8 Feb 2017

ⁱⁱⁱ Frank, John. “With Session One-third Over, Colorado Lawmakers Inch toward Deal to Improve Roads.” *The Denver Post*. N.p., 22 Feb. 2017. Web. 14 Mar. 2017.

^{iv} “Low Real Interest Rates.” *The Wall Street Journal*. Dow Jones & Company, 16 Feb. 2017. Web. 14 Mar. 2017.

^v Bernanke, Ben S. “Why Are Interest Rates so Low?” *Brookings*. Brookings, 29 July 2016. Web. 14 Mar. 2017.

^{vi} Traum, Nora, and Shu-Chun S. Yang. “When Does Government Debt Crowd Out Investment?” *SSRN Electronic Journal* (2015)

^{vii} Downs, A. (2004). *Still Stuck in Traffic*. Washington DC, Brookings Institute.

^{viii} Marshall, Wes. “Elements of Access: Induced Demand.” *Transportist*. N.p., 20 June 2016. Web. 14 Mar. 2017.

^{ix} Health Effects Institute Panel on the Health Effects of Traffic-Related Air Pollution, *Traffic-Related Air Pollution: A Critical Review of the Literature on Emissions, Exposure, and Health Effects*. Health Effects Institute: Boston, 2010.

^x “Toxics Release Inventory Factsheet: Colorado” *United States Environmental Protection Agency*. 2015.

^{xi} Goetz, Andrew, and Sutapa Bhattacharjee. “Impact of Light Rail on Traffic Congestion in Denver.” *Journal of Transport Geography*. 2012.

^{xii} Ratner, Keith A., and Andrew R. Goetz. “The Reshaping of Land Use and Urban Form in Denver through Transit-oriented Development.” *Cities* 30 (2013): 31-46. Web.

^{xiii} Hensher, David A., and Rhonda Daniels. “Productivity Measurement in the Urban Bus Sector.” *Transport Policy* 2.3 (1995): 179-94. Web.

^{xiv} “Denver Transportation by the Numbers.” *TRIP*. Tripnet.org, 1 Mar. 2017. Web.

^{xv} Black, Alan. *Urban Mass Transportation Planning*. New York: McGraw-Hill, 1995. Print.