

Highlights

This is the first Conditions and Performance Report that begins to capture the effects of investment in highways, bridges and transit undertaken since the enactment of the Transportation Equity Act for the 21st Century (TEA-21) in 1998. Based on data for 2000, the report also reflects enhancements in ongoing work by the Federal Highway and Federal Transit Administrations to improve the estimation of the conditions and performance of highways, bridges and transit and to forecast the future investment that will be required to maintain and improve this transportation infrastructure.

Highlights: Highways and Bridges

Since TEA-21 was enacted, combined investment by all levels of government in highway infrastructure has increased sharply. Total highway expenditures by Federal, State and local governments increased by 25.0 percent between 1997 and 2000. This equates to 14.4 percent increase in constant dollar terms. Highway capital spending alone rose to \$64.6 billion in 2000, a 33.7 percent increase over 1997.

The increased Federal funding levels for highway capital investment under TEA-21 through 2000 have been matched and exceeded by increases in State and local investment. Taken as a whole, State and local governments did not simply substitute Federal funds for their own during this robust economic period. Instead, they poured billions of additional dollars into transportation projects beyond the minimum increases necessary to meet Federal matching requirements. As a result, the State and locally-funded share of highway capital investment increased from 1997 to 2000. The State and local share of capital outlay had remained in a range from 54 to 59 percent between 1987 and 1997. In 1998, however, the State and local share of highway capital outlay increased above 60 percent for the first time since 1959, and remained above that level through 2000.

The TEA-21 era has also coincided with a shift in the types of capital improvements being made by State and local governments. The percentage of capital investment going for “system preservation”—the resurfacing, rehabilitation or reconstruction of existing highway lanes and bridges—increased from 47.6 percent in 1997 to 52.0 percent in 2000. The combined result of the increase in total capital investment and the shift in the types of improvements being made was a 45.7 percent increase in spending on system preservation, from \$23.2 billion in 1997 to \$33.6 billion in 2000. System preservation projects tend to have shorter lead times and are often less controversial than system expansion projects, which made many of them attractive candidates as Federal funding increased over this period. Investment in system expansion (the construction of new roads and bridges and the widening of existing roads) grew more slowly during this period, rising 20.8 percent from \$21.6 billion to \$25.9 billion.

It is important to note that due to the nature of the Federal-aid highway program as a multiple-year reimbursable program, the impact of increases in obligation levels phases in gradually over a number of years. Consequently the full effect of TEA-21 on the condition and the performance of the nation’s highways and bridges has not yet been realized.

Physical Conditions Have Improved

The large increase in system preservation investment since 1997 has had a positive effect on the overall physical condition of the Nation’s highway and bridge infrastructure. The percentage of highway mileage with

“acceptable” ride quality rose from 82.5 percent in 1993 to 86.0 percent in 2000. The percentage of bridge deck area considered deficient dropped from 30.9 percent in 1996 to 27.9 percent in 2000. These improvements, however, were not uniform across all highways and bridges. The condition of higher-order roads, for example, has improved considerably since 1993, while conditions on many lower-order roads have worsened. Bridge condition also differs by functional system. For example, the percentage of Interstate bridges classified as structurally deficient or functionally obsolete is lower than the comparable percentages for bridges on collectors or local roads.

Operational Performance Has Declined

Despite the historic investment in highway infrastructure and improving conditions on many roads and bridges, operational performance—the use of that infrastructure—has steadily deteriorated over the past decade. In 1987, for example, a trip that would take 20 minutes during non-congested periods required, on average, 25.8 minutes under congested conditions. By 2000, the same trip under congested conditions required 30.2 minutes, or an additional 4.4 minutes.

Future Investment Scenarios

There is significant room for increases in highway capital investment that would result in positive net benefits to the American people, in terms of reductions in travel time, vehicle operating costs, crashes, emissions, and highway agency costs. The Cost to Improve Highways and Bridges Scenario presented in this report describes an “investment ceiling” above which it would not be cost-beneficial to invest. The average annual Cost to Improve highways and bridges is projected to be \$106.9 billion for 2001-2020 (stated in constant year 2000 dollars). This is 65.3 percent higher than the \$64.6 billion of total capital investments by all levels of government in 2000. Note that this “gap” reflects future investment requirements stated in constant dollars; additional annual increases in investment would be required to offset the effects of inflation.

Even maintaining the overall conditions and performance of highways and bridges at current levels would require significantly more combined investment by all levels of government. The Cost to Maintain Highways and Bridges Scenario describes a level of investment at which future conditions and performance would be maintained at a level sufficient to keep average highway user costs from rising above their 2000 levels, based on projections of future highway use. The average annual investment is projected to be \$75.9 billion (in constant \$2000) for 2001-2020, which is 17.5 percent larger than the \$64.6 billion of capital spending in 2000.

Capital spending by all levels of government is projected to increase in constant dollar terms over the remainder of the life of TEA-21, which will tend to reduce the “gap” between average annual spending and the Cost to Maintain. However, this assumes that Federal, State and local governments will be in a financial position to allow them to continue to increase their highway and bridge investments, albeit at slower rates than those observed from 1997 to 2000. All levels of government may not be able to sustain the rate of increase in infrastructure investment observed in recent years, but the full effects that recent reductions in State and local tax receipts will have on their level of infrastructure investment are not yet clear.

Impacts of Future Investments

In addition to the two main investment scenarios outlined above, this report also predicts the impacts of numerous alternative future investment levels on a variety of condition and performance indicators.

If investment were to remain at year 2000 levels, or projected levels for 2001 to 2003, it is projected that recent trends observed in the condition and performance of the highway system would continue. At this range of investment levels, the operational performance of the highway system is expected to further deteriorate: average speeds would decline, the amount of delay experienced by drivers would increase, and the average length of congested periods on the Nation's urban principal arterials would increase. Recent trends towards improvements in bridges conditions are expected to continue; however, the aging of the Nation's bridges, particularly on the Interstate system, will present additional challenges in the future.

Composition of Future Investments

The preceding edition of the C&P report suggested that it would be cost-beneficial to devote a larger share of future increases in highway capital investment towards system preservation. As discussed above, such a shift did occur between 1997 and 2000, resulting in significant improvements in the physical conditions of the Nation's highway and bridge infrastructure. However, the operational performance of the highway system continued to decline over this period.

In part because combined Federal, State and local infrastructure investment has been more successful in addressing physical conditions than operating performance since 1997, the future investment requirement analyses in this report now suggest that it would be cost-beneficial to devote a larger share of future increases in highway capital investment towards system expansion.

Conclusion

Since the enactment of TEA-21, State and local governments—spurred in part by higher levels of Federal investment—have poured billions of dollars into highway infrastructure. This investment led to improved highway and bridge conditions, particularly on higher-order functional systems. Despite record levels of funding, however, congestion increased throughout the country. Analysis of highway and bridge needs and investment requirements suggests that future funding might be reoriented toward system expansion to reduce user costs and enhance system performance.

Highlights: Transit

Record levels of Federal investment in transit under TEA-21 were not only matched, but were exceeded by the combined investments of State and local governments from 1997 through 2000.

Total funding by Federal, State and local governments, increased by 20 percent between 1997 and 2000, and by 15 percent in constant dollar terms. Total spending on capital investment by all levels of government increased by 19 percent over the same period. Federal funding for capital investment increased by a total of three percent, while State and local funding increased by 37 percent. Increases in State and local funding drove the Federal share of capital funding for transit down from 54 percent in 1997 to 47 percent in 2000.

Since the implementation of TEA-21, the allocation of transit capital expenditures by type of investment has remained relatively constant. In 2000, 58 percent of transit capital expenditures were for facilities, 31 percent for rolling stock and 11 percent were for other capital investment. These funds were drawn from all sources—Federal, State and local—including formula, New Starts, Fixed Guideway Modernization, and Bus and Bus Facility funds. The composition of capital expenditures in 1997 was almost identical. 58 percent of transit capital expenditures were for facilities, 29 percent for rolling stock, and 13 percent for other capital investment.

Transit Infrastructure Has Expanded

The significant growth in total capital investment under TEA-21 is reflected in an expansion of the National transit infrastructure. Between 1997 and 2000, the number of urban transit vehicles increased by 2.6 percent, track mileage grew by 6.6 percent, the number of stations increased by 5.4 percent, and the number of urban maintenance facilities grew by 4.1 percent.

Transit Use Has Increased

With new and modernized transit vehicles and facilities, passengers use has also increased, particularly transit rail use. Passenger miles traveled on transit increased by 12.2 percent between 1997 and 2000. Passenger miles traveled on rail increased by 16.4 percent, more than twice the 7.6 percent increase that occurred on non-rail modes. The distance traveled by transit vehicles in service also increased by 9.6 percent. Vehicle occupancy reached a new high in 2000, primarily as a result of increased occupancy rates on rail vehicles.

Physical Conditions Have Remained Constant

Bus and rail vehicle conditions have remained relatively constant since 1997. Bus conditions have improved slightly as a result of new vehicle purchases, and rail conditions have declined marginally. The condition of rail vehicles for earlier years has been adjusted downward from that reported in the last C&P Report, as a result of an improved approach to the calculation of deterioration.

The conditions of bus and rail maintenance facilities have declined since 1997. About 75 percent of the decline in rail facility condition was due to methodological revisions. Changes since 1997 in the condition of other rail infrastructure have varied. Specifically, the condition of power systems and structures has improved slightly, although it is estimated that more than 20 percent of all structures remain in substandard condition. Station conditions show solid improvement, and track conditions have remained constant. Conditions of yards have declined slightly, but all remain in adequate or better condition.

Operational Performance Has Decreased for Rail

Vehicle utilization rates have increased for rail and decreased for other modes. Heavy, light and commuter rail utilization reached new highs in 2000, with commuter rail showing the highest utilization. Bus, demand response and vanpool utilization decreased. Average rail operating speeds have declined since 1997, primarily due to increased use of older, slower rail systems.

Future Investment Requirements

The average annual Cost to Improve both the physical condition of transit assets and transit operational performance to targeted levels by 2020 is estimated to be \$20.6 billion in 2000 dollars, 128 percent higher than transit capital spending in 2000. The estimated average annual Cost to Maintain transit asset conditions and operating performance is estimated to be \$14.8 billion, 64 percent more than 2000 capital spending. More than 50 percent of these projected funding requirements are for asset rehabilitation and replacement.

Not surprisingly, with more than 90 percent of passenger miles traveled on transit systems in areas with populations of over 1 million, more than 90 percent of transit investment requirements are expected to be in these urban areas. These increased investment requirements reflect an enlarged transit infrastructure base, updated capital cost estimates for vehicles, and a downward revision in the average condition of rail vehicles as a result of changes in methodology. As in the past, a higher proportion of projected capital outlays will be

for non-vehicle purchases than for the purchase of vehicles. The largest increase in investment needed to maintain performance through the expansion of the asset base will be for fixed guideway elements and vehicles. To “improve performance,” significant investment will be required in system design and rights-of-way acquisition.

Projected investment requirements are sensitive to forecasts of passenger miles traveled. The estimated investment requirements presented in this report are based on an increase of 1.6 percent in the average annual passenger miles traveled, which reflects the average of transit travel forecasts by Metropolitan Planning Organizations. This projected rate is well below the average annual growth of passenger miles traveled since 1995 of 3.4 percent. Should these projected rates prove to be understated, the projected investment requirements will be higher.

Conclusion

Increased Federal funding for transit capital investment under TEA-21, combined with a substantial increase in local government funding, has expanded transit infrastructure and permitted the average condition of system assets to be maintained between 1997 and 2000. However, an overall increase in transit rail use has led to a decline in the performance of rail modes, as the average operating speeds decreased with the increased use of older, slower rail assets. As the Nation’s population continues to increase, with larger concentrations of people in urban areas, the need for investment in transit infrastructure will continue to grow.

