"HEARTBURN HIGHWAYS"

THE COST TO MOTORISTS OF TRAFFIC CONGESTION, TRAFFIC CRASHES AND DETERIORATED PAVEMENTS AND THE 50 ROADS AND HIGHWAYS IN COLORADO THAT CAUSE DRIVERS THE MOST STRESS

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Founded in 1971, TRIP ® of Washington, DC is a nonprofit organization that researches, evaluates and distributes economic and technical data on highway transportation issues. TRIP is sponsored by insurance companies, equipment manufacturers, distributors and suppliers; businesses involved in highway engineering, construction and finance; labor unions; and organizations concerned with an efficient and safe highway transportation network.

Executive Summary

With the already high level of stress and expense involved in modern life, it is critical that a region's transportation system be designed to minimize cost and stress to motorists. Colorado's extensive network of roads and bridges allows the state's 4.6 million residents to safely and freely travel, while enabling businesses to efficiently serve their customers. However, continued growth in Colorado's population and travel is straining the capacity of the state's transportation system, causing further deterioration and increasing the level of stress and the monetary costs experienced by the state's drivers.

As a result of increased use, Colorado's system of roads and bridges is in inadequate condition and urban congestion is worsening. Deteriorated roads and highways, a lack of some desirable roadway safety features and increasing traffic congestion are costing motorists in the form of additional traffic accidents, travel delays and vehicle operating costs.

Making needed improvements to Colorado's roads and bridges is key to providing a safer, smoother, more efficient transportation system that will save motorists money and time while improving the economic livelihood of the entire state.

This report estimates the monetary cost to Colorado motorists of driving on roads that are increasingly congested, have poor pavement conditions and lack desirable safety features. The report also identifies the 50 sections of roadway throughout Colorado that cause the greatest stress to the state's drivers because they have high rates of traffic congestion and serious traffic crashes, as well as significantly deteriorated pavement. This list is based on a combined index that measures and ranks safety, congestion and pavement condition rates on routes throughout the state.

Sources of information for this study include the U.S. Department of Transportation (DOT), the Colorado Department of Transportation (CDOT), the Federal Highway Administration (FHWA), the U.S. Census Bureau, the National Highway Traffic Safety Administration (NHTSA), the Texas Transportation Institute (TTI) and the Federal Highway Administration's National Bridge Inventory (NBI).

Key findings of the report:

TRIP estimates that Colorado's roadways that lack desirable safety features, have inadequate capacity to meet travel demands or have poor pavement conditions cost the state's drivers $3.3 billion annually in the form of traffic accidents, additional vehicle operating costs and congestion-related delays. TRIP estimates that the average annual cost of inadequate roadways is $1,577 annually per driver in the Denver metro area, $1,103 annually per driver in the Colorado Springs area, and $814 per urban driver living elsewhere in the state.

- Traffic accidents and fatalities in which roadway design was an important factor cost Colorado motorists approximately $1.1 billion annually, including medical costs, lost economic and household productivity, property damage and travel delays. Roadway design-related safety costs are estimated at $368 annually per Colorado driver.

- Traffic congestion in Colorado costs licensed drivers $1.24 billion annually in delays and wasted fuel. Annual traffic congestion costs per driver are $865 in the Denver metro area and $451 in the Colorado Springs area. The annual congestion cost for urban Colorado drivers not residing in Denver or Colorado Springs is $125.

- Driving on roads in need of repair costs Colorado's motorists $955 million – $321 per driver – annually in extra vehicle operating costs, including accelerated vehicle depreciation, additional repair costs and increased fuel consumption and tire wear. Additional annual vehicle operating costs are estimated to be $344 in the Denver metro area and $284 in the Colorado Springs area.

TRIP has identified and ranked the 50 segments of roadway throughout Colorado that cause the greatest stress to the state's motorists because they have the highest levels of congestion, the highest occurrence of fatal and serious traffic crashes and significant pavement deterioration. This list is based on a combined index that measures and ranks safety, congestion and pavement condition rates on routes throughout the state. The following is a list of the top 10 roads that cause Colorado motorists the greatest stress because they have significantly deteriorated pavement conditions and high rates of traffic congestion and serious traffic crashes. A complete list of roads can be found in the body of the report, and additional data pertaining to each route is listed in Appendices A and B.

1. **US 36/Boulder Turnpike- State Highway 157 to I-25** (Boulder, Broomfield, Jefferson, Adams counties)- Safety/Congestion
2. **I-25 Valley Highway, Broadway to Alameda**(Denver County)- Safety
3. **US 287, Sheridan Boulevard to Pike Road in Longmont**(Boulder, Broomfield Counties)- Congestion
4. **I-25 Emerson Street to US 36**(Adams, Denver Counties)- Congestion
5. **Wadsworth Boulevard, US 285 (Hampden Avenue) to US 287** (Broomfield, Denver and Jefferson Counties)- Congestion

6. **State Highway 74 between Idledale and Morrison** (Jefferson County)- Safety
7. **US 285, State Highway 8 to I-25**(Arapahoe, Denver and Jefferson Counties)- Congestion
8. **C-470, Wadsworth Boulevard to Yosemite Street** (Arapahoe, Douglas and Jefferson Counties)- Congestion
9. **US 50 near the Junction of State Highway 149**(Gunnison County)- Safety
10. **I-25, 84th Avenue to State Highway 119** (Adams, Broomfield and Weld Counties)- Congestion

- Congested roads on the list (carrying a minimum of 20,000 vehicles per day) have been identified and ranked based on an index that includes the length of the congested section of road and the amount of traffic carried on the facility compared to the amount of vehicle travel that the road was designed to accommodate.

- Roads that present safety concerns have been identified using an index that measures fatal and injury causing accidents on the road (between 1999 and 2003) against the length of the road and the amount of traffic on the road. The safety survey was limited to roads that carry a minimum of 2,000 vehicles per day.

- Roads with poor pavement on the list (carrying a minimum of 20,000 vehicles per day) have been identified and ranked based on an index that includes pavement conditions, amount of traffic and length.

Steady population growth has resulted in increased vehicle travel on Colorado's transportation system, resulting in growing urban traffic congestion levels and longer commute times.

- Colorado's population increased by 38 percent from 1990 to 2004, from 3.3 million residents to 4.6 million residents. This was the second largest population increase in the nation, behind only Nevada.

- Vehicle travel in Colorado increased by 60 percent between 1990 and 2003, from 27 billion vehicle miles of travel (VMT) to 43 billion VMT. Vehicle travel in Colorado is projected to increase by another 45 percent by 2020, to 62 billion vehicle miles of travel.

- Thirty percent of Colorado's urban highways were congested in 2003, the latest year for which data is available, carrying traffic volumes that resulted in significant rush hour delays.

Improving safety features on Colorado's roads and highways would result in a decrease in fatal traffic accidents.

- An average of 685 people were killed each year in motor vehicle accidents in Colorado from 1999 through 2004.

- There are three key factors associated with fatal vehicle accidents: driver behavior, vehicle design and roadway design. It is estimated that roadway design is an important factor in one-third of fatal traffic accidents.

- Low cost safety improvements include rumble strips, centerline rumble strips, improving signage and pavement/lane markings, installing lighting, removing or shielding roadside obstacles, the use of chevrons and post-mounted delineators along curves and upgrading or adding guardrails.

- Moderate-cost improvements include adding turn lanes at intersections, resurfacing pavements and adding median barriers.

- Moderate to high-cost improvements include improving roadway alignment, reducing the angle of curves, widening lanes, adding or paving shoulders and adding intermittent passing lanes or adding a third or fourth lane.
- The Federal Highway Administration has found that every $100 million spent on needed highway safety improvements will result in 145 fewer traffic fatalities over a 10-year period.

Pavement conditions on 43 percent of Colorado's major roads are either poor or mediocre.

- Approximately 14 percent of Colorado's major roads were rated in poor condition in 2003, the latest year for which data is available, and are in need of resurfacing or reconstruction. An additional 29 percent of the state's major roads were rated in mediocre condition in 2003.

- In Denver, 22 percent of major roads are in poor condition and an additional 23 percent are in mediocre condition. In Colorado Springs, 17 percent of major roads are in poor condition and an additional 20 percent are in mediocre condition.

Introduction

With all of the stress of modern life, it is important that a region's highway system provide drivers with a safe, smooth and efficient driving experience. Colorado's extensive network of roads and bridges provides transportation for the state's 4.6 million residents and its visitors while enabling businesses to serve their customers. However, Colorado's roads and highways have deteriorated, do not include all desirable safety features, and are becoming increasingly congested. This can cause increased stress and additional hidden costs to drivers in the state.

Making needed improvements to Colorado's roads and bridges is key to providing a safer, more efficient transportation system that will relieve motorist's stress while saving them time and money. Significant road and highway improvements throughout the state can serve to foster a better quality of life for Colorado's residents and visitors by providing them with a transportation system that is safe, efficient and well maintained.

When roads and highways lack desirable safety features, have high levels of traffic congestion or poor pavement conditions, it increases stress on motorists and costs them money in the form of increased wear and tear on their vehicle, lost time and an increased likelihood and severity of traffic crashes.

This report estimates of the monetary cost to Colorado motorists of driving on roads that are increasingly congested, have poor pavement conditions and lack desirable safety features. The report also identifies 50 sections of "heartburn highways" throughout Colorado. These are roads and highways that cause the most stress to drivers in the state because they have high levels of congestion, high rates of serious traffic crashes, and significantly deteriorated pavement conditions. This list is based on a combined index that measures serious traffic accidents, congestion rates and pavement conditions on routes throughout the state.

Sources of data for this study include the U.S. Department of Transportation (US DOT), the Colorado Department of Transportation (CDOT), the Federal Highway Administration (FHWA), the Texas Transportation Institute (TTI), the U.S. Census Bureau, the National Highway Traffic Safety Administration (NHTSA), and the National Bridge Inventory (NBI).

Population Growth, Travel Trends and Traffic Congestion

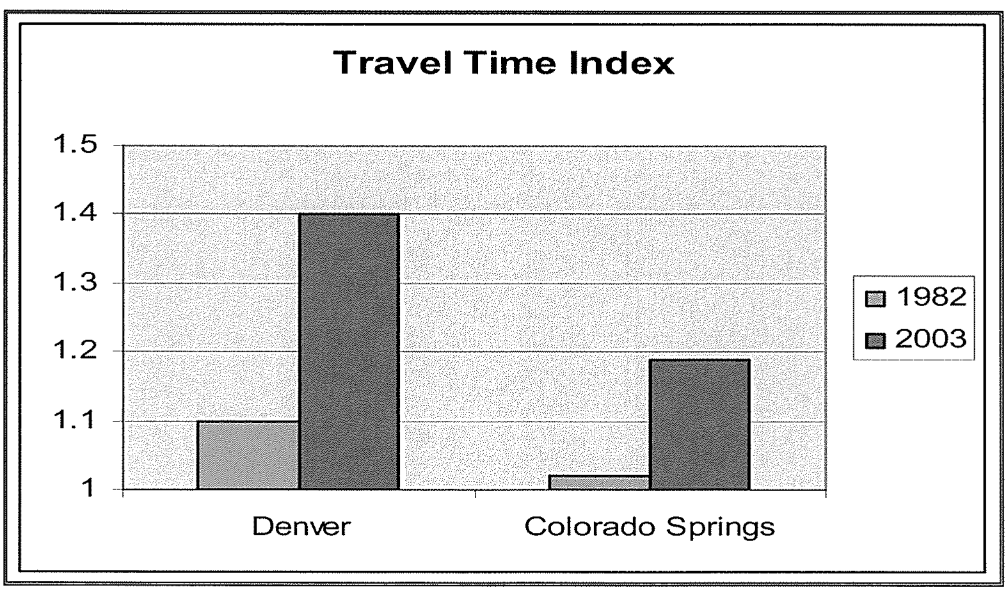
Colorado residents enjoy modern lifestyles that rely on a high level of personal and commercial mobility. Rapid population growth has resulted in increased traffic on the state's roads and bridges. Colorado's population reached 4.6 million in 2003, up from 3.3 million in 1990 – an increase of approximately 38 percent, the second largest increase in the nation.

In addition to population growth, vehicle travel in Colorado increased by 60 percent from 1990 to 2003, the third highest increase in the nation. Vehicle miles of travel in Colorado rose from 27 billion vehicle miles of travel (VMT) to 43 billion vehicle miles of travel.[1] Based on population and other lifestyle trends, TRIP estimates that travel on Colorado's roads and highways will increase by another 45 percent by 2020, to 62 billion vehicle miles of travel.

Traffic congestion is a growing burden in Colorado's key urban areas and threatens to impede the state's economic development. Congestion on Colorado's urban highways is increasing as a result of steady increases in vehicle travel. In 2003, the latest year for which data is available, 30 percent of Colorado's urban highways (Interstates and other freeways) were congested, carrying traffic volumes that result in significant rush hour delays.[2] These routes are considered congested because the levels of traffic they carry are likely to cause delays during peak travel hours, as a result of traffic levels being in excess of what the highway can carry without experiencing delays. Highways that carry high levels of traffic are also more vulnerable to experiencing significant traffic delays as a result of traffic accidents or other incidents.

Urban traffic congestion has increased over the past several years. Denver's travel time index was 1.40 in 2003, up from 1.10 in 1982. This means that the average trip in 2003 took 40 percent longer to complete during rush hour than during non-rush hour.[3] Colorado Springs had a travel time index of 1.19 in 2003, up from 1.02 in 1982, indicating that the average trip in 2003 took 19 percent longer to complete during rush hour than during non-rush hour.[4]

Chart 1. Travel Time Index for Colorado Springs and Denver



Source: Texas Transportation Institute 2005 Urban Mobility Report.

Traffic Safety in Colorado

There are three key factors associated with fatal vehicle accidents: driver behavior, vehicle design and roadway design. It is estimated that roadway design is an important factor in approximately one-third of fatal traffic accidents. In Colorado, an average of 685 people were killed annually in motor vehicle accidents from 1999 through 2004, according to the National Highway Transportation Safety Administration.[5]

Improving safety on Colorado's roads and highway system can be achieved through further improvements in vehicle safety; improvements in driver, pedestrian, and bicyclist behavior; and, a variety of improvements in roadway safety features. Roadway improvements such as adding lanes, removing obstacles, adding or improving medians, widening lanes, widening and paving shoulders, improving intersection design, and upgrading road markings and traffic signals can reduce traffic fatalities and vehicle accidents. In fact, the Federal Highway Administration has found that every $100 million spent on needed highway safety improvements will result in 145 fewer traffic fatalities over a 10-year period.[6]

Roads that lack sufficient lanes, have sharp curves, or have inadequately designed intersections or interchanges pose greater risks to motorists, pedestrians and bicyclists. The following chart shows the correlation between specific road improvements and the reduction of fatal accident rates nationally.

Chart 2. Reduction in fatal accident rates after needed roadway improvements[7]

Type of Improvement	Reduction in Fatal Accident Rates after Improvements
New Traffic Signals	53%
Turning Lanes and Traffic Signalization	47%
Widen or Modify Bridge	49%
Construct Median for Traffic Separation	73%
Realign Roadway	66%
Remove Roadside Obstacles	66%
Widen or Improve Shoulder	22%

Source: TRIP analysis of U.S. Department of Transportation data

The type of safety design improvement that is appropriate for a section of road will depend partly on the amount of funding available and the nature of the safety problem on that section of road. Several studies have classified rural safety improvements by both their effectiveness and their cost.

Low cost safety improvements can include the following:

- Roadside and centerline rumble strips to alert drivers that they are crossing the center line or approaching the shoulder of a roadway. Rumble strips have been found to reduce run-off-the-road crashes by 25 to 43 percent.
- Improved signage and pavement markings and additional lighting can help improve night-time visibility and help drivers to navigate a roadway more easily.
- Shielding, removal or relocation of road-side obstacles such as large rocks, utility poles or heavy mail boxes.
- Upgrading or adding guardrails has been found to reduce traffic fatality rates by between 50-58 percent.[8] In addition, the use of chevrons or post-mounted delineators can reduce

accidents at curves by providing drivers with better visual cues about the presence and geometry of a curve.

Moderate cost safety improvements can include the following:

- The installation of median barriers has been found to reduce traffic fatality rates by 65 percent.[9]
- The addition of left turn lanes at rural intersections was found to reduce accidents by between 33 and 48 percent.[10] The addition of right turn lanes at intersections was found to reduce accidents by between eight and 26 percent.[11]
- Resurfaced pavements have been found to result in a 25 percent reduction in fatal crashes. [12]

Moderate to high cost safety improvements can include the following:

- Paving or widening shoulders has been found to reduce traffic fatality rates by 10 to 35 percent, depending on the width of the widening and the location.[13]
- Realigning roadways has been found to average a 50 percent reduction in traffic fatality rates.[14]
- Adding passing lanes has been found to reduce traffic fatality rates by 20 percent and the addition of a two-way left-turn lane has been found to reduce traffic fatality rates by 30 percent.[15]
- Making lanes wider has been found to reduce traffic fatality rates by eight to 10 percent.[16]
- A recent report on the likely safety benefit of converting two-lane rural roads into four-lanes routes found that traffic accident rates would be reduced by between 40 to 60 percent.

THE COST OF COLORADO'S INADEQUATE ROADS

Many of Colorado's roads lack critical safety features, are in substandard condition and lack adequate capacity to handle travel demand. As motorists drive on substandard roads and highways, they incur increased costs in the form of reduced safety, increased vehicle wear and required vehicle maintenance, as well as wasted time and fuel.

The Cost to Motorists of Roads Lacking Optimum Safety Features

Traffic accidents take a tremendous economic toll on a community, in addition to the suffering and grief that they cause to those injured or killed and their loved ones. A 2002 report by the U.S. Department of Transportation's National Highway Traffic Safety Administration (NHTSA) has found that motor vehicle crashes carry a cost to individuals that includes medical costs, lost economic and household productivity, property damage and travel delays.[17]

TRIP estimates that roadway design is an important factor in one-third of traffic fatalities, based on an analysis of federal highway safety data. Based on this data, TRIP estimates that the safety cost of roads that lack desirable safety features in Colorado is approximately $1.1 billion per year, or $368 per motorist.

The Cost to Motorists of Roads in Inadequate Condition

TRIP has calculated the additional cost to motorists of driving on roads in poor or unacceptable condition. When roads are in poor condition, which may include potholes, rutting or rough surfaces, the cost to operate and maintain a vehicle increases. These additional vehicle operating costs include accelerated vehicle depreciation, increased vehicle repair costs, additional fuel consumption and more rapid tire wear.

The pavement condition of the state's major roads – which includes Interstate highways, freeways, and major routes connecting urban areas and major routes within cities - are evaluated annually and classified as being in poor, mediocre, fair or good condition.. In 2003, the latest year for which data is available, 14 percent of Colorado's major roads were rated in poor condition, while 29 percent of the state's major roads were rated in mediocre condition.[18] Roads rated poor are badly cracked or broken. In some cases, poor roads can be resurfaced, but often are too deteriorated and must be reconstructed.

In Denver, 22 percent of major roads were rated in poor condition and an additional 23 percent were in mediocre condition in 2003. In Colorado Springs, 17 percent of major roads were rated in poor condition and an additional 20 percent were in mediocre condition.[19]

Pavement failure is caused by a combination of traffic, moisture and climate. Moisture often works its way into road surfaces and the materials that form the road's foundation. Road surfaces at intersections are even more prone to deterioration because the slow-moving or standing loads occurring at these sites subject the pavement to higher levels of stress. It is critical that roads are fixed before they require major repairs because reconstructing roads costs approximately four times more than resurfacing them.[20]

A desirable goal for state and local organizations that are responsible for road maintenance is to keep 75 percent of major roads in good condition.[21] In Colorado, 35 percent of the state's major roads and highways are in good condition.[22]

TRIP estimates that driving on substandard roads costs the average Colorado motorist $321 per year in extra vehicle operating costs – a total of $955 million statewide. In the Denver metro area, motorists pay an additional $344 per year in extra vehicle operating costs because of deficient roads, while drivers in the Colorado Springs area pay $284 per year.

Additional vehicle operating costs have been calculated in the Highway Development and Management Model (HDM), which is recognized by the U.S. Department of Transportation and more than 100 other countries as the definitive analysis of the impact of road conditions on vehicle operating costs. The HDM report is based on numerous studies that have measured the impact of various factors, including road conditions, on vehicle operating costs.[23]

The HDM study found that road deterioration increases ownership, repair, fuel and tire costs. The report found that deteriorated roads accelerate the pace of depreciation of vehicles and the need for repairs because the stress on the vehicle increases in proportion to the level of roughness of the pavement surface. Similarly, tire wear and fuel consumption increase as roads deteriorate since there is less efficient transfer of power to the drive train and additional friction between the road and the tires.

TRIP's additional vehicle operating cost estimate is based on taking the average number of miles driven annually by a region's driver, calculating current vehicle operating costs based on AAA's 2004 vehicle operating costs and then using the HDM model to estimate the additional vehicle operating costs being paid by drivers as a result of substandard roads.[24] Additional research on the impact of road conditions on fuel consumption by the Texas Transportation Institute (TTI) is also factored into the TRIP vehicle operating cost methodology.

The Cost to Motorists of Congested Roadways

Congested roadways increase trip length and fuel consumption. Slower traffic, particularly during the morning and evening weekday rush hours, results in workers taking longer to reach work or get home and slows the movement of products and services. Based on travel trends, roadway capacity and population figures, TRIP estimated a per-motorist cost of congestion for the state of Colorado as well as the major urban areas based on travel trends, roadway capacity and population figures.

Traffic congestion costs each Denver area motorist an average of $865 each year in lost time and wasted fuel,[25] while each driver in Colorado Springs pays an additional $451.[26] The average cost of traffic congestion in lost time and wasted fuel for Colorado drivers not in Colorado's major urban areas is estimated at $125 per driver.[27] The traffic congestion cost to drivers in other urban areas of the state was determined by comparing urban freeway traffic levels in the state's largest urban areas with urban areas outside these regions. The total urban congestion cost for Colorado motorists is $1.24 billion. This is the cost of additional time and fuel wanted as a result of traffic congestion.

Colorado's urban congestion cost estimates are based on data from the Texas Transportation Institute's 2005 Urban Mobility report, which estimated congestion costs for the nation's largest 75 urban areas. In order to estimate congestion costs, TRIP obtained FHWA traffic count data per lane mile and estimated traffic congestion based on TTI findings correlating traffic counts per lane mile with congestion costs to motorists.

Total Cost of Colorado's Inadequate Roads

Inadequate highways and roads cost Colorado's motorists more than $3.3 billion every year because of additional traffic accidents, lost time and fuel, and increased wear and tear on their vehicles. The following is a breakdown of Colorado's annual total costs associated with driving on a roadway system that lacks optimal safety features and adequate capacity, and is in substandard condition.

Chart 3. Total Annual Costs Due to Driving on Colorado's Inadequate Roads

Safety	**$1.1 billion**
Congestion	**$1.24 billion**
Vehicle Operating Cost	**$955 million**
TOTAL	**$3.3 billion**

Source: TRIP analysis of Federal Highway Administration data, National Highway Traffic Safety Administration data and Texas Transportation Institute data.

The following is a breakdown of the annual costs per Colorado driver associated with driving on a roadway system that lacks optimal safety features and adequate capacity, and is in substandard condition.

Chart 4. Annual Costs per Driver Due to Driving on Colorado's Inadequate Roads

Costs per driver	Denver	Colorado Springs	Other Colorado Urban Areas
Safety	$368	$368	$368
Congestion	$865	$451	$125
VOC	$344	$284	$321
Total	$1,577	$1,103	$814

Source: TRIP analysis of Federal Highway Administration data, National Highway Traffic Safety Administration data and Texas Transportation Institute data.

"Heartburn Highways" in Colorado

TRIP has identified and ranked the 50 segments of roadway throughout Colorado that cause the greatest stress to the state's motorists because they have high levels of traffic congestion and occurrences of fatal and serious traffic crashes. This list is based on a combined index that measures and ranks accident and congestion rates on routes throughout the state.

Congested roads on the list (carrying a minimum of 20,000 vehicles per day) have been identified and ranked based on an index that includes the length of the congested section of road and the amount of traffic carried on the facility compared to the amount of vehicle travel that the road was designed to accommodate. For example, a highway listed with a volume/capacity (V/C) rate of 1.32 carries 32 percent more traffic than the amount of vehicles it was designed to carry. A highway with a V/C rate of .85 or above is considered congested.

Roads that present safety concerns have been identified using an index that measures fatal and injury causing accidents on the road (between 1999 and 2003) against the length of the road and the amount of traffic on the road. The safety survey was limited to roads that carry a minimum of 2,000 vehicles per day.

Roads with poor pavement on the list (carrying a minimum of 20,000 vehicles per day) have been identified and ranked based on an index that includes pavement conditions, amount of traffic and length.

Additional data pertaining to each route is listed in Appendices A and B.

The following is a list of the 50 Colorado roads that cause the state's motorists the greatest stress because they have the highest levels of congestion and the highest level of serious and fatal accidents:

Chart 5: Colorado routes with high rates of serious crashes, traffic congestion and pavement deterioration.

1. **US 36/Boulder Turnpike- State Highway 157 to I-25** (Boulder, Broomfield, Jefferson, Adams counties)- Safety/Congestion
2. **I-25 Valley Highway, Broadway to Alameda**(Denver County)- Safety
3. **US 287, Sheridan Boulevard to Pike Road in Longmont**(Boulder, Broomfield Counties)- Congestion
4. **I-25 Emerson Street to US 36**(Adams, Denver Counties)- Congestion
5. **Wadsworth Boulevard, US 285 (Hampden Avenue) to US 287** (Broomfield, Denver and Jefferson Counties)- Congestion
6. **State Highway 74 between Idledale and Morrison**(Jefferson County)- Safety
7. **US 285, State Highway 8 to I-25** (Arapahoe, Denver and Jefferson Counties)- Congestion
8. **C-470, Wadsworth Boulevard to Yosemite Street** (Arapahoe, Douglas and Jefferson Counties)- Congestion
9. **US 50 near the Junction of State Highway 149** (Gunnison County)- Safety
10. **I-25, 84th Avenue to State Highway 119** (Adams, Broomfield and Weld Counties)- Congestion
11. **I-25, State Highway 66 to north of Wellington** (Larimer and Weld Counties)- Pavement
12. **I-70, east of the Utah/Colorado Border** (Mesa County)- Safety
13. **I-25, Fillmore Street to State Highway 105 in Monument** (El Paso County)- Congestion

14. **US 85 near Rockport** (Weld County)- Safety
15. **State Highway 119 near Nederland** (Boulder County)- Safety
16. **I-25 near US 24** (El Paso County)- Safety
17. **I-225, Parker Road to I-70** (Arapahoe County)- Congestion
18. **US 160 in Alamosa** (Alamosa County)- Safety
19. **Sheridan Boulevard, I-70 to US 36** (Adams, Denver and Jefferson County)- Congestion
20. **US 285, Kenosha Pass** (Park County)- Safety
21. **Arapahoe Road, Peoria Street to Parker Road** (Arapahoe County)- Congestion
22. **I-270, I-76 to I-70** (Denver County)- Pavement
23. **I-70, Dumont to Beaver Brook Interchange** (Clear Creek and Jefferson County)- Congestion
24. **State Highway 121, US 6 to Colfax Avenue (US 40)** (Jefferson County)- Safety
25. **Parker Road, Hampden Avenue to Mississippi Avenue** (Arapahoe County)- Congestion
26. **US 6, east of US 40** (Clear Creek County)- Safety
27. **University Boulevard, C-470 to US 285** (Arapahoe and Douglas Counties)- Congestion
28. **Federal Boulevard (US 287), US 36 to Sheridan Boulevard** (Adams County)- Congestion
29. **Federal Boulevard (State Highway 88), 8th Avenue to US 285** (Denver, Arapahoe Counties)- Congestion
30. **I-76, Wadsworth Boulevard to Broadway** (Denver County)- Pavement
31. **US 50, west of State Highway 92** (Gunnison County)- Safety
32. **State Highway 44 (104th Avenue), US 85 to Colorado Boulevard** (Adams County)- Safety
33. **Hampden Avenue/Havana Street, I-25 to Parker Road** (Denver County)- Congestion
34. **US 285 near Shaffers Crossing** (Jefferson County)- Safety
35. **Belleview Avenue, Federal Boulevard to I-25** (Arapahoe County)- Congestion
36. **I-70, US 6 near Minturn east** (Eagle County)- Pavement
37. **State Highway 119, Lashley Street in Longmont to I-25** (Boulder and Weld Counties)- Congestion
38. **State Highway 2 (Colorado Boulevard), Evans Avenue to US 40 (Colfax Avenue)** (Denver County)- Congestion
39. **US 24 near Redcliff** (Eagle County)- Safety
40. **US 50 near State Highway 45 in Pueblo** (Pueblo County)- Congestion
41. **I-25, Pueblo north** (Pueblo County)- Pavement
42. **C-470, State Highway 8 (Morrison Road) to Bowles Avenue** (Jefferson County)- Congestion
43. **State Highway 119, Hover Road in Longmont to US 287** (Boulder County)- Congestion
44. **Kipling Street, 6th Avenue to I-70** (Jefferson County)- Congestion
45. **US 6 (6th Avenue), Kipling Street to Sheridan Boulevard** (Jefferson County)- Congestion
46. **I-70, Morrison Road to US 6 (6th Avenue)** (Jefferson County)- Congestion
47. **US 287 (Federal Boulevard), 23rd Avenue to 72nd Avenue** (Adams and Denver Counties)- Congestion
48. **US 160, west of South Fork** (Mineral County)- Safety

49. **State Highway 68 (Harmony Road), US 287 in Fort Collins to I-25** (Larimer County)- Congestion
50. **State Highway 72 near Ward** (Boulder County)- Safety

Source: TRIP analysis of CDOT data.

Conclusion

Reducing the stress and expense caused by inadequate roads in Colorado is a critical challenge. In addition to the stress they cause, inadequate roads and bridges cost Colorado motorists billions of dollars every year in wasted time and fuel, injuries and fatalities caused by traffic accidents, and wear and tear on their vehicles. Making needed improvements to Colorado's roads and highways is key to providing a safer, more efficient transportation system that will save motorists money and time, while improving the economic livelihood of the entire state and its residents.

A comprehensive plan for a safer, more efficient transportation system in Colorado must include projects that will increase safety, relieve congestion and improve road and bridge conditions.

Endnotes

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[24] Your Driving Costs. American Automobile Association. 2003.

[25] 2005 Urban Mobility Report. Texas Transportation Institute.
[26] Ibid.
[27] TRIP estimate made by comparing urban freeway traffic levels in the Denver and Colorado Springs areas to the rest of Colorado.

APPENDIX A

Rank	Highway	From	To	County	Injury Accidents 1999-2003	Fatal Accidents 1999-2003
		Foothills Parkway				
1	036B	ON SH 36 SE/O SH 157, BOULDER	ON SH 36 W/O I-25,MAINLINE BETWN 25 & BROAD	BOULDER, BROOMFIELD, JEFFERSON, ADAMS	998	12
2	25	ON I-25 BROADWAY INTERCHANGE	ON I-25 S/O SH 6, 6TH AVE INTERCHANGE	DENVER	421	7
6	74	ON SH 74 E/O GRAPEVINE RD, IDLEDALE	ON SH 74 W/O SH 8, MORRISON	JEFFERSON	47	3
9	50	ON SH 50 MILEPOST 121	ON SH 50 SE/O CO RD 867	GUNNISON	18	2
12	70	ON I-70 E/O RABBIT VALLEY INTERCHANGE CO RD L.60	ON I-70 MILEPOST 5.3	MESA	206	0
14	85	ON SH 85 E/O CO RD 122	ON SH 85 W/O CO RD 126	WELD	3	3
15	119	ON SH 119 NE/O CO RD 128P	ON SH 119 E/O CR 132, MAGNOLIA RD	BOULDER	63	3
16	25	ON I-25 SH 24, CIMARRON ST INTERCHANGE	ON I-25 N/O BIJOU ST INTERCHANGE	EL PASO	289	0
18	160	ON SH 160 W/O SH 285, ALAMOSA	ON SH 160 E/O SH 17, N/O ALAMOSA	ALAMOSA	105	0
20	285	ON SH 285 NE/O CR 77, JEFFERSON	ON SH 285 E/O CO RD 56	PARK	3	2
24	121	ON SH 121, WADSWORTH BLVD S/O SH 6, 6TH AVE	ON SH 121, WADSWORTH BLVD N/O 10TH AVE	JEFFERSON	134	2
26	6	ON SH 6 JCT SH 40 SE	ON SH 6 JCT SH 119, W/O WYE	CLEAR CREEK	32	3
31	50	ON SH 50 SE/O CO RD 24	ON SH 50 N/O CO RD 50E	GUNNISON	41	5
32	44	ON SH 44, 104TH AVE W/O SH 85	ON SH 44, 104TH AVE W/O COLORADO BLVD	ADAMS	126	0
34	285	ON SH 285 NE/O ELK CREEK RD, SHAFFERS CROSSING	ON SH 285 S/O FOXTON RD	JEFFERSON	80	8
39	24	ON SH 24 NW/O HIGH ST, CR 124A, RED CLIFF	ON SH 24 N/O HOMESTAKE LAKE RD	EAGLE	7	3
48	160	ON SH 160 NE/O CR 380	ON SH 160 MINERAL-RIO GRANDE COUNTY LINE	MINERAL	10	1
50	72	ON SH 72 SE/O CO RD 52	ON SH 72 WARD CITY LIMITS	BOULDER	6	2

APPENDIX B

Rank	Highway	From	To	County	Average V/C	Max V/C	ADT	Lanes
1	036B	ON SH 36 SE/O SH 157, BOULDER	ON SH 36 W/O I-25,MAINLINE BETWN 25 & BROAD	BOULDER, BROOMFIELD, JEFFERSON, ADAMS	1.03	**1.31**	86,900	4,6
3	287C	ON SH 287 W/O SHERIDAN BLVD	ON SH 287 N/O PIKE RD, LONGMONT	BOULDER, BROOMFIELD	1.31	**1.99**	34,900	4
4	025A	ON I-25 NW/O EMERSON ST RAMPS	ON I-25 N/O SH 36 INTERCHANGE	ADAMS, DENVER	0.97	**1.11**	204,700	6,8
5	121A	ON SH 121, WADSWORTH BLVD S/O SH 285, HAMPDEN AV	ON SH 121, WADSWORTH BLVD BYPASS S/O SH 287, BROOM	DENVER, BROOMFIELD, JEFFERSON	1.16	**1.74**	46,300	4,6
7	285D	ON SH 285 SW/O SH 8, S/O MORRISON	ON SH 285, HAMPDEN AVE W/O I-25	ARAPAHOE, DENVER, JEFFERSON	1.07	**1.58**	57,600	4
8	470A	ON SH 470 W/O SH 121, WADSWORTH BLVD	ON SH 470 E/O YOSEMITE ST W/O I-25	ARAPAHOE, DOUGLAS, JEFFERSON	1.04	**1.23**	73,100	4,6
10	025A	ON I-25 N/O 84TH AVE INTERCHANGE	ON I-25 S/O SH 119 INTERCHANGE	ADAMS, BROOMFIELD, WELD	1.02	**1.14**	105,800	4,6
13	025A	ON I-25 N/O SH 38, FILLMORE ST INTERCHANGE	ON I-25 S/O SH 105, MONUMENT	EL PASO	0.97	**1.20**	75,800	4
17	225A	ON I-225 N/O SH 83, PARKER RD	ON I-225 S/O I-70	ARAPAHOE	1.09	**1.17**	103,300	4
19	095A	ON SH 95, SHERIDAN BLVD S/O I-70	ON SH 95, SHERIDAN BLVD S/O SH 36	ADAMS, DENVER, JEFFERSON	1.17	**1.34**	41,500	4
21	088B	ON SH 88, ARAPAHOE RD W/O PEORIA ST	ON SH 88, ARAPAHOE RD W/O SH 83, PARKER RD	ARAPAHOE	1.20	**1.36**	56,300	6
23	070A	ON I-70 E/O DUMONT INTERCHANGE	ON I-70 E/O CR 65, BEAVER BROOK INTERCHANGE	CLEAR CREEK, JEFFERSON	0.97	**1.25**	41,100	4
25	083A	ON SH 83, PARKER RD S/O HAMPDEN AVE	ON SH 83, PARKER RD NW/O MISSISSIPPI AVE	ARAPAHOE	1.06	**1.31**	48,300	4,6
27	177A	ON SH 177, UNIVERSITY BLVD N/O SH 470	ON SH 177, UNIV BLVD S/O SH 285, (AT SUNSET DR)	ARAPAHOE, DOUGLAS	1.14	**1.27**	38,600	4
28	287C	ON SH 287, FEDERAL BLVD N/O SH 36, N/O COTTONWOOD D	ON SH 287 E/O SHERIDAN BLVD	ADAMS	1.08	**1.37**	34,900	4
29	088A	ON SH 88, FEDERAL BLVD N/O 8TH AVE	ON SH 88, FEDERAL BLVD N/O SH 285	DENVER, ARAPAHOE	1.09	**1.29**	37,600	4
33	030A	ON SH 30, HAMPDEN AVE E/O I-25	ON SH 30, HAVANA ST S/O SH 83, PARKER RD	DENVER	1.14	**1.23**	56,000	6
35	088A	ON SH 88, BELLEVIEW AVE E/O FEDERAL BLVD	ON SH 88, BELLEVIEW AVE W/O I-25	ARAPAHOE	1.03	**1.22**	33,100	4
37	119C	ON 3RD AVE E/O LASHLEY ST, LONGMONT	ON SH 119 W/O I-25, W/O I-25 W FRONTAGE RD	BOULDER, WELD	1.05	**1.21**	29,800	4
38	002A	ON SH 2, COLO BLVD S/O EVANS AVE	ON SH 2, COLO BLVD S/O SH 40, COLFAX AVE	DENVER	0.99	**1.20**	54,700	6
40	050A	ON SH 50 W/O SH 45, PUEBLO	ON SH 50 E/O SH 45, PUEBLO	PUEBLO	1.19	**1.19**	40,300	4
42	470A	ON SH 470 S/O SH 8, MORRISON RD	ON SH 470 S/O BOWLES AVE	JEFFERSON	1.02	**1.17**	61,200	4
43	119B	ON SH 119 SW/O HOVER RD, LONGMONT	ON SH 119 W/O S JCT SH 287, LONGMONT	BOULDER	1.10	**1.21**	33,100	4
44	391A	ON SH 391, KIPLING ST N/O 6TH AVE N FRONTAGE RD	ON SH 391, KIPLING ST S/O I-70 (AT CO RD 193)	JEFFERSON	1.04	**1.15**	37,900	4
45	006G	ON SH 6, 6TH AVE E/O SH 391, KIPLING ST, LAKEWOOD	ON SH 6, 6TH AVE E/O SH 95, SHERIDAN BLVD	JEFFERSON	0.99	**1.03**	115525	6
46	070A	ON I-70 SW/O SH 26 & SH 40	ON I-70 S/O SH 6, 6TH AVE	JEFFERSON	1.03	**1.07**	66800	6
47	287C	ON SH 287, FEDERAL BLVD N/O 23RD AVE	ON SH 287, FEDERAL BLVD S/O 72ND AVE	ADAMS, DENVER	1.02	**1.16**	35,200	4
49	068A	ON SH 68 E/O SH 287, FT COLLINS	ON SH 68, 'I-25 INTERCHANGE (HARMONY ROAD)	LARIMER	1.05	**1.12**	33,000	4