



AGGREGATES INDUSTRY & TRANSPORTATION FUNDING

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Educational Outreach Committee Chair

*Strength
in Numbers*

Presentation Agenda

- Aggregates in our Life
- Colorado transportation infrastructure condition
- Importance of transportation funding
- Current funding mechanisms
- Proposed funding mechanisms
- Actions moving forward

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Colorado Stone, Sand & Gravel Association

- Representing the majority of the construction aggregate producers in Colorado
- Aligned with NSSGA regarding lobbying, environmental issues, etc.
- 4 main components:
 - Governmental Affairs
 - Land Use & Environment
 - Safety (part 46 Training program with DNR)
 - Education and Community Outreach



Aggregate Demand

- U.S. annual production is in excess of 2.25 billion tons.
- Consumption of aggregates:
 - 10 tons per person per year (NSSGA)
- In 2014 Colorado produced 52.7 million tons of aggregate (USGS)



Economic Impact

- Colorado aggregate production employment (Phoenix Center)
 - Directly Employment: 1,555
 - In-Direct Employment: 3,092
- Average earning per industry job were \$75,129 in 2016. Well above national average of \$61,586 (Phoenix Center)
- Direct tax revenue (Tax Revenue)
 - \$6385 on average per employee annually.
 - Direct employment contributed \$9.9 million in 2016.

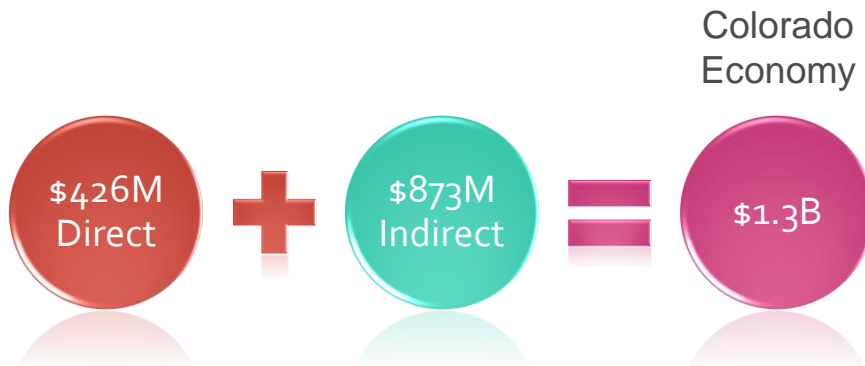
Table 4. Top Ten Occupations in Industry Group

SOC	Description	Employment (2016)	% of Jobs	Median Hourly Wage
47-2073	Operating Engineers/Other Const. Equip. Operators	6,804	11.0%	\$22.60
53-3032	Heavy and Tractor-Trailer Truck Drivers	6,396	10.3%	\$19.32
53-7032	Excavating and Loading Machine and Dragline Operators	4,949	8.0%	\$20.34
51-9021	Crushing, Grinding, Polishing Setters, Operators, ...	2,461	4.0%	\$16.56
47-5041	Continuous Mining Machine Operators	2,222	3.6%	\$24.11
47-5051	Rock Splitters, Quarry	2,072	3.3%	\$16.40
47-1011	First-Line Supervisors of Const. Trades and Extraction	1,963	3.2%	\$28.31
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	1,829	2.9%	\$23.37
11-1021	General and Operations Managers	1,744	2.8%	\$48.04
43-9061	Office Clerks, General	1,742	2.8%	\$14.54



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Aggregate Industry Contribution

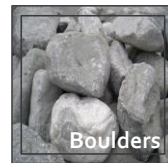
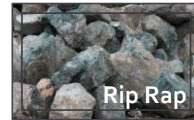


Source: Phoenix Center for Advanced Legal & Economic Policy Studies: *The Economic Impact of the Natural Aggregates Industry: A National, State, and County Analysis*

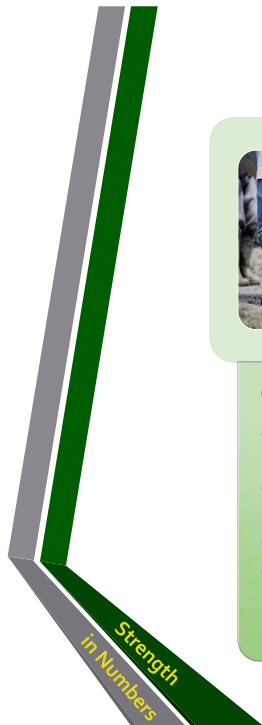


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Aggregate Products



Aggregate Utilization



Concrete

- 80% Aggregate
- Floors and walls
- Concrete pipe
- Tilt Up and Precast Structures

Asphalt

- 95% Aggregate
- Roads
- Shingles

Drainage

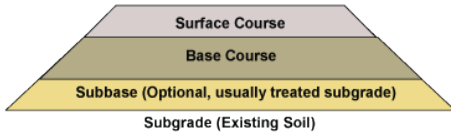
- French Drains
- Erosion Control
- Under Drainage, golf course, sport fields

Other

- Armor Stone
- Base for foundations and roads
- Utilities
- Building stone and block

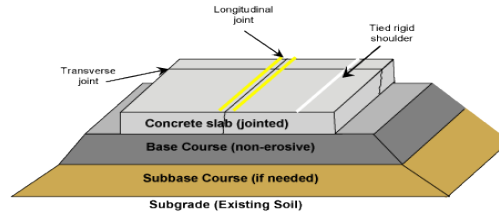


Roads and Highways

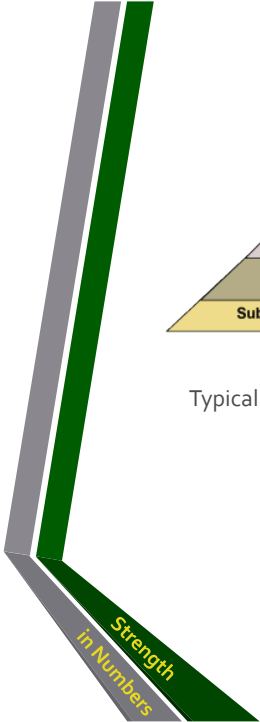


Typical Asphalt Road

Interstate requires 40,000 tons of aggregate per one lane mile



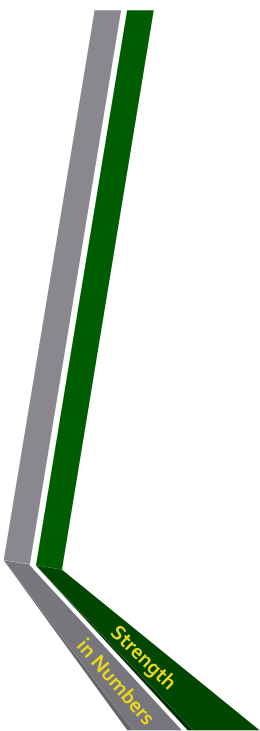
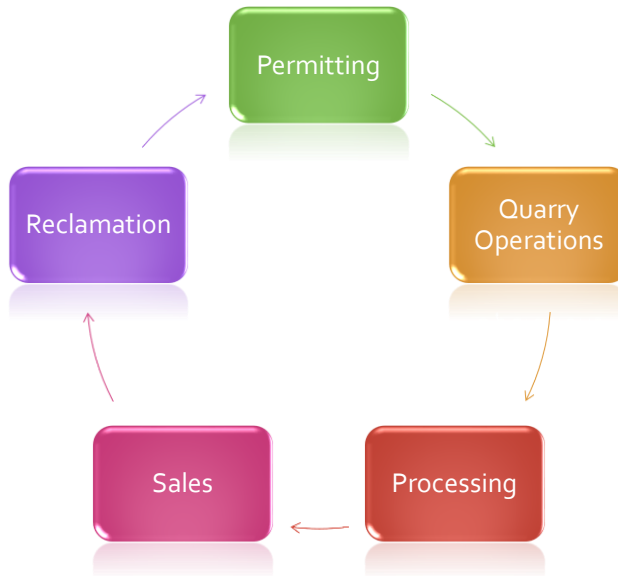
Typical Concrete Road



Source: Wikipedia.com

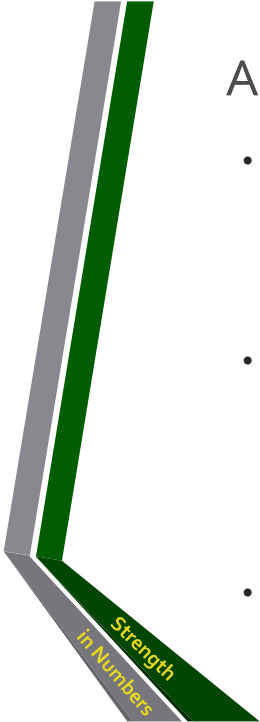
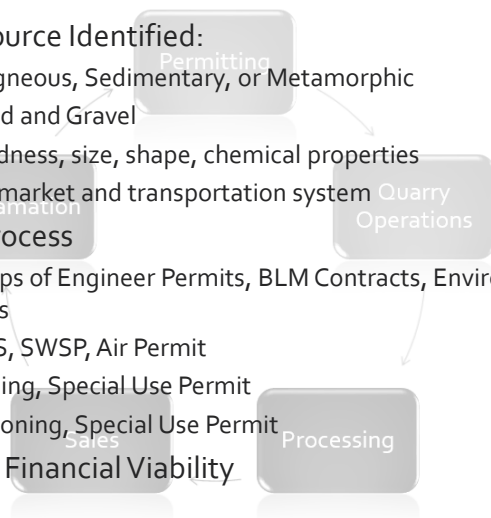


Aggregate Production Cycle



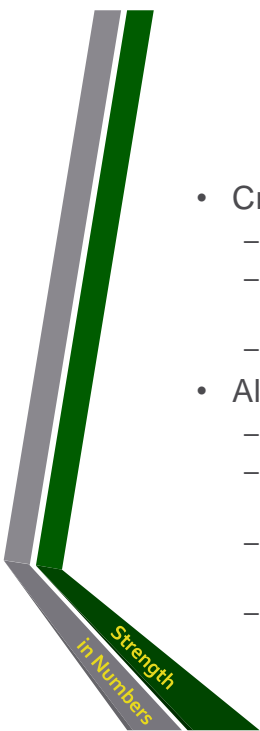
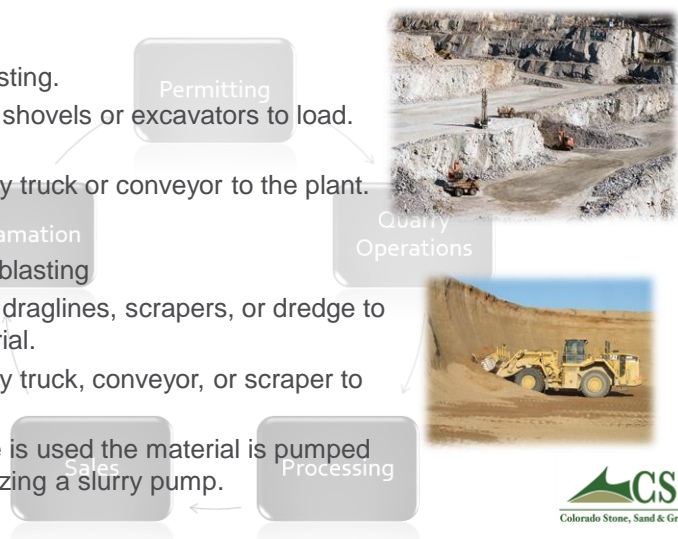
Aggregate Production Cycle - Permitting

- Aggregate Source Identified:
 - Hard rock: Igneous, Sedimentary, or Metamorphic
 - Alluvial: Sand and Gravel
 - Quality: hardness, size, shape, chemical properties
 - Location to market and transportation system
- Permitting Process
 - Federal: Corps of Engineer Permits, BLM Contracts, Environmental Assessments
 - State: DRMS, SWSP, Air Permit
 - County: Zoning, Special Use Permit
 - Municipal: Zoning, Special Use Permit
- Evaluation of Financial Viability



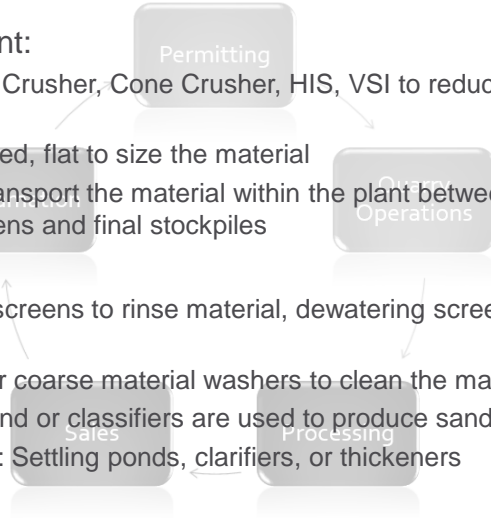
Aggregate Production Cycle – Quarry Operations

- Crushed Stone:
 - Drilling and blasting.
 - Utilize loaders, shovels or excavators to load material.
 - Haul material by truck or conveyor to the plant.
- Alluvial
 - No drilling and blasting
 - Utilize loaders, draglines, scrapers, or dredge to excavate material.
 - Haul material by truck, conveyor, or scraper to the plant.
 - When a dredge is used the material is pumped to the plant utilizing a slurry pump.



Aggregate Production Cycle - Processing

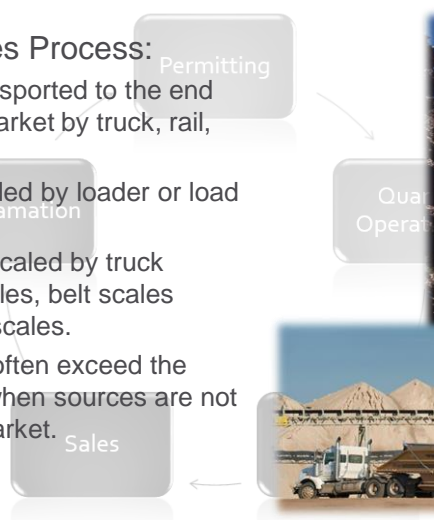
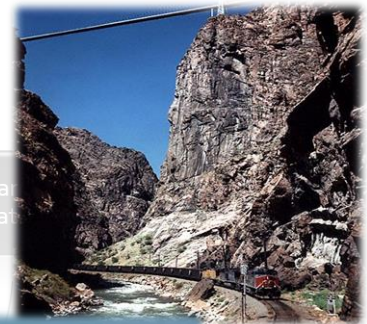
- Processing Plant:
 - Crushers: Jaw Crusher, Cone Crusher, HSI, VSI to reduce the size of the material
 - Screens: Inclined, flat to size the material
 - Conveyors: Transport the material within the plant between crushers, screens and final stockpiles
- Wash Plant:
 - Screens: Wet screens to rinse material, dewatering screens to remove water
 - Log washers or coarse material washers to clean the material
 - Sand screws and or classifiers are used to produce sand
 - Recycle Water: Settling ponds, clarifiers, or thickeners



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Aggregate Production Cycle - Sales

- Aggregate Sales Process:
 - Material is transported to the end customer or market by truck, rail, barge, or ship.
 - Material is loaded by loader or load out bins.
 - Materials are scaled by truck scales, rail scales, belt scales and/or loader scales.
 - Freight Costs often exceed the material cost when sources are not close to the market.



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Aggregate Production Cycle - Reclamation

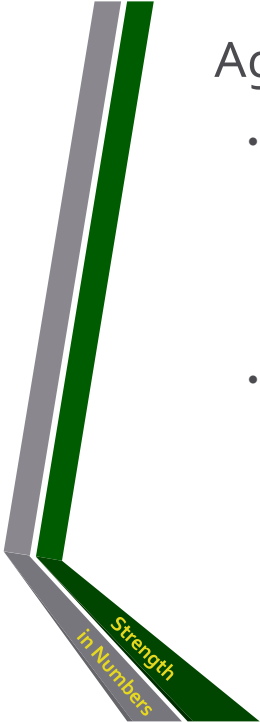
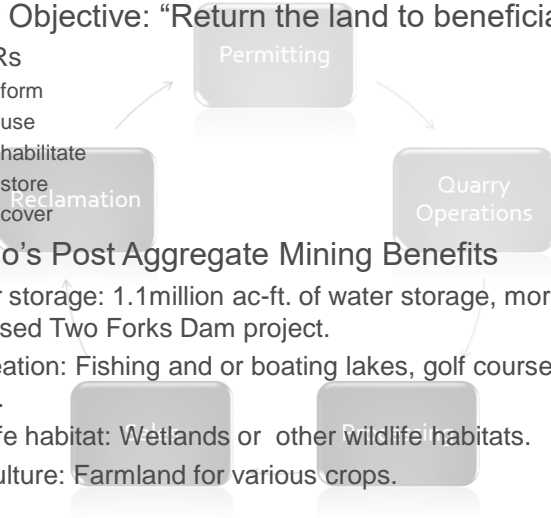
- Primary Objective: "Return the land to beneficial use"

- Five Rs

- Reform
- Reuse
- Rehabilitate
- Restore
- Recover

- Colorado's Post Aggregate Mining Benefits

- Water storage: 1.1 million ac-ft. of water storage, more than the proposed Two Forks Dam project.
- Recreation: Fishing and or boating lakes, golf course, and parks.
- Wildlife habitat: Wetlands or other wildlife habitats.
- Agriculture: Farmland for various crops.



Calhoun Eaton Site – Eagle County

During Mining



After Reclamation



Transportation Infrastructure in Colorado



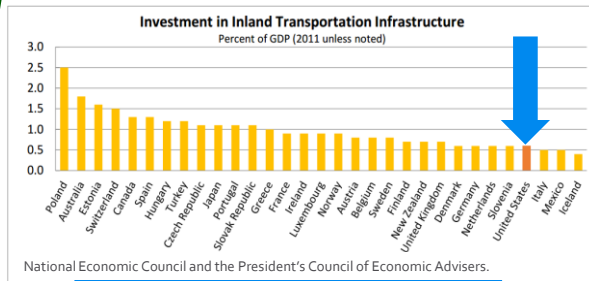
The basic equipment and structures, such as roads and bridges, that are needed for a country, region, or organization to function properly



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Global Comparison

28th in Transportation Investment



National Economic Council and the President's Council of Economic Advisers.

16th in Quality of Roads



The Global Competitiveness Report
2014-2015
2.02 Quality of roads

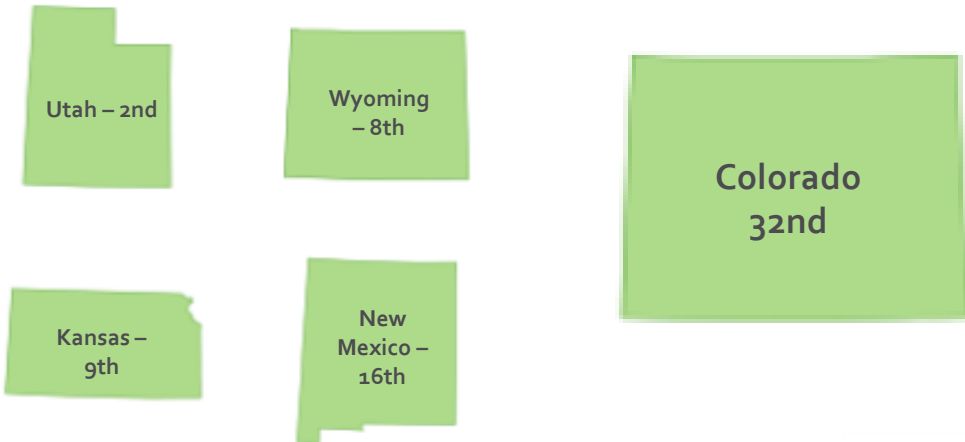
RANK	COUNTRY/ECONOMY	VALUE	1	MEAN 4.0	7
1	United Arab Emirates	6.6	██████████	██████████	██████████
2	Portugal	6.3	██████████	██████████	██████████
3	Austria	6.3	██████████	██████████	██████████
4	France	6.2	██████████	██████████	██████████
5	Netherlands	6.1	██████████	██████████	██████████
6	Singapore	6.1	██████████	██████████	██████████
7	Hong Kong SAR	6.0	██████████	██████████	██████████
8	Oman	6.0	██████████	██████████	██████████
9	Switzerland	6.0	██████████	██████████	██████████
10	Japan	5.9	██████████	██████████	██████████
11	Spain	5.9	██████████	██████████	██████████
12	Taiwan, China	5.9	██████████	██████████	██████████
13	Germany	5.9	██████████	██████████	██████████
14	Finland	5.9	██████████	██████████	██████████
15	Luxembourg	5.7	██████████	██████████	██████████
16	United States	5.7	██████████	██████████	██████████
17	Croatia	5.6	██████████	██████████	██████████
18	Korea, Rep.	5.6	██████████	██████████	██████████
19	Malaysia	5.6	██████████	██████████	██████████
20	Sweden	5.5	██████████	██████████	██████████
21	Denmark	5.4	██████████	██████████	██████████
22	Bahrain	5.4	██████████	██████████	██████████
23	Canada	5.3	██████████	██████████	██████████
24	Cyprus	5.3	██████████	██████████	██████████
25	Ireland	5.3	██████████	██████████	██████████



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We Are Not Keeping Pace with Our Neighbors

2014 FHWA Pavement Condition:



Source: FHWA Highway Statistics

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Colorado Road Conditions Continue to Decline

35 percent of Colorado's major urban roads are in poor condition:

41 percent in Colorado Springs area in poor condition

43 percent in the Denver urban area

12 percent of Colorado's major mountain and outstate roads have pavements in poor condition:

44 percent are mediocre or fair

Poor Condition Defined
Signs of deterioration, including rutting, cracks and potholes. In some cases, these roads can be resurfaced, but often are too deteriorated and must be reconstructed.



Source: TRIP

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Road Conditions Impact All Coloradans

- Fatality rate on Colorado's rural roads and non-interstate highways is **more than double** the rate on all other roads in the state
- Driving on poor roads costs Colorado motorists a total of **\$2.2B annually in extra vehicle operating costs**
 - Costs include accelerated vehicle depreciation, additional repair costs and increased fuel consumption and tire wear

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Source: TRIP



Why is transportation funding important?

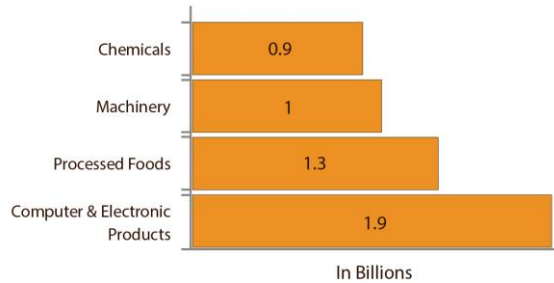
- The ability to efficiently move goods and services is critical for the U.S. to maintain our position as a world leader
- Interstate commerce is vital to national trade
- Spending on transportation strengthens the economy and boosts job growth
- Outdated transportation infrastructure is a growing risk to public safety
- Colorado's projected population growth and what it means for statewide transportation

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Interstate commerce → Vital to Colorado trade

Colorado Exports in 2015



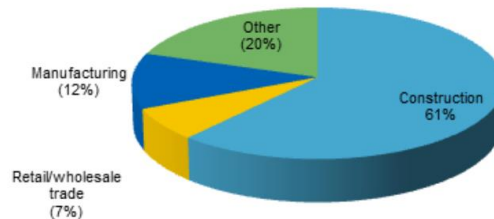
- Trade supported **733,900 jobs in Colorado in 2013, or 21% of total jobs.** (U.S. Global Leadership Coalition)
- **Agricultural exports totaled over \$1.7 billion** in 2014. (U.S. Global Leadership Coalition)
- Colorado is an ideal hub for interstate and international commerce with **major national crossroads for Interstate Highways I-25, I-76, and I-70.**



Infrastructure spending strengthens the national economy, boosts job growth

- **\$1.3 billion dollar investment in infrastructure = 29,000 construction jobs** + jobs to other infrastructure-related industries
- **Adds \$2.0 billion to real economic growth**
- Increased growth and more **job gains long after the project ended**

Distribution of Jobs Created by Infrastructure Investment:



Source: U.S. Infrastructure Investment: A Chance To Reap More Than We Sow
Standards & Poor's Rating Service



If we stay this course, we are headed for even slower traffic, longer commutes, less safe roads and bridges



CSSGA
Colorado Stone, Sand & Gravel Association

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Trillion Dollar Infrastructure Plan



- Currently no concrete plan has been set forth
- Would require bi-partisan support in a deeply divided political climate
- Impact on Colorado infrastructure funding is unclear

CSSGA
Colorado Stone, Sand & Gravel Association

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Gas Tax No Longer Sustainable Funding Source



40.4 cents per gallon

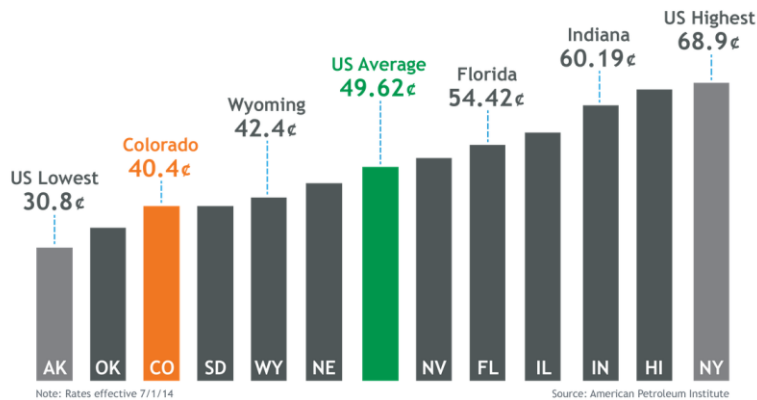
- 22 cents to state
- 18.4 cents to feds

- Federal and state gas taxes have been fixed for more than two decades
- Revenue has steadily declined as Coloradans burn less gasoline in more fuel-efficient cars
- **CDOT is taking in 30 percent less money** from gas taxes now than it did in 2000
(Source: Inside Energy)

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Federal and State Gas Tax



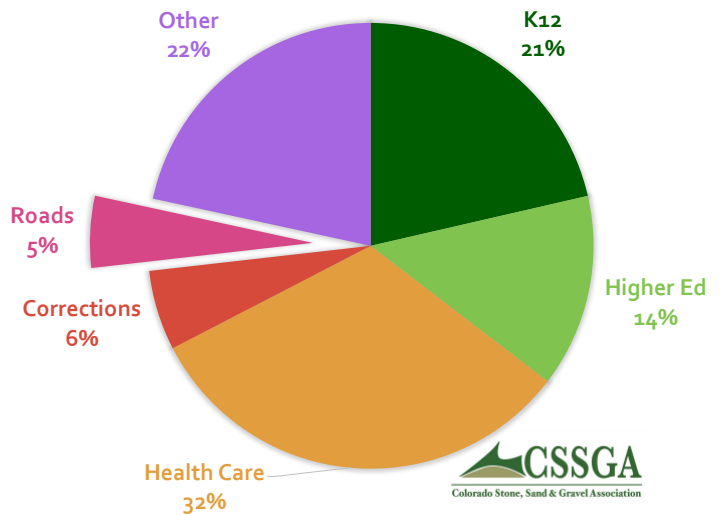
Colorado ranks 33rd in the U.S. for gas tax per gallon. Despite costly maintenance due to mountain terrain and extreme weather – our tax is below average. We pay less than Wyoming and South Dakota. (CDOTa)

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In Colorado Transportation Not A General Fund Reality

- **Transportation** just over 5 percent in FY2015-16.
- Health care represents 32 percent of the budget
- K-12 at 21.4 percent and higher education at 14 percent
- Corrections at 5.8 percent.

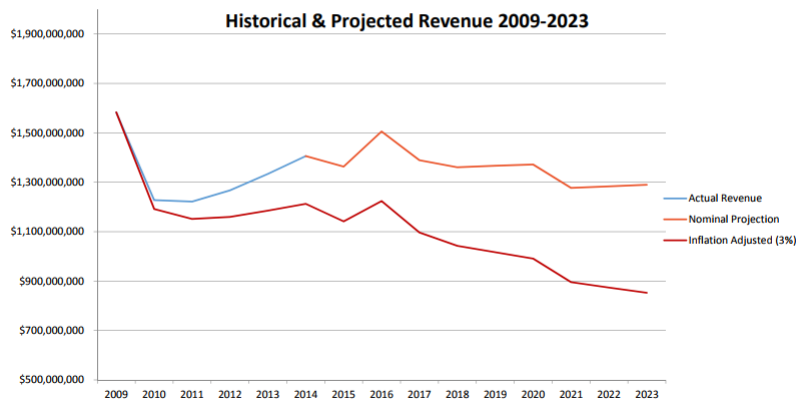


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CDOT Revenue Projection – 2009 to 2023



Declining Revenue



Source: CDOT(c)



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Proposed Funding Mechanisms

- Increase gas tax
- Vehicle Miles Traveled (VMT) tax
- Toll roads
- Public Private Partnerships (P3)
- Sales Tax Increase

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Now what?

- Educate your family, neighbors, coworkers, and friends
- Think about combinations of solutions for a long-term fix for transportation funding
- Support funding mechanisms when they appear on your ballot

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- Tax Revenue. Based on the average yearly salary of an aggregate mining employee according to Phoenix Report (\$75,129) multiplied by Employee paid State Tax (3.2%), Employer paid Unemployment Tax (3.1%) and Employer paid Workers Comp (2.2%).
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