



PUBLIC WORKS-ROAD & BRIDGE CAPITAL & MAINTENANCE JULY - 2015

PUBLIC WORKS / ROAD & BRIDGE PROJECT HISTORY :

- La Plata County maintains 653 miles of road. Approximately 222 miles are paved and the remaining 431 miles are gravel. The County has experienced significant residential growth over the past forty years. That growth has been built in large part on rural “farm to market” gravel roads that historically accommodated on average less than two-hundred average daily trips (ADT). Increased traffic on gravel roads has at least two significant impacts including increased maintenance cost and a potential for an increased incident of accidents.

- **Gravel roads** are the lowest service provided to the traveling public and in many cases the volume of traffic is so low paving is not economically feasible. The average daily traffic used to justify paving is typically four (400) to five hundred (500) vehicles per day depending on a number of factors including, climate, type and size of vehicles, and speeds traveled. To mitigate road dust and minimize maintenance costs, the County implemented a program in the 1980's to surface many of our primitive roads with gravel and also treated the higher ADT gravel roads with magnesium chloride, a road stabilizer and dust suppressant.

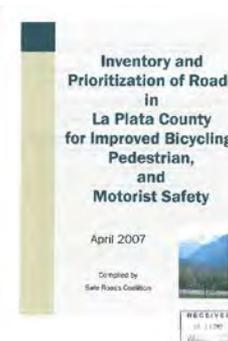
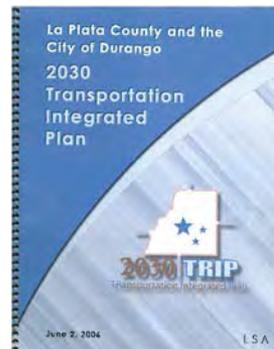
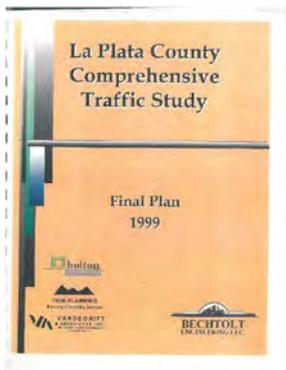


CR 228 – West End – Approx. 1,000 ADT



Typical Early Farm to Market County Road

- The gravel road maintenance program continues to meet the County's need on most lower ADT roads, however a number of farm to market roads have seen significant growth in traffic and now serve as collector roads with close to 1,000 ADT.
- Improved design standards for paved roads, increased traffic, and multi-modal uses, also drive the need for wider paved roads with improved geometry at significant cost.
- The County has completed a number of studies, including transportation studies that identified existing and future needs and system deficiencies, and surface evaluation reports for both paved and gravel roads that rate the condition of the surface and identifies and prioritize future road maintenance. These studies have in part helped guide the County's Public Works capital improvement program, however most capital projects for at least the past fifteen to twenty years have relied in great part on funding from State and Federal grants.



- Most road reconstruction projects have been funded in part with Energy Impact grants (EIG), however some have also been funded with the Gaming grants, although Gaming grants were used mostly for asphalt overlay projects. Numerous County bridges have been replaced using both Energy Impact grants, and Federal “Off-System Bridges” grants.
- During the thirteen year period from 2002 to 2014 the County invested approximately \$40,700,000 in capital road and bridge projects, or an average of \$3,100,000 per year. During that period, approximately \$16,300,000 or 40% was funded by grants.



County Road 213 – 2009 EIG



County Road 234 – 2008 EIG

IDENTIFYING PUBLIC WORKS CAPITAL PROJECTS AND FUTURE FUNDING NEEDS:

- The County currently has a backlog of capital Public Works projects, in part the result of rapid growth in the past that exceeded our ability to fund needed improvements.
- The County has over the past twenty years reconstructed many County Roads, most notably County Roads 240, 234, and 213, and most major reconstruction projects incorporate the latest design standards including improvements to both the horizontal and vertical alignment and paved shoulders. The cost of major reconstruction projects can vary from \$750,000 to over \$1,500,000 per mile depending on the type of construction and other design constraints which may include, retaining walls, major drainage improvements, and in some cases significant utility relocations.

Another significant challenge is the lack of a consistent right-of-way or road easement. Many of our rights-of-way are considered “prescriptive easements” or rights established by use over time and in many cases are just wide enough to accommodate the historic road width.

- A chip seal surface treatment, is typically considered road maintenance and recommended on average every seven years to ten years to extend the service life of asphalt pavement. This intermediate surface treatment maintains surface friction and helps to seal micro cracks that if left unsealed can expand through freeze thaw cycles leading to potholes and degradation of the pavement and road base.
- Resurfacing or overlaying a paved road with two to three inches or more of asphalt pavement is considered a capital project usually required every twenty to thirty years to add strength and prolong the pavement life, this can also restore the ride quality, surface drainage, and restore the skid-resistance to a pavement polished by traffic. The cost of typical asphalt overlays is in the range of \$350,000 to \$400,000 per mile.
- When improved, gravel roads may be surfaced with a chip seal or asphalt pavement. Chip sealing a gravel road can provide a durable all weather surface depending on the volume and type of traffic for significantly less cost than conventional asphalt paving and may be sufficient for a long term or as an intermediate improvement.

BRIDGES

- The County has forty-nine “off-system” bridges, defined as having a span of twenty feet or greater. The inspection of most off-system bridges are conducted every two years funded by a Federal Highway Administration program administered by the Colorado Department of Transportation.
- It is usually apparent when a bridge starts to decline and load posting (weight restrictions) is one obvious sign of an aging or non-maintained bridge. Narrow bridge decks with minimal or no shoulders are another indicator of an older “functionally obsolete” bridge.



Lightner Creek Bridge – 2013
FHWA Bridge Grant



CR 527 Saul's Creek Bridge – 2008



New Saul's Creek Bridge – 2009
FHWA & Energy Impact Grant

- **Roads** are usually less noticeable as they start to fail and in many cases may not be apparent until pot holes appear and by then the road most likely needs to be reconstructed. As the volume of traffic increases on a road, the level of service may decline as the result of narrow lanes, poor geometry limiting sight distance, and narrow or no shoulders providing minimal opportunity to recover if a vehicle momentarily leaves the travel lane. Transportation studies are typically conducted every five to seven years in growing communities and are used in part to identify existing and future levels of service and to identify and prioritize projects that will help to safely accommodate existing and future traffic.
- La Plata County has completed a number of studies over the past fifteen years providing us with a fairly good understanding of our infrastructure deficiencies and needed safety improvements to accommodate current traffic and future growth. Our challenge is to determine how to fund future improvements as well as continue to fund maintenance of existing infrastructure. The current draft of the 2015 to 2024 (Ten-Year) Capital Improvement Plan for the Organizational Development Initiative (ODI) identified just over \$60,000,000 of capital Public Works projects or an average of \$6,000,000 per year. Realizing funding at that level with existing revenues is not possible, our next challenge will be to further prioritize these projects based on the level of funding that can be supported.

- The June 2, 2006 - 2030 Transportation Integrated Plan (2030 TRIP) identified: \$82,064,000 of road improvements, including \$6,475,000 of Intersection improvements for a twenty-five year project total of \$88,539,000, or \$3,541,560 per year average.
- The 1999 Comprehensive Traffic Study identified twenty years of improvements including; \$31,460,000 in efficiency improvements, \$195,900,000 capacity road improvements, \$12,800,000 major safety improvements, for a total estimate of \$240,160,000. Realizing funding limitations, this amount was "pared down" to \$62,600,000 to meet "anticipated funding limits". Again providing an annual average of \$3,130,000.

PUBLIC WORKS 2015 – 2024 CAPITAL IMPROVEMENT PLAN – ROAD PROJECTS

Organizational Development Initiative (ODI) 2015 - 2024 Capital Improvement Plan - Transportation Projects													
Proj ID	Ten Year Road Reconstruction	length miles	Est. 10-yr Total	5 YEAR CIP					10 YEAR CIP				
				2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
CR 251 / CR 250 (Urban-Improv)*	0.7	\$2,500,000	\$1,000,000	\$1,500,000									
CR 233 - East end to CR 234	0.8	\$3,500,000		\$3,500,000									
CR 141, CR 142 west to CR 210	0.6	\$450,000			\$450,000								
CR 141 , CR 210 west to CR 125 (see intersections)	0.6	\$450,000				\$450,000							
Hermosa Meadows Rd (9R & HOA partner)	0.4	\$810,000			\$810,000								
CR 301 - CR 302 south to CR 300, Gravel Pit	1.0	\$700,000				\$700,000							
CR 517 Urban Improvements	0.8	\$1,600,000				\$1,600,000							
CR 228 West End - CR 234 to pavement**	1.5	\$1,600,000					\$1,600,000						
CR 234, CR 237 to CR 225 (see Bridge proj.)	1.3	\$3,050,000						\$3,050,000					
CR 214 gravel to pavement**	0.8	\$574,000							\$574,000				
CR 234, CR 228 to US 160 (CR 234A-Inter)	0.9	\$1,750,000							\$1,750,000				
CR 214 Reconstruct Slip Area - Ret. Walls/Drains	0.1	\$400,000								\$400,000			
CR 509, from CR 510 north to Dry Creek**	0.3	\$240,000								\$240,000			
CR 218 - Sunny side Elementary School - Urban	0.2	\$350,000								\$350,000			
CR 120 (GCC - Traffic) Paved section*	2.5	\$1,743,000								\$1,743,000			
CR 510 - East end, CR 513 to 509**	6.1	\$5,000,000									\$5,000,000		
CR 120 (GCC - Traffic) Gravel Section**	4.0	\$2,800,000										\$2,800,000	
Ten Year Total	22.4	\$27,517,000	\$1,000,000	\$5,000,000	\$1,260,000	\$2,750,000	\$1,600,000	\$3,050,000	\$2,324,000	\$2,733,000	\$5,000,000	\$2,800,000	
Potential Road Projects beyond 10 years													
CR 204-Junction Creek Rd. (2 year project)	2.6	\$4,400,000											
CR 125 - CR 141 to Srfch, Pave of double pin	3.8	\$2,660,000											
CR 141 US 160 to CR 142 - ret. Walls	3.1	\$4,650,000											
CR 234 - CR 240 south to "Brown's Drop-off"	0.8	\$560,000											
CR 309A Srfch to CR 318**	4.4	\$3,101,000											
CR 225 Srfch to CR 234** major	1.8	\$2,625,000											
CR 220 US 550 to CR 301**	1.3	\$896,000											
CR 220 CR 301 to SH 172**	1.4	\$980,000											
CR 228 to CR 502**	3.3	\$2,338,000											
CR 311 CR 314 to SH 172**	2.5	\$1,778,000											
CR 502 CR 505 to CR 504**	2.8	\$1,925,000											
CR 301 - CR 220 south to CR 302	3.1	\$2,191,000											
CR 509 - south to SH 172	3.2	\$2,240,000											
CR 513 - SH 172 to CR 510	2.5	\$1,736,000											
CR 330 - SH 151 to State Line	4.5	\$3,150,000											
Road Reconstruction Total - beyond 10 Years	63.5	\$35,230,000											

Notes: Srfch = surface change, usually asphalt to gravel.

The estimated project costs does not include identification of, funding partners, grants, or use of other available funds.

Project dates, year scheduled is based on previous 5 year CIP's, 2012 Asphalt Road PASER, the 2013 Gravel Road PASER, and in some cases a best guess where other funding partners may be involved.

County Road 251 (aka 32nd Street) Will not be scheduled until a formal agreement is reached between City and County on cost share and annexation. Date shown is best estimate.

Hermosa Meadows Road project dependent on County agreements with stakeholders prior to design and construction. Total cost shown, county cost estm. at 1/3 total. Date shown is best estimate.

Project costs in 2014 dollars, not adjusted for inflation. "Bikeable shoulders" will be included in reconstruction of arterial and collector roads.

Some reconstruction projects identified as possible Full Depth Reclamation (FDR) est. at \$700,000 / mile. Major reconstruction est. at \$1,500,000 / mile. Actual est. used where available.

*Projects identified in the 2012 Asphalt PASER (5-year plan) - reconstructed asphalt road projects - projects dates as suggested in Asphalt PASER

** Projects identified in the 2013 Gravel PASER - gravel road to paved road projects - project dates not identified in the Gravel PASER



PUBLIC WORKS 2015 - 2024 CAPITAL IMPROVEMENT PLAN - ASPHALT OVERLAYS

Organizational Development Initiative (ODI) 2015 - 2024 Capital Improvement Plan - Transportation Projects													
Proj. ID	Ten Year Paving - Overlay Projects	length miles	Estimated Total	5 YEAR CIP					10 YEAR CIP				
				2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
	CR 502 - US 160 to CR 505, PR 4	2.3	\$784,000	\$784,000									
	CR 203 - US 550 2.36 miles north, PR 4	2.4	\$850,000		\$850,000								
	CR 252 - US 550 to CR 250, PR 4	0.9	\$280,000		\$280,000								
	CR 305 srfch to CR 302, PR 4	0.7	\$310,000		\$310,000								
	CR 203 - 2.36 miles north of 550 to CR 252, PR 4	2.4	\$890,000			\$890,000							
	CR 250 - CR 254 to CR 252, PR 4 (spot paving 4 mi.)	6.1	\$1,360,000			\$1,360,000							
	CR 222 - Ranchos Florida to CR 510, PR 4	0.6	\$180,000				\$180,000						
	CR 210 - CR 141 to CR 212. Lake Impact-cost share	4.0	\$1,600,000				\$1,600,000						
	CR 203 - CR 252 to US 550, PR 5	2.1	\$820,000					\$820,000					
	CR 142 - CR 141 to Sprg Road, PR 5	0.7	\$260,000					\$260,000					
	CR 318 - CR 311 to J Road, PR 5	2.5	\$1,040,000						\$1,040,000				
	CR 240 - CR 234 to 240a, PR 5 - 6	2.1	\$662,000						\$662,000				
	CR 240 - CR 245 to 243, PR 6	2.3	\$860,000							\$860,000			
	CR 141 - CR 126 to CR 136, PR 6	2.0	\$740,000								\$740,000		
	CR 240 - 246 to 245, PR 6	2.0	\$730,000									\$730,000	
	CR 141 - SH 140 to CR 126, PR 6	1.4	\$530,000										\$530,000
	Ten Year Total	34.3	\$11,896,000	\$784,000	\$1,440,000	\$2,250,000	\$1,780,000	\$1,080,000	\$1,702,000	\$860,000	\$740,000	\$730,000	\$530,000
	Potential Overlay Projects beyond 10 years												
	CR 120 West - CR 122 to CR 116	1.0	\$350,000										
	CR 501 - Chamber to CR 510A	4.0	\$1,400,000										
	CR 243 End of asphalt to USFS	3.5	\$1,225,000										
	CR 309 - SH 172 to CR 309A	1.4	\$472,500										
	Overlay Total - beyond 10 Years		\$3,447,500										
Notes: Srfch = surface change, usually asphalt to gravel. PR = PASER Rating, scale 1 to 10, with 10 = new road.													
Some asphalt overlay projects may be suitable for chip seal application at lower cost depending on road grades and volume and type of traffic.													
Typical overlay estimate varies from \$350,000 to \$400,000 per mile depending on road width and condition. Cost estimates where provided in Asphalt PASER used.													
Project dates, year scheduled is based on previous 5 year CIP's, 2012 Asphalt Road PASER, the 2013 Gravel Road PASER, and in some cases a best guess where other funding partners may be involved.													
The 2012 asphalt PASER identified the above paving projects over a 5-year period, 2013-2017. These project were re-prioritized over the above defined 10-year period.													
Project costs in 2014 dollars, not adjusted for inflation.													

PUBLIC WORKS 2015 - 2024 CAPITAL IMPROVEMENT PLAN - INTERSECTIONS

Organizational Development Initiative (ODI) 2015 - 2024 Capital Improvement Plan - Transportation Projects												
Proj. ID	Ten Year Intersection Projects	Estimated Total Project	5 YEAR CIP					10 YEAR CIP				
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1	SH 172 - SH 151, Ignacio, RAMP project, cost share	\$180,000	\$180,000									
2	CR 141 - CR 142 Rafter J (see also reconstruction-FDR)	\$500,000	\$500,000									
3	CR 223 - CR 225, realignment of dominate CR 225	\$350,000		\$350,000								
4	CR 509 - Bayfield Pkwy, limited sight distance	\$100,000			\$100,000							
5	CR 229 - US 160 - Right-in, right-out*	\$750,000				\$750,000						
6	SH 172 - CR 309A, Airport Road Intersection reloc.	\$5,000,000					\$5,000,000					
7	CR 240 - CR 243, Helen's Store/Inter-Slide Mitigation	\$1,500,000						\$1,500,000				
8	CR 501 - CR 502 - Possible Round-about	\$1,200,000							\$1,200,000			
9	CR 501 - CR 240 (2030 TRIP)	\$750,000								\$750,000		
10	CR 240 - CR 245 (2030 TRIP)	\$750,000									\$750,000	
11	CR 234 - CR 225 (2030 TRIP)	\$750,000										\$750,000
12	CR 225 - CR 228 (2030 TRIP)	\$750,000										\$750,000
	Ten Year Total	\$12,580,000	\$680,000	\$350,000	\$100,000	\$750,000	\$5,000,000	\$1,500,000	\$1,200,000	\$750,000	\$750,000	\$1,500,000
	Potential Intersection Projects beyond 10 years											
	CR 521 - SH 151 IACAP identified project (BIA) HES?	\$1,500,000										
	CR 301 - CR 302 gravel pit impact	\$750,000										
	CR 318 - CR 309A Airport traffic - when CR 309A impr.	\$1,500,000										
	CR 318 - CR 310 energy impacts	\$1,200,000										
	US 160 - CR 526 energy impacts	\$2,500,000										
	Intersection Total - beyond 10 Years	\$7,450,000										
Notes:												
*State Highway 160 and CR 229 intersection included as project has been discussed by State and County as possible Hazard Elimination System grant. Other SH / CR intersections not listed.												
Numerous State Highway - County Road intersection projects identified in the US 160 EIS and US 550 EA not included in this CIP as CDOT will most likely set the schedule and take the lead.												
CR 250 - 243, Helen's Store intersection improvements will have to include some slide mitigation work to accommodate intersection improvements.												
Current levels of service and signal warrants at high ADT County Road intersections not sufficient at this time to justify signalization. Future traffic signals potentially 10 years or more out.												
Intersection priorities as set by Public Works staff, February 2014. Project costs in 2014 dollars, not adjusted for inflation.												

PUBLIC WORKS 2015 - 2024 CAPITAL IMPROVEMENT PLAN - BRIDGES

Organizational Development Initiative (ODI) 2015 - 2024 Capital Improvement Plan - Transportation Projects												
Proj. ID	Ten Year Bridge & Major Drainage Projects	Est. 10-yr Total	5 YEAR CIP					10 YEAR CIP				
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1	CR 141 Jack and Bore, 18" & 36" Replacement*	\$150,000	\$150,000									
2	CR 501 Vallecito Creek Bdg, Maint. Work SR 50.8**	\$500,000		\$500,000								
3	CR 234 Florida Farmer's Canal Bdg, SR 74.2*	\$750,000			\$750,000							
4	CR 321 Tiffany Draw NR , abutments failed	\$850,000				\$850,000						
5	CR 228 Florida Farmer's Canal Bdg, SR 72.2**	\$750,000					\$750,000					
6	CR 314 Rock Creek Bdg, NR , under 20'*	\$1,000,000						\$1,000,000				
7	CR 245 Florida River Bdg., new bridge deck, SR 76.4**	\$250,000							\$250,000			
8	CR 334 Morrison Ditch, NR	\$850,000							\$850,000			
9	CR 334 Allison Ditch Bdg, load restricted, SR 55.1*	\$750,000								\$750,000		
10	CR 122 La Plata River Bdg, load restricted, SR 47.1*	\$1,500,000									\$1,500,000	
11	CR 522 Ute Creek, NR	\$850,000										\$850,000
Ten Year Total		\$8,200,000	\$150,000	\$500,000	\$750,000	\$850,000	\$750,000	\$1,000,000	\$1,100,000	\$750,000	\$1,500,000	\$850,000
Potential Bridge Projects beyond 10 years												
	CR 516 King Ditch, NR	\$750,000										
	CR 509 King Ditch, NR	\$750,000										
	CR 521 Beaver Creek, NR	\$750,000										
	CR 502 - Ditch crossing, NR	\$500,000										
Bridge Total - beyond 10 Years		\$2,750,000										
Notes: Bridge = Bdg.												
* Single asterisk indicates structure replacement, ** double asterisk indicates major bridge maintenance.												
SR = sufficiency rating, National bridge rating scale. 1 to 100, with 100 for new bridge.												
NR = not rated, bridges under 20 feet in span typically not rated by State.												
Place holder for small bridge inventory to be completed upon completion of small bridge inventory in March 2014. Project costs in 2014 dollars, not adjusted for inflation.												

PUBLIC WORKS 2015 - 2024 CAPITAL IMPROVEMENT PLAN - SUMMARY

Organizational Development Initiative (ODI) 2015 - 2024 Capital Improvement Plan - Transportation Projects												
			5 YEAR CIP					10 YEAR CIP				
Sheet	Public Works Ten Year Capital Summary	Est. 10-YR TOTAL	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1	Road Reconstruction	\$27,517,000	\$1,000,000	\$5,000,000	\$1,260,000	\$2,750,000	\$1,600,000	\$3,050,000	\$2,324,000	\$2,733,000	\$5,000,000	\$2,800,000
2	Paving - Overlay Projects	\$11,896,000	\$784,000	\$1,440,000	\$2,250,000	\$1,780,000	\$1,080,000	\$1,702,000	\$860,000	\$740,000	\$730,000	\$530,000
3	Intersection Projects	\$12,580,000	\$680,000	\$350,000	\$100,000	\$750,000	\$5,000,000	\$1,500,000	\$1,200,000	\$750,000	\$750,000	\$1,500,000
4	Bridge & Major Drainage Projects	\$8,200,000	\$150,000	\$500,000	\$750,000	\$850,000	\$750,000	\$1,000,000	\$1,100,000	\$750,000	\$1,500,000	\$850,000
	Ten Year Total	\$60,193,000	\$2,614,000	\$7,290,000	\$4,360,000	\$6,130,000	\$8,430,000	\$7,252,000	\$5,484,000	\$4,973,000	\$7,980,000	\$5,680,000
	Potential Capital Projects beyond 10 years	BEYOND 10 YEARS										
1	Road Reconstruction	\$35,230,000										
2	Paving - Overlay Projects	\$3,447,500										
3	Intersection Projects	\$7,450,000										
4	Bridge & Major Drainage Projects	\$2,750,000										
	Total Beyond 10 Years	\$48,877,500										

Notes:

2030 TRIP projected costs: As a comparison, the June 2, 2006 - 2030 Transportation Integrated Plan (2030 TRIP) identified; \$82,064,000 of road improvements, \$6,475,000 of Intersection improvements for a 25 year project total of \$88,539,000. The study also provided a cost estimate for Ewing Mesa Road at \$18,349,000, not included in the 2030 TRIP total.

1999 Comprehensive Traffic Study: The 1999 Comprehensive Traffic Study identified 20 years of improvements including; \$31,460,000 in efficiency improvements, \$195,900,000 capacity road improvements (and prioritized these to , \$12,800,000 major safety improvements, for a total estimate of \$240,160,000. Realizing funding limitations this amount was "pared down " to \$62,600,000 to meet "anticipated funding limits".

Project costs in 2014 dollars, not adjusted for inflation.

Summary of Past Capital Road & Bridge Projects

2002 – 2014 Major Capital Road & Bridge Projects						
YEAR	COUNTY ROAD	CONSTRUCTION PROJECT	MILES	GRANTS	TOTAL AMOUNT	YEAR TOTAL
2002	CR 213	Reconstruction Project	0.5	Yes	\$ 579,527	
	CR 234	Reconstruction Brown's Drop Off	0.75	Yes	\$ 1,101,957	
2002 TOTAL						\$1,681,484
2003	CR 211	CR 211 East End Reconstruction	1.32	ALP	\$ 1,426,980	
	CR 250	MSE Wall – Road Reconstruction	0.25	No	\$ 239,360	
	CR 501	Reconstruction Bridge #3	NA	Yes	\$ 2,125,640	
	CR 141	Curve Realignment	0.9	Yes	\$ 700,458	
2003 TOTAL						\$4,492,438
2004	CR 521	Reconstruction Project – Urban Impro.	0.75	Yes	\$ 1,620,673	
	RIVER ROAD	Animas River Bridge Construction	0.2	Yes	\$ 3,607,170	
2004 TOTAL						\$ 5,227,843
2005	CR 213	Reconstruction Project	1.96	Yes	\$ 1,843,862	
	CR 213	Asphalt Overlay Project	8.0	Yes	\$ 1,668,207	
	CR 521	Asphalt Overlay Project	5.0	Yes	\$ 600,000	
2005 TOTAL						\$4,112,069
2006	CR 141	Bridge Replacement #33	0.2	Yes	\$ 525,510	
	CR 234	Reconstruction Self's Hill	0.75	Yes	\$ 1,700,808	
	CR 501	Asphalt Overlay Project	4.5	Yes	\$ 800,000	
2006 TOTAL						\$3,026,318
2007	CR 234	Reconstruction Project-Self's Hill - 228	1.25	Yes	\$ 2,424,323	
	CR 213	Reconstruction Project	1.5	Yes	\$ 2,798,550	
	CR 521	Asphalt Overlay Project	3.9	Yes	\$ 1,124,475	
2007 TOTAL						\$6,347,348
2008	CR 141	Bridge Replacement #3	0.2	Yes	\$ 740,390	
	CR 213	Reconstruction Project	0.9	Yes	\$ 1,598,899	
	CR 311-314	3 Concrete Box Culverts	NA	Yes	\$ 186,061	
2008 TOTAL						\$2,525,350

Summary of Past Road & Bridge Capital Projects

2002 – 2014 Major Capital Road & Bridge Projects						
YEAR	COUNTY ROAD	CONSTRUCTION PROJECT	MILES	GRANTS	TOTAL AMOUNT	YEAR TOTAL
2009	CR 213	Reconstruction Project	0.9	Yes	\$ 1,075,025	
	CR 234	Reconstruction Project – 235-228	0.6	Yes	\$ 1,232,595	
	CR 240	Recon Intersection CR 234 & 240	0.25	Impact fees	\$ 455,279	
	CR 501	CR 501 bike path	0.75	Yes	\$ 362,417	
2009 TOTAL						\$2,762,899
2010	CR 309-309A	Reconstruction of Intersection	0.5	Yes	\$ 874,230	
	CR 141	Bridge Replacement	0.2	Yes	\$ 499,018	
	CR 210	Chip and Seal – New Lake Nighthorse Rd	4	no	\$ 800,000	
	CR 527	Reconstruction Bridge #1	0.2	Yes	\$ 491,031	
2010 TOTAL						\$2,664,279
2011	CR 309-309A	Landscaping Airport Intersection		Yes	\$ 293,696	
	CR 309	Culvert Replacement – Jack & Bore	NA	NO	\$ 47,454	
2011 TOTAL						\$341,241
2012	CR 141	CR 141/210 Intersection	0.75	No	\$ 821,295	
	CR 250	Full Depth Reclamation	0.7	No	\$398,452	
	CR 517	Full Depth Reclamation	1.0	Yes	\$427,056	
2012 TOTAL						\$1,646,803
2013	CR 207	Lightner Creek Bridge	NA	Yes	\$ 653,708	
	CR 141	Full Depth Reclamation	2.7	Yes	\$ 1,359,557	
2013 TOTAL						\$2,013,265
2014						
	CR 311-513	Oxford Intersection Project	0.3	Yes	\$ 3,500,000	
	CR 105	Box Culvert Project	0.1	No	\$ 60,000	
	CR 210	Lake Nighthorse Left Turn Lane	0.15	No	\$ 300,000	
2014 TOTAL						\$3,860,000
Total Capital 2002-2014						\$40,701,337
Average Per Year 2002-2014 – 13 years						\$3,130,872

MAINTENANCE ACTIVITIES

PAVED COUNTY ROADS

2012 - PAVEMENT SURFACE EVALUATION AND RATING (PASER)

THE PASER SYSTEM IS A PROCESS USED TO EVALUATE THE SURFACE CONDITION OF ASPHALT PAVEMENT. IT DESCRIBES TYPES OF SURFACE DEFECTS AND PROVIDES A SYSTEM TO VISUALLY RATE PAVEMENT CONDITION. THE RATING SYSTEM USES A SCALE OF ONE (1) TO TEN (10) TO RANGING FROM "FAILED" AT ONE TO EXCELLENT AT TEN.



MAINTENANCE ACTIVITIES

PAVED COUNTY ROADS

2012 - PAVEMENT SURFACE EVALUATION AND RATING (PASER) - Continued

The four major categories of common asphalt pavement surface distress include:

- **Surface defects;** raveling, flushing, polishing
- **Surface deformation;** rutting, distortion-ripping and shoving, settling, frost heave
- **Cracks;** transverse, reflection, slippage, longitudinal, block, and alligator cracks
- **Patches and potholes**

Deterioration has two general causes:

1. environmental due to weathering and aging
2. structural caused by repeated traffic loadings

La Plata County Public Works completed our 2012 Pavement Surface Evaluation and Rating (PASER) during the months of August and September in 2012. This required driving the 222 miles of paved county roads to complete a visual evaluation of the surface condition, documenting sections of each road where there are significant changes in the surface conditions, and reviewing the records of past paving and capital projects. To build a digital data base the roads we also located using GPS data collection, and representative sections of the roads were photographed to document the current surface condition.

Note: Some background information provided by the PASER Manual for Asphalt Roads prepared by the Transportation Information Center, University of Wisconsin-Madison.

MAINTENANCE ACTIVITIES

PAVED COUNTY ROADS

2012 - PAVEMENT SURFACE EVALUATION AND RATING (PASER) - Continued

The 2012 PASER report is used to provide a snapshot in time of the surface condition of our paved county roads, and can be used to assist in scheduling future projects.

TABLE A – CONDITION SUMMARY OF 222 MILES OF PAVED COUNTY ROADS				
Condition	EXCELLENT	VERY GOOD - GOOD	FAIR	POOR
Miles of road	8.5	165.2	45.8	2.5
Percent of total	3.8%	74.4%	20.6%	1.2%

According to our 2012 PASER report, 78.2% of our 222 miles of paved county roads are in good to excellent condition and 21.8% are in fair to poor condition.

Using this information to look ahead and project our future maintenance and capital projects will help us to determine what level of funding may be required to keep our roads at their existing level or potentially what they may look like over time if the investment is not made.

The maintenance typically includes chip seal and asphalt overlays, while the capital projects include conventional reconstruction or full depth reclamation.

MAINTENANCE ACTIVITIES

GRAVEL COUNTY ROADS

2013 Gravel PASER - EXECUTIVE SUMMARY

In 2013 a gravel road assessment was conducted using a method to value criteria commonly used when assessing a gravel road. The final report of this assessment provides Public Works and Road and Bridge staff with valuable information for making informed decisions to maintain and improve the County's gravel road network.

To assess gravel road conditions during the period of July and August 2013 a PASER method was used as a guide. A numeric value from 1 – 5 was used in rating each of the road segments listed in the HUTF Report. Three areas of the roadway were evaluated: crown (cross slopes of the road), drainage condition, and existing gravel layer condition.

Information provided in this report is as follows: Average PASER Ratings by District, miles of gravel roads in the network, average maintenance cost per mile, gallons of magnesium chloride (MgCl) budgeted in 2013, total square yards maintained by each District, average maintenance costs per year, a list of gravel to pavement improvements for consideration, Low-Medium-High ADT counts, and 2014 – 2022 forecast for gravel quantities. Cost data information came from reports generated by R&B PubWorks cost accounting software.

The 2013 gravel PASER evaluated 304 miles of gravel county roads, of which 212-miles were found to be in GOOD CONDITION, 85- miles in FAIR CONDITION, and 7-miles are in POOR CONDITION.

MAINTENANCE ACTIVITIES

GRAVEL COUNTY ROADS, continued

Average daily traffic (ADT) counts significantly impact maintenance costs on gravel roads. The higher the ADT count the more often the road needs graded and resurfaced. Average maintenance cost per mile were divided into Low, Medium and High ADT counts as a way to show how ADT counts impact the cost of road maintenance.

MgCl lowers the cost of maintaining gravel roads by reducing gravel loss, number of times a road would normally be graded annually, protects air quality and extends the resurfacing cycle. Without it, the gravel layer on average deteriorates at a rate of one inch per year. Gravel loss is typically cut in half when MgCl is used. As an example: a three-inch gravel layer is anticipated to last six or more years instead of just three years.

Adequate road crown helps to shed rainfall and snowmelt from impacting the road surface. If the crown is too flat, moisture tends to puddle which leads to potholing and surface deterioration

MAINTENANCE ACTIVITIES

GRAVEL COUNTY ROADS, continued

Most of La Plata County gravel roads when surveyed in 2013 were in good condition. There is however possible changes plus the continuation of in place maintenance practices that can be made to reduce gravel road maintenance costs:

- Continue practice of reducing gravel resurfacing material depth from 4-inches when applicable.
- Consider case by case applying MgCl to roads with lower Average Daily Traffic Counts possibly < 100 ADT on a 2 year cycle. Geographic alignment, speed of vehicles and type of vehicles are all important factors as well.
- Continue to annually consider not applying MgCl a second time to roads treated twice annually if applicable. Possibly spot treatment vs. entire road.
- Reassess gravel road conditions typically on a two to three year cycle.
- Currently the top 10 Gravel to Pavement Improvement Projects with Average Daily Traffic (ADT) counts greater than 500 equate to over 27 miles. Estimate for these needed improvements using 2013 costs are \$31.8 million (table 4). A portion of these projects are candidates for Energy Impact Grant Funding and are incorporated in the Public Works Capital Improvement Plan.

MAINTENANCE ACTIVITIES

GRAVEL COUNTY ROADS, continued



West end of County Road 228.
Example of a farm to market road
impacted by residential
development over the past 30
years. Current average ADT is over
900.

MAINTENANCE ACTIVITIES

WINTER MAINTENANCE - **Snow and Ice Removal Procedures**

Snow and Ice Removal operations are considered a core program vital to the welfare of the County. The basic philosophy governing the County's snow and ice program is to provide road maintenance services to residents and travelers in La Plata County so they can experience reasonably safe driving conditions during winter months.

GENERAL:

During the winter months, snow removal is the primary responsibility of the La Plata County Road and Bridge Department. To keep over 600 miles of county roads clear, County Road and Bridge crews drive in excess of 1,500 miles for every winter snow storm. (This does not include state highways, such as 160, 550, 140, 172, and 151, roads within municipalities or private roads.)

For snow removal and road maintenance purposes, the County is divided into four districts, each with its own Road and Bridge crew or "team." County roads in the 100s are in District I, 200s are in District II, 300s are in District III and 500s are in District V. During the winter months, Road & Bridge teams are working or on call for work seven days a week.

MAINTENANCE ACTIVITIES

WINTER MAINTENANCE - Continued

As required by La Plata County Code Section 42-94, and by resolution, the Board of County Commissioners annually adopts a County Road Maintenance Map. The County Road Maintenance Map designates the level of service to be provided for each road. The various levels of service include snow removal under normal operating conditions and are identified below:

PLOWED THE SAME DAY: These include both Arterial Service and Local Service roads as designated in the annual Highway User Tax Fund (HUTF) report. This level of road is plowed to accommodate roads considered primary to the system, school bus and mail routes.

PLOWED AFTER SAME DAY ROADS: These roads are typically designated as Local Service Roads within the HUTF Report and may only provide access to residents.

SUMMER MAINTENANCE ONLY: These roads are typically designated as Local Service Roads within the HUTF Report. Roads identified by the County for summer maintenance services only are not school bus or mail routes and in most cases do not serve residents. However, on occasion, these roads will provide access to residents but to date the road has not been formally adopted by the County for a change in service level.

MAINTENANCE ACTIVITIES

WINTER MAINTENANCE - continued

Forest Service (summer and winter maintained): Typically include roads designated as Local Service Roads within the HUTF Report. The summer and winter maintained status usually indicates these roads are either a school bus route, mail route, have full time residents or all three.

Forest Service (summer maintenance only): Typically include roads designated as Local Service Roads within the HUTF Report and owned by the Forest Service. County maintenance levels are established through the Road Maintenance Schedule “A” Agreement with the United States Forest Service.

Third Party Maintained: County roads maintained by a third party including snow removal.

Non-Maintained: County roads designated in the HUTF Report as non-maintained. These roads typically have never been improved (usually no base or surface gravel), are currently not in use and have not been formally adopted by the County for a change in service level.

MAINTENANCE ACTIVITIES

WINTER MAINTENANCE - continued

Forest Service (summer and winter maintained): Typically include roads designated as Local Service Roads within the HUTF Report. The summer and winter maintained status usually indicates these roads are either a school bus route, mail route, have full time residents or all three.

Forest Service (summer maintenance only): Typically include roads designated as Local Service Roads within the HUTF Report and owned by the Forest Service. County maintenance levels are established through the Road Maintenance Schedule “A” Agreement with the United States Forest Service.

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MAINTENANCE ACTIVITIES

WINTER MAINTENANCE – continued – SNOW REMOVAL ROAD CLASSIFICATION & PRIORITY SYSTEM:

Level One: Indicates the road will be plowed to maintain continuous all weather access within the maximum capabilities of the County. These roads are considered arterial to the road system, school bus and mail routes, provide connectivity to municipalities and in some cases State and US Highways.

Level Two: Indicates the road will be plowed to provide reasonable all weather access. These roads are collector roads and are typically school bus and mail routes. Every attempt will be made to plow these roads the same day as the storm. Depending on storm intensity, storm duration, or other storm emergencies, snow removal of roads with a classification of Level Two may be delayed or suspended to provide the required resources to meet the objective of plowing Level One Roads.

Level Three: Indicates the road will be plowed to provide reasonable all weather access. These roads are not typically school bus or mail routes, and may provide access to residents. Every attempt will be made to plow these roads the same day as the storm. Depending on storm intensity, storm duration, or other storm emergencies, snow removal of roads with a classification of Level Three will be the first roads identified to either delay or suspend snow removal efforts in order to provide the required resources to meet the objective of plowing Level One and Two Roads.

Level Four: Are roads with a Summer and Winter Maintenance (plowed after all other roads) defined service level formally adopted by the County.

Level Five: Are non-maintained roads which will not be plowed by the County.

MAINTENANCE ACTIVITIES

WINTER MAINTENANCE – continued – **OPERATIONAL CLASSIFICATIONS:**

Normal Operating Conditions: winter storm weather which can be managed by normal or slightly modified operations within the discretion of the Road and Bridge District Team Leader.

Serious Operating Conditions: hazardous conditions beyond normal (glare ice, whiteout, high winds, ice storm and extreme avalanche danger). Serious conditions may also be the result of work force sickness, equipment failure or snow plow accident. Serious conditions require the coordination of the Road and Bridge Superintendent and Team Leader.

Extreme Operating Conditions (potential emergency): possibility of, or inability to keep up with the storm due to weather, extended operations, emergency situation (i.e., major traffic accident, school closure(s), power outage or road closures. Extreme conditions require the coordination of Public Works Director, Road and Bridge Superintendent and Team Leader.

Stated Emergency: Office of Emergency Management (OEM) or County Manager states emergency conditions that threaten to, or are impacting safety and resources of La Plata County.

Declared Disaster: Board of County Commissioners (BoCC) declares State of Disaster which will shift command of resources to a Coordination Team (Sheriff, OEM, Public Works Director and Superintendent), which may be located at the Emergency Operations Center (EOC).

In the case of a Stated Emergency or Declared Disaster, operations may be directed by the Sheriff or OEM through an Incident Command System for the better good of the community. Public Works Director, Road and Bridge Superintendent or designee shall be part of the Incident Command to ensure coordinated response. Operations will be guided by La Plata County Emergency Operations Plan (EOP).

MAINTENANCE ACTIVITIES

WINTER MAINTENANCE – continued – **SNOW REMOVAL OPERATIONS:**

Storm Warning Notification: In advance of a storm, the county with the aide of weather forecasting (i.e., EWARN from the National Weather Service, Grand Junction CO, The Weather Channel and/or the internet) will notify employees of an upcoming event.

Scheduling: A storms intensity, duration, temperature, traffic conditions and time of day effect the time needed to plow a route. Roads may not be plowed or sanded consistently at the same time throughout the winter or the storm due to these variables.

Plowing operations of paved roads will commence as soon as snow begins to accumulate on the road surface. Gravel roads will be plowed after the accumulation of four (4) inches of snow. In cases where the storm begins late in the evening, after all school busses and peak rush hour, plowing of gravel roads may be delayed until early in the morning.

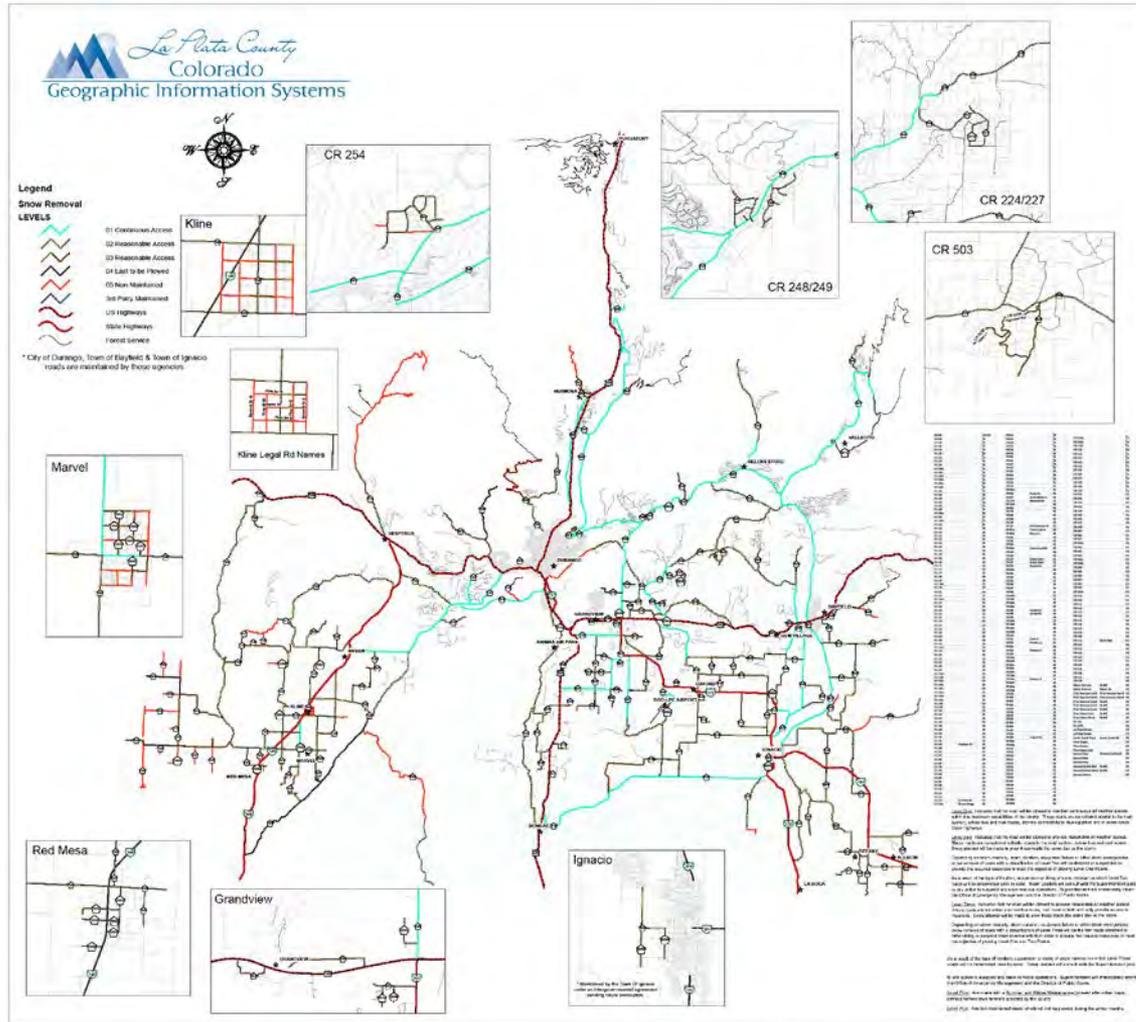
After the storm sets in and plowing is scheduled daily, plows and graders will be dispatched from their assigned District maintenance shop with the objective of getting to the furthest point on their route prior to the first school bus. In some cases, this means only one travel lane of the road will be plowed. Plowing operations of both paved and gravel roads will continue throughout the storm.

Plowing: As a general rule, gravel roads will be plowed once in a twenty-four (24) hour period. Snow will be moved from the center line of the road to the shoulder, including intersections. On subsequent passes, second lanes and turn lanes will be plowed. Widening of roads will begin when the traveled roadway has been plowed and sanded (paved roads) or plowed (gravel roads).

Plowing of other facilities, i.e., transfer station access, park and ride areas, and school bus turnarounds will be scheduled during the storm. Timing of the plowing will be on a case by case basis.

MAINTENANCE ACTIVITIES

WINTER MAINTENANCE – continued



Snow Removal Priority Levels

MAINTENANCE ACTIVITIES

WINTER MAINTENANCE – continued – snow slide CR 243 – January 2010



MAINTENANCE ACTIVITIES

POINTS TO CONSIDER

- The asphalt surface on most paved roads will have a service life of approximately 20 years, and this can vary depending on level of maintenance, volume and type of traffic, and climatic conditions. The service life can usually be extended with routine maintenance including crack sealing, surface treatments, milling and overlays. This type of maintenance does not typically add structural capacity to the pavement but can restore the surface for rideability, safety and environmental protection from the elements.
- Pavement Surface Evaluation and Rating (PASER) reports are considered one of the best tools for pavement management. Our 2012 PASER report included 222 miles of asphalt roads and was completed in-house using an employee that managed our paving program for over 20 years. The cost of contracting this service can be as much as \$200 to \$300 per mile per year. Based on our limited revenues and the cost of conducting a PASER analysis on an annual basis, we recommend conducting a PASER every 3 to 5 years.
- One of the challenges we face is higher maintenance cost associated with some of our higher ADT gravel roads. Based on the 2013 gravel PASER most of gravel roads are currently in reasonable conditions however gravel roads are subject to changing sooner than paved roads.
- The County Code requires *“All new roads having a projected trip generation of 400 or greater ADT (average daily traffic) shall be paved.”* The cost of maintaining gravel roads depends on weather, road base or structure, drainage, and the volume and type of traffic. The County currently maintains a number of gravel roads where the average daily traffic exceeds 400 ADT, including county roads; 228, 510, 309A, 502, 120(north), and 330 to name a few.