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Moore Township ROAD MAINTENANCE PROGRAM

Data & Statistics

Maintenance Funding & Strategy

DISCLAIMERS

The quantity and cost values used throughout this presentation are based on available information.

Be advised that as of this report, only 88% of roads have been fully cataloged in the Township GIS system and assigned a Condition Assessment. Additionally, a comprehensive quality control check of acquired GIS road inventory data is pending.

Cost estimates provided herein are fairly rough and very basic inflation projections are used. Though cost values could vary, the cost comparisons presented illustrate relative disparities.

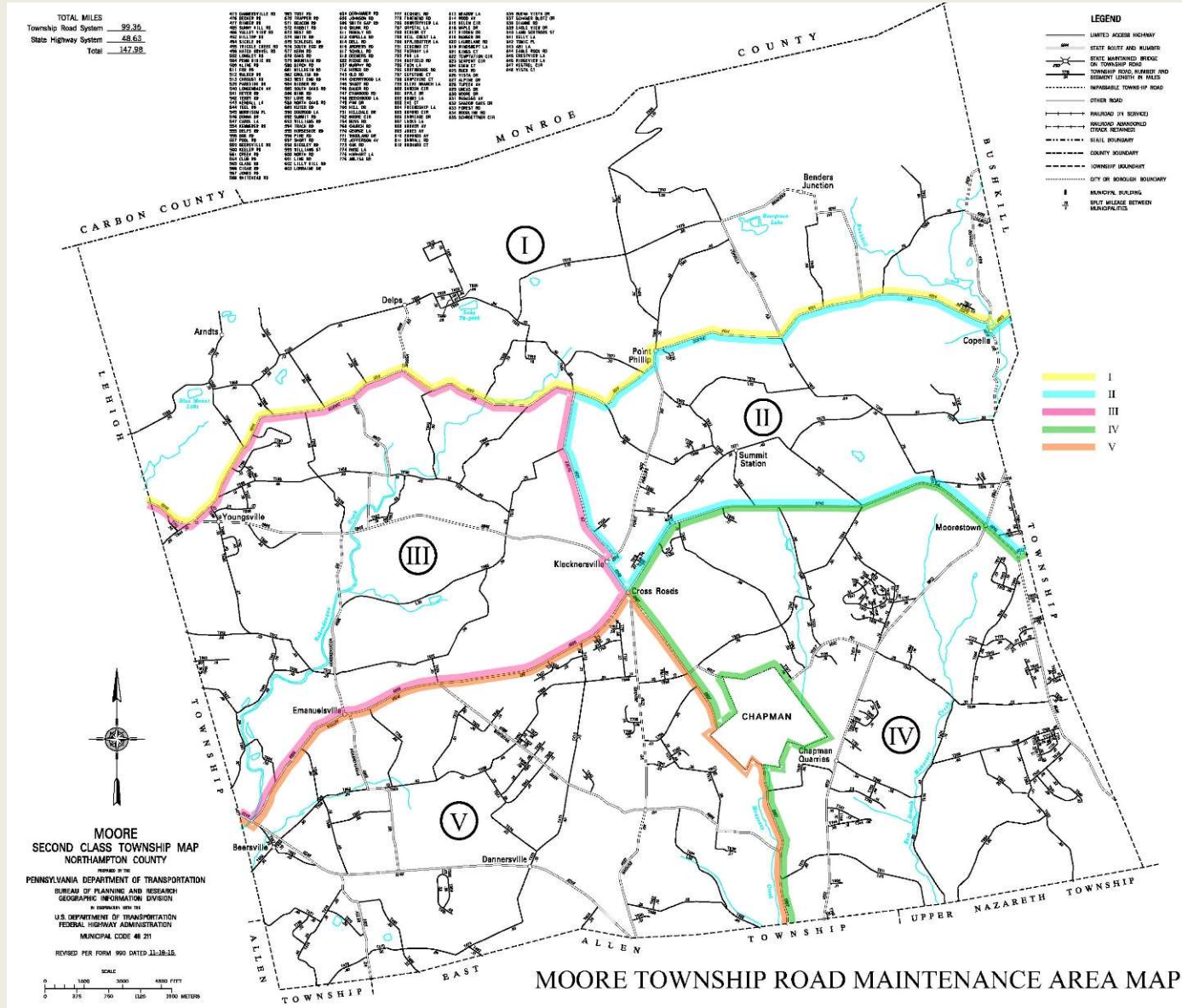
Moore Township Road Network Statistics



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TOWNSHIP MAINTENANCE AREA (MA) MAP

01



99.35

TOTAL ROAD MILES PER PENNDOT TOWNSHIP MAP

Actual total will be slightly more taking into account road segments that may not qualify for Liquid Fuels and not previously grandfathered

92.21

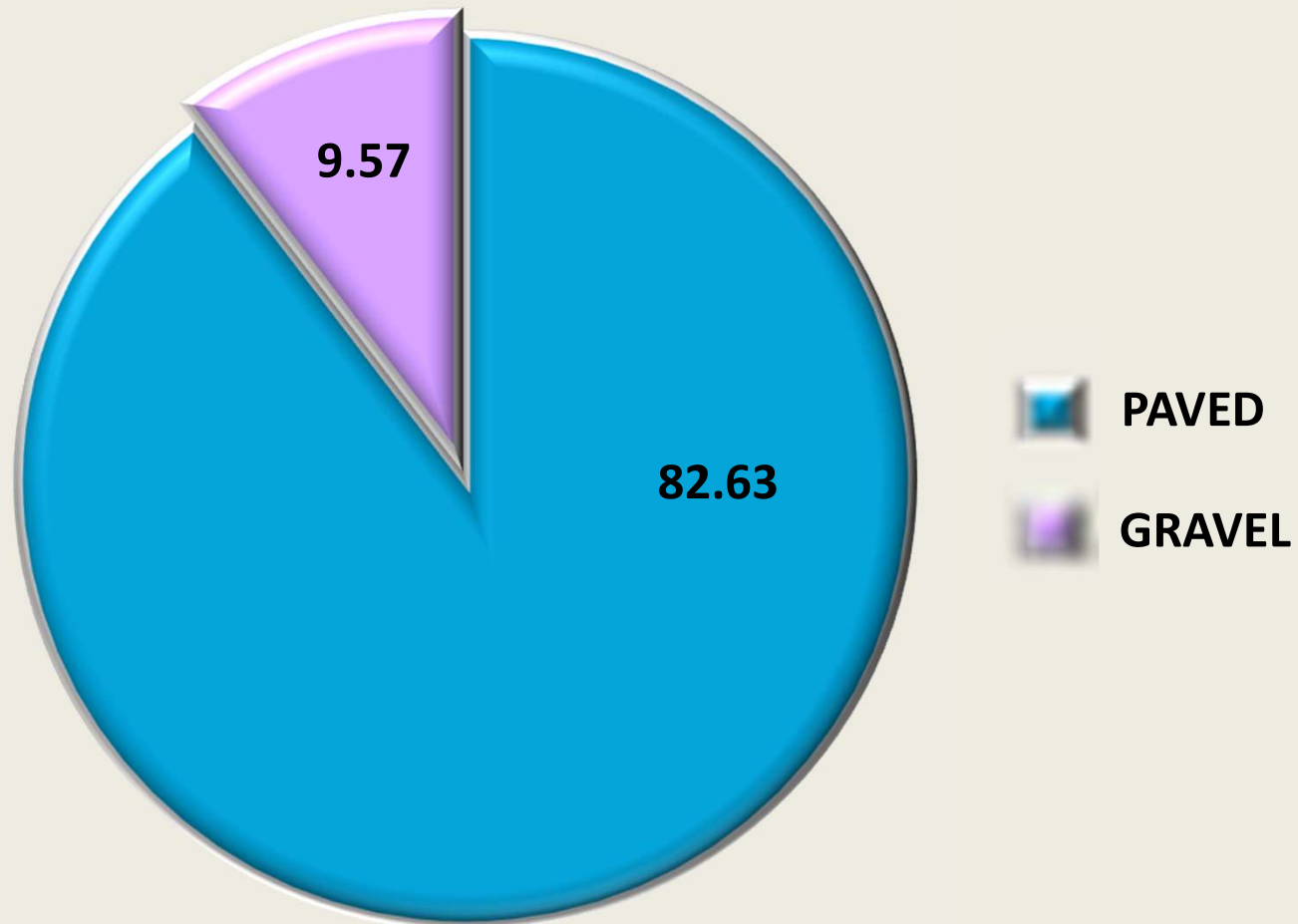
TOTAL ROAD MILES CATALOGED IN GIS

96.73% cataloged to date based on PennDOT Total

87.46

TOTAL ROAD MILES CATALOGED AND ASSIGNED CONDITION ASSESSMENT

88.03% cataloged and assigned condition assessment to date based on PennDOT Total



92.21 TOTAL MILES ROADS CATALOGED TO DATE


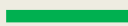



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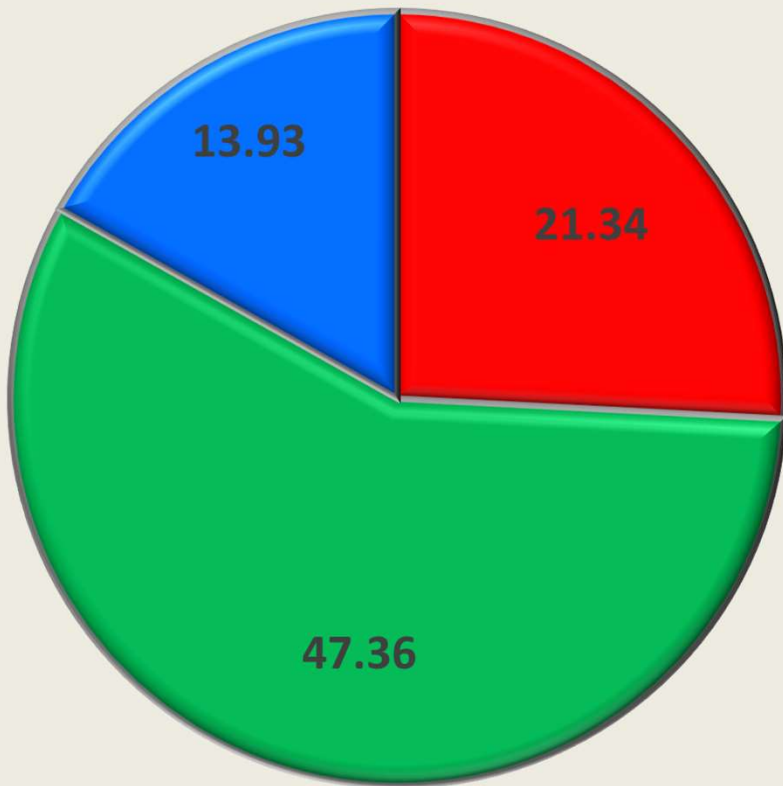
ROAD CLASSIFICATION MAP

01

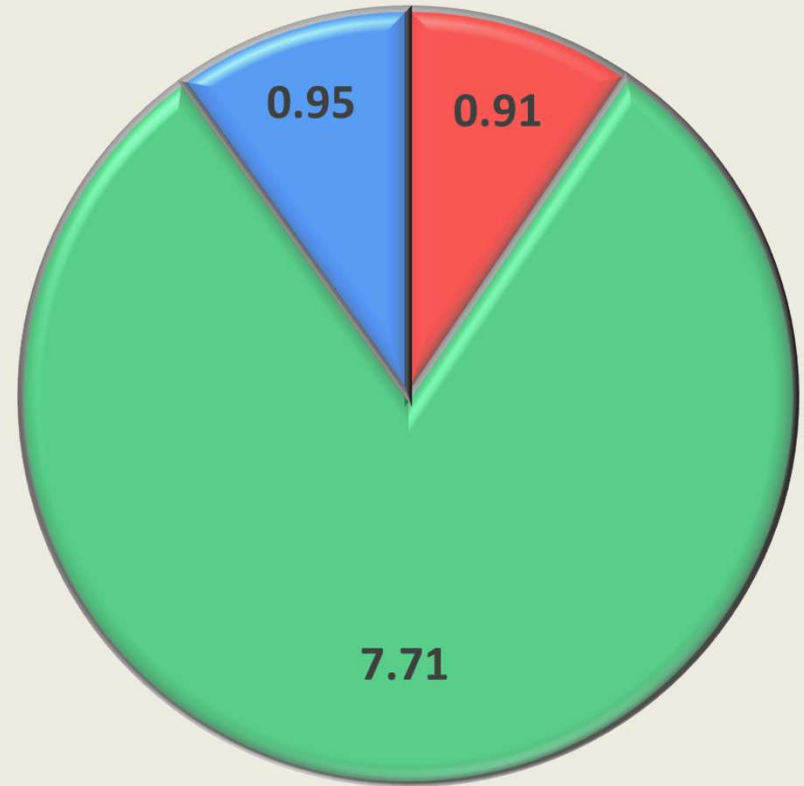


-  Collector
-  Local-1
(Thru-Streets)
-  Local-2
(Internal Streets)

PAVED ROADS



GRAVEL ROADS



- COLLECTOR
- LOCAL-1
- LOCAL-2

82.63 PAVED ROAD MILES

9.57 GRAVEL ROAD MILES

Values based on road miles cataloged and classified in GIS, expect less Local-1 and more Local-2 after GIS Data QC Check

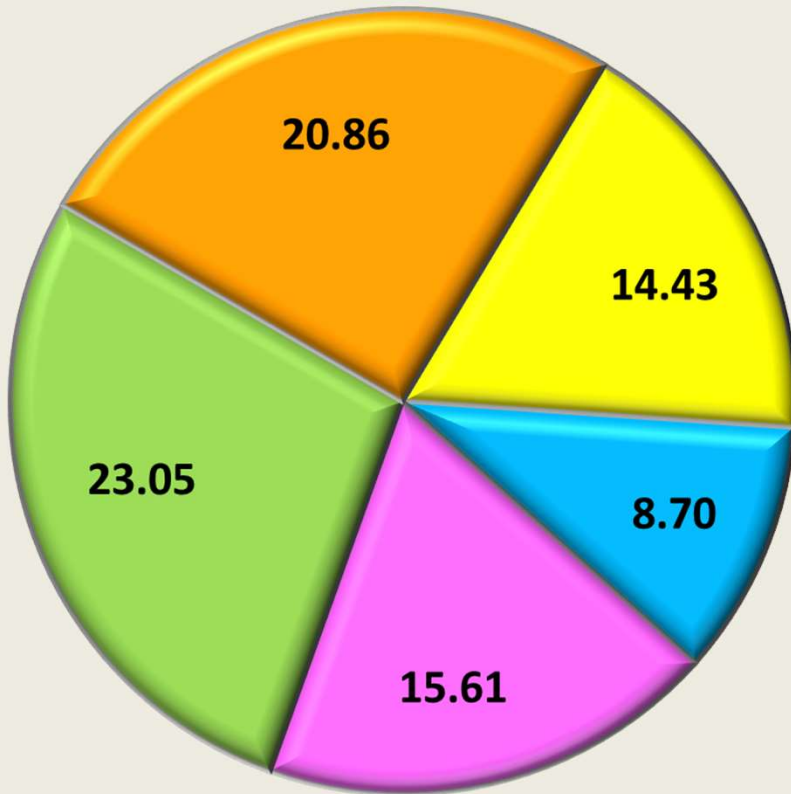


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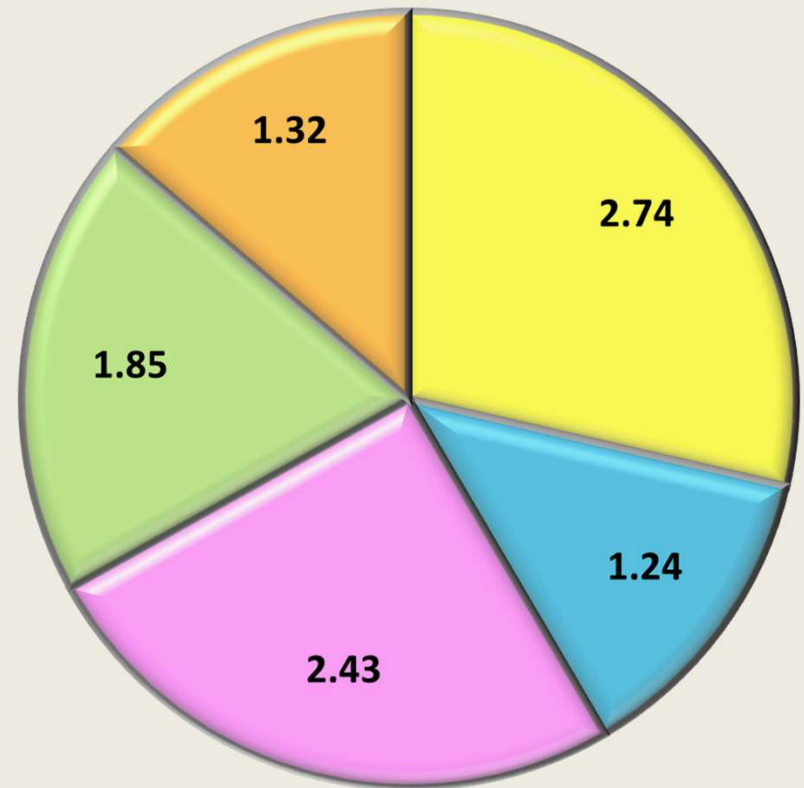
TOWNSHIP ROAD MILES BY MAINTENANCE AREA (MA)

01

PAVED ROADS



GRAVEL ROADS



- MA-1
- MA-2
- MA-3
- MA-4
- MA-5

82.63

PAVED ROAD MILES

9.57

GRAVEL ROAD MILES

Values based on road miles cataloged and classified in GIS

- | | |
|--------------|---|
| A. Excellent | No work required for min. three (3) years. |
| B. Very Good | Requires maintenance, primarily crack sealing. |
| C. Good | Requires crack repair and surface treatment, but no base reconstruction. |
| D. Fair | Requires limited to no base reconstruction; Needs extensive crack repair and surface treatment. |
| E. Poor | Requires extensive but partial base reconstruction, crack repair, and surface treatment. |
| F. Failing | Requires full reconstruction. |



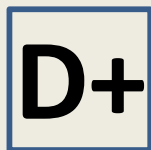
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MAINTENANCE AREA DATA – PAVED ROADS

01

MAINT. AREA	ROAD CLASS	# of RD SEGS.	ROAD MILES	CONDITION
I	Collector	4	2.03	C-
	Local-1	27	10.40	D+
	Local-2	14	2.00	D+
	Total	45	14.43	D+
II	Collector	8	2.31	D
	Local-1	18	5.19	D+
	Local-2	9	1.20	C-
	Total	35	8.70	D+
III	Collector	14	5.61	D+
	Local-1	31	8.47	C+
	Local-2	8	1.53	C+
	Total	53	15.61	C+

MAINT. AREA	ROAD CLASS	# of RD SEGS	ROAD MILES	CONDITION
IV	Collector	10	4.03	C-
	Local-1	49	12.88	D+
	Local-2	37	6.13	C
	Total	96	23.04	C-
V	Collector	27	7.38	D
	Local-1	41	10.42	D+
	Local-2	21	3.06	C
	Total	89	20.86	D+



OVERALL PAVED ROAD CONDITION IN MT

These calculations undervalue actual total road miles due to GIS database not being 100% complete



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MAINTENANCE AREA DATA – GRAVEL ROADS

01

MAINT. AREA	ROAD CLASS	# of RD SEGS.	ROAD MILES	CONDITION
I	Collector	0	-	-
	Local-1	5	1.79	C-
	Local-2	3	0.95	D+
	Total	8	2.74	C-
II	Collector	0	-	-
	Local-1	2	1.24	D-
	Local-2	0	-	-
	Total	2	1.24	D-
III	Collector	1	0.49	E
	Local-1	6	1.94	C
	Local-2	0	-	-
	Total	7	2.43	D+

MAINT. AREA	ROAD CLASS	# of RD SEGS	ROAD MILES	CONDITION
IV	Collector	1	0.42	D
	Local-1	2	1.43	D-
	Local-2	0	-	-
	Total	3	1.85	D-
V	Collector	0	-	-
	Local-1	3	3.46	C-
	Local-2	0	-	-
	Total	3	3.46	C-

D+

OVERALL GRAVEL ROAD CONDITION IN MT

These calculations undervalue actual total road miles due to GIS database not being 100% complete

- Fair
- Majority of Road Miles degrading rapidly
- Focus on maintenance over reconstruction

Comprehensive Road Maintenance Strategy

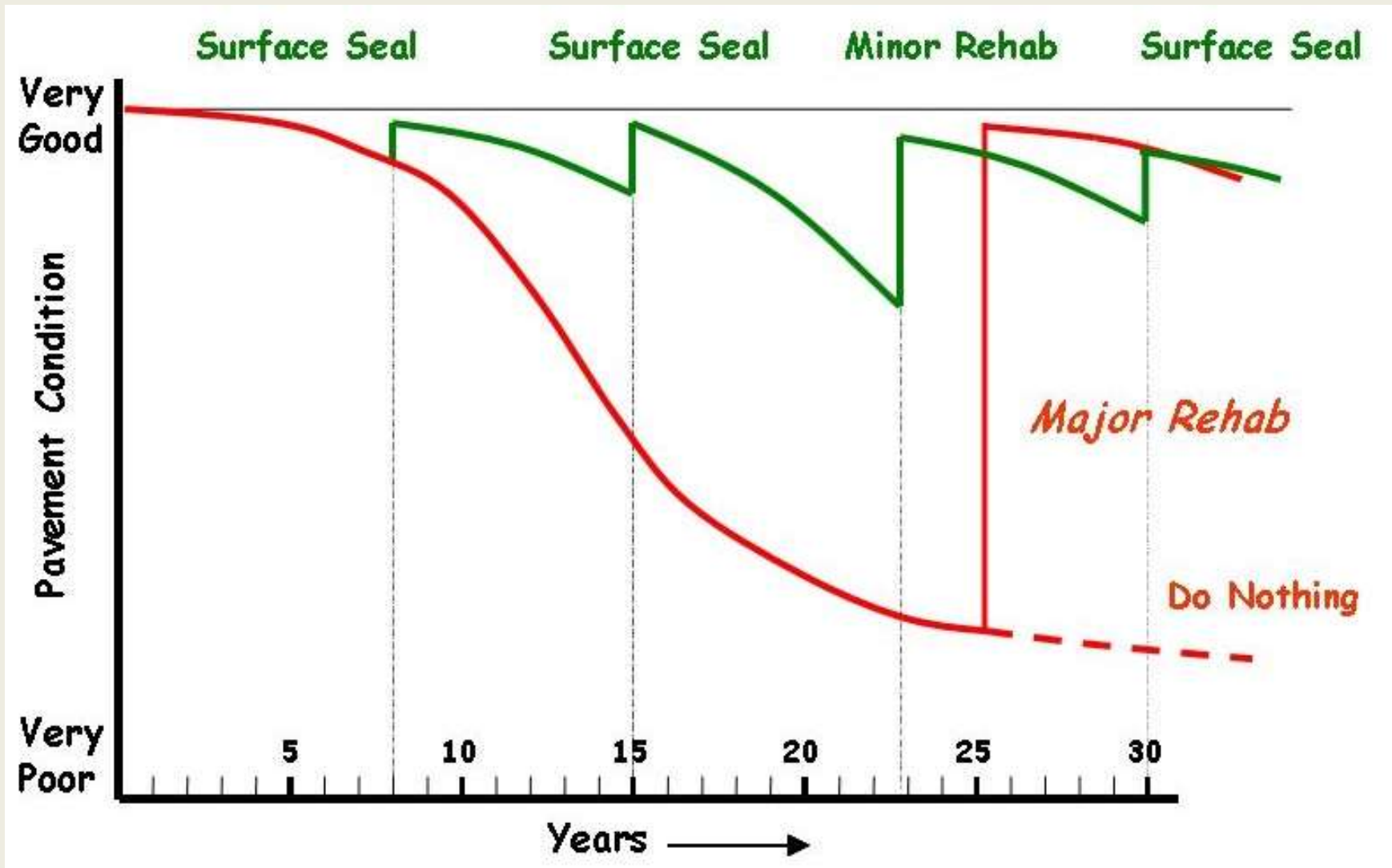
- Focus on maintenance options over major reconstruction and resurfacing options to address maximum road miles per year possible to slow rate of overall system degradation.
- Bolster existing annual maintenance activity.
- Annually address other issues such as safety and drainage.
- Equip and maximally utilize Township Road Department in-house capabilities.
- Complete comprehensive, GIS-based infrastructure inventory to better manage all aspects of MT's road network

- Target functionally deficient roads first.
- Address collector roads at or close to functionally deficient.
- Apply surface treatment on B/C roads to extend serviceable life and defer accelerated deterioration from crack formation.
- Over five-year multi-year road maintenance programs, distribute funds throughout Township by Maintenance Area.
- While urban and suburban communities would want to target an average condition grade B, it would be appropriate for Moore Township to target a goal of average condition grade C.
- Starting at current average condition grade D+, plan should be to incrementally improve first to condition grade C-, then reorganize program to achieve condition grade C.

- Look for options to reduce overall pavement area:
 - Reduce width of roads to minimums where feasible as road maintenance activities are completed.
 - Look at Options to vacate/privatize existing roads.
 - Plan and implement a pavement-to-gravel road conversion program.
- Invest in gravel road construction and maintenance methods that will improve functional performance and reduce maintenance burden.
- Address roadside drainage issues to mitigate accelerated pavement deterioration due to inadequate drainage.

- Utilize alternative approaches to road construction:
 - Roller Compacted Concrete
 - Flexible Pavement Overlays
 - Paving Fabrics
 - In-House Pavement Grinding/Milling
 - In-House Paving
 - Invest in pro-active gravel road maintenance options:
 - Dust Palliatives
 - Water Bars
 - Roadside Drainage
 - Driving Surface Aggregate
- Invest in in-house capabilities – but be cognizant to pay scales that encourage workers to get trained by Township and then depart for private work.

The Funding Challenge





TYPICAL ROAD MAINTENANCE/REPAIR COSTS (ESTIMATES)

03

Crack Sealing	\$3,500 to \$5,000 per road mile
Double Oil and Chip	\$68,000 to \$85,000 per road mile
Mill & Overlay	\$280,000 to \$350,000 per road mile
Full Depth Reconstruction (Collector Road)	\$1,600,000 per road mile
Full Depth Reconstruction (Local-1 Road)	\$1,400,000 per road mile
Full-Depth Reconstruction (Local-2 Road)	\$1,300,000 per road mile

If suitable conditions exist, full depth reclamation can reduce reconstruction costs.



IDEAL MAINTENANCE PLAN FOR TYPICAL 1 MILE OF PAVED ROAD

<u>COND.</u>	<u>ACTIVITY</u>	OPTION-1 <u>REG. MAINT.</u> <u>MAINT. COST</u>	<u>YEAR</u>	OPTION-2 <u>DO NOTHING</u> <u>MAINT. COST</u>	<u>ACTIVITY</u>	<u>COND.</u>
A	-	\$ 0	0	\$ 0	-	A
B	Maintenance	\$ 85,000	6	\$ 0	-	B
C	Maintenance	\$ 95,200	12	\$ 0	-	C
B	Mill & Overlay	\$ 544,000	18	\$ 0	-	D/E
C	Maintenance	\$ 125,800	24	\$2,368,000	Reconstruction	A
D	Maintenance	\$ 136,000	30	\$ 0	-	B
A	Reconstruction	\$2,580,000	36	\$ 0	-	C
B	Maintenance	\$ 156,400	42	\$ 0	-	D/E
C	Maintenance	<u>\$ 166,600</u>	48	<u>\$3,136,000</u>	Reconstruction	A
		\$3,880,200		\$5,504,000		

\$1.62M MORE PER ROAD MILE OVER 48 YEARS TO DO NOTHING

calculations assume 27-foot wide road, 2.0% annual rate of inflation, and target road condition B

MOORE TOWNSHIP 2022 EXPENSE BUDGET†

- Emergency Services	\$2,192,200	37.5%
- Public Works Department	\$1,571,400	26.9%
- General Administration/Services	\$ 821,822	14.0%
- Land Preservation	\$ 541,000	9.3%
- Stormwater Management	\$ 520,000	8.9%
- Recreation/Historical	\$ 198,700	3.4%

† Based on all Township Accounts (General, Liquid Fuels, Preservation, ARP, etc.)

Note: 2022 Budget includes one-time ARP funding of \$726,400.

MOORE TOWNSHIP 2022 EXPENSE BUDGET

-	Emergency Services	\$2,192,200	37.5%
-	Public Works Department	\$1,571,400	26.9%
	Overhead	\$ 962,100	
	Road Maintenance and Repairs	\$ 244,000	4.2%
	Machinery Rental and Purchase	\$ 145,300	} \$ 227,300
	Repairs Tools and Machinery	\$ 82,000	
	Winter Maintenance	\$ 120,000	
	Street Cleaning	\$ 10,000	
	Traffic Control Devices	\$ 8,000	
-	General Administration/Services	\$ 821,822	14.0%
-	Land Preservation	\$ 541,000	9.3%
-	Stormwater Management	\$ 520,000	8.9%
-	Recreation/Historical	\$ 198,700	3.4%

		Reconstr.	Value at Current
PAVED	miles	\$/mile	Reconstr. Cost, \$
Collector	21.34	\$1,600,000.00	\$34,144,000.00
Local-1	47.36	\$1,400,000.00	\$66,304,000.00
Local-2	13.93	\$1,300,000.00	\$18,109,000.00
		Reconstr.	Value at Current
GRAVEL	miles	\$/mile	Reconstr. Cost, \$
ALL	9.57	\$500,000.00	\$4,785,000.00
		Total Value*	\$123,342,000.00

* These calculations are based on road miles cataloged in GIS database to date, therefore undervalues total value.

INFRASTRUCTURE LIKELY REPRESENTS OVER 90% OF TOTAL CAPITAL INVESTMENT IN THE TOWNSHIP AND, AS A CONSEQUENCE, IS A DRIVER OF LONG-TERM BUDGET LIABILITY

- 99.35* Total Township Road Maintenance Miles
 - 86.21 miles paved (estimate)
 - 13.14 miles gravel (estimate)
- 7-Year Maintenance Cycle
 - 12.32 miles of paved road per year, including 2.38 miles of full-reconstruction on 36 year cycle with recommended annual maintenance.
 - 13.14 miles of gravel road per year
- 10-Year Maintenance Cycle
 - 8.62 miles of paved road per year, including 2.38 miles of full-reconstruction on 36 year cycle with recommended annual maintenance.
 - 13.14 miles of gravel road per year

*** Values based on PennDOT miles with estimated total of gravel roads based on roads in database not yet assigned road surface type.**

- Current Road Maintenance and Repair Funding
 - 2 miles of surface treatments
 - 3 miles of in-house pavement maintenance
 - Limited to no full-reconstruction miles
 - 13.14 miles of gravel road maintenance (regrading, adding stone)

Deficiencies:

- 2.38 miles/year of full reconstruction economically infeasible.
- 4.5 to 8 miles of surface treatments not being done.
- For each 1 mile of road reconstructed at \$1.4M per road mile, approx. 16.5 miles of road maintenance has to be deferred.
- For each 500 feet of road reconstructed at \$132K, 2 miles of surface treatments cannot be done.

FUNDING LEVELS FOR ACTUAL ROAD CONSTRUCTION (MAINTENANCE, REPAIR, AND RECONSTRUCTION)

- Min. Funding Level for Avg. B Grade Roads: \$ 4,687,000/yr
 - Min. Recommended Funding Level: \$ 650,000/yr
 - Current Funding Level: \$ 244,000/yr
- Min. Funding Deficit* \$ 406,000/yr

These numbers do not include:

- Traffic control devices (signs, line striping, etc)
- Guiderail maintenance
- Culverts and Bridges
- Stormwater Infrastructure

- **Liquid Fuels Funding** = \$5,455 per road mile for 2022. This is an important funding source but inadequate to meet needs, since only \$2,456 per road mile is going toward actual road construction work.
- **Taxes:** Township is under-investing in local infrastructure. Township revenues should minimally cover basic road maintenance costs. It is infeasible to make up funding shortfalls through residential taxation alone. Township may want to look at land planning for ways to diversify tax revenues to limit long-term burden on residential households.
- **Bonding/Bank Loans** should be considered for reconstruction projects to spread the cost over a number of years.

- Look at long-term funding options to increase level of funding available for actual construction costs currently only \$240,000, which is only \$2,415.70 per road mile based on PennDOT value of 99.35 miles of local roads in Township.
- Work towards goal of \$650,000 based on 2022 dollars and plan for annual inflationary adjustments.
- Consider creation of a restricted account road improvement fund (RIF) that will not be used for other purposes and would specifically be funded by year-end transfers from general fund during years of positive year-end budget balance. This fund should be used to build up a rainy-day fund for unforeseen cost such as culvert washout and to supplement annual road work costs.

**MOORE TOWNSHIP
ROAD MAINTENANCE PROGRAM PRESENTATION
PRESENTED AT THE MAY 26, 2022
BOARD OF SUPERVISORS WORKSHOP MEETING**

PRESENTATION PREPARED BY

