



Upper Nazareth Township ROAD MAINTENANCE PROGRAM

Data & Statistics
Maintenance Funding & Strategy
2017 Update

DISCLAIMER

The cost values used throughout this presentation are based on available information, and fairly rough cost estimates and cost inflation projections. Though cost values could vary, the cost comparisons presented illustrate relative disparities.

Upper Nazareth Township Road Network Statistics



ROAD PROGRAM HISTORY – 2005 - 2017

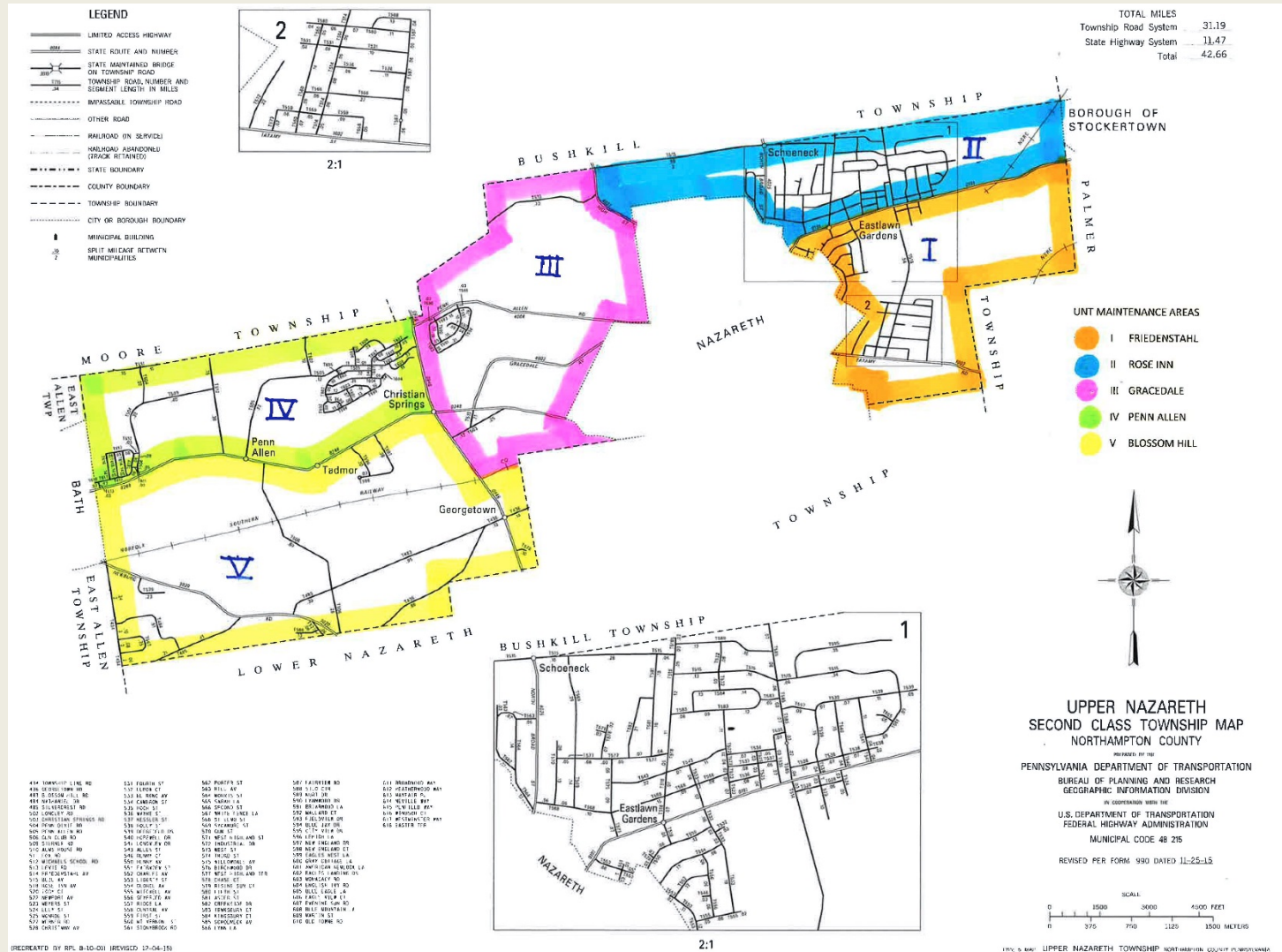
01

Work History

Year	Miles	Sq.Yds.	Contract Cost		
2006	0.258	3,230	\$ 147,980		
2007	0.391	4,126	\$ 121,260		
2008	0.000	0	\$ -		
2009	0.000	0	\$ -	Before Multi-Year Program	
2010	0.889	7,908	\$ 248,360	<i>Total Miles</i>	<i>Total Costs</i>
2011	0.000	0	\$ -	1.538	\$ 517,600
2012	1.160	26,616	\$ 159,380		
2013	4.342	68,863	\$ 172,955		
2014	0.000	0	\$ -		
2015	0.000	0	\$ -	1st Multi-Year Program Cycle	
2016	2.429	37,490	\$ 111,720	<i>Total Miles</i>	<i>Total Costs</i>
2017	2.784	53,615	\$ 142,270	10.715	\$ 586,325

TOWNSHIP MAINTENANCE AREA MAP

01



9/6/2017

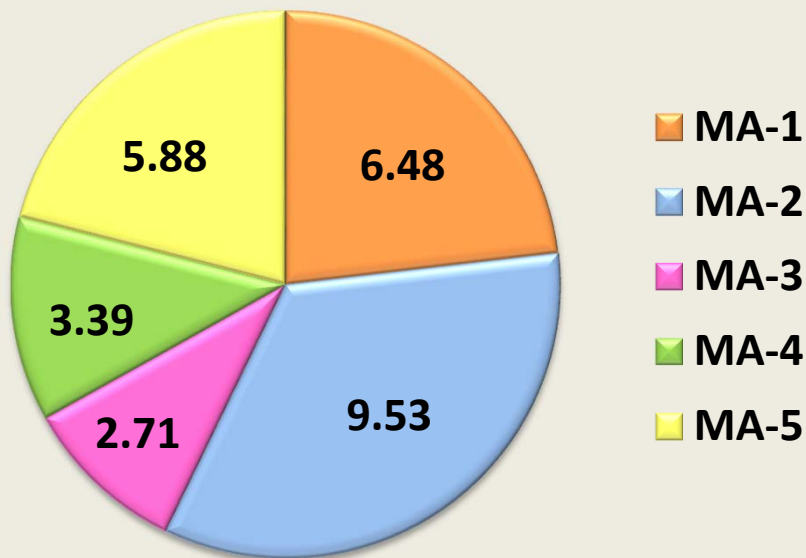
UNT ROAD MAINTENANCE PROGRAM

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TOWNSHIP ROAD MILES BY MAINTENANCE AREA (MA)

01

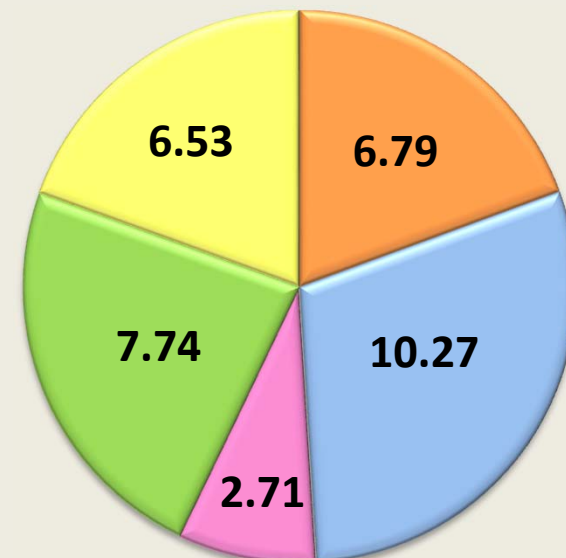
**Road Miles by Maintenance Area
(2011)**



27.99

**TOTAL MILES OF
TOWNSHIP ROADS IN 2011**

**Road Miles by Maintenance Area
(2017)**



34.04

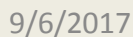
**TOTAL MILES OF
TOWNSHIP ROADS IN 2017**

6.05

**CHANGE IN MILES OF ROAD FROM 2011 TO 2017 –
MOSTLY WEST SIDE OF THE TOWNSHIP**



01

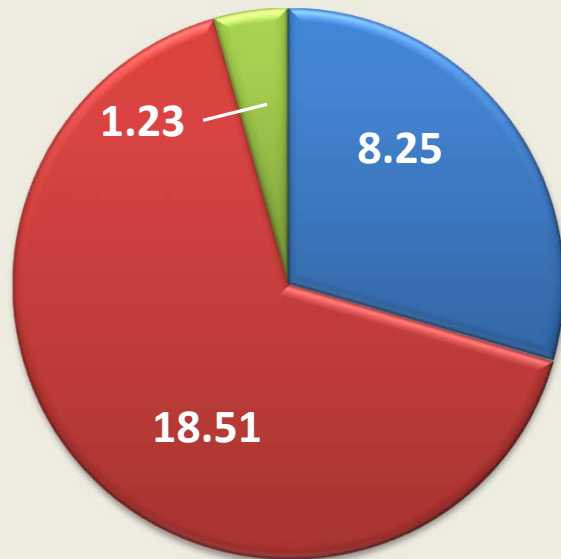


UNT ROAD MAINTENANCE PROGRAM

TOWNSHIP ROAD MILES BY ROAD CLASS

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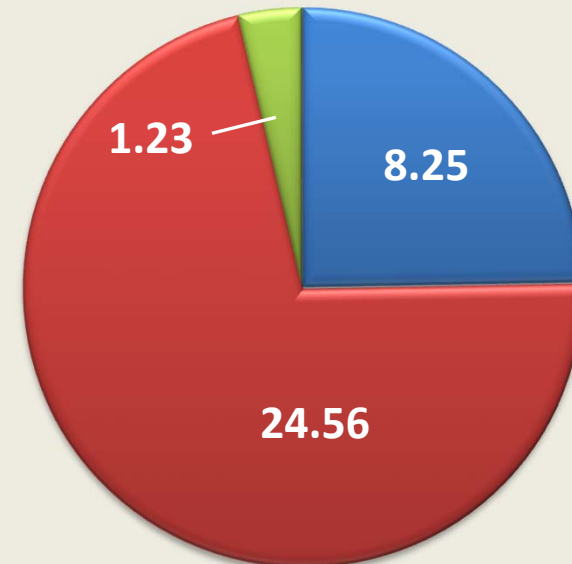
**Miles by Road Class
(2011)**



27.99

**TOTAL MILES OF
TOWNSHIP ROADS IN 2011**

**Miles by Road Class
(2017)**



34.04

**TOTAL MILES OF
TOWNSHIP ROADS IN 2017**

6.05

**CHANGE IN MILES OF ROAD FROM 2011 TO 2017 –
ALL LOCAL**



EXPLANATION OF ROAD CONDITION GRADES

01

- | | |
|--------------|--|
| A. Excellent | Like new, no work required. |
| B. Very Good | Requires maintenance, 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. Would benefit from a structural overlay |
| E. Poor | Requires extensive but partial base reconstruction, crack repair, and structural overlay. |
| F. Failing | Requires full reconstruction. Mitigate with extensive patching to maintain minimal level of service |

ROAD GRADE BY CLASSIFICATION

<i>Road Classification</i>	<i>Total Miles</i>	<i>Grade</i>
ALLEY	1.23	E+
LOCAL ROAD	24.56	C+
COLLECTOR	8.25	D+

THE MAJORITY OF OUR WORST ROADS ARE ALLEYS AND COLLECTORS, BUT THE LONG TERM LIABILITY IS WHEN ROADS PUT IN AT AROUND THE SAME TIME IN A LARGE RESIDENTIAL NEIGHBORHOOD NEED TO BE RECONSTRUCTED.

Friedenstahl = 0.87 mile

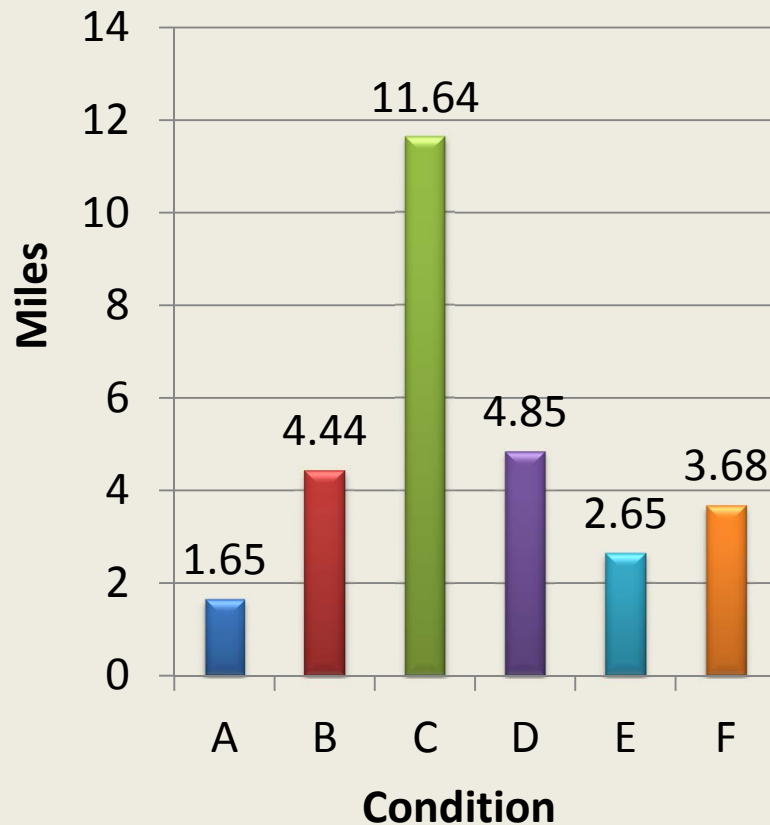
Rose Inn = 0.52 mile

Hillside Development = 1.93 mile

OVERALL ROAD CONDITIONS

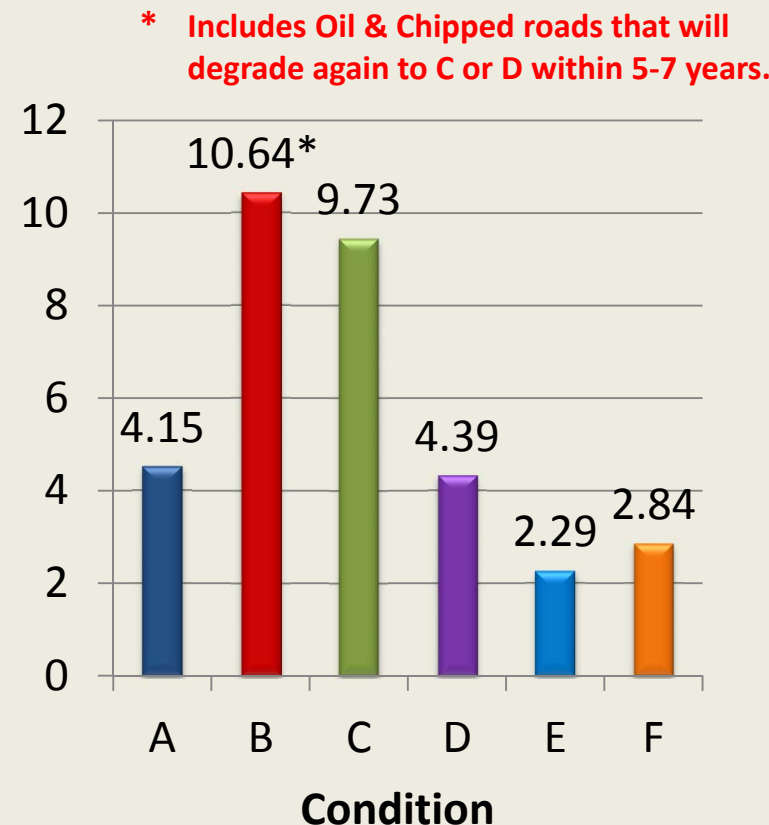
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**Overall Road Condition
(2011)**



C- OVERALL GRADE (2011)

**Overall Road Condition
(2017)**



C OVERALL GRADE (2017)

- 1ST Cycle of Multi-Year Road Program a success.
- Continue surface treatments on roads left unaddressed during 1st Multi-Year Cycle.
- Public Works has steadily improved capability & productivity and is instrumental in keeping failing roads serviceable.
- Roads still deteriorating faster than we can keep up.
- Current funding is inadequate.

- Multi-Year Road Program largely met goal of stabilizing as many road miles as possible. Program was not fully implemented as planned due to Florey Farms and SR. 191 Projects which were not included in the work history statistics for the Road Program.
- Our efforts in applying surface treatments to 7.85 miles of road since 2012 have helped stabilize some roads. Surface treatments delay degradation due to freeze-thaw effects, but they do not slow structural failure.

- As in 2011, the majority of roads are good candidates to be preserved with surface treatments. Roads needing re-construction need a lot of temporary work to keep serviceable.
- Public Works efforts to do substantial repairs, esp. on Gun Club Road, Christian Springs, Klipple, and Fox have improved some failing roads, or segments of them at least.
- Improved equipment and experience within the Public Works Dept. has been of great value not only doing significant repairs, but also paving roads such as Fox Rd. and Klipple.

- One reason overall road grade has improved is the acceptance of new roads, primarily in the Eagles Landing, Redcliffe and Florey Farms developments.
- Roads treated with surface treatments applied five or more years ago should be re-done within the next two (2) years.
- Approximately six (6) miles still need immediate reconstruction at an average cost of \$1.5M dollars per road mile.
- At current funding levels, roads will continue to decay at a faster rate than we can keep up with them.

The Funding Challenge

ESTIMATED CAPITAL VALUE OF UPPER NAZARETH TOWNSHIP

EVERYTHING BUT INFRASTRUCTURE

\$3,925,0000

- Municipal Building
- Friedenstahl Ave. and Daniels Road Public Works Facilities
- Administration Vehicle
- Police Vehicles & Equipment
- Public Works Vehicles & Equipment
- Parks & Recreation

INFRASTRUCTURE*

\$42,360,000 to \$66,175,000

- Roads (est. \$1.2M to \$1.5M per mile)
- Traffic Signals
- Bridges/Culverts >8 ft. Long

* Does not include:

- Culverts <8 ft. long
- Storm collection and conveyance system
- Guardrail
- Signs

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

GENERAL FUND BUDGET EXPENDITURE

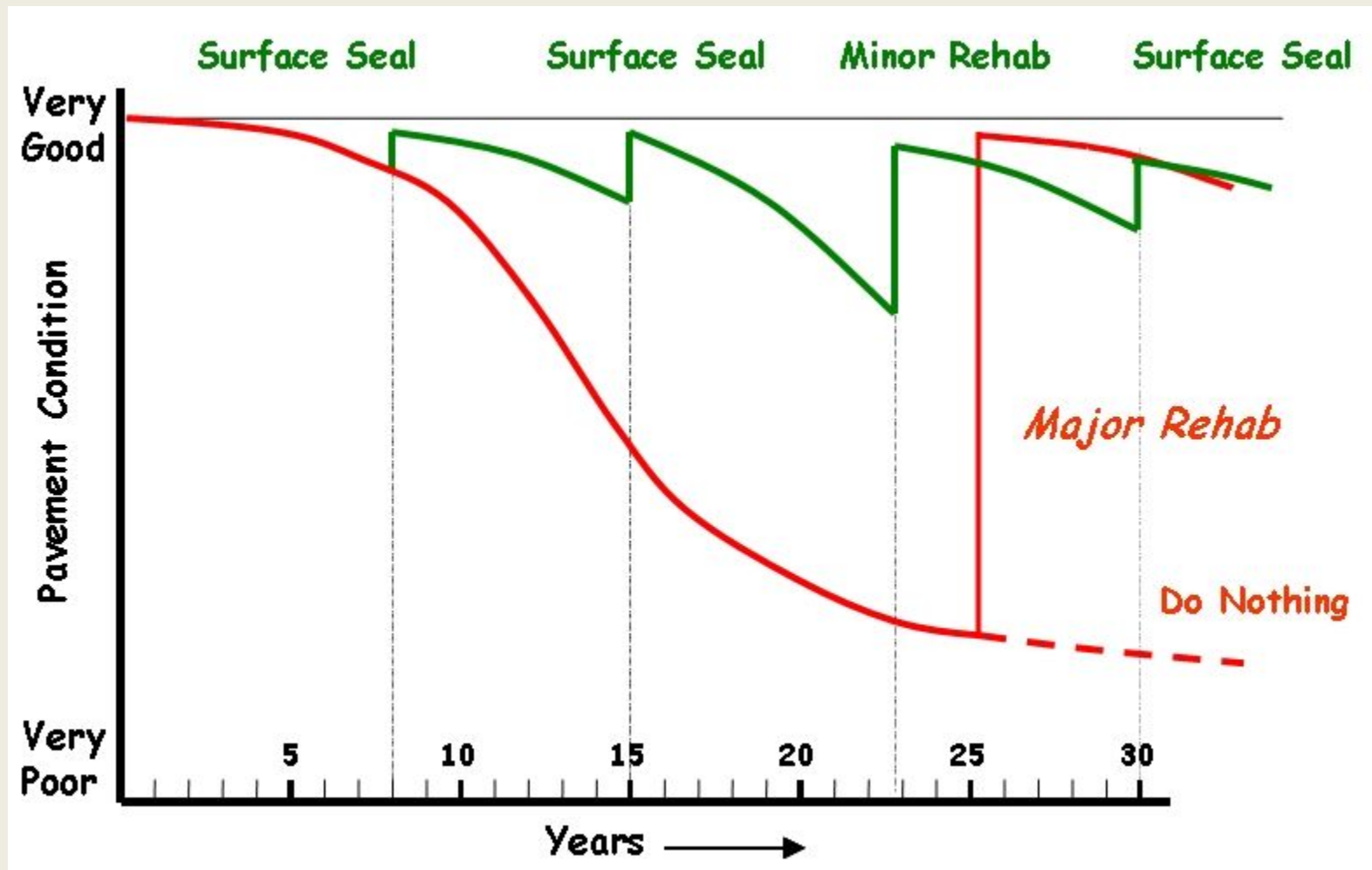
- Police Department	\$1,369,600	46.1%
- Public Works Department	\$ 585,960*	19.7% / 25.1%†
- Administration	\$ 531,950	17.9%
- Fire Department/Ambulance	\$ 173,700	5.8%
- Library/Civic	\$ 85,900	2.9%
- Waste/Recycling	\$ 76,460	2.6%
- Parks & Recreation	\$ 76,260	2.6%
- Gen. Gov. Building/Plant	\$ 57,570	1.9%
- Zoning/Emergency Mgmt.	\$ 12,140	0.4%

* Includes labor time used for recreation, building, waste and other activity not related to road maintenance.

† If include \$214,000 Liquid Fuels Funding – \$73,000 of this goes to street lighting, winter maintenance, and signal maintenance and thus unavailable for road construction.

EXTENDING PAVEMENT LIFE WITH MAINTENANCE

02



MAINTENANCE PLAN FOR TYPICAL 1 MILE OF ROAD

		OPTION-1		OPTION-2		
		REG. MAINT.		DO NOTHING		
<u>COND.</u>	<u>ACTIVITY</u>	<u>MAINT. COST</u>	<u>YEAR</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	\$2,220,000	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	\$ 166,600	48	\$2,940,000	Reconstruction	A

**\$1.27M MORE PER ROAD MILE OVER 48 YEARS TO DO NOTHING,
THAT'S \$44.5M OVER 48 YEARS ASSUMING GOAL OF 'B' RATED ROAD NETWORK**

ROAD MAINTENANCE FUNDING LEVELS

ACTUAL

\$ 553,200

Not all of this goes directly into road work.
Includes street light electricity, public
works employee pay, etc.

DESIRABLE*

\$2,920,000

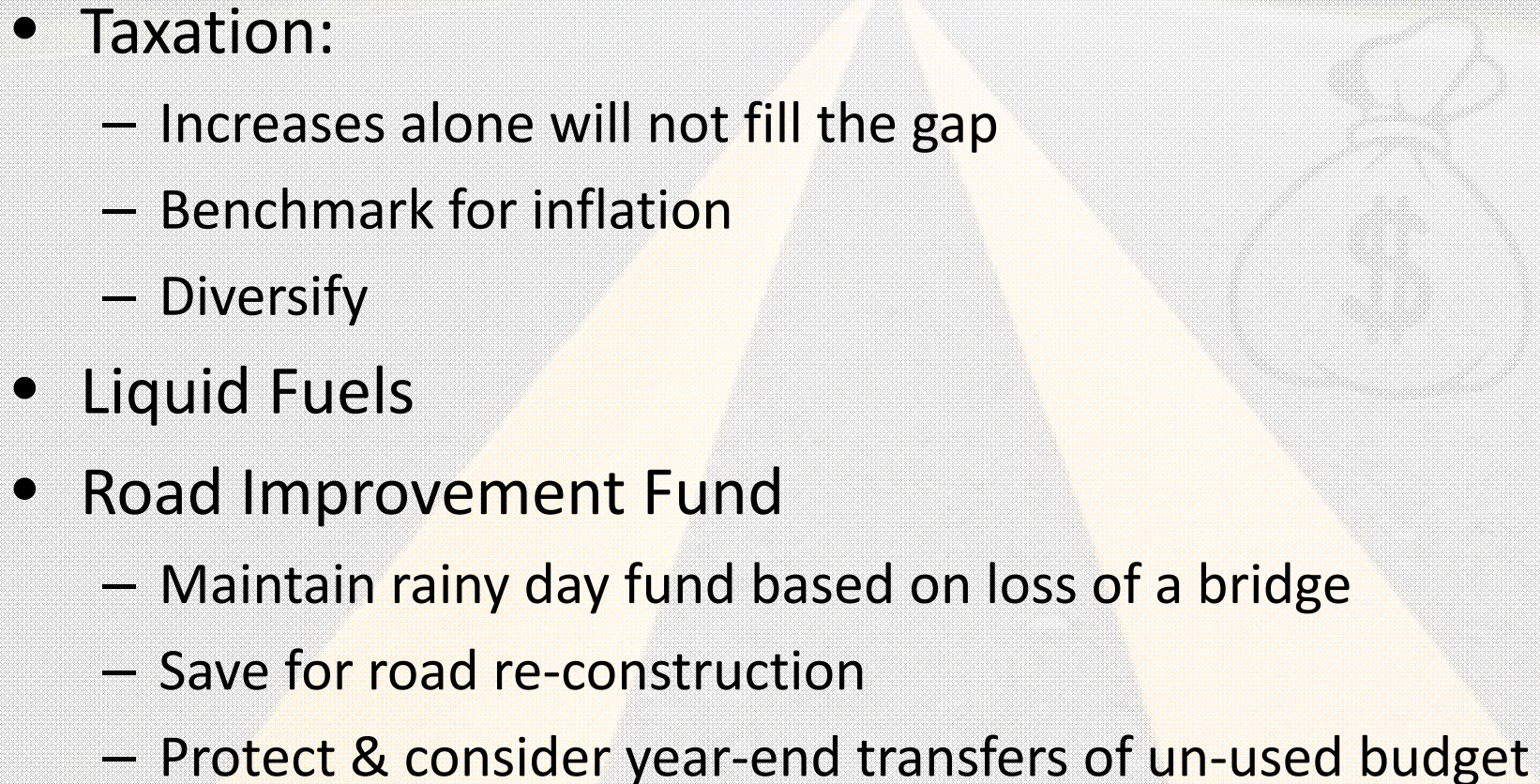
* Assumes goal to maintain an overall
condition 'B' across entire road network.

**THIS IS A BIG DISPARITY AND IT IS NOT THE PURPOSE OF THIS PRESENTATION TO
SUGGEST THE DESIRABLE FUNDING LEVEL IS FEASIBLE FOR THE FORESEEABLE FUTURE.**

**THIS DOES ILLUSTRATE THE DEGREE TO WHICH
ROAD MAINTENANCE IS CURRENTLY UNDERFUNDED.**

**FUNDING FOR BASIC MAINTENANCE IS INADEQUATE, LET ALONE FUNDING TO
RECONSTRUCT FAILING ROADS. THE BASIC QUESTION COMES DOWN TO WHAT LEVEL
OF DEGRADATION IS TOLERABLE TO THE COMMUNITY.**

Funding & Mitigation Strategies for Stretching Road Dollars

- 
- Taxation:
 - Increases alone will not fill the gap
 - Benchmark for inflation
 - Diversify
 - Liquid Fuels
 - Road Improvement Fund
 - Maintain rainy day fund based on loss of a bridge
 - Save for road re-construction
 - Protect & consider year-end transfers of un-used budget

TAXATION-1

- Taxation alone of the current Township economy cannot fill the funding gap. The community needs to wrestle with what level of taxation is reasonable to protect the enormous investment in the Township's infrastructure.
- However, if tax income becomes stagnant and does not keep up with rising costs of labor, material and services, then an indexed scheme to increase taxes on a planned schedule should be considered to avoid regular political fights.
- Lobby State Legislature to equalize playing field with municipalities who had or established a Business Privilege Tax prior to 1988.

TAXATION-2

- Preliminary analysis of residential taxation rates indicates personal income & property taxes are insufficient to keep up with cost of infrastructure maintenance and it is unlikely rates can be raised high enough to fill the gap.
- A serious effort is needed to diversify the economy of the Township to increase non-residential tax income potential.
- The Township should explore options to hire a land planning specialist to re-work zoning on underdeveloped areas of the Township to maximize non-residential development and develop a plan that might incentivize such development.

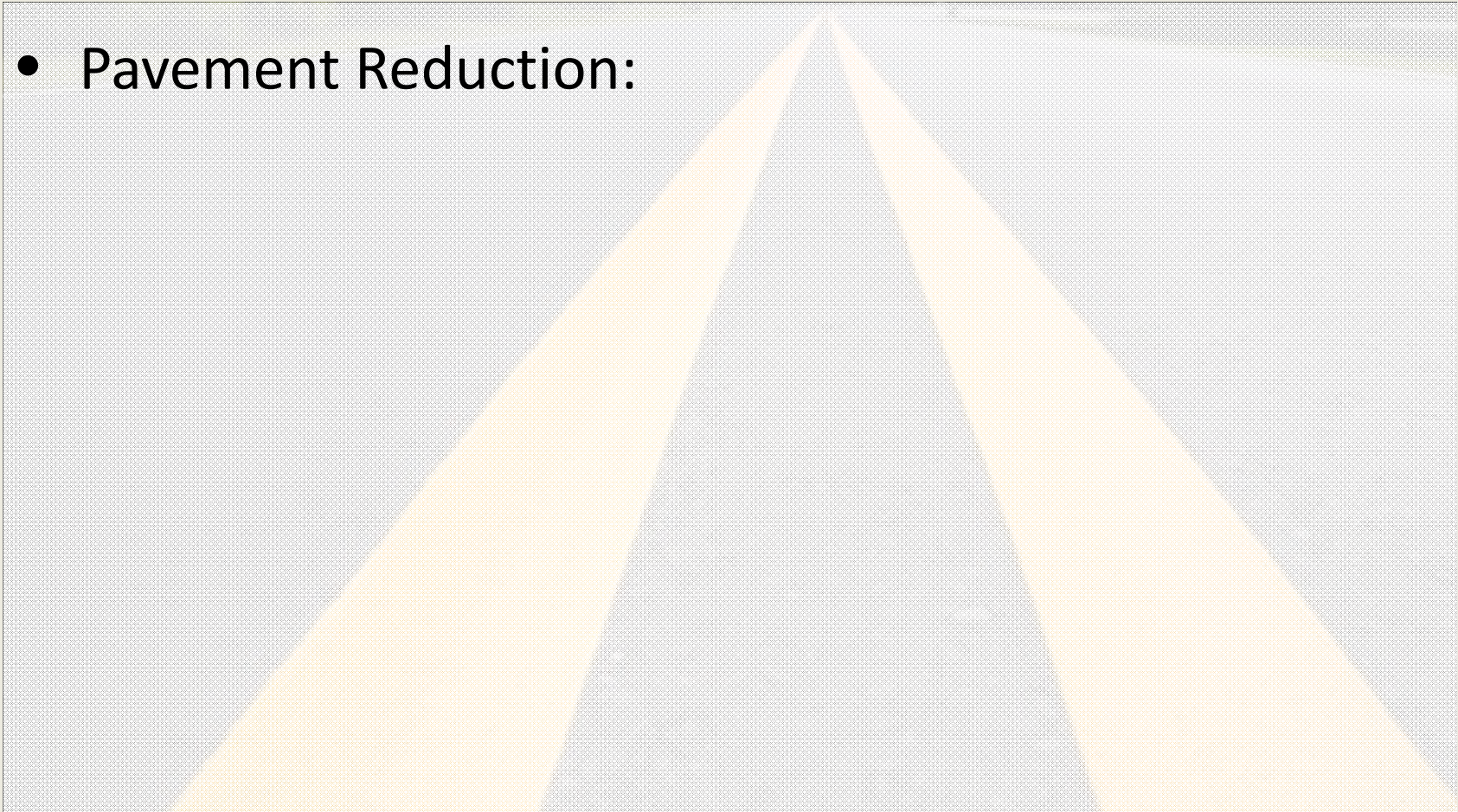
LIQUID FUELS

- Liquid Fuels funding from the state is inadequate to meet the Township's funding needs. It is a valuable supplement.
- Development policy must maintain that any new road will meet criteria for Liquid Fuels disbursement.
- Current policy of using Liquid Fuels for as many non-construction activities as possible (e.g. street lighting, salt, cinders, asphalt used by Public Works Dept. etc.) has been effective and should be continued with the caveat that Township funding should be preserved.

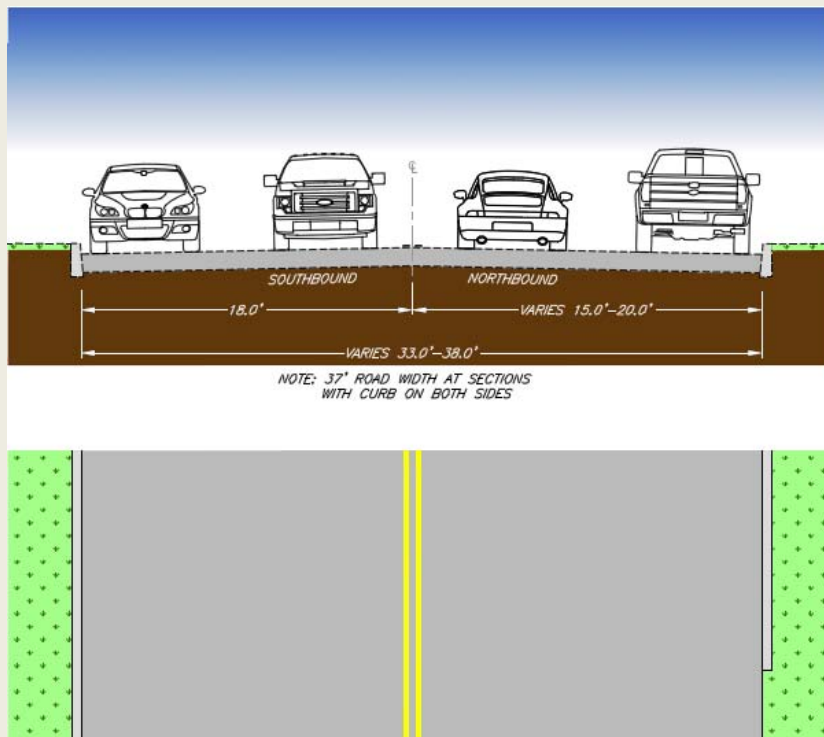
ROAD IMPROVEMENT FUND (RIF)

- The RIF has been a critical safety net since its implementation and should be preserved and protected. We are getting close to base-line value of \$400,000 for emergency rainy day fund.
- Minimum General Fund Transfer equal to value of material and services previously paid for with General Funds but since 2011 paid with Liquid Fuels should continue.
- Consider policy of transferring unused General Fund Budget monies into RIF at end of fiscal year to build up reserve for funding major road reconstruction.

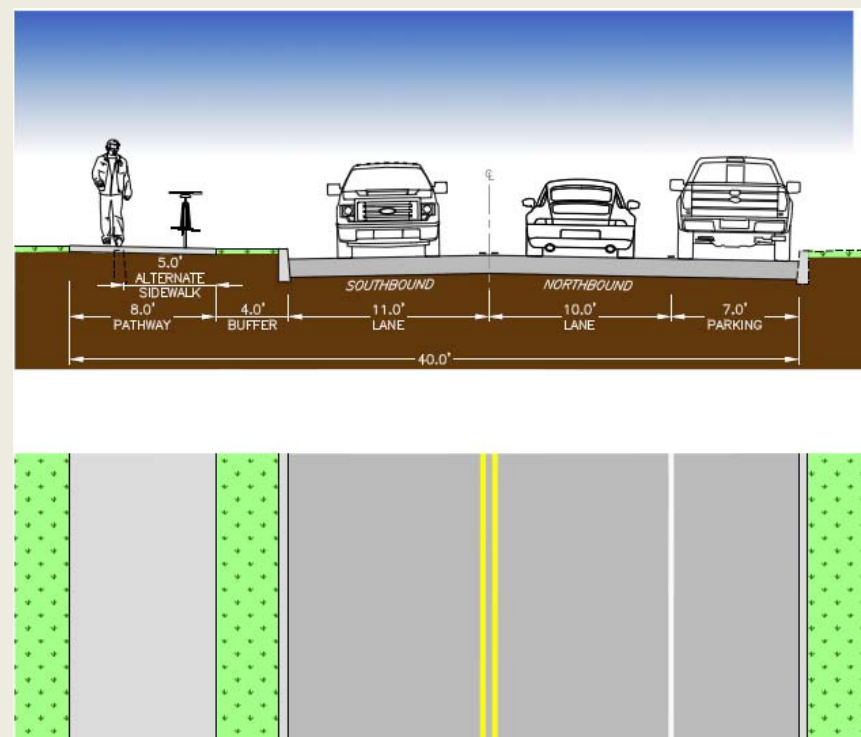
- Pavement Reduction:



MITIGATION-1: PAVEMENT REDUCTION



EXISTING

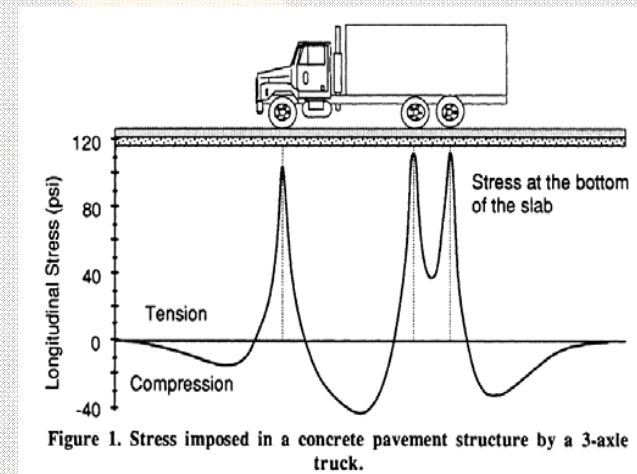


PROPOSED

- Pavement Reduction:
 - Decrease long-term cost
 - Traffic calming
 - Opportunity to improve pedestrian access
- Construction Technology
 - Full Depth Reclamation
 - Roller Compacted Concrete



- Pavement Reduction:
 - Decrease long-term cost
 - Traffic calming
 - Opportunity to improve pedestrian access
- Construction Technology
 - Full Depth Reclamation
 - Roller Compacted Concrete
- Protect
 - 3-axle garbage truck \approx 1,400 Cars



MITIGATION-1: PAVEMENT REDUCTION

- Reduce existing pavement area.

Adopt Traditional Neighborhood Design principles to reduce road widths of existing and future roads – this is an Action Item that should be advanced to modify existing Ordinances. When roads are reconstructed, reduce the width of the road. Benefits include:

- Reduced pavement area to maintain (incl. snow removal)
- Traffic calming
- Opportunity to build sidewalks and bike-walks
- Long-term \$ savings

MITIGATION-2: CONSTRUCTION TECHNOLOGY

- Adopt innovative road construction methods such as:
 - Full-Depth Reclamation
Strengthens sub-grade; greatly reduces quantity of material to excavate and replace
 - Exposed Roller Compacted Concrete
Potentially less or equal cost to asphalt, but no asphalt surface treatment every six (6) years

MITIGATION-3: PROTECT

- Maintain appropriate truck/heavy load restrictions.
- Issue with Garbage Trucks:
 - Plenty of studies supporting evidence that higher volume of garbage trucks can contribute to advanced degradation

One (1) 3-axle garbage truck = 1,429 cars trips
 - Load wise, pavement design models say we need more pavement thickness for 12 trucks per week than 2 trucks per week, but our roads should be ok. This is true of a new road, but counterbalanced by:
 - Age of our existing roads
 - Old pavement spec is much thinner than new spec, therefore more flexible
 - High risk due to local spring thaw condition where ground soil is saturated with water – this causes accelerated structural failure.

NEAR TERM PLAN

NEXT 6 YEARS

- Educate the taxpayers of the situation with our infrastructure.
- Maintain all-of-the-above approach to infrastructure maintenance to include road repair and maintenance, safety, drainage, and bridge maintenance.
- Continue current oil & chip program until all suitable roads are covered. As funds allow, look at using more expensive surface treatments on 2nd cycle of surface treatments.
- Need to begin doing overlays to extend structural life of existing roads as funds allow.
- Complete re-construction of Liberty Street as funding allows.



QUESTIONS