

TOWN OF MIDDLEBURY HIGHWAY DEPARTMENT CAPITAL IMPROVEMENT PLAN



2019

Funding provided by
VTrans Better Roads Program and the Town of Middlebury,
with the assistance of Addison County Regional Planning Commission
and a Fulcrum mobile data

Introduction

In Spring 2017 the Town of Middlebury received a grant from the VTrans Better Roads Program to conduct a culvert and road erosion inventory, prioritize identified projects and develop a Capital Improvement Plan (CIP) to implement the projects over a period of five years.

This CIP, a multi- year plan, is focused on the culvert and road erosion segment inventories. It prioritizes projects and creates a completion timeline while efficiently using available funds and current resources.

Highway Capital Reserve Fund

Middlebury annually sets appropriations for highways and gravel roads, which includes culverts. In 2019, \$391,00 was set aside for paved roads and \$80,000 for gravel roads. The Infrastructure Committee determines and reviews all projects. The Road Commissioner's annual budget includes the annual maintenance/ highway needs as well as anticipated projects. Any remaining unspent capital funds carry over from the previous year.

The proposed CIP relies on the use of capital reserve funds and grant opportunities to finance the program. As part of the CIP process, the capital reserves need to be examined to determine the impact on the funds and whether current funding levels will support these expenditures, or if increases in the budget and/or appropriations will be necessary. Additional projects will be undertaken as grant funding allows.

Components of Highway Department

The Highway Department is made up of a six full time crew and a few part-time seasonal workers. There are 66.06 miles of local roads (Class 1, 2 and 3), 2.73 miles of Class 4 roads, 10 bridges and 281 culverts that are maintained by the Highway Department. In addition to year round maintenance and paving of the local roads, the Highway Department is responsible for

the repair and/or replacement of street signs, roadside mowing, ditch and culvert work, maintenance of all town equipment, and municipal parking.

Capital Improvement Plan

The (CIP) is a comprehensive plan for the road erosion and structures projects, with estimated costs and revenues. It was developed with the Public Works Operations Director. General maintenance, though part of the Highway Department's responsibility, is not included in a CIP.

The town has an equipment replacement schedule so it is not included in this CIP. Road erosion projects combine road segments that have the highest priority as well as any failing culverts. Other segments in the vicinity were added into these projects to comprehensively address any areas in need of improvements.

Major Infrastructure Projects

Roads

The town has approximately 66 miles of road, approximately 85% of which are paved and the rest are gravel. Major storm damage or other circumstances may modify the proposed schedule.

Municipal Road General Permit

Act 64 of 2015 has shifted priorities for the State and Town Highway Departments. Starting in July 2018, ANR annually issues to the town a general permit, which is intended to achieve significant reductions in stormwater-related erosion from both paved and unpaved roads. By addressing these erosion-related issues, town roads will be improved by stabilizing the road drainage systems and bringing them up to basic maintenance standards, including additional corrective measure to reduce erosion and phosphorus runoff or other water quality issues. Towns must develop a schedule and requirements for the inventory of roads, prioritization of projects, and project implementation.

This plan incorporates these priorities by comprehensively looking at the roads. In Spring/Summer 2019 an inventory of all Class 2, 3 and 4 roads that have the potential to affect water quality was completed. Roads were divided into 100 meter or 328 feet

segments, totaling 1176 for the town. These segments were assessed on crown, grader berm, drainage, conveyance area and culverts. Gully or rill erosion was noted.

A prioritization system was developed based on 3 factors- erosion risk, slope, and phosphorus export potential. Working with Addison County Regional Planning Commission, we adopted the comparison matrix idea but evaluated the variables in separate tables. The segment priorities found using the various tables were then combined to determine an overall segment priority. The segment priority is assigned a Very High Priority if it is identified as such in any of the tables, otherwise lower priorities were averaged to arrive at a Low, Moderate or High Priority.

Road Erosion Risk Priority

MRGP Status	Low Rd Erosion Risk	Moderate Rd Erosion Risk	High Rd Erosion Risk
Fully Meets	Fully Meets	Fully Meets	Fully Meets
Partially Meets	Low Priority	Moderate Priority	High Priority
Does Not Meet	Moderate Priority	High Priority	Very High Priority

Road Field Slope Risk Priority

MRGP Status	0 - 4.9% Field Slope	5 - 9.9% Field Slope	10%+ Field Slope
Fully Meets	Fully Meets	Fully Meets	Fully Meets
Partially Meets	Low Priority	Moderate Priority	High Priority
Does Not Meet	Moderate Priority	High Priority	Very High Priority

Road Phosphorus Export Potential Priority

MRGP Status	Low Rd TP Export (< 25 kg/yr)	Medium Rd TP Export (25 – 60 kg/yr)	High Rd TP Export (> 60 kg/yr)
Fully Meets	Fully Meets	Fully Meets	Fully Meets
Partially Meets	Low Priority	Moderate Priority	High Priority
Does Not Meet	Moderate Priority	High Priority	Very High Priority

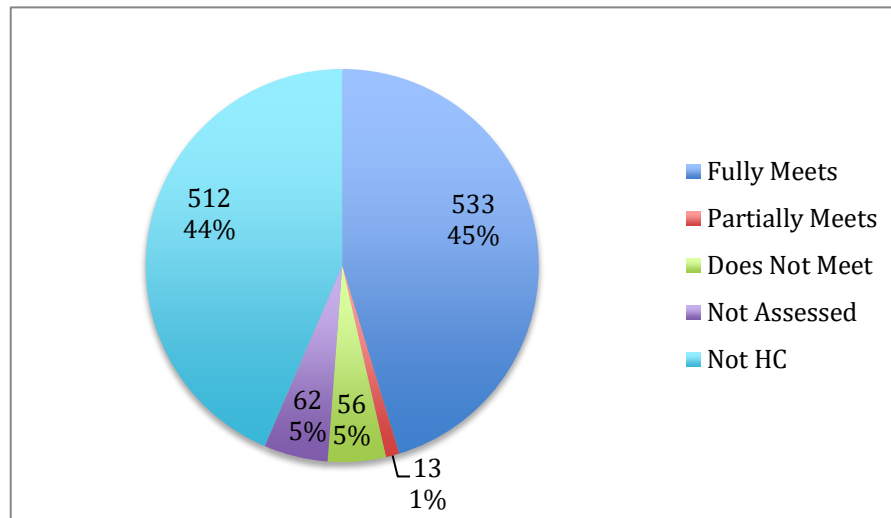
*TP = Total Road Phosphorus export from catchment watershed (modeled value)
Phosphorus export values are interpolated from the Lake Champlain TMDL model for paved and unpaved roads and were developed by watershed catchment by the Vermont DEC.

All segments received a prioritization score. Middlebury's segments comprised all categories, from fully meets the Municipal Road General Permit standards (533 segments), to those not meeting or partially meeting the standards (69 segments). A total of 512 segments of the 1176 were determined to be not hydrologically connected. Prioritization classification yielded 40 segments to be very high priority, 13 are high priority, 10 are moderate priority and 6 are low priority. The segments not assessed (62 segments), which are located on TH14, TH31, TH37, TH114, Middle Road N, Munson, Creek, Abbey Pond and Forest Ridge and Purinton Roads, were either segments that were impassable or private roads.

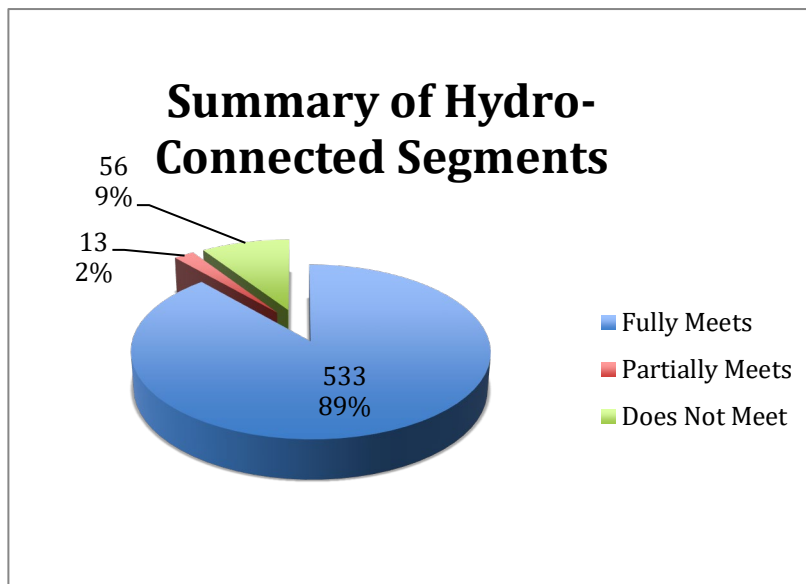
Road Erosion Inventory Results

The first pie chart depicts all of the segments that the Agency of Natural Resources identified to be inventoried (1176 segments) and the second pie chart shows only the rating of those segments that in the field were determined to be hydrologically connected (664 segments), and excludes the segments that were determined not to be.

MIDDLEBURY'S ROAD SEGMENTS



Summary of Hydro-Connected Segments



The focus for the CIP is on the segments that have a slope of 10% or more and are Very High Priority as these are required to be addressed by 2025. These 7 segments are located on North Branch and Dragon Brook Roads. The highest slope for the High Priority segment is 8%, which is also located on Dragon Brook Road.

Projects were created by combining those segments that are in close vicinity to each other and upgrading/replacing culverts, as that was often the reason that segments did not meet the standards. Project costs were developed by the Public Works Operations Director, using local costs and 2019 FEMA rates.

NORTH BRANCH ROAD (Map 1) -

9 Very High Priority Segments: #138255, #138256, #138257, #138258, #138259, #138260, #138261, #138262, #138263. 6 New Culverts & 12 Replacements

Middlebury Road Erosion Inventory Map



Legend (visible content)

Overall Priority - Combined Types

- ★ Very High Priority
- No HC - inspected
- Not Assessed

Hydroconnected segments Jan 2018

- ↔ No
- ↔ Yes

Middlebury Culverts

- < 15.0 in
- Fair
- Good
- 15.0 to < 18.0
- Excellent
- 24.0 to < 30.0
- Critical
- Poor
- Good
- 36.0 to < 42.0
- Poor
- 48.0 to < 60.0
- Good

- Town Boundary

Vermont Imagery

Sources:
MRGP Rd Inventory, Middlebury, 2019;
by Bill Kernan, Town of Middlebury and Benton Wright, ECO AmeriCorps
Statewide River Corridors: VT DEC, Jan, 2015
Statewide Small Stream 50 ft Setback: VT DEC, Jun, 2017 v.2
Wetlands; VSWI, 2011
Flood Hazard: FEMA
ACRPC 1/2020

Notes:

These segments have low to very high slopes, unstable drainage ditches, and low to high phosphorus export potential.

0 1000 feet

Middlebury Road Erosion Inventory Map

NORTH BRANCH ROAD (Map 2) - 2 High Priority Segments: #138247 & #138248, 1 Moderate Priority Segment: #138246

Legend (visible content)

Overall Priority - Combined Types

- ★ High Priority
- ★ Moderate Priority
- Fully Meets MRGP
- No HC - inspected

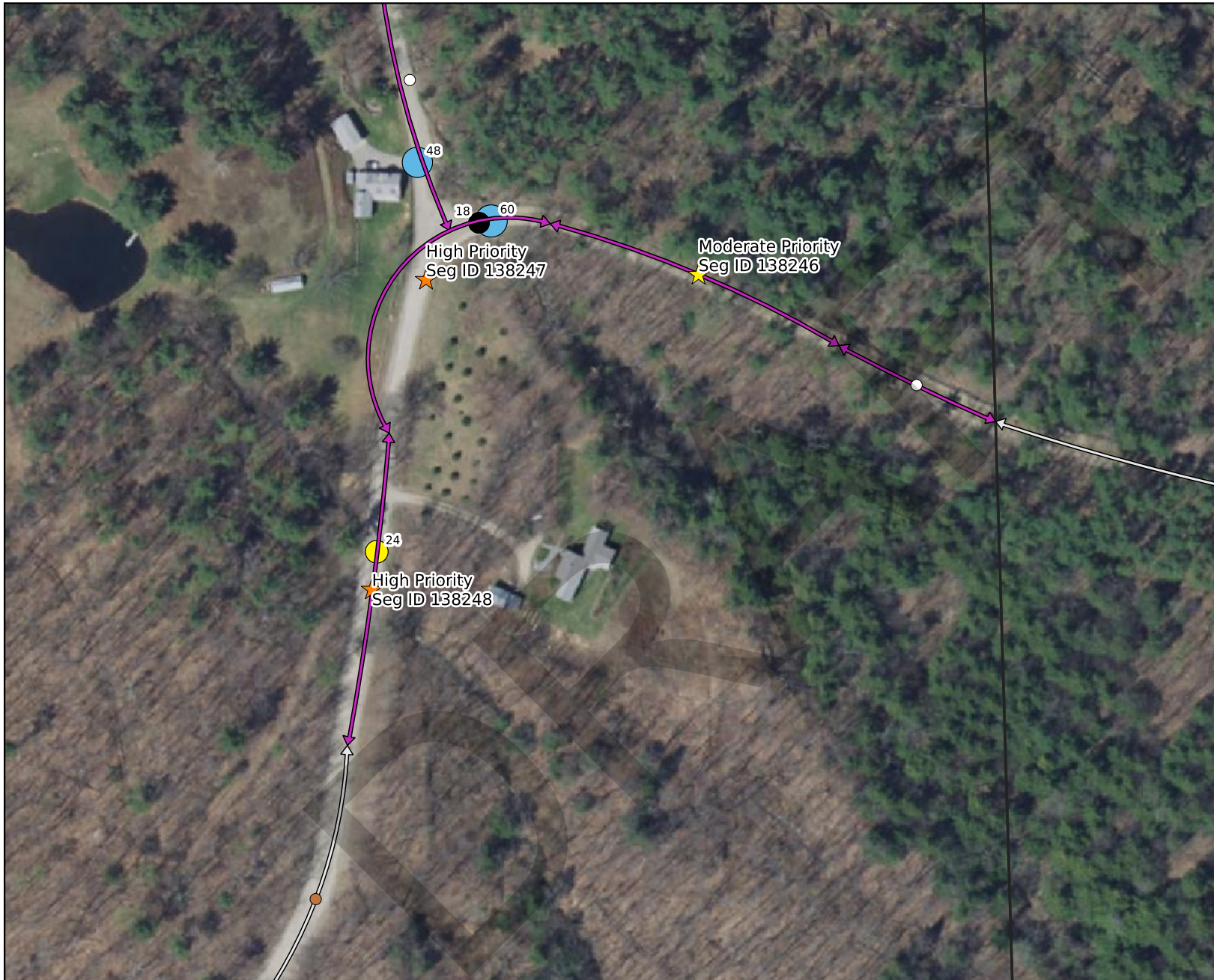
Hydroconnected segments Jan 2018

- ↔ No
- ↔ Yes

Middlebury Culverts

- 18.0 to < 24.0
- Closed
- 24.0 to < 30.0
- Fair
- 48.0 to < 60.0
- Excellent
- 60.0 to < 72.0
- Excellent
- Town Boundary

Vermont Imagery



Sources:
MRGP Rd Inventory, Middlebury, 2019;
by Bill Kernan, Town of Middlebury and Benton Wright, ECO AmeriCorps
Statewide River Corridors: VT DEC, Jan, 2015
Statewide Small Stream 50 ft Setback: VT DEC, Jun, 2017 v.2
Wetlands; VSWI, 2011
Flood Hazard: FEMA
ACRPC 1/2020

Notes:

These segments have low to very high slopes, unstable drainage ditches, and low to high phosphorus export potential.

0 300 feet

NORTH BRANCH ROAD – 9 Very High Priority Segments #138247, #138248 #138255, #138256, #138257, #138258, #138259, #138260, #138261, #138262 & #138263, 2 High Priority Segments #138247 & #138248 & 1 Moderate Priority Segment #138246 & 12 culverts to be replaced & 6 new culverts

These segments have low to very high slopes, unstable drainage ditches, and low to high phosphorus export potential.

**North Branch Rd
section # 138263**

There is an existing 15" RCP culvert in good shape, but we will need to install a concrete head wall on inlet side & a stone lined settling basin on the outlet end of the culvert to avoid erosion; replace & up-size the existing 12" metal culvert with a 18"X50' HDPE culvert, install a concrete head wall on inlet side & stone the outlet to avoid erosion; berm/spoil removal as well as ditching both sides of road throughout entire segment; stone line ditch on west side of road for the length of the segment; haul 3 loads of municipal mix to re-establish crown - est'd 4 - 8 hour days

PERSONNEL	HOURS	RATE		EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL
Cram	32	\$31.58	\$1,010.56	excavator rental / day	4	\$310.00	\$1,240.00	4" erosion stone (T)	64	\$7.80	\$499.20
Devino	32	\$20.72	\$663.04	# 358 dump truck	32	\$75.00	\$2,400.00	3/4" municipal mix (T)	48	\$13.95	\$669.60
Dwire, D	32	\$15.00	\$480.00	#306 pickup w/mulcher	32	\$65.00	\$2,080.00	18" HDPE culvert (ft)	50	\$16.00	\$800.00
Dwire, I	32	\$25.46	\$814.72	# 348 backhoe	32	\$80.00	\$2,560.00	2'X3' concrete headwall	6	\$55.00	\$330.00
Fleming	32	\$21.24	\$679.68	# 353 dump truck	32	\$75.00	\$2,400.00				
Kimball	32	\$21.77	\$696.64	# 357 dump truck	32	\$75.00	\$2,400.00				
Warden	32	\$23.12	\$739.84	# 355 dump truck	32	\$75.00	\$2,400.00				
TOTAL		<u>\$22,863.28</u>	\$5,084.48				\$15,480.00				\$2,298.80

**North Branch Rd
section # 138262**

replace 3 12" exsisting metal culverts with 18"X50' HDPE culverts; install concrete head walls on inlet side & stone outlets to avoid erosion; ditching on west side of road throughout entire segment; stone line ditch on west side of road throughout entire segment; haul 3 loads of municipal mix to re-establish crown - est'd 2 - 8 hour days

PERSONNEL	HOURS	RATE	SUB-TOTAL	EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL
Cram	16	\$31.58	\$505.28	excavator rental / day	2	\$310.00	\$620.00	4" erosion stone (T)	32	\$7.80	\$249.60
Devino	16	\$20.72	\$331.52	# 358 dump truck	16	\$75.00	\$1,200.00	3/4" municipal mix (T)	48	\$13.95	\$669.60
Dwire, D	16	\$15.00	\$240.00	#306 pickup w/mulcher	16	\$65.00	\$1,040.00	18" HDPE culvert (ft)	100	\$16.00	\$1,600.00
Dwire, I	16	\$25.46	\$407.36	# 348 backhoe	16	\$80.00	\$1,280.00	2'X3' concrete headwall	6	\$55.00	\$330.00
Fleming	16	\$21.24	\$339.84	# 353 dump truck	16	\$75.00	\$1,200.00				
Kimball	16	\$21.77	\$348.32	# 357 dump truck	16	\$75.00	\$1,200.00				
Warden	16	\$23.12	\$369.92	# 355 dump truck	16	\$75.00	\$1,200.00				
TOTAL		<u>\$13,131.44</u>	\$2,542.24				\$7,740.00				\$2,849.20

**North Branch Rd
section # 138261**

replace 3 existing culverts with 18"X50' HDPE culverts; install concrete head walls on inlets of all 3 culverts & stone the outlets to avoid erosion; grader berm/spoil removal on east side of road throughout entire segment; ditching on west side of road throughout the entire segment; stone line ditch on west side of road throughout entire segment; haul 9 loads of municipal mix to re-establish crown - est'd 3 - 8 hour days

PERSONNEL	HOURS	RATE	SUB-TOTAL	EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL
Cram	24	\$31.58	\$757.92	excavator rental / day	3	\$310.00	\$930.00	4" erosion stone (T)	128	\$7.80	\$998.40
Devino	24	\$20.72	\$497.28	# 358 dump truck	24	\$75.00	\$1,800.00	3/4" municipal mix (T)	144	\$13.95	\$2,008.80
Dwire, D	24	\$15.00	\$360.00	#306 pickup w/mulcher	24	\$65.00	\$1,560.00	18" HDPE culvert (ft)	150	\$16.00	\$2,400.00
Dwire, I	24	\$25.46	\$611.04	# 348 backhoe	24	\$80.00	\$1,920.00	2'X3' concrete headwall	9	\$55.00	\$495.00
Fleming	24	\$21.24	\$509.76	# 353 dump truck	24	\$75.00	\$1,800.00				
Kimball	24	\$21.77	\$522.48	# 357 dump truck	24	\$75.00	\$1,800.00				
Warden	24	\$23.12	\$554.88	# 355 dump truck	24	\$75.00	\$1,800.00				
TOTAL		<u>\$21,325.56</u>	\$3,813.36				\$11,610.00				\$5,902.20

North Branch Rd
section # 138260

replace existing culvert with a 18"X50' HDPE culvert; install a concrete head wall on the inlet side & stone the outlet end to prevent erosion; grader berm/spoil removal on east side of road throughout entire segment; ditching on west side of road throughout entire segment; stone line ditch on west side of road throughout entire segment; haul 3 loads of municipal mix to re-establish crown - est'd 2 - 8 hour days

PERSONNEL	HOURS	RATE	SUB-TOTAL	EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL
Cram	16	\$31.58	\$505.28	excavator rental / day	2	\$310.00	\$620.00	4" erosion stone (T)	48	\$7.80	\$374.40
Devino	16	\$20.72	\$331.52	# 358 dump truck	16	\$75.00	\$1,200.00	3/4" municipal mix (T)	48	\$13.95	\$669.60
Dwire, D	16	\$15.00	\$240.00	#306 pickup w/mulcher	16	\$65.00	\$1,040.00	18" HDPE culvert (ft)	50	\$16.00	\$800.00
Dwire, I	16	\$25.46	\$407.36	# 348 backhoe	16	\$80.00	\$1,280.00	2'X3' concrete headwall	3	\$55.00	\$165.00
Fleming	16	\$21.24	\$339.84	# 353 dump truck	16	\$75.00	\$1,200.00				
Kimball	16	\$21.77	\$348.32	# 357 dump truck	16	\$75.00	\$1,200.00				
Warden	16	\$23.12	\$369.92	# 355 dump truck	16	\$75.00	\$1,200.00				
TOTAL			\$2,542.24				\$7,740.00				\$2,009.00

North Branch Rd
section # 138259

install a new 15"X30' HDPE culvert at camp driveway; stone inlet & outlet to prevent erosion; tree & stump removal on both sides of road to allow for installing proper ditches; ditching both sides of road throughout entire segment; stone line ditches on both sides of road throughout entire segment; haul 3 loads of municipal mix to re-establish crown - est'd 3 - 8 hour days

PERSONNEL	HOURS	RATE	SUB-TOTAL	EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL
Cram	24	\$31.58	\$757.92	excavator rental / day	3	\$310.00	\$930.00	4" erosion stone (T)	96	\$7.80	\$748.80
Devino	24	\$20.72	\$497.28	# 358 dump truck	24	\$75.00	\$1,800.00	3/4" municipal mix (T)	48	\$13.95	\$669.60
Dwire, D	24	\$15.00	\$360.00	#306 pickup w/mulcher	24	\$65.00	\$1,560.00	15" HDPE culvert (ft)	30	\$10.59	\$317.70
Dwire, I	24	\$25.46	\$611.04	# 348 backhoe	24	\$80.00	\$1,920.00				
Fleming	24	\$21.24	\$509.76	# 353 dump truck	24	\$75.00	\$1,800.00				
Kimball	24	\$21.77	\$522.48	# 357 dump truck	24	\$75.00	\$1,800.00				
Warden	24	\$23.12	\$554.88	# 355 dump truck	24	\$75.00	\$1,800.00				
TOTAL			\$3,813.36				\$11,610.00				\$1,736.10

North Branch Rd
section # 138258

install a new 15"X40' HDPE culvert at land access road; stone inlet & outlet to prevent erosion; tree & stump removal on both sides of road to allow for installing proper ditches; ditching both sides of road throughout entire segment; stone line ditches on both sides of road throughout entire segment; install a stone lined settling basin at bottom of hill on west side of road; haul 5 loads of municipal mix to re-establish crown est'd 7 - 8 hour days

PERSONNEL	HOURS	RATE	SUB-TOTAL	EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL
Cram	56	\$31.58	\$1,768.48	excavator rental / day	7	\$310.00	\$2,170.00	4" erosion stone (T)	144	\$7.80	\$1,123.20
Devino	56	\$20.72	\$1,160.32	# 358 dump truck	56	\$75.00	\$4,200.00	3/4" municipal mix (T)	80	\$13.95	\$1,116.00
Dwire, D	56	\$15.00	\$840.00	#306 pickup w/mulcher	56	\$65.00	\$3,640.00	15" HDPE culvert (ft)	40	\$10.59	\$423.60
Dwire, I	56	\$25.46	\$1,425.76	# 348 backhoe	56	\$80.00	\$4,480.00				
Fleming	56	\$21.24	\$1,189.44	# 353 dump truck	56	\$75.00	\$4,200.00				
Kimball	56	\$21.77	\$1,219.12	# 357 dump truck	56	\$75.00	\$4,200.00				
Warden	56	\$23.12	\$1,294.72	# 355 dump truck	56	\$75.00	\$4,200.00				
TOTAL			\$8,897.84				\$27,090.00				\$2,662.80

North Branch Rd
section # 138257

replace existing culvert with a 18"X50' HDPE culvert; install concrete head wall on inlet side & stone outlet to prevent erosion; tree & stump removal on both sides of road to allow for installing proper ditches; ditching both sides of road throughout entire segment; stone line ditches on both sides of road throughout entire segment; haul 3 loads of municipal mix to re-establish crown - est'd 5 - 8 hour days

PERSONNEL	HOURS	RATE	SUB-TOTAL	EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL
Cram	40	\$31.58	\$1,263.20	excavator rental / day	5	\$310.00	\$1,550.00	4" erosion stone (T)	80	\$7.80	\$624.00
Devino	40	\$20.72	\$828.80	# 358 dump truck	40	\$75.00	\$3,000.00	3/4" municipal mix (T)	48	\$13.95	\$669.60
Dwire, D	40	\$15.00	\$600.00	#306 pickup w/mulcher	40	\$65.00	\$2,600.00	18" HDPE culvert (ft)	50	\$16.00	\$800.00
Dwire, I	40	\$25.46	\$1,018.40	# 348 backhoe	40	\$80.00	\$3,200.00	2'X3' concrete headwall	3	\$55.00	\$165.00
Fleming	40	\$21.24	\$849.60	# 353 dump truck	40	\$75.00	\$3,000.00				
Kimball	40	\$21.77	\$870.80	# 357 dump truck	40	\$75.00	\$3,000.00				
Warden	40	\$23.12	\$924.80	# 355 dump truck	40	\$75.00	\$3,000.00				
TOTAL			\$6,355.60				\$19,350.00				\$2,258.60

North Branch Rd
section # 138256

36" metal cross culvert needs to be replaced; THIS WOULD NEED TO BE A CONTRACTED JOB & MAY NEED TO BE ENGINEERED; install new 15"X30' HDPE drive culvert @ land access road; stone inlet & outlet to prevent erosion; ditching both sides of road throughout the entire segment; stone line ditches on both sides of road throughout entire segment; haul 4 loads of municipal mix to re-establish crown - est'd 3 - 8 hour days

PERSONNEL	HOURS	RATE	SUB-TOTAL	EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL
Cram	24	\$31.58	\$757.92	excavator rental / day	3	\$310.00	\$930.00	4" erosion stone (T)	80	\$7.80	\$624.00
Devino	24	\$20.72	\$497.28	# 358 dump truck	24	\$75.00	\$1,800.00	3/4" municipal mix (T)	64	\$13.95	\$892.80
Dwire, D	24	\$15.00	\$360.00	#306 pickup w/mulcher	24	\$65.00	\$1,560.00	15" HDPE culvert (ft)	30	\$10.59	\$317.70
Dwire, I	24	\$25.46	\$611.04	# 348 backhoe	24	\$80.00	\$1,920.00				
Fleming	24	\$21.24	\$509.76	# 353 dump truck	24	\$75.00	\$1,800.00				
Kimball	24	\$21.77	\$522.48	# 357 dump truck	24	\$75.00	\$1,800.00				
Warden	24	\$23.12	\$554.88	# 355 dump truck	24	\$75.00	\$1,800.00				
TOTAL			\$3,813.36				\$11,610.00				\$1,834.50

North Branch Rd
section # 138255

replace 2 existing culverts with 18"X50' HDPE culverts; install concrete head walls on inlet side of culverts & stone the outlet to prevent erosion; tree & stump removal on both sides of road to allow for installing proper ditches; ditching both sides of road throughout entire segment; stone line ditches on both sides of road throughout entire segment; haul 3 loads of municipal mix to re-establish crown - est'd 6 - 8 hour days

PERSONNEL	HOURS	RATE	SUB-TOTAL	EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL
Cram	48	\$31.58	\$1,515.84	excavator rental / day	6	\$310.00	\$1,860.00	4" erosion stone (T)	96	\$7.80	\$748.80
Devino	48	\$20.72	\$994.56	# 358 dump truck	48	\$75.00	\$3,600.00	3/4" municipal mix (T)	48	\$13.95	\$669.60
Dwire, D	48	\$15.00	\$720.00	#306 pickup w/mulcher	48	\$65.00	\$3,120.00	18" HDPE culvert (ft)	100	\$16.00	\$1,600.00
Dwire, I	48	\$25.46	\$1,222.08	# 348 backhoe	48	\$80.00	\$3,840.00	2'X3' concrete headwall	6	\$55.00	\$330.00
Fleming	48	\$21.24	\$1,019.52	# 353 dump truck	48	\$75.00	\$3,600.00				
Kimball	48	\$21.77	\$1,044.96	# 357 dump truck	48	\$75.00	\$3,600.00				
Warden	48	\$23.12	\$1,109.76	# 355 dump truck	48	\$75.00	\$3,600.00				
TOTAL			\$7,626.72				\$23,220.00				\$3,348.40

North Branch Rd
section # 138248

install 3 new 15"X30' HDPE drive culverts; stone inlets & outlets to prevent erosion; tree & stump removal on both sides of road to allow for installing proper ditches; ditching both sides of road throughout entire segment; stone line ditches on both sides of road throughout entire segment; haul 6 loads of gravel for drive culvert transitions as well as re-establishing crown - est'd 4 - 8 hour days

	PERSONNEL	HOURS	RATE	SUB-TOTAL	EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL
	Cram	32	\$31.58	\$1,010.56	excavator rental / day	4	\$310.00	\$1,240.00	4" erosion stone (T)	64	\$7.80	\$499.20
	Devino	32	\$20.72	\$663.04	# 358 dump truck	32	\$75.00	\$2,400.00	3/4" municipal mix (T)	96	\$13.95	\$1,339.20
	Dwire, D	32	\$15.00	\$480.00	#306 pickup w/mulcher	32	\$65.00	\$2,080.00	15" HDPE culvert (ft)	90	\$10.59	\$953.10
	Dwire, I	32	\$25.46	\$814.72	# 348 backhoe	32	\$80.00	\$2,560.00				
	Fleming	32	\$21.24	\$679.68	# 353 dump truck	32	\$75.00	\$2,400.00				
	Kimball	32	\$21.77	\$696.64	# 357 dump truck	32	\$75.00	\$2,400.00				
	Warden	32	\$23.12	\$739.84	# 355 dump truck	32	\$75.00	\$2,400.00				
TOTAL				\$5,084.48				\$15,480.00				\$2,791.50

North Branch Rd
section # 138247

tree & stump removal on both sides of road to allow for installing proper ditches; ditching both sides of road throughout entire segment; haul 3 loads of municipal mix to re-establish crown - est'd 2 - 8 hour days

	PERSONNEL	HOURS	RATE	SUB-TOTAL	EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL
	Cram	16	\$31.58	\$505.28	excavator rental / day	2	\$310.00	\$620.00				
	Devino	16	\$20.72	\$331.52	# 358 dump truck	16	\$75.00	\$1,200.00	3/4" municipal mix (T)	48	\$13.95	\$669.60
	Dwire, D	16	\$15.00	\$240.00	#306 pickup w/mulcher	16	\$65.00	\$1,040.00				
	Dwire, I	16	\$25.46	\$407.36	# 348 backhoe	16	\$80.00	\$1,280.00				
	Fleming	16	\$21.24	\$339.84	# 353 dump truck	16	\$75.00	\$1,200.00				
	Kimball	16	\$21.77	\$348.32	# 357 dump truck	16	\$75.00	\$1,200.00				
	Warden	16	\$23.12	\$369.92	# 355 dump truck	16	\$75.00	\$1,200.00				
TOTAL				\$2,542.24				\$7,740.00				\$669.60

North Branch Rd
section # 138246

ditching north side of road throughout entire segment; stone line ditch on north side of road throughout entire segment; haul 3 loads of municipal mix to re-establish crown - est'd 1 - 8 hour day

	PERSONNEL	HOURS	RATE	SUB-TOTAL	EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL
	Cram	8	\$31.58	\$252.64	excavator rental / day	1	\$310.00	\$310.00	4" erosion stone (T)	96	\$7.80	\$748.80
	Devino	8	\$20.72	\$165.76	# 358 dump truck	8	\$75.00	\$600.00	3/4" municipal mix (T)	48	\$13.95	\$669.60
	Dwire, D	8	\$15.00	\$120.00	#306 pickup w/mulcher	8	\$65.00	\$520.00				
	Dwire, I	8	\$25.46	\$203.68	# 348 backhoe	8	\$80.00	\$640.00				
	Fleming	8	\$21.24	\$169.92	# 353 dump truck	8	\$75.00	\$600.00				
	Kimball	8	\$21.77	\$174.16	# 357 dump truck	8	\$75.00	\$600.00				
	Warden	8	\$23.12	\$184.96	# 355 dump truck	8	\$75.00	\$600.00				
TOTAL				\$1,271.12				\$3,870.00				\$1,418.40

North Branch Rd
section # R042918D

outfall of culvert is perched, need to stone outlet to prevent any further erosion - est'd 4 hours

PERSONNEL	HOURS	RATE	SUB-TOTAL	EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL
Cram	4	\$31.58	\$126.32	excavator rental / day	0.5	\$310.00	\$155.00	4" erosion stone (T)	48	\$7.80	\$374.40
Devino	4	\$20.72	\$82.88	# 358 dump truck	4	\$75.00	\$300.00				
Fleming	4	\$21.24	\$84.96	# 353 dump truck	4	\$75.00	\$300.00				
Warden	4	\$23.12	\$92.48	# 355 dump truck	4	\$75.00	\$300.00				
			\$386.64				\$1,055.00				\$374.40

TOTAL **\$1,816.04**

TOTAL \$ **\$247,522.18**

TOTAL **42.5**
DAYS

Middlebury Road Erosion Inventory Map

7 Very High Priority Segments: #34069, #34070, #34071, #34072, #34073, #34074, #34075. 5 Culvert Replacements

Legend (visible content)

Overall Priority - Combined Types

★ Very High Priority

★ High Priority

Hydroconnected segments Jan 2018

↔ No

↔ Yes

Middlebury Culverts

○ < 15.0 in

○ Poor

○ Good

□ Town Boundary

Vermont Imagery



Sources:
MRGP Rd Inventory, Middlebury, 2019;
by Bill Kernan, Town of Middlebury and Benton Wright, ECO AmeriCorps
Statewide River Corridors: VT DEC, Jan, 2015
Statewide Small Stream 50 ft Setback: VT DEC, Jun, 2017 v.2
Wetlands; VSWI, 2011
Flood Hazard: FEMA
ACRPC 1/2020

Notes:

These segments have very high to moderate slopes, unstable drainage ditches with some gully erosion, and moderate to high erosion risk.

0 800 feet

DRAGON BROOK ROAD – 7 Very High Priority Segments #34069, #34070, #34071, #34072, #34073, #34074 & #34075 & 5 culverts to be replaced.

These segments have very high to moderate slopes, unstable drainage ditches with some gully erosion, and moderate to high erosion risk.

**Dragon Brook Rd
section # 34075**

replace existing 12" culvert with an 18"X60' HDPE culvert; install a concrete head wall on the inlet side & stone the outlet to prevent erosion; tree & stump removal on both sides of road to allow for installing proper ditches; ditching both sides of road throughout entire segment; stone line ditches on both sides of road throughout entire segment; haul 3 loads of municipal mix to re-establish crown - est'd 3 - 8 hour days

	PERSONNEL	HOURS	RATE	EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL	
	Cram	24	\$31.58	\$757.92	excavator rental / day	3	\$310.00	\$930.00	4" erosion stone (T)	96	\$7.80	\$748.80
	Devino	24	\$20.72	\$497.28	# 358 dump truck	24	\$75.00	\$1,800.00	3/4" municipal mix (T)	48	\$13.95	\$669.60
	Dwire, D	24	\$15.00	\$360.00	#306 pickup w/mulcher	24	\$65.00	\$1,560.00	18" HDPE culvert (ft)	60	\$16.00	\$960.00
	Dwire, I	24	\$25.46	\$611.04	# 348 backhoe	24	\$80.00	\$1,920.00	2'X3' concrete headwall	3	\$55.00	\$165.00
	Fleming	24	\$21.24	\$509.76	# 353 dump truck	24	\$75.00	\$1,800.00				
	Kimball	24	\$21.77	\$522.48	# 357 dump truck	24	\$75.00	\$1,800.00				
	Warden	24	\$23.12	\$554.88	# 355 dump truck	24	\$75.00	\$1,800.00				
TOTAL	\$17,966.76		\$3,813.36				\$11,610.00			\$2,543.40		

**Dragon Brook Rd
section # 34074**

replace existing drive culvert with an 18"X30' HDPE culvert; stone inlet & outlet to prevent erosion; removal of ledge on the east side of road in multiple locations throughout the segment to install a proper ditch; grader berm/spoil removal as well as ditching on both sides of road throughout entire segment; stone line ditch on east side of road throughout entire segment; haul 3 loads of municipal mix to re-establish crown - est'd 3 - 8 hour days

	PERSONNEL	HOURS	RATE	EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL	
	Cram	24	\$31.58	\$757.92	excavator rental / day	3	\$310.00	\$930.00	4" erosion stone (T)	48	\$7.80	\$374.40
	Devino	24	\$20.72	\$497.28	# 358 dump truck	24	\$75.00	\$1,800.00	3/4" municipal mix (T)	48	\$13.95	\$669.60
	Dwire, D	24	\$15.00	\$360.00	#306 pickup w/mulcher	24	\$65.00	\$1,560.00	18" HDPE culvert (ft)	30	\$16.00	\$480.00
	Dwire, I	24	\$25.46	\$611.04	# 348 backhoe	24	\$80.00	\$1,920.00	jack hammer rental	8	\$250.00	\$2,000.00
	Fleming	24	\$21.24	\$509.76	# 353 dump truck	24	\$75.00	\$1,800.00				
	Kimball	24	\$21.77	\$522.48	# 357 dump truck	24	\$75.00	\$1,800.00				
	Warden	24	\$23.12	\$554.88	# 355 dump truck	24	\$75.00	\$1,800.00				
TOTAL	\$18,947.36		\$3,813.36				\$11,610.00			\$3,524.00		

**Dragon Brook Rd
section # 34073**

replace existing 12" metal culvert with an 18"X60' HDPE culvert; install a concrete head wall on the inlet side & stone the outlet to prevent erosion; removal of ledge on the east side of road in multiple locations throughout the segment to install a proper ditch; grader berm/spoil removal as well as ditching on both sides of road throughout entire segment; stone line ditch on east side of road throughout entire segment; haul 3 loads of municipal mix to re-establish crown - est'd 2 - 8 hour days

	PERSONNEL	HOURS	RATE		EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL
	Cram	16	\$31.58	\$505.28	excavator rental / day	2	\$310.00	\$620.00	4" erosion stone (T)	80	\$7.80	\$624.00
	Devino	16	\$20.72	\$331.52	# 358 dump truck	16	\$75.00	\$1,200.00	3/4" municipal mix (T)	48	\$13.95	\$669.60
	Dwire, D	16	\$15.00	\$240.00	#306 pickup w/mulcher	16	\$65.00	\$1,040.00	18" HDPE culvert (ft)	60	\$16.00	\$960.00
	Dwire, I	16	\$25.46	\$407.36	# 348 backhoe	16	\$80.00	\$1,280.00	2'X3' concrete headwall	3	\$55.00	\$165.00
	Fleming	16	\$21.24	\$339.84	# 353 dump truck	16	\$75.00	\$1,200.00	jack hammer rental	8	\$250.00	\$2,000.00
	Kimball	16	\$21.77	\$348.32	# 357 dump truck	16	\$75.00	\$1,200.00				
	Warden	16	\$23.12	\$369.92	# 355 dump truck	16	\$75.00	\$1,200.00				
TOTAL	\$14,700.84			\$2,542.24				\$7,740.00				\$4,418.60

Dragon Brook Rd
section # 34072

replace existing 12" metal culvert with an 18"X60' HDPE culvert; install a concrete head wall on the inlet side & stone the outlet side to prevent erosion; removal of ledge on the east side of the road in multiple locations throughout the segment to install a proper ditch; grader berm/spoil removal as well as ditching on both sides of road throughout entire segment; stone line ditch on east side of road throughout entire segment; haul 3 loads of municipal mix to re-establish crown - est'd 2 - 8 hour days

	PERSONNEL	HOURS	RATE	EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL	
	Cram	16	\$31.58	\$505.28	excavator rental / day	2	\$310.00	\$620.00	4" erosion stone (T)	96	\$7.80	\$748.80
	Devino	16	\$20.72	\$331.52	# 358 dump truck	16	\$75.00	\$1,200.00	3/4" municipal mix (T)	48	\$13.95	\$669.60
	Dwire, D	16	\$15.00	\$240.00	#306 pickup w/mulcher	16	\$65.00	\$1,040.00	18" HDPE culvert (ft)	60	\$16.00	\$960.00
	Dwire, I	16	\$25.46	\$407.36	# 348 backhoe	16	\$80.00	\$1,280.00	2'X3' concrete headwall	3	\$55.00	\$165.00
	Fleming	16	\$21.24	\$339.84	# 353 dump truck	16	\$75.00	\$1,200.00	jack hammer rental	8	\$250.00	\$2,000.00
	Kimball	16	\$21.77	\$348.32	# 357 dump truck	16	\$75.00	\$1,200.00				
	Warden	16	\$23.12	\$369.92	# 355 dump truck	16	\$75.00	\$1,200.00				
TOTAL	\$14,825.64		\$2,542.24				\$7,740.00			\$4,543.40		

Dragon Brook Rd
section # 34071

removal of berm & spoils pile throughout entire segment on east side of road; ditching on west side of road where needed; stone line ditch on west side of road to prevent erosion; seed & mulch east side of road throughout segment; haul 3 loads of municipal mix to re-establish crown - est'd 2 - 8 hour days

	PERSONNEL	HOURS	RATE	EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL	
	Cram	16	\$31.58	\$505.28	excavator rental / day	2	\$310.00	\$620.00	4" erosion stone (T)	48	\$7.80	\$374.40
	Devino	16	\$20.72	\$331.52	# 358 dump truck	16	\$75.00	\$1,200.00	3/4" municipal mix (T)	48	\$13.95	\$669.60
	Dwire, D	16	\$15.00	\$240.00	#306 pickup w/mulcher	16	\$65.00	\$1,040.00	hay (bale)	150	\$3.25	\$487.50
	Dwire, I	16	\$25.46	\$407.36	# 348 backhoe	16	\$80.00	\$1,280.00	seed (50 lb)	3	\$84.87	\$254.61
	Fleming	16	\$21.24	\$339.84	# 353 dump truck	16	\$75.00	\$1,200.00				
	Kimball	16	\$21.77	\$348.32	# 357 dump truck	16	\$75.00	\$1,200.00				
	Warden	16	\$23.12	\$369.92	# 355 dump truck	16	\$75.00	\$1,200.00				
TOTAL	\$12,068.35			\$2,542.24			\$7,740.00				\$1,786.11	

Dragon Brook Rd
section # 34070

replace existing 12" metal culvert with an 18"X60' HDPE culvert; install a concrete head wall on inlet side & stone outlet side to prevent erosion; tree & stump removal on both sides of road to allow for installing proper ditches; grader berm/spoil removal as well as ditching on both sides of road throughout entire segment; stone line ditch on east side of road throughout entire segment; haul 3 loads of municipal mix to re-establish crown; seeding & mulching west side of road - est'd 6 - 8 hour days

	PERSONNEL	HOURS	RATE	EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL	
	Cram	48	\$31.58	\$1,515.84	excavator rental / day	6	\$310.00	\$1,860.00	4" erosion stone (T)	64	\$7.80	\$499.20
	Devino	48	\$20.72	\$994.56	# 358 dump truck	48	\$75.00	\$3,600.00	3/4" municipal mix (T)	48	\$13.95	\$669.60
	Dwire, D	48	\$15.00	\$720.00	#306 pickup w/mulcher	48	\$65.00	\$3,120.00	18" HDPE culvert (ft)	60	\$16.00	\$960.00
	Dwire, I	48	\$25.46	\$1,222.08	# 348 backhoe	48	\$80.00	\$3,840.00	2'X3' concrete headwall	3	\$55.00	\$165.00
	Fleming	48	\$21.24	\$1,019.52	# 353 dump truck	48	\$75.00	\$3,600.00	hay (bale)	150	\$3.25	\$487.50
	Kimball	48	\$21.77	\$1,044.96	# 357 dump truck	48	\$75.00	\$3,600.00	seed (50 lb)	3	\$84.87	\$254.61
	Warden	48	\$23.12	\$1,109.76	# 355 dump truck	48	\$75.00	\$3,600.00				
TOTAL	\$33,882.63		\$7,626.72				\$23,220.00			\$3,035.91		

Dragon Brook Rd
section # 34069

tree & stump removal on both sides of road to allow for installing proper ditches; ditching on both sides of road throughout entire segment; stone line ditch on east side of road throughout entire segment; install 2 stone lined settling basins on west side of road to help with erosion; will need to hire a contractor to remove 2 large oak trees leaning towards the power lines; haul 4 loads of municipal mix to re-establish crown est'd 6 - 8 hour days

PERSONNEL	HOURS	RATE		EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL
Cram	48	\$31.58	\$1,515.84	excavator rental / day	6	\$310.00	\$1,860.00	4" erosion stone (T)	192	\$7.80	\$1,497.60
Devino	48	\$20.72	\$994.56	# 358 dump truck	48	\$75.00	\$3,600.00	3/4" municipal mix (T)	64	\$13.95	\$892.80
Dwire, D	48	\$15.00	\$720.00	#306 pickup w/mulcher	48	\$65.00	\$3,120.00	hay (bale)	150	\$3.25	\$487.50
Dwire, I	48	\$25.46	\$1,222.08	# 348 backhoe	48	\$80.00	\$3,840.00	seed (50 lb)	3	\$84.87	\$254.61
Fleming	48	\$21.24	\$1,019.52	# 353 dump truck	48	\$75.00	\$3,600.00	oak tree removal	2	\$500.00	\$1,000.00
Kimball	48	\$21.77	\$1,044.96	# 357 dump truck	48	\$75.00	\$3,600.00				
Warden	48	\$23.12	\$1,109.76	# 355 dump truck	48	\$75.00	\$3,600.00				
TOTAL			\$7,626.72				\$23,220.00				\$4,132.51

TOTAL \$ **\$147,370.81**
TOTAL **24**
DAYS

EAST MUNGER STREET –

Middlebury Road Erosion Inventory Map 4 High Priority Segments: #93324, #93325, #93326, #93339. 1 Culvert Replacement

Legend (visible content)

Overall Priority - Combined Types

- ★ High Priority
- Fully Meets MRGP
- No HC - inspected

Hydroconnected segments Jan 2018

- ↔ No
- ↔ Yes

Middlebury Culverts

- 15.0 to < 18.0
- Good
- 24.0 to < 30.0
- Good
- 36.0 to < 42.0
- Fair
- Good

- Town Boundary

Vermont Imagery



Sources:
MRGP Rd Inventory, Middlebury, 2019;
by Bill Kernan, Town of Middlebury and Benton Wright, ECO AmeriCorps
Statewide River Corridors: VT DEC, Jan, 2015
Statewide Small Stream 50 ft Setback: VT DEC, Jun, 2017 v.2
Wetlands; VSWI, 2011
Flood Hazard: FEMA
ACRPC 1/2020

Notes:

These segments have unstable drainage ditches, with rill erosion and moderate phosphorus export potential.

0 1000 feet

EAST MUNGER STREET –4 High Priority Segments #93324, #93325, #93326 & #93339 & 1 culvert to be replaced.

These segments have unstable drainage ditches, with rill erosion and moderate phosphorus export potential.

East Munger St section # 93339

in this segment there has been past issues with the manure pond @ Butler's farm over-flowing, then running & discharging into the ditch on the north side of the road; this segment has already been ditched an stone lined

East Munger St section # 93326

tree & stump removal on both sides of road to allow for installing proper ditches; ditching both sides of road throughout entire segment; seeding & mulching ditches on both sides of road throughout entire segment; haul 3 loads of municipal mix to re-establish crown - est'd 5 - 8 hour days

PERSONNEL	HOURS	RATE		EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL
Cram	40	\$31.58	\$1,263.20	excavator rental / day	5	\$310.00	\$1,550.00	3/4" municipal mix (T)	48	\$13.95	\$669.60
Devino	40	\$20.72	\$828.80	# 358 dump truck	40	\$75.00	\$3,000.00	hay (bale)	100	\$3.25	\$325.00
Dwire, D	40	\$15.00	\$600.00	#306 pickup w/mulcher	40	\$65.00	\$2,600.00	seed (50 lb)	2	\$84.87	\$169.74
Dwire, I	40	\$25.46	\$1,018.40	# 348 backhoe	40	\$80.00	\$3,200.00				
Fleming	40	\$21.24	\$849.60	# 353 dump truck	40	\$75.00	\$3,000.00				
Kimball	40	\$21.77	\$870.80	# 357 dump truck	40	\$75.00	\$3,000.00				
Warden	40	\$23.12	\$924.80	# 355 dump truck	40	\$75.00	\$3,000.00				
TOTAL			\$26,869.94				\$19,350.00				\$1,164.34
			\$6,355.60								

East Munger St section # 93325

tree & stump removal on both sides of road to allow for installing proper ditches; ditching both sides of road throughout entire segment; seed & mulch ditching areas for erosion control; haul 3 loads of municipal mix to re-establish crown - est'd 2 - 8 hour days

PERSONNEL	HOURS	RATE		EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL
Cram	16	\$31.58	\$505.28	excavator rental / day	2	\$310.00	\$620.00	3/4" municipal mix (T)	48	\$13.95	\$669.60
Devino	16	\$20.72	\$331.52	# 358 dump truck	16	\$75.00	\$1,200.00	hay (bale)	100	\$3.25	\$325.00
Dwire, D	16	\$15.00	\$240.00	#306 pickup w/mulcher	16	\$65.00	\$1,040.00	seed (50 lb)	2	\$84.87	\$169.74
Dwire, I	16	\$25.46	\$407.36	# 348 backhoe	16	\$80.00	\$1,280.00				
Fleming	16	\$21.24	\$339.84	# 353 dump truck	16	\$75.00	\$1,200.00				
Kimball	16	\$21.77	\$348.32	# 357 dump truck	16	\$75.00	\$1,200.00				
Warden	16	\$23.12	\$369.92	# 355 dump truck	16	\$75.00	\$1,200.00				
TOTAL			\$11,446.58				\$7,740.00				\$1,164.34
			\$2,542.24								

East Munger St section # 93324

replace existing 12" culvert with a 18"X50' HDPE culvert; stone inlet & outlet to prevent erosion; tree & stump removal on both sides of road to allow to installing proper ditches; ditching both sides of road throughout entire segment; seeding & mulching ditches both sides of road throughout entire segment to prevent erosion; haul 4 loads of municipal mix to re-establish crown - est'd 6 - 8 hour days

PERSONNEL	HOURS	RATE		EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL
Cram	48	\$31.58	\$1,515.84	excavator rental / day	6	\$310.00	\$1,860.00	3/4" municipal mix (T)	64	\$13.95	\$892.80
Devino	48	\$20.72	\$994.56	# 358 dump truck	48	\$75.00	\$3,600.00	18" HDPE culvert (ft)	50	\$16.00	\$800.00
Dwire, D	48	\$15.00	\$720.00	#306 pickup w/mulcher	48	\$65.00	\$3,120.00	hay (bale)	100	\$3.25	\$325.00
Dwire, I	48	\$25.46	\$1,222.08	# 348 backhoe	48	\$80.00	\$3,840.00	seed (50 lb)	2	\$84.87	\$169.74
Fleming	48	\$21.24	\$1,019.52	# 353 dump truck	48	\$75.00	\$3,600.00				
Kimball	48	\$21.77	\$1,044.96	# 357 dump truck	48	\$75.00	\$3,600.00				
Warden	48	\$23.12	\$1,109.76	# 355 dump truck	48	\$75.00	\$3,600.00				
TOTAL			\$33,034.26				\$23,220.00				\$2,187.54
			\$7,626.72								

TOTAL \$ **\$71,350.78**
TOTAL
DAYS **13**

Overall Priority - Combined Types

- ★ Very High Priority
- No HC - inspected

Hydroconnected segments Jan 2018

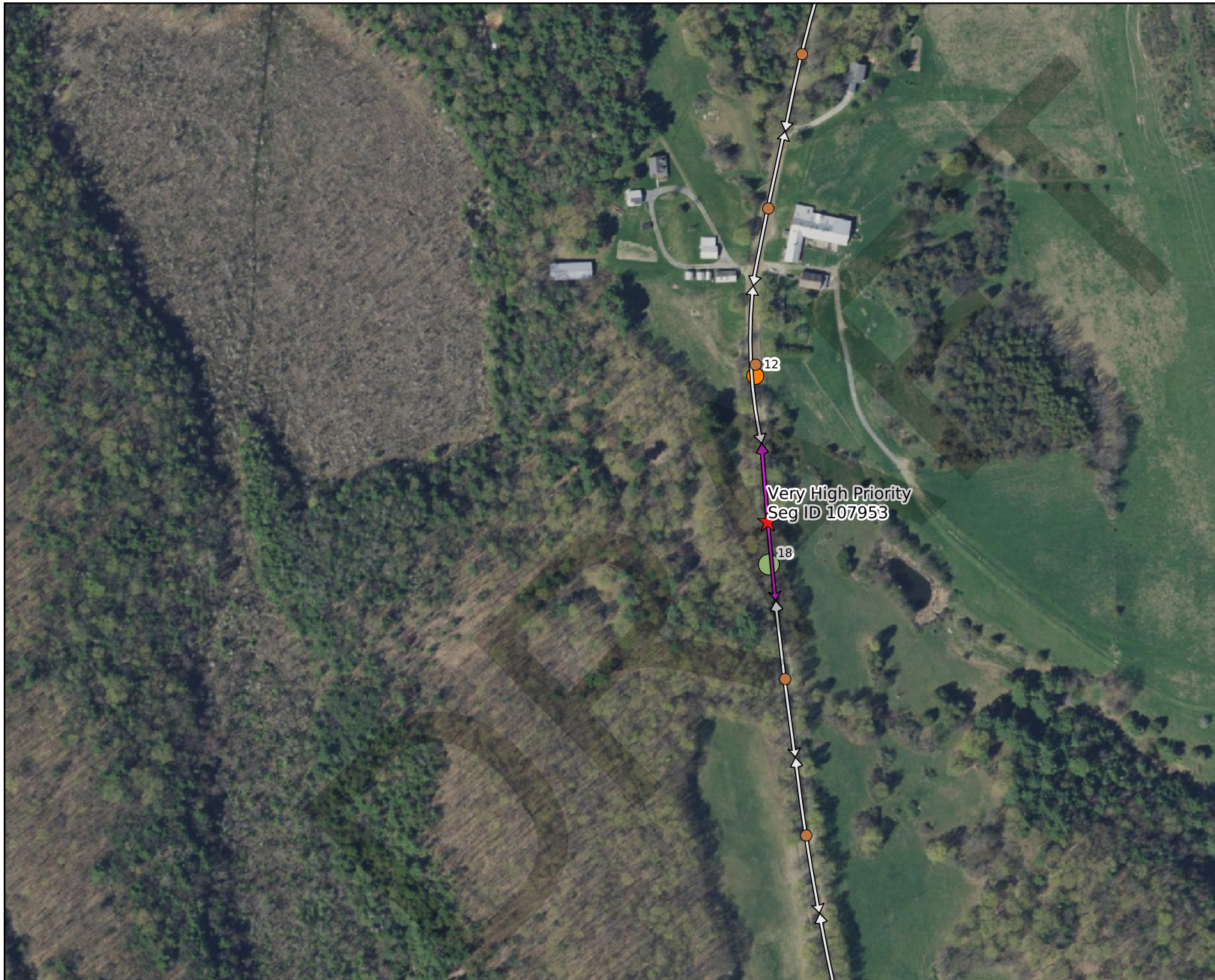
- ↔ No
- ↔ Yes

Middlebury Culverts

- < 15.0 in
- Critical
- 18.0 to < 24.0
- Good

- Town Boundary

Vermont Imagery



Sources:
MRGP Rd Inventory, Middlebury, 2019;
by Bill Kernan, Town of Middlebury and Benton Wright, ECO AmeriCorps
Statewide River Corridors: VT DEC, Jan, 2015
Statewide Small Stream 50 ft Setback: VT DEC, Jun, 2017 v.2
Wetlands; VSWI, 2011
Flood Hazard: FEMA
ACRPC 1/2020

This segment has high phosphorus export potential and gully erosion at the culvert.

HALPIN ROAD – 1 Very High Priority Segment #107953

This segment has high phosphorus export potential and gully erosion at the culvert.

[Halpin Rd](#)
section # 107953

tree & stump removal on both sides of road to allow for installing proper ditches; ditching both sides of road throughout entire segment; seeding & mulching ditches on both sides of road throughout entire segment; haul 3 loads of municipal mix to re-establish crown - est'd 5 - 8 hour days

	PERSONNEL	HOURS	RATE		EQUIPMENT	HOURS	RATE	SUB-TOTAL	MATERIALS	QTY (T)	COST	SUB-TOTAL
	Dwire, I	4	\$25.46	\$101.84	# 348 backhoe	4	\$80.00	\$320.00	4" erosion stone (T)	16	\$7.80	\$124.80
	Fleming	4	\$21.24	\$84.96	# 353 dump truck	4	\$75.00	\$300.00				
TOTAL				\$186.80				\$620.00				\$124.80

\$931.60

Town of Middlebury Capital Improvement Plan for Highway Department					
Budget Year	Component	Cost	Potential Source of Revenue/Grant	Town Appropriation &/or Trade In	End Balance
2021					
	Roads & Culverts	\$471,000	Better Roads Grant	\$471,000	\$0
	Road Erosion Segment Projects-NORTH BRANCH ROAD – 11 Very High Priority Segments #138247, #138248 #138255, #138256, #138257, #138258, #138259, #138260, #138261, #138262 & #138263, 2 High Priority Segments #138247 & #138248 & 1 Moderate Priority Segment #138246 & 12 culverts to be replaced & 6 new culverts	\$247,522	Better Roads Grant		-\$247,522
2021 ROAD PROJECT TOTALS		\$718,522		\$471,000	-\$247,522
2022					
	Roads & Culverts	\$591,000	VTrans Class 2 Paving	\$591,000	-\$247,522
	Road Erosion Segment Projects-DRAGON BROOK ROAD – 7 Very High Priority Segments #34069, #34070, #34071, #34072, #34073, #34074 & #34075 & 5 culverts to be replaced.	\$147,371	Better Roads Grant		-\$394,893
2022 ROAD PROJECT TOTALS		\$738,371		\$591,000	-\$394,893
2023					
	Roads & Culverts	\$635,000		\$635,000	-\$394,893
	Road Erosion Segment Projects-HALPIN ROAD – 1 Very High Priority Segment #107953	\$932	Better Roads Grant		-\$395,825
2023 ROAD PROJECT TOTALS		\$635,932		\$635,000	-\$395,825
2024					
	Roads & Culverts	\$680,000	VTrans Class 2 Paving	\$680,000	-\$395,825
	Road Erosion Segment Projects-EAST MUNGER STREET –4 High Priority Segments #93324, #93325 & #93326 & #93339 & 1 culvert to be replaced.	\$71,351	Better Roads Grant		-\$467,176
2024 ROAD PROJECT TOTALS		\$751,351		\$680,000	-\$467,176
2025					
	Roads & Culverts	\$724,000		\$724,000	-\$467,176
	Road Erosion Segment Projects-		Better Roads		-\$467,176
2025 ROAD PROJECT TOTALS		\$724,000		\$724,000	-\$467,176
2026					
	Roads & Culverts	\$780,000	VTrans Class 2 Paving	\$780,000	-\$467,176
	Road Erosion Segment Projects				-\$467,176
2026 ROAD PROJECT TOTALS		\$780,000		\$780,000	-\$467,176
2027					
	Roads & Culverts				
	Road Erosion Segment Projects				
2027 ROAD PROJECT TOTALS				\$0	\$0