

Mansfield Municipal Electric Department (MMED)
Capital Work Plan
(FY 2018) July 2017 – June 2018

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I. Executive Summary

Each year MMED establishes a 'Capital Work Plan' to invest ratepayer funds to improve system infrastructure and solidify Mansfield Electric's position as an industry leader in providing safe, reliable, and affordable electric energy to all its customers.

MMED has consistently had four primary objectives:

- I. Maintain a safe working environment for its employees.
- II. Invest in a strong system reliability performance.
- III. Provide affordable and competitive electric rates to its ratepayers.
- IV. Provide financial benefits to the Town of Mansfield that is consistent with sound financial management of the utility.

Each year the Engineering and Operations staff of MMED spend considerable time identifying critical infrastructure improvements and overall MMED operational needs to improve system operations. After defining each project along with stating its intended goal, each investment is estimated by the following breakdown;

- Labor Expenses (MMED)
- Expenses for outside resources (Contractor, Police Details, etc.)
- Vehicle hours
- Timeline to complete
- Total Cost estimate

Finally, each investment in the 'Capital Work Plan' is classified in one of four types of projects:

1. One Time Projects - are to be completed in the Fiscal Year
2. Recurring Projects - with a period of two or more years
3. Billable Projects (ex. State Funded projects)
4. General Plant Improvements

From the analysis above, the MMED staff has identified (28) capital project investments equal to \$4,614,658 for the fiscal year 2018. This total includes the installation of 2MW Distributive Generation peaking unit to be installed in FY18 (est. cost \$2.7M). Note: MMWEC has a flush of funds remaining to be returned to MMED in the estimated value over \$2.3M.

A summary breakdown of each is identified in the following chart:

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II. Capital Work Plan Summary:

Capital Work Plan Cost Summary July 2017 to June 2018									
	<i>Project</i>	<i>Type</i>	<i>Contract Services</i>	<i>MMED Labor</i>	<i>MMED Materials</i>	<i>MMED Hours - Line Crew</i>	<i>Trucks</i>	<i>Details</i>	<i>Total</i>
FY18-1 A	Circuit Improvement - West Street	One Time		\$29,760	\$19,200	372	\$3,600	\$13,560	\$66,120
FY18-1 B	Circuit Improvement - Hope and Shields	One Time		\$37,908	\$22,000	468	\$4,680	\$15,000	\$79,588
FY18-2	LED Roadway Lighting	One Time		\$109,350	\$229,500	1350	\$10,125	\$15,000	\$363,975
FY18-3	Jewell Street Manhole and Conduit Installation	One-Time	\$305,000					\$20,000	\$325,000
FY18-4	Distributed Generation Project	One Time	\$2,769,795						\$2,769,795
FY18-5	ERT and TOU Meters	Recurring		\$28,980	\$80,000				\$108,980
FY18-6	Padmount Switchgear Project	One Time		\$15,000	\$45,000	185	\$2,500	\$2,500	\$65,000
FY18-7	Pole Replacements	Recurring		\$34,500	\$26,700	431	\$2,400	\$3,600	\$67,200
FY18-8	Overhead Emergency Repair Contingency	General		\$25,000	\$39,000	313	\$3,000	\$3,000	\$70,000
FY18-9	Underground Cable Repair Contingency	General	\$20,000	\$20,000	\$20,000	250	\$2,500	\$2,500	\$65,000
FY18-10	New Transformers as Required	General			\$50,000				\$50,000
FY18-11	New Electric Services as Required	General		\$15,000	\$3,000	188			\$18,000
FY18-12	New metering equipment (not including above meters)	General		\$3,000	\$12,000				\$15,000
FY18-13	Install new streetlights as required.	General		\$5,000	\$15,000	63			\$20,000
FY18-14	New Office Equipment	General			\$5,000				\$5,000

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FY18-15	Office Carpet Replacement	One Time	\$20,000						\$20,000
FY18-16	Transition Office/Garage Alarm system onto SCADA	One Time	\$7,500		\$2,500				\$10,000
FY18-17	Vehicle - 15,000 to 18,000 GVWR dump truck with plow	One Time			\$75,000				\$75,000
FY18-18	Three Phase Power Quality Recorder and training	One Time			\$10,000				\$10,000
FY18-19	Purchase of new tools for vehicles and shop	General			\$15,000				\$15,000
FY18-20	New laboratory equipment	General			\$9,500				\$9,500
FY18-21	New radio equipment	General			\$2,500				\$2,500
FY18-22	Gilbert Street Meters Replacement	One Time	\$15,000		\$55,000				\$70,000
FY18-23	Computer hardware and software	General			\$20,000				\$20,000
FY18-24	Reimbursable Customer Projects	Billable				750			\$0
FY18-25	Old garage environmental cleanup and shoring	One Time	\$30,000						\$30,000
FY18-27	Circuit tie for outage contingency plan 1W5 and 1W8	One Time		\$15,000	\$7,500	200	\$6,000	\$3,500	\$32,000
FY18-28	Engineering and Operations Management	General		\$232,000					\$232,000
Total			\$3,167,295	\$570,498	\$763,400	4,570	\$34,805	\$78,660	\$4,614,658

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III. Capital Work Project Descriptions

- FY18-1A Circuit Improvements - improve system reliability with continued expansion of spacer cable. This project completes the 600 amp grid on the 1W8 by upgrading the conductor on West Street from 336 Aluminum to 477 Aluminum. See map on page 11.
- FY18-1B: Circuit Improvements - improve system reliability with continued expansion of spacer cable. This project extends the 600 amp grid on the 2W4 by upgrading the conductor on Hope and Shields Street to 477 Aluminum. See map on page 12.
- FY18-2: LED Roadway Lighting - reduce Town expenses by installing energy efficient LED roadway lighting. This project completes a retrofit of 2,700 of MMED's roadway street lights. State funding is covering 50% of the material cost.
- FY18-3: Jewell Street Manhole and Conduit Installation – two part project to underground one of the three overhead distribution circuits on Jewell Street. This budget includes the manholes and conduit. The FY19 budget will have cabling and splicing. See map on page 13.
- FY18-4: Distributed Generation Project - reduce transmission and capacity costs by installing a 2.5MW distributed generation unit at Gilbert Street Substation
- FY18-5: ERT Meters and TOU meters - reduce operations cost by installing Electronic Radio Transmitting meters. The program to purchase and install ERT meters started in FY12. 1,200 advanced radio read meters are budgeted to be replaced in FY18. We are also purchasing 60 meters programmed to allow for more technical customer load analysis of MMED's largest accounts.
- FY18-6: Padmount switchgear replacement - review of outage reports found several dead-front padmount switches that experienced several animal related outages. We plan to replace three of these switches with dead-front switchgear that should mitigate animal contact related outages.
- FY18-7: Pole Replacements – increase system reliability by replacing deteriorated poles. MMED maintains a list of poles that need to be replaced.
- FY18-8: Overhead Emergency Repair Contingency – increase system reliability by addressing unforeseen problems as they arise. This is for unforeseen overhead pole work that must be performed based on customer complaint, system conditions or storm repair.
- FY18-9: Underground Cable Repair Contingency – increase system reliability by addressing unforeseen problems as they arise. This is for unforeseen underground cable work that

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must be performed based on customer complaint, system outage conditions or storm repair.

FY18-10: New Transformers as Required – meet customer service expectations by maintaining adequate stock of transformers.

FY18-11: New Electric Services – meet customer demands with the timely installation of new services. This is for the replacement of electric services that fail and the installation of new services.

FY18-12: New Metering Equipment – meet new customer expectations to maintain a stock of metering equipment required to meter customer loads. This is for the purchase and installation of metering equipment such as current transformers and potential transformers and related equipment.

FY18-13: Install New Street Lights as Required – meet customer service standards by the timely repair of street light outages. This is for the replacement of street light components that have failed.

FY18-14: New Office Equipment – This is for the purchase of new office equipment.

FY18-15: Office carpet replacement – In most areas of the office, the carpet is original (est. 20 years old) and is wearing thin with many seams showing. Replacement will complement the previous capital improvement projects (office lighting / front office) completed in FY17.

FY18-16: Transition office alarm system onto SCADA – reduce long term expenses by transitioning the office alarm system onto MMED SCADA system. MMED currently pays \$2,800 per year for alarm expenses. When the system is on the MMED SCADA these yearly charges will be eliminated. Payback is under 4 years. Alarms would go to the station operator.

FY18-17: Vehicle Replacement (#12) - replace 1999 one ton dump truck with a new 15,000 to 18,000 GVWR dump truck with plow. The vehicle to be replaced is rotting out. The old vehicle was repainted many years ago and body rot is becoming a problem. The cabin floor is rotting out.

FY18-18: Three phase power quality recorder – purchase a new power quality recorder to better analyze power quality service inquiries. This will be used to investigate inquiries from commercial customers that believe that the MMED system is causing a negative impact on the electrical system inside the commercial building.

FY18-19: Purchase of New Tools for Vehicles and Shop – This is for the purchase of new tools.

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- FY18-20: New Laboratory Equipment – This is for the purchase of new laboratory equipment as needed.
- FY18-21: New Radio Equipment – required for safe, reliable communication between vehicles.
- FY18-22: Gilbert Street Meters replacement – replacement of old failing meters at Gilbert Street. Sixteen meters that provide analog readings and digital SCADA data are antiquated and direct spare replacements are no longer available. The new replacements will provide the same function but will also allow a connection to the MV90 data collection system.
- FY18-23: Computer hardware and software - purchase of new computers and software
- FY18-24: Reimbursable Customer Projects – work needed to meet new customer service deadlines. All costs reimbursed by the customer.
- FY18-25: Old garage environmental cleanup and shoring – work needed to meet environmental regulations based on existing conditions. Also work needed to ensure the integrity of the garage floor.
- FY18-26: Circuit tie for outage contingency plan 1W5 and 1W8 – install a circuit tie between the 1W5 and the 1W8. This project will provide additional switching capability in the event of system outages.
- FY18-27: Engineering and Operations Management – increase system reliability by planning, designing and implementing the capital plan.

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IV. Projected 5 Year Capital Work Plan Summary (FY19-FY23)

Mansfield Municipal Electric Department Projected Five Year Plan (as of April 2017) Capital Budget						
Description	FY18 Proposed	FY19 Projected	FY20 Projected	FY21 Projected	FY22 Projected	FY23 Projected
Ongoing Annual Capital Requirements	\$ 971,908	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000
Meter Test Board	\$ -	\$ 40,000	\$ -	\$ -	\$ -	\$ -
Jewell Street Underground Circuit Project	\$ 325,000	\$ 150,000				
LED Roadway Lighting	\$ 363,975	\$ -	\$ 75,000	\$ -	\$ 50,000	\$ 50,000
Distributed Generation	\$ 2,769,795	\$ -	\$ -	\$ -	\$ -	\$ -
Replace Transformers T1 and T2 at Gilbert Street Substation	\$ -	\$ 2,500,000	\$ -	\$ -	\$ -	\$ -
Advanced Metering Infrastructure	\$ 108,980	\$ 95,000	\$ -	\$ -	\$ 50,000	\$ 50,000
Fiber Commercialization Project	\$ -	\$ -	\$ -	\$ -	\$ 400,000	\$ 400,000
Automated Switching Project	\$ -	\$ -	\$ -	\$ -	\$ 300,000	\$ 300,000
New Vehicles	\$ 75,000	\$ 45,000	\$ 335,000	\$ 275,000	\$ -	\$ 25,000
Total Projected Annual Capital Budget	\$ 4,614,658	\$ 3,830,000	\$ 1,410,000	\$ 1,275,000	\$ 1,800,000	\$ 1,825,000
Notes: (1) Ongoing Capital Budget projections based on projected proposed budget of \$1,000,000 carried through FY23						
(2) MMWEC flush of funds (\$2.3M) for retirement of Nuclear assets debt service will be returned to MMED in FY18						

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Appendix A: MMED Employee Hours for Capital Work Plan

Mansfield Municipal Electric Department								
Analysis Of Available Hours By MMED Employee For Capital Work Plan								
Manhour Summary July 2017 - June 2018								
MMED Personnel Available For Capital Work	Total Work Hours (1)	Weather (2)	Vacation (3)	Sick/Personal (4)	Holidays (5)	Other Operations and Maintenance (6)	Billable Work (7)	Capital Hours (8)
TRASK, CHRIS	2,216	80	80	64	104	1,236	107	545
BELLAVANCE, RALPH	2,216	80	200	64	104	1,116	107	545
CURRAN, SHAWN	2,216	80	200	64	104	1,116	107	545
WEIR, TOM	2,216	0	240	64	104	904	0	904
DIGGIN, PAUL	2,216	80	200	64	104	1,116	107	545
MILLER, TAYLOR	2,216	80	80	64	104	1,236	107	545
THOMPSON, JAY	2,216	80	200	64	104	1,116	107	545
ROMANKO, DAN	2,216	80	80	64	104	1,236	107	545
CARROLL, PATRICK (10)	2,080	0	192	64	104	1,245	0	475
COX, CHRIS (11)	1,950	0	188	60	98	802	0	802
SOLLECITO, JOSEPH (12)	2,080	0	200	64	104	1,370	0	342
Totals	23,838	560	1,860	700	1,138	12,492	750	6,338
NOTES:	(1) Total hours for line personnel based on all hours worked during July through June (excludes emergency work). Available manhours for productive work is total work hours less weather less vacation less sick/personal less holidays. (2) Weather based on historical loss of productivity due to cold and wet weather conditions. Time charged to operations and maintenance. (3) Vacation time based on full use of available vacation hours that each employee earns during the year. (4) Sick and personal time usage based on an average of 5 sick days used per year as well as 3 personal days each year. (5) Holidays based on 13 holidays (12 full days, 2 half days) available to employees during year. (6) Other Operations and Maintenance time detailed in FY15 Operating budget. (7) Billable work is to perform customer related projects, such as residential developments or commercial buildings, generated through Planning Board approval process. (8) Capital hours for Linemen that are available for use in capital work plan is determined in detailed project summaries which accompany this report. All other hours in capital work plan based on allocations set forth below. (9) Line Supervisor time allocated 50% to capital, 50% expense for all productive hours worked. (10) Meter Foreman time allocated 10% to capital for installation of new meters and 90% to maintenance for meter repair, meter reading and station operations. Meter Foreman also allocated 300 capital hours for advanced radio read meter installation. (11) Electrical Engineer allocated 50% to capital, 50% to expense for normal hours worked. 37.5 hour work week. (12) Director allocated 20% to capital, 80% to expense for normal hours worked. 40 hour work week.							

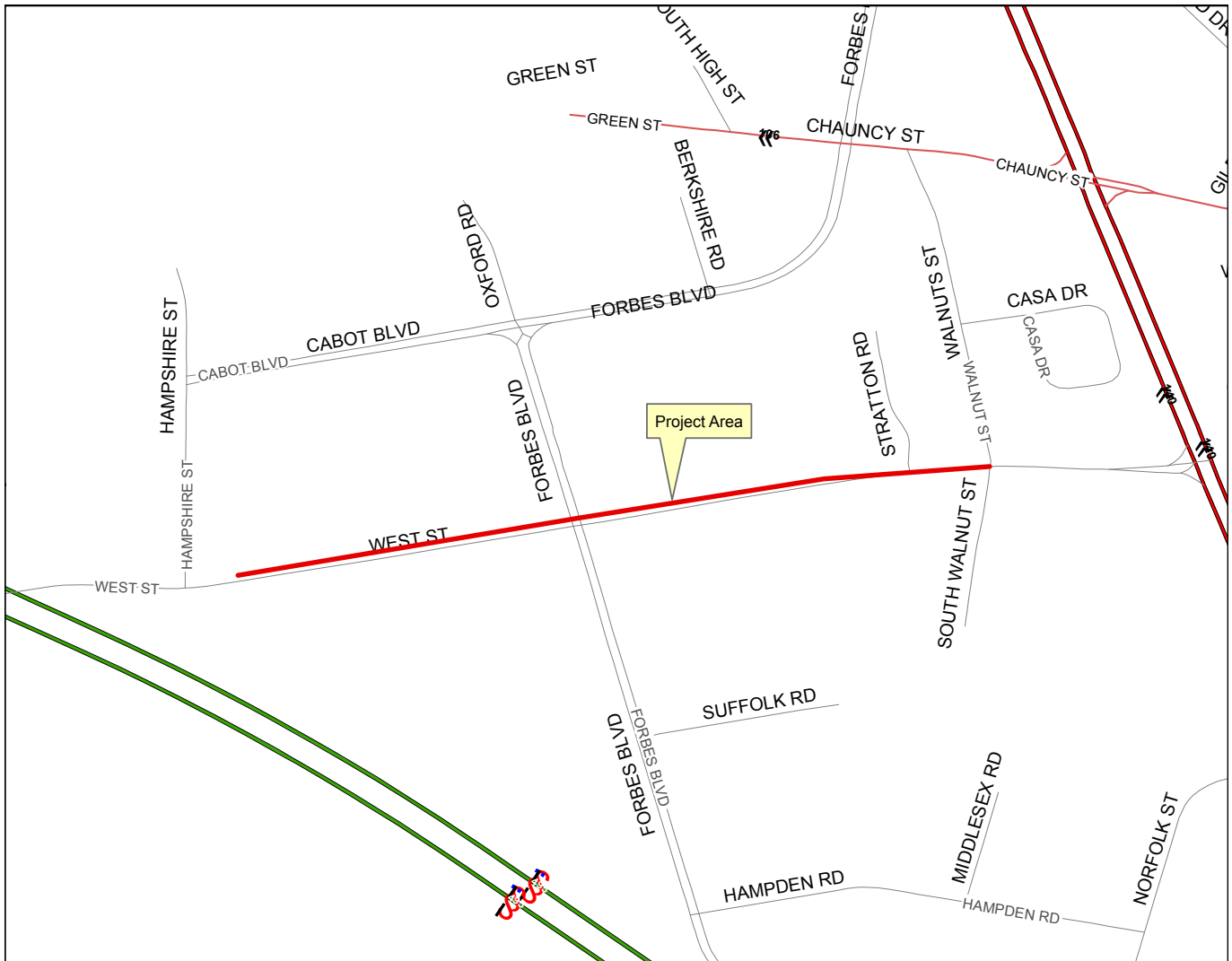
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Appendix B: MMED Vehicle List – Expense & Replacement Plan

MANSFIELD MUNICIPAL ELECTRIC DEPARTMENT VEHICLE LIST											April 2017				
VEH.	YEAR	Years old	MANF.	MODEL	VIN	PLATE #	G.V.W.	FUEL	COST \$	Repair / PM Expenses	Mileage / Hours	Assigned to	VEH.	Replace	To Be Replaced in
501	2005	11	Ford	Five Hundred	1FAHP26135G17278	M71-943	N/A	gas	\$21,218.00	\$5,200.00	70200	pool	501	2020	FY20
509	2008	8	Ford	Taurus	1FAHP24W68G123951	M79955	N/A	gas	\$18,950.00	\$2,200.00	25100	pool	509	2023	FY23
510	2012	4	Ford	F250 4X4 P/U	1FT7X2B65CEA43053	M88522	5,080	gas	\$33,849.00	\$1,900.00	22000	Sta Op	510	2024	2024
511	2015	1	Ford	F250 4X4 P/U	1FTB7X2B67FEB98501	M93043	8,800	gas	\$38,672.00	\$4,300.00	19000	Stock	511	2027	2027
512	1999	17	Ford	F350 Dump	1FDWF37S4XEE59008	M58-126	11,200	gas	\$33,778.00	\$39,650.00	43000	line	512	2019	FY18
513	1996	20	Chev	C1500 P/U	1GCEC14W2TZ120691	M38-035	6,100	gas	\$12,979.00	\$7,900.00	106000	Line	513		
514	2015	1	Chev	K2500 Utility	1GB0KUEG1FZ544037	M93596	5,080	gas	\$39,997.00	\$600.00	20000	line	514	2027	2027
515	2009	7	Ford	Ranger R15 P/U	1FTZR15V4YPB97720	M53-630	5,080	gas	\$17,665.00	\$3,900.00	62500	meter	515	2016	FY20
516	2016	0	Ford	F350 Utility	1FTRF3B64GED28186	M97480	11,000	gas	\$34,247.08	\$1,100.00	0	meter	516	2023	FY24
517	2007	9	Ford	F350 Utility 4400/7Post-Plus	1FTWF312YX7EA84582	M80-333	10,700	gas	\$34,001.00	\$3,200.00	66000	Sta Op	517	2019	FY19
518	2011	5	IH	Mat.	1HTMKAAR8BH362390	M84269	35,000	diesel	\$220,229.00	\$20,000.00	23000 / 5000	Line Bucket	518	2026	2026
519	2003	13	Sterling	L7500 Rack Dump	2FZAATAK03AK69243	M84009	40,600	diesel	\$74,988.00	\$44,100.00	15000	Line	519	2023	2023
520	2003	13	Ford	F750 Versa-Lift 42	3FDFX75N93MB02579	M69-842	33,000	diesel	\$104,431.00	\$97,000.00	45000 / 8000	Line Bucket	520	2018	FY21
521	2012	4	Ford	F250 4X4 P/U	1FTNX21S83EC61722	M69848	8,800	gas	\$28,970.00	\$5,000.00	42000	Line Foreman	521	2024	2024
522	2016	0	IH	Ford F750	1FDYX7DE4GDA02779	M95923	35,000	diesel	\$229,641.00	\$12,600.00	3000	Line Bucket	522	2031	
523	2000	16	Sterling	L7501 Digger	2FZHAJBB5YAG46810	M58-142	36,220	diesel	\$144,790.00	\$47,000.00	20000	Line spare Digger	523		
524	1996	20	JCB	Backhoe 214	SLP214TCIE0444474	M54-511	16,200	diesel	\$48,286.00	\$33,000.00	4400		524	2026	2026
525	2006	10	Ford	F750 Altec LM45	3FRXX75T76V360780	M75816	33,000	diesel	\$120,183.56	\$81,000.00	55000	Line Bucket	525	2021	FY20
526	2015	1	Frtlnr	MT55/Utilimaster	4UZAADU4FCGB9088	M89268	25,500	diesel	\$136,938.00	\$8,100.00	2200	Line UG splice	526	2030	2030
527	2006	10	Sterling	Swaploader	2FZACHCS66AM34219	M41-322	35,000	diesel	\$170,788.00	\$136,500.00	17000	Line	527	2026	2027
528	2001	15	ih	4900	1HTSDAAR01H355787	M65557	35,000	diesel	\$129,470.00	\$57,000.00	49000	Line Spare Bucke	528		
529	2016	0	IH	Terex Digger	3HAMMMMR8GL109952	M94817	37,000	diesel	\$249,902.00	\$8,300.00	2600	Line Digger	529	2031	2031
									\$1,943,972.64	\$619,550.00					
Vehicle Replacement Guide Lines:															
1	Heavy Duty work vehicles (Digger and Bucket trucks) to be replaced every						15 years								
2	Small pickups to be replaced every						7 years								
3	Large pickups to be replaced every						12 years								
4	Pool cars to be replaced every						15 years								
5	Dump trucks to be replaced every						20 years								
6	Backhoe to be replaced every						30 years								

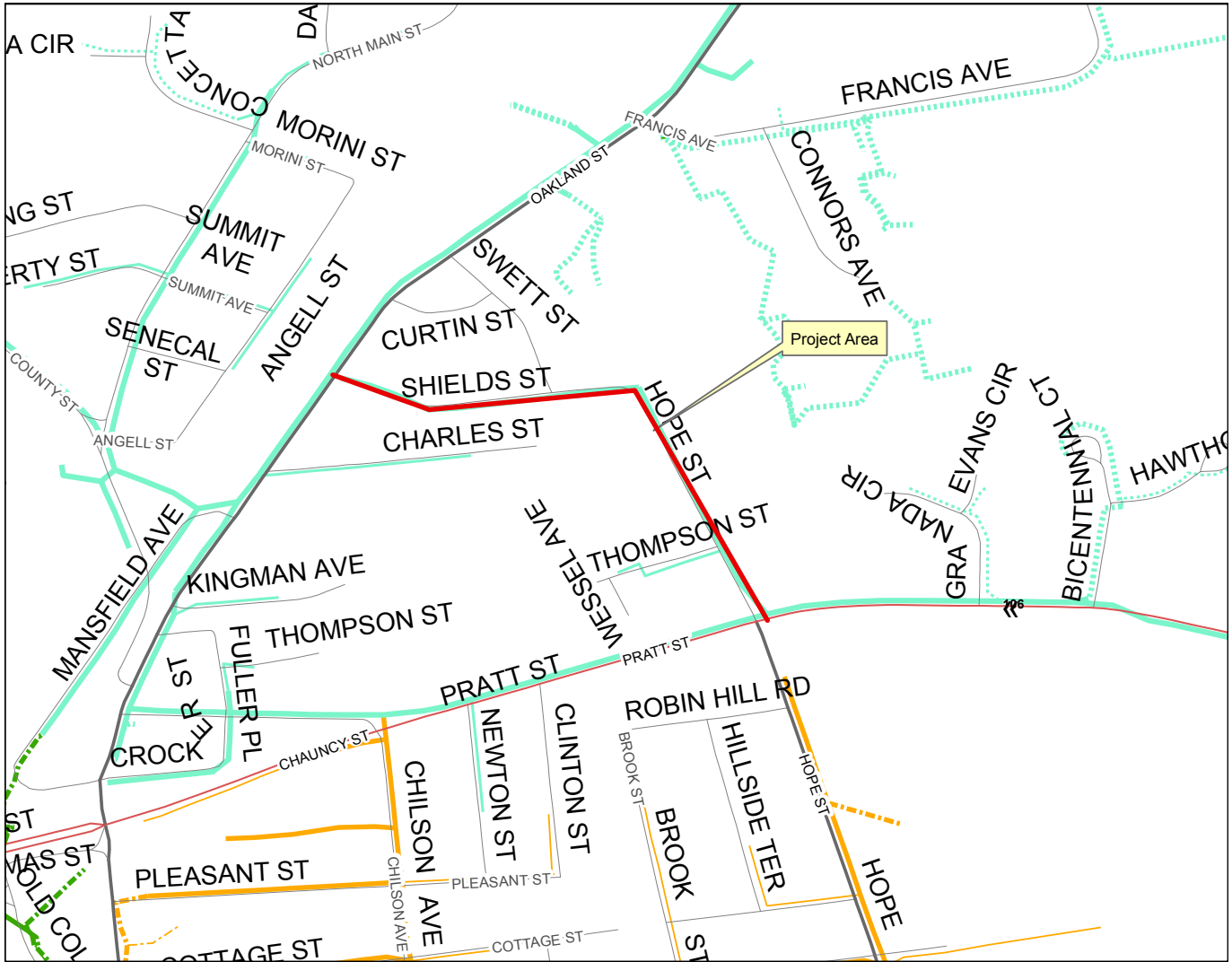
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1W8 West Street 477 Cable Upgrade Project



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2W4 Shields and Hope 477 Cable Upgrade Project



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Jewell Street Manhole and Conduit Project

