This document is a brief look at the proposed 2020 budget for the Metropolitan Mosquito Control District (MMCD). The information provided helps the reader understand our organization, the services we provide and the funding sources used to provide those services. On behalf of our Board of Commissioners and staff we thank the citizens of our seven-county metropolitan service area for the opportunity to provide these valuable services.

**Metropolitan Mosquito Control Commission**

Anoka:  Mike Gamache  
        Mandy Meisner  
        Robyn West  

Carver:  James Ische  
        Tom Workman  

Dakota:  Tom Egan  
        Mary Liz Holberg  
        Liz Workman (Chair)  

Hennepin:  Jan Callison  
            Angela Conley  
            Jeff Johnson (Vice Chair)  

Ramsey:  Jim McDonough  
         Mary Jo McGuire  
         Rafael Ortega  

Scott:  Michael Beard  
        Tom Wolf  

Washington:  Gary Kriesel (Secretary)  
            Fran Miron
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Mission, Vision, Values

The Metropolitan Mosquito Control District provides biting insect control and tick monitoring to the citizens of the seven Minneapolis-St. Paul metropolitan counties, under the direction of the Metropolitan Mosquito Control Commission board - 18 elected commissioners.

Mission Statement

The Metropolitan Mosquito Control District’s mission is to promote health and well-being by protecting the public from disease and annoyance caused by mosquitoes, black flies, and ticks in an environmentally sensitive manner.

Vision Statement

To be the leading mosquito abatement district in the world. MMCD leads through innovation, technology, stewardship, partnership, public service and effectiveness.

Value Statement

MMCD values integrity/trust, cooperation, respect, and competence in our interactions with colleagues and customers.
MMCD Demographics

Date Initiated: 1958
Service Area: 2,970 square miles
Population est. 2018 3.099 million
1.2 million households
Counties Included: Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, Washington

MMCD Services

The Metropolitan Mosquito Control District (MMCD) protects public health and well-being using an integrated pest management approach in its control of disease transmissions and human biting mosquitoes. The majority of control targets immature mosquitoes that develop in over 80,000 unique wetland settings and over 79,000 catch basins and 25,000 other man-made habitats within the seven-county service area. Control of adult mosquitoes is also conducted to reduce the risk of disease and annoyance.

MMCD monitors and controls immature black flies that develop in five major rivers and numerous small streams located within the service area. Immature black flies are treated with a natural soil bacterium (Bti) under a permit issued by the Minnesota Department of Natural Resources.

MMCD monitors the distribution of deer ticks that are capable of transmitting Lyme disease, human granulocytic anaplasmosis (formerly known as ehrlichiosis), babesiosis and Powassan virus. MMCD works closely with the Minnesota Department of Health in providing information to citizens to reduce the risk of tick transmitted diseases.

MMCD provides information, using a diverse network of outlets and venues, designed to inform citizens about its activities and to assist citizens in managing the impact of biting insects and ticks on their health and well-being.
Background

MMCD, created by the legislature in 1958, serves 3.099 million citizens (Met Council 2018 est.) in Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington counties. It is governed by a board of 18 elected county commissioners representing those counties and is supported by property taxes. A diagram depicting the Legislative, Regulatory and Advisory Structure can be found on page 7 of this document.

The District currently provides its services through the work of 208 seasonal staff and 55 regular full-time staff. licensed to apply control materials by the Minnesota Department of Agriculture. A diagram depicting MMCD’s organizational structure can be found on page 8 of this document.

The Twin Cities metropolitan area stretches outward from the central cities of Minneapolis and St. Paul to the surrounding suburbs and rural areas, including some 189 cities and townships. The region’s natural environment (including over 900 lakes) and wildlife are prized by its citizens. However, the natural environment also provides abundant habitat for mosquitoes, black flies, and ticks.

- The District's 2,970 sq. mi. area includes approximately 209,000 acres of wetlands that are prime habitat for mosquito larvae. For most townships in the north and northwest parts of the District, mosquito-producing wetlands (marshes, roadside ditches, wet pastures, woodland pools) cover between 15 and 50% of the township.
- Over 79,000 storm water catch basins and 25,000 other manmade habitats require treatment to control mosquito vectors of West Nile virus. Woodlots throughout the District are home to the mosquito that can carry La Crosse encephalitis. This disease primarily affects children and the adult mosquitoes that transmit it seldom fly more than ¼ mile from where they develop.
- Human or animal cases of other mosquito-borne viruses, including western equine encephalitis, eastern equine encephalitis, and Jamestown canyon virus have also been known to occur (infrequently) in this area. Dog heartworm, a parasite carried by mosquitoes that causes disease in dogs, is endemic in the area.
- Woodlands throughout the District (primarily the northeastern half) harbor the tick that can carry Lyme disease, human granulocytic anaplasmosis, babesiosis and Powassan virus.
- The five major rivers in the area (Mississippi, Minnesota, Rum, Crow and South Fork Crow) all are known to produce black flies ("biting gnats"), and river flood plains can produce high numbers of floodwater mosquitoes.

To provide the most service to the most District citizens, MMCD focuses its larval control operations in areas where the most people live (priority zone 1). Services
including disease prevention and public event treatments are provided throughout the District.
METROPOLITAN MOSQUITO CONTROL COMMISSION and DISTRICT

Legislative, Regulatory and Advisory Structure

METRO COUNTIES BOARDS OF COMMISSIONERS
Appoints members to serve 1-year terms as Metropolitan Mosquito Control Commissioners

Primary Advisory Entities:
- Technical Advisory Board
- Lyme Disease Technical Advisory Board

METROPOLITAN MOSQUITO CONTROL COMMISSION
Independent taxing authority created by State Legislature at M.S. 473.701 et seq
- Anoka County (3)
- Carver County (2)
- Dakota County (3)
- Hennepin County (3)
- Ramsey County (3)
- Scott County (2)
- Washington County (2)

Ultimate Advisory Service Entity:
Citizens of the District

Primary Minnesota Regulatory Authorities:
- MN Pollution Control Agency
- MN Occupational Safety Admin
- MN Dept. of Health
- MN Dept. of Natural Resources
- MN Dept. of Agriculture

METROPOLITAN MOSQUITO CONTROL DISTRICT
Legislatively created operating entity of Metropolitan Mosquito Control Commission

Primary Federal Regulatory Authorities:
- US Fish and Wildlife
- US Environmental Protection Agency
- US Occupational Safety Administration
The Executive Director is appointed by the Commission
Financial Policies

MMCD’s financial policies/guidelines provide the basic background upon which overall concepts for fiscal management of the District are based. The policies guide the decision-making process of the Commission and are designed to provide a stable foundation to minimize the impact of changing conditions. The following multi-year policies provide a basis upon which program proposals can be judged:

- The District will maintain a working capital flow balance sufficient to minimize short term borrowing with the long-term goal of maintaining a positive cash balance.
- The District will continue to take advantage of investment opportunities to maximize the return on investment which will help reduce operating costs.
- The District will avoid large fluctuations in its property tax levy. However, actual expenditures may vary from year to year, resulting in fluctuations in fund balance and cash.
- Cash balances will be invested in conservative instruments which bring reasonable return and meet statutory requirements. Collateral will be held on investments as required in statute.
- The District is not currently authorized to issue bonds. Any major projects need to be budgeted in a fiscal year and financed from the fund balance or a levy increase or through the bonding authority of the member counties. The District may use tax anticipation notes to support short-term operational needs but will seek to minimize interest expense when interest rates are high and, if necessary, incur additional interest expense when interest rates are low.
- The District’s fund balance may reflect the results of these policy guidelines such as maintaining a cash flow balance for working capital, equipment replacement, facility maintenance, other major projects or long-term obligations. The District will maintain five-year capital and operating plans as guides to program and financial direction.
- The District's financial statements are audited annually, currently being conducted by the firm HLB Tautges Redpath. Financial statements will be produced in accordance with GAAP for fund accounting. The District also prepares Government-wide financial statements based on accrual accounting.
- The governmental fund is the general operating fund of the District used to account for all financial activities of the District.
- The primary source of revenue is property tax. Investment income and miscellaneous revenues make up a small portion of total District revenue and are distributed to operations and reduce future tax levy needs.
- The Commission adopts an annual budget for the fiscal year starting the following January.
Budget Guidelines

MMCD’s primary source of revenue (99% projected for 2020) is property tax collected from the seven participating counties; investment income and miscellaneous revenues make up the remaining 1% of the District revenue.

MMCD’s board of Commissioners has directed staff to develop a 2020 budget that maintains current service levels, manages operations and includes a capital budget plan that identifies the current capital needs of the district. The 2020 operating and capital budget is $19,551,564 which represents a 1.0% increase over 2019.

The Metropolitan Mosquito Control Commission approved a capital budget planning guide that gave the Commission, staff, and the public an outline of future capital needs in order to meet expected service demands. The capital budget is updated annually with sensitivity to population growth and current economic trends (pages 15-17).

Property Tax Levy for 2020

Weather conditions have a significant impact on MMCD’s program. The annual expenditure budget is based on need and past experience. Recent annual weather variations have made the budget process a challenge. Between 2010 and 2015 MMCD responded to changes in expenditures by keeping the property tax levy flat and using the Fund Balance to address infrastructure needs and to fund control.

The Fund Balance Policy designates the minimum amount of money to be maintained in the unassigned portion of the Fund Balance. That minimum level was reached at the end of 2015.

2016 was the third record service demand year bringing the Fund Balance $2.1 million below the minimum determined by the policy. MMCD responded by increasing the payable property tax levy over the next four years in an effort to narrow the gap between the levy payable and the expense budget and to increase the Fund Balance. We also held budget increases to a minimum and implemented five expenditure reductions steps to save an amount equal to the difference between the budget and the levy.

In 2020 MMCD’s payable property tax levy will be $18,665,369 which is a 2% increase over the 2019 levy. Based on this proposed 2020 levy the MMCD tax on a home with an approximate assessed valuation of $250,000 is projected to remain under $14.00 per household.
Where MMCD Dollars Come From and Where They Go

The pie charts below illustrate where MMCD revenues come from and where dollars are scheduled to be spent by major function for 2020.
General Fund Revenue and Fund Balance

The General Fund is the operating fund of the District and is used to account for all financial activities. The table on page 13 summarizes the revenues and expenditures of the fund, including the ending balance which is the difference between revenue and expense plus retained reserves. The District’s fiscal year is the calendar year.

The table on page 13 shows the beginning fund balance, the property tax levy (alphabetically by county) and any miscellaneous revenue and a summarized breakdown of District expenditures by major categories, a more detailed description of expenditures is included in the table on page 14.

The table on page 13 also shows the Ending Fund Balance, which includes the following: Non-spendable and Committed - which includes control materials carried forward from year-to-year, $1,500,000 for emergency disease or nuisance control and other funds that are assigned for future use. Unassigned/working capital which is made up of approximately 55% of the succeeding year budget less 90% of control material in stock and two percent of the levy for tax delinquencies should be maintained to provide working capital prior to tax collections which are received in July of the next operating year.

Components of the 2020 Year End Fund Balance:

<table>
<thead>
<tr>
<th>Component</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-spendable</td>
<td>$3,000,000</td>
</tr>
<tr>
<td>Restricted</td>
<td>0</td>
</tr>
<tr>
<td>Unrestricted</td>
<td></td>
</tr>
<tr>
<td>Committed Emergency Disease Vector Control</td>
<td>1,500,000</td>
</tr>
<tr>
<td>Committed Anoka Lease Early Bond Retirement</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Committed Building (St. Paul Roof Replacement)</td>
<td>300,000</td>
</tr>
<tr>
<td>Assigned Employee benefits payable</td>
<td>900,000</td>
</tr>
<tr>
<td>Unassigned Working Capital: 55% of 2021 budget less 90% of control materials in stock</td>
<td>$8,084,623</td>
</tr>
<tr>
<td>2% for property tax delinquencies</td>
<td>$380,774</td>
</tr>
<tr>
<td>Remaining unassigned</td>
<td>0</td>
</tr>
<tr>
<td>Total unassigned</td>
<td>$8,465,397</td>
</tr>
<tr>
<td>Total Fund Balance</td>
<td>$15,165,397</td>
</tr>
</tbody>
</table>
## 2020 Budget – Metropolitan Mosquito Control District

### Budget in Brief – Operations Resources and Expenditures

<table>
<thead>
<tr>
<th>Actual 2016</th>
<th>Actual 2017</th>
<th>Actual 2018</th>
<th>Budget 2019</th>
<th>Proposed 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning Balance $14,305,542</td>
<td>$12,192,381</td>
<td>$13,063,662</td>
<td>$15,598,209</td>
<td>$14,729,606</td>
</tr>
<tr>
<td><strong>Revenues/Sources</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Property Taxes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anoka County $1,566,798</td>
<td>$1,587,353</td>
<td>$1,660,247</td>
<td>$1,661,584</td>
<td>$1,694,816</td>
</tr>
<tr>
<td>Carver County $615,960</td>
<td>$627,464</td>
<td>$638,676</td>
<td>$653,288</td>
<td>$666,354</td>
</tr>
<tr>
<td>Dakota County $2,233,911</td>
<td>$2,245,729</td>
<td>$2,271,175</td>
<td>$2,400,879</td>
<td>$2,448,897</td>
</tr>
<tr>
<td>Hennepin County $7,700,640</td>
<td>$8,096,999</td>
<td>$8,334,417</td>
<td>$8,487,253</td>
<td>$8,656,996</td>
</tr>
<tr>
<td>Ramsey County $2,386,084</td>
<td>$2,450,091</td>
<td>$2,574,312</td>
<td>$2,662,560</td>
<td>$2,715,811</td>
</tr>
<tr>
<td>Scott County $791,910</td>
<td>$794,603</td>
<td>$837,940</td>
<td>$874,710</td>
<td>$892,204</td>
</tr>
<tr>
<td>Washington County $1,490,805</td>
<td>$1,478,063</td>
<td>$1,515,689</td>
<td>$1,559,107</td>
<td>$1,590,289</td>
</tr>
<tr>
<td>Market Value Credit -</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total Property Taxes</strong> $16,786,108</td>
<td>$17,282,302</td>
<td>$17,832,456</td>
<td>$18,299,381</td>
<td>$18,665,369</td>
</tr>
<tr>
<td><strong>Other Financing Sources</strong></td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td><strong>Miscellaneous</strong></td>
<td>$196,139</td>
<td>$243,688</td>
<td>$285,442</td>
<td>$190,000</td>
</tr>
<tr>
<td><strong>Total Other Sources</strong></td>
<td>$196,139</td>
<td>$243,688</td>
<td>$285,442</td>
<td>$190,000</td>
</tr>
<tr>
<td><strong>Total Revenue</strong> $16,982,247</td>
<td>$17,525,990</td>
<td>$18,117,898</td>
<td>$18,489,381</td>
<td>$18,900,369</td>
</tr>
</tbody>
</table>

### Expenditures/Uses

| Commissioner | $2,852 | $2,780 | $2,177 | $3,660 | $3,660 |
| Control Operations | $17,612,146 | $14,696,007 | $14,242,771 | $17,805,615 | $18,010,448 |
| Capital Outlay | $2,233,911 | $2,245,729 | $2,271,175 | $2,400,879 | $2,448,897 |
| Administration | $965,179 | $1,012,517 | $987,194 | $1,011,189 | $1,009,936 |
| **TOTAL** | $19,095,408 | $16,654,709 | $15,583,351 | $19,357,984 | $19,551,564 |

### Ending Fund Balance

| Nonspendable/Committed/Assigned | $5,670,186 | $6,529,303 | $6,556,126 | $6,556,126 | $6,556,126 |
| Unassigned/Working Capital/Tax Delinquencies | $6,522,465 | $6,534,359 | $9,042,083 | $8,173,480 | $7,522,285 |
| **TOTAL** | $12,192,381 | $13,063,662 | $15,598,209 | $14,729,606 | $14,078,411 |

### Amount From Fund Balance Used For Expenditures

| $2,113,161 | ($871,281) | ($2,534,547) | $868,803 | $651,195 |
|------------------------|-------------|-------------|-------------|-------------|---------------|
| 1 Salary and Wages     | $735,967    | $761,158    | $765,333    | $787,377    | $792,046      |
| 2 Building Expense     | $56,833     | $57,013     | $66,571     | $50,740     | $52,770       |
| 3 Office Supplies      | $38,335     | $59,746     | $30,207     | $33,870     | $33,870       |
| 4 Travel and Mileage   | $2,957      | $2,377      | $1,735      | $4,250      | $4,250        |
| 5 Insurance            | $11,727     | $11,287     | $10,182     | $15,754     | $12,500       |
| 6 Interest             | $0          | $0          | $0          | $0          | $0            |
| 7 General Expenses     | $117,089    | $119,702    | $113,166    | $117,000    | $114,000      |
| 8 Repair and Maintenance | $2,273     | $1,347      | $0          | $500        | $500          |
| 9 Total Admin. Operations | $965,181   | $1,012,630  | $987,194    | $1,009,491  | $1,009,936    |
|                        |             |             |             |             |               |
| 10 Administration Capital | $14,068    | $12,493     | $0          | $0          | $0            |
| 11 Total Administration - | $979,249   | $1,025,123  | $987,194    | $1,009,491  | $1,009,936    |
|                        |             |             |             |             |               |
| COMMISSION             |             |             |             |             |               |
| 15 Per Diem            | $0          | $0          | $0          | $0          | $0            |
| 16 Travel and Mileage  | $2,852      | $2,780      | $2,177      | $3,660      | $3,660        |
| 17 Total Commissioners - | $2,852      | $2,780      | $2,177      | $3,660      | $3,660        |
|                        |             |             |             |             |               |
| CONTROL/MONITORING     |             |             |             |             |               |
| 20 Salary and Wages    | $6,988,072  | $6,625,114  | $6,559,521  | $7,434,013  | $7,652,148    |
| 21 Rent and Building Costs | $738,918  | $1,098,603  | $846,623    | $894,660    | $894,660      |
| 22 Supplies & Expenses | $228,004    | $312,010    | $248,544    | $281,850    | $281,850      |
| 23 Control Materials   | $6,040,605  | $4,244,856  | $4,137,801  | $5,831,000  | $5,831,000    |
| 24 Helicopter          | $2,974,990  | $1,728,305  | $1,553,479  | $2,527,560  | $2,527,560    |
| 25 Transportation Expenses | $166,090  | $159,917    | $175,049    | $186,390    | $186,390      |
| 26 Insurance           | $225,719    | $266,828    | $251,095    | $268,510    | $268,510      |
| 27 General Expenses    | $137,986    | $142,834    | $180,498    | $156,630    | $156,630      |
| 28 Repair and Maintenance | $111,759   | $117,364    | $290,161    | $211,700    | $211,700      |
| 29 Total Control Operations | $17,612,143| $14,695,831| $14,242,771| $17,792,313| $18,010,448  |
|                        |             |             |             |             |               |
| 30 Control Capital      | $501,164    | $930,972    | $351,209    | $552,520    | $527,520      |
| 31 Total Control Division - | $18,113,307| $15,626,803| $14,593,980| $18,344,833| $18,537,968  |
|                        |             |             |             |             |               |
| 34 TOTAL ANNUAL BUDGET  | $19,095,408 | $16,654,706| $15,583,351| $19,357,984| $19,551,564  |
|                        |             |             |             |             |               |
| Levy                   | $16,786,108 | $17,300,234| $17,832,456| $18,299,381| $18,665,369  |
|                        |             |             |             |             |               |
| Revenue - other sources | $196,139    | $225,753    | $285,442    | 190,000     | 235,000       |
| Fund Balance (end of year) | $12,192,381| $13,063,662| $15,598,209| $14,729,606| $14,078,411  |
| Amount from FB used for exp. | $2,113,161 | ($871,281) | ($2,534,547)| $868,603    | $651,195      |
MMCD Capital Budget

The 2020 Capital Budget is developed as the current year expenditures and of a broader outline of the future capital needs. Every year Metropolitan Mosquito Control Commission reviews and updates a long-term strategic plan for the District. This plan is used as a guide to meet future needs and expected service demands. The capital budget is predicated on several overarching factors:

- That metropolitan area citizens believe mosquito control is an important service to them.
- That mosquito and tick-borne diseases remain a threat to the public health of metropolitan residents.
- That population growth and development will increase the need for more intense and effective control activity in the expanding metropolitan area.
- That the property tax base will eventually grow through development, thus reducing the demand on current taxpayers to meet expanded service needs.

The Capital Budget is presented in three segments:

**Capital Equipment Plan**

The capital equipment plan represents new items to meet the expanded needs of service demands, and a replacement strategy for each major type of purchase, vehicles, field equipment, technology (IT), and other support-based activities. These replacement costs are consistent with the practices of MMCD relative to equipment life cycles and general serviceability of equipment. Some replacement is determined by upgrades or normal wear. The equipment budget for 2020 is $527,520 (more details on pages 16-17).

**Capital Maintenance Plan**

The capital maintenance plan represents significant repairs and maintenance of the MMCD’s current facilities which consists of replacement, repair, upgrade and general upkeep of facilities. Examples include: roof repair and replacement, parking lot repair or replacement, HVAC equipment replacement, landscaping, and the like.

As an ongoing process, each year we will evaluate each of the facilities and identify areas that need attention in an effort to continue to take a proactive approach to facility maintenance, totaling $50,000.
Capital Facilities Plan

The capital facilities plan was developed to ensure that MMCD facilities are adequate to address needs of the respective service areas over the next seven years, at least two years beyond the planning horizon. The facilities need to effectively house the equipment, employees and provide storage for treatment product in a safe and secure environment. The facility planning was driven by development patterns and the projected service expansion. Currently all the facilities provide adequate space for all essential needs and are owned by MMCD, with exception of the Oakdale facility which is leased and will suit our needs for several more years.

It is anticipated that any future facility expansions would be financed with tax-exempt bonds issued over a maximum fifteen-year term. MMCD does not possess bonding authority, so it must work expansions through arrangements with the respective counties or municipal entities, at present there are no plans to expand any of the facilities for the next few years.

2020 Capital Plan Summary:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Equipment (see breakdown page 17)</td>
<td>$477,520</td>
</tr>
<tr>
<td>Capital Maintenance</td>
<td>50,000</td>
</tr>
<tr>
<td>Capital Facilities</td>
<td>-0-</td>
</tr>
<tr>
<td>Total</td>
<td>$527,520</td>
</tr>
</tbody>
</table>
## Capital Equipment Plan 2020

### Vehicles
- $303,920
  - Trucks and Hybrid cars
    - (15-year replacement cycle)
  - Snow Plow (vehicle attachment)

### Field and Lab Equipment
- $79,600
  - Microscopes
    - (20-year replacement cycle)
  - Boats and motors (generally used for black fly treatments)
    - (8-year replacement cycle for boats)
  - Treatment Drone

### Technology
- $94,000
  - Hardware
    - Replacement of network equipment.
  - Software
    - Software applications are classified as intangible assets.
MMCD Strategic Objectives

MMCD has established strategic objectives designed to accomplish the mission in light of current conditions and upcoming needs to meet citizen expectations. MMCD operates within a team concept and uses full-time teams that represent technical knowledge bases and part-time teams and ad-hoc work groups that represent cross-functional issues such as equipment, human resources, information systems, etc.

1. **Maximize treatment capacity and efficacy through improved strategies, techniques, and products**
   - Manage available resources (personnel, control materials, equipment) to maximize services.
   - Evaluate new control materials and formulations to obtain more cost-effective products.
   - Incorporate development patterns and human population densities into service level determinations.
   - Evaluate operational and management practices for both productivity improvement and cost reductions.

2. **Ensure the environmental impacts of treatment are minimized**
   - Use surveillance-based Integrated Pest Management strategies to effectively control targeted species.
   - Effectively train staff to ensure proper treatments.
   - Utilize research, control results and technical expertise to determine control methods that mitigate potential adverse non-target effects.

3. **Optimize outreach and communication**
   - Ensure messages to citizens are both accurate and easy to understand.
   - Monitor citizen expectations through website, surveys, social media and phone calls.
   - Ensure that commission members and other public officials are adequately informed regarding policy, management, and operational decisions.
   - Make information available to citizens via the MMCD website and social media.
   - Maintain open communication with constituent communities, media and other stakeholders.
   - Market and present the school curriculum.
4. Reduce the incidence of mosquito and tick-borne diseases through surveillance, control, and education

- Maintain intensive focus on preventing local vector-borne illnesses with surveillance for vector species and pathogens and by managing vector populations.
- Remain current on new information related to chikungunya, Zika, and *Borrelia mayonii*; communicate important findings to staff and the public.
- Consult CDC, MDH and other experts; consider their recommendations when developing new vector-borne disease prevention strategies.
- Remain aware of and educated on vector-borne pathogens and of non-native vectors that could arrive in the District.
- Educate citizens on vector-borne illnesses using traditional media, social media, printed materials and public presentations.

5. Ensure that resources are sufficient to fulfill MMCD's mission

- Determine resources (staff, equipment, control materials) required to provide mosquito and black fly control and Lyme tick surveillance.
- Address long-term needs including vehicles, equipment, information systems, and facilities.
- Consider potential changes in demographics, climate, and technology when determining long-term needs.
- Ensure that all staff have the necessary training required to carry out the operational mission.

6. Incorporate Sustainable Operations into all future activities and plans.

- Educate employees about and involve employees in planning and executing wide ranging sustainability actions.
- Evaluate, devise and implement ways to reduce energy used to complete District operations.
- Research and evaluate how renewable energy technologies can be integrated into District operations.
- Reduce the amount of waste generated.
- Promote employee health and wellness.
- Seek out opportunities for employees to serve their communities by involving themselves in philanthropy, donations and volunteering.
7. Develop a safety-first organizational culture that promotes a safe healthy work environment.

- Promote a safety-first culture to reduce incidents and associated costs
- Expect safety first attitudes and practices
- Train personnel in safety expectations
- Investigate incidents and identify root causes

Specific projects and achievements designed to further the District’s strategic objectives are reviewed each year by the Management Team.
Progress in 2019

1. **Maximize Treatment Capacity and Efficacy**: Expanded partial air site treatments to apply larval control materials to portions of sites containing the majority of mosquito larvae, thereby reducing control material costs. Tested a new Methoprene formulation (P35) that may enable dosage reductions which will increase acres we can treat with current budgetary resources. Tested drones to evaluate potential surveillance and treatment efficiency improvements.

2. **Minimize Environmental Impacts**: Maintained employee pesticide certification training to ensure treatments follow pesticide label requirements designed to minimize non-target impacts. Completed an informal consultation with the US Fish & Wildlife Service to evaluate potential impact of our current mosquito control program on the endangered rusty patched bumblebee.

3. **Optimize Outreach**: Monitored citizen input, mosquito abundance, staff workload and ongoing operations information to develop timely messages that clearly communicate services that District staff can provide as well as other strategies citizens can employ. Worked with Legislators to preserve pesticide use for public health protection from local regulation of pesticides.

4. **Reduce Mosquito and Tick-borne Disease**: Collaborating for the third year with the CDC-funded Center of Excellence for Vector-borne Disease overseen by Medical Entomologists at the University of Wisconsin, Madison. Projects in 2019 include surveillance for Jamestown Canyon virus, investigations of the potential for pesticide resistance in mosquitoes and further defining the range and spread of *Aedes albopictus*. MMCD is part of a multi-agency collaboration to watch for introductions of the Asian Longhorned tick (*Haemaphysalis longicornis*).

5. **Ensure Sufficient Resources**: Hired a Public Affairs Coordinator to fill a vacant position. Staff attended more job fairs and distributed redesigned materials to attracted more qualified candidates for seasonal inspector positions. Reviewed and modified job descriptions based upon updated technology and District administrative needs.

6. **Sustainable Operations**: We continue to upgrade our vehicle fleet (integrate hybrids, smaller trucks) with the goal of minimizing fuel usage while maximizing the amount of work completed for each mile driven. We are working to reduce our waste stream through more effective recycling practices, increasing organics composting, by using reusable bulk control
material containers for the majority of these products, and by working with control material suppliers to recycle bags, containers, shrink wrap and pallets. We worked to increase staff participation in the sustainability culture at MMCD.

7. **Safety First Working Environment:** In 2019 we completed more building security measures begun in 2018 that included armed intruder training for all RFT staff in late 2018. Staff completed five Job Safety Analyses to determine how to prevent a repeat of certain work-related injuries.
2019 OPERATIONS UPDATE

Administration

MMCD administration enables operations staff to accomplish their tasks in an effective and efficient manner while controlling and coordinating resource use. Staff seeks to work with the public to identify and define citizen expectations, and these service level expectations are communicated to the Commission.

Achievements in 2019

1. MMCD’s 2018 financial statements were audited by a private firm, HLB Tautges Redpath.

2. The District experienced administrative staff retirements giving the District an opportunity to assess positions and make changes to job descriptions and shift responsibilities that created more efficient processes and a cost savings in administrative compensation. The District continues to add payroll and human resource tools and opportunities available through ADP.

3. The District continues to review investment strategies by taking advantage of the interest rates and making decisions to receive the best possible return on short term investments.

Public Affairs

District Public Affairs / Education is the bridge between public relations and government affairs. MMCD Public Affairs strives to effectively communicate the program to metro citizens, elected officials, governmental agencies and organizations that interact with MMCD.

Achievements in 2019

1. MMCD increased use of social media – Facebook and Twitter – to communicate directly with citizens and media. Our web site continued to feature frequently updated information including scheduled treatments, site maps, and the “Tick Risk Meter.” Information on tick-transmitted diseases, Zika risk education and West Nile virus prevention, was distributed at county fairs, and messages regarding vector borne disease prevention continued to be a high priority in 2019. A brochure outlining Jamestown Canyon virus and associated risks continued to be distributed. Outreach efforts continued to use the “Mosquito Mania” curriculum as a tool to build MMCD’s reputation as a source of information in metro middle and high schools.
2. Staff continued to work closely with the Minnesota Department of Health in creating consistent messages designed to reduce risk of West Nile virus and other mosquito- and tick-borne illness. Given the regional and national nature of West Nile virus transmission, and the emergence of additional tick-borne illnesses in the region, MMCD public affairs staff continued to work closely with the Minnesota Department of Agriculture and the University of Minnesota Extension Service in educating licensed applicators and refining control methods. These efforts, including distribution of a brochure highlighting Jamestown Canyon virus and vector biology, continue to enhance MMCD’s reputation as a source of technical information about mosquitoes, ticks, and disease prevention. MMCD continues to be viewed by local broadcast and print media as an organization that provides timely, credible information to people throughout the upper Midwest, and valuable services to metro area residents.

3. MMCD staff continued refining its Emergency Communications Response Plan. The process of establishing and maintaining crisis communications links with local and first-responders will continue in 2020.

4. MMCD staff continued to develop a working relationship with metro-area beekeepers in response to national and regional concerns about colony collapse disorder. Outreach will continue through beekeeper organizations. We continued to explore ways to record information about hive locations and use that information in our treatment plans.

5. Worked with field staff on hosting a University of Minnesota Public Health Institute class: “Emerging and Ecological Determinants of Vector borne Diseases.” This was a useful introduction to District knowledge and practices for young public health professionals.

6. Worked with staff from the MN Dept of Ag and the University of Minnesota Extension Service to update the “Category L” pesticide license test and training materials.

**Mosquito Control**

Mosquito control activities reduce regional populations of mosquitoes that affect the physical health and social well-being of citizens in the metropolitan area. Control is accomplished in an environmentally sensitive manner, using techniques and materials evaluated for safety and effectiveness.

For regional control, the District focuses on mosquitoes in their aquatic larval stage because dense populations of larvae are concentrated in discrete habitats where control materials can be applied efficiently. The District uses two soil bacteria, *Bacillus thuringiensis var. israelensis* (Bti) and *Bacillus sphaericus* (Bs),
another biological larvicide (spinosad) and an insect growth regulator (methoprene) to control mosquito larvae. Larval habitats are mapped and sampled to treat those areas that produce the most human-biting mosquitoes.

Control priority is given to sites near areas of high human population. Breeding sites with a history of consistent mosquito production receive priority during broods followed by sites observed to breed less often. This effort also includes collecting waste tires, other water-holding containers and filling wet tree holes to remove breeding sites of mosquitoes that may transmit La Crosse encephalitis, a potentially serious viral disease of children. The majority of control activities are regional larval control. Adult mosquito control is conducted in localized areas where mosquitoes of public health concern have been found, or where additional control is needed to reduce nuisance mosquitoes, primarily in park and recreation areas, for public events, and to respond to citizen requests for assistance with significant mosquito numbers in their neighborhoods.

Additional services are provided to combat disease-bearing species such as *Aedes triseriatus* (vector of La Crosse encephalitis), *Cx. pipiens*, *Cx. restuans*, and *Cx. tarsalis* (vectors of WNV, *Cx. tarsalis* is also a vector of western equine encephalitis), *Culiseta melanura* (vector of eastern equine encephalitis), *Aedes albopictus* and *Aedes japonicus* (both capable of transmitting several diseases). When surveillance indicates an increase in health risk, appropriate resources are used to reduce the threat. Control services also reduce populations of mosquitoes that can transmit Jamestown Canyon virus to people and heartworm to dogs.

In addition, staff provide information concerning mosquitoes, their habitats, and their control to the public as well as to public agencies including an annual review of District programs by the District’s Technical Advisory Board comprised of specialists from various state and local agencies. Our staff are in a unique position to serve as a resource for other wetlands concerns due to our extensive wetland mapping and frequent visits to area wetlands.

**Achievements in 2019**

1. Precipitation in 2019 was relatively low in March, April and June. Precipitation was higher in May, July and August with more precipitation in the southern parts of the District. This resulted in one large and extended brood of spring *Aedes* and three large and ten small-medium broods of *Aedes vexans* (typical season has four large broods).

2. In 2019 staff treated 213,749 acres to control larval spring *Aedes*, floodwater (*Ae. vexans*), *Culex* and cattail mosquitoes (*Coquillettidia perturbans*). During the last five years (2015-19), the average annual total was 245,287 acres (minimum = 189,173 acres and maximum = 322,512 acres).
3. Staff responded to 2,592 citizen phone calls in 2019. In 2018 MMCD received a total of 2,539 calls.

4. In 2019, WNV was detected in 5 of 650 mosquito samples tested by MMCD.

5. In 2019, District staff eliminated a total of 11,769 larval habitats including 395 tree holes, 1,611 containers and 9,763 tires.

6. Staff completed more than 266,391 catch basin treatments to control *Culex* mosquitoes as part of the District’s West Nile virus control program.

7. In 2019 staff treated 22,321 acres to control adult mosquitoes. During the last five years (2015-19), the average annual total was 50,261 acres (minimum = 22,321 acres and maximum = 82,583 acres).

**Technical Services**

The District's Integrated Pest Management program relies on environmental and technical information such as monitoring and evaluation. Surveillance, data management, equipment calibration and efficacy testing are essential to direct control activities, monitor success, and develop public information.

**Achievements in 2019**

**Surveillance and Lab**

1. Identified over 19,160 mosquito and black fly larval samples to help field staff direct resource use to the most valuable locations for control in 2019. This is similar to the previous two years, mostly due to the very late, cold spring.

2. Identified 9,584 adult mosquito and black fly samples in 2019. These samples help evaluate overall populations and program success as well as directing treatments.

3. April and May had ample snow-melt and rainfall, however, adult populations were relatively low early in the season due in part to our control efforts. The first mosquito emergence occurred after Memorial Day with a noticeable peak in mid-June that was comprised of spring *Aedes* and floodwater *Aedes* species. The cattail mosquitoes (*Cq. perturbans*) began emerging in large numbers beginning July 2 and July 9. The highest adult mosquito levels occurred in mid-July, and was four times higher than the 10-year average. Trapping on July 16 yielded over 153,000 summer *Aedes* and 53,389 *Cq. perturbans*. Adult numbers declined rapidly thereafter, and remained low throughout August and September. As happened last year, black fly populations were extremely high early in the spring. Staff were unable to sample and treat for black flies due to dangerously high, fast water flow on the rivers and streams.
Data Management
1. Tested drones to evaluate potential surveillance and treatment efficiency improvements.
2. Continued work with Houston Engineering on MMCD’s web-based data management system, including:
   - Developed more robust mobile maps
   - Improved tools for catch basin mapping
   - Expanded data entry for the lab to enter larval and adult identifications directly into Webster

Control Material and Nontarget Effect Evaluations
1. Tested Altosid P35 effectiveness against spring *Aedes*, the cattail mosquito and summer floodwater mosquitoes.
2. Tested Altosid P35 and Vectolex FG effectiveness against *Culex* mosquitoes (WNV vectors) in catch basins.
3. Continued evaluating the effectiveness of adulticides (barrier permethrin and ULV sumethrin or etofenprox), especially against vector mosquitoes.

Deer Tick Distribution Study
1. Continued multi-year sampling at 100 sites to monitor changes in deer tick populations. These ticks are the major vector of Lyme disease and human anaplasmosis, and according to MDH cases have been high statewide (most recent released data: 2018). Analysis of MMCD’s 2019 samples is ongoing.
Black Fly Control

Control teams manage black fly larval populations throughout the greater metropolitan area, using environmentally sensitive and cost-effective materials, in order to reduce the level of annoyance by black fly adults. This is achieved by monitoring larval populations and treating those areas where predetermined threshold levels are met or exceeded.

Black flies develop in rivers and streams and are best controlled in the larval stage using a liquid formulation of Bti. Five large rivers converge within the District, creating the potential for producing large populations of gnats throughout the spring and summer. Four black fly species found in this area are particularly annoying to humans and are targeted for control. In the spring (beginning in mid-April), many local small streams produce an aggressive human-biting black fly species called Simulium venustum. The most productive of these small streams are surveyed and treated when larval populations reach threshold levels.

The District has extensively studied the ecology of local rivers since the beginning of our black fly control program in 1984. These studies have shown that treatments have not affected the overall diversity or biomass of (non-target) organisms living in the rivers.

Achievements in 2019

1. The amount of material needed to control black fly larval populations is directly related to the levels of flow (discharge) in the rivers that we monitor and treat throughout the District. Our five-year history of the number of treatments and amount of material used is illustrated in Table 1. High water levels in the Minnesota and Mississippi rivers in May through mid-June made monitoring and treatments impossible. Sampling and treatments resumed on June 12 when river levels decreased enough to permit safe operations. The elevated water levels have increased material (Bti) used to treat the rivers. The delay of treatments in the Minnesota and Mississippi rivers resulted in very high adult black fly abundances in areas adjacent to the Minnesota and Mississippi rivers. The additional District rivers that we monitor (Rum and Crow rivers) have had higher than typical water levels also but not as extreme as the Minnesota and Mississippi rivers. Our adult monitoring network, which is a series of sweep-net collections throughout the district, has shown dramatically reduced numbers of adults since district wide treatments began in 1995 (Figure 1).

2. We continue to work with the Minnesota Department of Natural Resources to monitor long-term, non-target impacts of our larval treatments on the Districts rivers and streams. The monitoring conducted on the Mississippi River since
1995 has shown no measurable impacts to non-black fly macroinvertebrates due to our treatments.

Table 1. Number of Treatments and Gallons of liquid BtI applied to control Black Fly Larvae for the most recent five years (all rivers and small streams).

<table>
<thead>
<tr>
<th>Year</th>
<th># of treatments</th>
<th>BtI used (gal.)</th>
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<tbody>
<tr>
<td>2015</td>
<td>96</td>
<td>4,310.00</td>
</tr>
<tr>
<td>2016</td>
<td>58</td>
<td>3,096.15</td>
</tr>
<tr>
<td>2017</td>
<td>63</td>
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<tr>
<td>2018</td>
<td>47</td>
<td>3,034.20</td>
</tr>
<tr>
<td>2019</td>
<td>68</td>
<td>4,405.20</td>
</tr>
</tbody>
</table>

Figure 1. Daytime Sweep Net Collections, 1984-2019.