

Table of Contents

Acknowledgements	xxv
Executive Summary	xxvi
Background.....	xxvii
Purpose	xxvii
Canadian County Hazard Mitigation Advisory Committee (HMAC)	xxvii
The Planning Process	xxvii
Plan Summary	xxvii
Mitigation Action Plan	xxix
Chapter 1: Introduction	1
1.1 About the Plan.....	1
1.1.1 Purpose	2
1.1.2 Scope	2
1.1.3 Authority.....	2
1.1.4 Funding.....	2
1.1.5 Goals.....	3
1.1.6 Definition of Terms	5
1.1.7 Points of Contact	5
1.2 Community Description.....	6
1.2.1 Governance.....	10
1.2.2 Geography	10
1.2.3 Climate	10
1.2.4 History	12
1.2.5 Demographics.....	12
1.2.6 Lifelines.....	12
1.2.7 Economy.....	16
1.2.8 Development.....	17
1.2.9 Critical Facilities	19
Chapter 2: Existing Mitigation Strategies	28
2.1 About Hazard Mitigation Programs.....	28
2.1.1 National Flood Insurance Program (NFIP)	29
2.1.2 Firewise Community	29
2.1.3 Fire Hazard Mitigation	30
2.1.4 StormReady Community	30
2.1.5 Business Continuity Mitigation and Planning Programs.....	31

2.2	Public Information and Education	32
2.2.1	Public Information Infrastructure	32
2.2.2	Outreach Programs	32
2.3	Preventive Measures	33
2.3.1	Comprehensive Planning and Zoning	33
2.3.2	Floodplain and Stormwater Management	33
2.3.3	Building Codes	33
2.3.4	Capital Improvements Plan	33
2.3.5	Multi-Hazard Mitigation Plans	33
2.3.6	Capability Assessment	33
2.4	Structural Projects	35
2.4.1	Existing Structural Projects	35
2.4.2	Planned Structural Projects	35
2.5	Property Protection	36
2.6	Emergency Services	37
2.6.1	National Incident Management System (NIMS)	37
2.6.2	Emergency Operations Plan (EOP)	37
2.6.3	Emergency Operations Center (EOC)	38
2.6.4	Emergency Notification and Warning Systems	38
2.6.5	Fire Department Resources	39
2.6.6	Law Enforcement Department and Resources	42
2.6.7	Health Care Facilities and Shelters	42
2.6.8	Other City, County, State, and Federal Response	43
2.6.9	Volunteer Support Organizations	43
2.7	Natural Resource Protection	45
Chapter 3:	The Planning Process	46
	Planning Process Introduction	46
3.1	Step One: Organize to Prepare the Plan	47
3.2	Step Two: Involve the Public	51
3.3	Step Three: Coordinate with Other Agencies & Organizations	51
3.4	Step Four: Assess the Hazard	53
3.5	Step Five: Assess the Problem	55
3.6	Step Six: Set Goals	56
3.7	Step Seven: Review Possible Activities	56
3.8	Step Eight: Draft an Action Plan	57
3.9	Step Nine: Adopt the Plan	57

3.10 Step Ten: Implement, Evaluate, and Revise	58
Chapter 4: Natural and Man-Made Hazards	59
Introduction.....	59
Summary of Natural and Man-Made Hazards.....	61
Annual Average Damages	62
Hazards Vulnerability: Ranking Probability and Impact	63
Secondary Events	64
Vulnerability Assessment.....	65
Critical Facilities	65
4.1 Floods.....	67
4.1.1 Hazard Profile.....	67
4.1.2 History/Previous Occurrences	72
4.1.3 Vulnerability.....	75
4.1.4 Flood Scenario.....	75
4.1.5 Future Trends.....	75
4.1.6 Conclusion.....	76
4.1.7 Sources	77
4.2 Tornadoes.....	78
4.2.1 Hazard Profile.....	78
4.2.2 History/Previous Occurrences	80
4.2.3 Vulnerability.....	84
4.2.4 Tornado Scenario.....	86
4.2.5 Future Trends.....	86
4.2.6 Conclusion.....	88
4.2.7 Sources	89
4.3 High Winds	90
4.3.1 Hazard Profile.....	90
4.3.2 History/Previous Occurrences	92
4.3.3 Vulnerability.....	93
4.3.4 Future Trends.....	95
4.3.5 Conclusion.....	96
4.3.6 Sources	96
4.4 Lightning.....	98
4.4.1 Hazard Profile.....	98
4.4.2 History/Previous Occurrences	101
4.4.3 Vulnerability.....	102
4.4.4 Lightning Scenario	104

4.4.5	Future Trends.....	105
4.4.6	Conclusion.....	106
4.4.7	Sources	106
4.5	Hailstorm.....	108
4.5.1	Hazard Profile.....	108
4.5.2	History/Previous Occurrences	110
4.5.3	Vulnerability.....	112
4.5.4	Future Trends.....	113
4.5.5	Conclusion.....	114
4.5.6	Sources	114
4.6	Severe Winter Storms	115
4.6.1	Hazard Profile.....	115
4.6.2	History/Previous Occurrences	117
4.6.3	Vulnerability.....	119
4.6.4	Winter Storm Scenario	121
4.6.5	Future Trends.....	122
4.6.6	Conclusion.....	123
4.6.7	Sources	123
4.7	Extreme Heat	125
4.7.1	Hazard Profile.....	125
4.7.2	History/Previous Occurrences	126
4.7.3	Vulnerability.....	128
4.7.4	Heat Scenario.....	131
4.7.5	Future Trends.....	131
4.7.6	Conclusion.....	132
4.7.7	Sources	133
4.8	Drought	134
4.8.1	Hazard Profile.....	134
4.8.2	History/Previous Occurrences	139
4.8.3	Vulnerability.....	142
4.8.4	Drought Scenario.....	143
4.8.5	Future Trends.....	143
4.8.6	Conclusion.....	144
4.8.7	Sources	145
4.9	Expansive Soils.....	146
4.9.1	Hazard Profile.....	146
4.9.2	History/Previous Occurrences	149
4.9.3	Vulnerability.....	149

4.9.4	Expansive Soils Scenario	151
4.9.5	Future Trends.....	151
4.9.6	Conclusion	152
4.9.7	Sources	152
4.10	Urban Fires.....	154
4.10.1	Hazard Profile.....	154
4.10.2	History/Previous Occurrences	156
4.10.3	Vulnerability	157
4.10.4	Urban Fire Scenario.....	159
4.10.5	Future Trends.....	159
4.10.6	Conclusion	160
4.10.7	Sources	160
4.11	Wildfires.....	161
4.11.1	Hazard Profile.....	161
4.11.2	History/Previous Occurrences	164
4.11.3	Vulnerability	169
4.11.4	Wildfire Scenario.....	172
4.11.5	Future Trends.....	172
4.11.6	Conclusion	173
4.11.7	Sources	173
4.12	Earthquakes.....	174
4.12.1	Hazard Profile.....	174
4.12.2	History/Previous Occurrences	177
4.12.3	Vulnerability	179
4.12.4	Earthquake Scenario.....	180
4.12.5	Future Trends.....	181
4.12.6	Conclusion	181
4.12.7	Sources	182
4.13	Fixed Site Hazardous Material Events	183
4.13.1	Hazard Profile.....	183
4.13.2	Historical/Previous Occurrences	187
4.13.3	Vulnerability	188
4.13.4	Fixed-Site Event Scenario	191
4.13.5	Future Trends.....	191
4.13.6	Conclusion	191
4.13.7	Sources	191
4.14	Dam Failures	193
4.14.1	Hazard Profile.....	193

4.14.2 History/Previous Occurrences	197
4.14.3 Vulnerability.....	198
4.14.4 Dam Failure Scenario	201
4.14.5 Future Trends.....	201
4.14.6 Conclusion	202
4.14.7 Sources	202
4.15 Transportation Events	203
4.15.1 Hazard Profile.....	203
4.15.2 History/Previous Occurrences	210
4.15.3 Vulnerability.....	213
4.15.4 Transportation Scenario.....	215
4.15.5 Future Trends.....	215
4.15.6 Conclusion	217
4.15.7 Sources	217
4.16 Hazard Composite.....	218
Chapter 5: Mitigation Goals and Objectives.....	220
The Research, Review, and Prioritization Process	220
Changes in Hazard Mitigation Priorities	221
Mitigation Categories	221
5.1 Canadian County Hazard Mitigation Goals.....	223
5.1.1 Mission Statement	223
5.1.2 Mitigation Goal	223
5.1.3 Goals for All Natural Hazards	223
5.2 Hazard-Specific Goals and Objectives	224
Chapter 6: Action Plan.....	232
6.1 Mitigation Measures	232
Chapter 7: Plan Maintenance and Adoption.....	255
7.1 Monitoring, Evaluating, and Updating the Plan	255
7.2 Public Involvement	256
7.3 Incorporating the Multi-Hazard Mitigation Plan.....	256
Appendix A: Glossary of Terms	A-1
Appendix B: Mitigation Strategies.....	B-1
B.1 Public Information and Education	B-5
B.1.1 Public Information Program Strategy.....	B-5
B.1.2 Educational Programs.....	B-6
B.1.3 Outreach Projects.....	B-7

B.1.4	Technical Assistance	B-8
B.1.5	Map Information.....	B-8
B.1.6	Library	B-9
B.1.7	Websites	B-10
B.1.8	Real Estate Disclosure	B-12
B.1.9	Firewise Communities.....	B-12
B.1.10	Business Continuity Planning and Mitigation.....	B-13
B.1.11	Conclusions	B-15
B.1.12	Recommendations	B-15
B.2	Preventive Measures	B-17
B.2.1	Planning.....	B-17
B.2.2	Zoning.....	B-20
B.2.3	Floodplain Development Regulations	B-20
B.2.4	Stormwater Management.....	B-22
B.2.5	Building Codes	B-24
B.2.6	IBHS Fortified Home Program	B-24
B.2.7	Smoke Detectors.....	B-26
B.2.8	Hurricane Fasteners	B-26
B.2.9	Mobile Home Tie-Downs.....	B-27
B.2.10	Lightning Warning Systems	B-27
B.2.11	Power Outages from Winter Storms.....	B-29
B.2.12	Standby Electric Generators	B-30
B.2.13	Critical Facility Protection	B-32
B.2.14	Extreme Heat Protection.....	B-32
B.2.15	Proper Storage and Disposal of Hazardous Materials.....	B-33
B.2.16	Water Conservation.....	B-34
B.2.17	Open Space Preservation.....	B-34
B.2.18	Conclusions	B-35
B.2.19	Recommendations	B-35
B.3	Structural Projects.....	B-36
B.3.1	Safe Rooms.....	B-36
B.3.2	School Safe Rooms.....	B-37
B.3.3	Reservoirs and Detention	B-38
B.3.4	Levees and Floodwalls	B-38
B.3.5	Channel Improvements.....	B-39
B.3.6	Crossings and Roadways.....	B-39
B.3.7	Drainage and Storm Sewer Improvements.....	B-39
B.3.8	Drainage System Maintenance.....	B-40

B.3.9	Conclusions	B-40
B.3.10	Recommendations	B-40
B.4	Property Protection	B-41
B.4.1	The Community's Role	B-41
B.4.2	Insurance.....	B-42
B.4.3	Acquisition and Relocation	B-43
B.4.4	Building Elevation.....	B-44
B.4.5	Barriers	B-44
B.4.6	Retrofitting	B-44
B.4.7	Impact Resistant Windows and Doors	B-46
B.4.8	Impact Resistant Roofing	B-49
B.4.9	Lightning Protection Systems.....	B-50
B.4.10	Surge and Spike Protection	B-50
B.4.11	Landscaping for Wildfire Prevention	B-51
B.4.12	Conclusions	B-51
B.4.13	Recommendations	B-52
B.5	Emergency Services.....	B-53
B.5.1	Threat Recognition	B-53
B.5.2	Warning	B-54
B.5.3	9-1-1 and 2-1-1	B-56
B.5.4	Emergency Telephone Notification Systems (ETNS)	B-56
B.5.5	Response.....	B-56
B.5.6	Emergency Operations Plan (EOP)	B-57
B.5.7	Incident Command System (ICS)	B-58
B.5.8	Mutual Aid / Interagency Agreements	B-58
B.5.9	CERT (Community Emergency Response Team)	B-59
B.5.10	Debris Management.....	B-59
B.5.11	Critical Facilities Protection	B-59
B.5.12	Site Emergency Plans	B-60
B.5.13	Post-Disaster Recovery and Mitigation.....	B-60
B.5.14	StormReady Communities.....	B-61
B.5.15	Conclusions	B-62
B.5.16	Recommendations	B-62
B.6	Natural Resource Protection	B-63
B.6.1	Wetland Protection	B-63
B.6.2	Erosion and Sedimentation Control.....	B-64
B.6.3	River Restoration.....	B-65
B.6.4	Best Management Practices.....	B-65

B.6.5	Dumping Regulations	B-66
B.6.6	Conclusions	B-66
B.6.7	Recommendations	B-67
Appendix C: Meeting Agendas and Sign-in Sheets		C-1
Appendix D: Status of Prior Plan's Mitigation Measures		D-1
Unincorporated		D-1
Calumet		D-10
El Reno		D-12
Mustang		D-15
Piedmont		D-18
Union City.....		D-22
Appendix E: 2013 Plan Update Changes		E-1
Appendix F: Cities and Towns.....		F-1
Overview		F-1
F.1	Calumet	F-4
Section 1	Introduction	F-4
Section 2	Existing Mitigation Strategies	F-10
Section 3	Planning Process.....	F-11
Section 4	Natural and Man-Made Hazards	F-15
Section 5	Mitigation Strategy.....	F-38
F.2	El Reno.....	F-42
Section 1	Introduction	F-42
Section 2	Existing Mitigation Measures.....	F-55
Section 3	Planning Process.....	F-57
Section 4	Natural and Man-Made Hazards	F-63
Section 5	Mitigation Strategy.....	F-97
F.3	Mustang.....	F-101
Section 1	Introduction	F-101
Section 2	Existing Mitigation Measures.....	F-110
Section 3	Planning Process.....	F-112
Section 4	Natural and Man-Made Hazards	F-116
Section 5	Mitigation Strategy.....	F-146
F.4	Okarche	F-150
Section 1	Introduction	F-150
Section 2	Existing Mitigation Measures.....	F-158
Section 3	Planning Process.....	F-159

Section 4	Natural and Man-made Hazards	F-161
Section 5	Mitigation Strategy	F-184
F.5	Piedmont	F-187
Section 1	Introduction	F-187
Section 2	Existing Mitigation Measures.....	F-195
Section 3	Planning Process.....	F-197
Section 4	Natural and Man-made Hazards.....	F-202
Section 5	Mitigation Strategy	F-232
F.6	Union City.....	F-236
Section 1	Introduction	F-236
Section 2	Existing Mitigation Measures.....	F-244
Section 3	Planning Process.....	F-245
Section 4	Natural and Man-made Hazards.....	F-249
Section 5	Mitigation Strategy	F-276
Appendix G:	Public Schools	G-1
G.1	Overview	G-1
G.2	Banner Public School.....	G-7
Section 1	Introduction	G-7
Section 2	Existing Mitigation Strategies	G-9
Section 3	Hazards	G-10
Section 4	Mitigation Strategy	G-17
G.3	Calumet Public Schools	G-20
Section 1	Introduction	G-20
Section 2	Existing Mitigation Strategies	G-22
Section 3	Hazards	G-23
Section 4	Mitigation Strategy	G-31
G.4	Darlington School District	G-34
Section 1	Introduction	G-34
Section 2	Existing Mitigation Strategies	G-36
Section 3	Hazards	G-37
Section 4	Mitigation Strategy	G-45
G.5	El Reno Public Schools.....	G-48
Section 1	Introduction	G-48
Section 2	Existing Mitigation Strategies	G-50
Section 3	Hazards	G-52
Section 4	El Reno Schools Hazard Details.....	G-59
Section 5	Mitigation Strategy	G-86

G.6	Maple Public School	G-89
Section 1	Introduction	G-89
Section 2	Existing Mitigation Strategies	G-91
Section 3	Hazards	G-92
Section 4	Mitigation Strategy	G-100
G.7	Mustang School District	G-103
Section 1	Introduction	G-103
Section 2	Existing Mitigation Strategies	G-105
Section 3	Hazards	G-106
Section 4	Mustang Schools Details	G-113
Section 5	Mitigation Strategy	G-146
G.8	Okarche School District	G-149
Section 1	Introduction	G-149
Section 2	Existing Mitigation Strategies	G-151
Section 3	Hazards	G-152
Section 4	Mitigation Strategy	G-160
G.9	Piedmont Public Schools	G-163
Section 1	Introduction	G-163
Section 2	Existing Mitigation Strategies	G-165
Section 3	Hazards	G-166
Section 4	Piedmont Schools Details	G-173
Section 5	Mitigation Strategy	G-194
G.10	Union City Public Schools	G-197
Section 1	Introduction	G-197
Section 2	Existing Mitigation Strategies	G-199
Section 3	Hazards	G-200
Section 4	Mitigation Strategy	G-208
G.11	Redlands Community College	G-211
Section 1	Introduction	G-211
Section 2	Existing Mitigation Strategies	G-213
Section 3	Hazards	G-214
Section 4	Redlands Community College Satellite Facilities	G-221
Section 5	Mitigation Strategy	G-230
G.12	Canadian Valley Technology Center District. No. 6	G-233
Section 1	Introduction	G-233
Section 2	Existing Mitigation Strategies	G-234
Section 3	Hazards	G-235

Section 4	CVTC Canadian County Campuses	G-235
Section 5	Mitigation Strategy	G-243