

#### **Report to Council**

Department:	Development Services
Division:	Planning
Date:	July 20, 2020
Prepared by:	Niharika Bandaru, Climate Change Analyst
Report Number:	Planning-2020-15
Subject:	Climate Change Adaptation Plan – Progress Report 2
Number of Pages:	5

#### Recommendation(s)

**That** PLANNING-2020-15 entitled "Climate Change Adaptation Plan – Progress Report 2" prepared by "Niharika Bandaru" dated "July 20, 2020" be received.

#### Purpose

To provide Council with updates regarding the progress on the climate change adaptation planning process.

#### **Background and Discussion**

At its regular meeting of November 18, 2019, Council gave direction to Administration to implement the process leading to the creation of a proposed Climate Change Adaptation Plan, and provide regular updates on the progress.

#### Essex Climate Adaptation Team (ECAT)

On May 21<sup>st</sup>, 2020, a meeting was conducted electronically with the members of the ECAT, where members were presented with a summary of impact statements. Members were also engaged in three (3) discussions:

1. Discussion 1: Adaptive Capacity

Members were asked to identify the strengths and limitations of urban centres and rural areas within the boundaries of the Town of Essex. This activity was conducted to determine how resource availability, social networks, and service delivery between urban and rural areas vary and how that affects adaptation and resilience.

- 2. Discussion 2: Individual Vulnerability Members were presented with the profiles of different fictitious individuals and asked to determine individual vulnerabilities based on varied lifestyles and needs. This activity was conducted to obtain information on the variances in lifestyle and occupation based vulnerabilities of residents.
- Discussion 3: COVID-19 and Climate Adaptation
   Members were asked to identify how their sectors were affected by COVID-19, any
   similarities to complications from climate impacts, and lessons learned that could be
   applied to improving climate resilience within the Town of Essex.

Please refer to Appendix A for associated documents.

#### Internal Climate Adaptation Team (ICAT)

On May 28<sup>th</sup>, 2020, a meeting was conducted via Zoom with the members of the ICAT to provide instructions on conducting individual divisional Vulnerability and Risk Assessments (VA/RA). The ICAT members, representing all administrative divisions within the Town, were provided the list of impacts on a worksheet template and asked to rate in relation to their divisions the four (4) parameters which compose a VA/RA:

- level of Sensitivity (i.e. how sensitive a particular service area is to each climate impact);
- Adaptive Capacity (i.e. how much cost, labour, time, administrative work will it take to adjust to a given climate impact); o
- Perceived Likelihood (i.e. how a division perceives the likelihood of the impact occurring); and,
- Consequences from climate impacts (i.e. known or estimated consequences to local economy, public health, community & lifestyle, environment, and public administration from a particular climate impact).

Please refer to Appendix B for associated documents.

Following the submission of these worksheets, individual one-on-one meetings were conducted with each member representative to gain insight into responses and lay the groundwork for Risk Prioritization.

Data from the ICAT and ECAT meetings, VA/RAs, as well as regional research is currently being compiled to conduct a Risk Prioritization, whereby divisional and community-based priorities will be determined (High, Medium or Low priority). This will help ascertain the focus of resources in developing recommendations for solutions.

Furthermore, the following organizations were also individually consulted to inform the VA/RA process:

- Essex Region Conservation Authority
- ELK Energy
- City of Windsor
- Caldwell First Nation (still pending response)

Public consultation is being actively conducted through surveys made available on <u>www.essex.ca/ECAT</u>, and relevant data is being incorporated into the Climate Change Adaptation Planning process.

#### Project Plan and Next Steps

The project plan includes 4 phases:

- Phase 1: Assessing Climate Impacts
- Phase 2: Adaptation Planning
- Phase 3: Approval and Funding; and,
- Phase 4: Implementation

Although Phase 1 was originally targeted to be completed by the end of June, 2020, in order to accommodate postponed ICAT and ECAT meetings during the COVID-19 Emergency, Phase 1 is now forecasted to be completed by the end of July. Despite these schedule changes, efforts are being taken to ensure that the planned milestones are met, with minimal impacts to the overall project timeline.

The next ICAT meeting is scheduled for the end of July, where members will be presented with the collective results of the VA/RA, and Risk Prioritization. The team will start discussions on devising Objectives/Goals for the CCAP.

The next meeting for the ECAT is scheduled for July 14<sup>th</sup>, 2020, where members will be voting on the Vision statement for the Climate Change Adaptation Plan, as well as determining Objectives and discussing future Goals/Action Items for the CCAP.

Please refer to Appendix C for associated documents.

#### **Financial Impact**

None.

#### Consultations

Rita Jabbour, Manager, Planning Services

Lori Chadwick, Director, Development Services

#### **Link to Strategic Priorities**

- Manage, invest and plan for sustainable municipal infrastructure which meets current and future needs of the municipality and its citizens.
- Create a safe, friendly and inclusive community which encourages healthy, active living for people of all ages and abilities.
- Provide a fiscal stewardship and value for tax dollars to ensure long-term financial health to the municipality.
- Manage responsible and viable growth while preserving and enhancing the unique rural and small town character of the community.
- □ Improve the experiences of individuals, as both citizens and customers, in their interactions with the Town of Essex.

#### Appendix A

- 1. May 21st Presentation to Essex Climate Adaptation Team (ECAT)
- 2. Adaptive Capacity in Urban and Rural Areas of Town of Essex
- 3. Climate Vulnerability by Resident Type

### Housekeeping Items

#### **ECAT Members:**

Video on; Mic off

Mover, Seconder, All in Favour – Place your hand in front of the camera

Raise Hand, Press Reaction Button or Type in Chat Box to interact

Address your chats to : Everyone

#### **General Public:**

Video off; Mic off

Question/comment period after ECAT member discussion/activities



# Genessex

## Essex Climate Adaptation Team (ECAT) Meeting

21<sup>st</sup> May, 2020

### Agenda

- 1. Roll Call
- 2. Declarations of Conflict of Interest
- 3. Adoption of Published Agenda
- 4. Adoption of Minutes
- 5. New Discussions
- 6. Delegations
- 7. Future Meetings
- 8. Adjournment



 More extreme spring and summer weather resulting in decreased use of outdoor recreation areas and facilities, and increased demand for indoor facilities

 Milder winter temperatures leading to more ice and freezing rain and less snow resulting in infrastructure damage and public safety concerns throughout the community and on rural roads (e.g. visibility with snow drift)



 More extreme hot days >30°C and increased humidity resulting in increased heat and mental stress in youth, elderly, outdoor workers, and those with preexisting health conditions

 Increased temperature variability in shoulder seasons, leading to less confidence in historical weather patterns and planting / harvesting schedules



 More frequent/severe rainstorms leading to rising lake water levels resulting in wave uprush hazards and impacts to shoreline access, water quality, and damage to infrastructure adjacent to shoreline.

 More heavy rainfall events leading to increased flooding resulting in building damage, basement flooding, infrastructure stress, and public health and water quality concerns



• Increased annual temperatures leading to increased pests and spread of respiratory, waterborne, and vector human, animal, and plant diseases

• Milder winter temperatures leading to more ice and freezing rain and less snow resulting in increased salt usage and impacts to soil and water quality



 More extreme hot days >30°C leading to increased energy consumption resulting in increased energy costs

• More extreme weather events (e.g. windstorms, thunderstorms, heatwaves, polar vortices) resulting in power, communication, and service disruptions



 More frequent/severe droughts or floods leading to lower crop yields, damage to vegetation and gardens, and economic loss

• Higher lake levels and decreased lake health (algae blooms, E.coli, contaminants etc.) resulting in water shortages and usage restrictions



• Milder average winters leading to increased local tourism, active transportation, and outdoor programming but less traditional winter activities.

 Increased variability in local climate leading to reduced native natural habitat and faunal biodiversity





## What is Vulnerability?

Vulnerability refers to the susceptibility of a given service area to harm arising from climate change impacts.

- Sensitivity
- Adaptive Capacity

## What is Adaptive Capacity?

Adaptive capacity describes the ability of built, natural and human systems to accommodate changes in climate with minimum disruption or additional cost.

## What is Adaptive Capacity?

There are several key determinants of adaptive capacity:

- Economic resources
- Technology
- Information and skills
- Social Capital
- Institutions
- Equity



It is important to recognize that there are differences in the adaptive capacity of urban centers and rural communities.

URBAN	RURAL
<b>S</b> : Greater access to financial resources	S: Strong social capital
<b>S</b> : Easier access to technology	${\sf S}$ : Strong traditional and local knowledge
L: Higher costs of living	L: Limited economic resources

S: Strength L: Li

L: Limitation



### **Discussion # 1 : Adaptive Capacity**



ADAPTIVE CAPACITY

It is important to recognize that there are differences in the adaptive capacity of urban centers and rural communities. In the table below, list the strengths and limitations under each section.

URBAN CENTRES	RURAL COMMUNITIES
STRENGTHS	STRENGTHS
LIMITATIONS	LIMITATIONS
	essex

What are the differences and similarities in the adaptive capacities of **urban and rural centers?** 

**Urban** : Essex, Harrow, McGregor, Colchester Centres

Rural: Farms, wineries, scattered residences



### **Discussion # 2 : Vulnerability/Risk Assessment**



# Discussing the adaptive capacity of **individuals**.

## What are individual vulnerabilities?

What are current gaps in services?

## CLIMATE VULNERABILITY IN ESSEX

#### Age: 48 | Job Title: Family: M (Ages 19,

#### Age: 48 | Location: Colchester Job Title: Winegrower Family: Married, 3 children (Ages 19, 17, 9)

#### LEGEND

Vulnerability

- H, the resident is highly vulnerable S, the resident is somewhat
- vulnerable

#### HOBBIES

#### Travelling

- Travelling
  Gardening
- Gardening
- Rayaking
  Foodie
- Pay for kids' post-secondary education

GOALS

Have a more

reliable

VULNERABILITY COMMENTS

 Increased annual temperatures leading to increased pests and spread of respiratory, waterborne, and vector human, animal, and plant diseases

CLIMATE CHANGE IMPACTS

BIO Darryl's family has grown grapes for wine production in Colchester for over 20 years.

which he inherited after university. In 2014 and 2019, extremely cold periods in the winter

destroyed his grape buds and he spent the following year rebuilding the vines. His farm

has an irrigation system; but, excessive precipitation in early spring can damage delicate blossoms that turn into grapes. Darryl enjoys the community and natural habitat in

Colchester. His oldest child is in University and he plans on supporting all his kids' post-

secondary education in the future. He worries that with the unpredictable changes in

climate, his family cannot sustain their livelihood as wine-growers in Colchester.

- More extreme spring and summer weather resulting in decreased use of outdoor recreation areas and facilities, and increased demand for indoor facilities
- · Milder winter temperatures leading to more ice and freezing rain and less

# Discussion # 3 : COVID-19 and Climate Adaptation



## **Adaptation Planning**

How has COVID-19 affected your sector?

What are the lessons learnt?

What is applicable to Climate Adaptation Planning?



## **Delegations / Public Comments**

1. Indicate in chat box that you wish to comment (State your name)

2. Chair will invite you to speak

3. Unmute mic



### **Next Meeting Date:**

Summer 2020 TBD by Member Survey



### Thank You

nbandaru@essex.ca

### Public Feedback Form:

www.essex.ca/ECAT

## ADAPTIVE CAPACITY

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STRENGTHS	STRENGTHS
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### Darryl

Age: 48 | Location: Colchester Job Title: Winegrower Family: Married, 3 children (Ages 19, 17, 9)

#### BIO

Darryl's family has grown grapes for wine production in Colchester for over 20 years, which he inherited after university. In 2014 and 2019, extremely cold periods in the winter destroyed his grape buds and he spent the following year rebuilding the vines. His farm has an irrigation system; but, excessive precipitation in early spring can damage delicate blossoms that turn into grapes. Darryl enjoys the community and natural habitat in Colchester. His oldest child is in University and he plans on supporting all his kids' post-secondary education in the future. He worries that with the unpredictable changes in climate, his family cannot sustain their livelihood as wine-growers in Colchester.

#### **CLIMATE CHANGE IMPACTS**

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#### **LEGEND** Vulnerability

H, the resident is highlyvulnerableS, the resident is somewhat

vulnerable

#### HOBBIES

- Travelling
- Gardening
- Kayaking
- Foodie

#### GOALS

- Have a more reliable irrigation system
- Pay for kids'
   post-secondary
   education

#### VULNERABILITY COMMENTS



#### Mona

Age: 25 | Location: Essex Job Title: Student, Volunteer Firefighter Family: Single

#### BIO

Mona is a University of Windsor Master's student who also works part-time in the city. She lives in Essex with her parents and volunteers as a part-time firefighter. Extremely concerned about the climate crisis, she often participates in local climate protests. She commutes to Windsor every day to attend school in a Hybrid vehicle, and has been trying to persuade her parents to replace their SUV with an EV. Despite suffering from severe allergies, Mona enjoys outdoor activities like hiking and softball, and visits public fields and parks.

#### **CLIMATE CHANGE IMPACTS**

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#### **LEGEND** Vulnerability

H, the resident is highly vulnerableS, the resident is somewhat

HOBBIES

Activism

Photography

vulnerable

#### GOALS

- Graduate with minimal student loans
- Pursue her PhD.
- Encourage community to reduce carbon

# VULNERABILITY COMMENTS

#### Gary

 $\overline{\mathbf{O}}$ 

Age: 62 | Location: Harrow Job Title: Farmer Family: Married, 2 children, 4 grandchildren

#### BIO

Gary owns and operates a mixed farm in Harrow, where he grows sweet and field corn, and soybeans with the help of his wife and kids. The cattle and pigs on his farm are fed the grain grown there. He also grows fruit and vegetables which are pruned and picked with the help of workers that arrive in the spring from Central America. He is worried about heat waves and extreme heat in the summer as it has resulted in higher energy costs to keep his animal barns cooled. Flooding events have delayed seed sowing or destroyed crop. Gary enjoys water-based leisure activities in Lake Erie and Cedar Creek, as well as teaching his grand kids to bird-watch in the local conservation areas.

#### **CLIMATE CHANGE IMPACTS**

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#### **LEGEND** Vulnerability

H, the resident is highly vulnerable
S, the resident is somewhat vulnerable

#### HOBBIES

#### GOALS

Maintain lower

energy costs

- Fishing
- Boating
- Bird-watching

#### crop and meat yield

 Spend more time with grand-kids

#### VULNERABILITY COMMENTS



#### Maria

Age: 75 | Location: McGregor Job Title: Retired Family: Widowed, 1 child, 2 grandchildren

#### BIO

Maria has been living in a retirement home for the last three years. She moved to Canada in her thirties from Romania with her husband and one daughter, and lived in Windsor-Essex County since. She is severely diabetic and cannot drive; so she walks to local shops, or relies on family and friends to take her to the mall or stores outside of McGregor. She likes to spend time with her grandkids, who do visit her often, but she would like to take them to local festivals, parks, and libraries. She likes to for walks, but limits herself during the winter as she fears slipping and falling on the ice.

#### **CLIMATE CHANGE IMPACTS**

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#### **LEGEND** Vulnerability

H, the resident is highly vulnerable

**S**, the resident is somewhat vulnerable

#### HOBBIES

#### • Walking

- Shopping
- Reading
- Knitting

#### GOALS

- Be more independent
- Learn to use a computer
- Spend more outdoor time with grandkids

/ULNERABILITY	COMMENTS
• • • • • • • • • • • • • • • • • • • •	



Lisa

Age: 42 | Location: Essex Job Title: Janitor Family: Common Law, 2 children (Ages 8, 12)

BIO

Lisa lives with her partner, two children and mother at a geared income housing community in Essex, that does not have efficient cooling in the summer. She works as a janitor at two different jobs, and gets to work in a car that is in need of repair. She is a primary caregiver to her mother who suffers from severe arthritis and needs special medication. Her partner is unemployed and suffers from substance abuse and depression, and receives supplemental assistance from the government. Despite personal struggles, Lisa likes to participate in community volunteering opportunites.

#### **CLIMATE CHANGE IMPACTS**

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Vulnerability H, the resident is highly vulnerable S, the resident is somewhat vulnerable

LEGEND

#### HOBBIES

- Community Volunteering
- Watching TV

**GOALS** Find a full-time

- job Find a nurse for
- her mother Purchase a new
- car Improved health of her partner
- VULNERABILITY **COMMENTS**

 More frequent/ to vegetation a Higher lake lev contaminants e • More frequent/severe rainstorms leading to rising lake water levels resulting in wave uprush hazards and impacts to shoreline access, water quality, and damage to infrastructure adjacent to shoreline More heavy rainfall events leading to increased flooding resulting in building damage, basement flooding, infrastructure stress, and public health and water quality concerns Milder average winters leading to increased local tourism, active transportation, and outdoor programming but less traditional winter activites. Increased variability in local climate leading to reduced native natural habitat and faunal biodiversity Reference: Climate Change in Lincoln, Town of Lincoln

LEGEND

Vulnerability

S, the resident is somewhat

GOALS

Buying a home

**Obtaining full-**

time local

employment

H, the resident is highly

vulnerable

vulnerable

HOBBIES

Drinking craft bee

Playing video

Singing



#### Dylan

Age: 32 | Location: Essex Job Title: Researcher Family: Divorced, one child (Age: 2)

#### BIO

Dylan is a single parent who grew up in Essex. He travels often for his work as a contracted researcher, sometimes internationally, as his daughter stays in the care of his retired parents. He plans to find a full-time job locally, but is worried about the rising childcare costs until his daughter is old enough to go to school. Dylan rents a twobedroom basement unit. In the 2015 and 2016 floods, and again in 2019, the unit some flooding, craft beer festiv

- Increased anr respiratory, wa
- More extreme outdoor recrea facilities
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and now he worries every time it rains. In the summer, he likes to go to rals and events, and also take his daughter out to the parks and local the winter, he likes to take his daughter ice skating at the local arena.	Ice skating	<ul> <li>Spending more time with his daughter</li> </ul>	
CLIMATE CHANGE IMPACTS	VULNERABILITY	COMMENTS	
nual temperatures leading to increased pests and spread of aterborne, and vector human, animal, and plant diseases e spring and summer weather resulting in decreased use of ation areas and facilities, and increased demand for indoor			
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#### **Appendix B**

- 1. Climate Projections for the Town of Essex
- 2. Instructions & Glossary for Vulnerability & Risk Assessment Worksheet
- 3. Vulnerability & Risk Assessment Worksheet

The below table summarizes the climate projections for the Town of Essex. When creating impact statements it is important to look at the overall trends.

#### **Climate Projections for the Town of Essex**

The below table summarizes the climate projections for the Town of Essex. When creating impact statements it is important to look at the overall projections.

Hover over each Sub-Variable to see its definition.

Variable	Sub-Variable (Hover over each variable to view a description)	Recent Past Avg (1976-2005)*	2040 Projection	2060 Projection	Trend
Temperature	Hottest Day °C	33.5	36.7	37.8	$\mathbf{\uparrow}$
	Annual Mean Temperature °C	9.6	11.9	13.3	$\mathbf{\uparrow}$
	Number of Heat Waves	2.0	5.9	6.7	$\mathbf{\uparrow}$
	Length of Heat Waves (days)	3.5	5.9	7.6	$\mathbf{\uparrow}$
	Days Over 30 °C	15.4	45.9	58.4	$\mathbf{\uparrow}$
	Coldest Day °C	-19.6	-15.3	-13	$\mathbf{\uparrow}$
	Days Below -15°C	8.0	2.0	0.7	$\checkmark$
	Freeze-Thaw Cycles	57.2	49.2	39.3	$\checkmark$
	Frost-Free Season	193.4	214.7	227.4	$\uparrow$
	Ice Days (below 0°C)	44.9	27.2	17.7	$\checkmark$
Precipitation	Annual Mean Precipitation mm	825.0	851.2	925.8	$\mathbf{\uparrow}$
	Mean Spring Precipitation mm	218.0	242.8	253.7	$\mathbf{\uparrow}$
	Mean Summer Precipitation mm	220.0	191.5	224.9	$\mathbf{\uparrow}$
	Mean Winter Precipitation mm	181.0	190.3	225.2	$\mathbf{\uparrow}$
	Wet Days >10mm	25.3	26.7	30.3	$\mathbf{\uparrow}$
Other	Storm Events	40% increase in 1	.:100 storms, 25% ii	ncrease in 1:10	•
			storms		T
	Lake Levels	Lake Erie wate Short term pro	r level fluctuations v jections show highe	will increase. er lake levels.	Uncertain

Sources: Climate Atlas, Climate Data, Environment and Climate Change Canada, ERCA, US Army Corp of Engineers

Instructions for Assessing Vulnerability &	& Risk	
The sheet titled "Assessing Impact Statements" is a summary of the impacts identified by the ICAT, ECAT and research, that are related to your division (either directly or indirectly).		
STEPS: 1. Review the Impact Statements directly or indirectly impacting your division (hide all others). 2. Using the dropdown menu in each colomn, select the appropriate score for Sensitivity, Adaptative Capacity, and Risks (See glossary below) 3. If you struggle with deciding a score, or have an additional comment, please write it in the "Comments" columns at the far right. 4. Overall Vulnerability and Risk scores will automatically be calculated.		
Please only assess the impacts that directly or indirectly affect your department. Please let me know if you have any questions or concerns!		
<ul> <li>Vulnerability Assessments</li> <li>Vulnerability is a function of the exposure and sensitivity of a system to hazardous conditions, and the adaptive capacity or resilience of the system to cope, adapt, or recover from the effects of those conditions</li> <li>While conducting your vulnerability assessment, consider the following questions: <ul> <li>Is your department already able to accommodate existing weather patterns and changes in climate?</li> <li>Are there barriers to your department's ability to accommodate changes in climate?</li> <li>Is your department already stressed in ways that will limit its ability to accommodate changes in climate?</li> </ul> </li> </ul>		
is your department already stressed in ways that will inflicits ability to accommodate changes in climate?	Sensitivity Assessment	
Sensitivity: To determine how sensitive a service area is to projected changes in climate, consider the following questions:	S1- No, functionality will stay same	
<ul> <li>How exposed is the service area to the impacts of climate change?</li> <li>Is the service area subject to existing stresses?</li> <li>Will climate change cause the demand for a resource or service to exceed its supply or current abilities?</li> <li>Does the service area have limiting factors that may be affected by climate change?</li> </ul>	S2- Unlikely, functionality will likely stay the same S3- Yes, functionality likely to get worse S4- Yes, functionality will get worse S5- Yes, functionality will become unmanageable	
<ul> <li>Are there measures that are presently in place that are able to provide a buffer against expected future changes?</li> <li>With regard to ecological sensitivity – is there a plant and animal species of concern in your service area that is currently located near the limits of its range?</li> </ul>	Can service adjust to projected climate impact with minimal cost and disruption? Adaptive Capacity AC1- No, will require substantial cost and staff intervention	
Adaptive Capacity: To measure adaptive capacity, consider the projected impacts for your community and assess how those impacts will affect the systems in your service areas. Think about how the key determinants listed could affect your community's adaptive capacity. Also consider the extent to which current plans, policies and regulations account for the indentified set of climate variables and their future changes? By increasing adaptive capacity, a systems vulnerability to current and future climate is reduced.	AC2- No, will require significant costs and staff intervention AC3- Maybe, will require some costs and intervention AC4- Yes, some slight costs and staff intervention AC5- Yes, no costs or intervention needed	

#### Risk Assessments

• Risk is the combination of an event's likelihood and its consequences – risk therefore equals the probability of a climate hazard multiplied by the consequence of that event. **Consequence :** What are the known or estimated consequences (economic, ecological, social, and legal) of a particular climate change impact?

Likelihood: How likely is it that a projected impact will occur? Some climatic changes, such as increasing average temperatures and seal level rise, have more certainty while the frequency of extreme events has less.

		Consequence			
Public Health & Safety	Local Economy & Growth	Community & Lifestyle	Environment & Sustainability	Public Administration	Likelihood
C1- Negligible, Appearance of a	C1- Negligible, Minor shortfall	C1- Negligible, There would be	C1- Negligible, No	C1- Negligible, There would be	L1- Rare, Unlikely during the next 25 years
threat but no actual harm	relative to current forecasts	minor areas in which the region	environmental damage	minor instances of public	L2 - Unlikely, May arise once in 10-25 years
		was unable to maintain its	-	administration being under	L3- Possible, May arise once in 10 years
		current services		more than usual stress but it	L4- Likely, May arise about once per year
				could be managed	L5 - Amost Certain, Could occur several times per year
C2- Minor, Serious near misses	C2- Minor, Individually	C2- Minor, Isolated but	C2- Minor, Minor instances of	C2- Minor, Isolated instances	
or minor injuries	significant but isolated areas	noticeable examples of decline	environmental damage that	of public administration being	
	of reduction in economic	in services	could be reversed	under severe pressure	
	performance relative to current				
C2 Moderate Small number of	C2 Moderate Significant	C2 Moderate Conoral	C2 Mederate Isolated but	C2 Madarata Bublic	
injurior	conoral reduction in economic	co- moderate, General	cignificant instances of	administration would be under	
injuries	performance relative to current	appreciable decime in services	environmental damage that	severe pressure on several	
	forecasts		might be reversed with	fronts	
	lorecusts		intensive efforts	Tons	
C4- Major, Isolated instances	C4- Major, Regional stagnation	C4- Major, Severe and	C4- Major, Severe loss of	C4- Major, Public	
of serious injuries or loss of	such that businesses are	widespread decline in services	environmental amenity and a	administration would struggle	
life	unable to thrive and	and quality of life within the	danger of continuing	to remain effective and would	
	employment does not keep pace	community	environmental damage	be seen to be in danger of	
	with nonulation growth			failing completely	

C5- Catastrophic, Large C5- Catastophic, Regional C5- Catastophic, The region C5- Catastophic, Major C5- Public administration numbers of serious injuries or decline leading to widespread would be seen as very widespread loss of would fall into loss of lives business failure. Joss of unattractive. moribund and environmental amenity and decay and cease to be effective
loss of lives business failure, loss of unattractive, moribund and environmental amenity and decay and cease to be effective
employment and hardship unable to support its progressive irrecoverable community environmental damage

X	Direct Impact
0	Indirect Impact
Y	Positive Impact

Direct Impact : A direct result of a climate impact that directly affects the functionality of a department Indirect Impact: A result from interactions with the direct impact that result in affecting the functionality of a department Positive Impact : A positive outcome/result to a department in question that enhances a departments functionality

#### Vulnerability and Risk Assessment Worksheet

	X Direct Impact	DIVISIONS			RISK						Comments
CLIMATIC THREAT	O Indirect impact Y Positive impact IMPACT STATEMENT	Council Legal & Legistative Services Communications IT Human Resource Finance & Business Services Economic Development Devinage Panning Services Fire Pants & Facilities Recreation & Culture Environmental Services Capital Work & Asset Operationy/Drainage	SENSITIVITY Will climate impact affect functionality of given department(s)?	ADAPTIVE CAPACITY Can department(s) adjust to projected climate impact with minimal cost and disruption?	LIKELIHOOD What is the probability of the climate impact occurring	CONSEQUENCE Public Health & Safety What are the known or estimated consequences of the climate impact to public safety?	CONSEQUENCE Local Economy & Growth What are the known or estimated consequences of the climate impact to the local economy?	CONSEQUENCE Community & Lifestyle What are the known or estimated consequences of the climate impact to the community?	CONSEQUENCE Environment & Sustainability What are the known or estimated consequences of the climate impact to the environment?	CONSEQUENCE Public Administration What are the known or estimated consequences of the climate impact to public administration?	Do you have any additional comments?
Increased annual temperature	s Increased Urban Heat Island Effect resulting in increased health risks (asthma, hyperthermia, heat stroke, heart complications, mental stress), higher energy demand, infrastructure damage, lower air quality, and lower water quality detrimentally affecting daily lives of residents.			****						##	#
Increased annual temperature	s Increased chances of heat-related illnesses, disease outbreaks, property damage, and mental stress to workers leading to less productivity, increased number of sick days, reduced worker health and safety, increased backup manpower needs, and increased WGR claims			***						##	ŧ
Increased summer temperatures	Decrease of water supply (dry hydrants/ponds) for firefighting			***						##	#
Increased summer temperatures	A decrease in summer precipitation, drier conditions, and more lightning strikes leading to greater grass and forest fire risks resulting in increased fire calls, increased public health costs, and need for implementation of fire bans			****						##	#
Increased summer temperatures	An increase in summer temperatures with a decrease of summer rainfall may lead to a decrease in wetland habitat and biodiversity leading to loss of ecosystem services (flood control; air, soil, and water quality; pollination etc.)			***						**	#
Increased summer temperatures	Drought conditions and less frequent precipitation resulting in ground shrinkage, surface cracks on roadways, concrete heaving and flushing in motorways and building infrastructure, thereby increasing inspections, repair costs, and accident risk to motorist.			***						""	#
Increased summer temperatures	Higher water temperatures and higher lake levels will lead to an increase in algae blooms, E.coli, hypoxia and invasive aquatic species resulting in reduced water quality, fewer recreational activities and tourism (e.g. beach and marina closures, reduced fishing opportunities, fewer boat launches, closure of waterfront trails), and increased stress on shoreline water infrastructure			***						**	#
Increased summer temperatures	Higher demand on energy and water for cooling town facilities, municipal infrastructure, private facilities and homes resulting in increased costs, increased load, and increased maintenance.			***						""	#
More frequent/severe heat waves	Hotter days and heatwares will lead to decreased use of outdoor recreation facilities (parks,sport fields, conservation areas), less outdoor programming (e.g. events, festivals), decreased use of active transportation (e.g. CWATS), and result in increased demand on indoor activities, cooling centres, shade structures, beaches and splash nade.			***						""	#
More frequent/severe heat waves	Longer heat waves will result in USDA zone shifts for local flora and crops leading to changes in planting practices, rezoning and policy, and crop choices			###						##	#
Longer growing season	A longer growing season resulting in multiple crop harvests for certain crops, increased quality wine production, and increased opportunities to grow different types of crops in warmer weather			###						##	#
Longer growing season	Longer growing seasons, leading to increased issues optimizing Town fleet (e.g. leaf pick up equipment vs. snowplows)			###						##	#
Fewer freeze-thaw cycles	Decreased soil porosity and increased soil compaction of clayey soil types resulting in reduced soil drainage			***						##	#
Increased temperature variability in shoulder seasons	Delays in outdoor maintenance (e.g. sports fields, ball diamonds, Town parks, Town beautification etc.) accompanied by higher frequency of maintenance due to increased interruptions from incumbent weather.			***						##	#
Increased temperature variability in shoulder seasons	Extreme heat, cold, and variability (freeze-thaw cycles) resulting in increased damage(frost heaving, culvet freezing, watermain breaks, storm sewer freezing, bridge damage, reduced asphalt lifecycle) to infrastructure (roads, culverts, sidewalks, trails, parking lots, and outdoor recreation facilities) leading to increased preventative maintenance rearia; and labour costs.			***						##	#
Increased temperature variability in shoulder seasons	Increased temperature variability in shoulder seasons, and more frequent isolated storms leading to less confidence in historical weather patterns and planting / harvestine schedules			###						##	#
Milder winter temperatures	Increase in the tourism sector creating a demand for lodging and vacation rentals			***						##	#
Milder winter temperatures	Less ice cover on lakes would result in increased evaporation and subsequent increased winter-time precipitation									##	#
Milder winter temperatures	Less snow but more freezing rain may require increased road maintenance, resources, and emergency servicing			***						##	#
Milder winter temperatures	Milder winter temperatures leading to more ice and freezing rain and less snow resulting in infrastructure damage and public safety concerns throughout the community and on rural roads (e.g. visibility with snow drift)			****						""	#
Milder winter temperatures	Milder winter temperatures leading to more ice and freezing rain and less snow resulting in increased salt usage and impacts to soil and water quality			***						##	#
Milder winter temperatures	Milder average winters leading to increased local tourism (e.g. longer boating season), active transportation, and outdoor programming (e.g. outdoor events) but less traditional winter activities (e.g. outdoor ice skating)			***						""	#

Milder winter temperatures	Warmer lake temperature resulting in fewer water line breaks for water treatment infrastructure leading to cost savings	##	#		###	
Milder winter temperatures	Increased native habitat stress, milder winter temperature and loss of frozen					
	conditions will lead to species migrations, loss of native species, spread of	##	#		###	
	disease/invasives and increased pest survival (emerald ash borer, ticks, rats,					
Increased annual precipitation	Inundated watercourses and riparian zones will alter Provincially Significant Wetlands					
	(PSWs) which may result in ecological sensitivity	##	#		###	
Increased annual precipitation	Increased P,N loading from increased agricultural runoff and road salt will amplify					
	ouality					
Increased annual precipitation	Increased annual precipitation stress on sewage, septic, and water treatment leading					
	to reduced water pressures, surcharge, wastewater backup, and supply shortages	##	#		###	
Increased annual precipitation	Increased ground water saturation will lead to an increase in water table, posing					
increased annual precipitation	problems to pits and quarries, bluff failures, and increase in overland flooding	##	#		###	
Increased annual precipitation	Increased site specific flooding resulting in private infrastructure damage leading to	##	#		###	
Increased annual precipitation	economic loss and increased costs to renabilitate Increased flooding, erosion (creeks, valley lands, shoreline) leading to changes in land					
	uses and where new development can occur (change in floodplain areas, erosion	##	#		###	
	hazard setbacks. etc.)					
Increased annual precipitation	Increased humidity in wet months leading to increased mold in infrastructure and food		#			
	storage resulting in increased cost of maintenance and respiratory arritchons					
Increased annual precipitation	Longer flow patterns within watercourses, changes to shoreline, agricultural zone					
	changes in the municipality necesitating increased GIS mapping and planning	##	#		###	
Increased annual precipitation/	Higher lake levels will cause damage to shoreline, water intakes, drain outlets, pumps,					
Higher fluctuation of lake	flood valves, septic systems and associated equipment, resulting in changes to design					
levels	criteria, retrofitting existing infrastructure, and greater need for monitoring programs.		#		****	
Eluctuating lake lovels	A decrease in lake levels can increase the maintenance of Lyuster treatment					
riuctuating lake levels	infrastructure (water intake, drains etc.), marinas (navigation channels), docks, and	##	#		###	
	ramps.					
Fluctuating lake levels	A decrease in lake levels will support shoreline protection, beach formation, and	##	#		###	
More frequent/severe spring	habitat restoration. Flash flooding and higher water levels will increase waste and debris generated from					
time precipitation	damaged contents of structures causing increased pollution	##	#		###	
More frequent/severe winter	More shoreline erosion during the winter due to unfrozen lake surfaces and higher					
time precipitation	wave action from high wind and precipitation events, leading to loss of shoreline,	##	#		###	
More frequent/severe extreme	Compromised and damaged infrastructure can lead to greater safety risk to emergency					
weather events	personnel, municipal workers, and residents (e.g. falling debris, falling trees, bluff	##	#		###	
NA 6	failures etc.)					
weather events	nino effect) requiring budgeting for emergency snow clearance, road salting, increased					
weather events	social assistance (e.g. those with disabilities, homeless etc.)	##	#		###	
More frequent/severe extreme	Increased stress, pollution, and damage to public and private infrastructure from urban floading, coil aracian (bacaments, readways, cowers, drains etc.)					
windstorms, thunderstorms,	hooding, son erosion (basements, roadways, sewers, drains etc.)	##	#		###	
tornadoes etc.)						
Moro fraguant/couoro outromo	Domore to communication, nowar and, and utilities infractructure from covere and					
weather events (ex:	extreme weather events will cause disruptions in emergency services and					
windstorms, thunderstorms,	telecommunication, power outages, and increase backup needs.	##	#		###	
tornadoes etc.)						
More frequent/severe extreme	Higher equipment repair and maintenance costs from increased usage and damage					
weather events (ex:	from extreme weather (e.g. equipment fatigue, rust, corrosion, salt, sand).					
windstorms, thunderstorms,		##	#		###	
tornadoes etc.)						
More frequent/severe extreme	Extreme weather events (heat waves, flooding, cold snaps etc.) leading to cancellations					
weather events (ex:	of outdoor recreational events (e.g. festivals, tours) and facilities (e.g. sport fields, ball					
windstorms, thunderstorms,	diamonds, splash pads)resulting in reduced local tourism spending	##	#		###	
tornadoes etc.)						
More frequent/severe extreme	Increased travel and accessibility issues for Town workers during extreme weather					
weather events (ex:	events will require increased remote work and increased manpower in setting up					
windstorms, thunderstorms,	remote workplaces, meetings etc.	##	<b>"</b>		###	
tomadoes etc.)						
More frequent/severe extreme	Increased potential for extended power outage (brown outs, black outs) compromising					
weather events (ex:	critical infrastructure and service levels leading to increased demand and costs of					
tornadoes etc.)	backup systems and emergency planning.				"""	
More frequent/severe extreme	Increased roadway flooding, debris, damaged infrastructure will limit safe access to					
weather events (ex: windstorms, thunderstorms	responses, increased community vulnerability, and reduced safety	##	#			
tornadoes etc.)	in teaced survey.					

Climate change in general	Increased extended weather statements (heat warnings, flooding alerts, health/disease alerts) from WECHU, BRCA, County of Essex resulting in increased need for Town communication to residents (e.g. updated digital info, redo brochures, change scheduling and messaging) and increased man-hours spent responding to resident concerns.		ŧ		###	
Climate change in general	Electrical transmission, gas lines, water and telecomm infrastructure may have more failures, resulting in increased capital expenditures, maintenance, delays, and need for mannower	###	ŧ		****	
Climate change in general	Greater crop stress from increased spring flooding risks, summer drought, unseasonal frost, pests, diseases, crop disease and other climactic extremes can lead to increased demands (water, nutrient, labour, materials, insurance claims) and decreased economical output		Ŧ		****	
Climate change in general	Climate risks resulting in increased mental stress in youth, elderly, outdoor workers, those with preexisting health conditions, emergency personnel, and Town employees.		¥		****	
Climate change in general	Increased demands to Town Council and administration to provide support programs, social assistance programs, emergency measures, and funding to residents (e.g. shoreline assistance orceram)		¥		****	
Climate change in general	Increased immigration to the municipality due to climate stress in other regions, creating a demand for housing, social services, and increased resources	###	¥		***	
Climate change in general	Closure of businesses and Town facilities from extreme weather events and associated consequences like infrastructure damage, loss of communications, disease outbreaks, reduced accessibility, and overall increased threat of public hazards.		¥		****	
Climate change in general	Higher demand for services such as water and energy for farms resulting in review of services (e.g.implement potential need for irrigation for agricultural uses)	###	ŧ		***	
Climate change in general	Greater need for self reliance and community support in the face of more frequent and intense climate risks, posing greater challenge to vulnerable populations (e.g. those with disabilities, elderiv etc.)	###	ŧ		***	
Climate change in general	Greater climate risks causing chronic community anxiety leading to reduced overall quality of life of residents (especially those experiencing disabilities, homelessness, chronic illnesses. substance addictions etc.)		ŧ		***	
Climate change in general	Property loss, economic damage, physical accidents in public areas leading to increasing liability to Town	***	ŧ		###	
Climate change in general	Disruptions from extreme weather events leading to increased crime and reduced social equity resulting in higher demand for community policing	###	ŧ		###	

#### Appendix C

1. July 14<sup>th</sup> Presentation to Essex Climate Adaptation Team (ECAT)

### Housekeeping Items

**ECAT Members:** 

Video on; Mic off

Mover, Seconder, All in Favour – Place your hand in front of the camera

Raise Hand, Press Reaction Button or Type in Chat Box to interact

Address your chats to : Everyone

**General Public:** 

Video off; Mic off

Question/comment period after ECAT member discussion/activities





## Essex Climate Adaptation Team (ECAT) Meeting

14<sup>th</sup> July, 2020

Image Credit: Anne Benetau, 2020

### Agenda

- 1. Roll Call
- 2. Declarations of Conflict of Interest
- 3. Adoption of Published Agenda
- 4. Adoption of Minutes
- 5. New Discussions
- 6. Delegations
- 7. Future Meetings
- 8. Adjournment



## **Current Status**





## Vulnerability/ Risk Assessment

Recap:

Adaptive Capacity, Individual Vulnerability, COVID-19 based Vulnerability

Comprehensive Vulnerability and Risk Assessment/Prioritization:

- ICAT
- ELK Energy
- ERCA
- Caldwell Nation
- Farming Community
- Water Experts
- City of Windsor

**Public Consultation** 



## **Next Steps**





## Vision Statement & Goals



#### **Option 1**

The Town of Essex will adapt to changing climate conditions and embrace new opportunities to remain a healthy, vibrant, and sustainable community where you belong.

#### Option 2

The Town of Essex will commit to building a vibrant, sustainable, resilient, and healthy community by adapting to the impacts of climate change. We will improve the physical, natural, social, cultural, and local economic capacity of the community and residents through policy development, infrastructure investment, and community engagement.

#### **Option 3**

The Town of Essex will prepare for the future by implementing the Climate Change Adaptation Plan for a sustainable and resilient community. The Town will demonstrate leadership through strengthening infrastructure and policies, protecting natural and built assets, and preserving the health and well-being of its residents. By sustaining and improving livelihoods, experiences, comfort, and safety, we will continue being a place where you belong.









Original

#### Option 2

#### Revised

The Town of Essex will commit to building a vibrant, sustainable, resilient, and healthy community by adapting to the impacts of climate change. We will improve the physical, natural, social, cultural, and economic capacity of the community and residents through policy development, <u>resource expansion</u>, infrastructure investment, and community engagement.



**Option 3** 

The Town of Essex will prepare for the future by implementing the Climate Change Adaptation Plan for a sustainable and resilient community. The Town will demonstrate leadership through strengthening infrastructure and policies, protecting natural and built assets, and preserving the health and well-being of its residents. By sustaining and improving livelihoods, experiences, comfort, and safety, we will continue being a place where you belong.

Original

#### The Town of Essex will prepare for the future by implementing the Climate Change Adaptation Plan for a sustainable and resilient community. The Town will demonstrate leadership through strengthening infrastructure and policies, protecting natural and built assets, and preserving the health and well-being of its residents. By sustaining and improving livelihoods, experiences, comfort, and safety, we will continue being a place for residents, businesses, and visitors.

Revised

#### **Option 1**

The Town of Essex will adapt to changing climate conditions and embrace new opportunities to remain a healthy, vibrant, and sustainable community for residents, businesses, and visitors.

#### **Option 2**

The Town of Essex will commit to building a vibrant, sustainable, resilient, and healthy community by adapting to the impacts of climate change. We will improve the physical, natural, social, cultural, and economic capacity of the community and residents through policy development, resource expansion, infrastructure investment, and community engagement.

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The Town of Essex will prepare for the future by implementing the Climate Change Adaptation Plan for a sustainable and resilient community. The Town will demonstrate leadership through strengthening infrastructure and policies, protecting natural and built assets, and preserving the health and well-being of its residents. By sustaining and improving livelihoods, experiences, comfort, and safety, we will continue being a place for residents, businesses, and visitors.



## Goals for Climate Change Adaptation Plan (CCAP)



Interactive Discussion

1. For Members:

Go to: <a href="https://bit.ly/2Z51ejm">https://bit.ly/2Z51ejm</a> (link also displayed in Chat)\*

- \* Please ensure you have already signed up for a free MIRO account.
- 2. Public:

Continue to view the meeting on Zoom



## Goals for Climate Change Adaptation Plan (CCAP)



Interactive Discussion

Instructions:

• Stable Wi-Fi

• Open Miro

Share

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• Only work on stickies on your column





## Goals for Climate Change Adaptation Plan (CCAP)



Interactive Discussion

Instructions:

- Double click on a sticky to start typing
- DO NOT click/operate any other controls
- To navigate across the board, click on an empty grey area <u>outside the</u> <u>stickies</u> and drag left/right/up/down OR slide across your laptop trackpad with 2 fingers



## **Next Phase**





## **Questions?**

## **Delegations / Public Comments**

1. Indicate in chat box that you wish to comment (State your name)

2. Chair will invite you to speak

3. Unmute mic



### **Next Meeting Date:**

August 19, 2020; 5 PM



## Thank You

nbandaru@essex.ca Public Feedback Form:

www.essex.ca/ECAT

Image Credit: Anne Benetau, 2020