



When and how to integrate private property buyouts for disaster risk reduction

Webinar Series: Building Local Resilience to Climate Risks

Webinar 4 – November 27, 2023

Presenting: Sean Strang – Director of Flood Recovery and Mitigation, City of Merritt
Shaierree Cottar – Partners for Action

Host: Sharmalene Mendis-Millard
Senior Manager, Research Partnerships & Evaluation -- Partners for Action

p4a.info@uwaterloo.ca

Building Local Resilience to Climate Risks

A P4A/Climate Caucus Joint Webinar Series

Learn what efforts are underway to
**support local climate action,
adaptation and resilience** – and
what you can do in your
community



(Lewis, 2015)

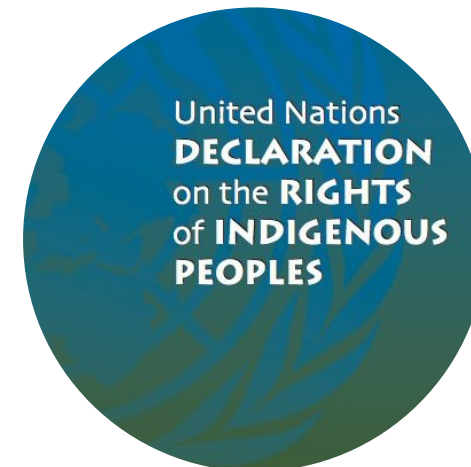
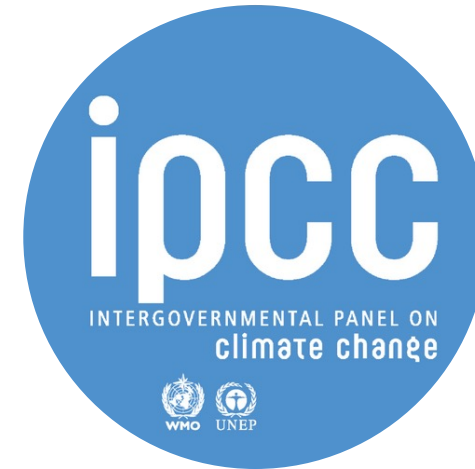
Partners for Action (P4A) respectfully acknowledges that we live and work on the traditional territory of the Neutral, Anishinaabeg and Haudenosaunee peoples, whose enduring presence, contributions and knowledges we recognize.

The University of Waterloo is situated on the Haldimand Tract, the land promised to the Six Nations that includes six miles on each side of the Grand River (see <https://www.protectthetract.com/>)

Learn about where you live and work at <https://native-land.ca/>

WHO WE ARE?

Climate Caucus (CC) is a non-partisan network of 600+ local elected climate leaders working collectively to address the Climate, Ecological, and Social Justice crises.



MISSION



Connect, support, and advocate for locally elected leaders to accelerate the transformation for communities to thrive

VISION



Communities are leading the transformation needed to thrive* within planetary boundaries

** Thrive means communities are resilient, healthy, regenerative, decarbonized and socially just*

Today's Agenda

- **About Climate Caucus and P4A** and how our work connects to this topic of **local climate resiliency**

CLIMATE CAUCUS
RESILIENCY SERIES

LOCAL RESILIENCY:
When and how to integrate private property buyouts for disaster risk reduction

NOV 27th, 11 am PT / 2 pm ET / 3 pm ADT

PARTNERS FOR ACTION

Sean Strang
Director of Flood Recovery and Mitigation
City of Merritt

- Audience **Q&A** period

About P4A:

Partners for Action is a research initiative that seeks to **empower Canadians** to become **flood resilient** by promoting **awareness and preparedness actions** that are **inclusive** and **evidence-based**.



An initiative of the Faculty of Environment

With founding support provided by:

Contact: p4a.info@uwaterloo.ca



UWATERLOO.CA/PARTNERS-FOR-ACTION/

Recent directions

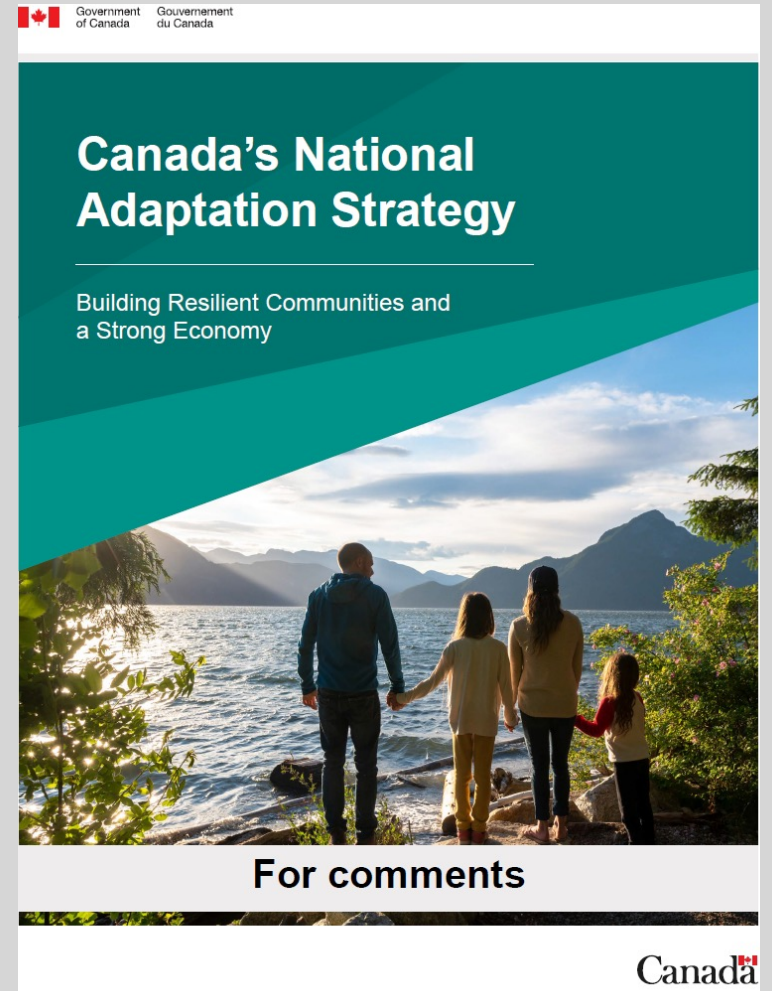
- To apply an **equity and justice lens** to climate action and adaptation work
 - all-of-society
 - multi-hazard
 - interdisciplinary research
 - applied / community-engaged



GOAL

*“Communities and all people living in Canada are better prepared to **prevent, mitigate, respond to, and recover** from the hazards, risks and consequences of **disasters linked to the changing climate**; the well-being and livelihoods of people living in Canada are better protected; and overall disaster risks have been reduced, particularly for vulnerable sectors, regions, and populations at greater risk.”*

CANADA’S FIRST NATIONAL ADAPTATION STRATEGY



Adaptation Strategies



Accommodate



Protect



Avoid



Retreat

Tasman District Council, 2021

- **Managed Retreat** – the purposeful, coordinated movement of people and assets (i.e., property, critical infrastructure) out of harm's way (Siders, 2019)

How do we engage in managed retreat?

Acquisition Tools

- Voluntary Buyouts
- Open Space Acquisitions
- Conservation Land Trusts
- Land Swaps
- Leasebacks



Key challenges with buyouts

- Absence of a federal buyout/relocation program
- No existing funding stream for buyouts (i.e., jurisdictional variance)
- Post-disaster: Highly reactive → ad-hoc programs
- Implications of voluntary buyouts leading to partial retreat
- Type of compensation (e.g., Pre-FMV, Post-FMV, capped) offered

Buying Out the Floodplain

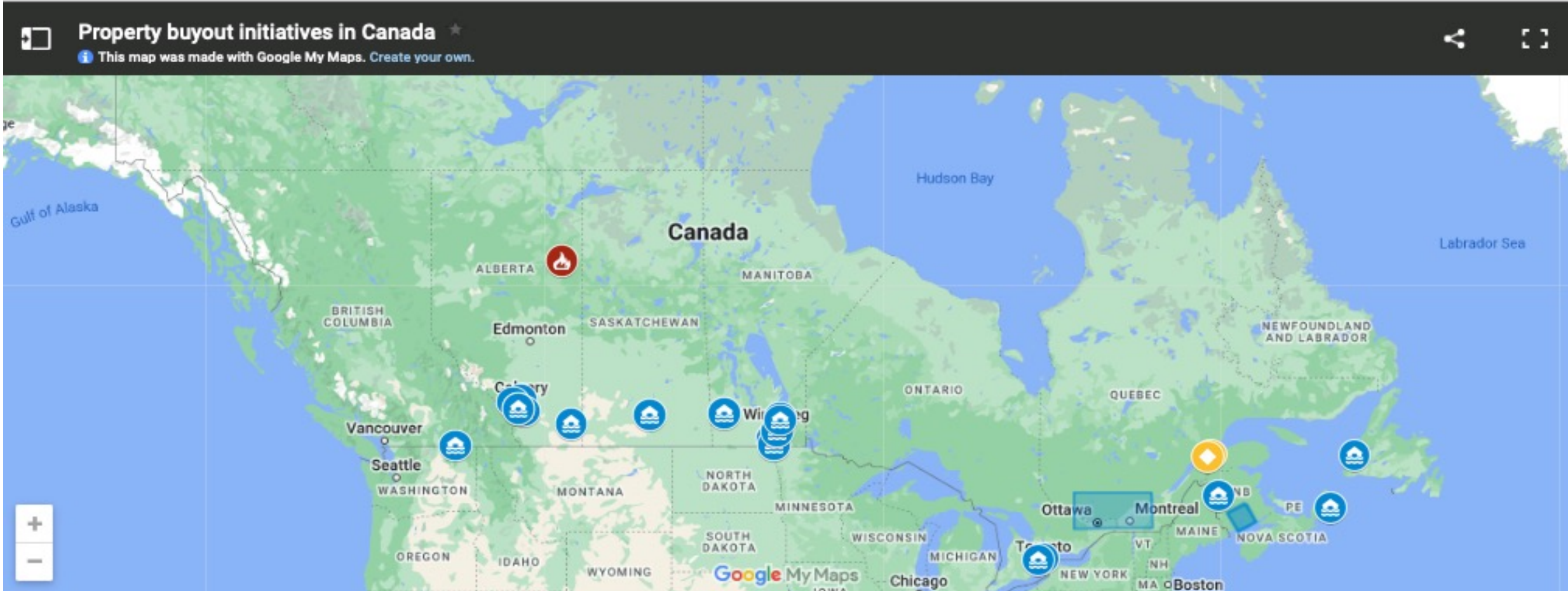
Recommendations for Strategic Relocation Programs in Canada

PARTNERS FOR ACTION

APRIL 2023



Where have property buyouts occurred in Canada?



- Grand Forks, BC
- Gatineau, QC
- High River, AB
- Toronto, ON
- Calgary, AB
- Saint John, NB
- Ritchot, MB
- Mississauga, ON
- Merritt, BC?



Introducing...




Merritt
FLOURISH UNDER THE SUN

Sean Strang
Director of Flood Recovery
and Mitigation



Q&A PERIOD



Local Resiliency: Integrating land buyouts into flood mitigation plans

Prepared by: Sean Strang
sean.strang@merritt.ca

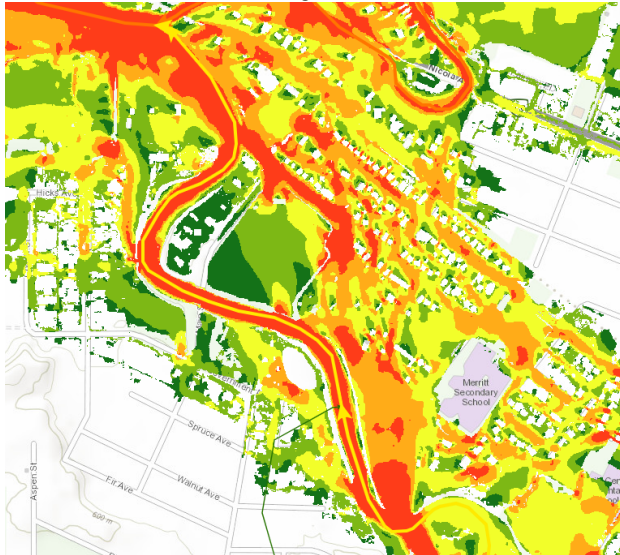
Why make a Flood Mitigation Plan?

- Flooding is Canada's most costly natural disaster
- Over \$1 billion per year in direct damages alone
- Decades of health damages (mold, land movement)
- Often non-insurable damages
- Risk is 'hidden'

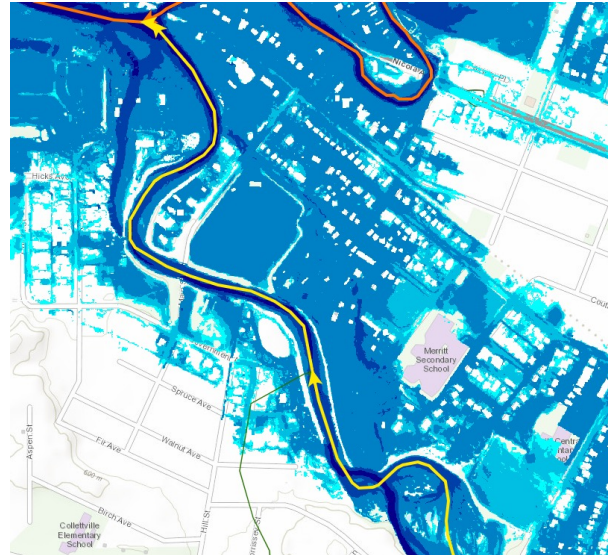
Precursors to a Flood Mitigation Plan

- Floodplain mapping, multiple levels of detail

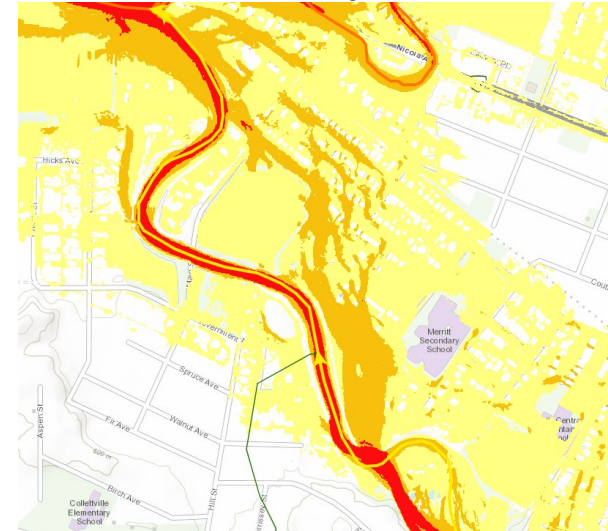
Flood velocity



x Flood Depth



= Flood Intensity



Types of Flood Mitigation

- Non-Structural

- Evacuating residents and removing structures entirely from specific floodplain (1 in 100, 1 in 200, etc)

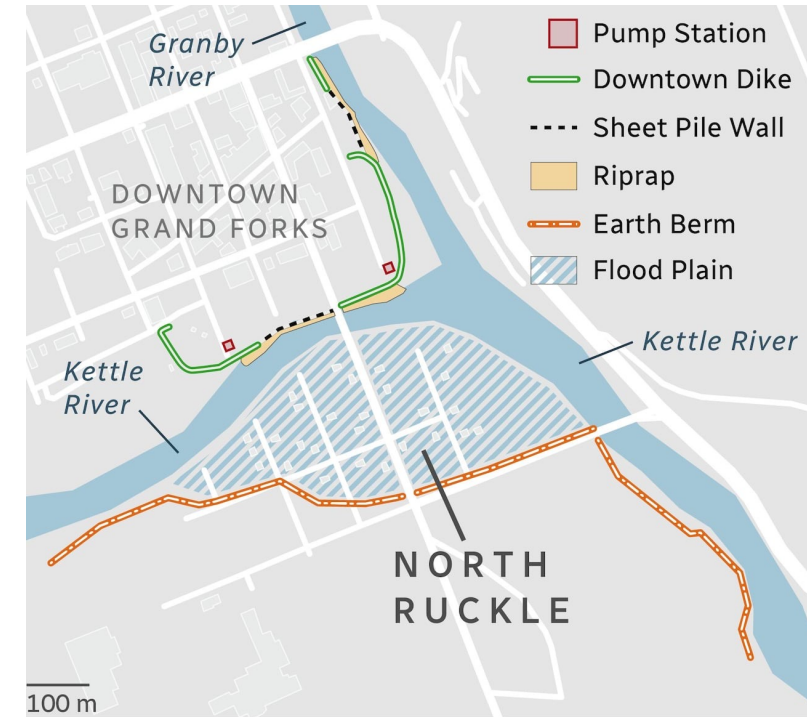
- Structural

- Grey infrastructure (dike, dams, concrete canals, pumping systems)
- Green infrastructure (water diversion and holding, wetlands restoration)

Types of Flood Mitigation

- Non Structural

- Typically this is called “Managed Retreat”
- Buying out an entire neighborhood
- Typically set by a 1-in-100 or 1-in-200 year event
- Financial benefits are due mainly to the buyout
- Often involves post-disaster flood damaged homes

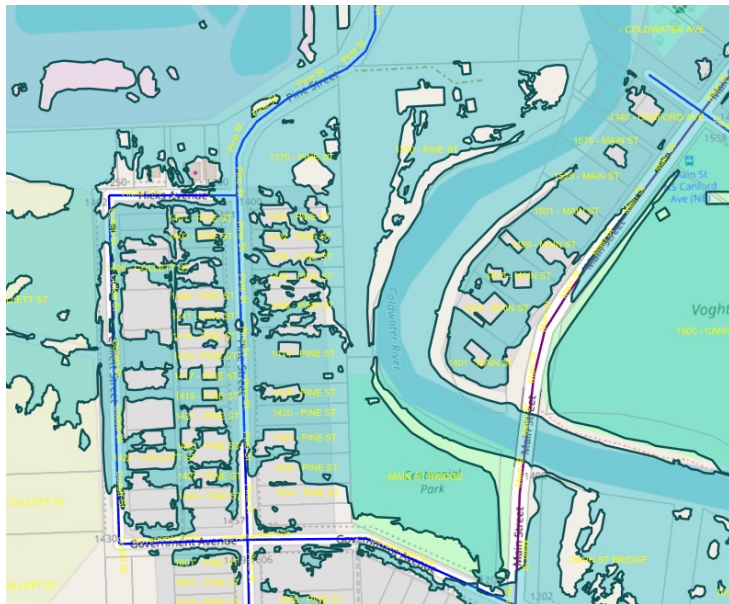


Source: Grand Forks Flood Mitigation Program • CBC News

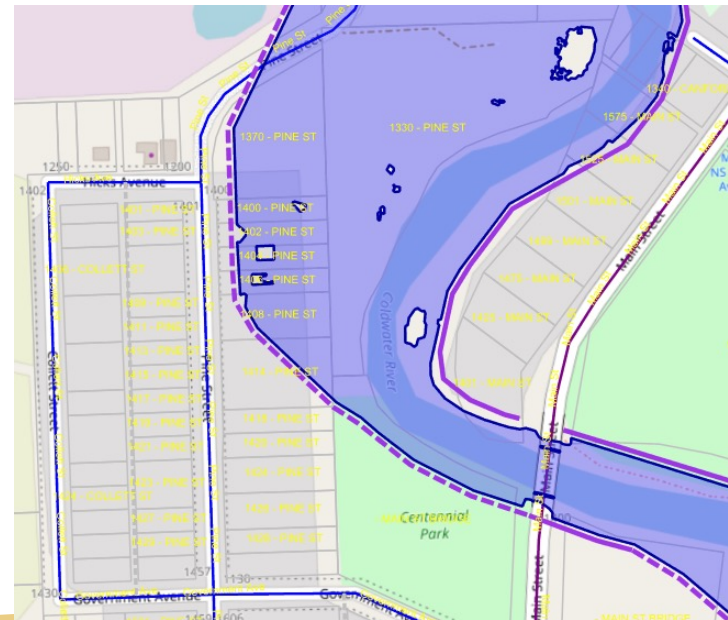
Types of Flood Mitigation

- Structural
 - Requires land to build... something

No Structural Mitigation



With Structural Mitigation



How to choose a plan?

- Land buyout is on a spectrum

No land required



Some land required



Full retreat



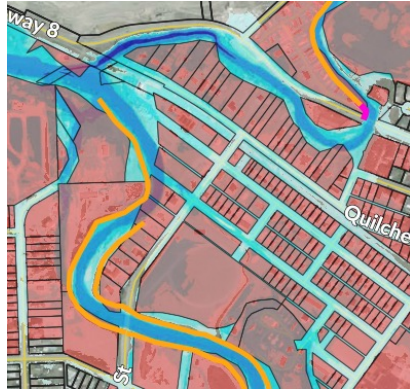
How to choose a plan?

- Do an options analysis

FLOOD MITIGATION PLAN
FLOOD MITIGATION CONCEPTS
OPTION 1: STATUS QUO



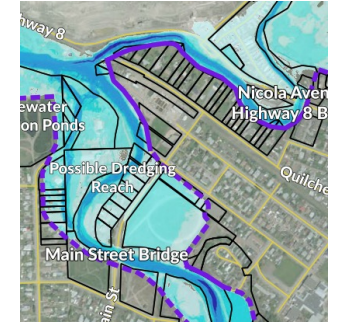
FLOOD MITIGATION PLAN
FLOOD MITIGATION CONCEPTS
OPTION 2: FULL FLOODPLAIN RETREAT



FLOOD MITIGATION PLAN
FLOOD MITIGATION CONCEPTS
OPTION 3: WATERSIDE DIKING



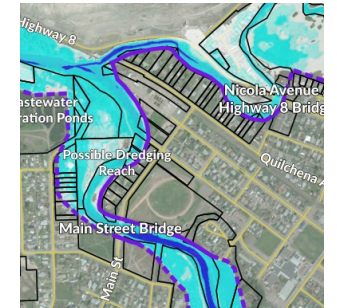
FLOOD MITIGATION PLAN
FLOOD MITIGATION CONCEPTS
OPTION 4a: COMBINATION DIKING



FLOOD MITIGATION PLAN
FLOOD MITIGATION CONCEPTS
OPTION 4b: COMBINATION DIKING



FLOOD MITIGATION PLAN
FLOOD MITIGATION CONCEPTS
OPTION 4c: COMBINATION DIKING



How to choose a plan?

- Evaluating options, one method is a Multi-Criteria Analysis
- MCA can be used per section or dike, or for the plan overall

Multi Criteria Analysis						
Flood Mitigation Option 5: Combined Diking						
Prepared by:	Chloe Sirges			Date:		August 9, 2022
Checked by:	Geoff Cahill			Date:		August 10, 2022
Theme	Criteria	Comments / Rationale		Criteria Weight	Criteria Rank	Weighted Score
		Coldwater River	Nicola River			
Technical	Hydraulic Conditions	Mostly wide and slow. Some higher velocity sections.	Narrow and high velocity through golf course.	0.0616	2	0.1233
	Flood Protection	Protects most properties (all that are within dikes) against design flood.		0.0651	3	0.1953
	Floodplain Restoration	Restores some key parts of the floodplain.	Restoration of some oxbows.	0.0443	2	0.0885
	Consideration of Other Plans	Can raise embankment dikes.	Dikes already high, hard to raise sheetpile.	0.0278	2	0.0556
	Innovation	Combination diking: innovative.	Road raising and sheetpile: innovative.	0.0061	3	0.0182
	Risk	Simple design, low risk	High risk around El Dorado/golf course	-0.0451	3	-0.1354
Construction	Constructability	Can apply continuous method for standard design.	Significant lengths of sheetpile and road raising.	0.0343	2	0.0687
	Critical Infrastructure	Relatively narrow footprint, fewer conflicts.	Narrowest footprint, fewest conflicts.	-0.0217	2	-0.0434
	3rd Party Conflicts	Relatively narrow footprint, fewer conflicts.	Narrowest footprint, fewest conflicts.	-0.0217	2	-0.0434
	Risk	Low risk due to simple design.	High risk: uncertainty with sheetpile/road raising.	-0.0223	3	-0.0669
Environmental	Regulatory	Isolating golf course oxbow may not be favourable.		0.0073	2	0.0146
	Cultural	Protects identified cultural properties.		0.0500	4	0.2000
	Benefits	Some habitat restored in floodplain.		0.0488	3	0.1463
	Concerns/Risks	In stream works introduce risk.	In stream works and isolating golf course oxbow.	-0.0439	2	-0.0878
Land Use	Property Impacts	Protects in-tact homes where possible.	Minimal impact.	-0.0104	2	-0.0209
	Future Development	Identified development properties protected.		0.0704	4	0.2817
	Public Space	Protects Voght park and golf course, has potential for linear ATC on at least 1 bank.		0.1122	4	0.4487
	Risk	Some acquisition risk; low.		-0.1070	1	-0.1070
Economic	Capital Cost	Option is reasonably priced.		-0.0794	2	-0.1588
	Operation & Maintenance	Some O&M required; less on setback dikes.		-0.0294	2	-0.0588
	Risk	Structural flood mitigation can be supported by grants.		-0.0912	2	-0.1824
Option 5 Score						0.736

How to choose a plan?

- Some general recommendations:
 - Economic:
 - Is ROI positive
 - Is funding available
 - Technical
 - What is the desired return period
 - What does the river 'want' to do
 - Environmental
 - Level of in-stream works required
 - Ending level of habitat value
 - Community
 - Will elected officials support the plan
 - Will the community support the plan
 - Equity
 - Are impacts focused on one group?
 - Are benefits focused on one group?
 - Reconciliation
 - What areas hold special meaning
 - How are our neighbors and partners being respected
 - How can they be included in the process
 - Constructability
 - Is fill material available
 - Are there prohibitive access issues

How to choose a plan?

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How to choose a plan?

- Two biggest stumbling blocks:

1. Financing

- What gets paid for gets built
- Grant programs for flood mitigation are complex, and infrequent
- Jurisdiction-specific

2. Land Buyouts

- Land buyouts are often not included in grant programs
- Valuation methods are wildly diverse
- Politically difficult at a local and senior government level
- Many lessons learned are applicable nation-wide

Financing

- Different jurisdictions have different grant programs
- Difficult to make universal recommendations across areas
- One primary tool should be an ROI-analysis, as this will aid picking between options

City of Merritt CBA and ROI of Flood Disaster Risk Management on the Coldwater River

Submitted to:

City of Merritt

Submitted by:

Nichols Applied Management Inc.

Management and Economic Consultants

Suite 302, 11523 – 100 Avenue NW

Edmonton, Alberta T5K 0J8

$$ROI = \frac{\text{Cost of damages during the asset life cycle}}{\text{Total eligible project cost}}$$

$$ROI = \frac{\$830,000,000}{\$116,500,000}$$

$$ROI = 7.1$$

The resulting ROI for the proposed flood mitigation project in Merritt suggests that the avoided damages during the asset life cycle will be roughly 7.1 times greater than the total eligible project cost.

Land Buyouts

- Land buyout is a spectrum
- Typical graphics involve either retreat or protection, but in reality most plans are a combination of both

Program Area 4:

Investing for Flood Resilience

Avoidance,
accommodation,
protection, and retreat



Flood Avoidance



Flood Accommodation



Flood Protection



Flood Retreat

Land Buyouts

- Non-Structural
 - Typically called “Managed Retreat”
 - The buyout IS the project
 - Typically advocated at a pre-flood (equity-based) valuation mechanism
- Structural
 - The buyout is BECAUSE OF the project (like an LRT)
 - Typically seen as a current-value (expropriation-based) pricing buyout

Land Buyouts

- Why does this matter?
- STRUCTURAL PROJECT (like an LRT)
 - Usually public infrastructure increases value of all homes
 - Current market value is high
 - Expropriation will allow the homeowner to live somewhere else
- POST FLOOD BUYOUTS
 - Property is at the lowest valuation level
 - Buyout is used to protect all the other homes behind
 - Expropriation pricing leads to 'eviction' from entire community

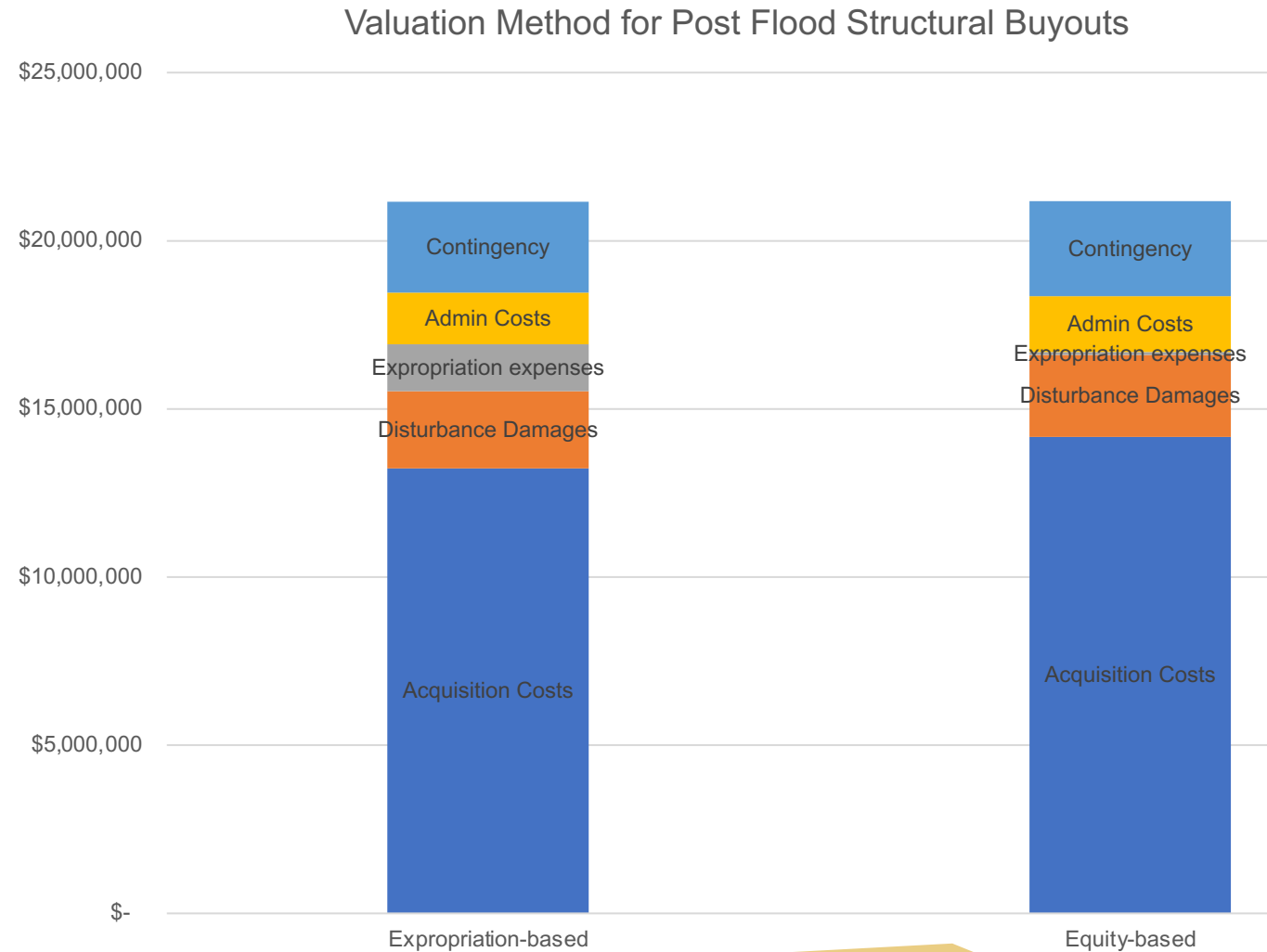
Land Buyouts



Land Buy Out Program Area	Buyout Method	Valuation Method	Notes
Grand Forks	Voluntary	Post-Flood appraisal	Significant social impacts of post-flood valuation
Ministry of Transportation	Expropriation	Land-agent negotiated	Negotiation worst-case scenario if equity desired
High River, AB	Voluntary	Pre-flood assessment	Assessment not a good metric for property value
Breezy Point, MB	Voluntary	Pre-flood appraisal	Voluntary area evacuation, not required for building infrastructure
Fort McMurray, AB	Expropriation	Land-agent negotiated	Mostly industrial and commercial, equal negotiation ability
Calgary, AB	Voluntary	Pre-flood assessment	Voluntary area evacuation, not required for building infrastructure

Land Buyouts

- Don't assume expropriation is cheaper!
- In some situations, expropriation is equivalent or **MORE** expensive to equity-based
- The difference is whether the money goes to expropriation lawyers, or land owners



Land Buyouts – Equity Considerations

- purchase price that enables the resident to obtain an equivalent home
- valuation that does not depend on the individuals ability to negotiate
- transparent process adopted by council, socialized to the community
- involvement of community housing program coordinator
- compensation for non-standard buyout housing types such as mobile homes
- integration with community post-flood emotional first aid organization
- 4 different 'file types' for varying situations: regular file, fast track, technical file, at risk file

Land Buyouts – Provincial/Federal Lands

- Assigning Provincial lands to a project can be difficult, especially in BC
- Ensure adequate communication with neighboring indigenous partners occurs early
- Sometimes a Statutory Right of Way is preferred

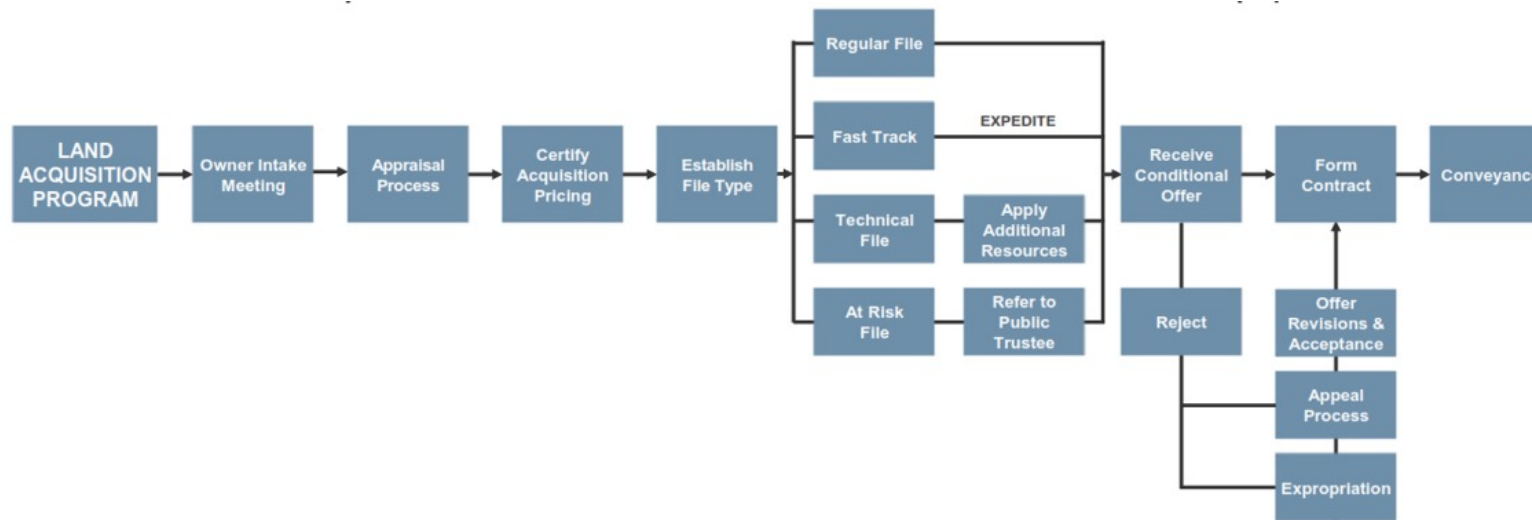


Land Buyouts – Risk Register

- Given the variability of land purchases, a Risk Register approach may be prudent
- A fulsome risk register should include at least:
 - Finance Risk
 - Legal Risk
 - Social Risk
 - Environmental Risk
 - Governance Risk
- This risk register can be used instead of a classic ‘contingency’ on the project

Land Buyouts – Schedule and Process

- Ensure the process is clear and transparent
- Whether expropriation is included as a final step may vary, but in an infrastructure project typically it needs 100% of the project area lands



Land Buyouts – Governance

- Land buyouts are contentious, they need to be sponsored and led by council, not staff
- Council should have direct input into the multi-criteria analysis or whichever tools is used
- Ensure community open houses are held and attended



Local Resiliency:

Integrating land buyouts into flood mitigation plans

Questions?

Prepared by: Sean Strang
sean.strang@merritt.ca