CITY OF SURREY
the future lives here.

CORPORATE REPORT

NO: R034 COUNCIL DATE: February 22, 2016

REGULAR COUNCIL

TO:	**Mayor & Council**	DATE:	**February 15, 2016**
FROM:	**General Manager, Engineering**	FILE:	**4815-708**
		XC:	**5225-23**

SUBJECT: **Development of a Surrey Coastal Flood Protection Strategy**

RECOMMENDATION

The Engineering Department recommends that Council:

1. Receive this report as information; and

2. Approve-in-principle the development of a Surrey Coastal Flood Protection Strategy as documented in this report, and direct staff to undertake a visioning process and consultation process and to report back to Council with a Coastal Flood Protection Strategy for future consideration that incorporates the results of these processes.

INTENT

The purpose of this report is to inform Council and obtain Council's approval for the development of a Coastal Flood Protection Strategy that addresses current flood hazards and incorporates long-term flood protection needs resulting from forecast climate change.

BACKGROUND

A regional Flood Strategy for the Fraser River floodplain is underway, facilitated by the Fraser Basin Council. Phase 1 of the regional study has begun to investigate the risk, vulnerabilities and consequences of a large flood event including effects of sea level rise. Phase 2 will entail the development of a regional strategy and potential funding.

While most of the past regional and provincial discussion has focused on the Fraser River, it is important that a Surrey managed strategy addressing Surrey's Boundary Bay Coastline commences to fully leverage the regional work and ensure the unique needs of Surrey are addressed. The City of Surrey is a coastal community with approximately one third of its landmass being in a floodplain. This includes the Crescent Beach and Mud Bay / Colebrook Coastal Floodplains, and the Nicomekl-Serpentine and Little Campbell River Floodplains as illustrated in the map attached as Appendix "I".

Several corporate reports were presented in the past that address topics that relate to the Coastal Flood Protection Strategy:

April 8, 2013: Corporate Report No. R054 – Responsibility for the Colebrook Dyking District & Mud Bay Dyking District

Since this time, significant operational and long-term issues facing the Colebrook Dyking District have come to light that the Coastal Strategy will incorporate. The report outlined:

- Dissolution of two Dyking Districts;
- Provincial reports regarding the estimated costs to address the impacts of sea level rise and other coastal hazards in Surrey ($1.6 billion); and
- Guidelines for Management of Coastal Flood Hazard Land Use (2011) setting out significantly higher elevations for coastal dykes.

November 25, 2013: Corporate Report No. R233 – City of Surrey Climate Action Strategy

The Climate Action strategy is composed of the Community Energy and Emissions Plan and a Climate Adaptation Strategy. The strategies and plans approved by Council are consistent with the BC Climate Action Charter and FCM Partners for Climate Protection. A few key goals of the strategy are:

- Minimizing risks and vulnerabilities from climate change impacts;
- Building adaptive capacity to respond effectively to climate change impacts over time; and
- Increasing awareness among the public and City staff to build understanding and capacity related to adaptation.

The report summarized the priority actions for immediate implementation of the Climate Adaptation Strategy. Some of the immediate actions are:

- CC-1.2: Integrate climate change education and awareness into existing programs and communications, and develop new education initiatives where gaps exist for Surrey residents and City staff.
- FL-1.1: Support the development of a Regional Flood Management Strategy in coordination with senior levels of governments, other municipalities and key stakeholders.
- FL-2.1: Conduct detailed analysis on Surrey-specific climate impacts, including the timelines and extent of sea level rise and its related effects on flood construction levels and floodplain designations.

September 24, 2014: Corporate Report No. R167 – Proposed Amendments to the Provincial Flood Hazard Area Land Use Management – Surrey Comments

Updates to the amendments have addressed several of Surrey's comments, and staff anticipate the Province to adopt the amendments in 2016. This report summarized:

- Recent publications pertaining to Flood Hazard Management in BC;
- Proposed Provincial Legislation changes which will affect land use and construction decisions in Surrey;
- Surrey perspectives on the key opportunities and concerns related to the proposed legislation; and
- Fraser Basin Council's Regional Flood Strategy Project.

October 20, 2015: Corporate Report No. R209 – Compact of Mayors

This report summarized:

- The larger global movement regarding climate commitments;

- The City's commitment to climate change action by signing onto the Compact of Mayors agreement; and
- A commitment to measuring impacts, setting targets, establishing a plan and annual reporting.

To assist priority actions set out in Surrey's Climate Action Strategy, several technical reports have been completed to understand the infrastructure vulnerabilities as a result of forecast Climate Change. This technical work, along with this strategy development, is included in the Engineering Department's 10 Year Servicing Plan.

On November 30, 2015, Council resolved (RES.R15) as follows:

> *That staff bring forward a Corporate Report outlining the steps and timeframe for the development of a Surrey Coastal Flood Protection Strategy and Consultation Process to Council for their consideration early in February 2016.*

DISCUSSION

Results from the Nicomekl, Serpentine and Little Campbell River Floodplain Review identify vulnerabilities and hazards within the current floodplain areas. As such, a comprehensive Coastal Flood Protection Strategy is required in an effort to increase community resilience, safety and health as a result of forecasted climate change impacts along Surrey's coastline.

The development of a Coastal Flood Protection Strategy will also advance the following items set out in Surrey's Climate Action Strategy:

1) The Engineering Department will be able to initiate the task "Develop drainage and flood control strategies based on cost-benefit analyses and site-specific needs" (Climate Adaptation Strategy Item FL-2.2).
2) The Planning & Development Department and Engineering Department will be able to "Review and revise regulatory bylaws and design standards to account for and minimize the impacts of climate change" (Climate Adaptation Strategy Item FL-2.5).
3) There will be support for the Fire Department to "Continue to build community capacity to respond effectively in an emergency" which was established as an action for immediate action (Climate Adaptation Strategy Item GS-4.1).

There are numerous potential flood protection scenarios that may play a role in achieving Surrey's vision to increase community resilience, safety and health. The high level types of flood protection that will be introduced, without limiting additional creative ideas, include:

- Retreat;
- Raising Dykes;
- Floodwalls;
- Barrier islands;
- Surge gates\breakwater;
- Greenshore approaches
- Secondary dykes;
- Re-naturalize\realignment; and
- Combination of alternatives.

The complexity and cost of coastal flood protection issues in Surrey are significant, and therefore extensive consultation and engagement with stakeholders is recommended in an effort to identify important issues and trade-offs with each flood protection scenario.

Through the visioning process, scenarios will be developed with stakeholders that work for the coastal floodplain area. Scenarios will likely combine and blend multiple types of flood protection.

Staff Steering Committee

A Staff Steering Committee is being established and will compose of senior staff from each of the Planning & Development Department, the Engineering Department, the Parks, Recreation & Culture Department, Surrey Fire Service and the Finance & Technology Department to oversee the development of the Coastal Flood Protection Strategy. The Staff Steering Committee will oversee and review the materials prepared to engage with stakeholders. They will review the flood protection strategies developed and advise on the need for additional technical data and modelling to develop a Coastal Flood Protection Strategy.

Community Consultation

An active process where all major stakeholder organizations and selected Committees of Council are represented and have an opportunity to participate in the visioning process is recommended. A series of Coastal Flood Protection Strategy Sub-Committees are envisaged as follows:

- Agriculture & Dyking;
- Environment & Recreation;
- Government;
- Resident & Business; and
- Utilities and Transportation.

The initial list of committee participants and tentative structure of sub-committees is listed in Appendix "II".

Staff will also consult the public through an open house format in addition to consulting directly with other stakeholders through defined sub-committees.

Funding the Coastal Flood Protection Strategy

As many of the coastal floodplain areas could benefit from extensive and costly engineering infrastructure that would only be possible through external cost sharing agreements, key potential funding partners will be involved from the beginning. In the Provincial Cost of Adaptation Report, the estimated cost of a combination of managed retreat and seismically stable structural flood defenses to achieve year 2100 design guidelines in Surrey is $1.6 billion (of a total Lower Mainland cost estimate of $9.5 billion).

The strategy will be cognisant that external funding commitments are beyond the control of Surrey, but could tie into the regional flood strategy looking at all the infrastructure and costs required for protection. A key item for the regional strategy is funding the significant flood control works necessary.

Timeline

It is expected that the education and outreach, consultation and visioning and strategy development will take a minimum of two years. Updates throughout the various phases of the Strategy Development will be forwarded to Council. The approximate timeline for key tasks are:

2016

- Establish advisory committee(s) to assist in the development of potential mitigation strategies;
- Initiate education and outreach to various stakeholders;
- Initiate development of preferred mitigation strategies;
- Initiate preferred mitigation strategies evaluation criteria;
- Update Council on consultation process by year's end; and
- Revisit Flood Protection Elevation Requirements for Hazard Area Development Permits (Crescent Beach and South Westminster).

2017

- Develop benefit/cost analysis for each draft mitigation strategy;
- Evaluate draft mitigation strategies;
- Identify potential funding partners;
- Link with Regional Flood strategy; and
- Update Council on consultation process by year's end.

2018

- Present preferred Coastal Strategy for Council's consideration; and
- Secure funding partners for Coastal Strategy.

Beyond 2018

- Implement aspects of the strategy and monitor; and
- Update the Coastal Strategy periodically as new climate change information becomes available.

Funding the Development of the Coastal Flood Protection Strategy

The estimated cost to support the development of the Coastal Flood Protection Strategy in 2016 is $250,000, $300,000 in 2017 and $50,000 in 2018. The funding to complete this work is included in the Engineering Department's 10-Year (2016-2015) 10-Year Servicing Plan.

SUSTAINABILITY CONSIDERATIONS

The proposed Strategy is an integral part of the Biodiversity Conservation Strategy and will assist in meeting the objectives of the City's Sustainability Charter; more particularly the following:

- EN 11: Initiate Actions in Support of the Climate Change Action Plan. This work supports delivery of several high priority actions listed in Surrey's Climate Change Action Plan, discussed in the preceding sections.

- EC 12: Enhance and Promote Surrey's Agriculture. To preserve the long-term viability of Surrey's agriculture land base requires a comprehensive understanding of what can be done to minimize adverse agricultural impact from Climate Change and sea level rise.
- EN8: Sustainable Engineering Standards & Practices. The Coastal Flood Protection Strategy will inform asset management and design standard changes to minimize the impact to the long-term operation of Surrey's Engineering infrastructure in the future.

CONCLUSION

Based on the above discussion, it is recommended that Council approve-in-principle the development of a Coastal Flood Protection Strategy as documented in this report, and direct staff to undertake a visioning process and consultation process and to report back to Council with a draft Coastal Flood Protection Strategy for future consideration that incorporates the results of these processes.

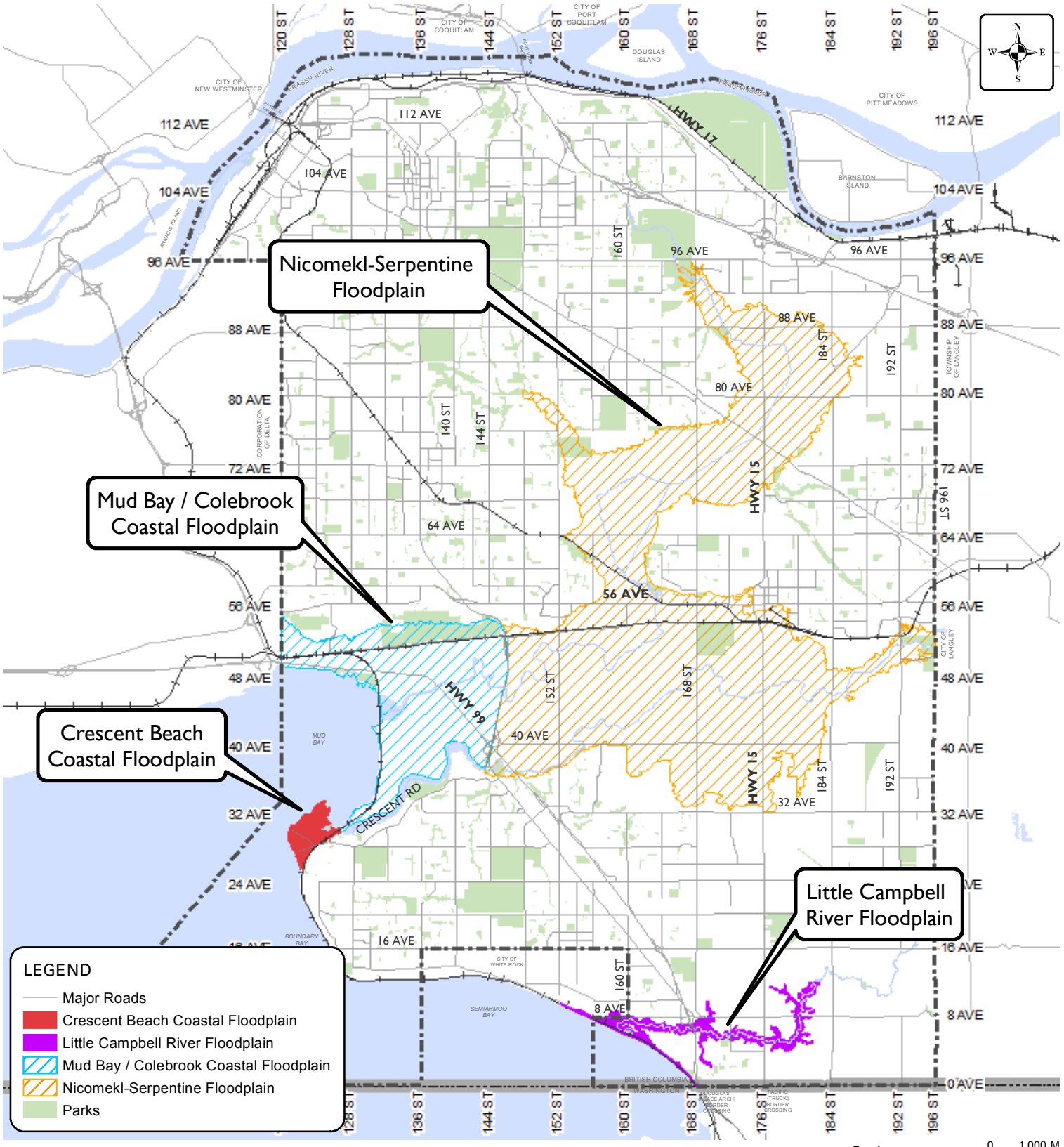
Fraser Smith, P.Eng., MBA
General Manager, Engineering

JA/clr

Appendix "I" – Crescent Beach and Mud Bay / Colebrook Coastal Floodplain and Nicomekl-Serpentine and Little Campbell River Floodplains Map
Appendix "II" - Structure of Proposed Steering Committee

g:\wp-docs\2016\admin\cr\01141431-ja (vl).docx
CLR 2/15/16 3:26 PM

APPENDIX "I"



Produced by GIS Section: 15-Feb-2016, EM9

Scale: 1:125,000 0 1,000 M

CITY OF SURREY
the future lives here.

Crescent Beach and Mud Bay / Colebrook Coastal Floodplains and Nicomekl-Serpentine and Little Campbell River Floodplains

ENGINEERING DEPARTMENT

Source: G:\MAPPING\GIS\Maps\CorporateReps\Utility\EM_Floodplains_MO_AP.mxd

APPENDIX "II"

Coastal Flood Protection Steering Committee

Government

Potential members may include:

- DFO
- Corp. of Delta
- City of White Rock
- City of Langley
- Twn. Of Langley
- MFLNRO

Utilities & Transportation

Potential members may include:

- TIC
- MOTI
- BC Hydro
- FortisBC
- Southern Railway of BC

Agricultural & Dyking

Potential members may include:

- AFSAC
- Mud Bay Dyking District
- Old Logging Ditch Improvement District
- Lowland Dyking Stakeholders Committee
- Ministry of Agriculture

Environment & Recreation

Potential members may include:

- ESAC
- MOE
- Fraser Basin Council
- Friends of Semiahmoo Bay
- Semiahmoo Fish & Game Club
- Ducks Unlimited

Resident & Business

Potential members may include:

- Community Associations
- SBOT
- Real Estate Foundation of BC
- DAC