

Infrastructure / Operations Resiliency Projects (in \$000s)

Identifier	Provincial Submission #	Department	Business Unit	Project Summary	Project Outcome (Benefits)	Capital Program #	Capital Budget (000's)	Operating Program #	Annual Operating Budget (000's)	Estimated Duration	Implementation Timing (Budget Cycle)
I-1		Community Services & Protective Services	CEMA	Pandemic Supply Top Up	Replace stock used during the floods, masks, gloves. Identify all hazard items that would also be beneficial during a pandemic and stock them as well.	935	100	<div> CITY OF CALGARY RECEIVED IN ENGINEERING TRADITIONS ROOM APR 01 2014 ITEM: <u>PFC2014-0282</u> CITY CLERK'S OFFICE </div>		Under 6 months	2014
I-2		Community Services & Protective Services	CFD	72 hour kits for fire stations	Station Resiliency	935	450			Under 6 months	2014
I-3		Community Services & Protective Services	CFD	Fire station in a box	Fire Station alerting systems, radios, and communications	935	140			Under 6 months	2014
I-4		Community Services & Protective Services	CFD	Temporary Fire Station	Sprung Structure as temporary fire station			001	120	Under 6 months	2014
I-5		Community Services & Protective Services	CFD	Critical Equipment and PPE	Critical Equipment and PPE to supply staff for 72 hours.	935	150	001	5	Under 6 months	2014
I-6		Community Services & Protective Services	CFD	Towing and Recovery Vehicle	Enable the recovery of CFD fleet assets during extreme weather events	935	550	001	10	Under 6 months	2014
I-7		Community Services &	CFD	72 Hr kits for staff	Preparedness for staff	935	300			Under 6 months	2014

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		Protective Services									
I-8	P8 P9 P10	Community Services & Protective Services	Parks	Bowness Park Lagoon Inlet Structure Protection - The 2013 flood caused significant damage to the lagoon inlet structure. During the course of completing the repairs to the structure gabion mattresses were installed to provide additional protection to the inlet.	The gabion mattresses should protect the inlet structure from future damage due to flood or high water, reducing or eliminating future costs related to flood repairs.	932	90			Under 6 months	2014
I-9	P8 P9 P10	Community Services & Protective Services	Parks	Bowness Park - Washrooms and Facilities • 2 Seasonal and 1 Year-round washrooms – mechanical put	Relocation of electrical or mechanical components above or out of areas susceptible to flood damage will protect them from damage due to future flood events. Resilient	932	500			Under 6 months	2014

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				on roof of all washrooms, originally on ground level. Went from tile to acrylic flooring on all washrooms	flooring will be resistant to future flood damage.						
I-10	P8 P9 P10	Community Services & Protective Services	Parks	Prince's Island - During the 2013 flood the causeway was completely destroyed. The causeway was also completely destroyed after the 2005 event. In order to increase the resilience of the causeway additional concrete and rip rap was incorporated into the structure. Final landscaping will be completed in the	After the 2005 event the shallow and deep utilities that run through the causeway were relocated below the anticipated depth of future erosion due to flooding. This resilience measure proved to be successful. The current resilience measures are designed to provide protection from further flood damage and will reduce The City's exposure to future flood related repair costs and if faced with a similar event, will maintain a critical connection to the Island for emergency responders.	932	100			Under 6 months	2014

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				spring of 2014.							
I-11	P8 P9 P10	Community Services & Protective Services	Parks	Beaver Dam Flats - During the June 2013 flood event, high water levels within Beaverdam Flats eroded and washed out a significant portion of the regional pathway and causeway.	The intent of the restoration work is to not only re-establish the functionality of the pathway and causeway, but to add resiliency to the structures for future high water events. If effective future flood related will be reduced or eliminated.	932	70			Under 6 months	2014
I-12	P8 P9 P10	Community Services & Protective Services	Parks	Griffith Woods Park Washrooms - Raised mechanical above flood line and flooring upgraded from tile to acrylic. Mechanical upgrades \$15,000.00 Flooring upgrades \$7,000.00	Relocation of electrical or mechanical components above or out of areas susceptible to flood damage will protect them from damage due to future flood events. Further flooring resilient to flood waters was installed.	932	20			Under 6 months	2014

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I-13	P8 P9 P10	Community Services & Protective Services	Parks	Carburn Park - Depot - Mechanical raised above flood line and eliminated downdraft furnaces. All moved above ground with ducting through roof. Further resilient flooring was installed. Mechanical costs \$125,000.00 Upgraded flooring \$9,000.00	Relocation of electrical or mechanical components above or out of areas susceptible to flood damage will protect them from damage due to future flood events. Resilient flooring will be resistant to future flood damage.	932	135			Under 6 months	2014
I-14	P8 P9 P10	Community Services & Protective Services	Parks	Sue Higgins Bridge Transitions - High water during the 2013 flood scoured out the pathway to bridge transitions from the Sue Higgins	Given this pedestrian overpass is an important link in the transportation network and heavily used for recreational purposes, resilience measures incorporated in the current design will minimize negative impacts by future flood events and allow for	932	300			6 - 12 months	2014

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				Pedestrian Overpass to the community of Douglasdale on one side and Fish Creek Park on the other. The current design for the project includes a steel I-beam structure attached to the bridge abutment and anchored by concrete footings installed in the respective parks on both sides of the bridge. Further fortified riverbank armouring and erosion protection will be provided.	uninterrupted use during a similar event.						
I-15	P14	Community Services & Protective Services	Recreation	Shouldice Aquatic Centre – Flood Control Planning and	Comprehensive investigation / determine options to improve flood protection and control	933	500			Under 6 months	2014

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				Implementation	(such as berms, floodway channels and protective barriers)						
I-18		Corporate Administration	City Clerks	Alternate Council / Committee facility	Fully operational audio/visual and technology to support an alternate Council Chamber	958	250			Under 6 months	2015
I-19		Corporate Administration	Corporate Security	SOCC - Generator	To ensure redundant power and network for SOCC located at Manchester	955	100	810	10	Under 6 months	2014
I-20		Corporate Administration	Corporate Security	Alarm Receiver Redundancy	1. To implement a redundant intrusion alarm receiver due to failure (caused by power and network outages) 2. To ensure load balancing across two pairs of alarm receivers	955	80			Under 6 months	2014
I-21		Corporate Administration	Corporate Security	Lenel Redundancy	1. To implement virtualised redundancy for Lenel (Intrusion and Access Control) software due to failure (caused by power and network outages) 2. To ensure load balancing across two pairs of virtualised servers	955	60			Under 6 months	2014

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I-22		Corporate Administration	Corporate Security	Mobile Command Vehicle	1. To establish primary communications (tethered wired and wireless) to allow MCV to connect remotely to security system head-ends and information management systems; 2. To establish a secure wireless access point from the MCV; 3. To establish secondary communications through a satellite modem; 4. To establish back-up voice communications; 5. To establish dedicated IT infrastructure to operate enterprise physical and information security systems remotely	955	120	810	12	Under 6 months	2014
I-23		Corporate Administration	Corporate Security	Technical Operations Centre (TOC) - Generator	To ensure redundant power and network for TOC located at Manchester	955	50	810	5	Under 6 months	2014
I-24		Corporate Administration	Corporate Security	Omnipresence (Physical Security Information Management	1. To implement virtualised redundancy for omnipresence (PSIM) hardware and software due	955	150			Under 6 months	2014

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				System) Redundancy	to failure (caused by power and network outages) 2. To ensure load balancing across two pairs of virtualised servers						
I-25		Corporate Administration	Corporate Security	CCTV Integration with CEMA Common Operating Picture (COP)	To integrate all Corporate Security CCTV cameras into the COP	955	50			Under 6 months	2014
I-26		Corporate Services	Corporate Properties & Buildings	Reduce the rate of ground water flow into the building by sealing cracks in the building envelope, tunnels, sewers, and other areas of water ingress.	Outcome is to slow the rate of water entry into the buildings and limit the points of ingress.	937	175	694	85	Under 6 months	2014
I-27		Corporate Services	Corporate Properties & Buildings	Channel any water entering the building away from critical building systems and into surge tanks (tunnel) or other holding basins.	Equipment and structure damage will be reduced by diverting water into safe containment areas.	937	550	694	10	Under 6 months	2014

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I-28		Corporate Services	Corporate Properties & Buildings	Remove the water in the holding basins at a rate that matches or exceeds the flow rate of water entering the building and accumulating in the holding basins.	Water must be removed from holding basins to ensure capacity remains for additional water containment.	937	350	694	50	Under 6 months	2014
I-29		Corporate Services	Corporate Properties & Buildings	Relocate electrical switch that distributes emergency generator to a physical point above any high water mark.	This action will eliminate the need to declare a building uninhabitable. It will not restore the facility to 'fit for purpose', however it will speed any repair process and reduce risks to any persons in the building.	937	600	694	18	Under 6 months	2014
I-30		Corporate Services	Corporate Properties & Buildings	Establish two administrative workplace hubs in both north and south sectors of Calgary.	Enable continuity of City service delivery to citizens and employee productivity.	937	900	694	10	Under 6 months	2014

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I-31		Corporate Services	Corporate Properties & Buildings	Update CPB CAD drawings to digitize, maintain and store so that they are available to stakeholders.	This action will enable timely and accurate access to building drawings. It will speed recovery and repair efforts and enable operator knowledge and access of building systems and location information.	937	700	694	10	Under 6 months	2014
I-32		Corporate Services	Corporate Properties & Buildings	Develop a CPB Emergency and Continuity Management Plan	Development and maintenance of this E&CM Plan will ensure that critical services within CPB are maintained before, during, and after a crisis, major emergency, or disaster.	937	10	694	150	Under 6 months	2014
I-33		Corporate Services	Corporate Properties & Buildings	Create an Emergency Service Counter plan and response	This initiative will ensure critical citizen-facing corporate services are available outside of the downtown core after an interruption of normal service within the downtown core or affecting access to the downtown core. Readiness to deploy by end of May 2014.	937	600	694	10	Under 6 months	2014
I-34		Corporate Services	Corporate Properties &	Disaster response	Specific to the protection of CPB structures and the	937	45	694	12	Under 6 months	2014

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			Buildings	resources, supplies, technology, exercises, and training.	required training needed to deploy and maintain services.						
I-35		Corporate Services	Corporate Properties & Buildings	Upgrade sump pumps and ensure a back up generator and transfer switch is available for the Alberta Trade Centre (ATC) building.	Will enhance the sump pump capability and capacity to maintain business continuity and life safety building systems.	937	200	694	40	Under 6 months	2014
I-36		Corporate Services	Corporate Properties & Buildings	Continued development of the Facility Management Network Operations Centre (FMNOC)	CPB Tactical Operations Centres, combined with an incident management structure will ensure proper information flow and prioritization of objectives.	937	50	694	10	Under 6 months	2014
I-38		Corporate Services	Office of Land Servicing & Housing	Emergency Management/ Response Plan	Complete a EMP in preparation of future events	943	20			Under 6 months	2014
I-39		Transportation	Calgary Transit	LRT tugger hi-rail truck	Allows trains to be pulled through unpowered sections	947	850	110	10	Under 6 months	2014

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I-40		Transportation	Calgary Transit	Access Calgary IVR network switch/backup	Provides customers (people with disabilities) ability to check trip status and provides AC system required to send out automated messages to customers	947	250	110	50	Under 6 months	2014
I-41		Transportation	Calgary Transit	Access Calgary Phone backup system	Provides customers ability to book trips, provides communication with AC service providers and external parties during major outages	947	300	110	30	Under 6 months	2014
I-42		Transportation	Calgary Transit	Internet mobile backup connection	Ability to provide continuity computer system use when regular hard wired internet connection fails	947	25	110	20	Under 6 months	2014
I-43		Transportation	Roads	Signal Cabinet Retrofit	Ability to quickly restore power via alternate sources (generator) without further damage to controller units; plug and play ability	948	300			Under 6 months	2014
I-44	P-33	Transportation	Roads	Provide Alberta Environment and Sustainable Resource Development alternate, safe	Alberta Environment can safely access and adjust flow into WID	948	350			Under 6 months	2014

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				access to WID headgates and sluice gates in case of flooding							
I-45		Transportation	Roads	Centre St Bridge - lower deck hanger modifications. Provide a detail that is more resistant to streamflow and debris impact	Lessen or eliminate the damage to hangers from impact	948	500			Under 6 months	2014
I-46		Transportation	Roads	Inglewood Bird Sanctuary Bridge C - construction of a deep (piled) foundation	Bridge has been dislodged twice (2005 & 2013) due to foundation failure. A piled foundation would provide greater resistance to streamflow and debris pressures.	948	500			Under 6 months	2014
I-47		Utilities & Environmental Protection	Environmental and Safety Management	Emergency equipment for staff	Better prepared staff to continue their work and respond in emergency situations	950	25			Under 6 months	2014
I-48		Calgary Police Service	Calgary Police Service	Radio System - Add to Pool of portable radios	Increase number of standby radios to allow for increased deployment during major events	953	975			Under 6 months	2014

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I-49		Calgary Police Service	Calgary Police Service	Livelihood Database replication	Protect our records management system against data centre failure	953	50	070	15	Under 6 months	2014
I-50		Calgary Police Service	Calgary Police Service	Mainframe Storage Upgrade	Upgrade backup storage system for PIMS	953	100	070	10	Under 6 months	2014
I-51		Calgary Police Service	Calgary Police Service	Satellite Radio	Purchase 250 Satellite Radio units to deploy in the event of loss of the radio system or deployment of CPS staff to location not covered by radio system	953	500	070	300	Under 6 months	2014
I-52		Chief Financial Officer	Finance & Supply	Supply warehouse preparation (yard prep, equipment, PPE, space and electronics preparation)	F&S has redundancy in place should a flood event occur			481	300	Under 6 months	2014
Total							\$ 13,190		\$ 1,302		
Total Infrastructure/Operations Resiliency Projects Submitted to Provincial Mitigation and Resiliency Funding Program (Potentially Recoverable)							\$ 2,065				

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