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# THE RED RIVER FLOODWAY EXPANSION PROJECT

## 4<sup>th</sup> International Symposium on Flood Defence

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## OUTLINE

History

- Floods
- Flood Protection in Winnipeg
- Floodway Expansion
- Environmental Assessment Process
- Innovation
- Construction Status and Future

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In last 200 years: #1: 1826 – 6 370 m<sup>3</sup>/s #2: 1852 – 4 670 m<sup>3</sup>/s #3: 1997 – 4 615 m<sup>3</sup>/s #4: 1861 – 3 480 m<sup>3</sup>/s #5: 1950 – 3 060 m<sup>3</sup>/s

History

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## **Original Red River Floodway**

**Diverts flood water around Winnipeg** 

- Opened in 1968
- To date, used more than twenty times
- Avoided flood damages in excess of \$8 Billion





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## **Floodway Channel**

- Length: 48 kilometres
- Top width: 200 300 metres
- Base width: 110 160 metres
- •Design depth: ~ 8 m

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Floodway Authority Outlet Structure

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## 1997 Flood in Winnipeg

- Largest flood in 20<sup>th</sup> century
- 5 km of primary dyke raised
- > 800 homes required 8 million sandbags



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## 1997 Flood in Winnipeg

Flood protection works taxed to the limit
Floodway design flow exceeded
"Wake-up call"



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## Post 1997 Studies

 International Red River Task Force (of the IJC) in 2000 recommended consideration of Floodway Expansion

 In 2001, Province commissioned a detailed study of flood protection for Winnipeg



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## **Post Flood Studies**

Outcome of studies was the Province's selection of the Floodway Expansion:

Protection against 1 in 700 year flood, 7 500 m³/s
Reduce Winnipeg's Flood risk by 80 %
Net benefits = \$900 million
No increase in artificial flooding upstream

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## 1:700 FLOODED AREA

Without an expanded floodway 450,000 residents would be flooded in a 1 in 700 year flood event





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## FLOODWAY EXPANSION DESIGN

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## **Design Milestones**

Pre-design data collection started Spring 2003

Pre-design started December 2003

Pre-design completed July 2004

Detailed design started Fall 2004

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Floodway Channel Expansion: Widening channel to handle larger floods than 1997 Flood.

> Inlet Control Structure: Improvements, Enhanced

Safety Features.

## Main Components of Expansion

Outlet Structure: Expansion and design improvements, erosion control

Channel Crossings: Drainage Systems, Bridges, Utilities.



West Dyke: Extension and Enhancement of Existing West Dyke System

### 5 Main Components of Floodway Expansion Proposal

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## **Channel Enlargement**

Increase flow capacity from 1,700 to 4,000 cms

- Widening No deepening
- 21,000,000 m<sup>3</sup> of excavation
- No land beyond property limits was required





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## **Environmental Review Process**

 Joint cooperative environmental review by Canada and Manitoba was agreed

Commenced in 2003

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**Environmental Review Process** 

Public Consultation MFA has listened to Manitobans 4 Rounds of consultation More than 300 hours of stakeholder meetings 20 community meetings Distribution of 100,000 newsletters • Over 100,000 hits to MFA website

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## **Public has Affected the Project**

Many notable changes in design and in the environmental assessment process.



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**Milestones in Review Process**  Commenced early work Feb 2003 Submitted EIS in August 2004 Submitted EIS Supplementary Filing in November 2004 Submitted response to Information Requests in December 2004 Manitoba Clean Environment Commission hearings mid-February to mid-March 2005 Submitted additional information to Federal agencies in **April 2005** July 8, 2005, MFA received Federal sign-off Provincial license

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## Innovations

Optimization of channel widening
Widening only – minimizes impact on groundwater
Aboriginal "set aside" work for West Dyke
Elimination of some bridge work to maintain budget, with replacement by channel excavation

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## **CONSTRUCTION PROGRESS**

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## **Construction Progress**

# Construction was officially initiated on September 23, 2005



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## **Channel Enlargement**

<u>Currently 31 of 48</u> <u>km Floodway channel</u> <u>are complete</u>





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## Improvements to the Inlet Structure



 <u>About 1/3 complete</u> <u>to date</u>

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## **Enlarged Outlet Structure**



- Widen structure and channel
- Energy dissipation measures
- Erosion protection

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## **Enlarged Outlet Structure**

## Construction started August 2007

- 25 % complete to date



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## **Upgrade of Highway Bridges**

PTH # 59 South



•<u>99 %</u> <u>complete</u>

Trans Canada Hwy # 1



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## **Upgrade of Railway Bridges**



 Modifying three existing railway bridges and replacing one railway bridge

• <u>50 %</u> <u>complete</u>

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## Relocation of the City of Winnipeg Aqueducts - <u>Complete</u>





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## Expansion of the West Dyke

## Raising and extending 45 km





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## **Projected Completions:**

 Scheduled completion of channel, hydraulic structures by March 2009

 Scheduled completion of bridges and West Dyke in Oct 2009

Restoration by Sept 30, 2010



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## **Construction Progress**

43 Contracts awarded to date worth \$ 450 million

~20 Contracts valued at ~ \$ 100 million yet to be tendered



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