

# Hot In-Place Recycling Asphalt Pilot Project

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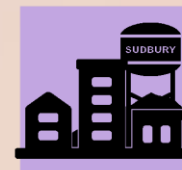
Growth and Infrastructure Department

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Wood Environment and Infrastructure

July 7, 2020

2019-2027 Strategic Plan Priorities



# Hot In-Place Recycling Asphalt Pilot Project

## Consultant Team

- Dan M. Cacciotti, P.Eng. – Project Manager - Wood
- Hoda Seddik, M.Sc., P.Eng. - Principal Pavement Engineer – Wood
- Param Dhillon, B.SC., P.Eng. – Asphalt Specialist – PNJ Engineering
- David M Brown, - Associate Project Manager - Wood



# Hot In-Place Recycling Asphalt Pilot Project

## Agenda

- Overview of History of Hot In-Place Recycling (HIR)
- Road requirements for HIR success
- Pilot Project Overview
- Summary

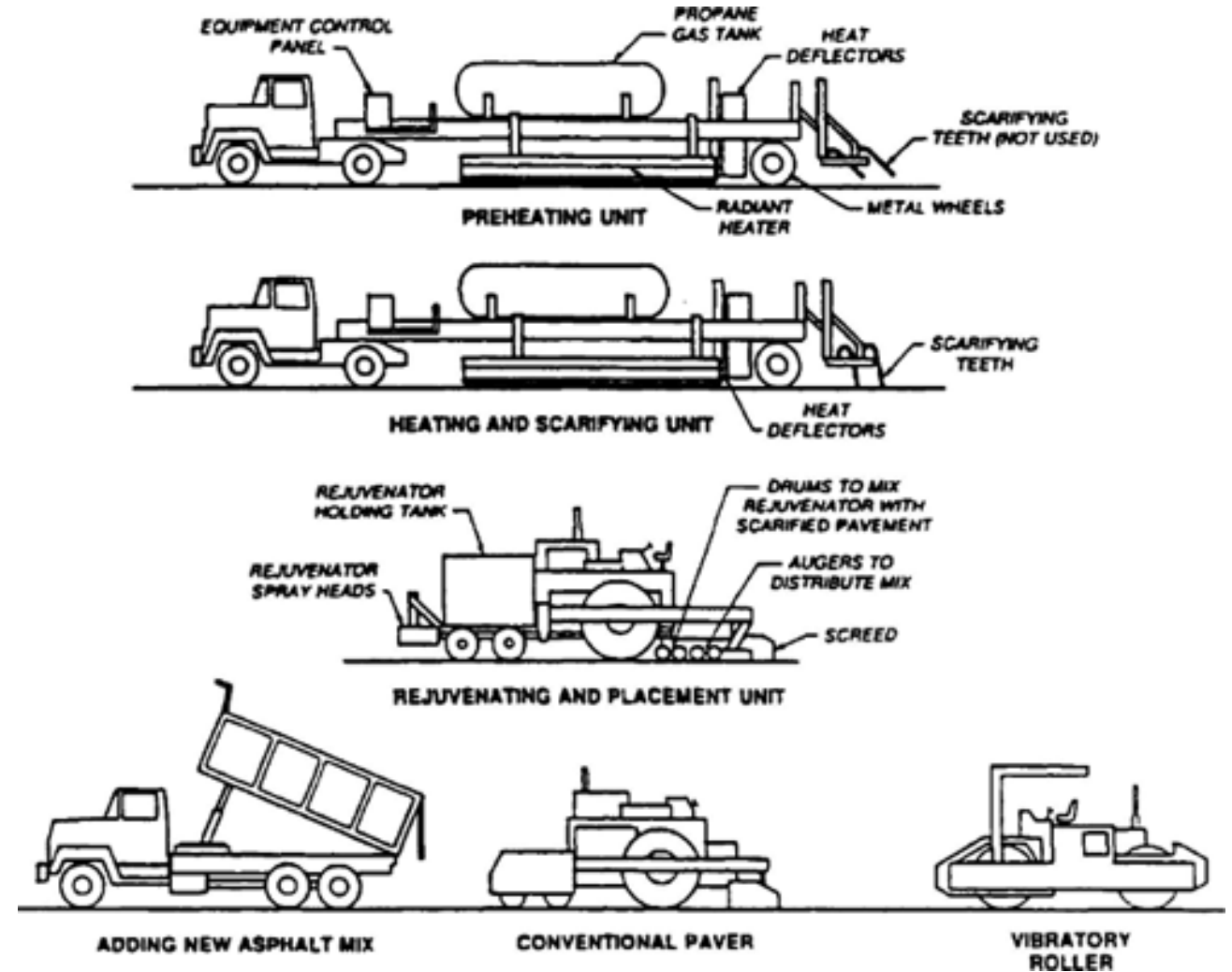


# Hot In-Place Recycling Asphalt Pilot Project





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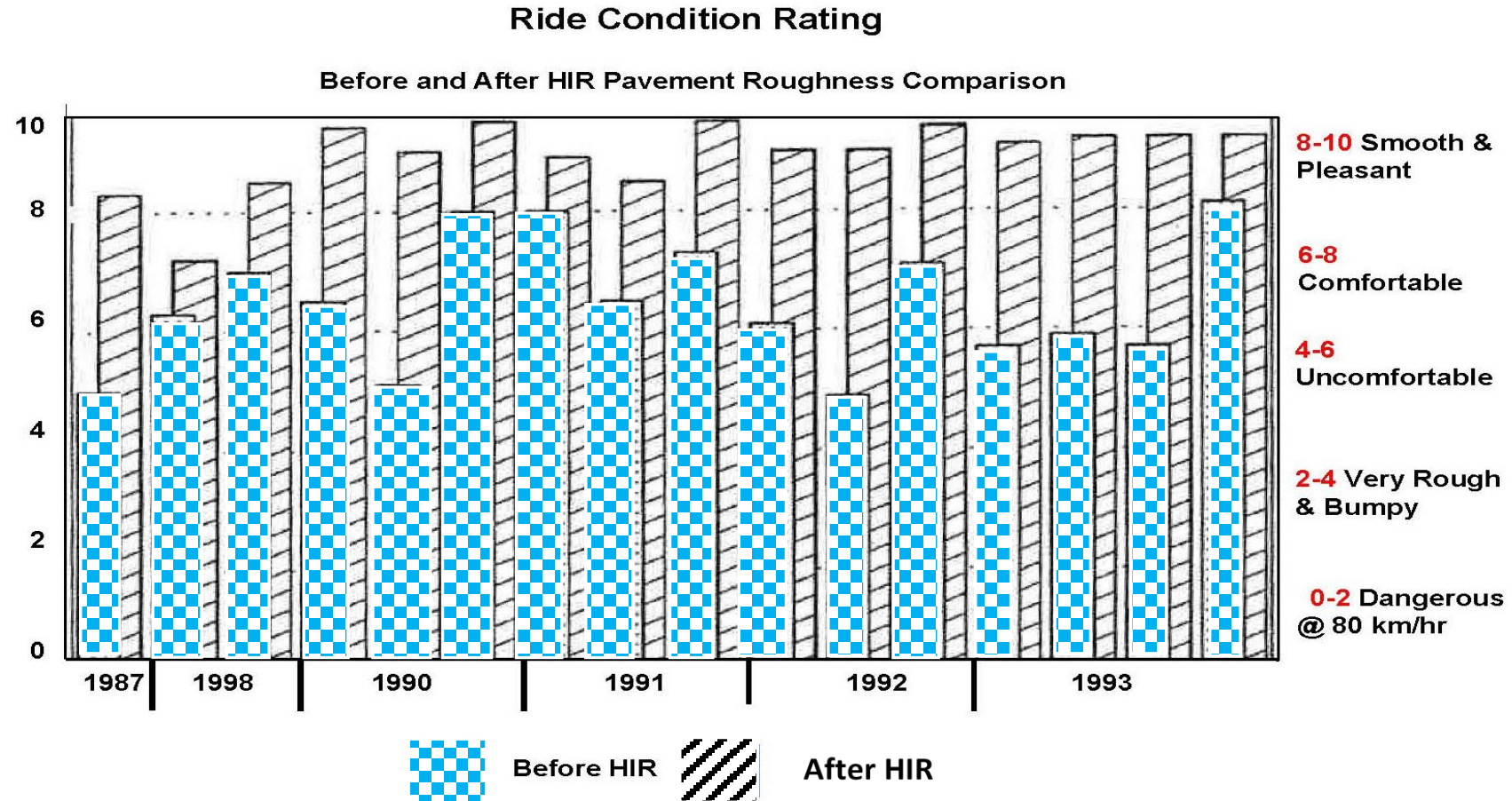
# Hot In-Place Recycling Asphalt Pilot Project

## MTO HIR Projects (1987 to 1993)

Project No.	Highway	Contract	Location	Length km	Pavement Design	Mix Design
1	24/2	87-26	Brantford	2	40 HL, 15 mm RHM over & 40 HIR/25 mm HL I over 40HIR	Rejuvenator <sup>(1)</sup>
2	21	01-89.05	Thamesville	4	25 mm HL4 over 35 HIR	Rejuvenator
3	140	04-89-17	Welland	5	25 mm HL3 over 40 HIR, and 40 HIR	Rejuvenator, Fine Aggregate
4	54	04-90-15	Brantford	8	40 mm HL3 over 30 HIR	Rejuvenator, Fine Aggregate
5	58A	04-90-14	Welland	5	40 HIR	Rejuvenator, Beneficiating Hot Mix
6	26	05-90-33	Collingwood	6	25 mm HL3 over 35 HIR	Rejuvenator, Fine Aggregate
7	17	91-350	Mattawa	9	25 mm HL3 over 50 mm HIR	Rejuvenator, Fine Aggregate
8	34	09-91-32	Lancaster	10	25 mm HL4 over 40 H1R	Rejuvenator, Fine Aggregate
9	21	03-91-06	Goderich	4	25 mm HL4 over 35 mm HIR	Rejuvenator, Fine Aggregate
10	11	91-92	Gravenhurst	6	25 mm HL3 over 40 mm HIR	Rejuvenator, Fine Aggregate
11	86	3-92-24	Waterloo	4	25 mm HL1 over 35 mm HIR	Rejuvenator, Fine Aggregate
12	26	5-92-48	Stayner	16	25 mm HL4 over 35 mm HIR	Rejuvenator, Fine Aggregate
12	11 & 17	03-219 Section I	Manitoba Border	49	25 mm HL4 over 40 mm HIR	Rejuvenator, Fine Aggregate
		Section II	Thunder Bay			
		Section III	Nipigon		Cold Mill 20 mm, 25 mm HL4 over 40 mm HIR	Rejuvenator, Fine Aggregate Rejuvenator
14	7	40-93-08	Sharbot Lake	27	25 mm HL1 over 40 mm HIR	Rejuvenator, Fine Aggregate
15	6	5-93-47	Mount Forest	12	25 mm HL4 over 35 mm HIR	Rejuvenator



# Hot In-Place Recycling Asphalt Pilot Project



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## Other MTO and Municipal HIR Projects

- Hamilton: 1997-2001, 485,000 sq. m, subdivision roads
- Toronto: 2000, Progress Avenue
- Richmond Hill: 2002, 0 O'Connor Crescent, Don Head Village and Marsh Street
- Kenora: 2018, Highway 17 and 17A (MTO), 35 km
- Huron County: 2020 County Road 17 (tendered), 16.5 km
- Raith (North of Thunder Bay): 2020, Highway 17 (MTO), 18.8km





# Hot In-Place Recycling Asphalt Pilot Project

## HIR Viability

1. Existing pavement structure needs to be structurally sound and free of major defects.
2. Existing asphalt cement needs to be conducive to the HIR process.
3. Project size needs to be sufficient to be cost effective.



# Hot In-Place Recycling Asphalt Pilot Project

## Scope of Work

1. Desktop review: roads identified for upcoming treatment, pavement condition data, geotechnical information, MTO & other municipality's documents.
2. Prepare preferred road list for HIR based on desk top review.
3. Field review of preferred road list.
4. Final selection for HIR candidate roads.
5. Field coring of road sections selected from candidate roads.
6. Lab testing.
7. Confirm viability of HIR treatment.



# Hot In-Place Recycling Asphalt Pilot Project

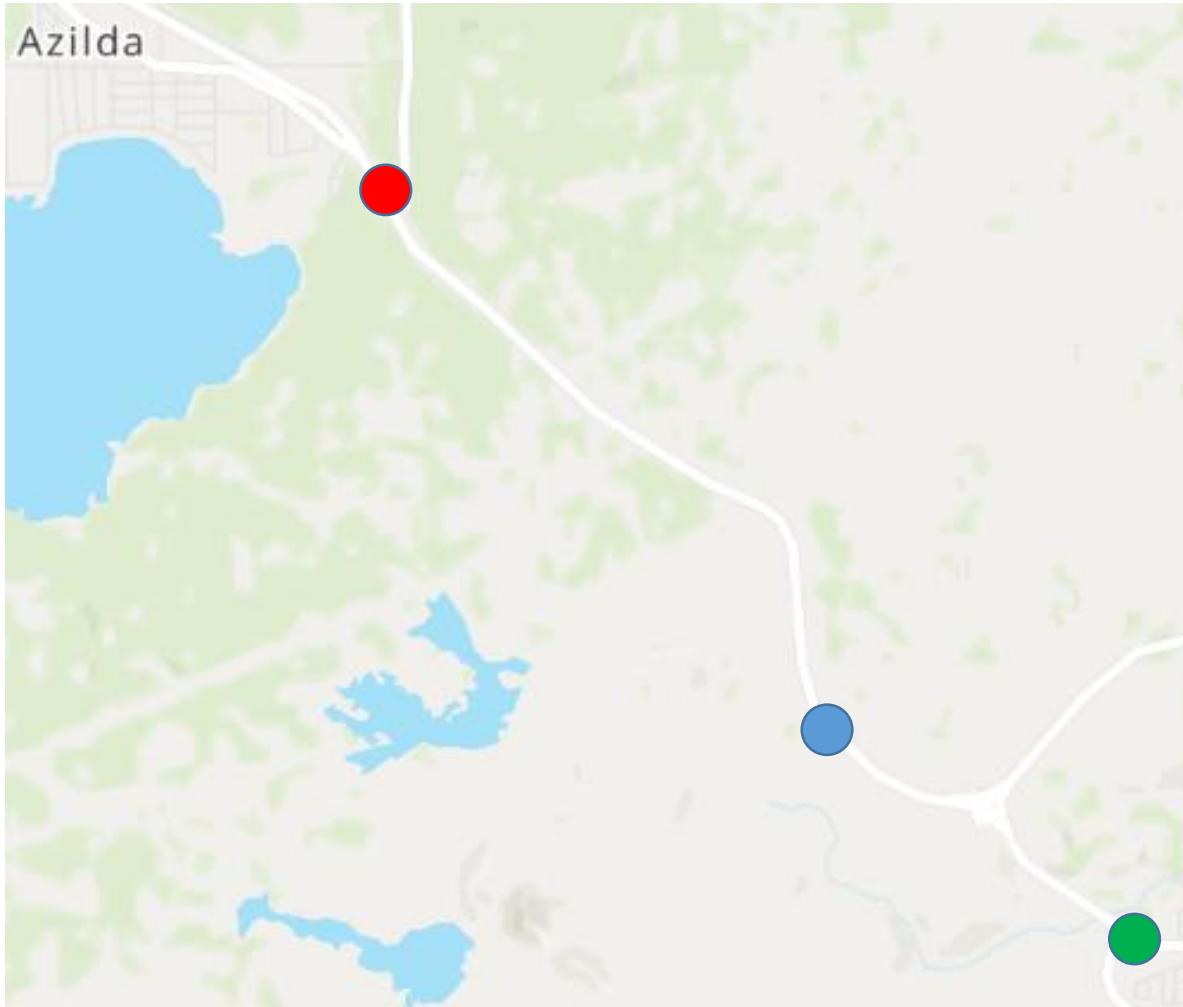
## Candidate Roads Selected

1. Municipal Road 35
2. Kingsway
3. Radar Road (MR85)
4. Bancroft

The following tests were completed on each road section:

- LS-282 Extraction of Asphalt Cement and Analysis of Extracted Aggregate from Bituminous Paving Mixtures
- AC/Gradation
- Pavement Compaction and In-Situ Air Voids
- Recovery of Asphalt
- Penetration of Bituminous Materials
- Viscosity Testing
- R 29 PG verification

# Hot In-Place Recycling Asphalt Pilot Project

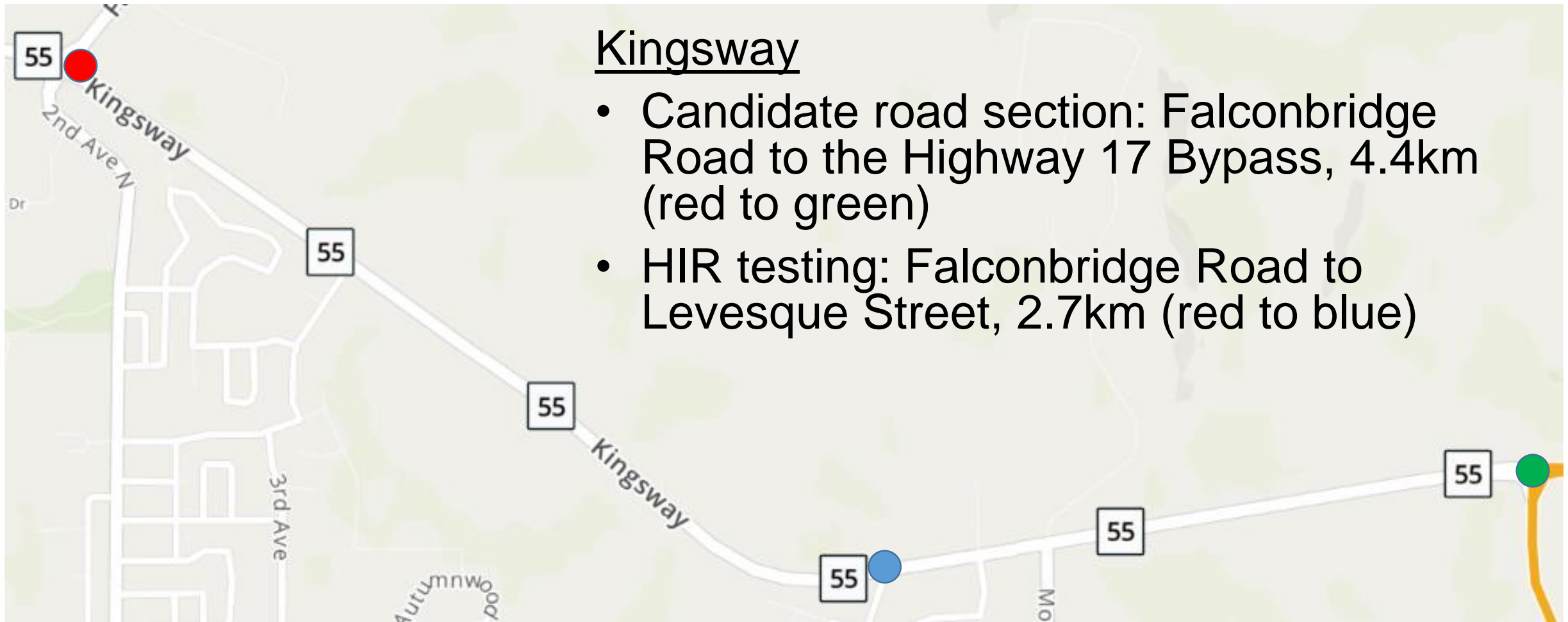


## Municipal Road 35

- Candidate road section: Notre Dame East (Azilda) to Big Nickel Road, 8.5km (red to green)
- HIR testing: Clarabelle Road to Big Nickel Road (MR34), 2.3 km (blue to green)



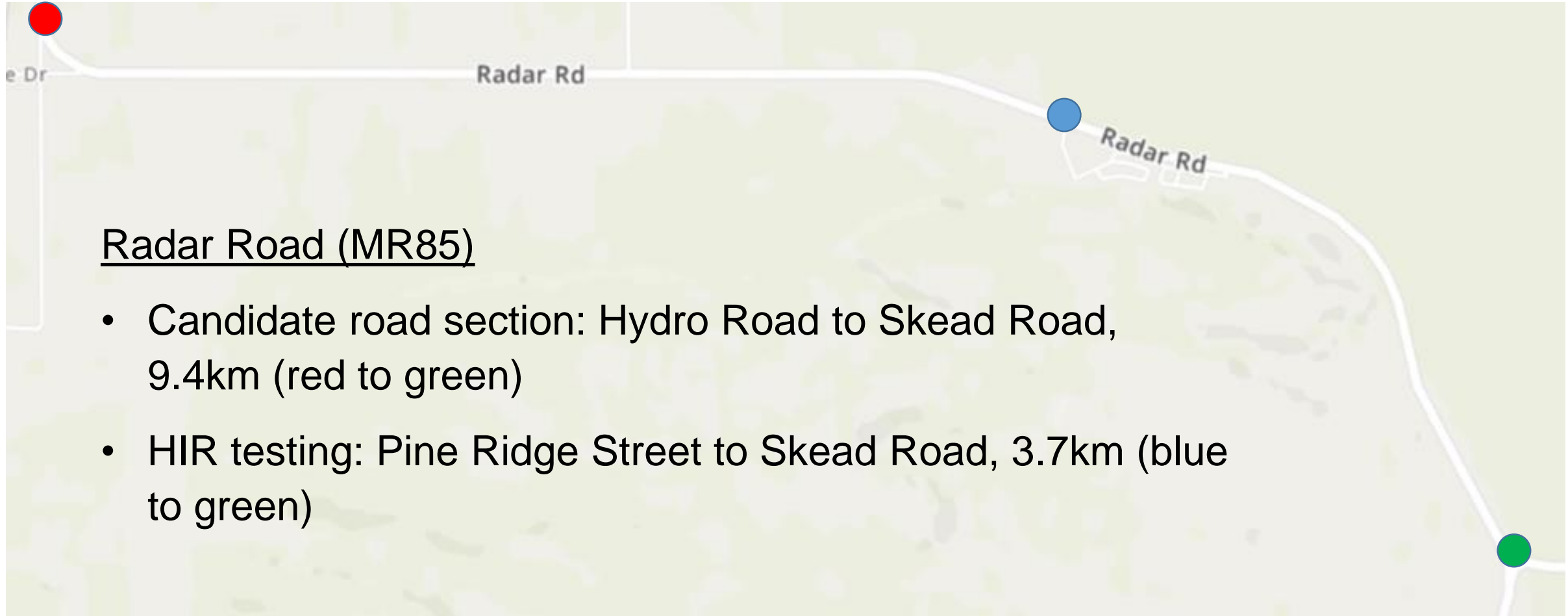
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## Kingsway

- Candidate road section: Falconbridge Road to the Highway 17 Bypass, 4.4km (red to green)
- HIR testing: Falconbridge Road to Levesque Street, 2.7km (red to blue)

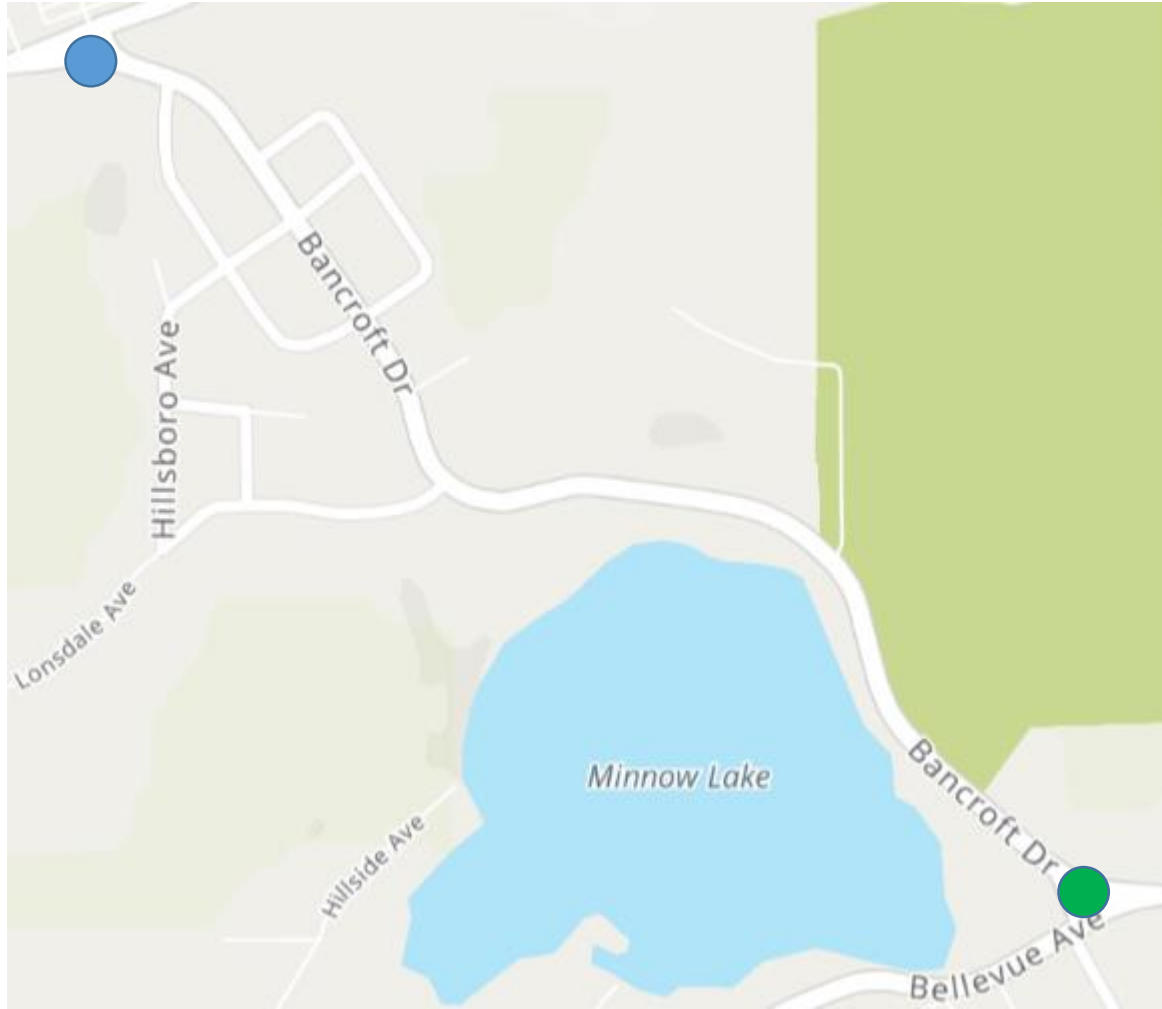
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## Radar Road (MR85)

- Candidate road section: Hydro Road to Skead Road, 9.4km (red to green)
- HIR testing: Pine Ridge Street to Skead Road, 3.7km (blue to green)

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## Bancroft Drive

- Candidate road section: Kingsway to Bellevue Avenue, 1.5km (blue to green)
- HIR testing: Kingsway to Bellevue Avenue, 1.5km (blue to green)

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## Municipal Road 35



(age: 17 years)

April 23, 2020

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## Kingsway



(age: 13 years)

April 23, 2020





# Hot In-Place Recycling Asphalt Pilot Project

## Radar Road (MR85)



(age: 12 years)

April 23, 2020

## Bancroft Drive



( age: 17 years)

April 23, 2020



# Hot In-Place Recycling Asphalt Pilot Project

## Summary

- HIR technology has been successfully used
- Project provides opportunity to implement and determine if HIR can be additional treatment option for CG
- Estimate 25 lane km could be treated with HIR
- Adjustment to limits of HIR treatment within the candidate road sections may be required
- Prequalification and Tender document



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