



**City of Beloit  
Winter Maintenance**

**Christine Walsh**



# Remember “the good old days...”

- Ground speed controlled spreaders & easy calibration



*Clearing snow from Fifth Avenue, New York City.*



The first snowplow to be operated in Ontario County was owned by Harold Archer of Archer Motors, Port Perry. The snowplow is seen here sitting in front of the Scugog Island "Red & White" store in February 1939. Note the big 'V' shaped plow on the front of the truck, with dual-chained wheels on the rear. Pictured beside the truck are, left, Ross Prentice and at right, Don Anderson.

# WHAT TO EXPECT

- **Our Experience**
- **Tools we use**
- **Materials**
- **Wet/Dry Application**
  - **Equipment**
  - **Challenges**
  - **Questions**



# Tools We Use

- **Pre-Snow and Ice Control Duties**
- **Training**
- **Weather Forecasting**
- **Advertising**
- **Debriefing**
- **Chemicals and Equipment**



# General Policy Statement

- **Goal of Snow and Ice Removal**
  - **Safe travel throughout the city due to the removal of snow and ice**



# Service Levels

- **Bare Pavement**
- **Bare Wheel Pass**
- **Passable Condition**



# Chemical Combinations Part of the Puzzle





**This is the original storage structure along with two holding tanks.**



# What We Have Built



**All the interior piping lines and hoses installed on the control unit.**



**The blending station and tank farm can...**

- Create brine
- Mix two products
- Blend the hot mix 3 product blend
- Store up to 65,000 gallons of product



# Liquid Capacity-65,000 gallons



**East Side**



**West Side**



# Dry Storage Capacity

1800 tons



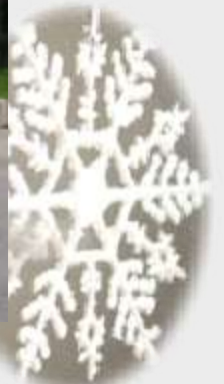
1000 tons



4500 tons



1300 tons



# How Do We Do It?

- **How do we do it?**
  - **Chemically**
    - **Salt**
    - **Calcium Chloride**
    - **Geomelt**
    - **Liquid Brine**
    - **Blends**
      - 50/50
      - 80/20
      - 80/15/5
  - **Prioritize**
    - **Main Roads**
    - **Bridges**
    - **Hills**
    - **Residential**





# **WHEN & HOW TO USE CHEMICALS**

**Pre-Wetting**

**Anti-icing**

**De-icing**



# **Keys to an Effective Anti-Icing and/or De-Icing Program**

- Be sensitive to the environment while providing a safe service to the traveling public.**
- Utilize materials that produce good results, are friendly to the environment, and yet remain cost effective.**
- Find equipment that meet specific needs.**

# Sensible Salting



# Salt

- In its crystal state salt melts nothing
- Salt brine melts snow and ice
- To achieve brine you need water and heat
- **THINK PAVEMENT TEMPERATURE**
- **Brine Solution-23%**



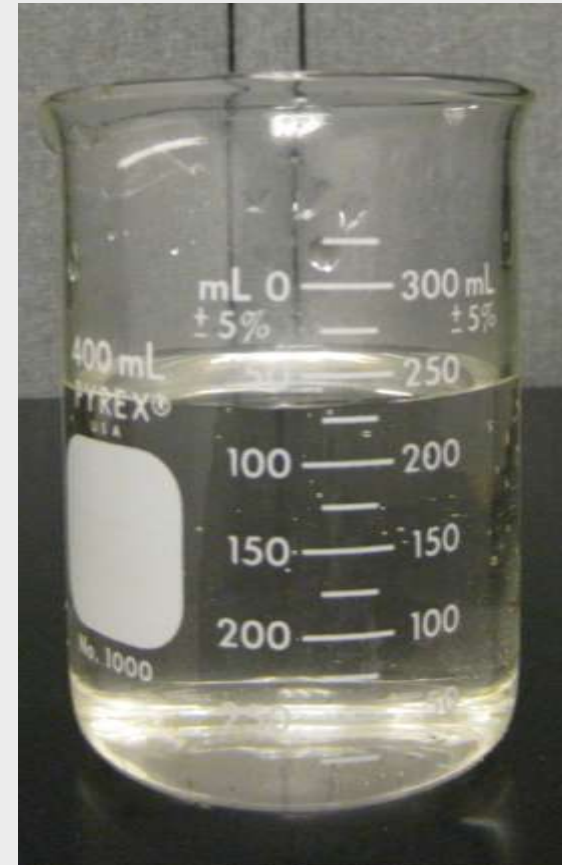


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# Calcium Chloride

- **Releases heat**
- **Attracts moisture**
- **Produces Brine**
- **Fast melting action**



# Geo-Melt

- **Lowers maintenance costs**
- **Biodegradable**
- **Naturally Renewable**
- **Less chloride is released into the environment**
- **Prevents Ice and Snow from sticking to the pavement**



# Salt Scatter

- **Pre-wetted Salt With Calcium Chloride or Geomelt**
  - **78% of rock salt will remain in the center of the roadway**
  - **9% of rock salt stays on each side of the road**
  - **4% of rock salt won't even be on the road**



## **Before Product**

Yates Ave

Date- 2/20/08

Mix- 50/50

Pavement Temp- 18 degrees

Air Temp- 9 degrees

Weather Conditions-

Light snow from 9 am-11am with fog  
later in the evening



## **After Product**

Yates Ave.

Date- 2/20/08

Mix- 50/50

Pavement Temp- 18 degrees

Air Temp- 9 degrees



## Before Product

Burton Street Looking West

Date- 1/31/08

Mix- 80/15/5

Weather Conditions-15 degrees

Light snow 3:45 pm-2:36 am



## After Product

Burton Street Looking East

Date- 2/1/08

Mix- 80/15/5

Weather Conditions-15 degrees

Haze and Overcast





Eaton Avenue

Date- 2/20/08

Mix- 50/50

Pavement Temp- 18 degrees

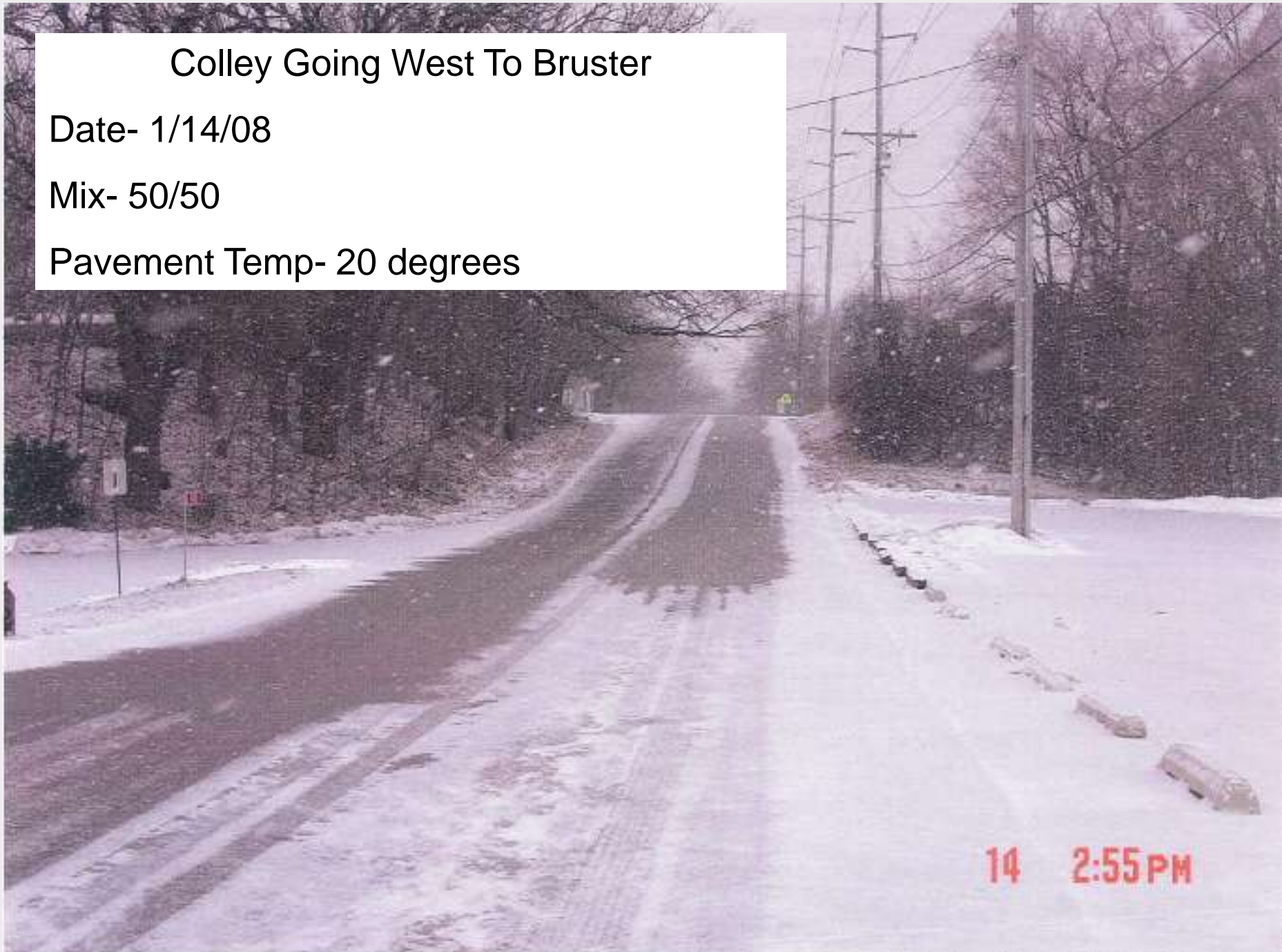
Air Temp- 9 degrees

# Colley Going West To Bruster

Date- 1/14/08

Mix- 50/50

Pavement Temp- 20 degrees



# Pre-wetting and Anti-icing



# Salt Scatter

- **Salt dispersed without being pre-wetted**
  - **46% of the rock salt stays in the center of the road**
  - **12% of the rock salt stays on each side of the road**
  - **30% of the rock salt does not stay on the road**





# EQUIPMENT



# Plowing is the Best Method of Removing Snow



**IT TAKES FOUR TIMES MORE SALT TO REMOVE ICE THAN TO PREVENT IT**



# Alternatives

**Straight Steel Blade** vs. *Rubber Encased Carbide Blade*



# Alternatives

## Joma blade bite



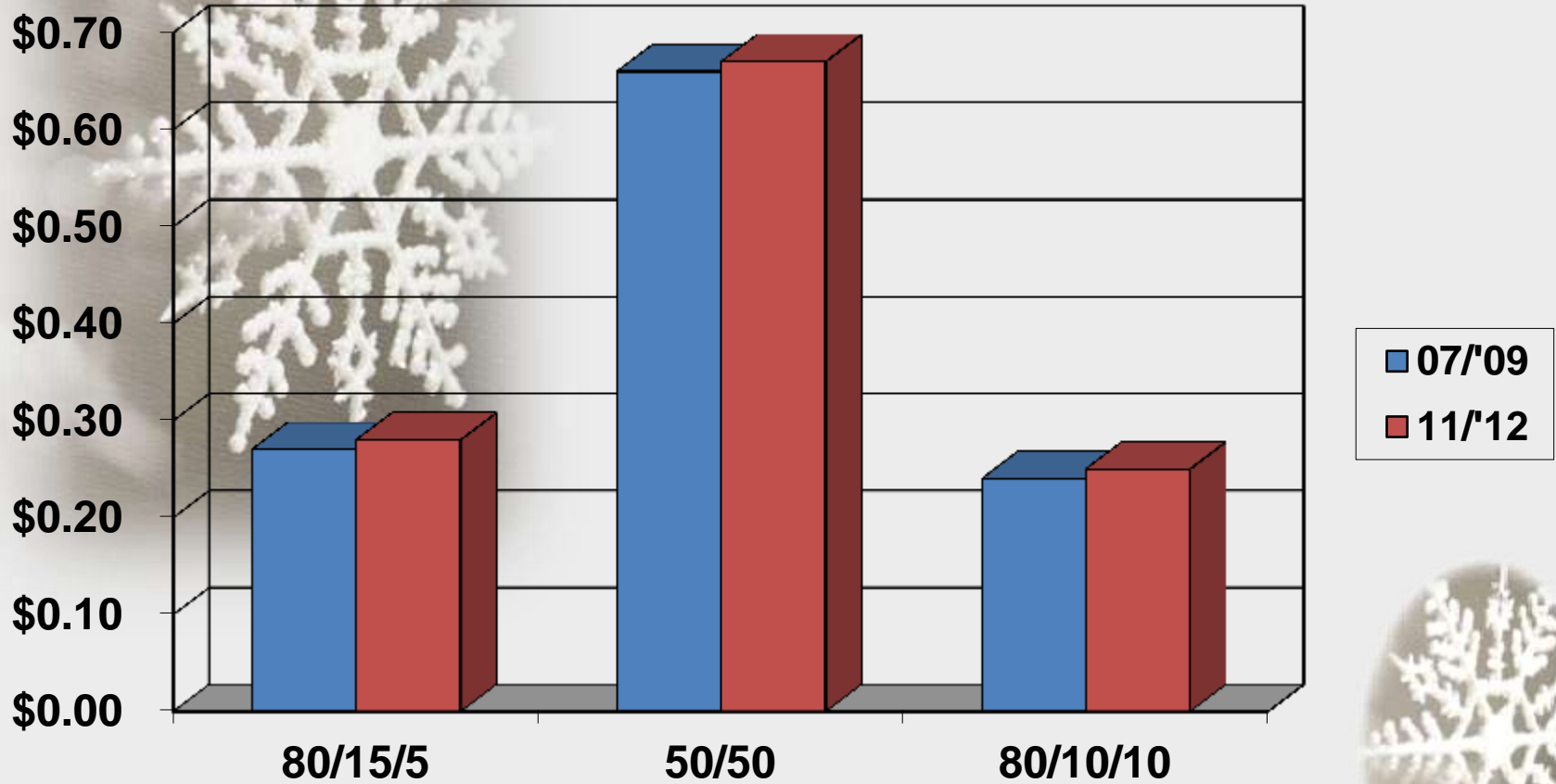
# Beloit

## Cost of Salt

- **2008-2009**
  - 4320 Tons: \$45.98
  - 4200 Tons: \$56.68
- **2009-2010**
  - 500 Tons: \$62.27
- **2010-2011**
  - 1000 Tons: \$55.04
- **2011-2012**
  - 2400 Tons: \$55.76



# LIQUID COSTS



# Cost per Lane Mile @ 45 Gal/Lane Mile

- '08/'09  
(\$45.98/Ton)

- Brine

- \$3.15

- 80/15/5

- \$12.15

- 80/10/10

- \$10.80

- 50/50

- \$29.70

- '11/'12

- (\$55.76/Ton)

- Brine

- \$4.05

- 80/15/5

- \$12.6

- 80/10/10

- \$11.25

- 50/50

- \$30.15



# Cost per Lane Mile Saddle Tanks @ 5 Gal/Lane Mile

- '08/'09

- Brine

- \$.35

- 80/15/5

- \$1.35

- 80/10/10

- \$1.20

- 50/50

- \$3.30



- '11/'12

- Brine

- \$.45

- 80/15/5

- \$1.40

- 80/10/10

- \$1.25

- 50/50

- \$3.35

# Alternatives, Politics, Public Opinion, Money





**Snow & Ice can financially break a city!**





# **Political Arena**



**Educate!**

**Educate!**

**Educate!**



# Public Perception

“Fabulous job clearing streets!”

“Keep up the great work, the retailers downtown appreciate your tireless efforts.”

“...the crews did a smashingly good job!”





**THE END  
THANK YOU!**

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