

2014 LTAP WINTER OPS CONFERENCE-Gaylord, MI

Snow removal Parks and Recreation Areas



Wixom Facts

- ❖ Maintains 51 lane miles of major and local roads (clears all streets curb-to-curb)
- ❖ Clears 11 miles of safety paths
- ❖ Clears all municipal parking lots; Police, City Hall, Library, Fire Station, Community Center and Downtown Parking lot.
- ❖ Fleet consists of 5 dump trucks, 3 pick-up trucks and 2 tool-cats
- ❖ In last 8 yrs, Wixom reduced salt use by +40%



Wixom's Hooklifts

- ❖ Same truck utilized for salt application by means of hook-lift
- ❖ INCREASED VERSATILITY



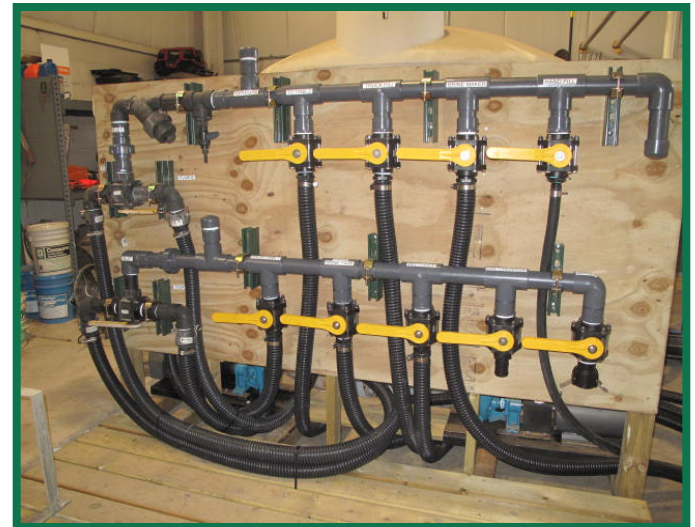
Walkway cleaning

- ❖ Tool-cat holds 100 gallons of brine
- ❖ Used exclusively at City Hall, Police Department, Library and Community Center. Bike paths after storm
- ❖ Replaced 'icy-melt' usage at City offices (cost saving over \$2,000 per year)



Wixom's Salt Brine

- Salt brine is made at the DPW
- Additives (agricultural bi-products, calcium chloride and/or magnesium) are used to increase efficiency and lower working temperatures
- Wixom currently uses 80% salt brine and 20% “Boost”



2014 FH's Parks / Golf Municipal Winter Maintenance Program-LTAP Winter Opps



**CITY OF WIXOM
DEPARTMENT OF PUBLIC WORKS**

**2041 CHARMS ROAD
WIXOM, MI 48393
www.wixomgov.org**



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Facts about Farmington Hills

- ❖ Metro-Detroit area city with population of 80,000
- ❖ Second largest city in Oakland County
- ❖ 9TH largest municipal / parking lot network in the state of Michigan and the largest in Oakland County
- ❖ Residents enjoy over 600 acres of public parks with miles of hiking and biking trails



FH's Parks Facts

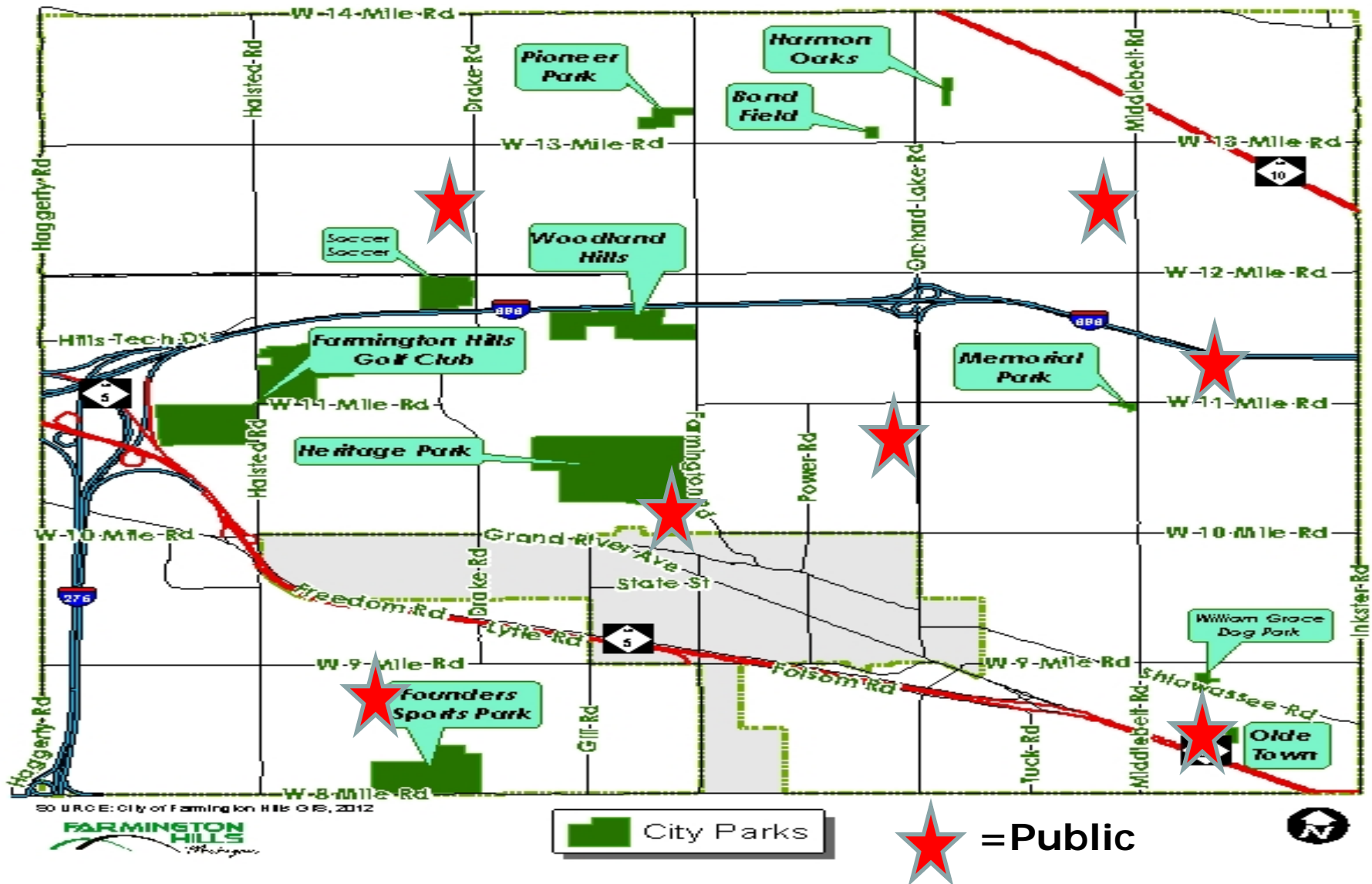
- ❖ Maintains all Public Facility's
“in-House” (clears all parking lots
curb-to-curb)
- ❖ Maintain all municipal parking lots;
City Hall Complex which includes PD
main, Fire Headquarters and Courts +
4 other Fire Dept. sites

FH's Parks Facts

- ❖ Clears multiple miles of sidewalks/pavers
- ❖ Community Centers ,Sports Parks,
- ❖ Historical Facility's etc.



FH's CITY LOCATIONS



FH's Parks Staff-Equip.

- ❖ Full and **Part Time** staffing
- ❖ Fleet consists of 3 dump trucks, 8 pick-up trucks and stake truck with DLA tank
- ❖ 2 pickups outfitted with DLA tanks
- ❖ In last 7yrs, FH's staff has reduced salt use by +30%

FH's Parks - Equip.



FH's Parks - Equip.



TRAINING-EQUIPMENT READINESS



- Calibration of granular/liquid equipment. (Utilizing “catch” tests)lbs/gal’s per acre
- Pre-winter meeting:procedures and “game plan” for the winter DLA research, **including employees input & expectations.**
- **Training** of personnel (Controllers, goals, etc.)

TRAINING-EQUIPMENT READINESS-Volume/Patterns



TEST MATERIALS – RESEARCH & DEVELOPMENT – LIQUIDS

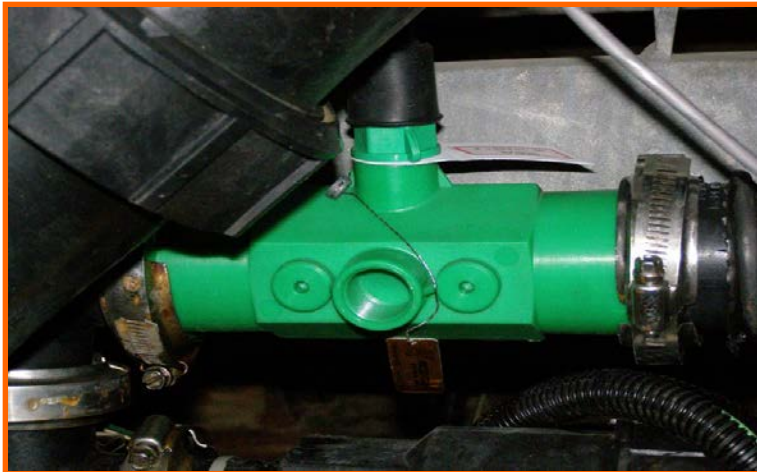


Anti-Icing"Pre-Treating"

DLA DE-ICING -Manual vs Auto



Consider using a **flow meter**
for consistent application(GPLM)





Over applying?????



DLA-ANTI-ICING



Dept's out doing other activity's-(trash, forestry, in house maintenance, voting)



DLA-ANTI-ICING



Parks Dept. Anti-Icing Prior to Event Sidewalks



Walkway Deicing

- Work with Vendors – Demo Units – Fail / Succeed
- Expectations-Volume – Pressure - Efficiency

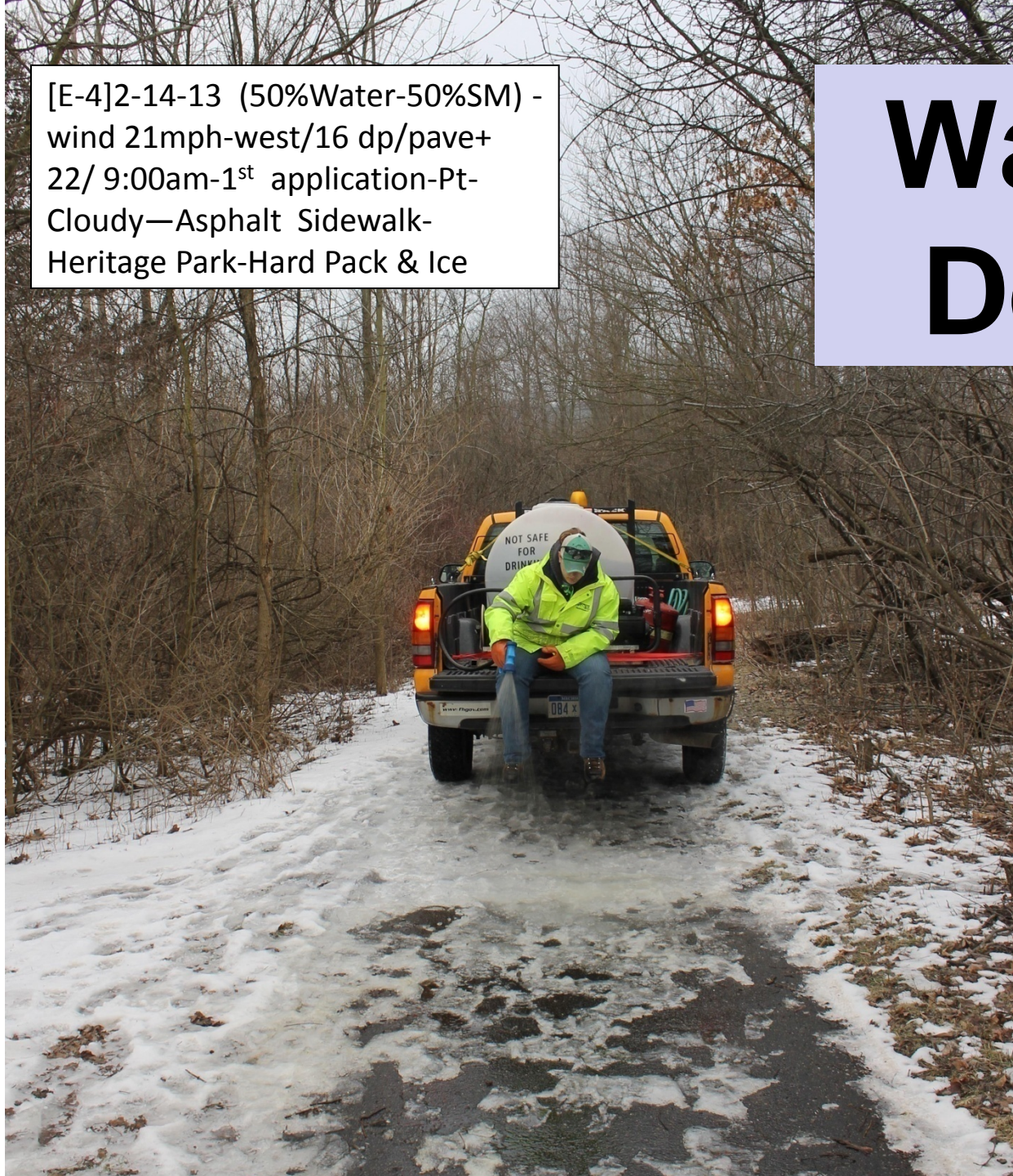


Walkway Deicing Challenges



[E-4]2-14-13 (50%Water-50%SM) -
wind 21mph-west/16 dp/pave+
22/ 9:00am-1st application-Pt-
Cloudy—Asphalt Sidewalk-
Heritage Park-Hard Pack & Ice

Walkway Deicing



LIQUIDS – DE-ICING – W/BRINE-BEET MIX @ 25 F – Sidewalk Application



1-13-12

**FARMINGTON
HILLS**
Michigan

P-3-12-21-12 DLA- City Hall Parking Lot/ Sidewalks (100%brine) -wind 22mphWNW/dp 27/pave +28/-12:5pm- No Blading ¼ inch of snow prior to application-Concrete Sidewalk-Lt Snow during App.



IMPROVEMENTS-Pre-Wet



TYPES OF TANKS – EQUIPMENT

– LIQUIDS



- Start small and keep it simple
- Use and/or modify existing tanks
- Try small vehicles, pick-up trucks
- Use self-contained skid units

LIQUIDS – DE-ICING –Walk or Ride behind Applicators



Multi-Use of TANK EQUIPMENT – LIQUIDS – Activities - Justification

- Dust Control , Spraying Pesticides Etc.



TYPES OF TANK EQUIPMENT –LIQUIDS – Larger Capacity/Uses

**As you Expand your Liquid Program
consider:**

- Management, employees and other departments' **buy-in**
- Tanker endorsements (MI 1K + Capacity)
- Multi-seasonal use justification
- Existing equipment rated for the weight of liquids
- **Shared Services –Dust Control/ Anti-Ice**

TOOLS TO HELP THE **DLA-Granular** PROCESS (Pavement vs. *Ambient* TEMP)



- Simple Handheld Infra-Red, Equipment-Mounted
- Weather Reports/Service/Network with Agencies



DATA-IMPORTANT

Winter 2012-2013
De-icing Liquid Application (DLA) Study
Farmington Hills, Novi, Wixom

"SM"

"ROAD - SOLUTIONS - PROJECT"

	Date	Application (Roadway, Bridge, Parking Lot)	Roadway Type (Asphalt, Concrete, Brick)	Daylight Weather Conditions (Overcast, Partly Sunny, Sunny)	Wind-Dew Point	BEGIN/END Pavement Temperature	PRE-treatment (Anti-icing)	POST-treatment (De-icing)	PSI/GPLM	Liquid-Mat's Used -	BST. Gal. used	Results / Comments / Observations
										70% BEANE 30% SM		
A-2	1/31/13	ROAD	ASPH.	OVERCAST	NW 30/15	22/22		X	45	10% BEANE 30% SM	150	WORKED WELL / MELTED WITHIN 1/2 HOUR - AVG TRAFFIC (LOCAL)
A-3	1/31/13	↓	CONCRETE	↓	↓	↓		X	55	↓	180	WORKED GOOD / ACCEPTABLE LOS LESS TRAFFIC (LOCAL)
B-1	2/1/13	↓	"	↓	18W/6	14/16		X	45	↓	175	WORKED WELL - ACCEPTABLE LOS LOW TRAFFIC 10:45 AM - 11:15 AM
B-2	2/1/13	↓	"	↓	18W/6	14/17		X	45/45	↓	145	35 VS 45 GPLM TO COMPARE 45 HAD A MINUTE BETTER RESULT
C-1	2/17/13	PARKING LOT	CONCRETE	CLEAR	20W/5	6/14		X	45	30% BEANE 30% SM	20	NO PLOWING / NO TRAFFIC 7:08 AM TO 10:51 AM
C-2	2/17/13	ROAD	"	PT CLOUDY/ CLEAR	22W/5	8/22		X	55/45	↓	100	NO PLOW - TESTING DIFF GALLONS/RATE 3 1/2 HR SPAN / LOW TRAFFIC / COMPLETE MELT OFF
C-3	2/17/13	↓	ASPH.	CLEAR	22W/6	11/20		X	50	↓	40	NO PLOW, VERY LOW TRAFFIC VOLUME LOS ACHIEVED, NOTE: SHADY AREA
E-1	2/14/13	SIDEWALK	ASPH.	CLOUDY	FW/18	22/34		X	?	50% BEANE 50% SM	100	2 APPS; USING A SMALL TANK BY HAND, REMOVED & BURNT THROUGH HARD PAV.
D-1	2/20/13	PARKING LOT	CONCRETE	PICKET AM PM - CLOUDY	21W/9	9/18		X	45	80% BEANE 20% SM LOW TRAFFIC	75/75	COMPARING 80/20 MIXES, SIDE BY SIDE APPLIED @ 6 AM / 3 HRS LATER - SIMILAR RESULTS
D-2	2/20/13	ROAD	ASPH/CONC.	AM - DARK	15E/24	22/23	X		45	COMPARING PRODUCTS 80% BEANE 20% SM	250/250	DIZZLE / NOT SNOW / COMPARING FRICTION STOPPING-STARTING, ETC. / SM HAD BETTER RESULTS
F-1 (AC)	3-13-13	ROAD	" / CONC. / ASPH.	PT. CLOUDY PT. SNOW	NW 20/21 ↓ AM	23/23.4 22/24	10/14.4 ↓	X X	45 45	80/20 BEANE	100/ 100	FAIR MELTING POWER ON CONC. - NO GOOD ON ASPHALT / SNOW WAS ICY
F-2	3-13-13	RESIDUAL	ALL -	SIMILAR	SQUAUS					BEANE/SM		GOOD RESIDUAL FOR 2-DAY

* 4 EVENTS CAME IN AS RAIN, WASHED PRODUCT
AWAY, NOT RECORDED [UNPREDICTABLE RAIN/SNOW FORECAST]



Brine Cost's Farmington Hills DPW

Winter 13/14

Unit Costs				
	\$/1000 cft	gal/cft	\$/gal	
Water	\$33.62	7.48	\$0.004	
	\$/ton	gal/ton	\$/gal	
Salt	\$46.51	900	\$0.052	
	\$/gal	\$/gal (15%)	\$/gal (20%)	
Beet	\$1.50	\$0.23	\$0.30	
			\$/gal (32%)	
Liq Calc. Chloride-Delivered			\$0.58	
	\$/hr	gal/hr	\$/gal	
Labor	\$44.11	1000	\$0.044	
Operator 2 – loaded (electrical costs etc.)				
Pure Brine Cost				
			\$/gal	\$0.10
85/15 Blended Brine				
			\$/gal	\$0.31
80/20 Blended Brine				
			\$/gal	\$0.38

LIQUID CHALLENGES

- ❖ Efficiency

 - Spraying liquids vs . Applying Granular

- ❖ Staffing- Hiring Seasonal-Part Timers

 - Training of supplemental force

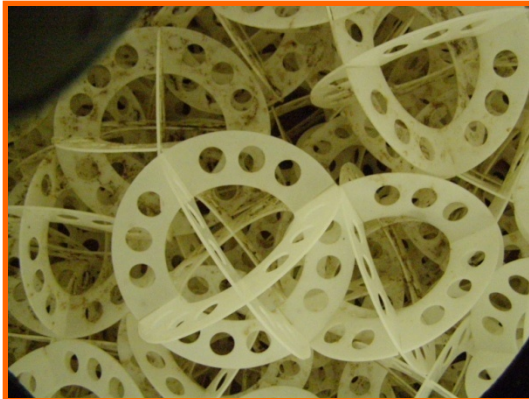
- ❖ Consistent application rates

- ❖ Filling of Tanks quickly

- ❖ "Buy in from Staff"

DLA TOOLS -ANTI-SURGE BLENDING CONSIDERATIONS

- Spheres or Balls to increase safety, braking, minimize driver fatigue, wear & tear on hauling vehicle
- Blending options, barrels, totes, bulk delivery, pricing



Mixing Organics

- Below the surface of liquid (use Anti-Foam)



- Not below the surface of liquid



[C-3]2-17-13 SM mix (80%brine20%SM) 50 gplm-wind 22mph-west/6 dp/pave+
11/ 8:04am-prior to application-Pt-Cloudy—Asphalt -Sporadic Traffic



11:00am-After application-Clear—Asphalt -
Sporadic Traffic-ATTN: Shaded Area



BENEFITS OF LIQUIDS – Granular Mess- WASTE



BENEFITS OF LIQUIDS – Granular Mess-Grass Damage



BENEFITS OF LIQUIDS – Considerations



- Residuals
- Less sod burn, parking lots and sidewalks
- Less salt powder, granular mess
- ***NO EVENT IS THE SAME*** (ground- air temps, dew points, wind, etc.)

LIQUIDS – DE-ICING – W/BRINE

8:30AM @ +28F -Parking Lot

Application



**FARMINGTON
HILLS**
Michigan

12-29-11

LIQUIDS – DE-ICING – W/BRINE

8:30AM @ +28F -Parking Lot

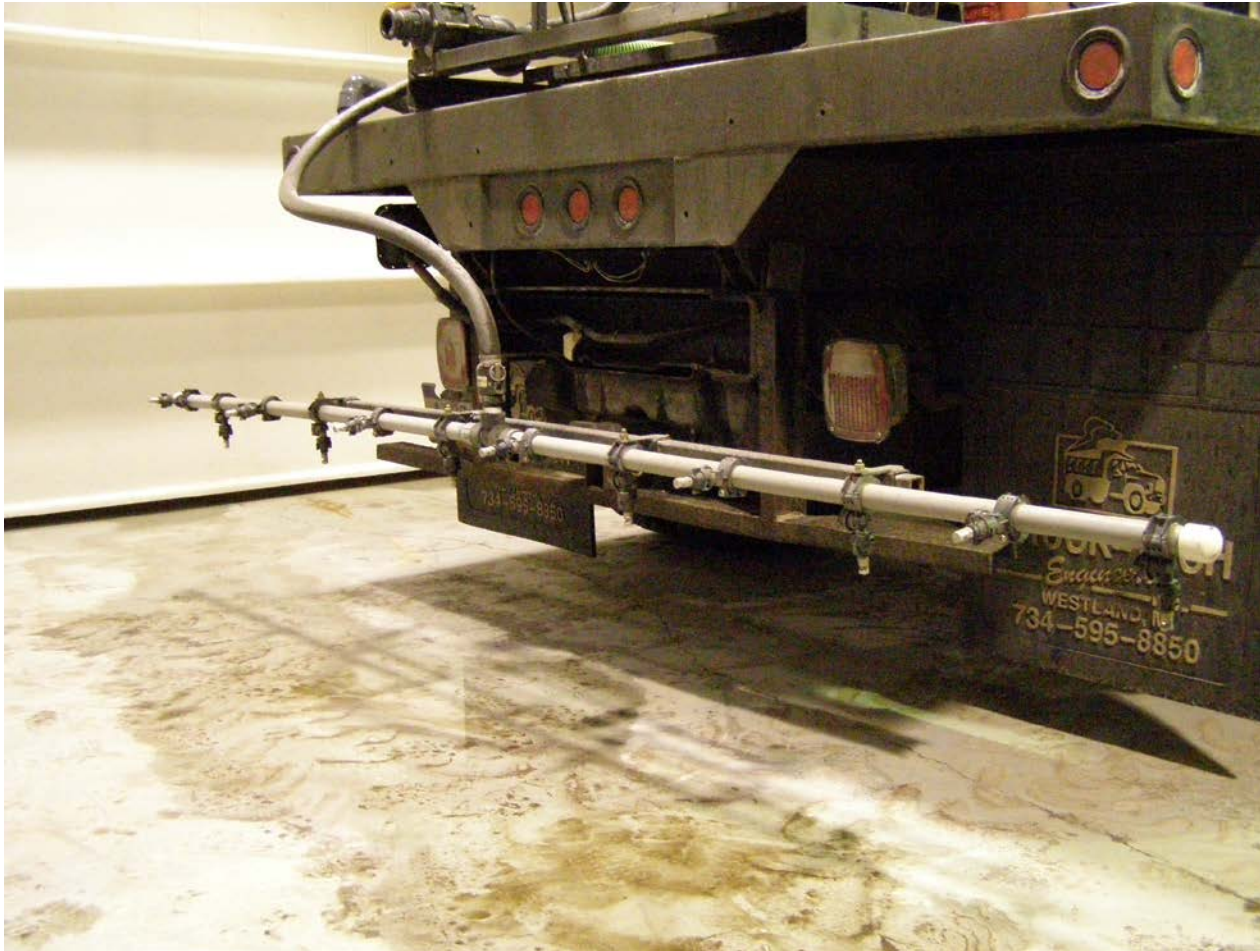
Application



12-29-11



BAR/APPLICATION SETUPS



ODOR-TRACKING(STOP SHORT)



TEST MATERIALS – RESEARCH & DEVELOPMENT – LIQUIDS

- Do research, APWA, Clear Roads, DOT websites etc.
- Use a hand sprayer, existing equipment
- Start “small”, network consider **Shared Services(Different Mat’s)**



S.E.MI.Winter Maintenance Team

- The City of Farmington Hills formed a local **Winter Maintenance Team** made up of representatives from southeast Michigan communities to network, collaborate, and learn about new techniques. The Committee meets regularly to hear from vendors and private contractors about new products and methods. It gives participants the chance to see what is working for other communities, establish goals, view research, and collect data. The team moves the meeting site to different facilities each time.



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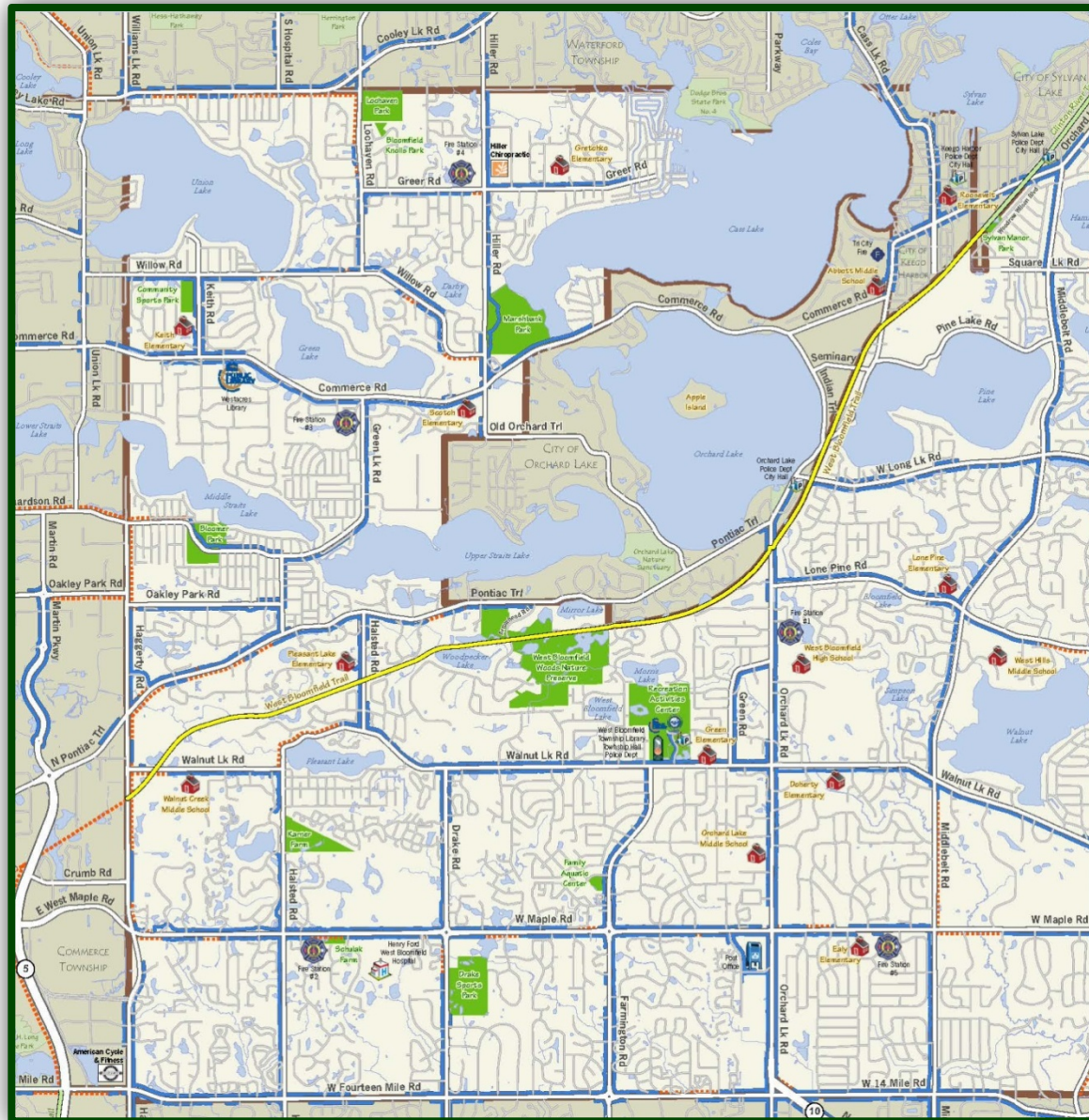


West Bloomfield Parks and Recreation

Serving 60,000 residents
13 locations, open 7 days a week



13 park locations



12 acres of parking lots and roadways
16,000 sq. ft. of sidewalks



Roadway bio-swales



Parking lot and roadway rain gardens



Maintenance yard with rain garden



Started in 2013 with our summer watering truck



Pre-treated sidewalk day before snowfall predicted at 2pm with an 80/20 mix



**Next morning at 7am $\frac{3}{4}$ inch of snow on ground and
still snowing**



Pre-treated asphalt night before at 4pm, 7am next morning ½ inch snow had fallen



Cleaned concrete sidewalk, 80/20 mix applied to bottom half, granular melt applied to top half



New sidewalk set-up for 2014



Our mechanic fabricated a walk-behind sprayer mount



We sent it out and had it hot dipped galvanized



Gravity feed into the sprayer



Pre-treated sidewalk to understand spray patterns and coverage



Cleaned concrete sidewalk applying 80/20 mix



First pass melting, second pass droplet size



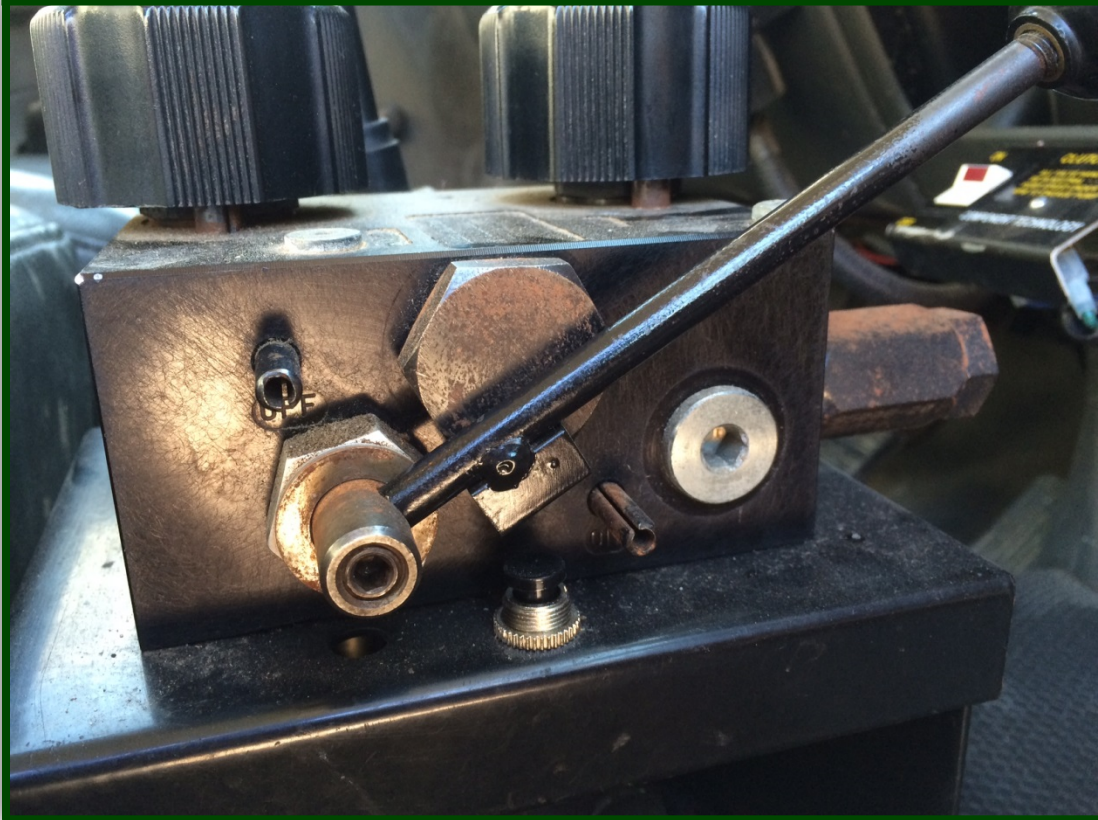
We built our first pre-wet salt system in-house



Two nozzles soaking salt at end of conveyor



Simple switch to turn pump on



50 gal. tank, clean out port, filter, pump, return line, supply line and two nozzles: \$400-\$500 invested

Applying salt and 80/20 blend at 20 gallons per ton



Electric cleaning station with salt neutralizer injection



Geo-thermal HVAC system



Park facility with solar hot water, waterless urinals and composting toilets





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