



# Alaska Department of Transportation & Public Facilities

## Past, Present and Future: The Evolution of Alaska DOT&PF's Snow Operations

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Northern Region Maintenance & Operations Manager

# Goals for today

## LEARNING OBJECTIVES

At the end of this  
experience, I will be  
better able to...

1. Identify outdated winter maintenance methodologies and evaluate operational efficiencies.
2. Analyze potential solutions and coordinate deployment of solutions within a large and diverse workforce.
3. Differentiate between successes and failures, and modify future endeavors based on data-driven assessments.



***Past, Present & Future: The Evolution of the  
Alaska Department of Transportation & Public Facilities  
Snow Operations***



# Alaska Department of Transportation & Public Facilities

- 3300 Employees
- 12,000 Lane Miles
- 5,600 Centerline Miles
- 836 Bridges
- 239 Rural Airports
- 2 International Airports
- 19 Harbors
- 776 Buildings (DOT&PF owned or managed)
- Alaska Marine Hwy System
  - 35 ports of call
  - 10 vessels
  - 3,500 miles



# Maintenance & Operations

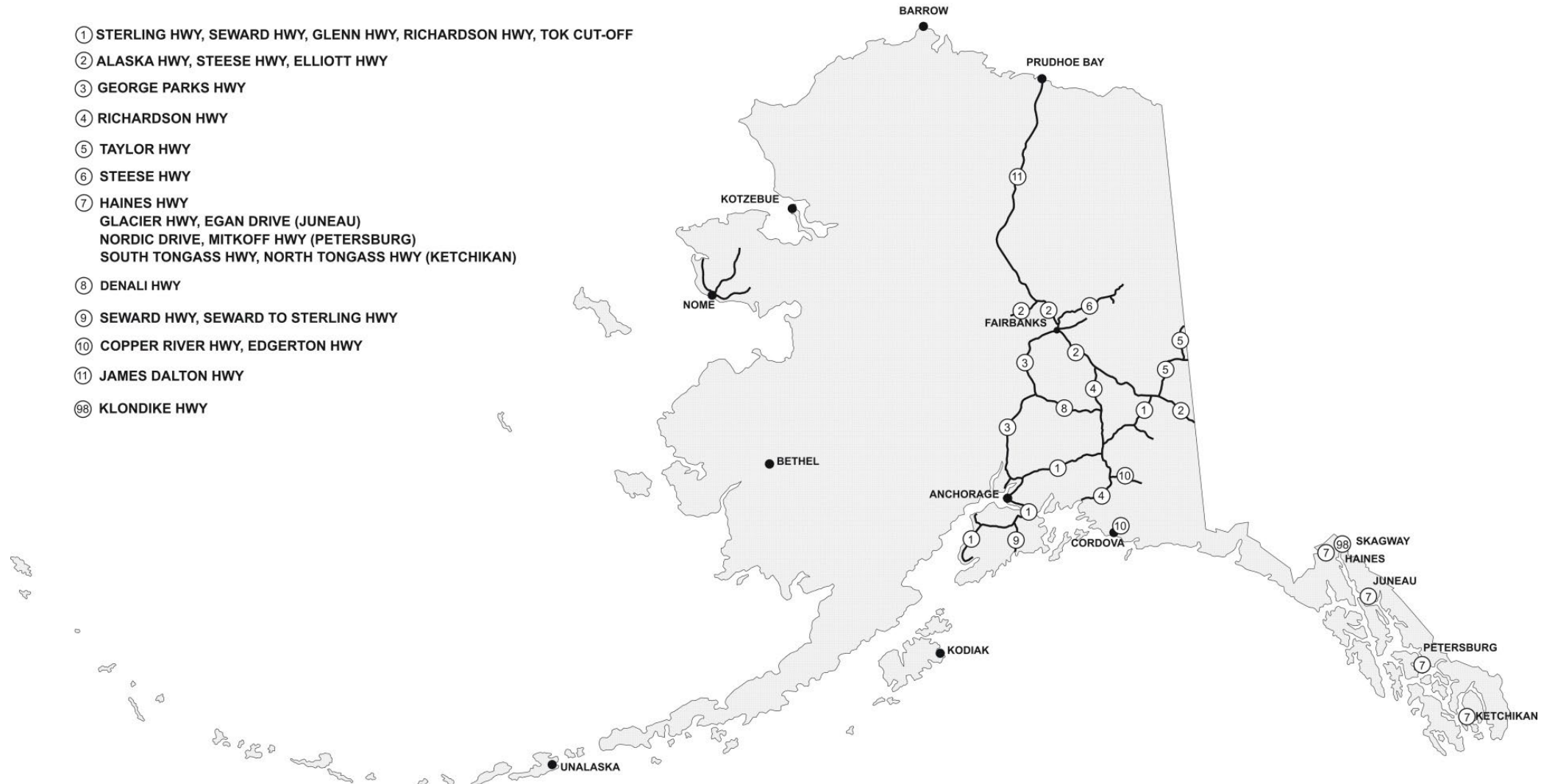
- Over 600 M&O Employees Statewide
- 74 Maintenance Stations
- 7372 Pieces of Equipment
- \$126M M&O Operating Budget
- \$34M SEF Operating Budget
- \$50M Snow and Ice Control
- 18,000 Tons of Salt Annually
- \$50M FHWA PM Program
- \$5-10M FAA Surface Maintenance

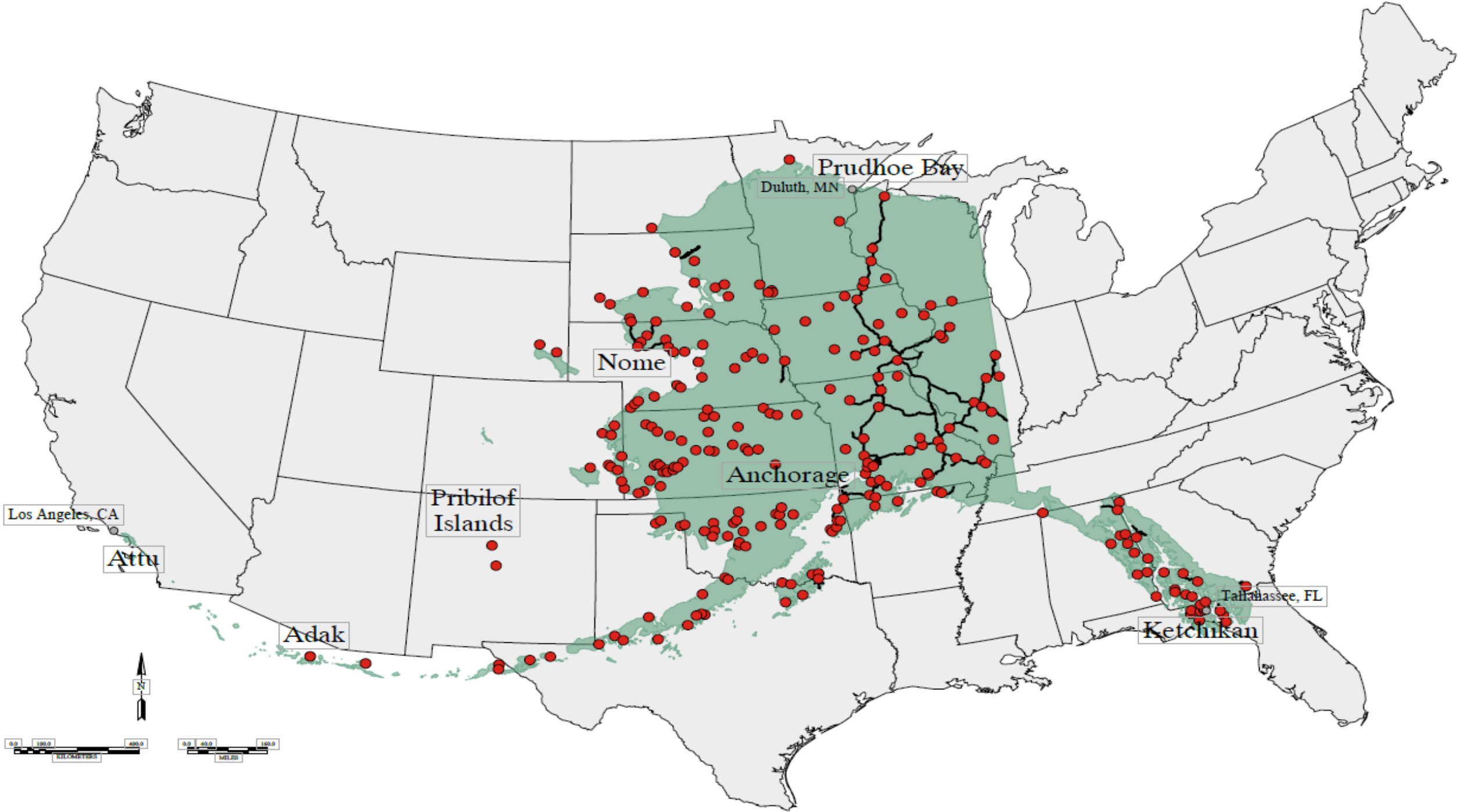


# Alaska Highway System

## ALASKA ROUTE NUMBERS

- ① STERLING HWY, SEWARD HWY, GLENN HWY, RICHARDSON HWY, TOK CUT-OFF
- ② ALASKA HWY, STEESE HWY, ELLIOTT HWY
- ③ GEORGE PARKS HWY
- ④ RICHARDSON HWY
- ⑤ TAYLOR HWY
- ⑥ STEESE HWY
- ⑦ HAINES HWY  
GLACIER HWY, EGAN DRIVE (JUNEAU)  
NORDIC DRIVE, MITKOFF HWY (PETERSBURG)  
SOUTH TONGASS HWY, NORTH TONGASS HWY (KETCHIKAN)
- ⑧ DENALI HWY
- ⑨ SEWARD HWY, SEWARD TO STERLING HWY
- ⑩ COPPER RIVER HWY, EDGERTON HWY
- ⑪ JAMES DALTON HWY
- ⑨⑧ KLONDIKE HWY









# Fred Meyer

2.42° 2.62° 3.39°



# Evolution of DOT&PF's Snow Plan

- Level of Service
- Equipment
- Training
- Statewide Communications (Internal and External) and Coordination
- Service Delivery
- Culture





# Levels of Service

- ▶ They are at the center of winter maintenance and drive all our actions (ideally)
- ▶ If you don't know where you're going, you'll end up somewhere else
- ▶ Very location specific – what works in Alaska would not work in Georgia!
- ▶ Road type specific – residential streets should not receive the same efforts as Interstates
- ▶ This is how you know you are done with a storm
- ▶ Level of Service determines what tools you will need for your winter

# Levels of Service- the Past

- What Level of Service?
- **1993 Maintenance Manual had very basic Priority system but not followed**
- No consistency from Maintenance Area to Maintenance Area
- 511 Reporting Very Confusing to the Public



## **Priority One**

- Assigned to major roads.
- Appropriate snow control operations usually begin before 50 millimeters (2 ") or more snow has accumulated.
- Sanding operations should begin when ice or compact snow conditions are evident and immediately after plowing, as conditions permit.

## **Priority Two**

- Assigned to roadways of a lesser priority than Priority One roads.
- Appropriate snow control operations usually begin after 50 millimeters (2 ") or more snow has accumulated and after Priority One sections of highway have been appropriately covered.
- Sanding operations should begin when ice or compact snow conditions are evident and Priority One sections of highway have been appropriately covered.

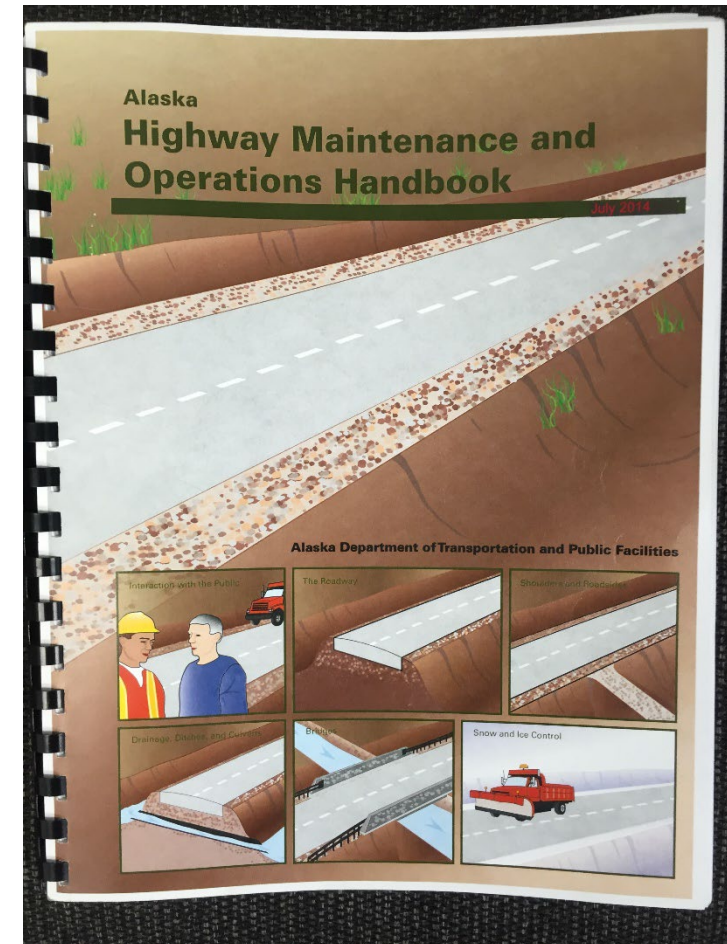
## **Priority Three**

- Assigned to local roads.
- Appropriate snow control operations should begin after Priority One and Two sections of highway have been considered. In some cases, because of the snowfall duration, these roads may become nearly impassable before they are plowed.
- Sanding operations should begin when ice or compact snow conditions are evident and Priority One sections of highway have been appropriately covered.



# Levels of Service- the Present

- Statewide Level of Service
- Built upon an honest and open discussion about levels and costs
- Totally transparent
- Consistent across the state
- Measurable
- All Maintenance Staff Trained





# Winter Road Maintenance Priority Map

Use your mouse to zoom and drag to your preferred location on the map. Click on a roadway for more information.

**Winter Conditions Vary. Response times depend on the severity and length of each winter storm.**

### PRIORITY LEVEL 1

high-volume, high-speed highways, expressways, minor highways, all safety corridors and other major urban and community routes. *May take up to 12 hours to clear after a winter storm.*

### PRIORITY LEVEL 2

routes of lesser priority based on traffic volume, speeds and uses. Typically, these are major highways and arterials connecting communities. *May take up to 18 hours to clear after a winter storm.*

### PRIORITY LEVEL 3

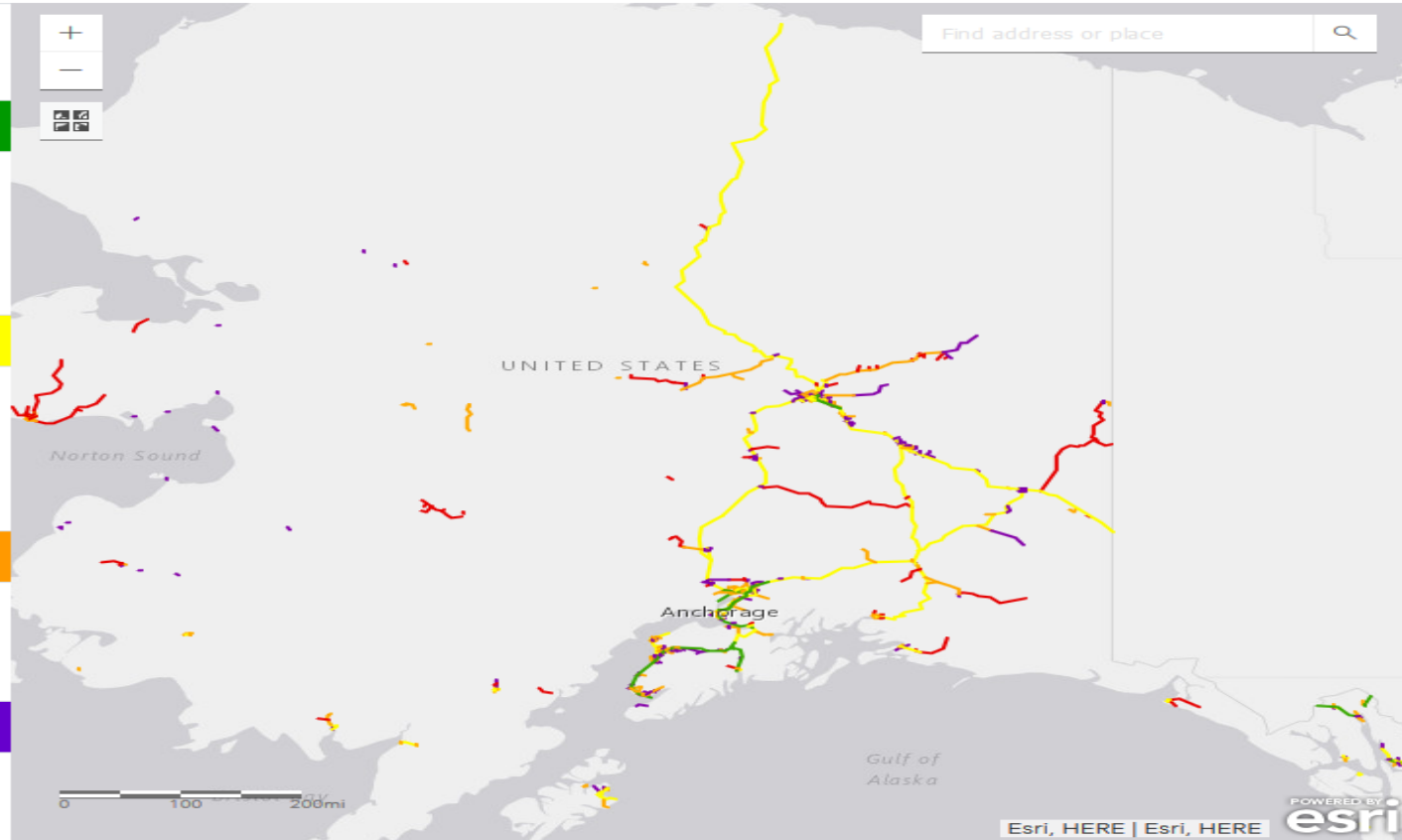
major local roads or collector roads located in larger urban communities. *May take up to 24 hours to clear after a winter storm.*

### PRIORITY LEVEL 4

minor local roads that provide residential or recreational access. *May take up to 30 hours to clear after a winter storm.*

### PRIORITY LEVEL 5

roadways that are designated as "No Winter Maintenance" routes, e.g. Denali Highway or Taylor Highway. Generally cleared only in spring to open road for summer traffic.





If you experience difficulty with this page, please contact [Ask DOT&PF](#).

**PLEASE NOTE: Most sidewalks are assigned the same priority level as the adjacent roadway, but will have a different level of service and response time due to the availability of resources.**



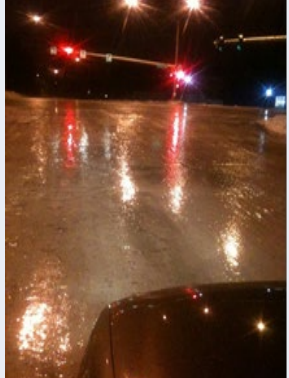


# Performance Targets



Performance Target	Performance Target Description	Illustration
<p style="text-align: center;"><b>A</b> (Good Winter Driving Conditions)</p>	<p>Bare pavement is the primary goal. Good winter driving conditions exist when snow and ice have been removed from the driving lanes and excessive loose snow has been removed from the shoulders and centerline of the highway. Short sections of ice and packed snow are acceptable and can be expected within the driving lanes between the wheel paths, as well as on centerline. Bare pavement may not be possible in the Northern and Central Region's during periods of extreme cold weather. Generally loose snow has been cleared and traction is good for most vehicles properly equipped for winter driving. If required for traction, 100% of roadway has sand present.</p>	
<p style="text-align: center;"><b>B</b> (Fair to Good Winter Driving Conditions)</p>	<p>Roads are passable with varying conditions. Drivers may encounter some standing water, packed snow and icy patches covering the surface. Generally loose snow has been cleared from the travel way and traction is adequate for most vehicles properly equipped for winter driving. If required for traction, sand applied to hills, curves, intersections, and bridge decks. LOS B represents a fair to good level of service, which ranges from targets of bare pavement as much as possible on higher-standard or highly traveled highways to snow-pack or icy conditions on northern region roads as well as on lower-standard or low-volume roads. Traffic moves at reduced speed, with isolated slowdowns or delays.</p>	



Performance Target	Performance Target Description	Illustration
<p><b>C</b> Fair to Poor Winter Driving Conditions)</p>	<p>Roads are generally passable with varying conditions. Drivers may encounter some standing water, loose snow, some snow drifts, packed snow and icy patches covering the surface. Patches of snow or ice exist even on the highest-standard roads, and these conditions may degenerate to predominately snow-packed or icy conditions throughout, with accompanying slowdowns or delays. On lower-standard or low-volume roads the surface is snow-covered (up to 2") with substantial traffic delays.</p>	
<p><b>D</b> (Poor Winter Driving Conditions)</p>	<p>Travel is challenging for most vehicles properly equipped for winter driving. Moderate snow accumulation on roads: up to 4". LOS D represents a marginal level of service where traffic moves slowly with substantial delays. Traction is marginal even for vehicles properly equipped for winter driving.</p>	
<p><b>F</b> (Hazardous Winter Driving Conditions)</p>	<p>Travel is not advised. Considerable snow accumulation on roads: 4" or more. Drivers may encounter snow drifts, berms, freezing rain, and glare ice. Traction is extremely poor even for vehicles properly equipped for winter driving.</p>	



# Honest Assessment

## MASTER Winter Events Snow & Ice Removal Event Worksheet

Event #	District	Camp	Foreman	Event Type Snow, Rain, or Combination	Total Inches	Event Start		Event End		Event Duration	Priority 1			Priority 2			Priority 3			Priority 4		
						Date	Time	Date	Time		Recovere d	Recovere d	Duration in Hours	Recovere d	Recovere d	Duration in Hours	Recovere d	Recovere d	Duration in Hours	Recovere d	Recovere d	Duration in Hours
1	Fairbanks	Montana Creek	Hendrickson	Snow	6.0	10/10/18	4:00 PM	10/11/18	5:00 AM	13:00			N/A			N/A	10/11/18	6:00 PM	13:00			N/A
2	Fairbanks	Montana Creek	Hendrickson	Freezing Rain	1.5	10/15/18	9:00 PM	10/16/18	8:00 PM	23:00			N/A			N/A	10/17/18	5:30 PM	21:30	10/18/18	6:00 PM	46:00
3	Fairbanks	Montana Creek	Hendrickson	Snow	4.0	10/19/18	2:30 PM	10/19/18	9:00 PM	06:30			N/A			N/A	10/20/18	6:00 PM	21:00	10/21/18	4:30 PM	43:30
4	Fairbanks	Montana Creek	Hendrickson	Snow	4.0	10/28/18	2:00 PM	10/29/18	3:00 PM	25:00			N/A			N/A	10/30/18	6:00 PM	27:00	10/30/18	5:00 PM	26:00
5	Fairbanks	Fairbanks	Davis	Snow	9.2	11/11/18	7:00 PM	11/14/18	11:30 AM	64:30	11/15/18	6:00 AM	18:30	11/15/18	6:00 PM	30:30	11/15/18	6:00 PM	30:30	11/16/18	6:00 AM	42:30
6	Fairbanks	Fairbanks	Davis	Snow	3.2	11/22/18	11:00 PM	11/23/18	11:00 AM	24:00	11/24/18	6:00 AM	07:00	11/26/18	11:00 PM	72:00	11/25/18	6:00 PM	43:00	11/26/18	6:00 AM	55:00
7	Fairbanks	Montana Creek	Hendrickson	Snow	4.0	11/09/18	4:00 PM	11/10/18	9:00 AM	17:00			N/A			N/A	11/10/18	6:00 PM	09:00			N/A
8	Fairbanks	Montana Creek	Hendrickson	Snow	12.0	11/11/18	4:30 AM	11/14/18	10:00 AM	77:30			N/A			N/A	11/15/18	6:00 PM	32:00	11/15/18	5:00 PM	31:00
9	Fairbanks	Montana Creek	Hendrickson	Snow	4.0	11/22/18	10:00 AM	11/23/18	5:00 PM	31:00			N/A			N/A	11/24/18	6:00 PM	25:00	11/24/18	5:00 PM	24:00
10	Fairbanks	Montana Creek	Hendrickson	Snow	3.0	12/09/18	1:00 PM	12/09/18	8:00 PM	07:00			N/A			N/A	12/10/18	6:00 PM	22:00			N/A
11	Fairbanks	Fairbanks	Davis	Snow	2.1	12/03/18	2:30 AM	12/03/18	3:00 PM	12:30	12/03/18	6:00 PM	03:00	12/05/18	6:00 AM	39:00	12/05/18	6:00 PM	51:00	12/05/18	6:00 PM	51:00
12	Fairbanks	Fairbanks	Davis	Snow	3.2	01/02/19	10:00 AM	01/03/19	6:00 AM	20:00	01/04/19	6:00 PM	36:00	01/04/19	6:00 PM	36:00	01/04/19	6:00 PM	36:00	01/04/19	6:00 PM	36:00
13	Fairbanks	Montana Creek	Hendrickson	Snow	3.0	01/02/19	10:00 AM	01/03/19	3:00 AM	17:00			N/A			N/A	01/04/19	6:00 PM	39:00			N/A
14	Fairbanks	Montana Creek	Hendrickson	Snow	5.0	01/25/19	6:00 AM	01/25/19	11:00 PM	17:00			N/A			N/A	01/26/19	6:00 PM	19:00			N/A
15	Fairbanks	Fairbanks	Davis	Snow	3.0	01/25/19	3:00 PM	01/26/19	9:00 AM	18:00	01/28/19	6:00 AM	45:00	01/28/19	6:00 AM	45:00	01/28/19	6:00 AM	45:00	01/27/19	6:00 PM	33:00
16	Fairbanks	Montana Creek	Hendrickson	Snow	7.0	02/03/19	5:00 AM	02/04/19	7:00 PM	38:00			N/A			N/A	02/06/19	6:00 PM	47:00			N/A
17	Fairbanks	Montana Creek	Hendrickson	Snow	2.0	01/28/19	6:00 PM	01/29/19	3:00 PM	21:00			N/A			N/A	01/30/19	4:00 PM	25:00	01/30/19	3:00 PM	24:00
18	Fairbanks	Montana Creek	Hendrickson	Snow	2.0	02/08/19	5:00 PM	02/08/19	9:00 PM	04:00			N/A			N/A	02/09/19	6:00 PM	21:00			N/A
19	Fairbanks	Fairbanks	Davis	Snow	5.8	02/11/19	6:00 PM	02/13/19	5:00 PM	47:00	02/14/19	6:00 AM	13:00	02/14/19	6:00 AM	13:00	02/15/19	6:00 AM	37:00	02/15/19	6:00 AM	37:00
20	Fairbanks	Montana Creek	Hendrickson	Snow	6.0	02/17/19	11:00 PM	02/19/19	7:00 PM	44:00			N/A			N/A	02/20/19	6:00 PM	23:00			N/A
21	Fairbanks	Montana Creek	Hendrickson	Snow	5.0	02/11/19	10:00 PM	02/13/19	5:00 AM	31:00			N/A			N/A	02/14/19	5:30 PM	36:30	02/14/19	4:30 PM	35:30
22	Fairbanks	Fairbanks	Davis	Snow	3.4	02/17/19	10:00 PM	02/18/19	1:00 PM	15:00	02/19/19	6:00 AM	17:00	02/19/19	6:00 PM	29:00	02/20/19	6:00 AM	41:00	02/20/19	6:00 AM	41:00

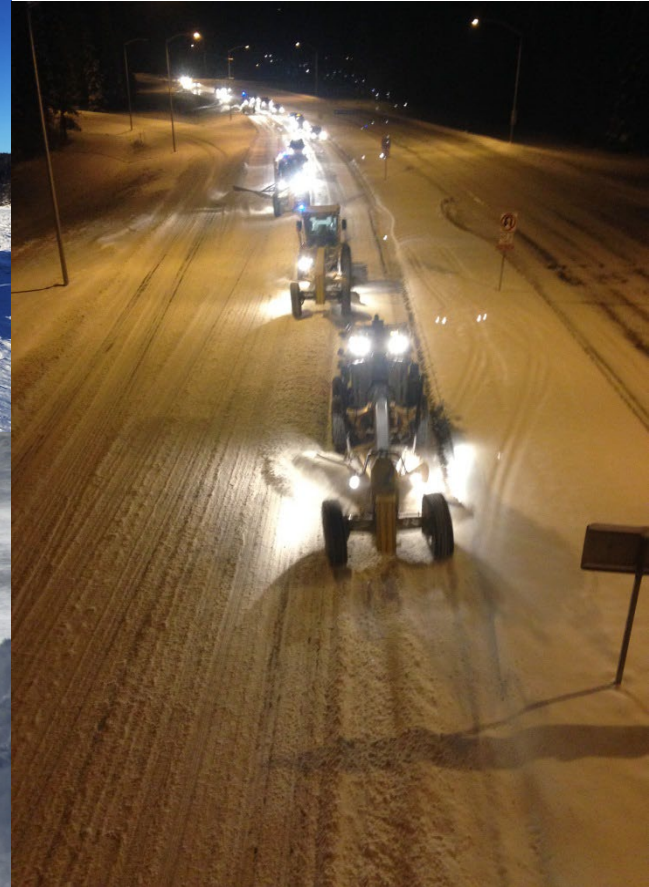


# Levels of Service- the Future

- Needs ongoing dialogue – not only in terms of formal review but also in terms of in-storm expectations
- As maintenance budgets increase or decrease, a thorough review is needed
- Yes, it is political, but it is necessary...



# Equipment- the Past





# Equipment- the Present

- Technology is changing at a rapid pace – Including our equipment
- Analyze/implement technology
- Train/educate
- Provide the tools
- Thinking outside the box
- Willing to take a chance – possibly fail
- Customer expectations are changing and becoming more demanding – the Answer: innovate

# Winter Maintenance Efficiencies

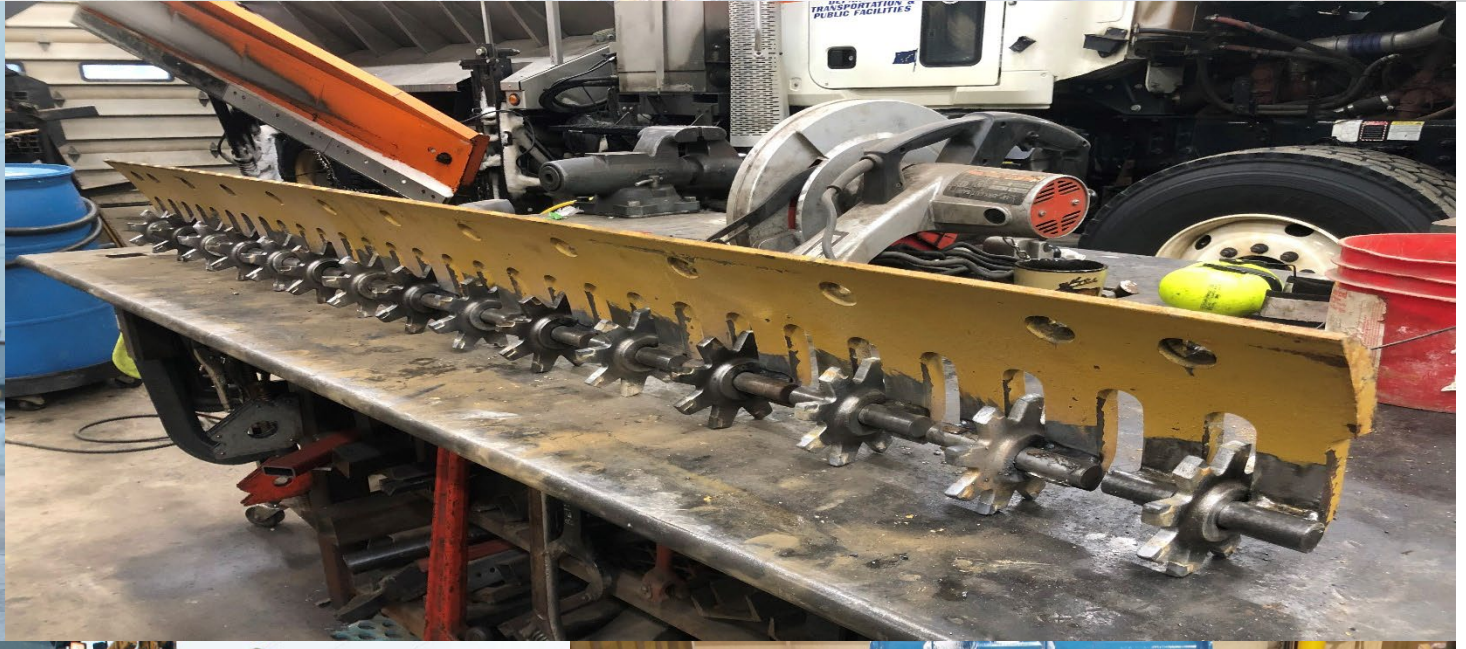
- Road Priority Assessment
- Smart Snowplows
- Snow Plow Efficiencies
  - Expandable Plow
  - Finger Plow
  - Towplow
- Expanding Highway Anti-icing Program
  - 12 Enhanced Salt Brine Units
- Ice Breakers
- Jet Truck
- Mobile Weather Detection System
- 68 RWIS Installations
- Alaska Specific eMDSS



# Recurring Challenges



# Innovations





# Proactive Anti-Icing Program



# Implementation of Cutting Edge Technology

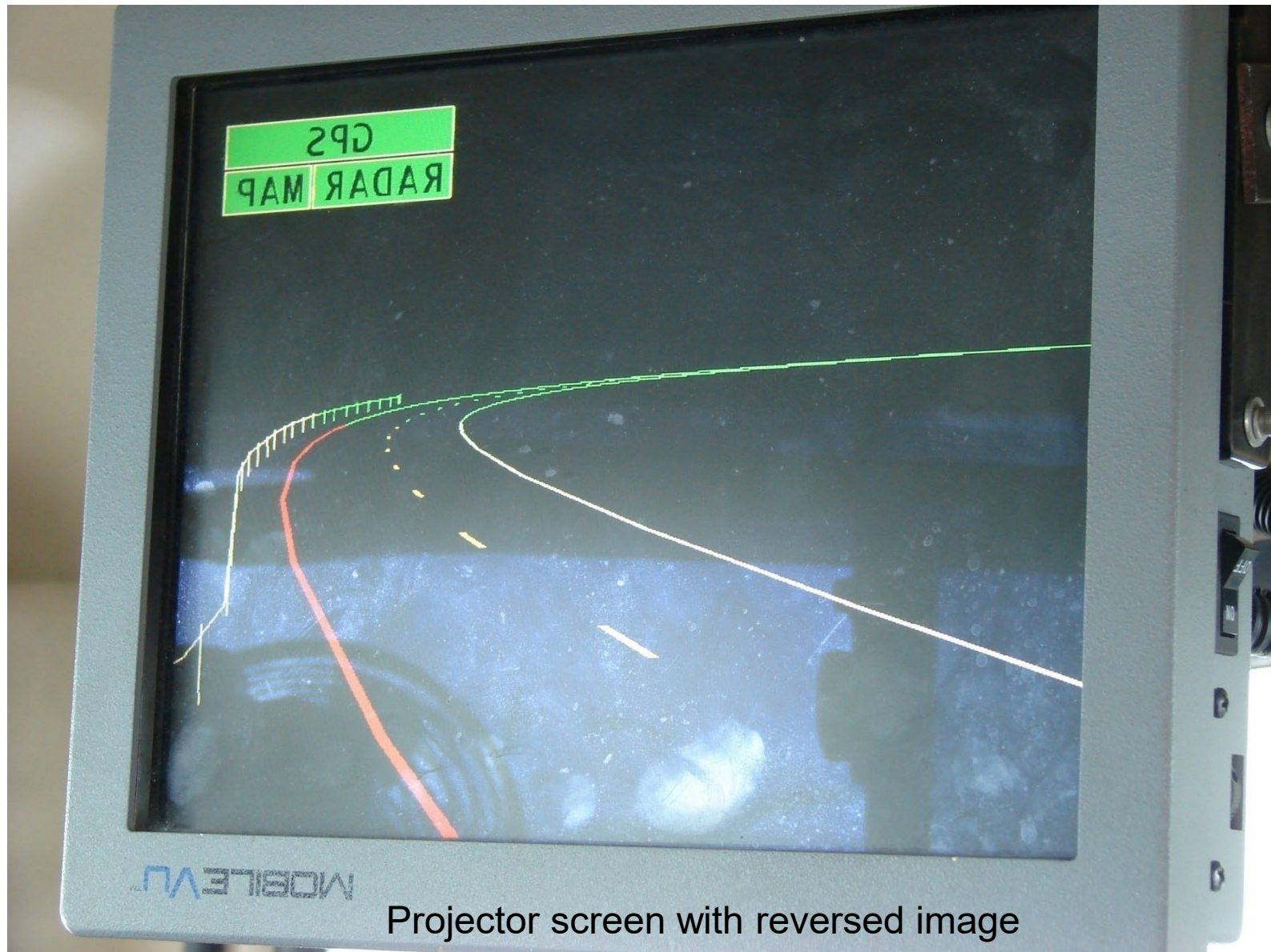


**Alaska's Smart Vehicle System**





# Heads up Display



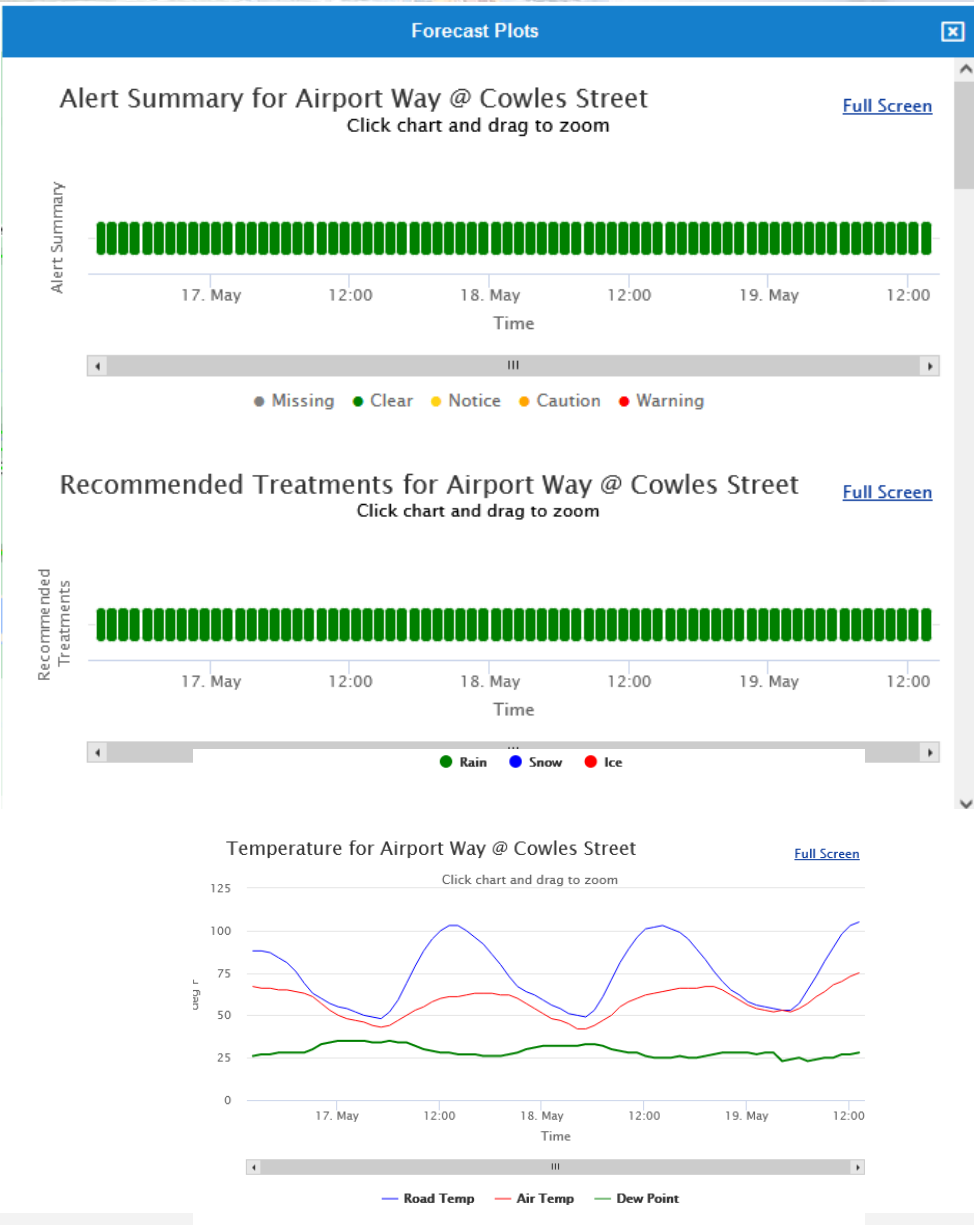
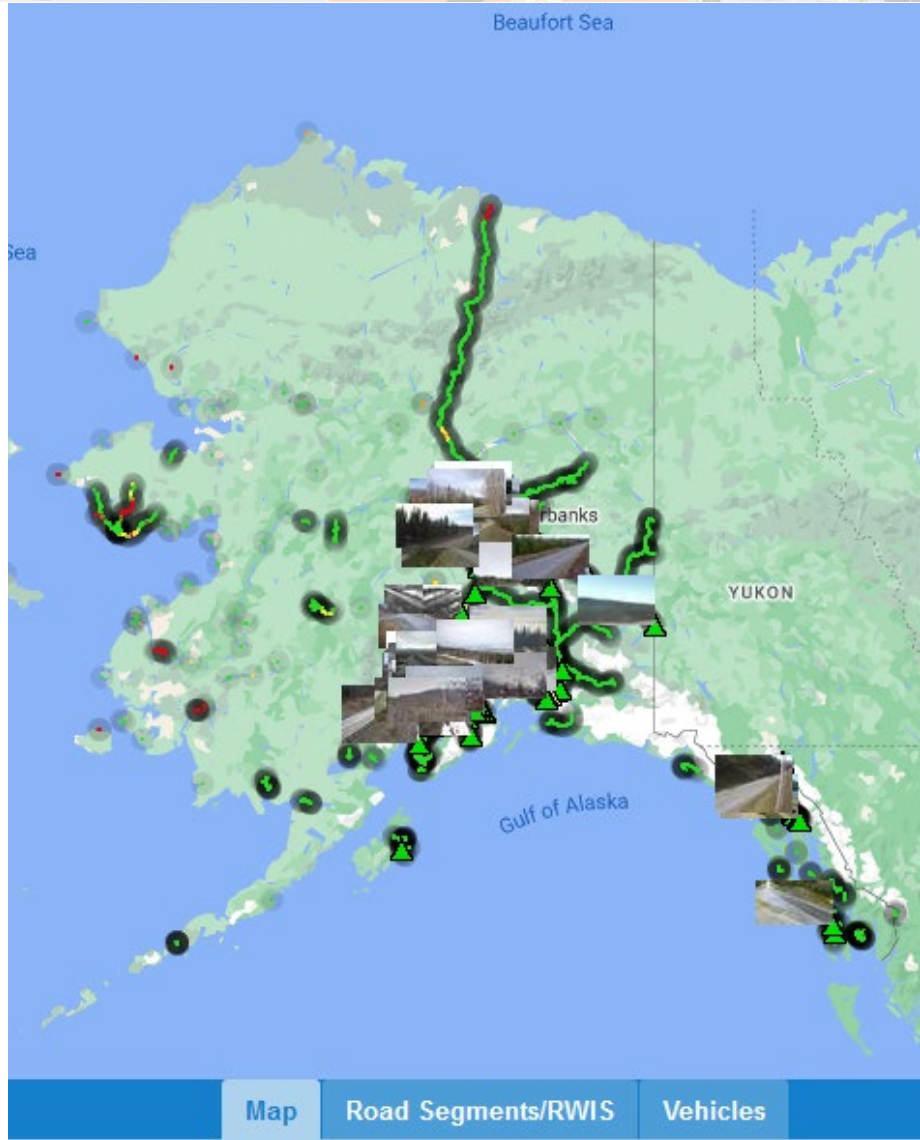
Projector screen with reversed image



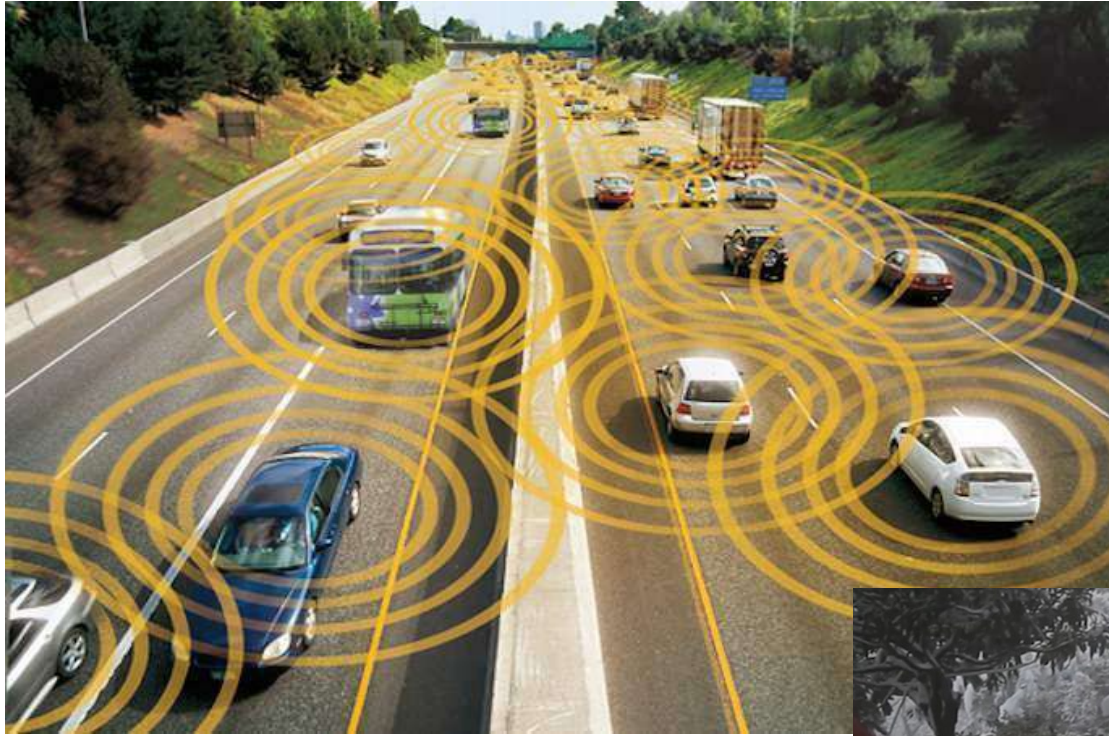
# Start up Technology



# Alaska Specific MDSS



# Equipment- the Future?



# Training- the Past

- No coordinated Training Program – technical or leadership
- Each maintenance station responsible for their own training- “here are the keys...”
- 1993 Maintenance Manual – *No one knew about it*





# Training- the Present

- Statewide Training DVD's and Webinars
- Computer based training – YouTube, etc
- Utilize vendor training – often free
- Created New Maintenance Handbook
- Alaska Maintenance Leadership Academy
- NHI Maintenance Leadership Academy
- Statewide M&O Meetings
- Cross Training
- After Action Reviews and Training



YouTube

# Training- the Future?

- Continue DVD Development but encourage more “Hands-on-Training”
- More consistent training across Maintenance Stations/Districts/Regions
- Designated Trainers in each District
- Expand cross training opportunities
- Mentoring
- Certificate Programs
- Training Academy?



# Statewide Communication and Coordination- the Past

- Limited communications and coordination between districts and almost none between regions
- No consistent Level of Service
- No consistent definition of road conditions
- No sharing of solutions/successes



# Statewide Communications and Coordination- the Present

**THE GREAT STATE of ALASKA**  
**Traveler 511 info AK**  
Alaska Department of Transportation and Public Facilities  
**KNOW B4 U GO**

myAlaska Departments State Employees  
Sign Up Log In Statewide  
511 Map News Text View My 511 Links About

**ALERTS** Parks Hwy to close at MP 199 on Wednesday, May 17th from 9:00am-1:00pm for military exercise.

**MY ROUTES**  
A Starting Point  
B Destination  
Reset  
[Need help with 511 website?](#)

**MY CAMERAS**  
Please login to customize My Cameras.  
Richardson Highway @ Edgerton Highway MP 82.7

**Map Legend**  
Clear All  
 Road Conditions  
No Report Good Fair Difficult  
Very Difficult Hazardous Road Closure No Winter Maintenance  
 Mountain Passes  
 Traffic Speeds  
 Seasonal Loads  
 Mileposts  
 Incidents  
 Roadwork / Maintenance  
 Closures  
 Weather Incidents  
 Special Events  
 Waze Reports  
 Waze Incidents





# Social Media



Alaska Department of Transportation & Public Facilities

November 18, 2018

We've got a little bit of weather moving in to start the week! #Fairbanks: you've got a slight chance of freezing rain and expected snow Monday. The Richardson, Glenn, and Tok Cutoff Highways near Glennallen, Gakona, Copper Center, and between Delta and Paxson are difficult to hazardous with freezing rain.

DOT&PF crews are working the roads to make them safer and they're preparing for what's to come. What are you doing to prepare?

[511.alaska.gov](http://511.alaska.gov) | [dot.alaska.gov/winter](http://dot.alaska.gov/winter)



alaska\_dotpf  
Fairbanks, Alaska

alaska\_dotpf Check out this bird's eye view of University Avenue in #Fairbanks! This photo was taken by our Fairbanks signals and lighting foreman, Eric Slay, this week while he repaired a fixture and replaced a 400 watt high pressure sodium bulb. Eric worked from a bucket truck as temperatures hovered around zero degrees. Does your office feel a little warmer now? #winterinalaska #alaska #zerodegrees #outsideoffice #alaskastrong northerngospel Thanks for keeping the lights on! What is timetable for led replacements?

tylerkramer I swear the people who control the traffic light timers take the bus ericslay @northerngospel within the next 3-5 years everything should be LED.

Alaska DOT&PF  
@AlaskaDOTPF

New Year's Eve driving conditions are a little dicey out there, Alaska! Warmer temps are making some roads slick. If you plan to go out and celebrate tonight, make sure you have a designated driver! Don't take any chances on our winter roads. [511.alaska.gov](http://511.alaska.gov)



# Statewide Communications and Coordination – the Future?

- Expanded statewide coordination and cross-training
- Cross boundary infrastructure and procedure reviews
- 511 real time GPS tracker
- Track a Plow?
- Real time updates
- Data based decision making
- Interactive cameras

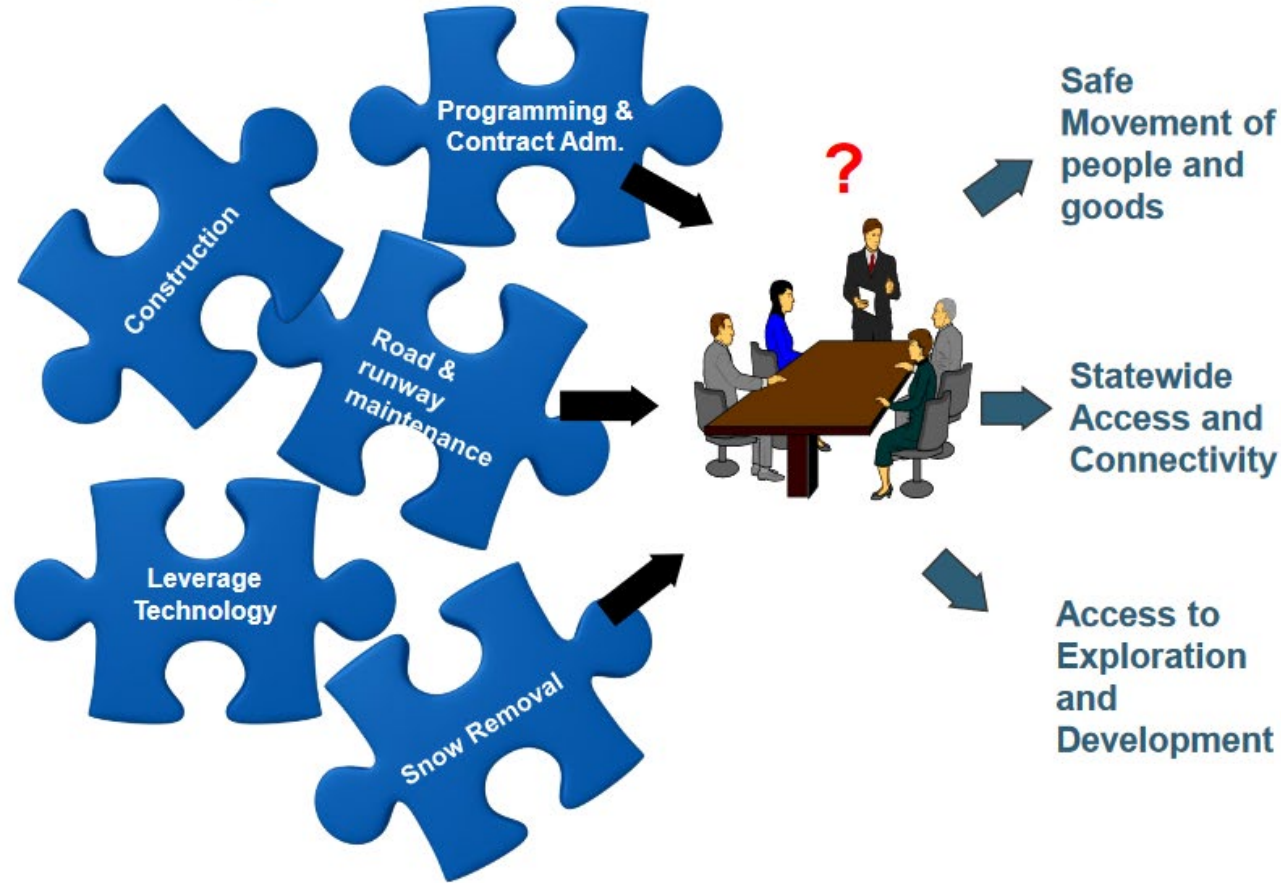
# Service Delivery- the Past

- Mission Statement “Provide for the Movement of People and Goods and the Delivery of State Services.”
- Successful year- “We spent ALL of the funds we were allocated!”



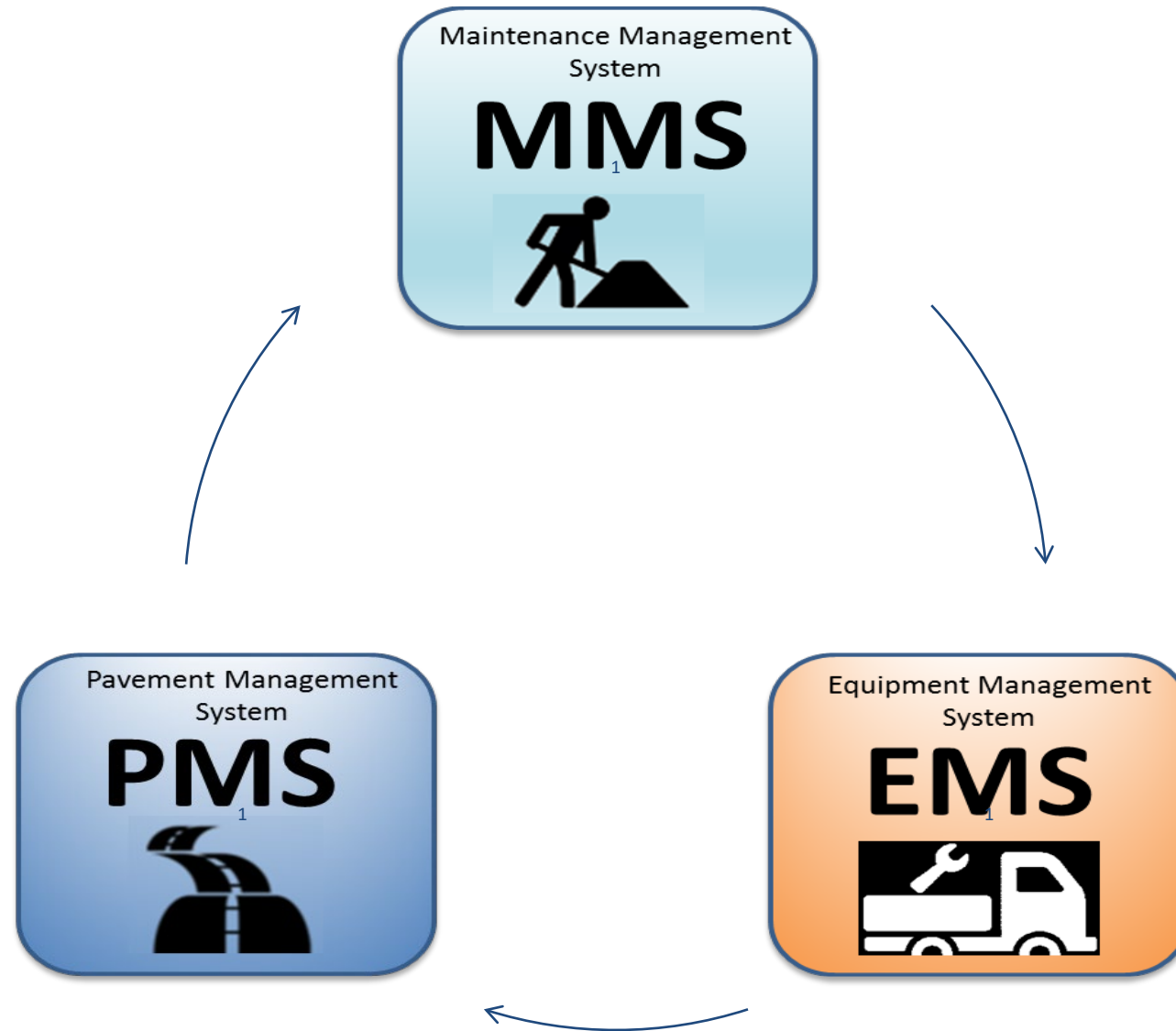
# Service Delivery- the Present

Investing in RESULTS, not Activities



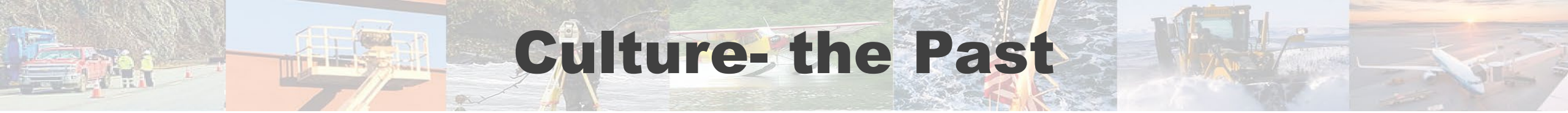


# Service Delivery- the Future?



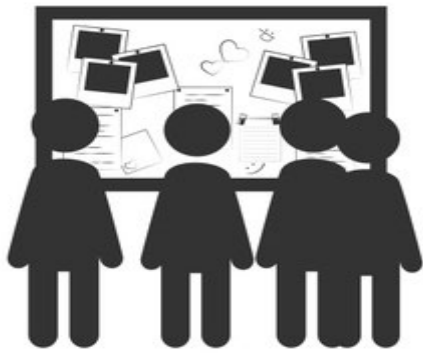
# Culture- the Past

- Poor labor relations
- Lack of communication
- “Top-down” management philosophy
- Discipline as the “motivator”
- “Always done it this way” syndrome
- Egos
- Fear of subordinate skills/knowledge
- No Succession Planning or Mentoring



# Culture- the Present

- Adopted Servant Leadership Philosophy
- Employee Engagement at all levels
- Developed Department-wide Core Values
  - Integrity, Excellence, Respect, Safety
- Employee Recognition
- Ideas Program
- Allow Mistakes without overall failure

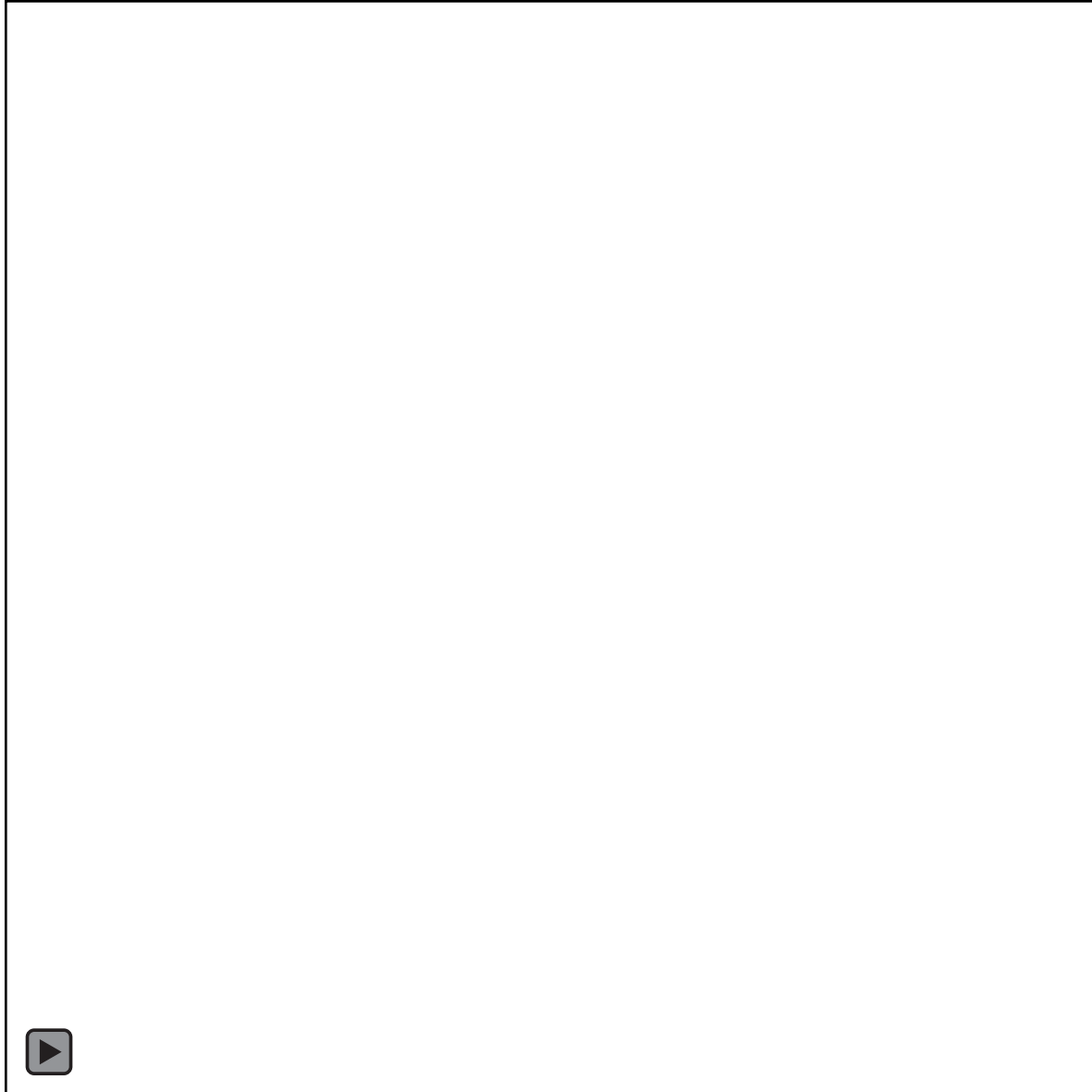
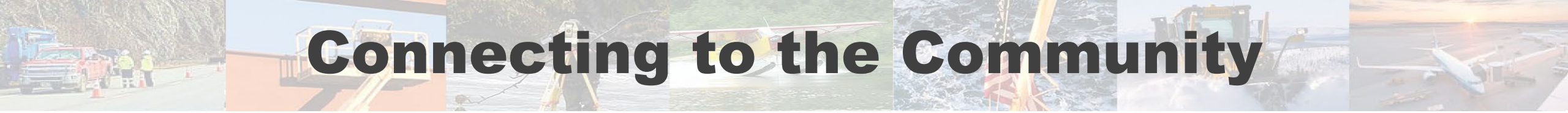


# Culture- the Future?

- Culture change takes time
- Small steps will lead to great strides!
- More staff involvement in the decision making process
- Empower all levels of the organization
- Invest in Respect
- Embrace Respectful Conflict
- Consistency



# Connecting to the Community



# Questions?

