



Introduction to Managing Road Dust

ITEP Road Dust Management Series: Webinar 1 of 4



May 28, 2020

Acknowledgments



ALASKA NATIVE
TRIBAL HEALTH
CONSORTIUM





Facilitator

Mansel A Nelson

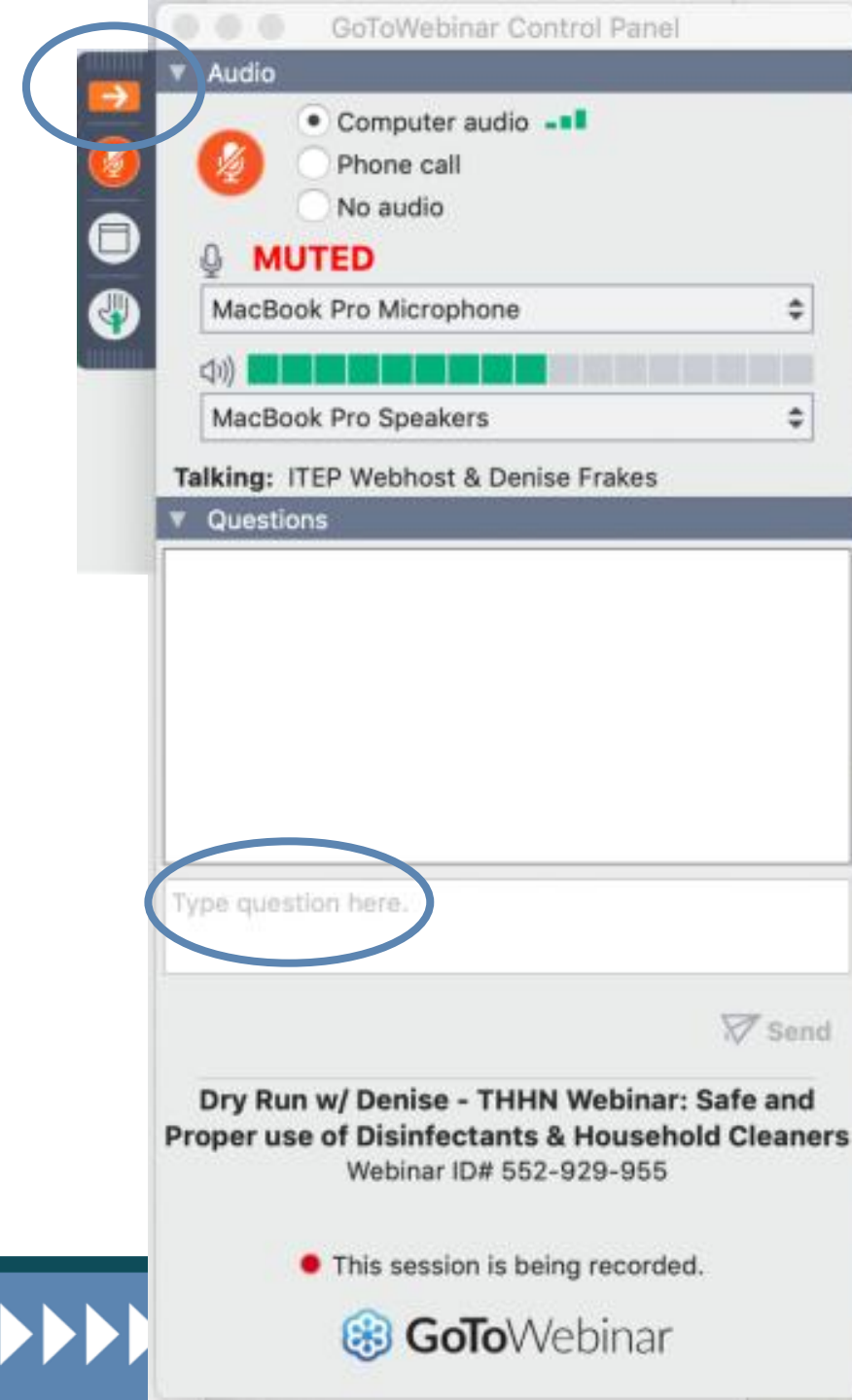
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Welcome to Today's Webinar

If your webinar control panel on the upper right side of your screen is minimized, you can click on the orange arrow on the grab tab **to access the audio and questions box.**



Webinar Logistics



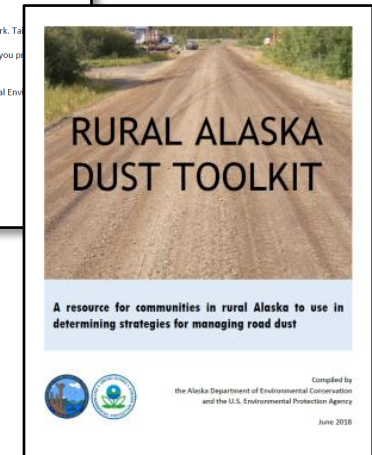
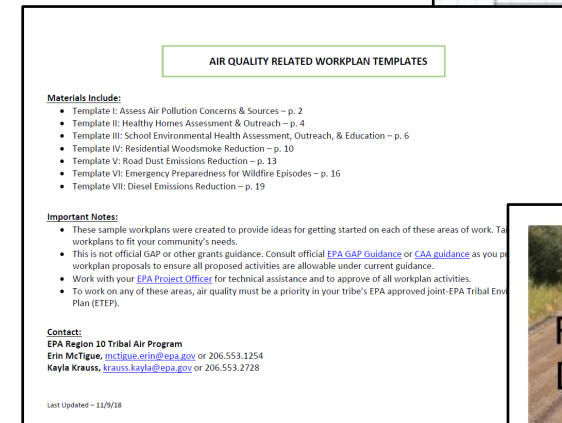
- Webinar is being recorded
 - URL for the recording will be in post-webinar email
- Questions
 - Use the Question box in the control panel to submit questions any time
 - If joining by phone only, you can text your questions to 928-221-1222 or email your questions to gay.santina@epa.gov
 - Questions will be answered at the end of the webinar
- Please complete the webinar feedback survey
 - Link for the feedback survey will be in post-webinar email
- Training Certificates are available for everyone who completes all 4 webinars



Webinar Materials

The following materials from the webinar will be available by URL, which will be sent in the post-webinar email:

- Presenter bios
- Slides from Webinar #1
- Flyer for Webinar #2
- Rural Alaska Dust Toolkit
- Road dust workplan templates for GAP
- Educational materials for K-12 science activities



Presenters



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Poll 1

Which of the following best describes your role?

- IGAP or other Environmental Staff
- Transportation Coordinator
- Community or Tribal Leader
- Federal and State Partner
- Other



Poll 2

In what region is your community?

- Southeast, Aleutian and Pribilof Islands, Upper and Lower Cook Inlet, Kodiak Area, Bristol Bay
- Yukon-Kuskokwim
- Interior
- North Slope, Northwest Arctic
- Other





Getting Started:

Dust management approaches and the importance of reducing road dust



Webinar Overview

- Importance of reducing road dust, sources, and dust management approaches
- Institutional controls for managing road dust
- Changing behaviors through community education and outreach
- Other considerations (to be covered further in Webinars 2-4)
 - Road design, maintenance, monitoring, and dust suppressants
 - Funding and partnerships
 - Engaging community leaders
 - Case studies
- Q&A



What starts on the road, ends in your lungs...





Benefits of Reducing Dust

HEALTH

- Breathing dust, and any contaminants that may have mixed with it, aggravates respiratory conditions

SUBSISTENCE

- Dust may be blown onto fish racks or subsistence foods near the road

ENVIRONMENTAL

- Dust ends up in streams, covers vegetation, and adds particulate matter to the air

SAFETY

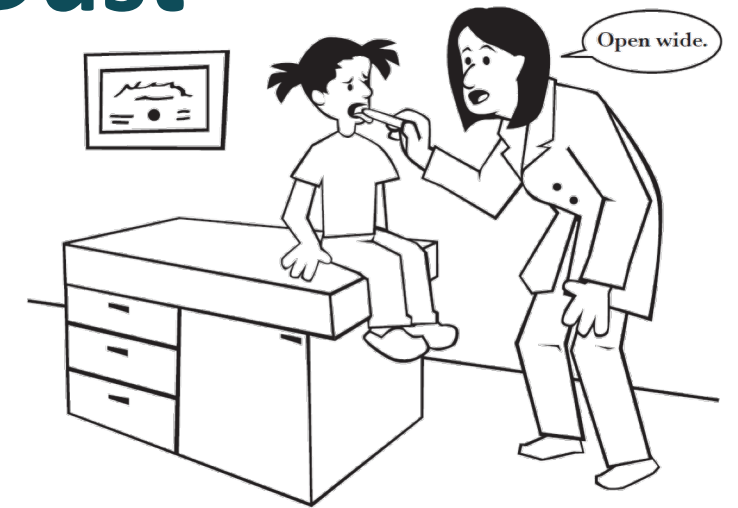
- Visibility and road safety issues can arise from airborne dust

FINANCIAL

- Roads and road material are an investment that can be blown away; dust also eats away at vehicles

QUALITY OF LIFE

- Dust is a nuisance!



Too much dust can make me sick.

3



Too much dust can make the fish sick.



Sources of Dust

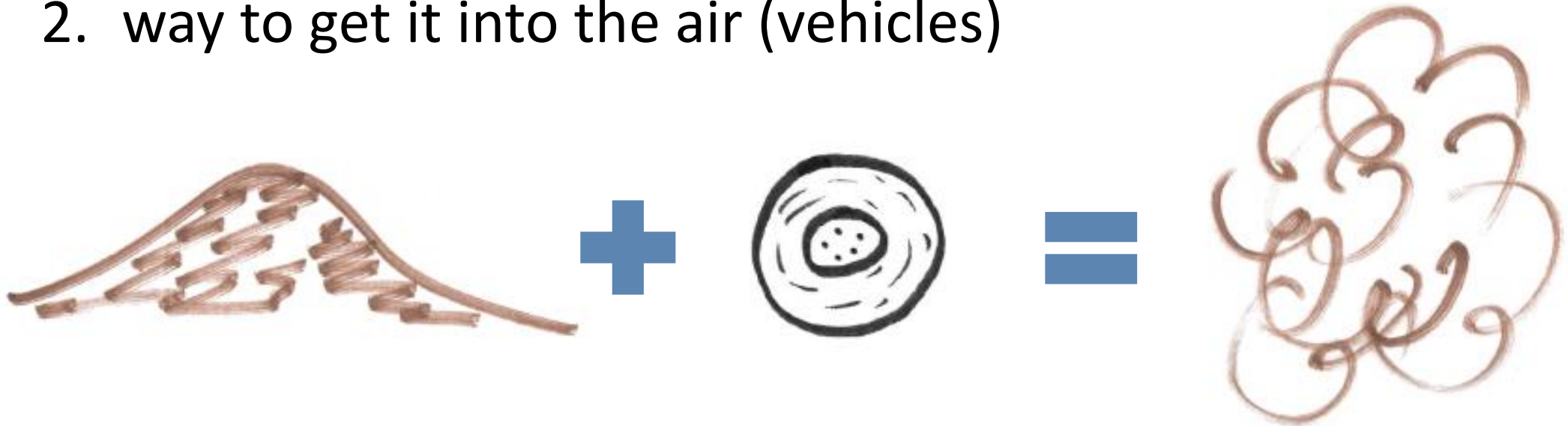
- **Vehicles** and ATVs on unpaved roads
- **Human activities** (such as driving or construction) on areas without vegetation
- **Wind** blowing across unpaved roads, runways, gravel pits, and dry riverbeds



Reducing Road Dust

Need to address at least one of the two causes of dust:

1. Source of dust (road)
2. way to get it into the air (vehicles)



Recommended Dust Management Approaches

Level 4: ~3% of communities

51-61 dusty days (May-Sept)
> 500 vehicles/day

Level 2: ~50% of communities

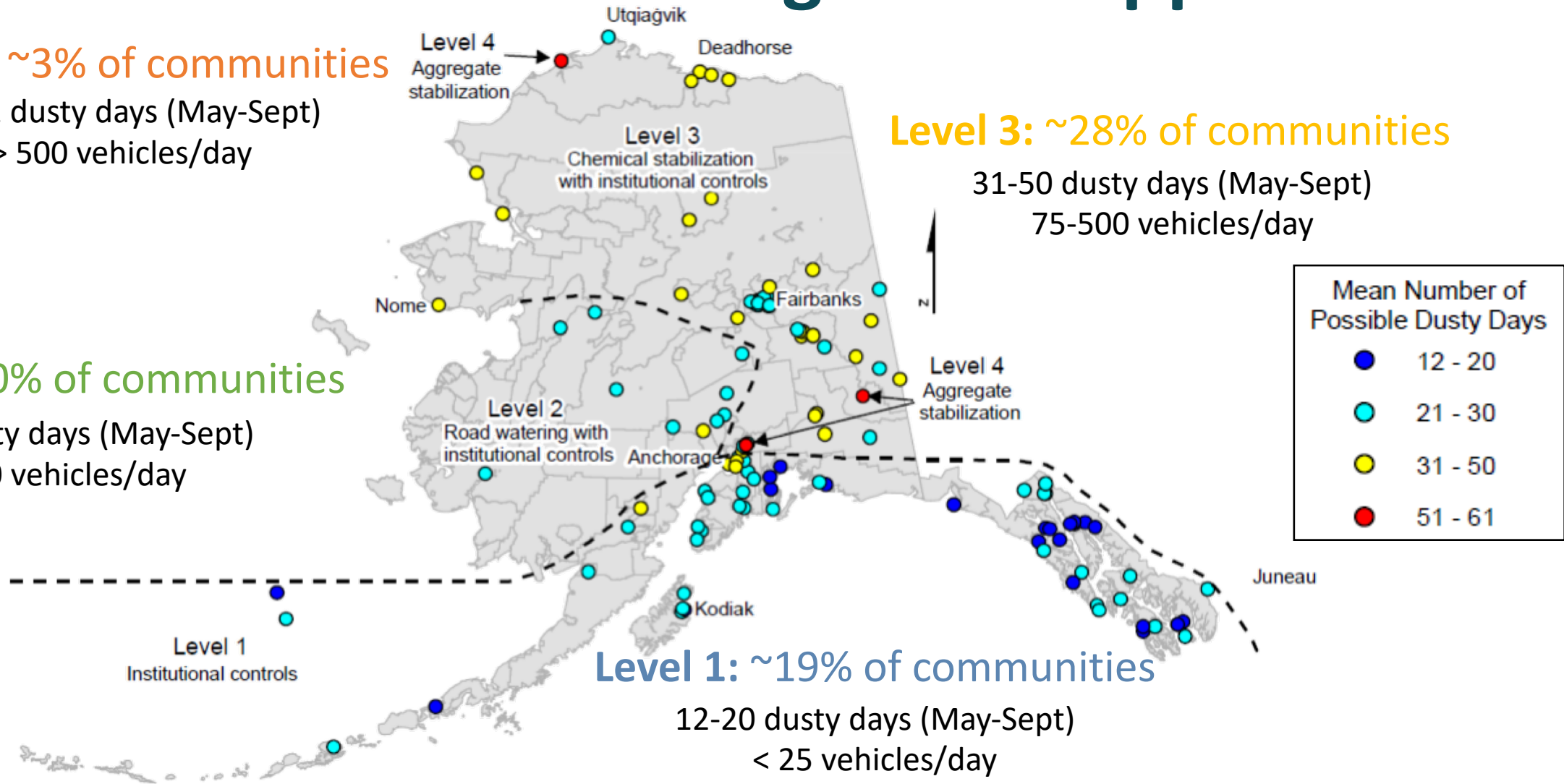
21-30 dusty days (May-Sept)
25-50 vehicles/day

Level 3: ~28% of communities

31-50 dusty days (May-Sept)
75-500 vehicles/day

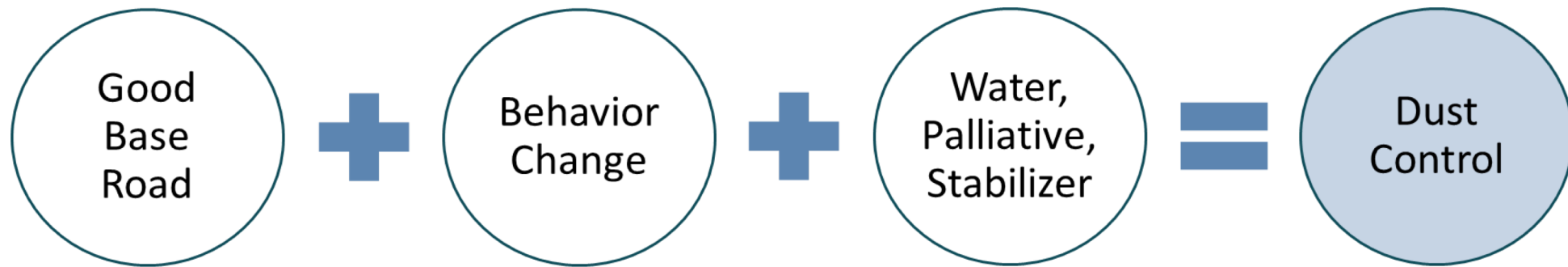
Level 1: ~19% of communities

12-20 dusty days (May-Sept)
< 25 vehicles/day



Additional Considerations

- The appropriate level of dust management will vary by climate, region, soil type, and traffic
- These approaches should build on each other
- Good road design and maintenance, paired with behavior change, are key components of dust management at all levels



*Communities can have **immediate impacts** by supporting behavior change and starting with a good base road.*



Poll 3

Which impact of road dust are you and your community most concerned about?

- Public health
- The environment and/or subsistence resources
- Pedestrian, driver, and road safety
- Community quality of life
- Other



Poll 4

How is your community currently managing road dust? (select all that apply)

- Education and outreach on the impacts of road dust
- Encouraging slower driving speeds and other behaviors
- Road watering
- Chemical dust suppressants
- Other or none





Level 1 Dust Management: **Driving Behaviors and Institutional Controls**



Assessment of Roads and Capacity

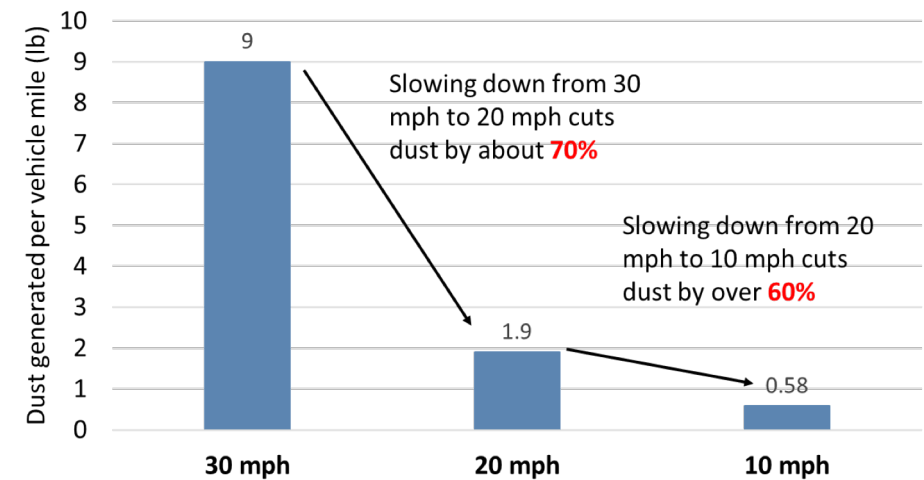
- Identify heavy use roads and streets
- Estimate speed on primary streets
- Locate areas where people gather
 - Store, Post Office, school, clinic, church
- Locate sensitive populations
 - Elderly
 - Respiratory conditions
- Inventory road condition
- Prioritize and focus
- Observe and adjust



Slow Down and Consider Setting Speed Limits



- Increasing speed from 10 to 20 mph \cong 2x as much dust
- Increasing speed from 20 to 30 mph \cong 3x as much dust





Eliminate Aggressive Driving

- Rapid starts and stops damage the road and creates dust
- Sharp turns and acceleration up hills damages the road and creates dust
- Slowing down helps road treatments that reduce dust last longer



Walk Instead of Drive

- Choosing alternatives to driving reduces dust
- Stay healthy by walking





Reduce Unnecessary Trips

- Combine trips when possible
- Think about why you are making the trip
- Park and walk
- Limit driving on the dustiest days



Other Practices

Cover loads



Please Dad, let's cover the load.

Don't drive on dry riverbeds or in the river



Please Brother, don't drive in the river.
Cloudy water is hard for fish to breathe.



Poll 5

Which of the following do you have in your community? (select all that apply)

- Approved speed ordinance
- Posted speed signs
- Enforced speed limits
- None
- Not sure





Level 1 Dust Management:

Changing Driving Behaviors through Community Engagement and Outreach

Driver Behavior is Important

- Communities can reduce dust without making significant changes to the road or expensive purchases
 - Slow down when driving
 - Eliminate aggressive driving
 - Drive less
- These practices can be implemented immediately
- Low cost



Community Engagement and Support

- Slowing down and other dust-aware driving behaviors requires individuals to make new choices
- Getting and keeping the community engaged in discussions about dust management means finding unique ways to communicate
- Think about what type of engagement approach works best for your community
 - Community engagement is hard, and every community is different!
 - Behavior change takes time...

Community support is critical for successful dust management!



Hold a Community Meeting

- Share why these changes are important—educate your community about the health effects of dust and how slowing down and other behavior changes reduces road dust
- Ask youth, elders, and tribal leadership to share their observations, ideas, and concerns about dust
- Discuss how the community is impacted by dust and what actions everyone would be willing to take
- Follow up on suggestions that are the most workable and keep the community informed about progress



Modifying Driver Behaviors and Changing Community Norms

- What's the norm in your community?
- Think about and discuss motivations for driving at different speeds
 - Why do people drive at the speed they currently do?
 - Do they want to drive slower? Why or why not?
 - What's their motivation to make a change?
- Talk to residents about why these alternatives may be challenging and what the community can do to overcome those difficulties



Communication Strategies

- Communicating your new dust management strategy is an important part of getting the community involved
- Consider using some of the following:
 - Radio announcements
 - TV announcements
 - Newsletter or newspaper articles
 - Flyers
 - Letters and emails
 - Social media



Community Outreach Ideas

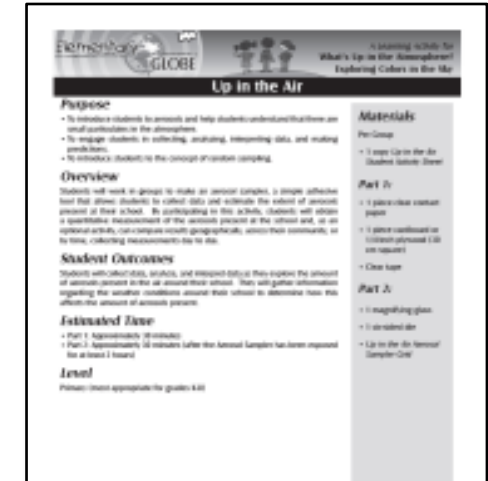
- Demonstrate dust-aware driving behaviors
- Host a public health presentation
- Go door-to-door to talk to community members about road dust
- Measure speeds of vehicles and take dust photos
- Post “slow-down” signs in residential areas



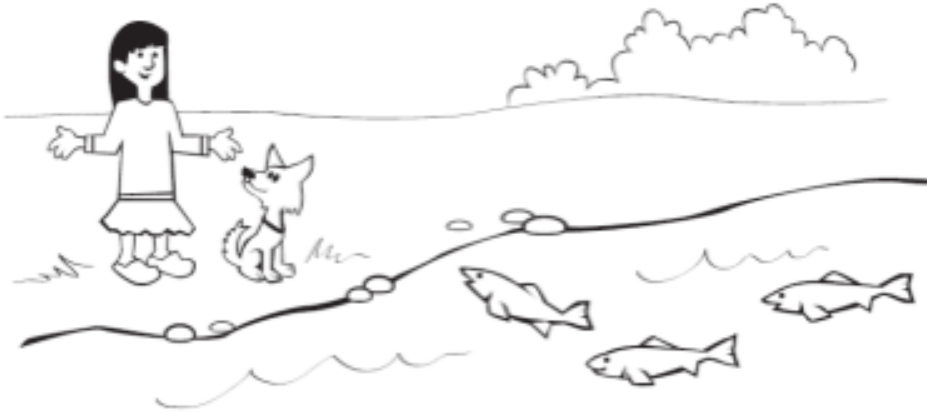
School/Youth Activities

Include youth in:

- Making road signs and developing slogans
- Creating social media posts and videos
- Measuring speeds, measuring dust, and participating in dust demonstrations
- When youth are learning to drive, teach them good driving habits like gentle acceleration and braking



Engaging Kids and Adults



1. _____
2. _____
3. _____
4. _____
5. _____

Ask your friends and family how they can reduce dust. Make a list.



1. _____
2. _____
3. _____
4. _____
5. _____

Where are the dusty places in your village? Make a list.



Tools and Outreach Materials

Dust Activity Book for Kids (DEC)

<http://dec.alaska.gov/air/doc/dust-activity-book.pdf>

Dust Radio Commercial (DEC)

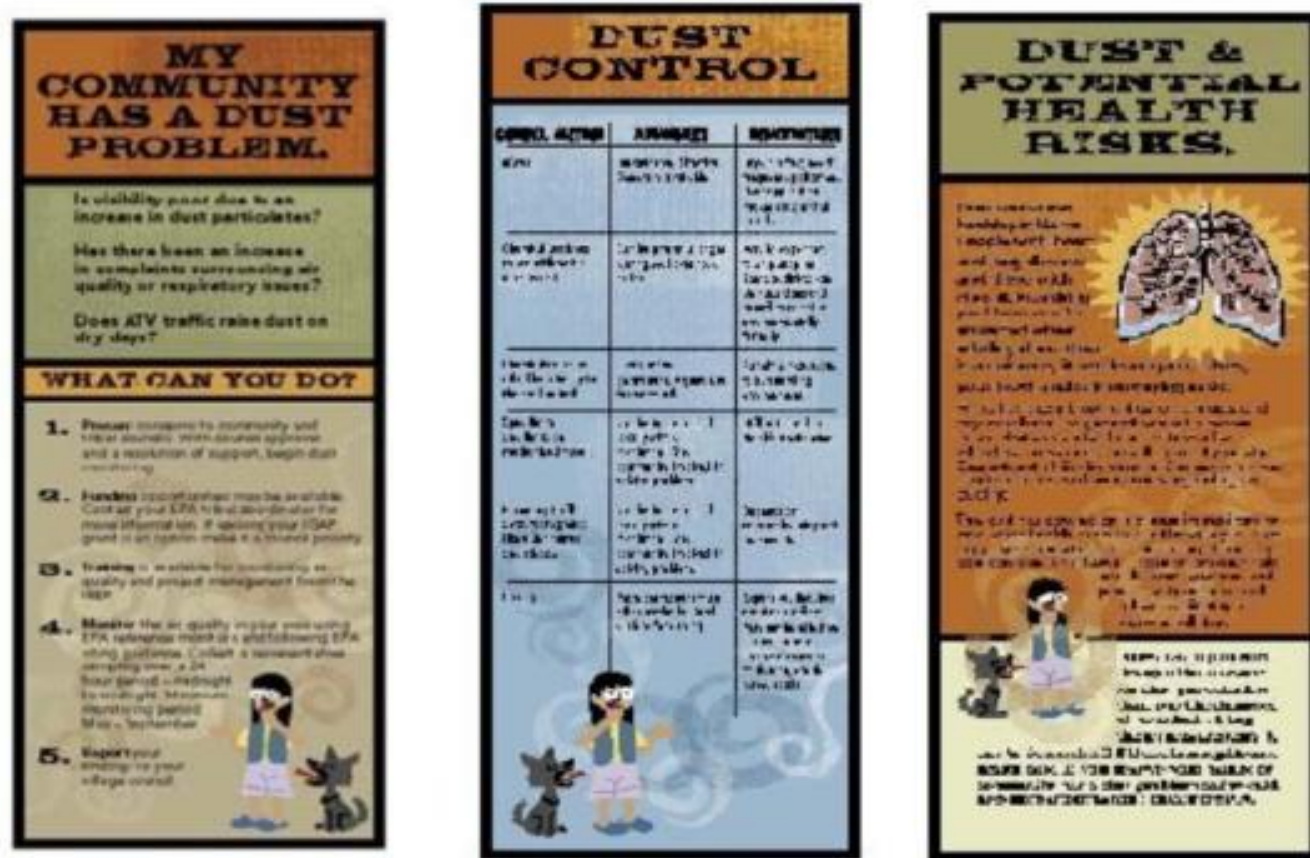
<https://dec.alaska.gov/air/anpms/doc-anpms/Clear the Air.mp3>

Dust Fact Sheet (EPA)

<https://nepis.epa.gov/Exe/ZyPDF.cgi/P100IDLO.PDF?Dockkey=P100IDLO.PDF>

This is a "RURAL ALASKA DUST COMMUNITY SELF-ASSESSMENT" form. It contains various sections for community information, road conditions, and dust control measures. The form includes fields for community name, population, and road conditions. It also has sections for "Road Dust", "Road Dust Control", and "Road Dust Monitoring". The form is designed to be filled out by a community to assess its dust problem and identify control measures.

Dust Pamphlets (DEC)



<https://dec.alaska.gov/air/anpms/pm/dust.htm>

Dust Videos

TV Dust Commercial (DEC)

<http://dec.alaska.gov/air/anpms/pm/video/dust.htm>



Keep the Dust Down (DEC)

<https://www.youtube.com/watch?v=yLgeaN9YoN8>

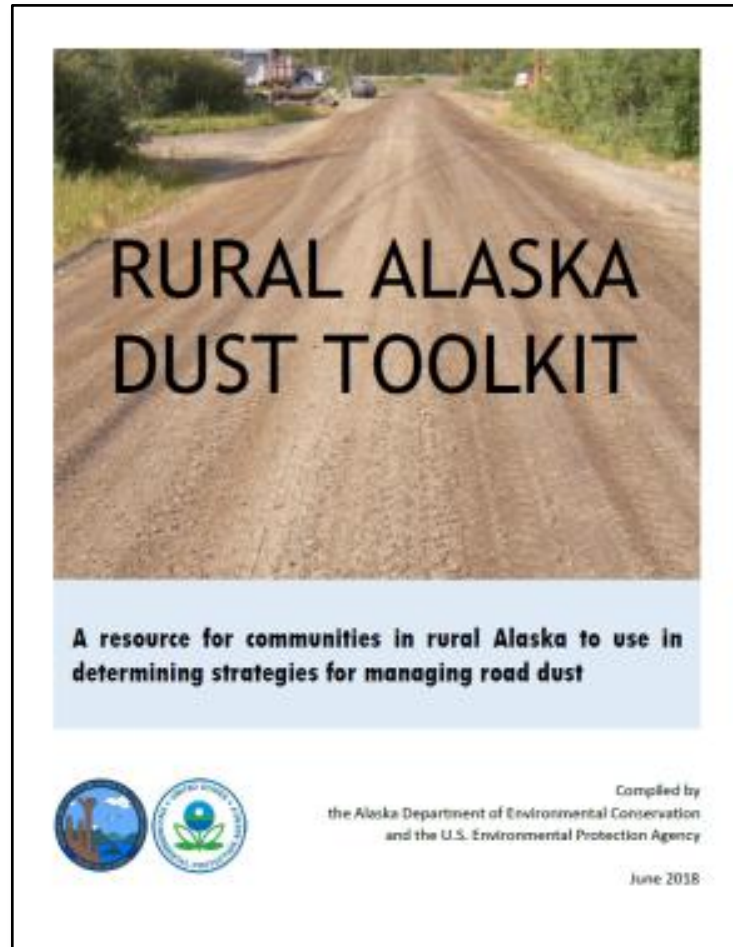


Clean Air, Healthy Villages: Road Dust (EPA)

<https://www.youtube.com/watch?v=7Jghut7waR4>



Dust Toolkit



Toolkit Sections

1. Self-Assessment
2. Behavior Change
3. Road Design and Maintenance
4. Dust Suppressants
5. Dust Monitoring
6. Funding Guide
7. Contacts and Resources

<http://dec.alaska.gov/media/6390/final-dust-toolkit-061518.pdf>



Reinforcing New Driving Norms

- Celebrate improvements and community champions
- Add speed bumps to the road
- Post an electronic speed sign so people get immediate feedback
- Know your legislative ability to establish and enforce a speed ordinance
 - Does your Council (Tribal, Village, Municipal, City) have legislating powers?
 - Do you know what class of city or municipality you are?
 - Are you in an Organized or Unorganized Borough?
 - Do you have authority over the roads in question?
 - Do you know what other rights/obligations you have under AK State Law?

Developing and Enforcing Speed Limits

- Speed limits can help support education and outreach efforts
- Know the difference between different types of speed signs:
 - A yellow sign indicates a suggested speed limit (not legally binding)
 - A white sign indicates a legally binding speed restriction

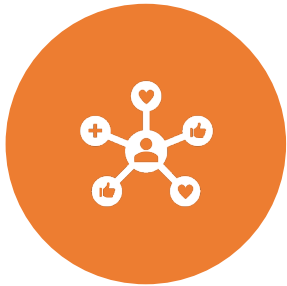


- If you have attempted to use yellow signage in heavy dust areas to reduce road dust without success, it might be time to pass a speed ordinance
 - Ensure your community has legal status to enforce binding speed limits
 - Once instituted, assign either a Police Officer or Peace Officer to enforce the speed restrictions



Managing Expectations

Behavior change is hard and will take time...



Be mindful of what's possible to do with the resources available



Understand community limitations



Don't promise more than you can deliver



Develop a multi-year improvement plan and sustain efforts



Poll 6

**What kinds of roads do you have in your community?
(select all that apply)**

- Paved
- Unpaved (dirt)
- Gravel
- Boardwalk
- Other



Poll 7

What is the typical condition of the roads in your community? (select all that apply)

- Well-maintained with good drainage (may still be dusty)
- Lots of potholes
- Washboarding (bumpy or corrugated)
- Standing water
- Other





Other Considerations:

Road Design, Maintenance, Monitoring, and Dust Suppressants





Importance of Road Design and Maintenance

- A properly constructed gravel road will
 - Last longer
 - Reduce the frequency of maintenance and grading
 - Ride smoother and safer
 - Reduce fugitive dust

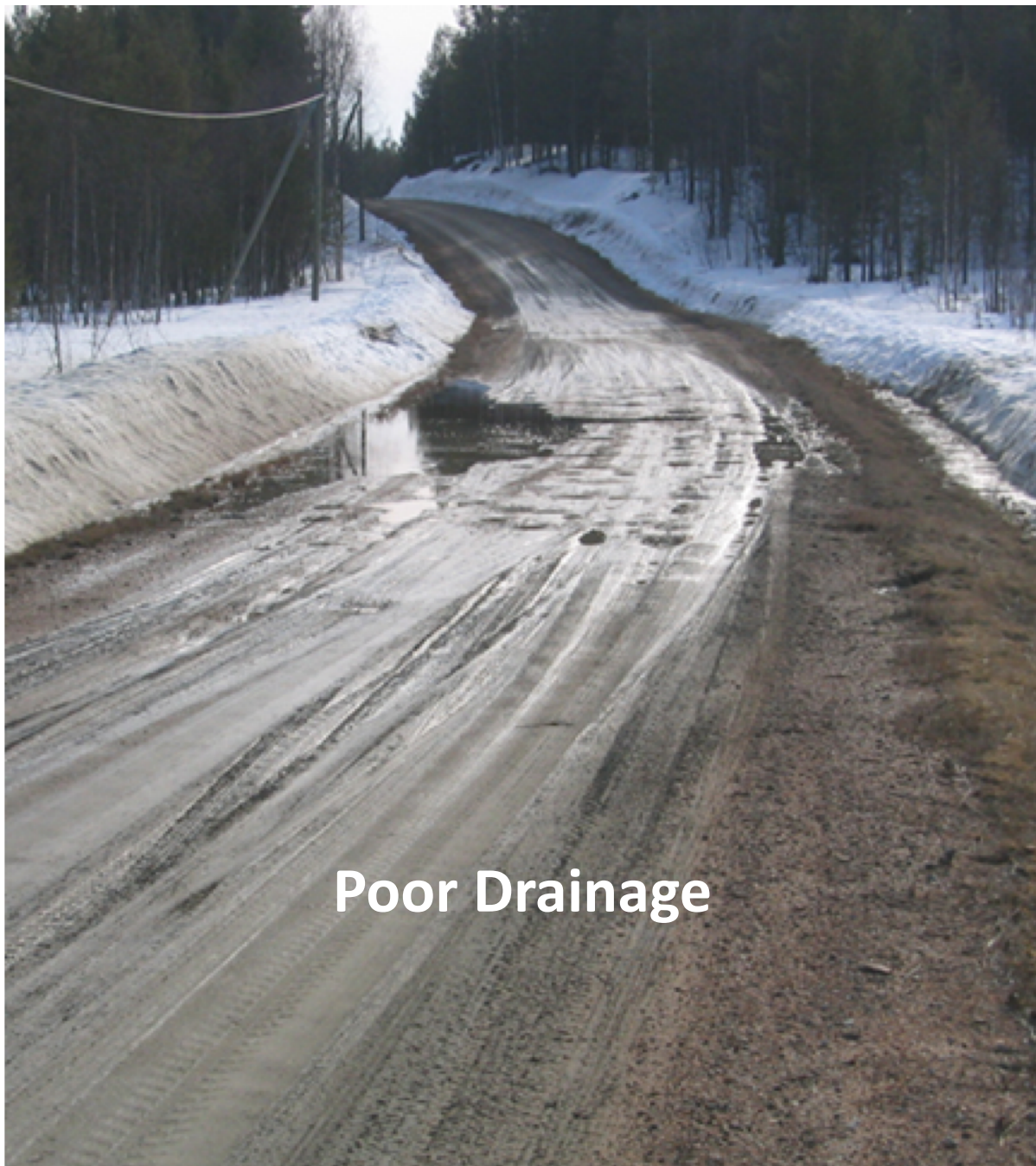




A Good Road Crown is Critical

- Should be between 3-5%
- Enables proper drainage





Poor Drainage



Good Drainage



Roads Should Have the Correct Fines Content

- Should be between 8-15% for untreated roads (passing the #200 sieve)





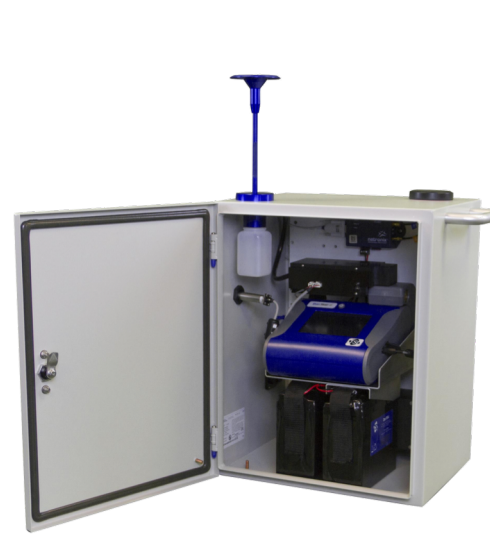
Types of Dust Suppressants

- Water
- Calcium chloride
- Synthetic fluids



Types of Dust Monitoring

- Compliance-based
 - Hi-Vol samplers
 - Opacity
- Non-regulatory measurements
 - Portable monitors (ex. DustTrak)
 - Low-cost sensors (ex. PurpleAir)
 - Visual monitoring (using photos and observations)



Poll 8

**What sources of funding does your community currently use to support dust management work?
(select all that apply)**

- IGAP grant
- MOU with City Government
- BIA transportation funds
- Other Federal funding
- Other State/Local funding





Funding and Partnerships: **Road Dust Activities for IGAP Workplans**

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Possible IGAP Activities

- Take **training** on dust emissions, air quality, health impacts, and mitigation strategies (ATCEM, via webinar, AFE, etc.)
- Conduct or update an existing ANTHC Phase I Air Quality **Assessment**
- Collect information and compile a report about dust in your community (ex. windshield survey, map, community meetings, interviews, etc.)
- Use **outreach** materials to help raise community awareness
- Educate your community about the health risks of road dust and share **strategies** for how they can reduce dust:
 - Community meetings – talk about how reducing speed reduces dust
 - Public announcements on dusty, windy days
 - Show road dust video at a community meeting or the school
 - Youth dust project: photos of dust at different driving speeds
 - Youth dust campaign: poster contest, bumper stickers, radio ads



Possible IGAP Activities (cont'd)

- Participate in the Alaska Tribal Air Workgroup
- Build **partnerships** and identify sources of funding and technical assistance
- Develop a project, draft a grant proposal, and submit for funding
- Implement a dust control project and measure the results
- Share learnings with others



Road Dust Workplan Templates for IGAP

<https://www.epa.gov/sites/production/files/2018-11/documents/r10-gap-tools-air-workplan-templates.pdf>

Template V: Road Dust Emissions Reduction

Indian General Assistance Program WORK PLAN TEMPLATE			
Tribe/Tribal Consortia: EPA Region 10 Project/Budget Period:			
Title	Road Dust Emissions Reduction		
Description			
Long-Term Outcome	Reduced road dust in the community and improved safety and health of residents, particularly among vulnerable populations.		
Measure(s)	C3.19, C3.20		
Intermediate Outcomes	<ul style="list-style-type: none"> Increased awareness of the sources and health impacts of road dust so that informed decisions can be made on developing strategies to address it. Community road dust strategy (may include education and outreach, applications submitted for additional funding, collaborations with other agencies, choosing an appropriate dust suppressant, and road improvements). 		
Estimated Component Cost			
Estimated Work Year			
Commitments		End Date	Outputs & Deliverables
1.1	Obtain training on road dust, air quality, health impacts, and mitigation strategies. Contact EPA , ADEC , or ANTHC for assistance identifying training and written materials. Start by reviewing the Rural Alaska Dust Toolkit .	September 30	Training summary and trip report shared with Tribal Council and EPA.
1.2	Complete an assessment of road dust sources, impacts, and capacity to manage using ANTHC's Phase I Community Air Quality Assessment Tool and the Community Dust Self-Assessment in the Dust Toolkit. ANTHC can provide assistance in conducting this assessment.	November 30	Summary or copy of assessment shared with Tribal Council and EPA.
1.3	Collect information and compile a report about dust in the community. Possible activities include: <ul style="list-style-type: none"> Take photos around the community to document where there are dusty conditions and note the times of the day or year when dust is particularly problematic. Create a map of dusty areas and any areas where water or palliatives have been applied. Talk to community members, roads staff, clinic staff, Tribal Council, airport staff, or others about their observations and concerns related to road dust. Identify existing funding for roads work and any dust mitigation strategies used previously. 	November 30	Copy of report or results in quarterly reports to EPA and Tribal Council.

Last Updated – 11/9/18

13

Potential Purchasing Needs

- Behavior change
 - Speed signs or "dust sensitive" signs
 - Radar gun to measure speeds
 - Road maintenance
- Graders and other equipment
- Dust suppressants
 - Application equipment
 - Dust suppressant products
 - Lab testing of local roads materials to identify an appropriate palliative and application rate
 - Freight/shipping
- Soil stabilization – expensive per mile cost



Key Partners in Your Community

- **Environmental Department (IGAP Program)**
Help with air quality assessment, community outreach and education, partnership building
- **Transportation Staff**
Roads inventory, knowledge of funding streams, expertise in dust control (water or palliative application), etc.
- **Clinic Staff**
Health expertise, knowledge of respiratory and cardiovascular illness in the community, could support outreach and education, know whether more patients come in on dusty days
- **School/Youth**
Involve youth in projects (dust sampling, community outreach on speed reduction, etc.)





Rural Alaska Dust Partnership

Working together to implement sustainable solutions for dust management