POTENTIAL FOR UNMANNED AERIAL VEHICLE (UAV) ASSESSMENT OF LOCAL ROADS

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HOW THIS TECHNOLOGY CAN BE USED:

- A cost effective means to assessment local roads – better than a "windshield" survey.
- Assessment of roads prior to change in functional class
  - Example: Local Road changed to Agribusiness Access
- Assessment after catastrophic events
  - Example: Post flood assessment
- Assessment prior to use for detour or construction haul roads

VIDEO OF UAV

Example for Potential Use:

This very low volume local road carried less than 20 vehicles per day for years and years.

Overall condition was fair, but always a problem section in the spring.

Drainage and safety issues

Then, late in 2011 a large commercial dairy was permitted along this road.

It became the primary access route.

Very minimal improvements were made.

The geometry of the road was essentially left unchanged.

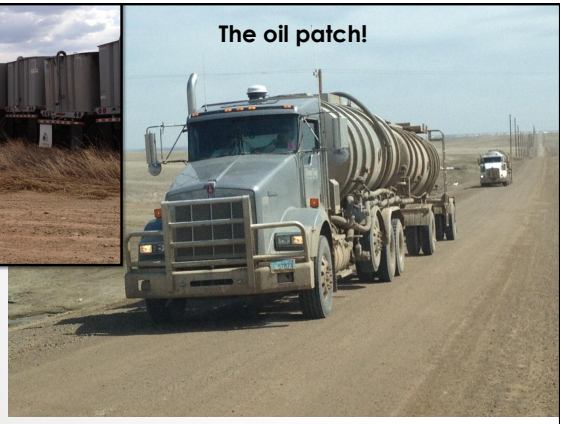
It also became a winter maintenance problem.

Bigger perspective:

What happens if one of these delivers grain?

Many people (including the SD Dept of Ag) realized significantly greater improvement was needed after the dairy was built.

Aerial imagery would have been extremely helpful to show the potential problems



The oil patch!

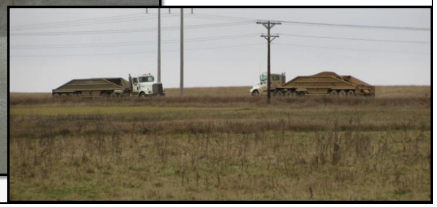
Potential for assessment after flood events?

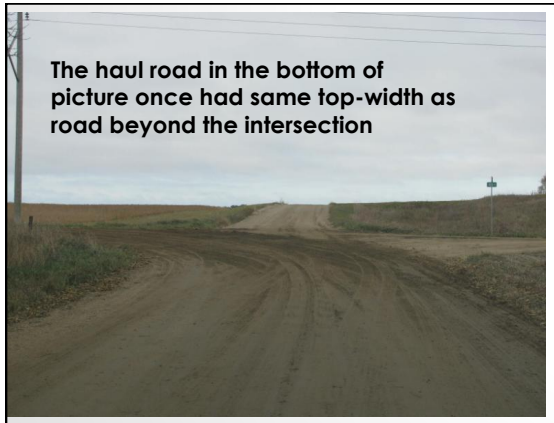
- Aggregate loss
- Ditches filled
- Culverts possibly plugged

Other potential:
Rapid assessment of proposed haul roads

Aggregate production and hauling in late 2009 on a wind tower project

Rapid movement of a lot of material – all on local roads.
Daily truck traffic went from virtually none (except in grain harvest) to 150 – 200 per day for nearly eight months.





The haul road in the bottom of picture once had same top-width as road beyond the intersection

Significant damage to geometry of the roads as well.

Existing roads too narrow for trucks to meet – added routes had to be used to keep trucks from meeting one another – increasing miles of road affected.

The real problems began in spring of 2010!

Continued throughout the summer

Big problem at end:

Restoration by the Wind Tower Const Company – but to what condition?

No good assessment of previous road condition led to dis-agreement later.

Experience during a UAV demonstration project this past June:

What you see if you get out of the vehicle and closely examine a box culvert site:

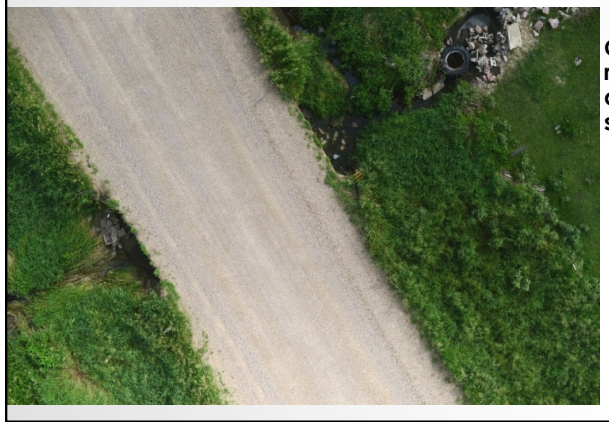
Channel problems after recent flood

It was hard to see another problem even while walking the road shoulder.

Serious erosion left near vertical drop-off just off traveled way.

Channel problems

Aerial observation of the same site



Clear view of road width and drop-off at the structure

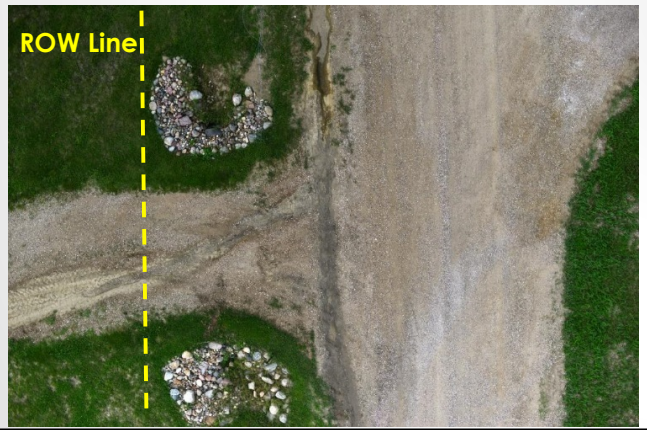
Erosion at roadside clearly visible:

Bonus photo:

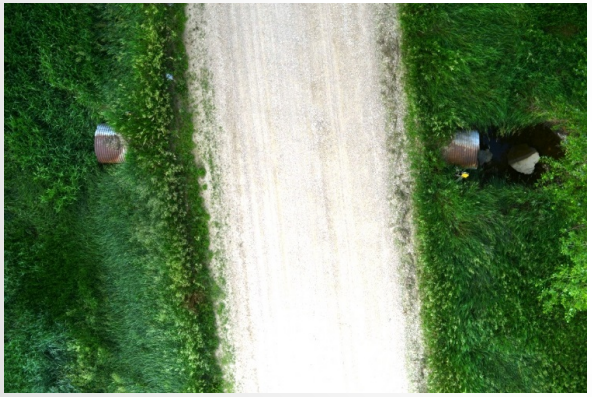
Close look at farm entrance near the site.

More potential:

Looking at ROW encroachment issues



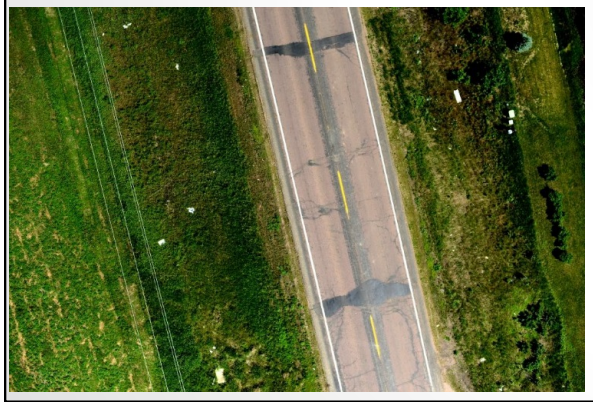
Gravel loss after storm event



Culvert site on local road

Very high resolution allows you to zoom in and get a good look at outlet and pipe end condition:

Potential for paved road geometry and condition evaluation as well.



Significant extent and severity of pavement cracking

A VERY SHORT SUMMARY OF WHAT CAN BE DONE WITH UAV ASSESSMENT

Thank You