

Tools in the Permitting Toolbox:

**The Utility and Drawbacks of
Visual Assessments and
Shadow Flicker Studies**

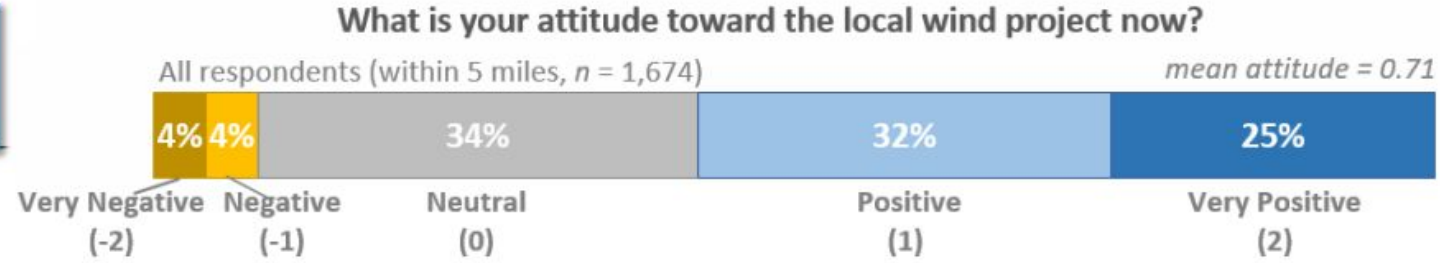
Agenda

- Introduction to Visual Assessment and Shadow Flicker Studies
- How Technology can be Applied
- Use of Assessments in Great Plains, and Nebraska
- View from County Commissioner



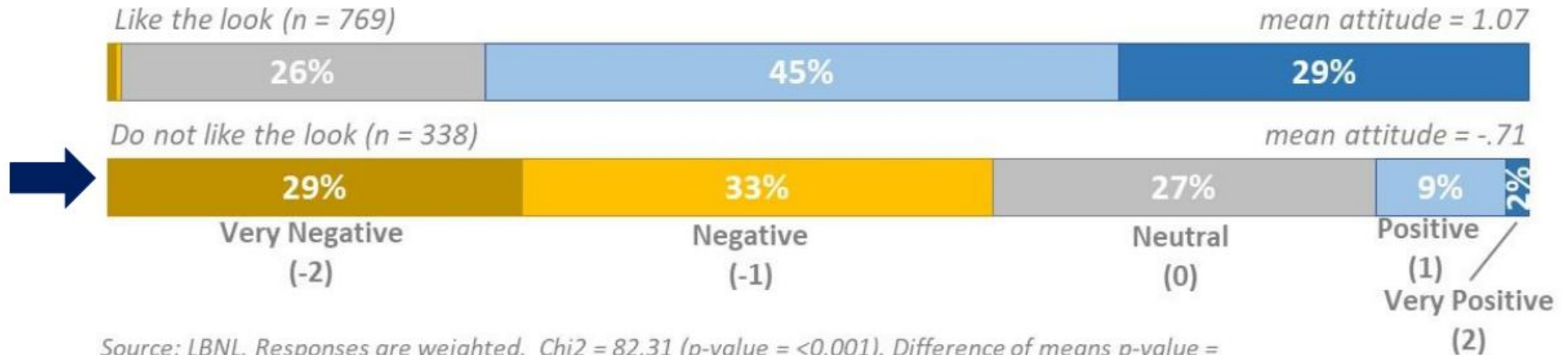
Why Aesthetics Matter?

Sensory Perceptions



by Aesthetics

Do you like the way the wind project looks?



Hoehn, B., J. Firestone, J. Rand, D. Elliott, G. Hübner, J. Pohl, R. Wiser, E. Lantz (2018) Overall Analysis of Attitudes of 1,705 Wind Power Project Neighbors. Lawrence Berkeley National Laboratory. Preliminary Results Webinar. January 30, 2018.

Preliminary Overall Analysis of Attitudes Conclusions

- Distance not correlated to attitudes
- Perceived economic impacts influence attitudes
- Perceptions of the planning process strongly correlated
- Attitudes change over time.
- Sensory perceptions are strongly linked to attitudes
- Demographics are not linked to attitude differences

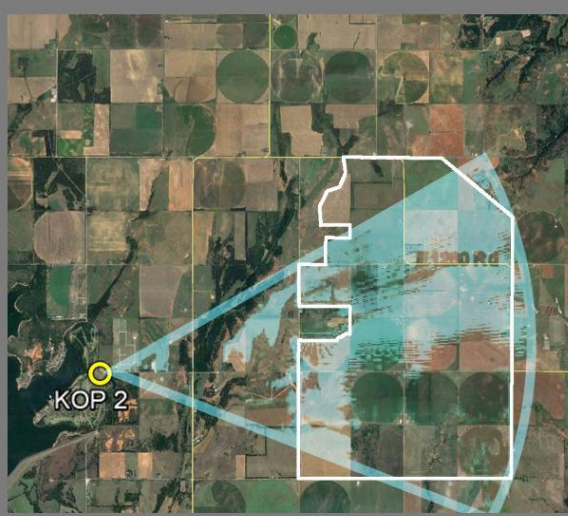
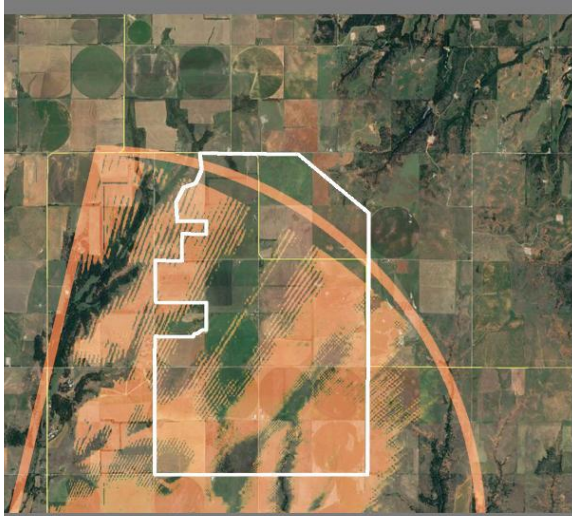
Introduction to Visual Assessment and Shadow Flicker Studies

Visual Assessment – Viewshed mapping, photographic and virtual simulations and field inventories of views

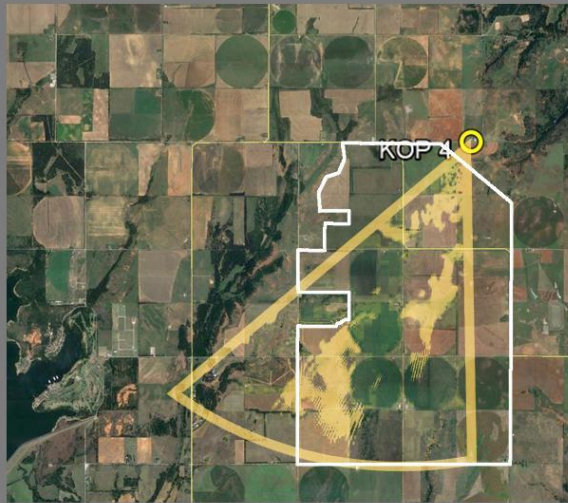
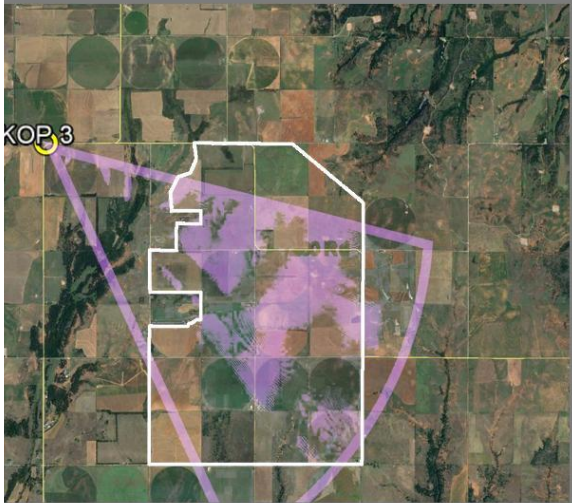
Shadow Flicker Study – Specific visual assessment that reviews the shadows cast on stationary objects by rotating wind turbine blades which cause changes in sunlight, perceived as “flicker”

Example: Visual Assessment

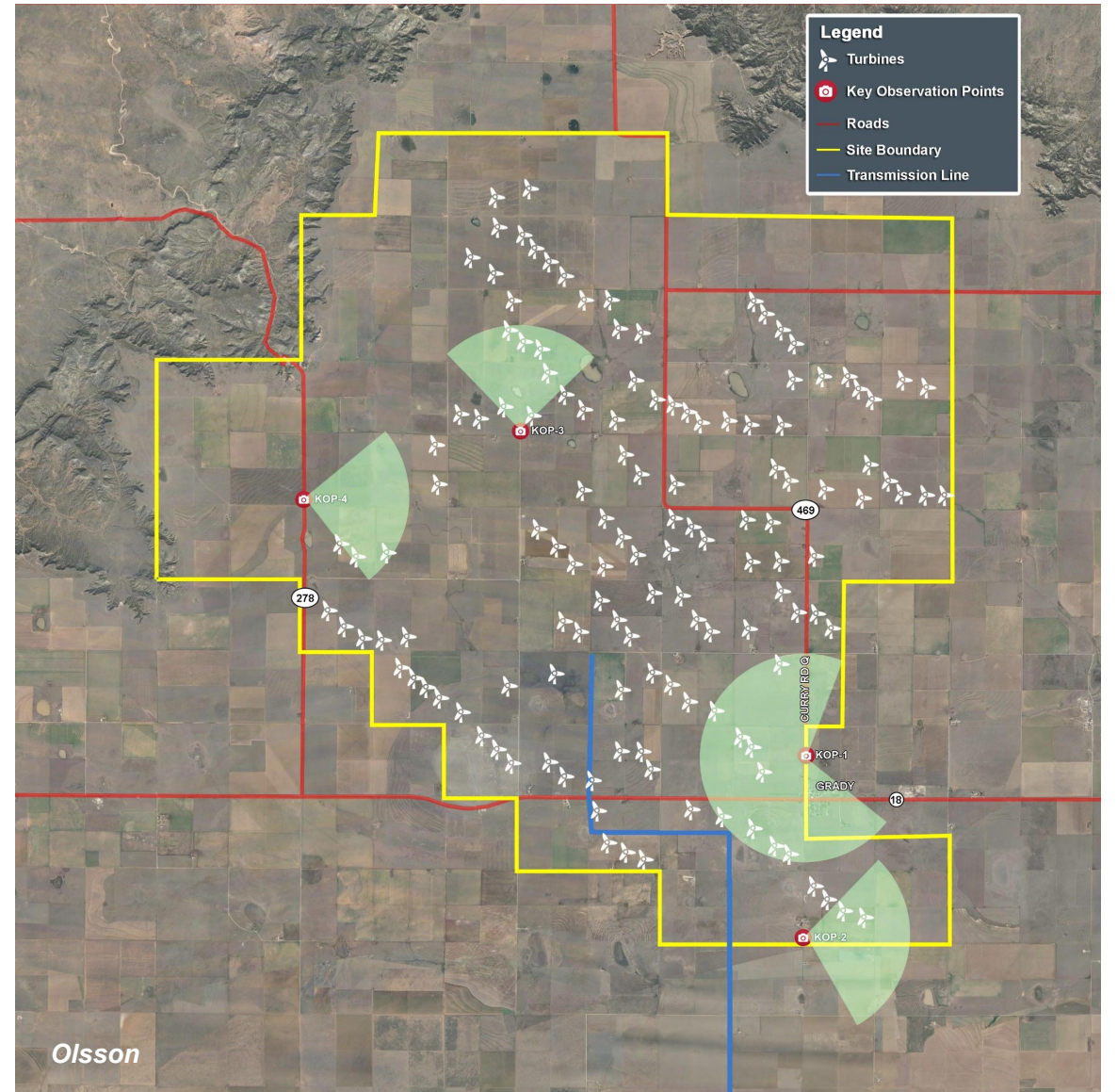




KOP 2



KOP 4









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Example: Shadow Flicker Study





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Use of Visual Assessments in Great Plains

- Upper Great Plains WAPA EIS
- Region covers Iowa, Minnesota, Montana, *Nebraska*, North Dakota, South Dakota
 - “Assessment of visual resources needs to be part of the project’s early [pre-planning phases] and must continue throughout the life of the project.”
 - Example Summit Wind Project, EA, 2015
 - Example: Willow Creek Wind Project, EA, 2016

Use of Shadow Flicker Studies in Great Plains

- Upper Great Plains WAPA EIS
- Region covers Iowa, Minnesota, Montana, *Nebraska*, North Dakota, South Dakota
 - Example: Wilton IV Wind Energy Center IV EIS, 2013
 - NOTE: This project was cancelled in 2017

An aerial photograph of a Nebraska landscape during sunset. The scene features rolling green hills, a dirt road, a reservoir on the left, and several wind turbines scattered across the horizon. The sky is filled with soft, golden clouds, and the sun is low on the left side, creating a lens flare effect. The overall atmosphere is serene and scenic.

What About Nebraska?

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Use of Visual Assessments and Shadow Flicker Studies in Nebraska

“Visual impacts and impacts to local and migratory bird populations are also an important issue to address”

Report of the Nebraska Power Association To Governor Mike Johanns February 2002

Visual Assessments Generally Not Required

**Shadow Flicker Studies Generally
Not Required**

Views from a County Commissioner

William Tolke, Holt County Commissioner

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Wind Energy
Olsson Visual Assessment