# UNLEASHING THE POWER OF GIS MCDA IN COMMUNITY BUILDING

A MAPPING SUCCESS STORY!

WHAT IN THE WORLD IS GIS?

- Chances are you've *heard* of GIS. But given its history as a technology gatekept by "experts", it's also likely that what GIS is and what it does is likely a bit of a mystery.

- It's a computer system that organizes, stores, analyzes, and maps data. **Simply put, GIS is the intersection of location and data.**
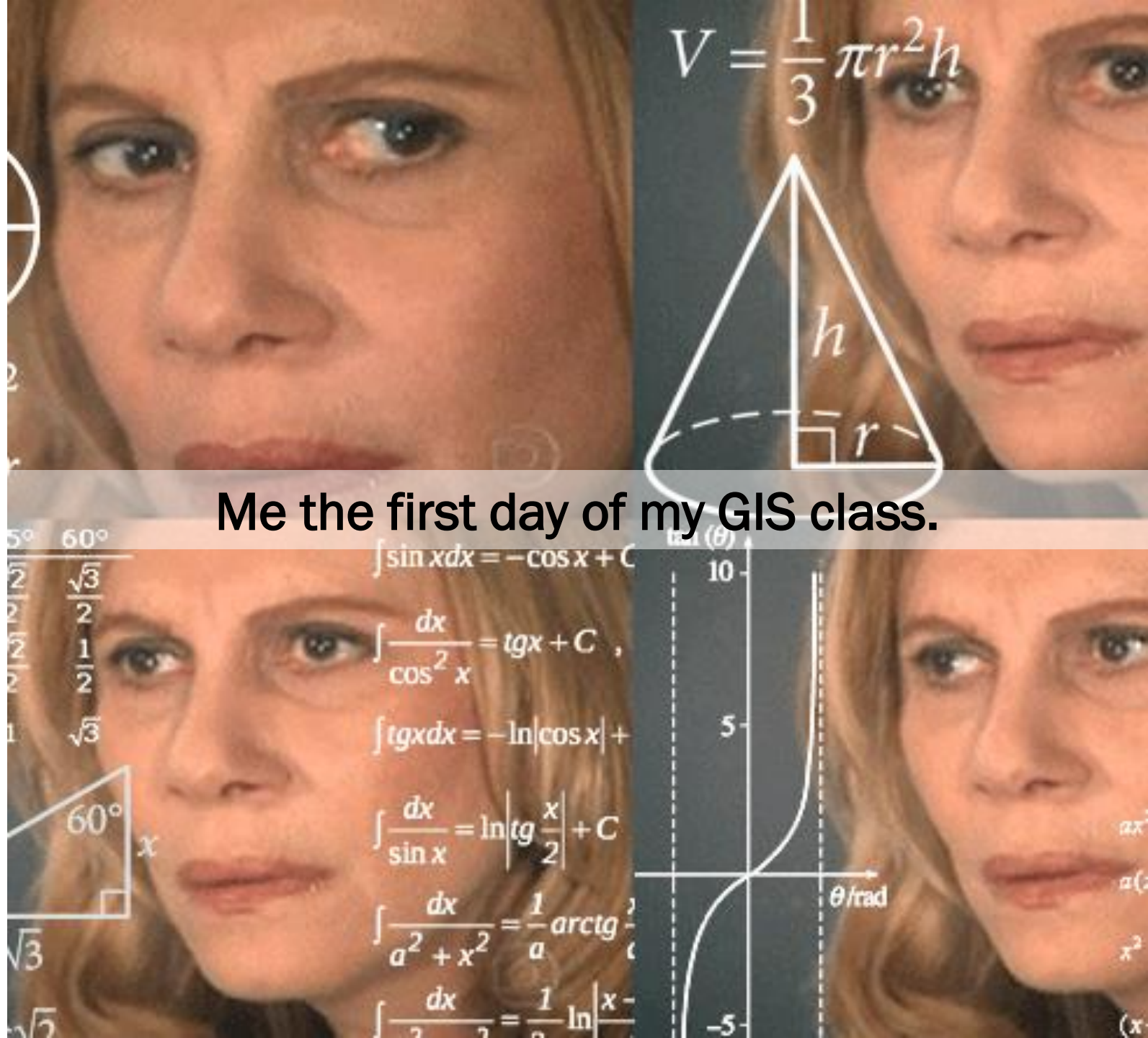
Me the first day of my GIS class.

SHREK SAID IT BEST

- GIS involves layering location-based data on a map. Visualizing data in this way improves decision making and understanding of the world around us. **GIS is a representation of the world as it exists right now; but can also show us what could be.**
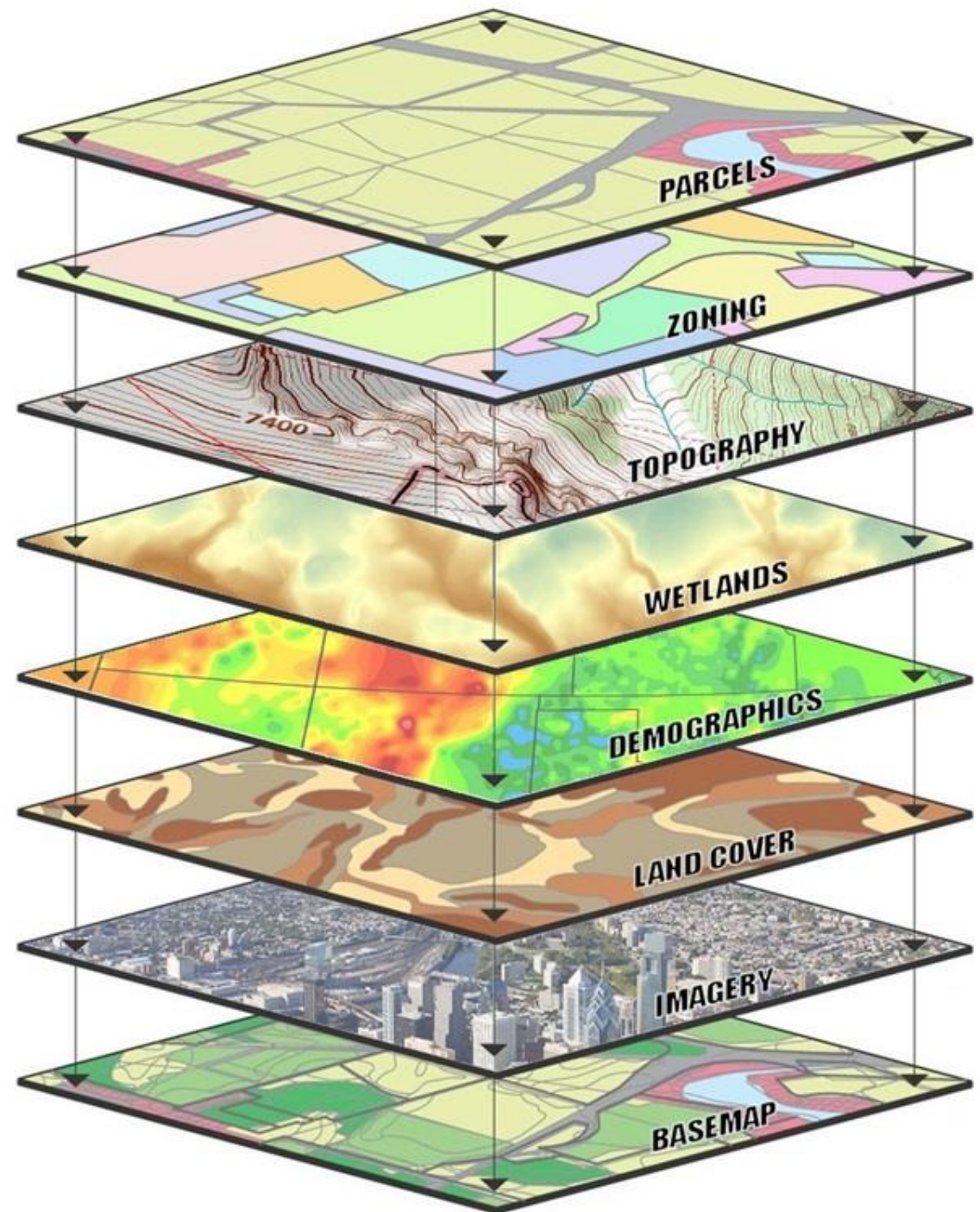
HOW BUILT UP IS YOUR GIS INFRASTRUCTURE?

HOW IS GIS DATA PLAYING A ROLE WHEN YOU ARE MAKING LAND USE RECOMMENDATIONS OR DECISIONS?

THE POWER IS IN YOUR HANDS!

AUDIENCE CHECK-IN

GIS MCDA IS AS EASY AS ~~PIE~~ *CHOOSING A BANANA*

GIS MCDA IS AS EASY AS ~~PIE~~

CHOOSING A BANANA

Multiple

Criteria

Decision

Analysis
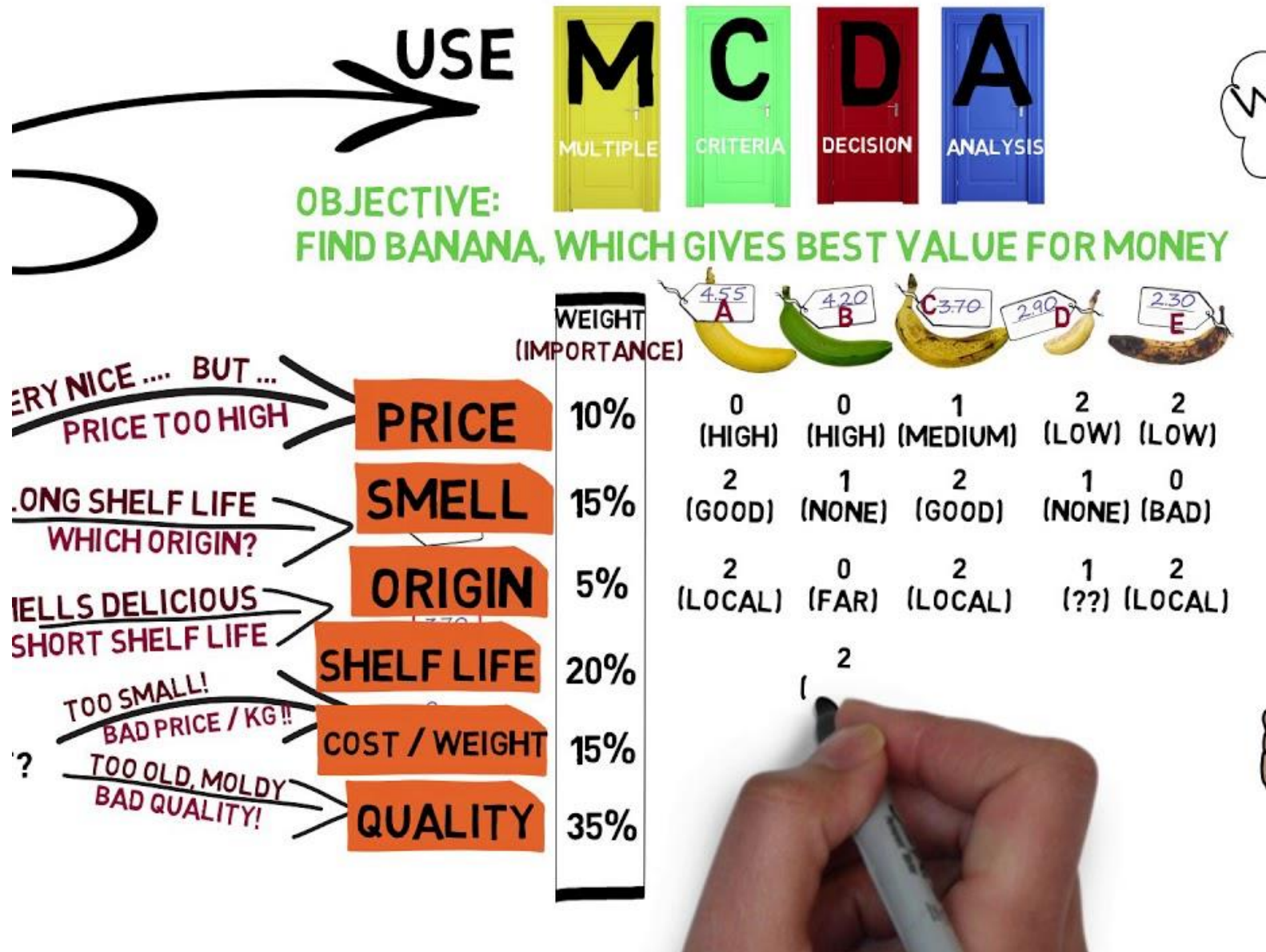
ENOUGH BANANA TALK, WHAT DOES THIS MEAN

STOP MONKEYING AROUND….
WHAT DOES THIS MEAN???!!!

SREDA - Agri-Business Industry
Multi-Criteria Location Decision Analysis (MCLDA)
With Environmental Constraints

Legend

SREDA - Project Boundary
Watercourse
Urban Municipalities

Value
High : 85.25

Low : 9.5

0   5   10   20   30
Kilometers   1:550,000
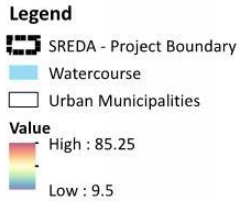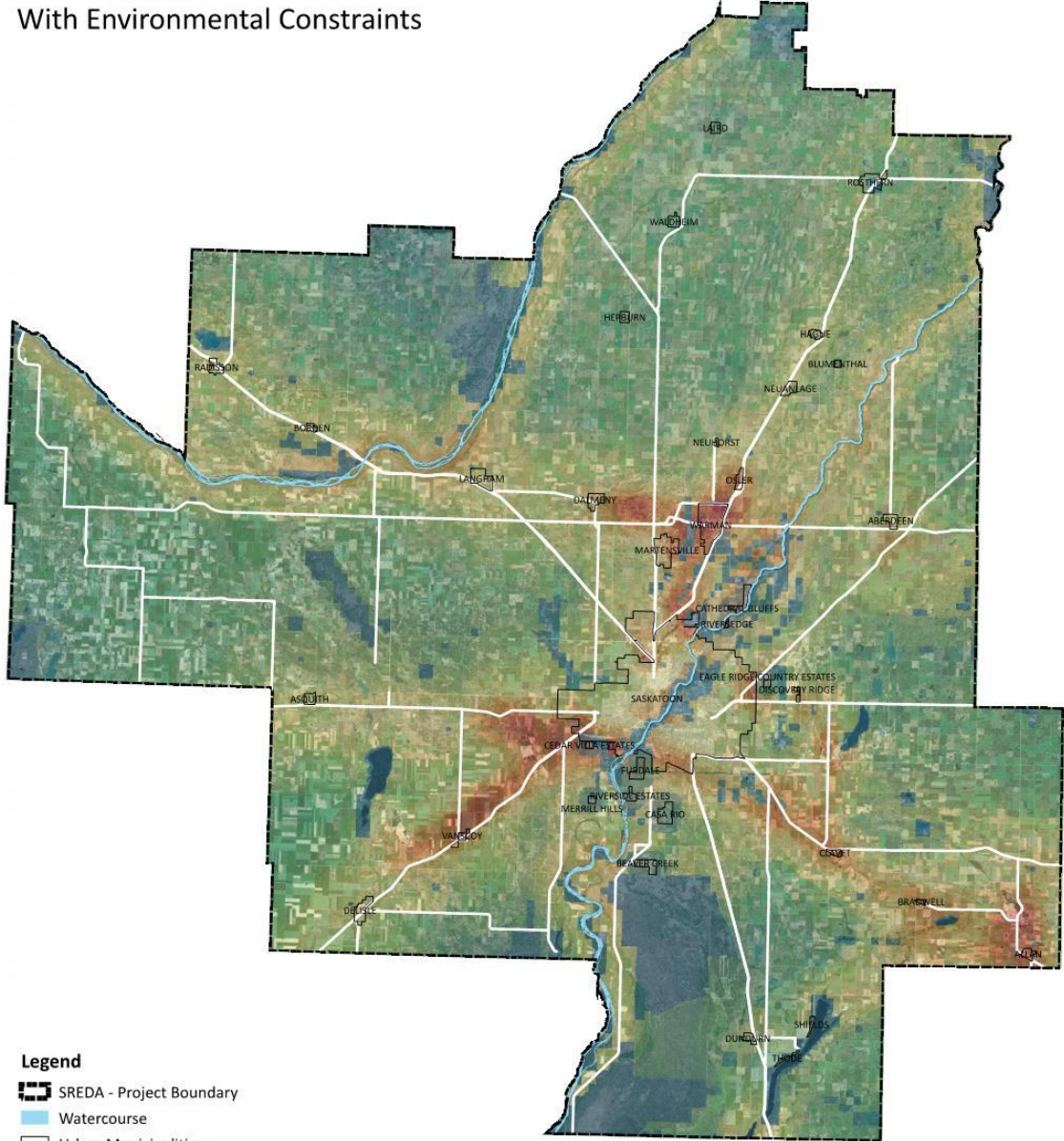
MCDA BENEFITS

- Proactive planning

- Easy to receive input and feedback from stakeholders

- Can include any spatial data

- Methodology can be tracked in GIS and reproduced

- Collaborative regional development

- Harmonizing economics with community

- Data-driven land use decisions

MCDA CONSTRAINTS

- Does not take into consideration non-spatial elements, such as aesthetics associated with a land use

- Can only be used to determine the development suitability/likelihood of one specific use

- Possibility of biased criteria

Wait a minute

AUDIENCE CHECK-IN

IS ANYONE ALIVE OUT THERE

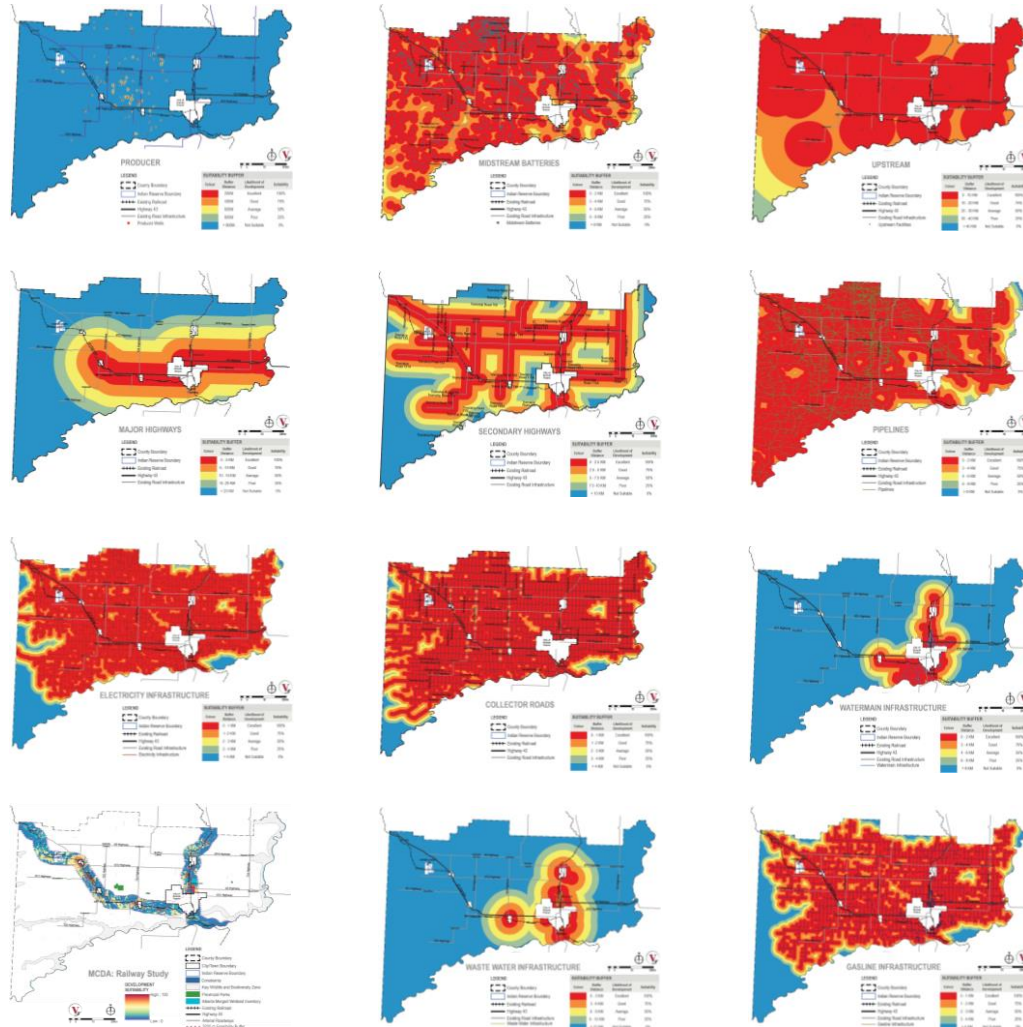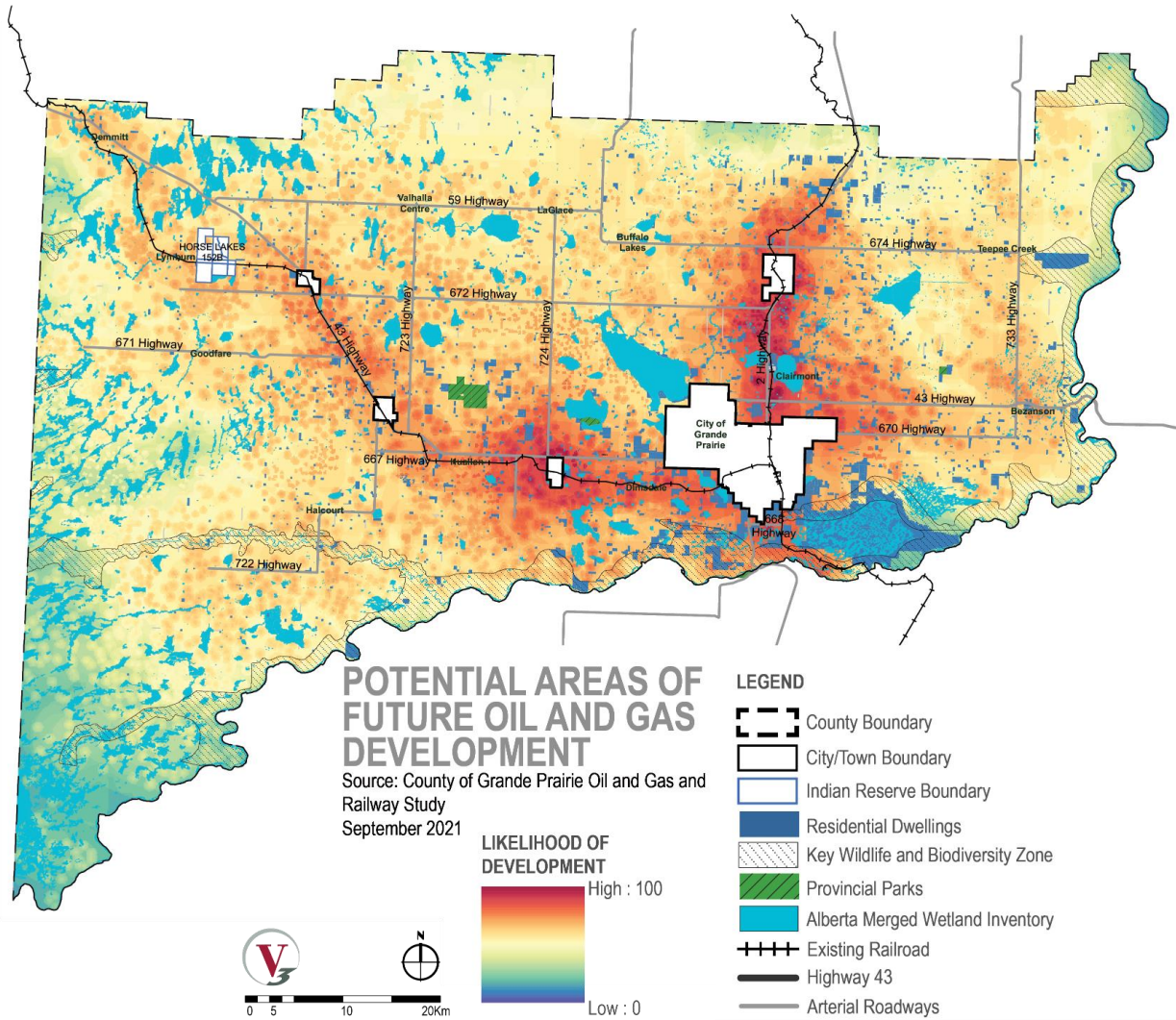# WHAT'S THE RECIPE FOR SUCCESS?

- Define the question

- Define the criteria (constraint and proximity)

- Define the values

- Determine the weights

- HIT GO! (or validate – then GO!)

MCDA CASE STUDY

CRITERIA	SUITABILITY BUFFER VALUES				
Likelihood of Development	Excellent (4)	Good (3)	Average (2)	Poor (1)	Not Suitable (0)
% Suitability	100%	75%	50%	25%	0%
Transportation					
Major Highway	0 to 5KM	5 to 10KM	10 to 15KM	15 to 20KM	> 20KM
Secondary Highway (arterial)	0 to 2.5KM	2.5 to 5KM	5 to 7.5KM	7.5 to 10KM	>10KM
Collector Roads	0 to 1KM	1 to 2KM	2 to 3KM	3 to 4KM	>4KM
Existing Oil and Gas Industry					
Producer (new wells 2017-2021)	200M	400M	600M	800M	1000M
Midstream (Batteries, etc.)	0 to 2KM	2 to 4KM	4 to 6KM	6 to 8KM	>8 KM
Upstream (Refineries, etc.)	0 to 10KM	10 to 20KM	20 to 30KM	30 to 40KM	>40KM
Pipelines	0 to 2KM	2 to 4KM	4 to 6KM	6 to 8KM	>8KM
Water Infrastructure	0 to 2km	2 to 4KM	4 to 6KM	6 to 8KM	>8KM
Electricity Infrastructure	0 to 1KM	1 to 2KM	2 to 3KM	3 to 4KM	>4KM
Railway MCDA Outcomes*	75 – 100%	50 – 75%	50 – 25%	< 25%	< 25%
Waste Water Infrastructure	0 to 3KM	3 to 6KM	6 to 9KM	9 to 12KM	>12KM
Gas Line Infrastructure	0 to 1KM	1 to 2KM	2 to 3KM	3 to 4KM	>4KM

MCDA CASE STUDY

POTENTIAL AREAS OF FUTURE OIL AND GAS DEVELOPMENT
Source: County of Grande Prairie Oil and Gas and Railway Study
September 2021

LEGEND
- County Boundary
- City/Town Boundary
- Indian Reserve Boundary
- Residential Dwellings
- Key Wildlife and Biodiversity Zone
- Provincial Parks
- Alberta Merged Wetland Inventory
- Existing Railroad
- Highway 43
- Arterial Roadways

LIKELIHOOD OF DEVELOPMENT
High : 100
Low : 0

CRITERIA	WEIGHTING (%)
Likelihood of Development	
% Suitability	*Equals to 100 %*
EXISTING OIL AND GAS INDUSTRY	
Producer (New wells 2017-2021)	25%
Midstream (Batteries, etc.)	5%
Upstream (Refineries, etc.)	5%
Pipelines	5%
TRANSPORTATION	
Major Highway	
Secondary Highway (arterial)	20%
Collector Roads	
WATER INFRASTRUCTURE	10%
ELECTRICITY INFRASTRUCTURE	10%
RAILWAY STUDY OUTCOMES	10%
WASTEWATER INFRASTRUCTURE	5%
GAS LINE INFRASTRUCTURE	5%

OTHER APPLICATIONS

- Site selection

- Targeted economic sector development

- Development forecasting

- Any other land use application where you need to compare bananas to bananas

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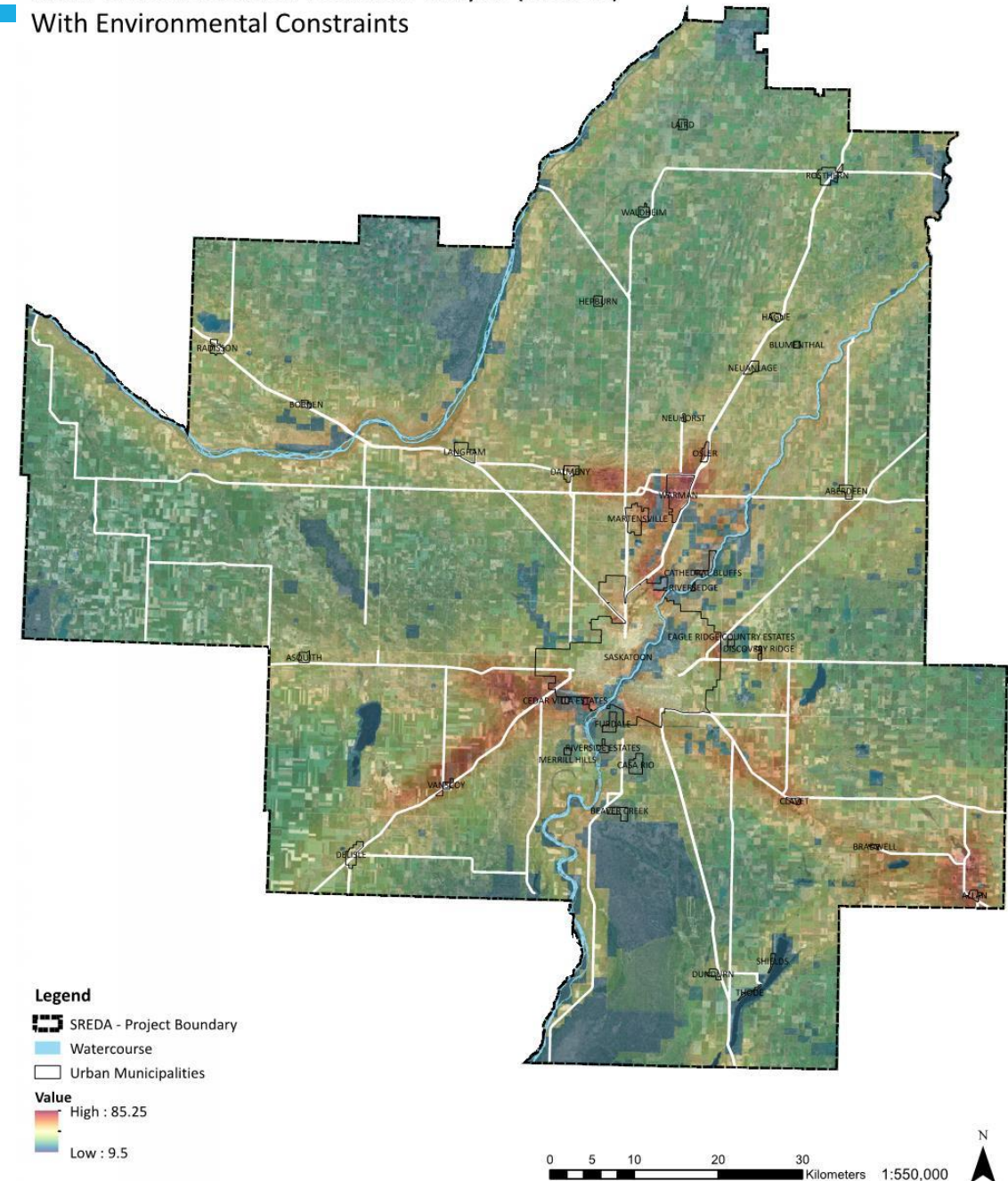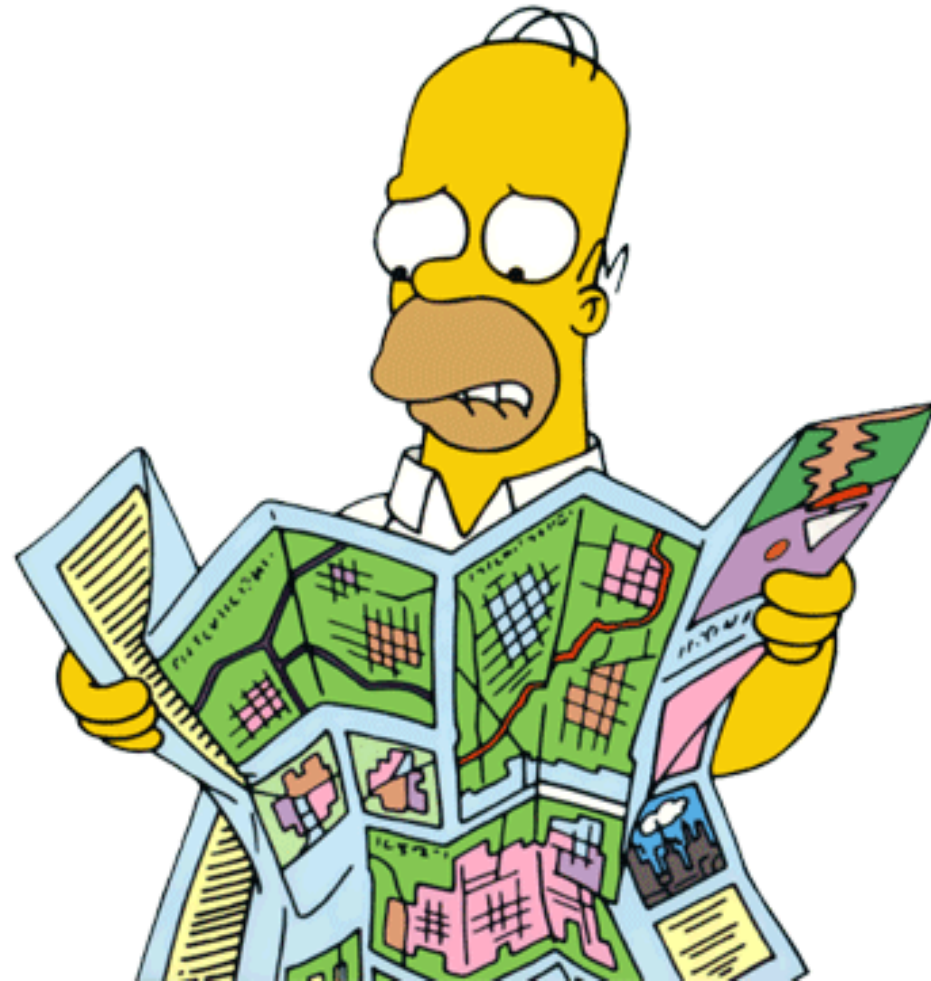
TYING AN MCDA TO THE PLANNING FRAMEWORK
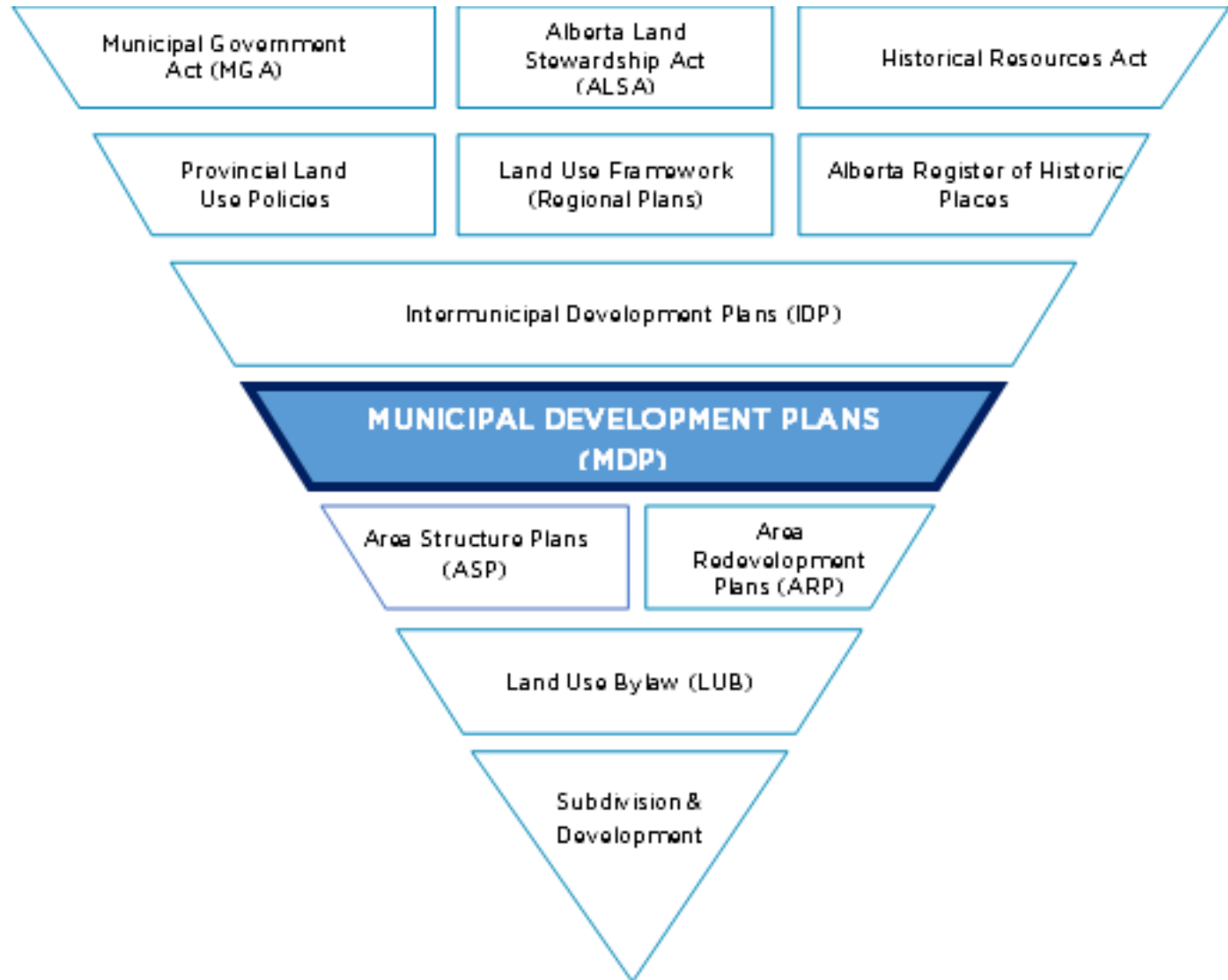
WHERE DO WE GO FROM HERE?

- Take inventory.

- Determine the gaps.

- Be on the lookout for opportunities.

It's the only way you'll be able to unleash the power of GIS MCDA in building your communities.

CAN YOU SEE THIS BEING USED IN YOUR COMMUNITY?
(OR IN YOUR LINE OF WORK?)

QUESTIONS?

THANK YOU!

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