



Nebraska Department of Roads

Innovation Task Force

Meeting 3

June 8, 2016

WELCOME & OVERVIEW



Task Force Charge

1. Explore ways to innovate and improve business practices at NDOR
2. Look at national trends to examine how transportation investments can help grow Nebraska

Today's Topics

Practical Design: Focus on needs not just engineering standards

Project Prioritization and Stakeholder Outreach: Expanded process and scope options

Today's Topics

Practical Design: Focus on needs not just engineering standards

Project Prioritization and Stakeholder Outreach: Expanded Process and Scope Options

Be Entrepreneurial
Engaging • Empowering

Practical Design / Scope Options: Build a **great system** rather than a few great projects

\$31M



\$31M



Legislative Update



Transportation Innovation Act



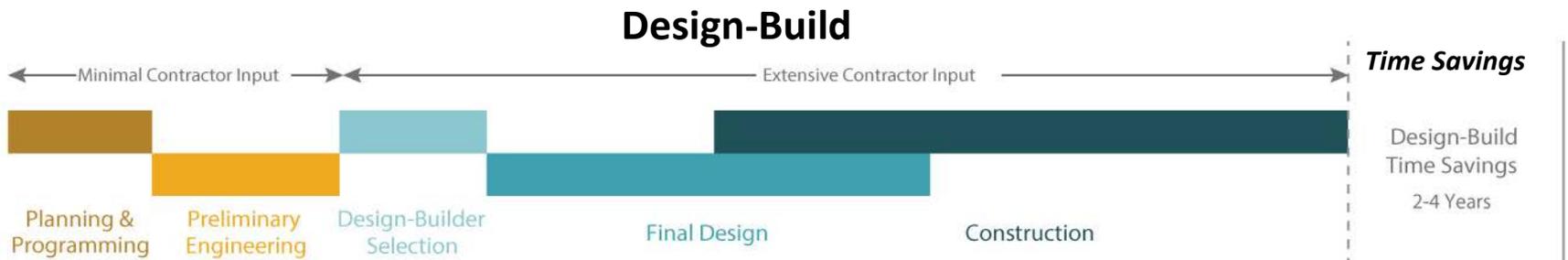
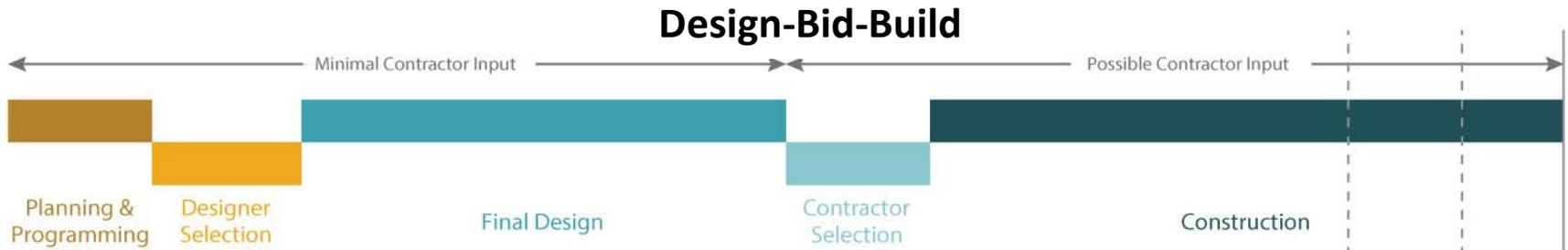
Transportation Infrastructure Bank

Creates three programs:

- Accelerated State Highway Capital Improvement Program
- County Bridge Match
- Economic Opportunity Program

Allows the use of alternative contracting methods

More money and more tools to go faster



Practical Design

Mike Owen



NDOR responsibilities

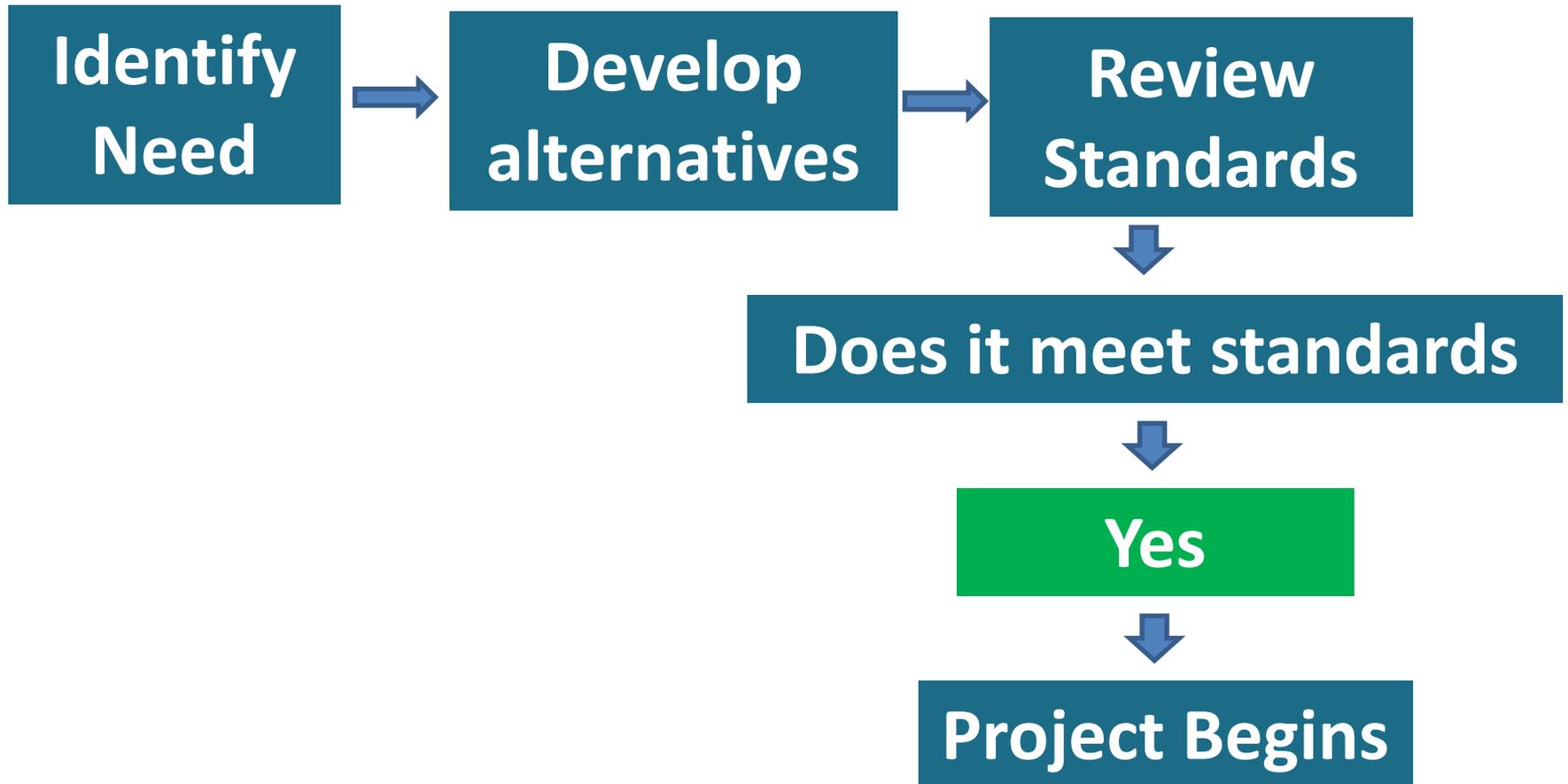
9,902 miles
to maintain

3,502 bridges
to maintain

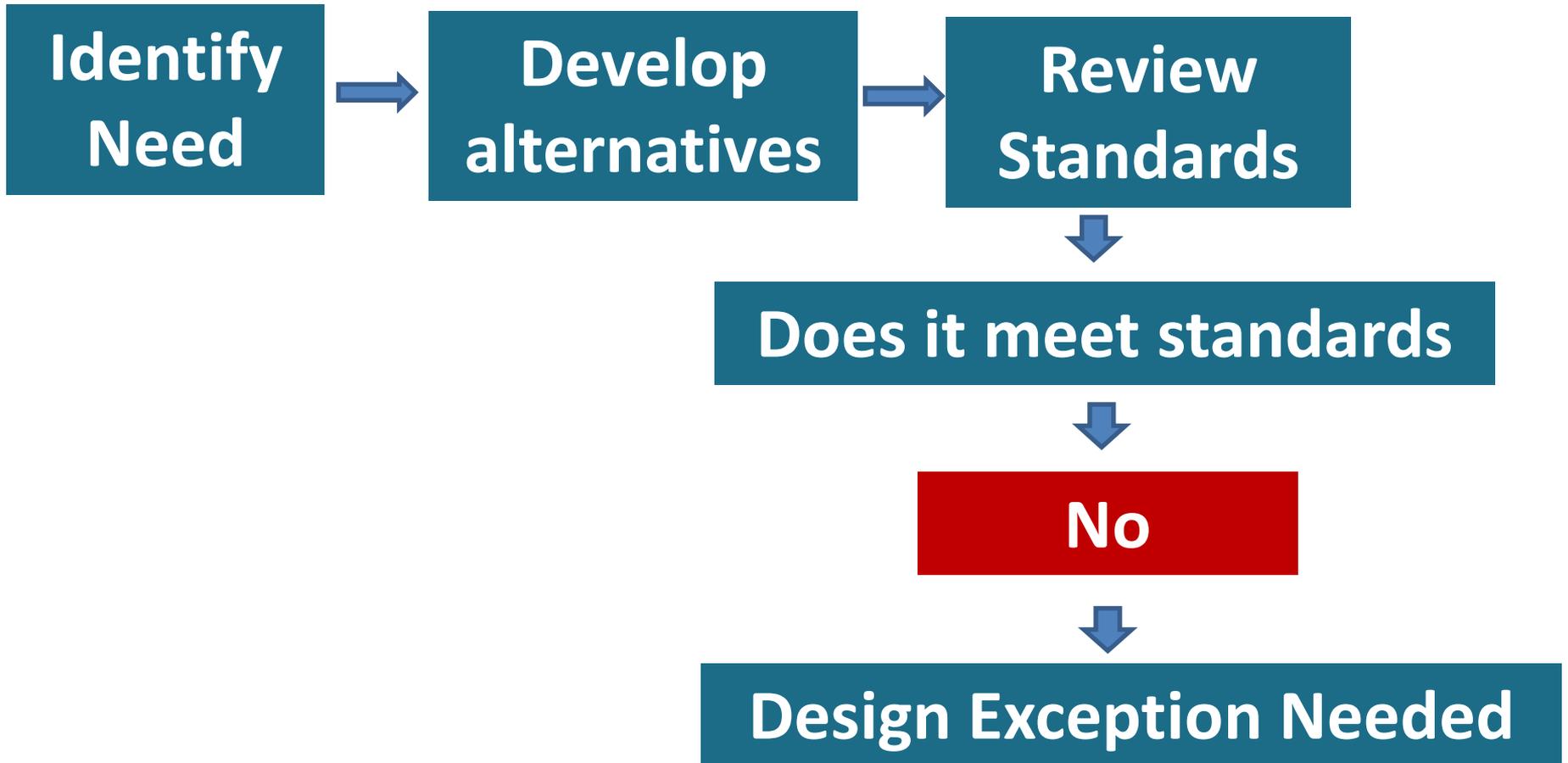
38% 

Vehicle miles travel
since 1990

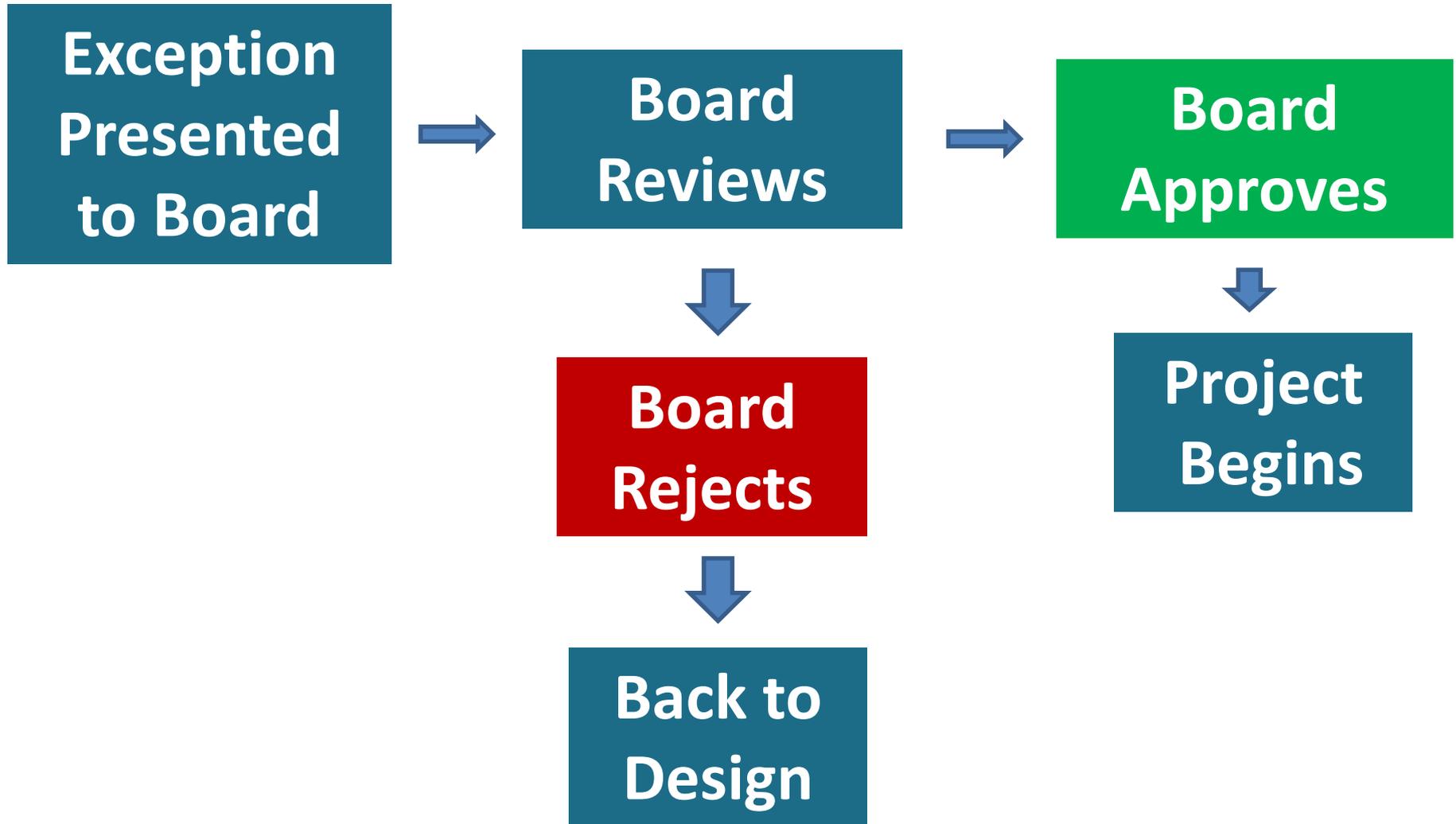
NDOR design process



NDOR design process



NDOR design exception process



Our state is evolving & so should our processes



Our stakeholders want options

“ I did see something about passing lanes being a possibility ... 4 lanes would be ideal but I’m sure that will not happen in my lifetime ... I would recommend passing lanes every so often... ”

**To be more responsive, we
must be...**

Entrepreneurial

Engaging

Empowering

A modernized highway system is not just about upgrading your infrastructure -- it means updating your business practices, too

How do we modernize our business practices?



Imagine:

**You're a design
engineer**

Inspection identifies a bridge problem



Challenge:

Multiple standards apply

Bridge Replacement

- **10 foot** shoulder required

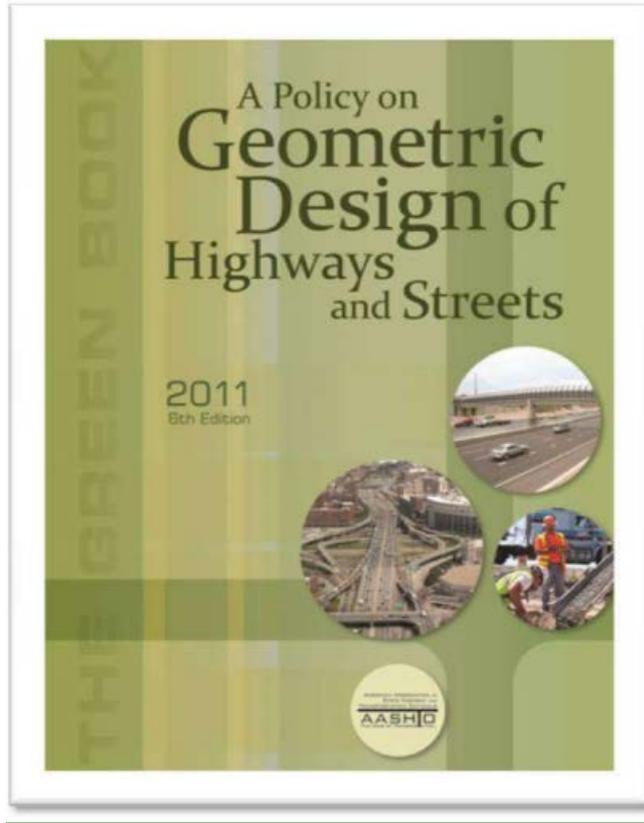
Highway Repair

- **6 foot** shoulder required

The practical solution



Standards provide uniformity; judgment must also be applied



Nebraska Minimum Design Standards



Counties, Municipalities, State

What to do when we replace 350' bridge?

Meet Need

\$2,000,000

Widened to fit the approach roadway

Might have to widen at future date when road is upgraded

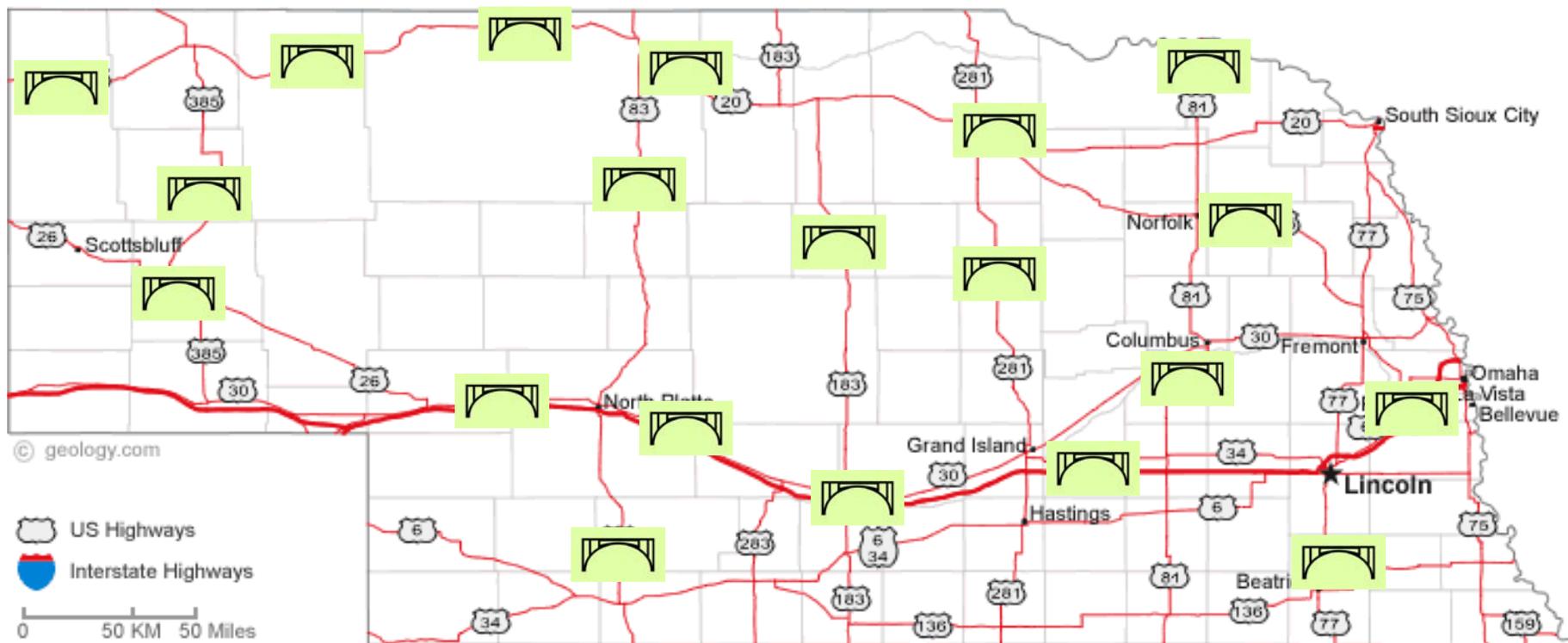
Meet Standards

\$2,500,000

Widened to meet standards for a new bridge

Will not have to be widened if and when road is upgraded

Hundreds of bridges need to be replaced in the next 10 years



If we stick to the standards, we'd be able to address 20% fewer bridges



Industry term is practical design

- Allows you to build the best overall system rather than a few great projects
- Focuses on meeting a need
- Requires thoughtful decisions to balance short and long-term needs rather than unquestioned application of design standards

Practical design principles

- Apply good judgment
- Empower engineers to be more innovative & creative
- Create a solution that fits the location
- Emphasize being practical and cost-efficient

Other states using practical design

- Missouri
- Idaho
- Kentucky
- Kansas
- Oregon
- Utah
- Federal recognition flexibility in design is important

Missouri



MoDOT.

Before



MoDOT

After

\$8 million in savings

Kansas



Before



After

\$11 million in savings

Kentucky



\$766,500 in savings

Practical Design in Nebraska



2 + 2 Approach: Heartland Expressway



\$31 million in savings

Super 2



Measured approach

- Safety evaluations and enhancements remain project specific
- Must comply with regulations

Why now?

- Movement in the industry is toward this business model because the benefits are demonstrated
- This approach will benefit our citizens and is responsive to what they want

Facilitated Discussion

- Questions about and reaction to practical design principles



How might NDOR embrace practical design?



“The last act of a dying organization is to get out a new and enlarged edition of the rule book.”

**- John Gardner
Former HHS
Secretary**

Internal shifts needed

- Empower our engineers to think beyond what we've done in the past
- Focus on needs not just standards
- Evaluate our policies to allow more flexibility
- Start right away – this can be done without changes to statutes and rules and regulations

External step also focuses NDOR on standards

- Board of Classification, established 1969
- City, county, citizen and NDOR representatives
- Meets monthly
- Oversees state, county and city roadways; their functional classifications, design standards and design exceptions
- Give citizens input on transportation system

External design exception process is unique to Nebraska

- Culturally, NDOR can be reluctant to initiate the exception process which delays internal decisions
- Sometimes there are miscommunications around complex design issues
- NDOR would potentially seek more design exceptions to implement approach

NDOR wants to explore an NDOR-led exception review process

- Greater flexibility to focus on meeting the need not the standard
- Greater efficiency
 - Board has approved all 15 exceptions in 2 years
 - More initiative by NDOR Design Staff
- Fiscal responsibility

Facilitated Discussion

- How might NDOR approach this issue internally and externally?
- What other concerns do you have?



Prioritizing Capital Improvement Projects

Brandie Neemann



GROW

NEBRASKA

GROW

NEBRASKA

BUILD NEBRASKA ACT
THE NEXT 10 YEARS



TRANSPORTATION
INNOVATION ACT

Build Nebraska Act

\$600 million
2013-2023

16 BNA projects selected

\$600 million
2024-2033

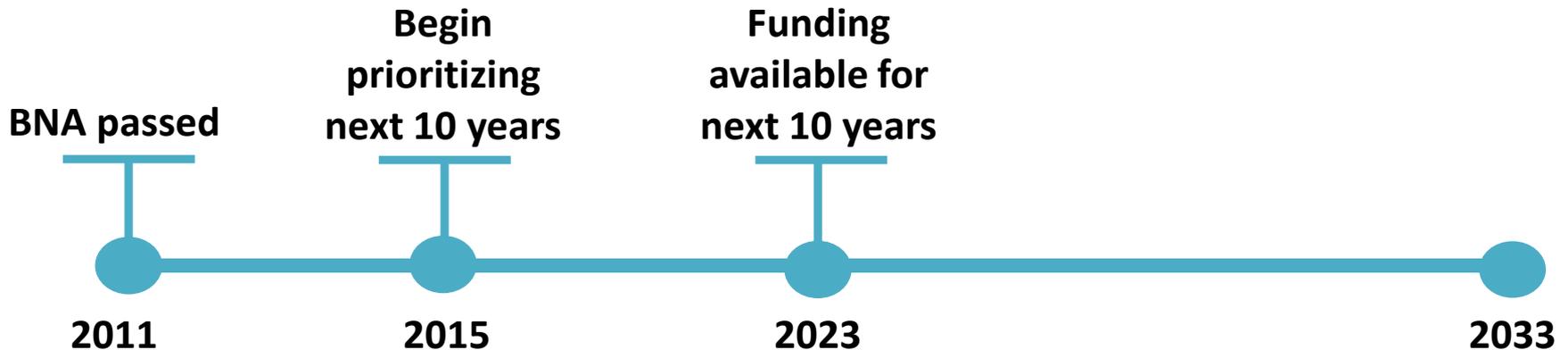
Next 10 years of BNA projects



Transportation Innovation Act

- Accelerated State Highway Capital Improvement Program
- County Bridge Match
- Economic Opportunities

**\$600 million +
\$450 million**



Today's Focus



January Outreach:

We **listened**, developed **options**,
and are **analyzing** those options.

January 2016

59 projects
>\$3 billion



June 2016

275 options
>\$8 billion

Scope Options Lead to a Great System, Not Just a Few Great Projects

- Segments of long corridors
- Alternatives to building a divided 4-lane highway:
 - 2 + 2
 - Super 2
- Other option to consider:
 - Bypass/No bypass



A Super 2 highway

Expanding the Process

Engineering Performance



Economic Performance



More Stakeholder Input

Expanding the Process

Engineering Performance – 60%



Economic Performance – 40%



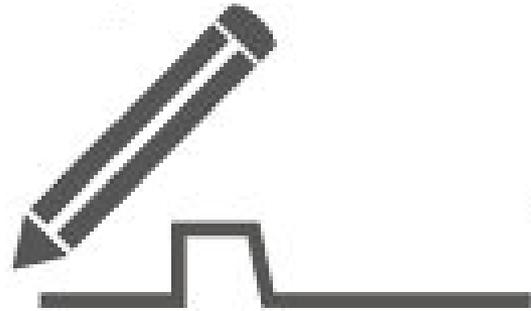
More Stakeholder Input

Engineering Performance

- Traffic Volume
 - Cars and trucks
 - Congestion
- Travel time savings
- Types of improvements being made
- Cost of improvement
- Maintenance and operation costs of the roadway
- Safety

Engineering Performance

- Data intensive analysis
 - Traffic volumes
 - Crash data
 - Cost estimates
 - Travel characteristics
- Requires consultation with experts throughout NDOR, other State Agencies, and national experts
- Each option is being individually considered
- We have preliminary results complete



Economic Performance Factors

- Growth in Jobs Created
- Growth in Wage Income
- Growth in Gross State Product

Use Economic Factors To:

- Support the state's goal to Grow Nebraska
- Differentiate between seemingly similar projects
- Understand how transportation investments are experienced in the wider economy

Grow Nebraska



Highway project investments



Grow Nebraska



Travel Benefits



*Time
savings*



*Lower vehicle
operating costs*



*Increased
reliability*



*Fewer
crashes*



Grow Nebraska



Response to Savings

Those benefits result in transportation cost savings and can be redirected to other uses.



Households can spend more on housing, retail, food, entertainment and other discretionary items.



Business can either lower the cost of their product, keep the profits, or invest in the business – all of which increase the Gross State Product.



Grow Nebraska



Economic Growth



*Employees spend money
locally and regionally*



*Business hires
more employees*



*Business buys
more supplies*

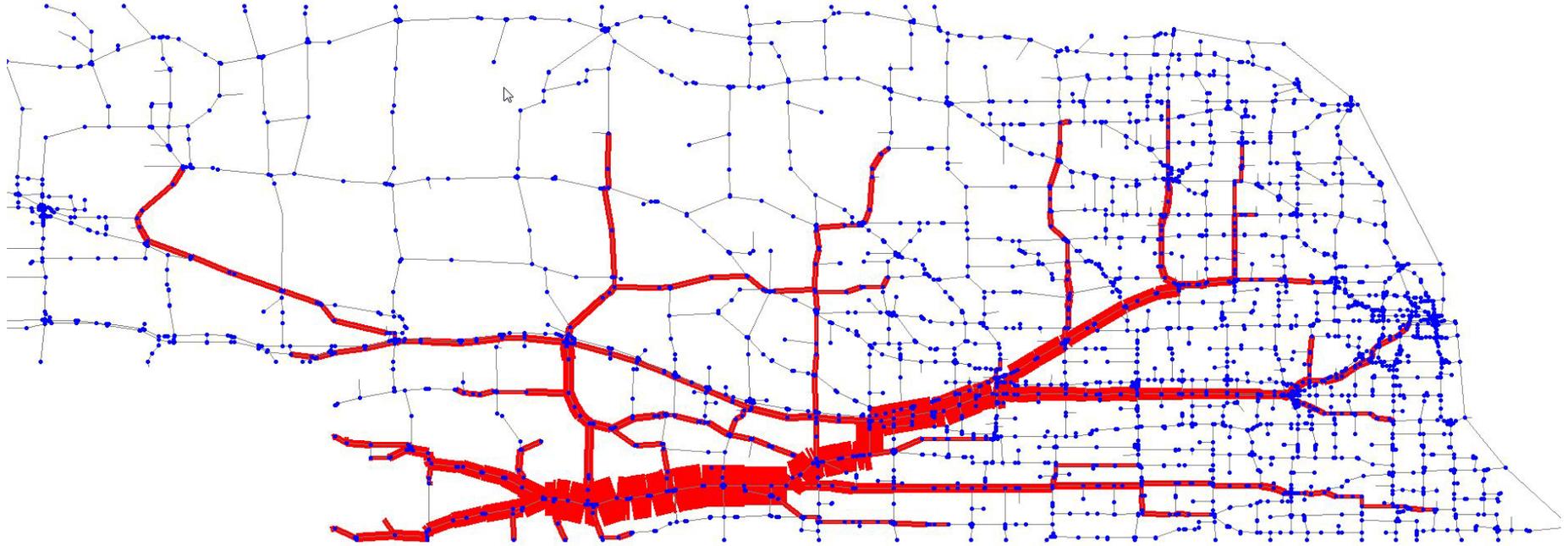
Differentiate Between Projects

	<u>Project A</u>	<u>Project B</u>
Engineering Performance	Benefit/Cost = <u>1.76</u>	Benefit/Cost = <u>1.76</u>
Economic Performance	100 jobs by the end of 25 years	200 – 300 jobs by the end of 25 years
	\$6M wage income per year	\$22M wage income per year
	\$10M Gross State Product per year	\$32M Gross State Product per year

Transportation Investments and the Wider Economy



Highways are Economic Lifelines



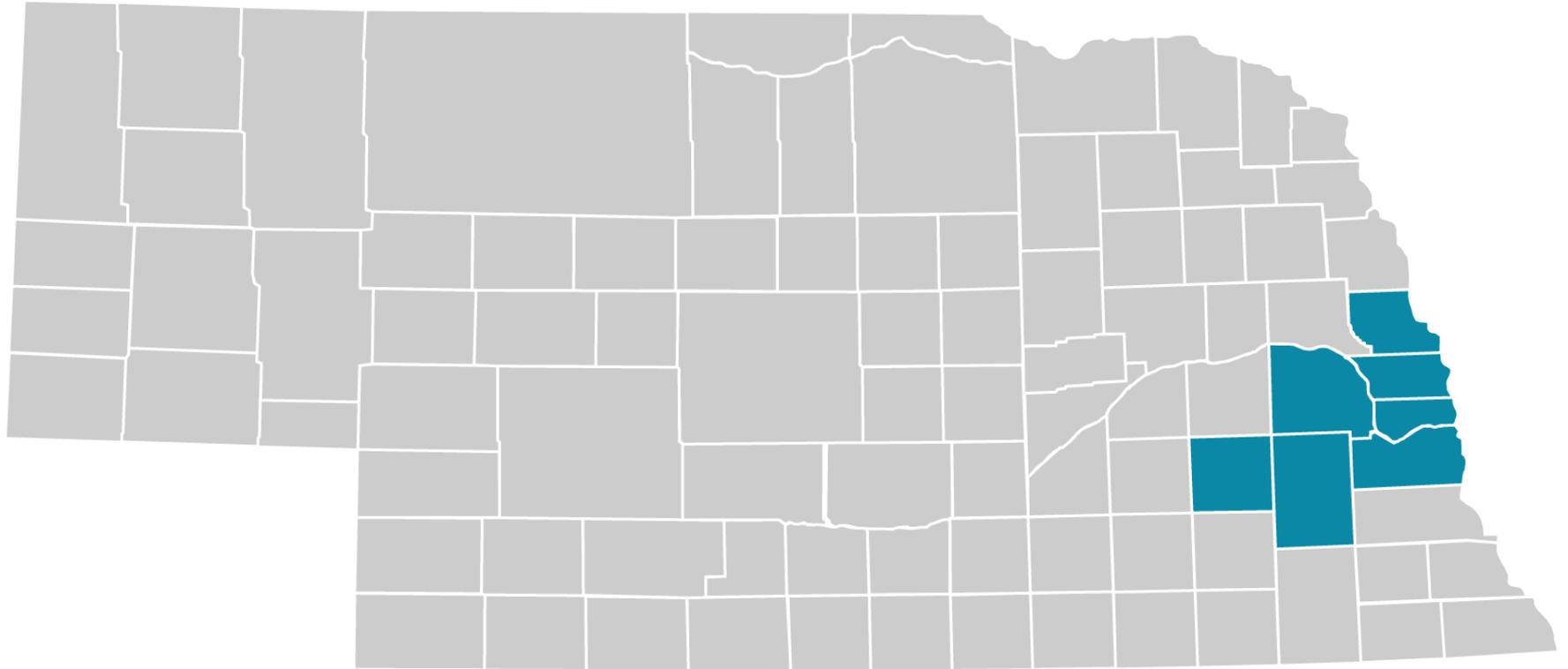
**Economic benefits have far
reaching effects**

Economic Performance

- Growth in Jobs Created
- Growth in Wage Income
- Growth in Gross State Product

Differences between rural and urban areas are accounted for.

Rural and Urban Areas



Rural Counties
Urban Counties

How Urban and Rural Differences are Accounted For

- Projects are divided based on rural and urban county designation
- Multi-Regional Input-Output analysis conducted
 - Analysis based on location of project
 - Levels the playing field
 - Reflects “spill over” economic activity
- Separate urban and rural scoring criteria

Highway Investment

Highway
Investment



Benefits
e.g, Faster, cheaper
deliveries

Highway
Investment



Benefits
e.g, Faster, cheaper
deliveries



Different businesses
(industries) experience
different levels of benefits

Highway
Investment

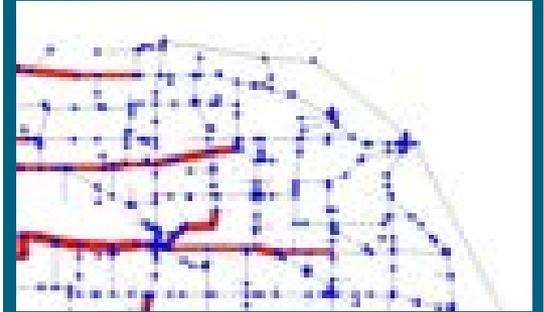


Benefits
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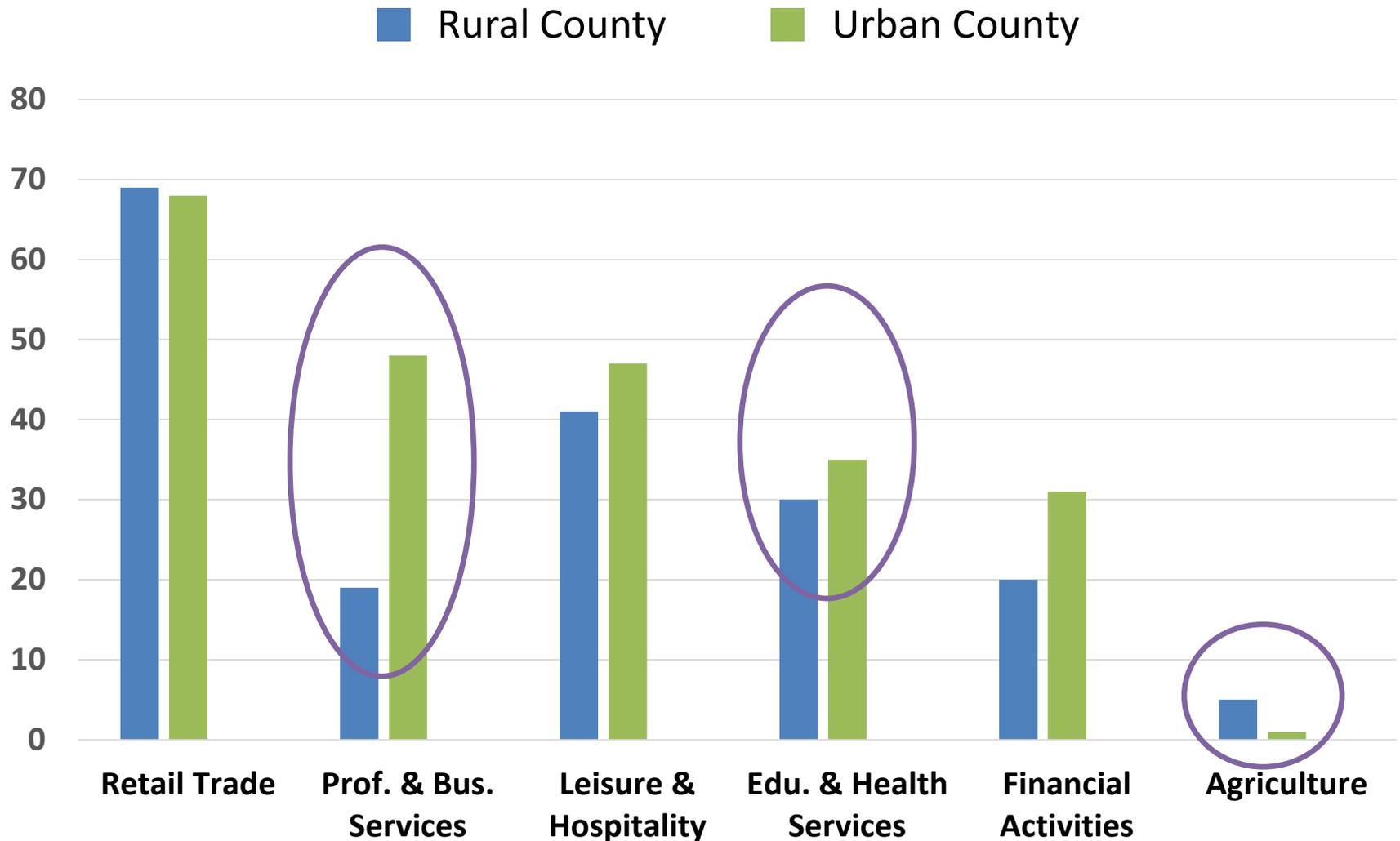
Regions respond
differently too



Difference in Economic Benefits by County - \$40M Travel Time Savings

Benefits	Factor	Urban County	Rural County
Engineering	Travel Time Savings (Cars & Trucks)	\$40M	\$40M
Economy	Jobs Created	248	208
	Gross State Product	\$16.1M	\$14.7M
	Wage Income	\$9.9M	\$8.9M

Industries Impacted Differently by \$40M Travel Time Savings



Analysis considers 14 industry types

Industry	Value Added		Jobs		Wage Income	
	Rural	Urban	Rural	Urban	Rural	Urban
Agriculture & Extraction	\$0.3	\$0.0	5	1	\$0.3	\$0.0
Utilities	\$0.1	\$0.2	1	1	\$0.1	\$0.0
Construction	\$0.1	\$0.1	2	2	\$0.1	\$0.1
Manufacturing	\$0.7	\$0.3	6	3	\$0.4	\$0.3
Wholesale Trade	\$0.7	\$0.3	6	2	\$0.3	\$0.2
Retail Trade	\$5.6	\$3.1	69	68	\$3.3	\$2.0
Transportation	\$0.2	\$0.3	2	4	\$0.1	\$0.2
Postal & Warehousing	\$0.1	\$0.1	3	2	\$0.1	\$0.1
Media and Information	\$0.2	\$0.5	4	4	\$0.1	\$0.3
Financial Activities	\$1.9	\$4.4	20	31	\$0.8	\$1.5
Prof. & Bus. Services	\$1.0	\$2.8	19	48	\$0.8	\$2.3
Educ. & Health Services	\$1.7	\$1.8	30	35	\$1.4	\$1.6
Leisure & Hospitality	\$2.1	\$2.0	41	47	\$1.3	\$1.2
Government	\$0.0	\$0.0	0	0	\$0.0	\$0.0
Total	\$14.7	\$16.1	208	248	\$8.9	\$9.9

TREDIS® and the Data

- Nationally recognized software
- County-level data
- Multiple sources
 - US Census Bureau
 - Implan
 - Moody's Analytics
 - Bureau of Economic Analysis
 - Bureau of Labor Statistics
 - And more!
- Data is paired with NDOR data on travel patterns

Stakeholder Input

- Added candidate projects
- Input on scope options
- Future growth and desired system connections
- How to keep highway system at 10,000 mile limit
- Input on economic factors
- Input on engineering / economic analysis weighting

1,000+
engaged

Other input

- Innovation Task Force
- District engineers and staff
- NDED and NDOL
- Nebraska transportation industry representatives
- National experts

Scoring to Compare Like Projects

Urban and rural identification



Categorization

(e.g., Viaducts, Interchanges, highways)



Apply Engineering + Economic Formula to calculate scores



Project Selection

(Considers other important factors)

Facilitated Discussion

1. What resonates?
2. What's confusing?
3. What questions do you have?



WE WANT TO HEAR FROM

YOU. 

BUILD NEBRASKA ACT
THE NEXT 10 YEARS

TRANSPORTATION
INNOVATION ACT

July Stakeholder Meetings



Winter

Gather input
on process
and project
candidates



Spring

Consider input
and analyze
projects



Summer

Results &
feedback



Fall

Final Project
Selection
Announcement

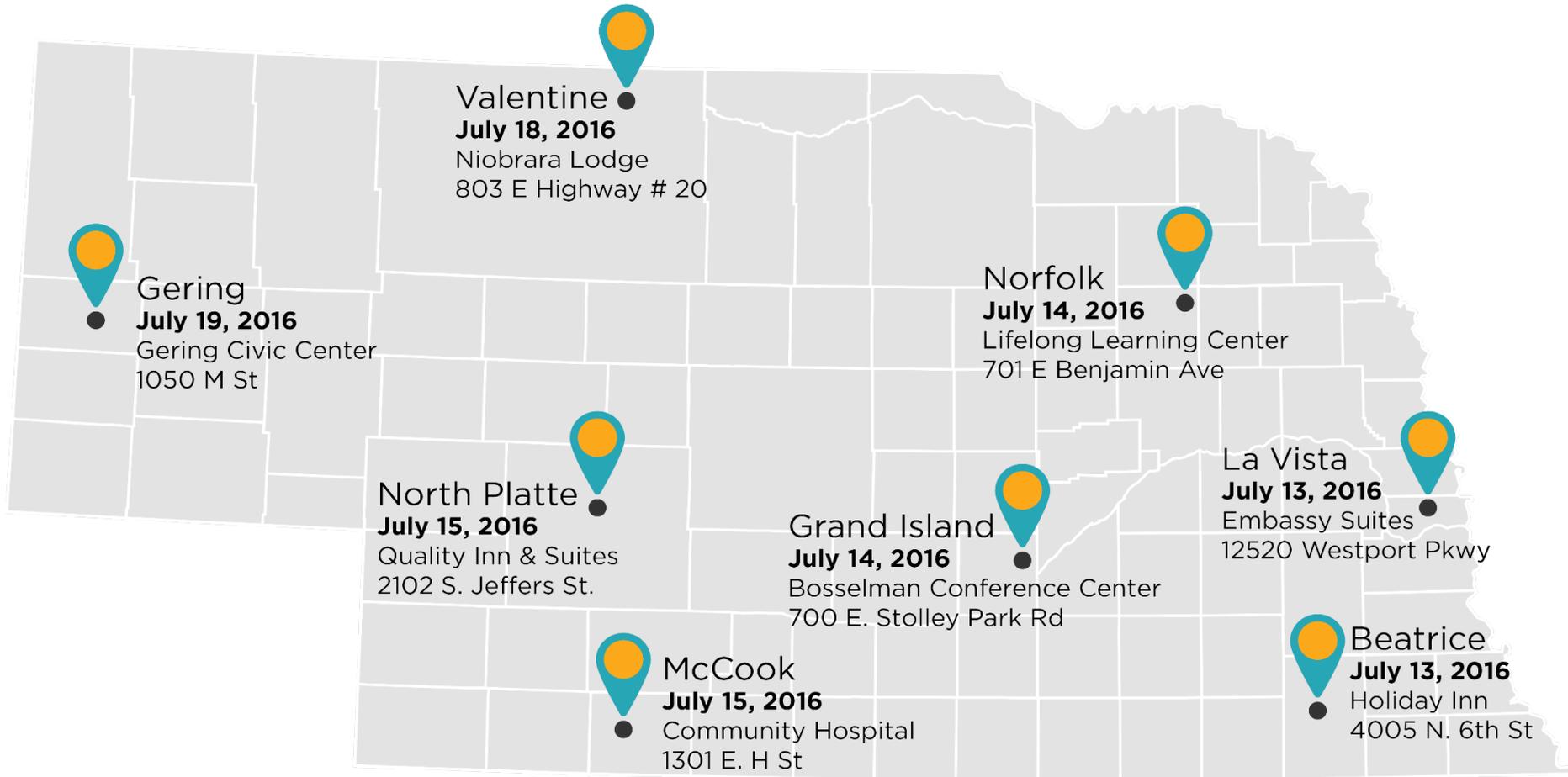
Prioritization



Selection



Upcoming Stakeholder Meetings



Stakeholder Engagement Used to inform investment decisions

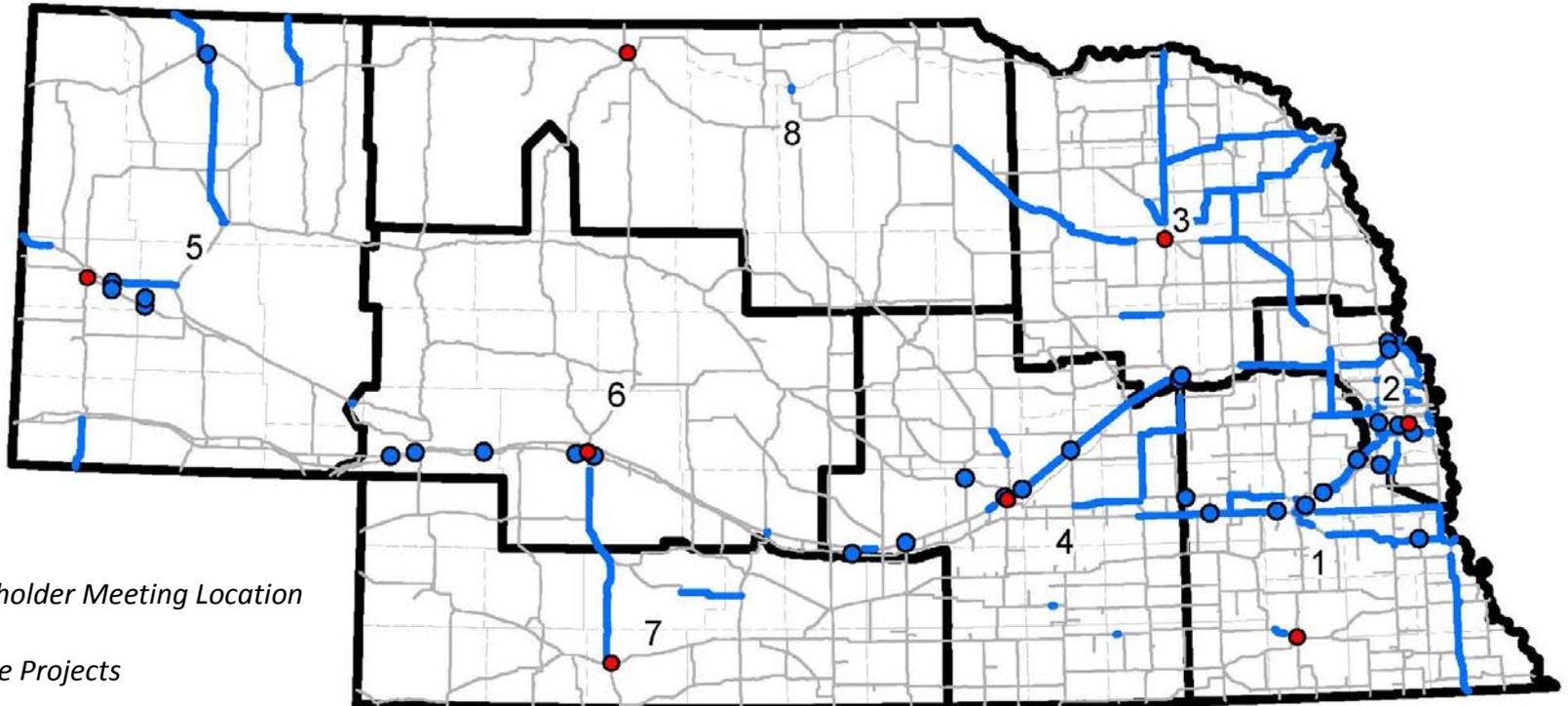
Discussions will focus on:

- Scope options
- Project performance
- Trade-offs
- How projects could support local priorities

July Stakeholder Meeting Approach

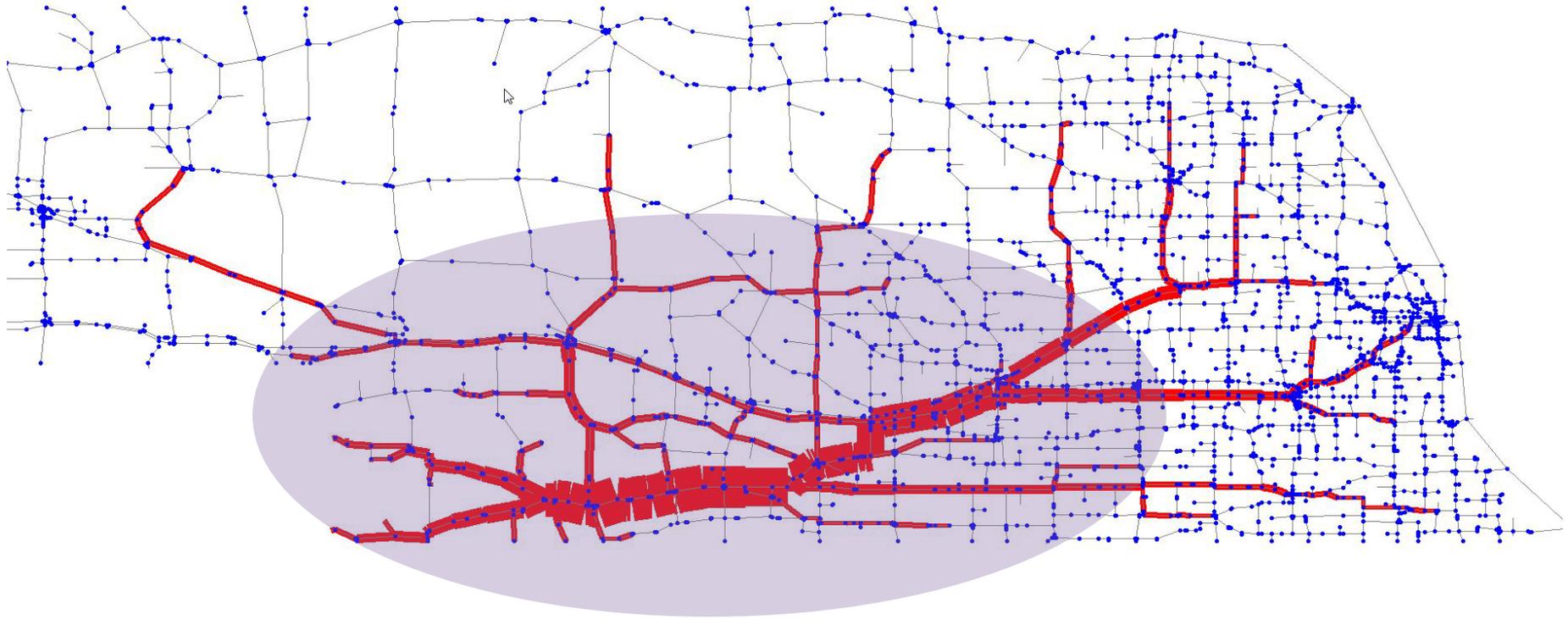
- Prioritization process overview
- Breakout groups
 - Project list includes cost, miles, scopes, engineering, economic assessment, overall performance, traffic, and safety for tradeoff discussion
 - Develop package of project priorities within spending range and why
 - Report out

Looking Beyond Traditional District Boundaries

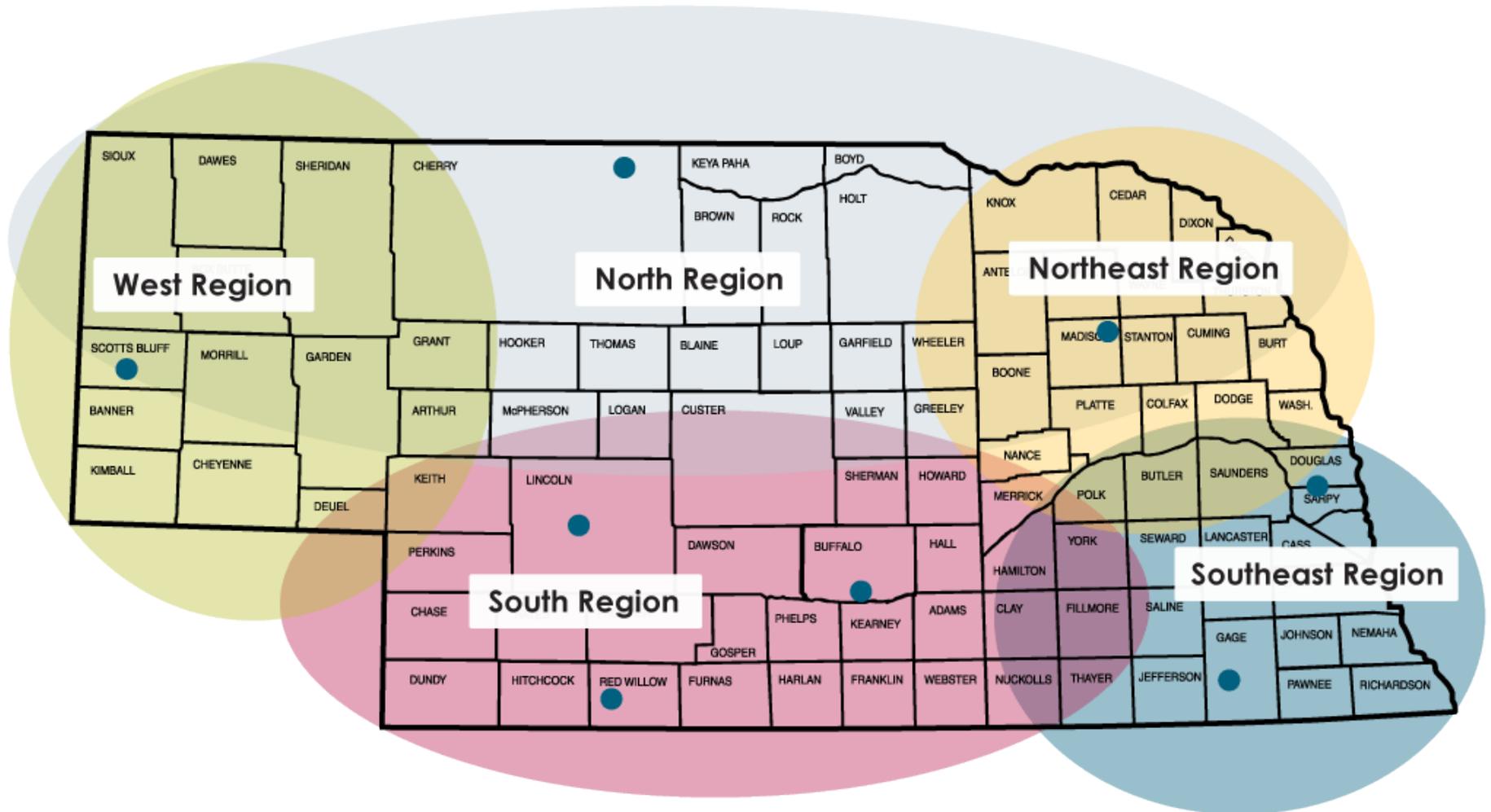


Recognizing Broader Effects

Regional approach recognizes regional impacts of transportation investment



Regional Approach



● July Stakeholder Meeting Location

Trade-off Conversations

- Recognize financial constraints
- Develop minimum and maximum spending ranges for regions
- Enables us to consider trade-offs among projects

Example Project List and Handout for Innovation Task Force Discussion

A/B

Example Packages totaling \$400 million or less

Packages A and B are examples of combination of projects and are provided for illustrative purposes. These packages are intended to foster discussion about options for selecting projects. NDOR is interested in hearing your thoughts about these packages and your ideas for other combinations of projects.

Package	Cost	Miles Completed
A	\$397	111
B	\$400	94



Scope Options

With far more transportation needs than dollars available, NDOR is exploring a variety of scope options to expand the ability to provide more transportation improvements. Those options include:

- **4 lane divided highway** - A four lane highway where access is controlled. Intersections may be at-grade or have on and off ramps.
- **4 lane expressway** - Same as the 4 lane divided highway, but on Nebraska's designated expressway system.
- **Bypass** - A highway that avoids or bypasses a town to allow highway traffic to flow without interference from local traffic.
- **Super 2** - A two-lane roadway with better paved shoulders and passing lanes about every 5 miles.
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Package	ID	Project Description	Scope Options	Project Cost (millions)	Project Length (miles)	Projected Average Daily Traffic (2036)	Crash Rate	Engineering Performance	Economic Performance	Overall Performance
4-lane and 2-lane projects										
B	1	N-82 from Yutan to Platte River	4 lane divided highway	\$10	2	10,255	1.416			
B	2	N-82 from Platte River east	4 lane divided highway	\$26	3	9,770	1.429			
A	3	US 276 Expressway from Pilger to Scribner	4 lane divided highway with bypasses	\$297	50	7,390	0.646			
	4	US 275 west of Pilger	4 lane divided highway, no bypasses	\$175						
	5	US 275 from Pilger to Wisner	4 lane divided expressway	\$43	9	7,390	0.193			
	6	US 275 from Wisner to Beemer	4 lane divided expressway with bypass	\$53	9	7,105	0.964			
	7	US 275 from Beemer to West Point	4 lane divided expressway, no bypass	\$29	7	6,310	0.519			
	8	US 275 from West Point North and South	4 lane divided expressway	\$26	6	6,630	0.639			
	9	US 275 from West Point North and South	4 lane divided expressway with bypass	\$89	9	8,915	0.924			
	10	US 275 from Scribner North and South	4 lane divided expressway, no bypass	\$4	9	7,730	0.740			
B	10	N-26 from Minatare to US 886	4 lane divided expressway	\$56	9	7,730	0.740			
B	11	US 281 from St. Paul south	4 lane divided highway	\$43	18	4,114	0.683			
B	12	US 83 from McCook to North Platte	4 lane divided highway	\$18	8	4,935	0.825			
A	13	US 83 from McCook to North Platte	Super 2	\$248	60	2,545	0.791			
	14	US 83 from McCook to Frontier County line	Super 2	\$92	9	2,580	0.503			
	15	US 83 from Frontier County Line to Road 736	4 lane divided highway	\$39	10	2,310	0.844			
	16	US 83 from Road 736 to N-23	Super 2	\$15	12	2,135	1.373			
	17	US 83 from N-23 South Junction to North Junction	4 lane divided highway	\$41	14	2,755	0.991			
	18	US 83 from N-23 to Lone Star Road	Super 2	\$15	6	2,530	0.289			
	19	US 83 from Lone Star Road to North Platte	4 lane divided highway	\$25	9	3,190	0.321			
	20	US 83 from Lone Star Road to North Platte	Super 2	\$9						
			Super 2	\$13						
Viaduct projects										
B	19	L-80F in Utioa	New viaduct	\$10	2	1,365	4.151			
A	20	N-11 in Calro	New viaduct	\$8	1	3,375	1.816			

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Crash Rate
The crash rate reflects how many crashes are occurring per 100 million vehicle miles traveled.

Engineering Performance
The score takes into account the amount of traffic, percent of cars and trucks, congestion, travel time savings, safety, vehicle operating costs, cost of improvement, and maintenance and operation costs of the roadway.

Economic Performance
The score is determined by measuring growth in jobs created, wage income, and gross state product.

Overall Performance
The proposed weighting includes engineering score at 60% and the economic impact score at 40%.

Constraints, Trade-offs & Packages

A/B

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	D	2	N-82 from Platte River east	4 lane divided highway	\$26	3	9,770	1.429		
	A	3	US 276 Expressway from Pilger to Scribner	4 lane divided highway with bypasses	\$297					
				4 lane divided highway, no bypasses	\$175	50	7,390	0.646		
		4	US 275 west of Pilger	4 lane divided expressway	\$43	9	7,390	0.193		
		5	US 275 from Pilger to Wisner	4 lane divided expressway with bypass	\$53	9	7,105	0.964		
		6	US 275 from Wisner to Beemer	4 lane divided expressway	\$30	7	6,310	0.519		
		7	US 275 from Beemer to West Point	4 lane divided expressway	\$26	6	6,630	0.639		
		8	US 275 from West Point North and South	4 lane divided expressway with bypass	\$89	9	8,915	0.924		
				4 lane divided expressway, no bypass	\$4					
		9	US 275 from Scribner North and South	4 lane divided expressway with bypass	\$56	9	7,730	0.740		
				4 lane divided expressway, no bypass	\$43					
	D	10	N-28 from Minatare to US 886	4 lane divided highway	\$80	18	4,114	0.683		
	B	11	US 281 from Rt. Paul south	4 lane divided highway	\$18	8	4,935	0.825		
	D	12	US 83 from McCook to North Platte	4 lane divided highway	\$248					
				Super 2	\$92	60	2,545	0.791		
		13	US 83 from McCook to Frontier County line	4 lane divided highway	\$39	9	2,580	0.503		
				Super 2	\$15					
		14	US 83 from Frontier County Line to Road 736	4 lane divided highway	\$41	10	2,310	0.844		
				Super 2	\$15					
		15	US 83 from Road 736 to N-23	4 lane divided highway	\$49	12	2,135	1.373		
				Super 2	\$18					
		16	US 83 from N-23 South Junction to North Junction	4 lane divided highway	\$57	14	2,755	0.991		
				Super 2	\$21					
		17	US 83 from N-23 to Lone Star Road	4 lane divided highway	\$25	6	2,530	0.289		
				Super 2	\$9					
		18	US 83 from Lone Star Road to North Platte	4 lane divided highway	\$36	9	3,190	0.321		
				Super 2	\$13					
Viaduct projects										
	D	19	L-80F in Utioa	New viaduct	\$10	2	1,365	4.151		
	D	20	N-11 in Calro	New viaduct	\$8	1	3,375	1.816		

This handout contains draft language and is an example for illustrative purposes only. Prepared for Innovation Task Force meeting on June 8, 2016.

Crash Rate

The crash rate reflects how many crashes are occurring per 100 million vehicle miles traveled.

Engineering Performance

The score takes into account the amount of traffic, percent of cars and trucks, congestion, travel time savings, safety, vehicle operating costs, cost of improvement, and maintenance and operation costs of the roadway.

Economic Performance

The score is determined by measuring growth in jobs created, wage income, and gross state product.

Overall Performance

The proposed weighting includes engineering score at 60% and the economic impact score at 40%.

Crash Rate, Engineering, Economic and Overall Performance

A/B

Example Packages totaling \$400 million or less

Packages A and B are examples of combination of projects and are provided for illustrative purposes. These packages are intended to foster discussion about options for selecting projects. NDOR is interested in hearing your thoughts about these packages and your ideas for other combinations of projects.

Package	Cost	Miles Completed
A	\$397	111
B	\$400	94



Scope Options

With far more transportation needs than dollars available, NDOR is exploring a variety of scope options to expand the ability to provide more transportation improvements. Those options include:

- **4 lane divided highway** - A four lane highway where access is controlled. Intersections may be at-grade or have on and off ramps.
- **4 lane expressway** - Same as the 4 lane divided highway, but on Nebraska's designated expressway system.
- **Bypass** - A highway that avoids or bypasses a town to allow highway traffic to flow without interference from local traffic.
- **Super 2** - A two-lane roadway with better paved shoulders and passing lanes about every 5 miles.
- **2 + 2** - A highway that uses the existing two lanes of highway and adds two more lanes to make a 4-lane divided highway.

Package	ID	Project Description	Scope Options	Project Cost (millions)	Project Length (miles)	Projected Average Daily Traffic (2036)	Crash Rate	Engineering Performance	Economic Performance	Overall Performance
4-lane and 2-lane projects										
B	1	N-82 from Yutan to Platte River	4 lane divided highway	\$10	2	10,255	1.416			
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	6	US 275 from Wisner to Beemer	4 lane divided expressway, no bypass	\$29						
	6	US 275 from Wisner to Beemer	4 lane divided expressway	\$30	7	6,310	0.519			
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Overall Performance

The proposed weighting includes engineering score at 60% and the economic impact score at 40%.

Breakout Groups for July

- Groups should be made up of community reps from across the region
- Review candidate project list
- Dot projects you want to make sure are discussed
- Develop a package of projects that fits within your regional range
- Record why those projects are included in your package
- Be prepared to report out

Report Out

- Projects within your package
- Estimated total package cost
- Why did your group select those projects and scopes?

Prioritization **≠** ***Selection***

Project Selection: Other Considerations

- Public Support
- Geographic Inclusion
- Corridor Completion
- Supplemental Funding

Facilitated Discussion



Lightning Round



WRAP UP & THANK YOU

<http://roads.nebraska.gov/innovation-task-force>





Nebraska Department of Roads

Innovation Task Force