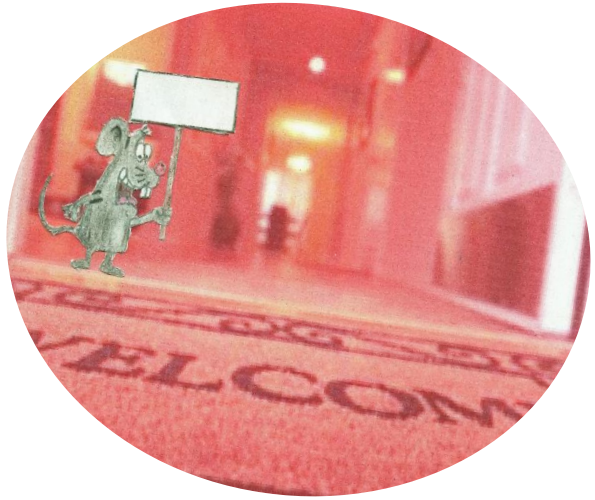
Security

Weather Conditions

Duration

Accessibility



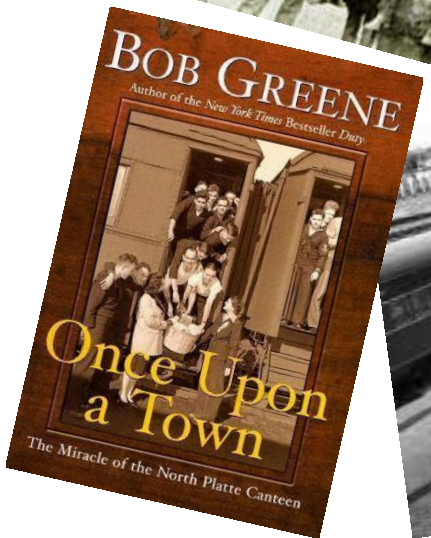
Accommodations

Diversion

- It is in the light of these six criteria that I assessed my hometown and its general region's suitability as a site from which to observe the total solar eclipse of 21 August 2017. Let's see how well it stacks up.

Security in Western Nebraska

1. Rural Western setting with low crime rate. Security is as good as any community of similar size anywhere in the path of totality.
2. Originally a notoriously wild railroad town that for its first year of existence was called “Hell on Wheels Town.”
3. Home during WWII to the famous North Platte Canteen that provided free food and beverage for all troop trains from Christmas Day 1941 to April 1946. Est more than 6 million service men and women were served.



- With a population of approximately 25,000, North Platte is small by any standard, yet it is the nearest thing to a city within a 100 miles to the east, and over 200 miles in any other direction. Certainly we have our share of troublesome characters, but mischief and crime do seem to have a rural aura about them. Cattle rustling, for instance, still ranks among the more common crimes, but should present no problem to the eclipse traveler, provided he leaves his prize heifer at home.
- Frequently the character of a town is revealed in its history. North Platte is no exception and two brief accounts draw apposing pictures of the human spectrum there to be encountered. First North Platte is a railroad town, originally composed of society's varmints drawn by the lure of construction crews with railroad pay and nowhere to spend it. In 1866 during its first year of existence, it was known as "Hell on Wheels Town." As the teachers at the local high school can assure you, the descendants of many of those first citizens still make their presence known. Secondly, during WWII the citizens of North Platte and surrounding communities established a canteen that freely served the many troop trains that stopped on their long journey across the country. Even in times of strictest rationing, free food and drink greeted every train from Christmas Eve 1941 until the canteen closed in April 1946, having served over 6 million service men and women. Weigh the citizenry of our town in either light, and when all is said, security is as good if not better than that found in any other community of comparable size within the eclipse path across America.

- Let’s turn now to something of a more obvious concern: what are the weather prospects?

August Weather Conditions Typical for Western Nebraska

- The NOAA weather station at North Platte has made access of quick weather updates readily available even in the days before the internet. But I have often noted that on many occasions what meteorologists called “sunny or clear skies” often differed from my own assessment of the heavens.

- Therefore in 1995 I set out to make my own eclipse day observations. Initially my approach was simple. I would observe the sky on the day and at the time (12:55 PM CDT) of the future eclipse and record the percentage of clear sky. This process was made more complex when at various times I attempted to extend the observation period to a 3 day window and later to a 7 day window. Because of both personal and business obligations that required travel during the eclipse window period, maintenance of either expanded schedule was sometimes difficult to meet. I was able, however, to manipulate my schedule to make observations at eclipse time on eclipse day for all 20 observation opportunities.

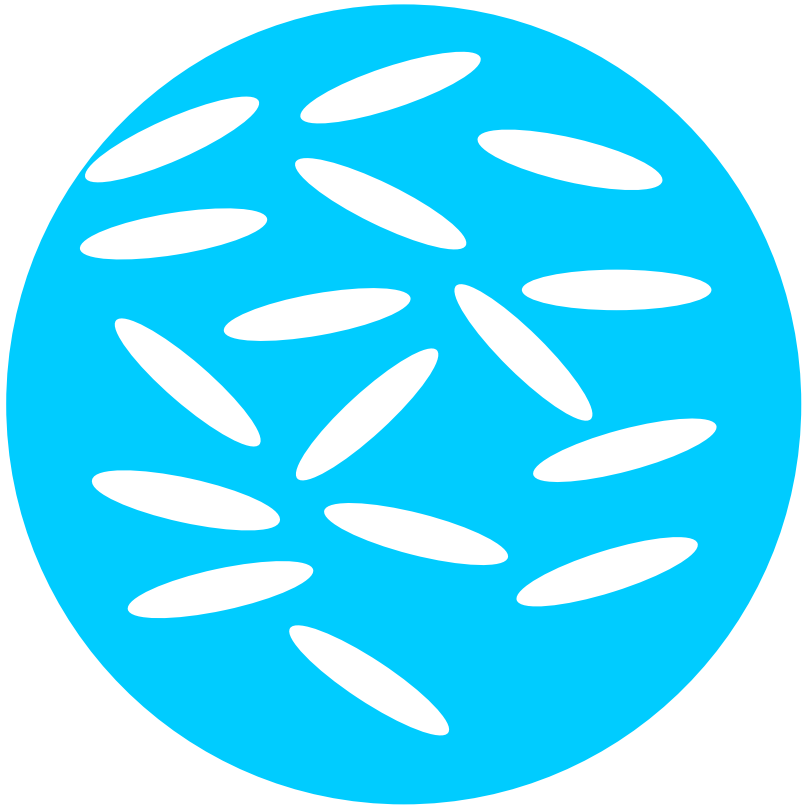
Days Observed within Observation Window 1995 -2014							
Year/Day	18-Aug	19-Aug	20-Aug	21-Aug	22-Aug	23-Aug	24-Aug
1995				X			
1996				X			
1997	X	X	X	X			
1998				X			
1999			X	X	X		
2000	X	X	X	X	X		X
2001	X	X	X	X	X	X	X
2002	X	X	X	X	X	X	X
2003	X	X	X	X	X	X	X
2004			X	X	X		
2005	X	X	X	X	X	X	
2006	X	X	X	X	X	X	X
2007	X	X	X	X	X	X	
2008	X	X	X	X	X	X	X
2009	X	X	X	X	X	X	X
2010	X	X	X	X	X	X	X
2011	X	X	X	X	X	X	
2012			X	X	X		
2013			X	X	X		
2014	X	X	X	X	X	X	X
percentage	65%	65%	85%	100%	80%	55%	45%

- Over the period from 1995 through 2014, 99 out of a potential 140 days were observed within a seven day window centered on 21 August. The highest percentage of observations (100%) occurring on eclipse day. The second highest number of observations occurred in the three day window of 20 – 22 August (92%) and the least number of observations occurred in the peripheral days both before and after the future eclipse date (18 -19 and 23-24 August (58%) resulting in an observation average of 71% for all days observed. A growing concern early on in the observing process was the accuracy of the percentage of clear skies estimates.

Percentage of days within 1 week eclipse window (18 - 24 Aug) when sky conditions were observed 1995-2014

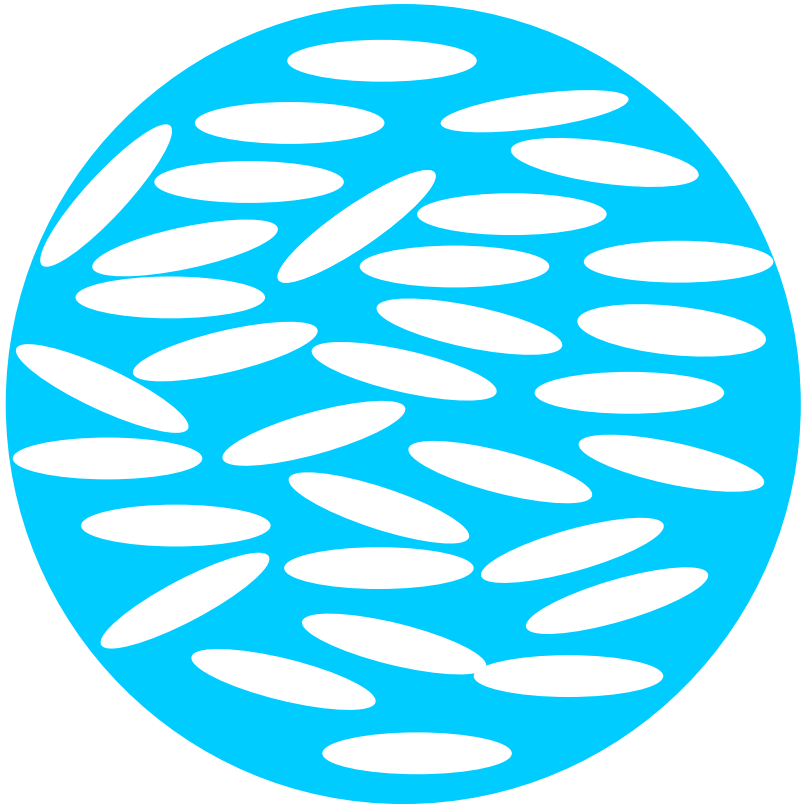
Full Week Window:	Peripheral Days	3 Day Window:	Eclipse Day
18 -24 Aug 99/140 =	18-19&23-24 Aug 46/80=	20 – 22 Aug 55/60 =	21 Aug 20/20=
71%	58%	92%	100%

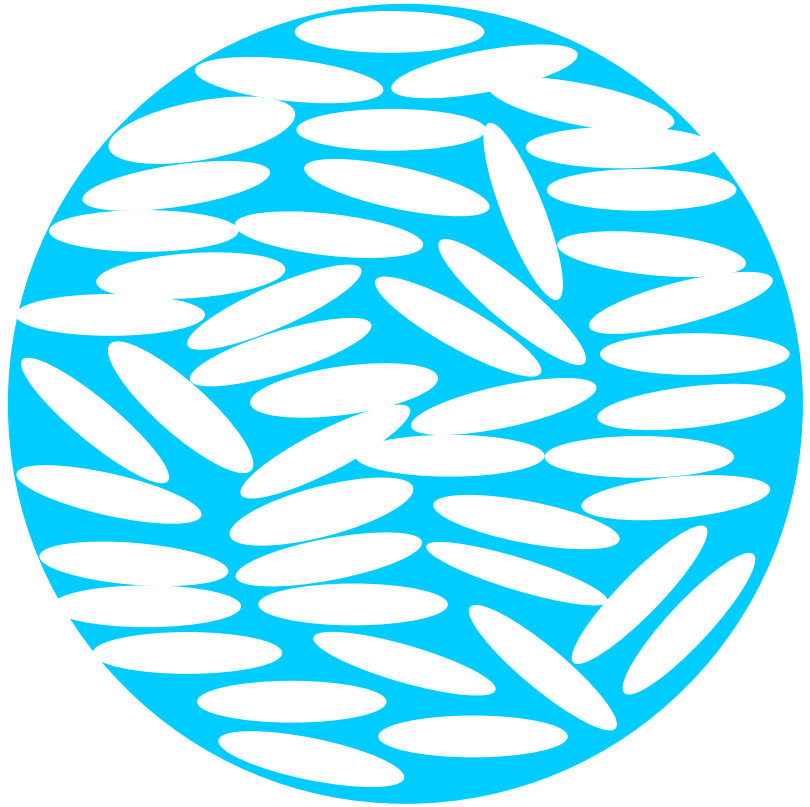
- To assist in these estimates, I made and used “clear skies – cloudy skies ratio templates” that represent 75% clear skies, 50% clear skies and 25% clear skies. From studying sky conditions over the last twenty years in conjunction with the eclipse weather observations



One to Three Area Ratio: White to Blue = 75% Clear Skies

One to One Area Ratio: White to Blue = 50% Clear Skies





Three to One Area Ratio: White to Blue = 25% Clear Skies

- From studying sky conditions over the last twenty years in conjunction with the eclipse weather observations, I have arrived at the conclusion that 65% clear skies is the very minimum sky condition where successful eclipse observation is likely. And that itself is dependent on where in relationship to the Sun the clear sky and cloud are located.

13 to 20 Area Ratio: White to Blue = 65% clear skies

- What information did I glean from these observations? First, the bad news. Using 65% clear skies as the cutoff point between positive observation days and negative observation days, my data indicates that 34% of the days observed fall in the negative days' category. Another disturbing fact is that during eight of the twenty years, negative percentages extended over two or more days in the observation window. While some weather patterns moved out swiftly, too many seemed to linger.

	Average Clear Sky During Negative Days at Time of Eclipse						
year/day	18-Aug	19-Aug	20-Aug	21-Aug	22-Aug	23-Aug	24-Aug
1995	no	no	no		no	no	no
1996	no	no	no	0%	no	no	no
1997	0%			15%	no	no	no
1998	no	no	no		no	no	no
1999	no	no				no	no
2000	0%	0%	40%			no	
2001				0%		20%	0%
2002		50%	0%	0%			
2003	0%						
2004	no	no				no	no
2005		50%			40%	0%	no
2006	50%	0%	50%	50%			
2007					0%	10%	no
2008	60%		15%			0%	
2009							
2010		0%				0%	
2011		0%	35%	30%			no
2012	no	no				no	no
2013	no	no			0%	no	no
2014			25%		0%	0%	
Average of Clear Sky During Negative Days:			13%	Negative Days:	34/99	34%	

- Taking in the overall picture produces less ominous prospects. Five of the seven days in the observation window over the 20 year period produced clear skies percentages that fall above my 65% threshold value, while the 21 Aug, or "eclipse day" observations, produced a very respectable 74% clear sky value.

Percentages of Clear Sky for All Days Observed at Eclipse Time							
year	date	Column1	Column2	Column3	Column4	Column5	Column6
	18-Aug	19-Aug	20-Aug	21-Aug	22-Aug	23-Aug	24-Aug
1995				**100%**			
1996				**0%**			
1997	0%	65%	70%	**15%**			
1998				**100%**			
1999			100%	**100%**	100%		
2000	0%	0%	40%	**100%**	70%		100%
2001	100%	100%	85%	**0%**	90%	0%	20%
2002	80%	50%	0%	**0%**	100%	90%	100%
2003	0%	100%	100%	**100%**	80%	100%	100%
2004			100%	**100%**	100%		
2005	100%	50%	100%	**95%**	40%	0%	
2006	50%	0%	50%	**50%**	100%	100%	90%
2007	100%	100%	100%	**100%**	0%	10%	
2008	60%	100%	15%	**100%**	100%	0%	65%
2009	100%	70%	70%	**85%**	100%	90%	100%
2010	100%	0%	100%	**100%**	100%	0%	100%
2011	100%	0%	35%	**30%**	100%	100%	
2012			100%	**100%**	85%		
2013			100%	**100%**	0%		
2014	100%	90%	25%	**100%**	0%	0%	100%
Average	68%	56%	70%	**74%**	73%	45%	86%

- In an attempt to eliminate the potential for observational prejudice in terms of determining the clear sky – cloudy sky percentage, let's look at absolute days, or days with 100% or 0% clear skies. During the seven day period for 20 years of observing a total of 67 days were either 100% or 0% clear: 48 being clear and 19 being clouded. Translated into percentages for observed days, 48% of the observed days were completely clear, and 19% were completely clouded over. And we look at only absolute days, 72% were clear, 28% cloudy.

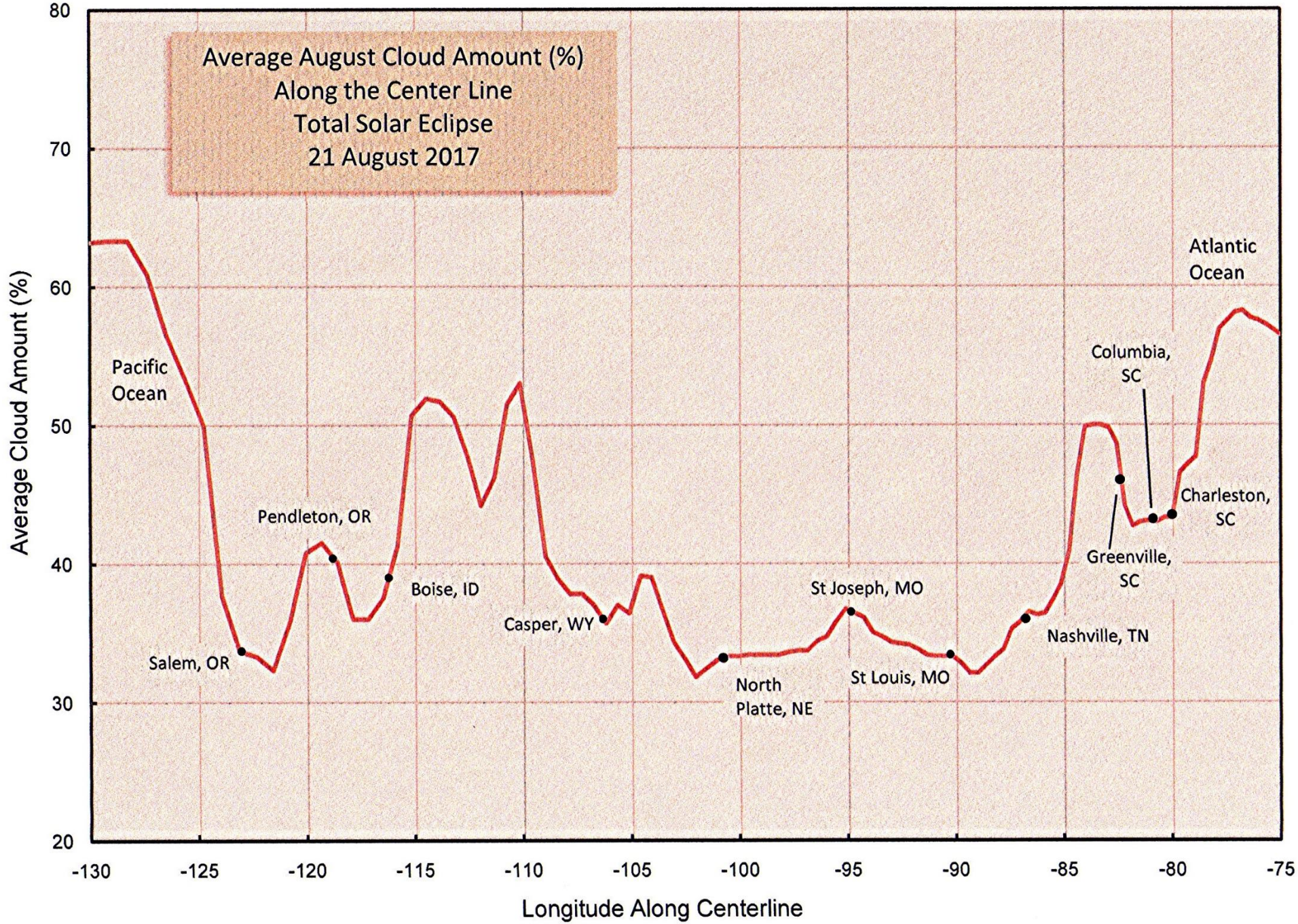
Days Observed with Either 0% or 100% Clear Skies at Eclipse Time

year	date	Column1	Column2	Column3	Column4	Column5	Column6
	18-Aug	19-Aug	20-Aug	21-Aug	22-Aug	23-Aug	24-Aug
1995				**100%**			
1996				**0%**			
1997	0%						
1998				**100%**			
1999			100%	**100%**	100%		
2000	0%	0%		**100%**			100%
2001	100%	100%		**0%**		0%	
2002			0%	**0%**	100%		100%
2003	0%	100%	100%	**100%**		100%	100%
2004			100%	**100%**	100%		
2005	100%		100%			0%	
2006		0%			100%	100%	
2007	100%	100%	100%	**100%**	0%		
2008		100%		**100%**	100%	0%	
2009	100%				100%		100%
2010	100%	0%	100%	**100%**	100%	0%	100%
2011	100%	0%			100%	100%	
2012			100%	**100%**			
2013			100%	**100%**	0%		
2014	100%			**100%**	0%	0%	100%
Days 100%	7	4	8	12	8	3	6
Days 0%	3	4	1	3	1	4	0
Total 0% Days:	19		Total 100% Days:	48			

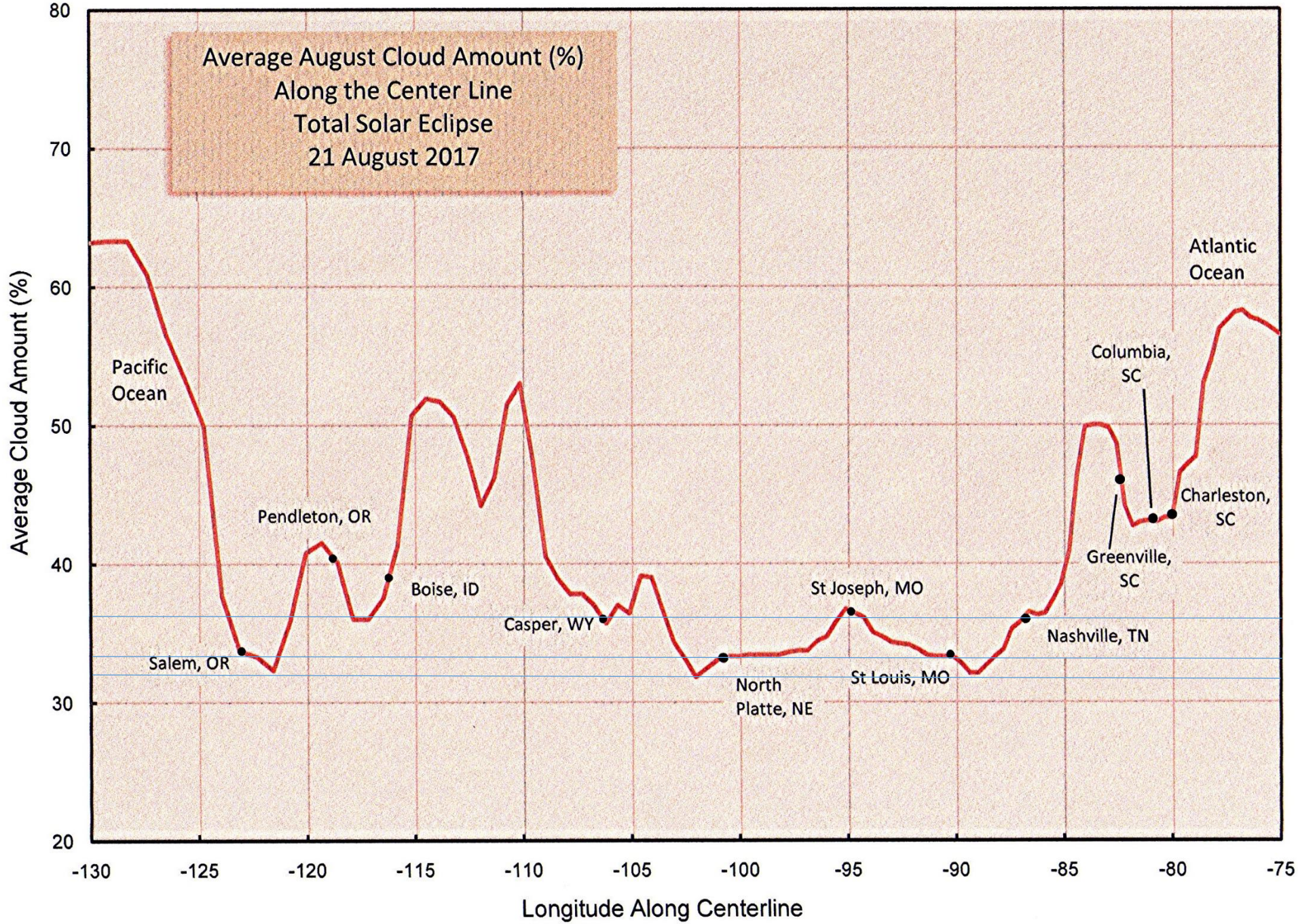
- Looking again at the Percentage of Clear Sky Table we see that for all days observed, the combined percent average of clear skies is 68%. This value is only slightly above the success threshold value that I determined to be 65% clear skies. Should I therefore begin to look for a site with better weather prospects?

Percentages of Clear Sky for All Days Observed at Eclipse Time							
year	date	Column1	Column2	Column3	Column4	Column5	Column6
	18-Aug	19-Aug	20-Aug	21-Aug	22-Aug	23-Aug	24-Aug
1995				**100%**			
1996				**0%**			
1997	0%	65%	70%	**15%**			
1998				**100%**			
1999			100%	**100%**	100%		
2000	0%	0%	40%	**100%**	70%		100%
2001	100%	100%	85%	**0%**	90%	0%	20%
2002	80%	50%	0%	**0%**	100%	90%	100%
2003	0%	100%	100%	**100%**	80%	100%	100%
2004			100%	**100%**	100%		
2005	100%	50%	100%	**95%**	40%	0%	
2006	50%	0%	50%	**50%**	100%	100%	90%
2007	100%	100%	100%	**100%**	0%	10%	
2008	60%	100%	15%	**100%**	100%	0%	65%
2009	100%	70%	70%	**85%**	100%	90%	100%
2010	100%	0%	100%	**100%**	100%	0%	100%
2011	100%	0%	35%	**30%**	100%	100%	
2012			100%	**100%**	85%		
2013			100%	**100%**	0%		
2014	100%	90%	25%	**100%**	0%	0%	100%
Average	68%	56%	70%	**74%**	73%	45%	86%
Grand Average:					**68%**		

- To answer that, I looked at the “Average August Cloud Amount (%) Along the Center Line Total Solar Eclipse 21 August 2017” graph that Jay Anderson created for his presentation at the Solar Eclipse Conference in 2007 at the Griffith Observatory in Los Angles.


Average August Cloud Amount (%)
Along the Center Line
Total Solar Eclipse
21 August 2017
Average Cloud Amount (%)
80
70
60
50
40
30
20
-130
-125
-120
-115
-110
-105
-100
-95
-90
-85
-80
-75
Longitude Along Centerline
Pacific Ocean
Salem, OR
Pendleton, OR
Boise, ID
Casper, WY
North Platte, NE
St Joseph, MO
St Louis, MO
Nashville, TN
Columbia, SC
Greenville, SC
Charleston, SC
Atlantic Ocean

- This graph has since appeared with the addition of several place names in the Third Edition of Littman, Espenak and Willcox's *Totality: Eclipses of the Sun* on page 261 and on page 263 of the same book's Third Edition—Newly Updated version. The graph charts the percentage of cloud as opposed to my listing of the percentage of clear skies. I added the horizontal blue lines to make it easier to compare the average cloud cover for several different locations. The lowest cloud amounts for the listed cities is 33% for Salem, Oregon; North Platte, Nebraska; and St. Louis, Missouri. Each of the cities named also has a "low point" to either its east or west that decreases the 33% value by 1 or 2 percentage points, and are clearly, according to the graph, the locations with the lowest percent of cloud cover along the entire eclipse path. Two observations can thus be made regarding the 68% clear sky value that my observations wrought. First, the percentage of clear skies for North Platte obtained through 20 years of observation closely agrees to the value expressed in the 2007 Eclipse Conference Graph, and secondly, I could not appreciably increase my prospects for clear skies by selecting an alternate site.


Average August Cloud Amount (%)
Along the Center Line
Total Solar Eclipse
21 August 2017
Average Cloud Amount (%)
80
70
60
50
40
30
20
-130
-125
-120
-115
-110
-105
-100
-95
-90
-85
-80
-75
Longitude Along Centerline
Pacific Ocean
Salem, OR
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Boise, ID
Casper, WY
North Platte, NE
St Joseph, MO
St Louis, MO
Nashville, TN
Columbia, SC
Greenville, SC
Charleston, SC
Atlantic Ocean

- With the weather question settled for the moment, at least, Let's inspect the question of duration. What will be the greatest duration of totality in the entire eclipse path, where will it occur and how long will totality last at my home in North Platte? Unfortunately, the maximum totality for the 21 August 2017 eclipse is only in the low average range for eclipses: 2:40. The eclipse is, however, a member of a saroes series that in the 26th century will produce three eclipses of greater than seven minute duration. That however, presents us little comfort here and now and we must make due with our meagre 2:40. But where must one go to experience this luxury of maximum time?

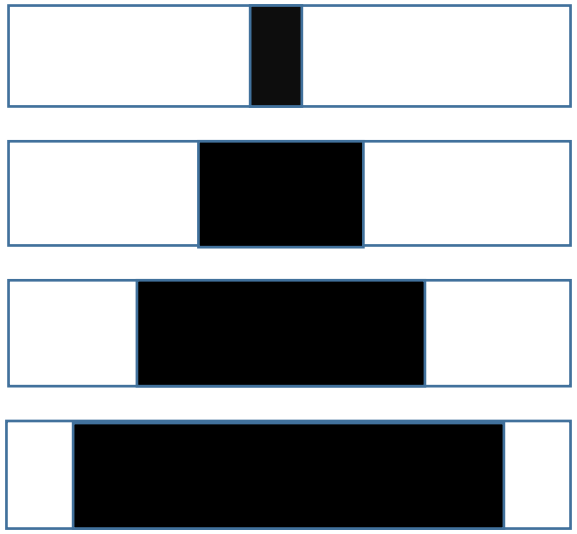
Duration of Eclipse

Total Eclipses of Saros 145: Watch the Duration Grow!
(Time Lapse between listed eclipses is one Exeligmos)

1909 (A/T):	:24	2342 (T):	4:16
1963 (T):	1:40	2396 (T):	5:12
2017 (T):	2:40	2450 (T):	6:19
2071 (T):	3:11	2504 (T):	7:10
2125 (T):	3:15	2558 (T):	6:43
2179 (T):	3:12	2612 (T):	4:45
2233(T):	3:18	2666 (P)	
2288 (T):	3:38		

(for whole saros ave. totality: 4:02)

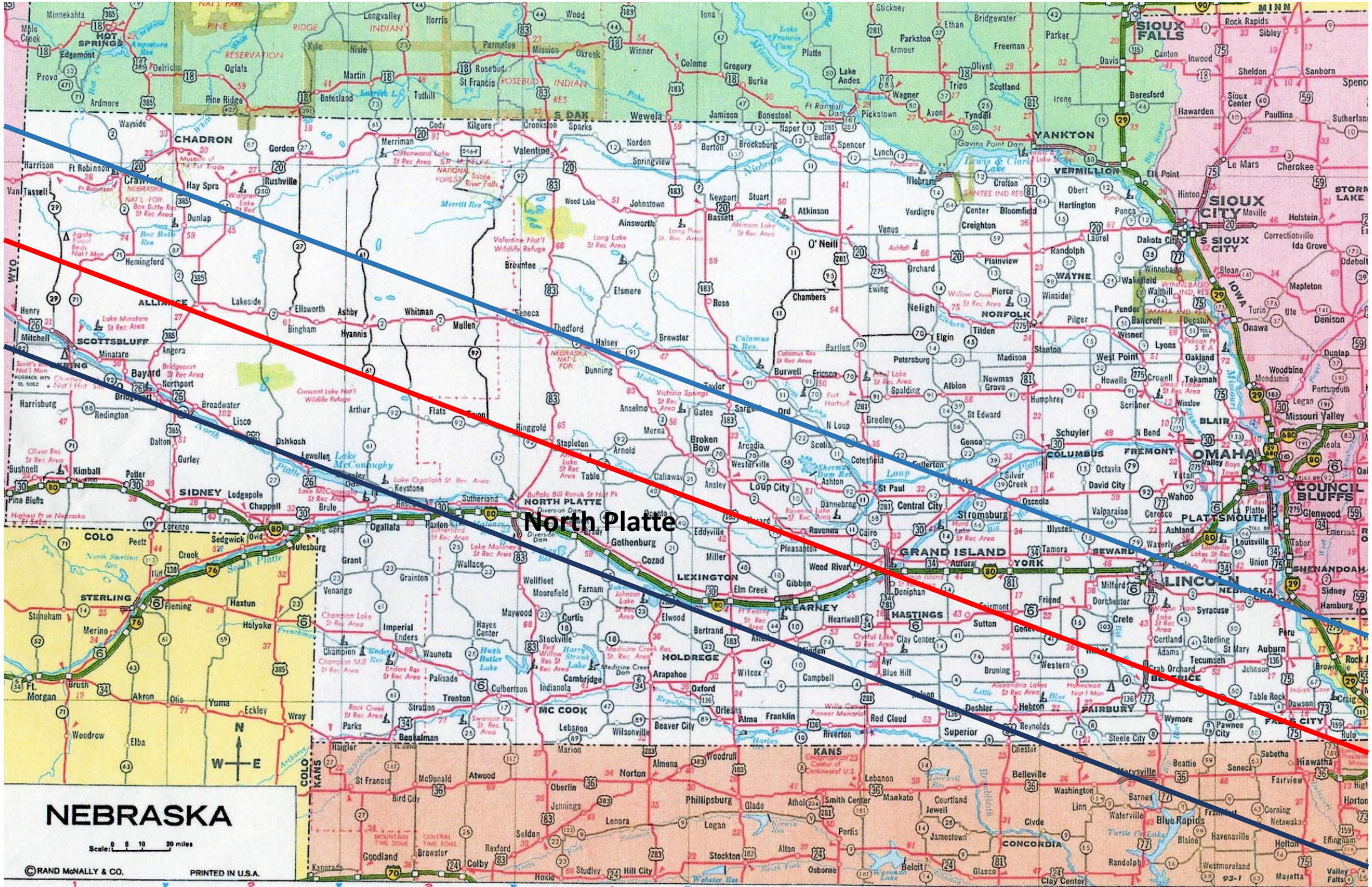
Length of totality expressed for " Point of Greatest Eclipse" for each event.



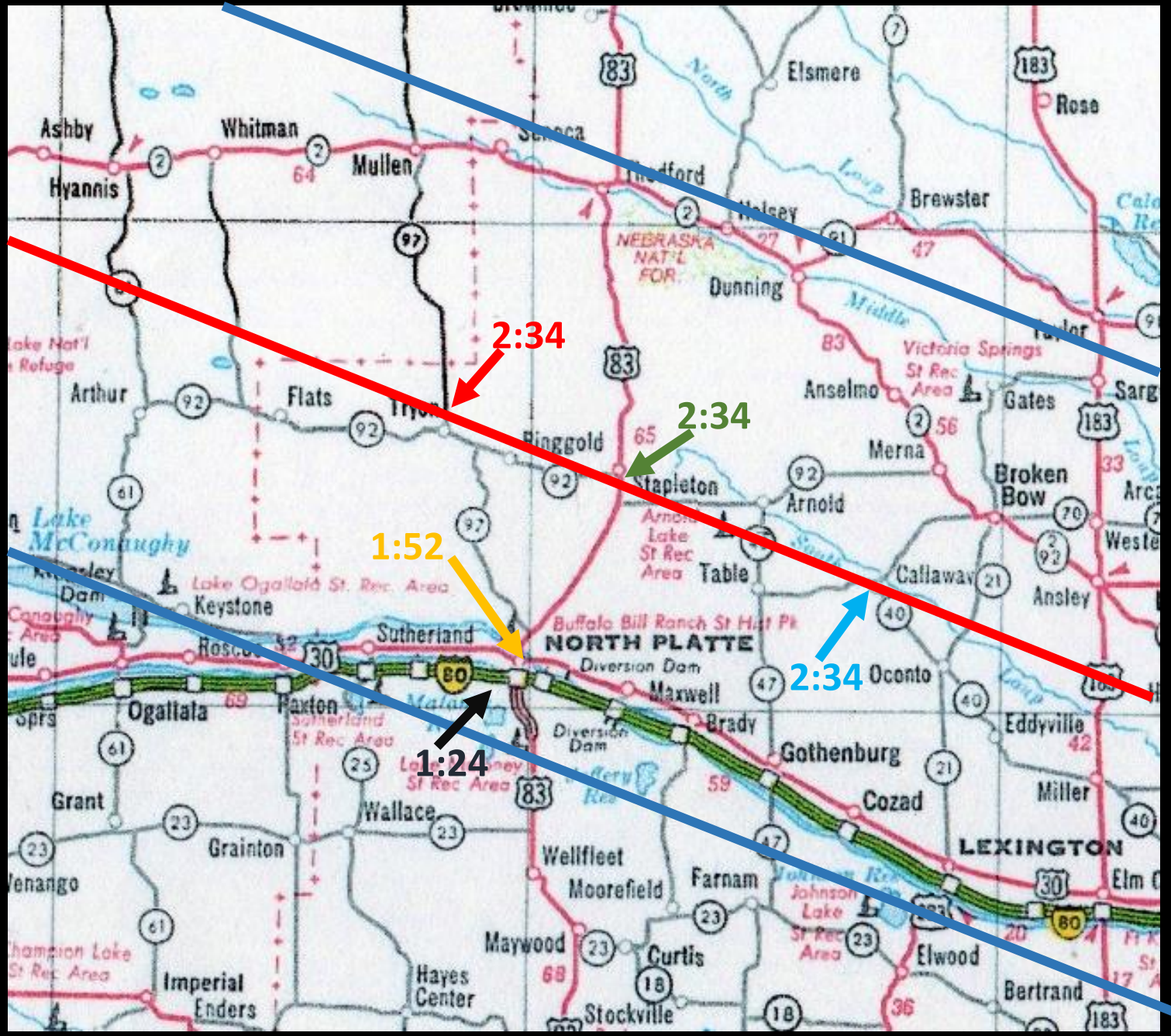
- The point of Greatest Eclipse occurs in eastern Kentucky with the point of greatest duration occurring a little to the west in southern Illinois. When duration is combined with good weather prospects, this location seems to offer the very best prospects within the entire eclipse path. Western Nebraska, being well to the west of the point of greatest eclipse, experiences a shorter totality that ranges from 2:30 to 2:35 on the central line. This value, however, falls well within my 90% of maximum totality maxim that I stated as my duration goal for any eclipse, which is for this event 2:24. But it is easy for me from even this general eclipse map to see that North Platte is somewhat south of the central line. But how far?


2:00
2:10
2:20
2:30
2:35
Greatest
Eclipse 2:40
Greatest Duration
2:41

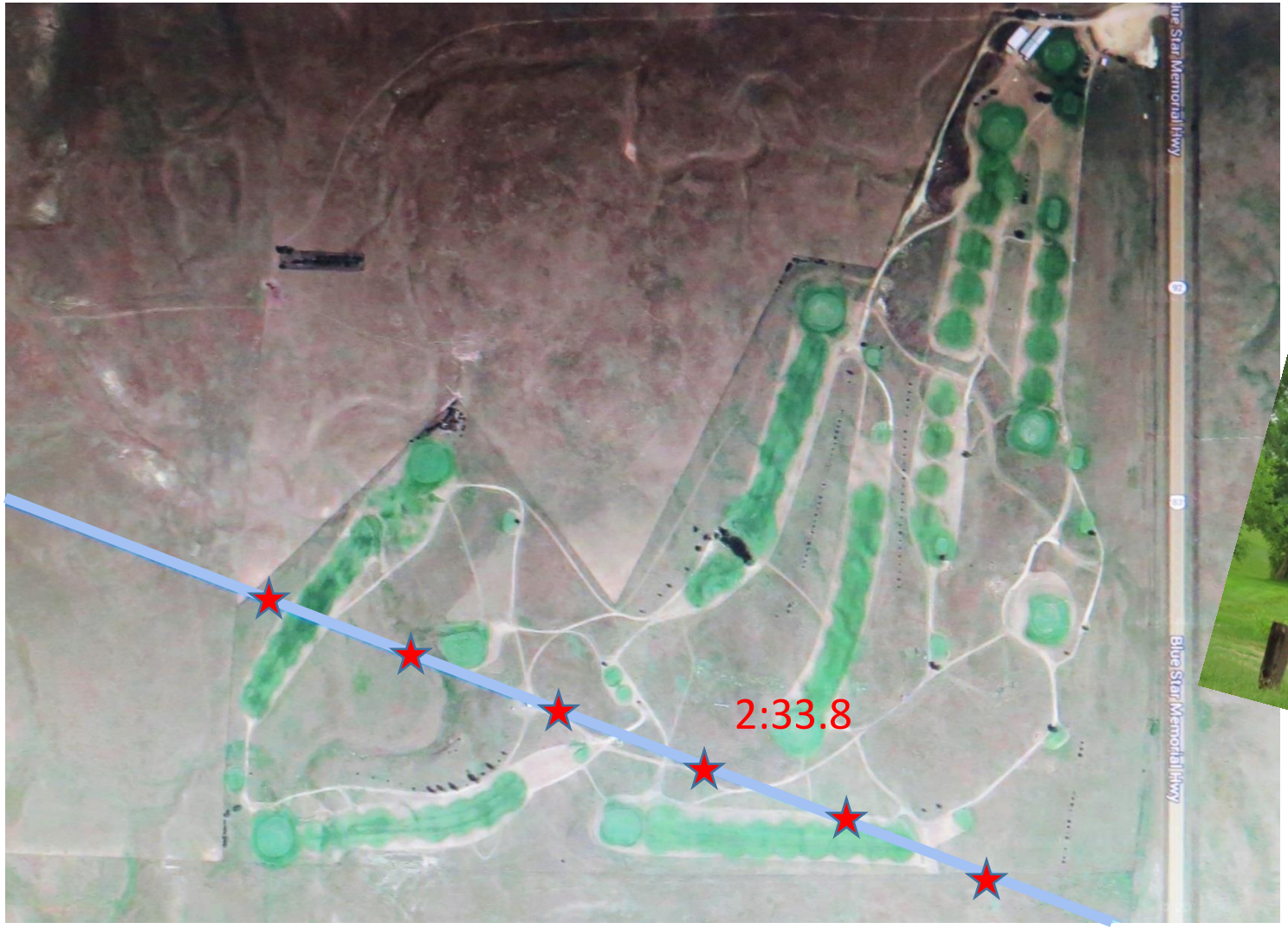
- Projecting the eclipse path onto a more detailed map shows that North Platte is, in fact, close to the southern limit of totality.


North Platte
NEBRASKA
Scale: 0 5 10 20 miles
©RAND McNALLY & CO.
PRINTED IN U.S.A.

- And since my residence at the time that I began my observing project is located even farther south, totality will only be 1:24 -- a value far below my goal of 90% of maximum or 2:24. Observing “at home” in the strictest sense is out of the question. In fact if I expanded the definition and moved to the city’s northern limits and stood ankle deep in the North Platte River and leaned as far north as I could, I would still experience only 1:52 of totality. At home simply isn’t going to work! But what about “in the neighborhood?” Less than 30 miles away two small towns lie almost directly on the central line: Tryon up the winding State highway 97 and Stapleton up Federal highway 83.


2:34
2:34
1:52
1:24
2:34
Ashby
Whitman
Mullen
Hyannis
Elsmere
Rose
Brewster
Dunning
Arthur
Flats
Ringgold
Stapleton
Anselmo
Merna
Gates
Broken Bow
Arnold
Table
Callaway
Ansley
Keystone
Sutherland
NORTH PLATTE
Maxwell
Brady
Oconto
Gothenburg
Cozad
Eddyville
Miller
LEXINGTON
Ogallala
Paxton
Grant
Wallace
Grainton
Wellfleet
Moorefield
Farnam
Maywood
Curtis
Elwood
Bertrand
Imperial
Enders
Hayes Center
Stockville
Lake McConaughy
Lake Ogallala St. Rec. Area
Buffalo Bill Ranch St Hist Pk
Diversion Dam
Victoria Springs St Rec Area
Arnold Lake St Rec Area
Johnson Lake St Rec Area
Champion Lake St Rec Area
NEBRASKA NAT'L FOR.

- In fact, as Google Maps show, the central line of the eclipse passes over the Stapleton community nine hole golf course, producing 2:34.8 of totality. Here then, within easy driving distance, is a suitable and easily assessable observing location open to the public. And the Stapleton community is aware of the coming eclipse and excited about the prospect of hosting an observing event.

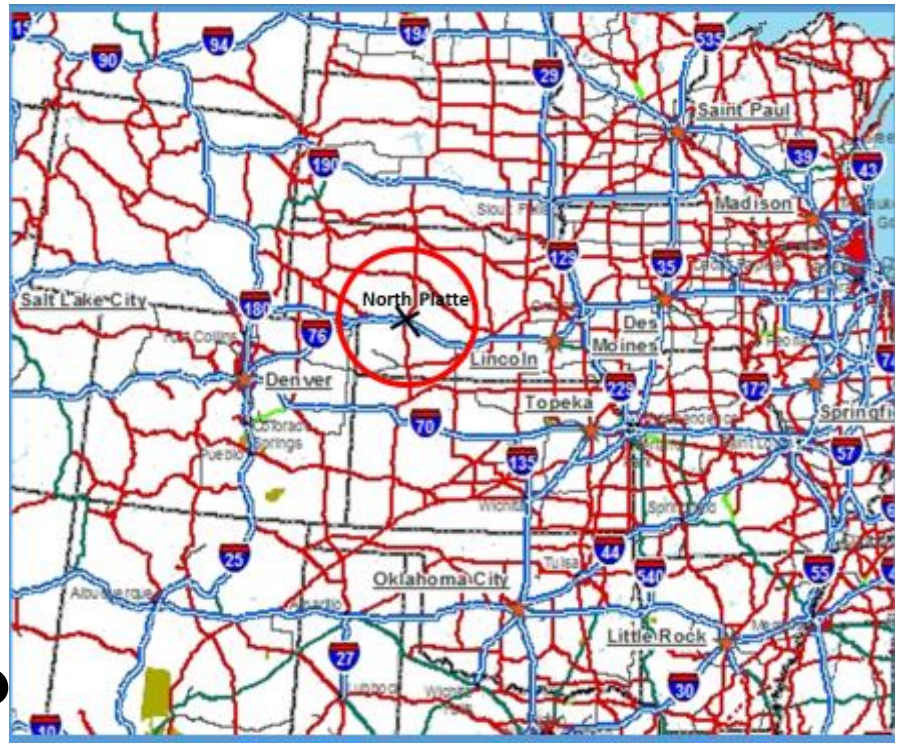

Blue Star Memorial Hwy
2:33.8


WELCOME TO
AUGUSTA WIND
GOLF COURSE

- But how easy is it to get to Western Nebraska?

Accessibility and Mobility, or

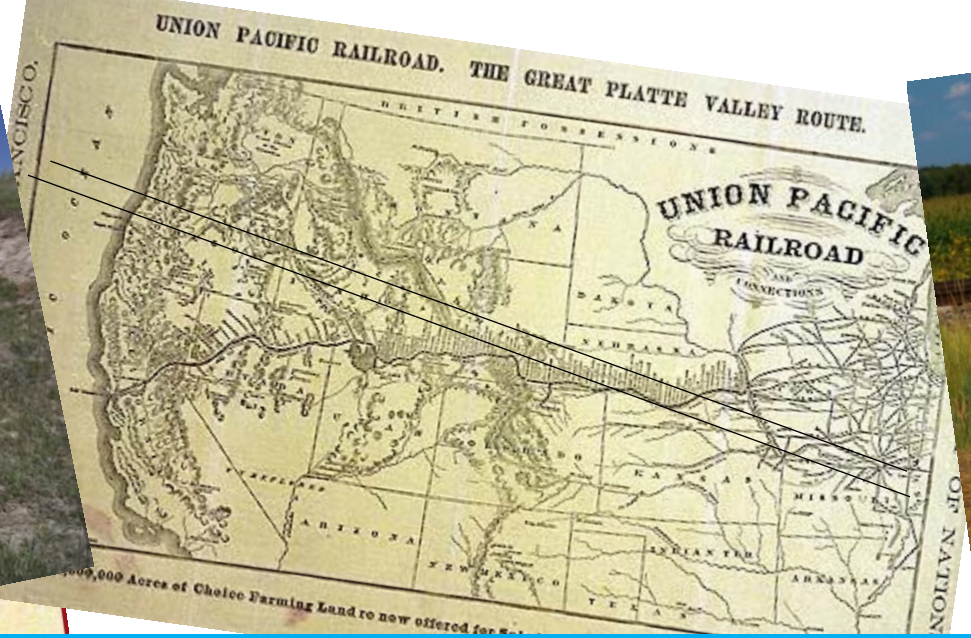
If a person wanted to observe the eclipse from Western Nebraska, how could he get there? And more importantly, once there, what could he do to find better skies if cloudy conditions prevail?



- A joke common among the locals is that North Platte is a day's drive from anywhere, which prompted a local travel center owner to inform his customers of exactly where they were on their Interstate 80 journey. It is not a chance happening that both North Platte and Interstate 80 are located where they are.

The Virtue of being “Nowhere” is that it must be passed through to get to Anywhere.

- As several volumes about the 2017 eclipse point out, the umbral path very closely follows the Oregon and Mormon trails that were the routes of the most recent mass migration in human history. Both trails and several others that passed across Nebraska followed what is called the Great Platte River Road. I80 is nothing more than a new trail across this easy east-west path that was known and used even in prehistoric times. In past ages as now, it was common practice for travelers to rest and re coop at the confluence of the two prairie rivers whose joined waters cut out the shallow valley that give ease to their journey. Vestiges of the old trails still linger. At locations west of North Platte one may still see the ruts where wheels so compacted the soil that nothing can grow there even after 150 years since the last wagon moved on. Following the wagon trains came the railroad. It too stopped at the confluence and in that pause North Platte was born. But it left an indelible legacy of another kind. For here, like the traveler who pauses in his journey, so too does a great portion of the commerce of the nation.



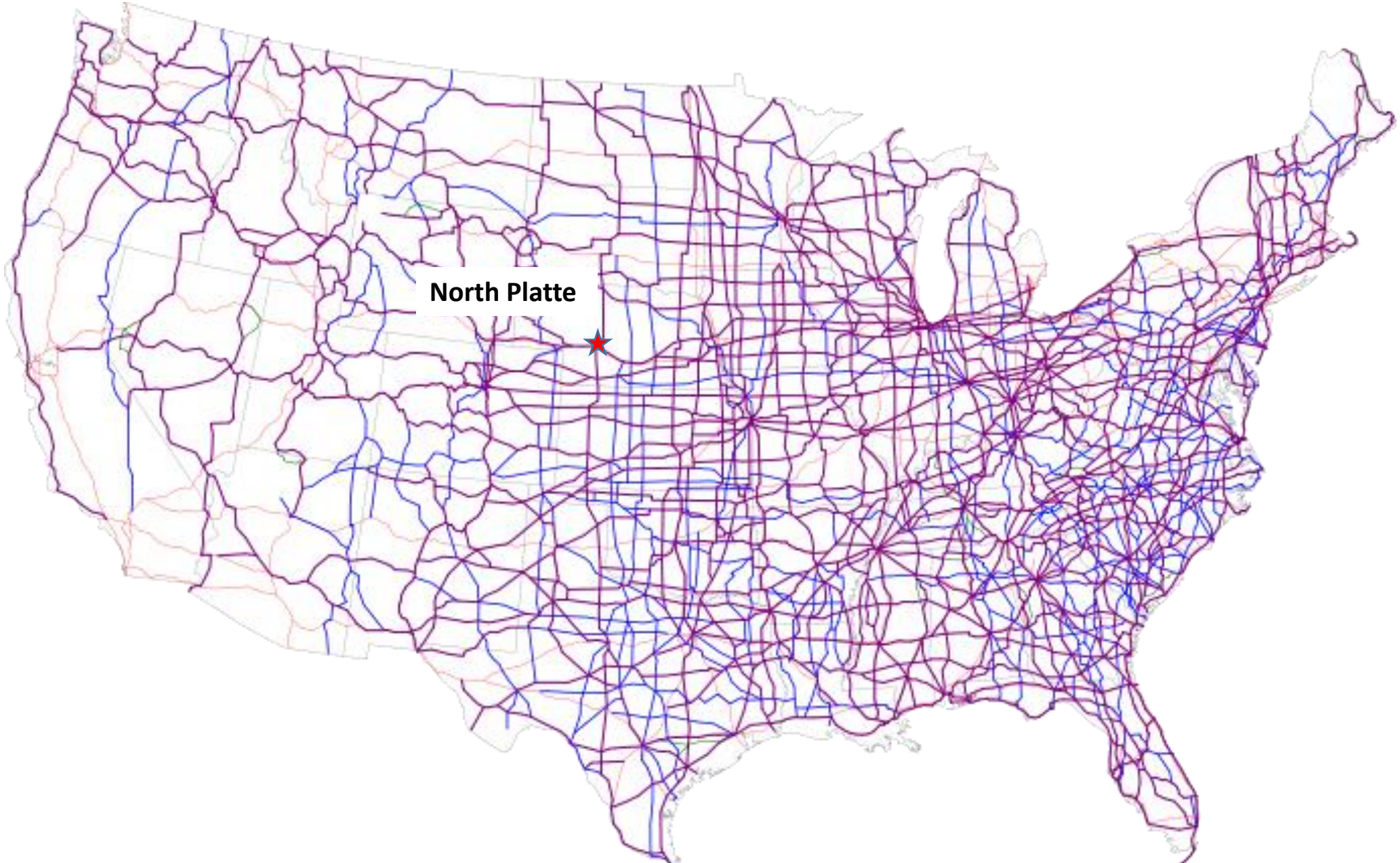
The Eclipse Path Across Nebraska Will Follow the Great Migratory Route: The Platte River Road

- The Union Pacific Bailey Yard, North Platte, Nebraska, is the largest railroad classification facility in the world. What moves east or what moves west stops here and is shuffled and redirected to its final location. But while your car or toothbrush can get here via rail, you cannot arrive in North Platte by train. Passenger service, after 105 years ended on 1 May 1971.

- With one possible exception. The Union Pacific Railroad maintains a historic Steam facility in Cheyenne, Wyoming, and frequently provides steam transportation and display for local celebrations along its main trunk line. It has been suggested to the railroad that stream transportation to North Platte for the 2017 eclipse would be a historical reenactment of the railroad's providing astronomers and other scientists free transportation from the east to Cheyenne for 1878 July 29 total solar eclipse. While approval is yet to be granted, those most familiar with the application process are quite optimistic.

Reenacting history: For the 1878 July 29 eclipse in the West, Union Pacific provided free transportation to Cheyenne, Wyoming for astronomers. It is hoped that the Union Pacific will reenact this deed of generosity by providing steam transportation to North Platte for the 2017 August 21 eclipse.

- But until the rail connection is complete, how does one get to North Platte and on into the ranching country to the north where the central line of the eclipse brings greatest totality? Travel by private automobile or coach across the nation's highway system is the most effective means of arrival.


North Platte

- But for those too far away for this to be practical, the Denver International Airport is a mere 4 hours away, and for those intrepid souls I spoke of earlier, Great Lakes Airways Beechcraft 1900D turbo prop commuter planes fly twice daily between North Platte and Denver with a one hour service.

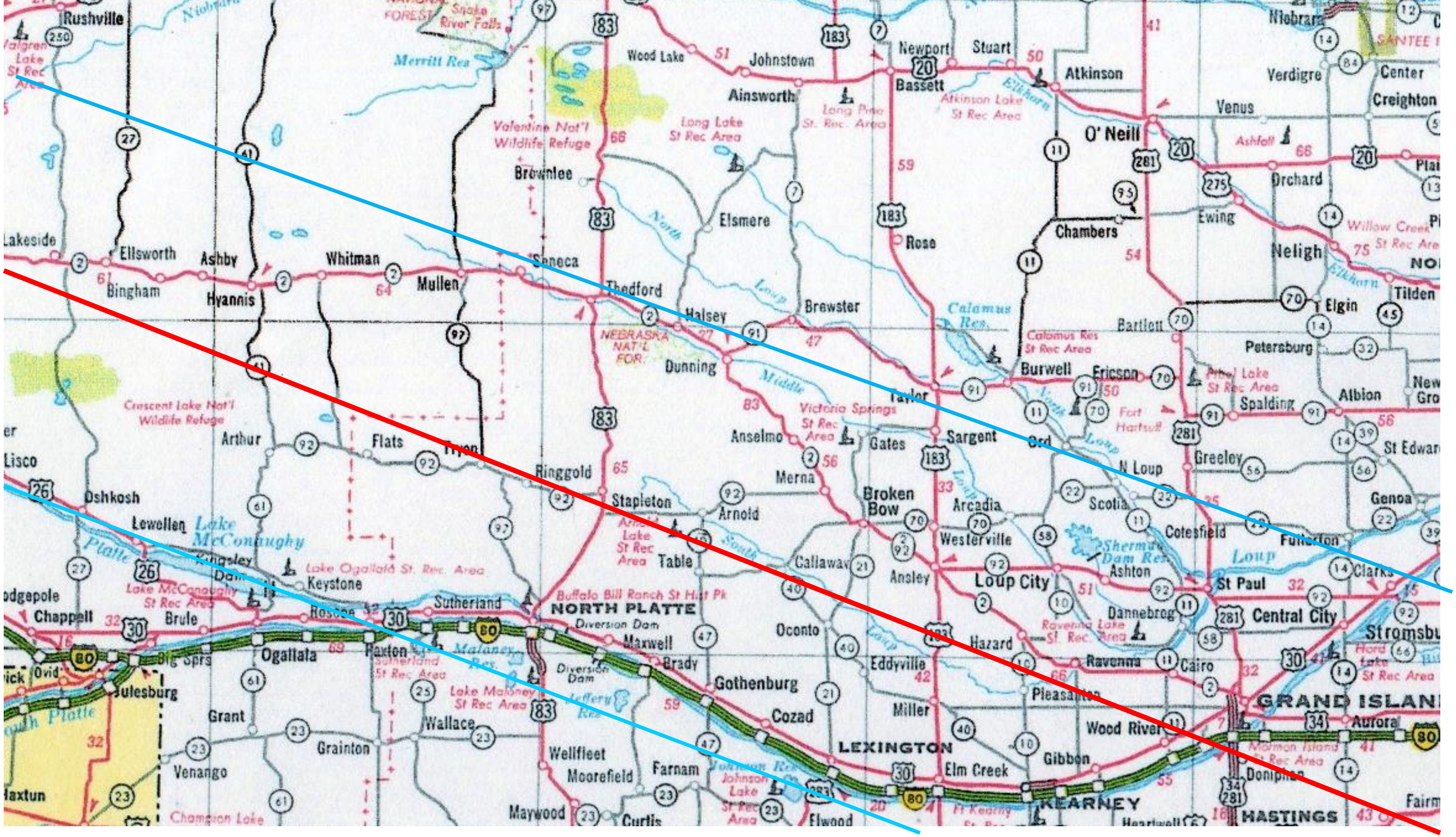

Great Lakes
FlightAware


North Platte Regional Airport
LEE BIRD FIELD

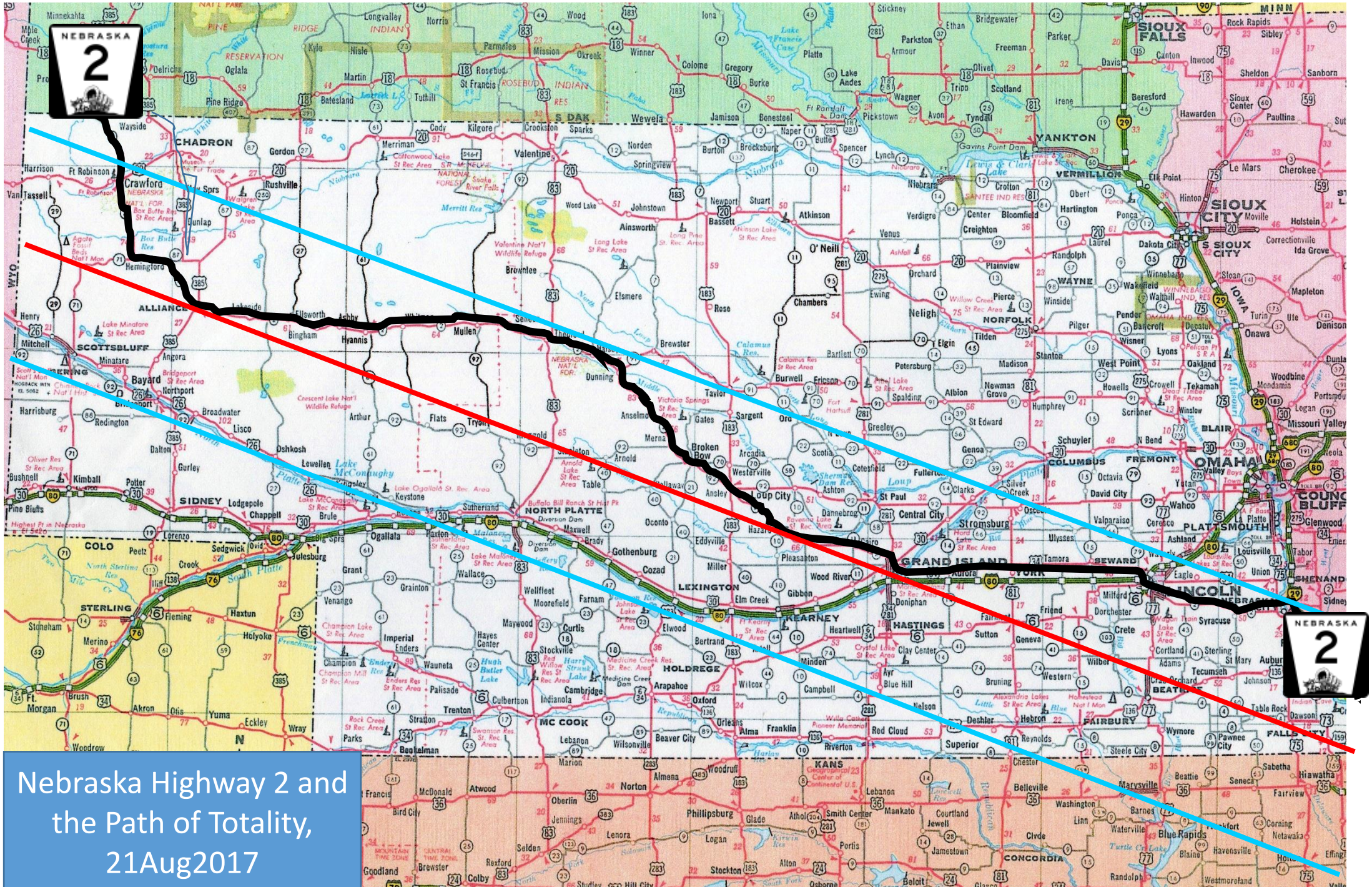
Average Clear Sky During Negative Days at Time of Eclipse							
year/day	18-Aug	19-Aug	20-Aug	21-Aug	22-Aug	23-Aug	24-Aug
1995	no	no	no		no	no	no
1996	no	no	no	0%	no	no	no
1997	0%			15%	no	no	no
1998	no	no	no		no	no	no
1999	no	no				no	no
2000	0%	0%	40%			no	
2001				+ 0%		20%	0%
2002		+ 50%	0%	0%			
2003	+ 0%						
2004	no	no				no	no
2005		+ 50%			+ 40%	+ 0%	no
2006	50%	0%	+ 50%	+ 50%			
2007					0%	10%	no
2008	60%		15%			+ 0%	
2009							
2010		0%				0%	
2011		0%	+ 35%	+ 30%			no
2012	no	no				no	no
2013	no	no			0%	no	no
2014			+ 25%		+ 0%	+ 0%	
Average of Clear Sky During Negative Days:		13%	Negative Days:		34/99	34%	

+ Locations in driving distance observed or reported with considerably better observing conditions

- Most persons will be north of the city in the ranching country for the eclipse. If ill weather at any one location threatens, local roads provide quick mobility. While highways 97 and 83 provide North-South passage, highways 30, 92 and 2 provide easy east-west passage.


Rushville
Merritt Res
Wood Lake
Johnstown
Newport
Stuart
Atkinson
Niobrara
Verdigre
Center
Creighton
Ainsworth
Bassett
Long Pine St. Rec. Area
Atkinson Lake St Rec Area
Venus
O' Neill
Ashfall
Valentine Nat'l Wildlife Refuge
Long Lake St Rec Area
Brownlee
Orchard
Elsmere
Rose
Chambers
Ewing
Neligh
Willow Creek St Rec Area
Lakeside
Ellsworth
Ashby
Whitman
Seneca
Bingham
Hyannis
Mullen
Thedford
Halsey
Brewster
Tilden
Elgin
Bartlett
Calamus Res.
NEBRASKA NAT'L FOR.
Dunning
Calamus Res St Rec Area
Petersburg
Burwell
Ericson
Pibel Lake St Rec Area
Albion
Taylor
Spalding
Crescent Lake Nat'l Wildlife Refuge
Victoria Springs St Rec Area
Arthur
Flats
Tryon
Anselmo
Gates
Sargent
Ord
Greeley
St Edward
Lisco
Ringgold
N Loup
Oshkosh
Stapleton
Merna
Broken Bow
Arcadia
Scotia
Genoa
Lewellen
Lake McConaughy
Arnold
Westerville
Cotesfield
Fullerton
Kingsley Dam
Table
Callaway
Sherman Dam Res.
Ashton
Clarks
Keystone
Lake Ogallala St. Rec. Area
Ansley
Loup City
Lodgepole
Lake McConaughy St Rec Area
Buffalo Bill Ranch St Hist Pk
St Paul
Chappell
Brule
Roscoe
Sutherland
NORTH PLATTE
Dannebrog
Central City
Diversion Dam
Oconto
Stromsburg
Ogallala
Paxton
Maxwell
Hazard
Ravenna Lake St. Rec. Area
Ovid
Big Sprs
Sutherland St Rec Area
Brady
Eddyville
Ravenna
Cairo
Julesburg
Gothenburg
Pleasanton
GRAND ISLAND
Grant
Lake Maloney St Rec Area
Wallace
Cozad
Miller
Wood River
Aurora
Grainton
Wellfleet
LEXINGTON
Gibbon
Mormon Island St Rec Area
Venango
Moorefield
Farnam
Johnson Lake St Rec Area
Elm Creek
Doniphan
Haxtun
Maywood
Curtis
Elwood
KEARNEY
HASTINGS
Champion Lake

- Highway 2 seems to have been laid out with the 2017 eclipse in mind. Of the 468 miles that the eclipse travels in its trip across Nebraska, over 440 of those miles are shared with highway 2.


NEBRASKA
2
NEBRASKA
2
Nebraska Highway 2 and the Path of Totality, 21Aug2017