# **Rover Route Development Toolkit**

**For Improving Rover Productivity** 

## Contributed by Upper Midwest Rovers Presented at Aurora'18 by Mel, KCOP/r

# **Rover RDK- Goals**

### **Rover Route Development Kit includes:**

- 8 digit Maidenhead grid designations of submitted sites
- Rover operating observations from each site
- Forward/reverse bearings, distances/profiles to "Anchors"
- Both on-line and downloadable visuals (.jpg, .kml .kmz)
- Graphical views of rover operating sites
- Google map based rover routing tool

### Provide a sustainable database of rover operating sites Updated with <u>new</u> sites and <u>changes</u> to existing sites

# **Rover RDK- Goals**

### **>**Reduced time for development of rover routes

- Improve the productivity of current rovers
- Reduce the uncertainty for new rovers

## >Spice up your roving experience

- Add a new band grid this year
- Change-up your rover route with a different grid this year
- Activate a "rare" grid for the fixed stations

### >Help stations locate rovers

Predetermined bearings to known, rover sites

# **Rover RDK- Goals**

- > Distinguish between sites that are suitable for:
  - Low band operation (ABCD, 50-432 MHz)
    - May have power line or residential RFI on some bands
  - Microwave band operation (9EFGHI+, 902-10GHz)
    - May have foliage blockages in some directions
    - May have cell tower interference on some bands

# •One rover site doesn't suit all!

## **Rover RDK Implementation and Access**

- Can view M.S. EXCEL version on-line at box.com
  - Does <u>\*NOT\*</u> require M.S. Office on your computer!
  - Viewable on PCs and tablets
  - PDF version also available for downloading

## ><u>Anyone</u> with the link can <u>view & download</u> files:

- Images (.jpg), Google Map (.kml) & Google Earth locations (.kmz)
- Desktop/smartphone/tablet with Google Map app (FREE)
- Optional Google Earth app (FREE)

### Master Upper Midwest Rover Site Survey - link

Mas	ter Upper Mid	west Rove	er Site Surv	vey				_			-		-	-	
									8	GGL	GGL	GGL	360*	360°	
	<< <contribute< th=""><th>ed&gt;&gt;&gt;</th><th></th><th>~~~~~</th><th>&lt;&lt;&lt;<location>&gt;&gt;</location></th><th>»»»»»»</th><th></th><th></th><th>1</th><th>Map</th><th>Earth</th><th>Earth</th><th>Low</th><th>High</th><th></th></contribute<>	ed>>>		~~~~~	<<< <location>&gt;&gt;</location>	»»»»»»			1	Map	Earth	Earth	Low	High	
	Entered	By	Area	Grid	Latitude	Longitude	Lat,Long CSV	EI	ev.	Link	Link	Link	Link	Link	Near City/Town
1	20 -	The second second		EN151j86 -	N45°24'9.37"	- W 97° 0'50,48" -	N45°24'9.37".W 97° 0'50.48"		-	m -					
2	fearered	комнс	?	EN15ox81	N45°57'52"	W96°45'44"	N45°57'52",W96°45'44"		hardware and the		kmz			jpg	
3		комнс	MN	EN15xx94	N45°58'44.44"	W96° 0'28.34"	N45°58'44.44", W96° 0'28.34"	1			kmz		jpg	jpg	Elbow Lake area
4	2013	комнс	MN	EN15xx95	N45°58'52"	W96*0'14"	N45°58'52",W96°0'14"				kmz		jpg	jpg	Elbow Lake area
5		комнс	ND	EN16nw84	N46°56'3.85"	W 96°50'37.72"	N46°56'3.85",W 96°50'37.72"	3	12000		kmz		jpg	ipg	Fargo area
6	2013	комнс	MN	EN16xa95	N46° 1'16.47"	W96° 0'1.13"	N46° 1'16.47",W96° 0'1.13"	1	204	map	kmz		jpg	jpg	Elbow Lake area
7		комнс	MN	EN17xc16	N 47° 6'33.27"	W96° 4'3.35"	N 47° 6'33.27", W96° 4'3.35"				kmz		jpg	jpg	Ogema area
8	2013	комнс	1	EN18xa01	N48° 0'0.01"	W 96° 4'34.08"	N48° 0'0.01",W 96° 4'34.08"				kmz		jpg	jpg	
9	6/7/2017	WOZQ	MN	EN24WV	N44° 52' 39"	W94° 8' 35"	N44° 52' 39" ,W94° 8' 35"				kmz		jpg	jpg	
10		комнс	MN	EN25ax04	N45°58'41.04"	W95°59'52.88"	N45°58'41.04", W95°59'52.88"	1			kmz		jpg	jpg	Elbow Lake area
11		комнс	MN	EN25ax07	N45°59'29.61"	W95°59'55.63"	N45°59'29.61", W95°59'55.63"				kmz	_	jpg	jpg	Elbow Lake area
12	6/7/2017	WOZQ	MN	EN25WB	N45° 2' 55"	W94° 5' 1"	N45° 2' 55" ,W94° 5' 1"			-	kmz		jpg	jpg	
13		комнс	MN	EN25xx56	N45°59'0.24"	W94° 2'15.86"	N45°59'0.24",W94° 2'15.86"	1			kmz		jpg	jpg	Pierz area
14		комнс	MN	EN26aa05	N46° 1'16.72"	W95*59'57.53"	N46° 1'16.72",W95°59'57.53"				kmz		jpg	jpg	Elbow Lake area
15		комнс	MN	EN26aa55	N46° 1'16.32"	W95°57'17.24"	N46° 1'16.32",W95°57'17.24"	1	259 1	map	kmz	jpg	jpg	jpg	Elbow Lake area
16		комнс	MN	EN26xa03	N46° 0'47.93"	W94° 4'41.49"	N46° 0'47.93", W94° 4'41.49"	1.			kmz		jpg	jpg	Lastrop area
17		комнс	MN	EN27ax95	N47°58'52"	W95°55'15"	N47°58'52",W95°55'15"			map	kmz	jpg	jpg	jpg	
18	2013	комнс	1	EN28aa84	N48° 1'11.63"	W95°55'58.48"	N48° 1'11.63",W95°55'58.48"	1	151	map	kmz	jpg	jpg	jpg	
19	6/7/2017	WOZQ	MN	EN33XW	N43° 56' 1"	W92° 0' 1''	N43° 56' 1" ,W92° 0' 1"				kmz	jpg	jpg	jpg	
20		KCOP		EN33XW17	N43°56'57.3180	" W092°04'00.5016"	N43°56'57.3180", W092°04'00.5016"		1	map	kmz	jpg	jpg	jpg	
21		KCOP		EN33XW94	N43°56'01.0392	" W092°00'15.2136"	N43°56'01.0392", W092°00'15.2136"		1	map	kmz	jpg	jpg	jpg	
22		KCOP	1	EN33XW94	N43°56'01.4640	" W092°00'10.5156"	N43°56'01.4640", W092°00'10.5156"		1	map	kmz	jpg	jpg	jpg	
23		KCOP		EN33XX99	N43°59'55.3884	" W092°00'29.8188"	N43°59'55.3884", W092°00'29.8188"		1	map	kmz	jpg	jpg	jpg	
24	6/7/2017	WOZQ	MN	EN34AV	N44° 54' 29"	W93° 59' 30''	N44° 54' 29" ,W93° 59' 30"		1	map	kmz	jpg	jpg	jpg	
25	6/7/2017	WOZQ	MN	EN34OI	N44° 20' 40"	W92° 46' 6"	N44° 20' 40" ,W92° 46' 6"		1	map	kmz	jpg	jpg	jpg	
26		KCOP		EN34XA14	N44°01'13.5084	" W092°04'23.4156"	N44°01'13.5084", W092°04'23.4156"		1	map	kmz	jpg	jpg	jpg	
27		KCOP		EN34XA90	N44°00'03.0132	" W092°00'09.8964"	N44°00'03.0132", W092°00'09.8964"		1	map	kmz	jpg	jpg	jpg	
28		KCOP		EN34XA97	N44°01'52.5468	" W092°00'23.0688"	N44°01'52.5468", W092°00'23.0688"		1	map	kmz	jpg	jpg	jpg	
29	6/7/2017	WOZQ	MN	EN35AD	N45° 8' 54"	W93° 57' 1''	N45° 8' 54" ,W93° 57' 1"		1	map	kmz	jpg	jpg	jpg	
30		комнс	MN	EN36ab13	N46° 3'21.19"	W93°59'24.19"	N46° 3'21.19", W93°59'24.19"	1	317 1	map	kmz	jpg	jpg	jpg	Lastrop area
31	6/7/2017	WOZQ	MN	EN43AW	N43° 56' 1"	W92° 0' 1''	N43° 56' 1" ,W92° 0' 1"		1	map	kmz	jpg	jpg	jpg	
32		KCOP		EN43AW04	N43°56'01.2300	" W091°59'57.6744"	N43°56'01.2300", W091°59'57.6744"		1	map	kmz	jpg	jpg	jpg	
33		KCOP		EN43AX19	N43°59'56.7132	" W091°59'18.7548"	N43°59'56.7132", W091°59'18.7548"		3	map	kmz	jpg	jpg	jpg	
34		KCOP		EN43AX27	N43°59'23.8704	" W091°58'46.3116"	N43°59'23.8704", W091°58'46.3116"		J	map	kmz	jpg	jpg	jpg	
35		KCOP		EN44AA00	N44°00'03.0888	" W091°59'49.7796	N44°00'03.0888", W091°59'49.7796"		a)	map	kmz	jpg	jpg	jpg	
36		KCOP		EN44AA04	N44°01'12.7524	" W091°59'44.9196"	N44°01'12.7524", W091°59'44.9196"		3	map	kmz	jpg	jpg	jpg	
37		KCOP		EN44AA09	N44°02'22.6716	" W091°59'56.3064"	N44°02'22.6716", W091°59'56.3064"		1	map	kmz	jpg	jpg	jpg	
38		KCOP	?error?	EN44AB98	N44°04'43.2984	W091°55'17.1192"	N44°04'43.2984", W091°55'17.1192"		1	map	kmz	jpg	jpg	jpg	
39	6/7/2017	WOZQ	MN	EN44BB	N44° 3' 26"	W91° 52' 26''	N44° 3' 26" ,W91° 52' 26"		J	map	kmz	jpg	jpg	jpg	
40		KCOP		EN44BC19	N44°07'16.2804	" W091°54'02.2680"	N44°07'16.2804", W091°54'02.2680"		J	map	kmz	jpg	jpg	jpg	
											lenna a	ing	ing	ing	

## **Rover RDK Rollout Plans**

- >Minimum Site Information Required:
  - Geographic Coordinates (any standard format)
  - or just 8 digit Maidenhead Grid Square
  - Additional site information added overtime
- Sites initially edited by KØMHC
  •Other editor(s) may participate over time
- **Ready for use for June, 2018 VHF Contest**
- >Continuing updates thereafter

### Typical Site – Google Earth "Snapshot" Image

EN33XW94

Write a description for your map.

W 92°00'18"

#### EN33XW94

STATION BANDS BEAR REV DIST W0GHZ- ?????- 326/ 145/ 140 K0AWU- ABCD9EI- 342/ 161/ 382 W0UC- ABCD9E- 31/ 211/ 103 K2DRH- ABCD9E- 148/ 330/ 287 NT0V- ABCD9EFGI- 314/ 130/ 698

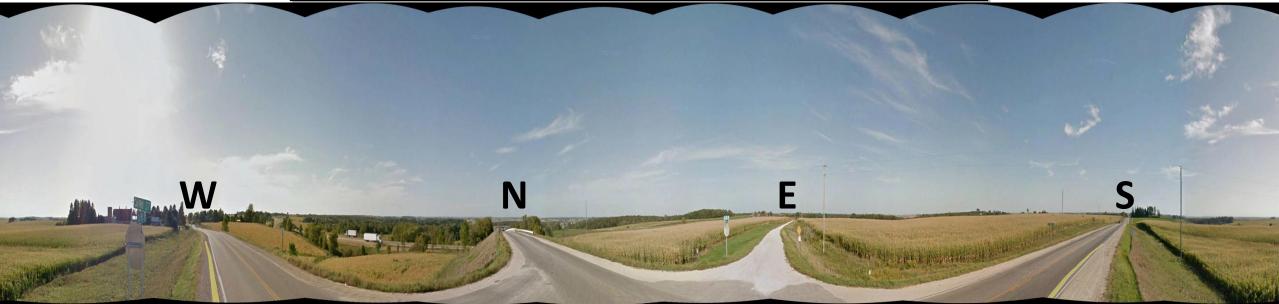
Directions: To here - From here

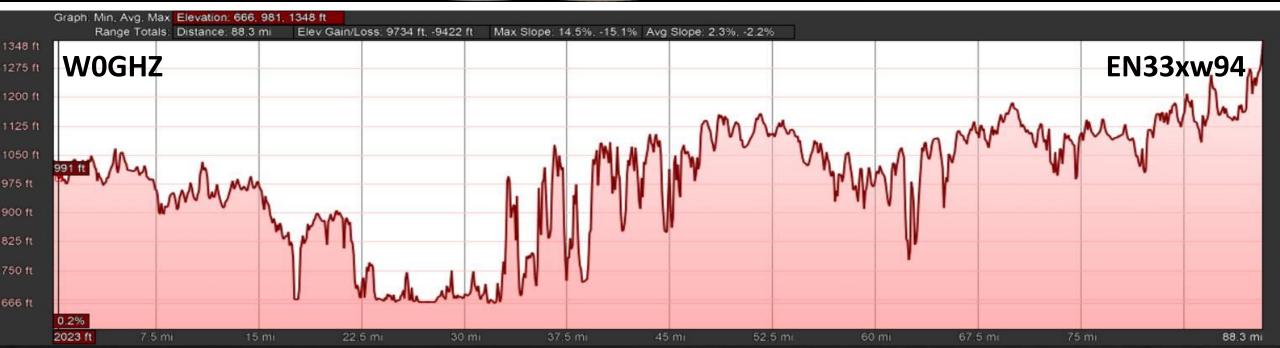
2103370094

×

Google Earth

### **360 Panoramas and Profiles**





### **Typical Site – Operating Information**

×

### EN33XW94

STATION BANDS BEAR REV DIST W0GHZ- ??????- 326/ 145/ 140 K0AWU- ABCD9EI- 342/ 161/ 382 W0UC- ABCD9E- 31/ 211/ 103 K2DRH- ABCD9E- 148/ 330/ 287 NT0V- ABCD9EFGI- 314/ 130/ 698

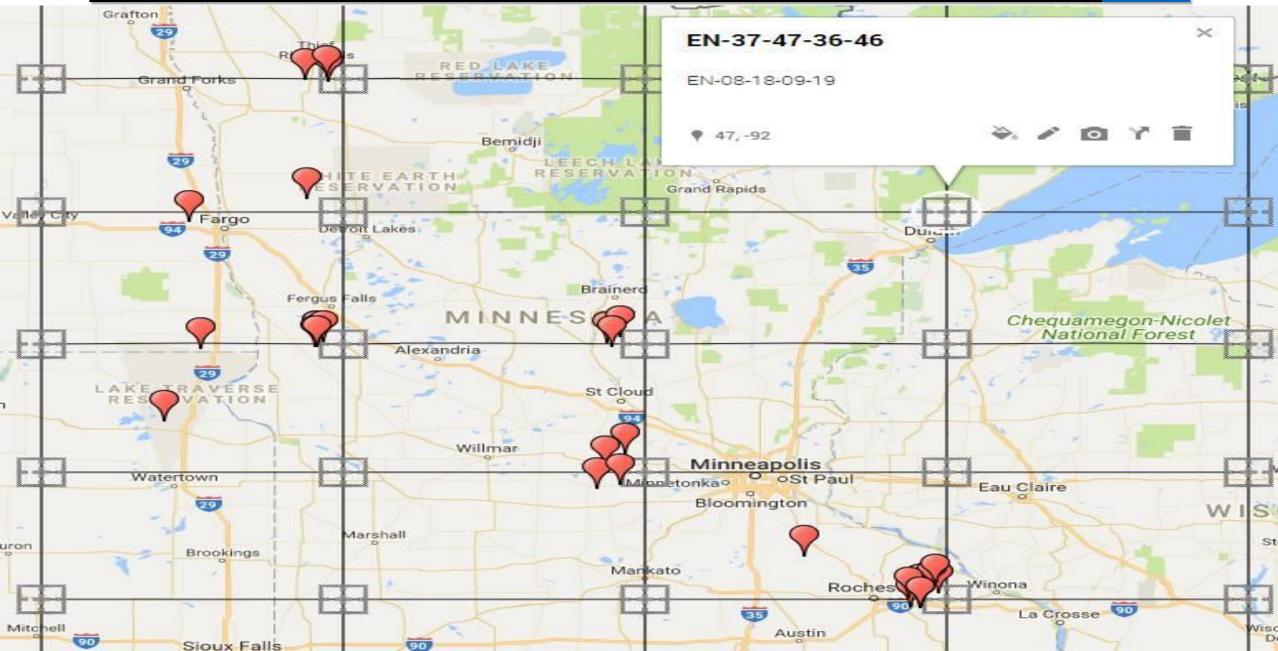
Directions: To here - From here

ENDDA

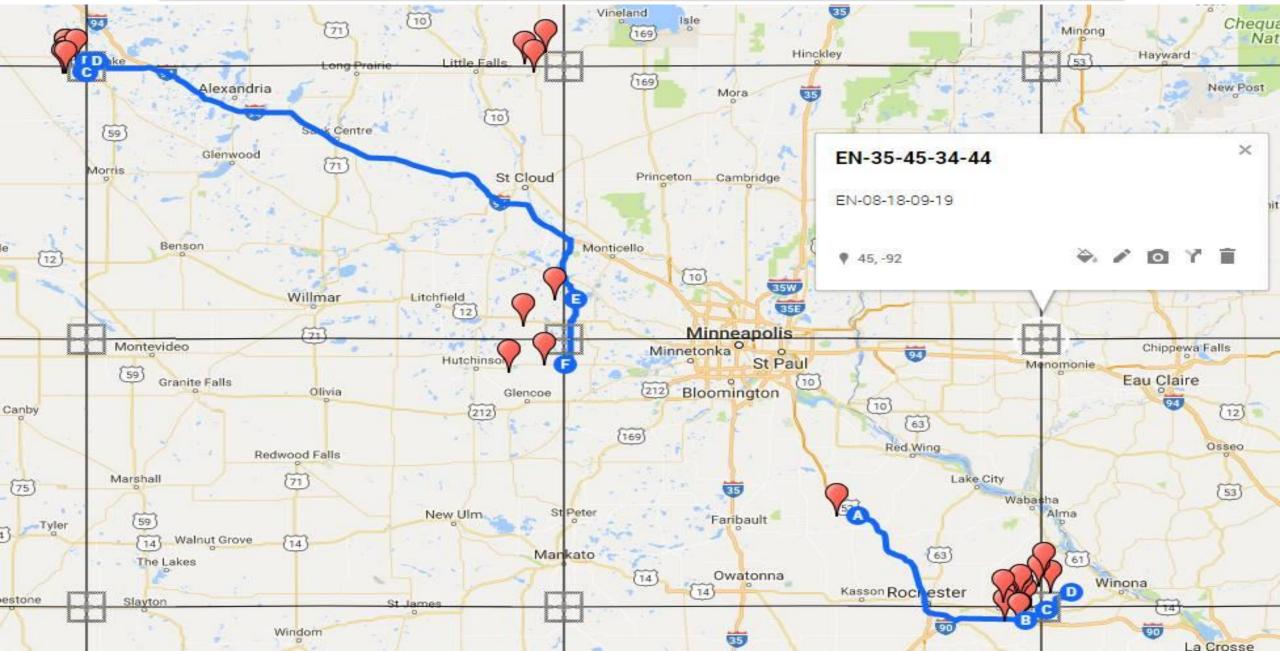
### Information included in each site description for "anchor" stations. The "anchor" stations will change over time.

<u>ANCHOR</u> <u>STATION</u>	<u>BANDS</u>	<u>BEARING</u>	<u>REVERSE</u>	<u>DISTANCE</u>						
W0GHZ-	??????-	326/	145/	140						
KOAWU-	ABCD9EI.	342/	161/	382						
W0UC-	ABCD9E.	31/	211/	103						
K2DRH-	ABCD9E-	148/	330/	287						
NTOV-	ABCD9EFGI	314/	130/	698						

### **GOAL: Faster Creation of Rover Routes - link**



### **GOAL: Faster Creation of Rover Routes**



### <u>Rover RDK Survey – What's Next?</u>

- Include your suggested additional sites
  E-mail to kØmhc@arrl.net
- Review and update current site information
- >Add information from site visitations

### <u>Rover RDK Survey – What's Next?</u>

### Field test for June rover route planning!

- Revise based on rover usage and feedback
- Weed out marginal or unsafe sites

### >Additional tools for the Route Development Kit

Users guide for route development

### >Add link to NLRS website

## Your Contributions Are Appreciated

- **Rover Contributors:**
- Jon, WØZQ/r
- Mel, KCØP/r
- •Brock, W6GMT/r
- Jim, KØMHC/r
- Others?

## >Other Rover Site Links:

- N2MH Rover Site Locator
- Oregon Rover Locations
- <u>Amateur Radio Rover</u> <u>Operating Sites by K9JK</u>
- K5ND Rover Routes
- STX/NTX Site Survey
- <u>RMG Rover Sites KA5D</u>
- Where have all the rovers gone?

