

To: Gary Langston, Kennecott Land

From: BYU Capstone Project (TWGS Engineering)

Subject: Data Submittal

Date: 2/21/2012

The purpose of this memo is the submittal of the data collected from the speed studies performed by TWGS Engineering on Daybreak Parkway. Studies were completed in the four previously designated areas. These areas have been labeled one through four to aid in better identification (See Attachment). Data was collected from positions one and four on February 4th, 2012 (weekend) in the late afternoon and February 9th, 2012 (weekday) during the evening peak hours. Data was collected from positions two and three on February 4th, 2012 (weekend) in the late afternoon and February 10th, 2012 (weekday) during the morning peak hours. Weather did not play a role in altering speeds. Every day for which data was collected was dry and free from ice. Speed was measured on a standard radar gun from a concealed location inside of a parked car.

Attachments to this memo include Location of Data Collection, Summary of Speed Studies, Analysis Results, and Summary Histograms. The data in these attachments contains both the previous Kennecott data and the data collected by TWGS Engineering.

TWGS Engineering

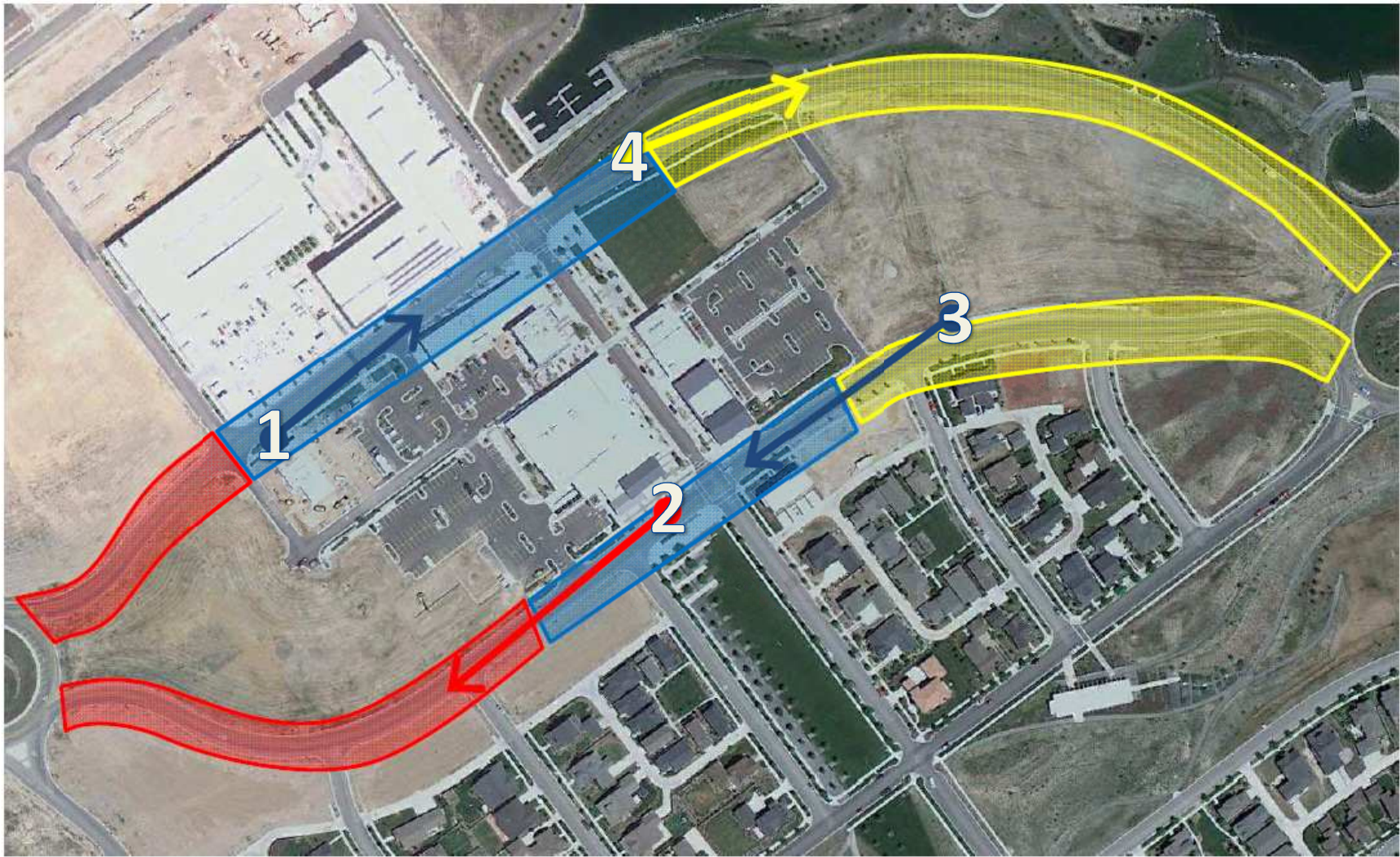
Bradley Magnusson

Alex Wright

Ken Rose

Shawn Larson

Attachment A
Data Collection Locations



Speed Study Data Collection Locations - Radar

Attachment B
Summary of Speed Studies

Location 1

WB Daybreak Parkway in front of RioTinto Corp Center

	Kennecott Data	TWGS Data	
Date:	11/2/2011	2/4/2012	2/9/2012
Time Period:	12:30 - 1:30 pm	3:23pm -	5:03pm -
Total # of Observations:	337	100	100
# of Buses:	1	N/A	N/A
# of Trucks:	32	N/A	N/A
Mean Speed:	29.7 mph	30.5 mph	31.67 mph
85% Speed:	34 mph	35 mph	36 mph
Highest Observed:	50 - 1 vehicles	40 1-vehicles	45 1-vehicles
Lowest Observed:	16 - 3 vehicles	18 2-vehicles	17 1-vehicles

Location 2

EB Daybreak Parkway near Lake Run Rd

Date:	11/1/2011	2/4/2012	2/10/2012
Time Period:	4:25 - 4:55 pm	4:00pm -	7:15am -
Total # of Observations:	291	100	100
# of Buses:	5	N/A	N/A
# of Trucks:	1	N/A	N/A
Mean Speed:	38.9 mph	28.7 mph	33.79 mph
85% Speed:	42 mph	34 mph	37.85 mph
Highest Observed:	54 - 1 vehicle	37 2-vehicles	46 1-vehicles
Lowest Observed:	25 - 1 vehicle	15 1-vehicles	25 2-vehicles

Location 3

EB Daybreak Rim Way near Kestrel Rise Rd Area

Date:	11/1/2011	2/4/2012	2/10/2012
Time Period:	3:20 - 4:20 pm	4:45pm -	7:45am -
Total # of Observations:	550	100	100
# of Buses:	4	N/A	N/A
# of Trucks:	11	N/A	N/A
Mean Speed:	33.3 mph	31.1 mph	34.1 mph
85% Speed:	36 mph	35 mph	38 mph
Highest Observed:	44 - 3 vehicles	44 1-vehicles	42 2-vehicles
Lowest Observed:	25 - 3 vehicles	13 1-vehicles	28 2-vehicles

Location 4

WB Daybreak Parkway East of SoDa Row Area

Date:	11/1/2011	2/4/2012	2/9/2012
Time Period:	2:10 - 3:10 pm	5:23pm -	5:38pm -
Total # of Observations:	409	100	100
# of Buses:	10	N/A	N/A
# of Trucks:	11	N/A	N/A
Mean Speed:	35.1 mph	31.7 mph	33.36 mph
85% Speed:	38 mph	37 mph	37 mph
Highest Observed:	45 - 2 vehicles	44 1-vehicles	45 1-vehicles
Lowest Observed:	20 - 1 vehicle	17 1-vehicles	24 1-vehicles

Attachment C
Analysis Results

WB Daybreak Parkway in front of RioTinto Corp Center - 1

Kennecott Data

Speed	Frequency	Cumulative Frequency	Cumulative %	Speed Percentile
16	3	3	0.89%	
17	1	4	1.19%	
18	1	5	1.48%	
19	1	6	1.78%	
20	6	12	3.56%	
21	1	13	3.86%	
22	7	20	5.93%	
23	11	31	9.20%	
24	10	41	12.17%	
25	20	61	18.10%	
26	20	81	24.04%	
27	24	105	31.16%	
28	24	129	38.28%	
29	25	154	45.70%	50%
30	37	191	56.68%	50% Mode
31	28	219	64.99%	
32	29	248	73.59%	
33	24	272	80.71%	
34	13	285	84.57%	85%
35	21	306	90.80%	
36	12	318	94.36%	
37	7	325	96.44%	
38	6	331	98.22%	
39	2	333	98.81%	
40	1	334	99.11%	
41	1	335	99.41%	
42	1	336	99.70%	
50	1	337	100.00%	

Mean Speed: 29.7 mph

TWGS, BYU Capstone data

Date: 9 February, 2012

Weekday

Speed	Frequency	Cumulative Frequency	Cumulative %	Speed Percentile
17	1	1	1.00%	
18	0	1	1.00%	
19	0	1	1.00%	
20	0	1	1.00%	
21	1	2	2.00%	
22	0	2	2.00%	
23	1	3	3.00%	
24	1	4	4.00%	
25	0	4	4.00%	
26	4	8	8.00%	
27	5	13	13.00%	
28	7	20	20.00%	
29	7	27	27.00%	
30	10	37	37.00%	
31	10	47	47.00%	50%
32	15	62	62.00%	50% Mode
33	7	69	69.00%	
34	8	77	77.00%	
35	6	83	83.00%	85%
36	7	90	90.00%	
37	4	94	94.00%	
38	1	95	95.00%	
39	2	97	97.00%	
40	2	99	99.00%	
41	0	99	99.00%	
42	0	99	99.00%	
43	0	99	99.00%	
44	0	99	99.00%	
45	1	100	100.00%	

Mean Speed: 31.7 mph

TWGS, BYU Capstone data

Date: 4 February, 2012

Weekend

Speed	Frequency	Cumulative Frequency	Cumulative %	Speed Percentile
17	0	0	0.00%	
18	2	2	2.00%	
19	0	2	2.00%	
20	0	2	2.00%	
21	1	3	3.00%	
22	0	3	3.00%	
23	2	5	5.00%	
24	4	9	9.00%	
25	8	17	17.00%	
26	1	18	18.00%	
27	6	24	24.00%	
28	4	28	28.00%	
29	12	40	40.00%	Mode
30	7	47	47.00%	50%
31	7	54	54.00%	50%
32	12	66	66.00%	Mode
33	11	77	77.00%	
34	7	84	84.00%	85%
35	5	89	89.00%	
36	4	93	93.00%	
37	2	95	95.00%	
38	3	98	98.00%	
39	1	99	99.00%	
40	1	100	100.00%	

Mean Speed: 30.5 mph

Kennecott Data

Speed	Frequency	Cumulative Frequency	Cumulative %	Speed Percentile
29	1	1	0.34%	
31	2	3	1.03%	
32	4	7	2.41%	
33	7	14	4.81%	
34	13	27	9.28%	
35	19	46	15.81%	
36	17	63	21.65%	
37	31	94	32.30%	
38	32	126	43.30%	50%
39	34	160	54.98%	50%
40	44	204	70.10%	Mode
41	29	233	80.07%	
42	19	252	86.60%	85%
43	13	265	91.07%	
44	11	276	94.85%	
45	4	280	96.22%	
46	4	284	97.59%	
47	3	287	98.63%	
48	1	288	98.97%	
49	2	290	99.66%	
54	1	291	100.00%	

Mean Speed: 38.9 mph

TWGS, BYU Capstone data

Date: 10 February, 2012

Weekday

Speed	Frequency	Cumulative Frequency	Cumulative %	Speed Percentile
25	2	2	2%	
26	0	2	2%	
27	2	4	4%	
28	1	5	5%	
29	3	8	8%	
30	11	19	19%	
31	6	25	25%	
32	15	40	40%	Mode
33	9	49	49%	50%
34	11	60	60%	50%
35	12	72	72%	
36	9	81	81%	
37	4	85	85%	85%
38	5	90	90%	
39	1	91	91%	
40	5	96	96%	
41	0	96	96%	
42	3	99	99%	
43	0	99	99%	
44	0	99	99%	
45	0	99	99%	
46	1	100	100%	

Mean Speed: 33.79

TWGS, BYU Capstone data

Date: 4 February, 2012

Weekend

Speed	Frequency	Cumulative Frequency	Cumulative %	Speed Percentile
15	1	1	1%	
16	0	1	1%	
17	0	1	1%	
18	1	2	2%	
19	2	4	4%	
20	6	10	10%	
21	1	11	11%	
22	2	13	13%	
23	4	17	17%	
24	3	20	20%	
25	6	26	26%	
26	6	32	32%	
27	6	38	38%	
28	4	42	42%	
29	8	50	50%	50%
30	8	58	58%	
31	8	66	66%	
32	10	76	76%	Mode
33	3	79	79%	
34	9	88	88%	85%
35	6	94	94%	
36	4	98	98%	
37	2	100	100%	

Mean Speed: 28.73

Kennecott Data

Speed	Frequency	Cumulative Frequency	Cumulative %	Speed Percentile
25	4	4	0.73%	
26	8	12	2.18%	
27	10	22	4.00%	
28	9	31	5.64%	
29	18	49	8.91%	
30	55	104	18.91%	
31	56	160	29.09%	
32	65	225	40.91%	50%
33	70	295	53.64%	50% Mode
34	67	362	65.82%	
35	60	422	76.73%	
36	44	466	84.73%	85%
37	38	504	91.64%	
38	18	522	94.91%	
39	10	532	96.73%	
40	8	540	98.18%	
41	1	541	98.36%	
42	6	547	99.45%	
44	3	550	100.00%	

Mean Speed: 33.3 mph

TWGS, BYU Capstone data

Date: 4 February, 2012

Weekend

Speed	Frequency	Cumulative Frequency	Cumulative %	Speed Percentile
13	1	1	1.00%	
14	0	1	1.00%	
15	0	1	1.00%	
16	0	1	1.00%	
17	0	1	1.00%	
18	0	1	1.00%	
19	1	2	2.00%	
20	1	3	3.00%	
21	0	3	3.00%	
22	0	3	3.00%	
23	0	3	3.00%	
24	0	3	3.00%	
25	2	5	5.00%	
26	3	8	8.00%	
27	5	13	13.00%	
28	12	25	25.00%	
29	9	34	34.00%	
30	11	45	45.00%	50%
31	8	53	53.00%	50%
32	13	66	66.00%	Mode
33	12	78	78.00%	
34	6	84	84.00%	85%
35	6	90	90.00%	
36	2	92	92.00%	
37	1	93	93.00%	
38	1	94	94.00%	
39	0	94	94.00%	
40	4	98	98.00%	
41	0	98	98.00%	
42	1	99	99.00%	
43	0	99	99.00%	
44	1	100	100.00%	
45	0	100	100.00%	

Mean Speed: 31.1 mph

TWGS, BYU Capstone data

Date: 10 February, 2012

Weekday

Speed	Frequency	Cumulative Frequency	Cumulative %	Speed Percentile
28	2	2	2.00%	
29	2	4	4.00%	
30	8	12	12.00%	
31	6	18	18.00%	
32	13	31	31.00%	
33	11	42	42.00%	50%
34	16	58	58.00%	50% Mode
35	16	74	74.00%	Mode
36	9	83	83.00%	
37	1	84	84.00%	85%
38	8	92	92.00%	
39	3	95	95.00%	
40	2	97	97.00%	
41	1	98	98.00%	
42	2	100	100.00%	

Mean Speed: 34.1 mph

WB Daybreak Parkway East of SoDa Row Area - 4

Kennecott Data

Speed	Frequency	Cumulative Frequency	Cumulative %	Speed Percentile
20	1	1	0.24%	
23	1	2	0.49%	
24	2	4	0.98%	
25	1	5	1.22%	
26	2	7	1.71%	
27	3	10	2.44%	
28	7	17	4.16%	
29	2	19	4.65%	
30	12	31	7.58%	
31	19	50	12.22%	
32	33	83	20.29%	
33	45	128	31.30%	
34	45	173	42.30%	50%
35	49	222	54.28%	50% Mode
36	42	264	64.55%	
37	44	308	75.31%	
38	39	347	84.84%	85%
39	17	364	89.00%	
40	17	381	93.15%	
41	12	393	96.09%	
42	10	403	98.53%	
43	3	406	99.27%	
44	1	407	99.51%	
45	2	409	100.00%	

Mean Speed: 35.1 mph

TWGS, BYU Capstone data

Date: 9 February, 2012

Weekday

Speed	Frequency	Cumulative Frequency	Cumulative %	Speed Percentile
24	1	1	1%	
25	1	2	2%	
26	0	2	2%	
27	3	5	5%	
28	6	11	11%	
29	6	17	17%	
30	5	22	22%	
31	11	33	33%	
32	11	44	44%	50%
33	7	51	51%	50%
34	7	58	58%	
35	13	71	71%	Mode
36	13	84	84%	Mode
37	3	87	87%	85%
38	3	90	90%	
39	6	96	96%	
40	1	97	97%	
41	0	97	97%	
42	1	98	98%	
43	1	99	99%	
44	0	99	99%	
45	1	100	100%	

Mean Speed: 33.36

TWGS, BYU Capstone data

Date: 4 February, 2012

Weekend

Speed	Frequency	Cumulative Frequency	Cumulative %	Speed Percentile
17	1	1	1%	
18	0	1	1%	
19	0	1	1%	
20	2	3	3%	
21	1	4	4%	
22	0	4	4%	
23	2	6	6%	
24	3	9	9%	
25	0	9	9%	
26	1	10	10%	
27	4	14	14%	
28	7	21	21%	
29	10	31	31%	
30	12	43	43%	Mode
31	6	49	49%	50%
32	9	58	58%	50%
33	11	69	69%	
34	2	71	71%	
35	4	75	75%	
36	4	79	79%	
37	8	87	87%	85%
38	7	94	94%	
39	3	97	97%	
40	1	98	98%	
41	0	98	98%	
42	1	99	99%	
43	0	99	99%	
44	1	100	100%	
45	0	100	100%	

Mean Speed: 31.7

Attachment D
Summary Histograms

