Appendix F - 1

OPEX Estimate

OPEX Estimate

		VRH/D	VRH/Y	
NTD Estimated	128.91	160	46400	5,981,424
UTA Estimated	96.98	160	46400	4,500,000

SOURCE DATA

UTA 2012 - Table 12 | UTA 2012 - Table 14 | UTA 2012 - Table 24

			OPEX Costs					OP Delivered					OPEX	
Mode	TOS	VOMS	Veh Ops	Veh Mtce	NonVehMtce	GenAdmin	Total	VAMS	YR-VehMi	YR-VehRevMi	YR-VehHr	YR-VehRevHr	per VOMS	per VehHr
CB	DO	38	6,568,200	2,232,200	921,000	2,264,106	11,985,572	57	2,153,300	1,963,100	96,600	64,200	315,410	124.10
MB	DO	497	61,603,129	19,059,903	6,979,850	18,060,280	105,703,162	513	15,888,400	13,703,300	1,099,200	820,000	212,682	96.20
MB	PT	6	389,507	217,522	30,111	482,198	1,119,338	8	236,100	198,600	14,600	13,100	186,556	76.60

CALCULATED DATA

Mode	TOS	Cost per Revenue Mile	Cost per Revenue Hour	Cost per Vehicle Mile	Cost per Vehicle Hour
CB	DO	6.11	186.69	5.57	124.07
MB	DO	7.71	128.91	6.65	96.16
MB	PT	5.64	85.45	4.74	76.67

Cost per Revenue Hour in 2014 Dollars $133.11

Increased from 2012 cost using CPI

Appendix F - 2

Bus Calculations

Bus Fleet Requirement Calculator **Data items to enter in red.**

Modeled	**Alt A**	**Alt B**	**Comments / Instructions**
Round Trip Distance	**22.30**	**23.10**	**Enter r/t distance in miles**
Net Round Trip Time	**47.19**	**42.75**	**Enter r/t time in minutes**
Assumptions			
Layover Time (Total)	**10.00**	**6.00**	Shorter for BRT due to reliable travel time / **Enter total layover (both ends of route)**
Service Frequency	**4**	**6**	**Enter service frequency as number of trips per hour per direction (e.g. peak headway)**
			2 = 30 minute headway, 3=20 minute headway, 4=15 minute headway, 5=12-minute headway, 6=10 minute headway)
Calculated			
Total Round Trip Time	57.19	48.75	Calculated
Average Speed (mph)	28.35	32.42	Calculated
Operating Fleet	7.0	9.0	Calculated. Note: Rounds up to next higher bus requirement (no partial buses can be used)
Fleet with 20% Spare	9.0	11.0	Calculated at 20% Note: Rounds up to next higher bus requirement
	Alt A	**Alt B**	
Calculated Fleet Required	**9**	**11**	**Number of buses required to meet VOMS with adequate spare ratio**

Appendix F - 3

O&M Cost Estimates for Alternatives A and B

SOUTH DAVIS

Operating Statistics & Costs for Alternative Service Plans

Alternative B	Peak Headway	Daily Average Hours/Day	OffPeak Headway	Evening Average Hours/Day	1-way trips per day	Deadhead Veh-Miles	Peak Vehicles	Deadhead Veh-Hours	Total Daily Veh-Hours	Daily Op. Cost per hour	Combined Op. Cost per hour	Daily Op. Cost	Oper. days per year	Annual Operating Cost Estimates Annual Oper. Cost
BRT	10	6	15	12	168	180	6	0.6	111.4	$133	$14,828	**$14,828**	248	$3,677,457
Weekday														
BRT	15	6	15	9.5	124	120	4	0.6	64.3	$133	$8,555	**$8,555**	64	$547,490
Saturday														
BRT	30	6	30	9.5	62	60	2	0.6	32.1	$133	$4,277	**$4,277**	53	$226,695
Sunday														
													Total Annual	**$4,451,642**

operating cost per revenue-hour $133.11

Assuming Service 4:30 10:30 on weekdays
7:00 to 10:30 on Saturday
7:00 to 10:30 on Sunday

Daily Deadhead Miles per bus (two-way) 30
Daily Deadhead Time per bus (two-way) 34

Operating Cost Inputs
Using UTA NTD data from 2012 Tables 12 and 14 to estimate Cost per Revenue Hour
Cost was escalated to from 2012 to 2014 dollars using CPI ($128.91 escalated to $133.11)

Cost per Trip.
3,570 weekday ridership (WFRC)
3,570 annualized (multiply by 290) = 1,035,300
1035300 divided by $4,451,642 = $4.30

SOUTH DAVIS

Operating Statistics & Costs for Alternative Service Plans

Alternative A	Peak Headway	Daily Average Hours/Day	OffPeak Headway	Evening Average Hours/Day	1-way trips per day	Deadhead Veh-Miles	Peak Vehicles	Deadhead Veh-Hours	Total Daily Veh-Hours	Daily Op. Cost per hour	Combined Op. Cost per hour	Daily Op. Cost	Oper. days per year	Annual Operating Cost Estimates Annual Oper. Cost
Enhanced Bus, Weekday	15	6	15	12	144	120	4	0.6	74.3	$133	$9,886	**$9,886**	248	$2,451,638
Enhanced Bus Saturday	30	6	30	9.5	62	60	2	0.6	32.1	$133	$4,277	**$4,277**	64	$273,745
													Total Annual	**$2,725,383**

operating cost per revenue-hour $133.11

Assuming Service 4:30 10:30 on weekdays
7:00 to 10:30 on Saturday
No service on Sunday

Daily Deadhead Miles per bus (two-way) 30
Daily Deadhead Time per bus (two-way) 34

Operating Cost Inputs
Using UTA NTD data from 2012 Tables 12 and 14 to estimate Cost per Revenue Hour
Cost was escalated to from 2012 to 2014 dollars using CPI ($128.91 escalated to $133.11)

Cost per Trip.
2,074 weekday ridership (WFRC)
2,074 annualized (multiply by 290) = 601,460
601460 divided by $2,725,383 = $4.53

Deadhead Calculations

Location	Miles One-way	Time Estimate One-way	Daily Miles per bus	Deadhead time per bus
Woods Cross - 750 S 800 W, Woods Cross	14.9	17	30	34

Assumes buses are stationed at the UTA Salt Lake Base, 3600 S 700 W, Salt Lake City.

operating cost per service-hour $131.58

Appendix F - 4

O&M Cost Estimates for Circulator

SOUTH DAVIS

Operating Statistics & Costs for Alternative Service Plans

Circulator	Peak Headway	Daily Average Hours/Day	OffPeak Headway	Evening Average Hours/Day	1-way trips per day	Deadhead Veh-Miles	Peak Vehicles	Deadhead Veh-Hours	Total Daily Veh-Hours	Daily Op. Cost per hour	Daily Op. Cost per mile	Combined Op. Cost per hour	Daily Op. Cost	Oper. days per year	Annual Operating Cost Estimates Annual Oper. Cost
Circulator	30	6	30	6	48	26	2	0.3	24.6	$133	$0.00	$3,275	**$3,275**	248	$812,077
Weekday															
Circulator	30	6	30	4	40	26	2	0.3	20.6	$133	$0.00	$2,742	**$2,742**	64	$175,492
Saturday															
No service															
Sunday														**Total Annual**	**$987,570**

operating cost per revenue-hour $133.11

Assuming Service 12 hrs on weekdays
10 hrs on Saturday
no service on Sunday

Operating Cost Inputs
Using UTA NTD data from 2012 Tables 12 and 14 to estimate Cost per Revenue Hour
Cost was escalated to from 2012 to 2014 dollars using CPI ($128.91 escalated to $133.11)

Daily Deadhead Miles per bus (two-way) 13
Daily Deadhead Time per bus (two-way) 18

$389,000 Gillig 2013 bus

Deadhead Calculations

	Location	Miles One-way	Time Estimate One-way	Daily Miles per bus	Deadhead time per bus
BRT	Woods Cross - 750 S 800 W, Woods Cross	14.9	17	30	34
Circulator	N 300 and W South Temple	6.4	9	13	18

Assumes buses are stationed at the UTA Salt Lake Base, 3600 S 700 W, Salt Lake City.

operating cost per service-hour $131.58