

## Operating and Maintenance Costs

Conceptual Operations and Maintenance (O&M) Costs were calculated using RTD's methodology. Their methodology relies on the average hourly cost for operating a transit service (driver salaries, fuel, etc.), multiplied by the total number of hours a bus operates to meet the service span (hours of service over the course of the day), multiplied by the number of buses necessary to meet the service frequency (frequency of buses per hour, i.e. 7.5 minute frequency = 1 bus every 7.5 minutes) requirement set forth in the alternate scenarios. This number is then annualized for service over the course of a year. That number is added to the average annual maintenance cost for transit vehicles multiplied by the total number of vehicles necessary to operate the service span and frequency in the alternate operations scenarios. The following tables contain the O&M costs for the operations scenarios tested for this project.

# SH7

## BUS RAPID TRANSIT STUDY

SH 7 BRT  
CONCEPTUAL FLEET SIZE CALCULATIONS AND O&M COSTS - 7.5/15 minute headways  
draft 1/11/17

|                |       | Operating scenario |              |              |              |              |              |              |             |              |               |
|----------------|-------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|--------------|---------------|
|                |       | 1-0                | 1-1          | 1-2          | 1-3          | 1-4          | 2            | 3            | 4           | 4+1          | 5 (same as 1) |
| Mixed Traffic  | Fleet | 30                 | 31           | 31           | 31           | 31           | 30           | 31           | 20          | 49           |               |
|                | Costs | \$12,145,500       | \$12,379,500 | \$12,379,500 | \$12,379,500 | \$12,379,500 | \$12,145,500 | \$12,379,500 | \$8,019,000 | \$20,164,500 |               |
| Dedicated Lane | Fleet | 25                 | 25           | 25           | 25           | 25           | 23           | 26           | 14          | 39           | 25            |
|                | Costs | \$11,209,500       | \$11,209,500 | \$11,209,500 | \$11,209,500 | \$11,209,500 | \$10,224,000 | \$11,443,500 | \$6,331,500 | \$17,541,000 | \$11,209,500  |
| Managed Lane   | Fleet | 26                 | 26           | 26           | 26           | 26           | 26           | 27           | 14          | 40           |               |
|                | Costs | \$11,443,500       | \$11,443,500 | \$11,443,500 | \$11,443,500 | \$11,443,500 | \$10,692,000 | \$11,677,500 | \$6,331,500 | \$17,775,000 |               |
| Standard Bus   | Fleet | 34                 | 34           | 34           | 34           | 34           | 34           | 35           | 21          | 55           |               |
|                | Costs | \$13,599,000       | \$13,599,000 | \$13,599,000 | \$13,599,000 | \$13,599,000 | \$13,599,000 | \$13,833,000 | \$8,253,000 | \$21,852,000 |               |

# SH7 BUS RAPID TRANSIT STUDY

SH7 BRT  
CONCEPTUAL FLEET SIZE CALCULATIONS AND O&M COSTS  
draft 1/11/17

## OPERATING SCENARIO 1-0 2040 MIXED TRAFFIC

| 7.5 min peak headways |               |  |  |
|-----------------------|---------------|--|--|
| distance              | 27.7 miles    |  |  |
| time                  | 76 minutes    | 172 rt plus 20 min. layover              |  |
|                       | 1,26667 hours | 22,93333 buses                           |  |
| avg speed             | 21.86842 mph  | 23 rounded                               |  |
|                       |               | 30 Incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |              |  |  |
|--------------------------|--------------|--|--|
| distance                 | 27.7 miles   |  |  |
| time                     | 54 minutes   | 128 rt plus layover                      |  |
|                          | 0.9 hours    | 8,533333 buses                           |  |
| avg speed                | 30.77778 mph | 9 rounded                                |  |
|                          |              | 12 Incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |          | Runs/hr/  |      | Buses/ | Total hours | Max psgr<br>cap/veh | Max psgr<br>cap/day | Daily<br>Vehicle<br>rev hrs | all day  |           |            | all day |       | Plus  |              | Cost/hr | Ann cost |
|-----------|----------|-----------|------|--------|-------------|---------------------|---------------------|-----------------------------|----------|-----------|------------|---------|-------|-------|--------------|---------|----------|
| Hours     | Headways | direction | hour | 260    |             |                     |                     |                             | 52       | 53        | 365 20% dh |         |       |       |              |         |          |
| Peaks     | 6        | 15        | 4    | 23     | 138         |                     |                     | 138                         | Weekdays | Saturdays | Sundays    |         |       |       |              |         |          |
| Off-Peaks | 12       | 30        | 2    | 9      | 108         |                     |                     | 108                         | 63960    | 8424      | 8586       |         |       |       |              |         |          |
| Total     | 18       |           |      |        | 246         | 75                  | 18450               | 246                         | 63960    | 8424      | 8586       | 80970   | 97164 | \$125 | \$12,145,500 |         |          |

## OPERATING SCENARIO 1-0 2040 DEDICATED LANES

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 59 minutes     | 138 rt plus 20 min. layover              |  |
|                       | 0.983333 hours | 18.4 buses                               |  |
| avg speed             | 28.16949 mph   | 19 rounded                               |  |
|                       |                | 25 Incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |               |  |  |
|--------------------------|---------------|--|--|
| distance                 | 27.7 miles    |  |  |
| time                     | 52 minutes    | 124 rt plus layover                      |  |
|                          | 0.86667 hours | 8,266667 buses                           |  |
| avg speed                | 31.96154 mph  | 9 rounded                                |  |
|                          |               | 12 Incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/ | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | Operating Hours |           |       | Plus 365 20% dh | Cost/hr | Ann cost           |
|-----------|--------------------|----------|------|--------|-------------|------------------|------------------|-----------------------|-----------------|-----------|-------|-----------------|---------|--------------------|
| Hours     | Headways direction | hour     | hour | 18 hrs |             |                  |                  |                       | 18 hrs          | 30 min    |       |                 |         |                    |
| Peaks     | 6                  | 15       | 4    | 19     | 114         |                  |                  | 114                   | all day         | all day   | 260   | 52              | 53      |                    |
| Off-Peaks | 12                 | 30       | 2    | 9      | 108         |                  |                  | 108                   | Weekdays        | Saturdays | 57720 | 8424            | 8586    |                    |
| Total     | 18                 |          |      |        | 222         | 75               | 16650            | 222                   |                 |           |       | 74730           | 89676   | \$125 \$11,209,500 |

## OPERATING SCENARIO 1-0 2040 MANAGED LANES

| 7.5 min peak headways |               |  |  |
|-----------------------|---------------|--|--|
| distance              | 27.7 miles    |  |  |
| time                  | 64 minutes    | 148 rt plus 20 min. layover              |  |
|                       | 1,06667 hours | 19,73333 buses                           |  |
| avg speed             | 25.96875 mph  | 20 rounded                               |  |
|                       |               | 26 Incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |               |  |  |
|--------------------------|---------------|--|--|
| distance                 | 27.7 miles    |  |  |
| time                     | 52 minutes    | 124 rt plus layover                      |  |
|                          | 0.86667 hours | 8,266667 buses                           |  |
| avg speed                | 31.96154 mph  | 9 rounded                                |  |
|                          |               | 12 Incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |          | Runs/hr/  |      | Buses/ | Total hours | Max psgr<br>cap/veh | Max psgr<br>cap/day | Daily<br>Vehicle<br>rev hrs | all day  |           |            | all day |       | Plus  |              | Cost/hr | Ann cost |
|-----------|----------|-----------|------|--------|-------------|---------------------|---------------------|-----------------------------|----------|-----------|------------|---------|-------|-------|--------------|---------|----------|
| Hours     | Headways | direction | hour | 260    |             |                     |                     |                             | 52       | 53        | 365 20% dh |         |       |       |              |         |          |
| Peaks     | 6        | 15        | 4    | 20     | 120         |                     |                     | 120                         | Weekdays | Saturdays | Sundays    |         |       |       |              |         |          |
| Off-Peaks | 12       | 30        | 2    | 9      | 108         |                     |                     | 108                         | 59280    | 8424      | 8586       |         |       |       |              |         |          |
| Total     | 18       |           |      |        | 228         | 75                  | 17100               | 228                         | 59280    | 8424      | 8586       | 76290   | 91548 | \$125 | \$11,443,500 |         |          |

## OPERATING SCENARIO 1-0 2040 STANDARD BUS

| 7.5 min peak headways |               |  |  |
|-----------------------|---------------|--|--|
| distance              | 27.7 miles    |  |  |
| time                  | 85 minutes    | 190 rt plus 20 min. layover              |  |
|                       | 1,41667 hours | 25,33333 buses                           |  |
| avg speed             | 19.55294 mph  | 26 rounded                               |  |
|                       |               | 34 Incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |               |  |  |
|--------------------------|---------------|--|--|
| distance                 | 27.7 miles    |  |  |
| time                     | 61 minutes    | 142 rt plus layover                      |  |
|                          | 1,01667 hours | 9,466667 buses                           |  |
| avg speed                | 27.2459 mph   | 10 rounded                               |  |
|                          |               | 13 Incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |          | Runs/hr/  |      | Buses/ | Total hours | Max psgr<br>cap/veh | Max psgr<br>cap/day | Daily<br>Vehicle<br>rev hrs | all day  |           |            | Plus  |        | Cost/hr | Ann cost     |
|-----------|----------|-----------|------|--------|-------------|---------------------|---------------------|-----------------------------|----------|-----------|------------|-------|--------|---------|--------------|
| Hours     | Headways | direction | hour | 260    |             |                     |                     |                             | 52       | 53        | 365 20% dh |       |        |         |              |
| Peaks     | 6        | 15        | 4    | 26     | 156         |                     |                     | 156                         | Weekdays | Saturdays | Sundays    |       |        |         |              |
| Off-Peaks | 12       | 30        | 2    | 10     | 120         |                     |                     | 120                         | 71760    | 9360      | 9540       |       |        |         |              |
| Total     | 18       |           |      |        | 276         | 75                  | 20700               | 276                         | 71760    | 9360      | 9540       | 90660 | 108792 | \$125   | \$13,599,000 |

# SH7 BUS RAPID TRANSIT STUDY

SH 7 BRT  
CONCEPTUAL FLEET SIZE CALCULATIONS AND O&M COSTS  
draft 1/11/17

## OPERATING SCENARIO 1-1 2040 MIXED TRAFFIC

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 77 minutes     | 174 rt plus 20 min. layover              |  |
|                       | 1.283333 hours | 23.2 buses                               |  |
| avg speed             | 21.58442 mph   | 24 rounded                               |  |
|                       |                | 31 Incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |              |  |  |
|--------------------------|--------------|--|--|
| distance                 | 27.7 miles   |  |  |
| time                     | 54 minutes   | 128 rt plus layover                      |  |
|                          | 0.9 hours    | 8.533333 buses                           |  |
| avg speed                | 30.77778 mph | 9 rounded                                |  |
|                          |              | 12 Incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/ | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | all day  |           |         | Plus 365 20% dh | Cost/hr | Ann cost           |
|-----------|--------------------|----------|------|--------|-------------|------------------|------------------|-----------------------|----------|-----------|---------|-----------------|---------|--------------------|
| Hours     | Headways direction | hour     | hour | 260    |             |                  |                  |                       | 52       | 53        |         |                 |         |                    |
| Peaks     | 6                  | 15       | 4    | 24     | 144         |                  |                  | 144                   | Weekdays | Saturdays | Sundays |                 |         |                    |
| Off-Peaks | 12                 | 30       | 2    | 9      | 108         |                  |                  | 108                   | 65520    | 8424      | 8586    |                 |         |                    |
| Total     | 18                 |          |      |        | 252         | 75               | 18900            | 252                   | 65520    | 8424      | 8586    | 82530           | 99036   | \$125 \$12,379,500 |

## OPERATING SCENARIO 1-1 2040 DEDICATED LANES

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 59 minutes     | 138 rt plus 20 min. layover              |  |
|                       | 0.983333 hours | 18.4 buses                               |  |
| avg speed             | 28.16949 mph   | 19 rounded                               |  |
|                       |                | 25 Incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |                |  |  |
|--------------------------|----------------|--|--|
| distance                 | 27.7 miles     |  |  |
| time                     | 52 minutes     | 124 rt plus layover                      |  |
|                          | 0.866667 hours | 8.266667 buses                           |  |
| avg speed                | 31.96154 mph   | 9 rounded                                |  |
|                          |                | 12 Incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/ | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | all day  |           |         | Plus 365 20% dh | Cost/hr | Ann cost           |
|-----------|--------------------|----------|------|--------|-------------|------------------|------------------|-----------------------|----------|-----------|---------|-----------------|---------|--------------------|
| Hours     | Headways direction | hour     | hour | 260    |             |                  |                  |                       | 52       | 53        |         |                 |         |                    |
| Peaks     | 6                  | 15       | 4    | 19     | 114         |                  |                  | 114                   | Weekdays | Saturdays | Sundays |                 |         |                    |
| Off-Peaks | 12                 | 30       | 2    | 9      | 108         |                  |                  | 108                   | 57720    | 8424      | 8586    |                 |         |                    |
| Total     | 18                 |          |      |        | 222         | 75               | 16650            | 222                   | 57720    | 8424      | 8586    | 74730           | 89676   | \$125 \$11,209,500 |

## OPERATING SCENARIO 1-1 2040 MANAGED LANES

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 65 minutes     | 150 rt plus 20 min. layover              |  |
|                       | 1.083333 hours | 20 buses                                 |  |
| avg speed             | 25.56923 mph   | 20 rounded                               |  |
|                       |                | 26 Incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |                |  |  |
|--------------------------|----------------|--|--|
| distance                 | 27.7 miles     |  |  |
| time                     | 52 minutes     | 124 rt plus layover                      |  |
|                          | 0.866667 hours | 8.266667 buses                           |  |
| avg speed                | 31.96154 mph   | 9 rounded                                |  |
|                          |                | 12 Incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/ | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | all day  |           |            | Plus  | Cost/hr | Ann cost           |
|-----------|--------------------|----------|------|--------|-------------|------------------|------------------|-----------------------|----------|-----------|------------|-------|---------|--------------------|
| Hours     | Headways direction | hour     | hour | 260    |             |                  |                  |                       | 52       | 53        | 365 20% dh |       |         |                    |
| Peaks     | 6                  | 15       | 4    | 20     | 120         |                  |                  | 120                   | Weekdays | Saturdays | Sundays    |       |         |                    |
| Off-Peaks | 12                 | 30       | 2    | 9      | 108         |                  |                  | 108                   | 59280    | 8424      | 8586       |       |         |                    |
| Total     | 18                 |          |      |        | 228         | 75               | 17100            | 228                   | 59280    | 8424      | 8586       | 76290 | 91548   | \$125 \$11,443,500 |

## OPERATING SCENARIO 1-1 2040 STANDARD BUS

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 86 minutes     | 192 rt plus 20 min. layover              |  |
|                       | 1.433333 hours | 25.6 buses                               |  |
| avg speed             | 19.32558 mph   | 26 rounded                               |  |
|                       |                | 34 Incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |                |  |  |
|--------------------------|----------------|--|--|
| distance                 | 27.7 miles     |  |  |
| time                     | 62 minutes     | 144 rt plus layover                      |  |
|                          | 1.033333 hours | 9.6 buses                                |  |
| avg speed                | 26.80645 mph   | 10 rounded                               |  |
|                          |                | 13 Incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/ | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | all day  |           |            | Plus  | Cost/hr | Ann cost           |
|-----------|--------------------|----------|------|--------|-------------|------------------|------------------|-----------------------|----------|-----------|------------|-------|---------|--------------------|
| Hours     | Headways direction | hour     | hour | 260    |             |                  |                  |                       | 52       | 53        | 365 20% dh |       |         |                    |
| Peaks     | 6                  | 15       | 4    | 26     | 156         |                  |                  | 156                   | Weekdays | Saturdays | Sundays    |       |         |                    |
| Off-Peaks | 12                 | 30       | 2    | 10     | 120         |                  |                  | 120                   | 71760    | 9360      | 9540       |       |         |                    |
| Total     | 18                 |          |      |        | 276         | 75               | 20700            | 276                   | 71760    | 9360      | 9540       | 90660 | 108792  | \$125 \$13,599,000 |

# SH7 BUS RAPID TRANSIT STUDY

SH 7 BRT  
CONCEPTUAL FLEET SIZE CALCULATIONS AND O&M COSTS  
draft 1/11/17

## OPERATING SCENARIO 1-2 2040 MIXED TRAFFIC

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 77 minutes     | 174 rt plus 20 min. layover              |  |
|                       | 1.283333 hours | 23.2 buses                               |  |
| avg speed             | 21.58442 mph   | 24 rounded                               |  |
|                       |                | 31 incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |              |  |  |
|--------------------------|--------------|--|--|
| distance                 | 27.7 miles   |  |  |
| time                     | 54 minutes   | 128 rt plus layover                      |  |
|                          | 0.9 hours    | 8.533333 buses                           |  |
| avg speed                | 30.77778 mph | 9 rounded                                |  |
|                          |              | 12 incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/ | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | all day  |           |         | Plus 365 20% dh | Cost/hr | Ann cost           |
|-----------|--------------------|----------|------|--------|-------------|------------------|------------------|-----------------------|----------|-----------|---------|-----------------|---------|--------------------|
| Hours     | Headways direction | hour     | hour | 260    |             |                  |                  |                       | 52       | 53        |         |                 |         |                    |
| Peaks     | 6                  | 15       | 4    | 24     | 144         |                  |                  | 144                   | Weekdays | Saturdays | Sundays |                 |         |                    |
| Off-Peaks | 12                 | 30       | 2    | 9      | 108         |                  |                  | 108                   | 65520    | 8424      | 8586    |                 |         |                    |
| Total     | 18                 |          |      |        | 252         | 75               | 18900            | 252                   | 65520    | 8424      | 8586    | 82530           | 99036   | \$125 \$12,379,500 |

## OPERATING SCENARIO 1-2 2040 DEDICATED LANES

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 59 minutes     | 138 rt plus 20 min. layover              |  |
|                       | 0.983333 hours | 18.4 buses                               |  |
| avg speed             | 28.16949 mph   | 19 rounded                               |  |
|                       |                | 25 incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |                |  |  |
|--------------------------|----------------|--|--|
| distance                 | 27.7 miles     |  |  |
| time                     | 52 minutes     | 124 rt plus layover                      |  |
|                          | 0.866667 hours | 8.266667 buses                           |  |
| avg speed                | 31.96154 mph   | 9 rounded                                |  |
|                          |                | 12 incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/ | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | all day  |           |         | Plus 365 20% dh | Cost/hr | Ann cost           |
|-----------|--------------------|----------|------|--------|-------------|------------------|------------------|-----------------------|----------|-----------|---------|-----------------|---------|--------------------|
| Hours     | Headways direction | hour     | hour | 260    |             |                  |                  |                       | 52       | 53        |         |                 |         |                    |
| Peaks     | 6                  | 15       | 4    | 19     | 114         |                  |                  | 114                   | Weekdays | Saturdays | Sundays |                 |         |                    |
| Off-Peaks | 12                 | 30       | 2    | 9      | 108         |                  |                  | 108                   | 57720    | 8424      | 8586    |                 |         |                    |
| Total     | 18                 |          |      |        | 222         | 75               | 16650            | 222                   | 57720    | 8424      | 8586    | 74730           | 89676   | \$125 \$11,209,500 |

## OPERATING SCENARIO 1-2 2040 MANAGED LANES

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 65 minutes     | 150 rt plus 20 min. layover              |  |
|                       | 1.083333 hours | 20 buses                                 |  |
| avg speed             | 25.56923 mph   | 20 rounded                               |  |
|                       |                | 26 incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |                |  |  |
|--------------------------|----------------|--|--|
| distance                 | 27.7 miles     |  |  |
| time                     | 52 minutes     | 124 rt plus layover                      |  |
|                          | 0.866667 hours | 8.266667 buses                           |  |
| avg speed                | 31.96154 mph   | 9 rounded                                |  |
|                          |                | 12 incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/ | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | all day  |           |         | Plus 365 20% dh | Cost/hr | Ann cost           |
|-----------|--------------------|----------|------|--------|-------------|------------------|------------------|-----------------------|----------|-----------|---------|-----------------|---------|--------------------|
| Hours     | Headways direction | hour     | hour | 260    |             |                  |                  |                       | 52       | 53        |         |                 |         |                    |
| Peaks     | 6                  | 15       | 4    | 20     | 120         |                  |                  | 120                   | Weekdays | Saturdays | Sundays |                 |         |                    |
| Off-Peaks | 12                 | 30       | 2    | 9      | 108         |                  |                  | 108                   | 59280    | 8424      | 8586    |                 |         |                    |
| Total     | 18                 |          |      |        | 228         | 75               | 17100            | 228                   | 59280    | 8424      | 8586    | 76290           | 91548   | \$125 \$11,443,500 |

## OPERATING SCENARIO 1-2 2040 STANDARD BUS

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 86 minutes     | 192 rt plus 20 min. layover              |  |
|                       | 1.433333 hours | 25.6 buses                               |  |
| avg speed             | 19.32558 mph   | 26 rounded                               |  |
|                       |                | 34 incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |                |  |  |
|--------------------------|----------------|--|--|
| distance                 | 27.7 miles     |  |  |
| time                     | 62 minutes     | 144 rt plus layover                      |  |
|                          | 1.033333 hours | 9.6 buses                                |  |
| avg speed                | 26.80645 mph   | 10 rounded                               |  |
|                          |                | 13 incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/ | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | all day  |           |         | Plus 365 20% dh | Cost/hr | Ann cost           |
|-----------|--------------------|----------|------|--------|-------------|------------------|------------------|-----------------------|----------|-----------|---------|-----------------|---------|--------------------|
| Hours     | Headways direction | hour     | hour | 260    |             |                  |                  |                       | 52       | 53        |         |                 |         |                    |
| Peaks     | 6                  | 15       | 4    | 26     | 156         |                  |                  | 156                   | Weekdays | Saturdays | Sundays |                 |         |                    |
| Off-Peaks | 12                 | 30       | 2    | 10     | 120         |                  |                  | 120                   | 71760    | 9360      | 9540    |                 |         |                    |
| Total     | 18                 |          |      |        | 276         | 75               | 20700            | 276                   | 71760    | 9360      | 9540    | 90660           | 108792  | \$125 \$13,599,000 |

# SH7 BUS RAPID TRANSIT STUDY

SH 7 BRT  
CONCEPTUAL FLEET SIZE CALCULATIONS AND O&M COSTS  
draft 1/11/17

## OPERATING SCENARIO 1-3 2040 MIXED TRAFFIC

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 77 minutes     | 174 rt plus 20 min. layover              |  |
|                       | 1.283333 hours | 23.2 buses                               |  |
| avg speed             | 21.58442 mph   | 24 rounded                               |  |
|                       |                | 31 incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |              |  |  |
|--------------------------|--------------|--|--|
| distance                 | 27.7 miles   |  |  |
| time                     | 54 minutes   | 128 rt plus layover                      |  |
|                          | 0.9 hours    | 8.533333 buses                           |  |
| avg speed                | 30.77778 mph | 9 rounded                                |  |
|                          |              | 12 incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/ | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | all day  |           |            | Plus  | Cost/hr | Ann cost           |
|-----------|--------------------|----------|------|--------|-------------|------------------|------------------|-----------------------|----------|-----------|------------|-------|---------|--------------------|
| Hours     | Headways direction | hour     | hour | 260    |             |                  |                  |                       | 52       | 53        | 365 20% dh |       |         |                    |
| Peaks     | 6                  | 15       | 4    | 24     | 144         |                  |                  | 144                   | Weekdays | Saturdays | Sundays    |       |         |                    |
| Off-Peaks | 12                 | 30       | 2    | 9      | 108         |                  |                  | 108                   | 65520    | 8424      | 8586       |       |         |                    |
| Total     | 18                 |          |      |        | 252         | 75               | 18900            | 252                   | 65520    | 8424      | 8586       | 82530 | 99036   | \$125 \$12,379,500 |

## OPERATING SCENARIO 1-3 2040 DEDICATED LANES

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 59 minutes     | 138 rt plus 20 min. layover              |  |
|                       | 0.983333 hours | 18.4 buses                               |  |
| avg speed             | 28.16949 mph   | 19 rounded                               |  |
|                       |                | 25 incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |                |  |  |
|--------------------------|----------------|--|--|
| distance                 | 27.7 miles     |  |  |
| time                     | 52 minutes     | 124 rt plus layover                      |  |
|                          | 0.866667 hours | 8.266667 buses                           |  |
| avg speed                | 31.96154 mph   | 9 rounded                                |  |
|                          |                | 12 incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/ | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | all day  |           |         | Plus 365 20% dh | Cost/hr | Ann cost           |
|-----------|--------------------|----------|------|--------|-------------|------------------|------------------|-----------------------|----------|-----------|---------|-----------------|---------|--------------------|
| Hours     | Headways direction | hour     | hour | 260    |             |                  |                  |                       | 52       | 53        |         |                 |         |                    |
| Peaks     | 6                  | 15       | 4    | 19     | 114         |                  |                  | 114                   | Weekdays | Saturdays | Sundays |                 |         |                    |
| Off-Peaks | 12                 | 30       | 2    | 9      | 108         |                  |                  | 108                   | 57720    | 8424      | 8586    |                 |         |                    |
| Total     | 18                 |          |      |        | 222         | 75               | 16650            | 222                   | 57720    | 8424      | 8586    | 74730           | 89676   | \$125 \$11,209,500 |

## OPERATING SCENARIO 1-3 2040 MANAGED LANES

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 65 minutes     | 150 rt plus 20 min. layover              |  |
|                       | 1.083333 hours | 20 buses                                 |  |
| avg speed             | 25.56923 mph   | 20 rounded                               |  |
|                       |                | 26 incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |                |  |  |
|--------------------------|----------------|--|--|
| distance                 | 27.7 miles     |  |  |
| time                     | 52 minutes     | 124 rt plus layover                      |  |
|                          | 0.866667 hours | 8.266667 buses                           |  |
| avg speed                | 31.96154 mph   | 9 rounded                                |  |
|                          |                | 12 incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/ | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | all day  |           |            | Plus  | Cost/hr | Ann cost           |
|-----------|--------------------|----------|------|--------|-------------|------------------|------------------|-----------------------|----------|-----------|------------|-------|---------|--------------------|
| Hours     | Headways direction | hour     | hour | 260    |             |                  |                  |                       | 52       | 53        | 365 20% dh |       |         |                    |
| Peaks     | 6                  | 15       | 4    | 20     | 120         |                  |                  | 120                   | Weekdays | Saturdays | Sundays    |       |         |                    |
| Off-Peaks | 12                 | 30       | 2    | 9      | 108         |                  |                  | 108                   | 59280    | 8424      | 8586       |       |         |                    |
| Total     | 18                 |          |      |        | 228         | 75               | 17100            | 228                   | 59280    | 8424      | 8586       | 76290 | 91548   | \$125 \$11,443,500 |

## OPERATING SCENARIO 1-3 2040 STANDARD BUS

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 86 minutes     | 192 rt plus 20 min. layover              |  |
|                       | 1.433333 hours | 25.6 buses                               |  |
| avg speed             | 19.32558 mph   | 26 rounded                               |  |
|                       |                | 34 incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |                |  |  |
|--------------------------|----------------|--|--|
| distance                 | 27.7 miles     |  |  |
| time                     | 62 minutes     | 144 rt plus layover                      |  |
|                          | 1.033333 hours | 9.6 buses                                |  |
| avg speed                | 26.80645 mph   | 10 rounded                               |  |
|                          |                | 13 incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |          | Runs/hr/  |      | Buses/ | Total hours | Max psgr<br>cap/veh | Max psgr<br>cap/day | Daily<br>Vehicle<br>rev hrs | all day  |           |         | Plus  | Cost/hr | Ann cost           |
|-----------|----------|-----------|------|--------|-------------|---------------------|---------------------|-----------------------------|----------|-----------|---------|-------|---------|--------------------|
| Hours     | Headways | direction | hour | hour   |             |                     |                     |                             | 260      | 52        | 53      | 365   |         |                    |
| Peaks     | 6        | 15        | 4    | 26     | 156         |                     |                     | 156                         | Weekdays | Saturdays | Sundays |       |         |                    |
| Off-Peaks | 12       | 30        | 2    | 10     | 120         |                     |                     | 120                         | 71760    | 9360      | 9540    |       |         |                    |
| Total     | 18       |           |      |        | 276         | 75                  | 20700               | 276                         | 71760    | 9360      | 9540    | 90660 | 108792  | \$125 \$13,599,000 |

# SH7 BUS RAPID TRANSIT STUDY

SH 7 BRT  
CONCEPTUAL FLEET SIZE CALCULATIONS AND O&M COSTS  
draft 1/11/17

## OPERATING SCENARIO 1-4 2040 MIXED TRAFFIC

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 77 minutes     | 174 rt plus 20 min. layover              |  |
|                       | 1.283333 hours | 23.2 buses                               |  |
| avg speed             | 21.58442 mph   | 24 rounded                               |  |
|                       |                | 31 incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |              |  |  |
|--------------------------|--------------|--|--|
| distance                 | 27.7 miles   |  |  |
| time                     | 54 minutes   | 128 rt plus layover                      |  |
|                          | 0.9 hours    | 8.533333 buses                           |  |
| avg speed                | 30.77778 mph | 9 rounded                                |  |
|                          |              | 12 incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/ | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | all day  |           |         | Plus   |       | Cost/hr | Ann cost     |
|-----------|--------------------|----------|------|--------|-------------|------------------|------------------|-----------------------|----------|-----------|---------|--------|-------|---------|--------------|
| Hours     | Headways direction | hour     | hour | 260    |             |                  |                  |                       | 52       | 53        | 365     | 20% dh |       |         |              |
| Peaks     | 6                  | 15       | 4    | 24     | 144         |                  |                  | 144                   | Weekdays | Saturdays | Sundays |        |       |         |              |
| Off-Peaks | 12                 | 30       | 2    | 9      | 108         |                  |                  | 108                   | 65520    | 8424      | 8586    |        |       |         |              |
| Total     | 18                 |          |      |        | 252         | 75               | 18900            | 252                   | 65520    | 8424      | 8586    | 82530  | 99036 | \$125   | \$12,379,500 |

## OPERATING SCENARIO 1-4 2040 DEDICATED LANES

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 59 minutes     | 138 rt plus 20 min. layover              |  |
|                       | 0.983333 hours | 18.4 buses                               |  |
| avg speed             | 28.16949 mph   | 19 rounded                               |  |
|                       |                | 25 incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |                |  |  |
|--------------------------|----------------|--|--|
| distance                 | 27.7 miles     |  |  |
| time                     | 52 minutes     | 124 rt plus layover                      |  |
|                          | 0.866667 hours | 8.266667 buses                           |  |
| avg speed                | 31.96154 mph   | 9 rounded                                |  |
|                          |                | 12 incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/ | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | all day  |           |            | Plus  | Cost/hr | Ann cost           |
|-----------|--------------------|----------|------|--------|-------------|------------------|------------------|-----------------------|----------|-----------|------------|-------|---------|--------------------|
| Hours     | Headways direction | hour     | hour | 260    |             |                  |                  |                       | 52       | 53        | 365 20% dh |       |         |                    |
| Peaks     | 6                  | 15       | 4    | 19     | 114         |                  |                  | 114                   | Weekdays | Saturdays | Sundays    |       |         |                    |
| Off-Peaks | 12                 | 30       | 2    | 9      | 108         |                  |                  | 108                   | 57720    | 8424      | 8586       |       |         |                    |
| Total     | 18                 |          |      |        | 222         | 75               | 16650            | 222                   | 57720    | 8424      | 8586       | 74730 | 89676   | \$125 \$11,209,500 |

## OPERATING SCENARIO 1-4 2040 MANAGED LANES

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 65 minutes     | 150 rt plus 20 min. layover              |  |
|                       | 1.083333 hours | 20 buses                                 |  |
| avg speed             | 25.56923 mph   | 20 rounded                               |  |
|                       |                | 26 incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |                |  |  |
|--------------------------|----------------|--|--|
| distance                 | 27.7 miles     |  |  |
| time                     | 52 minutes     | 124 rt plus layover                      |  |
|                          | 0.866667 hours | 8.266667 buses                           |  |
| avg speed                | 31.96154 mph   | 9 rounded                                |  |
|                          |                | 12 incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/ | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | all day  |           |         | Plus   |       | Cost/hr | Ann cost     |
|-----------|--------------------|----------|------|--------|-------------|------------------|------------------|-----------------------|----------|-----------|---------|--------|-------|---------|--------------|
| Hours     | Headways direction | hour     | hour | 260    |             |                  |                  |                       | 52       | 53        | 365     | 20% dh |       |         |              |
| Peaks     | 6                  | 15       | 4    | 20     | 120         |                  |                  | 120                   | Weekdays | Saturdays | Sundays |        |       |         |              |
| Off-Peaks | 12                 | 30       | 2    | 9      | 108         |                  |                  | 108                   | 59280    | 8424      | 8586    |        |       |         |              |
| Total     | 18                 |          |      |        | 228         | 75               | 17100            | 228                   | 59280    | 8424      | 8586    | 76290  | 91548 | \$125   | \$11,443,500 |

## OPERATING SCENARIO 1-4 2040 STANDARD BUS

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 86 minutes     | 192 rt plus 20 min. layover              |  |
|                       | 1.433333 hours | 25.6 buses                               |  |
| avg speed             | 19.32558 mph   | 26 rounded                               |  |
|                       |                | 34 incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |                |  |  |
|--------------------------|----------------|--|--|
| distance                 | 27.7 miles     |  |  |
| time                     | 62 minutes     | 144 rt plus layover                      |  |
|                          | 1.033333 hours | 9.6 buses                                |  |
| avg speed                | 26.80645 mph   | 10 rounded                               |  |
|                          |                | 13 incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/ | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | all day  |           |         | Plus   |        | Cost/hr | Ann cost     |
|-----------|--------------------|----------|------|--------|-------------|------------------|------------------|-----------------------|----------|-----------|---------|--------|--------|---------|--------------|
| Hours     | Headways direction | hour     | hour | 260    |             |                  |                  |                       | 52       | 53        | 365     | 20% dh |        |         |              |
| Peaks     | 6                  | 15       | 4    | 26     | 156         |                  |                  | 156                   | Weekdays | Saturdays | Sundays |        |        |         |              |
| Off-Peaks | 12                 | 30       | 2    | 10     | 120         |                  |                  | 120                   | 71760    | 9360      | 9540    |        |        |         |              |
| Total     | 18                 |          |      |        | 276         | 75               | 20700            | 276                   | 71760    | 9360      | 9540    | 90660  | 108792 | \$125   | \$13,599,000 |



# SH7 BUS RAPID TRANSIT STUDY

SH 7 BRT  
CONCEPTUAL FLEET SIZE CALCULATIONS AND O&M COSTS  
draft 1/11/17

## OPERATING SCENARIO 2 2040 MIXED TRAFFIC

| 7.5 min peak headways |               |  |  |
|-----------------------|---------------|--|--|
| distance              | 27.7 miles    |  |  |
| time                  | 76 minutes    | 172 rt plus 20 min. layover              |  |
|                       | 1.26667 hours | 22.93333 buses                           |  |
| avg speed             | 21.86842 mph  | 23 rounded                               |  |
|                       |               | 30 incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |                |  |  |
|--------------------------|----------------|--|--|
| distance                 | 27.7 miles     |  |  |
| time                     | 53 minutes     | 126 rt plus layover                      |  |
|                          | 0.883333 hours | 8.4 buses                                |  |
| avg speed                | 31.35849 mph   | 9 rounded                                |  |
|                          |                | 12 incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           | Hours | Runs/hr/ |           | Buses/ | Total hours | Max psgr<br>cap/veh | Max psgr<br>cap/day | Daily<br>Vehicle<br>rev hrs | Operating Hours             |                             |         | Plus<br>365 20% dh | Cost/hr | Ann cost           |
|-----------|-------|----------|-----------|--------|-------------|---------------------|---------------------|-----------------------------|-----------------------------|-----------------------------|---------|--------------------|---------|--------------------|
|           |       | Headways | direction |        |             |                     |                     |                             | 18 hrs<br>30 min<br>all day | 18 hrs<br>30 min<br>all day | 53      |                    |         |                    |
| Peaks     | 6     | 15       | 4         | 23     | 138         |                     |                     | 138                         | 260                         | 52                          | 53      |                    |         |                    |
| Off-Peaks | 12    | 30       | 2         | 9      | 108         |                     |                     | 108                         | Weekdays                    | Saturdays                   | Sundays |                    |         |                    |
|           |       |          |           |        |             |                     |                     |                             | 63960                       | 8424                        | 8586    |                    |         |                    |
| Total     | 18    |          |           |        | 246         | 75                  | 18450               | 246                         | 63960                       | 8424                        | 8586    | 80970              | 97164   | \$125 \$12,145,500 |

## OPERATING SCENARIO 2 2040 DEDICATED LANES

| 7.5 min peak headways |              |  |  |
|-----------------------|--------------|--|--|
| distance              | 27.7 miles   |  |  |
| time                  | 57 minutes   | 134 rt plus 20 min. layover              |  |
|                       | 0.95 hours   | 17.86667 buses                           |  |
| avg speed             | 29.15789 mph | 18 rounded                               |  |
|                       |              | 23 incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |                |  |  |
|--------------------------|----------------|--|--|
| distance                 | 27.7 miles     |  |  |
| time                     | 50 minutes     | 120 rt plus layover                      |  |
|                          | 0.833333 hours | 8 buses                                  |  |
| avg speed                | 33.24 mph      | 8 rounded                                |  |
|                          |                | 10 incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           | Hours | Runs/hr/ |           | Buses/ | Total hours | Max psgr<br>cap/veh | Max psgr<br>cap/day | Daily<br>Vehicle<br>rev hrs | Operating Hours             |                             |         | Plus<br>365 20% dh | Cost/hr | Ann cost           |
|-----------|-------|----------|-----------|--------|-------------|---------------------|---------------------|-----------------------------|-----------------------------|-----------------------------|---------|--------------------|---------|--------------------|
|           |       | Headways | direction |        |             |                     |                     |                             | 18 hrs<br>30 min<br>all day | 18 hrs<br>30 min<br>all day | 53      |                    |         |                    |
| Peaks     | 6     | 15       | 4         | 18     | 108         |                     |                     | 108                         | 260                         | 52                          | 53      |                    |         |                    |
| Off-Peaks | 12    | 30       | 2         | 8      | 96          |                     |                     | 96                          | Weekdays                    | Saturdays                   | Sundays |                    |         |                    |
|           |       |          |           |        |             |                     |                     |                             | 53040                       | 7488                        | 7632    |                    |         |                    |
| Total     | 18    |          |           |        | 204         | 75                  | 15300               | 204                         | 53040                       | 7488                        | 7632    | 68160              | 81792   | \$125 \$10,224,000 |

## OPERATING SCENARIO 2 2040 MANAGED LANES

| 7.5 min peak headways |              |  |  |
|-----------------------|--------------|--|--|
| distance              | 27.7 miles   |  |  |
| time                  | 63 minutes   | 146 rt plus 20 min. layover              |  |
|                       | 1.05 hours   | 19.46667 buses                           |  |
| avg speed             | 26.38095 mph | 20 rounded                               |  |
|                       |              | 26 incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |                |  |  |
|--------------------------|----------------|--|--|
| distance                 | 27.7 miles     |  |  |
| time                     | 50 minutes     | 120 rt plus layover                      |  |
|                          | 0.833333 hours | 8 buses                                  |  |
| avg speed                | 33.24 mph      | 8 rounded                                |  |
|                          |                | 10 incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           | Hours | Runs/hr/ |           | Buses/ | Total hours | Max psgr<br>cap/veh | Max psgr<br>cap/day | Daily<br>Vehicle<br>rev hrs | Operating Hours             |                             |         | Plus<br>365 20% dh | Cost/hr | Ann cost           |
|-----------|-------|----------|-----------|--------|-------------|---------------------|---------------------|-----------------------------|-----------------------------|-----------------------------|---------|--------------------|---------|--------------------|
|           |       | Headways | direction |        |             |                     |                     |                             | 18 hrs<br>30 min<br>all day | 18 hrs<br>30 min<br>all day | 53      |                    |         |                    |
| Peaks     | 6     | 15       | 4         | 20     | 120         |                     |                     | 120                         | 260                         | 52                          | 53      |                    |         |                    |
| Off-Peaks | 12    | 30       | 2         | 8      | 96          |                     |                     | 96                          | Weekdays                    | Saturdays                   | Sundays |                    |         |                    |
|           |       |          |           |        |             |                     |                     |                             | 56160                       | 7488                        | 7632    |                    |         |                    |
| Total     | 18    |          |           |        | 216         | 75                  | 16200               | 216                         | 56160                       | 7488                        | 7632    | 71280              | 85536   | \$125 \$10,692,000 |

## OPERATING SCENARIO 2 2040 STANDARD BUS

| 7.5 min peak headways |               |  |  |
|-----------------------|---------------|--|--|
| distance              | 27.7 miles    |  |  |
| time                  | 85 minutes    | 190 rt plus 20 min. layover              |  |
|                       | 1.41667 hours | 25.33333 buses                           |  |
| avg speed             | 19.55294 mph  | 26 rounded                               |  |
|                       |               | 34 incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |               |  |  |
|--------------------------|---------------|--|--|
| distance                 | 27.7 miles    |  |  |
| time                     | 61 minutes    | 142 rt plus layover                      |  |
|                          | 1.01667 hours | 9.46667 buses                            |  |
| avg speed                | 27.2459 mph   | 10 rounded                               |  |
|                          |               | 13 incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           | Hours | Runs/hr/ |           | Buses/ | Total hours | Max psgr<br>cap/veh | Max psgr<br>cap/day | Daily<br>Vehicle<br>rev hrs | Operating Hours             |                             |         | Plus<br>365 20% dh | Cost/hr | Ann cost           |
|-----------|-------|----------|-----------|--------|-------------|---------------------|---------------------|-----------------------------|-----------------------------|-----------------------------|---------|--------------------|---------|--------------------|
|           |       | Headways | direction |        |             |                     |                     |                             | 18 hrs<br>30 min<br>all day | 18 hrs<br>30 min<br>all day | 53      |                    |         |                    |
| Peaks     | 6     | 15       | 4         | 26     | 156         |                     |                     | 156                         | 260                         | 52                          | 53      |                    |         |                    |
| Off-Peaks | 12    | 30       | 2         | 10     | 120         |                     |                     | 120                         | Weekdays                    | Saturdays                   | Sundays |                    |         |                    |
|           |       |          |           |        |             |                     |                     |                             | 71760                       | 9360                        | 9540    |                    |         |                    |
| Total     | 18    |          |           |        | 276         | 75                  | 20700               | 276                         | 71760                       | 9360                        | 9540    | 90660              | 108792  | \$125 \$13,599,000 |

# SH7 BUS RAPID TRANSIT STUDY

SH 7 BRT  
CONCEPTUAL FLEET SIZE CALCULATIONS AND O&M COSTS  
draft 1/11/17

## OPERATING SCENARIO 3 2040 MIXED TRAFFIC

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 80 minutes     | 180 rt plus 20 min. layover              |  |
|                       | 1.333333 hours | 24 buses                                 |  |
| avg speed             | 20.775 mph     | 24 rounded                               |  |
|                       |                | 31 incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |              |  |  |
|--------------------------|--------------|--|--|
| distance                 | 27.7 miles   |  |  |
| time                     | 54 minutes   | 128 rt plus layover                      |  |
|                          | 0.9 hours    | 8.533333 buses                           |  |
| avg speed                | 30.77778 mph | 9 rounded                                |  |
|                          |              | 12 incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/ | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | all day  |           |            | Plus  | Cost/hr | Ann cost           |
|-----------|--------------------|----------|------|--------|-------------|------------------|------------------|-----------------------|----------|-----------|------------|-------|---------|--------------------|
| Hours     | Headways direction | hour     | hour | 260    |             |                  |                  |                       | 52       | 53        | 365 20% dh |       |         |                    |
| Peaks     | 6                  | 15       | 4    | 24     | 144         |                  |                  | 144                   | Weekdays | Saturdays | Sundays    |       |         |                    |
| Off-Peaks | 12                 | 30       | 2    | 9      | 108         |                  |                  | 108                   | 65520    | 8424      | 8586       |       |         |                    |
| Total     | 18                 |          |      |        | 252         | 75               | 18900            | 252                   | 65520    | 8424      | 8586       | 82530 | 99036   | \$125 \$12,379,500 |

## OPERATING SCENARIO 3 2040 DEDICATED LANES

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 62 minutes     | 144 rt plus 20 min. layover              |  |
|                       | 1.033333 hours | 19.2 buses                               |  |
| avg speed             | 26.80645 mph   | 20 rounded                               |  |
|                       |                | 26 incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |                |  |  |
|--------------------------|----------------|--|--|
| distance                 | 27.7 miles     |  |  |
| time                     | 52 minutes     | 124 rt plus layover                      |  |
|                          | 0.866667 hours | 8.266667 buses                           |  |
| avg speed                | 31.96154 mph   | 9 rounded                                |  |
|                          |                | 12 incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/ | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | all day  |           |            | Plus  | Cost/hr | Ann cost           |
|-----------|--------------------|----------|------|--------|-------------|------------------|------------------|-----------------------|----------|-----------|------------|-------|---------|--------------------|
| Hours     | Headways direction | hour     | hour | 260    |             |                  |                  |                       | 52       | 53        | 365 20% dh |       |         |                    |
| Peaks     | 6                  | 15       | 4    | 20     | 120         |                  |                  | 120                   | Weekdays | Saturdays | Sundays    |       |         |                    |
| Off-Peaks | 12                 | 30       | 2    | 9      | 108         |                  |                  | 108                   | 59280    | 8424      | 8586       |       |         |                    |
| Total     | 18                 |          |      |        | 228         | 75               | 17100            | 228                   | 59280    | 8424      | 8586       | 76290 | 91548   | \$125 \$11,443,500 |

## OPERATING SCENARIO 3 2040 MANAGED LANES

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 68 minutes     | 156 rt plus 20 min. layover              |  |
|                       | 1.133333 hours | 20.8 buses                               |  |
| avg speed             | 24.44118 mph   | 21 rounded                               |  |
|                       |                | 27 incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |                |  |  |
|--------------------------|----------------|--|--|
| distance                 | 27.7 miles     |  |  |
| time                     | 52 minutes     | 124 rt plus layover                      |  |
|                          | 0.866667 hours | 8.266667 buses                           |  |
| avg speed                | 31.96154 mph   | 9 rounded                                |  |
|                          |                | 12 incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/ | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | all day  |           |            | Plus  | Cost/hr | Ann cost           |
|-----------|--------------------|----------|------|--------|-------------|------------------|------------------|-----------------------|----------|-----------|------------|-------|---------|--------------------|
| Hours     | Headways direction | hour     | hour | 260    |             |                  |                  |                       | 52       | 53        | 365 20% dh |       |         |                    |
| Peaks     | 6                  | 15       | 4    | 21     | 126         |                  |                  | 126                   | Weekdays | Saturdays | Sundays    |       |         |                    |
| Off-Peaks | 12                 | 30       | 2    | 9      | 108         |                  |                  | 108                   | 60840    | 8424      | 8586       |       |         |                    |
| Total     | 18                 |          |      |        | 234         | 75               | 17550            | 234                   | 60840    | 8424      | 8586       | 77850 | 93420   | \$125 \$11,677,500 |

## OPERATING SCENARIO 3 2040 STANDARD BUS

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 89 minutes     | 198 rt plus 20 min. layover              |  |
|                       | 1.483333 hours | 26.4 buses                               |  |
| avg speed             | 18.67416 mph   | 27 rounded                               |  |
|                       |                | 35 incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |                |  |  |
|--------------------------|----------------|--|--|
| distance                 | 27.7 miles     |  |  |
| time                     | 62 minutes     | 144 rt plus layover                      |  |
|                          | 1.033333 hours | 9.6 buses                                |  |
| avg speed                | 26.80645 mph   | 10 rounded                               |  |
|                          |                | 13 incl 20% spares and 10% addl capacity |  |

RUNS AND CAPACITY (assumes 18-hour weekday)

|           |          | Runs/hr/  |      | Buses/ | Total hours | Max psgr<br>cap/veh | Max psgr<br>cap/day | Daily<br>Vehicle<br>rev hrs | all day  |           |         | Plus   | Cost/hr | Ann cost           |
|-----------|----------|-----------|------|--------|-------------|---------------------|---------------------|-----------------------------|----------|-----------|---------|--------|---------|--------------------|
| Hours     | Headways | direction | hour | 260    |             |                     |                     |                             | 52       | 53        | 365     | 20% dh |         |                    |
| Peaks     | 6        | 15        | 4    | 27     | 162         |                     |                     | 162                         | Weekdays | Saturdays | Sundays |        |         |                    |
| Off-Peaks | 12       | 30        | 2    | 10     | 120         |                     |                     | 120                         | 73320    | 9360      | 9540    |        |         |                    |
| Total     | 18       |           |      |        | 282         | 75                  | 21150               | 282                         | 73320    | 9360      | 9540    | 92220  | 110664  | \$125 \$13,833,000 |

# SH7 BUS RAPID TRANSIT STUDY

SH 7 BRT  
CONCEPTUAL FLEET SIZE CALCULATIONS AND O&M COSTS  
draft 1/11/17

## OPERATING SCENARIO 4 2040 MIXED TRAFFIC

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 43 minutes     | 106 rt plus 20 min. layover              |  |
|                       | 0.716667 hours | 14,13333 buses                           |  |
| avg speed             | 38.65116 mph   | 15 rounded                               |  |
|                       |                | 20 Incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |            |   |  |
|--------------------------|------------|---|--|
| distance                 | 27.7 miles |   |  |
| time                     | 30 minutes | 80 rt plus layover                      |  |
|                          | 0.5 hours  | 5,333333 buses                          |  |
| avg speed                | 55.4 mph   | 6 rounded                               |  |
|                          |            | 8 Incl 20% spares and 10% addl capacity |  |

### RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/        | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | all day       |           |         | Plus 365 20% dh | Cost/hr | Ann cost          |
|-----------|--------------------|----------|------|---------------|-------------|------------------|------------------|-----------------------|---------------|-----------|---------|-----------------|---------|-------------------|
| Hours     | Headways direction | hour     | hour | 18 hrs 30 min |             |                  |                  |                       | 18 hrs 30 min | 53        |         |                 |         |                   |
| Peaks     | 6                  | 15       | 4    | 15            | 90          |                  |                  | 90                    | Weekdays      | Saturdays | Sundays |                 |         |                   |
| Off-Peaks | 12                 | 30       | 2    | 6             | 72          |                  |                  | 72                    | 42120         | 5616      | 5724    |                 |         |                   |
| Total     | 18                 |          |      |               | 162         | 75               | 12150            | 162                   | 42120         | 5616      | 5724    | 53460           | 64152   | \$125 \$8,019,000 |

## OPERATING SCENARIO 4 2040 DEDICATED LANES

| 7.5 min peak headways |              |  |  |
|-----------------------|--------------|--|--|
| distance              | 27.7 miles   |  |  |
| time                  | 27 minutes   | 74 rt plus 20 min. layover               |  |
|                       | 0.45 hours   | 9,866667 buses                           |  |
| avg speed             | 61.55556 mph | 10 rounded                               |  |
|                       |              | 13 Incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |            |   |  |
|--------------------------|------------|---|--|
| distance                 | 27.7 miles |   |  |
| time                     | 24 minutes | 68 rt plus layover                      |  |
|                          | 0.4 hours  | 4,533333 buses                          |  |
| avg speed                | 69.25 mph  | 5 rounded                               |  |
|                          |            | 7 Incl 20% spares and 10% addl capacity |  |

### RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/ | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | all day  |           |         | Plus 365 20% dh | Cost/hr | Ann cost          |
|-----------|--------------------|----------|------|--------|-------------|------------------|------------------|-----------------------|----------|-----------|---------|-----------------|---------|-------------------|
| Hours     | Headways direction | hour     | hour | 260    |             |                  |                  |                       | 52       | 53        |         |                 |         |                   |
| Peaks     | 6                  | 15       | 4    | 10     | 60          |                  |                  | 60                    | Weekdays | Saturdays | Sundays |                 |         |                   |
| Off-Peaks | 12                 | 30       | 2    | 5      | 60          |                  |                  | 60                    | 31200    | 4680      | 4770    |                 |         |                   |
| Total     | 18                 |          |      |        | 120         | 75               | 9000             | 120                   | 31200    | 4680      | 4770    | 40650           | 48780   | \$125 \$6,097,500 |

## OPERATING SCENARIO 4 2040 MANAGED LANES

| 7.5 min peak headways |            |  |  |
|-----------------------|------------|--|--|
| distance              | 27.7 miles |  |  |
| time                  | 30 minutes | 80 rt plus 20 min. layover               |  |
|                       | 0.5 hours  | 10,666667 buses                          |  |
| avg speed             | 55.4 mph   | 11 rounded                               |  |
|                       |            | 14 Incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |            |   |  |
|--------------------------|------------|---|--|
| distance                 | 27.7 miles |   |  |
| time                     | 24 minutes | 68 rt plus layover                      |  |
|                          | 0.4 hours  | 4,533333 buses                          |  |
| avg speed                | 69.25 mph  | 5 rounded                               |  |
|                          |            | 7 Incl 20% spares and 10% addl capacity |  |

### RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/ | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | all day  |           |         | Plus   |       | Cost/hr | Ann cost    |
|-----------|--------------------|----------|------|--------|-------------|------------------|------------------|-----------------------|----------|-----------|---------|--------|-------|---------|-------------|
| Hours     | Headways direction | hour     | hour | 260    |             |                  |                  |                       | 52       | 53        | 365     | 20% dh |       |         |             |
| Peaks     | 6                  | 15       | 4    | 11     | 66          |                  |                  | 66                    | Weekdays | Saturdays | Sundays |        |       |         |             |
| Off-Peaks | 12                 | 30       | 2    | 5      | 60          |                  |                  | 60                    | 32760    | 4680      | 4770    |        |       |         |             |
| Total     | 18                 |          |      |        | 126         | 75               | 9450             | 126                   | 32760    | 4680      | 4770    | 42210  | 50652 | \$125   | \$6,331,500 |

## OPERATING SCENARIO 4 2040 STANDARD BUS

| 7.5 min peak headways |                |  |  |
|-----------------------|----------------|--|--|
| distance              | 27.7 miles     |  |  |
| time                  | 49 minutes     | 118 rt plus 20 min. layover              |  |
|                       | 0.816667 hours | 15,733333 buses                          |  |
| avg speed             | 33.91837 mph   | 16 rounded                               |  |
|                       |                | 21 Incl 20% spares and 10% addl capacity |  |

| 15 min off peak headways |                |   |  |
|--------------------------|----------------|---|--|
| distance                 | 27.7 miles     |   |  |
| time                     | 35 minutes     | 90 rt plus layover                      |  |
|                          | 0.583333 hours | 6 buses                                 |  |
| avg speed                | 47.48571 mph   | 6 rounded                               |  |
|                          |                | 8 Incl 20% spares and 10% addl capacity |  |

### RUNS AND CAPACITY (assumes 18-hour weekday)

|           |                    | Runs/hr/ |      | Buses/ | Total hours | Max psgr cap/veh | Max psgr cap/day | Daily Vehicle rev hrs | all day  |           |         | Plus 365 20% dh | Cost/hr | Ann cost          |
|-----------|--------------------|----------|------|--------|-------------|------------------|------------------|-----------------------|----------|-----------|---------|-----------------|---------|-------------------|
| Hours     | Headways direction | hour     | hour | 260    |             |                  |                  |                       | 52       | 53        |         |                 |         |                   |
| Peaks     | 6                  | 15       | 4    | 16     | 96          |                  |                  | 96                    | Weekdays | Saturdays | Sundays |                 |         |                   |
| Off-Peaks | 12                 | 30       | 2    | 6      | 72          |                  |                  | 72                    | 43680    | 5616      | 5724    |                 |         |                   |
| Total     | 18                 |          |      |        | 168         | 75               | 12600            | 168                   | 43680    | 5616      | 5724    | 55020           | 66024   | \$125 \$8,253,000 |