7.2. APPENDIX B: DETAILED EVALUATION CRITERIA RESULTS WORKSHEETS

Table of Contents

Summary Results Table

Alternative	Mode	Description	Performance	Land Use	Connectivity	Constraints	Choice/User Experience	Cost	Weighted Total
H3	**Rapid Streetcar**	Harbor Rapid Streetcar from Harbor Blvd/Westminster Ave to FTC	18	11	14	7	14	11	***74***
H5	**BRT**	Harbor Bus Rapid Transit from Harbor Blvd/MacArthur Ave to FTC	17	11	12	8	11	14	***73***
H2	**Streetcar**	Harbor Long Streetcar from Harbor Blvd/Westminster Ave to FTC	17	11	12	10	14	10	***73***
L1	**Streetcar**	Anaheim/Lemon Streetcar from Harbor Blvd/Westminster Ave to FTC	17	10	12	8	13	8	***68***
L4	**BRT**	Anaheim/Lemon Bus Rapid Transit from Harbor Blvd/MacArthur Ave to FTC	14	11	12	6	12	12	***66***
L2	**Rapid Streetcar**	Anaheim/Lemon Rapid Streetcar from Harbor Blvd/Westminster Ave to FTC	15	10	14	5	14	8	***65***
K1	**Streetcar**	Katella Streetcar from Harbor Blvd/Westminster Ave to ARTIC	15	11	10	11	12	6	***65***
H1	**Streetcar**	Harbor Short Streetcar from Harbor Blvd/Westminster Ave to Anaheim Resort	16	9	8	13	10	8	***64***
K2	**Bus**	Katella + Anaheim/Lemon Enhanced Bus from Harbor Blvd/Westminster Ave to FTC, every other trip to ARTIC	8	11	11	11	7	11	***57***
L3	**Bus**	Anaheim/Lemon Enhanced Bus from Harbor Blvd/Westminster Ave to FTC	10	10	9	11	5	11	***56***
K3	**Hybrid**	Katella + Anaheim/Lemon Streetcar-Enhanced Bus Hybrid from Harbor Blvd/Westminster Ave to Anaheim Resort via streetcar, from FTC to ARTIC via Enhanced Bus	10	11	11	10	9	7	***56***
H4	**Bus**	Harbor Enhanced Bus from Harbor Blvd/Westminster Ave to FTC	9	10	10	13	4	9	***55***

*2025 Year of Expenditure (YoE)

**Net ridership estimates derived from OCTAM. Calculated as the difference between baseline (2035) ridership estimates on OCTA routes 543, 43, 47, 50, and OC Streetcar and modeled ridership on same routes plus additional ridership from a project alternative. In cases where a project alternative obviates service on Bravo! 543, ridership from the 543 was removed. See Workbook 1B - Corridor Mobility for more information.

***Travel time savings calculated between different nodes for each alternative throughout Central Orange County. See 3A for details on methodology.

SCORING KEY		
○	Low	<5
◔	Medium-Low	5 - 10
◑	Medium	10-15
◕	Medium-High	15-20
●	High	20

WEIGHTING	
20%	Transit Performance
15%	Land Use
18%	Connectivity
15%	Constraints
17%	Moide Choice/User Experience
15%	Cost & Cost-Effectiveness

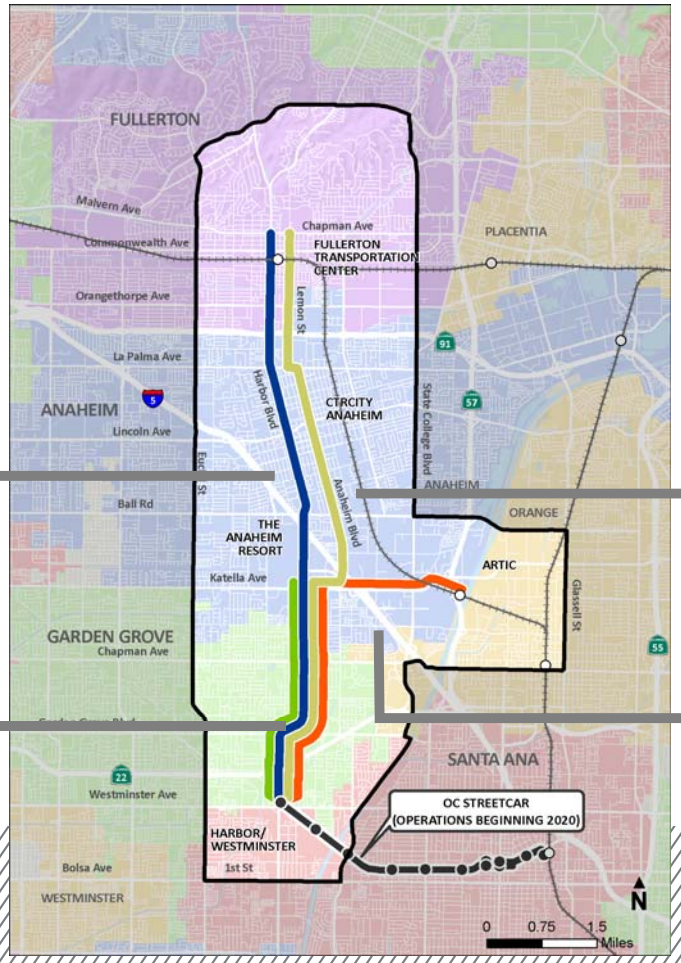
12 Draft Alternatives

HARBOR LONG

- H-2: Harbor Long Streetcar
- H-3: Harbor Rapid Streetcar
- H-4: Harbor Enhanced Bus
- H-5: Harbor Bus Rapid Transit

HARBOR SHORT

- H-1: Harbor Short Streetcar



ANAHEIM/LEMON

- L-1: Anaheim/Lemon Streetcar
- L-2: Anaheim/Lemon Rapid Streetcar
- L-3: Anaheim/Lemon Enhanced Bus
- L-4: Anaheim/Lemon BRT

KATELLA

- K-1: Katella Streetcar
- K-2: Katella+ Anaheim/Lemon Enhanced Bus
- K-3: Katella + Harbor Hybrid

1A: Average Operating Speeds - Summary

ALTERNATIVE	SCORE	
NB	-	
H1	◕	Alternative has medium-high improvement in speed compared to No Build, and medium-high ridership per mile.
H2	●	Alternative has high improvement in speed compared to No Build, with medium ridership per mile.
H3	●	Alternative has high improvement in speed compared to No Build, with medium-low ridership per mile.
H4	◔	Alternative has medium improvement in speed compared to No Build, with medium ridership per mile.
H5	●	Alternative has high improvement in speed compared to No Build, with medium-low ridership per mile.
L1	●	Alternative has high improvement in speed compared to No Build, with medium-low ridership per mile.
L2	●	Alternative has high improvement in speed compared to No Build, with medium-low ridership per mile.
L3	◔	Alternative has medium improvement in speed compared to No Build, with medium ridership per mile.
L4	◕	Alternative has medium-high improvement in speed compared to No Build, with medium ridership per mile.
K1	◕	Alternative has high improvement in speed compared to No Build, with medium-high ridership per mile.
K2	◔	Alternative has medium-low improvement in speed compared to No Build, with medium ridership per mile.
K3	◔	Alternative has medium-low improvement in speed compared to No Build, with medium ridership per mile.

1A: Average Operating Speeds - Detail

Alt.	Projected Operating Speeds (mph)				Percent Change in Speed Compared to No Build					Transit Ridership Per Mile (One-way)						Total Score	Overall Rating
	43	47	543	OCSC	43	47	543	OCSC	Score	43	47	543	OCSC	Total	Score		
Existing	12.4	12.2	16.1	10.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NB	11.4	11.3	14.9	10.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	487	N/A	N/A	N/A
H1	11.5	11.3	14.9	11.5	N/A	N/A	N/A	**10.5%**	3	432	355	351	1,725	**507**	4	7.0	4
H2	11.6	11.3	N/A	13.2	N/A	N/A	N/A	**27.1%**	5	451	328	0	1,725	**566**	5	10.0	5
H3	12.4	11.3	N/A	14.2	8.8%	N/A	N/A	**36.2%**	5	444	322	0	1,725	**570**	5	10.0	5
H4	11.6	11.3	16.4	10.4	N/A	N/A	**9.9%**	N/A	2	463	342	0	1,725	**409**	2	4.0	2
H5	13.2	11.3	17.5	10.4	15.3%	N/A	**17.1%**	N/A	4	452	327	0	1,725	**533**	4	8.0	5
L1	11.5	11.4	N/A	12.9	N/A	N/A	N/A	**24.3%**	5	437	348	0	1,725	**515**	4	9.0	5
L2	11.8	11.9	N/A	13.8	3.3%	5.7%	N/A	**33.0%**	5	430	343	0	1,725	**530**	4	9.0	5
L3	11.5	11.4	16.2	10.4	N/A	N/A	**8.3%**	N/A	2	456	357	0	1,725	**413**	2	4.0	2
L4	12.0	12.4	17.4	10.4	5.5%	9.7%	**16.5%**	N/A	4	434	348	0	1,725	**496**	3	7.0	4
K1	11.5	11.3	14.9	11.7	N/A	N/A	N/A	**12.7%**	3	428	350	349	1,725	**512**	4	7.0	4
K2	11.5	11.4	15.9	10.4	N/A	N/A	**6.2%**	N/A	2	532	342	0	1,725	**432**	2	4.0	2
K3	11.5	11.4	15.4	11.5	N/A	N/A	2.7%	**10.5%**	3	444	356	0	1,725	**444**	2	5.0	2

Notes:
This criteria provides the average operating transit speeds (overall MPH) for Routes 43, 47, 543, and the proposed OC Streetcar per alternative.

Percent Change in Speed Sub-Scores		
Scoring		**Sub-Score**
>20%	High	5
15-20%	Medium-High	4
10-15%	Medium	3
5-10%	Low-Medium	2
<5%	Low	1

Transit Ridership Per Mile Sub-Scores		
Scoring		**Sub-Score**
>550	High	5
500-550	Medium-High	4
450-500	Medium	3
400-450	Low-Medium	2
<400	Low	1

Criteria 1A Score		
Scoring		
8.0-9.0	High	●
7.0	Medium-High	◕
6.0	Medium	◑
4.0-5.0	Low-Medium	◔
3.0	Low	○

1B: Enhance Overall Corridor Mobility - Summary

ALTERNATIVE	SCORE	NOTES
NB	-	-
H1	◕	**104%** of throughput of No Build Alternative
H2	●	**114%** of throughput of No Build Alternative
H3	◕	**103%** of throughput of No Build Alternative
H4	◕	**100%** of throughput of No Build Alternative
H5	◕	**102%** of throughput of No Build Alternative
L1	●	**109%** of throughput of No Build Alternative
L2	◔	**90%** of throughput of No Build Alternative
L3	◕	**103%** of throughput of No Build Alternative
L4	◑	**97%** of throughput of No Build Alternative
K1	◕	**105%** of throughput of No Build Alternative
K2	◔	**94%** of throughput of No Build Alternative
K3	◑	**99%** of throughput of No Build Alternative

1B: Corridor Mobility - Detail

Alternative	Person in Vehicle Throughput		Transit Ridership							People Throughput		Increase Delta		Increase Percentage		Ratio of Existing - Total	Harvey Ball Rating
	South of Lampson Ave	Harbor North of Lincoln Ave	543	43	47	50	OCSC	Alternative	Total	South of Lampson Ave	North of Lincoln Ave	South of Lampson Ave	North of Lincoln Ave	South of Lampson Ave	North of Lincoln Ave		
Existing	33,039	30,298	4,394	8,520	8,899	5,074	7,160	0	34,046	67,085	64,344						
H1	32,645	-	4,351	7,908	8,735	5,069	7,160	3,705	36,927	69,572	-	2,487	-	4%	-	1.04	◕
H2	32,645	30,298	0	8,248	8,063	5,038	7,160	14,715	43,225	75,870	73,523	8,784	9,179	13%	14%	1.14	●
H3	27,209	19,963	0	8,118	7,932	5,038	7,160	15,238	43,486	70,696	63,449	3,610	-894	5%	-1%	1.03	◕
H4	33,039	30,298	0	8,465	8,416	5,074	7,160	5,151	34,265	67,304	64,563	219	219	0%	0%	1.00	◕
H5	27,209	19,963	0	8,270	8,034	5,038	7,160	14,628	43,131	70,340	63,094	3,254	-1,250	5%	-2%	1.02	◕
	South of Lampson Ave	Anaheim North of Lincoln Ave	543	43	47	50	OCSC	Alternative	Total	South of Lampson Ave	North of Lincoln Ave	South of Lampson Ave	North of Lincoln Ave	South of Lampson Ave	North of Lincoln Ave	Ratio of Existing - Total	Harvey Ball Rating
Existing	33,039	29,228	4,394	8,520	8,899	5,074	7,160		34,046	67,085	63,274						
L1	32,603	29,240	0	7,996	8,568	5,023	7,160	11,298	40,045	72,649	69,285	5,563	6,011	8%	9%	1.09	●
L2	27,052	19,266	0	7,866	8,433	5,053	7,160	12,545	41,057	68,109	60,323	1,024	-2,951	1%	-5%	0.90	◔
L3	32,997	29,240	0	8,347	8,792	5,059	7,160	5,417	34,774	67,771	64,014	686	740	1%	1%	1.03	◕
L4	27,502	19,266	0	7,949	8,559	5,053	7,160	12,043	40,764	68,266	60,030	1,181	-3,244	2%	-5%	0.97	◑
	South of Lampson Ave	West of State College Blvd	543	43	47	50	OCSC	Alternative	Total	South of Lampson Ave	West of State College Blvd	South of Lampson Ave	West of State College Blvd	South of Lampson Ave	West of State College Blvd	Ratio of Existing - Total	Harvey Ball Rating
Existing	33,039	63,789	4,394	8,520	8,899	5,074	7,160		34,046	67,085	97,835						
K1	32,588	63,442	4,332	7,831	8,603	4,789	7,160	5,461	38,175	70,763	101,617	3,678	3,782	5%	4%	1.05	◕
K2	32,954	63,684	-	9,742	8,412	4,876	7,160	4,878	35,068	68,022	93,874	937	-3,961	1%	-4%	0.94	◔
K3	32,588	63,442	-	8,127	8,763	4,789	7,160	6,973	35,813	68,401	92,282	1,315	-5,553	2%	-6%	0.99	◑

Notes:

1. Criteria measures the change in person throughput per alternative as a ratio of existing throughput
2. Alternatives where the ratio was greater than 1.05 (105%) scored the highest while alternatives where ther ratio was less than .9 (90%) scored the lowest
3. Route 543 assumed to be removed for all scenarios excepting H1 and K1
4. Route 43 assumed to take some of the lost 543 ridership and to give some riderhip to the scenario service based on modeled ratios. Scenarios where 543 is removed include increased Route 43 headway (20 mins to 15 mins
5. Route 47 is assumed to give some ridership to the alternative service based on modeled ratios
6. Route 60 is assumed to give some riderhip to the alternative based on modeled ratios
7. Ridership on the future OC Streetcar is assumed constant across all alternatives.

Scoring		Harvey Ball
>1.05	High	●
1-1.05	Medium-High	◕
.95-1	Medium	◑
0.9-0.95	Low-Medium	◔
<0.9	Low	○

1C: Reliability and On-Time Performance - Summary

ALTERNATIVE	SCORE	NOTES
NB	N/A	-
H1	◑	No dedicated lanes, medium existing LOS
H2	◔	No dedicated lanes, medium-high existing LOS
H3	◕	Dedicated transit lanes, medium-high existing LOS
H4	◔	No dedicated lanes, medium-high existing LOS
H5	◕	Dedicated transit lanes, medium-high existing LOS
L1	◑	No dedicated lanes, medium existing LOS
L2	◕	Dedicated transit lanes, medium existing LOS
L3	◑	No dedicated lanes, medium existing LOS
L4	◕	Dedicated transit lanes, medium existing LOS
K1	◑	No dedicated lanes, medium existing LOS
K2	◑	No dedicated lanes, medium existing LOS
K3	◑	No dedicated lanes, medium existing LOS

1C: Reliability and On-Time Performance - Detail

Alternative	Dedicated Lanes	Dedicated Lanes Score	Existing Alternative LOS (AM Peak) Southbound/Westbound	Existing Alternative LOS (AM Peak) Northbound/Eastbound	Existing Alternative LOS Score	Summary Score	Harvey Ball Rating
H1	No	2	C	C	3	5	◑
H2	No	2	D	C	2	4	◔
H3	Yes	5	D	C	2	7	◕
H4	No	2	D	C	2	4	◔
H5	Yes	5	D	C	2	7	◕
L1	No	2	C	C	3	5	◑
L2	Yes	5	C	C	3	8	◕
L3	No	2	C	C	3	5	◑
L4	Yes	5	C	C	3	8	◕
K1	No	2	C	C	3	5	◑
K2	No	2	C	C	3	5	◑
K3	No	2	C	C	3	5	◑

Dedicated Lanes Sub-Scores

Scoring		Sub-Score
Yes	High	5
N/A	Medium-High	4
N/A	Medium	3
No	Low-Medium	2
N/A	Low	1

Existing LOS Sub-Scores

Scoring		Sub-Score
N/A	High	5
N/A	Medium-High	4
C, Both Directions	Medium	3
D, Either Direction	Low-Medium	2
N/A	Low	1

Criteria 1C Score

Scoring		Harvey Ball
9-10	High	●
7-8	Medium-High	◕
5-6	Medium	◑
3-4	Low-Medium	◔
2	Low	○

Notes

LOS was measured at the following segments in both southbound/westbound and northbound/eastbound directions

Harbor Blvd: Ball Rd to La Palma Ave

Anaheim/Lemon: Ball Rd to La Palma Ave

Katella: Anaheim Blvd to State College Blvd

1D: New Linked Trips - Summary

ALTERNATIVE	SCORE	NOTES
NB	N/A	-
H1	●	1,536 New Linked Trips
H2	●	1,328 New Linked Trips
H3	●	1,356 New Linked Trips
H4	○	29 New Linked Trips
H5	◕	902 New Linked Trips
L1	◕	844 New Linked Trips
L2	◕	985 New Linked Trips
L3	○	23 New Linked Trips
L4	◑	642 New Linked Trips
K1	◕	909 New Linked Trips
K2	○	27 New Linked Trips
K3	◔	207 New Linked Trips

1D: New Linked Trips - Detail

Alternative	New Linked Trips per Mile with Build Alternative	Score
Existing	-	N/A
H1	1,536	●
H2	1,328	●
H3	1,356	●
H4	29	○
H5	902	◕
L1	844	◕
L2	985	◕
L3	23	○
L4	642	◑
K1	909	◕
K2	27	○
K3	207	◔

Score		Harvey Ball
>1000	High	●
800-1000	Medium-High	◕
400-800	Medium	◑
200-400	Low-Medium	◔
<200	Low	○

Notes:

1. Analysis assumes 1.43 linked trips per unlinked trip per STOPS model outputs.
2. Assumed Route Lenghts:

H1	3.4
H2	8
H3	8
H4	12
H5	12
L1	8.5
L2	8.5
L3	12.5
L4	12.5
K1	5.8
K2	10.5
K3	10.5

2A: Transit Compatible Land Uses - Summary

ALTERNATIVE	SCORE	NOTES
NB	N/A	-
H1	◑	High transit-friendly land use, medium-high population density, medium-low employment density, poor parking conditions,medium-high pedestrian facilities
H2	◕	Medium-high transit-friendly land use, high population density, medium employment density, medium parking conditions, medium-low pedestrian facilities
H3	◕	Medium-high transit-friendly land use, high population density, medium employment density, medium parking conditions, medium-low pedestrian facilities
H4	◕	Medium-high transit-friendly land use, high population density, medium employment density, medium parking conditions, medium-low pedestrian facilities
H5	◕	Medium-high transit-friendly land use, high population density, medium employment density, medium parking conditions, medium-low pedestrian facilities
L1	◑	Medium transit-friendly land use, high population density, medium employment density, medium-poor parking conditions, medium-low pedestrian facilities
L2	◑	Medium transit-friendly land use, high population density, medium employment density, medium-poor parking conditions, medium-low pedestrian facilities
L3	◑	Medium transit-friendly land use, high population density, medium employment density, medium-poor parking conditions, medium-low pedestrian facilities
L4	◑	Medium transit-friendly land use, high population density, medium employment density, medium-poor parking conditions, medium-low pedestrian facilities
K1	◑	High transit-friendly land use, high population density, medium employment density, poor parking conditions, medium-low pedestrian facilities
K2	◕	Medium-high transit-friendly land use, high population density, medium-high employment density, medium-poor parking conditions, medium-low pedestrian facilities
K3	◕	Medium-high transit-friendly land use, high population density, medium-high employment density, medium-poor parking conditions, medium-low pedestrian facilities

2A: Transit Compatible Land Uses - Detail

Alternative	Existing Land Uses		Population & Employment				Parking Conditions		Pedestrian Facilities		Summary Score	Harvey Ball Rating
	Combined Medium / High - Density Residential, Mixed Use, & Commercial	Score	Population Density 2035 (sq mi)	Score	Employment Density 2035 (sq mi)	Score	Percent Street - Facing Parking	Score	Avg Station Facilities	Score		
H1	70.4%	5	14,123	4	18,702	2	90.6%	1	61%	4	16	
H2	60.9%	4	19,464	5	15,632	3	57.9%	3	53%	2	17	
H3	60.9%	4	19,464	5	15,632	3	57.9%	3	53%	2	17	
H4	60.9%	4	19,464	5	15,632	3	57.9%	3	53%	2	17	
H5	60.9%	4	19,464	5	15,632	3	57.9%	3	53%	2	17	
L1	57.0%	3	18,988	5	15,607	3	70.9%	2	54%	2	15	
L2	57.0%	3	18,988	5	15,607	3	70.9%	2	54%	2	15	
L3	57.0%	3	18,988	5	15,607	3	70.9%	2	54%	2	15	
L4	57.0%	3	18,988	5	15,607	3	70.9%	2	54%	2	15	
K1	70.8%	5	17,250	5	22,853	3	82.9%	1	51%	2	16	
K2	61.0%	4	20,141	5	18,194	4	70.0%	2	53%	2	17	
K3	61.0%	4	20,141	5	18,194	4	70.0%	2	53%	2	17	

Sources:

1. Land Use: SCAG, 2008; City of Anaheim, 2017; City of Fullerton, 2015: City of Garden Grove, 2015

This data is based on half-mile station areas, as opposed to a solid half-mile buffer along the entire corridors.

2. Population & Employment: Orange County Projections 2015

Data is for combined half-mile station areas.

3. Parking Conditions & Pedestrian Facilities: Google Earth, 2017

Sub-Score		Total Scoring	Harvey Ball
5	High	21-25	
4	Medium-High	17-20	
3	Medium	13-16	
2	Low-Medium	9-12	
1	Low	5-8	

METHODOLOGY:

Land Use

Combined Medium/High-Density Residential, Mixed Use, & Commercial Land Uses - this measure combines the land uses most compatible with public transportation, bringing dense and economically productive activity closest to stations for local and regional access.

Scores:

≥65%	High
≥60%	Medium-High
≥55%	Medium
≥50%	Low-Medium
≥45%	Low

Population **Employment**

Population & employment density within combined half-mile station areas. Breakpoints are from the FTA's FAST Updated Interim Policy Guidance - Federal Transit Administration Capital Investment Grant Program.

Scores:		FTA Systemwide Threshold (Total)		H1 Sq Mi		H2-H5 Sq Mi		L1-L4 Sq Mi		K1 Sq Mi		K2-K3 Sq Mi	
≥15,000	High	220,000	High	60,440	High	30,303	High	27,990	High	39,286	High	22822	High
≥9,600	Medium-High	140,000	Medium-High	38,462	Medium-High	19,284	Medium-High	17,812	Medium-High	25,000	Medium-High	14523	Medium-High
≥5,760	Medium	70,000	Medium	19,231	Medium	9,642	Medium	8,906	Medium	12,500	Medium	7261	Medium
≥2,561	Low-Medium	40,000	Low-Medium	10,989	Low-Medium	5,510	Low-Medium	5,089	Low-Medium	7,143	Low-Medium	4149	Low-Medium
≤2,560	Low	40,000	Low	10,989	Low	5,510	Low	5,089	Low	7,143	Low	4149	Low

Parking Conditions

Street-facing parking is defined as off-street parking or car-filled lots (auto-body shops with lots full of cars, etc) along the roadway of each alternative corridor. This is measures not only land use and parking supply, but also of neighborhood character.

Scores:

≥35%	High
≥45%	Medium-High
≥55%	Medium
≥65%	Low-Medium
≥75%	Low

Pedestrian Facilities

Composite score based on presence of tactile pedestrian paving, sidewalk presence, enhanced crosswalks, sidewalk width, special pavement, and gathering space on corners.

Scores:

≥65%	High
≥60%	Medium-High
≥55%	Medium
≥50%	Low-Medium
≥45%	Low

2B: Economic Development - Summary

ALTERNATIVE	SCORE	NOTES
NB	N/A	-
H1	◑	High number of opportunity sites; Low number of transit-supportive plans; Zoning is highly-supportive of transit; Low number of affordable housing units
H2	◕	Medium-low number of opportunity sites; Medium-low number of transit-supportive plans; Zoning is medium supportive of transit; Medium number of affordable housing units
H3	◕	Medium-low number of opportunity sites; Medium-low number of transit-supportive plans; Zoning is medium supportive of transit; Medium number of affordable housing units
H4	◑	Medium-low number of opportunity sites; Medium-low number of transit-supportive plans; Zoning is medium supportive of transit; Medium-high number of affordable housing units
H5	◑	Medium-low number of opportunity sites; Medium-low number of transit-supportive plans; Zoning is medium supportive of zoning; Medium-high number of affordable housing units
L1	◕	Medium number of opportunity sites; Medium number of transit-supportive plans; Zoning provides low support for transit; Medium number of affordable housing units
L2	◕	Medium number of opportunity sites; Medium number of transit-supportive plans; Zoning provides low support for transit; Medium number of affordable housing units
L3	◑	Medium number of opportunity sites; Medium number of transit-supportive plans; Zoning provides low support for transit; Medium-high number of affordable housing units
L4	◑	Medium number of opportunity sites; Medium number of transit-supportive plans; Zoning provides low support for transit; Medium-high number of affordable housing units
K1	◕	Medium-high number of opportunity sites; Medium-low number of transit-supportive plans; Zoning is highly supportive of transit; Low number of affordable housing units
K2	◑	Medium-high number of opportunity sites; Medium-high number of transit supportive plans; Zoning is medium supportive of transit; Medium number of affordable housing units
K3	◑	Medium number of opportunity sites; Medium-high number of transit-supportive plans; Zoning is medium supportive of zoning; Medium number of affordable housing units

2B: Economic Development - Detail

Alternative	Opportunity Sites Score	Transit-Supportive Land Use Plans along Alternative Score	Existing Transit-Supportive Zoning along Alternative Score	Affordable Housing Score	Summary Score	Harvey Ball Rating
H1	1	2	5	4	12	◑
H2	3	3	4	5	15	◕
H3	3	3	4	5	15	◕
H4	3	3	4	2	12	◑
H5	3	3	4	2	12	◑
L1	2	4	3	5	14	◕
L2	2	4	3	5	14	◕
L3	2	4	3	2	11	◑
L4	2	4	3	2	11	◑
K1	1	5	5	4	15	◕
K2	2	5	4	2	13	◑
K3	2	5	4	2	13	◑

Notes:

Each sub-criterion received a 1-5 score per alternative. The sum of these scores is reflected by the final Harvey Ball Rating.

Alternatives were scored according to four criteria

1. Potential development opportunity (the percentage of the corridor frontage that consists of parking) where the corridor with the greatest amount of parking fronting it has greater potential for development.

2. Number of transit supportive land use plans (presence of specific plans and other types of plans governing a station area). There are five "hubs" of transit supportive plans: Downtown Fullerton, CtrCity Anaheim, Platinum Triangle, Anaheim Resort/Garden Walk, Harbor/Westminster. Points were apportioned according to the number of hubs through which an alternative passes.

3. Existing transit supportive zoning calculated as the proportion of Medium/High-Density Residential, Mixed Use, & Commercial Land Uses fronting an alternative.

4. Affordable housing scores were assigned according to a ranking of corridor cities, based on the percentage of a city's total housing comprised of existing affordable units

Scoring		Harvey Ball
17-20	High	●
14-16	Medium-High	◕
11-13	Medium	◑
8-10	Low-Medium	◔
4-7	Low	○

2C: VMT Impacts - Summary

ALTERNATIVE	SCORE	NOTES	
NB	N/A	-	
H1	○	**15,559**	Decrease in Countywide VMT
H2	●	**102,521**	Decrease in Countywide VMT
H3	●	**104,091**	Decrease in Countywide VMT
H4	◑	**57,519**	Decrease in Countywide VMT
H5	●	**102,850**	Decrease in Countywide VMT
L1	●	**97,431**	Decrease in Countywide VMT
L2	●	**102,822**	Decrease in Countywide VMT
L3	◕	**71,449**	Decrease in Countywide VMT
L4	●	**101,960**	Decrease in Countywide VMT
K1	◔	**34,690**	Decrease in Countywide VMT
K2	◕	**72,477**	Decrease in Countywide VMT
K3	◕	**76,093**	Decrease in Countywide VMT

2C: VMT Impacts - Detail (Revised)

Alternative	Total Private Vehicle Person Trips, Orange County (from Criterion 5B)	Daily Private Vehicle VMT, Orange County (Calculated)	Daily Transit VHT, Study Area (from Criterion 6B)	Daily Transit VHT, Orange County (Calculated)	Daily Transit VMT (Calculated)	Daily Total VMT, Orange County (Calculated)	Total Change	Harvey Ball Rating
NB	15,486,407	78,872,271	510	7,926	124,398	78,996,669	0	N/A
H1	15,483,272	78,856,304	536	7,952	124,806	78,981,110	-15,559	○
H2	15,466,153	78,769,115	550	7,966	125,033	78,894,148	-102,521	●
H3	15,465,891	78,767,783	535	7,951	124,795	78,892,577	-104,091	●
H4	15,475,112	78,814,746	510	7,926	124,404	78,939,150	-57,519	◑
H5	15,466,247	78,769,594	499	7,915	124,226	78,893,819	-102,850	●
L1	15,467,105	78,773,967	565	7,982	125,271	78,899,238	-97,431	●
L2	15,466,093	78,768,814	550	7,966	125,033	78,893,847	-102,822	●
L3	15,472,377	78,800,816	510	7,926	124,404	78,925,220	-71,449	◕
L4	15,466,386	78,770,304	510	7,926	124,404	78,894,708	-101,960	●
K1	15,479,422	78,836,696	566	7,982	125,282	78,961,978	-34,690	◔
K2	15,472,029	78,799,044	557	7,974	125,148	78,924,192	-72,477	◕
K3	15,471,284	78,795,248	569	7,985	125,328	78,920,576	-76,093	◕

Notes:

1. Criteria measures the total change in countywide VMT resulting from new alternative compared to No Build
2. Countywide VMT assumed to be private vehicle plus transit VMT
3. Average private vehicle trip length calculated from OCTAM
4. Transit VHT and VMT assumed to vary consistently by alternative (not assuming major changes in countywide transit speeds)

Scoring		Harvey Ball
>80,000	High	●
60,000-80,000	Medium-High	◕
40,000-60,000	Medium	◑
20,000-40,000	Low-Medium	◔
<20,000	Low	○

Inputs

Average Trip Length from OCTAM (mi):	5.093
Daily OCTA Transit VMT (from NTD):	124,398
Daily OCTA Transit VHT (from NTD):	7,926

2D: Environmental Impacts - Summary

ALTERNATIVE	SCORE	NOTES
NB	N/A	-
H1	●	No sensitive receptors or historic resources, medium housing, medium-high modal impact, medium construction impact
H2	◔	Medium sensitive receptors and historic resources, medium-high housing, high modal impact, medium-high construction impact
H3	◔	Medium sensitive receptors and historic resources, medium-high housing, high modal impact, medium-high construction impact
H4	◑	Medium sensitive receptors and historic resources, medium-high housing, medium-low modal impact, low construction impact
H5	◑	Medium sensitive receptors and historic resources, medium-high housing and modal impact, low-medium construction impact
L1	○	Medium sensitive receptors, high historic resources, medium-high housing, high modal impact, high construction impact
L2	○	Medium sensitive receptors, high historic resources, medium-high housing, high modal impact, high construction impact
L3	◑	Medium sensitive receptors, high historic resources, medium-high housing, medium-low modal impact, low construction impact
L4	◑	Medium sensitive receptors, high historic resources, medium-high housing and modal impact, low-medium construction impact
K1	●	No sensitive receptors or historic resources, medium-low housing, high modal impact, medium construction impact
K2	◑	Medium sensitive receptors, high historic resources, medium housing, medium-low modal impact, low construction impact
K3	◑	Medium sensitive receptors, high historic resources, medium housing, medium-high modal impact, medium construction impact

2D: Environmental Impacts - Detail

Alternative	Potential Sensitive Receptors									Historic Resources									Housing		Operating Impacts Score	Temporary Construction Impacts	Total	Harvey Ball Rating
	La Palma Park	Pearson Park	Orange Grove Elementary	Walnut Grove Park	Happy Hippo Preschool	Western Medical Ctr	Harbor Villa Care Center	Promises Guest Village	Potential Sensitive Receptors Score	Fullerton First Methodist Episcopal Church	Fullerton Odd Fellows Temple	Fullerton Santa Fe Depot	Commonwealth Post Office	Fullerton Union Pacific Depot	Anaheim Carnegie Library	Truxaw-Gervais House	North Gate of City of Anaheim	Historic Resources Score	Residential Land Use	Residential Score				
H1									**0.0**									**0.0**	27.6%	**2.7**	**2.7**	**3**	**2.8**	●
H2	2	2	2				2		**2.5**	2	2	2	2	2				**3.1**	39.0%	**3.9**	**9.5**	**4**	**8.1**	◔
H3	2	2	2				2		**2.5**	2	2	2	2	2				**3.1**	39.0%	**3.9**	**9.5**	**4**	**8.1**	◔
H4	1	1	1				1		**1.3**	1	1	1	1	1				**1.6**	39.0%	**3.9**	**6.7**	**1**	**5.3**	◑
H5	1	1					1		**0.9**	1	1	1	1	1				**1.6**	39.0%	**3.9**	**6.4**	**2**	**5.3**	◑
L1	2			2		2		2	**2.5**	2	2	2	2	2	2	2	2	**5.0**	36.4%	**3.6**	**11.1**	**5**	**9.6**	○
L2	2			2		1		2	**2.2**	2	2	2	2	2	2	2	2	**5.0**	36.4%	**3.6**	**10.8**	**5**	**9.3**	○
L3	1			1		1		1	**1.3**	1	1	1	1	1	1	1	1	**2.5**	36.4%	**3.6**	**7.4**	**1**	**5.8**	◑
L4	1			1		1		1	**1.3**	1	1	1	1	1	1	1	1	**2.5**	36.4%	**3.6**	**7.4**	**2**	**6.0**	◑
K1									**0.0**									**0.0**	20.7%	**2.0**	**2.0**	**3**	**2.3**	●
K2	1			1		1		1	**1.3**	1	1	1	1	1	1	1	1	**2.5**	32.4%	**3.2**	**7.0**	**1**	**5.5**	◑
K3	1			1		1		1	**1.3**	1	1	1	1	1	1	1	1	**2.5**	32.4%	**3**	**7.0**	**3**	**6.0**	◑

Notes:

1. This criteria identifies potential environmental impacts associated with construction and operation of a project alternative. Points were apportioned according to three categories:
   A) Potential sensitive receptors immediately fronting an alternative alignment (including schools, parks, hospitals, nursing and convalescent homes).
   B) Identified historic resources listed on the National and State registries (Historic Resources from SHPO: http://ohp.parks.ca.gov/, City Websites, and National Registry Website) immediately fronting an alternative alignment.
   For A) and B), streetcar alterantives are assumed to be twice as impactful as bus alternatives. Thus, streetcar impacts receive 1 while buses receive 2.
   C) Percentage of land use that is residential within a half-mile buffer, including low, medium, and high density residential. Land Use numbers are sourced from Criteria 2A.
3. Sub-scores A, B, and C were scored on a weighted 1-5 scale each to add up to a total score per alternative.
4. The alternative with the lowest score (fewest potential impacts) receives the highest rating while the alternative deemed the most impactful receives the lowest rating.
5. Temporary construction impact score assigned based on route length and mode: (5) streetcars on Anaheim/Lemon; (4) streetcars on Harbor (long); (3) Harbor "short" streetcar, Katella streetcar, and Katella + Harbor Hybrid; (2) Bus Rapid Transit alternatives (all); (1) Enhanced Bus (all)

Scoring		Harvey Ball
<=3	High	●
3-5	Medium-High	◕
5-7	Medium	◑
7-9	Low-Medium	◔
>9	Low	○

3A: Connectivity Between Transit Centers - Summary

ALTERNATIVE	SCORE	NOTES	
NB	-	-	
H1	◔	**3.4%**	improvement in travel time connectivity compared to No Build
H2	◕	**8.9%**	improvement in travel time connectivity compared to No Build
H3	●	**15.1%**	improvement in travel time connectivity compared to No Build
H4	●	**12.0%**	improvement in travel time connectivity compared to No Build
H5	●	**16.7%**	improvement in travel time connectivity compared to No Build
L1	◔	**2.2%**	improvement in travel time connectivity compared to No Build
L2	◕	**8.8%**	improvement in travel time connectivity compared to No Build
L3	◑	**7.0%**	improvement in travel time connectivity compared to No Build
L4	●	**12.8%**	improvement in travel time connectivity compared to No Build
K1	◔	**3.4%**	improvement in travel time connectivity compared to No Build
K2	◑	**6.1%**	improvement in travel time connectivity compared to No Build
K3	○	**-17.5%**	improvement in travel time connectivity compared to No Build

3A: Connectivity Between Transit Centers - Detail

Alternative	Percent Decrease in Travel Time Compared to No Build							
	CSUF to Harbor/Lampson	Knotts Berry Farm to Harbor/Westminster	DTSA to Disneyland Resort	Orange Station to Ctr City Anaheim	Little Saigon to FTC	FTC to Harbor/Westminster	Average	Harvey Ball Rating
H1	0.3%	0.0%	18.1%	2.1%	0.0%	0.0%	3.4%	◔
H2	23.8%	3.5%	16.7%	2.6%	4.0%	3.1%	8.9%	◕
H3	28.3%	8.9%	20.8%	7.0%	11.4%	14.2%	15.1%	●
H4	27.9%	7.7%	5.9%	7.7%	10.3%	12.5%	12.0%	●
H5	31.3%	11.9%	9.1%	11.1%	16.0%	21.1%	16.7%	●
L1	18.6%	-4.8%	16.7%	-5.3%	-3.4%	-8.2%	2.2%	◔
L2	23.3%	0.9%	20.8%	-0.4%	4.4%	3.6%	8.8%	◕
L3	24.4%	0.4%	4.7%	3.1%	5.0%	4.5%	7.0%	◑
L4	28.7%	5.4%	7.8%	7.8%	11.9%	15.0%	12.8%	●
K1	0.3%	0.0%	18.1%	0.0%	2.0%	0.0%	3.4%	◔
K2	23.9%	0.0%	4.7%	2.3%	2.2%	3.4%	6.1%	◑
K3	0.3%	-30.6%	22.8%	-28.4%	-32.4%	-36.9%	-17.5%	○

Methodology

1. The purpose of this criteria is to calculate travel time savings compared to No Build.
2. Ratings are based on select connections to activity centers located within and outside the study area.
3. Alternatives received higher scores if the travel time was lower compared to No Build travel time.

Scoring		Harvey Ball
>12%	High	●
8-12%	Medium-High	◕
4-8%	Medium	◑
0-4%	Low-Medium	◔
<0%	Low	○

Notes

1. Travel times for OCTA Routes traveling from outside of project area are based on AM weekday estimates from Google Maps.
2. Travel times use run time calculations from Task 1A.
3. Wait times are based on 50 percent of headways.
4. Transfer times are based on the FHWA 2009 Manual on Uniform Traffic Control Devices (MUTCD): https://mutcd.fhwa.dot.gov/htm/2009/part4/part4e.htm

3B: Ensure Zero-Transfer Rides to Activity Centers - Summary

ALTERNATIVE	SCORE	NOTES
NB	-	-
H1	◑	**1** additional zero-transfer ride compared to NB
H2	◑	**1** additional zero-transfer ride compared to NB
H3	◑	**1** additional zero-transfer ride compared to NB
H4	◔	**0** additional zero-transfer rides compared to NB
H5	◔	**0** additional zero-transfer rides compared to NB
L1	◑	**1** additional zero-transfer ride compared to NB
L2	◑	**1** additional zero-transfer ride compared to NB
L3	◔	**0** additional zero-transfer rides compared to NB
L4	◔	**0** additional zero-transfer rides compared to NB
K1	◕	**2** additional zero-transfer rides compared to NB
K2	◑	**1** additional zero-transfer ride compared to NB
K3	◑	**1** additional zero-transfer ride compared to NB

3B: Ensure Zero-Transfer Rides to Activity Centers - Detail

Alternatives	Number of Activity Centers	Percentage Score to NB	Harvey Balls
H1	6	20%	
H2	6	20%	
H3	6	20%	
H4	5	0%	
H5	5	0%	
L1	6	20%	
L2	6	20%	
L3	5	0%	
L4	5	0%	
K1	7	40%	
K2	6	20%	
K3	6	20%	

Scoring		Harvey Ball
N/A	High	
7	Medium-High	
6	Medium	
5	Low-Medium	
N/A	Low	

Methodology

1. Alternatives that provide transit service to the greatest number of activity centers with a zero transfer ride received a higher score.
2. 12 activity centers throughout central Orange County were selected according to three broad criteria: areas with large concentrations of transit trips, areas with large concentrations of zero-car households, and areas recognizable as activity "nodes"

3C: Regional Goals - Summary

ALTERNATIVE	SCORE	NOTES
NB	N/A	
H1	◑	Achieves a medium-low amount of regional goals.
H2	●	Achieves a high amount of regional goals.
H3	●	Achieves a high amount of regional goals.
H4	◑	Achieves a medium amount of regional goals.
H5	●	Achieves a high amount of regional goals.
L1	◕	Achieves a high amount of regional goals.
L2	◕	Achieves a medium-high amount of regional goals.
L3	◑	Achieves a medium amount of regional goals.
L4	◕	Achieves a high amount of regional goals.
K1	◑	Achieves a medium amount of regional goals.
K2	◑	Achieves a medium amount of regional goals.
K3	◑	Achieves a medium-high amount of regional goals.

3C: Regional Goals - Detail

	Regional Goals	NB	H1	H2	H3	H4	H5	L1	L2	L3	L4	K1	K2	K3	Notes
1	Improve Regional Economic Development and Competitiveness	-	3	4	4	3	3	4	4	3	3	4	3	3	Input from 2B
2	Maximize mobility and accessibility for all people and goods in the region	-	4	5	4	4	4	5	2	4	3	4	2	3	Input from 1B
3	Ensure travel safety and reliability for all people and goods in the region	-	4	3	4	3	4	2	3	2	3	4	2	2	Input from 4B
4	Preserve and ensure a sustainable regional transportation system	-	3	4	4	1	5	3	3	2	4	2	2	1	Input from 6B
5	Maximize the productivity of our transportation system	-	5	5	5	1	4	4	4	1	3	4	1	2	Input from 5A
6	Protect the environment and health of our residents by improving air quality and encouraging active transportation (e.g., bicycling and walking).	-	1	5	5	3	5	5	5	4	5	2	4	4	Input from 2C
7	Actively encourage and create incentives for energy efficiency, where possible.	-	1	5	5	3	5	5	5	4	5	2	4	4	Input from 2C
8	Encourage land use and growth patterns that facilitate transit and active transportation.	-	3	4	4	4	4	3	3	3	3	3	4	4	Input from 2A
9	Maximize the security of the regional transportation system through improved system monitoring, rapid recovery planning, and coordination with other security agencies.	-	3	3	3	3	3	3	3	3	3	3	3	3	No difference between alternatives
	Total		**27.0**	**38.0**	**38.0**	**25.0**	**37.0**	**34.0**	**32.0**	**26.0**	**32.0**	**28.0**	**25.0**	**26.0**	
	Harvey Ball Rating		◑	●	●	◑	●	◕	◕	◑	◕	◑	◑	◑	

Notes:
Alternatives were scored according to nine criteria listed above from SCAG RTP: 2016-2040 SCAG RTP/SCS Final Report p. 64 (76 in PDF) http://scagrtpscs.net/Documents/2016/final/f2016RTPSCS.pdf

Each criterion receives a 1-5 score	**Scoring**		**Harvey Ball**
High = 5	>= 35	High	●
Med-High = 4	30-35	Medium-High	◕
Med = 3	25-30	Medium	◑
Med-Low = 2	20-25	Low-Medium	◔
Low = 1	<20	Low	○

3D: First and Last Mile Connections - Summary

ALTERNATIVE	SCORE	NOTES
NB	N/A	-
H1	○	Alternative reaches Anaheim Resort and Harbor/Westminster, both of which have lower linear mileages of bikeways and sidewalks.
H2	○	Alternative reaches FTC, Anaheim Resort, and Harbor/Westminster. While FTC has a high presence of bikeways and sidewalks, the latter two do not.
H3	◔	Alternative reaches FTC, Anaheim Resort, Harbor/Westminster, and SARTC. While FTC and SARTC have a high presence of bikeways, the latter two do not.
H4	○	Alternative reaches FTC, Anaheim Resort, and Harbor/Westmisnter. While FTC has a high presence of bikeways and sidewalks, the latter two do not.
H5	○	Alternative reaches FTC, Anaheim Resort, and Harbor/Westminster. While FTC has a high presence of bikeways and sidewalks, the latter two do not.
L1	◕	Alternative reaches FTC, Anaheim Resort, Ctr City Anaheim, Harbor/Westminster and SARTC, offering a higher number of first and last mile connections.
L2	◕	Alternative reaches FTC, Anaheim Resort, Ctr City Anaheim, Harbor/Westminster and SARTC, offering a higher number of first and last mile connections.
L3	◔	Alternative reaches FTC, Anaheim Resort, Ctr City Anaheim, and Harbor/Westminster; offering a low-medium number of first and last mile connections.
L4	◔	Alternative reaches FTC, Anaheim Resort, Ctr City Anaheim, and Harbor/Westminster; offering a low-medium number of first and last mile connections.
K1	◔	Alternative reaches Anaheim Resort, ARTIC, and Harbor/Westminster; offering a low-medium number of first and last mile connections.
K2	◑	Alternative reaches FTC, Anaheim Resort, Ctr City Anaheim, and Harbor/Westminster; offering a moderate number of first and last mile connections.
K3	●	Alternative reaches all selected activity centers, offering the highest number of first and last mile connections.

3D: First and Last Mile Connections - Detail

Alternatives	Locations						Total Linear Miles	Score	Harvey Ball Rating
	FTC	SARTC	Ctr City Anaheim	ARTIC	Anaheim Resort	Harbor/ Westminster			
H1					1	1	60.54	2	○
H2	5				1	1	135.53	7	○
H3	5	4			1	1	203.98	11	◔
H4	5				1	1	135.53	7	○
H5	5				1	1	135.53	7	○
L1	5	4	3		1	1	247.44	14	◕
L2	5	4	3		1	1	247.44	14	◕
L3	5		3		1	1	178.99	10	◔
L4	5		3		1	1	178.99	10	◔
K1		4		2	1	1	166.54	8	◔
K2	5		3	2	1	1	216.55	12	◑
K3	5	4	3	2	1	1	285.00	16	●

Source: OCTA Sidewalk and Bikeway Inventory

Scoring		Harvey Ball
16+	High	●
14-15	Medium-High	◕
12-13	Medium	◑
8-11	Low-Medium	◔
0-7	Low	○

Notes:

1. This criteria identifies first and last mile connections to/from transit hubs and activity centers within or near the study area.
2. GIS analysis was used to calculate presence of bikeways and sidewalks (in linear miles) within a one-mile buffer for each of the following transit hubs and activity cente

1) FTC, 2) SARTC, 3) City Ctr Anaheim, 4) ARTIC, 5) Disneyland Resort, and 6) Harbor Blvd/Westminster Ave.

Methodology:

Points were appointed according to the following methodology:

A) If an alternative reached a greater number of activity centers or transit hubs with higher mileage of bikeways and sidewalks, it received a high score.

B) If an alternative reached a lower number of activity centers or transit hubs with higher mileage of bikeways and sidewalks, it received a medium-high score.

C) If an alternative reached a moderate number of activity centers or transit hubs with moderate mileage of bikeways and sidewalks, it received a medium score.

D) If an alternative reached a higher number of activity centers or transit hubs with lower mileage of bikeways and sidewalks, it received a low-medium score.

4A: Optimal Roadway Allocation - Summary

ALTERNATIVE	SCORE	NOTES
NB	N/A	-
H1	◕	0 Difference between Auto/Transit Lanes
H2	◕	0 Difference between Auto/Transit Lanes
H3	◔	27,891 Difference between Auto/Transit Lanes
H4	◕	0 Difference between Auto/Transit Lanes
H5	◔	26,326 Difference between Auto/Transit Lanes
L1	◕	0 Difference between Auto/Transit Lanes
L2	○	39,916 Difference between Auto/Transit Lanes
L3	◕	0 Difference between Auto/Transit Lanes
L4	○	41,721 Difference between Auto/Transit Lanes
K1	◕	0 Difference between Auto/Transit Lanes
K2	◕	0 Difference between Auto/Transit Lanes
K3	◕	0 Difference between Auto/Transit Lanes

4A: Optimal Roadway Allocation - Detail

Alternative	General Lanes	Person per Lane	Transit Lanes	Person per Lane	Difference between Auto/Transit Lanes	Harvey Ball Rating
Existing	3	27,181				
H1	3	25,021				◕
H2	3	25,625				◕
H3	2	34,031	1	6,139	27,891	◔
H4	3	27,097				◕
H5	2	33,401	1	7,075	26,326	◔
L1	2	29,233				◕
L2	1	46,196	1	6,280	39,916	○
L3	2	28,393				◕
L4	1	48,958	1	7,238	41,721	○
K1	3	23,063				◕
K2	3	23,337				◕
K3	3	22,988				◕

Notes:

1. Harbor Boulevard through the City of Anaheim primarily consists of four general lanes despite being classified as a six-lane divided roadway under the Orange County Master Plan of Arterial Highways (MPAH).
2. Alternatives where total persons was greater than 75K scored the highest.
3. Alternatives where total persons was lower than 60K scored the lowest.
4. This measure focuses on lane reduction scenarios. These results reflect corridor averages and outline impacts on lane reduction segments.
5. Should only partial lane reductions be implemented, then these would apply only to those sections.

6. The inclusion of dedicated transit lanes does not exempt local juridictions from being required to meet MPAH requirements to remain eligible for funding under Measure M2.

Scoring		Harvey Ball
N/A	High	●
0	Medium-High	◕
N/A	Medium	◑
20,000-30,000	Low-Medium	◔
>30,000	Low	○

4B: Roadway Incident & Collision Data

ALTERNATIVE	SCORE	NOTES
NB	N/A	-
H1	◕	Few turns, no dedicated lanes, medium accidents
H2	◑	Few turns, no dedicated lanes, many accidents
H3	◕	Few turns, dedicated transit lanes, many accidents
H4	◑	Few turns, no dedicated lanes, many accidents
H5	◕	Few turns, dedicated transit lanes, many accidents
L1	◔	Medium turns, no dedicated lanes, medium accidents
L2	◑	Medium turns, dedicated transit lanes, medium accidents
L3	◔	Medium turns, no dedicated lanes, medium accidents
L4	◑	Medium turns, dedicated transit lanes, medium accidents
K1	◕	Many turns, no dedicated lanes, few accidents
K2	◔	Many turns, no dedicated lanes, medium accidents
K3	◔	Many turns, no dedicated lanes, medium accidents

4B: Roadway Incident & Collision Data

Alternative	Turns	Turns Score	Dedicated Lanes	Dedicated Lanes Score	2015 Accidents Along Alternative (200 ft buffer)							Accidents Score	Summary Score	Harvey Ball Rating
					Garden Grove	Anaheim	Fullerton	Santa Ana	Sum	Alt Length (mi)	Per Mi			
H1	1	4	No	2	32	19	0	4	55	3.4	16.2	4	10	
H2	1	4	No	2	32	81	48	4	165	8	20.6	1	7	
H3	1	4	Yes	4	32	81	48	4	165	8	20.6	1	9	
H4	1	4	No	2	32	81	48	4	165	8	20.6	1	7	
H5	1	4	Yes	4	32	81	48	4	165	8	20.6	1	9	
L1	5	2	No	2	32	91	27	4	154	8.5	18.1	2	6	
L2	5	2	Yes	4	32	91	27	4	154	8.5	18.1	2	8	
L3	5	2	No	2	32	91	27	4	154	8.5	18.1	2	6	
L4	5	2	Yes	4	32	91	27	4	154	8.5	18.1	2	8	
K1	4	2	No	2	32	51	0	4	87	5.8	15.0	5	9	
K2	7	1	No	2	32	119	27	4	182	10.5	17.3	3	6	
K3	6	1	No	2	32	119	27	4	182	10.5	17.3	3	6	

Source: SWITRS/TIMS 2016; STV, 2017

Total Scoring		Harvey Ball
13-15	High	●
9-12	Medium-High	◕
7-8	Medium	◑
5-6	Low-Medium	◔
<5	Low	○

Methodology:

Turns measures how often the alternative will make a turn along the route, which is an increased safety risk.

H1	1 turn - from Harbor to Disney Way
H2-H5	1 turn - from Harbor onto either Santa Fe Ave (bus) or the tracks to Fullerton Station (streetcar)
L1-L5	5 turns- from Harbor to Disney Way, to Anaheim Blvd, to La Palma Ave, to Lemon St, to Santa Fe Ave (bus) or the tracks to Fullerton Station (streetcar)
K1	4 turns - from Harbor to Disney Way, to Clementine Ave, to Katella Ave, to the tracks leading to ARTIC
K2	7 turns - from Harbor onto Disney Way, to Anaheim Blvd, to La Palma Ave, to Lemon St, to Santa Fe Ave (bus) or the tracks to Fullerton Station (streetcar), as well as a turn between Katella and Anaheim Blvd, and into ARTIC
K3	6 turns - same as K2 minus the turn between Harbor and Disney Way, as these modes are separated and this would be a transfer rather than a vehicle making a turn

Turns Sub-Score		Points
0	High	5
1	Medium-High	4
2 to 3	Medium	3
4 to 5	Low-Medium	2
6 or more	Low	1

Dedicated Lanes Sub-Score		Points
Yes	Medium-High	4
No	Low-Medium	2

Accidents per Mi Sub-Score		Points
≥ 19	High	5
≥ 18	Medium-High	4
≥ 17	Medium	3
≥ 16	Low-Medium	2
≥ 15	Low	1

Note:

Accidents were measured within a 200ft radius along the alternative. If accidents were measured within the full half-mile station area, all alternatives would include overlapping accidents, as half-mile radii extended to nearby alternative alignments and would have included collisions more relevant to a separate alternative.

4C: Optimize Traffic Operations - Summary

ALTERNATIVE	SCORE	NOTES
NB	-	-
H1	◕	**100.0%** of No Build Speed in corridor
H2	●	**101.2%** of No Build Speed in corridor
H3	◔	**90.5%** of No Build Speed in corridor (dedicated transit lane)
H4	●	**101.2%** of No Build Speed in corridor
H5	◔	**90.5%** of No Build Speed in corridor (dedicated transit lane)
L1	◕	**100.0%** of No Build Speed in corridor
L2	○	**89.3%** of No Build Speed in corridor (dedicated transit lane)
L3	◕	**100.0%** of No Build Speed in corridor
L4	○	**89.3%** of No Build Speed in corridor (dedicated transit lane)
K1	◕	**100.0%** of No Build Speed in corridor
K2	◑	**95.0%** of No Build Speed in corridor
K3	◑	**95.0%** of No Build Speed in corridor

4C: Optimize Traffic Operations - Detail

Alternative	Average Peak Congested Speed of General Lane (MPH)	Dedicated Lane	Ratio of Existing	Harvey Ball Rating
NB	21.94			
H1	21.94		100.0%	◕
H2	22.22		101.2%	●
H3	19.85	Yes	90.5%	◔
H4	22.22		101.2%	●
H5	19.85	Yes	90.5%	◔
NB	23.43			
L1	23.42		100.0%	◕
L2	20.93	Yes	89.3%	○
L3	23.42		100.0%	◕
L4	20.93	Yes	89.3%	○
NB	25.00			
K1	25.00		100.0%	◕
K2	23.74		95.0%	◑
K3	23.74		95.0%	◑

Notes:

1. Criteria measures the change in peak congested speed resulting from new alternative.
2. Alternatives where the ratio was greater than 1 scored the highest.
3. Alternatives where the ratio was lowe than 0.9 scored the lowest.

Score		Harvey Ball
>100%	High	●
100%	Medium-High	◕
95-100%	Medium	◑
90-95%	Low-Medium	◔
<90%	Low	○

4D: Physical Constraints - Summary

ALTERNATIVE	SCORE	NOTES
NB	N/A	
H1	●	2 potential conflicts
H2	○	9 potential conflicts
H3	○	9 potential conflicts
H4	●	1 potential conflicts
H5	◑	6 potential conflicts
L1	○	10 potential conflict
L2	○	10 potential conflict
L3	●	1 potential conflict
L4	◑	5 potential conflict
K1	◑	6 potential conflicts
K2	●	2 potential conflict
K3	◕	4 potential conflict

4D: Physical Constraints - Detail

#	Potential Conflict	NB	H1	H2	H3	H4	H5	L1	L2	L3	L4	K1	K2	K3
1	Harbor Blvd Underpass at BNSF ROW	-		1	1									
2	Walnut Ave Overcrossing at Harbor Boulevard	-		1	1		1							
3	Harbor Blvd Underpass at Union Pacific Park Pedestrian Bridge	-		1	1									
4	Lemon St Underpass at BNSF ROW (N)	-						1	1					
5	Lemon St Underpass at BNSF ROW (S)	-						1	1					
6	Walnut Ave Overcrossing at Lemon St	-						1	1					
7	Lemon St Pedestrian Overcrossing at Elm Ave	-						1	1		1			
8	Box Culvert at Harbor Blvd/Rosslyn Ave (Fullerton Creek Channel)	-		1	1		1							
9	Box Culvert at Lemon St/Rosslyn Ave (Fullerton Creek Channel)	-						1	1		1			
10	Harbor Blvd Overcrossing at SR-91 Fwy	-		1	1		1							
11	Lemon St-Anaheim Blvd Overcrossing at SR-91 Fwy	-						1	1		1			
12	UPRR Santa Ana Branchline Grade X-ing at Harbor Blvd/Santa Ana St	-		1	1	1	1							
13	UPRR Santa Ana Branchline Grade X-ing at Anaheim Blvd/Santa Ana St	-						1	1	1	1		1	1
14	Harbor Blvd Overcrossing at I-5 Fwy	-		1	1		1							
15	Anaheim Blvd Underpass at I-5 Fwy	-						1	1					
16	Box Culvert at Harbor Blvd/Cardinal Cir (E Garden Grove Winsterburg Channel)	-	1	1	1		1	1	1		1	1		1
17	Harbor Blvd Underpass at SR-22 Fwy	-	1	1	1			1	1			1		1
18	Katella Ave Undercrossing at I-5 Fwy	-										1		
19	UPRR Santa Ana Branchline Grade X-ing at Katella Ave/Anaheim Wy-Lewis St	-										1	1	1
20	Katella Ave Underpass at LOSSAN Rail Corridor ROW	-										1		
21	Katella Ave Undercrossing at SR-57 Fwy	-										1		
	Total	-	2	9	9	1	6	10	10	1	5	6	2	4
	Harvey Ball Rating		●	○	○	●	◑	○	○	●	◑	◑	●	◕

Notes:

1. Alternatives were scored according to the total number of potential conflicts with structures along its corridor. Fewer conflicts = better score.
2. BRT impacts applied to roadway but not under structures.
3. Streetcar alternatives applied equally to roadway and structures. These may be adjusted for grade crossings, however.
4. Enhanced bus similar to existing OCTA service, thus no real impact aside from railroad crossings
5. Harbor Boulevard through the City of Anaheim primarily consists of four general lanes despite being classified as a six lane divide roadway under the Orange County Master Plan of Arterial Highways.

Scoring		Harvey Ball
<3	High	●
3-4	Medium-High	◕
5-6	Medium	◑
7-8	Low-Medium	◔
>8	Low	○

5A: Attract New Riders - Summary

ALTERNATIVE	SCORE	NOTES
NB	-	
H1	●	**2,196** Net OCTA Systemwide Ridership per Mile
H2	●	**1,899** Net OCTA Systemwide Ridership per Mile
H3	●	**1,939** Net OCTA Systemwide Ridership per Mile
H4	○	**41** Net OCTA Systemwide Ridership per Mile
H5	◕	**1,290** Net OCTA Systemwide Ridership per Mile
L1	◕	**1,207** Net OCTA Systemwide Ridership per Mile
L2	◕	**1,408** Net OCTA Systemwide Ridership per Mile
L3	○	**33** Net OCTA Systemwide Ridership per Mile
L4	◑	**918** Net OCTA Systemwide Ridership per Mile
K1	◕	**1,300** Net OCTA Systemwide Ridership per Mile
K2	○	**38** Net OCTA Systemwide Ridership per Mile
K3	◔	**296** Net OCTA Systemwide Ridership per Mile

5A: Attract New Riders - Detail

Alternative	Net OCTA Systemwide Ridership	Net OCTA Systemwide Ridership per Mile	Harvey Ball Rating
Existing	158,522		
H1	7,468	2,196	●
H2	15,194	1,899	●
H3	15,515	1,939	●
H4	493	41	○
H5	15,476	1,290	◕
L1	10,262	1,207	◕
L2	11,971	1,408	◕
L3	410	33	○
L4	11,477	918	◑
K1	7,542	1,300	◕
K2	401	38	○
K3	3,109	296	◔

Scoring		Harvey Ball
>1500	High	●
1000-1500	Medium-High	◕
500-1000	Medium	◑
100-500	Low-Medium	◔
<100	Low	○

Notes:

1. Criteria evaluates new per-mile systemwide ridership resulting from alternatives.
2. Alternatives net per mile systemwide ridership was greater than 1500 scored the highest.
3. Alternatives net per mile systemwide ridership was less than 100 scored the lowest.
4. Systemwide ridership impacts account for diversion from 543 to local routes and new riders on service alternatives.
5. Assumed Route Lengths per Alternative (miles):

H1 *3.4*
H2 *8*
H3 *8*
H4 *12*
H5 *12*

L1 *8.5*
L2 *8.5*
L3 *12.5*
L4 *12.5*

K1 *5.8*
K2 *10.5*
K3 *10.5*

5B: Promote Mode Shift to Transit - Summary

ALTERNATIVE	SCORE	NOTES	
NB	-		
H1	◑	0.02%	increase in transit mode share in Orange County compared to No Build Alternative
H2	◕	0.04%	increase in transit mode share in Orange County compared to No Build Alternative
H3	●	0.04%	increase in transit mode share in Orange County compared to No Build Alternative
H4	○	-0.02%	increase in transit mode share in Orange County compared to No Build Alternative
H5	◕	0.04%	increase in transit mode share in Orange County compared to No Build Alternative
L1	◕	0.04%	increase in transit mode share in Orange County compared to No Build Alternative
L2	●	0.04%	increase in transit mode share in Orange County compared to No Build Alternative
L3	○	0.00%	increase in transit mode share in Orange County compared to No Build Alternative
L4	●	0.04%	increase in transit mode share in Orange County compared to No Build Alternative
K1	●	0.05%	increase in transit mode share in Orange County compared to No Build Alternative
K2	○	0.00%	increase in transit mode share in Orange County compared to No Build Alternative
K3	○	0.01%	increase in transit mode share in Orange County compared to No Build Alternative

5B: Promote Mode Shift to Transit - Details

Alternative	Private Vehicle Person Trips - Orange County	Transit Person Trips - Orange County	Total Person Trips - Orange County	Transit Mode Share	Change in Transit Mode Share (compared to No Build)	Harvey Ball Rating
NB	15,486,407	180,516	15,666,922	**1.15%**	-	-
H1	15,483,272	183,673	15,666,945	**1.17%**	**0.02%**	
H2	15,466,153	186,517	15,652,669	**1.19%**	**0.04%**	
H3	15,465,891	186,778	15,652,669	**1.19%**	**0.04%**	
H4	15,475,112	177,557	15,652,669	**1.13%**	**-0.02%**	
H5	15,466,247	186,422	15,652,669	**1.19%**	**0.04%**	
L1	15,467,105	186,169	15,653,274	**1.19%**	**0.04%**	
L2	15,466,093	187,181	15,653,274	**1.20%**	**0.04%**	
L3	15,472,377	180,898	15,653,274	**1.16%**	**0.00%**	
L4	15,466,386	186,888	15,653,274	**1.19%**	**0.04%**	
K1	15,479,422	187,664	15,667,086	**1.20%**	**0.05%**	
K2	15,472,029	181,029	15,653,058	**1.16%**	**0.00%**	
K3	15,471,284	181,774	15,653,058	**1.16%**	**0.01%**	

Notes:

1. Criteria measures transit mode share of overall Orange County trips.
2. No Build, H3, L3, K1, K2 directly computed from OCTAM.
3. Remaining results imputed by comparing ridership in corridor to computed alternatives.

Scoring		Harvey Ball
>0.04%	High	
0.03-0.04%	Medium-High	
0.02-0.03%	Medium	
0.01-0.02%	Low-Medium	
<0.01%	Low	

5C: Linked Trips - Summary

ALTERNATIVE	SCORE	NOTES
NB	N/A	-
H1	◑	**840** weighted linked trips
H2	●	**1,445** weighted linked trips
H3	●	**1,505** weighted linked trips
H4	○	**330** weighted linked trips
H5	◑	**942** weighted linked trips
L1	◕	**1,069** weighted linked trips
L2	◕	**1,175** weighted linked trips
L3	○	**333** weighted linked trips
L4	◑	**741** weighted linked trips
K1	◑	**733** weighted linked trips
K2	○	**387** weighted linked trips
K3	◔	**511** weighted linked trips

5C: Linked Trips - Detail

Alternative	Linked Trips per Alternative	Linked Trips - Zero Car	Weighted Linked Trips	Harvey Ball Rating
Existing	-	-	-	-
H1	2,591	264	840	◑
H2	10,290	1,270	1,445	●
H3	10,656	1,384	1,505	●
H4	3,602	360	330	○
H5	10,230	1,079	942	◑
L1	7,901	1,185	1,069	◕
L2	8,773	1,212	1,175	◕
L3	3,788	374	333	○
L4	8,422	842	741	◑
K1	3,819	435	733	◑
K2	3,411	650	387	○
K3	4,876	488	511	◔

Notes:

1. Criteria evaluates new ridership resulting from alternatives as a ratio of existing ridership.
2. Assume 1.43 linked trips per unlinked trip per STOPS model
3. Weighted trips = 2*Zero Car Household trips + Other trips.
4. STOPS estimates a lower proportion of zero car households as riders for streetcar alternatives, but more zero car riders overall due to larger ridership totals.
5. Assumed Route Lengths:

H1	3.4
H2	8
H3	8
H4	12
H5	12
L1	8.5
L2	8.5
L3	12.5
L4	12.5
K1	5.8
K2	10.5
K3	10.5

Scoring		Harvey Ball
>1,300	High	●
1000-1300	Medium-High	◕
700-1000	Medium	◑
400-700	Low-Medium	◔
<400	Low	○

5D: Stop Amenities - Summary

ALTERNATIVE	SCORE	NOTES
NB	N/A	-
H1	○	1 new stop, improvements to 1 medium-amenity and 3 high-amenity stops
H2	◔	Improvements to 2 low-amenity, 2 medium-amenity and 6 high-amenity stops
H3	◔	Improvements to 2 low-amenity, 2 medium-amenity and 6 high-amenity stops
H4	◔	Improvements to 2 low-amenity, 2 medium-amenity and 6 high-amenity stops
H5	◔	Improvements to 2 low-amenity, 2 medium-amenity and 6 high-amenity stops
L1	◑	1 new stop, improvements to 4 low-amenity, 3 medium-amenity and 4 high-amenity stops
L2	◑	1 new stop, improvements to 4 low-amenity, 3 medium-amenity and 4 high-amenity stops
L3	◑	1 new stop, improvements to 4 low-amenity, 3 medium-amenity and 4 high-amenity stops
L4	◑	1 new stop, improvements to 4 low-amenity, 3 medium-amenity and 4 high-amenity stops
K1	◔	1 new stop, improvements to 2 medium-amenity and 7 high-amenity stops
K2	●	1 new stop, improvements to 6 low-amenity, 5 medium-amenity and 9 high-amenity stops
K3	●	1 new stop, improvements to 6 low-amenity, 5 medium-amenity and 9 high-amenity stops

5D: Stop Amenities - Detail

#	Corridor	Cross-Street/Terminus	Existing /NB	H1E	H1P	H2E	H2P	H3E	H3P	H4E	H4P	H5E	H5P	L1E	L1P	L2E	L2P	L3E	L3P	L4E	L4P	K1E	K1P	K2E	K2P	K3E	K3P
1	Fullerton Transportation Center		3			3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4			3	4	3	4
2	Harbor Blvd	Orangethorpe Ave	2			2	4	2	4	2	4	2	4											2	4	2	4
3	Harbor Blvd	La Palma Ave	1			1	4	1	4	1	4	1	4											1	4	1	4
4	Harbor Blvd	Lincoln Ave	1			1	4	1	4	1	4	1	4											1	4	1	4
5	Harbor Blvd	Ball Rd	3			3	4	3	4	3	4	3	4											3	4	3	4
6	Harbor Blvd	Disney Way	0	0	4	3	4	3	4	3	4	3	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4
7	Harbor Blvd	Katella Ave	3	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4
8	Harbor Blvd	Convention Way	0																								
9	Harbor Blvd	Chapman Ave	3	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4
10	Harbor Blvd	Lampson Ave	3	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4
11	Harbor Blvd	Garden Grove Blvd	2	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4
12	Harbor Blvd	Westminster Ave	1/2/4	4	4	4	4	4	4	1.5	4	1.5	4	4	4	4	4	1.5	4	1.5	4	4	4	1.5	4	4	4
13	Lemon St	Orangethorpe Ave	1											1	4	1	4	1	4	1	4			1	4	1	4
14	Lemon St-Anaheim Blvd	La Palma Ave	2											2	4	2	4	2	4	2	4			2	4	2	4
15	Lemon St-Anaheim Blvd	Lincoln Ave	2											2	4	2	4	2	4	2	4			2	4	2	4
16	Lemon St-Anaheim Blvd	Santa Ana St	1											1	4	1	4	1	4	1	4			1	4	1	4
17	Lemon St-Anaheim Blvd	Ball Rd	1											1	4	1	4	1	4	1	4			1	4	1	4
18	Lemon St-Anaheim Blvd	Cerritos Ave	1											1	4	1	4	1	4	1	4			1	4	1	4
19	Katella Ave	Clementine St	3																			3	4	3	4	3	4
20	Katella Ave	Anaheim Blvd-Haster St	3																					3	4	3	4
21	Katella Ave	Lewis St	2																			2	4	2	4	2	4
22	Katella Ave	State College Blvd	3																			3	4	3	4	3	4
23		ARTIC	3																			3	4	3	4	3	4
Net Change				**9.0**		**16.0**		**16.0**		**18.5**		**18.5**		**26.0**		**26.0**		**28.5**		**28.5**		**14.0**		**43.5**		**41.0**	
Harvey Ball Ratings				○		◔		◔		◔		◔		◑		◑		◑		◑		◔		●		●	

		0	1	0	0	0	0	1	1	1	1	1	1	1	1
Notes:	**# stops upgraded:**	**1**	0	2	2	2	2	4	4	4	4	0	6	6	
E = Existing		**2**	1	2	2	2	2	3	3	3	3	2	5	5	
P = Project		**3**	3	6	6	6	6	4	4	4	4	6	9	9	
Scoring:		**4**	1	1	1	0	0	1	1	0	0	1	0	1	

High amenity stop = 3
Med amenity stop = 2
Low amenity stop = 1
No stop = 0
New stops (Project) = 4

Scoring		Harvey Ball
>40	High	●
31-40	Medium-High	◕
21-30	Med	◑
11-20	Low-Medium	◔
<=10	Low	○

1. See Mobility Problem Definition Report for methodology/description of High, Medium, and Low amenity stops.
2. No-build (existing conditions) were detailed in the Mobility Problem Definition Report (section 2.5). Existing stops were ranked on a scale of 1-3, with 1 being the lowest and 3 being the highest.
3. Future prototypical stops as part of this project were awarded 4 points. It should be noted that this criteria does not adjust for length of corridor and overall number of stops. Thus, a long alternative with a high number of existing low amenity stops will likely score the best.

6A: Cost Effectiveness - Summary

ALTERNATIVE	SCORE	NOTES
NB	N/A	-
H1	○	**$11.73** cost per rider
H2	◑	**$5.58** cost per rider
H3	◑	**$5.54** cost per rider
H4	◕	**$2.68** cost per rider
H5	◕	**$2.72** cost per rider
L1	◔	**$8.18** cost per rider
L2	◔	**$7.60** cost per rider
L3	◕	**$2.62** cost per rider
L4	◕	**$3.78** cost per rider
K1	○	**$13.69** cost per rider
K2	◕	**$3.40** cost per rider
K3	◔	**$6.89** cost per rider

6A: Cost Effectiveness - Detail

Alternative	Capital Cost (2017$)	Capital Cost (YOE$)	Capital Cost (Annualized)	Annual O&M Cost*	Total Annual Cost	Annual Linked Trips (2035)	Weighted Cost/Rider (Current/Future Yr $ Average)**	Harvey Ball Rating
H1	$ 160,000,000	$ 260,000,000	$ 5,857,917	$ 3,093,161	$ 8,951,078	821,277	$11.73	○
H2	$ 370,000,000	$ 610,000,000	$ 13,927,958	$ 2,973,797	$ 16,901,755	3,261,832	$5.58	◑
H3	$ 420,000,000	$ 690,000,000	$ 15,448,642	$ 1,942,744	$ 17,391,385	3,377,764	$5.54	◑
H4	$ 40,000,000	$ 64,000,000	$ 1,800,354	$ 1,039,770	$ 2,840,124	1,141,807	$2.68	◕
H5	$ 150,000,000	$ 230,000,000	$ 7,086,130	$ 1,095,776	$ 8,181,907	3,242,547	$2.72	◕
L1	$ 400,000,000	$ 660,000,000	$ 15,025,353	$ 4,004,851	$ 19,030,204	2,504,395	$8.18	◔
L2	$ 450,000,000	$ 740,000,000	$ 16,662,334	$ 2,973,797	$ 19,636,131	2,780,814	$7.60	◔
L3	$ 40,000,000	$ 67,000,000	$ 1,880,706	$ 1,039,770	$ 2,920,476	1,200,771	$2.62	◕
L4	$ 160,000,000	$ 250,000,000	$ 7,609,604	$ 1,752,130	$ 9,361,734	2,669,537	$3.78	◕
K1	$ 270,000,000	$ 450,000,000	$ 10,236,165	$ 5,155,268	$ 15,391,433	1,210,524	$13.69	○
K2	$ 38,000,000	$ 60,000,000	$ 1,743,793	$ 1,672,356	$ 3,416,149	1,081,292	$3.40	◕
K3	$ 180,000,000	$ 300,000,000	$ 6,904,727	$ 2,990,736	$ 9,895,463	1,545,685	$6.89	◔

Notes:

*Net from No Build (2035)

**Column H calculated as average of cost per rider figures derived from current year (2015) and future year (2035) ridership.

YOE = Year of Expenditure: 2023 for Bus, 2025 for streetcar

Scoring		Harvey Ball
$0-2	High	●
$2-4	Medium-High	◕
$4-6	Medium	◑
$6-10	Low-Medium	◔
>$10	Low	○

6B: Design a Project with Minimal Operations Costs - Summary

ALTERNATIVE	SCORE	NOTES
NB	N/A	-
H1	◑	$ **14.02** net cost per new trip.
H2	◕	$ **8.31** net cost per new trip.
H3	◕	$ **8.31** net cost per new trip.
H4	○	$ **58.54** net cost per new trip.
H5	●	$ **4.06** net cost per new trip.
L1	◑	$ **14.31** net cost per new trip.
L2	◑	$ **12.64** net cost per new trip.
L3	◔	$ **18.09** net cost per new trip.
L4	◕	$ **6.29** net cost per new trip.
K1	◔	$ **16.82** net cost per new trip.
K2	◔	$ **15.09** net cost per new trip.
K3	○	$ **25.27** net cost per new trip.

6B: Design a Project with Minimal Operations Costs - Detail

Alternative	Marginal Annual O&M Cost	Annual Capital Cost	Annual Trips Over NB	Marginal Cost per Net Annual Trips	Harvey Ball Rating
Existing	$31,765,285	N/A	N/A	N/A	N/A
NB	$32,415,906	N/A	N/A	N/A	N/A
H1	$3,093,161	$5,857,917	638,557	$14.02	◑
H2	$2,973,797	$13,927,958	2,034,581	$8.31	◕
H3	$1,942,744	$15,448,642	2,092,547	$8.31	◕
H4	$1,039,770	$1,800,354	48,516	$58.54	○
H5	$1,095,776	$7,086,130	2,013,732	$4.06	●
L1	$4,004,851	$15,025,353	1,329,811	$14.31	◑
L2	$2,973,797	$16,662,334	1,554,096	$12.64	◑
L3	$1,039,770	$1,880,706	161,447	$18.09	◔
L4	$1,752,130	$7,609,604	1,489,210	$6.29	◕
K1	$5,155,268	$10,236,165	915,328	$16.82	◔
K2	$1,672,356	$1,743,793	226,423	$15.09	◔
K3	$2,990,736	$6,904,727	391,618	$25.27	○

Notes:

Scores based on annual incremental cost per new transit trip.

1. Alternatives with an annual incremental cost of $0-5 received a high score.
2. Alternatives with an annual incremental cost of $5-10 received a medium-high score.
3. Alternatives with an annual incremental cost of $10-15 received a medium score.
4. Alternatives with an annual incremental cost of $15-20 received a low-medium score.
5. Alternatives with an annual incremental cost greater than $20 received a low score.

Scoring		Harvey Ball
$0-5	High	●
$5-10	Medium-High	◕
$10-15	Medium	◑
$15-20	Low-Medium	◔
>=20	Low	○

6C: Balances Overall Project Cost and Benefits - Summary

ALTERNATIVE	SCORE	NOTES
NB	N/A	
H1	◑	**25%** annual farebox recovery ratio
H2	◑	**30%** annual farebox recovery ratio
H3	◕	**31%** annual farebox recovery ratio
H4	◔	**25%** annual farebox recovery ratio
H5	◕	**31%** annual farebox recovery ratio
L1	◑	**27%** annual farebox recovery ratio
L2	◑	**28%** annual farebox recovery ratio
L3	◑	**25%** annual farebox recovery ratio
L4	◑	**29%** annual farebox recovery ratio
K1	◔	**25%** annual farebox recovery ratio
K2	◑	**25%** annual farebox recovery ratio
K3	◔	**25%** annual farebox recovery ratio

6C: Balances Overall Project Costs and Benefits - Detail

Alternative	Daily Transit Ridership							Annual Ridership	Revenue per Boarding	Annual Fare Revenue (All Routes)	Annual O&M Cost	Farebox Recovery Ratio	Harvey Ball Rating
	543	43	47	50	OCSC	Alt.	Total						
NB	4,394	8,520	8,899	5,074	7,160	0	34,046	7,546,911	-	-	$32,415,906	-	N/A
H1	4,351	7,908	8,735	5,069	7,160	3,705	36,927	8,185,468	$1.10	$9,004,015	$35,509,067	25.4%	◑
H2	0	8,248	8,063	5,038	7,160	14,715	43,225	9,581,492	$1.10	$10,539,641	$35,389,703	29.8%	◑
H3	0	8,118	7,932	5,038	7,160	15,238	43,486	9,639,458	$1.10	$10,603,404	$34,358,650	30.9%	◕
H4	0	8,465	8,416	5,074	7,160	5,151	34,265	7,595,427	$1.10	$8,354,970	$33,455,676	25.0%	◔
H5	0	8,270	8,034	5,038	7,160	14,628	43,131	9,560,643	$1.10	$10,516,708	$33,511,682	31.4%	◕
L1	0	7,996	8,568	5,023	7,160	11,298	40,045	8,876,722	$1.10	$9,764,394	$36,420,757	26.8%	◑
L2	0	7,866	8,433	5,053	7,160	12,545	41,057	9,101,007	$1.10	$10,011,108	$35,389,703	28.3%	◑
L3	0	8,347	8,792	5,059	7,160	5,417	34,774	7,708,358	$1.10	$8,479,194	$33,455,676	25.3%	◑
L4	0	7,949	8,559	5,053	7,160	12,043	40,764	9,036,122	$1.10	$9,939,734	$34,168,036	29.1%	◑
K1	4,332	7,831	8,603	4,789	7,160	5,461	38,175	8,462,240	$1.10	$9,308,463	$37,571,174	24.8%	◔
K2	0	9,742	8,412	4,876	7,160	4,878	35,068	7,773,335	$1.10	$8,550,668	$34,088,262	25.1%	◑
K3	0	8,127	8,763	4,789	7,160	6,973	35,813	7,938,529	$1.10	$8,732,382	$35,406,642	24.7%	◔

Notes

1. This criteria provides the annual farebox recovery ratio for all alternatives.
2. Ridership inputs are from Task 1B - Enhance Overall Corridor Mobility.
3. Annual O&M cost inputs are from Task 6B - Operations Costs.

Scoring		Harvey Ball
>35%	High	●
30-35%	Medium-High	◕
25-30%	Medium	◑
20-25%	Low-Medium	◔
<20%	Low	○

6D: Financial Feasibility - Summary

ALTERNATIVE	SCORE	Notes
NB	N/A	
H1	◕	High capital cost, no connection to Metrolink
H2	◑	High capital cost, connection to Metrolink
H3	◑	High capital cost, connection to Metrolink
H4	●	Low capital cost, no dedicated lanes
H5	●	Low capital cost, dedicated lanes
L1	◑	High capital cost, connection to Metrolink
L2	◑	High capital cost, connection to Metrolink
L3	●	Low capital cost, no dedicated lanes
L4	●	Low capital cost, dedicated lanes
K1	◑	High capital cost, connection to Metrolink
K2	●	Low capital cost, no dedicated lanes
K3	◕	High capital cost, no connection to Metrolink

6D: Financial Feasibility - Detail

Annual Cost (Capital + O&M) - From 6A

Alternative	Annual Cost	Cost Rating
H1	$ 8,951,078	4
H2	$ 16,901,755	2
H3	$ 17,391,385	2
H4	$ 2,840,124	5
H5	$ 8,181,907	5
L1	$ 19,030,204	2
L2	$ 19,636,131	2
L3	$ 2,920,476	5
L4	$ 9,361,734	4
K1	$ 15,391,433	2
K2	$ 3,416,149	5
K3	$ 9,895,463	4

Financial Feasibility

Alternative	Reason	Rating
H1	High capital cost, no connection to Metrolink	2
H2	High capital cost, connection to Metrolink	3
H3	High capital cost, connection to Metrolink	3
H4	Low capital cost, no dedicated lanes	4
H5	Low capital cost, dedicated lanes	5
L1	High capital cost, connection to Metrolink	3
L2	High capital cost, connection to Metrolink	3
L3	Low capital cost, no dedicated lanes	4
L4	Low capital cost, dedicated lanes	5
K1	High capital cost, connection to Metrolink	3
K2	Low capital cost, no dedicated lanes	4
K3	High capital cost, no connection to Metrolink	2

Summary Table

Alternative	Total Rating	Score
H1	6	◕
H2	5	◑
H3	5	◑
H4	9	●
H5	10	●
L1	5	◑
L2	5	◑
L3	9	●
L4	9	●
K1	5	◑
K2	9	●
K3	6	◕

Scoring		Sub-Score
< $5M	Low	5
$5-10M	Medium-Low	4
$10-15M	Medium	3
$15-20M	Medium-High	2
>$20M	High	1

Scoring		Sub-Score
Easiest to fund	Low	5
	Medium-Low	4
v	Medium	3
	Medium-High	2
Hardest to fund	High	1

Criteria 6D Scoring		Harvey Ball
8-10	Low	●
6-8	Medium-Low	◕
4-6	Medium	◑
2-4	Medium-High	◔
< 2	High	○