

SETTING THE RIGHT PRICE FOR BUS TRANSIT : Culver CityBus Fare Structure Evaluation

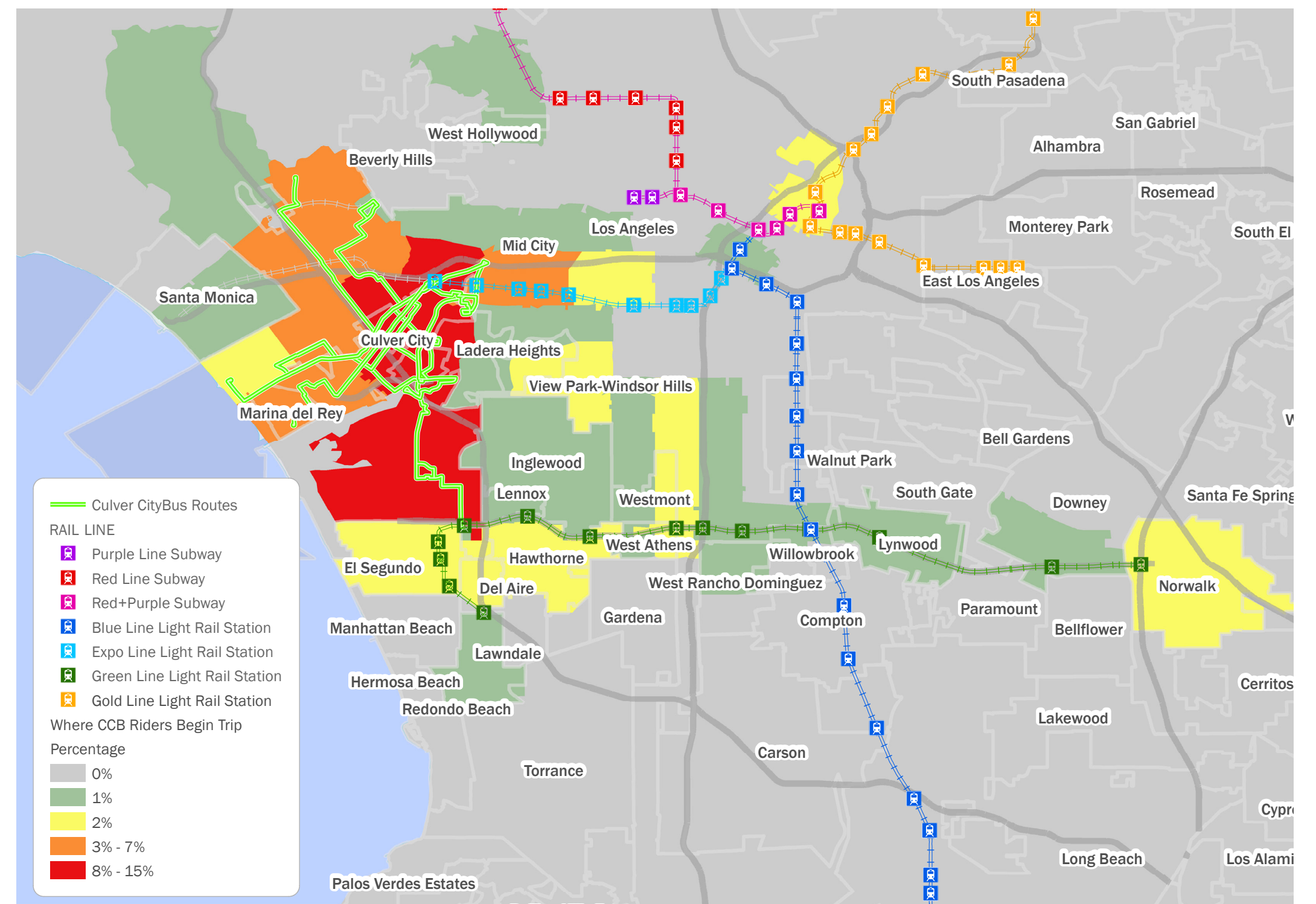
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Fare policy is always complicated and difficult for transit operators to deal with, taking into account funding for capital investments and operations, equity and operational issues including dwell time, network design and accessibility for new users. Two major operators sharing Culver CityBus' service area have recently made major changes to fare policy to reduce operating deficit, moving in opposite directions. Santa Monica's Big Blue Bus eliminated discounted local transfers and proposed to increase single ride cash fare to offset the increased cost in service associated with their response to Expo Line expansion in 2016. Los Angeles Metropolitan Transportation Authority (LA Metro) raised its cash fare to \$1.75, raised the price of prepaid transit passes, and offered 2-hour free transfers to smart card users.

Culver CityBus' fare structure is relatively complex, with a low cash fare, discounted fares for various groups, transfers discounted at different rates for intra- and interagency transfers, participation in the regional EZ pass monthly pass and the BruinGo program, under which UCLA students may ride at a steeply discounted rate using a flash pass. In addition, the expansion of the Metro Rail Expo Line Phase 2 in 2016 and Metro Rail Crenshaw Line in 2019 will affect transfer patterns and lead to redesigning Culver CityBus feeder services and a review of Culver CityBus' fare policy.

Lewis Center Award Winner for Innovative use of Spatial Analysis and GIS in Policy Analysis

FIGURE 1 -- WHERE CULVER CITY RIDERS BEGIN THEIR TRIPS



Source: Culver CityBus Passenger On-board Surveys (2011)

RESEARCH QUESTIONS

- How should Culver CityBus change its fare structure to better serve its riders and maximize its ridership and revenue?
- How does the recommended fare structure affect ridership and revenue, as well as its funding opportunities from Formula Allocation Procedure?

METHODOLOGY

- Literature review to understand role of fare policy in public transit systems and find common practices public transit agencies generally use for changing fare structures
- Selected case studies to study impacts on revenues and ridership after introduction of various fare strategies
- Evaluated Culver CityBus' ridership statistics and onboard surveys to document ridership patterns and potential for innovative fare strategies
- Cross tabulations of onboard surveys and research into Culver CityBus ridership distribution by fare media and type of riders (adult, senior/disabled, students) to understand riders' demographics and travel behavior
- Compared Culver CityBus' existing fare structure to other fare structures used by selected agencies in LA County to help Culver CityBus set pricing programs that better align with fare policies of neighboring agencies
- Addressed how recommended fare structure affects ridership and revenue on Culver CityBus, and whether the recommendation will greatly affect future funding opportunities from Formula Allocation Procedure

TABLE 1

CULVER CITYBUS RIDER CHARACTERISTICS

Frequency of Use	Percentage
First Time	2%
About once a month	4%
About once a week	4%
2 to 4 days a week	29%
5 or more days a week (Frequent Riders)	61%

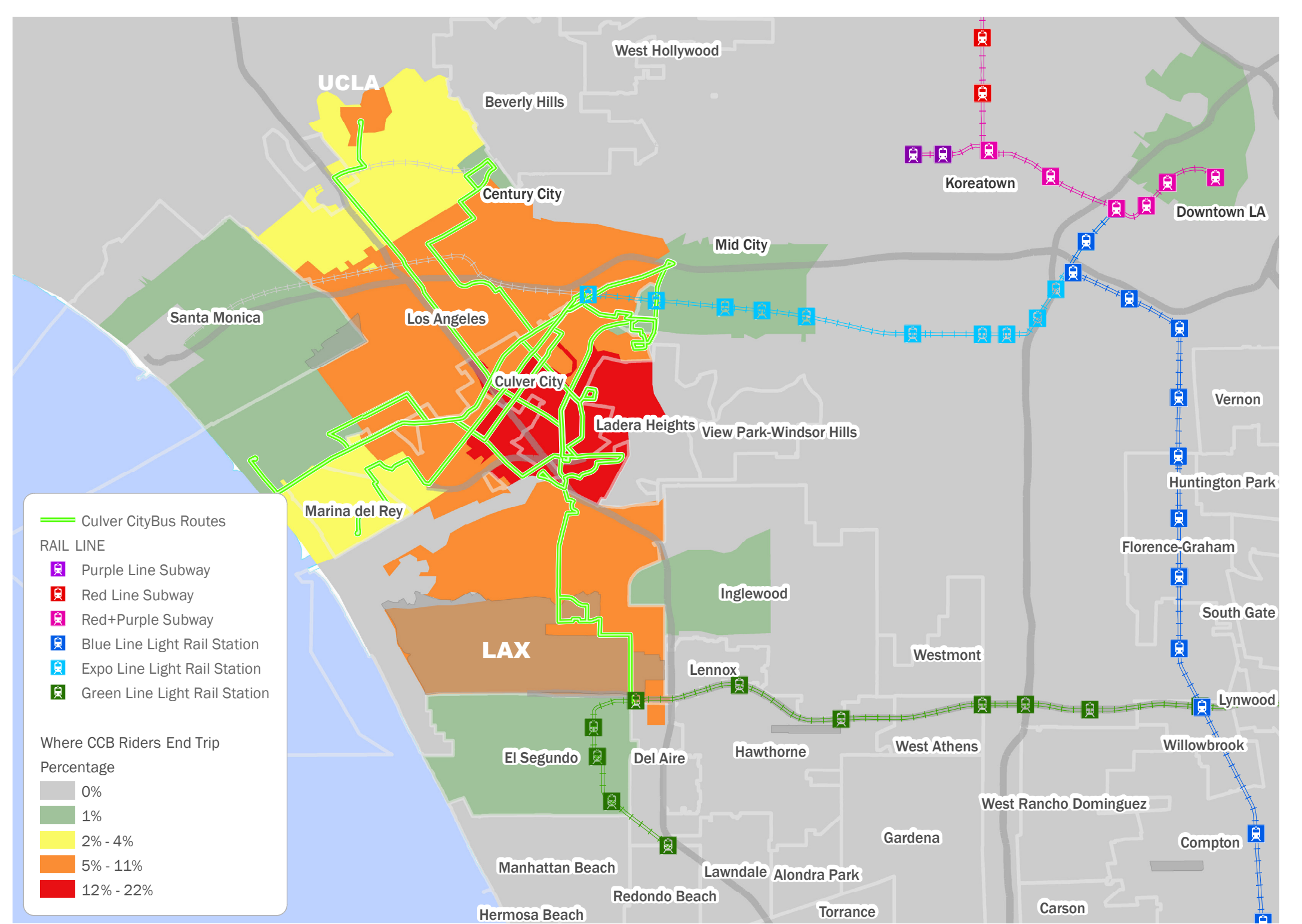
Trip Purpose	Percentage
Going Work	33%
Going Home	39%
School/ College	16%
Recreation or Social Activity	4%
Shopping Center or Store	5%
Medical/Dental Facility	3%
Childcare	1%
Other	4%

Transit Dependency (Riders' responses if Culver CityBus services were not available)	Percentage
Use another bus agency	52%
Drive alone	8%
Walk	13%
Driven by someone else	12%
Would not make trip	12%
Bicycle	8%
Carpool/Vanpool	3%
Taxi	3%
Other/ I don't know	3%

Mobile Phone Ownership	Percentage
Smartphone with internet access	34%
Mobile phone with text messaging	30%
Mobile phone	23%
None of the above	13%

Source: 2012 Line by Line Onboard Survey

FIGURE 2 -- WHERE CULVER CITY RIDERS END THEIR TRIPS



Source: Culver CityBus Passenger On-board Survey (2011)

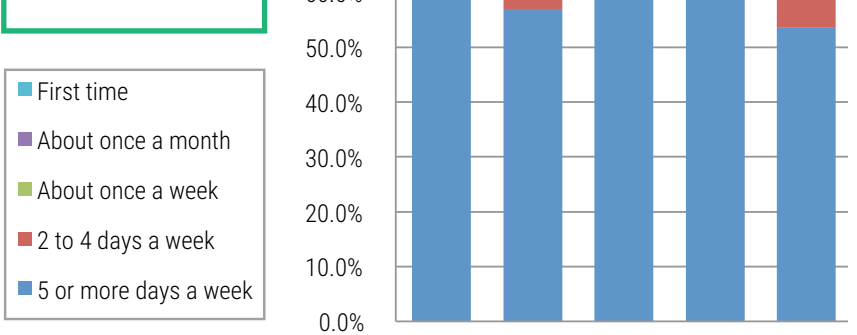
FINDINGS

1. Findings from Culver CityBus onboard surveys:

Figures 1 and 2 can help Culver CityBus staff better understand where their riders start/end their trips and to discover untapped markets outside their existing service network. Moreover, they can provide insight into possible service expansion in response to the opening of the Expo Light Rail Phase 2 in 2016. However, cross tabulations from onboard survey data provide a more in-depth analysis in understanding riders' travel behavior, which can help staff estimate riders' response to fare changes. One of the analyses showed that 61% of riders on Culver CityBus were frequent riders (Table 1). Since fare elasticities are different among various age groups, I classified bus ride frequency by age groups to predict responses to a fare change from each age group of riders (Figure 3). For instance, price elasticities for riders under 18 are higher than riders over 64 years in general, indicating younger riders are more sensitive than elderly riders to fare changes (Cervero 1990, Deleuw, Cather & Company 1979). Culver CityBus could apply this analysis in deciding the right pricing scheme that potentially meets the needs of different rider segments.

FIGURE 3

AGE VS. BUS RIDE FREQUENCY



2. Findings from LA Metro TAP Card Data:

Figures 4 and 5 reflect weekday peak-hour ridership patterns in the morning and afternoon. Data extracted from the Metro TAP card database display average daily boardings in a "google-traffic" color scheme. Red represents higher boardings and green means fewer boardings. The graphs help to identify ridership patterns, the significance of interagency transfers and deep discount group pass programs in Culver CityBus service network. Currently, Culver CityBus has a deep discount group pass program with UCLA (6% of the ridership). Interagency agency transfers typically occur at major street intersections (15% of ridership). West LA College is also identified as a high-ridership area, and yet the college does not currently have a discounted bus fare program similar to UCLA BruinGo! that encourage students to use public transit.

FIGURE 4 -- CULVER CITYBUS SERVICE NETWORK AM TRIPS DISTRIBUTION



Source: TAP Card Trip Data (November 2014)

FIGURE 5 -- CULVER CITYBUS SERVICE NETWORK PM TRIPS DISTRIBUTION



Source: TAP Card Trip Data (November 2014)

CONCLUSION & RECOMMENDATIONS

TABLE 2 -- CULVER CITYBUS RECOMMENDED FARE STRUCTURE

Rider Category	Type	Baseline Fare	Recommended Fare	% Fare Change
Adult	Cash Fare	\$1.00	\$1.25	25%
	Local Transfer	\$0.25	-	-
	Inter-Agency transfer	\$0.40	\$0.50	25%
	Day Pass	-	\$4.00	-
Senior/ Disabled	Monthly Pass	-	\$50.00	-
	Cash Fare	\$0.35	\$0.50	43%
	Local Transfer	\$0.10	-	-
	Inter-Agency transfer	\$0.20	\$0.25	25%
Student (K-12)	Day Pass	-	\$2.00	-
	Monthly Pass	-	\$25.00	-
	Cash Fare	\$0.75	\$1.25	67%
Program	Monthly Pass	-	\$30.00	-
	BruinGo!	\$33/quarter, or \$0.50 copay	\$33/quarter, or \$0.50 copay	-
	Playa Vista Agreement with Developer	-	2400 monthly pass each year at \$20.83	-
	West LA College	-	Free	-

Recommendations are made regarding fare structure and an evaluation is done on how the recommendation would affect ridership and revenue on Culver CityBus. The recommended fare structure raises cash fare trips and eliminates local transfers within the Culver CityBus network. Meanwhile, several fare media, such as monthly passes and day passes, are introduced to soften the impacts of fare increase and potential ridership decrease. The recommendation includes two new fare programs for participants at West LA College and Playa Vista that help to maximize ridership and revenue for Culver CityBus. A detailed recommended structure is illustrated in Table 2.

Based on my forecast, ridership would increase by 2% to 4% and revenue would rise by 16% to 17% if the recommendations were adopted, compared to the baseline fare structure. Farebox recovery ratio would increase from 20.9% to as high as 24.6%. Nevertheless, impacts on Fare Allocation Procedure could not be determined because there are some uncertainties accounted in the revenue forecast. The uncertainties include riders' actual response to fare changes and deep discounted pass program.

References: Culver CityBus Onboard Surveys, Metro TAP Card Data