



AGENDA

Transit Committee Meeting

Committee Members

Al Murray, Chairman
Steve Jones, Vice Chairman
Laurie Davies
Andrew Do
Miguel Pulido
Tom Tait
Gregory T. Winterbottom

Orange County Transportation Authority
Headquarters
550 South Main Street
Board Room – Conf. Room 07
Orange, California
Thursday, April 12, 2018 at 9:00 a.m.

Any person with a disability who requires a modification or accommodation in order to participate in this meeting should contact the OCTA Clerk of the Board, telephone (714) 560-5676, no less than two (2) business days prior to this meeting to enable OCTA to make reasonable arrangements to assure accessibility to this meeting.

Agenda descriptions are intended to give members of the public a general summary of items of business to be transacted or discussed. The posting of the recommended actions does not indicate what action will be taken. The Committee may take any action which it deems to be appropriate on the agenda item and is not limited in any way by the notice of the recommended action.

All documents relative to the items referenced in this agenda are available for public inspection at www.octa.net or through the Clerk of the Board's office at the OCTA Headquarters, 600 South Main Street, Orange, California.

Call to Order

Pledge of Allegiance

Director Davies

1. Public Comments

Special Calendar

2. Regional Transit Ridership Study

Kia Mortazavi

Philip Law, Manager, Transit/Rail Department, Southern California Association of Governments will give a presentation on regional transit ridership.



Consent Calendar (Items 3 through 5)

All items on the Consent Calendar are to be approved in one motion unless a Committee Member or a member of the public requests separate action or discussion on a specific item.

3. Approval of Minutes

Approval of the minutes of the Transit Committee meeting of March 8, 2018.

4. Agreement for the Construction of the Right-of-Way Slope Stabilization Project

Gerald Ray Smith, Jr. /James G. Beil

Overview

The Orange County Transportation Authority's Board of Directors approved the construction of the right-of-way slope stabilization project as part of the Orange County Transportation Authority's Fiscal Year 2017-18 Budget. Bids were received in accordance with the Orange County Transportation Authority's public works procurement procedures. Board of Directors' approval is requested to execute an agreement with the lowest responsive, responsible bidder.

Recommendations

- A. Find James McMinn, Inc., the apparent low bidder, as non-responsive due to failure to meet the federal requirement for Disadvantaged Business Enterprise participation.
- B. Authorize the Chief Executive Officer to negotiate and execute Agreement No. C-7-2047 between the Orange County Transportation Authority and Bosco Constructors, Inc., the lowest responsive, responsible bidder, in the amount of \$1,735,600, for construction of the right-of-way slope stabilization project.

5. Award of Agreement for Three-Position Bicycle Racks for 40-Foot Buses

Cliff Thorne/Kenneth Phipps

Overview

The Orange County Transportation Authority operates a fixed-route fleet of 484 40-foot compressed natural gas-powered buses. Approval is requested to execute an agreement for hardware and installation of up to 484, three-position bicycle racks on the buses in the fleet.



5. (Continued)

Recommendations

- A. Approve the selection of Complete Coach Works to provide hardware and installation of up to 484, three-position bicycle racks, with the option to purchase up to 73 additional units as needed.
- B. Authorize the Chief Executive Officer to negotiate and execute Agreement No. C-7-2136 between the Orange County Transportation Authority and Complete Coach Works in the amount of \$745,592, for the purchase and installation of up to 484, three-position bicycle racks, with an option to purchase 73 additional units as needed.

Regular Calendar

6. OC Bus 360° Update
Kurt Brotcke/Kia Mortazavi

Overview

The Orange County Transportation Authority is implementing a comprehensive effort to reconfigure transit services in response to changing market conditions. The goals are to address ridership declines by improving passenger travel times, and designing services to retain existing customers and attract new customers. A status report on major OC Bus 360° elements is presented for review.

Recommendation

Receive and file as an information item.

Discussion Items

7. Innovation Update
Lloyd Sullivan/Andrew Oftelie

The Office of Innovation will provide updates on the current state of technology and transportation, as well as Orange County Transportation Authority's Autonomous Vehicle, Transit Network Company, and On-Demand pilots.



AGENDA

Transit Committee Meeting

8. Chief Executive Officer's Report

9. Committee Members' Reports

10. Closed Session

There are no Closed Session items scheduled.

11. Adjournment

The next regularly scheduled meeting of this Committee will be held at **9:00 a.m. on Thursday, May 10, 2018**, at the Orange County Transportation Authority Headquarters, 550 South Main Street, Board Room - Conference Room 07, Orange, California.

Regional Transit Ridership Study

Falling Transit Ridership

OCTA Transit Committee

April 12, 2018

Philip Law, Transit/Rail Manager



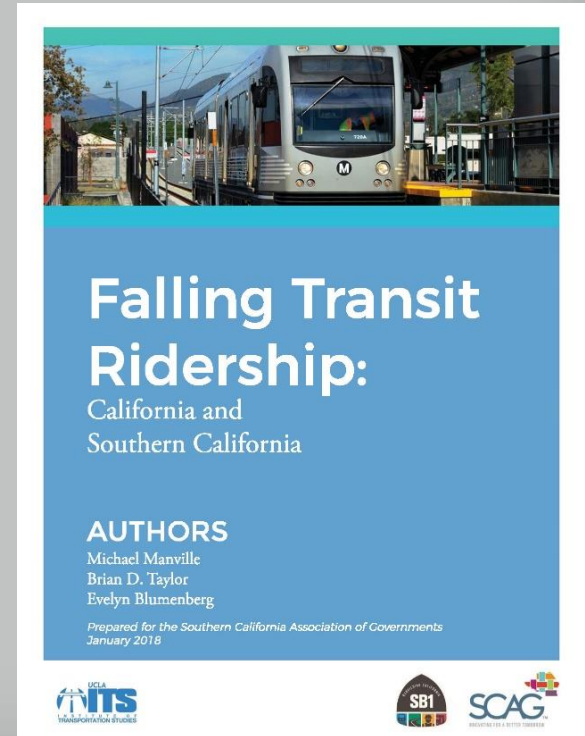
SCAG/UCLA Study Objectives

- To understand why transit ridership is declining, UCLA researchers proposed to analyze:
 - Changes in transit supply, demand, and finance in the region
 - Changes in the population of likely transit users
 - Changes in rider demographics

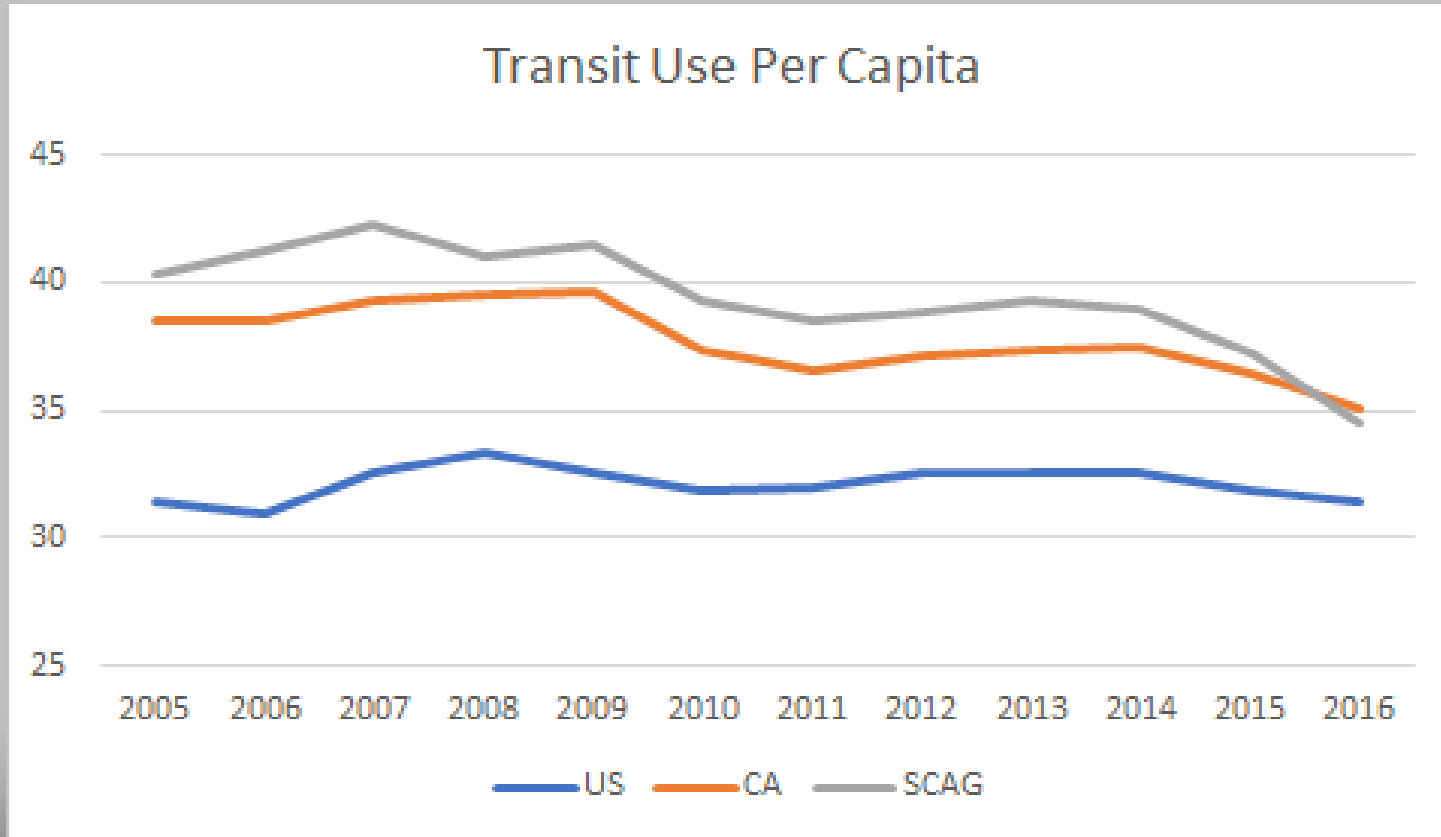


Summary of Findings

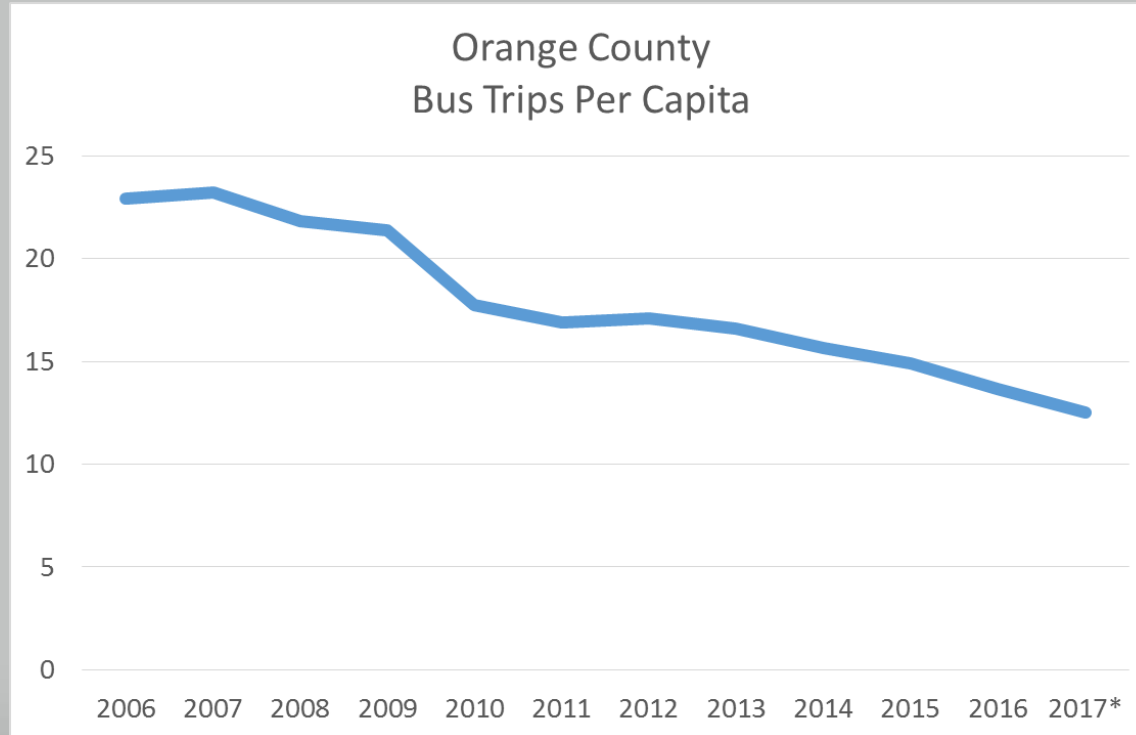
- Transit patronage trends
- Concentration and asymmetry of service and use
- Possible causes of recent ridership declines



SCAG Per Capita Ridership Down Since 2007



Orange County Shows Same Trend



Sources: National Transit Database (NTD), CA Department of Finance

*NTD monthly adjusted total for Fiscal Year 2017

Concentration and Asymmetry

- A few **people** make most of the trips
 - 2% ride very frequently, ~45 trips/month
 - 20% ride occasionally, ~12 trips/month
 - 78% ride transit very little/not at all, <1 trip/month
- A few **neighborhoods** generate most of the trips
 - 60% of transit commuters live in <1% of region's land area
- A few **operators** carry most of the passengers
 - Top 5 carry 83%

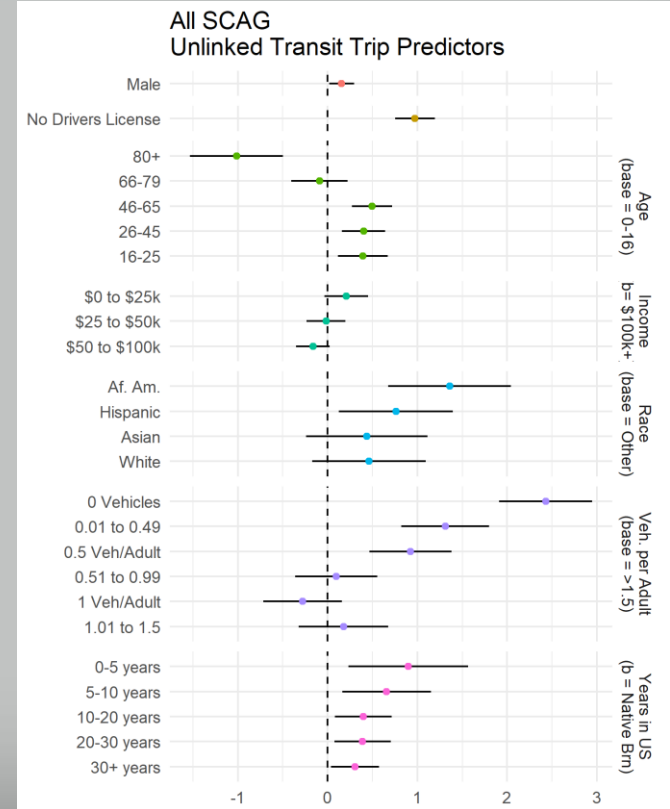
Concentrated Use Means Concentrated Ridership Losses

- Half of California's total lost ridership is accounted for by:
 - Metro Rail – Red, Blue, and Green Lines
 - 14 Metro bus routes
 - OCTA Route 43



What Explains Transit Use?

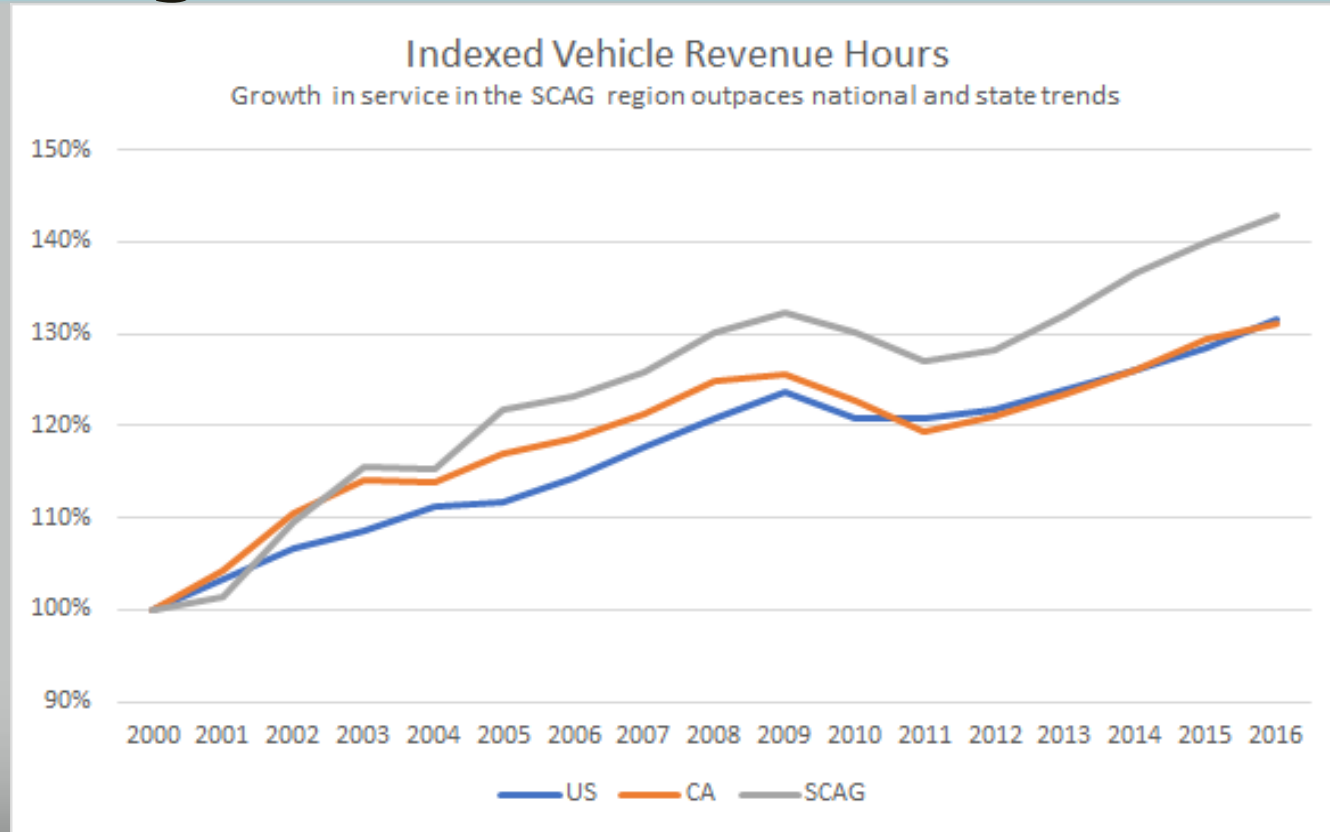
- No driver's license
- African-American
- 0-vehicle household
- Few-vehicle household
- Recent immigrants



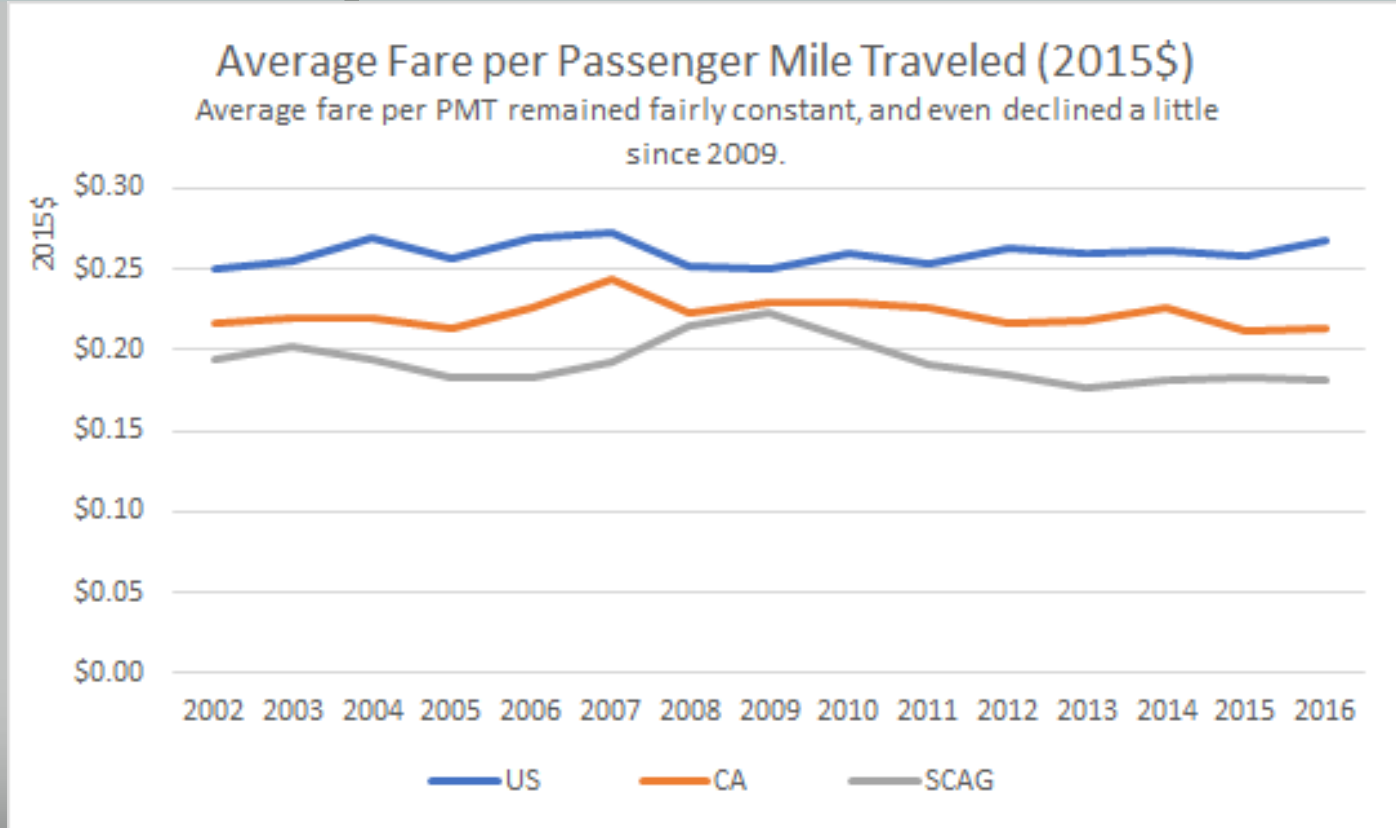
Possible Causes of Ridership Decline

- Factors transit operators can control
 - Transit service quantity and reliability
 - Transit fares
- Factors outside transit operators' control
 - Fuel prices
 - Transportation Network Companies (TNCs)
 - Neighborhood change
 - Vehicle ownership

Transit Service Quantity and Reliability Not Large Factors

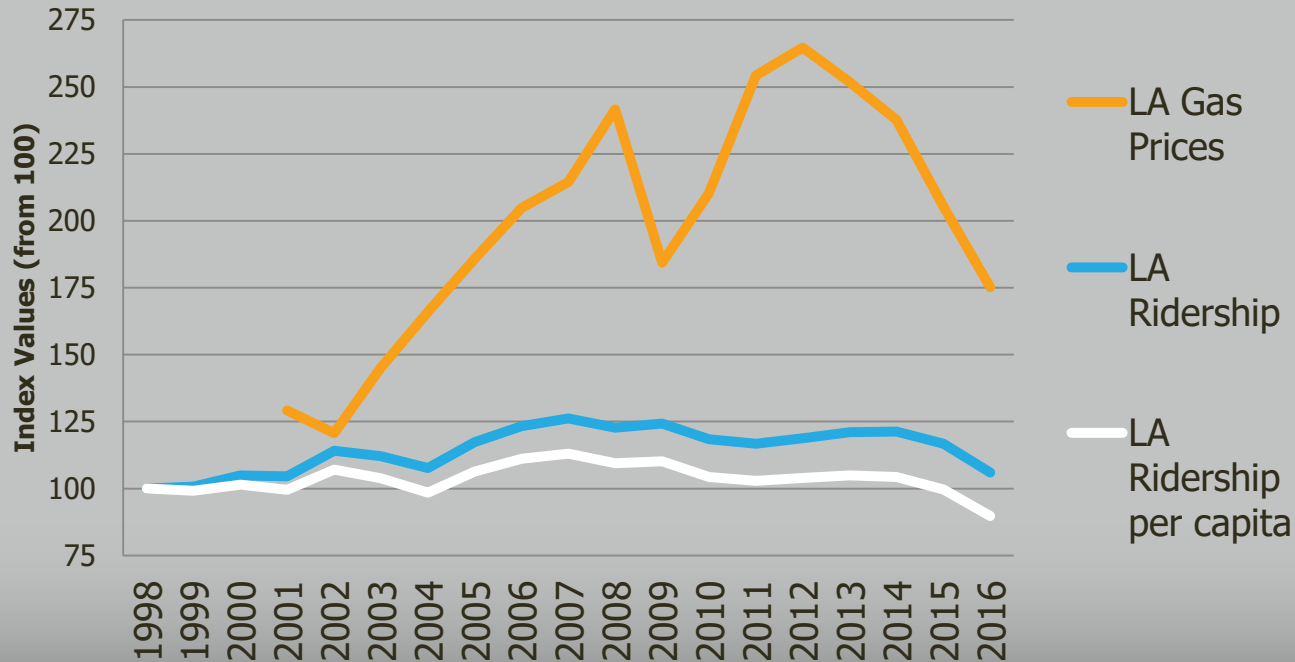


Transit Fares Probably Played a Role for Some Operators



Fuel Prices Likely Played Contributing, Not Leading Role

Transit Ridership and Gas Prices in Los Angeles Metropolitan Area



TNCs Likely Played Contributing, Not Leading Role

- TNC use is growing
 - Could both add/subtract transit riders
 - Detailed use data not publicly available
- Significant TNC use since 2012
 - Per capita transit down since 2007
- Research
 - Most TNC users not core transit users
 - Most TNC trips not core transit trips
- Another form of auto access
 - Continued TNC growth could make a bigger dent on transit use



New Research Report on TNC Use

Transit Cooperative Research Program (TCRP) Report 195: *Broadening Understanding of the Interplay Between Public Transit, Shared Mobility, and Personal Automobiles.*
<http://nap.edu/24996>

Six regions studied: Chicago, Los Angeles, Nashville, Seattle, DC and San Francisco.

- The heaviest TNC use is during **evenings and weekends**.
- Most TNC trips are short and concentrated in **downtown core neighborhoods**.
- There is no clear relationship between peak-hour TNC use and longer term changes in public transit usage.
- TNCs are used on a more **occasional basis**, not as routine.
- **Transit travel and wait times** were top concerns of survey respondents who replaced transit trips with TNC trips.
- TNC usage takes place in communities of **all income levels**.
- TNC use is associated with decreases in vehicle ownership and single-occupancy vehicle trips.

Smoking Gun: Private Vehicle Access Increased Substantially in the 2000s

1990s...

- SCAG region added 1.8 million people and 456,000 household vehicles
- 0.25 vehicles/new resident

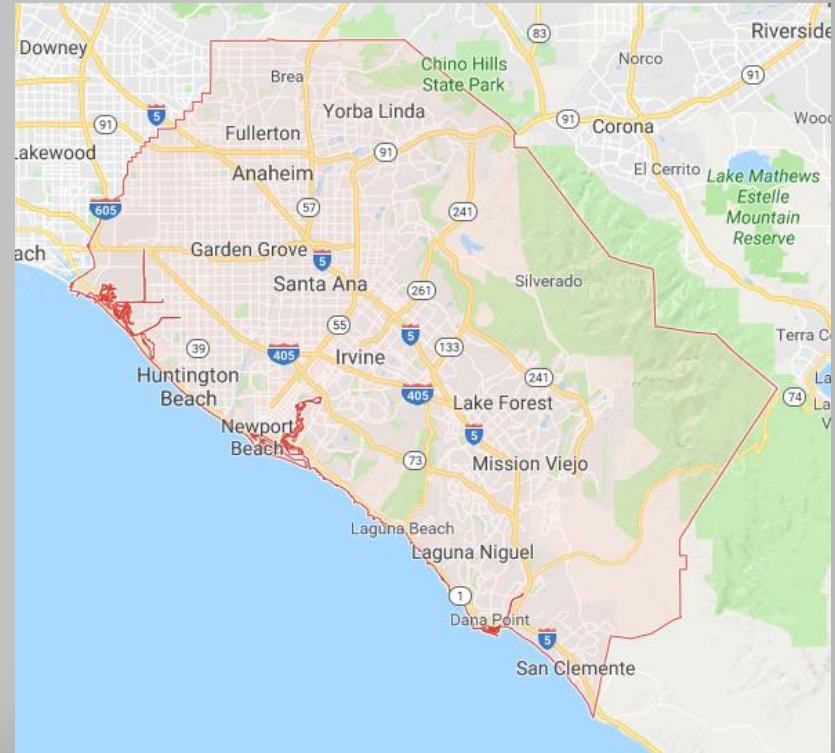
2000 to 2015...

- Region added 2.3 million people and 2.1 million household vehicles
- 0.95 vehicles/new resident
 - nearly 4X the rate of the 1990s

Similar Pattern in Orange County

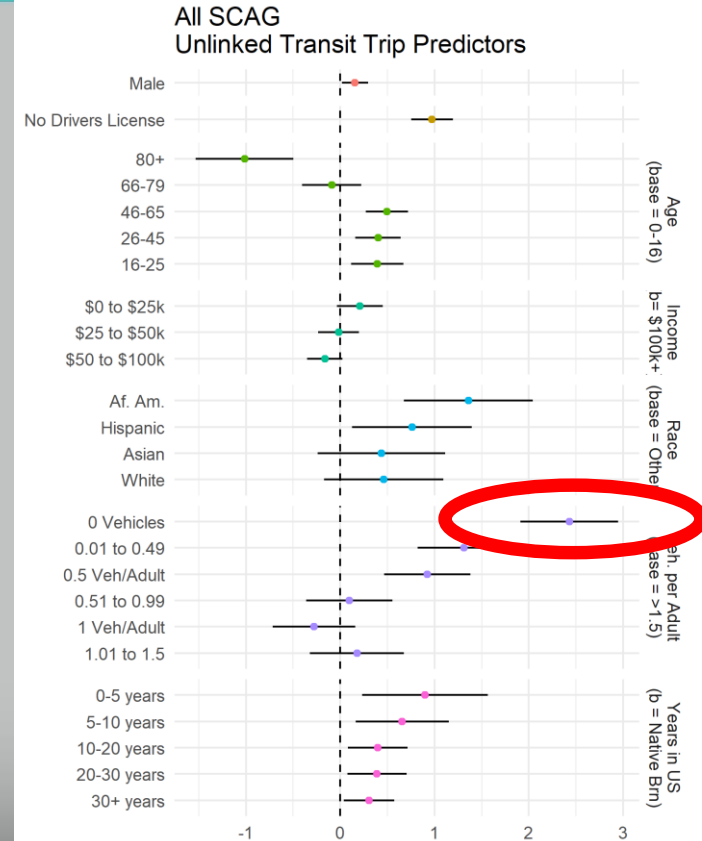
2000 to 2015...

- Orange County added 323,000 people (11% growth) and 319,000 household vehicles (18%)
- 0.99 vehicles/new resident

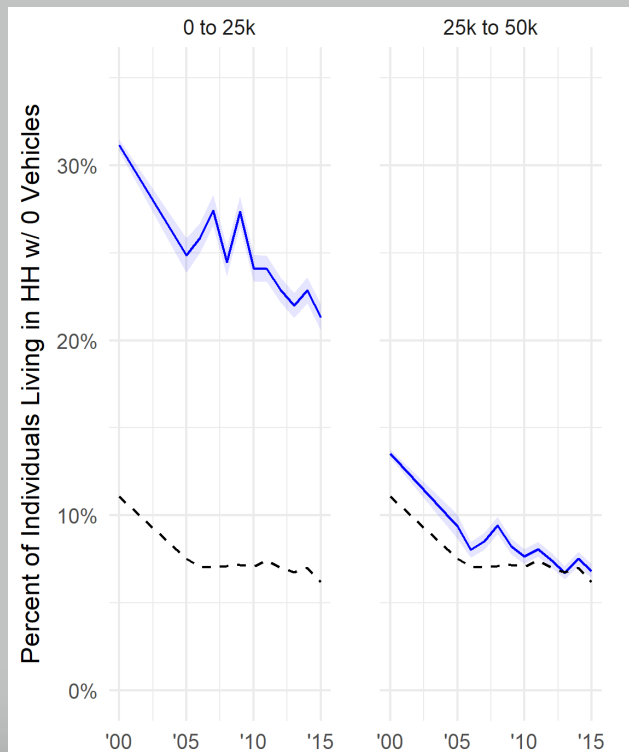


What Explains Transit Use?

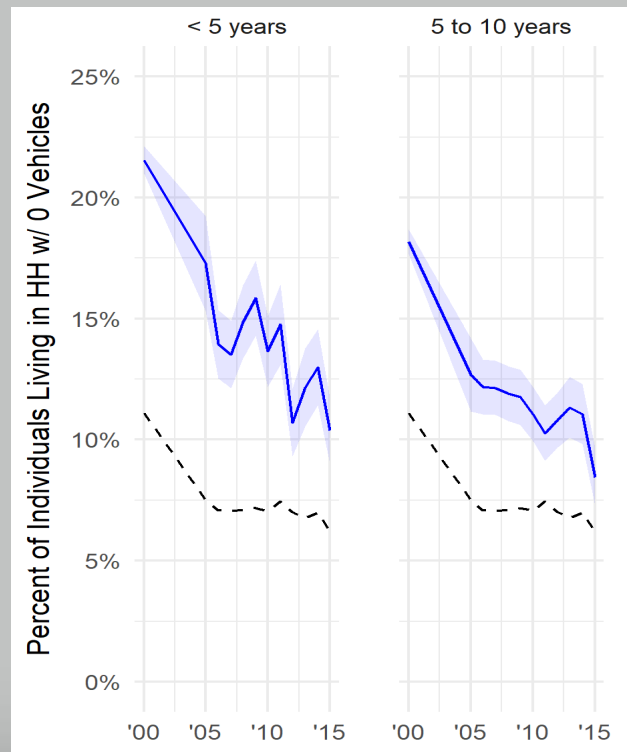
- No driver's license
- African-American
- 0-vehicle household
- Few-vehicle household
- Recent immigrants



Zero-vehicle households way down, especially in low-income households and among recent immigrants



Income



Years in U.S.

Changing Composition of Immigrants, 2000 to 2015

- Percentage of foreign born in SCAG region has remained flat at 30%-31%
 - Immigrants from Mexico down 13.4%
 - Immigrants from Asia up 23%
- Assimilation and cohort effects
 - As time passes, immigrants behave more like native born and drive more
 - More recent immigrants acquire more vehicles more quickly

Conclusions

- Increased vehicle access has likely had a very large effect on transit use
- The regional pool of transit users is changing
 - Fewer heavy-use “transit dependents” over time
 - More “choice riders” with access to cars
 - This situation is unlikely to reverse anytime soon
- Some trends are more variable
 - Fuel prices likely to rise again at some point



No Easy Answers

- Broaden the base of occasional transit users
 - If every fourth non-rider added one transit trip every two weeks, ridership would be up region-wide
- SCAG 2020 RTP/SCS* Update
 - Increased greenhouse gas reduction targets
 - Role of technology and innovation
 - Pyramid – smart land use, demand management, value pricing



Thank You

Philip Law

law@scag.ca.gov

213-236-1841





Committee Members Present

Al Murray, Chairman
Steve Jones, Vice Chairman
Laurie Davies
Andrew Do
Miguel Pulido
Gregory T. Winterbottom

Staff Present

Darrell E. Johnson, Chief Executive Officer
Laurena Weinert, Clerk of the Board
Sara Meisenheimer, Deputy Clerk of the Board
James Donich, General Counsel
OCTA Staff and members of the General Public

Committee Members Absent

Tom Tait

Call to Order

The March 8, 2018 regular meeting of the Transit Committee was called to order by Committee Chairman Murray at 9:01 a.m.

Pledge of Allegiance

Director Winterbottom led in the Pledge of Allegiance.

1. Public Comments

No public comments were received.

Special Calendar

There were no Special Calendar matters.

Consent Calendar (Items 2 through 7)

2. Approval of Minutes

A motion was made by Director Davies, seconded by Director Do, and declared passed by those present, to approve the minutes of the Transit Committee meeting of February 8, 2018.

Committee Chairman Murray abstained from the vote due to not being present at the February 8, 2018 Transit Committee meeting.

Director Pulido was not present to vote on this item.



3. Cooperative Agreement with the City of Laguna Niguel for Video Surveillance System at the Laguna Niguel/Mission Viejo Metrolink Station

A motion was made by Director Davies, seconded by Director Do, and declared passed by those present, to:

- A. Amend the Metrolink Surveillance System Deployment Program to include the Laguna Niguel/Mission Viejo Metrolink Station, and allocate Federal Transit Administration Grant Program 5309, in the amount of \$320,000, with a 20 percent match of \$80,000 in Proposition 1B funds, to the Laguna Niguel/Mission Viejo Metrolink Station video surveillance system project.
- B. Authorize the Chief Executive Officer to execute Cooperative Agreement No. C-7-2141 between the Orange County Transportation Authority and the City of Laguna Niguel to define roles, responsibilities, and funding for implementation of a video surveillance system at the Laguna Niguel/Mission Viejo Metrolink Station.

Director Pulido was not present to vote on this item.

4. Contract Change Order for Replacement of Heating and Ventilation Units at the Garden Grove Bus Base Maintenance Building

A motion was made by Director Davies, seconded by Director Do, and declared passed by those present, to authorize the Chief Executive Officer to negotiate and execute Contract Change Order No. 3 to Agreement No. C-6-1399 with Western Air Conditioning Company, Inc., in an amount of \$85,678, for the installation of new equipment curb foundations to support the new heating and ventilation units, and to add 48 calendar days to the contract duration.

Director Pulido was not present to vote on this item.

5. Agreement for Fullerton Park and Ride Minor Rehabilitation

A motion was made by Director Davies, seconded by Director Do, and declared passed by those present, to:

- A. Find Calpromax Engineering, Inc., the apparent low bidder, as non-responsive, due to failure to meet the federal requirement for Disadvantaged Business Enterprise participation.

5. (Continued)

- B. Authorize the Chief Executive Officer to negotiate and execute Agreement No. C-7-2066 between the Orange County Transportation Authority and RSB Group, Inc., the lowest responsive, responsible bidder, in the amount of \$854,000, for the Fullerton Park and Ride minor rehabilitation.

Director Pulido was not present to vote on this item.

6. Enhanced Mobility for Seniors and Disabled Grant Program Call for Projects

A motion was made by Director Davies, seconded by Director Do, and declared passed by those present, to direct staff to issue a call for projects for the Orange County Enhanced Mobility for Seniors and Disabled Grant Program.

Director Pulido was not present to vote this item.

7. Low Carbon Transit Operations Program Recommendations for Fiscal Year 2017-18 Funds

A motion was made by Director Davies, seconded by Director Do, and declared passed by those present, to:

- A. Approve the use of \$4,787,534 in fiscal year 2017-18 Low Carbon Transit Operations Program funding for Bravo! 529 Rapid Bus Service start-up and operations for the first three years.
- B. Approve Resolution 2018-022, consistent with the Low Carbon Transit Operations Program Guidelines.
- C. Authorize staff to make all necessary amendments to the Federal Transportation Improvement Program, as well as execute any necessary agreements to facilitate the above recommendations.

Director Pulido was not present to vote on this item.

Regular Calendar

8. OC Streetcar Project Update

Jim Beil, Executive Director of Capital Programs, reported on the following:

- Attachment A of the Staff Report was shown on the screen as a reference to the construction and vehicle manufacturing contracts timelines.
- Construction bids will be open on April 27th, and the construction contract award recommendation will be brought to the Board of Directors' meeting on June 25th.
- The proposed pricing vehicle contract will expire on June 4th and the costs could increase.
- Delayed vehicle production could result in costly delays to the construction contract.
- On April 13th, the Orange County Transportation Authority (OCTA) will be accessing the Full Funding Grant Agreement to determine if the bid opening will take place on April 27th.
- The right-of-way (ROW) acquisition for the maintenance storage facility has been challenging and the City of Santa Ana is taking the lead and partnering with OCTA to take possession of the properties.

A discussion ensued regarding:

- OCTA is delighted with the momentum and progress on the project.
- The importance to keep the vehicle and construction contract on schedule.
- Committee Chairman Murray expressed his appreciation to staff for their efforts on the OC Streetcar Project.
- The possible risks of delaying ROW and how it could impact OCTA financially.

Following the discussion, no action was taken on this receive and file information item.

9. Approval to Award Contract for Manufacturing and Delivery of Vehicles for the OC Streetcar Project

Darrell E. Johnson, Chief Executive Officer (CEO), provided opening comments and introduced Kelly Hart, Project Manager of Rail Programs and Facilities Engineering.

9. (Continued)

Ms. Hart introduced Mary Shavalier, Program Manager of Transit Extension, Lydia Bilynsky, Section Manager III of Capital Projects Team, and provided a PowerPoint presentation for this item as follows:

- Background;
- Vehicle Contract Scope;
- Vehicle Requirements;
- Vehicle Procurement;
- Evaluation Process;
- Evaluation Score – Best and Final Offer (BAFO) Results;
- Cost and Price Comparison – BAFO;
- Proposed Vehicle;
- S70 Vehicle Access;
- 70 Percent Low Floor Vehicle;
- Vehicle and Station Branding;
- Branding Process; and
- Recommendations.

A discussion ensued regarding:

- Whether or not there would be environmental changes in the future that would impact OCTA purchasing the eight streetcar vehicles.
- All door boarding on the streetcars, how the fares are purchased, and how the fares would be monitored onboard (the setup would be similar to Metrolink's system).
- Low floor access and the streetcars being able to accommodate four wheelchairs onboard.
- The option to purchase ten additional streetcar vehicles would need to be decided within the seven years of the contract.
- Positive feedback on the type of vehicles that OCTA will be purchasing for the OC Streetcar project, the next steps on Harbor Boulevard, and how seven years is a good time period for the contract.
- Compliments to OCTA's staff on the procurement and firm selection process.

A motion was made by Director Pulido, seconded by Director Jones, and declared passed by those present, to:

- A. Approve the selection of Siemens Industries, Inc., as the firm to provide eight streetcar vehicles contingent upon successful completion of a pre-award audit to confirm compliance with federal Buy America requirements.

9. (Continued)

- B. Authorize the Chief Executive Officer to negotiate and execute Agreement No. C-6-1445 between the Orange County Transportation Authority and Siemens Industries, Inc., in the amount of \$51,527,520, for the purchase of eight streetcar vehicles, spare parts, and tools, with an option to purchase up to ten additional streetcar vehicles and spare parts.

10. Transit Division Performance Measurements Report for the Second Quarter of Fiscal Year 2017-18

Johnny Dunning, Jr., Manager of Scheduling and Customer Advocacy, provided a PowerPoint presentation for this item as follows:

- Performance Measurements;
- Safety;
- Courtesy;
- Reliability – On Time Performance;
- Reliability – Miles Between Road Calls;
- Fixed-Route-Ridership and Productivity;
- ACCESS-Ridership and Productivity;
- Farebox Recovery Ratio;
- Cost per Revenue Vehicle Hour;
- Performance: Local Routes;
- Performance: Community Routes;
- Performance: Express/Stationlink Routes;
- Transit Performance and OC Bus 360°;
- Performance: System-wide Trends;
- Performance: OC Bus 360° Improvements;
- Performance: OC Bus 360° Reductions; and
- Next Steps.

A discussion ensued regarding:

- The causes of road calls on fixed-route buses are due to a coolant sensor failures.
- Cliff Thorne, Director of Maintenance, addressed the issues with the new buses and explained how the Maintenance department is working through the problems.
- The Maintenance department provides a weekly report to Darrell E. Johnson, CEO, on the details of the fleet.
- The goals of route restructuring and the results from it. Staff will continue to report on its findings.

10. (Continued)

- The three routes discontinued were: the 216 (San Juan Capistrano to Costa Mesa express), 212 (Irvine to San Juan Capistrano express), and the 454 (at the Orange Metrolink station).
- Director Do requested to make on-time performance (OTP), on a route and regional level, available online in an Excel format.
- An entire quarter is spent to prepare the quarterly reports.
- Director Davies requested the OTP by time slots during the day.
- When the reporting structure is changed, it is a challenge to compare to the previous quarter.

Following the discussion, no action was taken on this receive and file as information item.

11. Agreement for the Operation and Maintenance of a Micro-Transit Pilot Program

Darrell E. Johnson, CEO, provided opening comments and introduced Curt Burlingame, Department Manager of Contract Transportation Services.

Mr. Burlingame provided a PowerPoint presentation for this item as follows:

- What is Micro-Transit and Where Could it Work;
- OCTA Micro-Transit – Not a Transportation Network Company;
- Pilot Goals;
- Huntington Beach;
- Aliso Viejo/Laguna Niguel/Mission Viejo;
- Service Levels and Pricing;
- OC Flex;
- Procurement Process;
- Proposing Firms;
- Keolis Proposal; and
- Next Steps.

A discussion ensued regarding:

- Several Directors attended the Mayor's Forum in Huntington Beach, where this program was presented. It was well received and many mayors are looking forward to having a pilot program.
- Cities of Huntington Beach, Aliso Viejo, Laguna Niguel, and Mission Viejo will be a part of the pilot program.
- Committee Chairman Murray expressed his support and excitement for Micro-Transit Pilot Program.

11. (Continued)

- A verbal report will be provided to the Transit Committee monthly (by July) and a written report will be provided once the program makes its two to three month timeline.
- Examples of transit agencies having a similar program are Los Angeles County Metropolitan Transportation Authority and the larger metropolitan areas of Texas.
- Director Davies thanked OCTA for this service especially when there has been low ridership in Aliso Viejo, Laguna Niguel, and Mission Viejo.
- Once the program gets closer to implementation, OCTA will focus on communication around the service/fare policy and the feedback from the passengers.

A motion was made by Committee Chairman Murray, seconded by Director Winterbottom, and declared passed by those present, to by those present to:

- A. Approve the selection of Keolis Transit Services, LLC, as the firm to provide operation and maintenance services for the micro-transit pilot program.
- B. Authorize the Chief Executive Officer to negotiate and execute Agreement No. C-7-2052 between the Orange County Transportation Authority and Keolis Transit Services, LLC, in the amount of \$1,150,000, for a one-year initial term from July 1, 2018 through June 30, 2019, with two, one-year option terms to provide operation and maintenance services for the micro-transit pilot program.

Discussion Items

12. Chief Executive Officer's Report

Darrell E. Johnson, CEO, reported on the following:

- As of last week, mobile ticketing has been fully implemented and 46,000 individual accounts have been established. Out of the 130,000 daily riders, 106,000 tickets were sold. A full report on the status of mobilize ticketing will be presented to the Transit Committee.

12. (Continued)

- The Interstate 405 Improvement Project started construction Tuesday night. Closures are happening intermittently between Seal Beach Boulevard and Magnolia Street in Fountain Valley. The closure will start as early as 9:00 p.m. and expected to be finished by 5:00 a.m. on weekdays and 7:00 a.m. on weekends. This construction will continue over the next few months to include restriping portions of the freeway and setting up concrete barriers. More significant construction will start in the later part of the summer. For more information in real-time, visit an interactive map at octa.net/405map.

13. Committee Members' Reports

Director Winterbottom reported on a conversation with Darrell E. Johnson, CEO, about his longevity as a Board Member and how he will be approving the purchase of light rail vehicles for the first time.

Director Davies requested that the Micro-Transit Pilot Program PowerPoint be presented to all the cities that will be a part of the pilot program.

Committee Chairman Murray commended Director Do for the ribbon cutting ceremony at the new Orange County Animal Care Center in Tustin and Director Do invited everyone to take a tour of the new facility.

14. Closed Session

There were no Closed Session items scheduled.

15. Adjournment

The meeting was adjourned at 10:13 a.m. in recognition of March 8, 2018 International Women's Day.

The next regularly scheduled meeting of this Committee will be held at **9:00 a.m. on Thursday, April 12, 2018**, at the Orange County Transportation Authority Headquarters, 550 South Main Street, Board Room - Conference Room 07, Orange, California.

ATTEST

Al Murray
Committee Chairman

Sahara Meisenheimer
Deputy Clerk of the Board



April 12, 2018

To: Transit Committee

From: Darrell E. Johnson, Chief Executive Officer

Subject: Agreement for the Construction of the Right-of-Way Slope Stabilization Project

Overview

The Orange County Transportation Authority's Board of Directors approved the construction of the right-of-way slope stabilization project as part of the Orange County Transportation Authority's Fiscal Year 2017-18 Budget. Bids were received in accordance with the Orange County Transportation Authority's public works procurement procedures. Board of Directors' approval is requested to execute an agreement with the lowest responsive, responsible bidder.

Recommendations

- A. Find James McMinn, Inc., the apparent low bidder, as non-responsive due to failure to meet the federal requirement for Disadvantaged Business Enterprise participation.
- B. Authorize the Chief Executive Officer to negotiate and execute Agreement No. C-7-2047 between the Orange County Transportation Authority and Bosco Constructors, Inc., the lowest responsive, responsible bidder, in the amount of \$1,735,600, for construction of the right-of-way slope stabilization project.

Discussion

The Orange County Transportation Authority (OCTA) received a Federal Transit Administration (FTA) grant for preventative maintenance and to repair existing erosion to avoid slope failures on the OCTA-owned railroad right-of-way. OCTA, in conjunction with the Southern California Regional Rail Authority (SCRRA), performed field investigations that identified eight sites currently affected by erosion and/or runoff, which require repair and stabilization to mitigate potential impacts to rail operations. The sites are located in the cities of Irvine, Laguna Hills, Lake Forest, Mission Viejo, and San Juan Capistrano, and

contain nearly-vertical embankments that range in length from approximately 600 to 3,150 linear feet.

In May 2013, a contract task order was issued to perform a geotechnical evaluation that included potential mitigation recommendations for each of the selected sites. Those recommendations are site-specific and include mitigation alternatives such as grading, installation of additional rip-rap, construction of retaining walls, and shotcrete lining. The evaluation also concluded that delayed maintenance could potentially impact railroad operations by undermining the track bed and/or depositing soil and debris on the railroad tracks.

Final plans, specifications, and design were completed in September 2017. Based on project design and track work involved at four of the sites, it was determined that SCRRA would be best suited to lead the construction effort on those sites; this is consistent with prior practices. OCTA will be the project lead for the remaining locations outside of the operating area.

Procurement Approach

This procurement was handled in accordance with OCTA's Board of Directors (Board)-approved procedures for public works projects. These procedures, which conform to both state and federal requirements, require that contracts are awarded to the lowest responsive, responsible bidder after a sealed bidding process.

On December 11, 2017, the Board authorized the release of Invitation for Bids (IFB) 7-2047, which was issued electronically on CAMM NET. The project was advertised on December 11 and 18, 2017, in a newspaper of general circulation. A pre-bid conference and job-walk were held on December 19, 2017, and were attended by five firms. Four addenda were issued to provide the pre-bid conference registration sheets and handle administrative issues related to the IFB. On January 25, 2018, six bids were received and publicly opened.

All bids were reviewed by staff from both the Contracts Administration and Materials Management and Rail Programs departments to ensure compliance with the contract terms and conditions, and technical specifications. The list of bidders and bid amounts is presented below:

<u>Firm and Location</u>	<u>Bid Amount</u>
James McMinn, Inc. Grand Terrace, California	\$1,644,325
Bosco Constructors, Inc. Chatsworth, California	\$1,735,600

Philbin Construction Company dba Philbin General Engineering Laguna Niguel, California	\$2,034,000
Zusser Company, Inc. Los Angeles, California	\$2,541,484
Earth Construction and Mining Co. Garden Grove, California	\$2,954,900
Environmental Construction, Inc. Woodland Hills, California	\$4,734,239

The apparent low bidder, James McMinn, Inc., was found non-responsive due to the inability to secure the required Disadvantaged Business Enterprise participation or demonstrate sufficient good faith efforts as required by the United States Department of Transportation regulations, which is providing funding for the project.

The engineer's estimate for the project was \$1,873,437. The recommended firm's bid is 7.4 percent below the engineer's estimate and is considered by staff to be fair and reasonable.

State law requires award to the lowest responsive, responsible bidder. As such, staff recommends award to Bosco Constructors, Inc., as the lowest responsive, responsible bidder, in the amount of \$1,735,600, for the project.

Fiscal Impact

The project is included in OCTA's Fiscal Year 2017-18 Budget, Capital Programs Division, Account 0018-9084-C5052-0NC, and is funded with an FTA grant.

Summary

Based on the information provided, staff recommends the Board of Directors authorize the Chief Executive Officer to negotiate and execute Agreement No. C-7-2047 between the Orange County Transportation Authority and Bosco Constructors, Inc., the lowest responsive, responsible bidder, in the amount of \$1,735,600, for construction of the right-of-way slope stabilization project.

Attachment

None.

Prepared by:



Gerald Ray Smith Jr.
Sr. Rail Maintenance Right-of-Way
Administrator
(714) 560-5966

Approved by:



James G. Beil, P.E.
Executive Director, Capital Programs
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April 12, 2018

To: Transit Committee

From: Darrell E. Johnson, Chief Executive Officer

Subject: Award of Agreement for Three-Position Bicycle Racks for 40-Foot Buses

Overview

The Orange County Transportation Authority operates a fixed-route fleet of 484 40-foot compressed natural gas-powered buses. Approval is requested to execute an agreement for hardware and installation of up to 484, three-position bicycle racks on the buses in the fleet.

Recommendations

- A. Approve the selection of Complete Coach Works to provide hardware and installation of up to 484, three-position bicycle racks, with the option to purchase up to 73 additional units as needed.
- B. Authorize the Chief Executive Officer to negotiate and execute Agreement No. C-7-2136 between the Orange County Transportation Authority and Complete Coach Works in the amount of \$745,592, for the purchase and installation of up to 484, three-position bicycle racks, with an option to purchase 73 additional units as needed.

Discussion

Orange County Transportation Authority (OCTA)'s bus system offers 65 routes and over 5,500 bus stops to provide service throughout Orange County and into neighboring counties. The buses operating in the system currently have two-position bicycle racks; the purchase and installation of three-position bicycle racks will increase the capacity for bicycle riders on the existing 40-foot fleet by 50 percent.

OCTA will procure and gradually install three-position bicycle racks on all 40-foot buses in the active fleet. Installation on 60-foot vehicles and cutaway buses is still under evaluation and may be undertaken in the future. OCTA buses are

currently equipped with two-position bicycle racks; buses leave bicyclists at stops when the bicycle racks are full. The higher-capacity racks will reduce the number of times a bicyclist will be left behind and could conceivably make the system more attractive to bicyclists. Up to 484 three-position bicycle racks will be purchased and installed on the 40-foot buses. The agreement will have an option for 73 additional units intended to accommodate additional vehicles or to replace units damaged beyond repair.

OCTA tested two different three-position bicycle racks and conducted surveys seeking operator and customer feedback on the two models. The majority of the feedback received was positive, with coach operators and passengers citing the increased bicycle capacity as a well-liked feature. Additionally, the three-position bicycle racks were presented to the Customer Advocacy Committee Ped/Bike Subcommittee and were well received; staff was encouraged to continue with fleet-wide installation.

Procurement Approach

This procurement was handled in accordance with OCTA Board of Directors (Board)-approved procedures for materials and equipment greater than \$50,000. These procedures, which conform to both federal and state requirements, are used when minimum requirements can be clearly specified and, therefore, the lowest price is the only criterion for choosing among the bidders who are responsive and responsible after a sealed bid process.

On January 10, 2018, Invitation for Bids (IFB) 7-2136 was issued electronically through CAMM NET and was advertised in a newspaper of general circulation. Bidders were provided clarifications of IFB requirements and other administrative issues through four posted addenda on January 18, February 7, 13, and 20, 2018. On February 22, 2018, two sealed bids were received and publicly opened, with one firm in attendance.

Both bids were reviewed by staff from the Contracts Administration and Materials Management Department and the Maintenance Department to ensure compliance with the contract terms, legal requirements, and technical specifications. The list of bidders and bid amounts is presented below in alphabetical order:

<u>Firm and Location</u>	<u>Bid Amount</u>
Complete Coach Works Riverside, California	\$745,592
Midwest Bus Corporation Owosso, Michigan	\$763,857

The project manager's estimate for this project was \$765,980. The recommended bid of \$745,592 is 2.7 percent below the project manager's estimate.

The IFB requires award to the lowest responsive, responsible bidder. As such, staff recommends award to Complete Coach Works for the purchase and installation of 484 three-position bicycle racks. The total bid amount includes installation, a two-year base warranty, and sales tax.

Fiscal Impact

Funding for the procurement of the three-position bicycle rack project has been obtained through the Caltrans Low Carbon Transit Operation Program, Project ID, 16-17-D12-128, Capital Purchase/Install Vehicle Improvements.

Summary

Based on the information provided, staff recommends the Board authorize the Chief Executive Officer to negotiate and execute Agreement No. C-7-2136 between OCTA and Complete Coach Works, the lowest responsive and responsible bidder, in the amount of \$745,592, for the purchase and installation of up to 484, three-position bicycle racks, with an option to purchase 73 additional units as needed.

Attachment

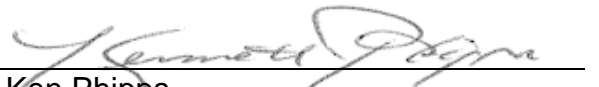
None.

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April 12, 2018

To: Transit Committee
From: Darrell E. Johnson, Chief Executive Officer
Subject: OC Bus 360° Update

Overview

The Orange County Transportation Authority is implementing a comprehensive effort to reconfigure transit services in response to changing market conditions. The goals are to address ridership declines by improving passenger travel times, and designing services to retain existing customers and attract new customers. A status report on major OC Bus 360° elements is presented for review.

Recommendation

Receive and file as an information item.

Background

To address continuing bus ridership declines, in 2015, the Board of Directors (Board) endorsed a comprehensive action plan (Plan), known as OC Bus 360°. This effort included a comprehensive review of current and former rider perceptions, a peer review panel that reviewed the Orange County Transportation Authority's (OCTA) performance and plans, new branding and marketing tactics tied to rider needs, upgraded bus routes and services to better match demand and capacity, technology changes to improve passenger experience, and pricing and other revenue changes to stimulate ridership and provide new funding.

Extensive work was invested by OCTA divisions to implement the Plan. This work included: (1) implementation of new and faster bus routes; (2) redeployment of services in June and October 2016, and June and October 2017, to improve efficiencies and build ridership; (3) competitively-awarded grants to local agencies for transit services tailored to community needs; (4) a promotional fare; (5) rollout of new technologies, such as mobile ticketing and real-time bus arrival information; and (6) extensive marketing, public outreach, and promotional campaigns (Attachment A).

Discussion**National and Regional Ridership**

Nationwide, bus ridership is down 4.9 percent, comparing the third quarter calendar year 2017 to 2016. Regionally, ridership is also down on large Southern California bus systems operated by Long Beach Transit, Los Angeles County Metropolitan Transportation Authority, North County Transit District (San Diego), Omnitrans (San Bernardino), Riverside Transit, and others (Attachment B).

The Southern California Association of Governments (SCAG) and the Institute for Transportation Studies at the University of California Los Angeles (UCLA) recently completed a study of major factors impacting regional ridership. UCLA released findings in January 2018 that indicate an increase in vehicle ownership, particularly among those most likely to take transit, is a key factor contributing to the decline. Low fuel prices and the rise of transportation network companies (TNC), such as Uber and Lyft, have also been suggested as potential causes, but UCLA's research suggests weaker correlations with these factors. The SCAG/UCLA report will be presented as a separate item.

OC Bus 360° Ridership Changes

Despite regional and national trends, OC Bus 360° efforts are showing positive signs, especially considering the impacts of external factors. OCTA ridership declined by 3.7 percent comparing the third quarter of 2017 to 2016, but ridership on routes that were improved in October 2016 increased by 12.8 percent (comparing average weekday ridership February 2018 to February 2017). Monitoring these changes is critical to continuing success, and recent changes to the quarterly Transit Division Performance Measurements Report include additional monitoring methods and data.

Service Improvements

Keeping pace with external factors impacting ridership presents new challenges. For OCTA, ridership and fare revenue declines underscore the need for implementation of strategies to improve productivity and reduce costs. Improving productivity (boardings/revenue vehicle hour {B/RVH}) is now a key goal as part of OC Bus 360°. For example, between 2013 and 2017, B/RVH declined 22 percent.

The February 2018 bus service change, approved by the Board in October 2017, implemented major changes to improve productivity (Attachment C). Combined with prior bus service changes in fiscal year 2017-18, resources for traditional fixed-route bus service will decline by approximately 11,000 RVH that can be used to grow service in other markets through on-demand and other potential transit services.

On-Demand Transit and OC Flex

OCTA is seeking to gain greater experience working with technology companies to test on-demand software systems and transit service. These technology options allow users to obtain point-to-point rides through smart phone apps integrated with payment systems and service providers. While TNC may be part of future efforts, the Federal Transit Administration (FTA) has raised concerns with transit operators and TNCs in certain circumstances. The FTA's concerns relate to meeting specific requirements included in the Americans with Disabilities Act and other federal laws (Attachment D).

OCTA is pursuing two on-demand transit demonstration projects, known as OC Flex, to respond to the issues raised by the FTA. These demonstration projects will gather lessons learned for a future point-to-point element of the transit system. Transaction-level data collection will be a critical part of the project to evaluate performance, verify costs, and ensure that the system is scalable and secure.

The OCTA Board awarded a contract to a service provider on March 26 and is currently procuring vehicles for the OC Flex demonstration service. Service is anticipated to begin in summer 2018.

Other Technology Innovations

During the February 2018 bus service change, OCTA launched the use of electronic readers for mobile ticketing validation. Instead of riders visually validating their OC Bus mobile tickets to a coach operator, they will now be able to present a quick response code within their mobile ticket to an electronic reader located near the farebox. This eliminates the need for coach operators to visually inspect each mobile ticket that is presented to them during the boarding process.

With the electronic readers in place, OCTA will now look into future projects to integrate other types of fare media that can be validated on the fixed-route system.

Project V Services

Project V is a competitive program under Measure M2 for jurisdictions to develop local bus transit services, such as community-based circulators and shuttles that complement regional bus and rail services, and meet needs in areas not adequately served by regional transit. Numerous projects and services are being planned and implemented by local agencies. These include vanpool services from local employment centers to transportation hubs, special event and seasonal services that operate during heavy traffic periods, and local community circulators that carry passengers between various shopping, medical, and transportation-related centers. While some services have been cancelled due to low usage, other services are performing above the minimum performance standard.

Thirteen local agencies expressed interest in a Project V call for projects (call), with an emphasis on special event services. Given this interest, the Board authorized a \$12 million Project V call on February 12, 2018. Applications from local agencies were due on March 23, 2018, and programming recommendations are expected to be presented for Board review in June 2018.

New College Pass Program and Ongoing Promotions

Several strategic marketing programs have proven effective in attracting new riders and increasing ridership. In September 2017, OCTA launched the new three-year Santa Ana College Pilot Pass Program, which allows 49,000 students to ride free for the first year with funding from a Low Carbon Transit Operations Program grant. During the remaining two years, costs are covered by a low semester fee paid by the students. As of February 2018, 5,509 students have used the pass, generating 573,187 boardings, and contributing a ridership increase of approximately eight percent to the adjacent routes. According to a recent student pass user survey, 14 percent of the students who used the new pass have never ridden the bus before, and 77 percent who used the bus before are now riding more often with the new pass.

Since June 2016, OCTA has implemented “Ride the OC Bus” campaigns through online and traditional media to create awareness, enhance perception, and encourage trial usage. The campaigns target commuters, students, and recreational riders primarily in the core service area, which contains the most improved routes. To date, more than 25,000 people have responded to the campaigns’ calls to action; and more than half had not ridden the OC Bus in the past six months. Through email campaigns, 10,300 new riders indicated that they continue to ride OC Bus.

Summary

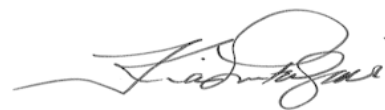
Elements of the OC Bus 360° Plan are proving successful, and new strategies are being pursued to improve productivity. These new strategies include fixed-route changes, new local services, testing new technologies, on-demand transit, and informing the public about these new efforts. A Project V call is also underway with programming recommendations for Board consideration in June 2018.

Attachments

- A. OC Bus 360 Update
- B. National, State, and Regional Transit Operator Ridership Trends
- C. February 2018 OC Bus Service Change
- D. Letter from Anthony R. Foxx, Secretary of Transportation, U.S. Department of Transportation, Dated December 5, 2016

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OC BUS 360 UPDATE

3/22/18

RIDERSHIP



↑ **12.8%**

increase in OC Bus average weekday
ridership on improved routes
(Feb 2018 vs Feb 2017)

↓ **4.9%**

decrease in nationwide
ridership (Q3 2017 vs 2016)

↓ **3.7%**

decrease in OC Bus
ridership (Q3 2017 vs 2016)

REAL-TIME BUS APPS



Approximately

1,100,000

app sessions
per month

MOBILE TICKETING APP



87,280

downloads
(Jun 2016 - Feb 2018)

7%

• Total fare revenue
• Double industry average

335

new app users per
week on average

MARKETING



25,200

OC residents responded to
bus marketing campaigns
(Jun 2016 - Feb 2018)

10,300

new prospects continue
to ride the bus
(Jun 2016 - Feb 2018)

Sep 2017 - Feb 2018

**PILOT COLLEGE
PASS PROGRAM**

Every student can ride
with a student I.D.

5,509 = 573,187

students used the pass

boardings



BRAVO! 560



57%

say travel time
improved by
15 minutes or more

32%

new riders
(riding less
than a year)

NATIONAL, STATE, AND REGIONAL TRANSIT OPERATOR RIDERSHIP TRENDS

All Modes: United States and Canada	Q3 2017 versus 2016
Heavy Rail	↓ -3.05 percent
Light Rail	↓ -1.90 percent
Commuter Rail	↓ -1.33 percent
Trolleybus	↓ -1.89 percent
Bus: Population Total	↓ -4.89 percent*
Bus: Population 2,000,000+	↓ -5.15 percent
Bus: Population 500,000 to 1,999,999	↓ -4.54 percent
Bus: Population 100,000 to 499,999	↓ -4.75 percent
Bus: Population Below 100,000	↓ -1.68 percent
Demand Response	↓ -1.05 percent
Other	↑ 0.13 percent
United States Total	↓ -3.65 percent
Canada Total	↑ 2.44 percent

Bus: California Large Agencies	Q3 2017 versus 2016
Long Beach Transit	↓ -9.81 percent
Los Angeles County Metropolitan Transportation Authority (LA Metro)	↓ -5.01 percent
Alameda-Contra Costa Transit District	↓ -1.37 percent
Orange County Transportation Authority	↓ -3.74 percent*
San Diego Metropolitan Transit System (MTS)	↓ -5.74 percent
San Francisco Muni	↑ 0.76 percent
Santa Clara Valley Transportation Authority	↓ -4.77 percent
Santa Monica Big Blue Bus	↓ -2.86 percent

Bus: Other Local Connecting Agencies	Q3 2017 versus 2016
Anaheim Resort Transit	Not Reported
City of Irvine (iShuttle)	Not Reported
Norwalk Transit	Not Reported
North County Transit District (NCTD)	↓ -8.08 percent
Riverside Transit	↓ -6.39 percent
Omnitrans (San Bernardino)	↓ -5.11 percent
Foothill Transit (San Gabriel Valley)	↓ -12.18 percent

Commuter Rail: Southern California	Q3 2017 versus 2016
Metrolink	↓ -2.75 percent
North County Transit District Coaster	↓ -4.83 percent

Light/Heavy Rail: Southern California	Q3 2017 versus 2016
LA Metro Heavy Rail	↓ 4.45 percent
LA Metro Light Rail	↑ 0.04 percent
NCTD Light Rail	↑ 1.63 percent
San Diego MTS Light Rail	↓ 1.82 percent

Source: American Public Transportation Association Ridership Report: Third Quarter 2017
<http://www.apta.com/resources/statistics/Pages/ridershipreport.aspx>

*Referenced in staff report

February 2018 OC Bus Service Change

The OC Bus February 2018 service change improved evening, weekday and weekend service on several routes and reduced service on others with low demand. In addition, service on some Stationlink and express routes was reduced or eliminated due to low ridership. Services and resources will be reallocated to high-demand areas to reduce travel times and serve more people. This service change was implemented on February 4, 2018.

Service improvements include:

- Improve weekday peak frequencies to 30 minutes on routes 56, 89, 90, and 91
- Improve weekday evening frequencies on routes 29, 50, 53, and 60
- Improve weekend frequencies on routes 29, 43, 50, 53, 54, 60, and 91
- Extend weekend evening service span on Route 46
- Extend Route 59 to The District at Tustin Legacy and improve frequency on weekends

Service reductions include:

- Eliminate bus trips with less than eight boardings in the morning or late evening on routes 30, 46, 50, 86, 89, 90, 153, and 178
- Reduce peak frequencies on routes 57, 178, and 543
- Reduce midday frequencies on routes 54, 66, and 543
- Reduce weekend frequencies on routes 29, 43, 64, and 543
- Reduce Saturday frequency on Route 70
- Restructure Stationlink Route 463 and eliminate Stationlink Route 454
- Eliminate Express routes 212 and 216
- Reduce trips on Express routes 211 and 721
- Eliminate Sunday service on Route 177
- Reduce or eliminate service on some lower-ridership segments of routes 463 and 794

Route by route details can be found at:

<http://www.octa.net/Bus/February-2018-Bus-Service-Plan/>



THE SECRETARY OF TRANSPORTATION
WASHINGTON, DC 20590

December 5, 2016

Dear Colleague:

The U.S. Department of Transportation encourages innovation and welcomes the interest of Transportation Network Companies (TNCs) and other private entities in meeting the travel needs of riders through partnerships with transit agencies. I applaud the transit industry for embracing the use of innovations in technology and new mobility concepts to create a more traveler-centric mobility environment that empowers travelers to make smart mobility decisions that address their individual needs, while contributing to desirable system outcomes. With that in mind, I am writing to remind you of your obligation to ensure equity and access as you partner with TNCs and continue to develop relationships with other private entities that offer the potential to provide improved service at a lower cost.

At the Department, we believe it is important to balance technological innovation with the basic civil rights principles of equity and accessibility inherent in the provision of transit service. There are basic Federal requirements that apply to transit service, including partnerships with TNCs and service operated under contract or other arrangement or relationship with private entities. Some of these are conditions of eligibility for Federal assistance (Title VI of the Civil Rights Act of 1964), while others apply independently regardless of whether Federal funding is involved (the Americans with Disabilities Act (ADA) of 1990).

For example, TNC services typically rely almost exclusively on the use of a smartphone linked to a credit or debit card to arrange for service, which presents a significant barrier to lower income and limited English proficiency individuals who do not own a smartphone and/or who do not have a credit card or bank account. Given that communities of color are disproportionately low-income, each public transit agency has an obligation under Title VI to ensure that alternative methods of both payment and reservations are available. Most TNCs currently lack accessible vehicles for persons with disabilities, including those who use wheelchairs. When your agency enters into a covered partnership with a TNC, however, you must ensure that your service is accessible to and usable by persons along the full spectrum of disabilities, including both physical and intellectual disabilities.

Unlike many other requirements, the transportation requirements under the ADA apply regardless of whether Federal funding is involved. The specific provisions of the Department's ADA regulations vary according to type of service provided, such as whether it is fixed route or demand-responsive. Currently the majority of partnerships with TNCs involve demand-responsive service. As such, you should be aware of two important points.

First, under DOT ADA Regulations (49 C.F.R. section 37.77), public entities operating a demand-responsive service must either acquire accessible vehicles or otherwise ensure that such services provide equivalent service to persons with disabilities, including those who use wheelchairs and/or have intellectual disabilities.

The need for your transit agency to provide wheelchair-accessible vehicles could be met in a number of ways, such as requiring the TNC to provide a sufficient quantity of vehicles as a condition of entering into an agreement with the transit agency; entering into a separate agreement with another entity that is capable of providing accessible vehicles; or relying on accessible vehicles that are already part of the paratransit fleet.

Second, service is considered equivalent when persons with disabilities, including wheelchair users, are provided with the same level of service according to the following criteria (see 49 C.F.R. section 37.77(c)):

- 1) Response time;
- 2) Fares;
- 3) Geographic area of service;
- 4) Hours and days of service;
- 5) Restrictions or priorities based on trip purpose;
- 6) Availability of information and reservations capability; and
- 7) Any constraints on capacity or service availability.

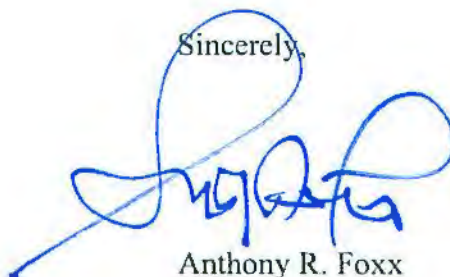
Some transit agencies have explored integrating TNCs into their paratransit service. The Department believes that TNCs have the potential to improve the provision of paratransit service, with the possibility of lowering costs while improving service to paratransit-eligible riders. Yet, it is important to emphasize that any such service improvements must benefit all paratransit riders. It would not be appropriate, for example, to offer real-time service to ambulatory paratransit riders, while leaving wheelchair users with next-day service.

Finally, it is important to ensure that TNC personnel are highly trained in professional and respectful interactions with persons with disabilities. All personnel should be familiar with requirements concerning the accommodation of service animals, for example, and personnel operating accessible vehicles must know how to operate boarding and securement equipment. Where TNCs are used to provide paratransit service, personnel should be familiar with the paratransit service criteria and the requirement to provide origin-to-destination service.

As long as all passengers are receiving service according to the service criteria or in the same manner, there is nothing to prevent transit agencies from engaging the services of TNCs—including for provision of paratransit services.

Once again, I commend the transit industry for embracing technology and innovation as a means to expand and improve the provision of transit services. As we embark on a new era in personal mobility, together we will ensure that our transportation system continues to provide effective mobility for all.

Sincerely,

A handwritten signature in blue ink, appearing to read "Anthony R. Foxx", with a large loop at the end of the signature.

Anthony R. Foxx

Orange County Transportation Authority Innovation Update

Topics

- What OCTA is Doing
 - Transit Technology Improvements
 - Mobile Applications
- What the Industry is Doing
 - Mobility as a Service
 - Autonomous and Connected Vehicles
- A look Ahead



Transit Technology

- Mobile Ticketing
 - 560 readers
 - 48,000 accounts
 - 615,000 purchases
- Automatic Vehicle Location
- Automated Passenger Counting
- Analytics



Mobile Application Rideshare

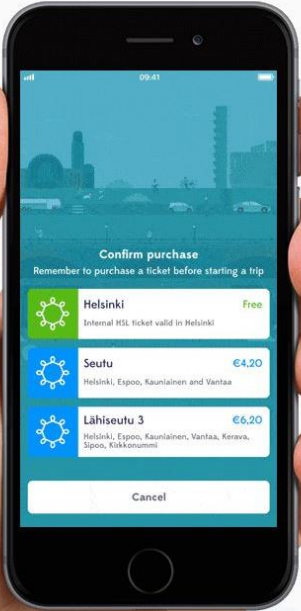
- Transit Network Companies
 - Uber 5.5 million rides per day
 - Lyft 1 million rides per day
 - San Clemente Pilot
- Dynamic Carpooling
 - Waze Carpool - Irvine Pilot
- Microtransit
 - OC Flex Pilot



Mobility As a Service

- Trip planning and payment across all shared modes of public and private transportation
 - Whim – Helsinki, Finland
 - Transdev – Babcock Ranch, Florida
 - moovel – Germany

Whim covers all your journeys



How it works

- Public transport
- Taxi
- Car
- Journey planner

- 1 Choose how you want to travel
- 2 Grab a ticket
- 3 You're ready to go!

Autonomous and Connected Vehicles

- 2020
 - Auto manufacturers claim they will have fully-automated vehicles (Level 5 AVs) commercially available
- 2030
 - Conservative estimates for AV adoption show a 10 to 20 percent market penetration, with AVs accounting for 10 to 30 percent of vehicle miles travelled
- 2050
 - Conservative estimates for AV adoption forecast 90 percent market penetration



Autonomous and Connected Vehicles

- U.S. DOT Autonomous Vehicle Proving Ground Program
 - San Diego
 - SANDAG partnered with the City of Chula Vista and Caltrans
 - Contra Costa County
 - GoMentum Station
- CA DMV
 - Approved regulations to allow for driverless testing. Trucks pending
- Shared fleet versus private car-ownership
 - Significant impacts to congestion, good or bad depending
 - Policy intervention will be needed to avoid an increase in total vehicle miles travelled



Shared Autonomous Vehicles

- Easymile
 - Bishop Ranch, San Ramon CA
 - First driverless bus approved to run on public roads in California, 3/6/18
- Navya
 - Las Vegas, NV



A Look Ahead

- Augmented Reality
 - Travel-demand mitigation tool by reducing the need for travel to physical locations
- Hyperloop
 - Routes have been proposed across the globe, including one between San Diego and Los Angeles that would take less than 13 minutes
- Delivery Robots
 - Starship and Marble have developed prototypes, and some have been released on San Francisco streets
- Drones and Flying Cars
 - Amazon, Uber, and Porsche have taken interest



A Look Ahead



EHANG 184 Autonomous Aerial Vehicle



Max weight 220 pounds
Flight time 30 minutes
Max distance 31 miles
Max speed 62 mph

