Memo

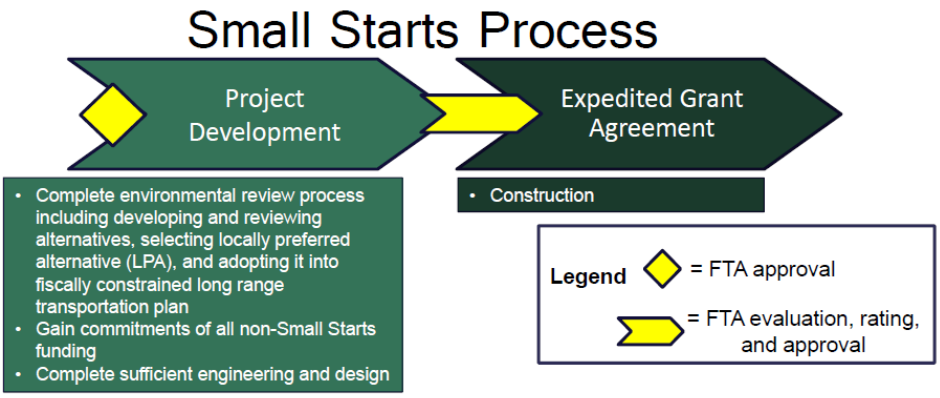
Date:	Tuesday, July 19, 2016
Project:	ART
To:	Project File
From:	HDR
Subject:	ART Traffic Impacts Summary

The following information was prepared to provide a summary of the anticipated traffic impacts of the proposed Albuquerque Rapid Transit (ART) bus rapid transit (BRT) project in relation to the project's categorical exclusion (CE) and Small Starts application (the analysis) completed by ABQ RIDE as part of the ART Central Avenue project.

Status of Traffic Analysis Evaluated

Typical transit projects involve many types of transportation analysis that vary in complexity and are implemented at different stages in the project's development from preliminary to final design. The process begins with a high-level analysis used to identify the transit corridor, determine the locations of bus stops, and help identify the level of environmental documentation required. Once mitigation measures and operational improvement are identified in the environmental documentation, those measures are further evaluated through the project development in both design and with traffic modeling. The CE clearly states that additional modeling would be necessary later in the project and identifies a number of mitigation measures that could be used to improve future conditions. This process is summarized in a presentation prepared by FTA.[1] The expedited grant agreement shown below is also referred to as the FTA Small Starts Grant Agreement (SSGA) which obligates Small Starts funding to the designated agency.

[1] https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/Final_Policy_Guidance_outreach_slides_-_August_2013_FINAL.pdf



The analysis conducted during the various stages of a project sets the framework for traffic operational expectations that must be carried forward.

Since the preliminary stage of analysis, ABQ RIDE has incorporated mitigation measures identified in the CE into the project's preliminary and final engineering. The relevant mitigation to the traffic operations includes the following:[2]

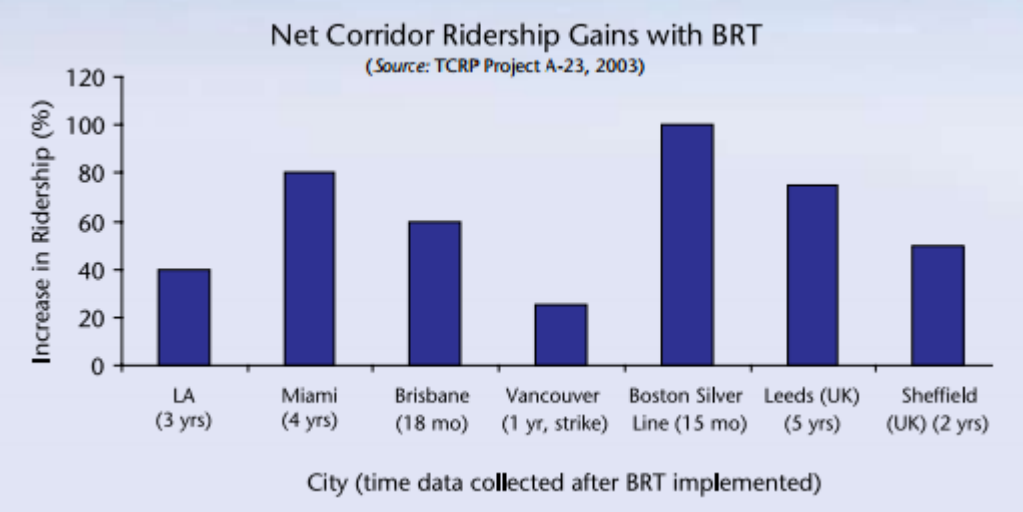
- Measures to mitigate traffic impacts caused by the proposed BRT system will be investigated by ABQ RIDE during project design in collaboration with the Traffic Engineering Division of the City of Albuquerque, Department of Municipal Development. Mitigation measures to be considered have included additional turn lanes at Rio Grande and additional lanes on various segments of the corridor and intersections as well as improved signal timing.
- The design of the intersection of Central Avenue and Rio Grande Boulevard will be modified to maintain level of service D for the intersection.
- Concerns with landscaping, pedestrian safety, and business access expressed by businesses and neighborhood groups during the planning phase of the proposed project will continue to be discussed and potential solutions (i.e., improved crossings, more U-turns, and improved landscaping) evaluated during the preliminary and final design stages of the project.

Mode Shift and Diversion

Many studies have shown significant mode shifts to transit with the implementation of a BRT system.[3] The mode shifts to transit shown below are even prior to including the

[2] http://abqbrt.blob.core.windows.net/resources/CatEx/Final_ART_CE%208-17-2015_web%20.pdf

bicycle and pedestrian mode shifts that often occur along corridors with the improved infrastructure and improved safety that occur as part of BRT projects.



It is correct to say that the proposed BRT system could divert traffic from Central Avenue to alternative routes. This diversion was reviewed by ABQ RIDE during the preliminary engineering phase of the project and was further evaluated as the design progressed. Additionally, data from the Mid-Region Council of Governments (MRCOG) showed that alternate parallel routes have additional capacity for through trips including the I-40 Bridge.

As the design progressed HDR further collaborated with MRCOG on their updated travel demand model for the year 2040. Through evaluation of the MRCOG travel demand model it was noted that the opening year traffic volumes produced in the CE were higher in some locations on the corridor than the MRCOG's 2040 forecasts for the AM and PM peak hours.

The following table was prepared by HDR and shows traffic volumes in the AM and PM peak hours with the proposed BRT system from the 2017 CE microsimulation analysis and 2040 MRCOG travel demand model.

[3] http://www.kimley-horn.com/Projects/fasttrackfresnocounty/downloads/BRT/BRTBrochure.pdf

Table 1. Opening Year and Horizon Year (2040) Peak Hour Traffic Volumes

Segment	2017		2040		Variance	
	PM Hour PB	AM Hour PB	PM Hour MCROG	AM Hour MCROG	PM 2017 to 2040	AM 2017 to 2040
East of Coors – West of Yucca	2,511	1,667	2,368	1,944	143	–277
East of Yucca – West of Old Coors Rd.	2,821	1,765	2,000	1,683	821	82
East of Old Coors Rd. – West of Atrisco	3,111	2,039	3,150	2,450	–39	–411
East of Atrisco – West of Sunset	2,915	2,115	5,667	3,751	–2,752	–1,636
East of Sunset – West of Tingley	3,809	2,954	6,983	4,770	–3,174	–1,816
East of Tingley – West of New York Ave.	4,020	3,249	5,637	3,557	–1,617	–308
East of New York – West of Rio Grande	3,516	2,807	5,492	3,461	–1,976	–654
East of Rio Grande Blvd. – West of Lomas	3,407	2,666	3,298	2,335	109	331
Southeast of Tijeras – Northwest of 12th St.	1,308	1,142	1,181	737	127	405
East of 1st – West of Broadway	1,300	1,105	1,176	671	124	434
East of Broadway – W. of I-25 W. Front. Rd. (Locust)	1,395	1,265	1,264	1,271	131	–6
E. of I-25 W. Front. Rd. (Locust) – West of I-25 E. Front. Rd.	1,640	1,630	1,269	1,603	371	27
East of I-25 E. Front. Rd. (Oak) – West of University	1,575	1,290	1,193	861	382	429
East of University – West of Yale	2,050	1,520	2,686	2,084	–636	–564
East of Yale – West of Girard	2,130	1,500	2,187	1,412	–57	88
East of Girard – West of Carlisle	1,885	1,270	1,745	1,328	140	–58
East of Carlisle – West of Washington	1,820	1,180	1,586	1,288	234	–108
East of Washington – West of San Mateo	1,760	1,125	1,239	1,066	521	59
East of San Mateo – West of San Pedro	2,050	1,345	1,970	1,545	80	–200
East of San Pedro – West of Louisiana	2,065	1,335	2,338	1,858	–273	–523

PB = Parson's Brinkerhoff (Traffic volumes obtained from PB provided VISSIM Model microsimulation models)
MCROG = Mid-Region Council of Governments

Model Calibration

Calibrating a short segment less than 1 minute is not appropriate; rather, the proposed BRT corridor itself or long segments of the corridor should be used in the model calibration process. The Federal Highway Administration's (FHWA) targets of variance are less than 60 seconds (1 minute) and/or less than 15% variance. The CE provided this travel time analysis and the values show that both the east and west segments for their entirety in both directions would meet the variance targets.

The table below is based on Tables 3-16 through 3-23 in the CE.

Table 2. Travel Time Comparison

From	To	Field Travel Time (s)	Modeled Travel Time (s)	Variance (s)	Variance (%)
AM Peak Hour					
Atrisco Vista Blvd.	1st St.	1,062.00	1,103.77	41.77	3.9%
1st St.	Atrisco Vista Blvd.	1,193.00	1,103.31	–89.69	–7.5%
Broadway Blvd.	Four Hills Blvd.	972.00	994.79	28.15	2.3%
Four Hills Blvd.*	Broadway Blvd.	1,061.00	1,115.04	25.50	2.4%
Total		**4,288.00**	**4,316.91**	**5.73**	**0.1%**
PM Peak Hour					
Atrisco Vista Blvd.	1st St.	1,010.00	1,101.58	91.58	9.1%
1st St.	Atrisco Vista Blvd.	1,193.00	1,311.34	118.34	9.9%
Broadway Blvd.	Four Hills Blvd.	1,295.00	1,278.20	–16.80	–1.3%
Four Hills Blvd.*	Broadway Blvd.	1,206.00	1,225.40	19.40	1.6%
Total		**4,704.00**	**4,916.52**	**212.52**	**4.5%**

*The total line is wrongly labeled, but the title of the table is correct.

As can be seen from CE results, all segments meet FHWA's suggested calibration target of less than 15% variance. Though some segments do not meet the less-than-1-minute standard, this specific standard is not typically used for corridors that have travel times longer than 7 minutes (such is the case with the Central Avenue).

Table 6-3: Travel Time Calibration Criteria

Criteria	Acceptance Targets
Modeled travel time within ±1 minute for routes with observed travel times less than 7 minutes.	All routes identified in the Data Collection Plan
Modeled travel time within ±15% for routes with observed travel times greater than 7 minutes.	All routes identified in the Data Collection Plan

Source: FHWA Traffic Analysis Toolbox Volume III (Wisconsin Department of Transportation)

Impacts to the Corridor

Many positive impacts of a BRT system include:

- Roadway safety improvements: Some streets with BRT systems have had as high as a 40% decrease in fatal and severe injuries.[4]

[4] http://www.wri.org/blog/2013/12/4-ways-cities-benefit-bus-rapid-transit-brt

- Improved mobility options for disabled persons: "[T]ransit projects often bring benefits by providing mobility to people with low incomes, [with] disabilities, or with otherwise limited access to transportation options. The benefits to these groups may be as important to consider as travel time savings."[5]
- Person-delay improvements: Intersection delay, does not take into account person-delay, which AQB RIDE anticipates will be significantly improved with the improved transit operations that can carry a much higher number of passengers than a typical single-passenger car and often more than even a typical bus such as the route 66 bus. BRT service along the corridor will operate more frequency with larger buses than current corridor service, thereby providing more corridor capacity.
- Transit stop safety improvements: "With modern technologies and facilities, customers report BRT systems to be safer than other local bus service."[6]

BRT systems and traffic analysis of BRT systems should take into account the overall benefits for all passengers, both automobile users and transit riders.

It is important to note that traffic models are limited in their ability to quantify operational benefits for corridor transit service. Many improvements included in the proposed ART project cannot be reflected in the modeling. For example:

- With the implementation of the proposed BRT system, fully functioning emergency vehicle preemption systems would be installed, thereby allowing better and quicker response times for emergency vehicles.
- Current technology for transit signal priority allows bus systems to communicate between multiple intersections so the signal system can make smarter decisions that will reduce transit travel times and minimize motor vehicle impacts by identifying the best gaps to allow buses to get a green light.
- Enhanced technology will allow better management of the system when a signal goes out. Currently, if a signal goes out, the City of Albuquerque traffic operations staff relies on phone calls from drivers to identify outages. With the new system, City traffic staff will get an automatic notification to their email and/or phone so that they can respond more quickly.

Though all of these benefits would have a positive effect on the operations of the proposed BRT corridor, they cannot be effectively captured in a traffic simulation.

[5] http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_352.pdf
[6] http://www.kimley-horn.com/Projects/fasttrackfresnocounty/downloads/BRT/BRTBrochure.pdf