Alameda Blvd
Adaptive Traffic Signal Study

Congestion Management Process – Dec. 6, 2013

Background & Purpose of Study

- Bernalillo County installed seven adaptive traffic signals along Alameda Blvd
  - Loretta Drive to 2nd St – 1.9 mile segment
  - Total cost = $300,000
- Performance-based contract
  - Average peak-period travel time reduction on Alameda
  - No significant increase in side street control delay
- MRCOG asked to determine extent of benefits
  - Congestion Management Process – measure impacts of proposed and recently implemented projects

Adaptive Signal Control Technoloy

- **Adaptive signal control technology** (ASCT) adjusts the traffic signal according to the observed traffic patterns
- Benefits of ASCT compared to conventional signal systems:
  - Distribute green light time equitably for all traffic movements
  - Improve travel time reliability
  - Reduce congestion by creating smoother flow

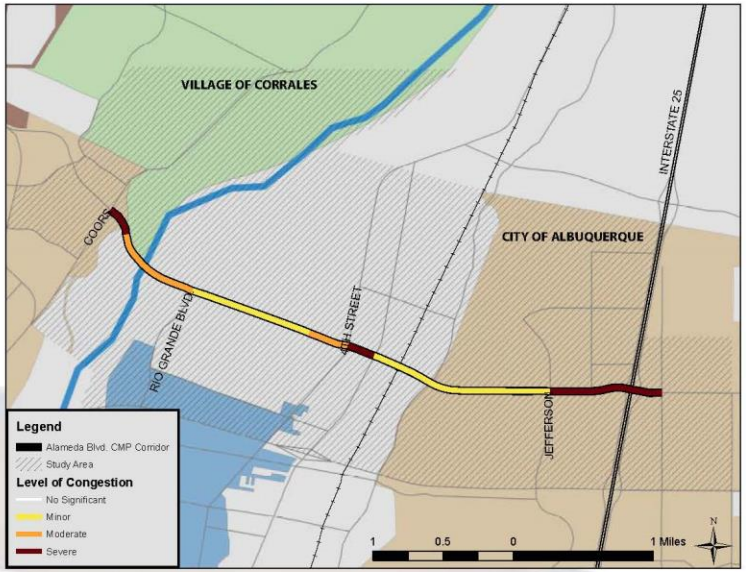
source: FHWA

Alameda Blvd

Alameda Blvd

2012

#1



Profile & Statistics

Corridor Profile*			
Study Area	10.6 Sq. Miles		
Length & No. of Segments	4.3 Miles - 11 segments		
Functional Class	Principal Arterial		
Access Control	none		
Speed Limit	35 - 45 mph		
Lanes	4 lanes		
Intelligent Transportation Systems	Designated corridor: Yes ITS Deployment: Yes - PF, CCTV, VDS		
Transit	*ABQ Ride* : Route 98 (commuter)		
Bicycle Facilities	Lanes: Coors to 2nd St Parallel trail from Corrales Drain to 4th St		
Summary Data^			
Highest Volume Segment	49,000		
Average Speeds (PM East)	16 - 38 mph		
Average Speeds (PM West)	15 - 38 mph		
Total Delay (PM East)	95 seconds (22 sec./mile)		
Total Delay (PM West)	121 seconds (28 sec./mile)		
Demographic Trends			
Measure	*2000*	*2008*	*2035*
Population	12,532	14,670	15,202
Employment	17,115	18,300	23,593
Corridor Ranks			
Volume/Capacity Ratio	**1 / 30**		
Speed Differential	**20 / 30**		
Crash Rates	**26 / 30**		
Overall Rank	**1 / 30**		

* See the introduction section for further explanation.
^ For more detailed information and segment level data consult the *CMP Atlas* on the MRCOG website.

Corridor Notes

- Alameda Blvd has been the #1 congested corridor in the AMPA since MRCOG began developing rankings in 2006.
- Alameda is a key river crossing providing access between I-25 and the metropolitan core and northwest Albuquerque and the City of Rio Rancho.
- The CMP corridor runs between Coors Blvd and San Pedro Dr has the most severe volume-related congestion in the metropolitan area.
- Overall **congestion** is most severe between Coors and Rio Grande Blvd, where volumes are particularly high, and Jefferson and I-25, where speeds are particularly low. Congestion is more severe in the eastbound direction in the AM, and the westbound direction in the PM.
- Total daily **volumes** are highest between Coors and Rio Grande Blvd (43,000-49,000 vehicles).
- Overall **crash rates** along Alameda are below the regional average. The intersections at Corrales Rd and Ellison Rd have crash rates more than twice the regional average.
- The study area is expected to see significant employment **growth** (29%) but only minimal population growth by 2035.

Transit Characteristics

- ABQ Ride operates one commuter service along Alameda, Route 98, which runs from the Northwest Transit Center to Wyoming Blvd and Kirtland AFB.
- Average weekday ridership in April 2012 was slightly less than 100 per day

Methodology

Compare conditions in Week 1 vs. Week 2

- Week 1: Preexisting signal timing plan
- Week 2: Adaptive traffic signals activated

Travel Time on Alameda – Post Oak Sensors

- Loretta Drive to 2nd St
- Both directions

Side Street Control Delay – Manual counts on 5 approaches

- Rio Grande
- 2nd St – North and South
- 4th St – North and South

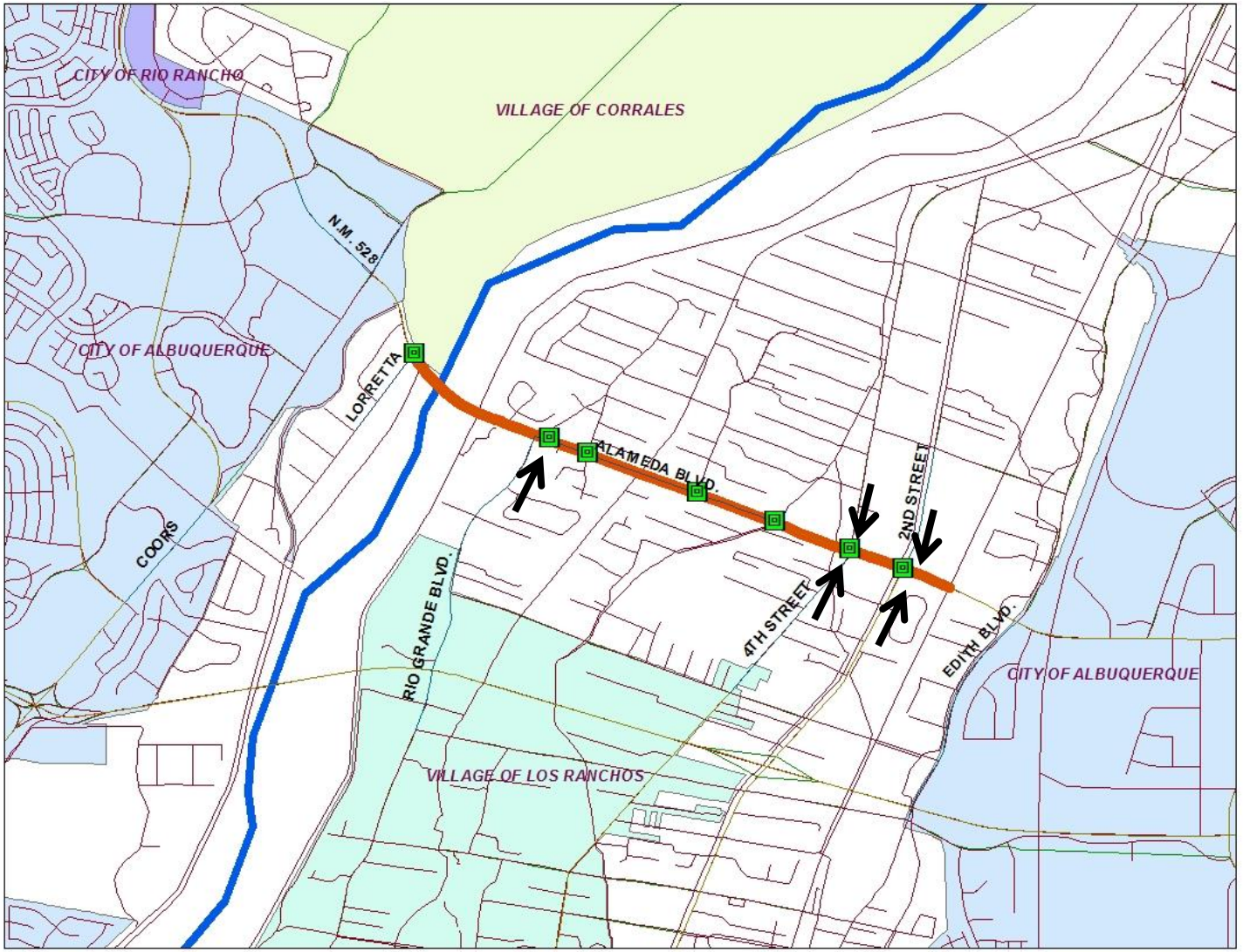
Methodology – Mainline Travel Time

- Travel Time on Alameda – Post Oak Sensors
  - Loretta to Rio Grande
  - Rio Grande to Guadalupe North
  - Guadalupe North to 2nd St
- Data reported in 15-minute intervals
  - AM Peak – 7:15-8:15 AM
  - Noon Peak – 12:00-1:00 PM
  - PM Peak – 4:15-5:15 PM
- Aggregated to 1.9-mile corridor level
- Each direction weighted by volume (directional split)

Methodology — Side Street Control Delay

- Control delay: sum of all delay components
  - Deceleration, stop, acceleration
- Side Street Control Delay Periods:
  - 7:15-8:15 am (morning peak)
  - 12-1 pm (noon peak)
  - 1–2 pm (early afternoon)
  - 3:15-4:15 pm (school peak)
  - 4:15-5:15 pm (evening peak)
- Manual queue counts
  - Five teams of two people
  - Through or stopped vehicles
  - Queue lengths on 11-second intervals

Study Locations



Complications

- Queues on Rio Grande in the afternoon exceeded 50 vehicles (beyond the line of sight)
  - → PM data for Rio Grande discarded
- Thursday 9/26 – Fatal crash on US 550 – Traffic diverted to Alameda Blvd
  - → Thursday data discarded due to excessive delay

Results – Alameda Travel Time

Eastbound – Loretta Drive to Second Street

Period	Week 1 Seconds	Week 2 Seconds	Week 1 MPH	Week 2 MPH	Time Savings (sec./vehicle)	Average Volume	Total Time Savings (Hours)
AM Peak	402.4	299.9	17.1	22.9	102.5	1785	50.8
Noon	192.0	198.3	35.8	34.7	-6.3	956	-1.7
PM Peak	210.6	211.1	32.6	32.6	-0.5	997	-0.1

- Total travel time savings of 49 hours per day
- Savings of almost 2 minutes per vehicle in AM peak
  - Result of traveling 5.8 MPH faster
- No significant change in the Noon or PM peak

Results – Alameda Travel Time

Westbound – 2nd St to Loretta Drive

Period	Week 1 Seconds	Week 2 Seconds	Week 1 MPH	Week 2 MPH	Time Savings (sec./vehicle)	Average Volume	Total Time Savings (Hours)
AM Peak	216.5	198.6	31.8	34.6	17.9	670	3.3
Noon	211.1	209.3	32.6	32.9	1.9	956	0.5
PM Peak	274.0	218.3	25.1	31.5	55.8	1543	23.9

- Total travel time savings of 28 hours per day
- Savings of almost 1 minute per vehicle in PM peak
  - Result of traveling 6.4 MPH faster
- No significant change in the Noon or AM peak

Results – Alameda Travel Time

Average Travel Time Reduction

Period	Eastbound	Westbound	Avg Travel Time Reduction
AM Peak	25%	8%	21%
Noon	-3%	1%	-1%
PM Peak	0%	20%	11%
Average Travel Time Reduction			**10.5%**

- Marked improvements in directional peak
  - 25% reduction in travel time in AM peak in Eastbound direction
  - 20% reduction in travel time in PM peak in Westbound direction
- Minimal impact in Noon peak – little room for improvement
- Average reduction (10.5%) met performance specifications

Results – Side Street Delay

- Side street control delay improved in 11 of the 14 time periods
- Average savings of 10.7 seconds (15.6%)
- Greatest improvement on Rio Grande Blvd (38-39% reduction in delay)

Two-Day Averages	Period	Week 1 (seconds)	Week 1 (seconds)	Change (seconds)	Change (%)
2nd St - Northbound	AM Peak	58.3	71.2	-12.9	-22%
	Noon	65.1	48.0	17.2	26%
	PM Peak	72.2	54.6	17.6	24%
2nd St - Southbound	AM Peak	59.4	60.2	-0.8	-1%
	Noon	57.4	46.6	10.9	19%
	PM Peak	74.3	62.2	12.1	16%
4th St - Northbound	AM Peak	66.5	60.5	6.1	9%
	Noon	57.7	54.2	3.5	6%
	PM Peak	101.1	81.6	19.5	19%
4th St - Southbound	AM Peak	48.3	44.4	4.0	8%
	Noon	44.9	42.4	2.6	6%
	PM Peak	57.7	64.6	-6.9	-12%
Rio Grande - Northbound	AM Peak	109.9	68.3	41.6	38%
	Noon	91.6	55.4	36.2	39%

Discussion / Next Steps

- Additional adaptive signals on Alameda Blvd
  - $400,000 from NMDOT to extend project west to Cottonwood
  - 4 more signals
- Is this an approach that can be replicated?
- What are the appropriate locations?
  - Are there “right” and “wrong” locations