









Background								
In addition, Sun Metro has modified 14 routes and/or schedules throughout El Paso starting October 1 st , 2006:								
	Route 3	Route 53						
1. Mahadandandan	Route 4	Route 57						
	Route 10	Route 61						
	Route 22	Route 62						
	Route 41	Route 64						
	Route 50	Route 65						
	Route 51	Route 66						

Sun Metro quality of service survey

63% of regular riders are dissatisfied with Sun Metro's services.

65% of regular riders wait for late buses three or more times a week.

70% of riders who have used Sun Metro for a year or more say service is worsen every year.

El Paso Times May 22-26 2006

Sun Metro quality of service survey

"Nearly two-thirds of regular riders, those who use the bus three or more times a week, said they frequently wait for late buses".

"38% of riders said they had waited an hour or longer for a late bus."

"19.4% of riders said they have waited two hours or longer"

El Paso Times May 22-26 2006

User's opinions of Sun metro service

"El Pasoans were satisfied with Sun Metro, rating it a 3.39 on a 5-point scale"

Ve Di	ery ssatisfied	Neutral		Satis			
	122	3		4	5		
		Areas of the O	ity				
Service	Westside	Central	Eastside	Lower Valley	Northeast	Total	Rank
Fire	4.44	4.24	4.37	4.42	4.28	4.36	1
Airport	3.98	3.93	3.99	4.04	4.02	3.99	2
Police	3.73	3.73	3.80	3.84	3.72	3.77	3
Libraries	3.69	3.60	3.66	3.70	3.77	3.68	4
Museums and Cultural Affairs	3.56	3.42	3.50	3.50	3.43	3.49	5
Zoo	3.49	3.27	3.44	3.45	3.48	3.43	6
Solid Waste Management	3.35	3.37	3.46	3.46	3.37	3.44	7
Sun Metro	3.37	3.33	3.37	3.40	3.48	3.39	8
3 Aleman and a second		\mathbf{N}					

Survey on measurement of satisfaction March 2006. Institute for Policy and Economic Development at the UTEP.

Some other comments....

"It frustrates me, I have to leave two and a half to three hours early to make sure I get to work on time," said Yvette Lopez, who rides Sun Metro regularly from the Lower Valley to her East Side job. (Yasmin A. Aboytes / El Paso Times)

More comments....

"*After waiting two hours* at the Sun Metro Eastside Terminal near Cielo Vista Mall, Ofelia Martinez, 80, stood while riding the packed Route 59 bus to San Jacinto plaza

Friday afternoon" (Yasmin A. Aboytes / El Paso Times)



More and more....

"People got to go to work, they have places to go people to see. This hot weather and the buses ain't working," said Alfredo Gomez from Northeast El Paso.

"It's too hot, we're sweating," complained Araceli Artelejo. She was at a temporary bus location where there's no shade and no place to sit.

KFOXTV, June 21, 2006

users comments....

"In fact, I've known at least three people who have lost their jobs because of Sun Metro's infamous tardiness" Jenni Burton, Newspaper Tree. El Paso's Original News Source May 2006.





Problem Statement

Different Surveys and comments are qualitative measurements of service. This makes it difficult to define a more realistic Level of Service.

Existing evaluations concerning Sun Metro's quality of service depend largely on the users and even non users' perception during the interview.

The need of an alternative approach to obtain a more reliable evaluation of bus performance (LOS).

Justification

It is necessary to obtain a reliable measurement of service quality to:

- Identify problematic sections along the route base on quantitative s rather than qualitative methods.
- Allow a better understanding of route performance.
- Implement effective plans to ensure schedule adherence and service efficiency.

Objective of the Research

To obtain the service measures of a sample route (Sun Metro R-15) based on the methodology of Transit Capacity and Quality of Service Manual with emphasis in Quantitative Methods.





Methodology

 Documentary and empirical data Meeting with Sun metro staff for some basic information:

-Line characteristics:

- ► Line length
- ► Numbers of drivers per route
- Drivers work hours
- ► Service Coverage
- ► Service Hours

	Methodology
	-Fleet characteristics and size:
	Units regular service
	Units in reserve
	Units in maintenance
	Bus capacities
	Line capacity
	Peak hours
Hard Marine	-Schedule
	Timetable during the study period
	One-way operating time
	 Terminal time
	Headway
S	Frequency
	Cycle speed
	Maximum operating speed

Methodology

- Data collection
 - -Definition of route characteristics
 - Bus station location
 - Survey trip along the route to collect the total number of bus stops
 - Providing codes to stations and stops
 - ► Identifying the physical conditions of facilities
 - ► Service hours and schedules provided
 - ► Line length measurement
 - ► Geometric configuration



Methodology

-Once peak hours were identified:

- Boarding different buses during 5 days to get data on:
 - ► Running time
 - ► Dwell time
 - Operating travel time
 - ► Boarding and Alighting times
 - Headway and Frequency (indirect method)

	Me	tho	do	lo	gу	/	
. F	Ű	Route 15 Do	Route information with the second sec	ation ads (OUTBO NOV 2006	UND)		
PEORMS	ID & NAME	Dwell	Time	Passa	angers	NOTES	
	MS CIVIC CENTER DOWNTOWN	STOP	RUN	Boarding	Alighting	Start Station	
	1 Oregon St North					Start Station	
	2 Eranklin Ave						
	3 Yandell Dr						
	4 Rio Grande Ave						
	5 Arizona Ave			1			
	6 California Ave			1			
	7 Cliff	-					
	8 Crosby Ave						
	9 Bim Bd			1			\sim
	10 University Ave						
	11 Kerbey Ave			1			
. Annhundurel.	12 Robinson Ave						
A. ARCHING MARKED	13 Baltimore Dr						
	14 Kern Plaza						
	15 Kern Dr						
	16 Mesita Dr						
	17 Mesita Dr (across)						
	18 Waymore Dr						
	19 Brentwood Ave						
	20 Executive Center Blvd 🗸						~ /
	21 Foothills Village						
	22 Sunset Inn MOTEL						
	23 OSA						
	24 Warren Inn complex (front)						
	25 Castellano Dr						
	26 Argonaut Dr						
	27 Vista Sol (across)						
	28 Festival Dr						
	29						
	30 Uncle Bao's (GYM)						
	31 Mesa Hills Dr 🗸 🗸						

	N	/leth	odo	olo	gy	1	
	UP	Route 15 Dor Date:	Route informa wntown-Crossroa Wednesday	tion ds (OUTBOUN (NOV 15th 2	ND) 2006	SUR HETRO	
	ID & NAME	STOP	RUN	Passan Boarding A	gers lighting	NOTES	
	MS CIVIC CENTER DOWNTOWN	9:13:19	9:20:01	42	ingriting	Start Station	/
	1 Oregon St North						
	2 Franklin Ave	9:22:58	9:23:02	1			
	3 Yandell Dr						
	4 Rio Grande Ave (EPC College)	9:19:09	9:19:13		1		
	5 Arizona Ave	9:20:12	9:20:19		1		
	6 California Ave						
	7 Cliff Dr	9:22:02	9:22:11		1		
	8 Crosby Ave						
	9 Rim Rd				0		
and are	10 University Ave 🗸	9:28:45	9:28:56	0	9	univ@intersection 9:28:45	
a 7 <i>19</i>	11 Kerbey Ave						/
	12 Robinson Ave	9:30:28	9:30:36		6		
	13 Baltimore Dr						
	14 Kern Plaza						
	15 Kern Dr						
	16 Mesita Dr						
	17 Mesita Dr (across)						
	18 Waymore Dr	9:32:50	9:32:54		2		
SIL	19 Brentwood Ave	9:33:38	9:33:44		4		\sim
20 Executive Center Blvd 🗸		9:34:11					
	21 Foothills Village	9:34:53	9:34:58	1	1		
	22 Sunset Inn MOTEL						
	23 OSA	9:35:39	9:35:44	1	2		\sim
	24 Warren Inn complex (front)	9:36:20	9:36:29	1	1		

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Analysis and Results

Headway

1.00	•		5t-
LOS	Avg. Headway (min)	ven/n	Comments
A	<10	>6	Passengers do not need schedules
В	10-14	5-6	Frequent service, passengers consult schedules
С	15-20	3-4	Maximum desirable time to wait if bus/train missed
D	21-30	2	Service unattractive to choice riders
E	31-60	1	Service available during the hour
F	>60	<1	Service unattractive to all riders

Timetable headway 30 minutes Level of Service <u>D</u>
 Some cases even showed a LOS: <u>E</u>



Analysis and Results Comfort and convenience Transit stops Load Factor Standing Passenger Area Comments LOS (p/seat) (ft²/p) (m²/p) No passenger need sit next to another Passengers can choose where to sit All passengers can sit А 0.00-0.50 >10.81 >1.00† B 0.51-0.75 0.76-1.00 8.2-10.8⁺ 5.5-8.1⁺ 0.76-1.00⁺ 0.51-0.75⁺ 1.01-1.25* 1.26-1.50* 3.9-5.4 2.2-3.8 0.36-0.50 0.20-0.35 D E Comfortable standee load for design Maximum schedule load <2.2 >1.50* <0.20 Crush load *Approximate value for comparison, for vehicles designed to have most passengers seated. LOS is based on area. †Used for vehicles designed to have most passengers standing. Acceptable level of services (A/B) off-peak hours However, during the peak hour the LOS is D









Analysis and Results Comfort and convenience.							
LOS Travel Time Difference (min)	Comments			- //			
LOSTravel Time Difference (min)CommentsA ≤ 0 Faster by transit than by automobileB1-15About as fast by transit as by automobileC16-30Tolerable for choice ridersD31-45Round-trip at least an hour longer by transitE46-60Tedious for all riders; may be best possible in small citiesF>60Unacceptable to most riders							
 Survey trips made on Tuesday November 14th using car: 							
	CAR	BUS	DIFFERENCE				
OUTBOUND TRIP (min)	23.75	44.63	20.88				
INBOUND TRIP (min)	23.02	49.00	25.98				
 Corresponding level of service: <u>C</u> 							

Summary of Results Comfort and convenience. Availability Avg Headway Hours of Service Coverage area Not possible D С **Comfort and convenience** Load factor On-time Convenience D D С Overall Level of Service for route 15: D



















Observations Cont..

- There are relatively close distances between stops (34, 80 90m) and as well there are stations with long distance in between (664, 538, 667, 649, 642m).
- There was a tendency to reach destinations on time when drivers felt monitored.

Conclusions

- The evaluation provides an alternative measurement of service quality of sun metro service
- It was possible to identify problematic sections along the route (e.g. University stop)
- At gives a tool for planners to ensure schedule adherence and service efficiency

Conclusions

The overall LOS obtained in Route 15 strongly encourages a revision in the entire bus system.

Additionally, all calculations and parameters can be automated in a data base template or spreadsheet saving calculation time and contributing to an updated and reliable estimation of LOS.

Thus, planners could use these resulting LOS to identify conflictive points or segments, ensuring schedule adherence and service efficiency in selected routes or the entire system.

Recommendations

- The use of passenger counters devices to evaluate the load and demand discrepancy.
- ► GIS based analysis to optimize distances between stops.
- Origin-Destination study could be synchronized with Mexican transportation authorities or agencies to have better results on passenger mobility estimation.

Low-floor (for people with disability) buses and smart cards are actions that help to reduce boarding and alighting times (TCQSM).



Recommendations

More recommendations in final report Full document available soon in ITE UTEP student chapter or by request

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Thank YouQuestions?

Background

"As part of transforming Sun Metro from a troubled organization into a first-rate bus service, a three-year, \$1.6 million management contract had just been awarded to **First Transit**, a transit management firm in Cincinnati." ake Rollow, El Paso Times, 10/11/2006