Evaluation of University Transit Systems Using Systems Engineering Approach

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RIMES http://rimes.utep.edu

The University of Texas at El Paso (UTEP)

BACKGROUND

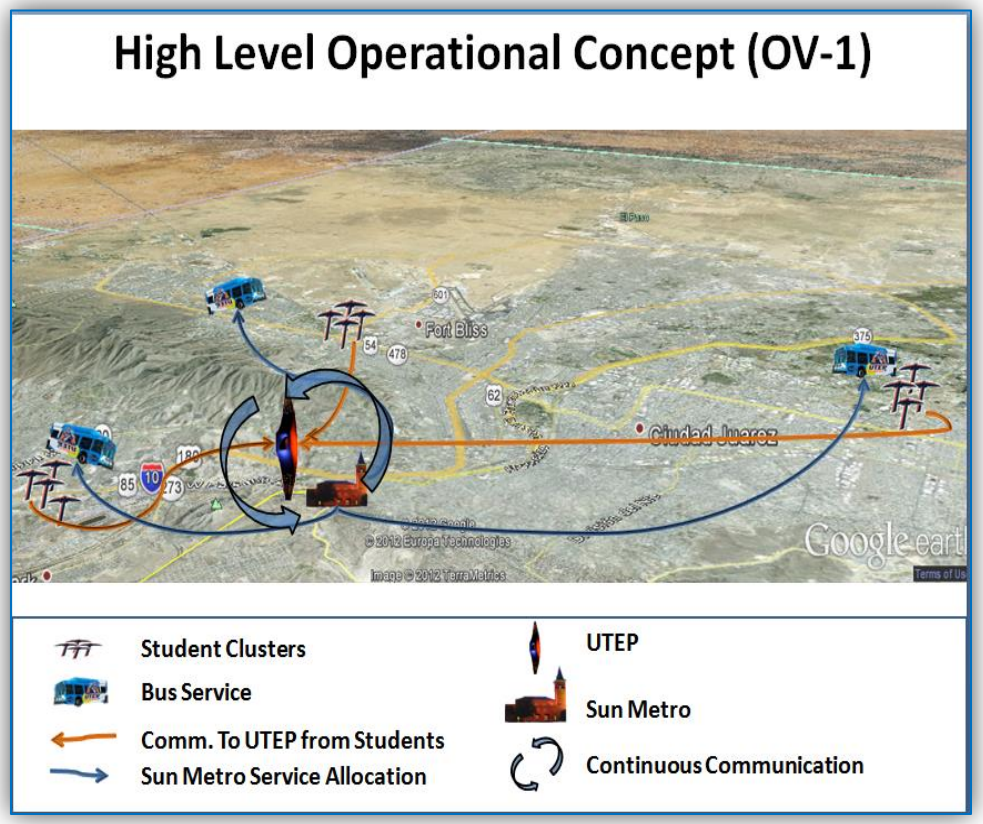
- The American Lung Association
- City of El Paso, TX graded “D” in scale A-F for Ozone quality
- US Environmental Protection Agency (EPA)
- University of Texas, El Paso as a commuter school
- Sun Metro, city’s service provider, service is not feasible for UTEP students

http://www.stateoftheair.org/2013/states/texas/el-paso-48141.html

OBJECTIVES

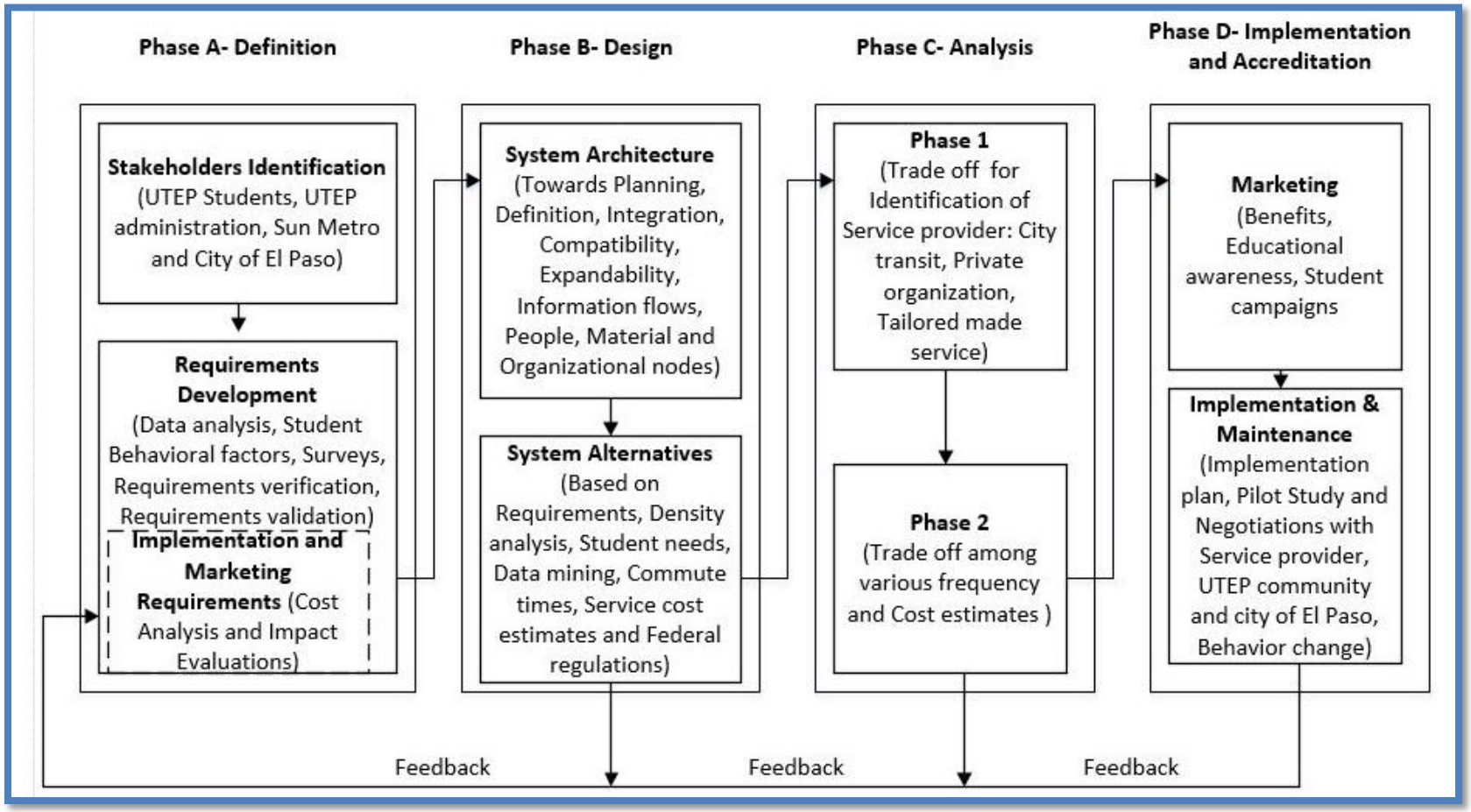
Development an efficient busing network for UTEP community

- Supports in improving El Paso's air quality
- Reduces commuting cost for students
- Stimulates a behavioral change in students



METHODOLOGY

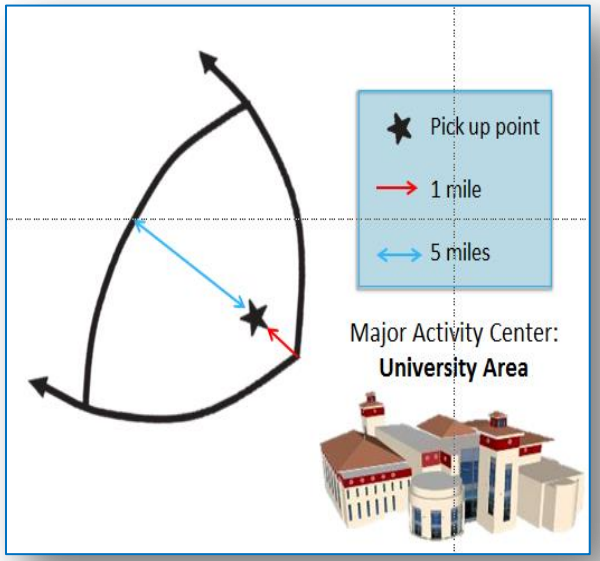
- 4 Phase approach



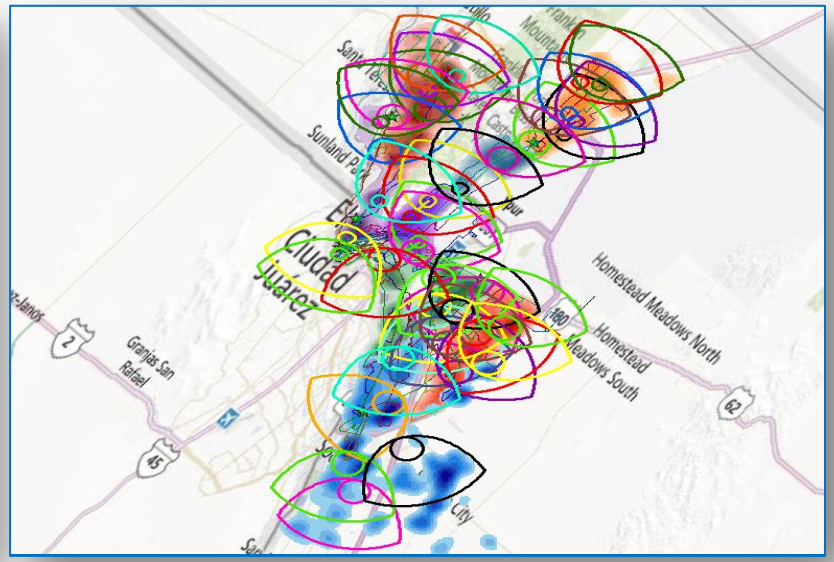
METHODOLOGY Cont.

- Parabola Catchment Methos
- ArcGIS

PICK-UP POINT IDENTIFICATION



Parabola Catchment Method



Student Density Analysis

RESULTS

TRADE-OFF ANALYSIS

Attributes	Weights
1. Parking area	10
2. Parking spaces	9
3. Transfer Stations	7
4. Coverage	9
5. 1 mile radius	10
6. 5 mile radius	10
7. Proximity to Highway	8
8. Proximity to BRT	5
9. Stop Inclination Grade	7
10. Adjacent to Shopping Center	7
11. Adjacent to Apartment	8
12. Adjacent to Hospital	5
13. Adjacent to Employment Center	6
14. Adjacent to School	4
15. Bus Pullout	5
16. Street Speed Limit	6
17. Proximity to Major Roads	7
18. Number of Lanes Per Street	5
19. Lighting on Bus Stops	10
20. Visibility	5
21. Power Grids	6
22. Sound Walls	5
23. Near Side	6
24. Mid Side	5
25. Far Side	6

West Side (Service Area: Dark Red)
1.Westwind Dr\Belvidere St.*
2.Mesa Hills\Sunland Park (2583)*
3.Redd\Resler (2695)*

Northeast (Service Area: Orange)
1.Dyer\Diana Northgate Center North *
2.Rushing Rd\Fairbanks Dr *
3.Kenworthy\Cohen Av.*

East Side (Service Area: Red)
1.Montwood Dr\Joe Battle*
2.Vista Del Sol \ Lee Trevino Dr*
3.Pebble Hills Blvd\ Saul Kleinfeld *

Dark Blue Service Area
1.North Loop\Zaragoza*
2.North Loop\Yarbrough*
3.Alameda\N Moon Rd *

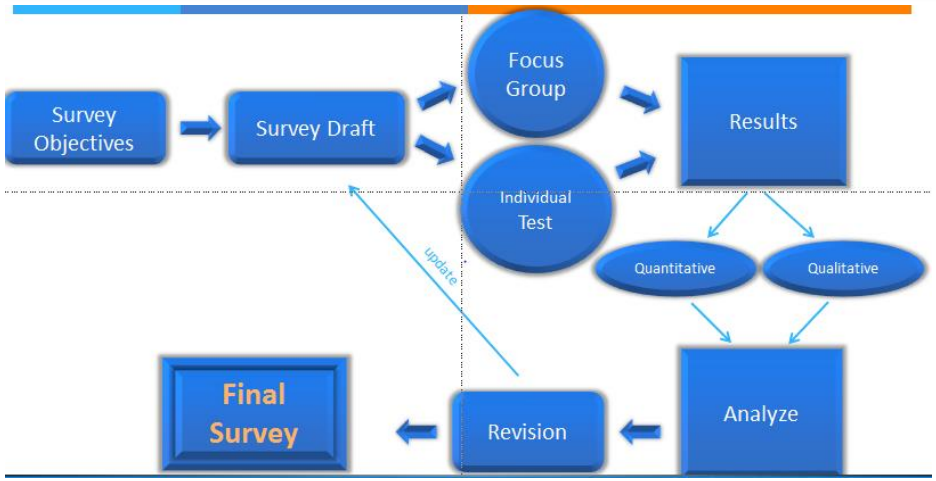
Light Purple Service Area
1.Santa Fe Transfer Center
2.Doniphan\Frontera
3.Stanton\O'Keeefe *

Dark Purple Service Area
1.Trowbridge Dr\Reynolds St.
2.Montana\Chelsea St.
3.N Piedras St.\Jackson Avenue

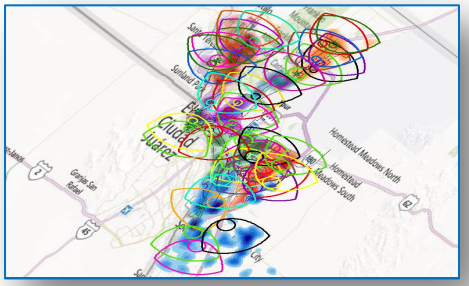
Green Service Area
1.Yarbrough\Edgemere *
2.Cielo Vista Transfer
3.McRae\Wedgewood*

Light Blue Service Area
1.Dyer\Tetons Dr*
2.Dyer\McConnel

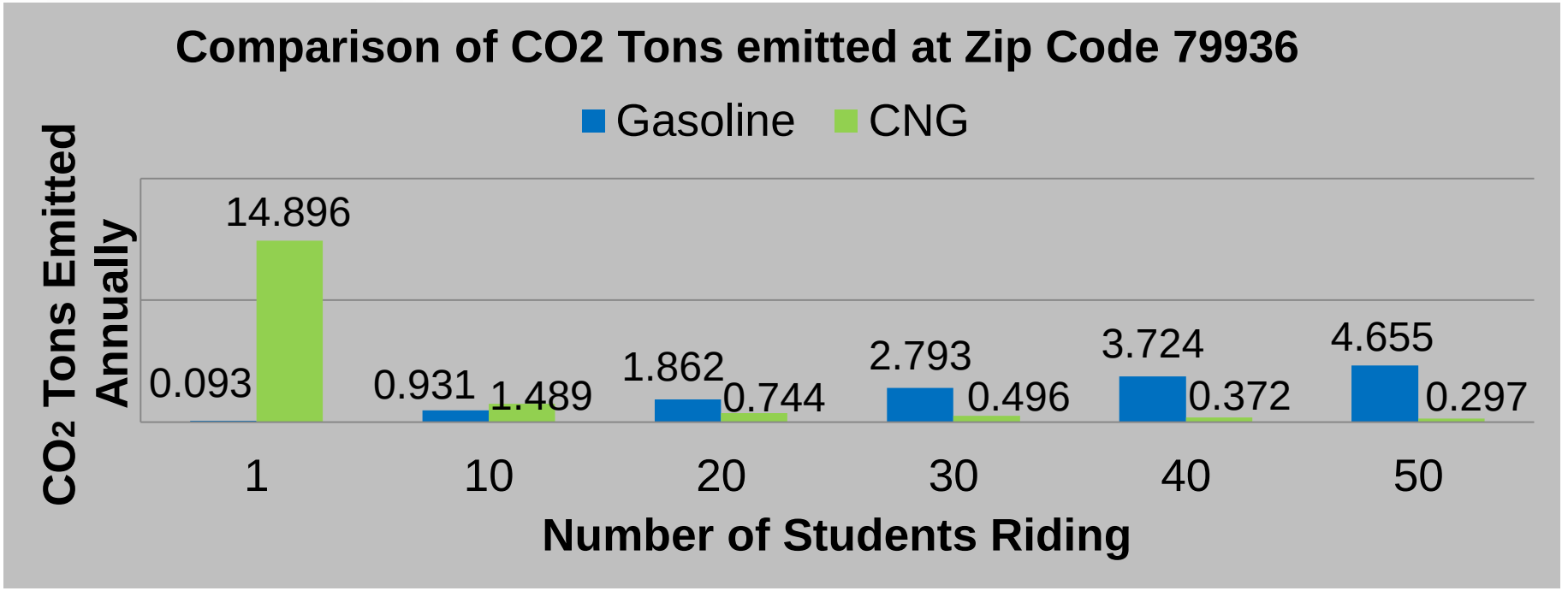
SURVEY QUANTITATIVE ANALYSIS



RESULTS Cont.



Zip code 79936, this is the largest between a neighborhood and the university campus



CONCLUSIONS/FUTURE WORK

- Successful cross-collaboration among multiple stakeholders to address environmental and students' needs.
- Identified a well-defined commuting alternative to UTEP students, based on systems engineering principles.
- System deployment plans are in place to implement the system route-by-route to reduce associated risks.

green alternatives

Thank You