TTI: 0-6608

Integrating the Transportation System with a University Transportation Master Plan

in cooperation with the
Federal Highway Administration and
the Texas Department of Transportation

URL: http://tti.tamu.edu/documents/0-6608-P2.pdf

Integrating the Transportation System with a University Transportation Master Plan

by

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TEXAS TRANSPORTATION INSTITUTE
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College Station, Texas 77843-3135

Agenda

- Introduction
- Conduct Literature Review
- Review Accident Locations
- Develop and Perform Faculty, Staff, and Student Surveys
- Characterize Current and Future systems
- Identify Gaps and Develop Scenarios
- Analyze Transportation System Integration and Interactions
- Estimate Costs
- Case Study Conclusions and Recommendations

Introduction and Research Objectives

- TxDOT commissioned TTI and the University of Texas at El Paso (UTEP) to perform a research study of the integration of the transportation system with the UTEP transportation master plan
- The objective is to document a methodology to analyze the interaction of a university campus transportation system and its surrounding metropolitan transportation system and to integrate both systems in a seamless fashion
- The study uses UTEP as a case study, but its results will have a near-term applicability for TxDOT particularly in urban areas where there is highly dense university campus populations

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Literature Review Task Overview

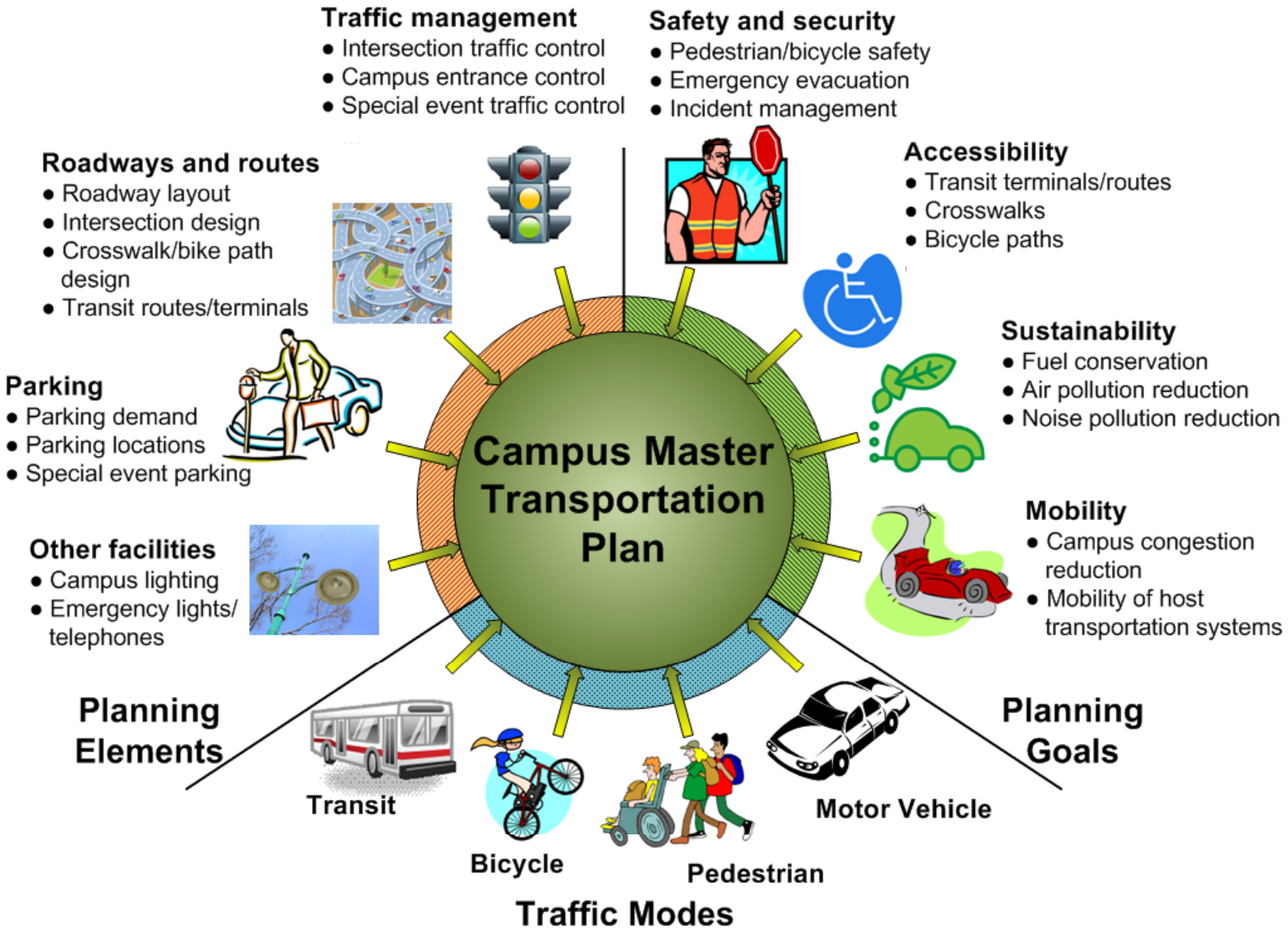
- Methodology
  - Focused on university campus master plans and campus transportation-related studies
- Organization of practices
  - Collaborative transportation planning practices
  - Pedestrian and bicycle practices
  - Transit-related practices
  - Parking-related practices
  - Motor vehicular traffic practices
- Task progress
  - Preliminary draft done
  - Draft reviewed by project expert panel (comments to be addressed)
  - Overall progress: 95%

University Campus Master Planning Areas

- Transportation
- Land use and development
- General infrastructure (e.g., storm water management, potable water facilities, sanitary sewer and treatment, and solid waste facilities)
- Campus safety and security
- Intergovernmental coordination and public relations
- Conservation and efficiency (e.g., energy and natural resource conservation and environmental protection)
- Capital improvements (e.g., financial capacity and project capital needs)
- Others (e.g., impact of technology advances, major social events, and diversity support)

Note: all of these areas are closely related to each other

Campus Master Transportation Planning



Campus Transportation Planning Practices

- Collaborative transportation planning
  - Collaboration with state transportation agencies, county, city, and other local public agencies (LPAs)
- Pedestrian and bicycle
  - Network: walkways and bicycle paths, maintenance, connectivity, etc.
  - Facilities: bike lockers, showers, shaded parking/walkways, pedestrian movers, etc.
  - Incentives: bicycle sharing programs, purchase discounts, rental bicycles, etc.
  - Safety: network improvement, safety awareness education, safety equipment (e.g., helmets and fluorescent vests), etc.
- Transit
  - Collaborative planning in routes, terminals, fare/passes, etc.
  - Incentives: fare discounts, transit malls/hubs, facilities at transit stops, service flexibility, etc.
  - Improvements: use Intelligent Transportation Systems (ITS) for vehicle location and arriving time, determine service schedule/routes considering class schedule/location, etc.

Campus Transportation Planning Practices

- Parking
  - Parking management: permit system, visitor parking, off-campus parking, advanced parking management systems, parking management at nearby neighborhoods, etc.
  - Campus resident parking: resident parking management, off-campus resident parking, incentives for car-free residents, etc.
- Motor vehicular traffic
  - Campus vehicular traffic control: roadway network configuration, roadway closures, class and activity schedule and location, etc.
  - Vehicular traffic and parking reduction: parking management skills, promoting alternative modes including carpool and vanpools, flexible working schedules, telecommunication technologies, car sharing programs, etc.
  - Emergency and service vehicle accessibility: persons with disabilities, service vehicles, vehicles in case of emergencies (e.g., fire, flood, hazardous material spill, and terrorism), etc.

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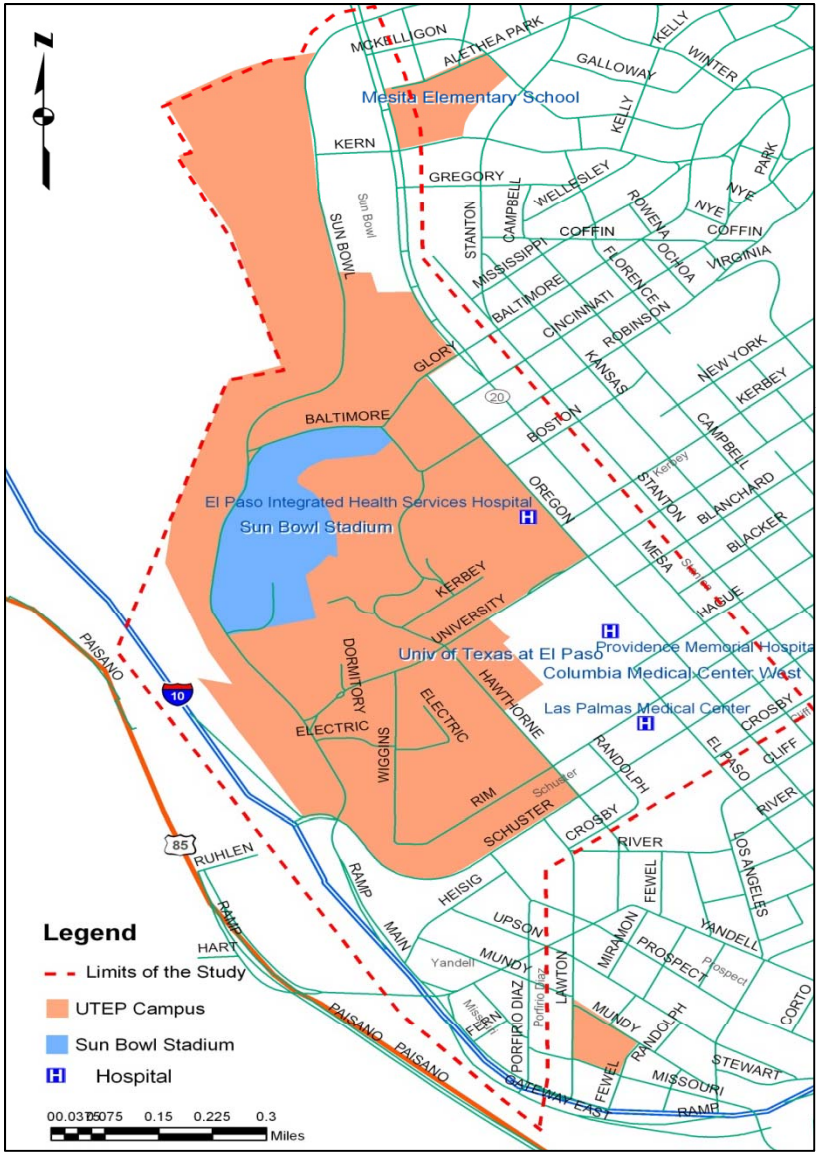
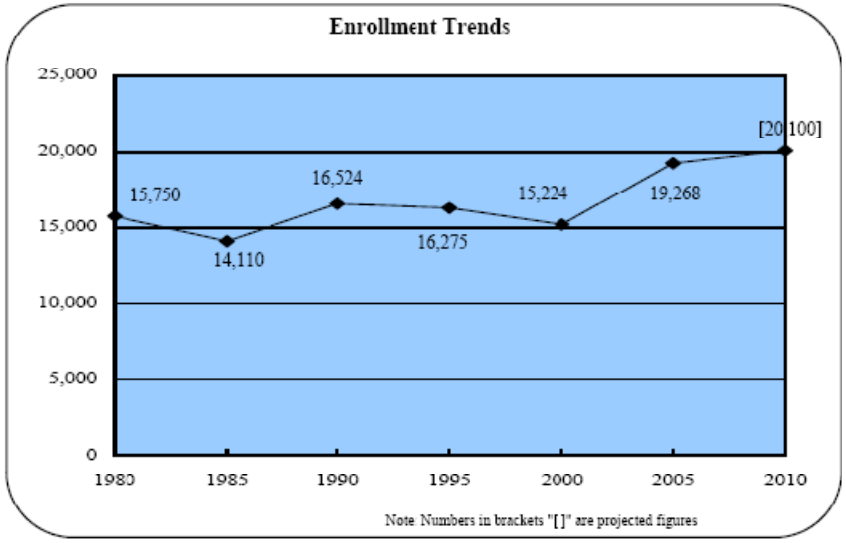
Review Accident Locations—Task Overview

- Based on a formal crash analysis
- Statistical analysis using historical data
  - Demographics
  - UTEP-enrollment patterns
  - Peak-periods and trends
  - Visibility conditions
  - Transportation modes
- Identify and prioritize traffic accident hotspots based on:
  - Frequency of the accidents
  - Frequency and severity of injuries
- Task progress
  - Draft reviewed by project expert panel (comments to be addressed)
  - Overall progress: 95%



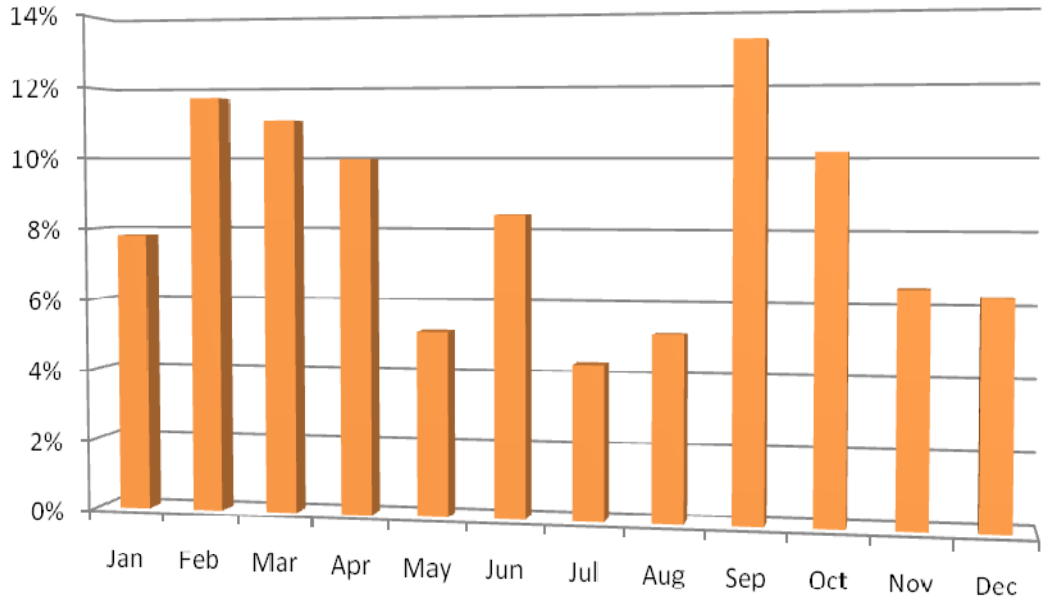
Demographics and UTEP-Enrollment Patterns

- El Paso population: 606,913 habitants (July 2007)
- For population 25 years and over, educational demographics are as follow:
  - High school or higher: 68.6%
  - Bachelor's degree or higher: 18.3%
  - Graduate or professional degree: 6.2%
- Enrollment has been increasing at 2.0% per year exceeding the average enrollment of public universities in Texas by 0.6%
- In 2007 with 20,154 students, enrollment was already exceeding the projections for year 2010



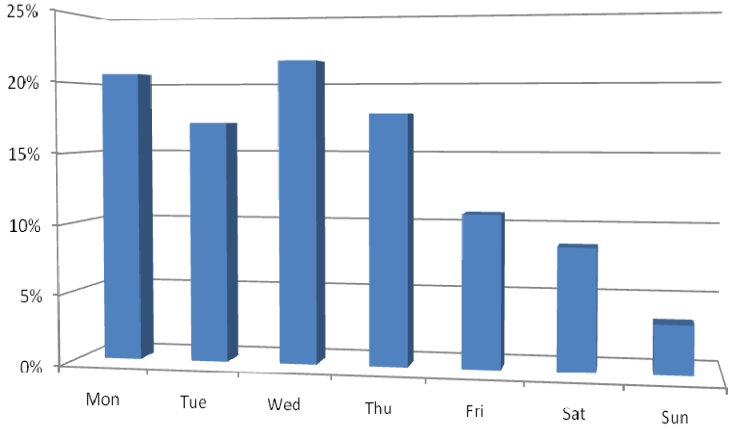
Peak Months for Traffic Accidents inside UTEP Campus

- Percentage of accidents per month inside UTEP campus
  - Data from January 2006 to May 2009
- Peak months are close to the beginning of each term of classes
  - Spring: February
  - Summer: June
  - Fall: September



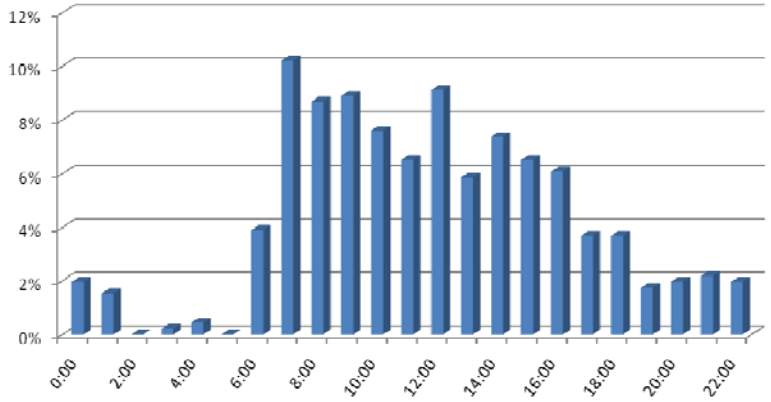
Peak Days and Hours for Traffic Accidents inside UTEP

- Class schedules are repetitive

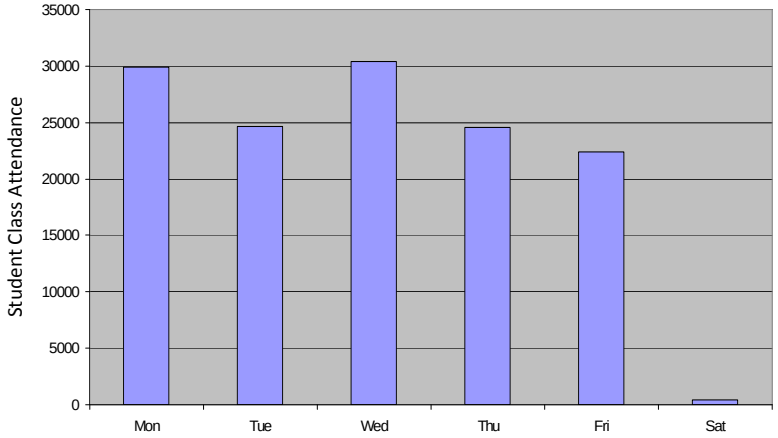


Traffic Accidents inside UTEP Campus per Weekday

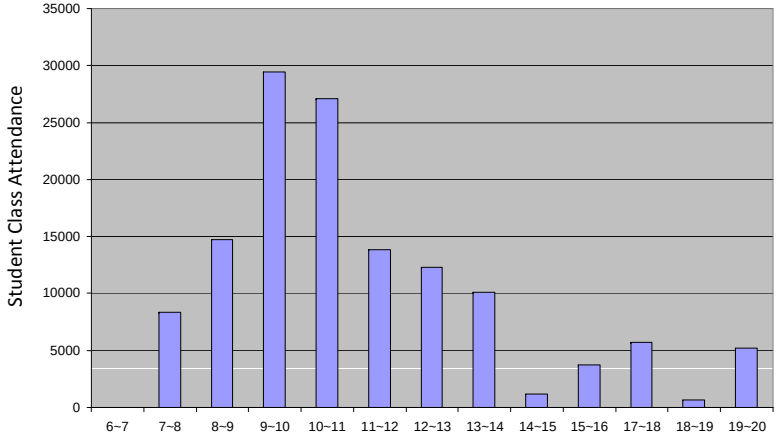
- Peak periods are highly correlated to attendance



Traffic Accidents inside UTEP Campus per Hour



Student's Attendance per Day (Yi-Chang 2002)

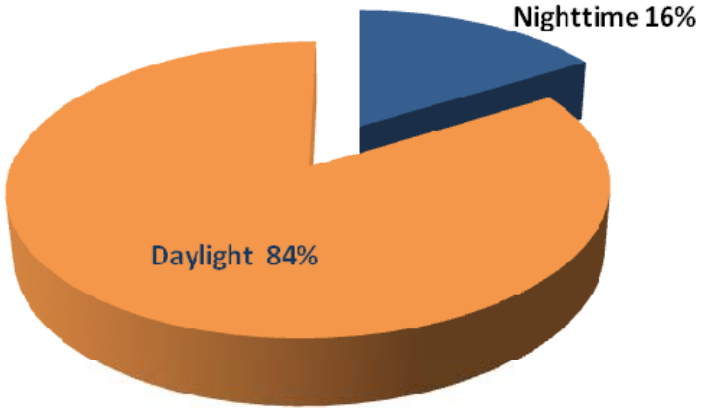


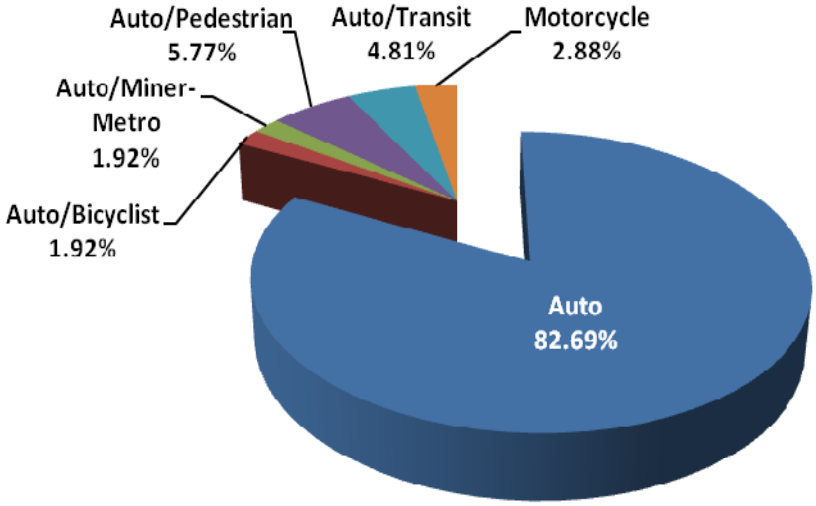
Student's Attendance per Hour (Yi-Chang 2002)

Visibility Conditions and Transportation Modes

- Data constraints to further segregate visibility conditions
  - Artificial lighting
  - Time periods with poor visibility conditions
- Daylight or nighttime classification
  - Accident's time of the day
  - The official Daylight Savings Times for sunrises and sunsets
- Transportation modes involved reported by UTEP Police Department
- Excludes accidents inside parking lots

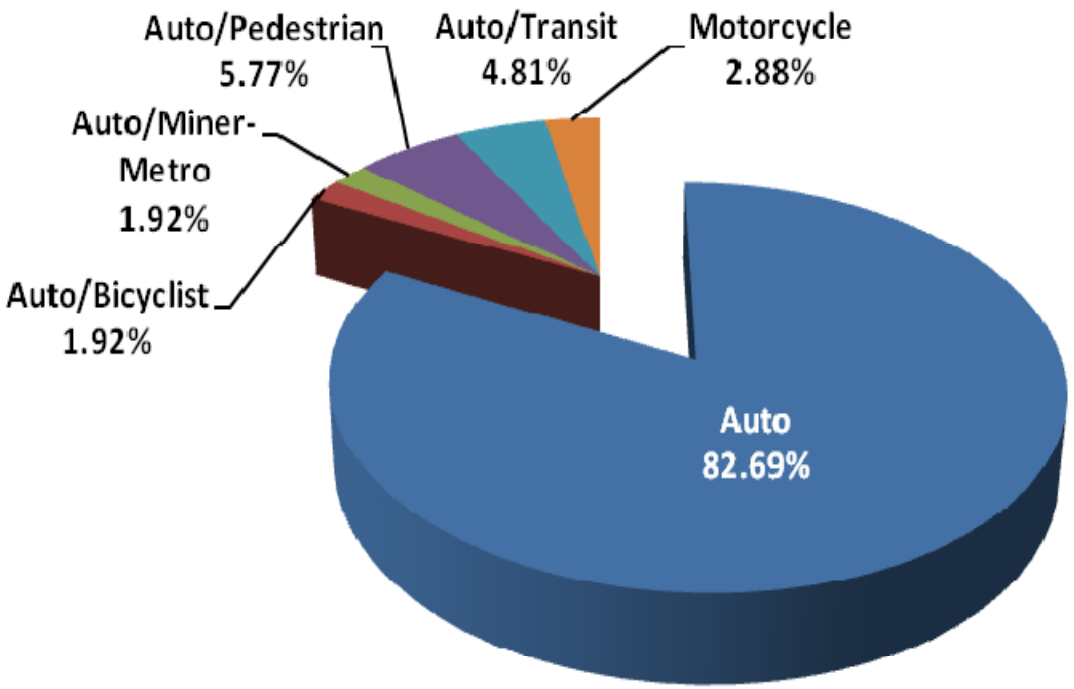
Visibility Conditions of Accidents inside UTEP





Percentages of Accidents per Transportation Mode

Modal Share of Accidents



Notes:
1) Transportation modes involved reported by UTEP Police Department
2) Excludes accidents inside parking lots

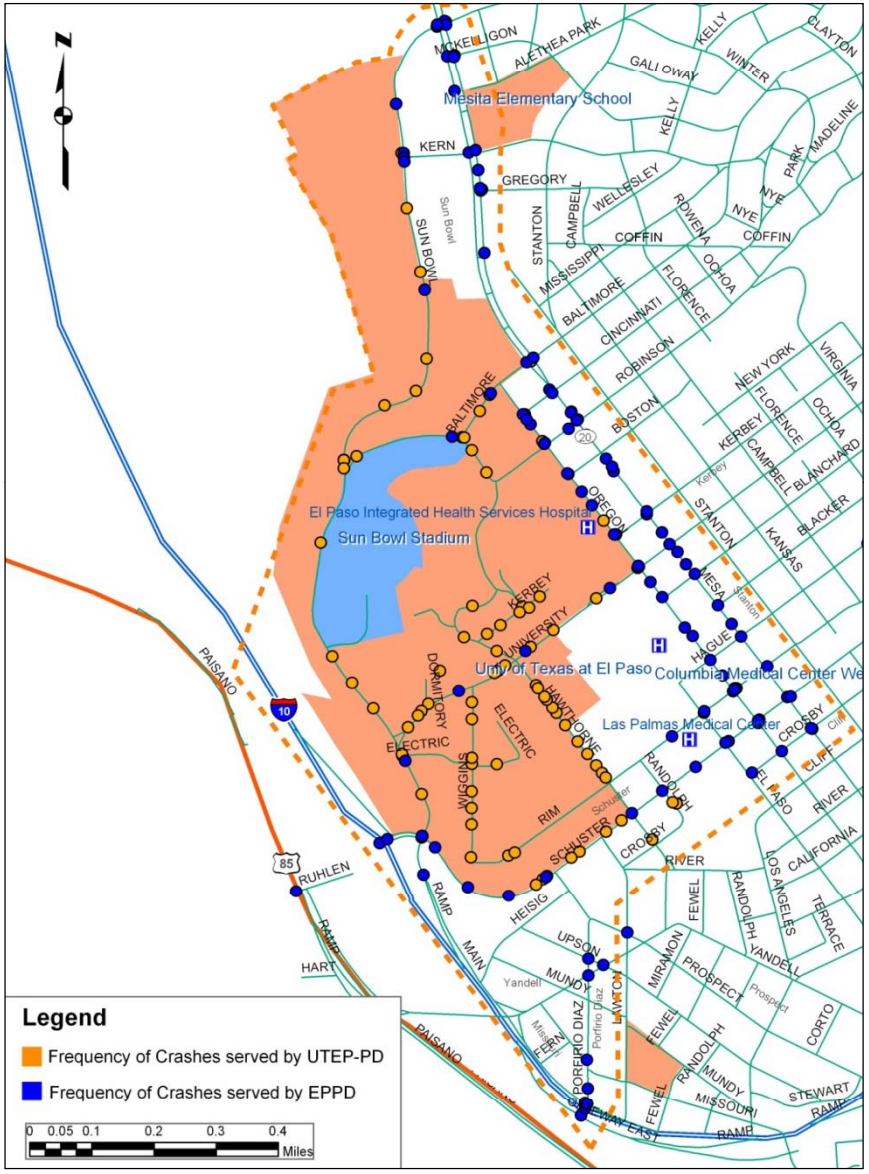
Corridor Analysis

Accidents Served by UTEP Police Department

- 99 accidents on corridors
- No fatalities
- 22 injuries — 7 inside parking lots
- 5 Accidents on corridors and parking lots entrance
- 357 minor accidents inside the parking lots

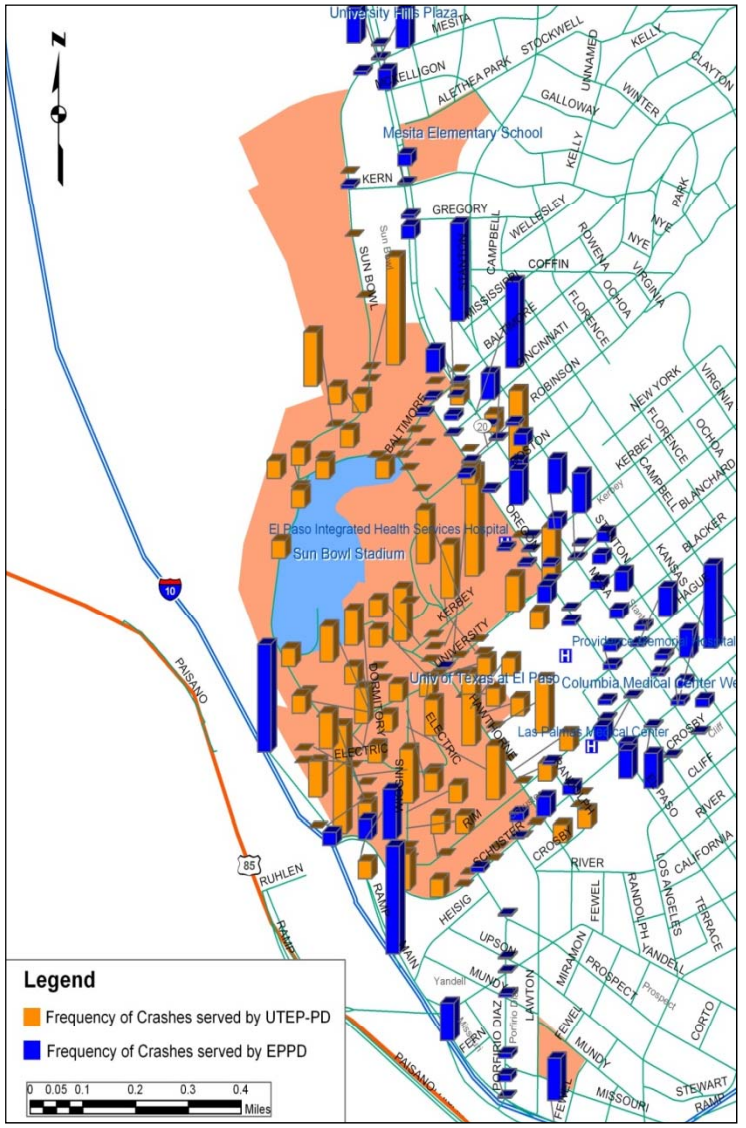
Accidents Served by El Paso Police Department (EPPD)

- 837 traffic accidents
- 3 fatalities
  - 2 N Mesa St. & Cincinnati (1 pedestrian)
  - 1 N Mesa St. & E Hague Rd. (1 pedestrian)
- 224 injuries



Traffic Accidents Hotspots

High Priority	Intermediate	Low Priority
I-10 & Schuster Ave. 132 Accidents 1 Incapacitating injury 7 Non-incapacitating 17 Minor injuries	**N Mesa St. & University Ave.** 22 Accidents 4 Non-incapacitating 7 Minor injuries	**Sun Bowl Dr.** 18 Accidents 8 Injuries (2 pedestrians)
N Mesa St. & Cincinnati Ave. 54 Accidents 2 Fatalities (1 pedestrian) 4 Non-incapacitating 12 Minor injuries	**Sun Bowl Dr. & Shuster Ave** 40 Accidents 1 Non-incapacitating 10 Minor injuries	**W University Ave. (UTEP)** 19 Accidents 1 Minor injury
N Mesa St. & Glory Rd. 57 Accidents 1 Incapacitating 5 Non-incapacitating 12 Minor injuries	**I-10 & Porfirio Diaz St.** 49 Accidents 1 Non-incapacitating 8 Minor injuries	**Hawthorne St. (UTEP)** 16 Accidents 3 injuries
N Mesa St. & Schuster Ave. 41 Accidents 1 Incapacitating 4 Non-incapacitating 30 Minor injuries	**N Oregon St. & Schuster Ave** 15 Accidents 3 Non-incapacitating 4 Minor injuries	**Wiggins Dr. (UTEP)** 15 Accidents
N Mesa St. & Hague Rd. 16 Accidents 1 Fatality (pedestrian) 2 Non-incapacitating 5 Minor injuries	**W Schuster Ave. & Hawthorne St.** 11 Accidents 3 Non-incapacitating 1 Minor injury	**Dormitory Rd. (UTEP)** 6 Accidents



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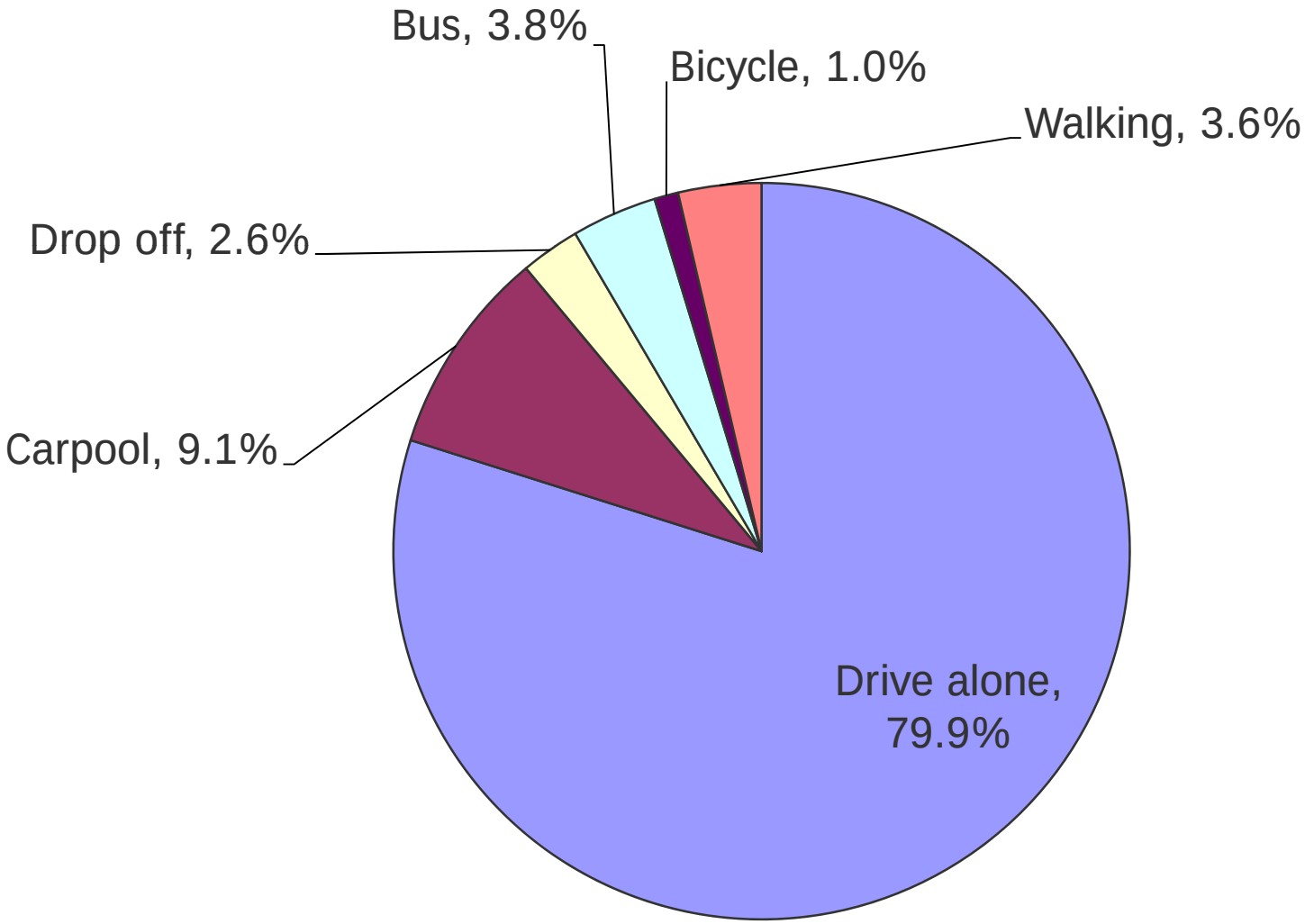
Faculty, Staff, and Student Surveys (Task 4)

- The survey was conducted the week of July 6, 2009
  - By Internet (via email broadcast)
  - By going to classrooms
  - All responses were entered into the survey web site

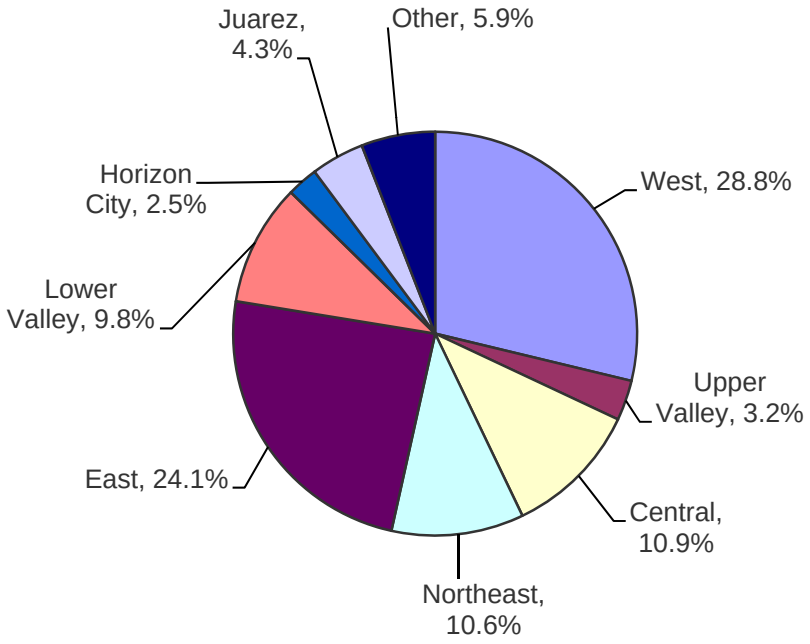
RESPONDENT PROFILE

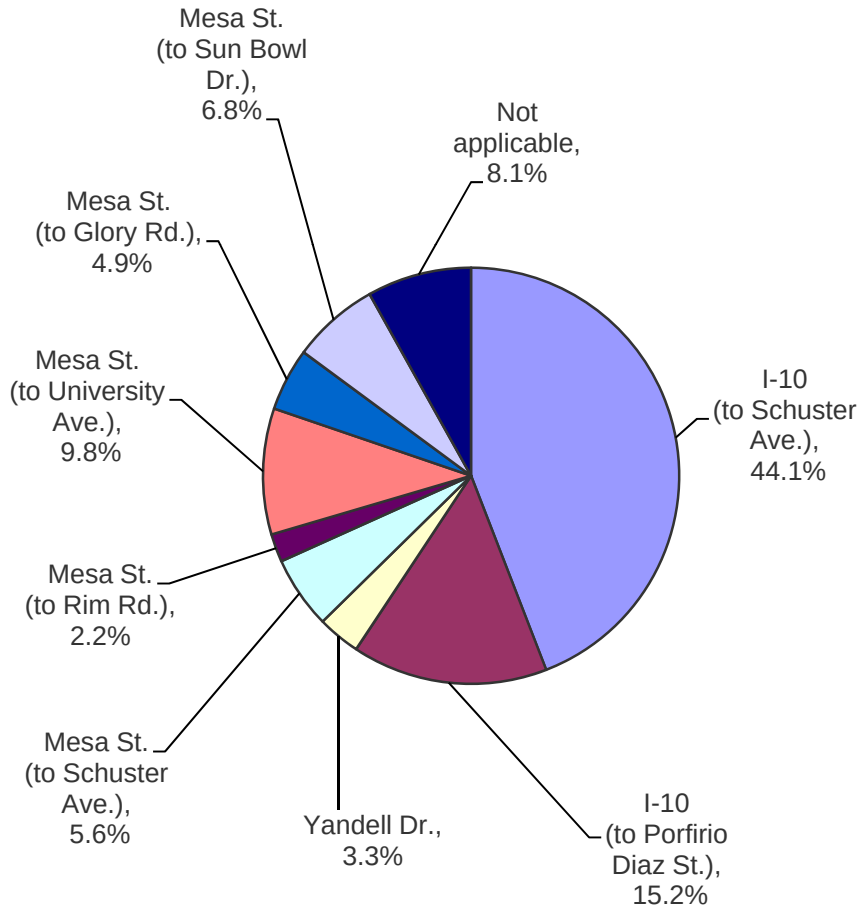
Respondent	No. of responses	%
Faculty	59	6.1%
Staff	188	19.5%
Student	713	74.0%
Visitor	4	0.4%
Total	964	100%

Mode of Transportation to/from Campus

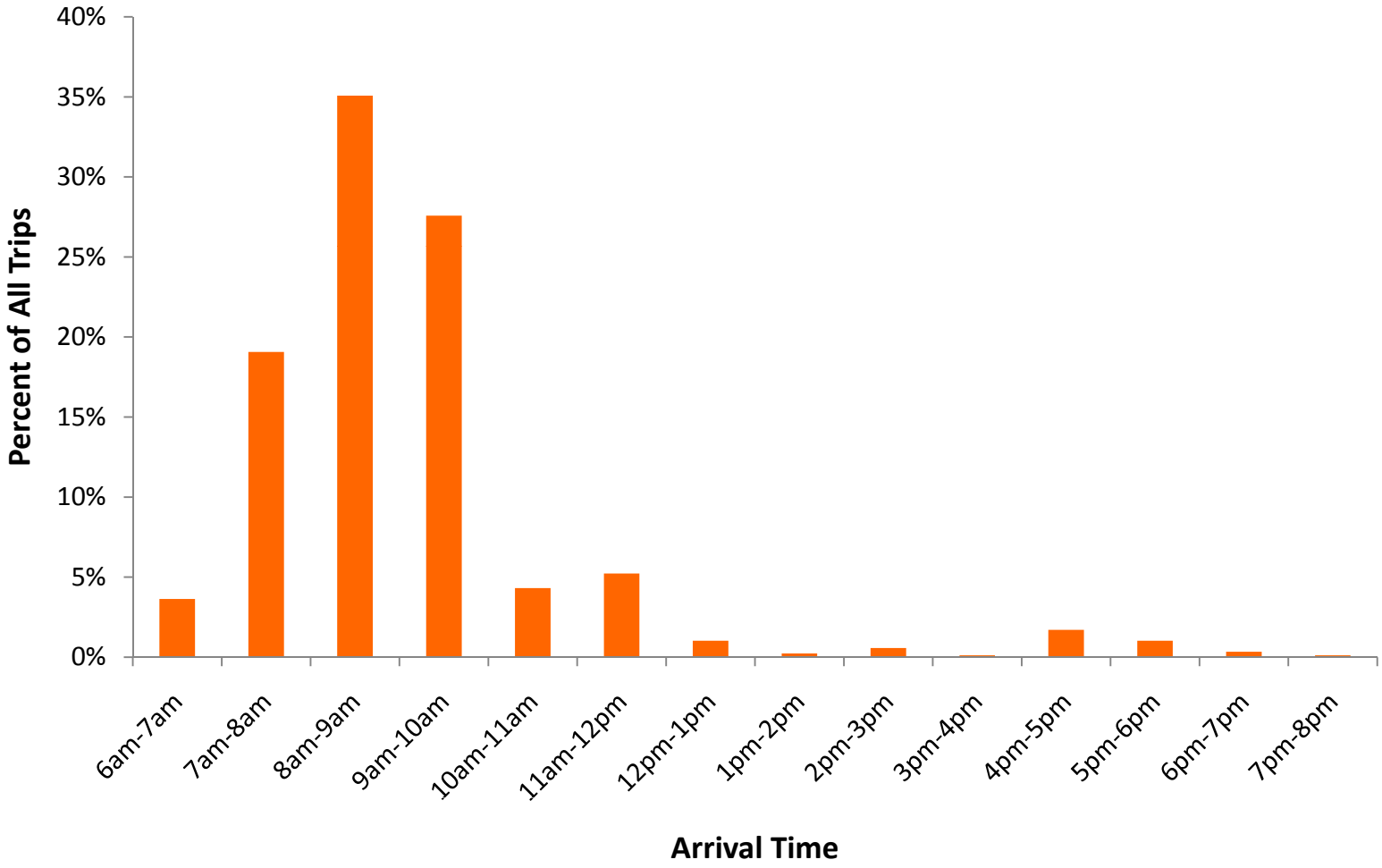


Trip Origins and Entry Points to Campus (Cars)

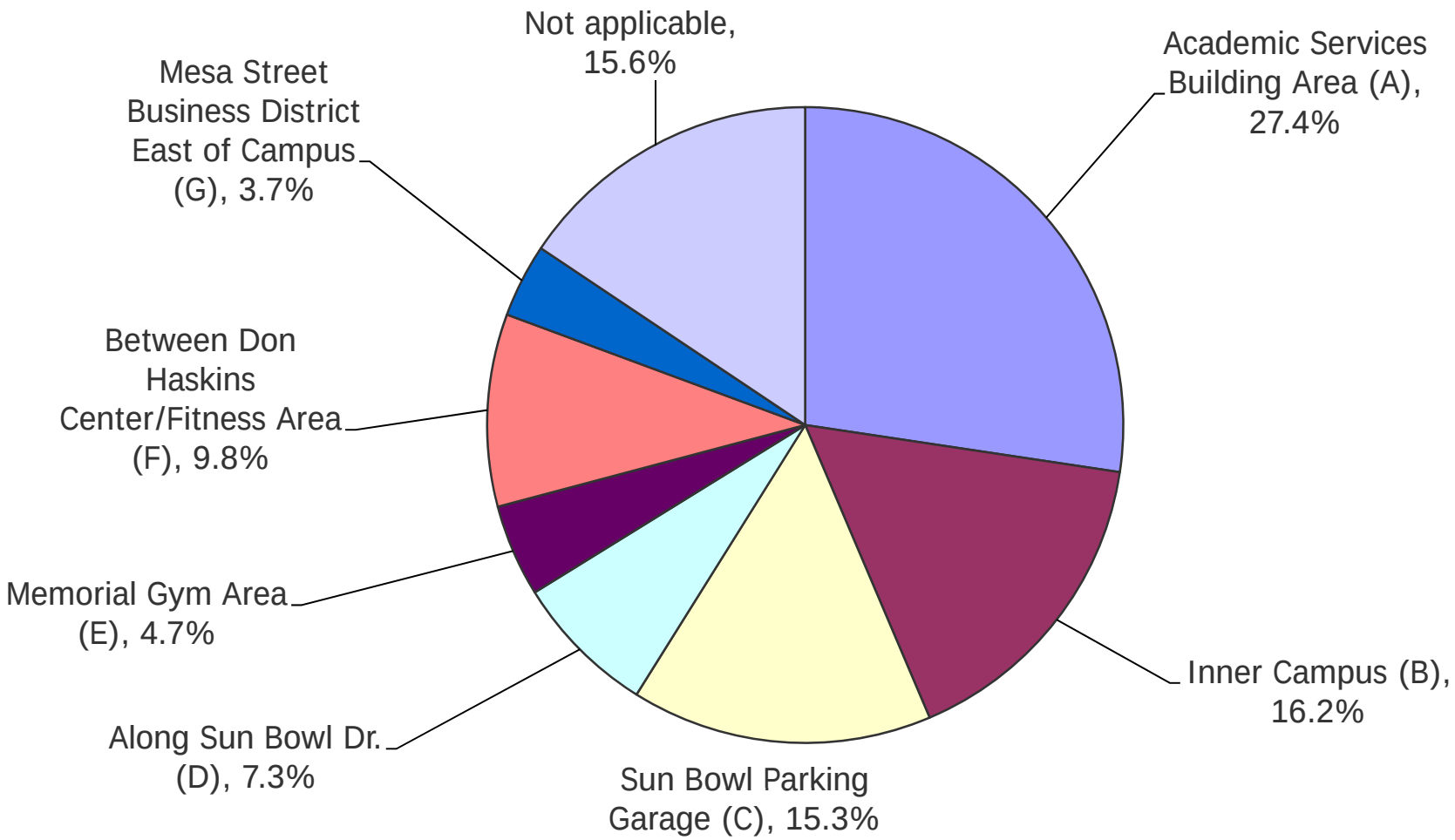




Arrival Time Distribution

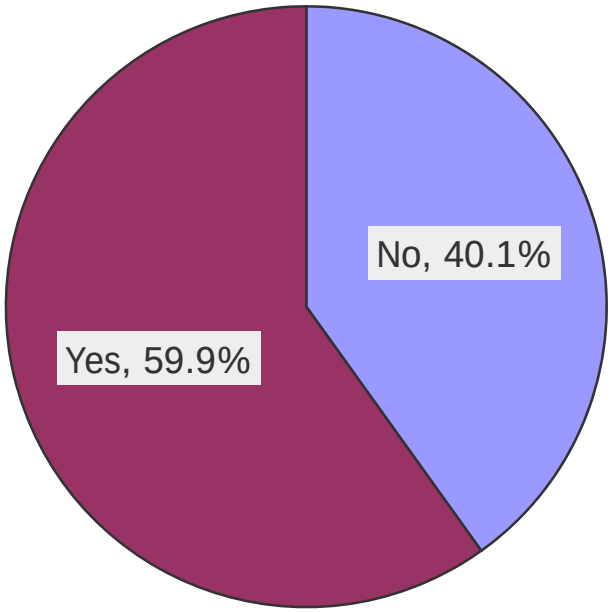


Parking Locations (Destinations in UTEP)

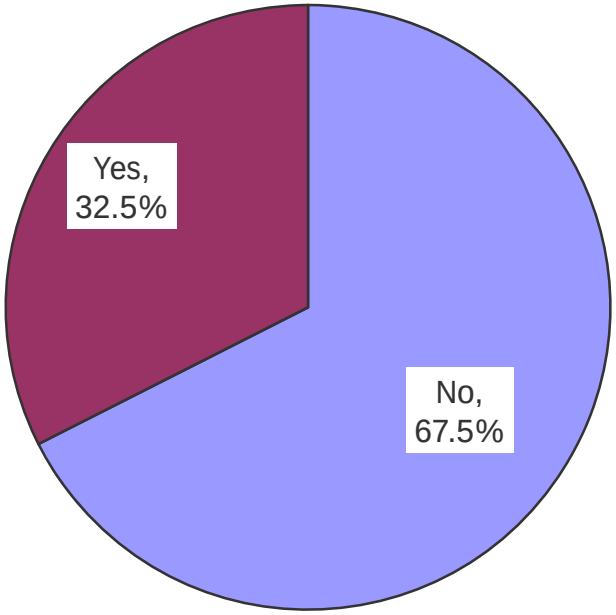


Questions Related to Safety

- Closing inner campus to traffic will improve safety?

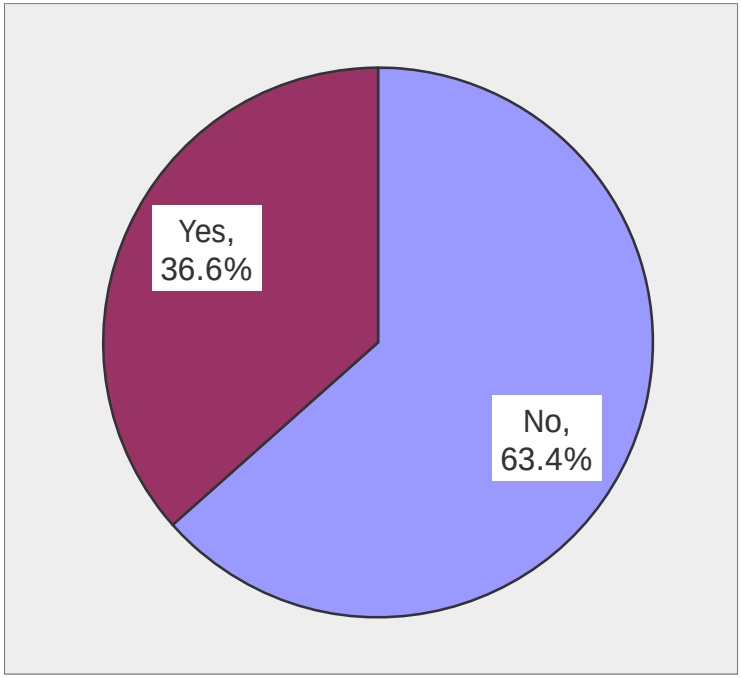


- Too many pedestrian-vehicle conflicts?



Questions Related to Safety

- Do you perceive any traffic safety problem on campus?
- Most frequently cited problems (from 319 comments)
  - Vehicles do not yield to pedestrians/bicyclists (64 or 20%)
  - Jaywalking (57 or 18%)
  - Crowd at Hawthorne/University intersection (47 or 15%)
  - Congestion at I-10/Schuster (44 or 14%)
  - Speeding on campus roads (41 or 13%)
  - Parking-related problems (22 or 7%)
- Implies:
  - Need to separate pedestrian and vehicle paths
  - Schuster realignment
  - Traffic calming



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Current Infrastructure – Parking Conditions

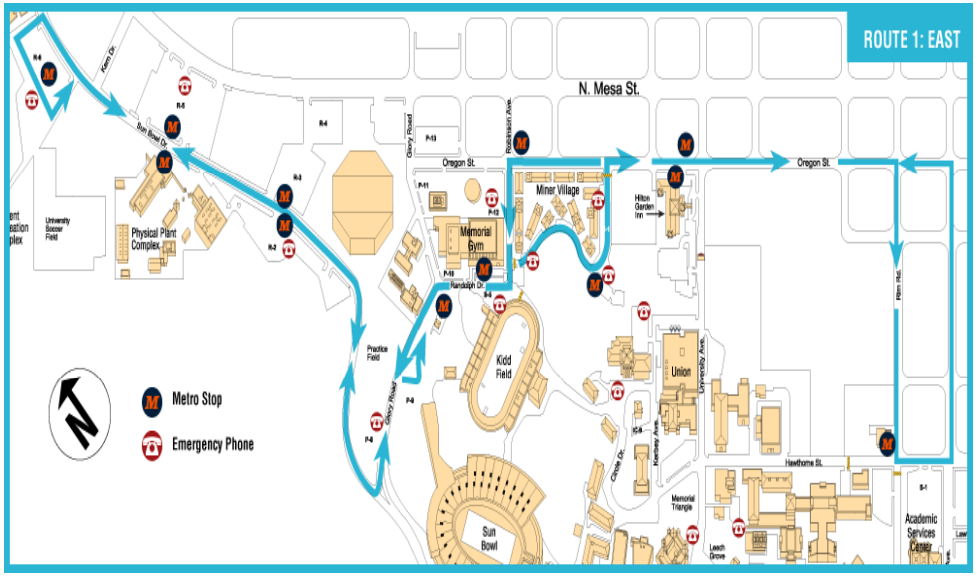
- UTEP Parking
  - More than 9,800 parking spaces
  - 54 parking lots
  - 1 multiple level parking garage
  - 125 carpool parking spaces
    - » Located in remote parking lot and by the Academic Services Building

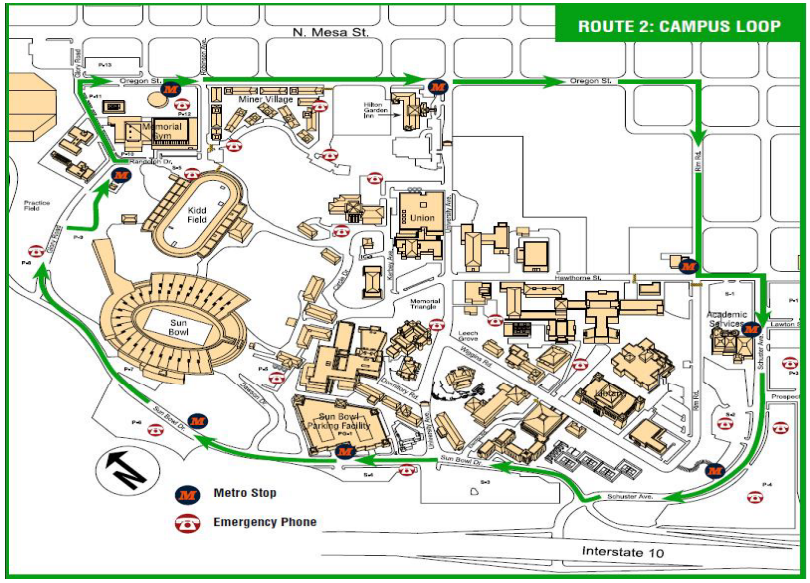
Current Infrastructure UTEP Campus Map

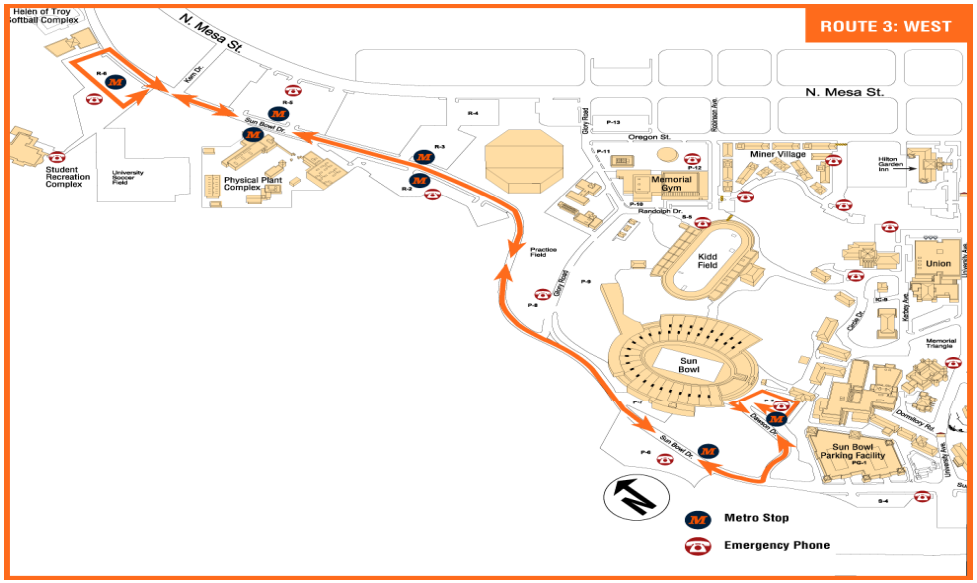
Current Infrastructure – Miner Metro Shuttle Bus Service

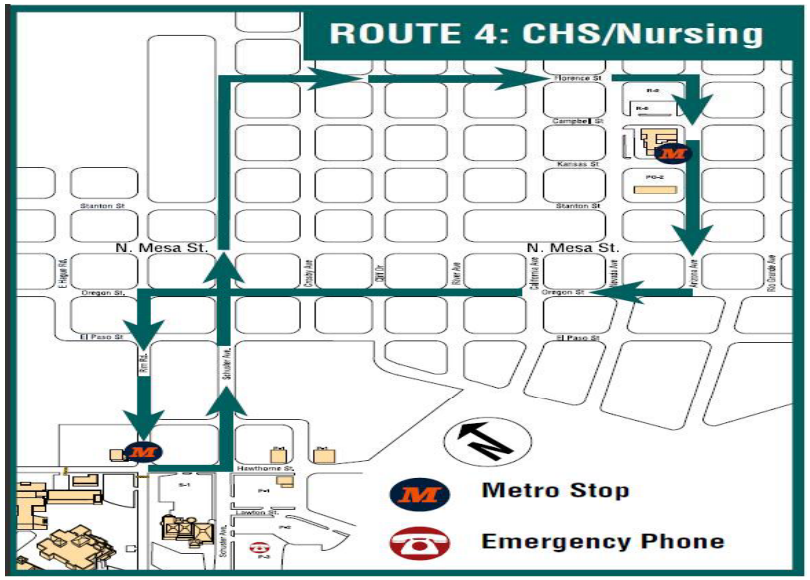
- Miner Metro Service
  - Miner Metro shuttles are free to all UTEP faculty, staff, students, and visitors
  - Service is available Monday through Friday when classes are in session during the fall, spring, and summer semesters
  - This service does not operate during wintermester, maymester, university holidays, or intersessions
  - Consists of four routes
    - » Route 1: East
      - Monday through Thursday between 6:35 a.m. and 9:30 p.m. and Friday between 6:35 a.m. and 6:30 p.m. (15 min intervals)
    - » Route 2: Campus Loop
      - Monday through Friday between 7:00 a.m. and 5:30 p.m. (25 min)
    - » Route 3: West
      - Monday through Thursday between 6:35 a.m. and 9:30 p.m. and Friday between 6:35 a.m. and 6:30 p.m. (15 min interval)
    - » Route 4: CHS/Nursing
      - Monday through Friday between 7:00 a.m. and 5:45 p.m.

Current Infrastructure – Miner Metro Bus Routes



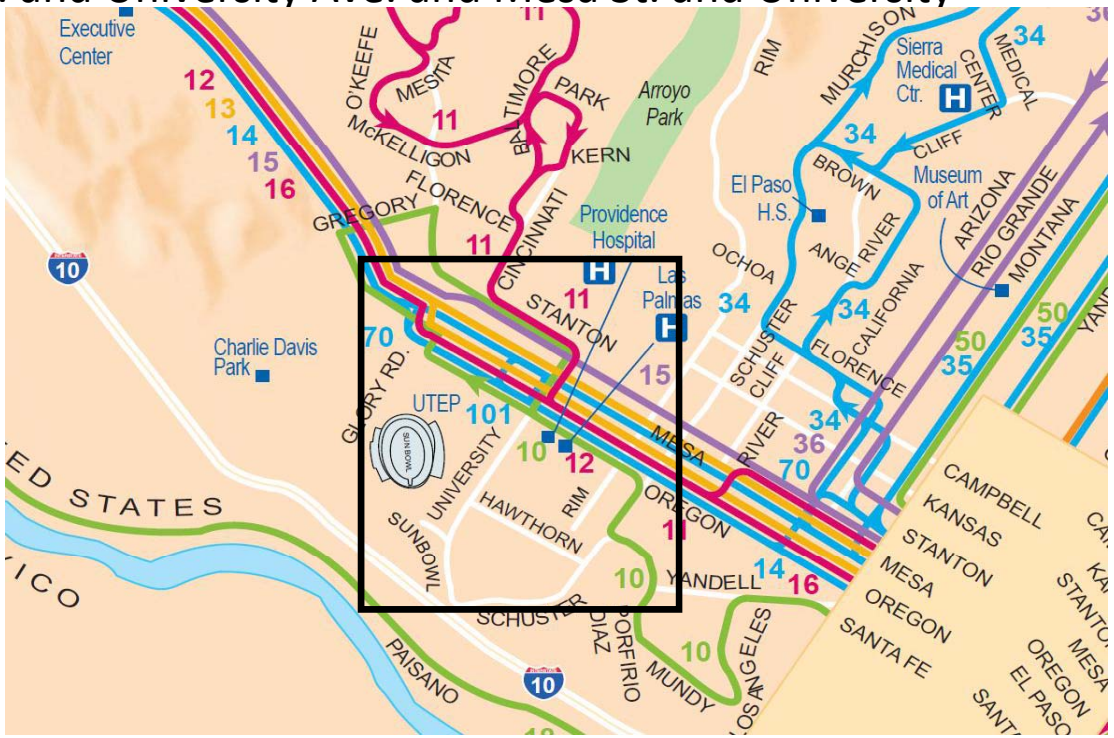






Current Infrastructure – Sun Metro Bus Routes

- Sun Metro Service
  - Routes 10, 11, 12, 13, 14, 15, 16, 70, and Smart 101 pass by UTEP main campus
    - » Route 70 only operates in the spring and fall semesters
  - Most of the stops for these routes where students get off are located near the intersection of Oregon St. and University Ave. and Mesa St. and University Ave.
- Student fare: $0.75 cents



Current Infrastructure – Special Events

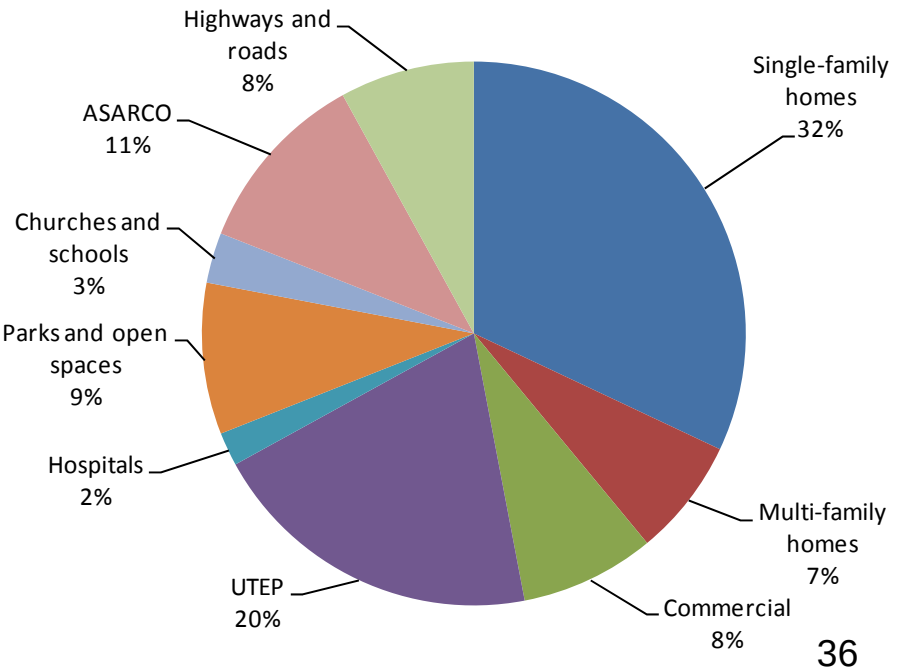
- Special Events at UTEP
  - Don Haskins Center
    - » Seating capacity: 11,767
    - » Events held:
      - UTEP basketball games
      - Sports events
      - Concerts
      - UTEP commencement ceremonies
      - El Paso Community College graduations
      - Area high school graduation ceremonies
    - » Parking lots used:
      - P-11 is closed for trucks and buses related to the event
      - Lots P-9, P-10, P-12, P-13, R-2, R-3, and R-4 are reserved for people attending the event

Current Infrastructure – Special Events cont.

- Sun Bowl Stadium
  - Seating capacity: 52,000
  - Events held:
    - UTEP football games and sports events
    - Concerts
  - Parking lots used:
    - Lots P-5, P-6, P-7, P-8, P-9, P-10, and parking garage
- Magoffin Auditorium
  - Seating capacity: 1,156
  - Events held:
    - UTEP ballet
    - El Paso Wind Symphony
    - Small concerts and plays
    - UTEP pre-commencement ceremonies
  - Parking lots used:
    - Parking spaces along Circle Dr. and Kerbey Ave.

Current Infrastructure – Surrounding Area

- Land Use
  - Private residents and UTEP are the primary land users
  - UTEP is surrounded by commercial and medical facilities
  - Neighborhoods located in Sunset Heights, El Paso High, and Rim-University have more residences for multiple families
  - The commercial area is located primarily along Mesa St. and includes:
    - Retail shops
    - Complexes
    - Restaurants
    - Office buildings
  - Medical area consists of:
    - Providence Memorial Hospital
    - Las Palmas Medical Center
    - Sierra Medical

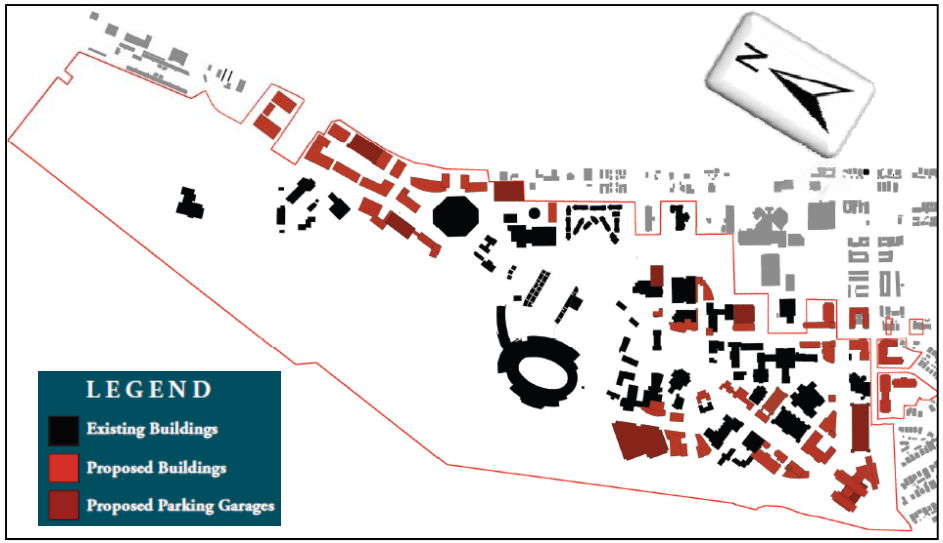


Future Infrastructure – Proposed Constructions

- New Buildings
  - Proposed Phase I will consist of 1,633,300 gross square feet (gsf) of buildings distributed among:
    - North Campus – 558,000 gsf
    - Core Campus – 1,000,300 gsf
    - Schuster Road – 75,000 gsf
  - Proposed Phase II will consist of 1,434,000 gsf of buildings distributed among:
    - North Campus – 303,000 gsf
    - Core Campus – 388,300 gsf
    - Schuster Road – 743,000 gsf
- Pedestrian plan
  - Will also consist of two phases of proposed open spaces and pedestrian walkways

Future Infrastructure – Proposed Construction

- Proposed Buildings and Parking Garages in Phase I



- Proposed Buildings and Parking Garages in Phase II

Future Infrastructure – Transit Terminal

- Transit Terminal
  - This Sun Metro transit terminal will be combined with one of the parking garages proposed in Phase I:
    - The Glory Road Transit Terminal and parking garage will be located at 100 E. Glory Road (next to the Don Haskins Center)
    - It will consist of a seven-story building of 202,000 sq. ft.
    - Transit terminal will be located on the ground floor
      - Four off street bus bays and four on street bus bays
    - Six floors of open parking garage for 442 cars
    - Enclosed waiting are with restrooms
    - Outdoor waiting areas
- The following screen shots of the proposed transit terminal were obtained from: www.neomedia-dg.com/Content/glory-road-transit-terminal.html
  *(This design may not be the final design for the terminal)

Future Infrastructure – Transit Terminal cont.

Future Infrastructure – Closure of Inner Campus

- Some of the features and modifications of closing part of inner campus include:
  - University Ave. is closed from the Union on the east to Wiggins Rd. and Hawthorne St. is closed from University Ave. to the Physical Sciences Building
  - A new pedestrian zone at the core of campus around Memorial Triangle
  - Closing the streets mentioned above along with parking lot IC-10 provides opportunity to create a new campus center
  - This open space would be well used for formal and informal campus gatherings
  - Pedestrian circulation will flow through the center of campus, and vehicular circulation will be kept at the perimeter except for special occasions
  - Smaller pedestrian paths connect between buildings and spaces creating a fine grain circulation network
  - Added green space will provide an area for passive recreation and socialization currently not found on campus
  - Closing University Ave. in this zone will ensure a safe environment for pedestrians

Future Infrastructure – Closure of Inner Campus cont.

Screen shot of proposed closed campus core with traffic redirected behind the Liberal Arts Building

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Gap Identification and Scenario Development

- The gap identification process focused on the following aspects:
  - Inadequate traffic control
  - Parking management
  - Pedestrian crossings
  - Bike paths
  - Transit service/UTEP shuttle program
- Findings and scenarios are based on the results obtained from the accident data analysis, UTEP surveys, a campus field study, and the literature review conducted
- The most critical improvements of transportation infrastructure are focused on enhancing safety and management

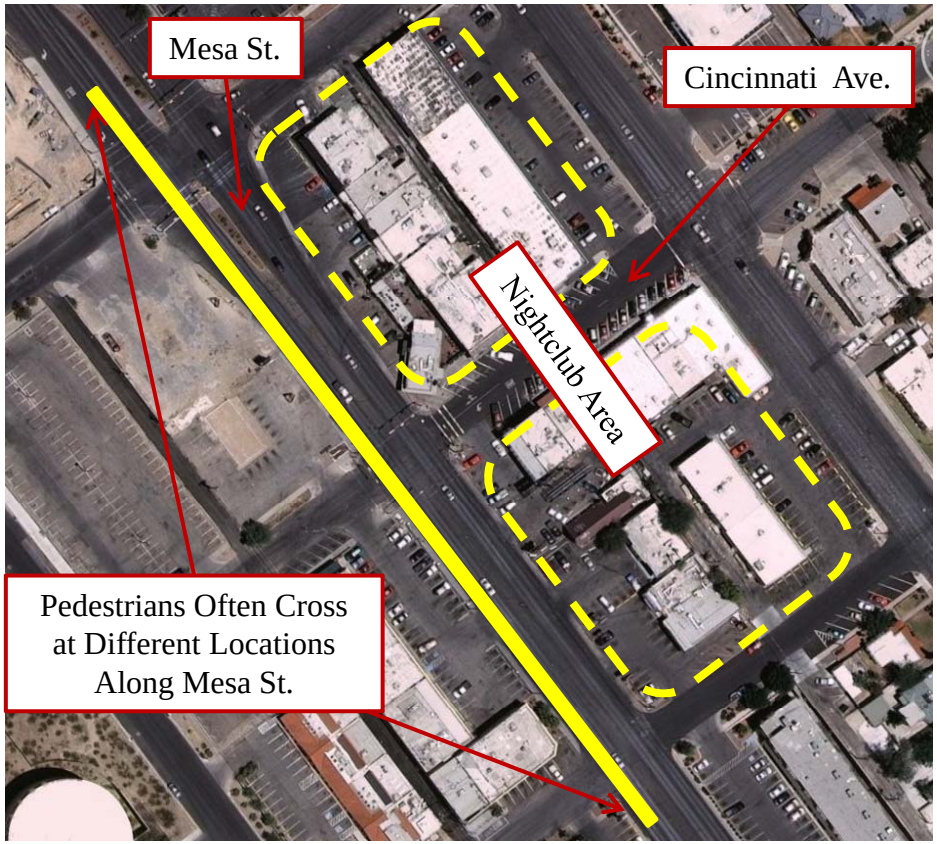
Accident Location Data Analysis – Common Issues

- Most common issues identified on the 6 priority intersections were:
  - Conflicts between pedestrians and vehicles causing spillbacks (e.g., Sun Bowl Dr. at University)
  - Pedestrian crossings striping not visible to drivers and inadequate lighting
  - Grade configuration along Mesa St. contributes to a reduced line of sight as well as lower reaction time for vehicles

The Crossing Striping on Hague Rd. near Mesa St. is Barely Visible to Drivers

Accident Location Data Analysis – Cincinnati and Mesa St.

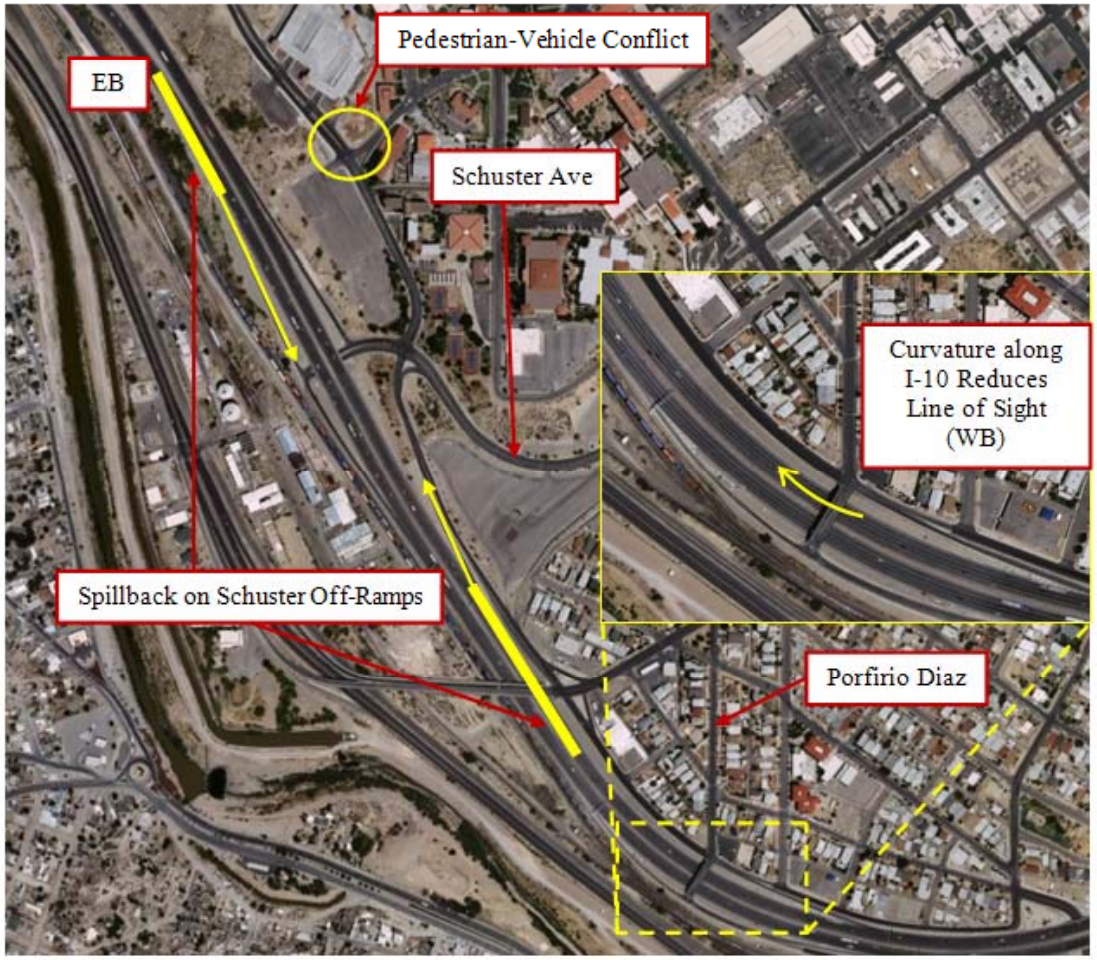
- The conflict between pedestrians and vehicles continues to grow and is often susceptible to accidents
  - "Jaywalking" is usually observed along Mesa St.
  - Demand for pedestrian signals is higher than other intersections due to nightlife and restaurants nearby



Mesa St. at Cincinnati Dr.

Accident Location Data Analysis – Campus Entry Points

- The I-10 Schuster off-ramps (both east and westbound) serve as one of the main entry points to the campus
- The pedestrian-vehicle conflict on Sun Bowl Dr. and University causes a spillback on I-10
- A pedestrian bridge could aid and mitigate the queue present at morning peak hours



During Morning Peak Hours , there is a Spillback on both Schuster Off-Ramps

UTEP Surveys

Issues

- As observed from the survey results, the following conclusions were obtained:
  - The current car pool program at UTEP doesn't provide enough incentives for students to enroll in the program (only a 15% discount is offered)
  - Public transportation system is rarely utilized due to unreliable travel times as well as stations that are relatively far from the main campus buildings
  - The long headways of UTEP's shuttle service might be the cause of its low usage among college students

Improvements Needed

- The university car pool program needs to offer better incentives such as higher permit discounts and exclusive parking lots to increase the user base
- Now with the new Bus Rapid Transit (BRT) system (Smart-101), the use of public transportation might increase since it offers a 10-minute headway and drop-off areas close to campus
- The shuttle service needs more express routes between the parking lots with the most demand at peak hours (such as remote parking lots)

Campus Field Study

- The field study conducted by TTI researchers at the UTEP campus helped identify additional concerns
- There is a need for designated pick-up and drop-off locations to enhance safety and traffic conditions around the area
- The lack of designated drop off locations create significant delays, queues, and safety concerns for both pedestrians and vehicles

Most Common Pick-Up and Drop-Off Locations around Campus

Campus Field Study cont.

- It was noted that portable radar speed signs seemed to be effective in controlling traffic around campus
  - With the radars deployed, the majority of vehicles respect the speed limit
  - Without the radars, vehicles start to speed up even though there are pedestrian crossings nearby due to adjacent parking lots

Portable Radar Speed Signs Proved to be Effective in Controlling Traffic along Sun Bowl Dr.

Literature Review

Pedestrian Crossings

- High-intensity Activated crosswalk (HAWK) signal devices could improve the safety of pedestrian crossings at high risk intersections such as Mesa/Cincinnati

Bike Riding Incentives

- Currently, the bike pathway network still needs improvements in areas where no paths exist
- The University should also get more involved with the community by offering lockers rentals or discounted safety gear (e.g., helmets)

HAWK Signal Device

Parking Management

- Students often park in the neighborhoods around the campus to avoid paying full price for a permit and thus creates complaints from the neighbors
- The university should work closely with the different neighborhoods to develop strategies to mitigate the well-known issue

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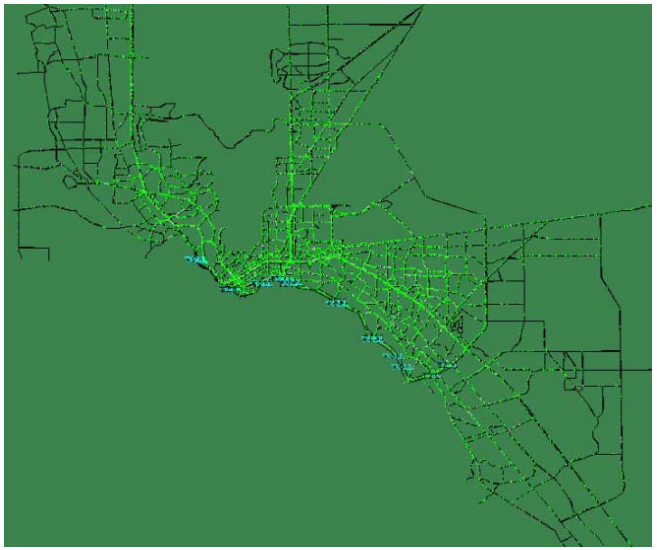
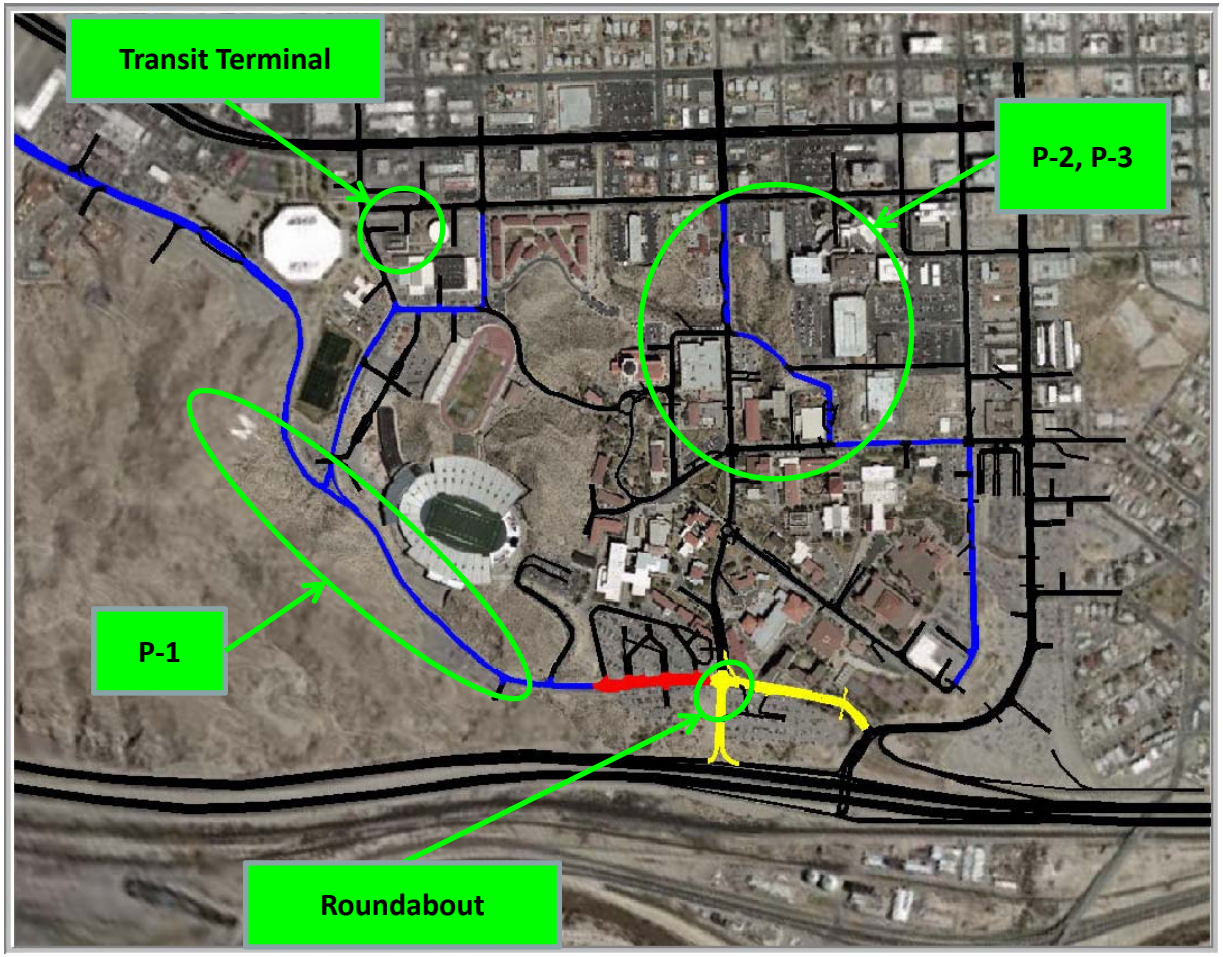
Analyze Transportation System Integration and Interactions

- Multi-resolution modeling approach
  - Mesoscopic
    - » Analyze how traffic redistributes given various design alternatives
  - Microscopic
    - » Analyze pedestrian/vehicle conflict points, transit service, traffic control, and parking alternatives

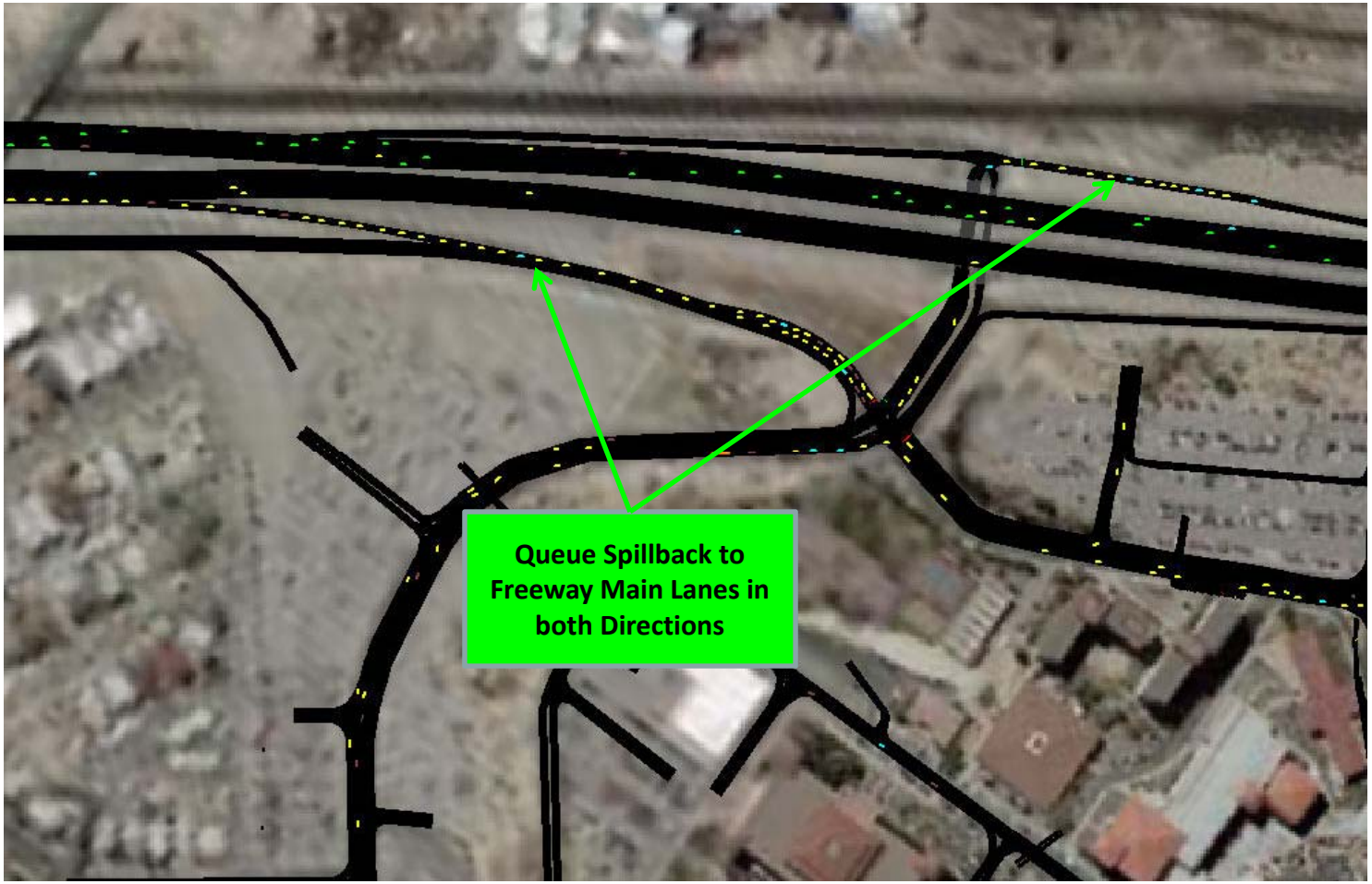


Integration between Systems



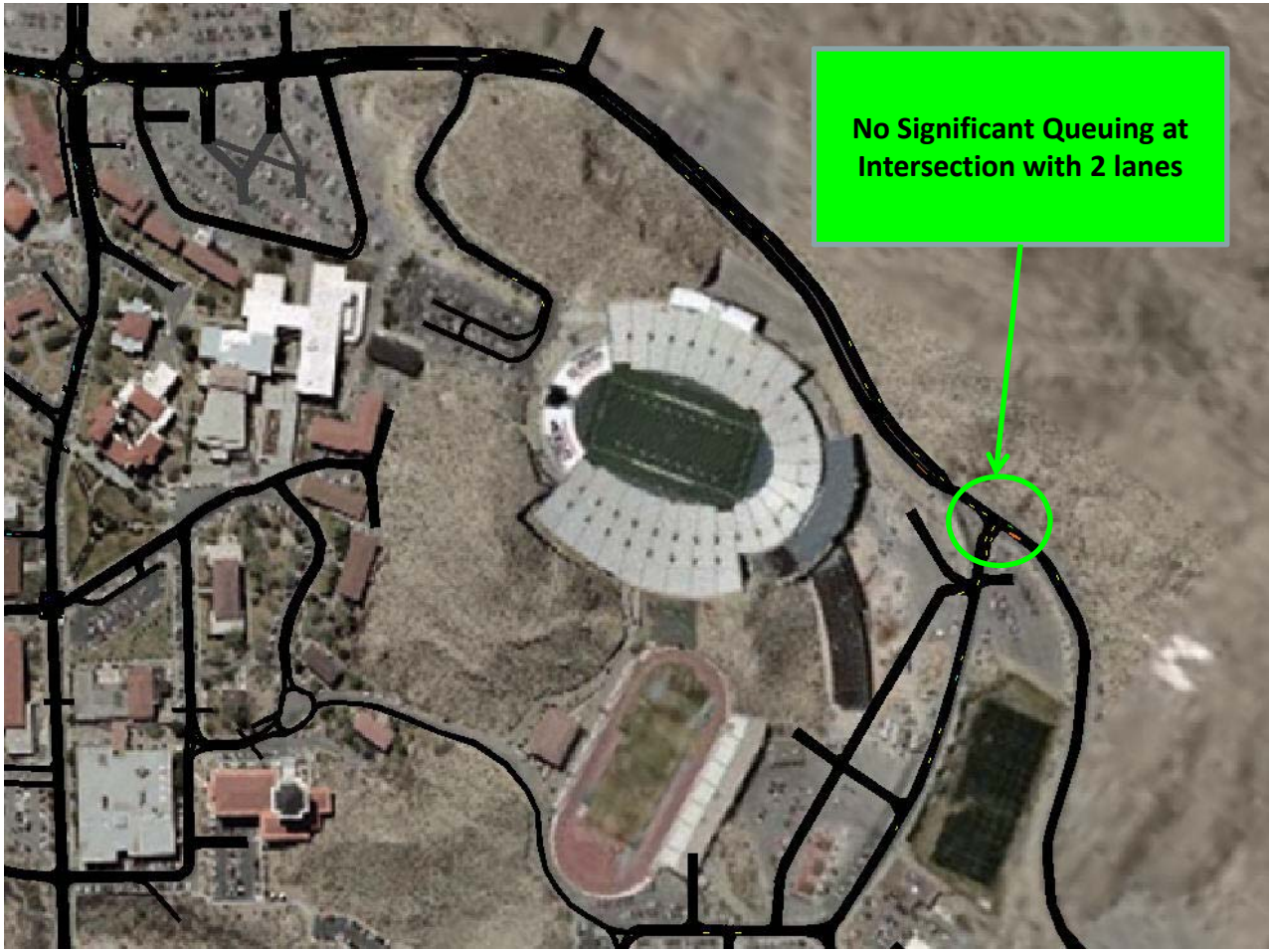
Existing

Integration between Systems



Existing

Integration between Systems

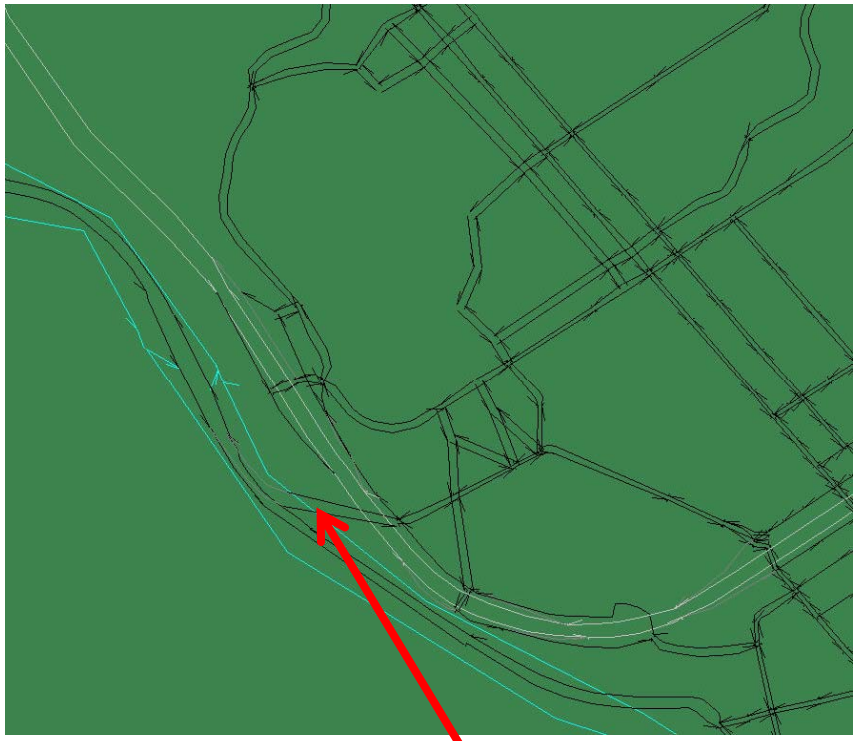


Existing

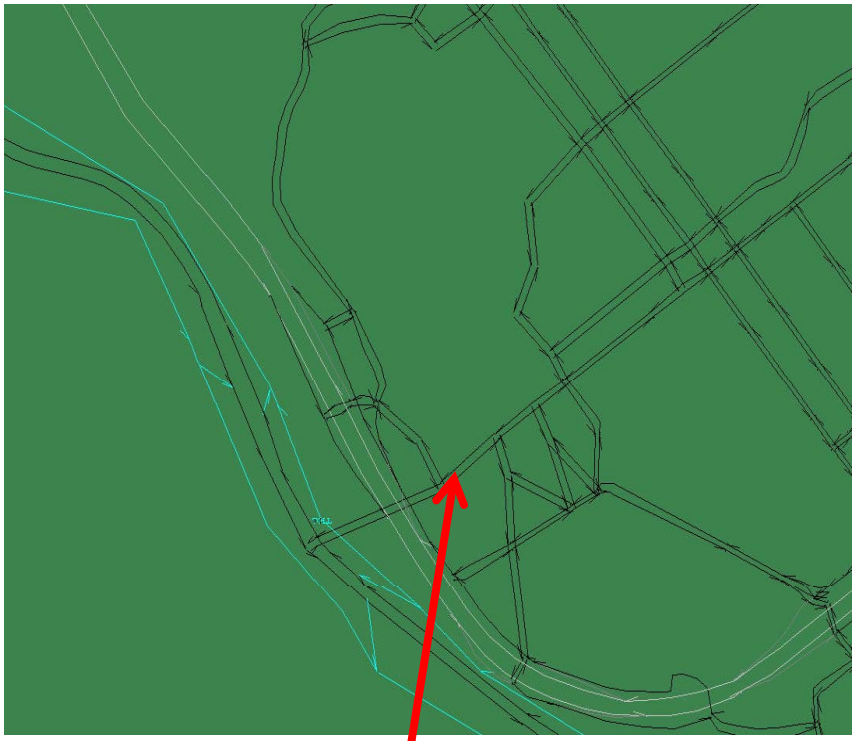
Integration between Systems

- Modeled for 2030
  - Used Metropolitan Planning Organization (MPO) gateway model for mesoscopic simulation
  - Included the remaining UTEP infrastructure improvements
  - Realigned campus entrance
  - Realigned Schuster Ave.
  - Connected Schuster to Paisano W.
  - Modeled in accordance with latest TxDOT drawings
    - » Network included Southern Relief Route
    - » Toll rates were $0.16/mile auto and $0.46/mile trucks
    - » Provided access control at various locations:
      - Paisano W.
      - Downtown
      - US 54
      - Yarbrough
      - Zaragoza

Integration between Systems

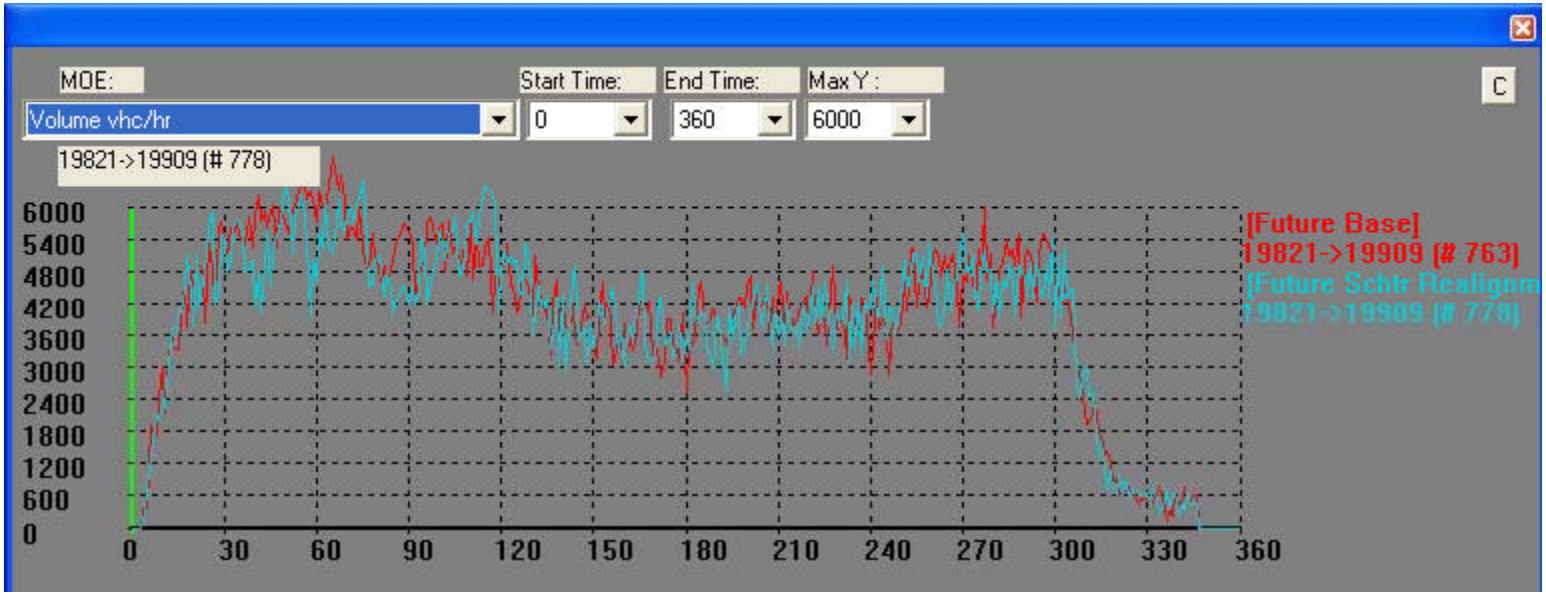


Managed Lanes



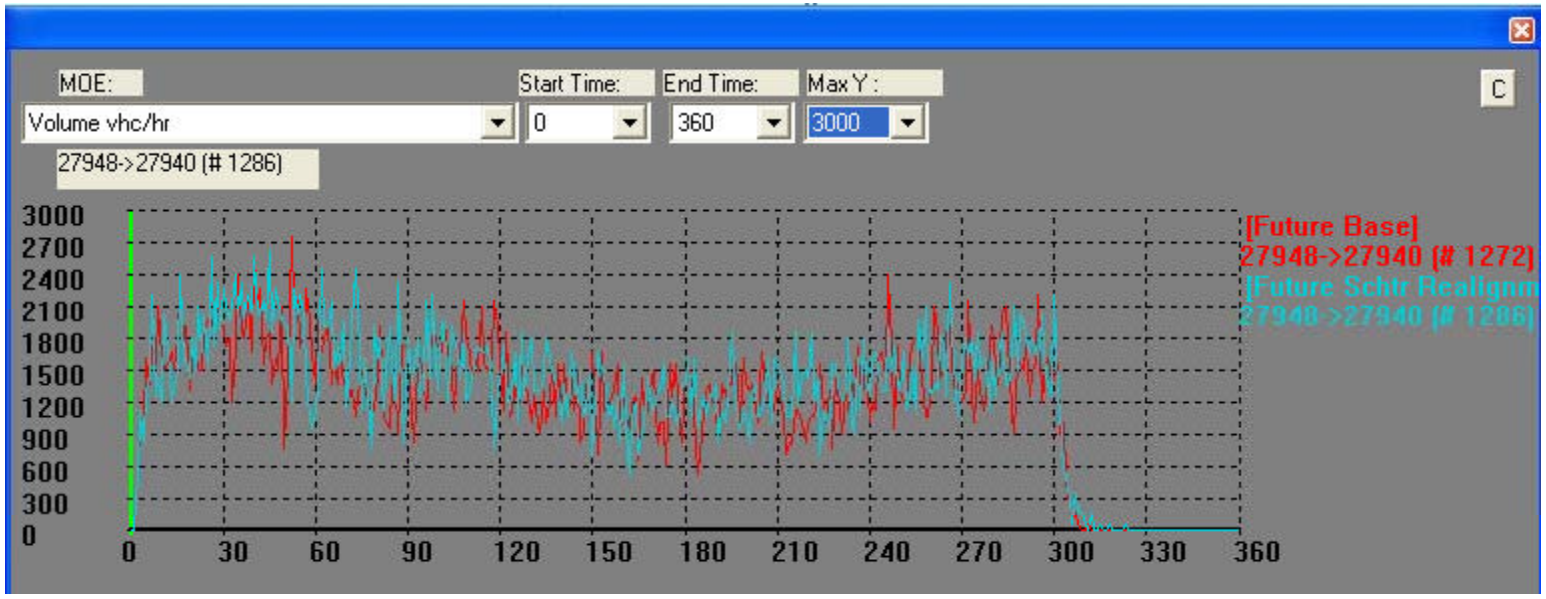
Managed Lanes with Schuster Realigned

Integration between Systems



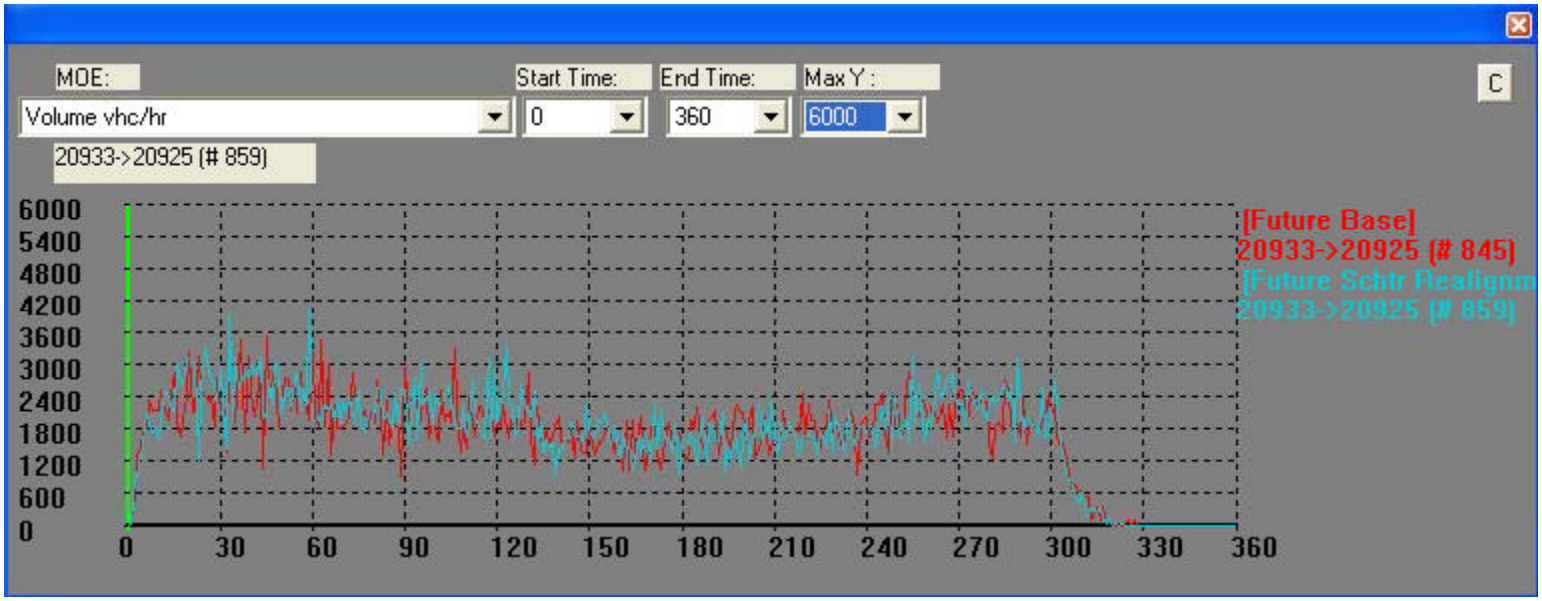
Schuster Off-Ramp Westbound

Integration between Systems



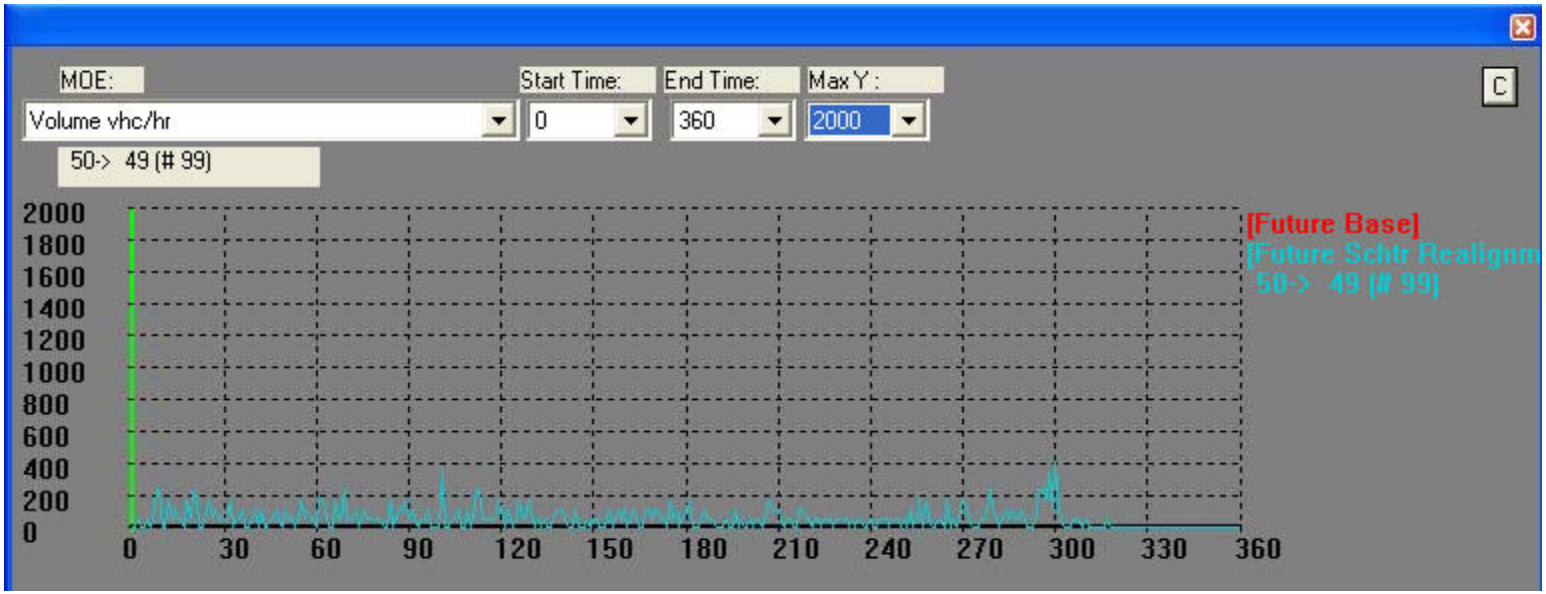
Mesa Northbound at Schuster

Integration between Systems



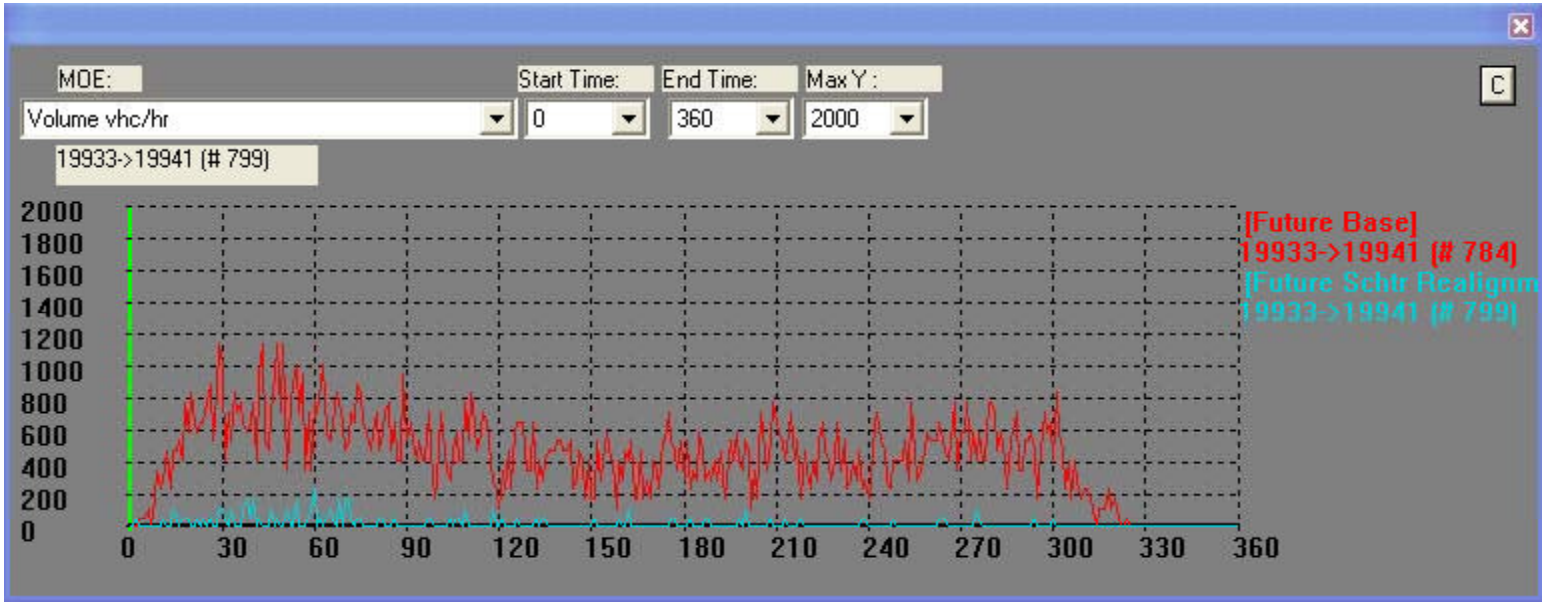
Mesa Southbound at Glory Rd.

Integration between Systems



Schuster Eastbound from Paisano W.

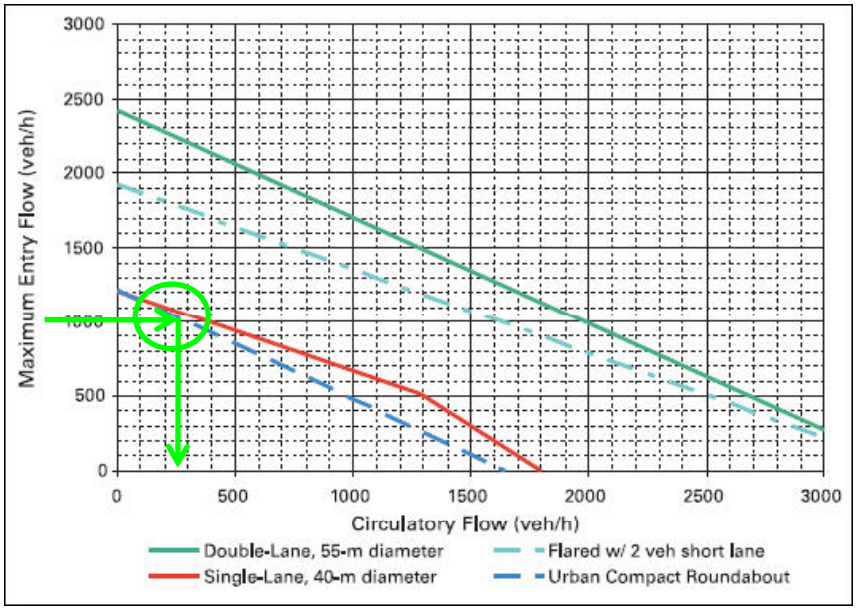
Integration between Systems



Inbound Traffic to Roundabout

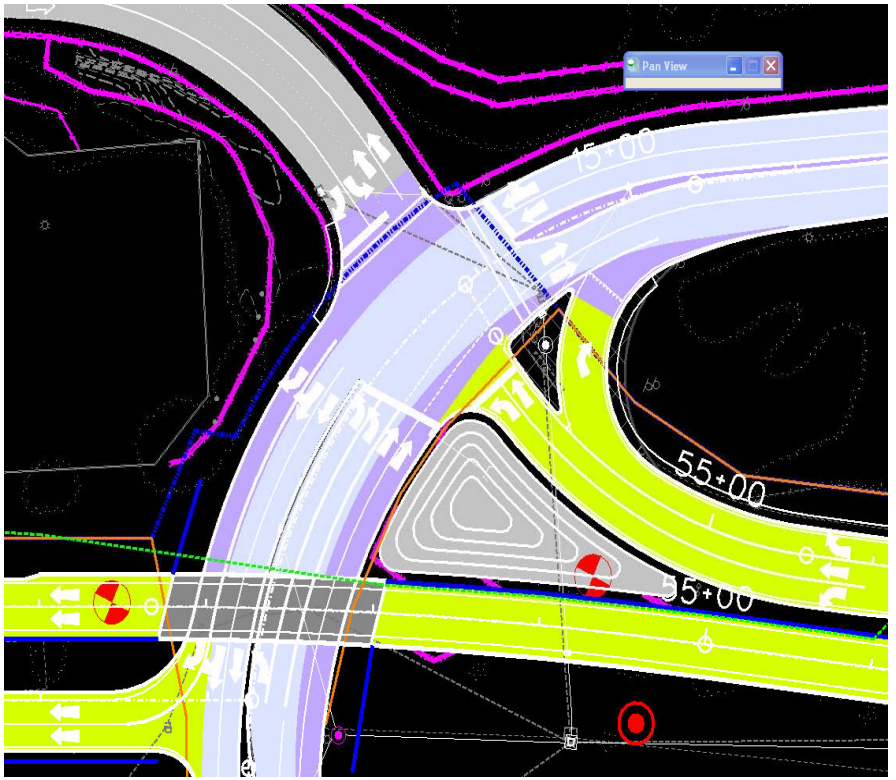
Integration between Systems

- Flow of vehicles on roundabouts weighs heavily on entry flow and diameter
- Proposed roundabout has a compact diameter
- Future flow will be heavy from 2 directs
- Simulation model is more “forgiving” than real life conditions



Source: Roundabouts: An Informational Guide Federal Highway Administration (FHWA)-RD-00-67

Integration between Systems



Integration between Systems

Sun Metro Routes	Travel Time from Farthest Stop Point to UTEP	Average Headway
10	7 min	30 min
11	10 min	1 hr
12	50 min	1 hr
13	40 min	1 hr
14	1 hr	30 min
15	30 min	25 min
16	45 min	2 hrs
70	30 min	30 min
101	20 min	10 min

Integration between Systems

Interactions between Modes

- Pedestrians cause significant speed reduction on Sun Bowl, Schuster, University, and Mesa
- Miner Metro experiences delays when traveling up Sun Bowl Dr. (route 2)
- Pedestrians cross at mid-block locations throughout the inner campus
- Campus lacks adequate drop-off locations
- Inadequate transit service from east side, northeast, and lower valley areas of El Paso
- Only 1 Miner Metro route services southern campus parking lots
- Special events on campus create unique traffic flow problems on Glory Rd., Randolph, Robinson, and Oregon

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Estimate Costs (Task 8)

- Recommended Infrastructure Improvements
  - Traffic lights
    - Hawthorne St. and Schuster Ave.
    - Prospect St. and Schuster Ave.
    - Glory Rd. and Sun Bowl Dr.
  - Dynamic Radar Signs (mounted)
    - Sun Bowl Dr. next to Don Haskins Center
    - Sun Bowl Dr. next to Sun Bowl Stadium
    - Robinson Ave. and Mesa St.
    - Schuster Ave. next to parking lot P-4
  - High-Intensity Activated Crosswalks (HAWK) Signals
    - Mesa St. and Hague Rd.
    - Schuster Ave. between parking lots P-4 & S-2
  - Roundabout
    - Sun Bowl Dr. and University Ave.

Estimate Costs (Task 8)

- Recommended Infrastructure Improvements
  - Pedestrian Bridges
    - » Sun Bowl Dr. connecting the S-3 parking lot with the new College of Health Sciences building, library and Undergraduate Learning Center
    - » Mesa St. between Glory Rd. and Cincinnati Ave. connecting the entertainment district with the new proposed parking lot
  - Lighted in-ground crosswalks
    - » Schuster Ave. between parking lot P-3 and the Academic Services Building
  - Variable signs
    - » Approximately 10 “No Parking” signs
    - » Approximately 20 “Bus Stop” signs (Miner Metro Shuttle)
    - » Five “Drop-off” location signs

Estimate Costs (Task 8)

- Costs obtained from recommendations

	Unit Price	Quantity	Cost
Traffic Light	$150,000	3	$450,000
Dynamic radar sign	$4,000	4	$16,000
No Parking sign	$20	10	$200
HAWK signal	$40,000	2	$80,000
Lighted in-ground crosswalk	$32,000	1	$32,000
Pedestrian bridge	$800,000	2	$1,600,000
Bus stop sign	$40	20	$800
Drop-off location sign	$40	5	$200

Total - $2,179,200

Estimate Costs (Task 8)

- Estimated cost obtained for each priority

Proposed Improvements	Unit Price
Priority 1 – Sun Bowl Dr.	$225,000
Priority 2 – Pedestrian Bridge	$800,000
Priority 3 – W. Schuster Ave.	$2,291,500
Priority 4 – Glory Rd.	$2,362,000
Priority 5 – Robinson/Randolph Dr.	$1,837,500
Priority 6 –Sun Bowl Dr. (North of University Ave. to N. Mesa St.)	$9,107,000
Priority 7 – Signalize W. Schuster/Prospect St.	$210,000
Priority 8 – Transit Improvements	$420,00 per bus (Sun Metro) + $672,000 per semester (Miner Metro)
Priority 9 – W. University Ave./Hawthorne Realignment	$5,153,000
Priority 10 – Inner Campus Closure	$692,000
Priority 11 – ITS Improvements	$933,000 + $50,000 (annual maintenance)

Total - $24,031,000

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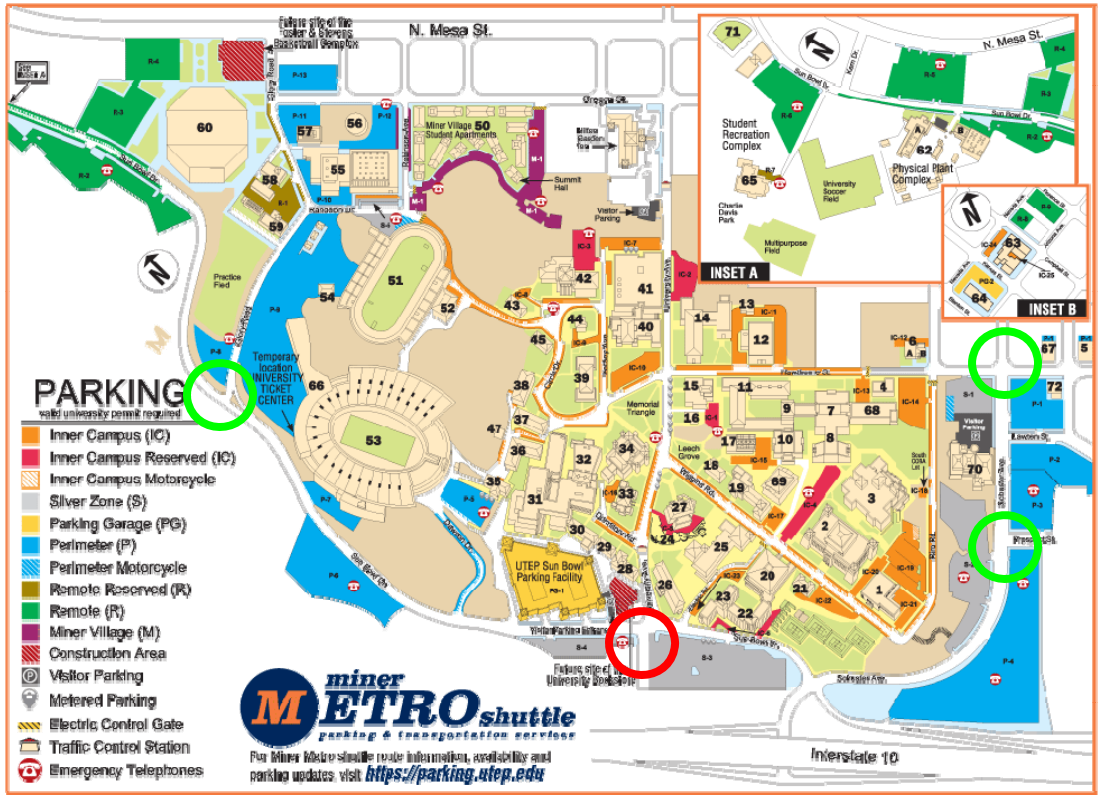
Traffic Control

- Signalize Sun Bowl Dr. and Glory Rd. (coordinated)
- Signalize University Ave. and Schuster Ave.
- Signalize Schuster Ave. and Prospect (new parking garage)
- Roundabout Sun Bowl Dr. and University Ave.

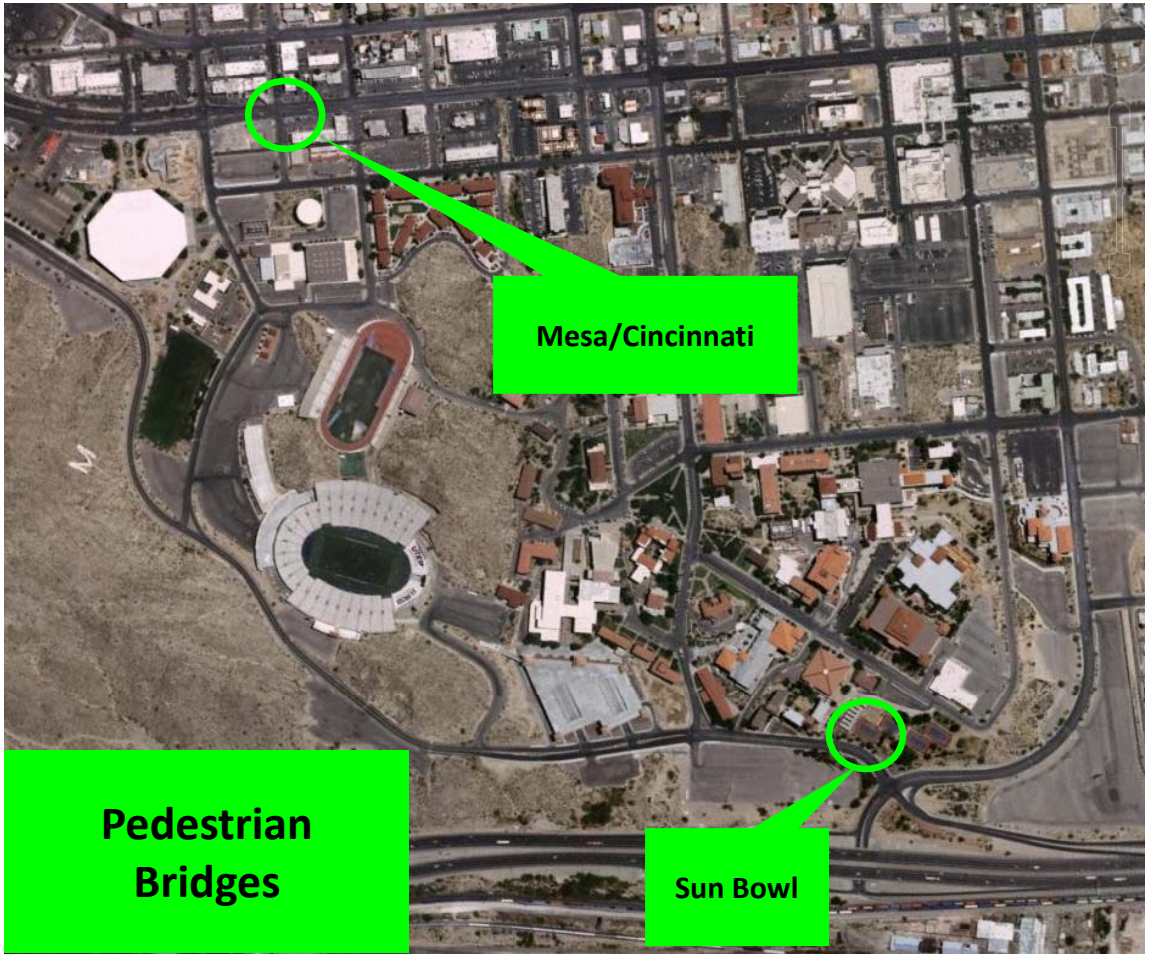


Traffic Control

Traffic Control

Pedestrian Crossings

Pedestrian Crossings



Transit

Transit

Transit

Transit

Walk/Bike Paths

Proposed Trail .85 Mile

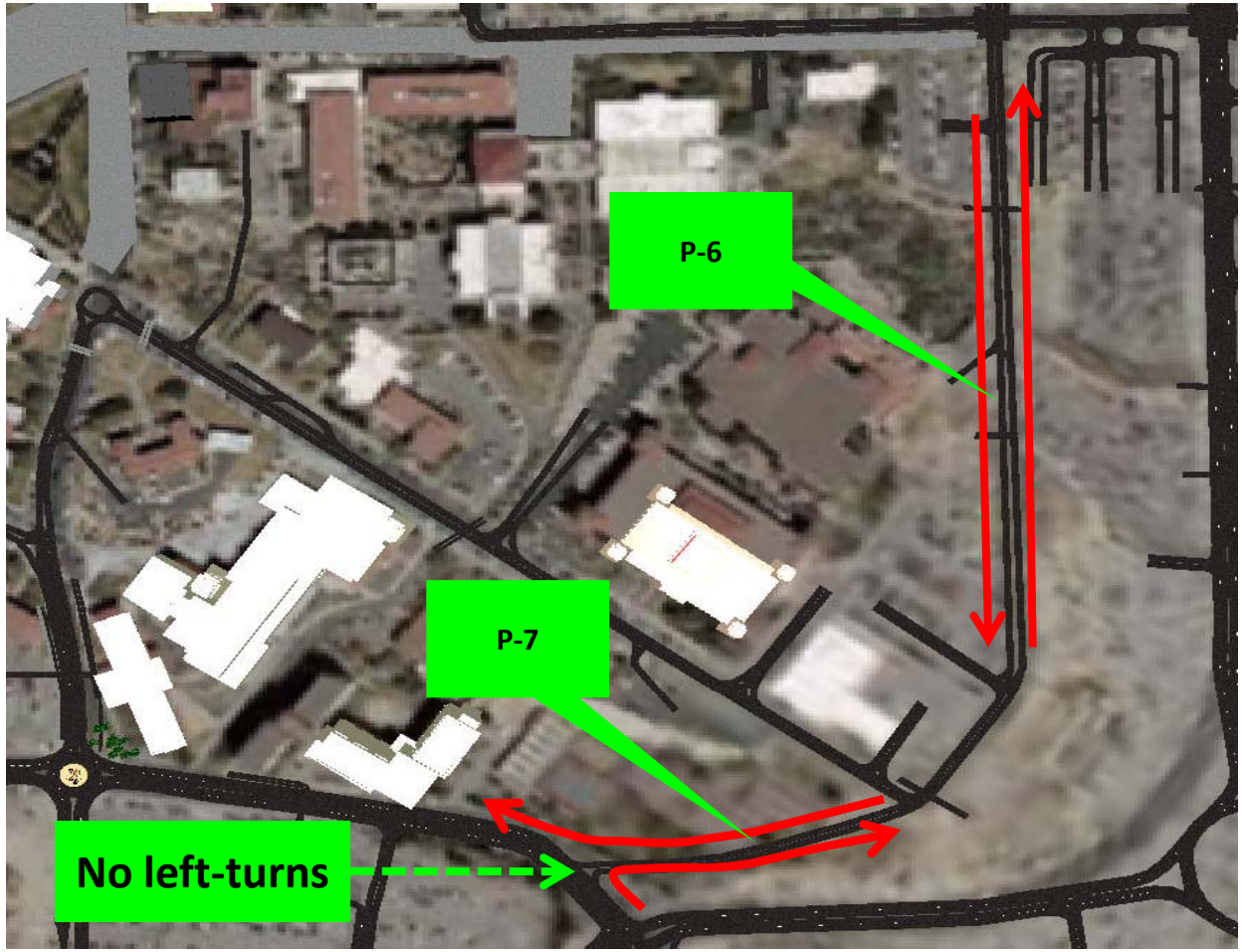
Infrastructure Improvements

1 Lane each Direction

Infrastructure Improvements

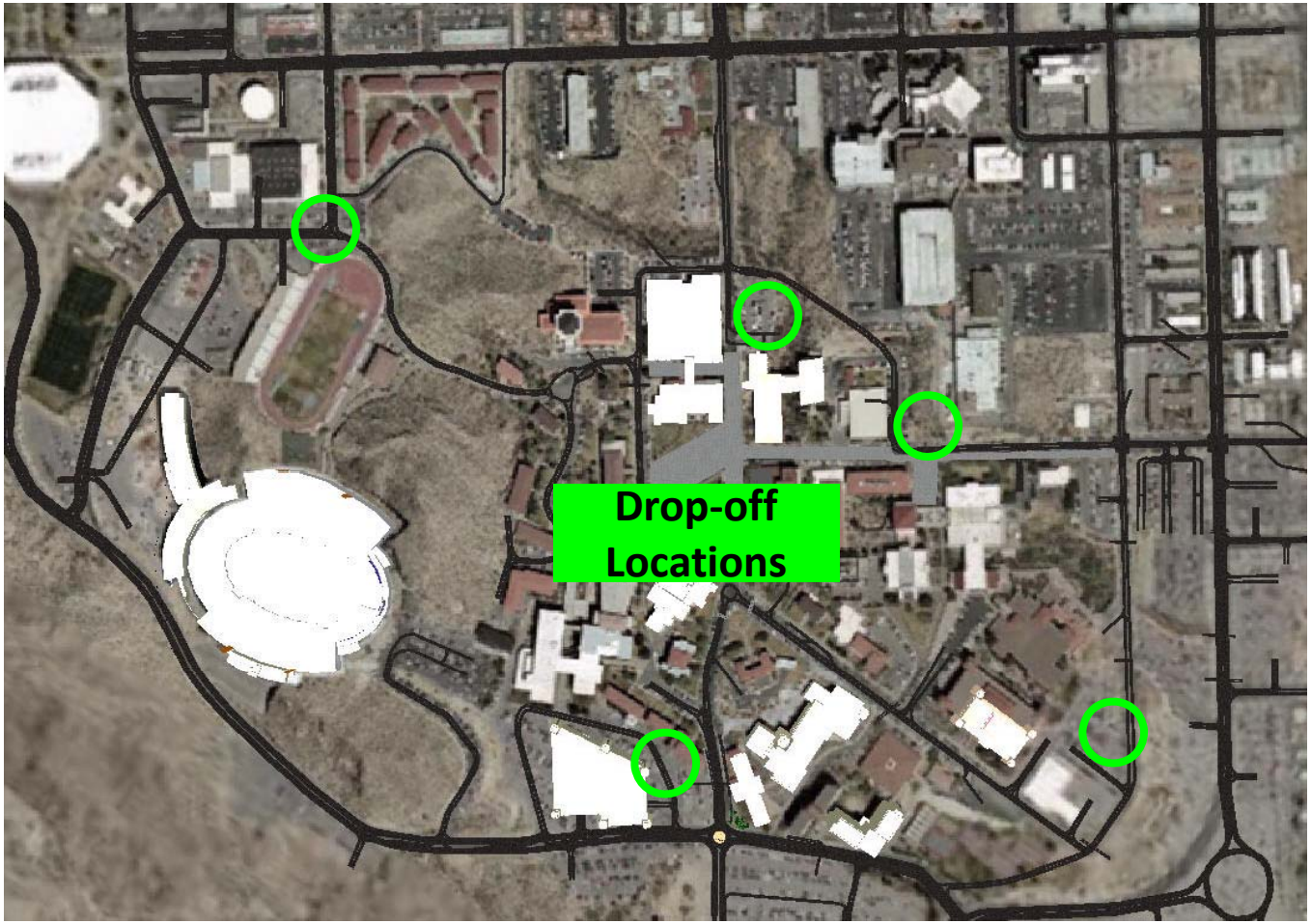
Widen to 2 Lanes

Infrastructure Improvements

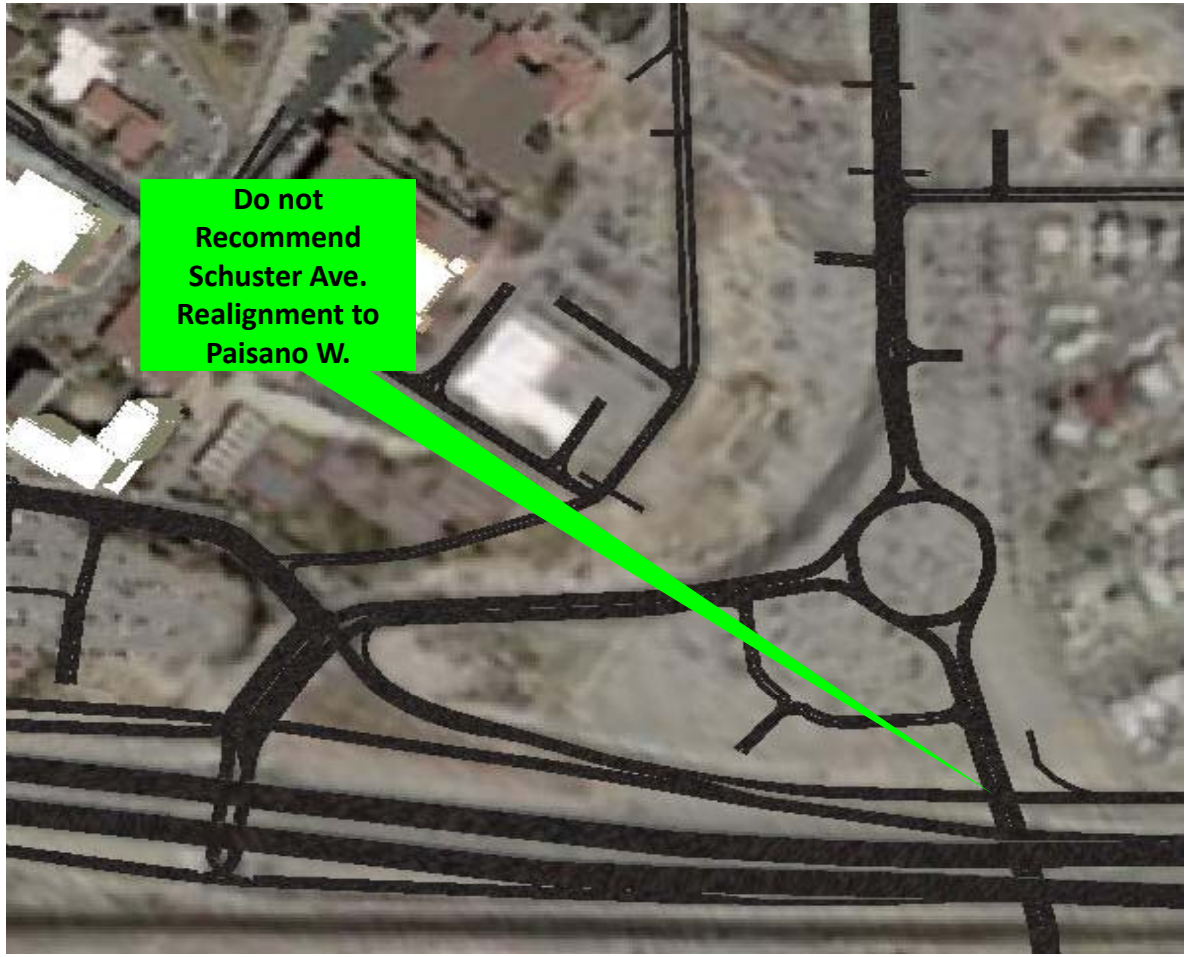


1 Lane each Direction

Infrastructure Improvements



Infrastructure Improvements



Infrastructure Improvements

- Researchers ranked UTEP transportation improvement projects as follows:
  1. P1 + Signals on Sun Bowl
  2. P2 + P3
  3. P6 + P7
  4. P4 + P5
- Revised shuttle service should coincide with transportation loop system
- Crosswalks are essential to the overall safety of pedestrians in and around campus
- Walk and bike paths non-essential but do provide much needed aesthetics to the campus culture by promoting healthy habits
- Drop-off locations should have adequate signage and be promoted before and during semester to educate drivers
- Keep inner campus closure at grade level to allow for emergency vehicle access