



# Parking In The Buff

LIFE IN A POST-PERMIT WORLD

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*24 April 2012*



A journey of a thousand miles begins with  
a single step.

- Lao-tzu

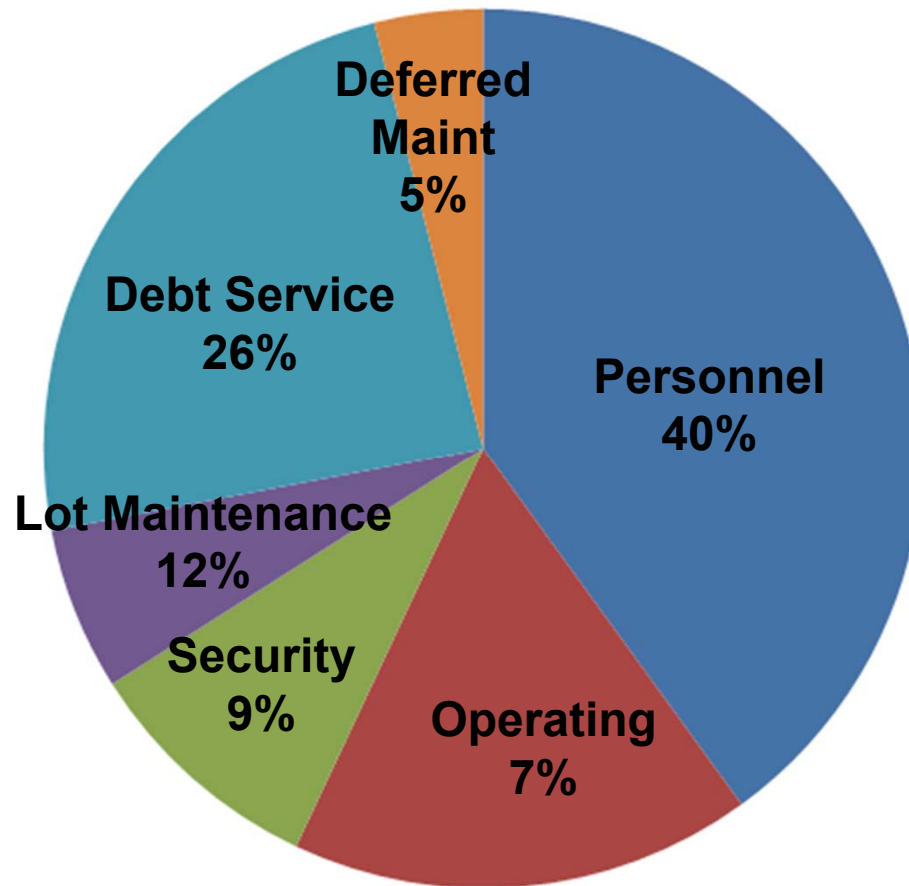


## A changing landscape...

- State budget shortfalls
- Institutional strategic focus on research
- Enrollment goals
- New revenue demands
- Cost reduction requirements
- Customer expectations



# Where the parking dollar goes...



PARKING IN THE BUFF:  
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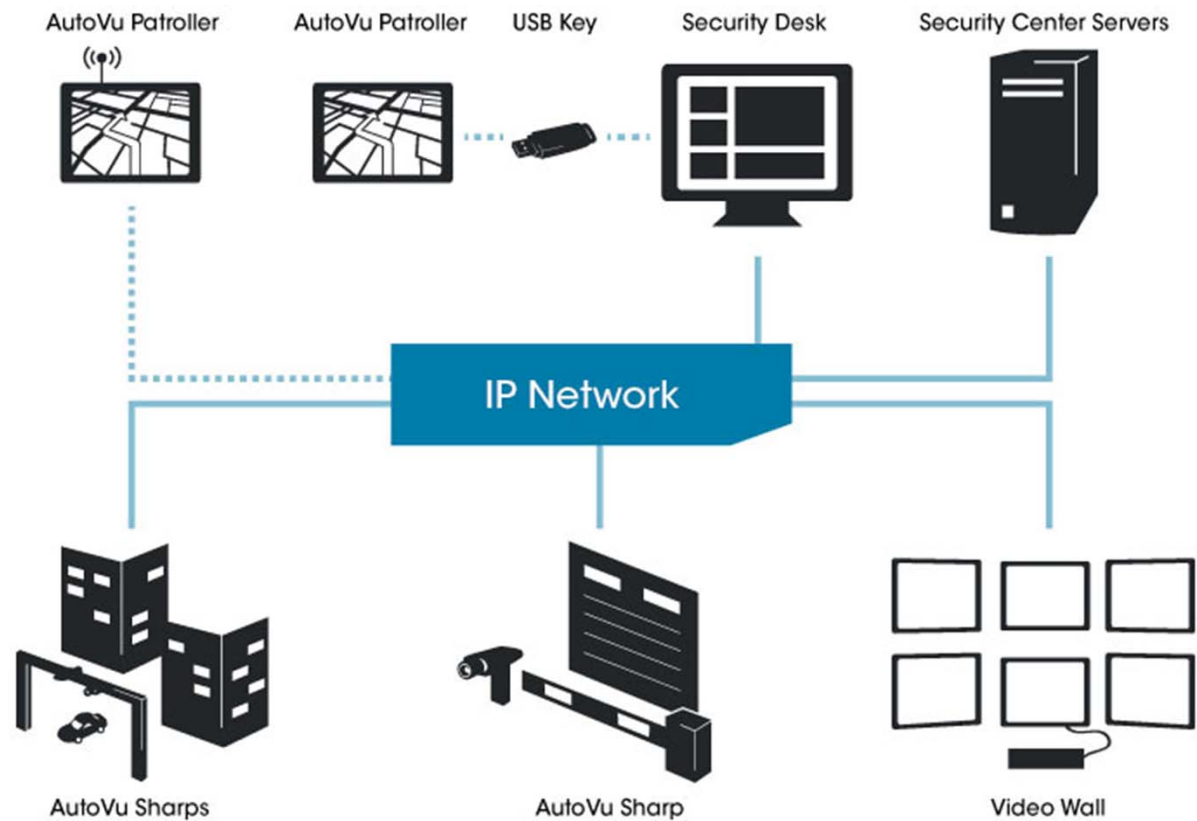


An LPR Primer



## Infrastructure

- Servers
- Cameras
- Vehicles



# SYSTEM DESIGN / COMPONENTS



## Cameras

- *Built in computer*
- *Processes Images & Character Recognition*
- *Communicates via IP Network*





- LPR
  - *License Plate Recognition*
- Read
  - *Deciphered license plate number*
- Hit
  - *When a license plate read matches a license plate in a loaded hotlist or does not have appropriate permits a hit is generated*
- Misread
  - *Plate read was deciphered incorrectly*



- Shared Permit Hit
  - *When two license plates sharing a permit are seen on campus within the allowed time frame*
- Parking Zone
  - *Lot or Facility Zone*
- ePermit
  - *Electronic or Virtual Permit*

# CAPABILITIES



- Automates the strict enforcement of several types of permits and time limits on campus.
- Cover campus-wide parking lots in more time efficient manner.
- Strengthens the safety and security of your University campus by automatically detecting black-listed vehicles. (Hotsheets/Scofflaw)

# CAPABILITIES



- Use data as evidence against infractions and optimize parking facility management.
- Improve the collection of unpaid vehicle infractions.
- Optimize campus permit and parking regulations based on collected lot occupancy data.

## CURRENT LIMITATIONS



- Issue, Record, and Print a Citation.
- 100% Accuracy
  - *Currently, reads 92% of plates accurately.*
- Auto GPS Locate Parking Lot
  - *Currently, **GPS-Assisted Parking Lot Selection***

Video



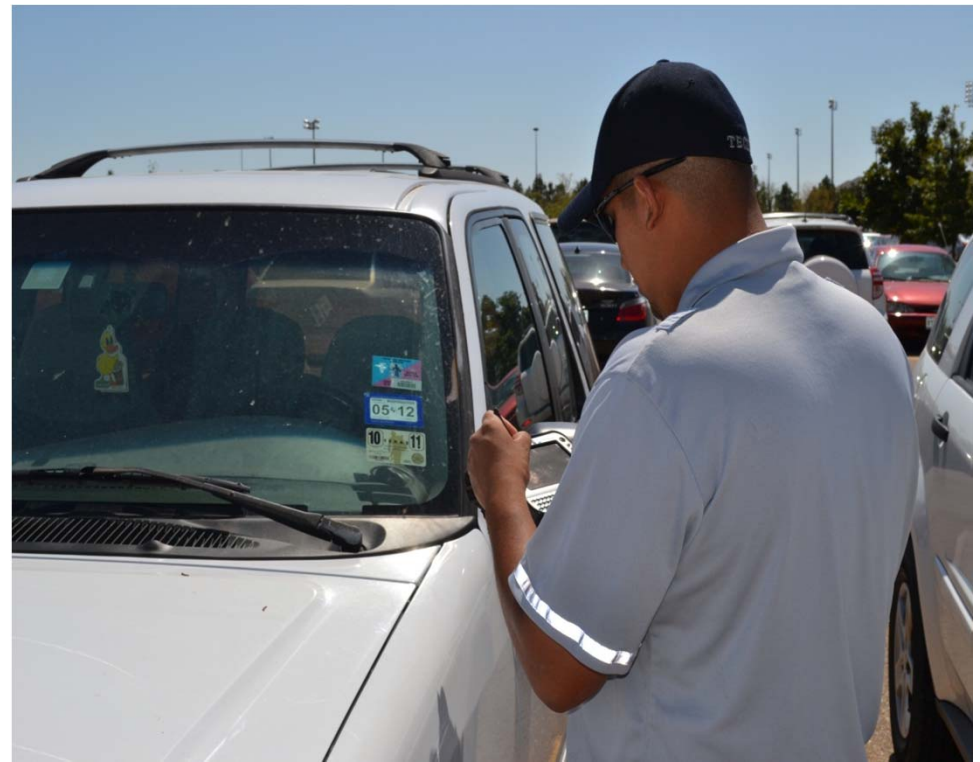


# Operational Implications: Enforcement & Guest Relations

# Implications: Enforcement & Guest Relations



## The Old Way





## The New Way



# Implications: Enforcement & Guest Relations



UPSLPR04

238 TechPark Patroller

## Permit Hit



Image  
Map

Edit plate

CJN934

Sep 21 2011, 14:04

3/10

State:  
Category:

More

Reject

Accept

Wednesday, Sep 21 2011, 14:09:45 (Main St - 18th St)

# Implications: Enforcement & Guest Relations

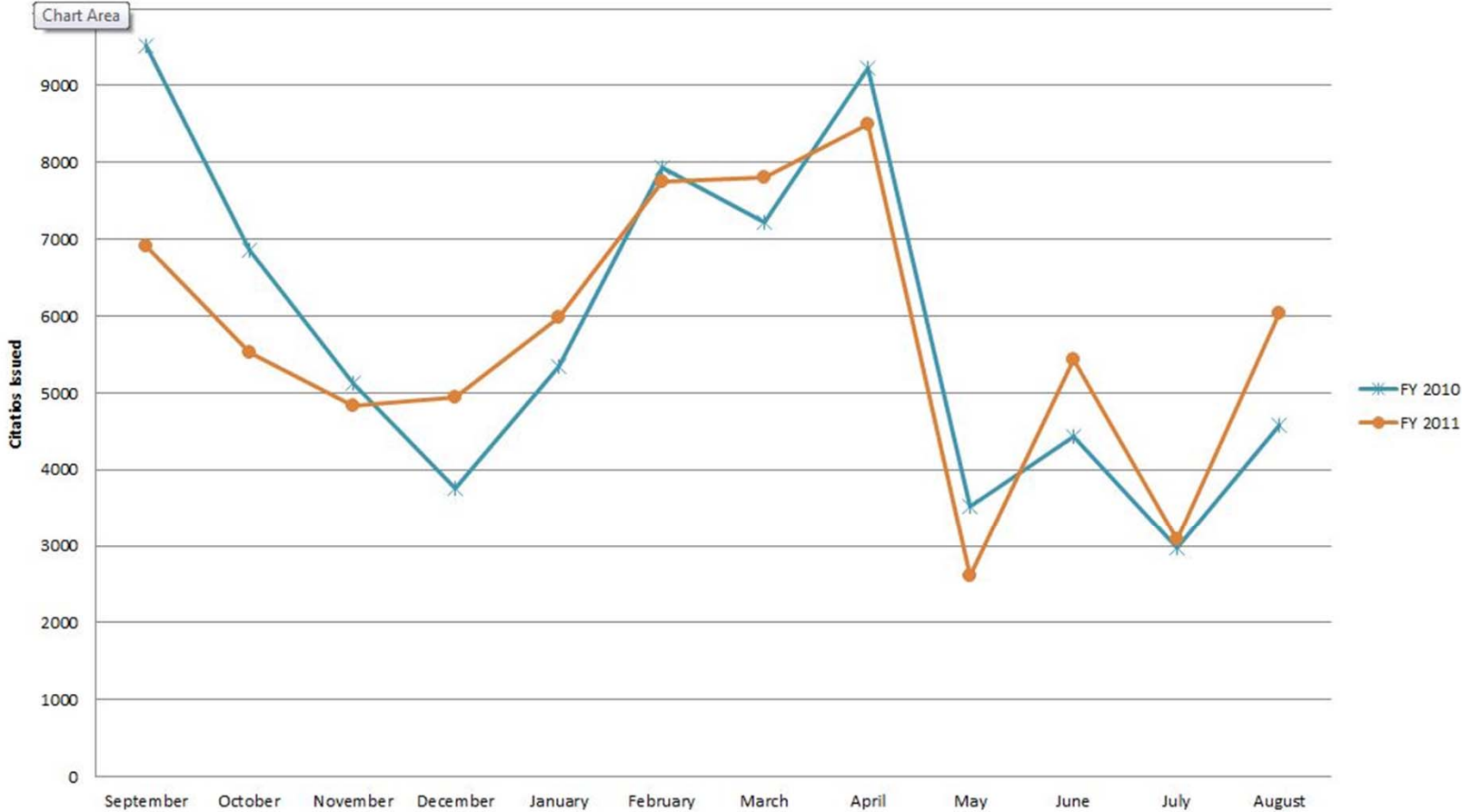


The screenshot shows a Bing Bird's Eye view of a large parking lot. The interface includes a left-hand menu with options: Menu, Vehicle Search, Citations, Boot Tow, Tire Chalks, LPR, MAPP, and Minimize. The top right of the map area displays "Zone: Z1". On the right side, there are navigation controls: left and right arrows, "Birds Eye" text, zoom in (+) and zoom out (-) buttons, "Show Hits" text, and a highlighted search result "Z1B(9)". The map itself shows several green callout boxes pointing to specific vehicles in the parking lot, and one red callout box. A scale bar at the bottom right indicates 20 meters. Copyright information at the bottom right reads "© 2011 Microsoft Corporation Pictometry Bird's Eye © 2010 Pictometry International Corp".



# First Year Results

Citation Issuance Count - Monthly Comparison





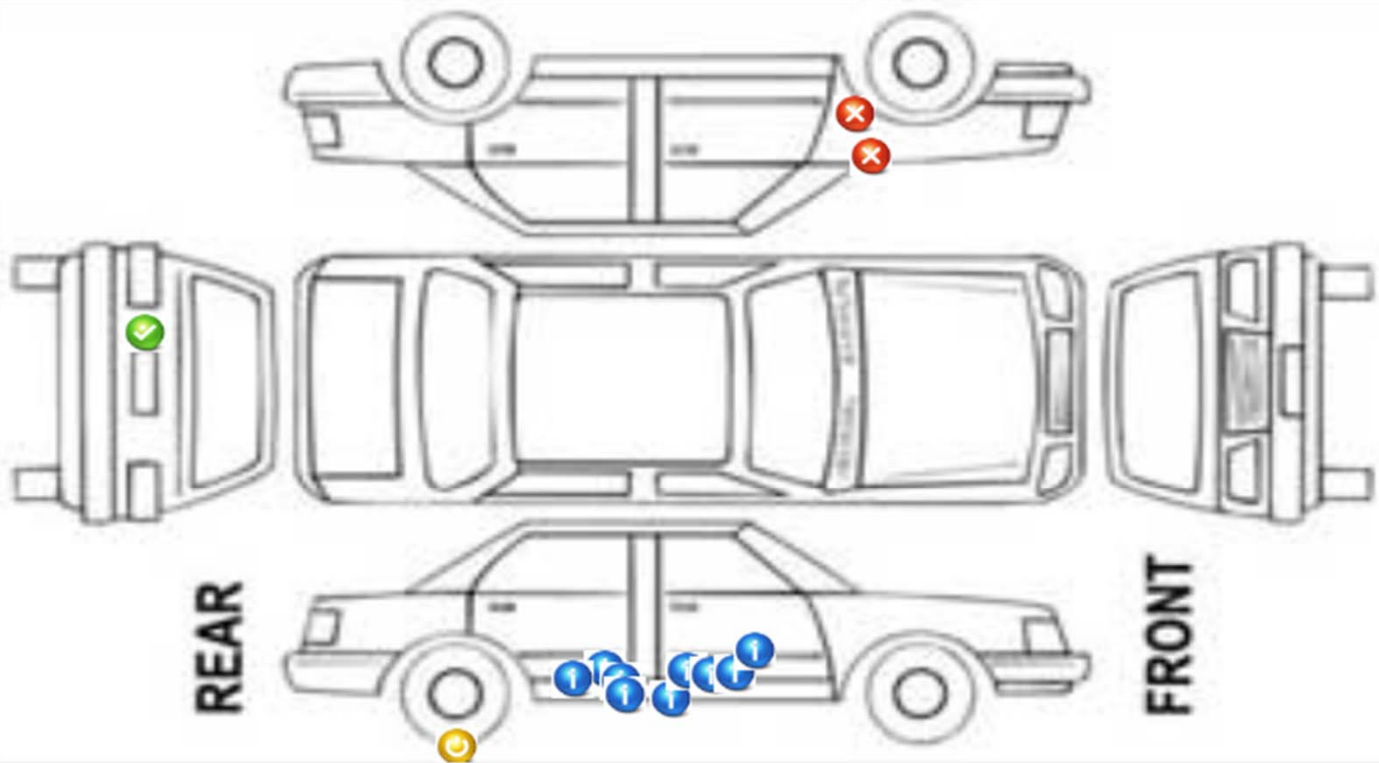
## Improved Efficiency

- Integration with Verrus
- Paperless Tows & Boots
- Peer to Peer Tire Chalks
- Automated Void Requests
- Handheld Monitoring

# Implications: Enforcement & Guest Relations



Please Select Type



Done

Damage List

- Scratch
- Scratch
- Missing
- Missing
- Dent
- Flat

# Implications: Enforcement & Guest Relations



Tech Park Active Devices						
HH 01	Network	Battery  100%	Not Logged In	Last sync: 9/20/2011 1:32:36 PM	Merge completed after processing 95 data change(s) (71 insert(s), 24 update(s), 0 delete(s), 0 conflict(s)).	
HH 02	Network	Battery  100%	Not Logged In	Last sync: 9/20/2011 2:21:49 AM	Merge completed after processing 18 data change(s) (17 insert(s), 1 update(s), 0 delete(s), 0 conflict(s)).	
HH 03	Network	Battery  76%	231 - Michael Warren	Last sync: 9/20/2011 1:30:44 PM	Request message generated, now making it ready for upload.	
HH 04	Network	Battery  21%	234 - Michael Mendez	Last sync: 9/20/2011 1:30:44 PM	Merge completed after processing 697 data change(s) (105 insert(s), 591 update(s), 1 delete(s), 0 conflict(s)).	
HH 05	Network	Battery  53%	235 - Jack Buffington	Last sync: 9/20/2011 1:25:51 PM	Merge completed after processing 1431 data change(s) (231 insert(s), 1200 update(s), 0 delete(s), 0 conflict(s)).	
HH 06	Network	Battery  41%	238 - Adam Ramirez	Last sync: 9/20/2011 1:29:53 PM	Merge completed after processing 1343 data change(s) (155 insert(s), 1187 update(s), 1 delete(s), 0 conflict(s)).	
HH 07	Network	Battery  38%	240 - Samuel Flores	Last sync: 9/20/2011 1:29:37 PM	The operation timed out.	
HH 08	Network	Battery  61%	249 - Richard Rodriguez	Last sync: 9/20/2011 12:33:55 PM	Merge completed after processing 120 data change(s) (96 insert(s), 24 update(s), 0 delete(s), 0 conflict(s)).	
HH 09	Network	Battery  100%	Not Logged In	Last sync: 9/20/2011 1:29:21 PM	Merge completed after processing 639 data change(s) (99 insert(s), 539 update(s), 1 delete(s), 0 conflict(s)).	
HH 10	Network	Battery  23%	239 - Kyle Kelley	Last sync: 9/20/2011 1:35:33 PM	Merge completed after processing 101 data change(s) (77 insert(s), 24 update(s), 0 delete(s), 0 conflict(s)).	
HH 11	Network	Battery  24%	Not Logged In	Last sync: 9/15/2011 3:22:41 PM	Merge completed after processing 210 data change(s) (121 insert(s), 89 update(s), 0 delete(s), 0 conflict(s)).	
HH 12	Network	Battery  100%	Not Logged In	Last sync: 9/20/2011 1:30:28 PM	Merge completed after processing 488 data change(s) (99 insert(s), 388 update(s), 1 delete(s), 0 conflict(s)).	
HH 13	Network	Battery  100%	Not Logged In	Last sync: 9/20/2011 1:32:39 PM	Merge completed after processing 93 data change(s) (70 insert(s), 23 update(s), 0 delete(s), 0 conflict(s)).	
HH 14	Network	Battery  100%	Not Logged In	Last sync: 9/20/2011 1:30:42 PM	Merge completed after processing 1144 data change(s) (100 insert(s), 1043 update(s), 1 delete(s), 0 conflict(s)).	

# Implications: Enforcement & Guest Relations



## Proof Positive

Rule	Hit type	Plate read	Plate origin	Plat	Con	Whi	Address	Patroller	Unit	User	Event timestamp	Reject reason
Z3	Permit	[Redacted]					3036 19TH St, Lubbock, TX 79410	Unit 2	Unit 2 Left	240	9/20/2011 1:18:45 P...	Misread
Z3	Permit	[Redacted]					3036 19TH St, Lubbock, TX 79410	Unit 2	Unit 2 Left	240	9/20/2011 1:18:46 P...	Misread
Z3	Permit	[Redacted]					3034 19TH St, Lubbock, TX 79410	Unit 2	Unit 2 Left	240	9/20/2011 1:18:46 P...	Misread
Z3	Permit	[Redacted]					3032 19TH St, Lubbock, TX 79410	Unit 2	Unit 2 Left	240	9/20/2011 1:18:47 P...	Misread
Z3	Permit	[Redacted]					3026 19TH St, Lubbock, TX 79410	Unit 2	Unit 2 Right	240	9/20/2011 1:18:47 P...	Misread
S1	Permit	[Redacted]					0 street, Lubbock, TX 79415	Unit 4	Unit 4 Left	238	9/20/2011 1:19:14 P...	
S1	Permit	[Redacted]					0 street, Lubbock, TX 79415	Unit 4	Unit 4 Left	238	9/20/2011 1:20:17 P...	Plate edited

Report 100 items (1 selected) Canvas Tiles Map

1 S1 Unpack

Hit information

Hit type: **Permit**  
Action taken: **Accepted**  
Reject reason:  
Watermark: ? Unknown [Click here to determine](#)

Plate read 965VZH

Patroller: **Unit 4**  
User: **238**  
Watermark: ? Unknown [Click here to determine](#)  
Hit rules: **S1**

Context images

[Redacted]

License plate matched  
9/20/2011 1:19:14 PM

# Implications: Enforcement & Guest Relations



## Texas student held on terrorism charges

*Saudi national studied chemical engineering at Texas Tech before transferring to South Plains College.*



Lubbock County Sheriff/ASSOCIATED PRESS

[ENLARGE PHOTO](#)

Khalid Ali-M Aldawsari published extremist messages, authorities say.



Betsy Blaney/ASSOCIATED PRESS

By **Adam Goldman and Betsy Blaney**  
ASSOCIATED PRESS

Updated: 11:11 p.m. Thursday, Feb. 24, 2011  
Published: 10:55 p.m. Thursday, Feb. 24, 2011

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LUBBOCK — A college student from Saudi Arabia who had studied chemical engineering at Texas Tech University bought explosive chemicals online as part of a plan to hide bomb materials inside dolls and baby carriages to blow up dams, nuclear plants or the Dallas home of former President George W. Bush, the Justice Department said Thursday.

"After mastering the English language, learning how to build explosives and continuous planning to target the infidel Americans, it is time for jihad," or holy war, Khalid Ali-M Aldawsari wrote in his private journal, according to court documents.

Aldawsari, 20, wrote that he had been planning an attack in the United States for years, even before coming to the U.S. on a scholarship. He said he was influenced by Osama bin Laden's speeches and bemoaned the plight of Muslims.

On Feb. 1, one of the chemical companies, Carolina Biological Supply of Burlington, N.C., reported a suspicious \$435 order by Aldawsari to the FBI.

Separately, Con-way Freight, a shipping company, notified Lubbock police and the FBI the same day with similar suspicions because it appeared the order wasn't intended for commercial use.

Within weeks, federal agents had traced his other online purchases, discovered extremist posts he made on the Internet and secretly read his diary and searched his off-campus apartment, computer and e-mail accounts, according to court records.

Trinitrophenol, the chemical explosive that Aldawsari is accused of trying to make, has approximately the same destructive power as TNT. FBI bomb experts said the amounts in the Aldawsari case

## Authorities charge suspect in Slaton murder; victim identified

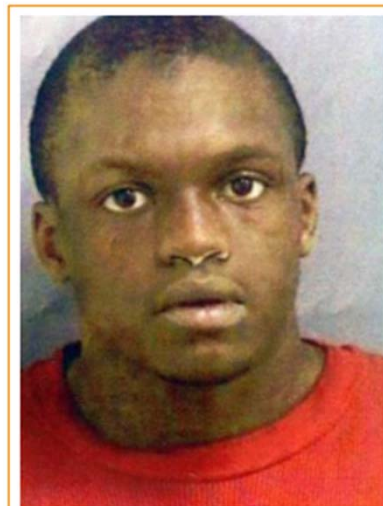
Authorities late Wednesday secured a murder charge against a 21-year-old man previously named a person of interest in Tuesday's shooting of an elderly woman and of her caretaker in Slaton.

Posted: February 22, 2012 - 12:42pm | Updated: February 23, 2012 - 1:35am

## Slaton murder suspect faced theft charge from Tech dorm

Court documents show the 21-year-old Texas Tech student from Houston charged with murdering an 89-year-old Slaton woman told police about his troubled life in a 2009 theft charge.

Posted: February 24, 2012 - 11:05pm | Updated: February 25, 2012 - 1:26am



Oguntope

By Adam D. Young

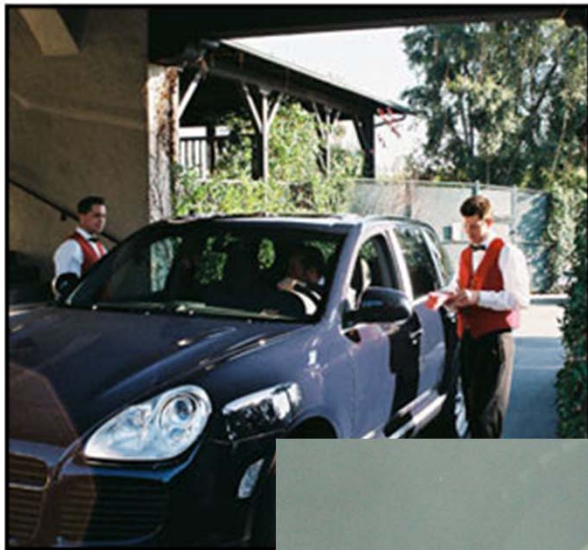
AVALANCHE-JOURNAL

Court documents show the 21-year-old Texas Tech student from Houston charged with murdering an 89-year-old Slaton woman this week and injuring her recently identified caregiver told police of his "life growing up on the streets" when faced with a still-pending 2009 theft charge.

Sampson Blake Oguntope, 21, was arrested again Tuesday evening in Lubbock, accused of fatally shooting 89-year-old Faye Bowen Gray in her Slaton home and injuring 21-year-old



## Future Applications





# Entry Stations



# Implications: Enforcement & Guest Relations



The screenshot shows a security software interface with a grid of camera feeds. Each feed displays a license plate read event. The interface includes a sidebar with a tree view of camera locations, a main canvas with multiple camera views, and a bottom toolbar with navigation and action buttons.

The screenshot displays a data table with columns for Plate, Zone, Lot, Unit, Officer, Plate Image, Context Image, and Date. A specific entry is highlighted, showing a license plate read for a car with plate number R10311981. Below the table, a video frame shows a car driving on a road, with a license plate read overlay indicating the car's entry details.

Plate	Zone	Lot	Unit	Officer	Plate Image	Context Image	Date
KRF620			Entry 3	272	[Image]	[Image]	10/6/2011 12:59:35 PM
Michael			R10311981		(940)		
			Entry 3	272	[Image]	[Image]	10/6/2011 12:59:30 PM
			Entry 1	253	[Image]	[Image]	10/6/2011 12:59:27 PM
			Entry 1	253	[Image]	[Image]	10/6/2011 12:59:16 PM
			Entry 7	251	[Image]	[Image]	10/6/2011 12:59:13 PM
			Entry 7	251	[Image]	[Image]	10/6/2011 12:59:10 PM

Entry 3  
272  
10/6/2011 12:59:35 PM

# Implications: Events



PARKING IN THE BUFF:  
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# Operational Implications: Business Office



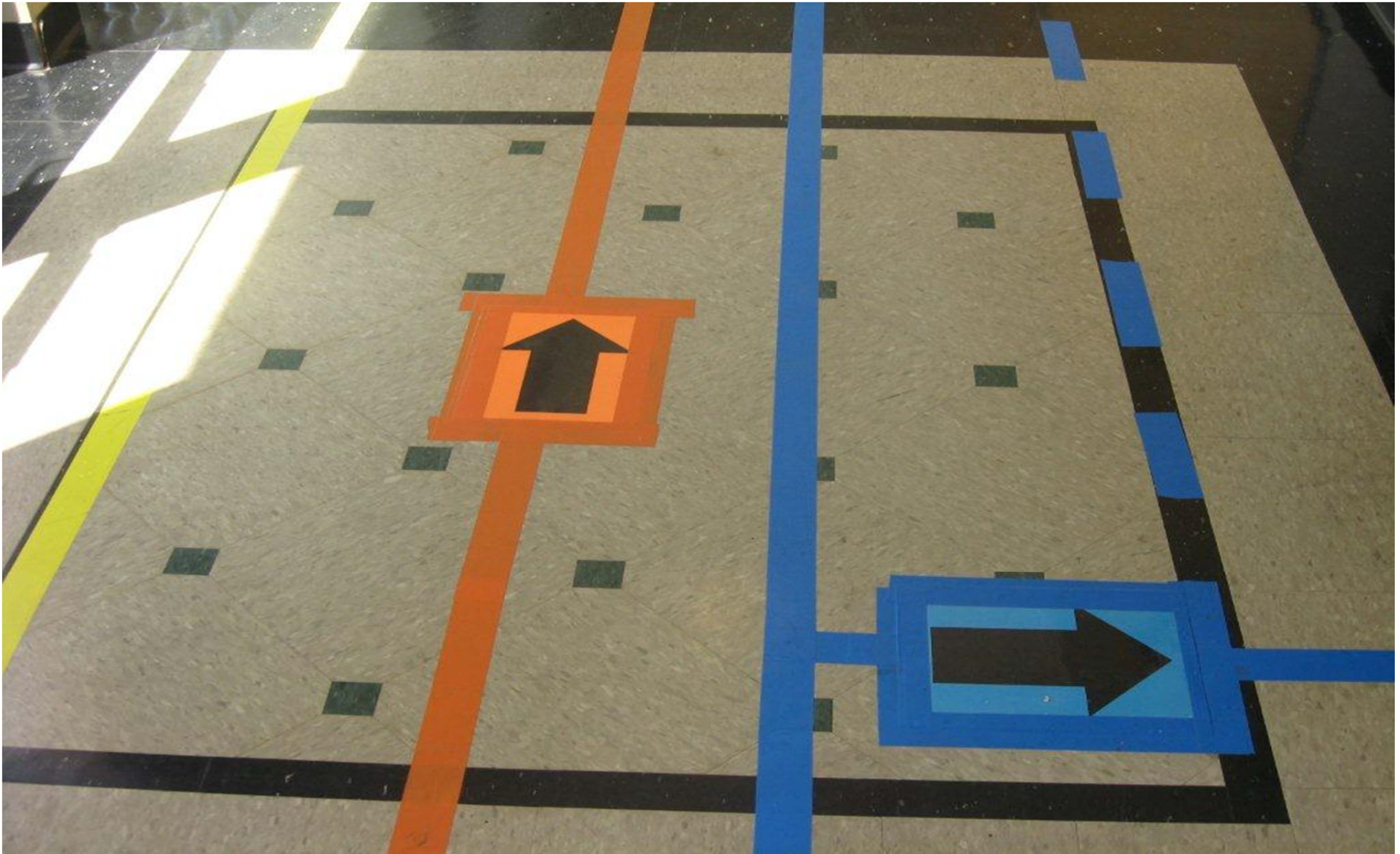
# FALL RUSH



# IMPLICATIONS: BUSINESS OFFICE



# IMPLICATIONS: BUSINESS OFFICE



# IMPLICATIONS: BUSINESS OFFICE



**STUDENTS:**

To Purchase  
A Permit

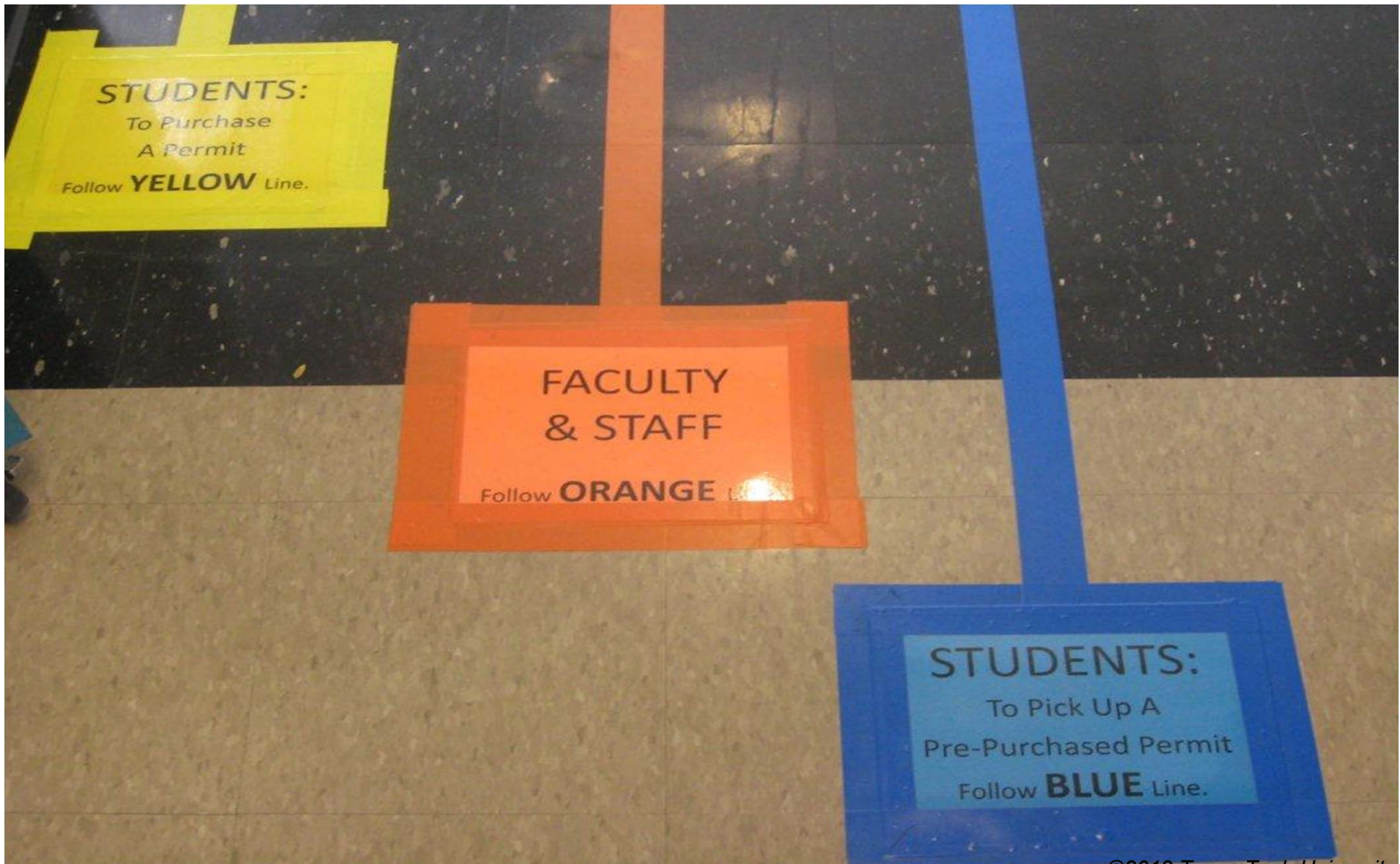
Follow **YELLOW** Line.

**STUDENTS:**

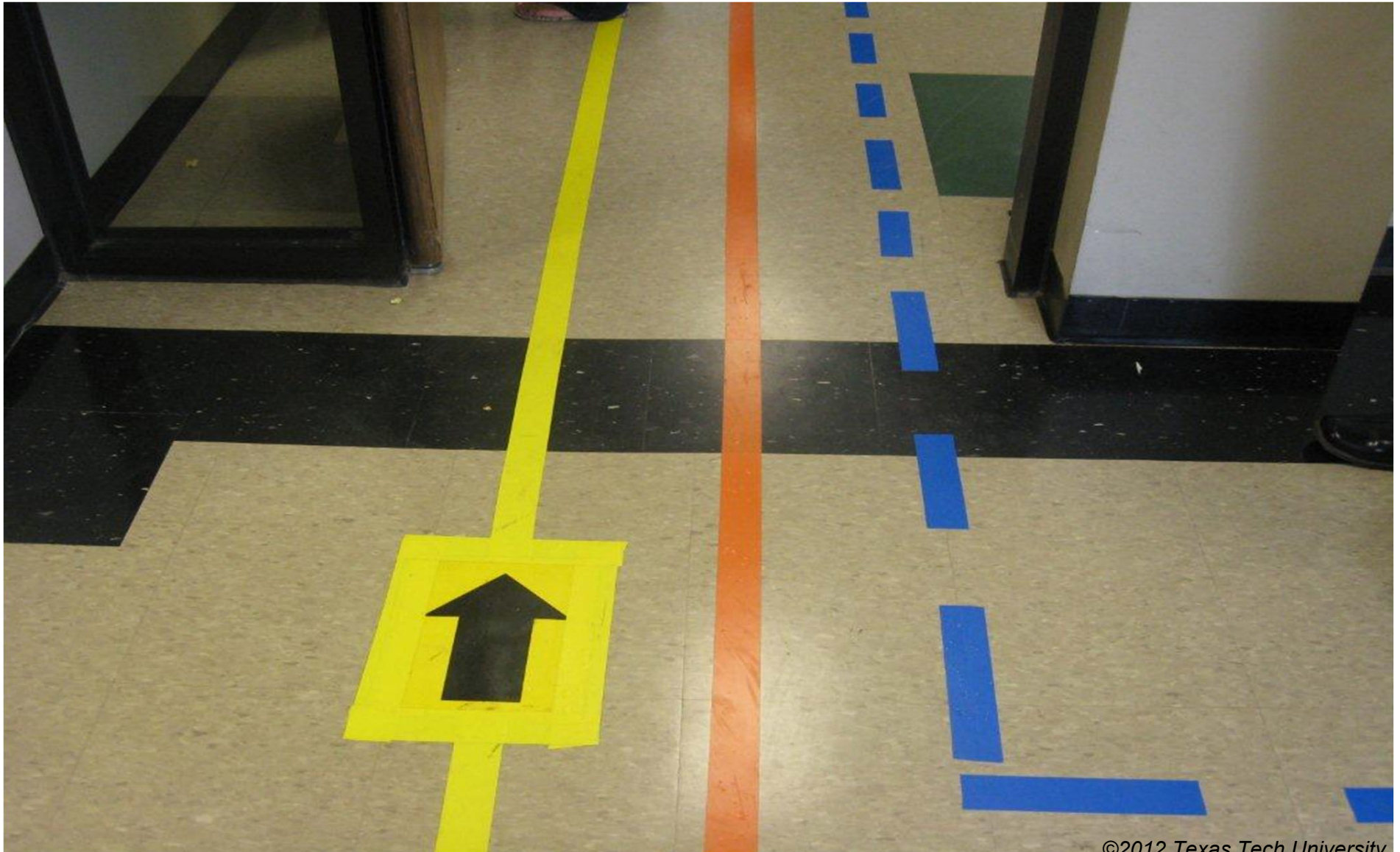
Need License Plate #  
and Valid ID to  
Purchase Permit.



# IMPLICATIONS: BUSINESS OFFICE



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# IMPLICATIONS: BUSINESS OFFICE



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# IMPLICATIONS: BUSINESS OFFICE



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## Now

- Same 2 week time period, no more color coding the hallways or lobby
- Our responsibilities have shifted in different directions: primarily deal with phone calls, wait list confirmations, emails, live chats, data research
- But as far as customers in the lobby....

# IMPLICATIONS: BUSINESS OFFICE



# IMPLICATIONS: BUSINESS OFFICE





## High Tech – Low Touch

### Ideas:

Since they aren't coming to us anymore, we'll go to them.

- **Lobby remodeling**
- **Disability warnings**
- **License plate reading apps**
- **Payment phone apps**
- **Committee for campus department informational meetings**
- **Parking Orientation at beginning of fall semester**
- **Post educational parking video links to other University pages**
- **Informational booth at SUB (Student Union Building)**



## Summary

- Immediate financial savings: no permit order, no postage on mass mail outs, personnel costs cut down
- More efficient use of time
- More efficient use of personnel
- **MOST IMPORTANTLY...**more convenience for the customer

PARKING IN THE BUFF:  
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# Operational Implications: Information Technology

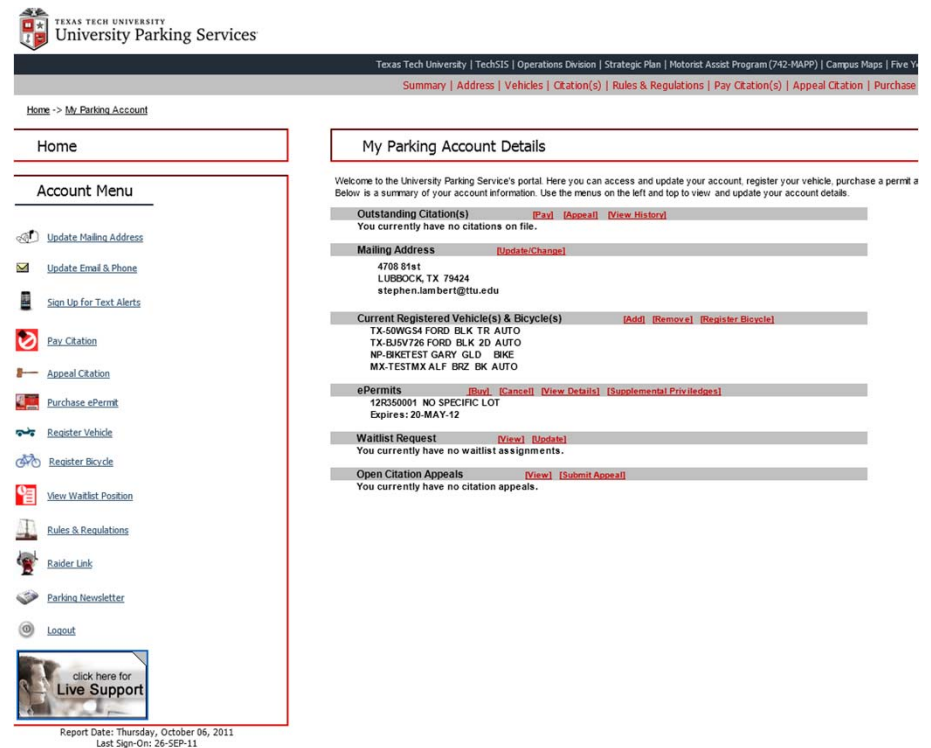


- Benefit from real time wireless communications.
  - *Gain remote access to all clients.*
  - *Ability to provide timely support*
  - *Increase Knowledge Base*

# Implications: Information Technology



- Website – [www.parking.ttu.edu](http://www.parking.ttu.edu)
  - *Almost everything is done on the website.*





- Increase Support Hours
  - 24/7

PARKING IN THE BUFF:  
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# Financial Implications



## Capital Investment

- LPR equipment
- Vehicles
- IT Infrastructure
- \$250,000



## Annual Cost Savings



- Permit order
  - *\$60,000*
- Permit mailing
  - *\$7,000+*
- Office personnel
  - *\$24,150*
- Enforcement personnel
  - *\$96,602*
- Customer happiness
  - *Priceless*



## Revenue Enhancement

- Add back the 4 parking enforcers?
  - *\$400,000*
- Permit sales due to improved utilization efficiency
  - ?
- Cost containment as system grows
  - *\$24,150 per 2,000 parking spaces*



TEXAS TECH UNIVERSITY

University Parking Services™