The Implications of New& Emerging Transportation Trends for Florida Main Street Businesses

Florida Main Street 2015 Annual Conference
St. Petersburg, Florida

Introduction & Overview

The session encompasses an overview of new & emerging trends in transportation from delivery drones & off site/door2door deliveries to Intelligent Transportation Systems/data collection & driverless cars & delivery trucks & how these trends are likely to impact Florida Main Street businesses & ways & means of adapting to their positive aspects.

Global Context? 200,000 new births worldwide everyday & 1 billion+ cars on the roadways worldwide.

Internet of "Things" & Data

- *Who Is Coming To Main Street & For What, From Where, How & For How Long?*

<u>Data Collection Options:</u>

- **Bluetooth & Cellular Technologies**
- **License Plate Survey**
- **Vehicle Intercept Survey**
- **Transponders**

Technology	Typical Costs	Time to Results	Accuracy/Coverage	Ease of Method
Household Travel Surveys	$100,000-$1+ million	Months to a year or more	Accuracy depends on survey respondents, in-depth data available, limited coverage area	**Difficult:** time consuming and expensive
Vehicle Intercept Surveys	$5,000/site*	Months	Accuracy depends on survey respondents, in-depth data available, limited coverage area	**Difficult:** time consuming and expensive
License Plate Surveys	$48,000/mile**	Months	Fairly accurate, coverage area limited by cost	**Difficult:** time consuming and expensive
Bluetooth	$20,000/mile**	Weeks	Accuracy depends on number of Bluetooth devices in discoverable mode, coverage area limited by cost	**Medium:** timely, equipment and installation required
Cellular Data	$10,000+	Weeks	High accuracy, largest sample size and coverage available	**Easy:** timely, no equipment needed

Cellular data offers high accuracy, as well as the largest sample size and coverage available.

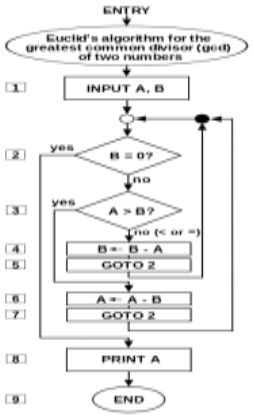
* Estimates based on 24 hrs survey

**Cambridge Systematic

Source: AirSage

Data Analyses, Algorithms

- Once data is collected algorithms are employed to connect supplies with demands online/on demand via internet by sorting & matching data points utilizing the untapped resources (e.g., Airbnb, Uber, etc.) as goods & services for sale & hire, or for marketing purposes.



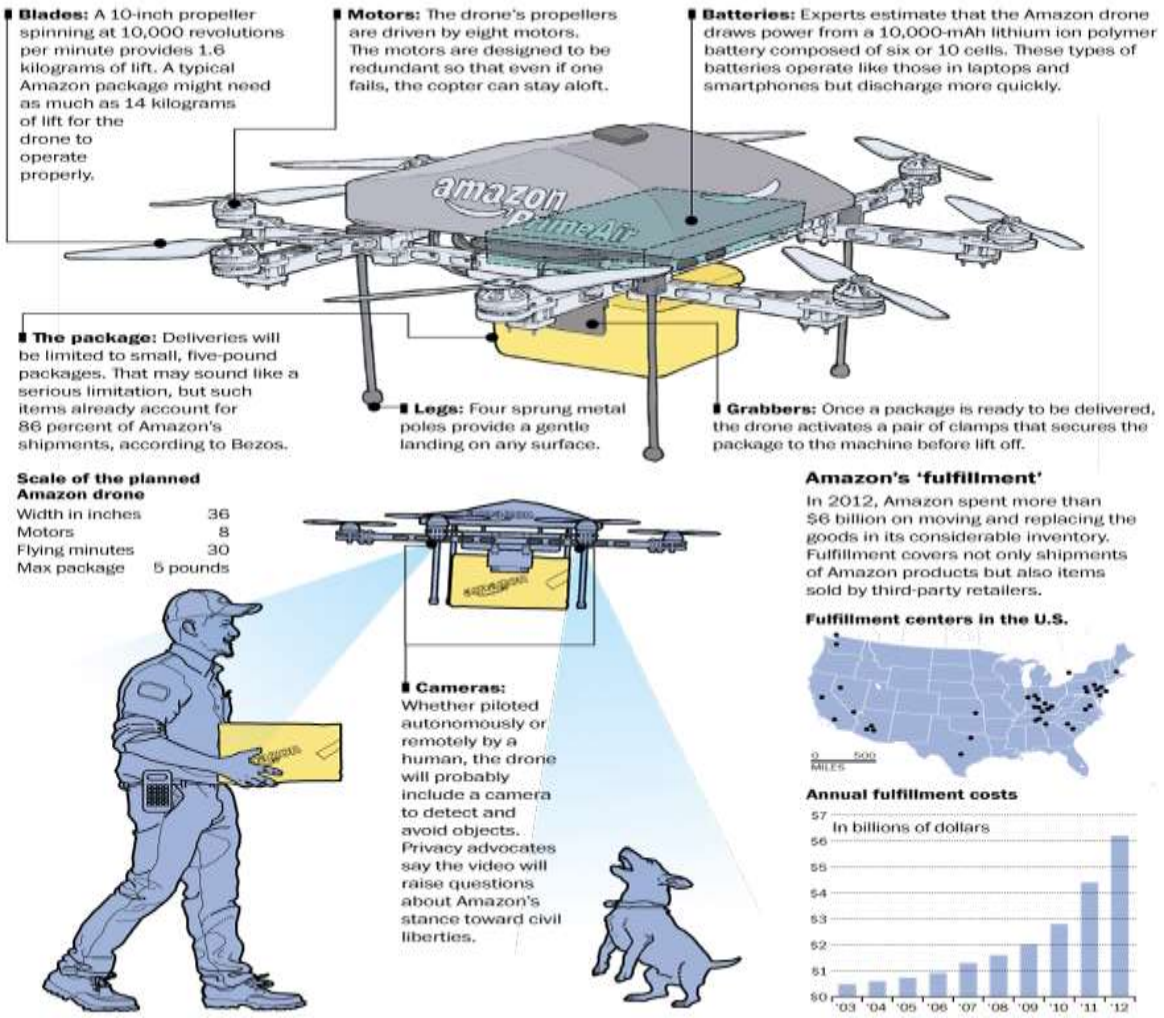
Privacy Issues

The records of online transactions & activities & the ownership & security of those records have prompted privacy concerns particularly amongst civil libertarians for possible data breaches, abuse, identity theft & other unlawful access to one's personal information.

Service/Product Delivery On & Off Main Street Sites

Once matches between supplies & demands are established, all efforts are employed to make the transactions, cheaper, faster, & safer by:

- **Delivery Drones**
- **E-Vehicles & Driverless Cars & Delivery Trucks**
- **Public Transit & Delivery Routes**
- **E-Bike/E-Vehicle Sharing**

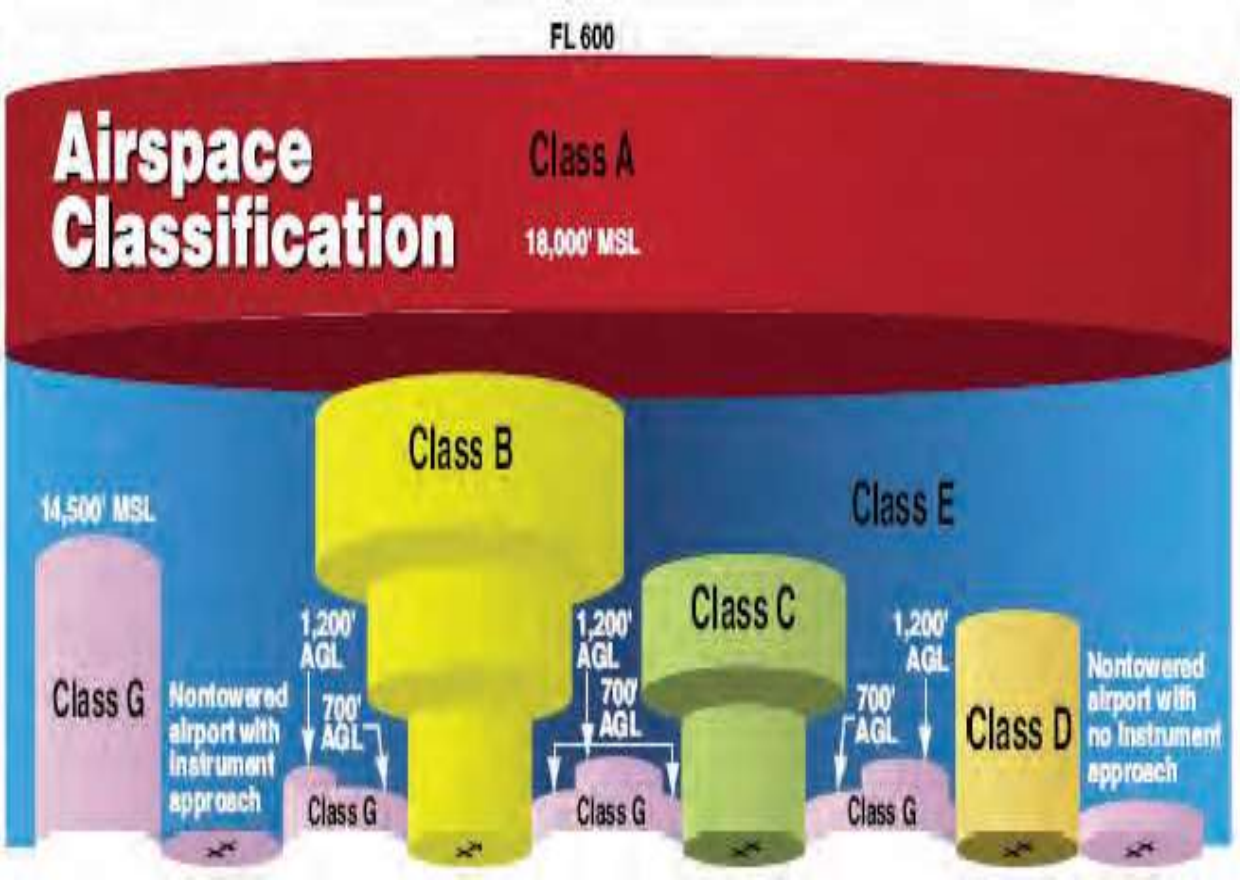

Blades: A 10-inch propeller spinning at 10,000 revolutions per minute provides 1.6 kilograms of lift. A typical Amazon package might need as much as 14 kilograms of lift for the drone to operate properly.
Motors: The drone's propellers are driven by eight motors. The motors are designed to be redundant so that even if one fails, the copter can stay aloft.
Batteries: Experts estimate that the Amazon drone draws power from a 10,000-mAh lithium ion polymer battery composed of six or 10 cells. These types of batteries operate like those in laptops and smartphones but discharge more quickly.
amazon PrimeAir
The package: Deliveries will be limited to small, five-pound packages. That may sound like a serious limitation, but such items already account for 86 percent of Amazon's shipments, according to Bezos.
Legs: Four sprung metal poles provide a gentle landing on any surface.
Grabbers: Once a package is ready to be delivered, the drone activates a pair of clamps that secures the package to the machine before lift off.
Scale of the planned Amazon drone
Width in inches 36
Motors 8
Flying minutes 30
Max package 5 pounds
Cameras: Whether piloted autonomously or remotely by a human, the drone will probably include a camera to detect and avoid objects. Privacy advocates say the video will raise questions about Amazon's stance toward civil liberties.
Amazon's 'fulfillment'
In 2012, Amazon spent more than $6 billion on moving and replacing the goods in its considerable inventory. Fulfillment covers not only shipments of Amazon products but also items sold by third-party retailers.
Fulfillment centers in the U.S.
0 500 MILES
Annual fulfillment costs
In billions of dollars
$7
$6
$5
$4
$3
$2
$1
$0
'03 '04 '05 '06 '07 '08 '09 '10 '11 '12

Delivery Fee That Consumers Pay For A Small Package

2.2kg (5lb) package delivered within 16.1km (10 miles) in the US

**Launch date unknown, and delivery fee is an estimate*
Source: ARK Investment Management, Company Info

BI INTELLIGENCE

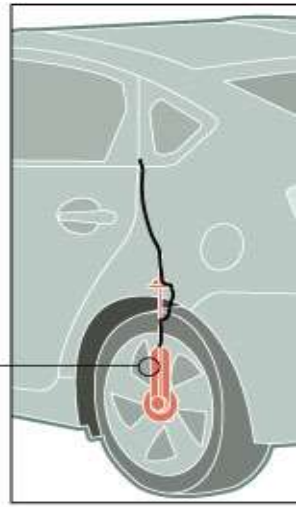


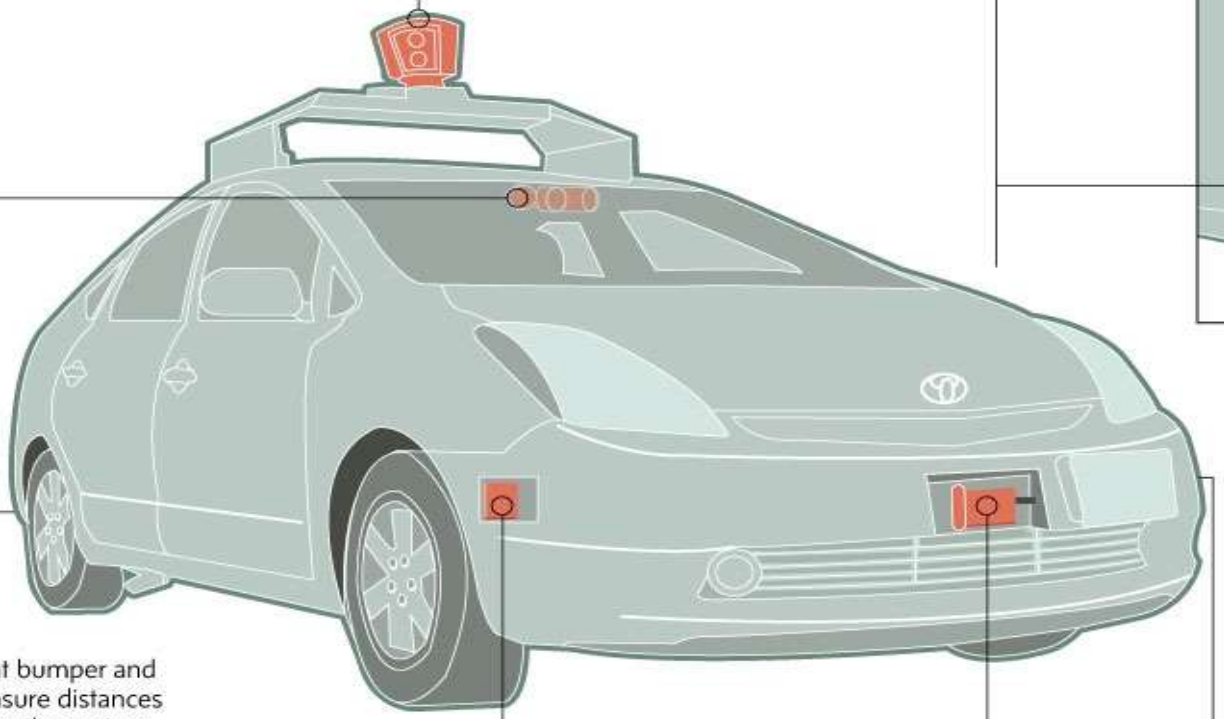
FAA Regulations for Drones Underway (200-500’ Probable Range of Altitude)

VIDEO CAMERA
Mounted near the rear-view mirror, the camera detects traffic lights and any moving objects.

LIDAR
A rotating sensor on the roof scans the area in a radius of 60 metres for creation of a dynamic, three-dimensional map of the environment.

POSITION ESTIMATOR
A sensor mounted on the left rear wheel measures lateral movements and determines the car's position on the map.





DISTANCE SENSORS
Four radars, three in the front bumper and one in the rear bumper, measure distances to various obstacles and allow the system to reduce the speed of the car.

CARRIE COCKBURN/THE GLOBE AND MAIL » SOURCES: GOOGLE; ARTICLESBASE.COM; WHEELS.CA

Electric Vehicle Models Available in the United States

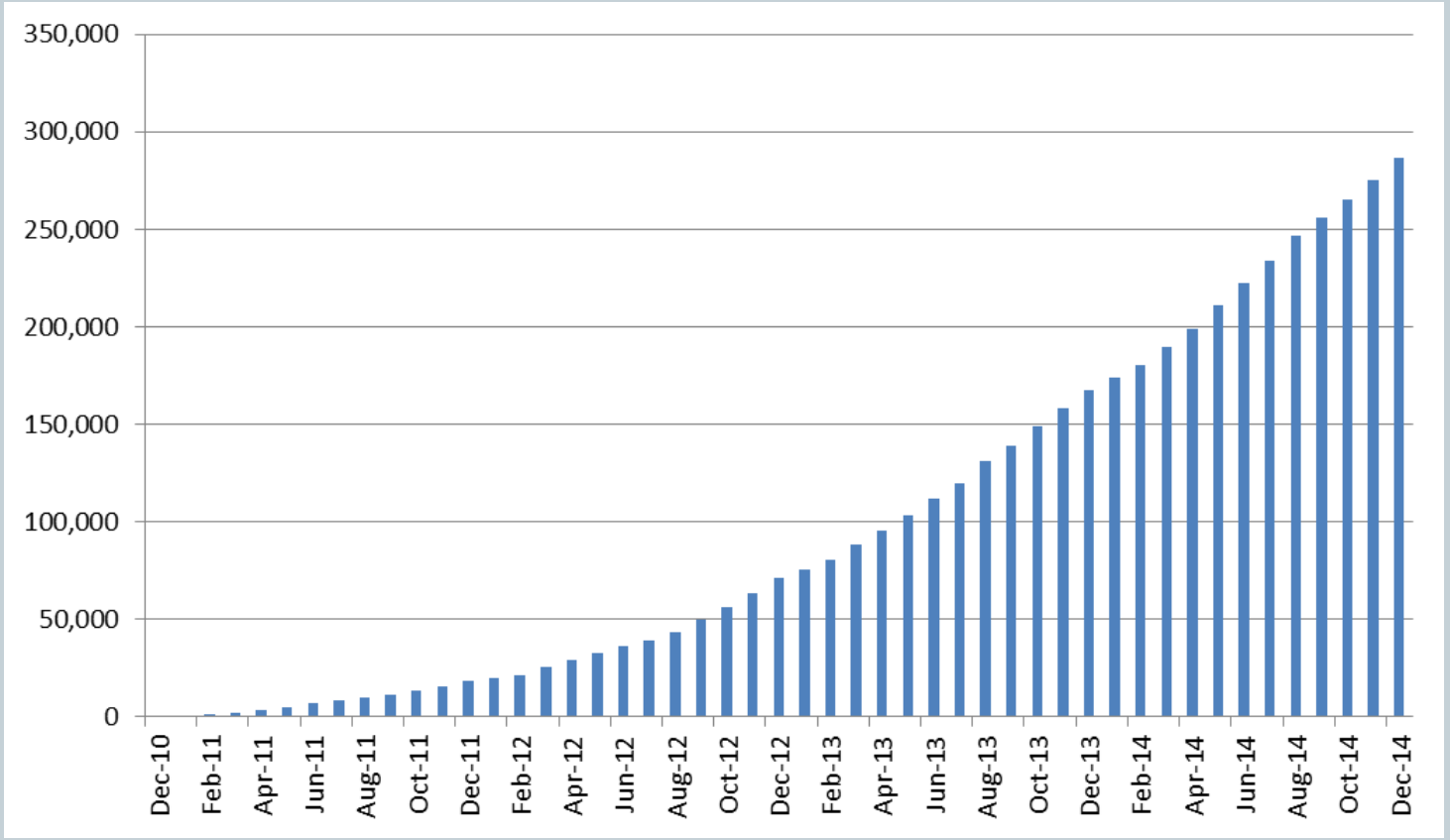
- Almost 300,000 EVs sold since 2010

- •Models available from BMW, Chevrolet,
- FIAT, Ford, Honda, Mitsubishi, Nissan,
- Porsche, Smart, Tesla, &Toyota

- •Financial incentives positively impact sales
- (federal tax credits, state incentives, & fuel cost savings)

- •Ownership benefits can include access to high
- occupancy vehicle (HOV) lanes, and premier or free parking

- •Pike Research has projected that by 2020, roughly
- 400,000 EVs will be sold in the U.S., each year



EVs Exponential Increase Since 2010

E-bike Prototype

Ideal for Fixed Route Commuter Trips & Around Neighborhood Outings & light Shopping (typically 10 to 30 miles per charge, depending on riders pedal power contributions, terrain, at speeds of up to 20 mph)

Solar E-Bike

Equipped w/ Solar Panels Capable of Charging while riding with the appropriate orientation (up to 100 miles per charge depending on riders pedal contribution, terrain, at speeds of up to 25 mph)

Design Solutions To Keep Main St. Customers & Attract New Ones

- **E-Vehicles/E-Bikes**
  - **Charger Parking**
  - **Valet Combination**
- **Use of Solar Panels for both Electricity & Covered Parking**
- **Main St. Parking Sharing & Shared Liability Insurance**

Charging Station Technologies (Level 1)

- Can be used by all modern EVs.
- Provides an EV with four miles of range per hour of charge and requires up to 18 hours for a full charge (depending on vehicle)
- Typical charging power is 12A to 16A and 1.4 kW, with a panel requirement of 1.8 kW to 2.4 kW (ChargePoint, Inc., 2013)
- Usually requires the EV user to provide electrical cord

Charging Station Technologies (Level 2)

- Can be used by all modern EVs
- Provides an EV with 20 miles of range per hour of charge (ChargePoint, Inc., 2013).
- Typical charging power is 32A and 6.6 kW with a panel requirement of 8.3 kW (ChargePoint, Inc., 2013).
- Electrical cord and connector is attached to the EV charging station.

Charging Station Technologies (Level 3)

- Sometimes called “fast chargers” or “DC fast charging” (150 miles of range for every hour of charging)
- Typical charging power is 50 kW, with a panel requirement of 62.5 kW (ChargePoint, Inc., 2013)
- Connectors are not standardized and can only be used by certain properly equipped EV models

SAE J1772

Typical Costs for EV Charging Stations

	Level 1	Level 2	Level 3
Equipment Costs (per unit)	**$200/$1,500**	**$3,500**	**$45,000**
Installation Costs	**$7,000**	**$7,000**	**$20,000**
Infrastructure Costs	**Variable**	**Variable**	**Variable**

Source: ChargePoint, Inc., September 2013

Better Parking Management Through Parking Sensor Technology

Via Sensors/ Repeaters/ Gateways For Demand Responsive Rate Adjustments & Better Utilization of Parking as Pavement Infrastructure vestment

- **Signage & Communications To Promote EVs.**

- Way-finding
- Advertising
- Notification to non-EV drivers
- EV parking spaces vs. active charging spaces
- Branding Main Street
- Ribbon cuttings, launches, and press releases
- Social Media
- Cell Phone Applications

- **On-Demand Vehicle/ Sharing**
  (ownership vs. access)
  Uber/RelayRides/ GetAround/ BuzzCar/ ZipCar/Rent-a-Wrek, etc.

- **Bike Sharing Stations**

Green Bikes/White Bikes

UNIVERSITY OF ALASKA FAIRBANKS
green bikes

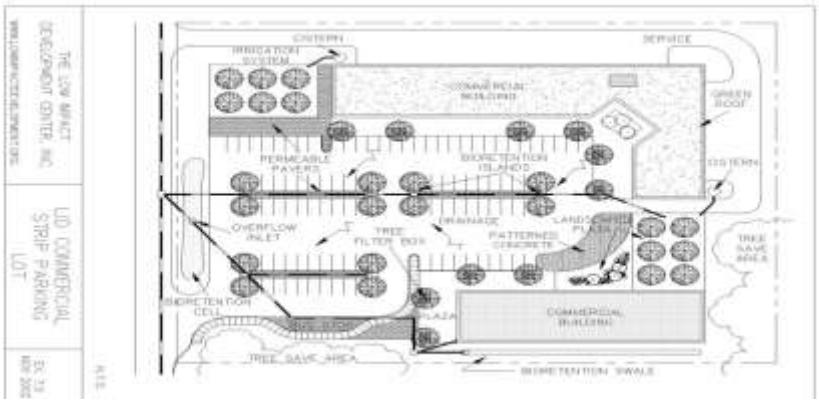
Main Street Transit Oriented Mixed Use Development Benefits:

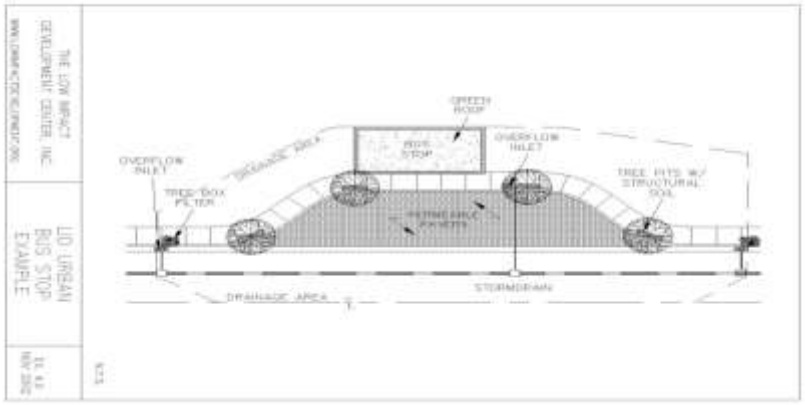
1) Opportunity for more efficient delivery of goods and services
2) Transit activated delivery routes
3) Transit Stop Amenities
4) Rental Bike Stations

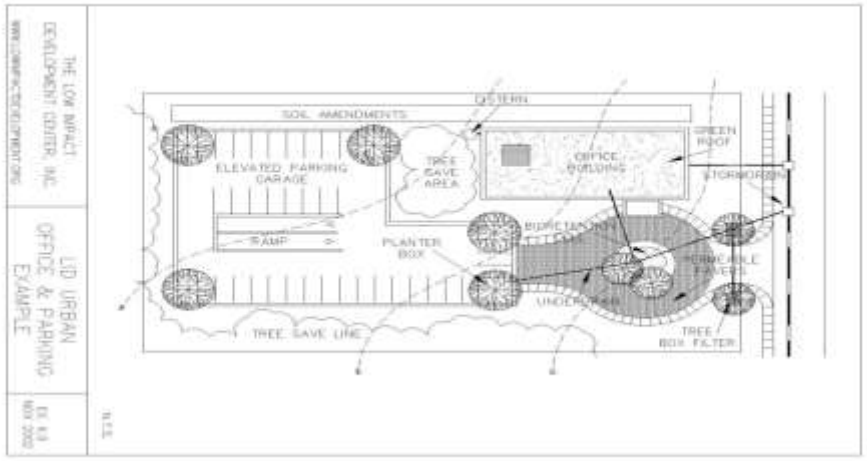
Source: Street Design, Dover, Messengale

Low Impact Development w/

- On-Site Storm Water Treatment & Use of Cistern (Rain Barrels) for Landscaping (Rain Gardens) w/ Permeable Pavements

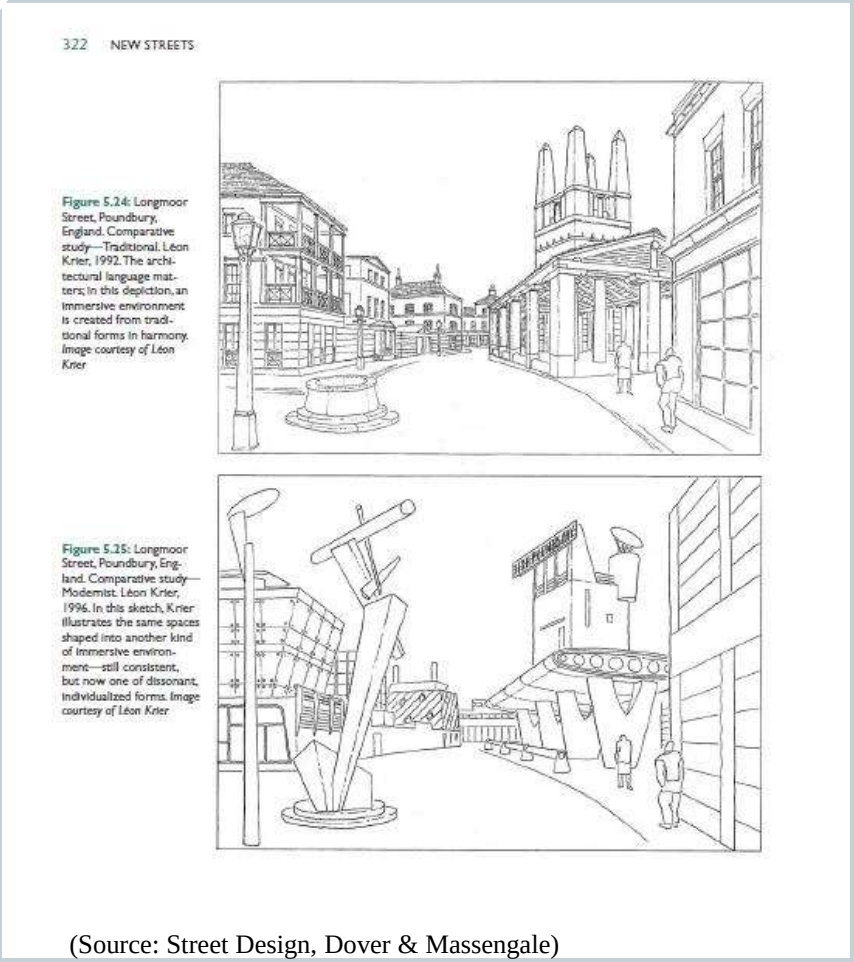






Main Streets as Art Oriented Magnets for "High Tech Seeing & Being Seen", Friendly to Pedestrian Activities.

Poundbury/England, Longmoor Street, Comparative Study of Traditional & Individualized Forms within the Same Street Layout is a good example.



(Source: Street Design, Dover & Massengale)

- **How to Safeguard Main Street Businesses Market Share?**

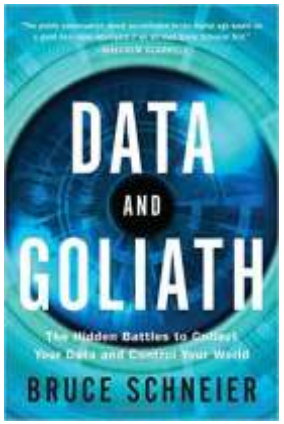
  By Making Main Streets Destinations to Draw Customers for Unique Experiences, Goods, & Services That Are Environmentally Friendly & Present an Alternative to Big Businesses Impersonal Services.

- In the 90's Walmart was the 800-pound Gorilla, now with e-bay, amazon, google & assortment of other online businesses, the challenge of Walmart proofing Main Street Businesses is multiplied.

- Although competition with these "Gorillas" may not be possible for mass produced consumers goods delivered cheaper & faster, quality products & unique goods & services remain within the realm of Main Street Business.

Main Street Businesses Security & Privacy Protection Through:

1. **Inherent Data Breach Resiliency Due to Small Scale**
2. **Adaptability to Alternative & Innovative Financial Transactions such as Digital & Community Currencies**



- **Main Street Businesses Options:**

Short term

1) Collect data about main street businesses customers as to who is coming to main street, for what, from where, how often & for how long, & find out their likes and dislikes of their main street experience.

2) Analyze data to assess how driving, parking, & staying for customers may be improved. Especially for delivery of goods & services.

Long term

1) Explore ways & means of quality service delivery in person & online/on demand through off site delivery by all means possible including drones for door to door delivery.

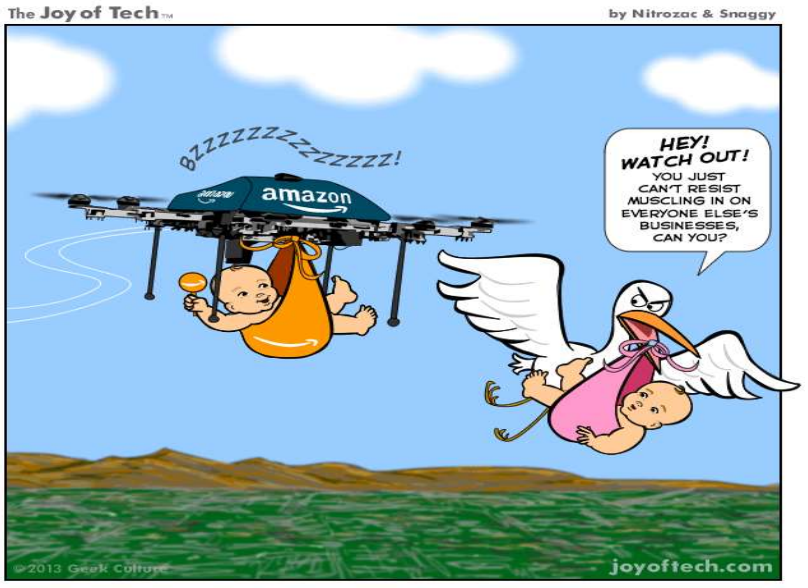
2) Capitalize on untapped potential for shared parking & E-Vehicles & E-bikes, valet, & other support services to enhance customers main street transportation experience.

3) Convert main streets to environmental friendly/art oriented high tech magnets to draw new customers.

4) Explore Main Street community currency to ensure security of financial transactions with main street businesses

Concluding Remarks

Adapt to, & employ positive aspects of the new & emerging transportation trends & technologies that are functional, efficient & aesthetic consistent with the main street Four-Point Approach of Design, Organization, Promotion, & Economic Restructuring



Comments /Q&A

CORBEL DESIGN Inc.
Architecture
.Landscape Architecture.
.Planning.

4786 Harbour Cay Blvd. Ft. Myers Fl. 33919
Tel. (407) 865-9799 * Fax (407) 865-9722
- WWW.CORBELDSEIGN.COM -

Mohsen Salehi, AICP, ITE(F)

Mohsen@CorbelDesign.com

AA003282