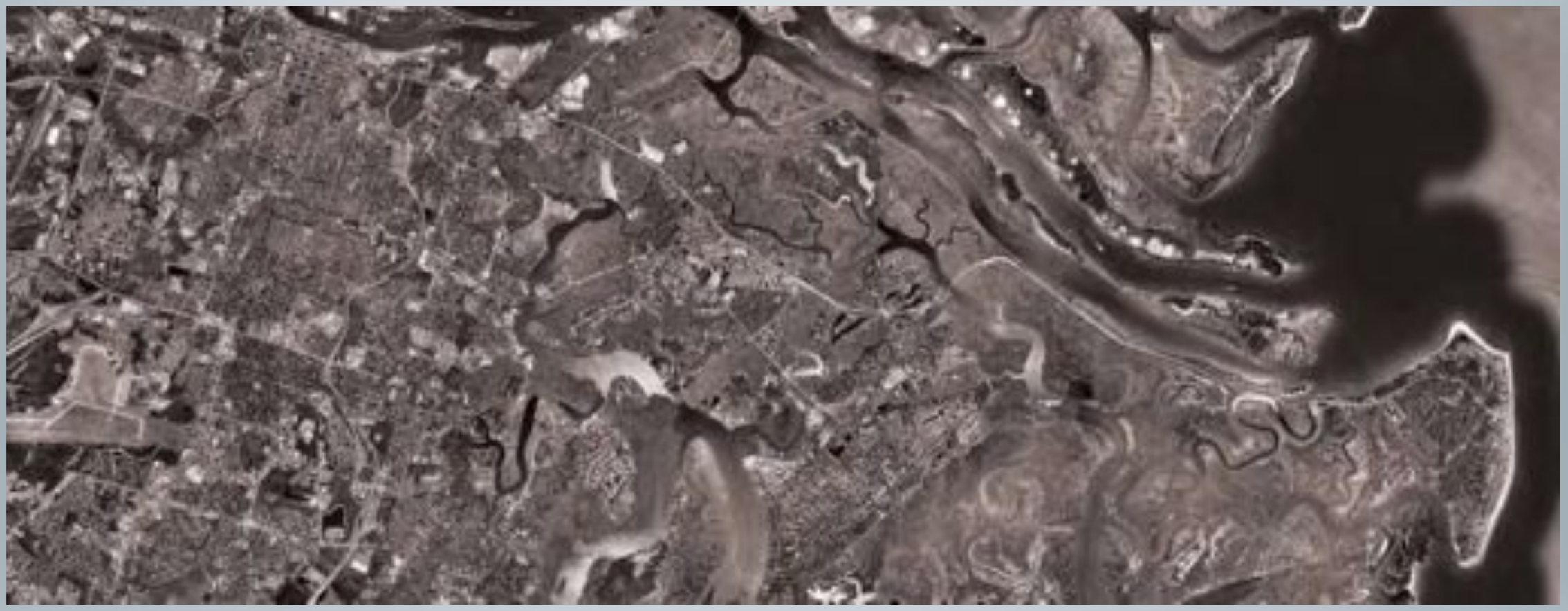


TYBEE ISLAND

Wave Ecology & The Highway 80 Challenge
Opening the Door on Data
October 25, 2010

"As concerned citizens of The City of Tybee Island, we will be conscientious stewards of our unique historic and cultural heritage, environmental resources, and diverse economic community. *We will also ensure that our growth does not exceed the Island's carrying capacity*."

- "Vision for the Future" City of Tybee Island Master Plan

CARRYING CAPACITY

The Human Application

$$I = P \times A \times T$$

I = Environmental Impact

P = Population (Size of Human Population)

A = Affluence (Level of Consumption by the Population)

T = Technology (Processes to Obtain Resources for Goods & Wastes)

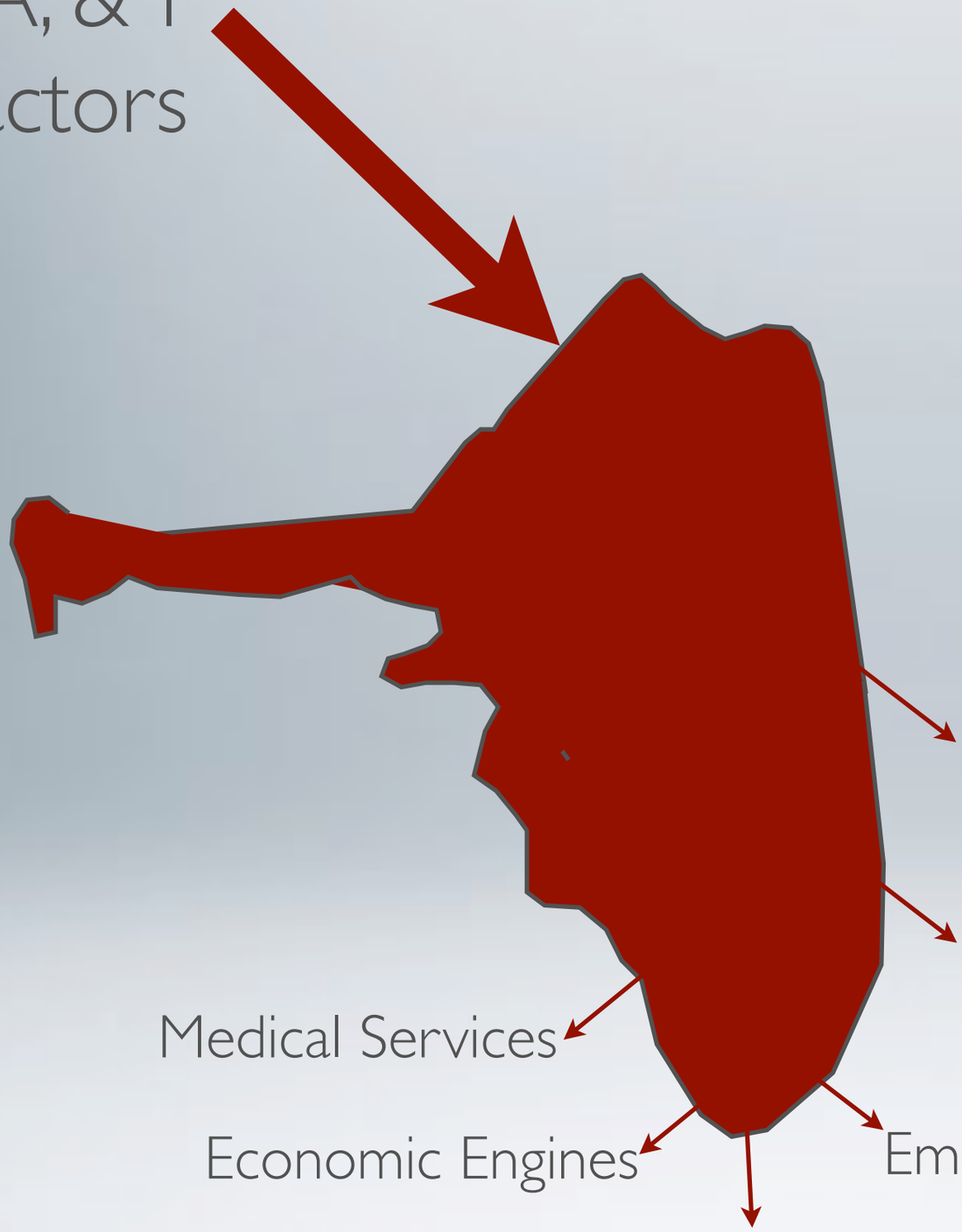
TYBEE'S CAPACITY...

HOW CAN WE KNOW?

CARRYING CAPACITY

I=PAT

P, A, & T Factors



Mobility Connectivity

Residential & Commercial Energy Sources

Medical Services

Economic Engines

Emergency Response

Consumer Goods

CARRYING CAPACITY

P-FACTORS

WHAT WE KNOW...

ANNUAL POPULATION = 3,800

PEAK TOURISM POPULATION = 10,000

July 3, 2010
16,173 vehicles x 2 = 32,346

CARRYING CAPACITY

A-FACTORS

CARRYING CAPACITY

A-FACTORS

Tybee citizens must rely on external sources
(i.e. one connection point at Highway 80)
for importing commodities

Daily Services Such As...

Food
Gas/Fuel
Medical/Dental Facilities
Solid Waste Disposal
Electricity
Construction/Building Supplies
and Many Others

CARRYING CAPACITY

A-FACTORS

Business as Usual...What is the revenue generator for Tybee?

3 NAICS Code Sectors with 20+ employees

Retail Trade = $5,848,000 annually / $786,000 payroll / 59 employees

Real Estate, Rental = $3,457,000 annually / $501,000 payroll / 23 employees

Accommodation & Food Service = $16,540,000 annually / $4,791,000 / 322 employees

*(Source: US Census Bureau 2002 Economic Census)

Tybee Island per capita income in 2000 = $32,406

Compared to $21,587 Nationally

*(Source: US Census Bureau 2000 Census)

CARRYING CAPACITY

T-FACTORS

Water & Sewerage = 10,000 persons

and NO more...

EPD has restricted the increase of water withdrawal permits

*Based on Current Permits, EPA Estimations & "Water and Wastewater Treatment Plant Operations" by Frank Spellman 2009

Floridan Aquifer
EPD Drinking Water
Permit # 025-0027

Average limit/year
0.960 MGD

Average limit/month
1.6 MGD

Tybee Island WPCP
EPD Permit # GA0020061

Average limit/month
1.0 MGD

CARRYING CAPACITY

T-FACTORS

Existing Housing = 2,859 Units

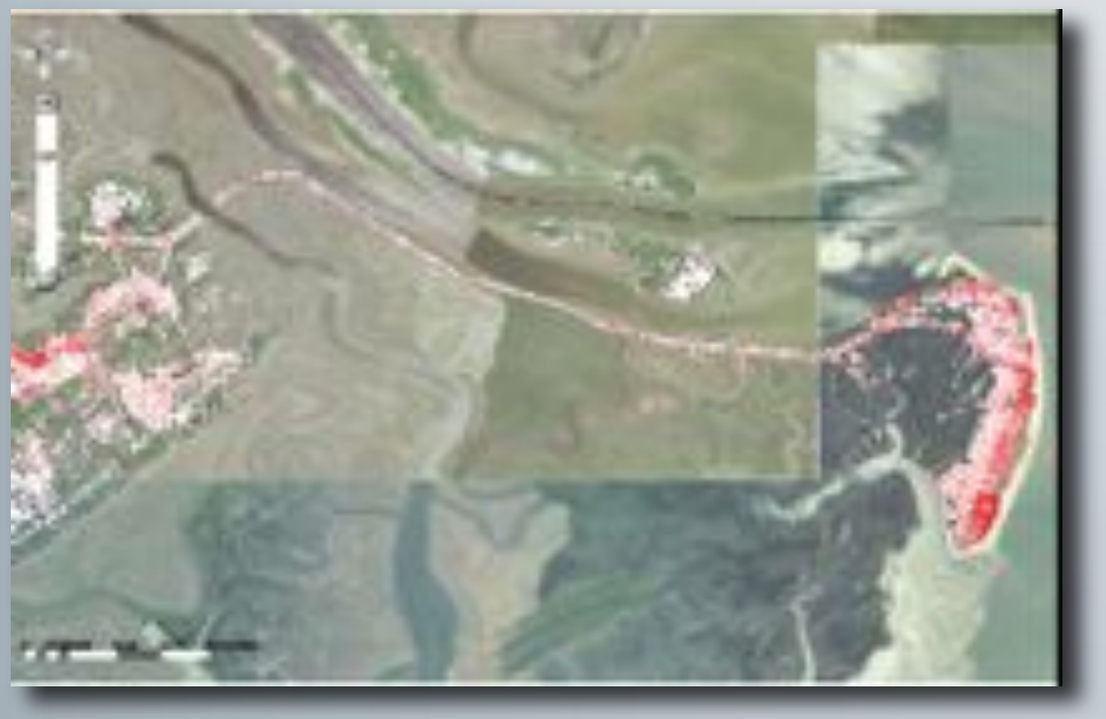
People = 5,918 (based on current household size)

Includes owner occupied and second/rental homes
Avg. Household Size (2000 Census) = 2.07
Current Residential Population = 3,716
*Based on 2000 Census Data (Includes both rental and owner occupied housing)

CARRYING CAPACITY

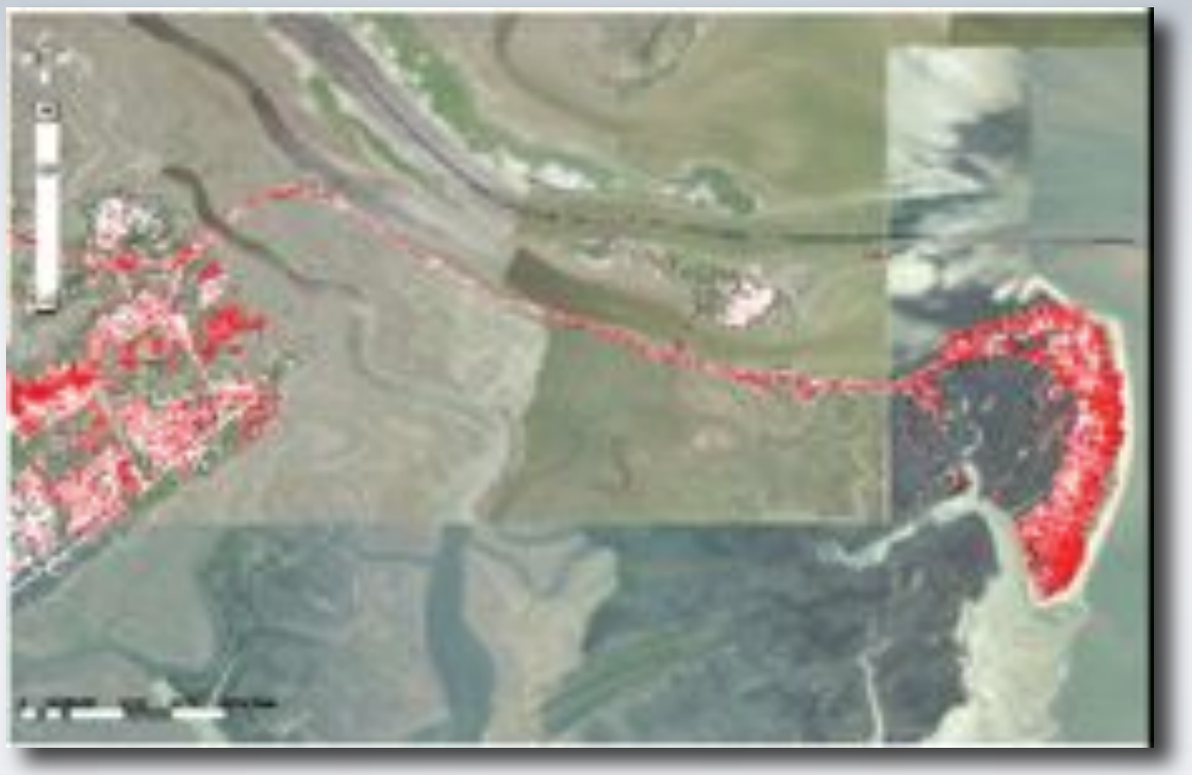
T-FACTORS

NARSAL: GA Impervious Cover 1991



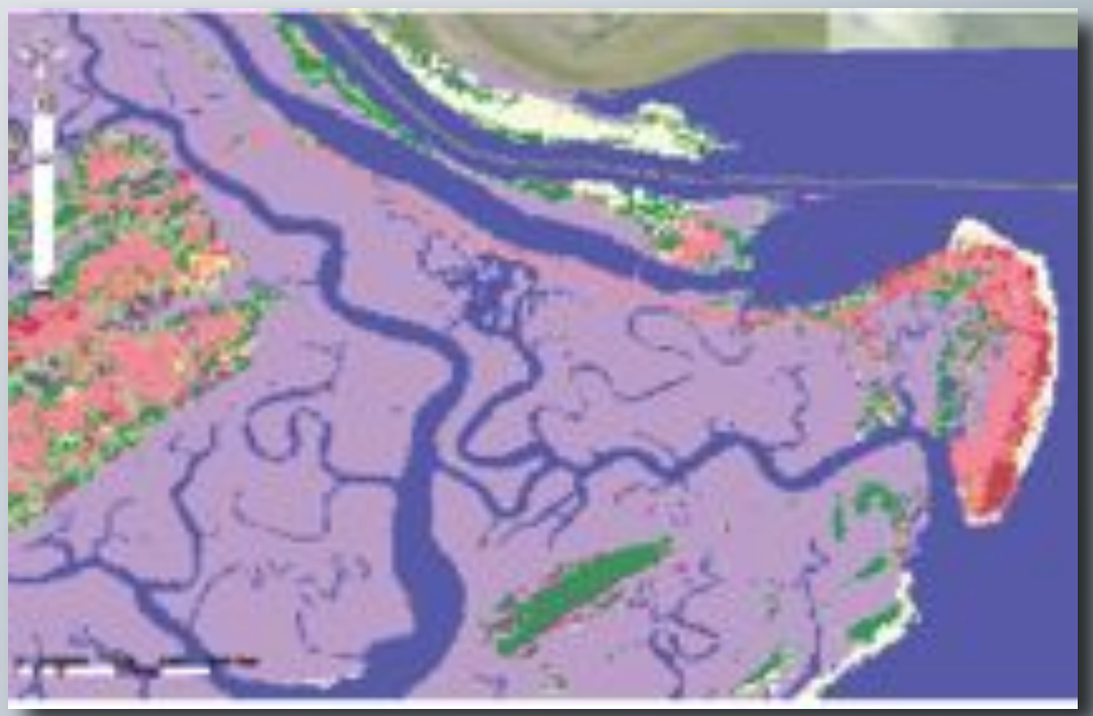
NARSAL: GA Impervious Cover 2001

NARSAL: GA Impervious Cover 2008

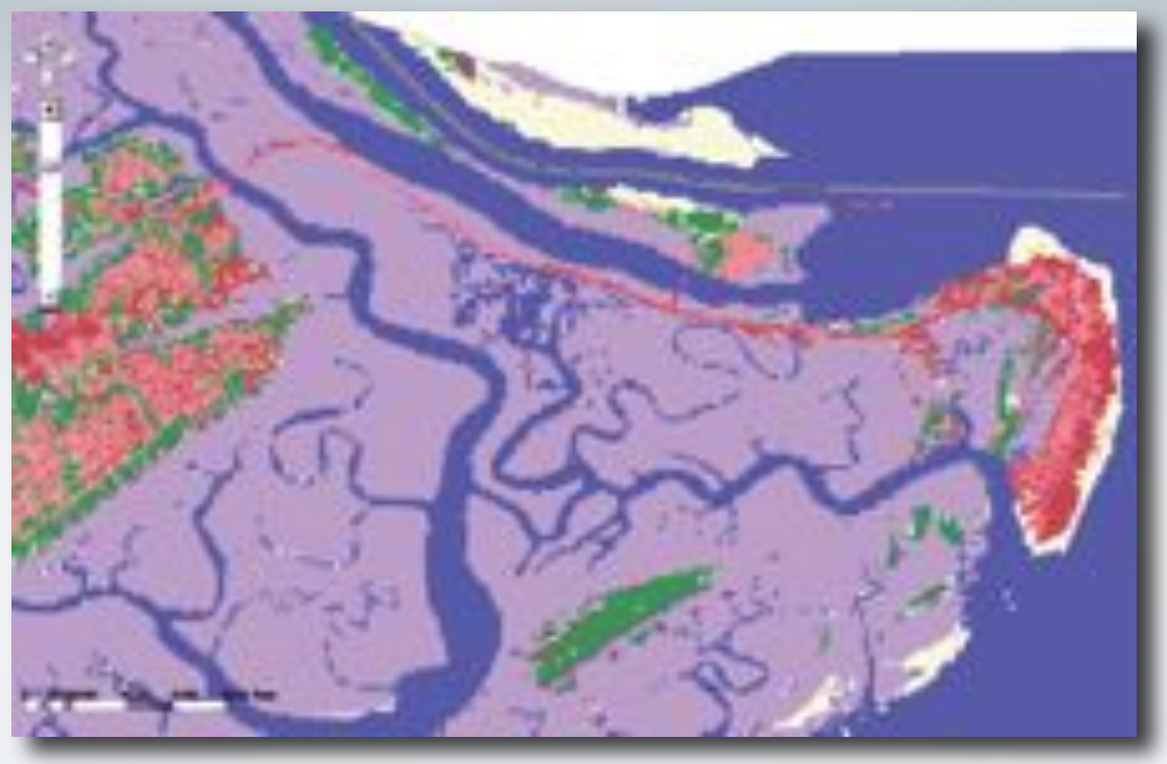


NARSAL: GA Land Use Trends 1974

NARSAL: GA Land Use Trends 2001



NARSAL: GA Land Use Trends 2008

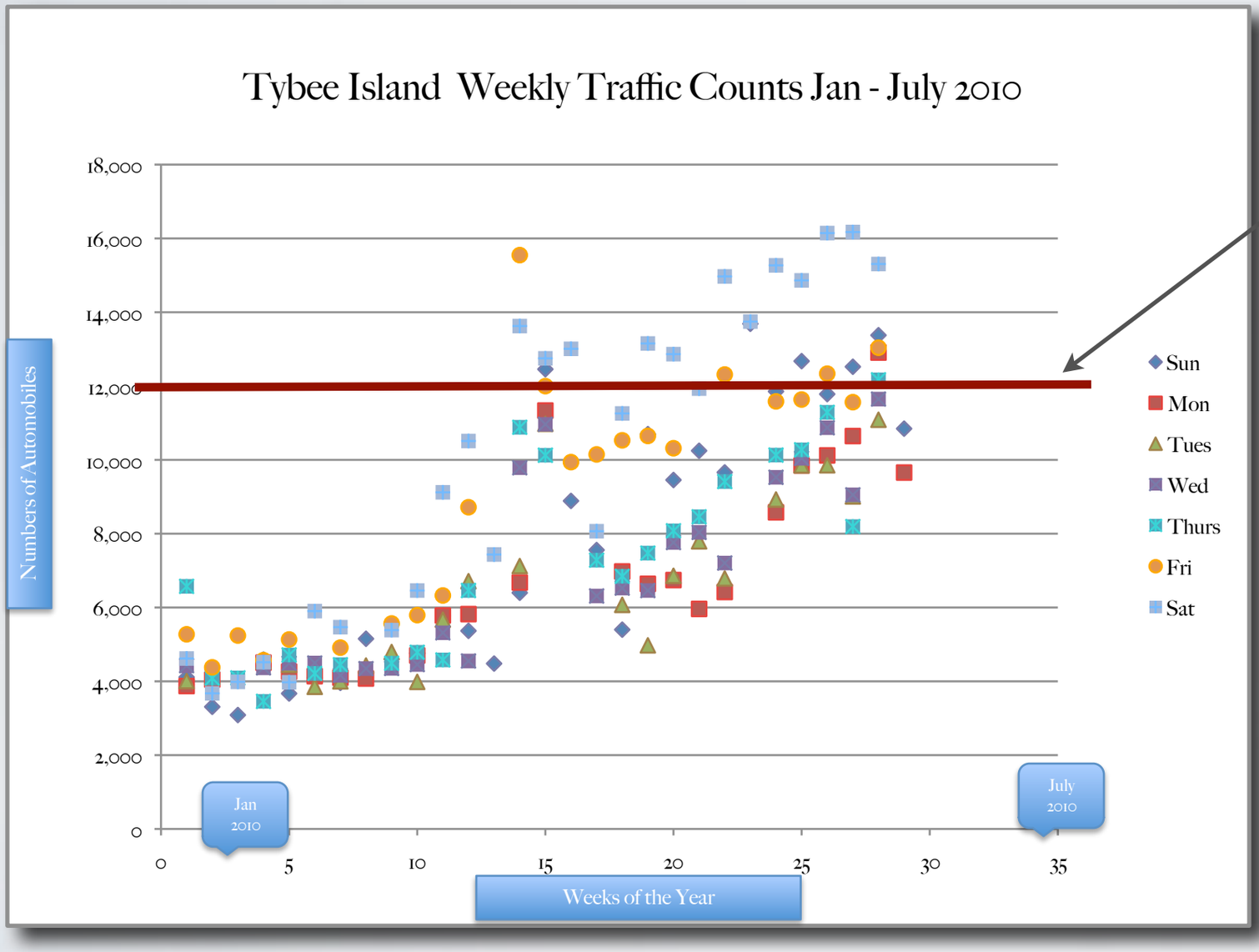


CARRYING CAPACITY

T-FACTORS

Hwy 80 Capacity = 12,000v/day*

*Based on Highway Capacity Manual v.2000 & "Capacity & Quality of Services of Two-lane Highways by the Midwest Research Institute at UC-Berkley



Days Breeching Capacity b/w Jan 2010 & Jul 2010 = 23

Aprox. 11%

Fri, Sat or Sun

Numbers given for estimation purposes. Exact highway capacity would need further calculation and traffic count data collected from two lane portion of roadway. Traffic Count data presented represents the four lane capacity area where two lane capacity of the Lazaretto Creek bridge turns into four lane. Since few ingress and egress points are located between the two lane to four lane conversion the data may still be utilizes for estimation purposes.

Days Breeching Capacity during Labor Day Weekend 2010 = 1

No hourly rates exceeded capacity

However highest hourly V/C ratio was 0.55

(1.0 indicates maximum roadway capacity)

(peak hr volume / capacity = v/c ratio)

CARRYING CAPACITY

T-FACTORS

Hwy 80 Capacity = Flooding*

*Based on NOAA Tidal Station #8670870 at Fort Pulaski & Chatham County Shallow Coastal Flooding Model at High Tide of 9.2 ft MSLW

CARRYING CAPACITY

T-FACTORS

Hwy 80 Capacity = Flooding*

*Based on NOAA Tidal Station #8670870 at Fort Pulaski & Chatham County Shallow Coastal Flooding Model

27 Days Above 9.0 ft
Sept 24, 2009 through October24, 2010

11 Days Above 9.2ft
Sept 24, 2009 through October24, 2010

8 Months Above 9.2ft

CARRYING CAPACITY

T-FACTORS

Solid Waste:

- Waste Pro Landfilled Offsite
- Recycling Shipped and Processed Offsite
- No Composting of Organic Materials
- No Material Reuse Center (including mulch, compost)

Electricity Supply:

- Georgia Power / International Paper Savannah Mill
- Coal Supplied from Scott's Branch Mountain, Kentucky

CARRYING CAPACITY

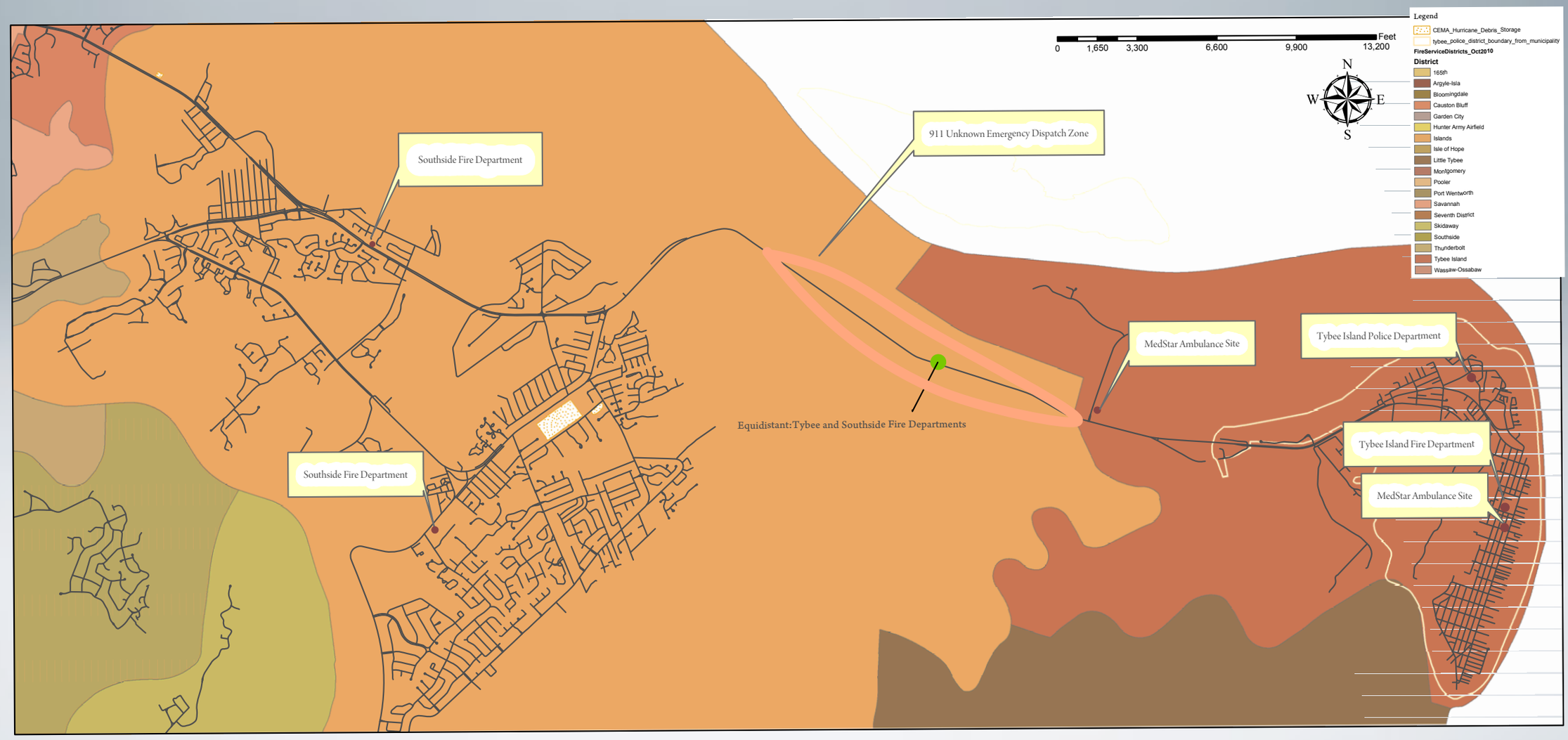
Conclusion:

- Carrying Capacity relative to many variables
- Exceeded by Urban Ecological standings
- Opportunity to support population beyond carrying capacity depends upon:
    - Implementing new technologies
    - Providing multiple modes of connectivity or utilization of resources within the area
    - Inter-governmental / Inter-agency coordination

INTER-GOV. / INTER-AGENCY COORDINATION

Working Together for a Central Purpose

Issue:
One Exit (Multiple Jurisdictions)
911 Dispatch Zone not linked to jurisdictions



Wave Ecology: Route 80 & Tybee Island

Emergency Management Services

Wave Ecology: Route 80 & Tybee Island

Traffic Conflicts and Emergency Services

Emergency Services*

*Based on data provided by the Savannah - Chatham PD, Tybee Island PD, CEMA, Tybee Island Fire Department, and U.S. Coast Guard

Water

7 Marinas located along the corridor = 0 public
Tybee Island two water-born vessels - 1 direct beach launch capacity
Savannah - Chatham PD no marine patrol watch beyond Bull River

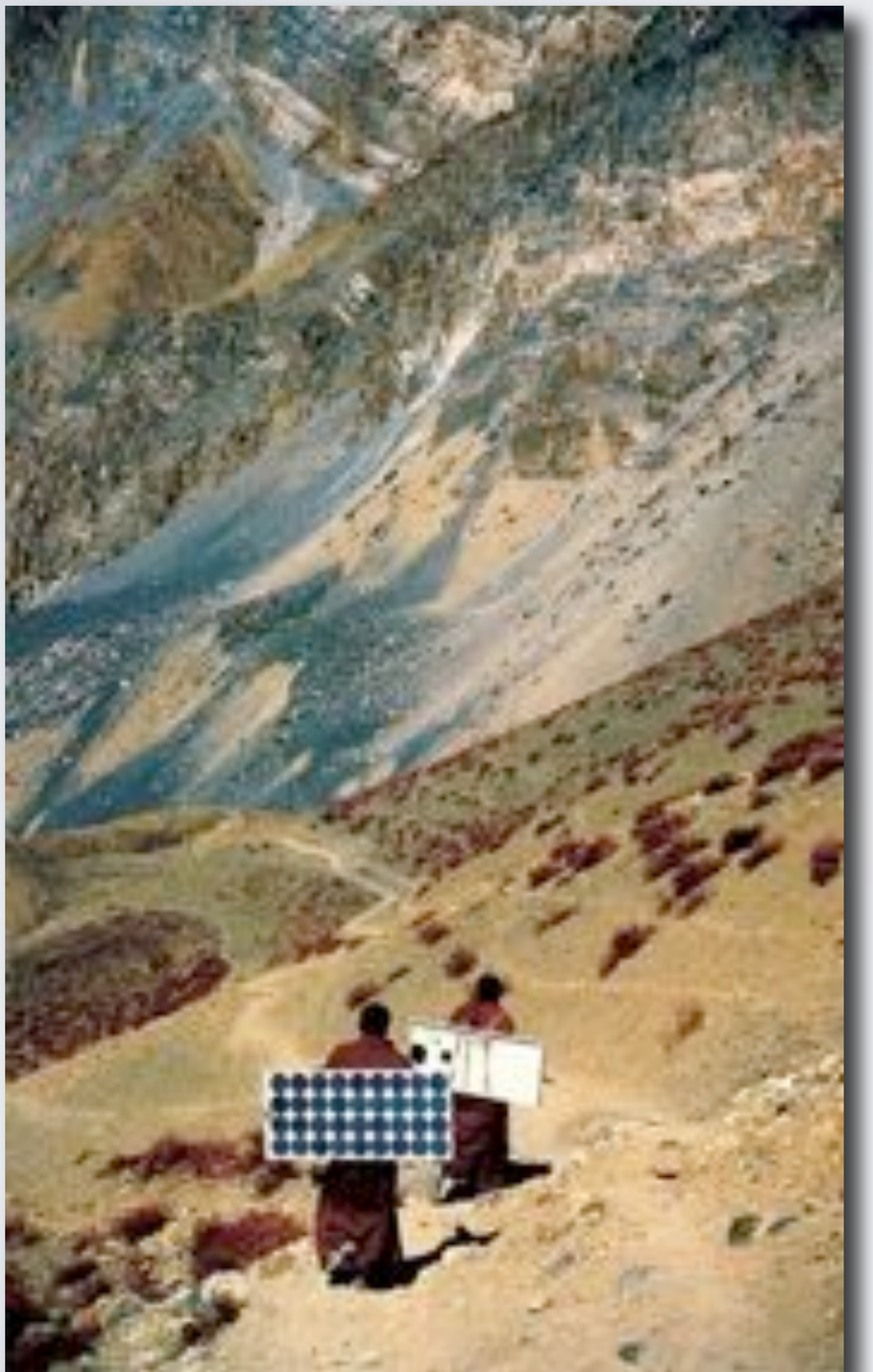
Air

7 Helipad areas (defined by 100ft x 100ft cleared upland)
1+ Coast Guard helicopters available (no MOU/LOA) when not supporting LNG or Savannah River vessel protection.

Land

Hwy 80 Emergency Jurisdiction not Tybee Island, yet only method of connectivity
Metro PD not frequently able to offer patrol units to reduce speed along Hwy 80
Largest Traffic Incident Area near Bull River Bridge (Hwy 80 & Johnny Mercer)
Private shuttle and electric car business available on Tybee Island
Known central activity hubs

CONCLUSION



One way or another the choice will be made by our generation, but it will affect life on earth for all generations to come.

-Lester Brown, Earth Policy Institute

Image of Tsewang Norbu of the Himalyan village of Digger. Trained at the Barefoot College of Tilonia, India in the installation and repair of solar photovoltaic units. All units were carried across the 18,400ft Khardungla Pass. Just an example of the commitment of this community leader to bringing in technologies that would improve the quality of life and carrying capacity of his community.