the heartbeat of HAMPTON ROADS TPO
TRANSPORTATION PLANNING ORGANIZATION

Public Transit Backbone

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For HRT-Participating Cities Transit Planning Meeting

Regional Building

October 26, 2018

Purpose

To **improve** the public transit system…

…via a **vision shared** by locality leadership.

Candidate vision: a **strong backbone**

Idea: to **improve and brand** backbone routes, e.g. :

- higher frequency
- consistent service hours
- shelters (at stops meeting ridership standard)

providing:

- **better service** on these routes
- a **reliable joiner** of local routes

Identification of a draft backbone

where transit is **most needed**

Where transit is most needed

- Question:
  - Where is transit most needed?
- Problem:
  - The census shows **workers who ride the bus**, but workers only ride the bus *where there is service*.
- Solution:
  - Use other census variables to develop an equation that "explains" actual bus usage (where service exists), and then apply that equation to *all of Hampton Roads* to find **"workers ready to ride"**
  - For development of equation, use a portion of *each agency's current service area*:
    - HRT: *Norfolk*; WATA: *Williamsburg*; and Suffolk: *downtown Suffolk*

Variables *desired* for explaining bus usage

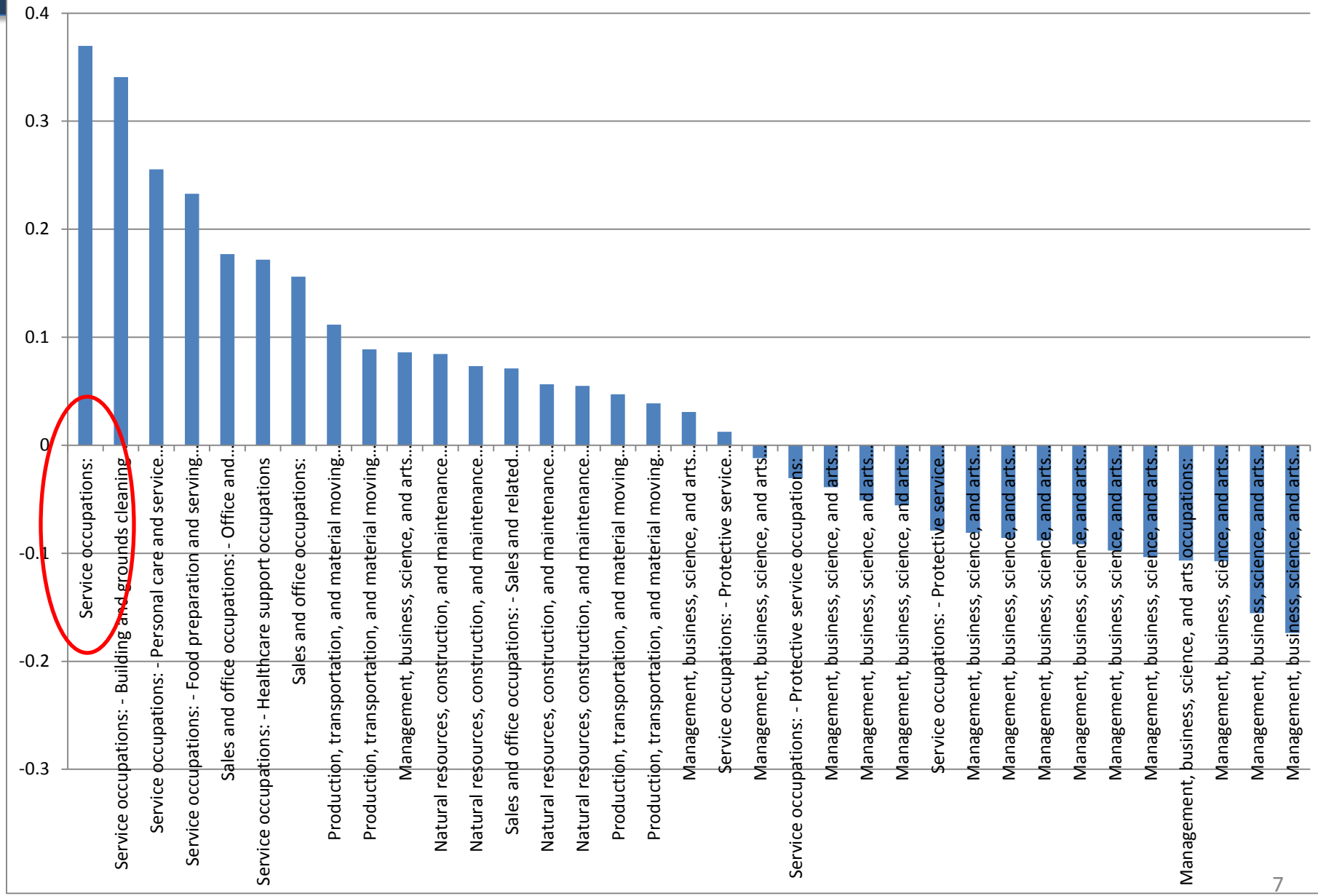
– HRT's *TDP FY18-27*, Jan. 2018, p. 3-42
  - **Low income**
  - **Zero-vehicle households**

Table 3-24 | Transit-Oriented Population Index

Category	Weight
Population (General / Minority)	30
Age (Youth / Senior)	5
~~Households~~	10
Income (Low)	20
Vehicle Ownership (Zero / One Car)	30
~~Disability Status (Yes)~~	5

– HRT's *Strategic Regional Transit Transformation Project*, RFP 18-76540, p. 15
  - "Most weekday trips are **commuters** traveling between home and **work**." ->

Correlation to "riding bus to work, workers"



Census tables *available* for explaining bus usage

- Low-income households
- Attached housing units
- Service occupation workers
- Zero-vehicle households

Best variables for explaining usage

bus riding to work, workers

Regression Statistics	
Multiple R	0.60
R Square	0.36
Adjusted R Square	**0.35**
Standard Error	24.7491
Observations	213

ANOVA

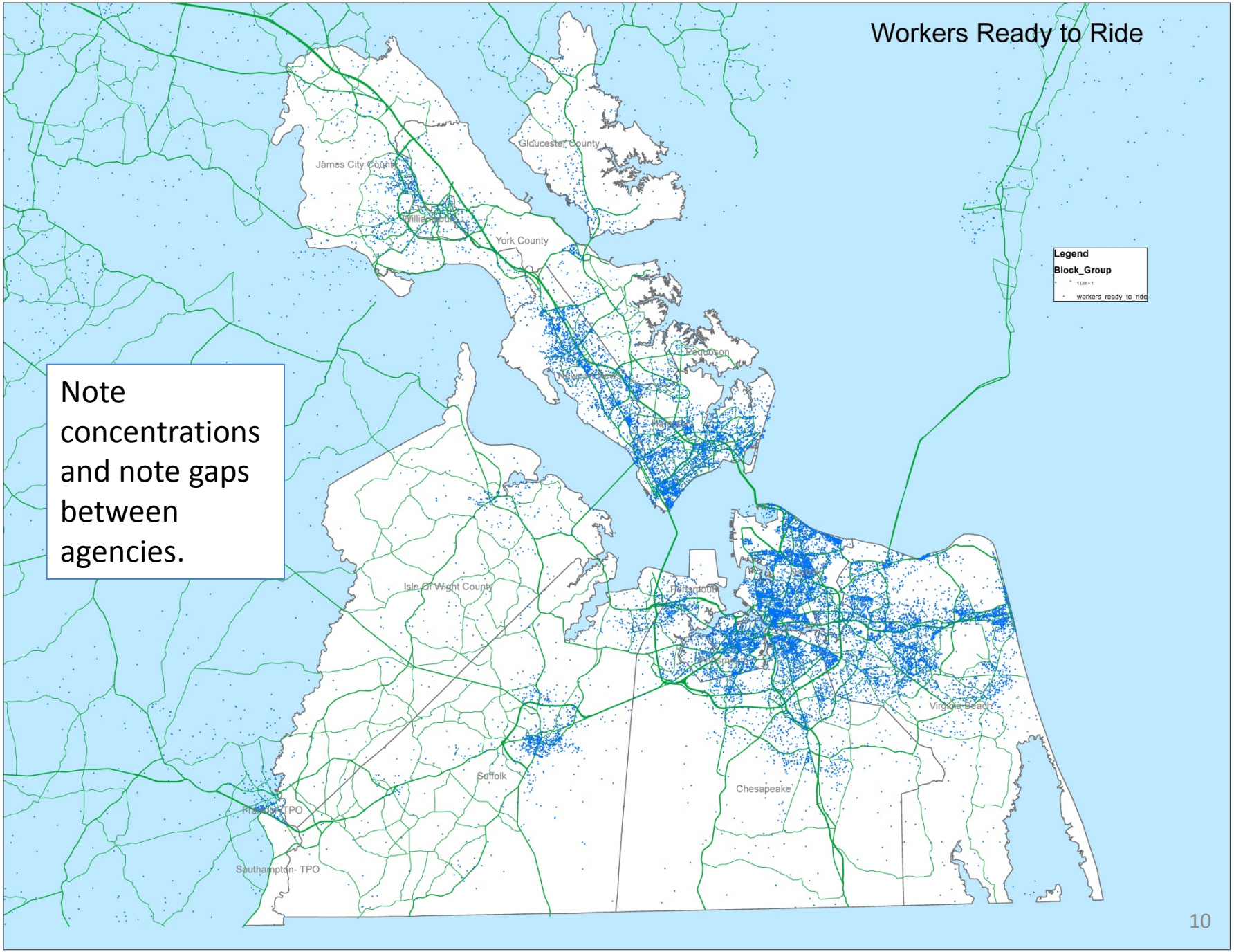
	df	*SS*	*MS*	*F*	*ignificance F*
Regression	2	72606.99	36303.5	59.26927	3.9E-21
Residual	210	128628.8	612.518		
Total	212	201235.8			

	Coefficients	*andard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	-0.41	2.89197	-0.1	0.886891	-6.11286	5.289161
service occupations, workers	0.14	0.033497	4.2	3.36E-05	0.075958	0.208027
zero-vehicle, households	0.22	0.025487	8.6	2.1E-15	0.16845	0.268937

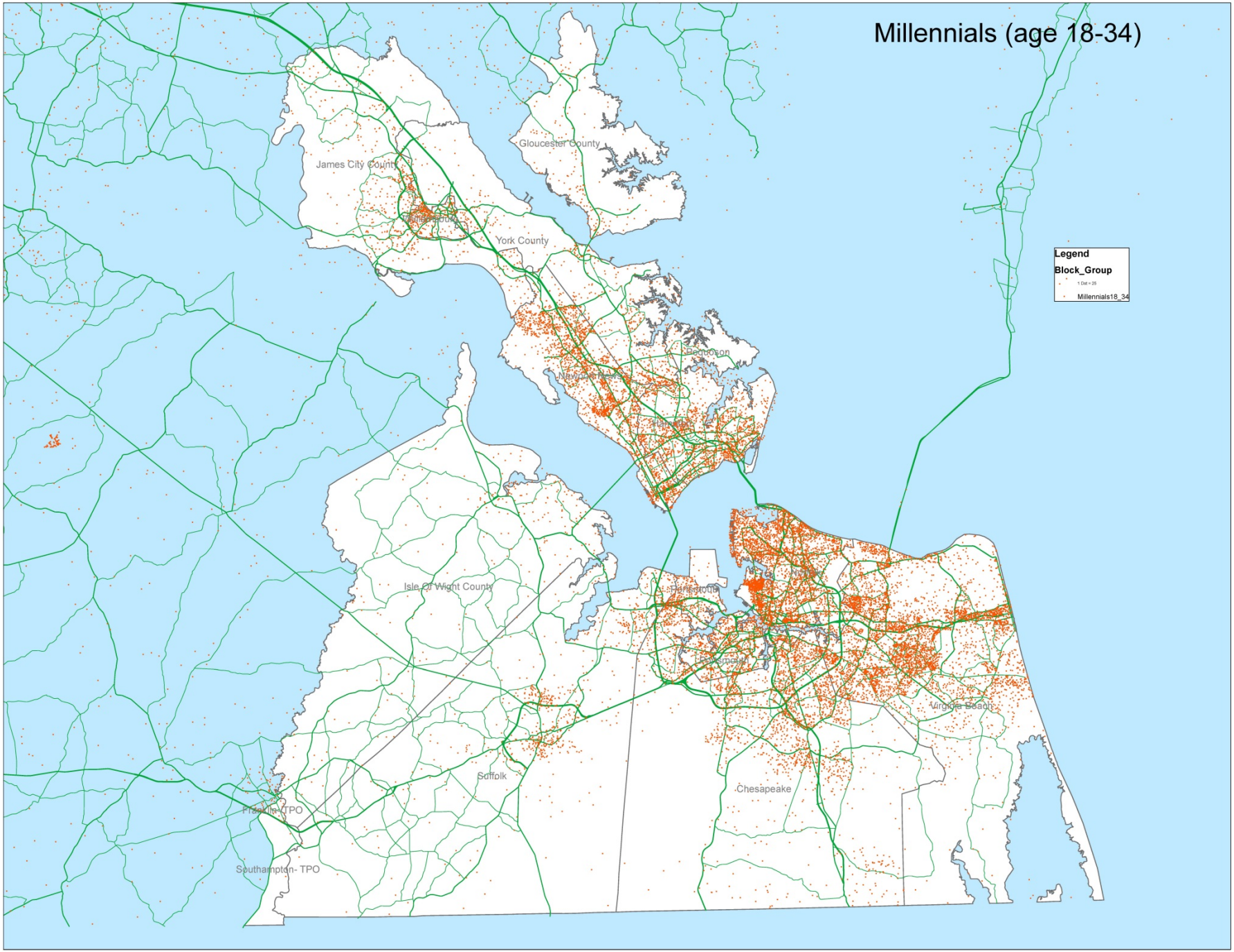
Current bus riders = 0.14*(service workers) + 0.22*(zero-vehicle households)

Therefore, applied to the whole region:

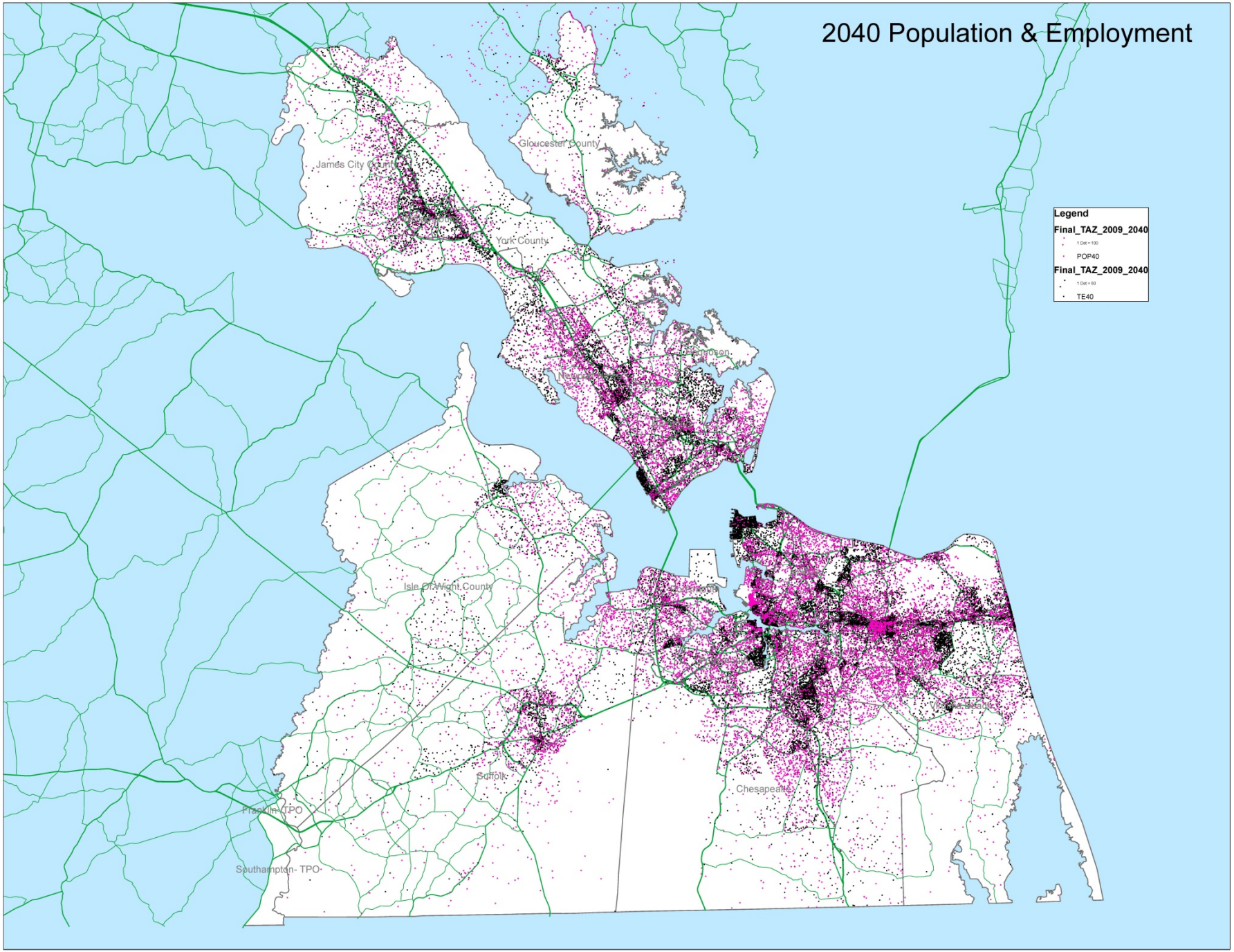
Workers ready-to-ride = 0.14*(service workers) + 0.22*(zero-vehicle households)


Workers Ready to Ride
Legend
Block_Group
workers_ready_to_ride
Gloucester County
James City County
York County
Isle Of Wight County
Suffolk
Chesapeake
Virginia Beach
Southampton- TPO
Note concentrations and note gaps between agencies.

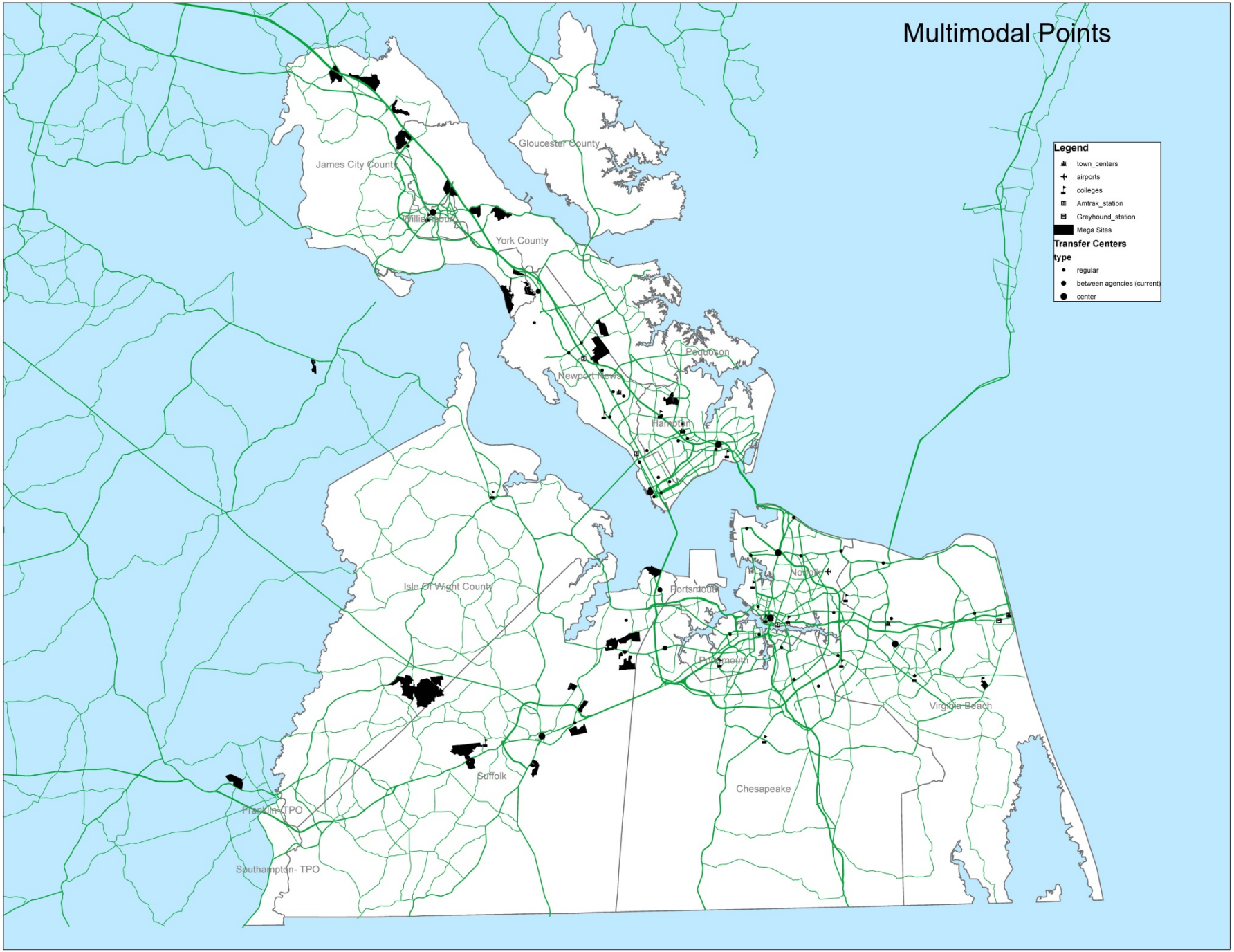
Millennials (age 18-34)

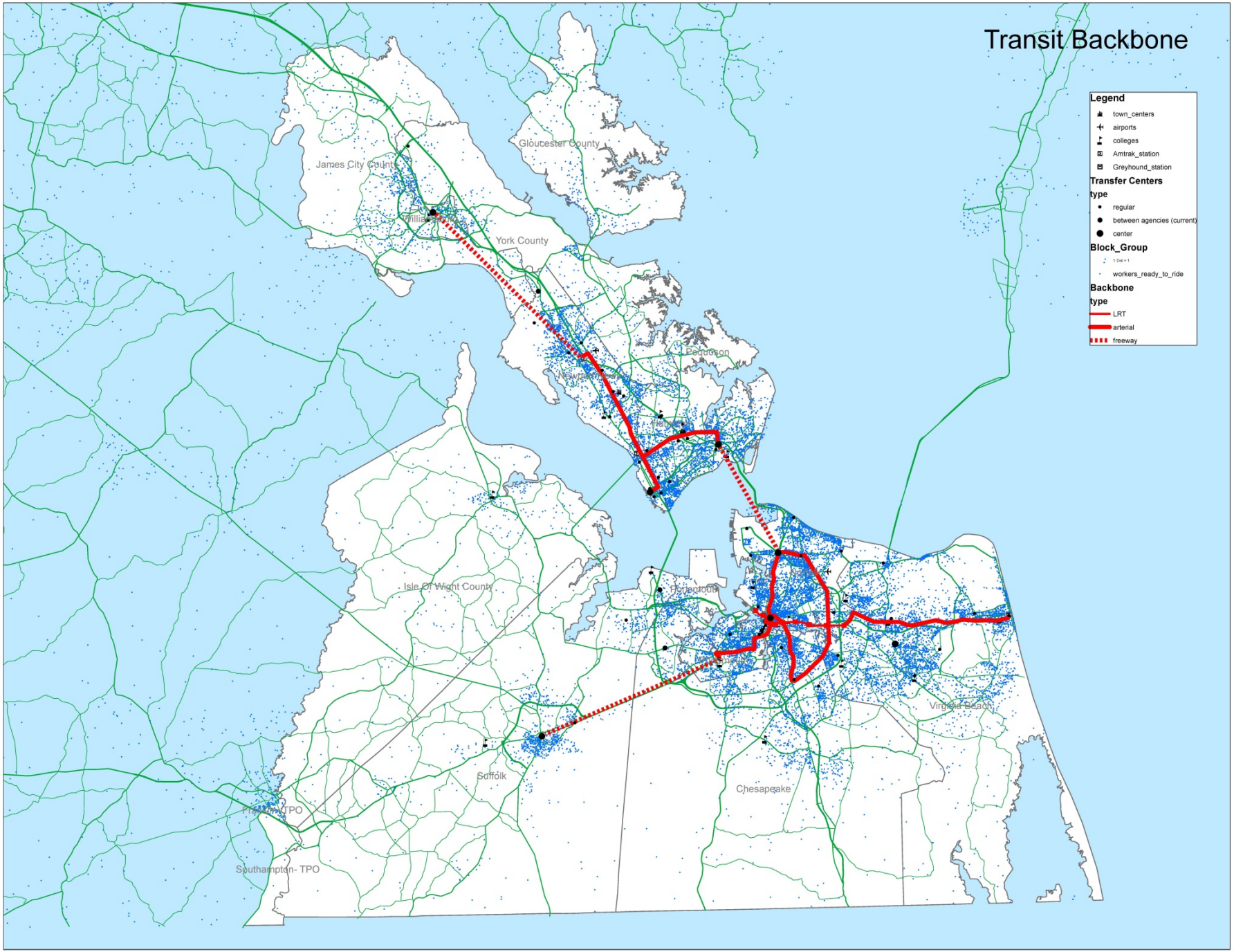


2040 Population & Employment



Multimodal Points




Transit Backbone
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colleges
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Greyhound_station
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freeway
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Gloucester County
York County
Isle Of Wight County
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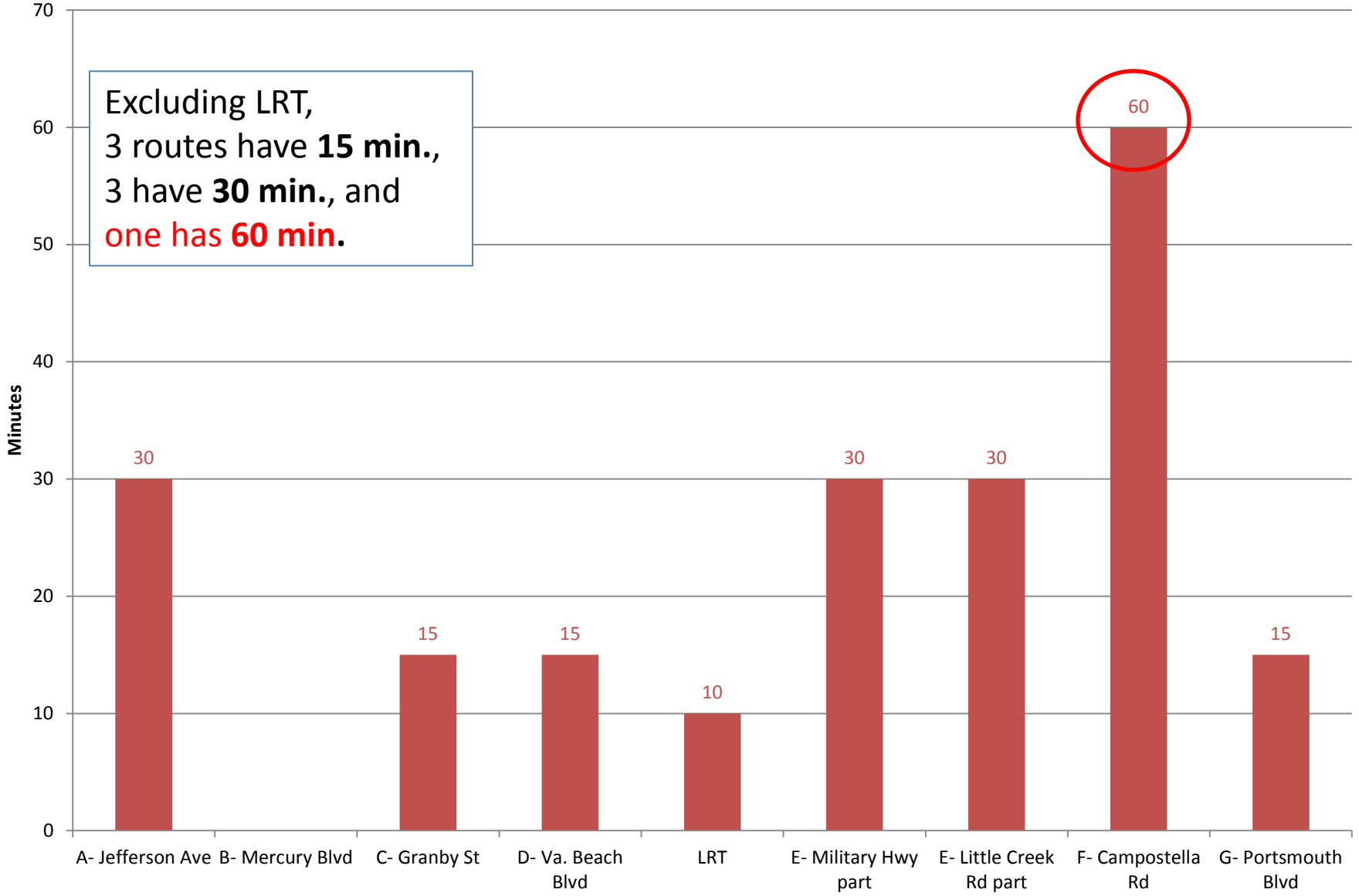
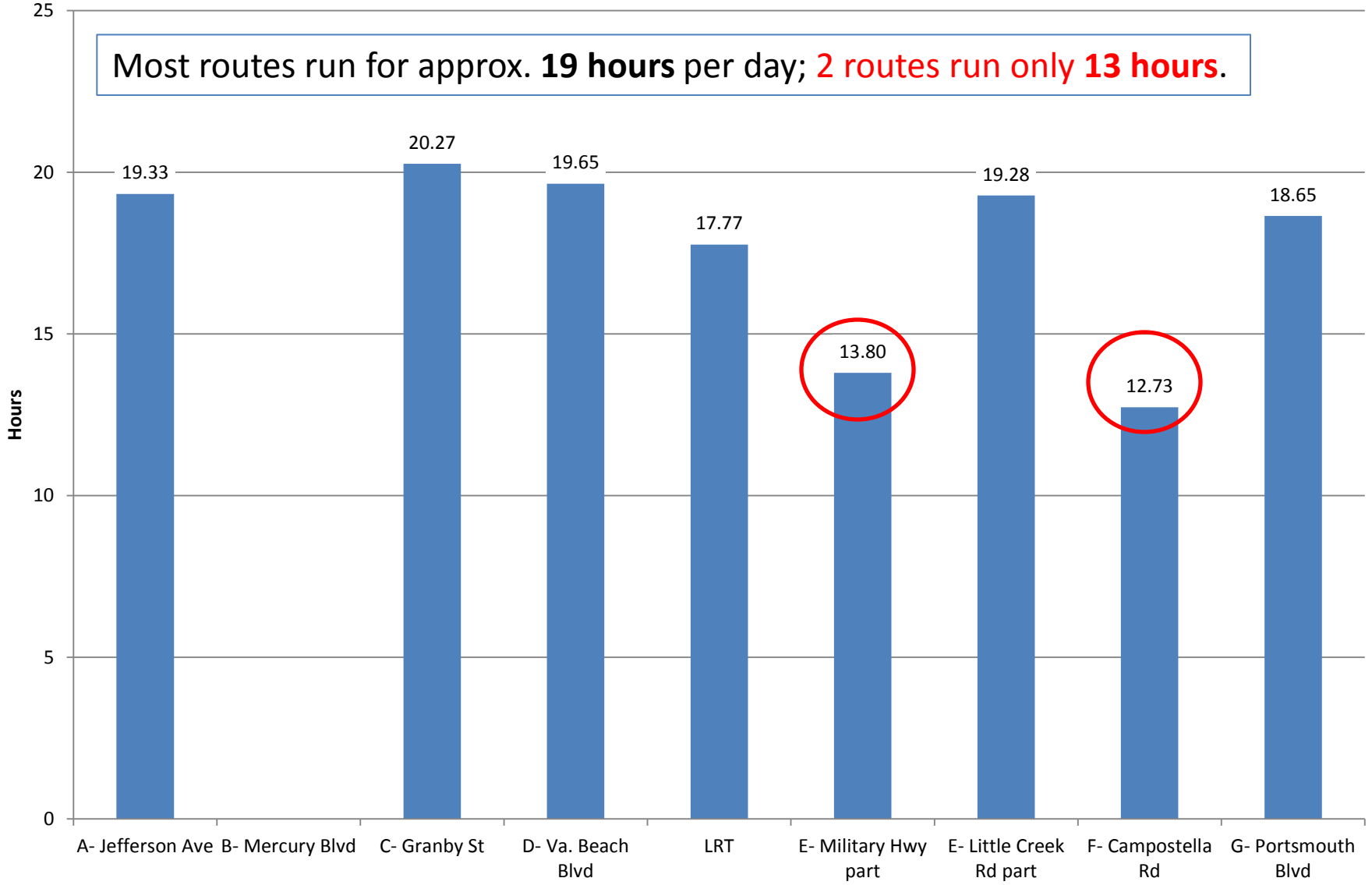
Current Status

Backbone Route	From	To	Existing Route
A- Jefferson Ave	Newport News Transit Ctr.	Bland Blvd Amtrak Station	112
B- Mercury Blvd	Newport News Transit Ctr.	Hampton Transit Center	[to be rei
C- Granby St	Dwntwn. Norfolk Transit Ctr.	Wards Corner Transfer Ctr.	1
D- Va. Beach Blvd	Newtown Road LRT Station	Artic Ave & 19th St	20
LRT	EVMC / Fort Norfolk	Newtown Rd	LRT
E- Military Hwy part	Robert Hall Transfer Center	Military & Little Creek	15
E- Little Creek Rd part	Military & Little Creek	Wards Corner Transfer Ctr.	21
F- Campostella Rd	Dwntwn. Norfolk Transit Ctr.	Robert Hall Transfer Center	13
G- Portsmouth Blvd	Dwntwn. Norfolk Transit Ctr.	Victory Crossing Transf. Ctr.	45

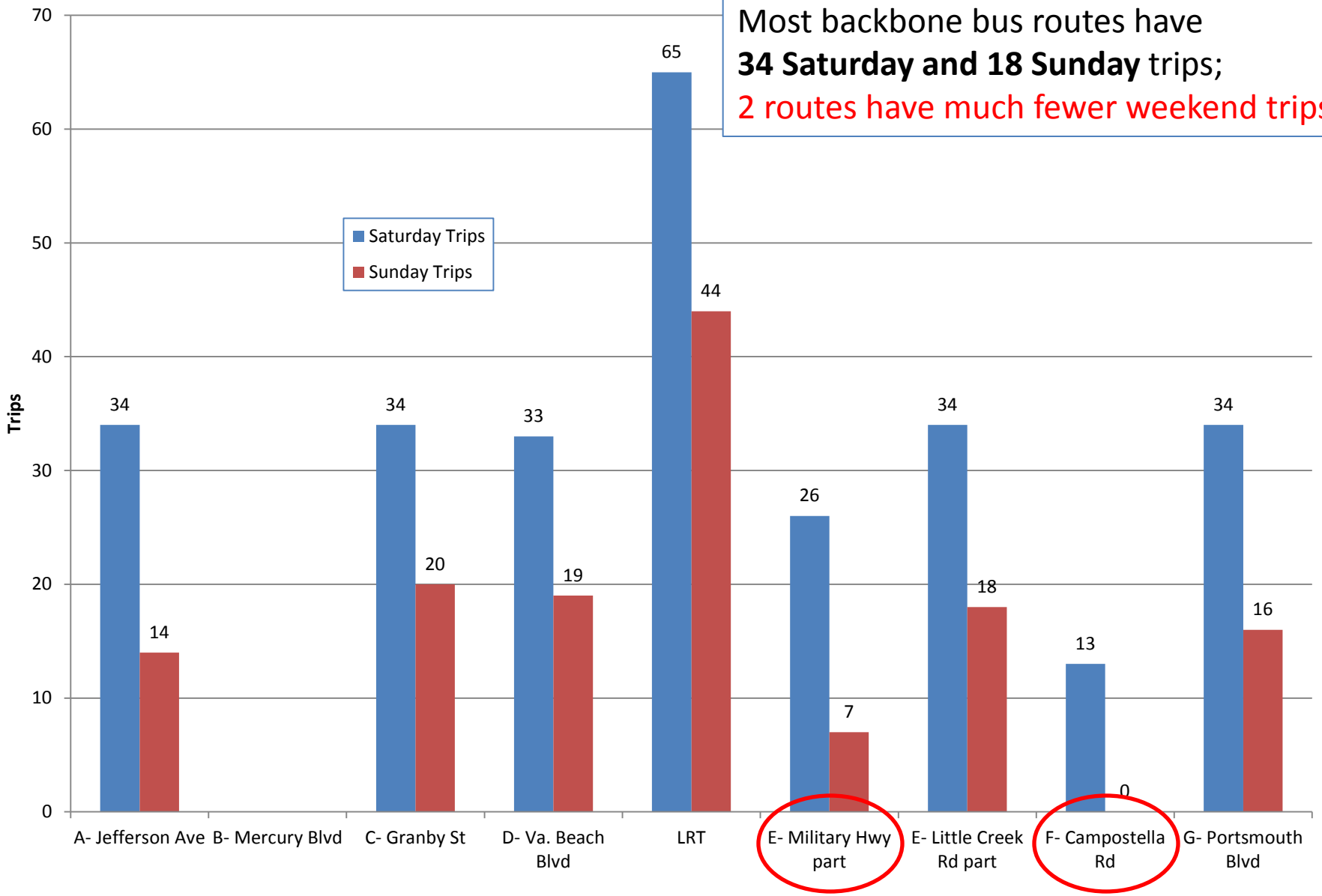
Peak-Period Frequency



Week-day Span of Service
(Pull-out to Pull-in)

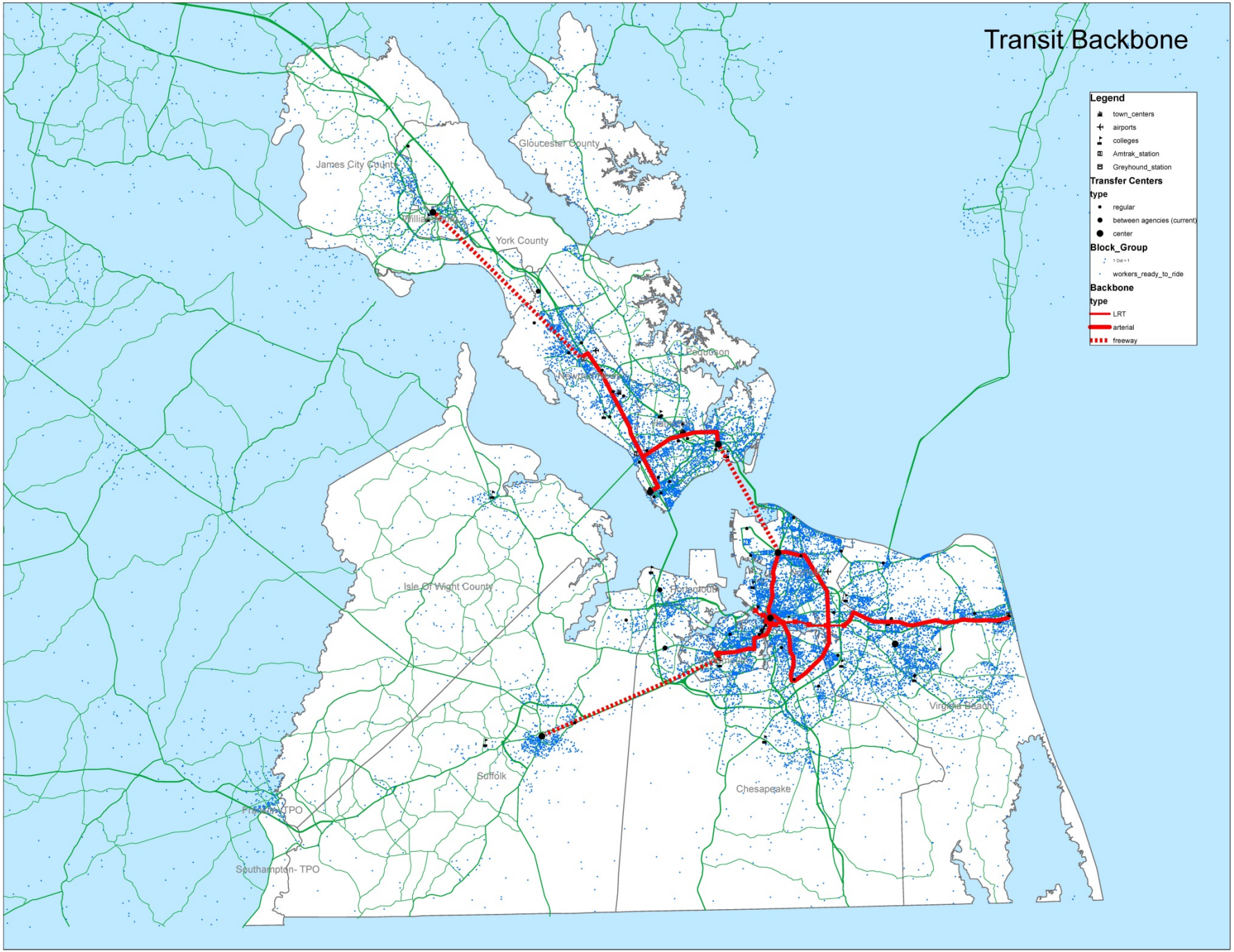


Weekend Trips



Possible Improvement Method

- As done with MAX routes, cities could **set-aside** a portion of their subsidy for Backbone routes.
  - If the backbone routes are to be improved while maintaining the same overall subsidy (i.e. **revenue neutral**), cities would **eliminate** some underutilized local routes, transferring those subsidies to the Backbone set-aside.
  - In order that the overall system be improved, improvement of the backbone routes must be **initially limited** so that the elimination of underutilized routes is limited.
- Post-implementation demonstration of the effectiveness of backbone routes could make agencies **more competitive** for state and federal dollars.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