RICHMOND CONNECTS

Needs Analysis Work Sessions

Thu Sep. 15
9:30 - 11:00

- EF 9: Communities of Concern
- INC 1a: Bicycle
- INC 1b: Pedestrian
- EF 6: Cyclists & Peds
- INC 5: Safety/Security
- INC 7: Maintenance

Fri Sep. 23
2:00 - 4:00

- **INC 2: Transit**
- **EF 7: Transit**
- **EF 1: Redlining**
- **EF 2: Dissection of Neighborhoods**
- **EF 3: Urban Renewal**
- **EF 4: Inner Ring Suburbs**

Tue Sep. 27
3:00 - 4:15

- INC 4: Land Use
- INC 6: Connectivity
- INC 8: Economic Development
- EF 5: Car-centric Planning

Thu Oct. 6
2:00 - 3:00

- INC 3: Freight
- INC 9: Technology
- INC 10: Sustainability
- EF 8: Climate Equity
- EF 10: Climate Resiliency

Today's Agenda

Revisions to Items Covered During the Last Work Session

- Equity Factor 9: Communities of Concern

Needs Analysis Initial Results

- Investment Need Category 2: Transit
- Equity Factor 7: Transit
- Equity Factor 1: Redlining
- Equity Factor 2: Dissection of Neighborhoods
- Equity Factor 3: Urban Renewal
- Equity Factor 4: Inner Ring Suburbs

Revisions to Items Covered During the Last Work Session

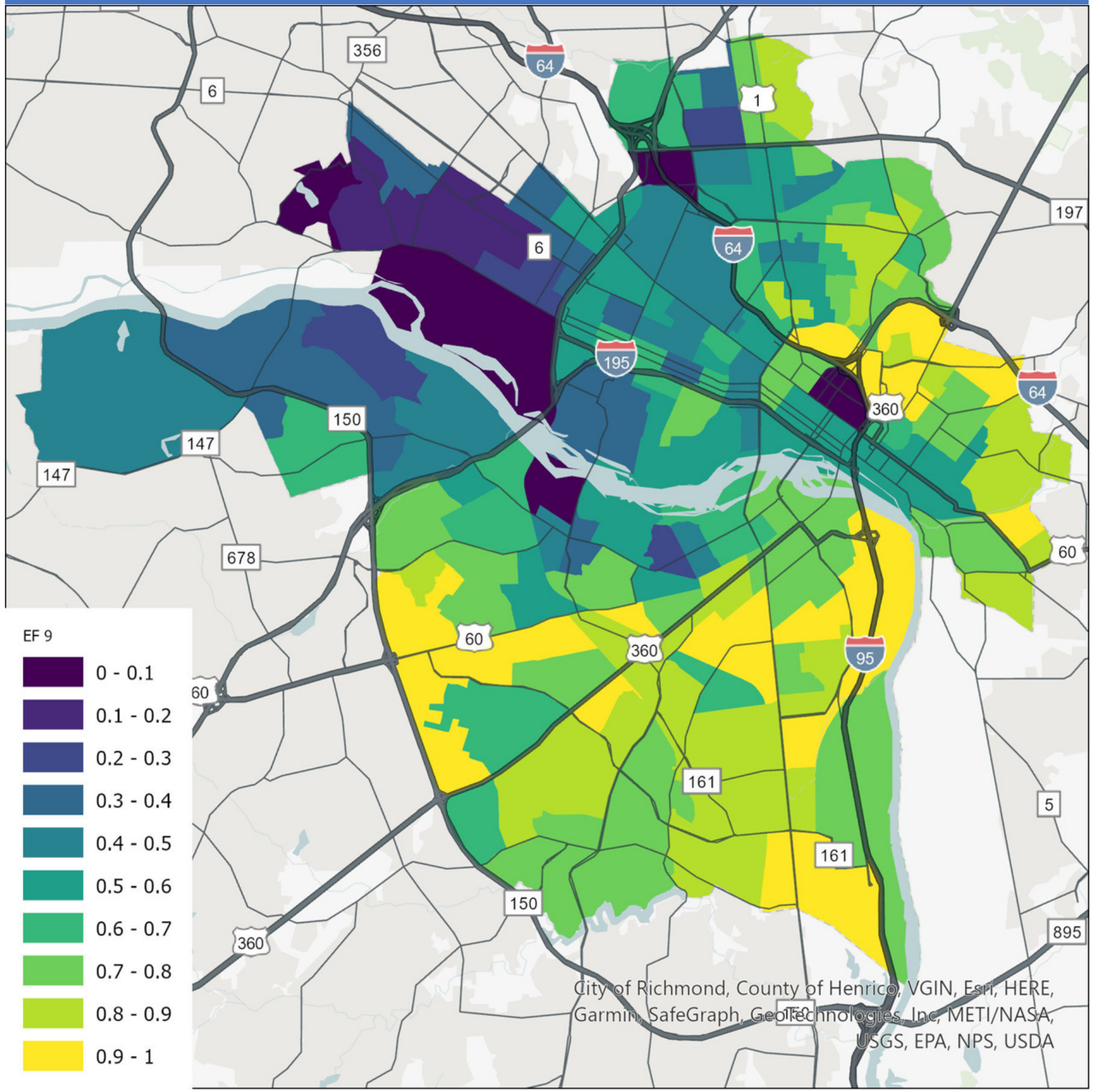
Equity Factor 9: Communities of Concern

Prioritize densely populated areas of communities of concern including communities of color, low-income communities, senior and limited mobility populations, families traveling with children, and at-risk youth.

Eight Components:

1. BIPOC
2. Low-income
3. Old age
4. Renters
5. Non-English primary language
6. At-risk youth
7. BIPOC renter
8. Limited mobility

Original Analysis



Equity Factor 9: Communities of Concern

Eight Components:

- BIPOC
- Low-income
- Old age
- Renters
- Non-English primary language
- At-risk youth
- BIPOC renter
- Limited mobility

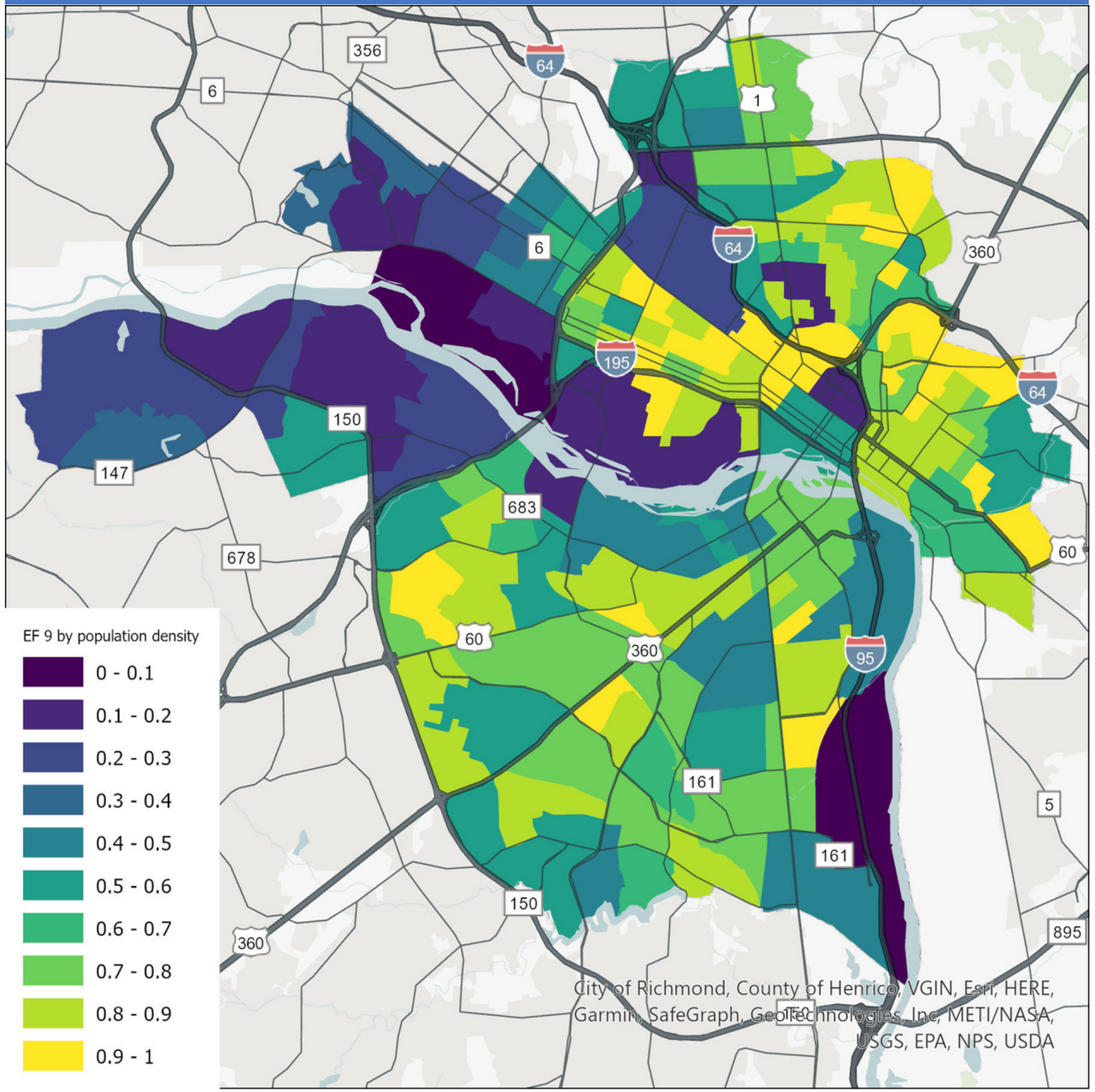
Original Analysis

- Based on the percentage of residents in each Census block that met the criteria.

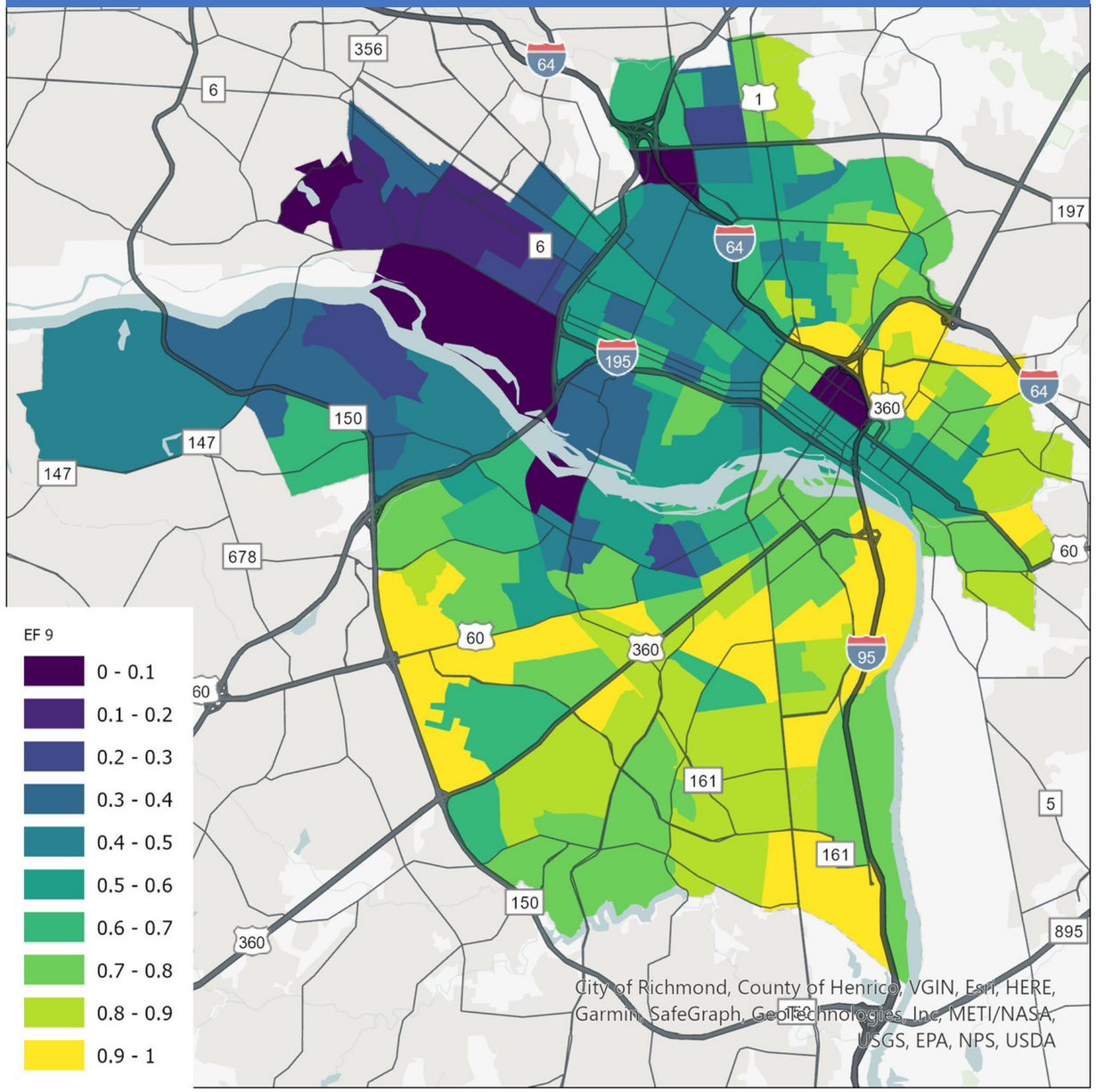
Alternate Analysis

- Based on population density to better reflect where there are more people who meet the criteria

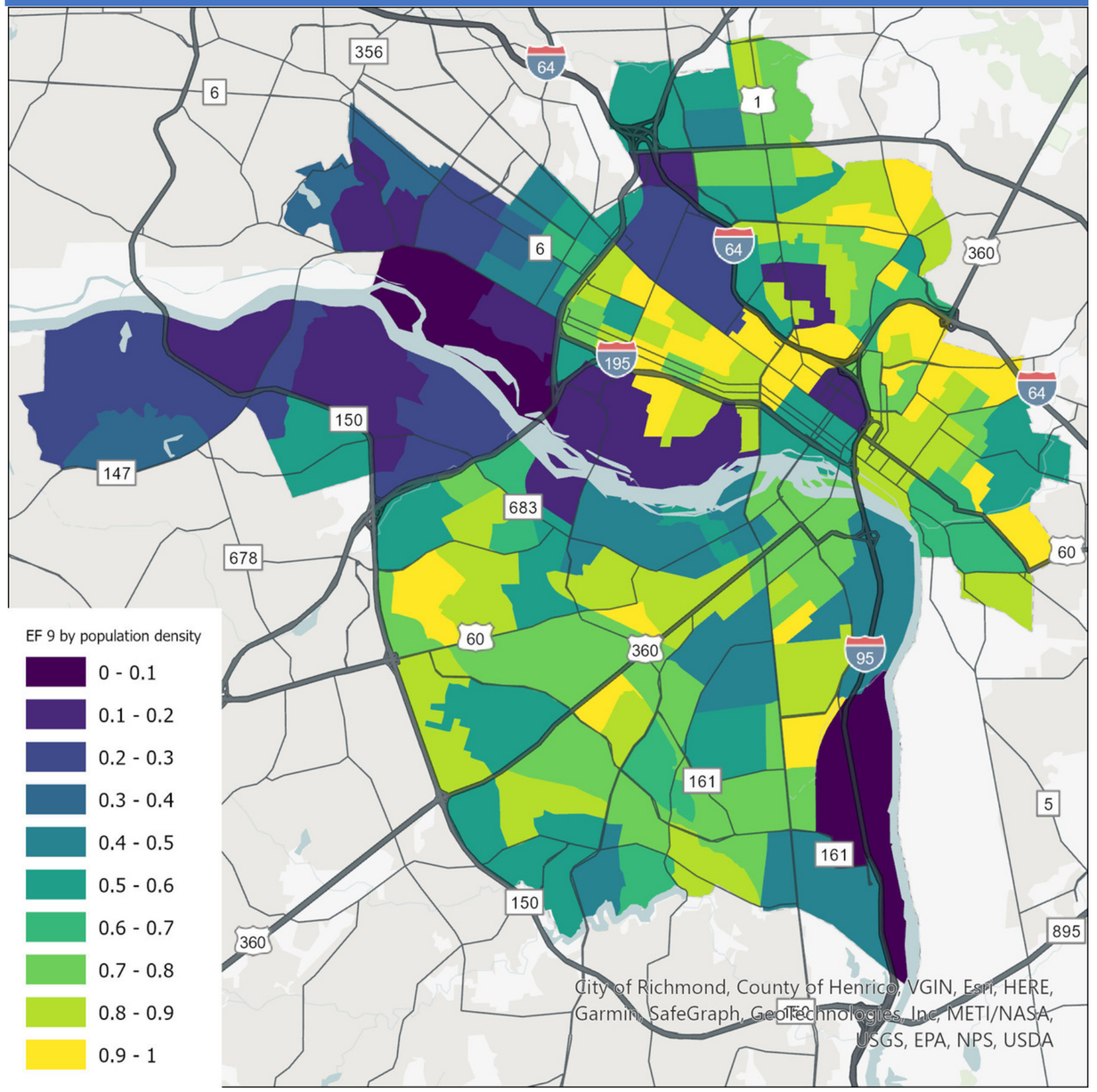
Alternate Analysis



Original Analysis - percentage



Alternate Analysis - population density



Needs Analysis Initial Results

Today we will cover:

Investment need categories
Pedestrian
Bike
Transit
Freight
Land Use
Safety
Connectivity
Maintenance
Economic Development
Technology
Sustainability

Equity Factors

1. Improve access to housing, jobs, services, recreation, and education, addressing remaining inequities created by **redlining**.
2. Reconnect and revitalize communities to address inequities created by the **highway system's dissection of neighborhoods**.
3. Improve neighborhood connnectivity and revitalize the fabric of the communities negatively impacted by **urban renewal**.
4. Improve access to housing, jobs, services, and education to address the **isolation of low-income inner ring suburbs** where families are pushed.
5. Address gaps in the multimodal network and utilize new planning tools to improve safety and accessibility deficiencies stemming from **traditional car-centric planning**.
6. Equitably increase the safety and comfort of **cyclists and pedestrians**, connecting communities of concern to opportunities.
7. Improve reliability of **transit** and other non-car services to increase access and remove barriers to opportunities for communities of concern.
8. Prioritize the needs of socially vulnerable users and address **climate and environmental equity** as identified in RVAGreen 2050.
9. Prioritize densely populated areas of **communities of concern** including communities of color, low-income communities, senior and limited mobility populations, families traveling with children, and at-risk youth.
10. Focus on improving **climate resiliency** for the most impacted communities.

Investment Need Category 2: **TRANSIT**

A transit need is revealed:

where access is significantly degraded by:

- the absence of transit,
- inadequate span of frequent service (off-peak service hours)
- unreliable service
- inaccessible/uncomfortable stops

with less tolerance for poor/underperforming accessibility:

- in Richmond 300 Nodes
- along Great Streets
- along streets with existing transit routes
- along the high injury street network

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Investment Need Category 2: **TRANSIT**

Component	Data Source and Description
Transit accessibility degraded by the absence of transit	Accessibility analysis (GRTC GTFS service routes)
Transit accessibility degraded by inadequate span of frequent service	Accessibility analysis (GRTC GTFS headways)
Transit accessibility degraded by unreliable service	Accessibility analysis (GRTC-provided on-time performance data)
Transit accessibility degraded by inaccessible/uncomfortable stops	Accessibility analysis (GRTC-provided stop amenity data)
Richmond 300 Nodes and Great Streets	Designated Great Streets and Nodes from Richmond 300
Streets with transit routes	GRTC Transit routes from September 2021
High injury street network	Richmond's High Injury Street Network is 7 percent of all road mileage in the City and accounts for 62 percent of all fatal and serious injury crashes.

Investment Need Category 2: **TRANSIT**

- Identify areas of transit need by comparing existing transit accessibility (which may be degraded by absence, infrequency, unreliability, discomfort, and/or inaccessibility problems) to an accessibility under "idealized" service conditions where all of these issues are solved.
  - Places where any of the above problems manifest imply more arduous travel by transit (as expressed in the metric)
  - A simple quantile is used to relativize transit need across the city

- Transit scores are multiplied by 0.5 outside the low transit access intolerance areas

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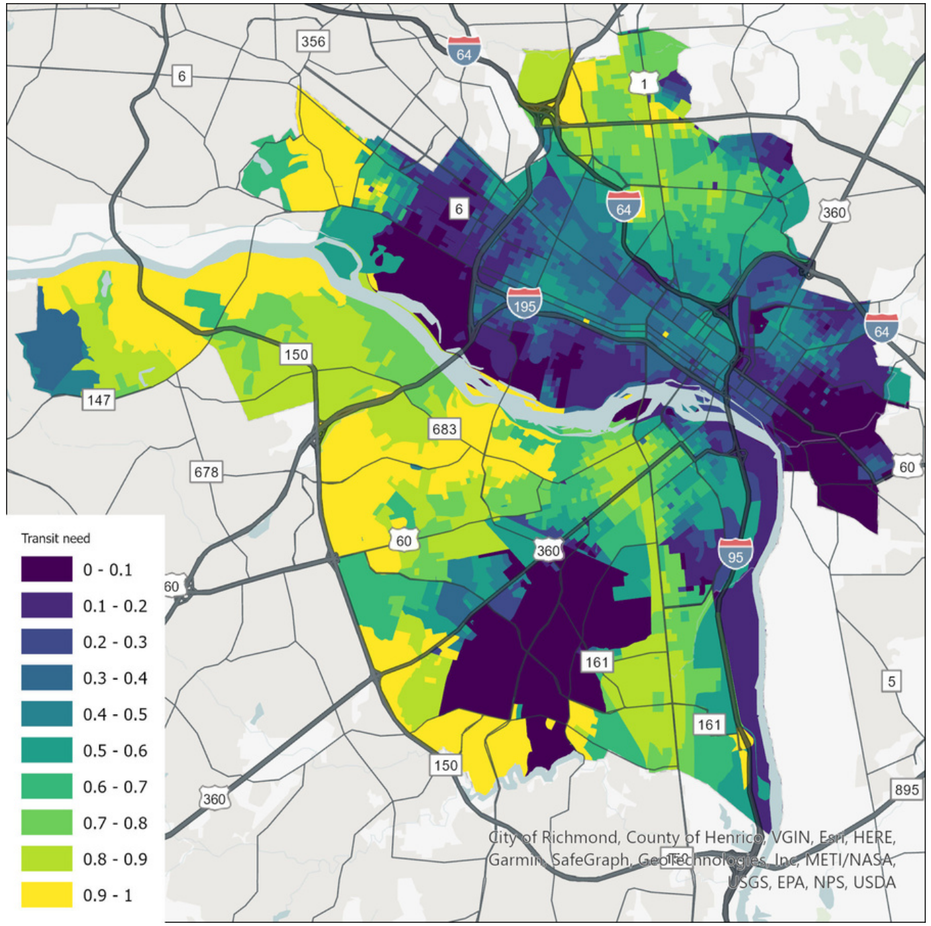
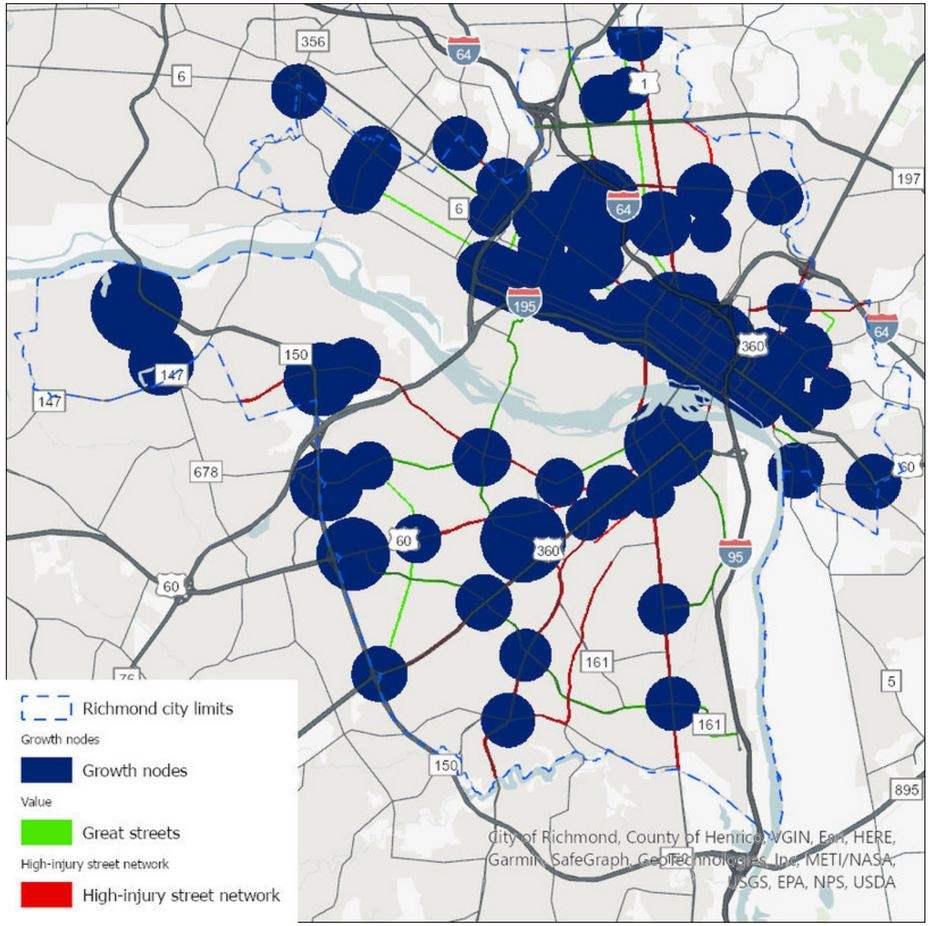
Investment Need Category 2: **TRANSIT**

Transit need



Low-tolerance areas



Investment Need Category 2:

TRANSIT

Combined Transit Need Map

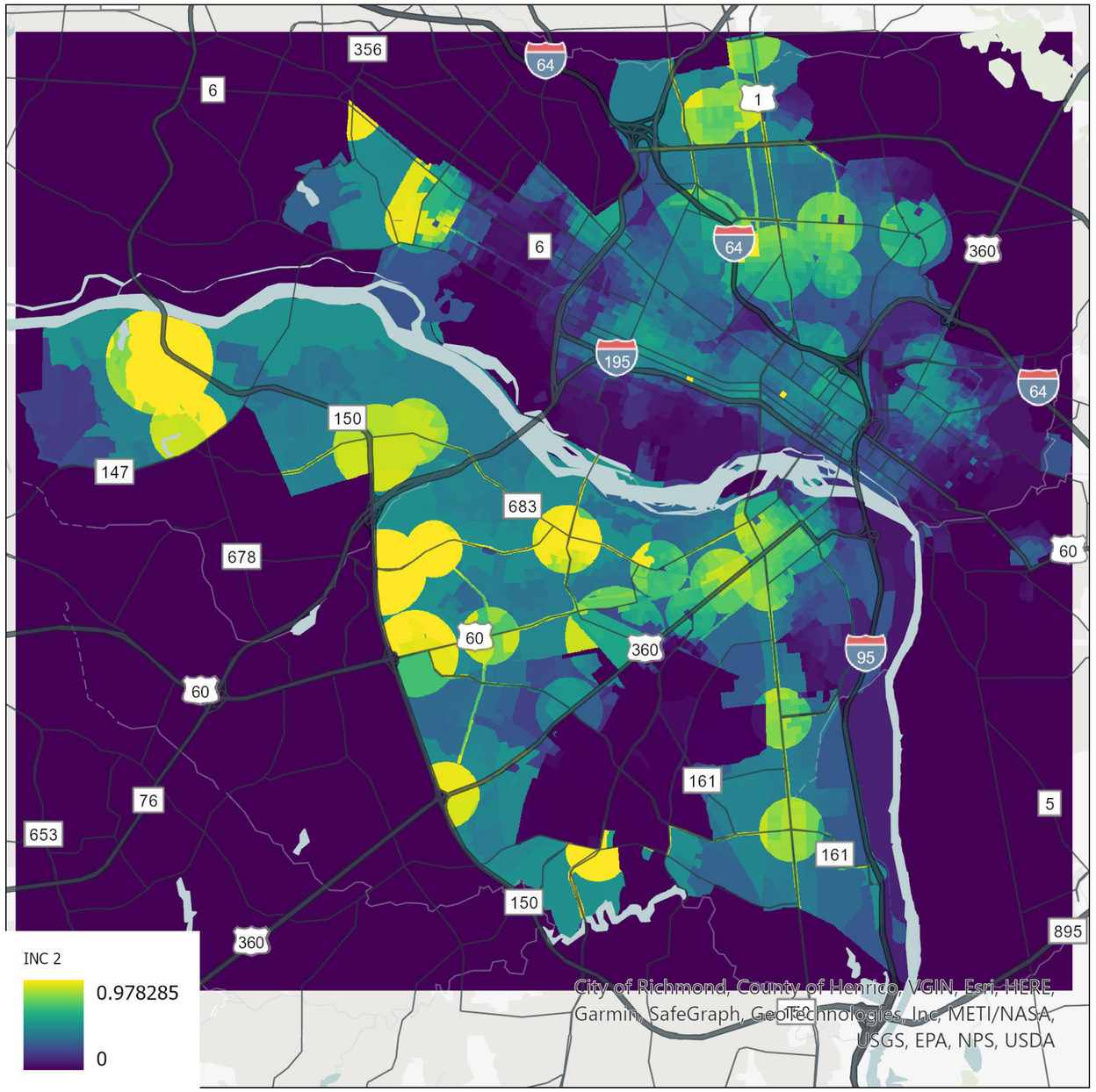
A transit need is revealed:

where access is significantly degraded by:

- the absence of transit,
- inadequate span of frequent service (off-peak service hours)
- unreliable service
- inaccessible/uncomfortable stops

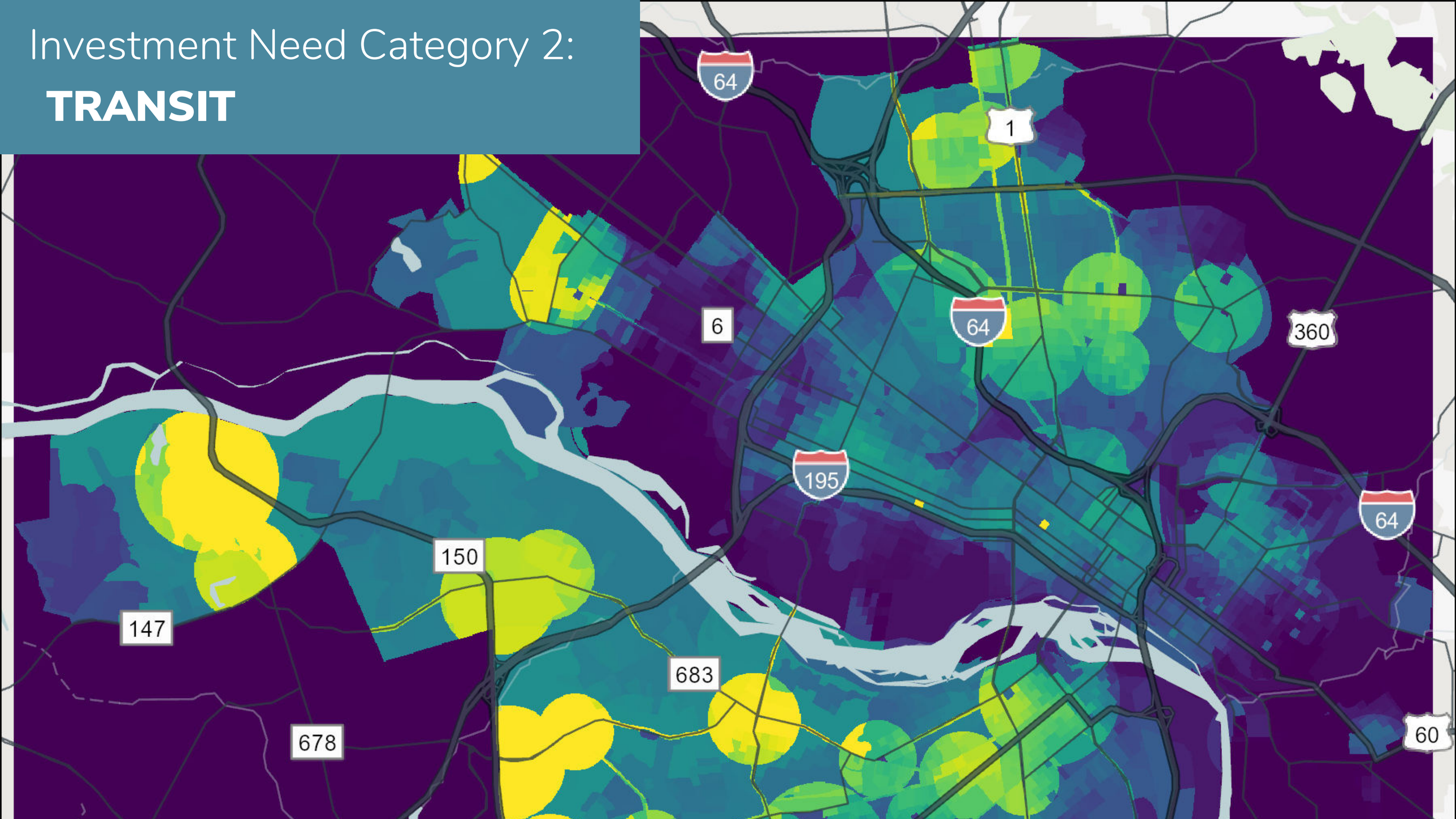
with less tolerance for poor/underperforming accessibility:

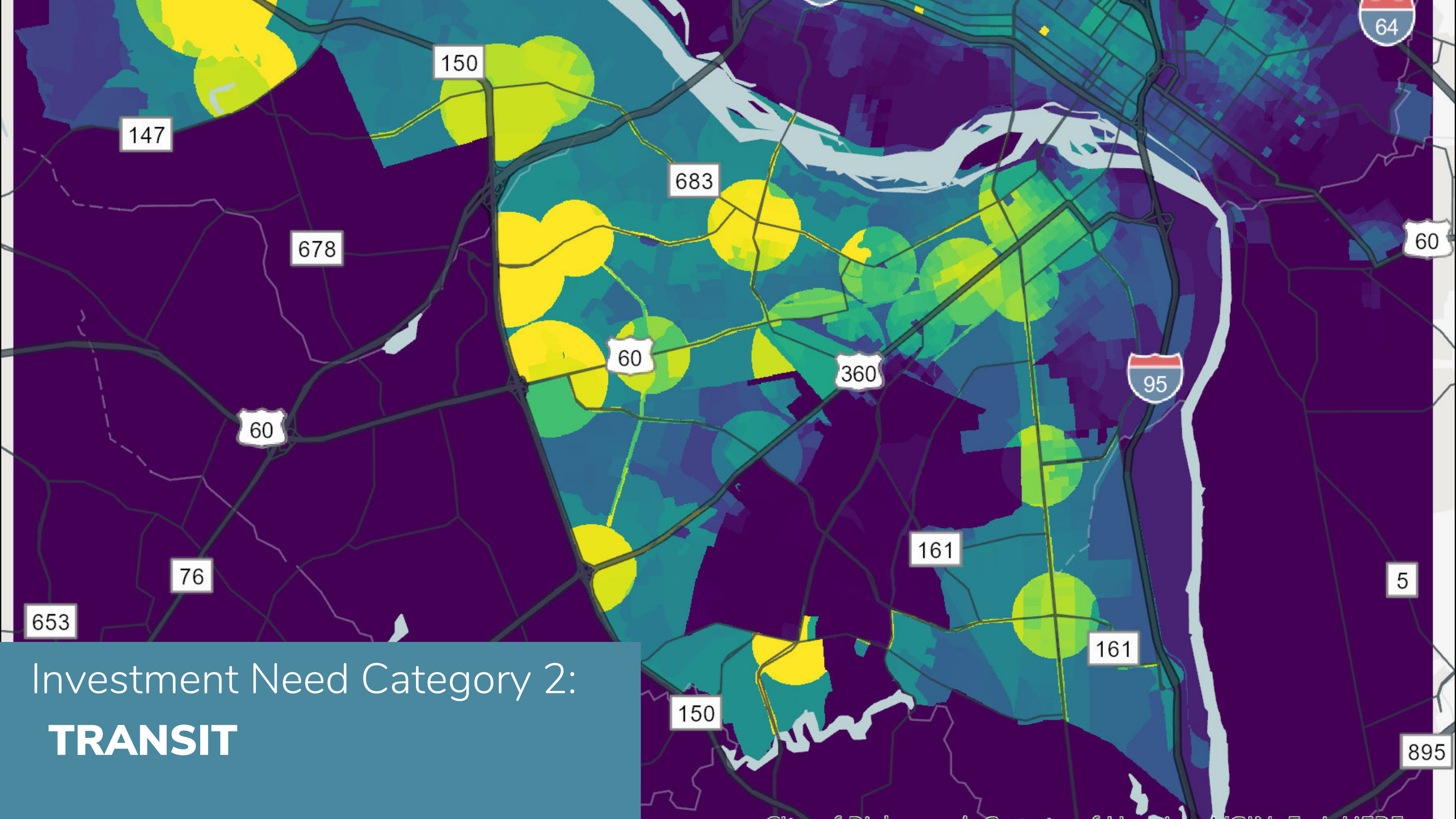
- in Richmond 300 Nodes
- along Great Streets
- along streets with existing transit routes
- along the high injury street network



Investment Need Category 2:

TRANSIT





Investment Need Category 2:

TRANSIT

Equity Factor 7

Improve reliability of transit and other non-car services to increase access and remove barriers to opportunities for communities of concern.

Areas highlighted for EF7 are those where:

- transit service frequency or reliability issues degrade access for destinations relevant to communities of concern, or
- walk access to transit stops degrades access where there is a high density of residents in communities of concern

Still investigating reliabillity of non-car services

RICHMOND CONNECTS

Equity Factor 7: Transit

Improve reliability of transit and other non-car services to increase access and remove barriers to opportunities for communities of concern.

Component	Data Source and Description
Transit service frequency	Accessibility analysis (GRTC GTFS headways)
Transit service reliability	Accessibility analysis (GRTC-provided on-time performance data)
Destinations relevant to communities of concern	Accessibility analysis (NHTS-informed destination choice models)
High density of residents in communities of concern	Replica population synthesis*
Areas where walk access to transit degrades access	Accessibility analysis (modifications to walk network, e.g. sidewalks)
Reliability of non-car services	N/A (currently)

*Replica's population synthesis model incorporates data from US Census ACS, LODES, TIGER, and PUMS; the Census Transportation Planning Products Program (CTPP); the US Department of Education and National Center for Education Statistics; and propietary building, parcel, and point of interest data

Equity Factor 7: Transit

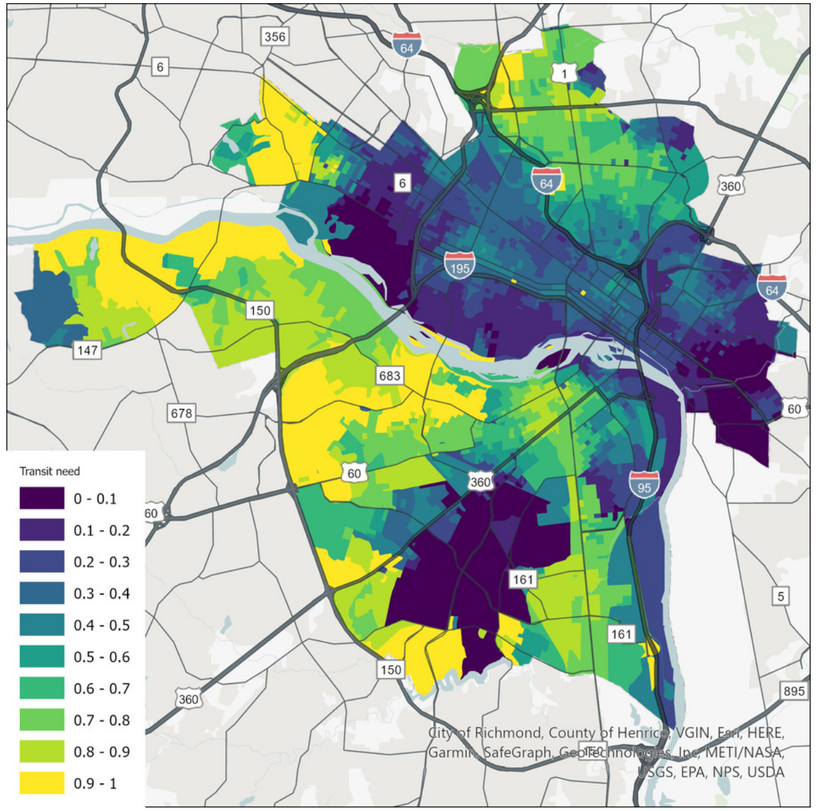
Improve reliability of transit and other non-car services to increase access and remove barriers to opportunities for communities of concern.

- Identify areas of transit need by comparing existing transit accessibility (which may be degraded by infrequency, unreliability, and/or inaccessibility problems) to an accessibility under "idealized" service conditions where all of these issues are solved.
  - Places where any of the above problems manifest imply more arduous travel by transit (as expressed in the metric)
  - A simple quantile is used to relativize transit need across the city
- Identify areas with high proportions of residents in communities of concern using the previous calculated Equity Factor 9 score
- Combine the above scores using a multivariate quantile (MVQ)

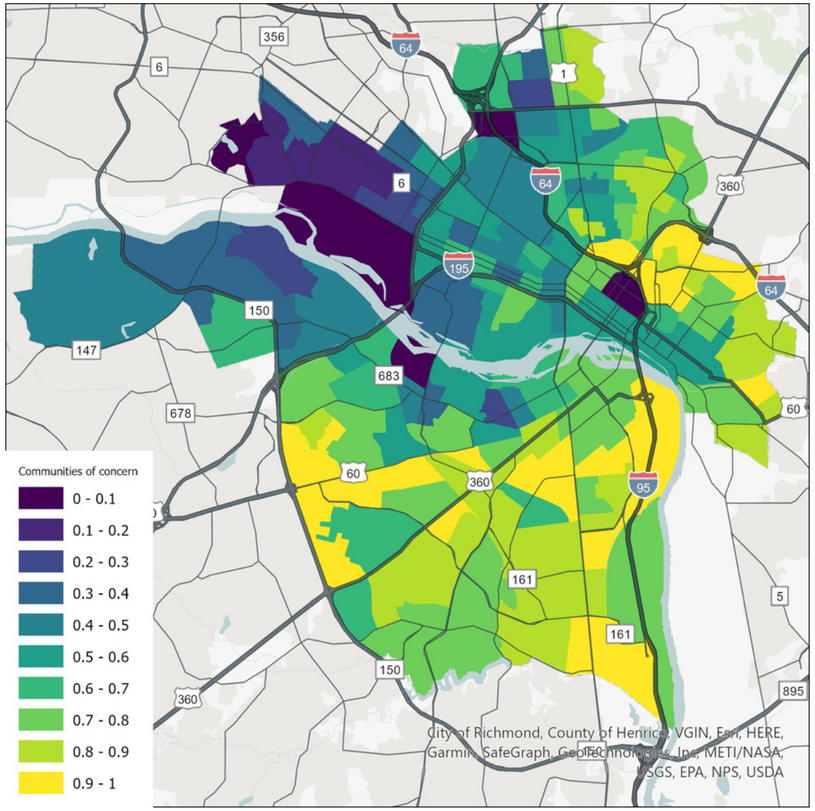
Equity Factor 7: Transit

Improve reliability of transit and other non-car services to increase access and remove barriers to opportunities for communities of concern.

Transit need



Communities of concern



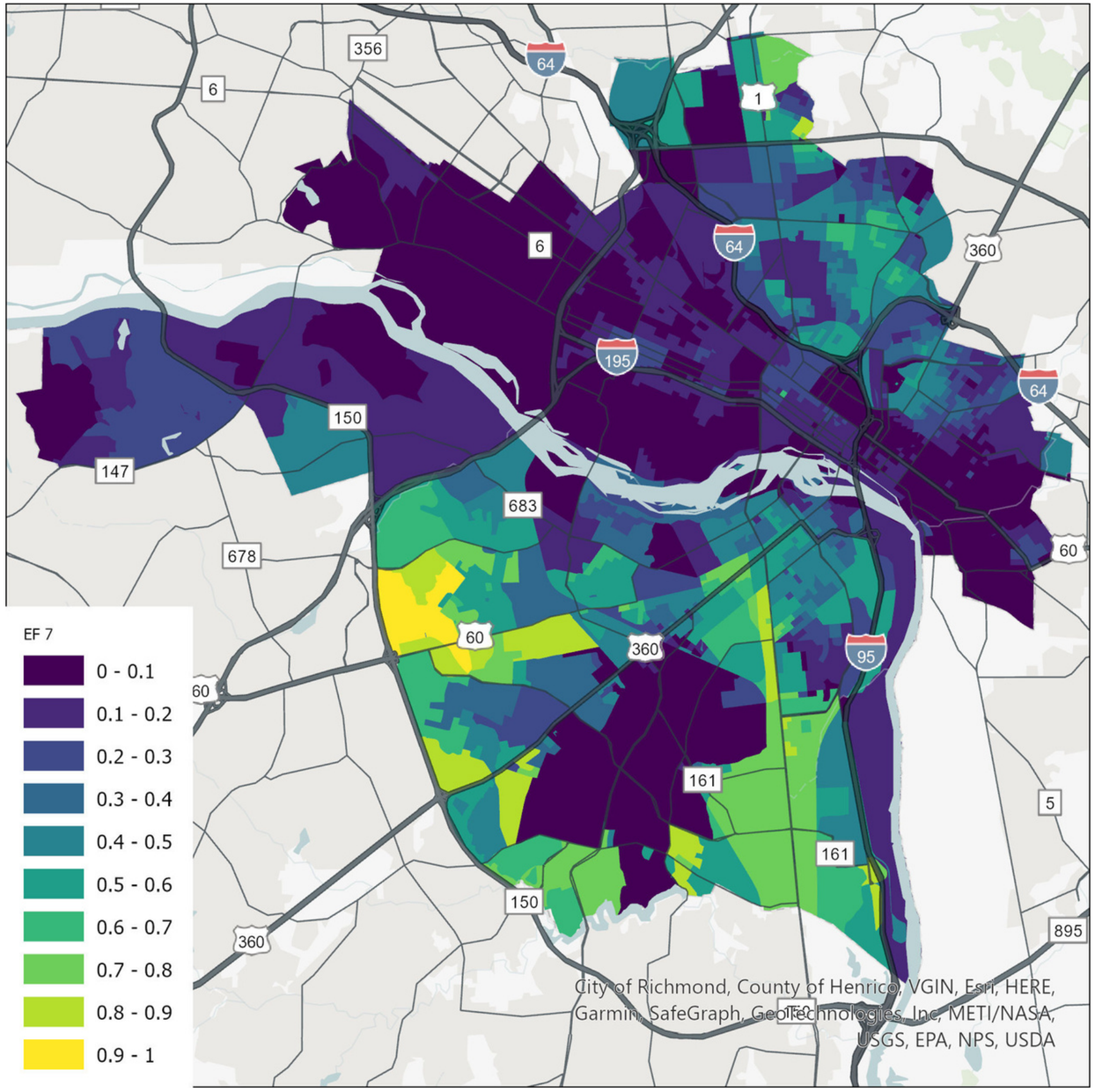
Equity Factor 7: Transit

Combined Map

Areas highlighted for EF7 are those where:

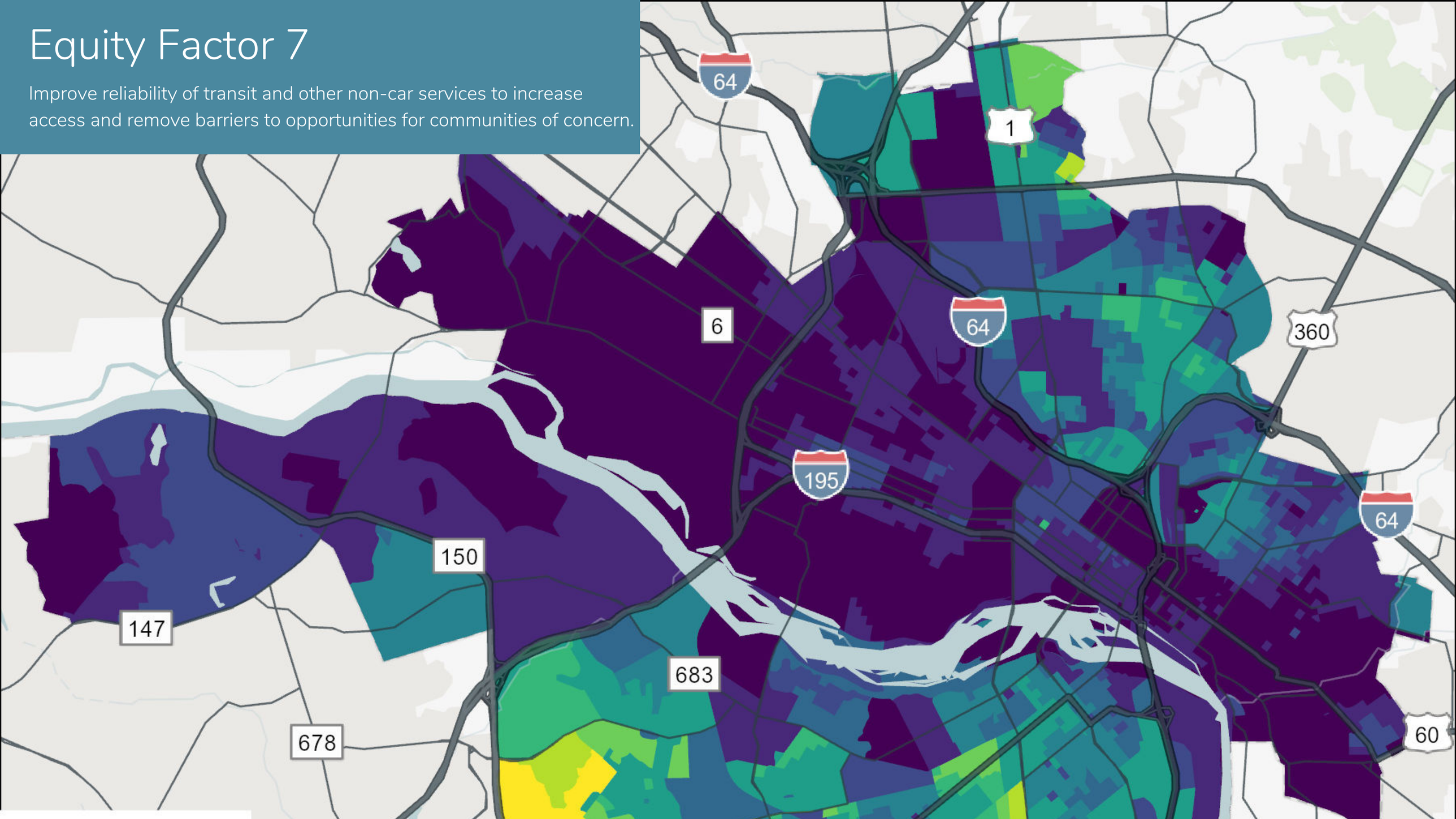
- transit service frequency or reliability issues degrade access for destinations relevant to communities of concern, or
- walk access to transit stops degrades access where there is a high density of residents in communities of concern

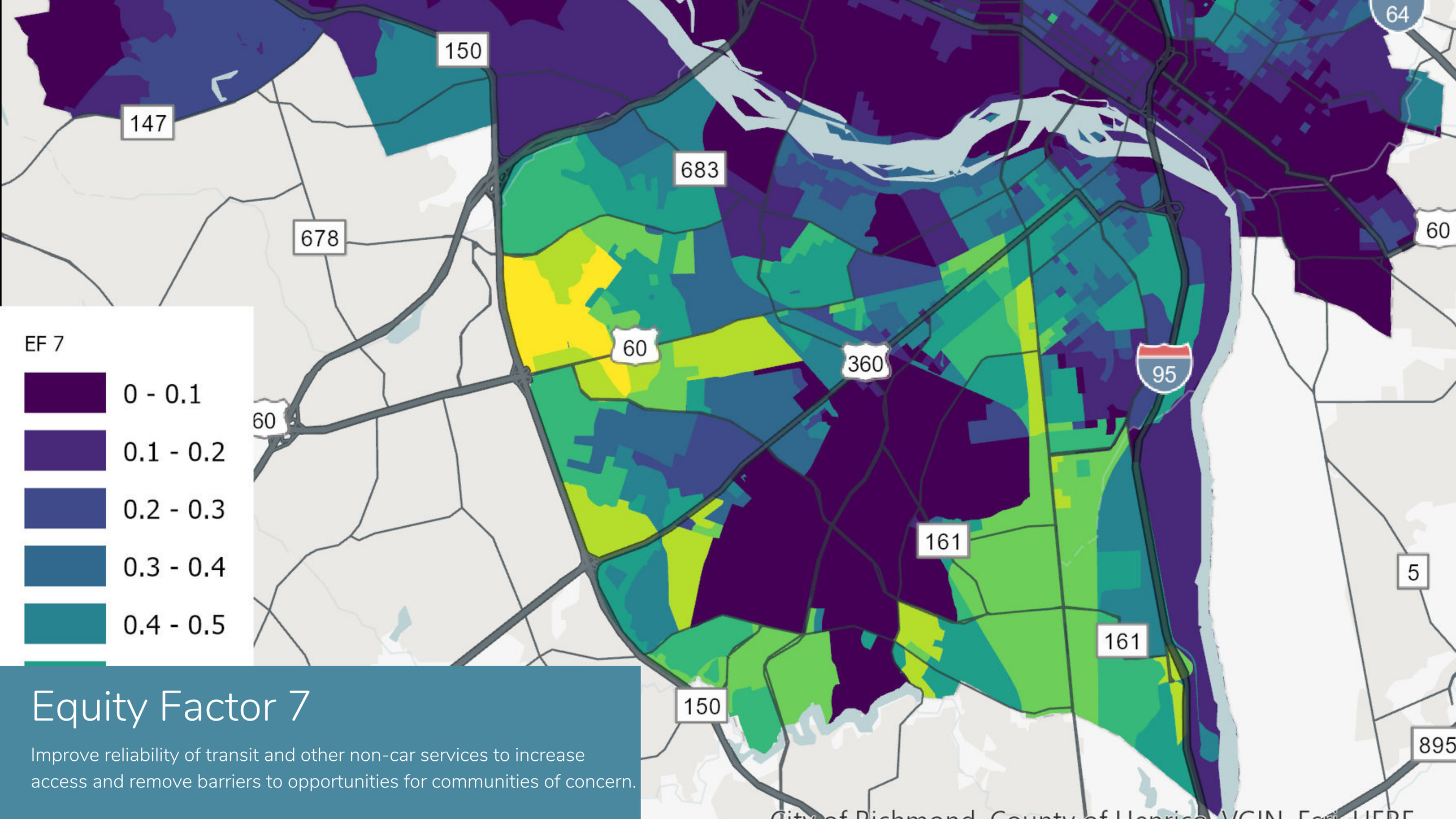
High EF 7 scores indicate areas where transit service for communities of concern is unreliable, infrequent, or hard to get to.



Equity Factor 7

Improve reliability of transit and other non-car services to increase access and remove barriers to opportunities for communities of concern.





Equity Factor 7

Improve reliability of transit and other non-car services to increase access and remove barriers to opportunities for communities of concern.

Equity Factor 1

Improve access to housing, jobs, services, recreation, and education, addressing remaining inequities created by redlining.

Areas highlighted for EF1 are those:

- that were redlined,
- that still have
  - high concentrations of low income and BIPOC populations, and
  - low rates of BIPOC home ownership, and
- where accessibility to jobs, services, recreation, and education by walk, bike, or transit modes is underperforming*

*Accessibility may underperform due to quality of service, connectivity, destination relevance, and land use factors.

RICHMOND CONNECTS

Equity Factor 1: Redlined Areas

Improve access to housing, jobs, services, recreation, and education, addressing remaining inequities created by redlining.

Component	Data Source and Description
Areas that were redlined	Home Owners' Loan Corporation (HOLC) 1937 Racist Redlining of Richmond, VA
High concentrations of low-income and BIPOC populations	Replica population synthesis*
Low rates of BIPOC home ownership	Replica population synthesis*
Accessibility to jobs, services, recreation, and education by walk, bike, or transit modes	Accessibility analysis (modifiers to walk [e.g. sidewalks], bike [e.g. bike lanes], and transit [e.g. frequency] networks)

*Replica's population synthesis model incorporates data from US Census ACS, LODES, TIGER, and PUMS; the Census Transportation Planning Products Program (CTPP); the US Department of Education and National Center for Education Statistics; and propietary building, parcel, and point of interest data

Equity Factor 1: Redlined Areas

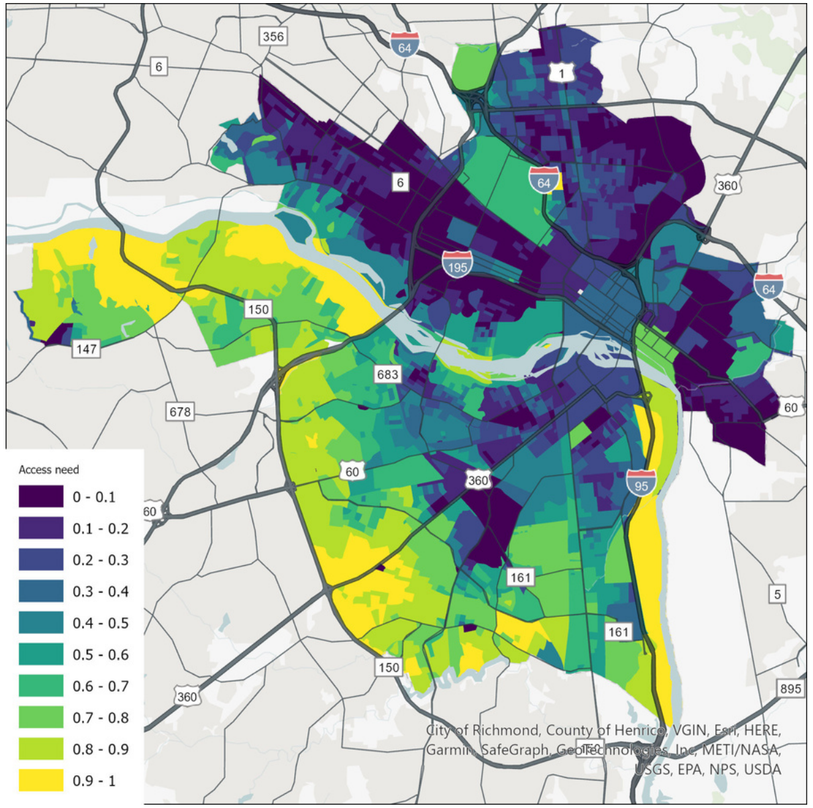
Improve access to housing, jobs, services, recreation, and education, addressing remaining inequities created by redlining.

- For each of the walk, bike, and transit modes, identify underperformance by either quality of service, connectivity, or lack of relevant destinations for accessibility to at least 3 destination types
- Combine the scores for each mode using MVQ to produce a composite accessibility score
- Combine percents BIPOC, low-income, and BIPOC-renter using MVQ to produce a communities of concern score
- Combine the scores produced in steps (2) and (3) using MVQ to produce the final EF1 score
- Report only blocks that fall within a redlined area

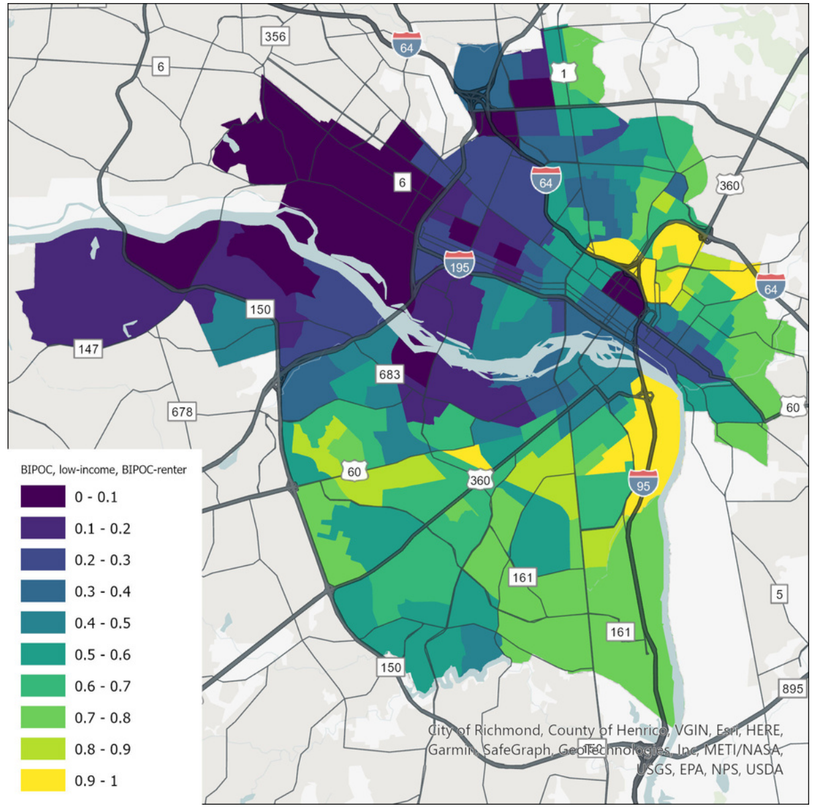
Equity Factor 1: Redlined Areas

Improve access to housing, jobs, services, recreation, and education, addressing remaining inequities created by redlining.

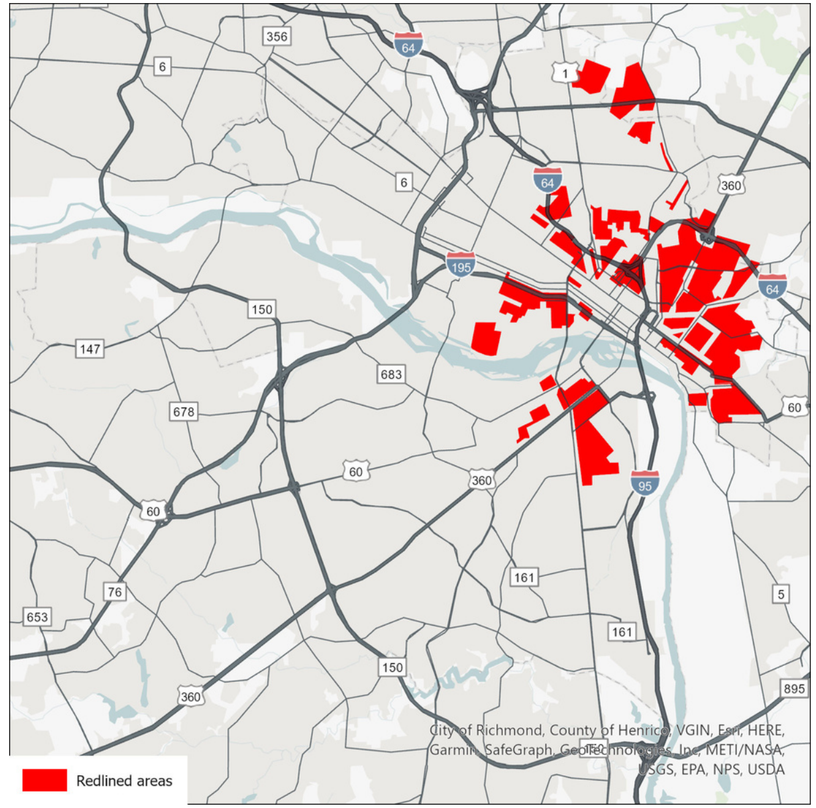
Access need



BIPOC, low-income, BIPOC renter



Redlined areas

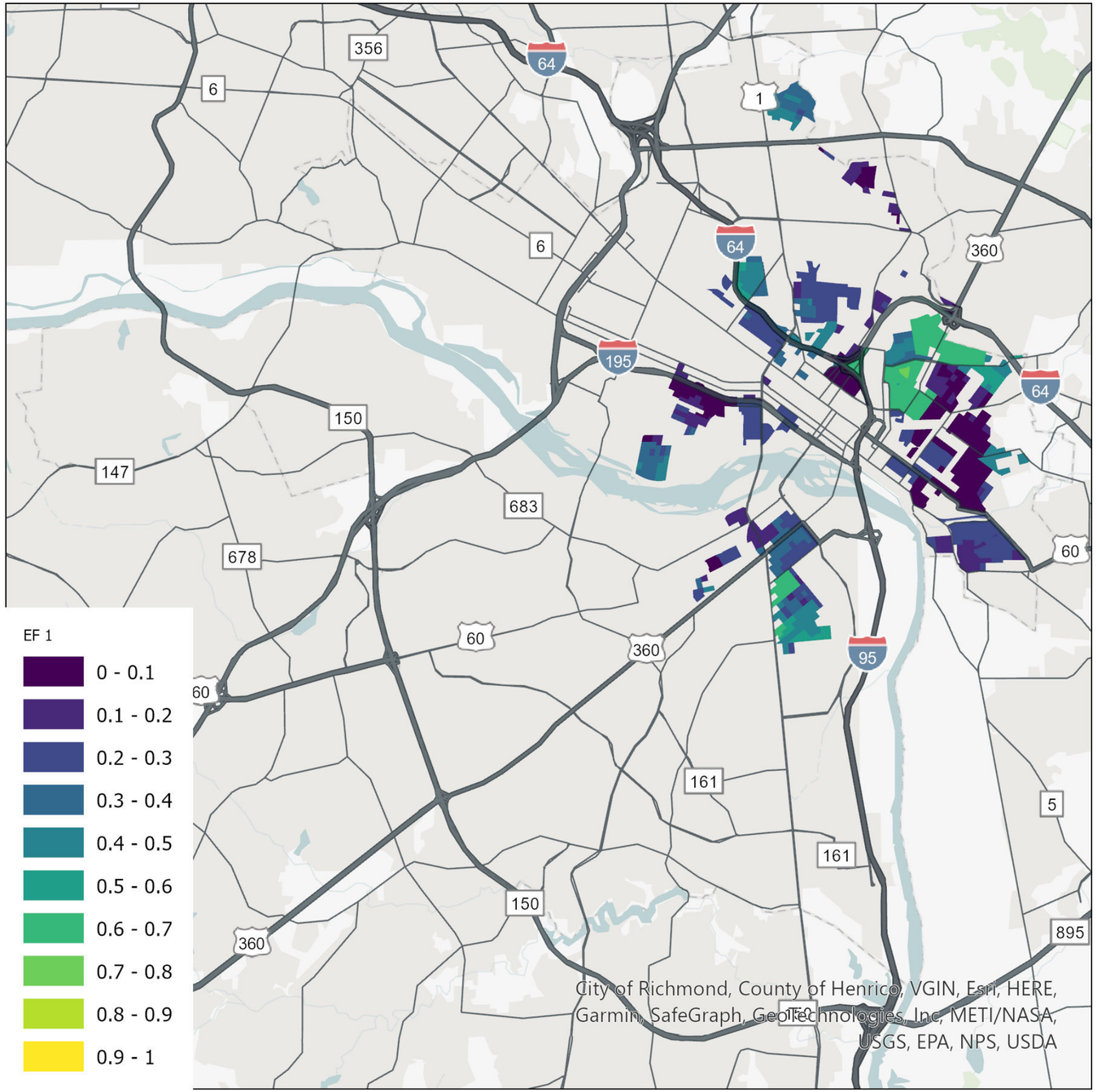


Equity Factor 1: Redlined Areas

Combined Map

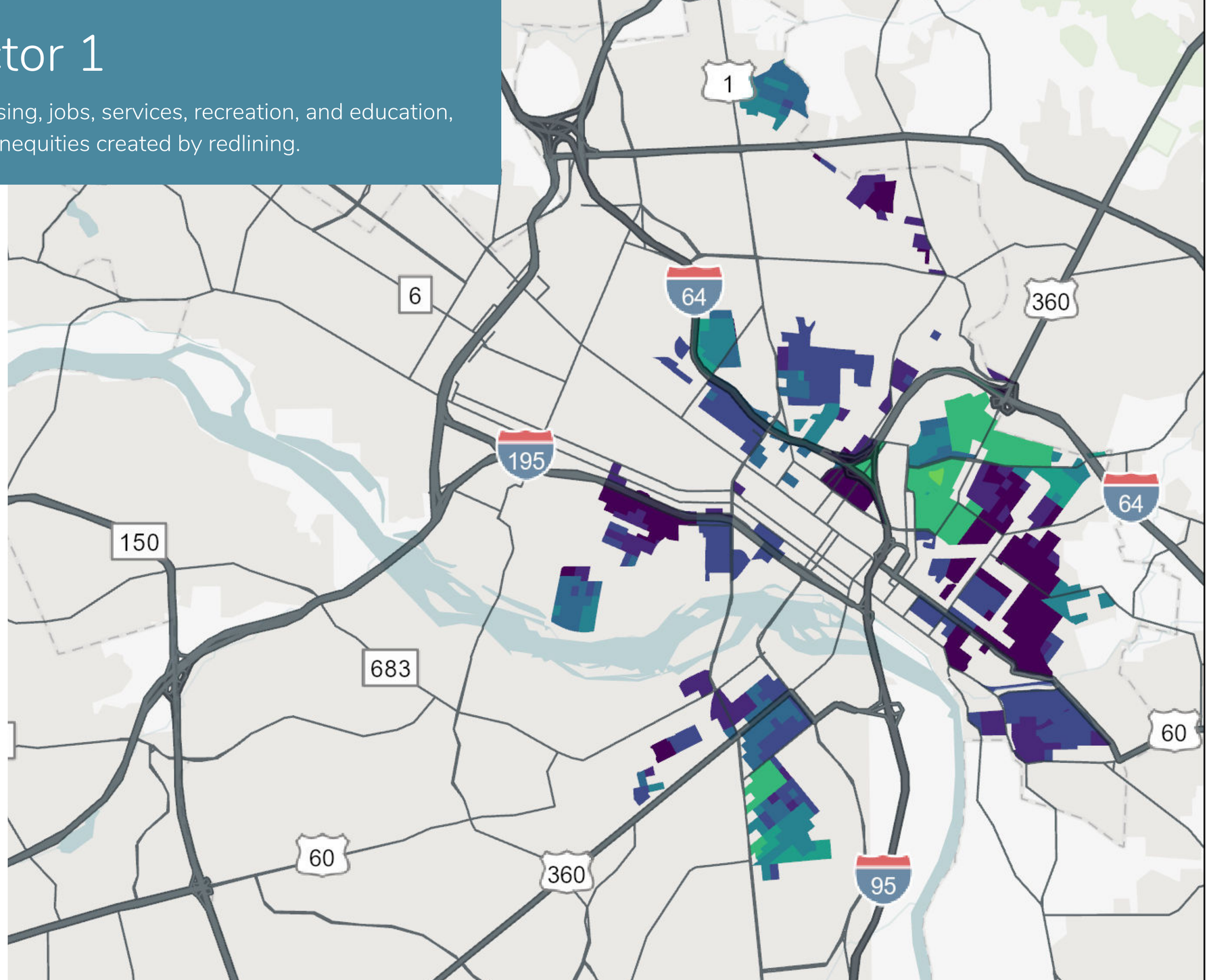
Areas highlighted for EF1 are those:

- that were redlined,
- that still have high concentrations of low income and BIPOC populations, and low rates of BIPOC home ownership, and
- where accessibility to jobs, services, recreation, and education by walk, bike, or transit modes is underperforming



Equity Factor 1

Improve access to housing, jobs, services, recreation, and education, addressing remaining inequities created by redlining.



Equity Factor 2

Reconnect and revitalize communities to address inequities created by the highway system's dissection of neighborhoods.

Areas highlighted for EF2 are those:

- that were dissected by highway construction,
- that have
  - high concentrations of low income and BIPOC populations, and
  - low rates of BIPOC home ownership, and
- where connectivity to jobs, services, recreation, and education by walk, bike, or transit modes is degrading accessibility

RICHMOND CONNECTS

Equity Factor 2: Dissected Neighborhoods

Reconnect and revitalize communities to address inequities created by the highway system's dissection of neighborhoods.

Component	Data Source and Description
Areas that were dissected by highway construction	I95 and I64 Linework from RVA Green 2050 Map, constructed in 1950s
High concentrations of low-income and BIPOC populations	Replica population synthesis*
Low rates of BIPOC home ownership	Replica population synthesis*
Areas where connectivity to jobs, services, recreation, and education by walk, bike, or transit modes is degrading accessibility	Accessibility analysis (idealized spatial distance for walk and bike networks; comparison of auto to transit access for transit networks)

*Replica's population synthesis model incorporates data from US Census ACS, LODES, TIGER, and PUMS; the Census Transportation Planning Products Program (CTPP); the US Department of Education and National Center for Education Statistics; and propietary building, parcel, and point of interest data

Equity Factor 2: Dissected Neighborhoods

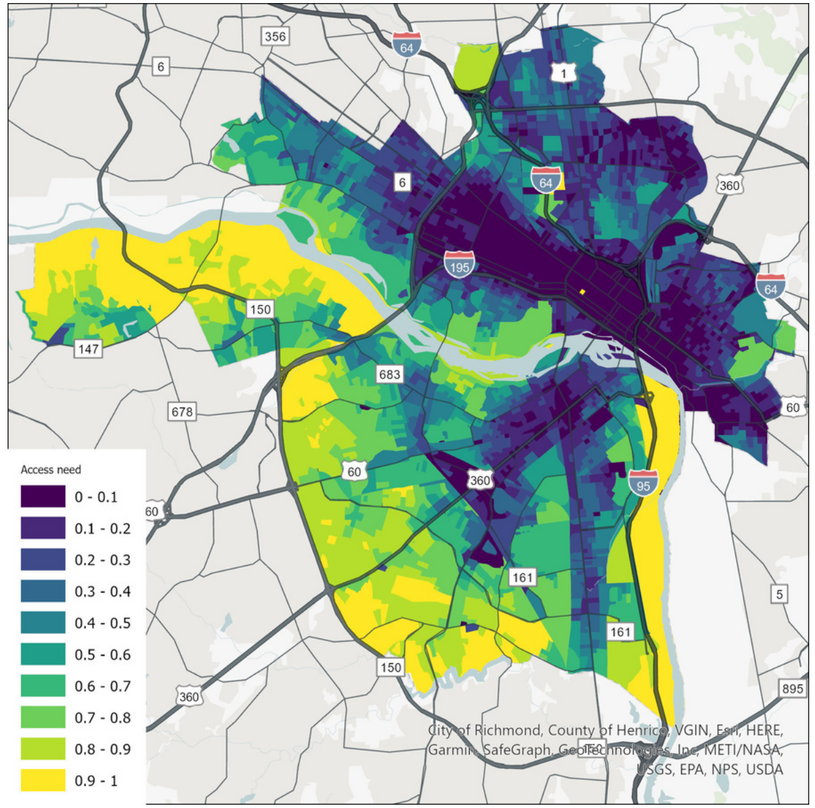
Reconnect and revitalize communities to address inequities created by the highway system's dissection of neighborhoods.

- For each of the walk, bike, and transit modes, identify underperformance by connectivity for accessibility to at least 3 destination types
- Combine the scores for each mode using MVQ to produce a composite accessibility score
- Combine percents BIPOC, low-income, and BIPOC-renter using MVQ to produce a communities of concern score
- Combine the scores produced in steps (2) and (3) using MVQ to produce the final EF2 score
- Report only blocks that fall within a dissected neighborhood

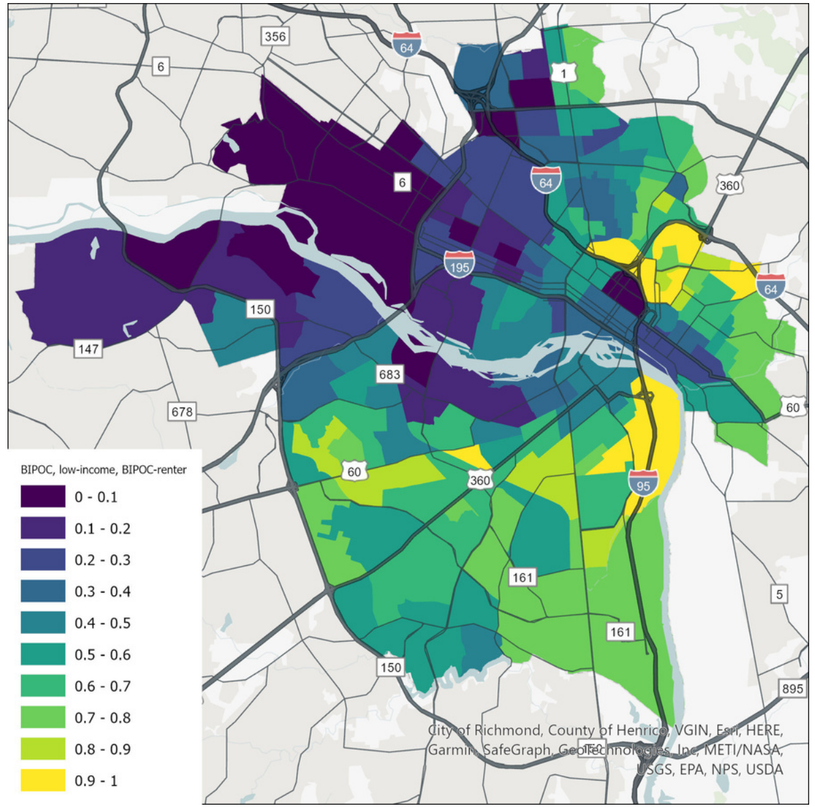
Equity Factor 2: Dissected Neighborhoods

Reconnect and revitalize communities to address inequities created by the highway system's dissection of neighborhoods.

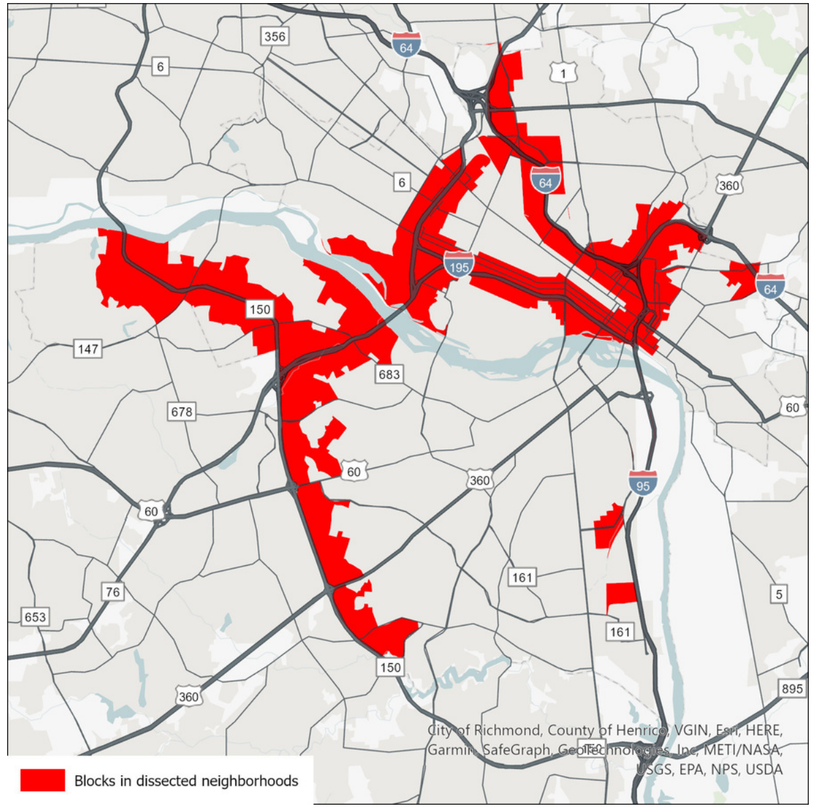
Access need



BIPOC, low-income, BIPOC renter



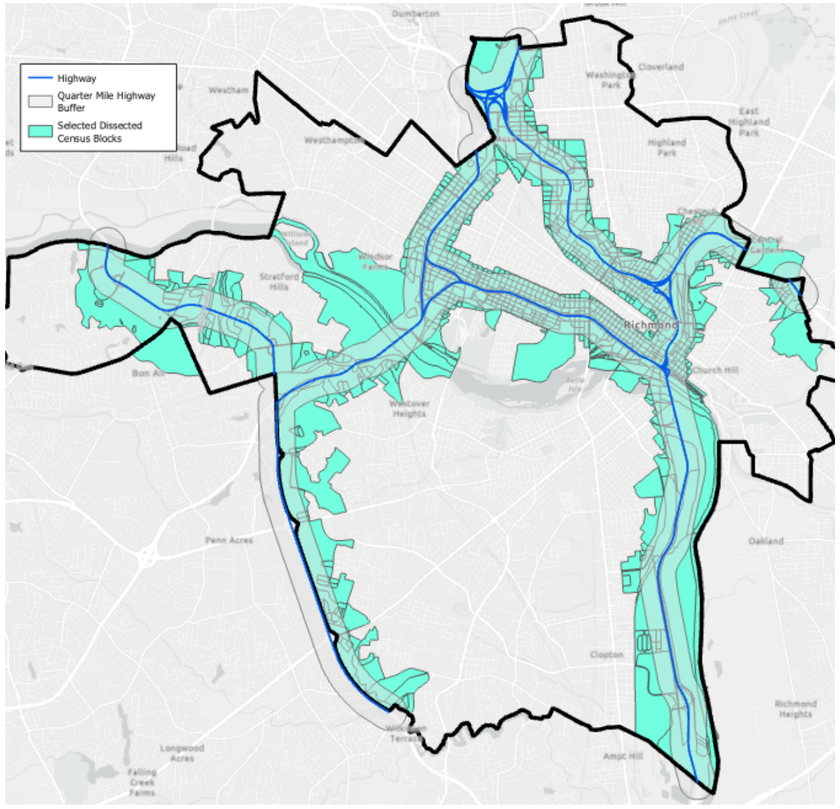
Dissected neighborhoods



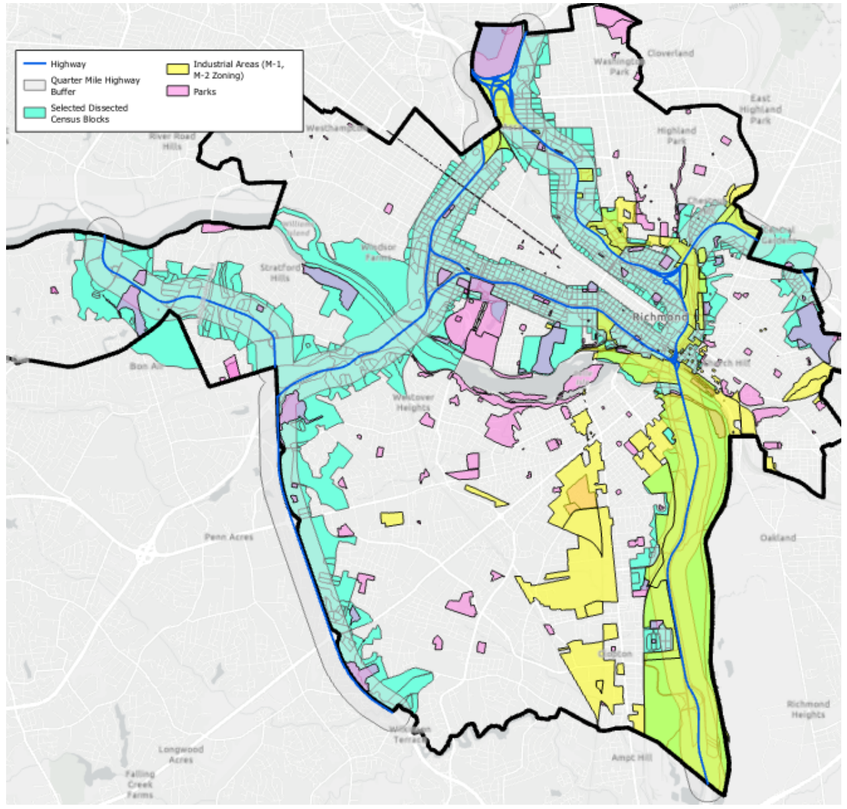
Equity Factor 2: Dissected Neighborhoods

Reconnect and revitalize communities to address inequities created by the highway system's dissection of neighborhoods.

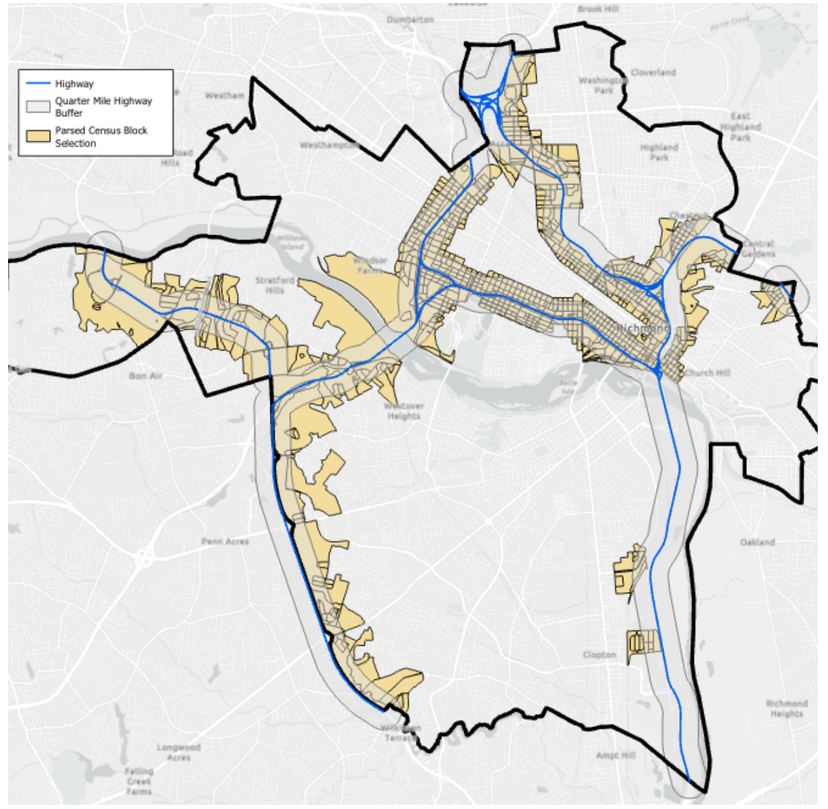
Census Blocks Dissected by Highway, Quarter Mile Buffer



Overlaying Industrial & Parks for Manual Deselection Process



Parsed Census Block Selection

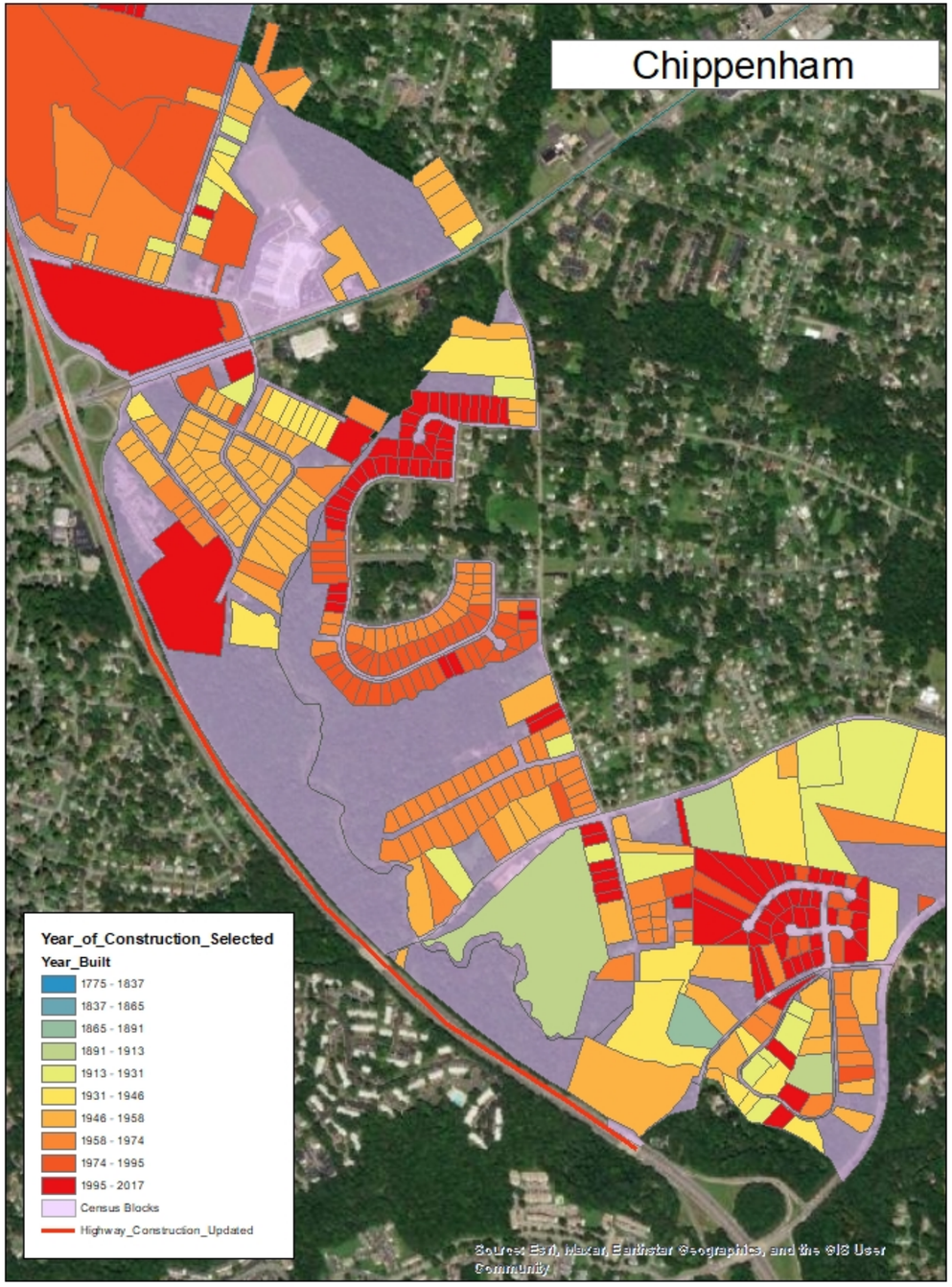


Equity Factor 2: Dissected Neighborhoods

Special Cases

Chippenham Area

- Looking at year of construction data overlaid onto selected census block areas
- Deselecting areas that were built after the construction of select highway

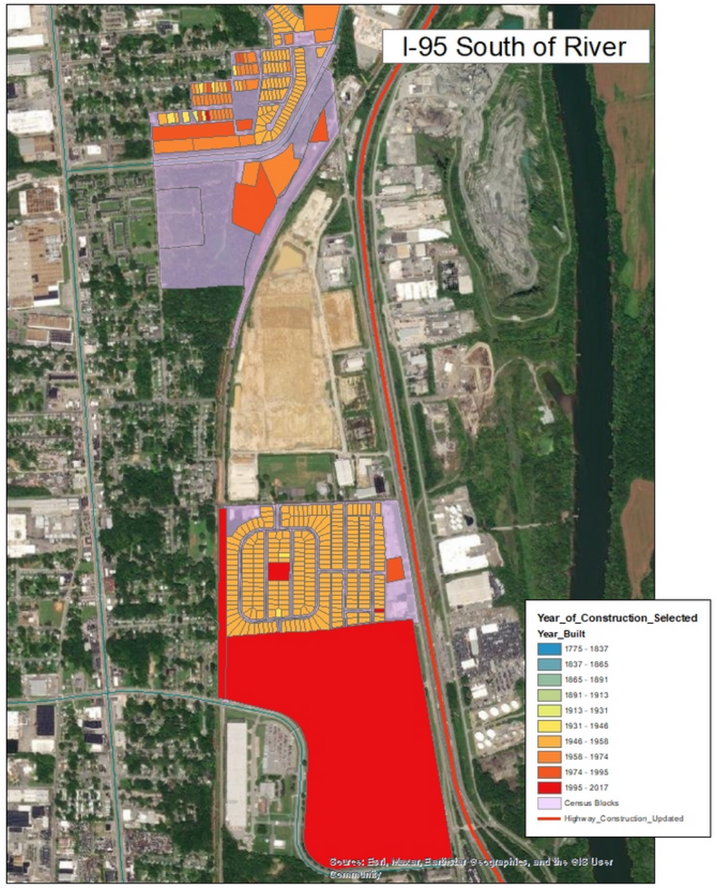


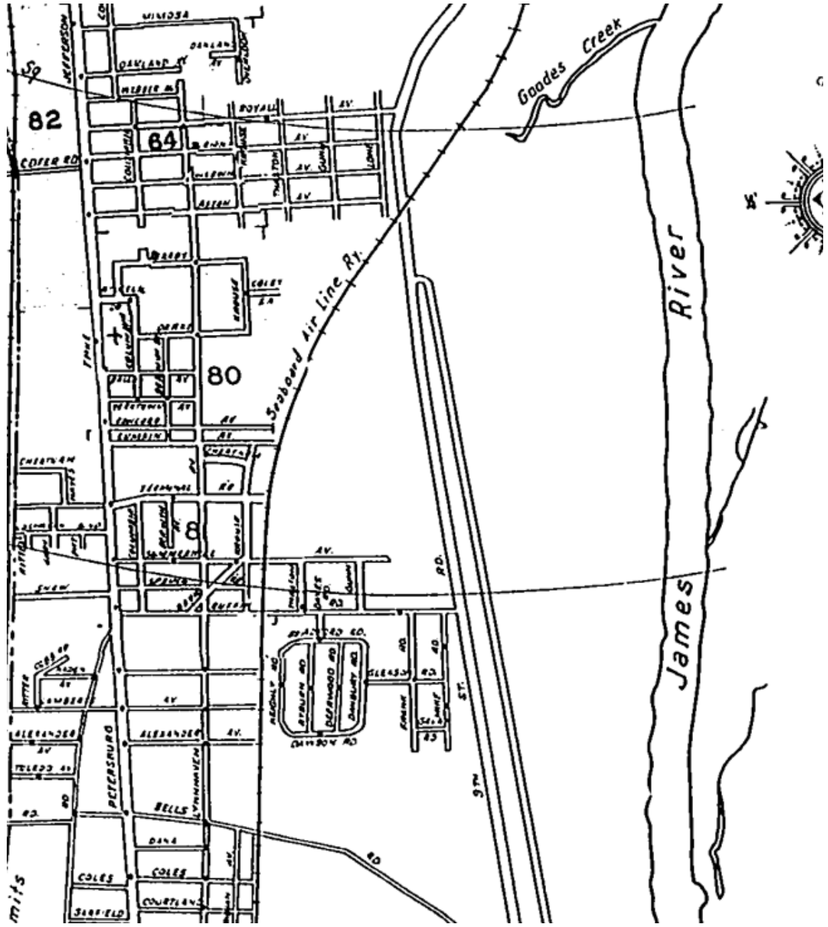
Equity Factor 2: Dissected Neighborhoods

Special Cases

I-95 South of River

- Looking at historical imagery to see if these neighborhoods were established before the construction of the select highway





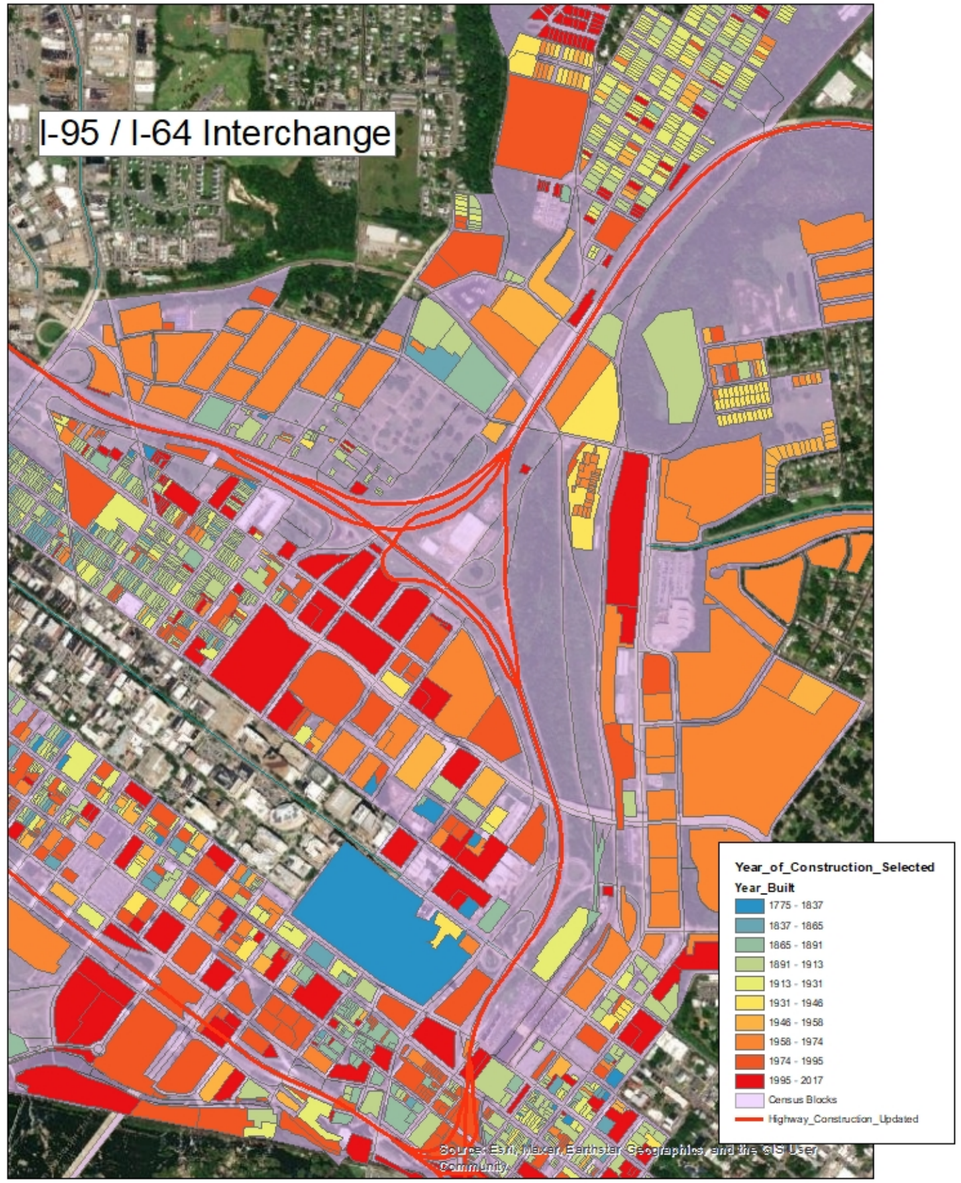
Sanborn Maps obtained through State Library

Equity Factor 2: Dissected Neighborhoods

Special Cases

I-95 / I-64 Interchange

- Run into cases of buildings being demolished, which skews the analysis
    - Coliseum and Convention Center

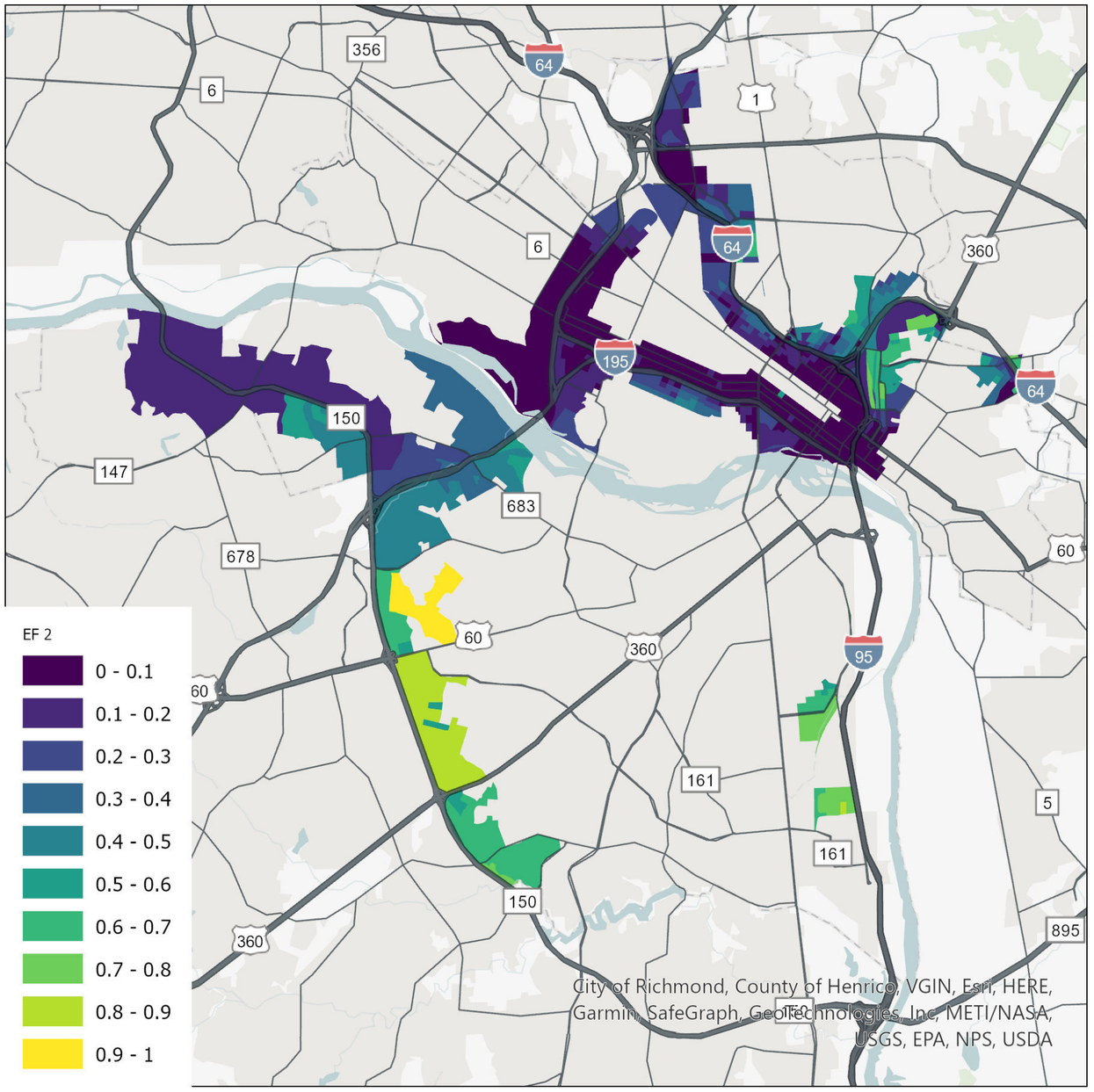


Equity Factor 2: Dissected Neighborhoods

Combined Map

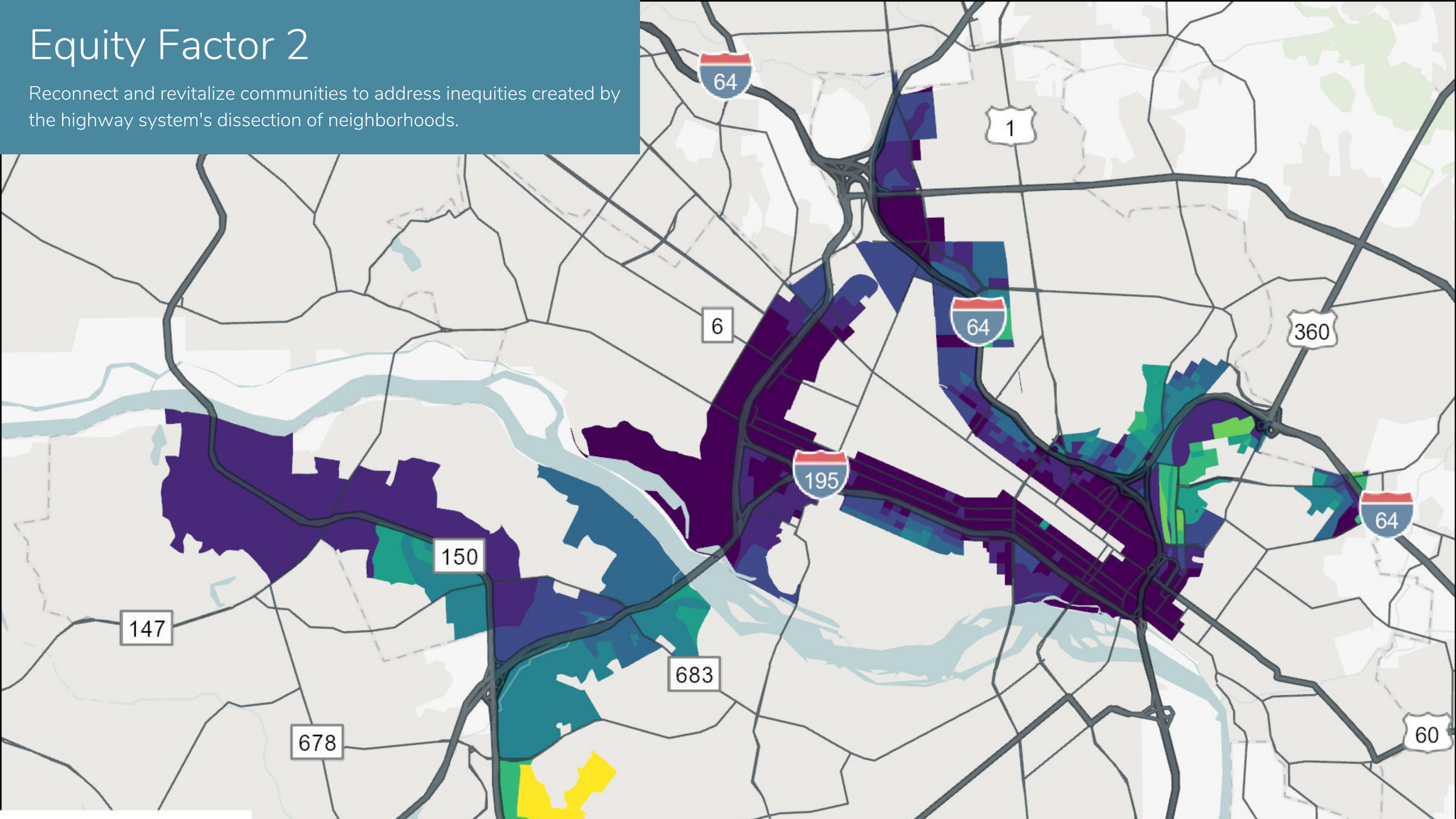
Areas highlighted for EF2 are those:

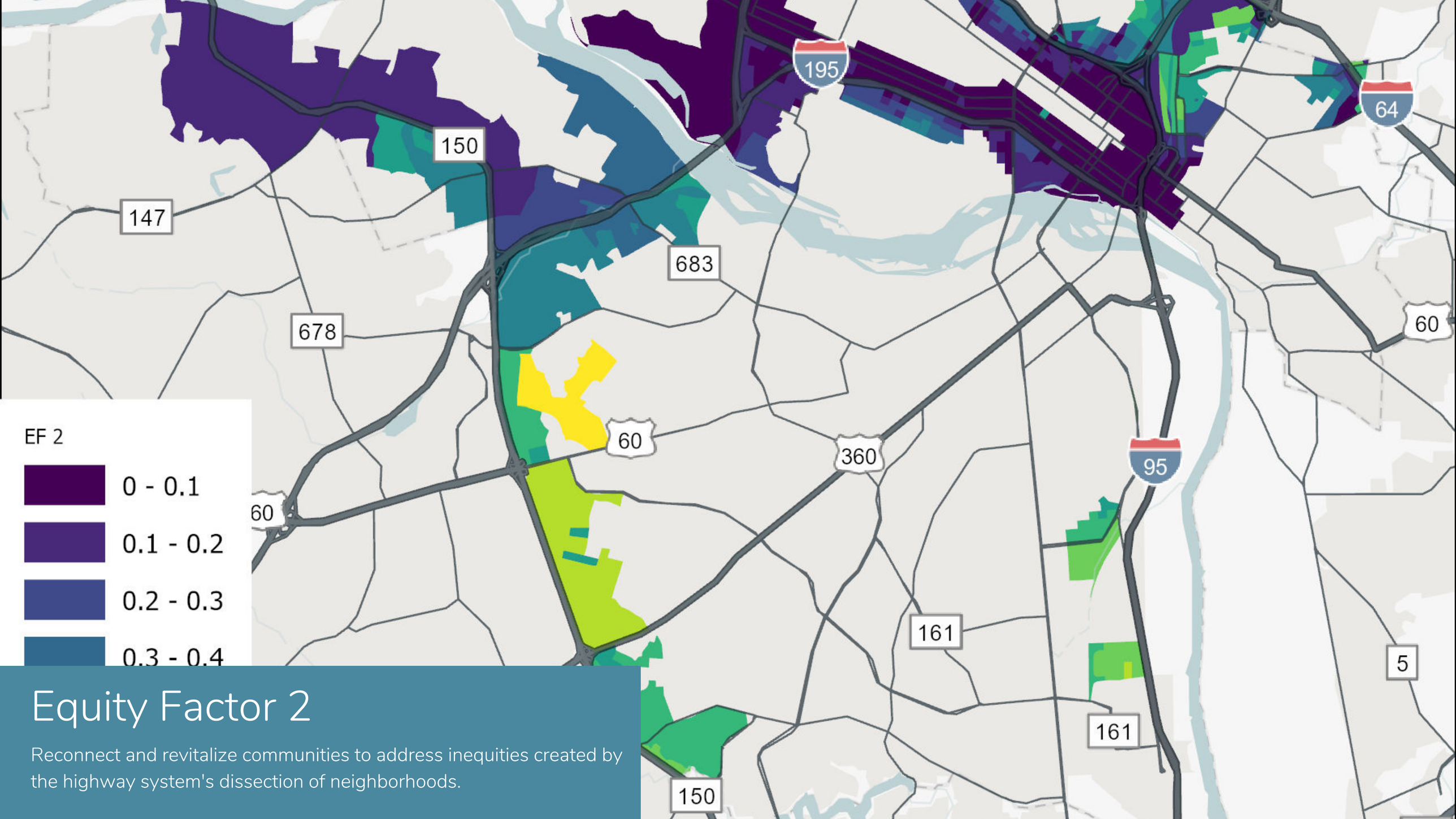
- that were dissected by highway construction,
- that have
  - high concentrations of low income and BIPOC populations, and
  - low rates of BIPOC home ownership, and
- where connectivity to jobs, services, recreation, and education by walk, bike, or transit modes is degrading accessibility



Equity Factor 2

Reconnect and revitalize communities to address inequities created by the highway system's dissection of neighborhoods.





Equity Factor 2

Reconnect and revitalize communities to address inequities created by the highway system's dissection of neighborhoods.

Equity Factor 3

Improve neighborhood connectivity and revitalize the fabric of the communities negatively impacted by urban renewal.

Areas highlighted for EF3 are those:

- that were affected by urban renewal projects,
- that have
  - high concentrations of low income and BIPOC populations, and
  - low rates of BIPOC home ownership, and
- where connectivity to jobs, services, recreation, and education by walk, bike, or transit modes is degrading accessibility

RICHMOND CONNECTS

Equity Factor 3: Urban Renewal

Improve neighborhood connectivity and revitalize the fabric of the communities negatively impacted by urban renewal.

Component	Data Source and Description
Areas that were impacted by urban renewal projects	Urban Renewal and Neighborhood Renewal Program Report for the City of Richmond (1976)
High concentrations of low-income and BIPOC populations	Replica population synthesis*
Low rates of BIPOC home ownership	Replica population synthesis*
Areas where connectivity to jobs, services, recreation, and education by walk, bike, or transit modes is degrading accessibility	Accessibility analysis (idealized spatial distance for walk and bike networks; comparison of auto to transit access for transit networks)

*Replica's population synthesis model incorporates data from US Census ACS, LODES, TIGER, and PUMS; the Census Transportation Planning Products Program (CTPP); the US Department of Education and National Center for Education Statistics; and propietary building, parcel, and point of interest data

Equity Factor 3: Urban Renewal

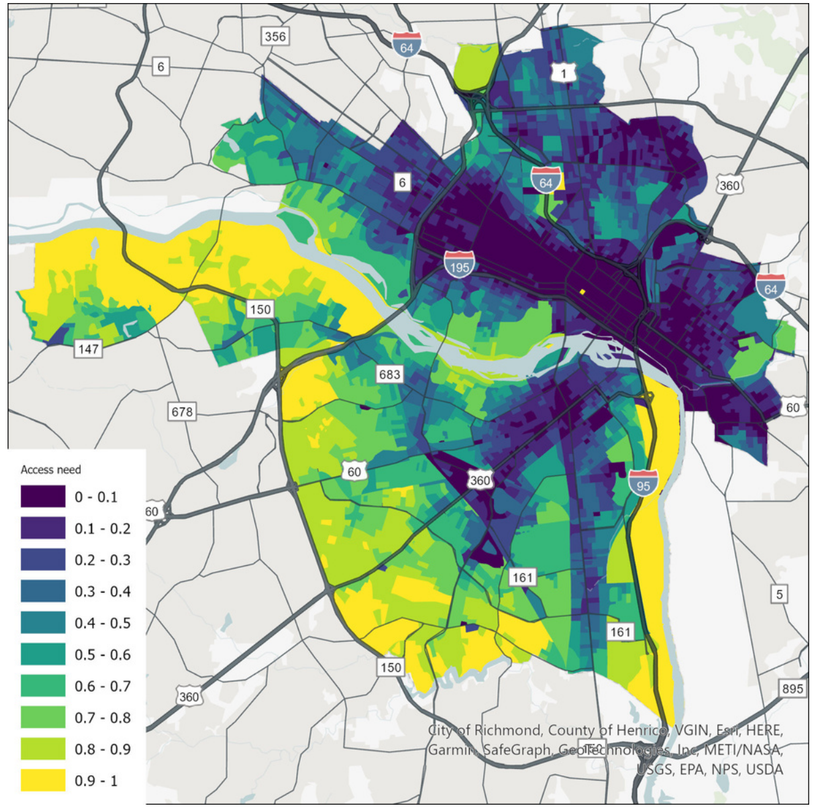
Improve neighborhood connectivity and revitalize the fabric of the communities negatively impacted by urban renewal.

- For each of the walk, bike, and transit modes, identify underperformance by connectivity for accessibility to at least 3 destination types
- Combine the scores for each mode using MVQ to produce a composite accessibility score
- Combine percents BIPOC, low-income, and BIPOC-renter using MVQ to produce a communities of concern score
- Combine the scores produced in steps (2) and (3) using MVQ to produce the final EF3 score
- Report only blocks that fall within an urban renewal area

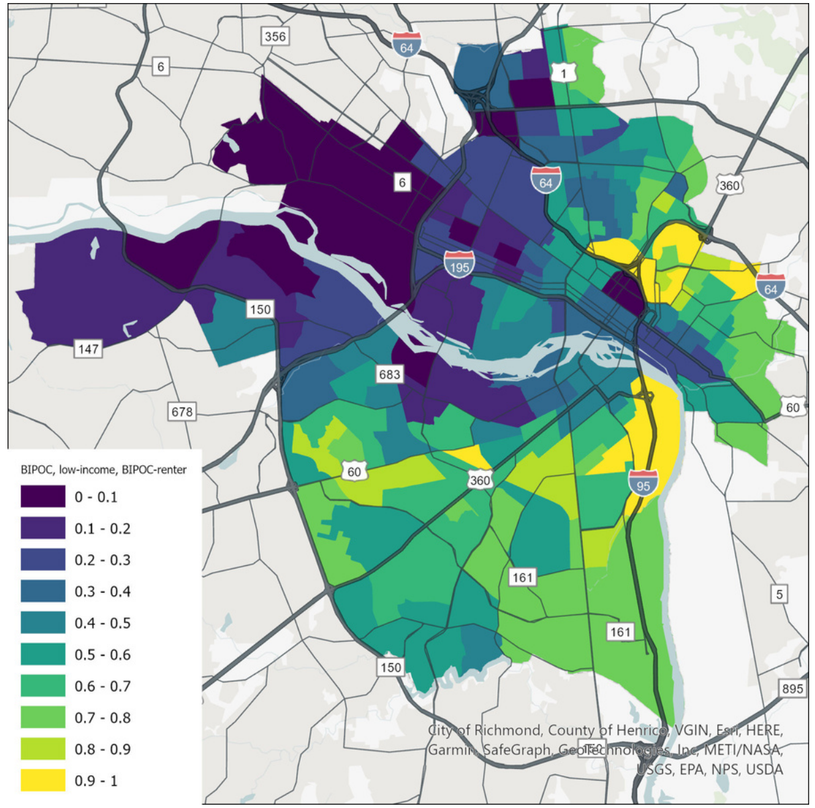
Equity Factor 3: Urban Renewal

Improve neighborhood connectivity and revitalize the fabric of the communities negatively impacted by urban renewal.

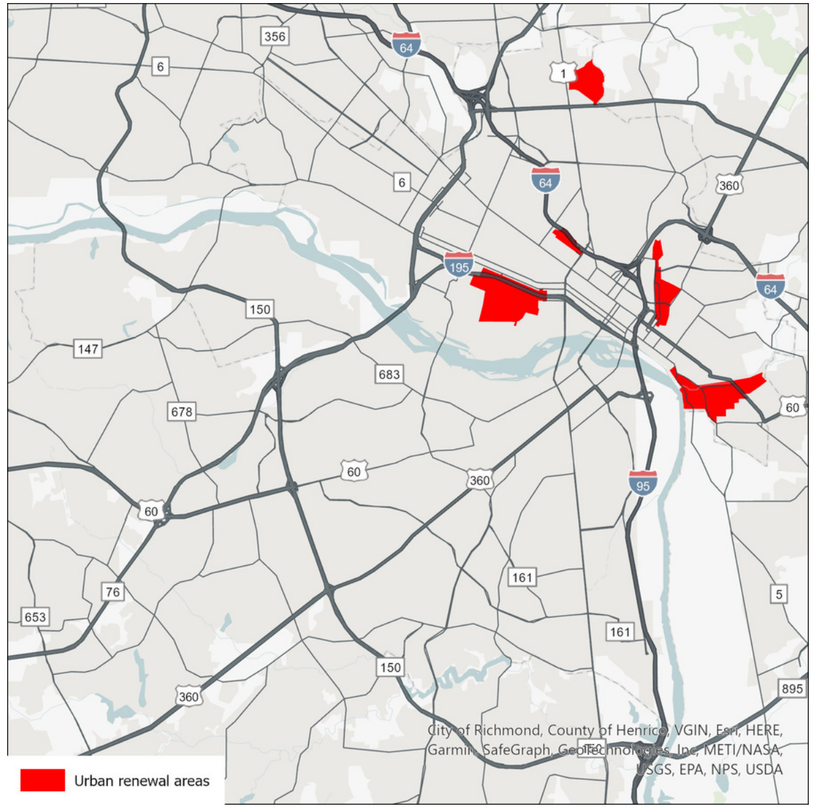
Access need



BIPOC, low-income, BIPOC renter



Urban renewal areas

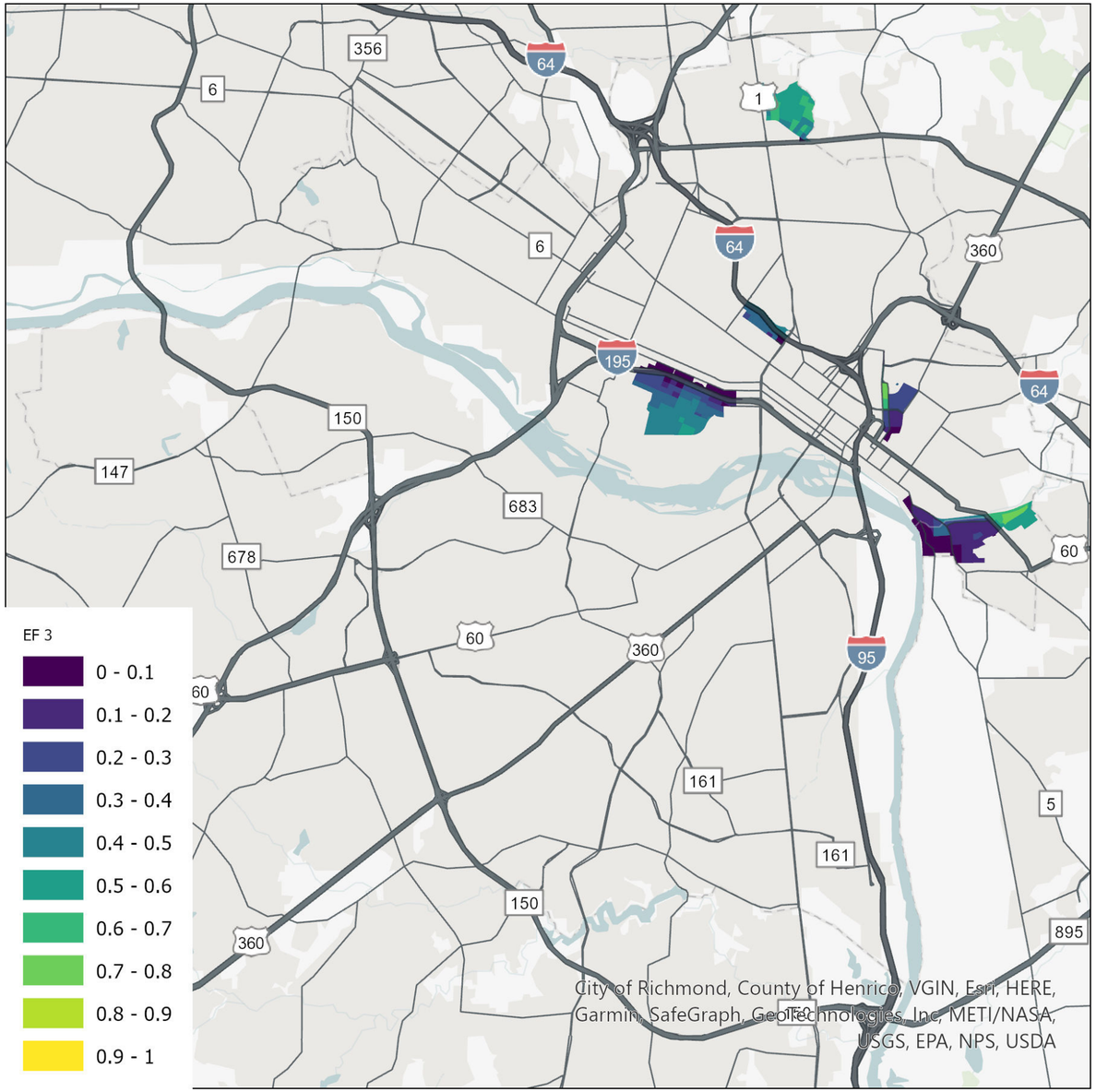


Equity Factor 3: Urban Renewal

Combined Map

Areas highlighted for EF3 are those:

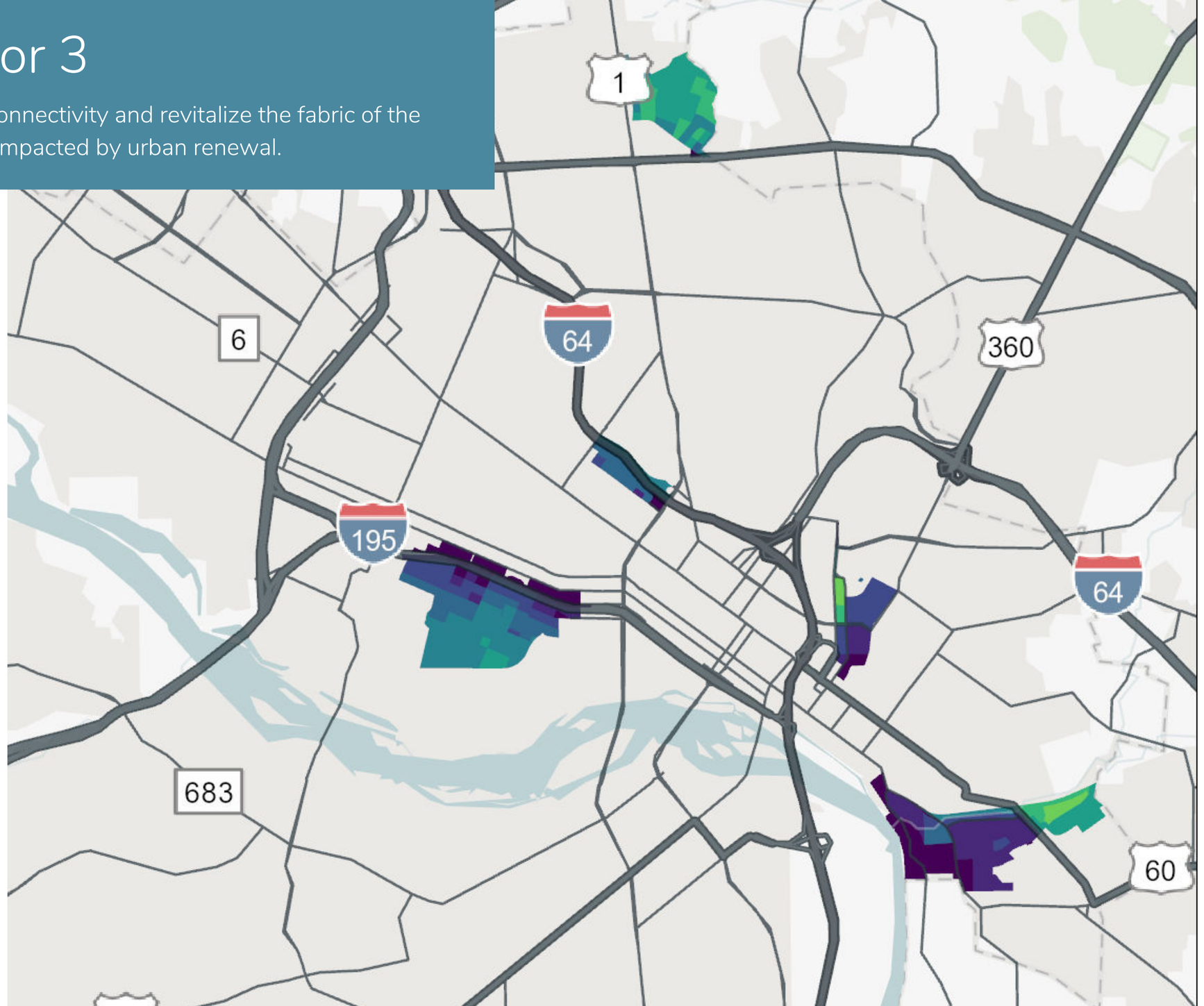
- that were affected by urban renewal projects,
- that have
  - high concentrations of low income and BIPOC populations, and
  - low rates of BIPOC home ownership, and
- where connectivity to jobs, services, recreation, and education by walk, bike, or transit modes is degrading accessibility



Note: Geography of urban renewal areas may change with new information/definitions. This is also true of the zoomed maps to follow

Equity Factor 3

Improve neighborhood connectivity and revitalize the fabric of the communities negatively impacted by urban renewal.



Equity Factor 4

Improve access to housing, jobs, services, and education to address the isolation of low-income inner ring suburbs where families are pushed.

Areas highlighted for EF4 are:

- inner ring suburbs,
- low income areas, and
- where accessibility is underperforming in providing connections to jobs, services, recreation, and education by walk, bike, or transit modes

RICHMOND CONNECTS

Equity Factor 4: Inner Ring Suburbs

Improve access to housing, jobs, services, and education to address the isolation of low-income inner ring suburbs where families are pushed.

Component	Data Source and Description
Inner ring suburbs	Urban design typologies (Streetcar Neighborhood, Post War Suburb, and any Apartment Court that was touching either of the prior classifications)
Low-income	Replica population synthesis*
Areas where accessibility is underperforming in providing connections to jobs, services, recreation, and education by walk, bike, or transit modes	Accessibility analysis (modifiers to walk [e.g. sidewalks], bike [e.g. bike lanes], and transit [e.g. frequency] networks)

*Replica's population synthesis model incorporates data from US Census ACS, LODES, TIGER, and PUMS; the Census Transportation Planning Products Program (CTPP); the US Department of Education and National Center for Education Statistics; and propietary building, parcel, and point of interest data

Equity Factor 4: Inner Ring Suburbs

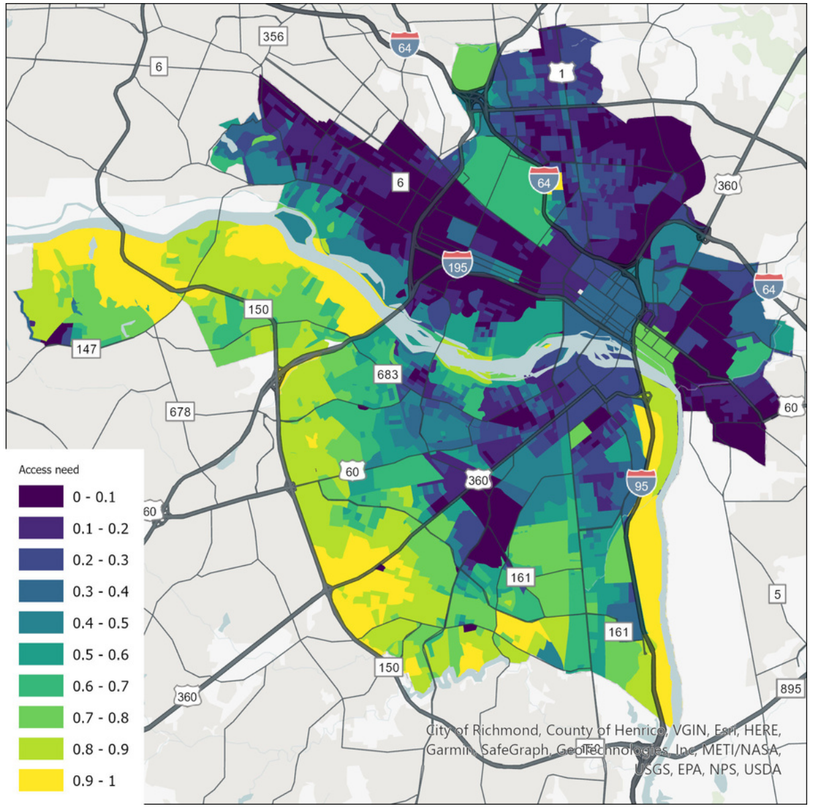
Improve access to housing, jobs, services, and education to address the isolation of low-income inner ring suburbs where families are pushed.

- For each of the walk, bike, and transit modes, identify underperformance by either quality of service, connectivity, or lack of relevant destinations for accessibility to at least 3 destination types
- Combine the scores for each mode using MVQ to produce a composite accessibility score
- Take a simple quantile of percent low-income as the low-income score
- Combine the scores produced in steps (2) and (3) using MVQ to produce the final EF4 score
- Report only blocks that fall within an inner-ring suburb

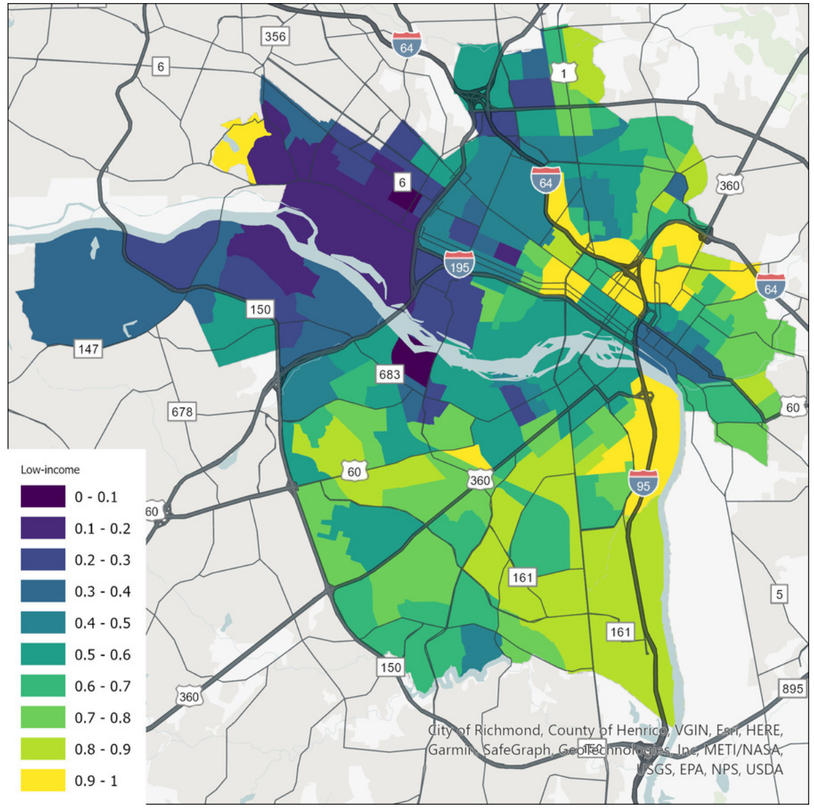
Equity Factor 4: Inner Ring Suburbs

Improve access to housing, jobs, services, and education to address the isolation of low-income inner ring suburbs where families are pushed.

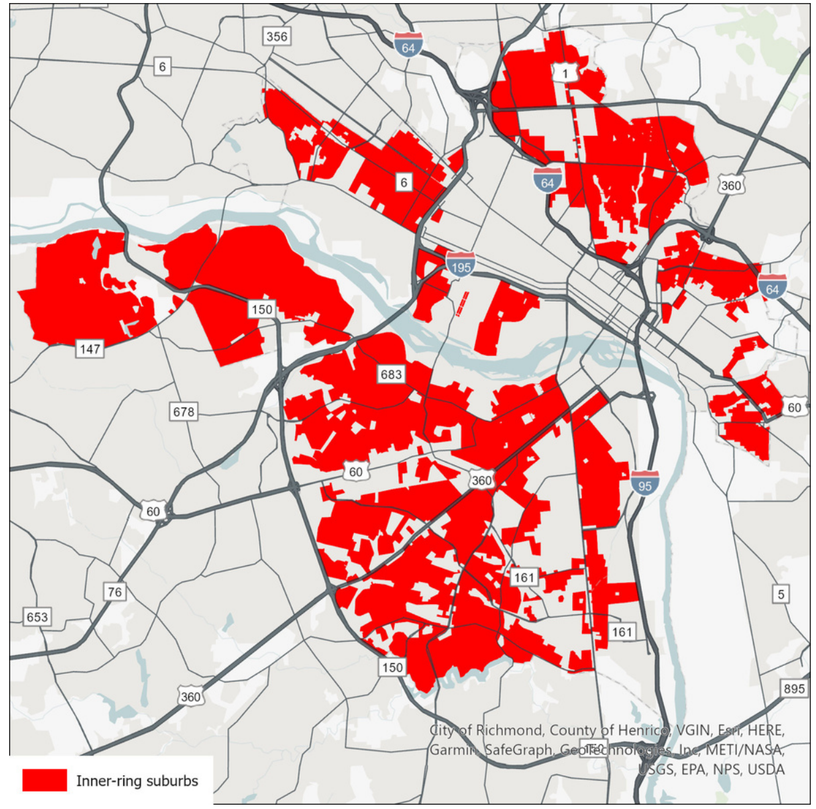
Access need



Low-income



Inner-ring suburbs

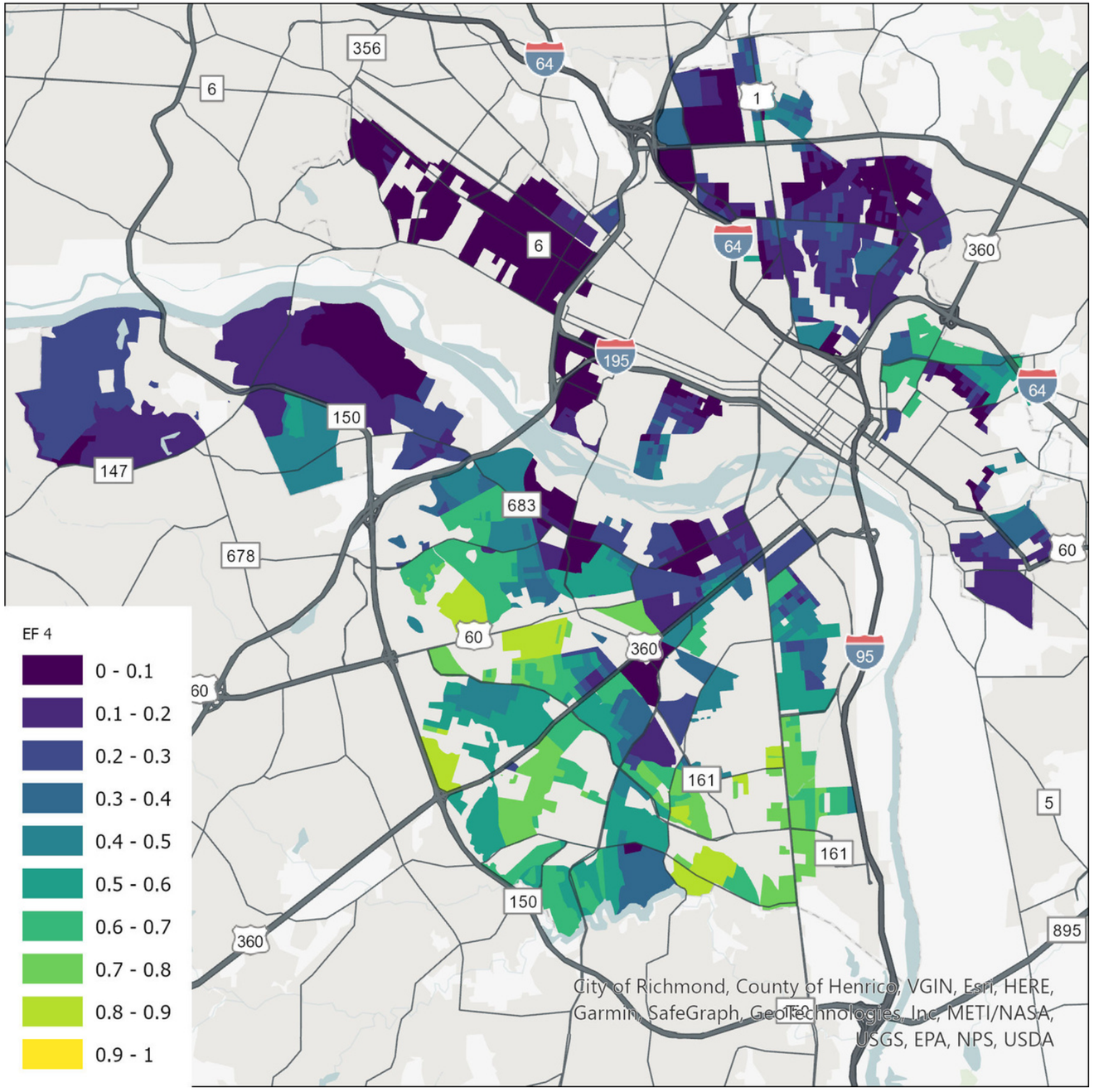


Equity Factor 4: Inner Ring Suburbs

Combined Map

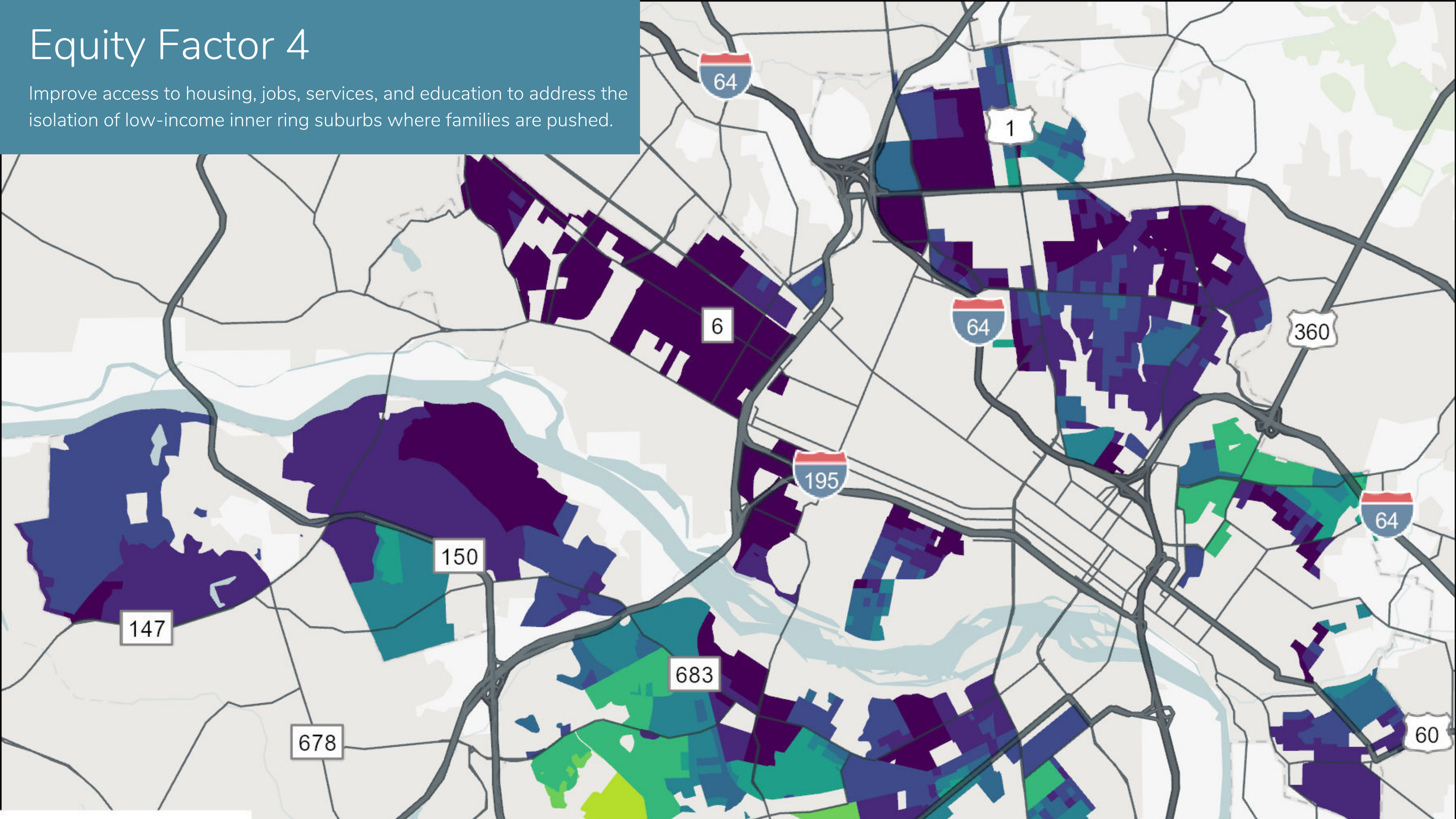
Areas highlighted for EF4 are:

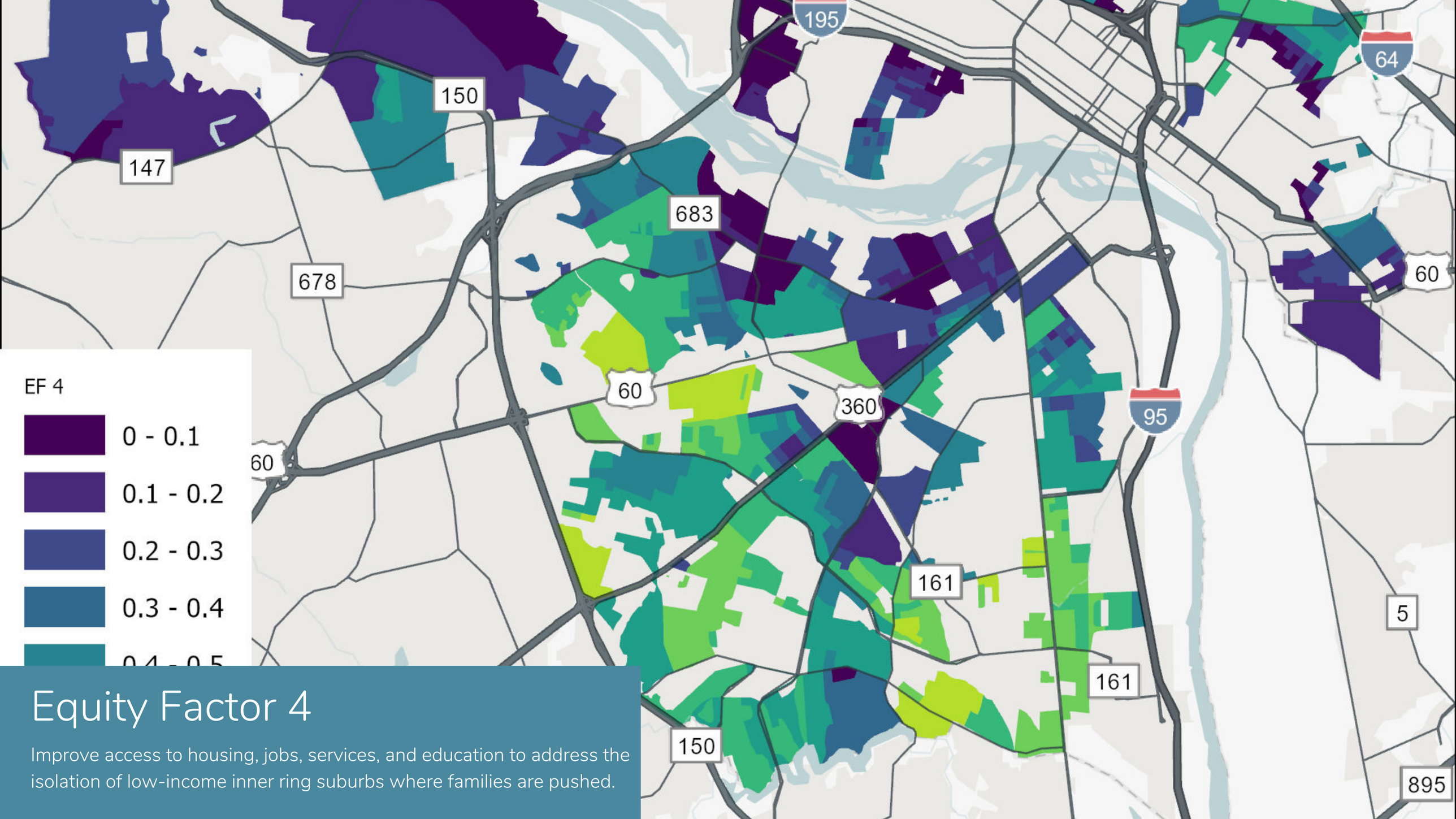
- inner ring suburbs, and
- low income areas, and
- where accessibility is underperforming in providing connections to jobs, services, recreation, and education by walk, bike, or transit modes



Equity Factor 4

Improve access to housing, jobs, services, and education to address the isolation of low-income inner ring suburbs where families are pushed.





Equity Factor 4

Improve access to housing, jobs, services, and education to address the isolation of low-income inner ring suburbs where families are pushed.

Questions & Discussion

3

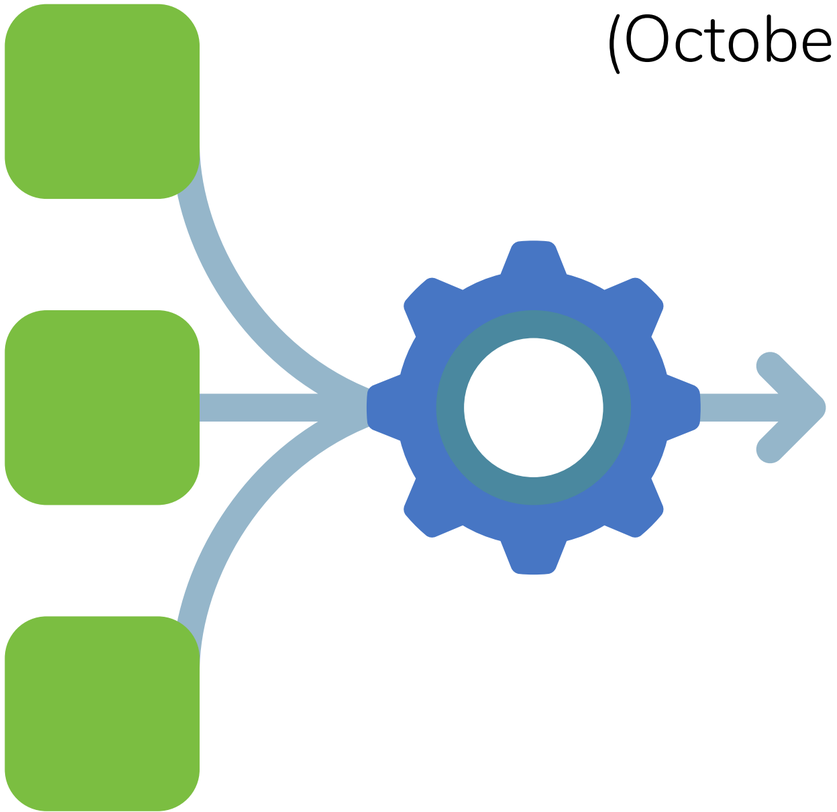
Next Steps

Next Process Steps

Turn the crank and present raw needs maps (September)

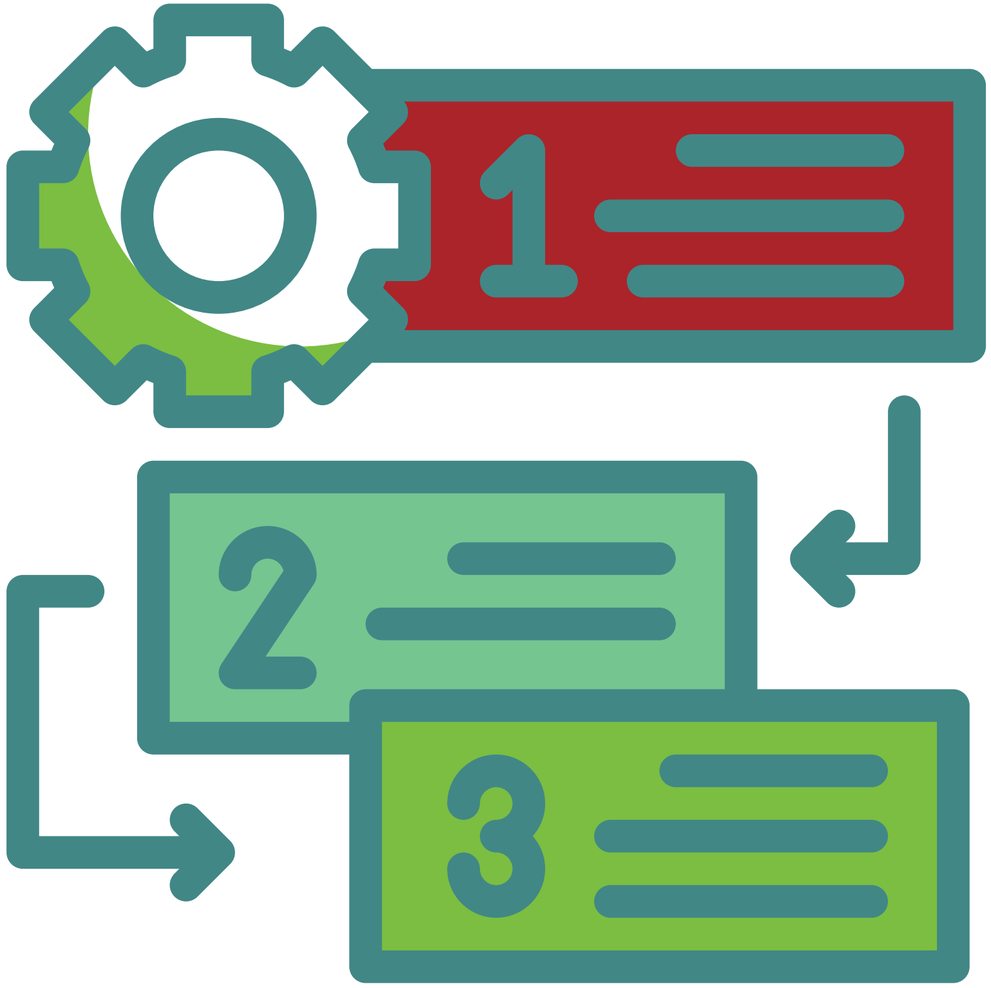
Combine people and network needs maps (October)

Take draft equity embedded maps to public (November)



Next Process Steps

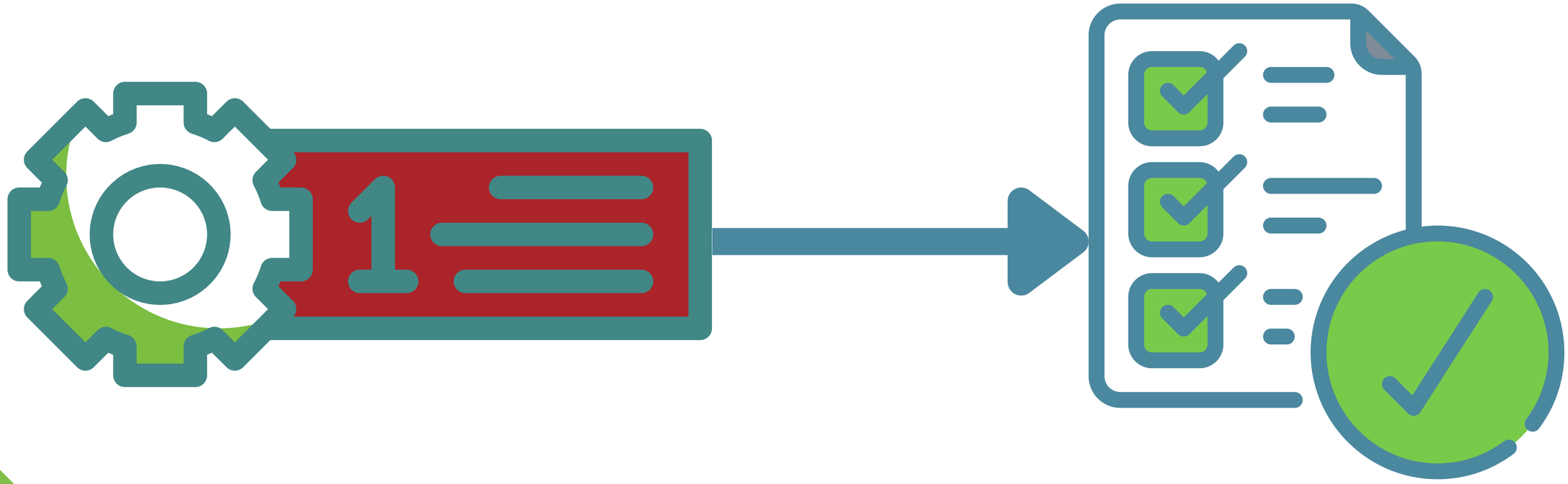
Set thresholds for to stratify and prioritize needs



Next Process Steps

Top needs finalized

Projects identified to meet top needs



Reference Slides

Needs Analysis Framework

Policy

Values that shape planning & investment

What do we need to know?

About the transportation system?

About users and residents?

Network Needs

Investment need categories

People Needs

Past injustices and demographic based needs

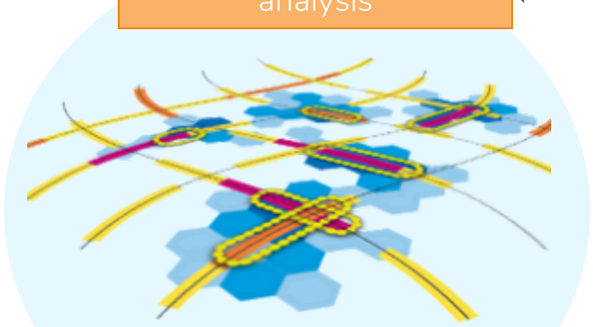
Transportation metrics

Equity metrics

Investment need composite score

Equity need composite score

Policy-based needs analysis



Needs Analysis Framework

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Policy-based needs analysis

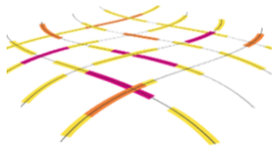
11 Investment Need Categories

10 Equity Factors

Ultimate Outcome

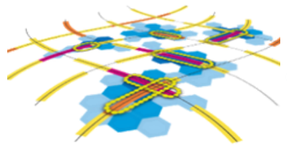
11 Integrated Needs Maps by Investment Need Category

11 Investment Need Category Composite Maps



10 Equity Factor Composite Maps

11 INC * 10 EFs = 11 integrated Maps



11

Simplify and pull out segments where top needs are located, lose background noise and present as 11 integrated needs maps

Ultimate Outcome

11 Integrated Needs Maps by Investment Need Category enriched with significance from Equity Factor Composite Maps

Investment need categories
Pedestrian
Bike
Transit
Freight
Land Use
Safety
Connectivity
Maintenance
Economic Development
Technology
Sustainability

× 11

Ultimate Outcome

11 Integrated Needs Maps by Investment Need Category

× 11

These maps will reveal the needs:

- What?
- Where?
- Who is impacted?

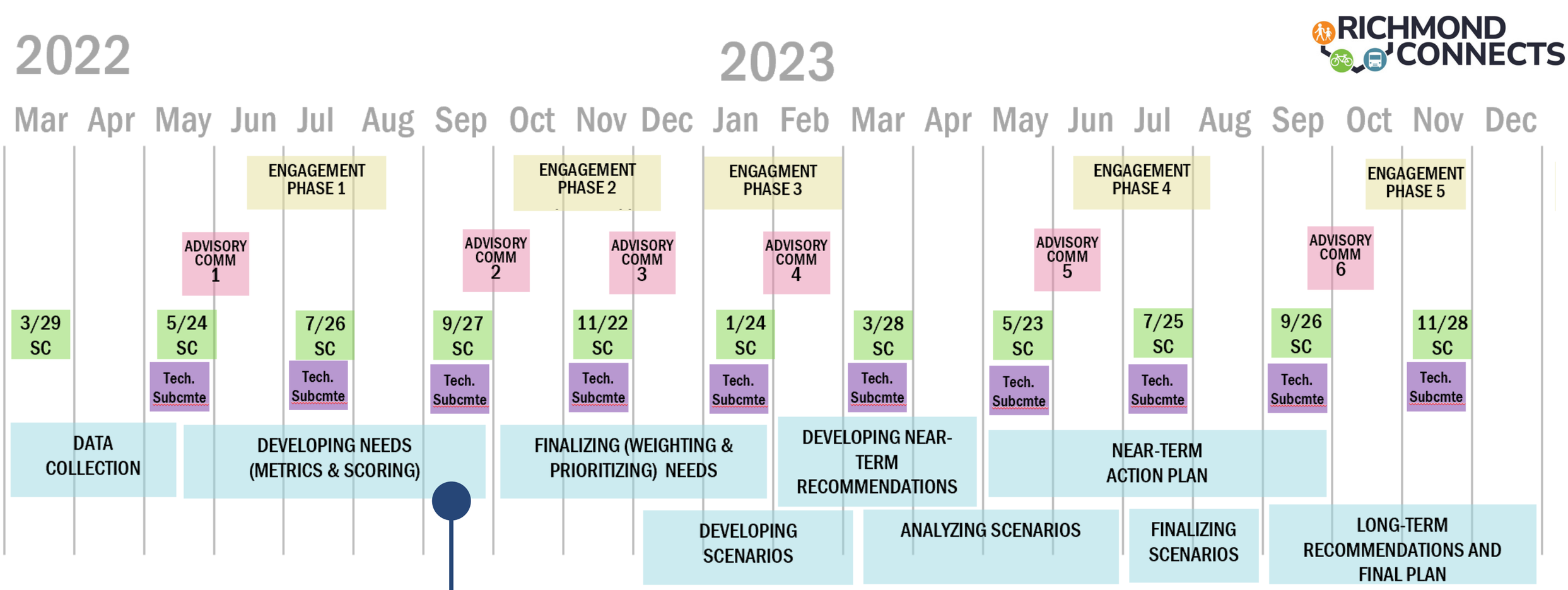
11 Investment Needs Categories and 10 Equity Factors

are the foundation of the needs analysis

Investment need categories
Pedestrian
Bike
Transit
Freight
Land Use
Safety
Connectivity
Maintenance
Economic Development
Technology
Sustainability

Equity Factors

1. Improve access to housing, jobs, services, recreation, and education, addressing remaining inequities created by **redlining**.
2. Reconnect and revitalize communities to address inequities created by the **highway system's dissection of neighborhoods**.
3. Improve neighborhood connnectivity and revitalize the fabric of the communities negatively impacted by **urban renewal**.
4. Improve access to housing, jobs, services, and education to address the **isolation of low-income inner ring suburbs** where families are pushed.
5. Address gaps in the multimodal network and utilize new planning tools to improve safety and accessibility deficiencies stemming from **traditional car-centric planning**.
6. Equitably increase the safety and comfort of **cyclists and pedestrians**, connecting communities of concern to opportunities.
7. Improve reliability of **transit** and other non-car services to increase access and remove barriers to opportunities for communities of concern.
8. Prioritize the needs of socially vulnerable users and address **climate and environmental equity** as identified in RVAGreen 2050.
9. Prioritize densely populated areas of **communities of concern** including communities of color, low-income communities, senior and limited mobility populations, families traveling with children, and at-risk youth.
10. Focus on improving **climate resiliency** for the most impacted communities.



We are here: Producing first cut of needs scores