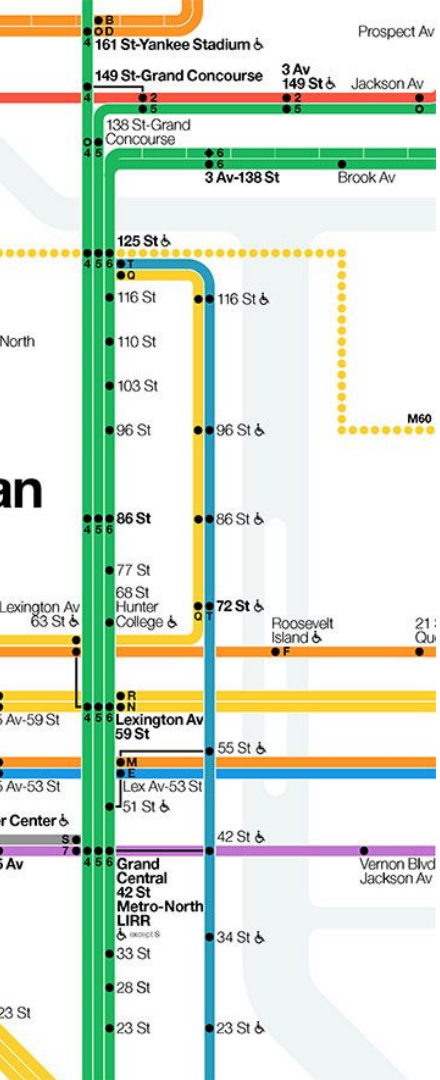
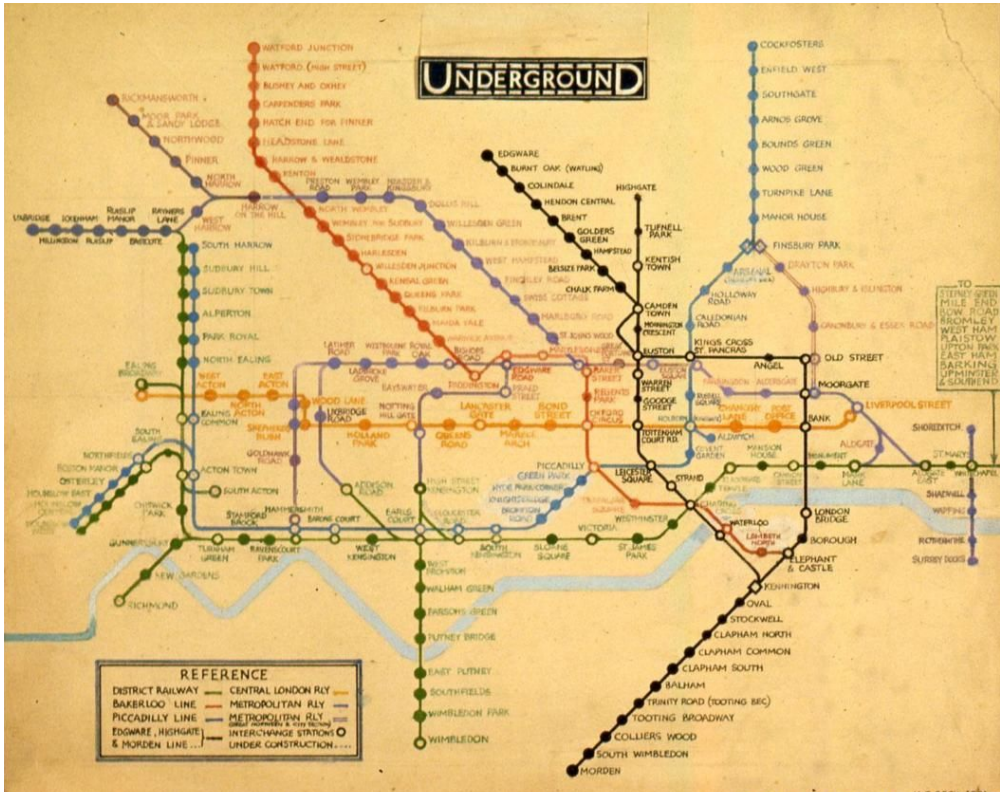


transitive.js and schematic mapping

Kate Chanba and David Emory

Transit Techies NYC August 29th, 2018


UNDERGROUND
REFERENCE
DISTRICT RAILWAY
CENTRAL LONDON RLY
BAKERLOO LINE
METROPOLITAN RLY
PICCADILLY LINE
METROPOLITAN RLY
EDGWARE, HIGHGATE & MORDEN LINE
INTERCHANGE STATIONS
UNDER CONSTRUCTION
WATFORD JUNCTION
WATFORD (High Street)
BUSHEY AND OXHEY
CARPENDERS PARK
HATCH END FOR PINNER
HEADSTONE LANE
HARROW & WEALDSTONE
RICKMANSWORTH
MOOR PARK & SANDY LODGE
NORTHWOOD
PINNER
NORTH HARROW
HARROW ON THE HILL
UXBRIDGE
HILLINGDON
RUISLIP
RUISLIP MANOR
EASTCOTE
RAYNERS LANE
WEST HARROW
SOUTH HARROW
SUDBURY HILL
SUDBURY TOWN
ALPERTON
PARK ROYAL
NORTH EALING
EDGWARE
BURNT OAK (WATLING)
COLINDALE
HENDON CENTRAL
BRENT
GOLDERS GREEN
HAMPSTEAD
BELSIZE PARK
CHALK FARM
HIGHGATE
TUFNELL PARK
KENTISH TOWN
CAMDEN TOWN
MORNINGTON CRESCENT
EUSTON
KINGS CROSS ST. PANCRAS
COCKFOSTERS
ENFIELD WEST
SOUTHGATE
ARNOS GROVE
BOUNDS GREEN
WOOD GREEN
TURNPIKE LANE
MANOR HOUSE
FINSBURY PARK
ANGEL
OLD STREET
MOORGATE
BANK
LIVERPOOL STREET
SHOREDITCH
ALDGATE
ALDGATE EAST
WHITECHAPEL
TOWER HILL
MONUMENT
CANNON STREET
MANSION HOUSE
BLACKFRIARS
TEMPLE
EMBANKMENT
CHARING CROSS
LEICESTER SQUARE
COVENT GARDEN
STRAND
PICCADILLY CIRCUS
GREEN PARK
HYDE PARK CORNER
KNIGHTSBRIDGE
SOUTH KENSINGTON
SLOANE SQUARE
VICTORIA
ST. JAMES'S PARK
WESTMINSTER
WATERLOO
LAMBETH NORTH
LONDON BORO
ELEPHANT & CASTLE
KENNINGTON
OVAL
STOCKWELL
CLAPHAM NORTH
CLAPHAM COMMON
CLAPHAM SOUTH
BALHAM
TRINITY ROAD (TOOTING BEC)
TOOTING BROADWAY
COLLIERS WOOD
SOUTH WIMBLEDON
MORDEN
WIMBLEDON
WIMBLEDON PARK
SOUTHFIELDS
EAST PUTNEY
PUTNEY BRIDGE
PARSONS GREEN
WALHAM GREEN
FULHAM BROADWAY
WEST BROMPTON
WEST KENSINGTON
EARLS COURT
GLOUCESTER ROAD
BROMPTON ROAD
KNIGHTSBRIDGE
HAMMERSMITH
BARONS COURT
STAMFORD BROOK
RAVENSCOURT PARK
TURNHAM GREEN
GUNNERSBURY
KEW GARDENS
RICHMOND
ACTON TOWN
SOUTH ACTON
CHISWICK PARK
NORTHFIELDS
BOSTON MANOR
OSTERLEY
HOUNSLOW EAST
HOUNSLOW CENTRAL
HOUNSLOW WEST
SOUTH EALING
EALING BROADWAY
WEST ACTON
NORTH ACTON
EALING COMMON
SHEPHERD'S BUSH
GOLDHAWK ROAD
HOLLAND PARK
NOTTING HILL GATE
LANCASTER GATE
QUEENSWAY
BAYSWATER
LADBROKE GROVE
WESTBOURNE PARK
ROYAL OAK
PADDINGTON
EDGWARE ROAD
BAKER STREET
REGENT'S PARK
OXFORD CIRCUS
BOND STREET
MARBLE ARCH
WARREN STREET
GOODGE STREET
TOTTENHAM COURT RD.
HOLBORN
CHANCERY LANE
LINCOLN'S INN FIELDS
RUSSELL SQUARE
KINGSWAY
ALDWYCH
WOOD LANE
WHITE CITY
LATIMER ROAD
WESTBOURNE ROAD
LADBROKE GROVE
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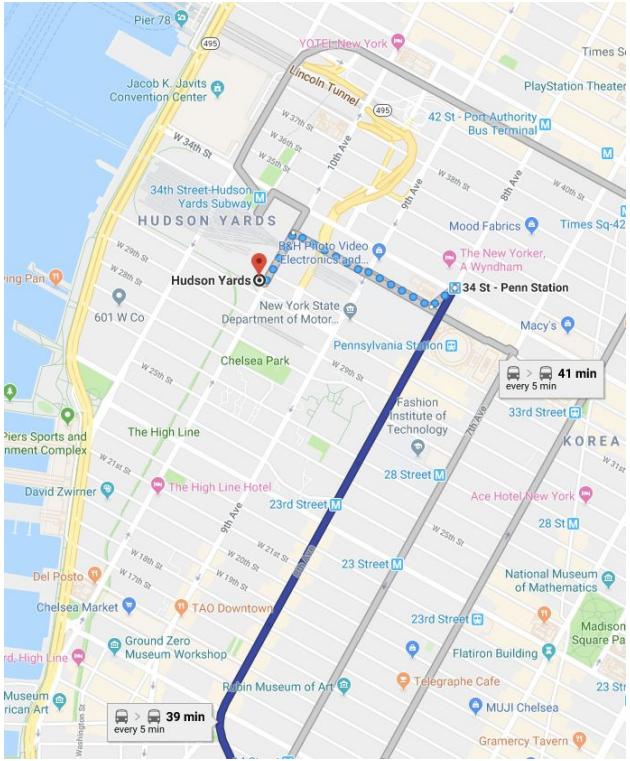
WATFORD JUNCTION
TO STERNEY GREEN MILE END SLOW ROAD BROMLEY WEST HAM PLAISTOW UPTON PARK EAST HAM BARKING UPMINSTER & SOUTHEND

Glenmont
Wheaton
Forest Glen
Silver Spring
Takoma
Greenbelt
College Park-U of Md
Prince George's Plaza
West Hyattsville
Fort Totten
Shady Grove
Rockville
Twinbrook
White Flint
Grosvenor-Strathmore
Medical Center
Bethesda
Friendship Heights
Van Ness-UDC
Cleveland Park
Woodley Park
Dupont Circle
Farragut North
Columbia Heights
U St
Shaw-Howard U
U Street
African-American Civil War Memorial/Cardozo
Brookland-CUA
Rhode Island Ave
NoMa-Gallaudet U
Union Station
New Carrollton
Landover
Cheverly
Deanwood
Minnesota Ave
Stadium-Armory
Benning Rd
Capitol Heights
Addison Rd
Morgan Blvd
Largo Town Center
McPherson Sq
Farragut West
Foggy Bottom-GWU
Rosslyn
Ballston-MU
Virginia Sq-GMU
Clarendon
Court House
Spring Hill
Tysons Corner
McLean
Vienna
Dunn Loring
West Falls Church
East Falls Church
Arlington Cemetery
Pentagon
Pentagon City
Crystal City
Ronald Reagan Washington National Airport
Braddock Rd
King St-Old Town
Eisenhower Ave
Huntington
Van Dorn St
Franconia-Springfield
Waterfront
Navy Yard-Ballpark
Capitol South
Federal Center SW
L'Enfant Plaza
Federal Triangle
Smithsonian
Archives
Gallery Place
Judiciary Sq
Metro Center
Chinatown
Potomac Ave
Eastern Market
Capitol Heights
Addison Rd
Benning Rd
Largo Town Center
Southern Ave
Naylor Rd
Suitland
Branch Ave
Congress Heights
Anacostia
Metro is accessible.
Map is not to scale

90 years later it has become the iconic symbol for London and is still trusted 2x more than a users' own experience.

Aren’t they great?

- Provide a shared understanding of the city
- Support the development of mental maps and personal navigation resources
- Are beautiful, historic, and iconic portraits of cities
- Make the underground system ‘come alive’ and interact with the above-ground world



Why are they missing from most trip planning applications?

- Traditional A to B trip planners do not emphasize system-level understanding of the transit network.
- They are difficult to automate, and are typically illustrated with a high level of detail and nuance by graphic designers.
- Still, there is value to incorporating schematic visual language into personalized (dynamic) trip plans.

End results are still works of art, and usability is largely subjective at this point

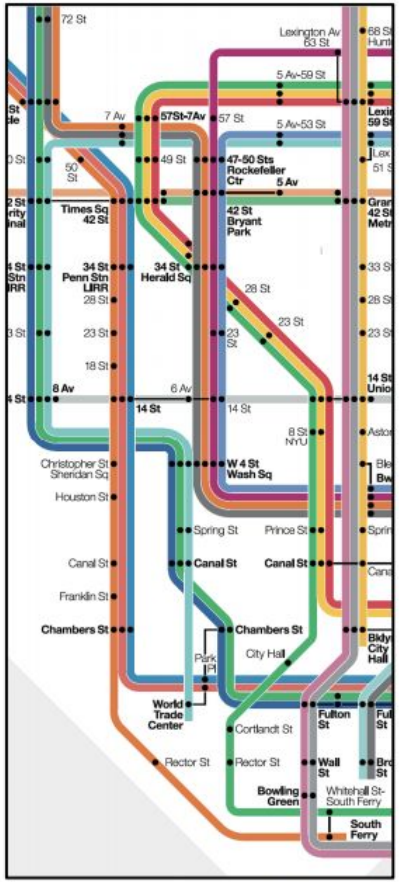


Fig. 1. Route colours

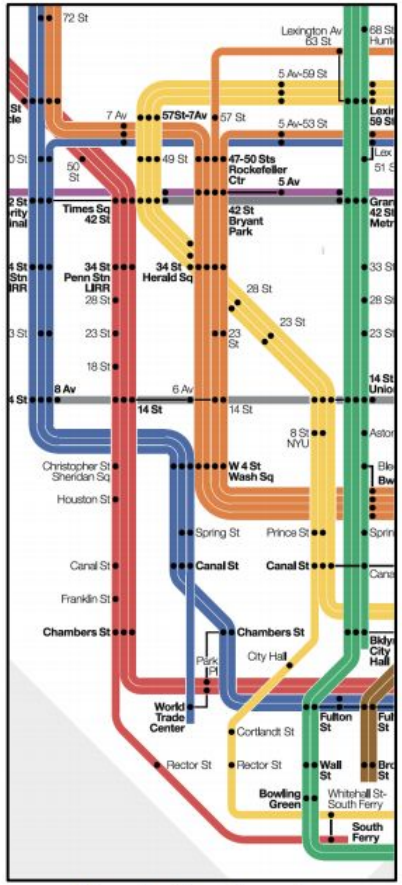


Fig. 2. Trunk colours

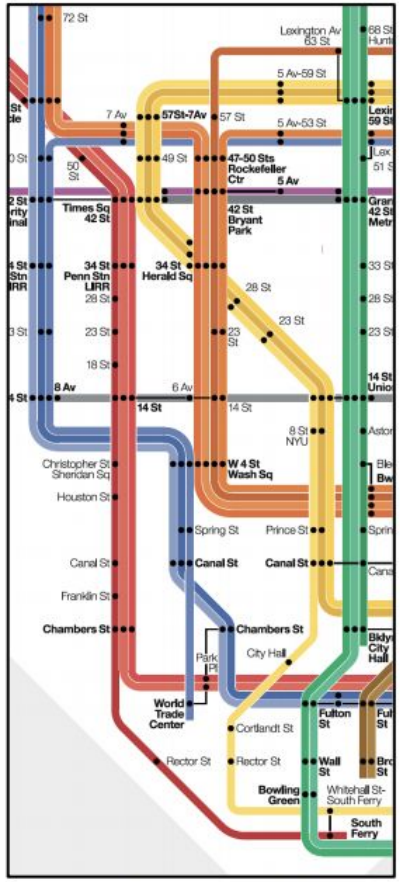


Fig. 3. Shaded colours

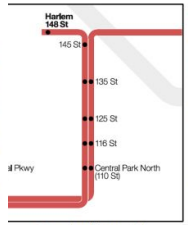


Fig. 4. Slip F, #12

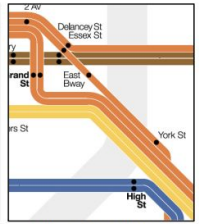


Fig. 5. Slip J, #8/#9

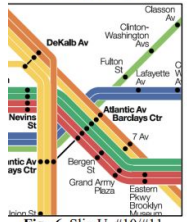


Fig. 6. Slip U, #10/#11

Fig. 7. Slip T, #14/#15

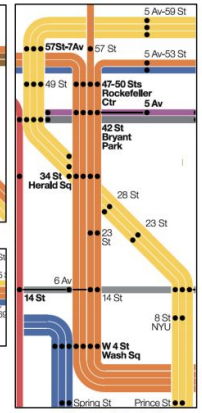
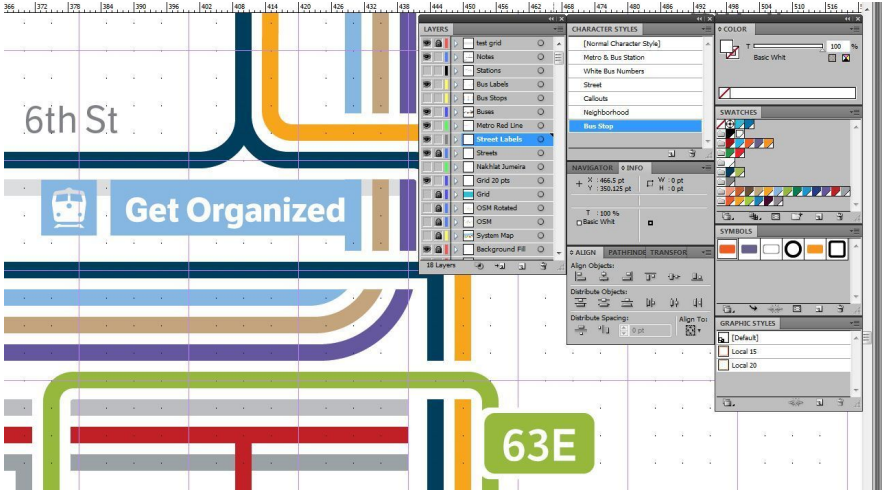
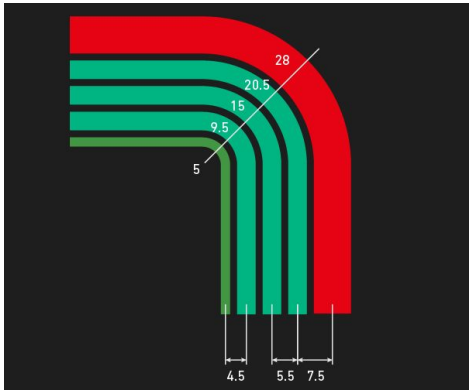


Fig. 8. Slip P, #7

Technical Challenges to Automation

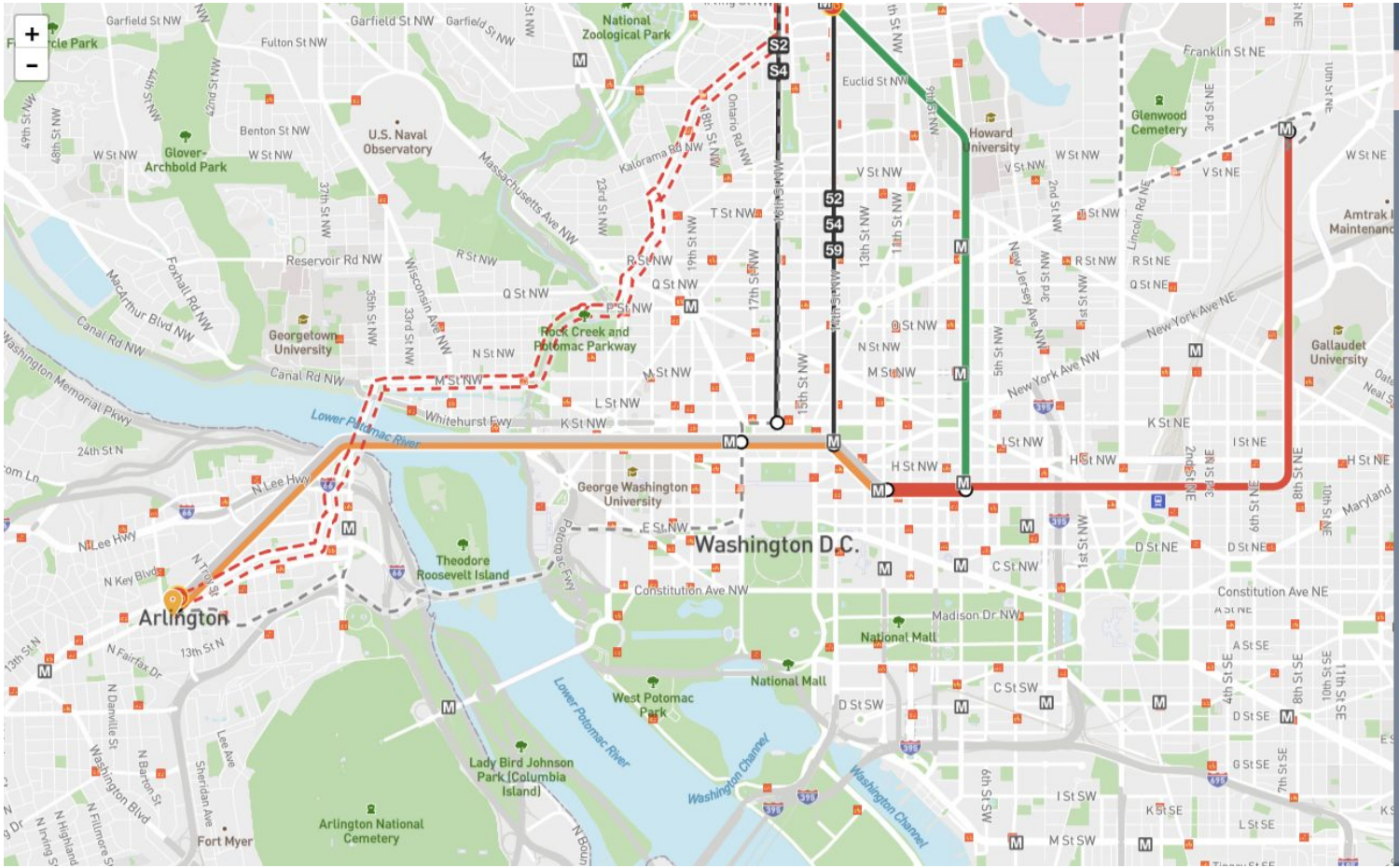
- Converting a geographic map to a schematic diagram requires distortion, how do we teach a computer to make good choices and sacrifices?
- Bundled offset parallel lines are one of the defining features of these maps





More Design and Technical Challenges

- How do we apply this style for multimodal trip plans?
- How do we keep a careful illustration up to date?
- OY the labels!
- Zoom levels



CarFreeAtoZ

New! Download the CarFreeAtoZ Mobile App for **Apple** or **Android**

Describe **your** trip

4301 13th St NW Washington, D...

2100 Wilson Blvd, Arlington, VA

Mon-Fri from 7am to 9am

More Settings

Found **11** transit, biking, driving, & walking options

bike

43 mins

5.7 mi biking

select

details

bikeshare

48 mins

5.2 mi biking

0.48 mi walking

select

details

transit $ 3.40

45 mins

8 min walking

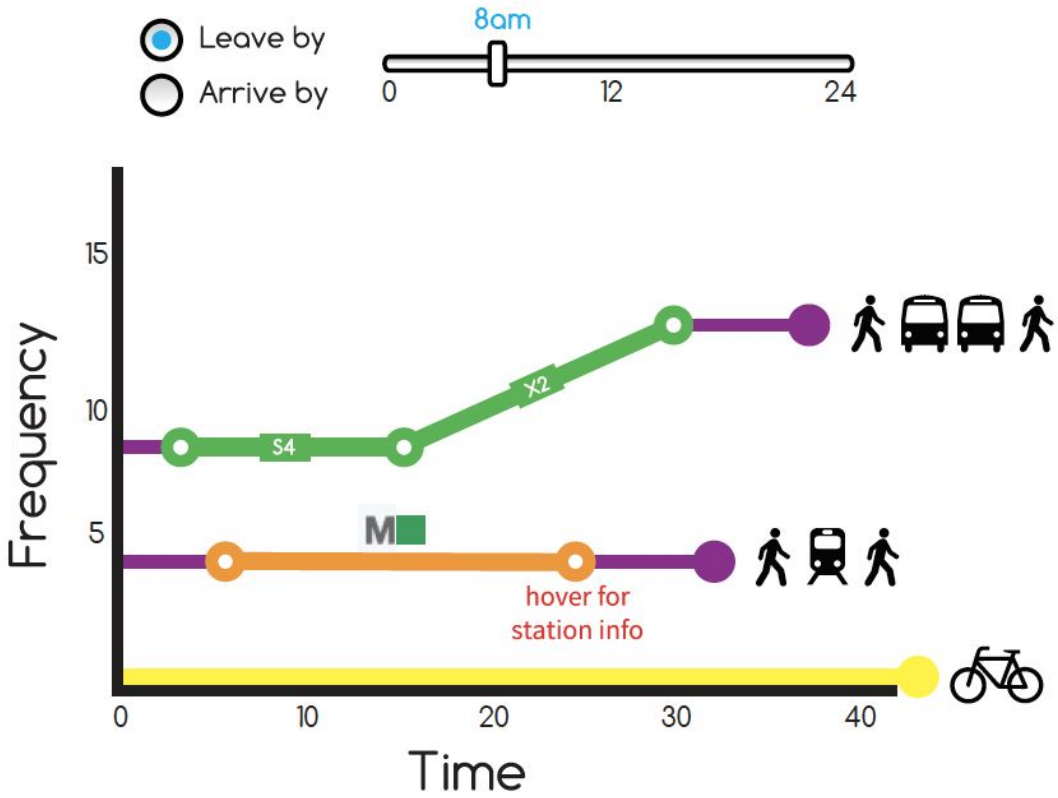
54

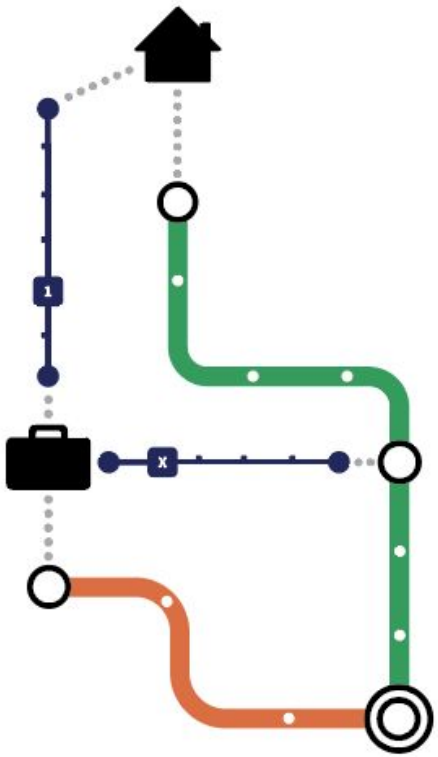
M

select

details

Graph Visualization





Arrive By Leave By 8am

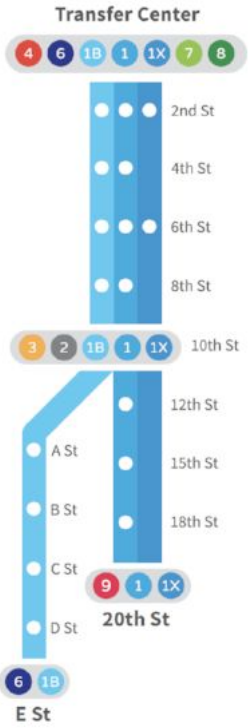
QUICKEST | FREQUENT | LESS TRANSFERS

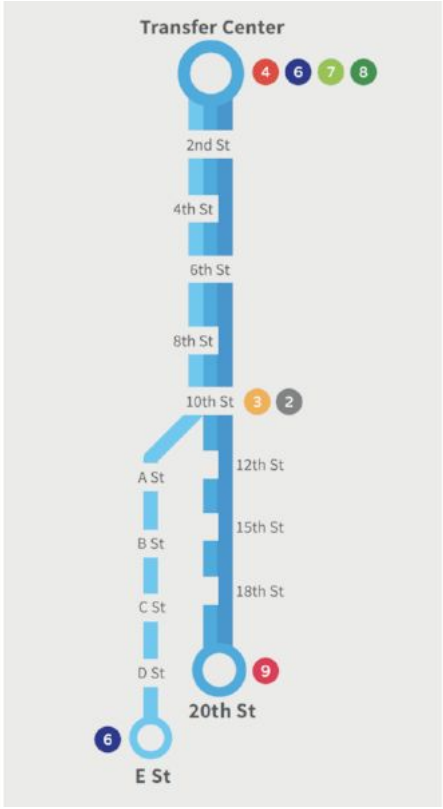
22 min 1

28 min M X

32 min M M

My Places ADD


Transfer Center
4 6 1B 1 1X 7 8
2nd St
4th St
6th St
8th St
3 2 1B 1 1X
10th St
12th St
15th St
18th St
A St
B St
C St
D St
9 1 1X
20th St
6 1B
E St


Transfer Center
4 6 7 8
2nd St
4th St
6th St
8th St
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A St
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C St
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12th St
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20th St
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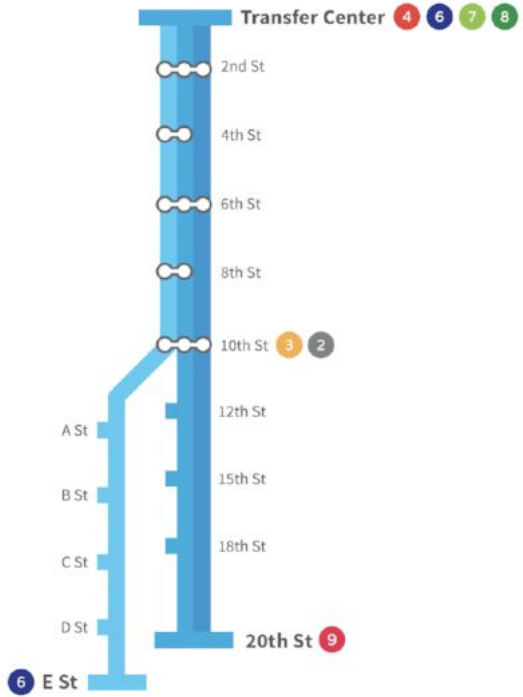
E St


Transfer Center 4 6 7 8
2nd St
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10th St 3 2
A St
B St
C St
D St
12th St
15th St
18th St
20th St 9
6 E St

DEFINITIONS

Route - a transit service consist of one or more distinct patterns

Pattern - a collection of transit trips within a route that share the same sequence and order of stops

Stop - a specific location that is served by one or more patterns. stops can be grouped together as part of a **Station**

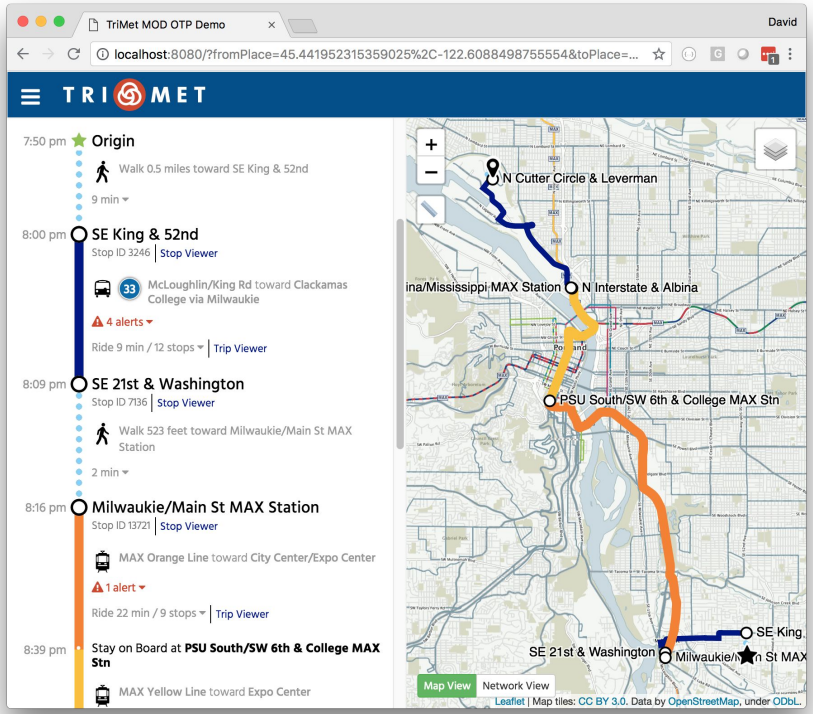
Style - a set of rules that translate conceptual inputs (the route/pattern/stop structure and any display criteria, such as zoom, temporal information, etc.) into a visual language that can be displayed on the screen

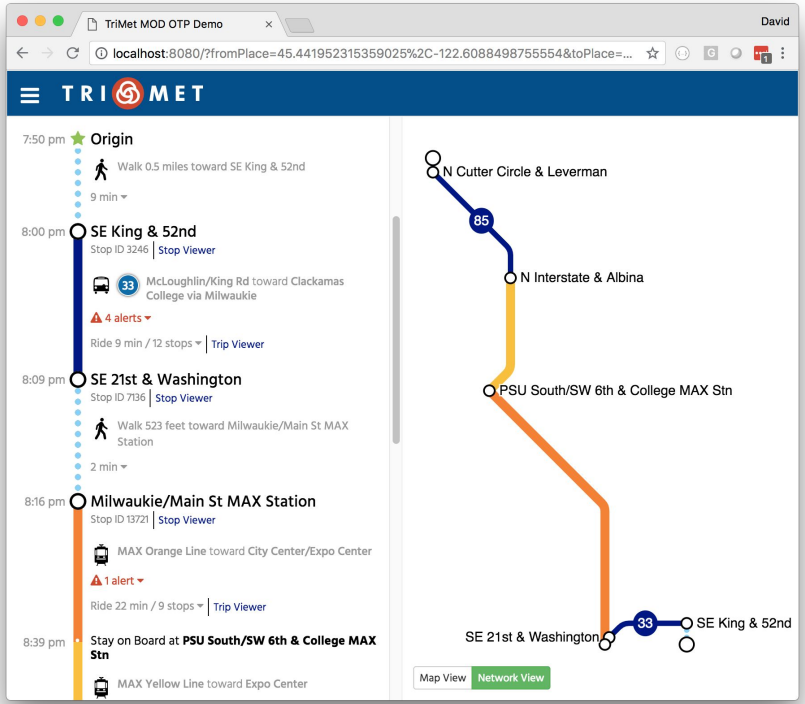
STYLE VISUAL LANGUAGE

This list attempts to enumerate all of the specific visual elements that could be affected by a style; i.e. the "outputs" of the styling process.

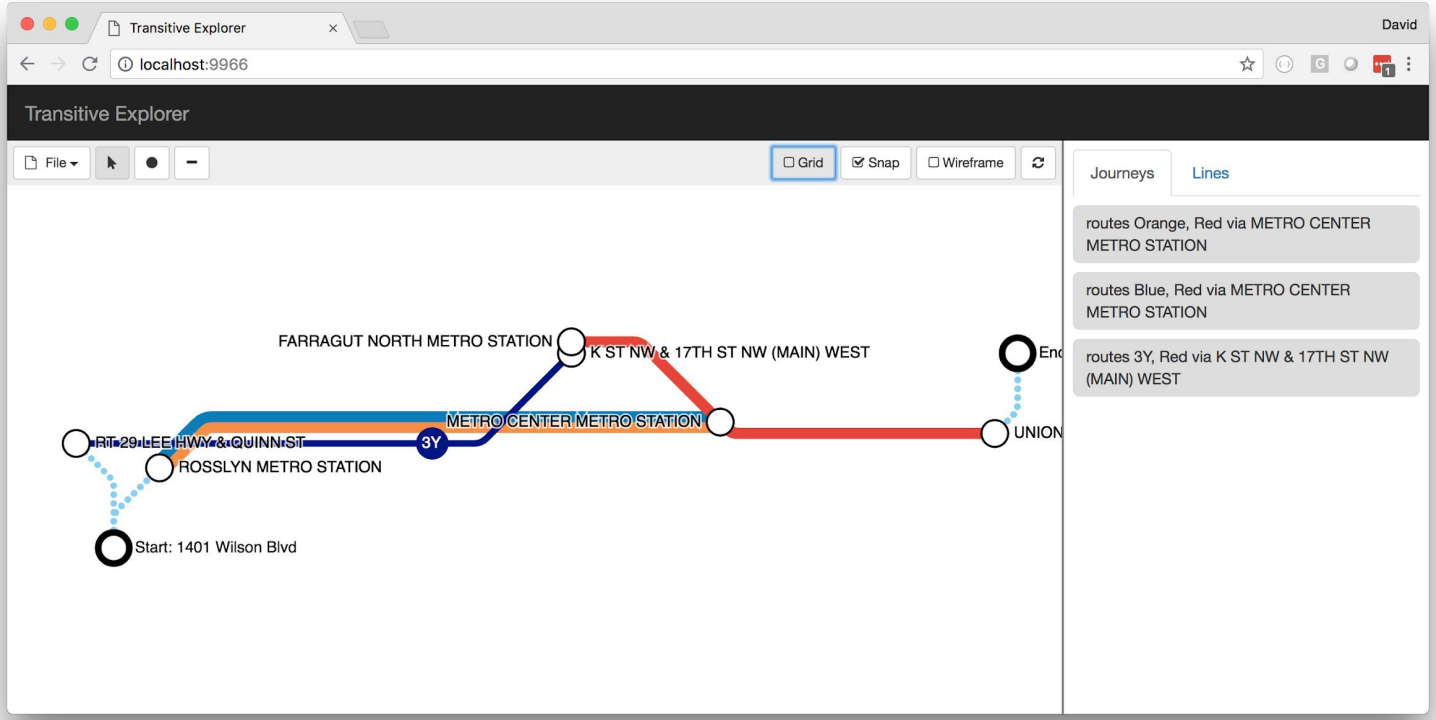
- *highlights indicate features targeted for support in iteration 1*
- *asterisks indicate features included in the mockups but that present particular implementation challenges*

Demo: TriMet MOD Demo





Demo: Transitive.js Data Explorer



Demo: Transitive.js Data Explorer

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@martarider

www.conveyal.com

https://github.com/conveyal/transitive.js

https://github.com/opentripplanner/otp-react-redux