Understanding Avon Street

January 17, 2019 | A Review of Character Along the Corridor
Presentation Outline

Review Of Context(s)  Street Design Elements  Traffic Volumes and Intersections  Diagrammatic Corridor Review  Examples  Concept Design and Preliminary Engineering Considerations

Project Progression

TRAJECTORY

Alignment  Right Values / Right Place / Right Time

Momentum  Right Resources / Right Skills / Right Solution / Right Result

Reward  Right Response / Right Execution

Energy

Time

January 2019

February - March 2019

Listen  Define  Develop  Deliver  Impact
Presentation Outline

- Review Of Context(s)
- Street Design Elements
- Traffic Volumes and Intersections
- Diagrammatic Corridor Review
- Examples
- Concept Design and Preliminary Engineering Considerations
Review of CAC Feedback on 12/20/2018

Main Concerns:

• Safety
  • Safe pedestrian routes and crossings
  • Safe bicycle routes
• Aesthetic / Character
  • Residential feel
  • Entrance Corridor elements
• Connectivity
  • Pedestrian and bicycle connections to major destinations
  • Alternative transit options
• Functionality
  • Increased intersection efficiency
  • Account for traffic demand increase from future developments
Review of Context(s) | Avon Street

Background Information:

- Suburban Context
  - mixed-use + residential area
  - separate residential community within commuting distance of a city
- Prescriptive ROW
- Transitional Corridor (3 Ways)
  1. Urban to Rural
  2. New Development
  3. Multiple Land Uses
Review of Context | Avon Street

Avon St. Land Use Categories

- Residential (Neighborhood)
- Residential (Urban Density)
- Office/ R&D/Flex/Light Ind.
- Industrial
- Mixed Use (Community)
- Institutional

> Each Street Typology has corridor design characteristics unique to it’s type. (Lane Widths for Industrial Use)

> Generally the design characteristics and their respective arrangements have to do with available Right-of-Way and design speed

In the case of this project: we’re estimating the ROW based on visual evidence.
Review of Context | Avon Street

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> Each Street Typology has corridor design characteristics unique to it’s type. (Lane Widths for Industrial Use)

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> The highest energy of the Corridor seems to be between Southern Pkwy and Mill Creek Dr.
“Streets are the lifeblood of our communities and the foundation of our […] economies. They make up more than 80 percent of all public space in cities and have the potential to foster business activity, serve as a front yard for residents, and provide a safe place for people to get around, whether on foot, bicycle, car, or transit. The vitality of […] life demands a design approach sensitive to the multi-faceted role streets play […]” NACTO (National Association of City Transportation Officials)
Street Design Elements (Kit of Parts)

ZONE:

1 - Vehicular Travel Lanes
   • Width, Quantity, Arrangement

2 – On Street Parking or Transit Stops
   • Macro Transit
   • Micro Transit

3 - Gutter and Drainage
   • Opportunity for LID Alternatives

4 – Curbing

5 – Vegetated Buffer, Verge, Utilities
   • At Margins or Center
   • Linear Park Opportunities
   • Wayfinding/Signage

6 – Pedestrian Zone
   • Sidewalk
   • Shared Use Path

7 – ROW Edges
   • Integration Zones
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Concept Design and Preliminary Engineering Considerations
Traffic Volumes and Intersections

Average Annual Daily Traffic
• **11,000** Vehicles per Day in 2017 with weekday traffic at **12,000 VPD**
• Likely to increase with new developments

VDOT Functional Classification
• Major Collector between SR-20 and City Limits
• Transitions to Minor Arterial within City
The project titled "Avon Street / Southern Pkwy. to Mill Creek" involves integrating with other projects and transitioning to the "Heart" of the Corridor. Getting this portion of the project "right" informs the rest of the project. The diagram highlights important points such as Project Integration with City, Transition to "Heart" of the Corridor, Project Integration with Biscuit Run and SR-20, and other strategic locations.
Identification of Discreet Projects

Organization of Project into Discreet work areas....
Traffic Volumes and Intersections

Mill Creek Drive to Southern Pkwy.

- Commercial Center
- Most Energy and Traffic Demand
- Two large intersections
Traffic Volumes and Intersections

Mill Creek Drive to Southern Pkwy.

- VDOT Intersection Spacing Requirements

<table>
<thead>
<tr>
<th>Highway Functional Classification</th>
<th>Legal Speed (mph)</th>
<th>Minimum Centerline to Centerline Spacing (Distance) in Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principal Arterial</td>
<td>≤ 30 mph</td>
<td>1,200, 1,500, 2,000</td>
</tr>
<tr>
<td></td>
<td>35 to 45 mph</td>
<td>1,200, 1,500, 2,000</td>
</tr>
<tr>
<td>Minor Arterial</td>
<td>≤ 30 mph</td>
<td>800, 1,000, 1,200</td>
</tr>
<tr>
<td></td>
<td>35 to 45 mph</td>
<td>800, 1,000, 1,200</td>
</tr>
<tr>
<td>Collector</td>
<td>≤ 30 mph</td>
<td>600, 900, 1,200</td>
</tr>
<tr>
<td></td>
<td>35 to 45 mph</td>
<td>600, 900, 1,200</td>
</tr>
<tr>
<td>Local Street</td>
<td>≤ 30 mph</td>
<td>1,500</td>
</tr>
<tr>
<td></td>
<td>35 to 45 mph</td>
<td>1,500</td>
</tr>
</tbody>
</table>

- Signalized intersections require more space due to abruptness and queue lengths
- Roundabouts offer harmonious interaction between intersections

750’ Center to Center
Traffic Volumes and Intersections

Design Idea:

• Two Single Lane Roundabouts at Southern Pkwy. and Mill Creek Dr.

Safety
  • Decreases crossing distance. Slows vehicles
  • Naturally integrated

Aesthetic
  • More Greenspace
  • Gateway / Landmark

Connectivity
  • Crossing in all directions
  • Creates Space for Transit

Functionality
  • Equal Priority to all directions
  • Capacity achieved through design, not signal timing.

Roundabout could allow median partial access median break depending on queue length.
Traffic Volumes and Intersections

Design Idea:

• One Single Lane Roundabout at Mill Creek Dr. and existing intersection to remain at Southern Pkwy.

• Cost Savings over Two Roundabout option

• Can still provide congestion and turning movement relief.

• Some impact on private Property
Avon Street / Mill Creek Drive Intersection

@ Mill Creek

- Providing a Roundabout at Mill Creek would create an abundance of space along the roadway and at the intersection to re-allocate parts of the ROW to pedestrians, bikes and transit.
- Approach Roadways would also benefit by the additional space.
- Creates opportunity for more greenspace and LID alternatives.
- Signals change of land-use
- Traffic Calming

Roundabout may allow median partial access median break
Avon Street / Mill Creek Drive Intersection

@ Mill Creek

- High Truck Volume based on visual evidence

- Imagine waiting at this crossing while a truck makes a turn....
Avon Street / Southern Pkwy. Intersection

@ Southern Pkwy

The Pros:
• Traffic Calming
• Gives a direct route to City
• Reduces pavement along approaches
• Contributes to a change in land-use users approach and/or depart commercial corridor
• Can work in unity with Roundabout at Mill Creek

The Cons:
• Affects Church Entrance and Private Property
Avon Street / Southern Pkwy. Intersection

@ Southern Pkwy Opt. 2

The **Pros:**
- Maintains existing conditions
- No negative impact on private property

The **Cons:**
- No Real Traffic Calming
- No priority given to any particular movement.
Avon Street / Southern Pkwy. to Mill Creek

Getting this portion of the project “right” informs the rest of the project.
Avon Street / Southern Pkwy. to Mill Creek

Getting this portion of the project “right” informs the rest of the project.

As we move into the next section we’ll see how space allocation along the corridor approaching these intersections is directly affected by the intersection geometry.
Identification of Discreet Projects

Organization of Project into Discreet work areas....
Diagrammatic Corridor Review | Phase C

Land Uses: **Urban Density** (L) and **Institutional** (R)
Approximate ROW: 65’-70’
Ideal Street Design Elements

- Traffic Counts can help inform turn lane warrants.
- Converging Chevrons for visual cue to slow-down.
- Shared Use Path Connects to I-64 Ped Bridge. Side of Avon TBD.
Diagrammatic Corridor Review | Phase D

Land Uses: **Urban Density (L)** and **Industrial (R)**
Approximate ROW: 65’-70’
Ideal Street Design Elements

- Turn-Lane Warrant Study may facilitate reduction in width and/or bus stop
- Width re-distributions dependent on intersection improvements at Southern Parkway
Diagrammatic Corridor Review | Phase E.1

Land Uses: **Mixed Use (L)** and **Residential (R)**
Approximate ROW: 80’
Ideal Street Design Elements

- Width Increases with Proximity to Intersection
- Great Linear Park Setting
Diagrammatic Corridor Review | Phase E.2

Land Uses: **Institutional (L)** and **Residential (R)**
Approximate ROW: 60’-65’
Coordinate with Cale Elem. School Project

Consider width re-distributions. Based on intersection improvements...

Cale Elementary School Sidewalk Project under-way in this area?
Diagrammatic Corridor Review | Phase F

Land Uses: **Industrial (L)** and **Residential (R)**
Approximate ROW: 55’
Ideal Street Design Elements

Review Dedicated Turn Lane Warrant

Shift Vehicular Lanes toward center. Improve Ped facilities on each side
Diagrammatic Corridor Review | Phase A

Land Uses: **Industrial (L)** and **Industrial (R)**
Approximate ROW: HIGHLY VARIABLE
   Topographically Challenged

Notes:
- Transitioning to Urban Corridor
- Transitioning to Minor Arterial
- Coordination with City Staff/Councilors
Considerations:

- Bridge Location should correspond with:
  - Future Development at PVCC Side
  - Connectivity to 5th St. Station
  - City Plans
  - Geometry of Phase A
  - Span Lengths on Either side ($$)
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Similar Project

Similarities

- Excessive Width of Existing Pavement
- Breadth of Intersection(s)
- Vehicles per day (13,000)
- Replacement of Signalized Intersection
- Lack of much needed pedestrian facilities
Similar Project

Similarities

- Abundance of Pedestrian Activity
- Desire for LID design options
- Re-Allocated Vehicular Space to Pedestrian and Bicycle Space
- Mass Transit Integration
Presentation Outline

1. Review Of Context(s)
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4. Diagrammatic Corridor Review
5. Examples

Concept Design and Preliminary Engineering Considerations
Next Steps

Define

- What are the highest priority street section elements?
- What are low priority elements?
- What community amenities are desired?

Develop

- Conceptual Alternatives
- Determine Feasibility of intersection improvement options

January 2019

February - March 2019