SSPA# 2018-1-1MS
Transportation Schedule

• Task Force Meeting #11 – April 2, 2019
  ❖ Overview of SSPA Transportation Assessment Methodology
  ❖ 2045 Baseline Conditions Results – Current Comprehensive Plan Build Out
  ❖ 2045 Total Future Conditions Results – Without Mitigation
  ❖ Potential Mitigation Measures
  ❖ Measures of Effectiveness - Mitigation Measures
  ❖ Scoring Mitigation - Categories

• Task Force Meeting #12 – April 9, 2019
  ❖ Questions from Task Force on Meeting #11 Materials
  ❖ 2045 Total Future Conditions With Mitigation Results
  ❖ Results of Scoring Mitigation Measures

• Task Force Meeting #14 – April 30, 2019
  ❖ Discussion of Transportation Mitigation and Results by Task Force
  ❖ Staff Response to Transportation Results and Proposed Mitigation
Traffic Study Process

- Determine scope, study area and methodology
- Data Collection
- Analyses
  - Trip generation
  - Trip distribution
  - Trip assignment
  - Analyses of LOS (Level of Service)/Queues
  - Problem evaluation
- Review original plan and propose any improvements
SSPA Transportation Assessment

• Built on existing 2018 weekday AM and PM peak hour traffic conditions completed by RK&K for FCDOT
• 2045 Baseline Conditions – Adopted Comprehensive Plan Land Use and Transportation Recommendations (includes Approved Entitlements)
• 2045 Total Future Conditions (Non-Mitigated) - Adopted Comprehensive Plan Land Use and Transportation Recommendations with the Two Nominations
What is a travel demand forecast model?

A systematic mathematical process for translating demand (people moving from one land use to another) and supply (available transportation systems) into projections of future travel demand.
Travel Demand Modeling – Input/Output Diagram

- Existing Land Use
- Existing Traffic
- Programmed Projects
- Existing Transportation Networks
- Future Transportation Networks
- Alternative Land Use

Travel Demand Modeling Program

Example Model Outputs:
- Performance Measures
- Traffic Forecasts
- Corridor Demand
- Trip Distributions
- Mode Distributions
- Alternative Feasibility

Example Application of Model Outputs:
- Metropolitan Long-Range Plans
- Traffic Studies (Corridor, EIS, PPTA, TIA)
- Highway Needs Assessment
- Project Prioritization
Model Limits
Study Limits

Merrifield Suburban Center
Location and Boundary

Key
- Merrifield Suburban Center Boundary
- Merrifield Commercial Revitalization Area (CRA)

Source: Fairfax County
2018 Transportation Network

Note: Numbers denote the total number of through lanes at each segment.

- **Interstate**
- **Other Principal Arterial**
- **Minor Arterial**
- **Major Collector**
- **Minor Collector**
2018 Existing Conditions
2018 Existing Conditions
Transportation Performance Measures

• Merrifield Suburban Center (MSC) Congestion Target – Minimum overall intersection LOS D
• Vehicle delays at all study intersections and assignment of LOS “Grade”
• Maximum queues at all study intersections
• Volume to Capacity ratios (V/C) on major links (Gallows Road, Lee Highway, Arlington Boulevard and Fairview Park Drive)
2045 Baseline Conditions

• Assessment includes:
  - Comprehensive Planned Land Uses throughout MSC and regional growth consistent with Council of Governments (COG) Model
  - Forecasts obtained from FCDOT and reviewed by FCDOT, VDOT and consultant team
  - Comprehensive Planned Transportation Network
  - Evaluated 26 key intersections within the MSC
2045 Baseline Transportation Network

Source: Fairfax County
2045 Baseline Conditions Results
2045 Baseline Conditions Results

Wells + Associates - April 2, 2019
Proposed Land Use Changes
Fairview Park and ICPH
2045 Total Future Conditions

• Assessment includes:
   2045 Baseline Conditions – Adopted Comprehensive Planned Land Uses throughout MSC and regional growth consistent with Council of Governments Model
   Adopted Comprehensive Planned Transportation Network
   Layered trips generated by two nominations on 2045 Baseline forecasts
   Evaluated all 26 intersections for levels of service and queuing without mitigation
2045 Total Future Results without Mitigation
2045 Total Future Results without Mitigation

Wells + Associates - April 2, 2019
# SSPA Transportation Assessment Intersection Summary Levels of Service

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Existing Condition</th>
<th>Baseline 2045</th>
<th>2045 with Nominations w/o Mitigation</th>
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<tr>
<td><strong>#</strong></td>
<td><strong>Name</strong></td>
<td><strong>AM</strong></td>
<td><strong>PM</strong></td>
</tr>
<tr>
<td>1</td>
<td>Gallows Rd/Prosperity Ave/Park Tower Dr</td>
<td>C</td>
<td>C</td>
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<tr>
<td>2</td>
<td>Gallows Rd/Lee Highway</td>
<td>D</td>
<td>E</td>
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<tr>
<td>3</td>
<td>Gallows Rd/Strawberry Ln/Porter Rd</td>
<td>C</td>
<td>D</td>
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<tr>
<td>4</td>
<td>Gallows Rd/Gatehouse Rd</td>
<td>D</td>
<td>E</td>
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<tr>
<td>5</td>
<td>Gallows Rd/Arlington Blvd</td>
<td>D</td>
<td>C</td>
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<tr>
<td>6</td>
<td>Gallows Rd/Willow Oaks Corporate Dr</td>
<td>A</td>
<td>A</td>
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<tr>
<td>7</td>
<td>Gallows Rd/Anderson Dr/Peterson</td>
<td>B</td>
<td>B</td>
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<tr>
<td>8</td>
<td>Gallows Rd/Blue Entrance/Street D</td>
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<td>B</td>
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<td>B</td>
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<td>11</td>
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<tr>
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<td>Express Lanes/Lee Highway</td>
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<tr>
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<td>Shreve Rd/Lee Highway</td>
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<td>Fairview Park Dr/Arlington Blvd. Ramps</td>
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<td>24</td>
<td>Arlington Blvd/Jaguar Trail</td>
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<td>C</td>
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<tr>
<td>25</td>
<td>Woodburn Rd/Tobin Rd</td>
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# Nominations Trip Impact

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<tr>
<td>1. Prosperity Avenue/Gallows Road</td>
<td>60 AM 76 PM</td>
<td>-3 AM 5 PM</td>
<td>3,672 AM 3,878 PM</td>
<td>2% AM 2% PM</td>
<td>0% AM &lt;1% PM</td>
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<td>2. Lee Highway/Gallows Road</td>
<td>206 AM 252 PM</td>
<td>-13 AM 18 PM</td>
<td>6,133 AM 7,000 PM</td>
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<td>3. Strawberry Lane/Gallows Road</td>
<td>206 AM 250 PM</td>
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<td>3,526 AM 4,177 PM</td>
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<td>0% AM 0% PM</td>
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<tr>
<td>4. Gatehouse Road/Gallows Road</td>
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<td>0 AM 0 PM</td>
<td>4,571 AM 5,182 PM</td>
<td>5% AM 5% PM</td>
<td>0% AM 0% PM</td>
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<tr>
<td>5. Route 50/Gallows Road</td>
<td>698 AM 989 PM</td>
<td>-20 AM 19 PM</td>
<td>5,683 AM 7,464 PM</td>
<td>12% AM 13% PM</td>
<td>0% AM &lt;1% PM</td>
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<tr>
<td>6. Willow Oaks Corporate Drive/Gallows Road</td>
<td>813 AM 1092 PM</td>
<td>-20 AM 19 PM</td>
<td>4,216 AM 6,097 PM</td>
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<tr>
<td>7. Anderson Drive/Gallows Road</td>
<td>749 AM 989 PM</td>
<td>-20 AM 19 PM</td>
<td>3,810 AM 5,692 PM</td>
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<td>0% AM &lt;1% PM</td>
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<td>8. Blue Entrance/Gallows Road</td>
<td>542 AM 690 PM</td>
<td>-20 AM 19 PM</td>
<td>4,226 AM 4,902 PM</td>
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<td>0% AM &lt;1% PM</td>
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<tr>
<td>9. Gray Entrance/Gallows Road</td>
<td>819 AM 937 PM</td>
<td>-20 AM 19 PM</td>
<td>4,259 AM 4,884 PM</td>
<td>19% AM 19% PM</td>
<td>0% AM &lt;1% PM</td>
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<tr>
<td>10. Woodburn Road/Gallows Road</td>
<td>760 AM 844 PM</td>
<td>-20 AM 19 PM</td>
<td>5,606 AM 5,870 PM</td>
<td>14% AM 14% PM</td>
<td>0% AM &lt;1% PM</td>
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<tr>
<td>11. Express Lanes/Gallows Road</td>
<td>402 AM 425 PM</td>
<td>-20 AM 19 PM</td>
<td>3,727 AM 4,572 PM</td>
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<td>12. I-495 NB Ramps/Gallows Road</td>
<td>301 AM 307 PM</td>
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<td>4,126 AM 4,355 PM</td>
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<td>13. Route 50/Williams Drive</td>
<td>200 AM 201 PM</td>
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<td>5,792 AM 5,050 PM</td>
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<tr>
<td>14. Route 50/Javier Road</td>
<td>149 AM 189 PM</td>
<td>-17 AM 21 PM</td>
<td>5,112 AM 4,805 PM</td>
<td>3% AM 4% PM</td>
<td>0% AM &lt;1% PM</td>
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<td>15. Route 50/Prosperity Avenue</td>
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<td>6,682 AM 6,460 PM</td>
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<td>0% AM &lt;1% PM</td>
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<td>16. Route 29/Cedar Lane</td>
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<td>-10 AM 13 PM</td>
<td>4,044 AM 3,930 PM</td>
<td>2% AM 3% PM</td>
<td>0% AM &lt;1% PM</td>
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<tr>
<td>17. Route 29/Prosperity Avenue</td>
<td>89 AM 114 PM</td>
<td>-10 AM 13 PM</td>
<td>4,824 AM 4,980 PM</td>
<td>2% AM 2% PM</td>
<td>0% AM &lt;1% PM</td>
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<tr>
<td>18. Route 29/Merrilee Drive</td>
<td>89 AM 114 PM</td>
<td>-10 AM 13 PM</td>
<td>3,324 AM 3,910 PM</td>
<td>3% AM 3% PM</td>
<td>0% AM &lt;1% PM</td>
</tr>
<tr>
<td>19. Route 29/Express Lanes</td>
<td>57 AM 62 PM</td>
<td>-26 AM 32 PM</td>
<td>3,876 AM 4,447 PM</td>
<td>1% AM 1% PM</td>
<td>0% AM &lt;1% PM</td>
</tr>
<tr>
<td>20. Route 29/Shreve Road</td>
<td>30 AM 38 PM</td>
<td>-27 AM 33 PM</td>
<td>3,698 AM 4,424 PM</td>
<td>1% AM 1% PM</td>
<td>0% AM &lt;1% PM</td>
</tr>
<tr>
<td>21. Route 29/Fairview Park Drive</td>
<td>30 AM 38 PM</td>
<td>-39 AM 47 PM</td>
<td>4,197 AM 5,044 PM</td>
<td>1% AM 1% PM</td>
<td>0% AM &lt;1% PM</td>
</tr>
<tr>
<td>22. Fairview Park Drive/Fairview Park Place</td>
<td>0 AM 0 PM</td>
<td>-104 AM 126 PM</td>
<td>2,536 AM 2,746 PM</td>
<td>0% AM 0% PM</td>
<td>-4% AM 5% PM</td>
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<tr>
<td>23N. Route 50/Fairview Park Drive (North)</td>
<td>0 AM 0 PM</td>
<td>-68 AM 102 PM</td>
<td>2,632 AM 3,102 PM</td>
<td>0% AM 0% PM</td>
<td>-5% AM 3% PM</td>
</tr>
<tr>
<td>23S. Route 50/Fairview Park Drive (South)</td>
<td>0 AM 0 PM</td>
<td>-78 AM 92 PM</td>
<td>1,372 AM 1,772 PM</td>
<td>0% AM 0% PM</td>
<td>-6% AM 5% PM</td>
</tr>
<tr>
<td>24. Route 50/Jaguar Trail</td>
<td>119 AM 151 PM</td>
<td>-17 AM 21 PM</td>
<td>6,952 AM 6,732 PM</td>
<td>2% AM 2% PM</td>
<td>0% AM &lt;1% PM</td>
</tr>
<tr>
<td>25. Tobin Road/Woodburn Road</td>
<td>74 AM 95 PM</td>
<td>0 AM 0 PM</td>
<td>1,464 AM 1,665 PM</td>
<td>5% AM 6% PM</td>
<td>0% AM 0% PM</td>
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Mitigation

“The action of reducing the severity, seriousness or painfulness of something.”

In Traffic Engineering terms, “mitigation” is the process that estimates the vehicle trips associated with a proposed land use in a particular location then requires that new land use to “lessen or reduce” the resultant traffic impact through roadway capacity increases or decreases in demand in order to maintain auto levels of service (LOS).
Mitigation

• Potential measures identified to achieve minimum overall LOS “D”

• Tiered approach

  ❖ Tier 1 – No right-of-way impacts (signal optimization, modification to lane use, trip distribution, wayfinding, etc.)
  ❖ Tier 2 – Minimal right-of-way impacts (additional or new turn lanes, through lanes)
  ❖ Tier 3 – Significant or large scale improvements (improvements serving broader area, new grid links)
Identification of Potential Mitigation Measures

• Reviewed 2045 Total Future Forecasts and resultant levels of service without mitigation

• Applied accepted Traffic Engineering practices to identify potential mitigation measures such as:
  ❖ Provide left-turns in the median of all divided highways
  ❖ Volume of turning movements – for example locations with more than 300 left-turns indicates a potential need for dual lefts
  ❖ Intersections with split phased signals should be evaluated for timing changes and/or optimizations
Existing Traffic Issues

Source: Google and Magister, Court of Camelot
Existing Traffic Issues

- Route 50 Operations
- I-495 Operations
- Little River Turnpike

Weave

Bottleneck

5 Lanes (1 Aux. + 4 Thru)

4 Lanes

Bottleneck
Existing Traffic Issues

Route 50 and Gallows Road Operations

Merge

I-495 Access

Little River Turnpike

Route 50

Merge

I-495 Access

Merge
ICPH Access

- Unique Site
- Planning Level Study
- Multiple Roadway Links
- Various Intersections
- Several Concepts
Identified Improvements

- Improve Merge
- Remove Weave
- Facilitate Gallows Road Traffic

- Planning Level Study
- Implementation of Mitigation Next Meeting
Identified Improvement

• Enhances I-495 and Route 50 Operations
• Increases Safety
Identified Improvement

- Remove Bottleneck

  - Adds Approx. 1,800 Vehicles/Hour Capacity
Potential Improvement Locations
Screening Matrix

• Developed by Dewberry in consultation with FCDOT and VDOT

• Considers two broad categories
  ❖ Impacts
  ❖ Benefits

• Categories weighted on numerical scale
Screening Matrix

• Impacts of mitigation measures
  - Access to existing/proposed parcels
  - Right-of-way acquisition
  - Environmental elements
  - Park land encroachment
  - Significant utility impacts
  - Cost to implement
Screening Matrix

• Benefits of mitigation measures
  ❖ Traffic operations
  ❖ Bicycle and pedestrian connectivity
  ❖ Roadway connectivity
Task Force Meeting #12 – April 9, 2019

• 2045 Total Future Conditions Analysis Results – With Mitigation
• Screening Matrix results
• ICPH Mitigation Package
• Fairview Park Mitigation
• Questions/Comments from Task Force
Questions?