Loisdale Road Corridor Transportation Study

Final Report

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September 30, 2009

Loisdale Road Corridor Transportation Study

Loisdale Road is a minor arterial roadway running east of and parallel to Interstate 95 in the Springfield area of Fairfax County. At its northern end, Loisdale Road connects to Franconia Road at its intersection with Commerce Street and ramp entrances to northbound and southbound I-95. At its southern end, Loisdale Road connects to Newington Road near its intersection with the Fairfax County Parkway and the I-95 (Newington) interchange ramps.

As a minor arterial roadway, Loisdale Road carries a mix of through and locally-generated traffic. Along its northern segments, Loisdale Road traverses the commercial area of Springfield, which includes hotels, retail and office development, and the Springfield regional shopping mall, which has been recently replanned and is currently undergoing redevelopment into a mixed-use town center at an overall floor area ratio (FAR) of 1.87. To the south, Loisdale Road serves as a frontage road providing access to industrially zoned and industrially developed properties. Between these segments, Loisdale Road provides access to the GSA Warehouse area and Springfield industrial park, an area planned for redevelopment to residential, institutional, and research and development uses at higher densities (reflecting its proximity to the Franconia-Springfield Metro Station), and the Loisdale Estates, a stable single family detached residential community consisting of 788 homes.

Background

With the advent of the Base Realignment and Closure Act of 2005 (BRAC), up to 18,000 new military jobs are planned to be relocated to the I-95 corridor in Northern Virginia. Most of these jobs will locate to the Springfield area. In addition to these military jobs, an indeterminate number of contractor jobs are expected to be attracted to Springfield to take advantage of its proximity to the new BRAC employment. In response to the BRAC action, planning activities have been underway in Springfield for a number of years to accommodate the anticipated growth and address impacts.

During the 2008 BRAC Area Plans Review (APR) process, three APR nominations were submitted to replan properties located along Loisdale Road, totaling 141 acres and 7,890,000 square feet of commercial office use. Given the impacts of the proposed development and policy and planning issues raised by these proposals, County staff recommended that these nominations be deferred into a special land use and transportation study, and the BRAC APR Task Force supported the staff recommendation. One APR nomination was later withdrawn. Also under consideration during this period were two BRAC APR nominations in the GSA Warehouse area (Springfield industrial park). If adopted, these nominations (1FS and 2FS) would also add traffic to the Loisdale Road corridor that would need to be taken into account in studies to replan the corridor.

In January 2009, the Board of Supervisors authorized the Loisdale Road Study to consider additional development in the portion of Land Unit K in the I-95 corridor Industrial area, west of the CSX railroad tracks between Loisdale Park and Newington Road, for office and private recreation uses. The study was asked to consider the impacts of a campus-style office complex and private recreation uses to replace a portion of the industrial-zoned land in the corridor. The study was asked to evaluate the adequacy of the existing and planned transportation network in the Loisdale Road corridor, and determine needs for improvements to accommodate the proposed development. The study was directed to be completed within a nine month timeframe.

Scenarios Tested

County staff developed a number of scenarios to examine the impacts of existing and future development on Loisdale Road. These scenarios included:

- Existing Development Traffic – Provides an assessment of current conditions, and a baseline against which to measure future conditions

- Comprehensive Plan Buildout – Provides an assessment of future conditions under the current Plan and a future baseline against which to measure the traffic impacts of proposals to amend the land use plan

- Comprehensive Plan Buildout Plus APR Nomination(s) – Provides an assessment of future traffic with the addition of the APR nomination(s) at the GSA Warehouse area

- Comprehensive Plan Buildout Plus APR Nomination(s) Plus Site – Provides an assessment of future traffic with the addition of the proposed land use at the site. This scenario represents the totality of traffic assuming that no further amendments are made to the Comprehensive Plan in the Loisdale Road corridor.

These scenarios were tested, and the findings are described below.

In addition to testing the above scenarios, several sensitivity analyses were also performed after the scenario tests were completed. These included examining the impacts of a change to the land use assumptions for the proposed site development, and examining the impacts of a change to the planned transportation network. These are also described in greater detail below.

Impact Assessment Methodology

The methodology for undertaking the impact assessment included collecting and assembling current traffic count data (2008) for intersections in the corridor, determining capacities at a planning level for the subject road segments (based on their functional classification) for both existing and future conditions, identifying intersection geometrics based on current geometry and/or future improvement plans, performing trip generation analyses for planned and proposed future development under each scenario, and developing peak hour traffic forecasts (assignments) for each scenario.

A combination of data sources were utilized to conduct the analysis. These included: Springfield Mall Town Center traffic impact studies, VDOT Chapter 527 traffic impact studies submitted for APR nominations in the corridor, VDOT and FCDOT traffic databases, and information and findings from the County's Springfield Connectivity Study, WMATA Franconia-Springfield Station Vision Plan, GSA Warehouse Area traffic studies, and BRAC DEIS and EIS traffic studies and other documents.

For each scenario the following was determined:

- Peak hour weekday traffic (AM and PM) on road links in the study area
- Volume-to-capacity (v/c) ratios on study area road links
- Intersection level-of-service (LOS) at study area intersections.

A layered approach was used to assess impacts for each of the scenarios. First, existing traffic conditions were assessed based on traffic counts undertaken by the FCDOT and by traffic consultants who had prepared VDOT Chapter 527 traffic studies for proposed BRAC plan amendments. Second, current year traffic was grown based on growth rates derived from modeling of Comprehensive Plan development buildout totals. Future year scenarios above the Comprehensive Plan buildout level were developed by generating new traffic from the proposed development areas using approved Institute of Transportation Engineers (ITE) methodology, and adding it to the previous volumes derived. The new peak hour trips were split and assigned to the local area network using trip distribution factors derived from the Fairfax County transportation model.

The study area included intersections and roadway segments (or links) in the Loisdale Road corridor and on adjacent approach roadways. The impact assessment did not extend to regional facilities beyond the corridor, e.g. Interstate 95, Fairfax County Parkway, and the Franconia-Springfield Parkway.

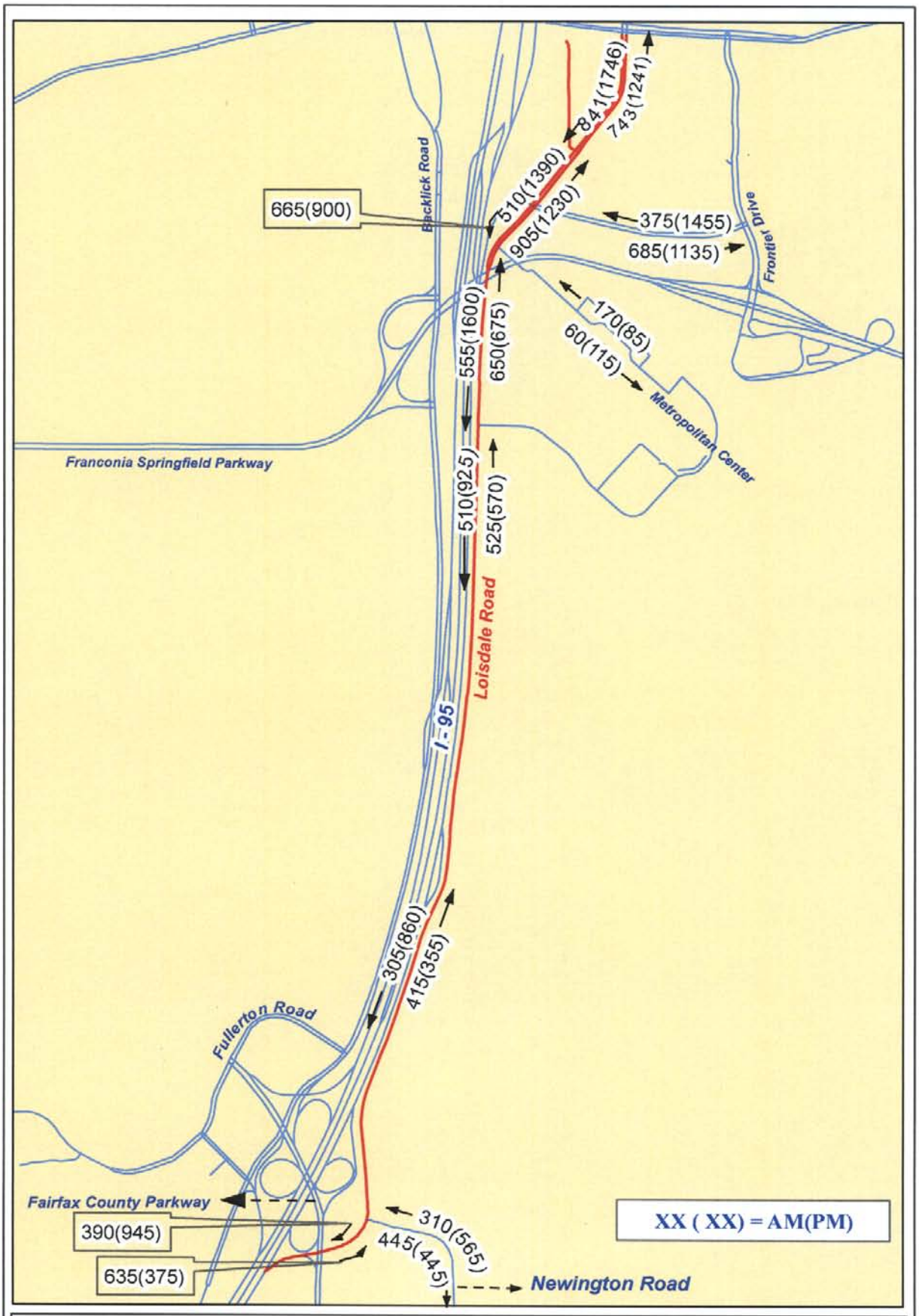
After AM and PM peak hour volumes were estimated for each scenario, volume-to-capacity ratios for study area roadway links were calculated by dividing the link volume by the (existing or planned) capacity of the roadway. Planning level link capacities were established for each facility type analyzed (see Appendix A for description). Applying this methodology, v/c ratios were derived for each roadway link in the subject area. A v/c ratio of .90 to .99 denotes a LOS E on the subject link, indicating high levels of traffic congestion (unstable flow). A v/c of 1.0 or greater denotes a LOS F (or failing) condition, indicating very high levels of traffic congestion and poor conditions unacceptable to most drivers. A v/c ratio of 1.0 or greater indicates a forecast level of traffic on a facility that would result in severely imbalanced ("oversaturated" or "breakdown") conditions under the roadway capacity provided in the County's current Transportation Plan (see Appendix B for a more complete description of LOS letter codes).

Intersection AM and PM peak hour levels of service (LOS) for the study area intersections were calculated using existing VDOT signal timings. Calculation of future year LOS at study area intersections was based on the traffic forecasts and existing or planned intersection geometrics. Intersection capacity analysis was based on an assumption of the existing intersection geometrics without mitigation, unless a mitigation plan had been adopted through a recent development plan approval.

Scenario 1 – Existing Peak Hour Traffic

The assessment of existing traffic provides a baseline against which to measure future conditions. Figure 1 shows the current AM and PM peak hour traffic volumes in the Loisdale Road study corridor. As shown, volumes exceed 1200 vehicles per hour (vph) in the PM peak hours in both directions north of Spring Mall Road. The volume exceeds 900 vph in the PM peak hour southbound direction from Spring Mall Road. In the PM southbound direction approaching Newington Road, the volume is approaching 900, which is the single lane LOS E/F threshold capacity for a minor arterial type B roadway as defined in the County's Transportation Plan. .

Figure 2 shows the existing volume–to-capacity (v/c) ratios derived for the study corridor roadway links. As Figure 2 demonstrates, v/c ratios are at an acceptable level for many sections of the study corridor. However, the existing v/c ratio already exceeds 1.0 in the PM southbound direction in the GSA Warehouse area south of Metropolitan Center Drive, indicating a LOS F condition. The v/c ratio is at .95 (LOS E level) at the PM southbound approach to Newington Road, and .94 (LOS E level) in the PM eastbound direction along Spring Mall Road. Other links in the study area corridor appear to have adequate capacity to support existing traffic conditions at an acceptable level of service based on this analysis.



Loisdale Road Corridor Study

Figure 1- Existing Peak Hour Traffic

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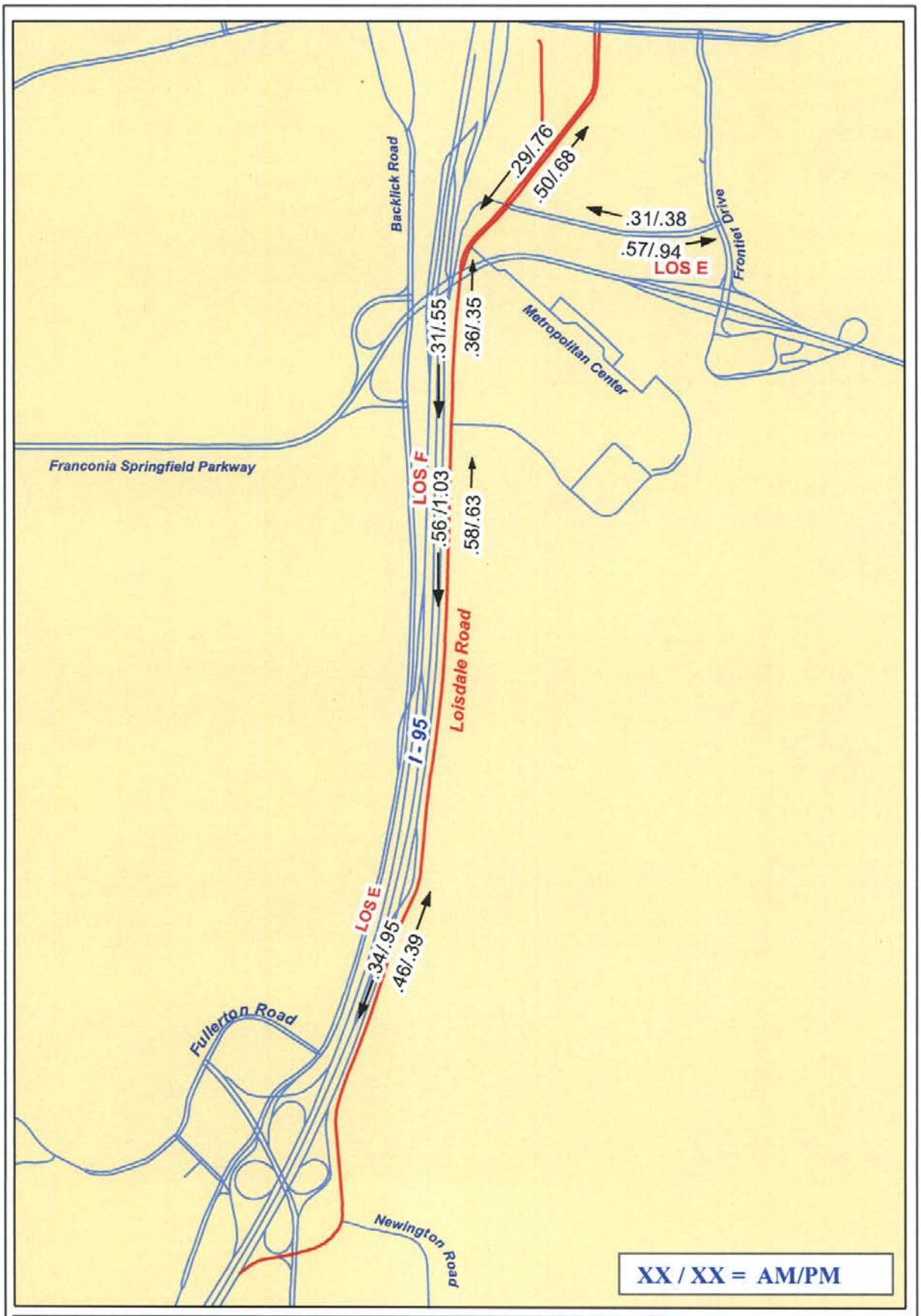

Loisdale Road Corridor Study

Figure 2- Existing Link Analysis -Volume to Capacity Ratios

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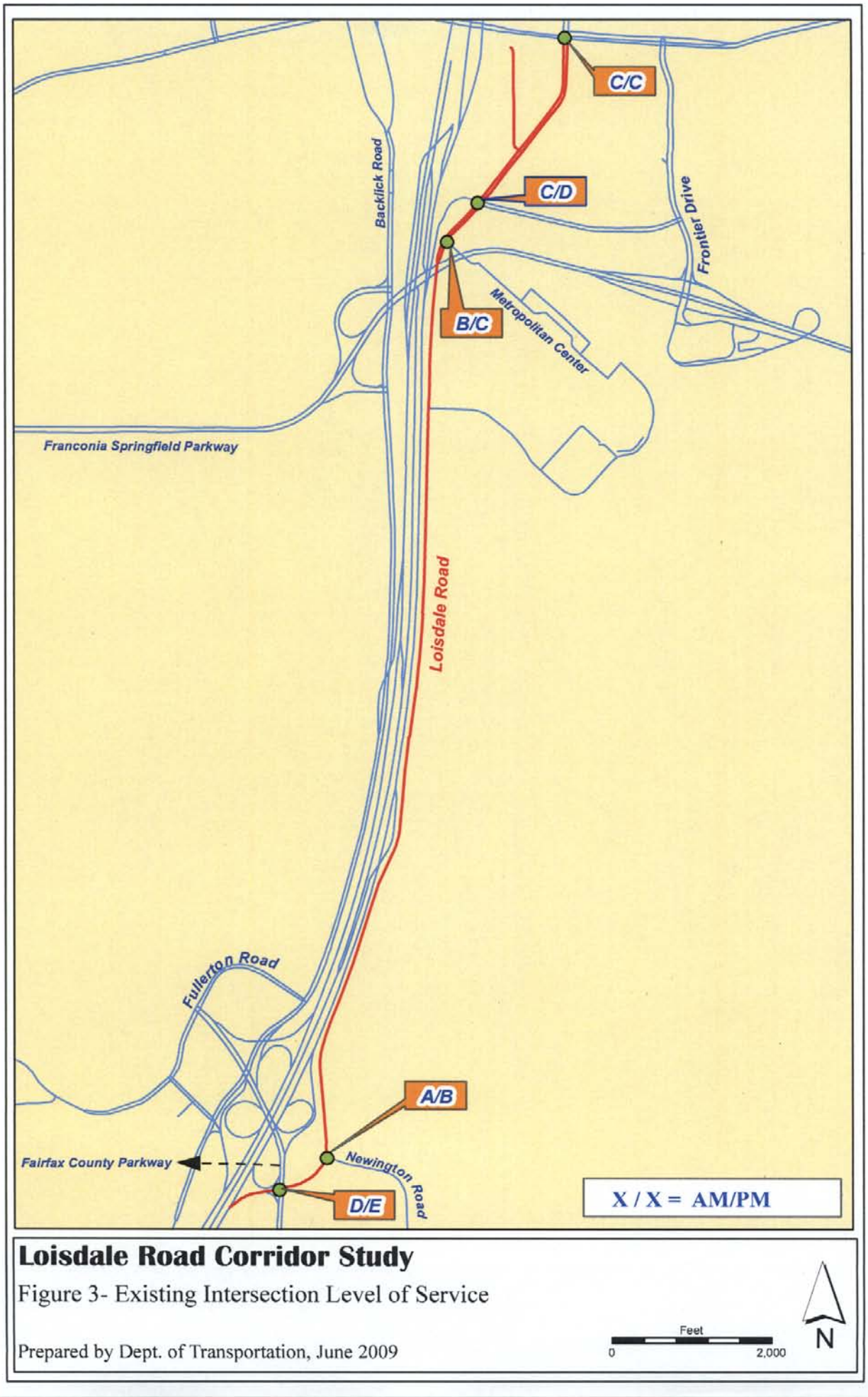

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Figure 3- Existing Intersection Level of Service

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Figure 3 shows the existing AM and PM peak hour LOS for intersections in the Loisdale Road corridor. As shown, most intersections are currently operating at an acceptable LOS in both the AM and PM peak hours, with the exception of the Newington Road intersection with the Fairfax County Parkway and I-95 off-ramp. That intersection is currently already operating at LOS E in the PM peak hour.

Scenario 2 – Comprehensive Plan Buildout Traffic

Figures 4 through 6 depict conditions under buildout of the County's current Comprehensive Plan for the Loisdale Road corridor. This scenario provides an assessment of future year traffic conditions (approximately 2030 timeframe) as the land use in the corridor is built to its potential under the Comprehensive Plan. Traffic generated by the existing and planned land uses is assessed against the planned capacity of the transportation network in the study corridor. In the Comprehensive Plan, Loisdale Road is planned to be widened to 4 lanes between Spring Mall Road and Springfield Center Drive (i.e., along the GSA Warehouse area), and to remain 2 lanes south of this area to Newington Road. In the Springfield commercial area north of Spring Mall Road, Loisdale Road is planned as a 4 lane section widening to 6 lanes as it approaches Franconia Road north of Loisdale Court. The segments north of Spring Mall Road are not planned for further widening (other than turn lanes and/or access improvements associated with the Springfield town center redevelopment).

The Comprehensive Plan Buildout Scenario determines the adequacy of the County's current Comprehensive Plan. It also provides a future year baseline against which to measure the BRAC plan amendment proposals, and establishes whether additional capacity would be needed in the County Transportation Plan.

Figure 4 shows the peak hour traffic volumes forecast in the Loisdale Road corridor under the Comprehensive Plan buildout conditions. As shown, volumes are substantially higher in both directions, particularly in the PM southbound direction. Volumes are also higher along Newington Road and along Spring Mall Road, with the eastbound volumes significantly higher along Spring Mall Road. In the PM condition, more southbound traffic is oriented to Loisdale Road, since the only other southbound exit from the corridor is at the I-95 entrance ramp located at the northern end of the corridor at Franconia Road.

Figure 5 shows the calculations of volume-to-capacity ratios in the study corridor under the current Plan buildout condition. As demonstrated, v/c ratios reveal poor LOS at many locations along the corridor. Poor LOS is most pronounced in the PM southbound direction along Loisdale Road, and AM and PM eastbound direction along Spring Mall Road. Figure 6 shows the corresponding intersection LOS. Of the five intersections analyzed, three display LOS E or F conditions during one or both peak hours. In the middle of the corridor, the intersection of

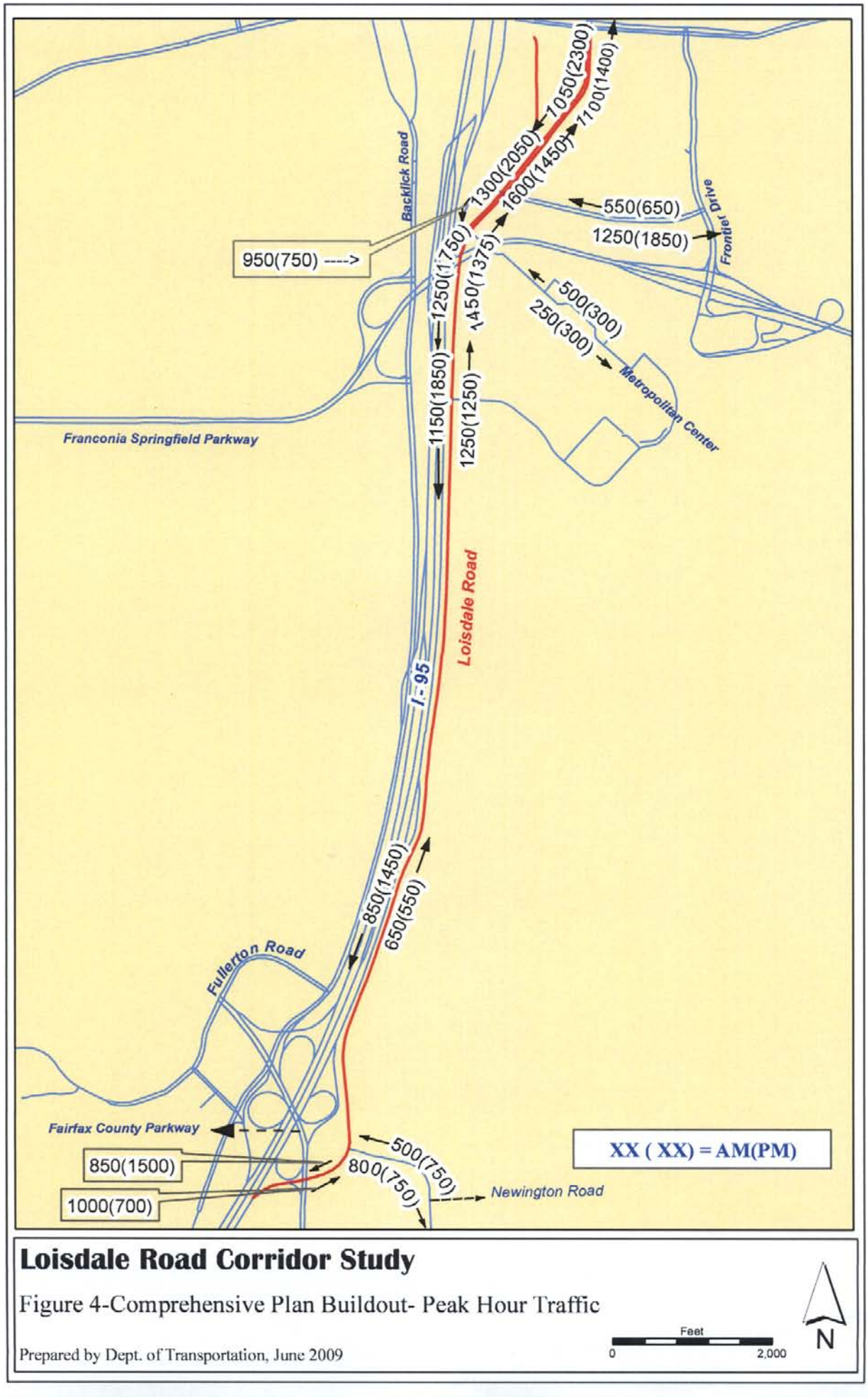

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Figure 4-Comprehensive Plan Buildout- Peak Hour Traffic

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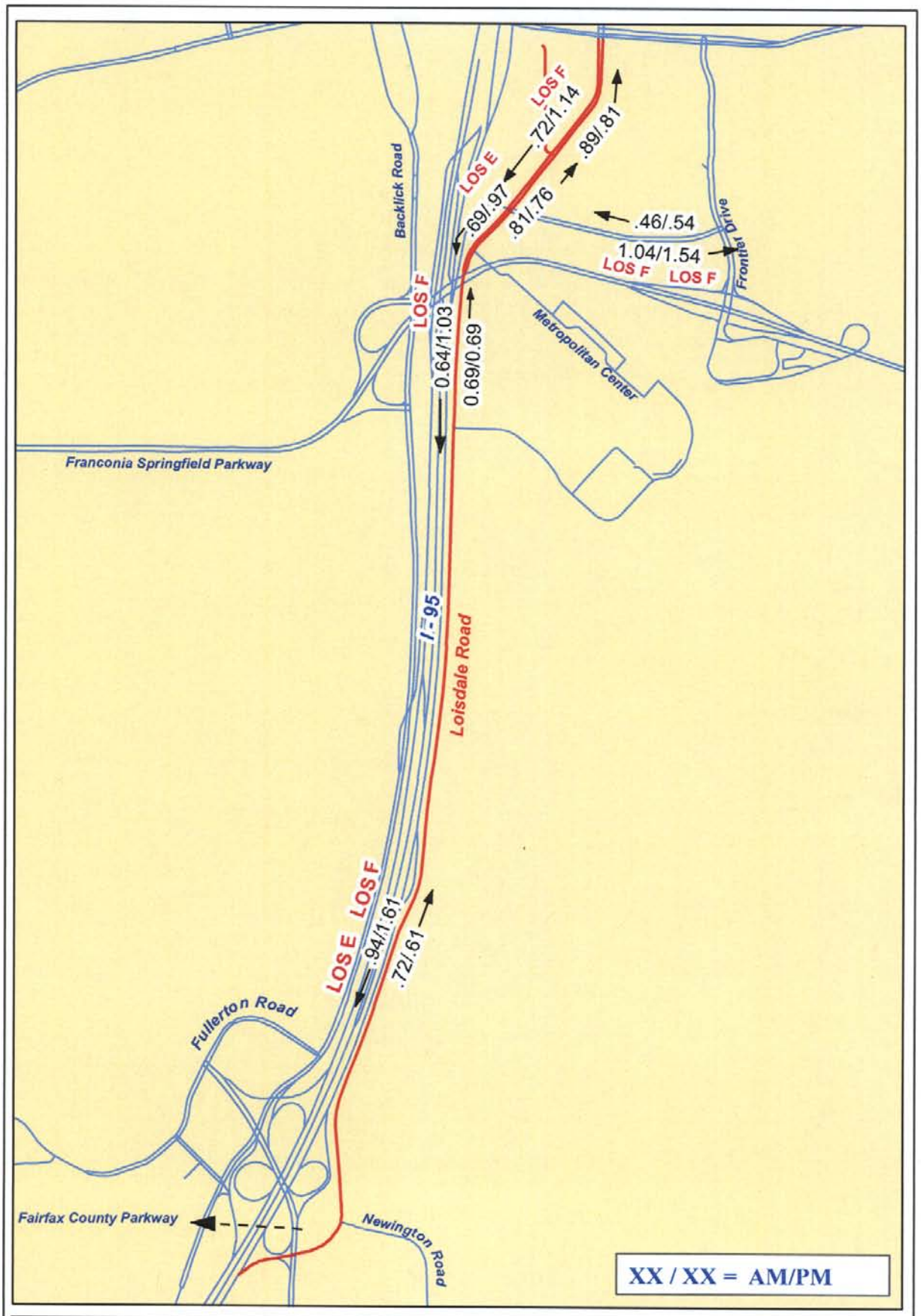

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Figure 5- Comprehensive Plan Build Out- Volume to Capacity Ratios

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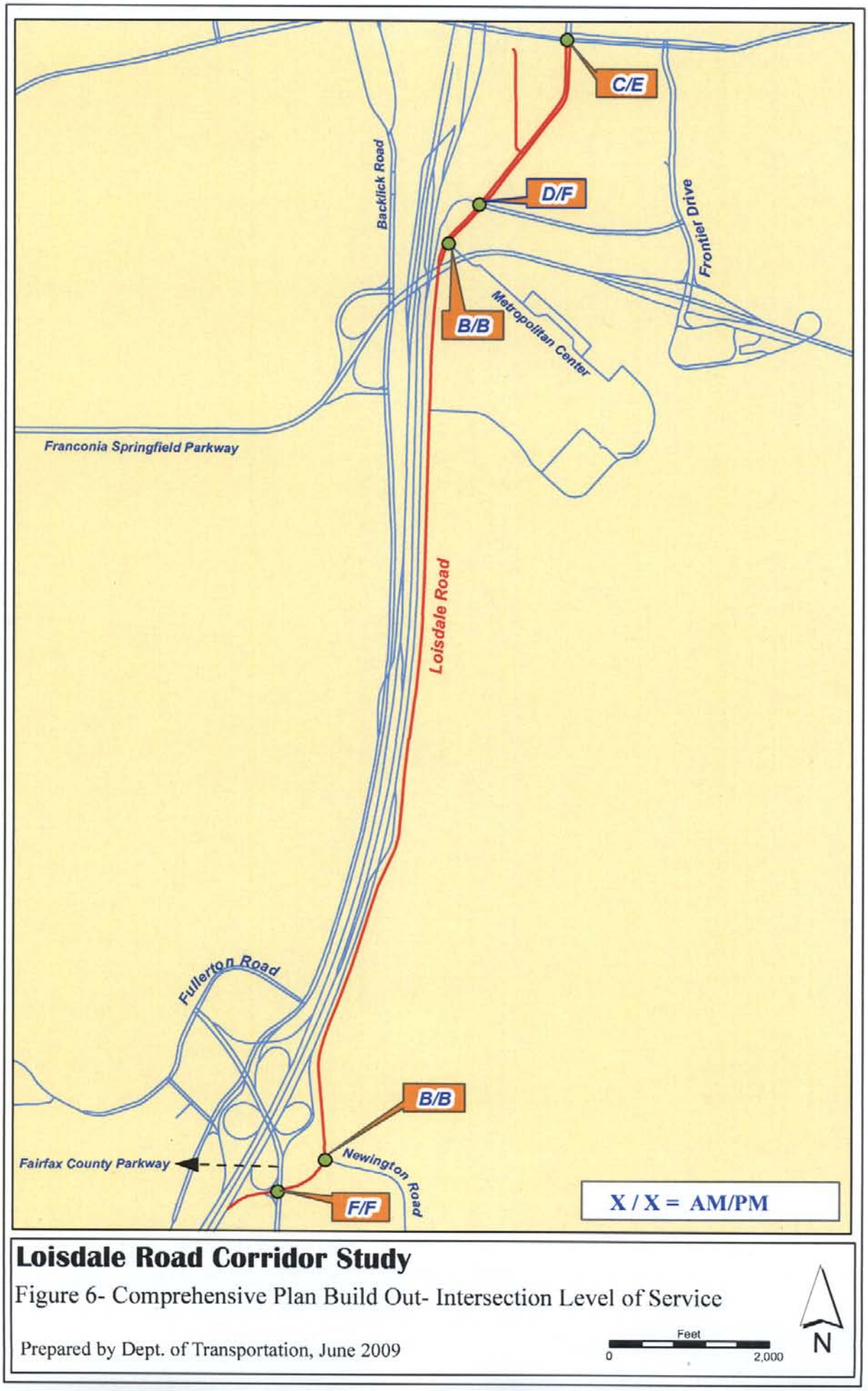

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Figure 6- Comprehensive Plan Build Out- Intersection Level of Service

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Loisdale Road/I-95 off-ramp/Spring Mall Road shows a LOS F in the PM peak hour. At the southern end of the corridor, the intersection of Newington Road with Fairfax County Parkway/I-95 off-ramp is shown to fail during both the AM and PM peak hour conditions.

Scenario 3 – Comprehensive Plan Buildout Plus APR Nomination Traffic

Under this scenario, traffic from the recently adopted Springfield Town Center plan and BRAC APR nomination 2FS at the GSA Warehouse area is added to the Comprehensive Plan buildout volumes. Figure 7 shows the resulting AM and PM peak hour traffic volumes. Figure 8 shows the resulting v/c ratios in the corridor for the various links analyzed. As shown, there is some further degradation of the LOS on various links from LOS E to LOS F, LOS F links display a greater volume-to-capacity imbalance (i.e., poorer performance), and several links that were previously shown to be operating at an acceptable level have now degraded to LOS E conditions. This is true of the northbound AM condition north of Newington Road, as well as the northbound PM condition approaching Spring Mall Road.

Figure 9 displays the intersection LOS for this scenario. Compared to the results for the Comprehensive Plan buildout scenario (Figure 6), LOS is shown to degrade in one or both peak hours at several of the intersections analyzed.

Scenario 4 – Comprehensive Plan Buildout Plus APR Nomination Plus Site Traffic

The Comprehensive Plan Buildout Plus APR Nomination Plus Site Traffic scenario assesses the impacts of adding site generated traffic from the 1 million square feet of office development proposed north of Newington in Land Unit K, to the background traffic generated by the current Comprehensive Plan plus APR nomination 2FS. This scenario represents the totality of traffic generated in the corridor, assuming no further amendments to the County's Comprehensive Plan are adopted in the future. As such, scenario 4 represents the "worst case" scenario for traffic impacts in the corridor.

Figure 10 shows the site generated peak hour traffic. Site traffic was generated by application of Institute of Transportation Engineers (ITE) trip generation rates to the 1 million square feet of office development proposed for the site (see Appendix for trip generation analysis). The Fairfax County transportation model was used to determine the assignment of site traffic north and south along the Loisdale Road corridor, and at the east/west split at Newington Road and the north/east split at Spring Mall Road intersections, respectively. As Figure 10 demonstrates, the proposed office development generates a considerable

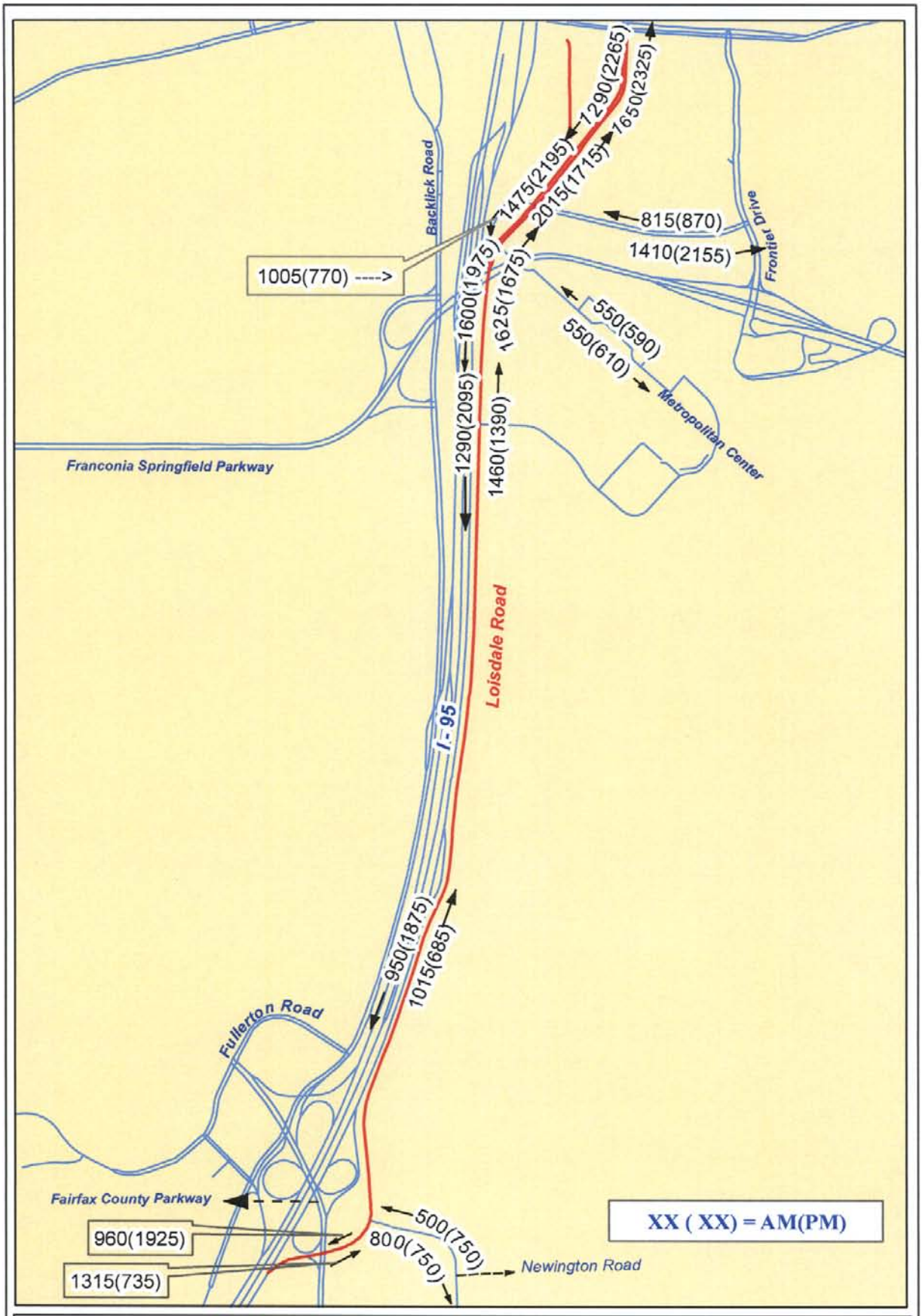

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Figure 7- Comprehensive Plan Buildout Plus APR Nomination- Peak Hour Traffic

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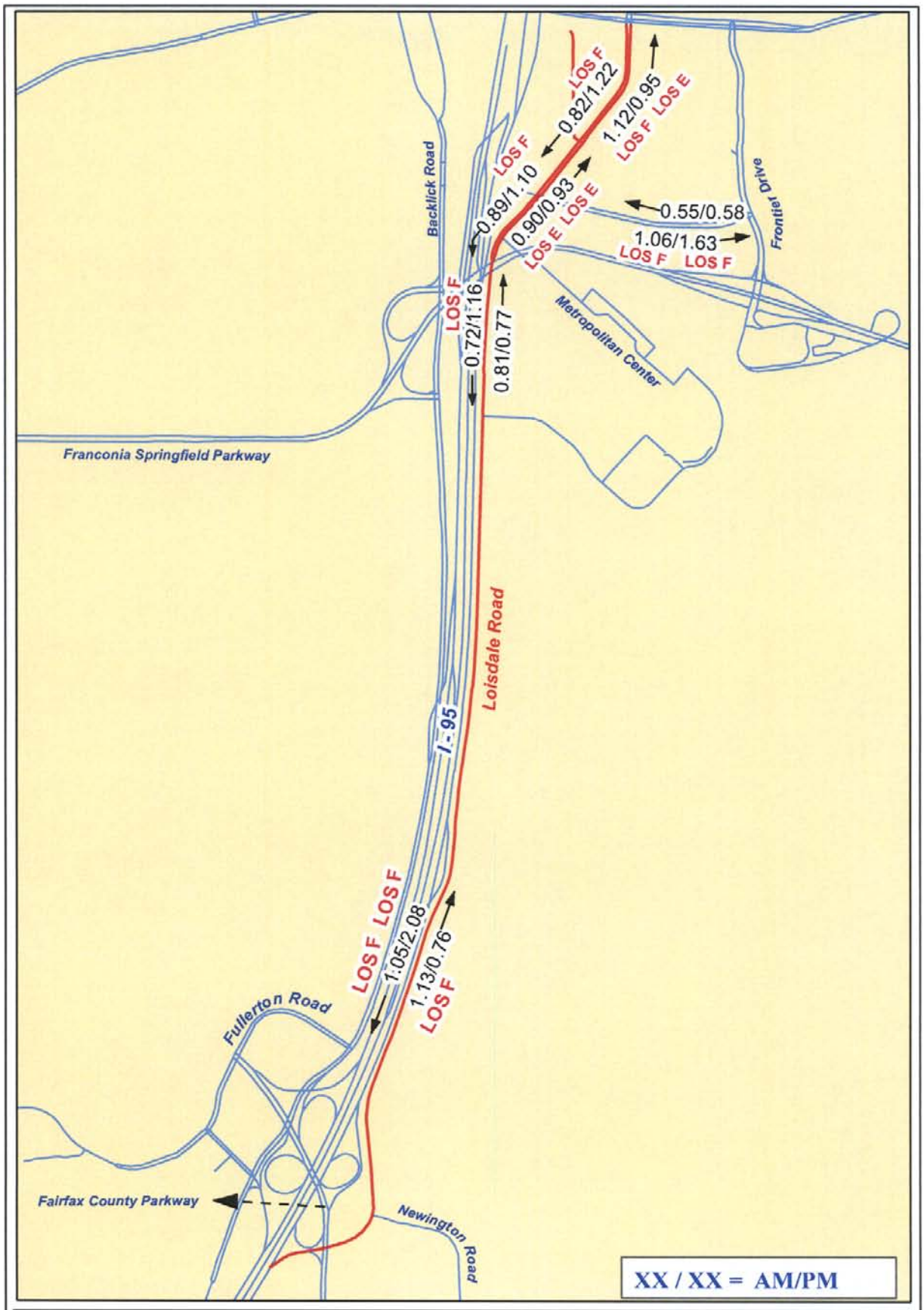

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Figure 8- Comprehensive Plan Build Out Plus APR Nomination-
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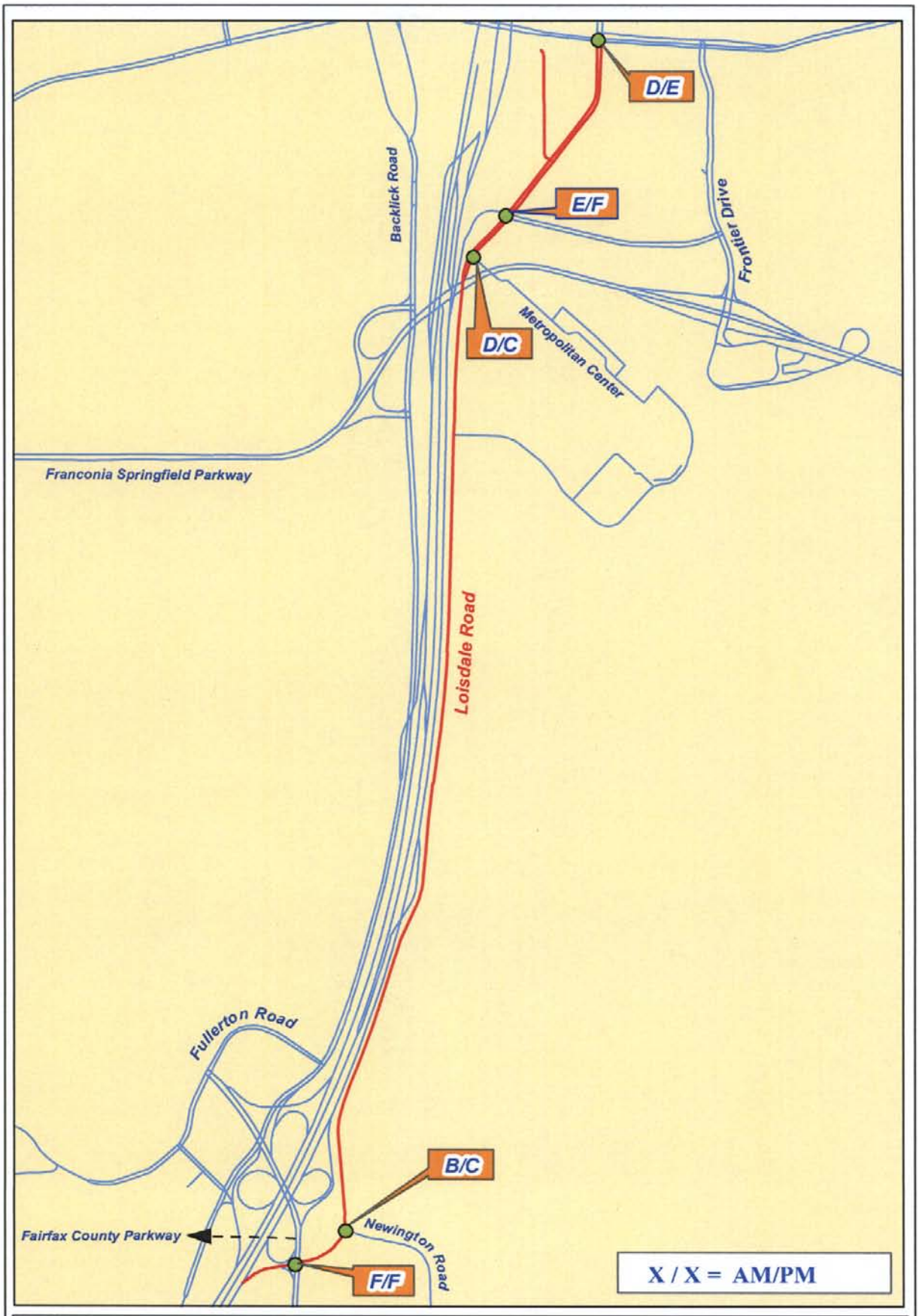

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Figure 9- Comprehensive Plan Build Out Plus APR Nomination-Intersection Level of Service

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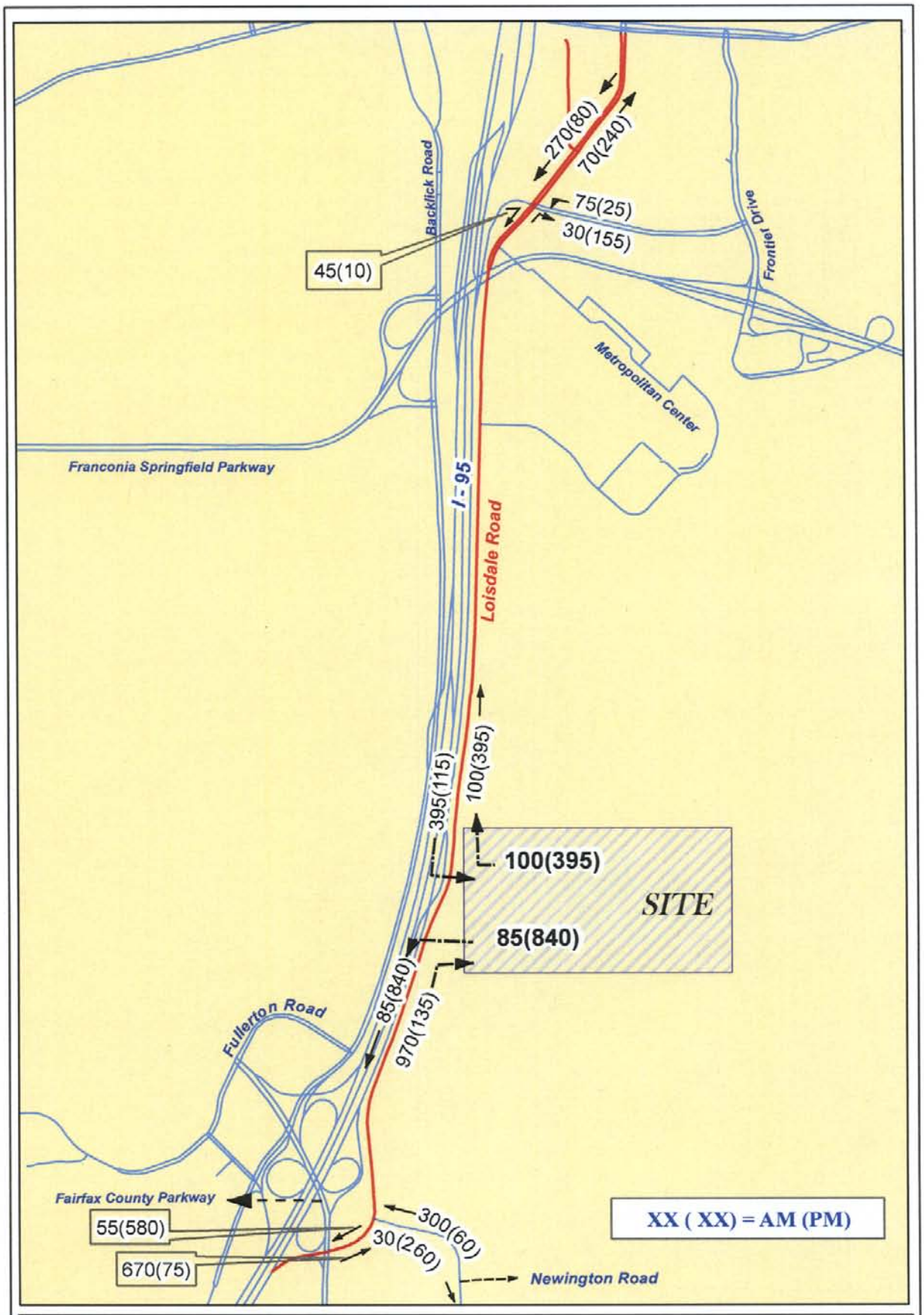

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Figure 10- Site Peak Hour Traffic Generation

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amount of traffic on Loisdale Road and adjacent facilities, with a strong orientation to and from the south.

Figure 11 shows the cumulative totals of AM and PM peak hour traffic in the study corridor. Figure 12 shows the impacts of these traffic volumes when the forecast volumes are assessed against current planned roadway capacity for each of the links analyzed in the corridor. As shown, almost every link displays a projected LOS E or F condition in both directions during one or both peak hours. The exception appears to be Spring Mall Road in the westbound direction, which demonstrates acceptable levels of service during both peak hours. Based on the assessment in Figure 12, there does not appear to be sufficient capacity in the current Comprehensive Plan Transportation Plan to support the additional development. V/C ratios at many locations are well above 1.0, which indicates that implementation of traffic mitigation measures alone (such as transportation demand management programs, transit shuttles, and intersection redesign) would be insufficient to reduce volumes and/or add system capacity enough to result in acceptable levels of service.

Figure 13 shows the intersection LOS in the Loisdale Road study corridor for Scenario 4. As shown, intersection LOS is poor at both the northern and southern ends of the corridor. While the intersections of Loisdale Road/Newington Road and Loisdale Road/Metropolitan Center Drive are shown to operate at acceptable levels, the intersection of Loisdale Road/I-95 off-ramp/Spring Mall Road is shown to be a major problem location in the central part of the corridor, operating at an LOS E in the AM and LOS F in the PM. To bring this intersection up to acceptable levels, mitigation should be undertaken in conjunction with future development.

Transportation Plan Designations for Loisdale Road

The current Comprehensive Plan has a 4-lane recommendation on Loisdale Road between Spring Mall Road and Springfield Center Drive. There is no recommendation to the south between Springfield Center Drive and Newington Road (it currently exists as a 2-lane undivided arterial facility, with some additional turn lane access at development entrances). Based on the foregoing analysis, County staff recommends that the current County Transportation Plan be amended as follows:

- Loisdale Road from Springfield Center Drive to Newington Road should be designated for future improvement to a 4 lane facility

- Loisdale Road from Spring Mall Road to Springfield Center Drive should be designated for future improvement to a 6 lane facility

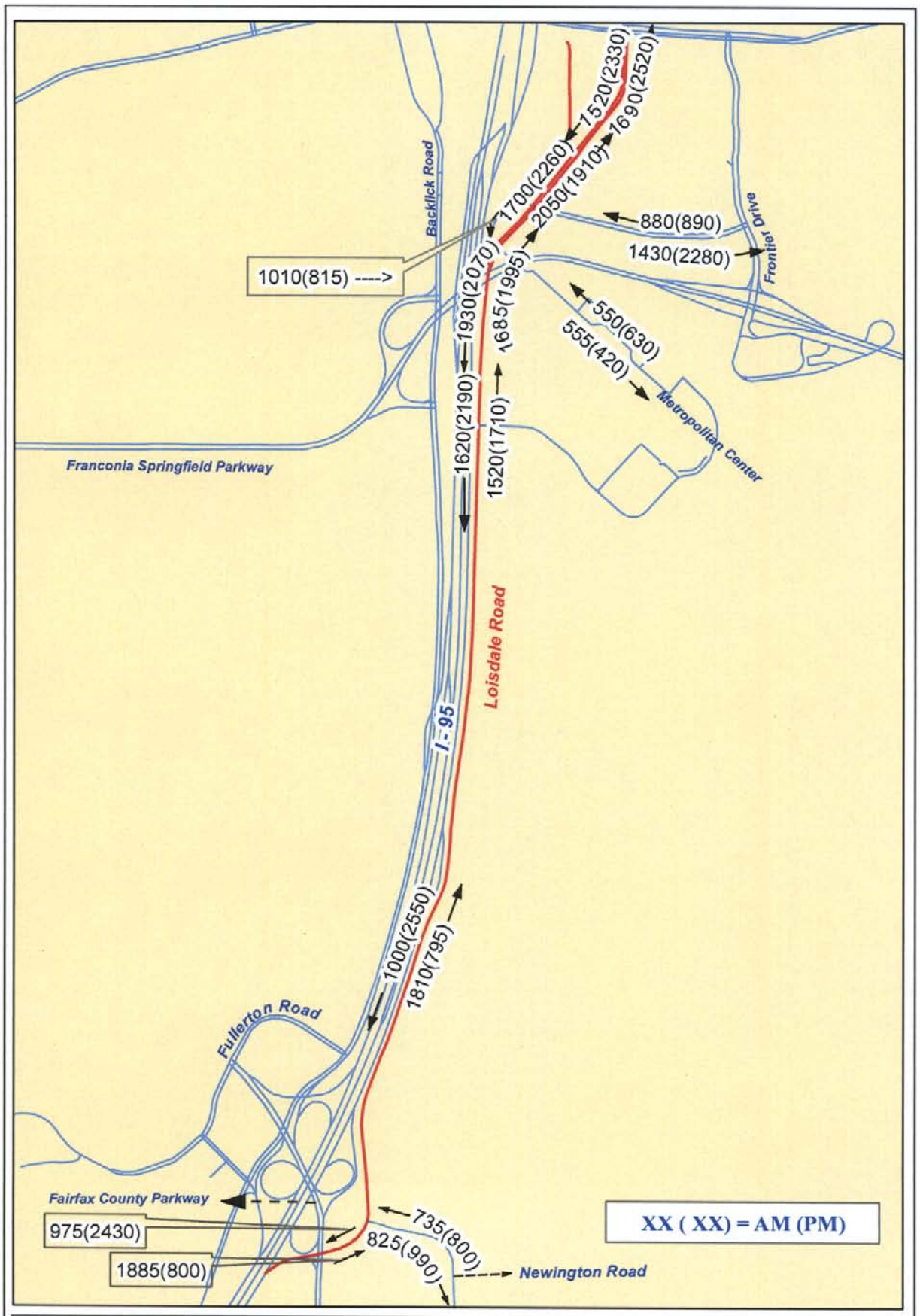

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Figure 11- Comprehensive Plan Buildout Plus All APR Sites Plus Site Peak Hour Traffic

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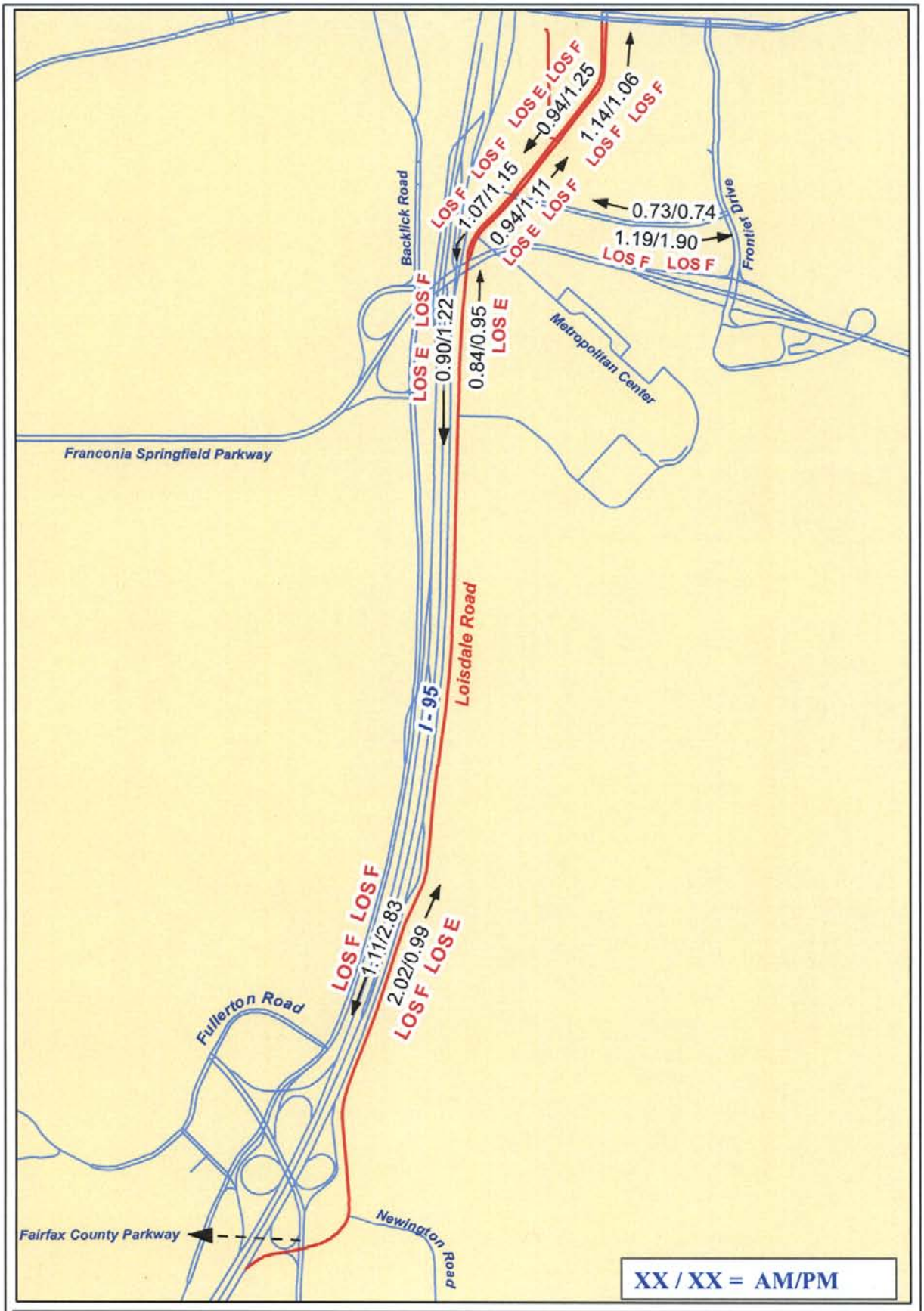

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Figure 12- Comprehensive Plan Build Out Plus APR Nomination Plus Site- Volume to Capacity Ratios

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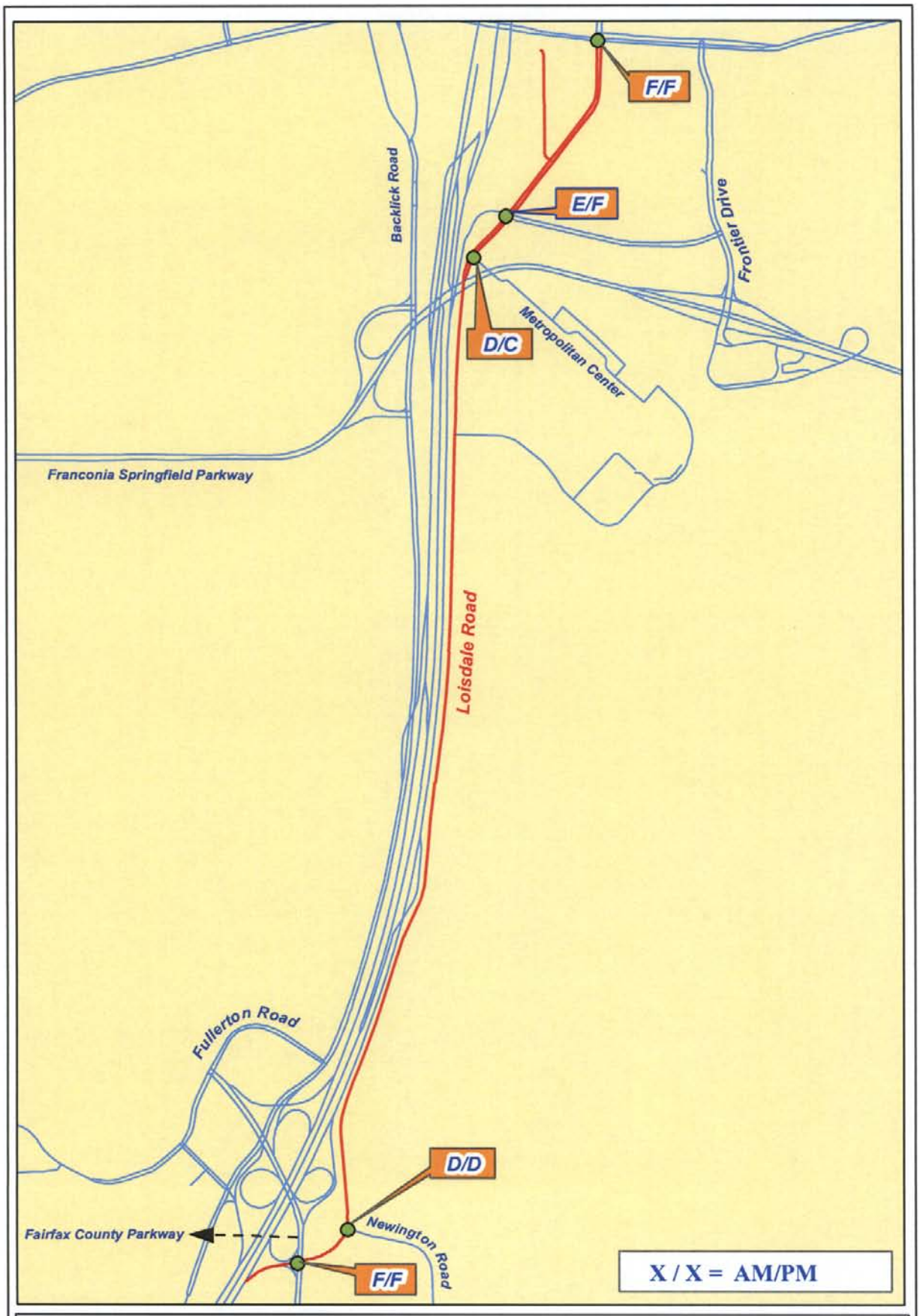

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Figure 13- Comprehensive Plan Build Out Plus APR Nomination Plus Site-Intersection Level of Service

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As demonstrated in the analysis, this would provide the capacity needed in the future with buildout of the Comprehensive Plan, including the recently adopted Springfield Town Center and BRAC APR amendments. Figure 14 shows the proposed County Transportation Plan designations for Loisdale Road.

It should be noted that in the near term Loisdale Road would not be expected to be rebuilt to these requirements as a VDOT project. Instead, sections of the roadway may be reconstructed as development and redevelopment occur along the corridor. Dedication of right-of-way and/or construction of frontage improvements would be required with redevelopment in the corridor. Over the longer term, as traffic continues to increase on Loisdale Road with growth in the Springfield area, sections of the roadway improvement may be proposed for VDOT or other public funding as needs increase and funding is made available. Residential areas such as the Loisdale Estates neighborhood can be protected from encroachment by maintaining the current 3 lane section (2 lanes with middle turn lane) through the area, as sections to the north and south are improved. It is also possible in the future that a narrower road section can be designed in this area so that impacts to the residential community are minimized.

As a supporting policy change, it is also recommended that the Plan for the Franconia-Springfield area establish a level of service (LOS) E threshold for mitigation of traffic impacts. A LOS E policy was adopted for the Town Center amendment and this would apply it as well to the GSA Warehouse and industrial park area along the middle and northern sections of the corridor. It would allow for higher levels of traffic in this section of Loisdale Road before mitigation is required. In recognition that plans for the Franconia-Springfield area call for developing into a more urban, mixed-use environment , development along this section of Loisdale Road would be required to maintain an overall LOS E standard at affected intersections and roadway segments and undertake additional pedestrian safety improvements and transit-supportive activities. Acceptable levels-of-service can be maintained in the area through a combination of intersection improvements, improved access management, pedestrian treatments, and implementation of transportation demand management programs that help to reduce peak period transportation demand.

Alternative Land Use Assumption for Site

After the scenarios were tested and findings developed, County staff was asked to examine the effects of an alternative land use plan for the proposed site development in Land Unit K. Under this proposal, the 1 million square feet of new office development proposed for the site would be replaced with a more modest scenario of 200,000 square feet of office development, and 100,000 square feet of new or used car sales.

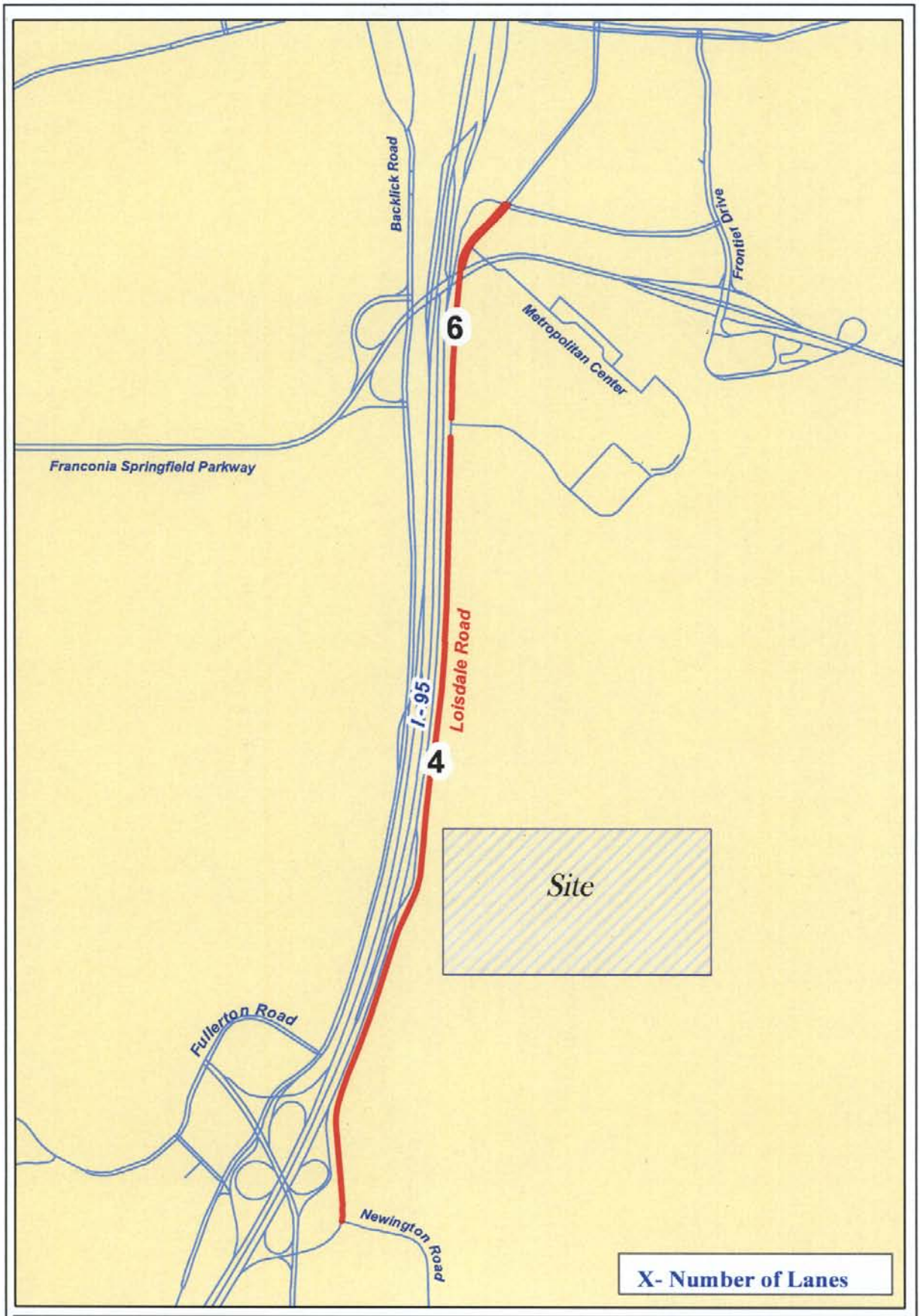

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Figure 14- Recommended Transportation Plan Designation for Loisdale Road

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The results of the trip generation analysis conducted for this alternative show that the impacts of the revised land use proposal would be positive. Estimated average daily trips (ADT) would decrease by approximately 9,000 compared to the original proposal analyzed. ADT under the alternative proposal is estimated to be only slightly more (300 trips) than under the current Comprehensive Plan buildout for Land Unit K. AM and PM peak hour traffic, which are the critical measures for assessing impacts to the transportation network, would decrease by substantial amounts when compared to the original proposal. Estimated AM and PM peak hour traffic would also be less than under the current Comprehensive Plan buildout. The primary reason for this is that the supply of industrially planned and zoned land in the corridor generating traffic under the Comprehensive Plan buildout would diminish substantially.

The resulting findings for the alternative land use proposal for the site are similar to those shown in Figures 7 – 9. There would be no additional traffic on Loisdale Road due to the proposed site development under this alternative land use scenario. In fact, the AM and PM peak hour volumes are estimated to be slightly lower than those shown in Figure 7. As a result, the v/c ratios shown in Figure 8 would also improve slightly. Appendix C provides the quantification of the alternative land use proposals for the site, and corresponding trip generation findings.

Frontier Drive Extension Alternative

Staff also tested the effects of adding an extension of Frontier Drive to the planned transportation network for the Springfield area, as an alternative to widening Loisdale Road to 6 lanes north of Loisdale Estates (i.e., amending the Plan for the currently planned 4 lane section between Springfield Center Drive and Spring Mall Drive). Under this proposal, Frontier Drive would be extended south of its current terminus at the Franconia-Springfield Parkway ramps, bridge the ravine separating the Franconia-Springfield Metro station from employment and housing at the GSA Warehouse and Springfield industrial park, and take over the existing alignment of Springfield Center Drive to terminate at a signalized intersection with Loisdale Road at approximately the same location.

The Frontier Drive extension improvement is proposed as a 4 lane divided minor arterial, providing access to/from the south for the Franconia-Springfield Metro station and redeveloping Springfield Town Center, while also improving access to the GSA Warehouse area, which can now only be accessed from Loisdale Road. The proposed extension of Frontier Drive would be expected to divert a significant amount of traffic that currently uses segments of Loisdale Road, Spring Mall Road, and existing Frontier Drive to travel to and from these areas.

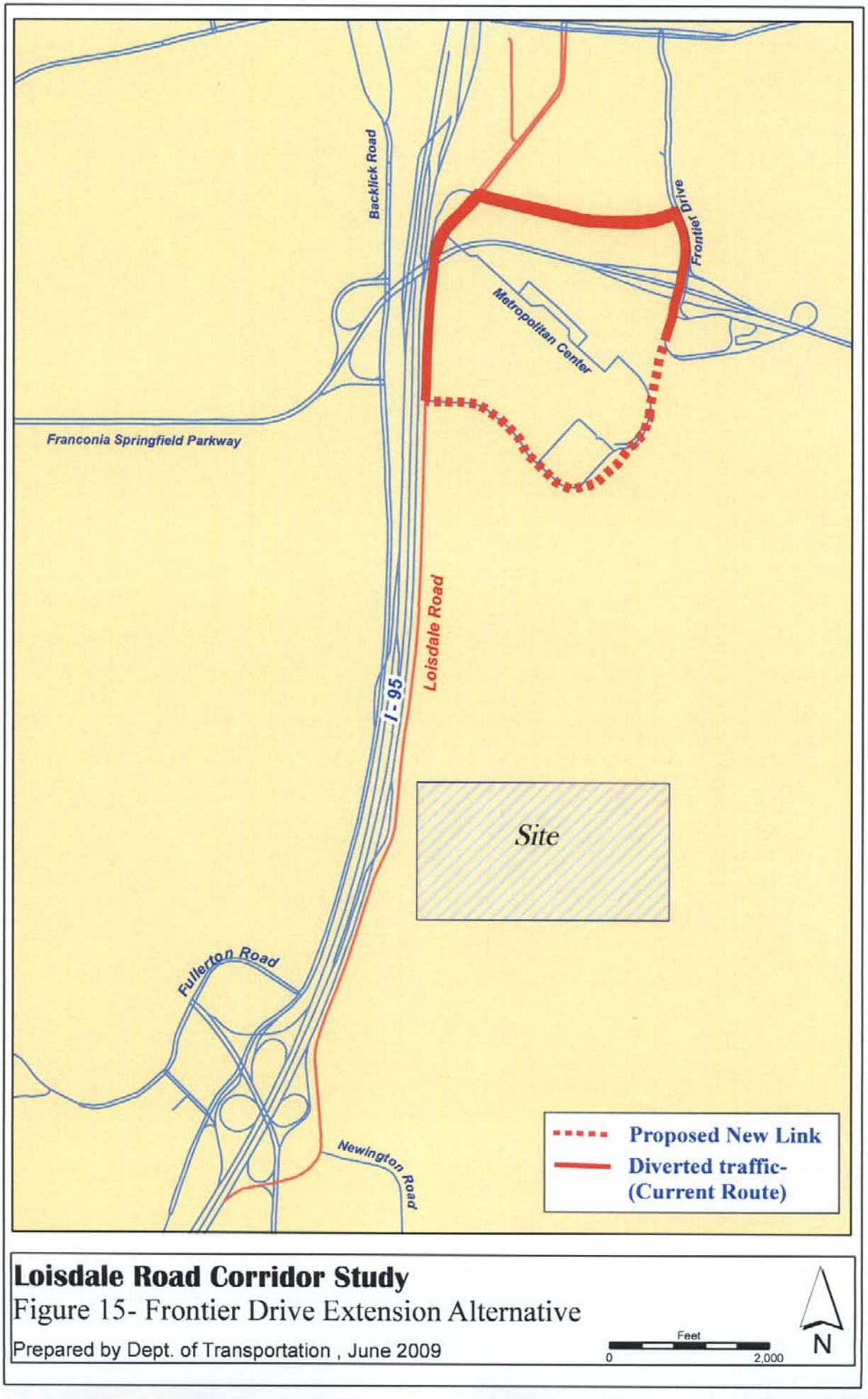

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Figure 15- Frontier Drive Extension Alternative

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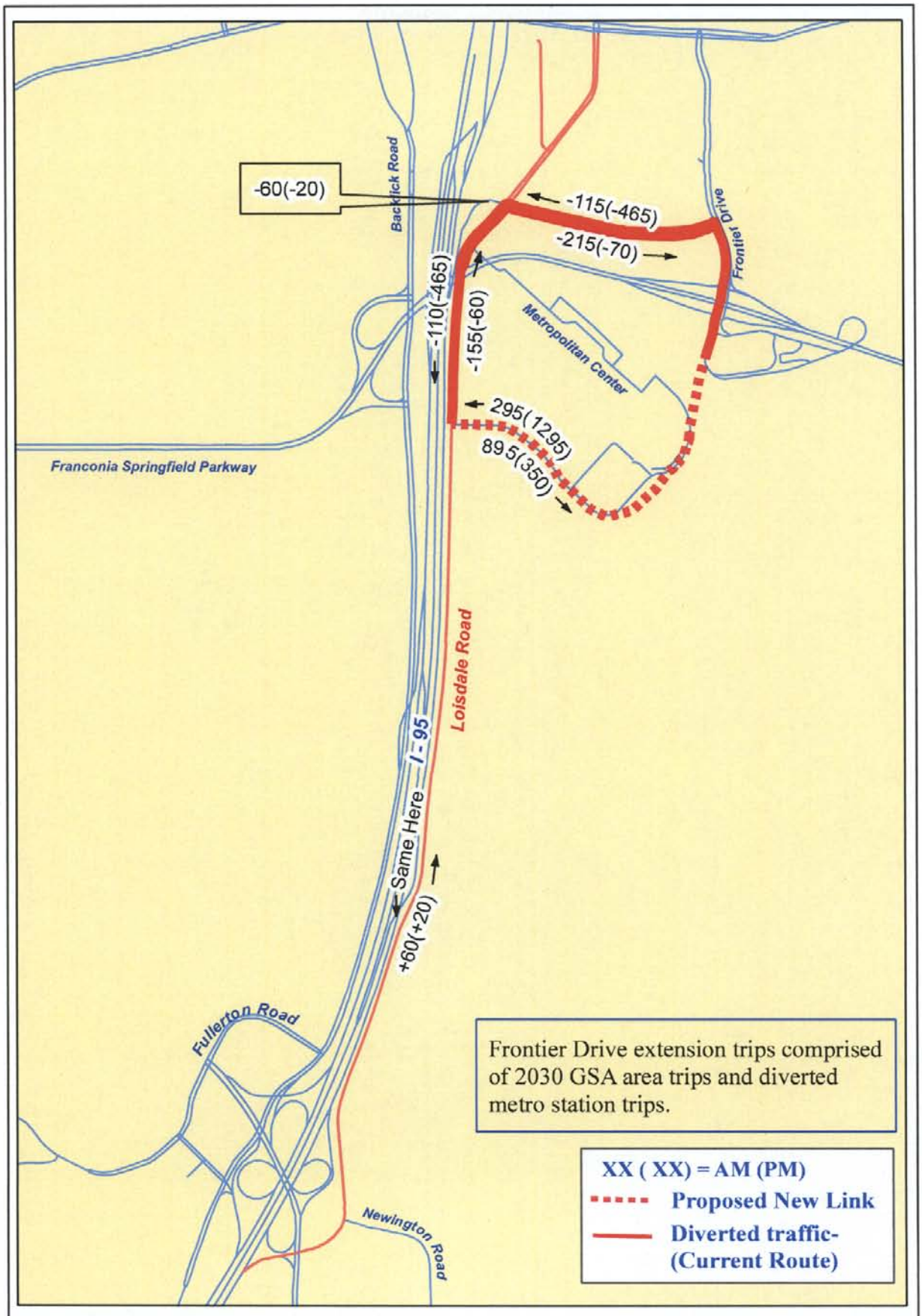

Loisdale Road Corridor Study

Figure 16- Frontier Drive Extension Alternative

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The new transportation link would thereby relieve pressure on the projected LOS E and F level intersections along the current path taken to access the Metro station, new Springfield Town Center, and Franconia-Springfield Parkway to and from the south.

Figure 15 depicts the current route that traffic takes and the proposed Frontier Drive Extension alternative.

Modeling analysis was conducted to estimate the amount of peak hour traffic diversion expected with the proposed 4 lane Frontier Drive extension. The analysis estimated that a significant share of the local and through peak hour traffic that uses the current path to and from the Franconia-Springfield Parkway and Metro station would be diverted to the new facility. Adding the Frontier Drive Extension link to the Comprehensive Plan would allow Loisdale Road between Springfield Center Drive and Spring Mall Road to operate as a 4-lane (planned) facility in the future at acceptable service levels (some additional intersection improvement may be needed to maintain a LOS E or better level at the Spring Mall Road/ I-95 exit ramp/Loisdale Road intersection in the future as the area builds out). By diverting traffic destined to/from the Metro station and Franconia-Springfield Parkway, the Frontier Drive extension would provide relief to the future congested and poorly performing intersections of Loisdale Road/ Metropolitan Center Drive, Loisdale Road/Spring Mall Road, Frontier Drive/ Spring Mall Road, and Frontier Drive/EB and WB Franconia-Springfield Parkway ramps, providing an opportunity for these intersections to be maintained at and/or improved to an acceptable level of service.

Figure 16 shows the AM and PM peak hour traffic estimated to be diverted with the new facility in place. With the addition of the new roadway link, v/c ratios are brought to LOS E or better levels at most areas of the diverted route with the exception of Spring Mall Road PM eastbound direction (it is expected that additional mitigation can be provided to bring this facility to an acceptable level of service in the future). Performance on the affected portions of Loisdale Road and Spring Mall Road is brought to more acceptable levels as a result of the inclusion of the Frontier Drive Extension improvement.

Conclusions/Findings

Based on the analysis of existing and planned future development in the Loisdale Road corridor, there will be a need to widen Loisdale Road in order to provide sufficient peak period capacity to accommodate projected future traffic loads. Already under existing conditions (2008), sections of Loisdale Road and Spring Mall Road are at or approaching a failing condition as measured by volume-to-capacity ratios. This is most evident in the PM peak hour, when more traffic uses Loisdale Road to exit the Springfield commercial area.

It was determined that as the current Comprehensive Plan for the area builds out (approximately by 2030), Loisdale Road in the subject area would need to be widened by at least a lane in each direction in order to accommodate peak period traffic at acceptable levels. Certain links were found to greatly exceed the planned capacity of the roadway, as evidenced by projected v/c ratios. These included the following:

- Loisdale Road southbound direction to Newington Road
- Loisdale Road north and southbound directions along the GSA Warehouse area south of Spring Mall Road
- Loisdale Road southbound direction from its intersection with Franconia Road
- Spring Mall Road eastbound direction between Loisdale Road and Frontier Drive

The analysis showed that under the current Comprehensive Plan build out condition, certain intersections in the Loisdale Road corridor are projected to degrade to LOS E or F levels without mitigation. These include the intersections of Loisdale Road/Franconia Road (LOS C/E), Loisdale Road/I-95 off-ramp/ Spring Mall Road (LOS D/F), and Newington Road/Fairfax County Parkway/I-95 off-ramp (LOS F/F).

The analysis undertook a layered approach to assessing the impacts of additional development in the corridor. First, the impacts of adding a supported BRAC APR nomination in the GSA warehouse area (2FS) and the recently adopted Springfield Town Center plan were assessed. New peak hour traffic was calculated and added to the previous Comprehensive Plan volumes, based on distribution of trips into and out of the corridor. The analysis showed further degradation of levels of service on study area roadway links and at key intersections examined. Next, proposed site traffic (under alternative 1) was calculated and added to these volumes. The resulting findings represented a “worst case” of Loisdale Road corridor traffic, based on the cumulative impact of proposed new land development added to currently planned development levels.

Figures 11 through 13 show the impacts of the total development proposed for the Loisdale Road corridor. With the additional traffic generated by the 1 million square feet of office development proposed at the site, v/c ratios (and corresponding LOS) degrade further in the corridor. Many links are shown to exceed the 1.0 v/c threshold that defines the boundary between LOS E and F. A number of links are shown to greatly exceed the 1.0 threshold. The LOS under this scenario is shown to be poor in both directions on Loisdale Road and on

more links when compared to previous scenarios. In addition, more intersections are shown to degrade to LOS F in one or both peak hours.

Based on the analysis described in this report, recommendations are made for amending the County's Transportation Plan. The following is proposed to support development under the existing Comprehensive Plan as well as added development potential adopted under the BRAC APR process:

- Loisdale Road from Springfield Center Drive to Newington Road should be designated for future widening to a 4 lane facility

- Loisdale Road from Spring Mall Road to Springfield Center Drive should be designated for future widening to a 6 lane facility

Should proposed site alternative 1 be adopted, Loisdale Road should be designated for future widening to a 6 lane facility throughout in order to handle forecast traffic at acceptable levels-of-service.

To support the increased development, it is also recommended that the level-of-service policy for the Franconia-Springfield area be amended, adopting a LOS E standard for mitigation of traffic impacts. Such mitigation could be accomplished through a combination of intersection improvements, access management/ frontage road improvements, implementation of TDM programs, and new transit service.

As an alternative to changing the Plan designation for Loisdale Road to 6 lanes between Spring Mall Road and Springfield Center Drive, the Plan could be amended to provide a future 4 lane extension of Frontier Drive between the Franconia-Springfield Parkway and Loisdale Road, interconnecting through the GSA Warehouse Area and Springfield industrial park to a terminus north of Loisdale Estates. In addition to minimizing the need to widen Loisdale Road to a 6 lane section in this area, the proposed new roadway link would provide other important benefits:

- Provides a more direct path to and from the south to the Franconia-Springfield Metro station, while relieving traffic congestion at the station's main entrance from the Franconia-Springfield Parkway

- Diverts traffic from sections of Loisdale Road and Spring Mall Road that are shown in the analysis to be performing increasingly more poorly in the future as development planned for the Springfield area build out

- Provides direct access to and from the Parkway to the redeveloping GSA warehouse area and Springfield industrial park, providing relief to Loisdale

Road while also providing the additional access needed to support higher levels of development in these areas

- Provides an opportunity for the new roadway link to incorporate a more direct pedestrian link to/from the Metro and VRE station, thereby expanding the station influence area and increasing opportunities for transit-oriented development and transit-related reductions in traffic.

Appendix A

Level of Service Volumes By Type of Roadway Facility

New Capacities – LOS Boundary

Level of Service Volumes By Type of Roadway Facility

New Capacities – LOS Boundary

Facility Type	Previous Capacity *D/E*	Previous Capacity *E/F*	New Capacity *D/E*	New Capacity *E/F*
Freeway/Expressway	1660	2000	1900	2300
Major Arterial	1082	1300	1200	1400
Minor Arterial A	788	875	900	1200
Minor Arterial B	675	750	750	900
Collector	450	500	500	600
Freeway Ramps				
- Directional	1200	1450	1400	1700
- Loop	900	1200	1100	1450

Notes:

1. Refer to Table A-2, Transportation Improvement Costs for the Fairfax Center Area, Fairfax County Office of Transportation, March 16, 1982, for earlier findings.
2. LOS Boundary defines the link capacity per directional lane for the type of facility to be analyzed, as defined in Fairfax County Comprehensive Plan Transportation Plan Element. Adjustments to these figures may be needed to account for facility types in other States or jurisdictions.
3. Estimated capacities are derived from Highway Capacity Manual and other sources.
4. This capacity table should be used for planning analysis only, and should not substitute for capacities established based on detailed engineering analysis.

J. Pedak
FCDOT
10/17/08

TABLE A-2

VOLUME TO CAPACITY RATIO AND LEVEL OF SERVICE
VOLUMES BY TYPE OF ROADWAY FACILITY

D/E ↓ C/F ↓

Type of Roadway Facility		Level of Service				
		A	B	C	D	E
FREEWAY / EXPRESSWAY	v/c	< .35	.35-.50	.50-.69	.69-.83	.83-1.0
	vph	700	700-1000	1000-1380	1380-1660	1660-2000
MAJOR SUBURBAN HIGHWAY (moderate interference) PRIMARY ARTERIAL	v/c	< .35	.35-.50	.50-.69	.69-.83	.83-1.0
	vph	456	456-652	652-900	900-1082	1082-1300
MAJOR SUBURBAN HIGHWAY (considerable interference) MINOR ARTERIAL A	v/c	< .6	.6-.7	.7-.8	.8-.9	.9-1.0
	vph	525	525-613	613-700	700-788	788-875
ARTERIAL STREETS MINOR ARTERIAL B (MAJOR COLLECTOR)	v/c	< .6	.6-.7	.7-.8	.8-.9	.9-1.0
	vph	450	450-525	525-600	600-675	675-750
MINOR Collector Roadways	v/c	< .6	.6-.7	.7-.8	.8-.9	.9-1.0
	vph	240	240-280	280-320	320-360 450	360-400 500

NOTE: v/c = volume to capacity ratio; vph = vehicles per hour LANE

SOURCES: Developed from following two sources: Highway Capacity Manual - Special Report #87, Highway Research Board (pp. 252-253); A Policy on Design of Urban Highways and Arterial Streets, American Association of State Highway Officials (p. 320)

* TABLE A-2 From Transportation Improvement Costs for the Fairfax Center Area. Fx. Co. Office of Transportation March 16, 1982.

Appendix B

Level of Service Descriptions

Level of Service Descriptions

Highway traffic congestion is expressed in terms of Level of Service (LOS) as defined by the Highway Capacity Manual (HCM). LOS is a letter code ranging from "A" for excellent conditions to "F" for failure conditions. The conditions defining the LOS for roadways are summarized below:

LOS A

- Free-flow operation

LOS B

- Reasonably free-flow
- Ability to maneuver is only slightly restricted
- Effects of minor incidents still easily absorbed

LOS C

- Speeds at or near free-flow
- Freedom to maneuver is noticeably restricted
- Queues may form

LOS D

- Speeds decline slightly with increasing flows
- Traffic density increases more quickly
- Freedom to maneuver is more noticeably limited
- Minor incidents create queuing

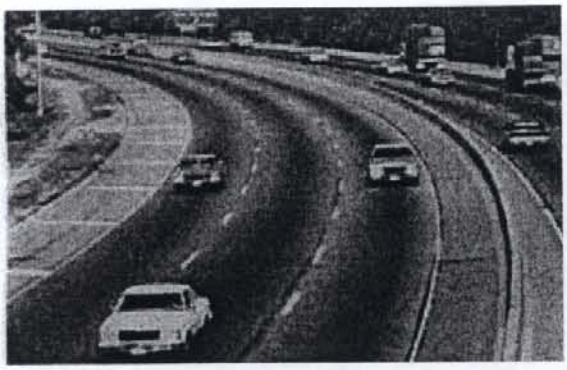
LOS E

- Operation near or at capacity (maximum throughput)
- No usable gaps in the traffic stream
- Operations extremely volatile
- Any disruption causes queuing

LOS F

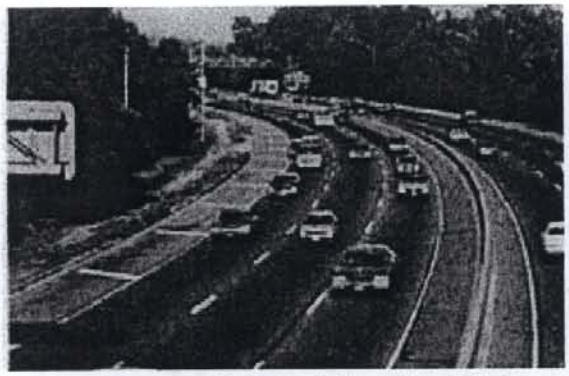
- Breakdown in flow
- Queues form behind breakdown points
- Demand is greater than capacity
- Long delays

FIGURE 1. LEVEL OF SERVICE (LOS) DEFINITIONS

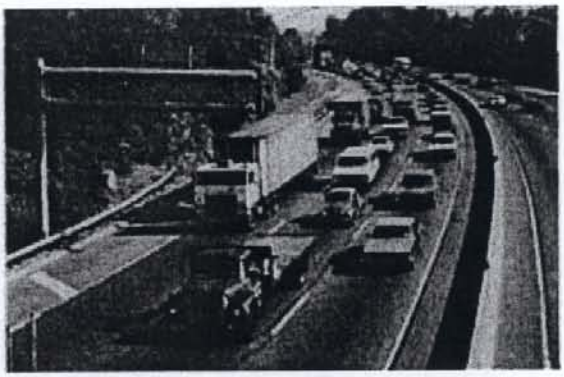


Level of Service A: Free-flow traffic with individual users virtually unaffected by the presence of others in the traffic stream.

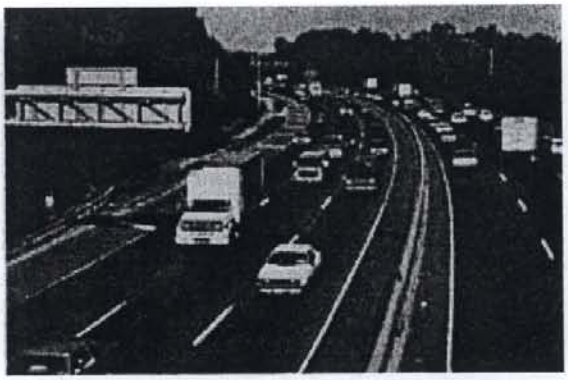
Level of Service D: High-density flow in which speed and freedom to maneuver are severely restricted and comfort and convenience have declined even though flow remains stable.



Level of Service B: Stable traffic flow with a high degree of freedom to select speed and operating conditions but with some influence from other users.



Level of Service E: Unstable flow at or near capacity levels with poor levels of comfort and convenience.



Level of Service C: Restricted flow that remains stable but with significant interactions with others in the traffic stream. The general level of comfort and convenience declines noticeably at this level.

Level of Service F: Forced traffic flow in which the amount of traffic approaching a point exceeds the amount that can be served. LOS F is characterized by stop-and-go waves, poor travel times, low comfort and convenience, and increased accident exposure.

Appendix C

Quantification of Land Use and Trip Generation Analysis

for Proposed Plan Alternative Scenarios

Quantification of Land Use

Quantification of Existing, Planned, Zoned, and Alternative Scenario development potential

	Area	Existing Development	Current Plan Base	Zoning	Alternative 1*	Alternative 2*
Losidale Study Area	120.6 acres	Industrial: 184,306 sf	Industrial: 1,838,969 sf	Industrial: 749,914 Office: 749,914 Residential: 84 dus	Industrial: 1,380,600 sf Office: 1,000,000 sf	Industrial: 843,209 sf Office: 200,000 sf Retail: 100,000 sf
TOTAL NON RES	5,254,198 sf	184,306 sf	1,838,969 sf	749,914 sf industrial or office	2,380,600 sf	1,143,209 sf

* Includes Parcels that would retain the current Comp Plan recommendation

Loisdale Road Corridor Study
Trip Generation Analysis

		AM		PM	
	Daily	*In*	*Out*	*In*	*Out*
Scenario					
Current Plan					
1,840,000 sf industrial	9,687	963	319	181	1,006
Proposed Plan Alt #1					
1,400,000 sf industrial	7,371	733	243	137	766
1,000,000 sf office	11,010	1,364	186	253	1,237
	18,381	2,097	429	390	2,003
Proposed Plan Alt #2					
843,200 sf industrial	4,439	441	146	83	461
100,000 sf auto dealer	3,334	150	53	101	158
200,000 sf office	2,202	273	37	50	247
	9,975	864	236	234	866

Notes: Trip generation estimates are based on application of trip rates from the Institute of Transportation Engineers (ITE) Trip Generation report, 8th Edition, 2008. Trip generation is estimated for average daily conditions and peak hours of adjacent street traffic. Industrial land use is assumed to split ½ light industrial and ½ warehousing. Proposed Plan alternatives are as identified in quantification tables prepared by the Fairfax County Department of Planning & Zoning.