Planning Unit Review: Overview

Arlington Public Schools (APS) has developed and maintained planning units for their district for over 10 years, and have utilized them for planning projects such as redistricting. Cropper GIS Consulting (Cropper) was contracted by Arlington Public Schools, VA to perform a review of their planning unit geography.

Cropper was tasked with providing the following services for APS:

- Assess the existing planning unit system and boundaries.
- Review alternate methods of developing 'planning units' for neighborhood school attendance boundaries against methods used by comparable school districts across the U.S.
- Benchmark the APS method of using planning units to create attendance zone boundaries against methods used by comparable school districts around the country, and by Montgomery County Public Schools, Maryland and Fairfax County Public Schools, Alexandria City Public Schools and Loudoun County Public Schools, Virginia.
- Recommend how APS should proceed in light of its upcoming needs to create attendance boundaries for one new middle school and one new elementary school.
- Provide any other recommendations on methods and strategies that could be used to create new attendance zone boundaries.

What is a planning unit?

A planning unit is the smallest geographic area used by school districts to perform spatial analysis of student population. The most common use of planning units is for school redistricting. Planning units are essentially the building blocks for redistricting, and they can be moved from one school to another to help meet redistricting objectives such as balancing school utilization. Without the use of planning units, a redistricting effort relies heavily on technology experts who are proficient in the use of Geographic Information Systems (GIS). A community-driven redistricting process must provide detailed information to committees so they can adequately understand the cause/effect of moving an area. The use of planning unit level data helps empower the community to develop redistricting scenarios without having to be an expert in GIS mapping technology.

Best practices are to have planning units designed with community boundaries, physical geography, and school redistricting criteria in mind, so that if a planning unit moves from one school to another, it is does not violate school redistricting criteria.

Planning units typically follow prominent geographic features such as major roads/highways, rivers, railroads, and other physical geographic features. Also, planning units should be designed in a manner that maintains/preserves the sense of community within the school district whenever possible. The definition of 'community' can differ greatly depending on the stakeholder's perception of the particular characteristic in common. Some 'communities' can consist of 1,000 students, where others may only have 50 to 100.

A planning unit is typically reassigned from a crowded school to an under-utilized school. Enrollment balancing helps to ensure that both schools are maximizing their use of existing school facilities while at the same time relieving over/under crowding conditions. As a general rule, a planning unit cannot be so large that moving the unit becomes ineffective and/or impossible. On the other hand, they should be small enough to serve their purpose while maintaining a sense of community. If a community is too large to be contained within a single planning unit, multiple planning units should be created and designed to pick up both sides of a residential street to maintain small area community relationships that families/children have with their neighbors.

School districts often ask if planning unit geography should align with U.S. Census Bureau geography such as census blocks or block groups. The U.S. Census Bureau created their block geography without any focus/attention on the community aspect that is so important with K-12 school planning. Census geography is designed to contain population within small areas for their decennial census. A census block will divide a community into small segments that follow the center of roads and other geographic features. According to the 2010 census, the physical size of a single census block varies from over 8,500 square miles to smaller than a tenth of a square mile and the population may vary from 0 to several hundred persons.

Because planning unit design needs to factor in many other aspects of the local area that Census geography does not address (such as communities, both sides of the road in residential areas, etc.) the use of census geography to delineate planning unit boundaries will likely create sub-optimal redistricting options that do not meet industry best practices.

Best Practices and Evaluation of Other School District's Planning Unit Design

Planning units are created either by school planning staff, or often by consultants, to assist with comprehensive redistricting processes. **Cropper** has created and implemented planning unit geography for school districts across the U.S. APS tasked **Cropper** to research similar school districts and to report back on the process they use for developing planning units. Provided below is the result of phone interviews that **Cropper** conducted with similar school districts to APS.

Loudoun County Public Schools, VA:
Loudoun County Public Schools, Virginia (LCPS) does not utilize the term "planning units", but they refer to theirs as 'Planning Zones'. LCPS uses planning zones for redistricting. There are 650-700 different zones that span the entire county school division and they are evaluated and updated on an annual basis. The planning zones are delineated by major physical geographic features, roads, railroads, neighborhood boundaries and property lines.

Planning zones are aligned with Elementary, Middle, and High School attendance boundaries to differentiate any particular feeder pattern combination that may exist within the school district. Although neighborhoods are factored into the design of the LCPS planning zones, larger neighborhoods are subdivided into multiple zones to provide greater flexibility for redistricting if/when necessary.

LCPS planning zones do not align with census geography, for the same reasons that were mentioned above in the prior section of this report. Census geography does not factor in school planning necessities such as aligning the zones to pick up both sides of a road for transportation efficiency, or recognizing neighborhood/community dynamics that must be accounted for in school redistricting processes.

Montgomery County Public Schools, MD
Montgomery County Public Schools, Maryland (MCPS) also utilizes planning unit geography, but they refer to theirs as 'School Analysis Zones". School Analysis Zones have been in place for over 10 years, and they have over 2,400 zones that cover the entire county school district of 150,000 students.

MCPS planners believe that the School Analysis Zones derive from the Parks and Planning Departments of the County, and they originated with old Census Traffic Analysis Zones. Traffic Analysis Zones were used in prior decennial Census counts, but were not used in the 2010 Census. Traffic Analysis Zones have a similar design as Census Blocks and Block Groups, therefore some of the MCPS School Analysis Zone boundaries are delineated by the street centerline. Also, the current school analysis zones cross over parcels/property lines and are not aligned along parcel boundaries. As MCPS evaluates their school analysis zones for specific projects, they continue to align them with major geographic features such as roads, streams, and parcels.

MCPS evaluates and updates their school analysis zones 3-4 times per year depending on the number redistricting efforts underway. Generally speaking, the total number of students in the zones vary from densely populated urban areas to less populous rural parts of the county.

Henrico County Public Schools, VA
Henrico County Public Schools, Virginia (HCPS) is the county school division that surrounds the City of Richmond. HCPS uses planning unit geography, but refers to them as 'Census Tracts'. HCPS census tracts do not align with Census tract geography although they share the same name. Census tracts were designed to serve the operational needs of the Census Bureau, while conversely HCPS census tracts were designed to support local school redistricting criteria for K-12 planning.

HCPS census tract data aligns with school attendance boundaries and geographic features such as major roads, rivers, and railroads. The school division also aligns their census tract data with neighborhood boundaries within the county. Larger neighborhoods are divided into smaller census tracts as needed.

HCPS has approximately 550 census tracts that they use as planning units for school redistricting processes. HCPS also monitors student enrollment trends with their planning units, and joins the number of students living within each tract by grade level. Grade level student data by census tract, allows HCPS to incorporate student enrollment projections into their redistricting estimates. For instance, if a redistricting plan is not going into effect for 2 years after the plan is established, the school division can provide a projected enrollment estimate by aging earlier grade cohorts upwards.

Henrico County still has a substantial amount of undeveloped land countywide. HCPS evaluates their census tract geography on an annual basis to determine if new tracts should be created to account for recently completed residential housing developments that are ready to be occupied by families with school aged children.

Alexandria City Public Schools, VA

Alexandria City Public Schools (ACPS) did not have planning unit data until 2015. Cropper GIS Consulting facilitated a division-wide redistricting effort for ACPS, with the objective of creating a boundary around a new school on the west end of their district. In addition to developing a new attendance boundary for their newly planned school, redistricting was needed to balance enrollment at schools that were crowded.

The planning units (called planning blocks) were drafted for ACPS at the beginning of the redistricting process, and a community-based volunteer redistricting committee evaluated and modified the planning unit geography in early stages of the project. As redistricting options were drafted by this committee and they learned more about how the planning units were configured in relation to boundary options, planning units were often further modified. A series of maps were provided to show committee members the number of elementary K-5 students living within each planning unit. This information empowered the committee and community to effectively provide suggested adjustments to redistricting options. Because planning units were numbered stakeholders could easily identify and agree on the area being discussed which was helpful in facilitating community conversation.

The use of planning units for community-based redistricting processes has proven to be a very effective tool in educating the public about how many students live within various areas of the district, along with communicating changes and requested adjustments easily without having to have expertise in GIS mapping software. When the redistricting process was completed, Alexandria City Public Schools had a total of 123 planning blocks.

Assessment of Arlington Public School's Planning Units

The Arlington Public Schools' (APS) planning unit geography meets industry standards. Currently, APS has a total of 216 planning units for the entire school division. Planning unit geography was examined to see if it aligned with the following important factors for K-12 planning:

1. **Elementary, Middle, and High School Boundaries:** All planning unit geography was already cut by elementary, middle, and high school boundaries. This enables users of the planning units to be able to clearly identify feeder pattern splits that exist between the three school boundary levels.

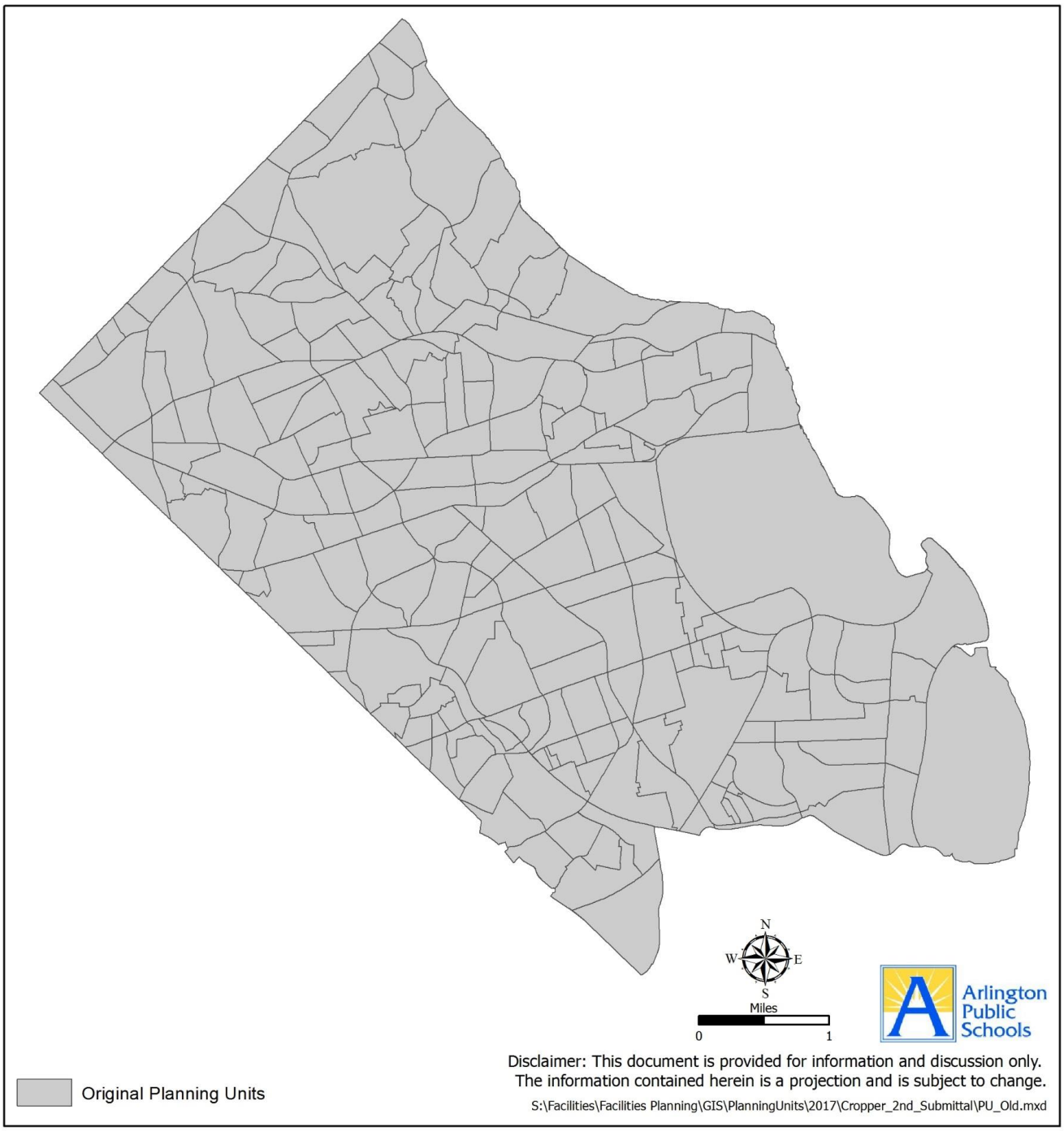
2. **Neighborhoods:** Most of the neighborhood outlines and civic association boundaries were cut within the planning unit geography. There were several planning units that were large and contained both single and multi-family housing. In these cases, there were suggested changes to cut the planning unit by single and multi-family developments, which enables the user of the planning units with more potential alternatives for future redistricting options development.

3. **Adjustments to align both sides of road:** There were instances where **Cropper** has recommended planning unit adjustments to align the planning unit with both sides of a road. Planning units can follow down major roads that do not have homes on both sides, but planning units are recommended to change in cases where the planning unit currently divides a road that has homes on both side of the street.

4. **Oversized planning units:** There were a few cases where planning units cover a very large area, with residential developments separated by non-populated areas. For instance, the planning unit that the Arlington National Cemetery is within has residential developments to the north and south of the cemetery. In this case, there is a suggestion to further split these planning units to provide more flexibility for communities that are adjacent to the cemetery.

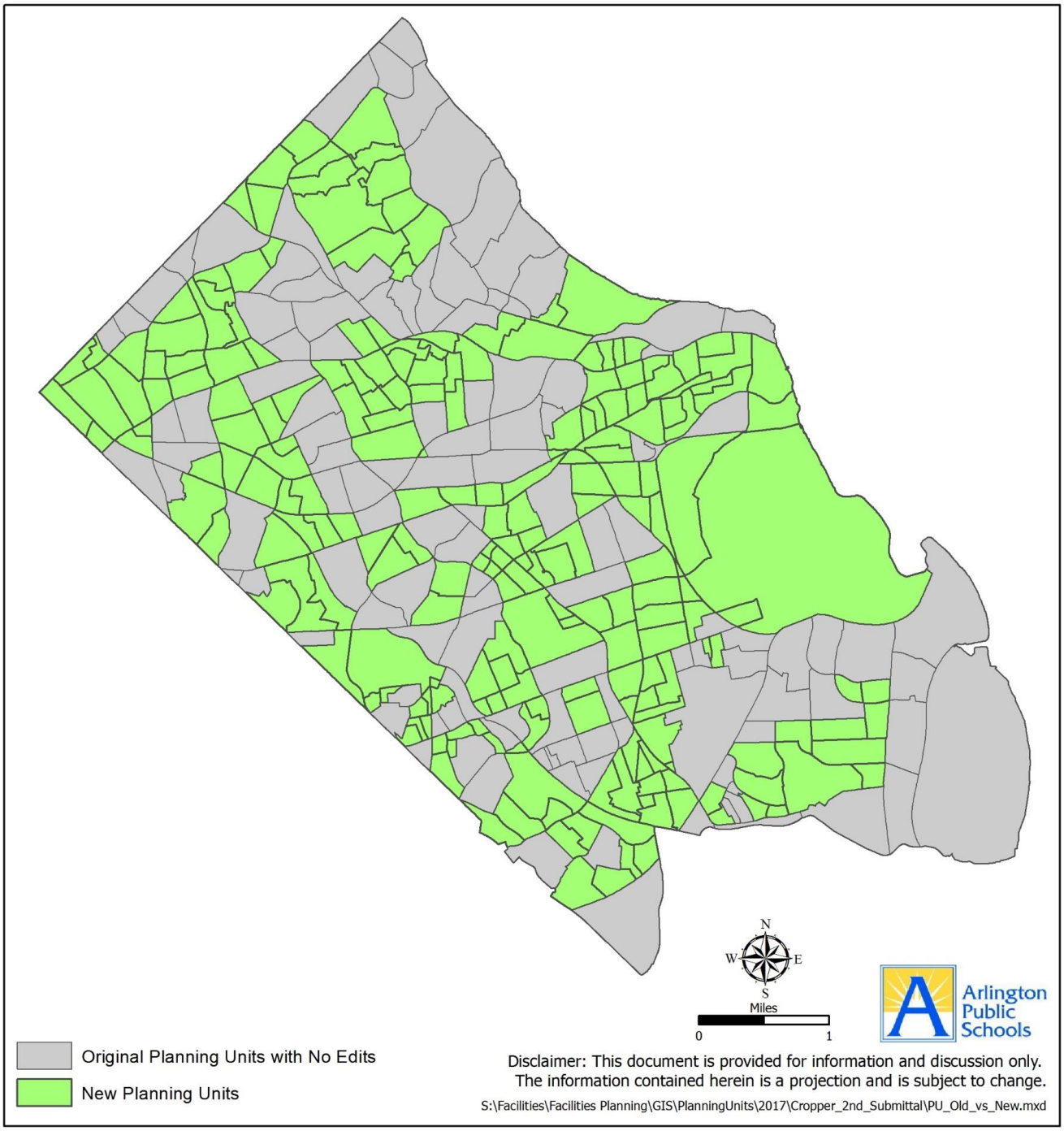
It should also be noted that the current APS planning units do align with census block geography whenever possible. This is done in a manner so that the planning units could be aggregated as much as possible to align with Census geography so the district can do comparative analysis to U.S. Census Bureau population and housing statistics.

Current APS Planning Units SY 2016-17

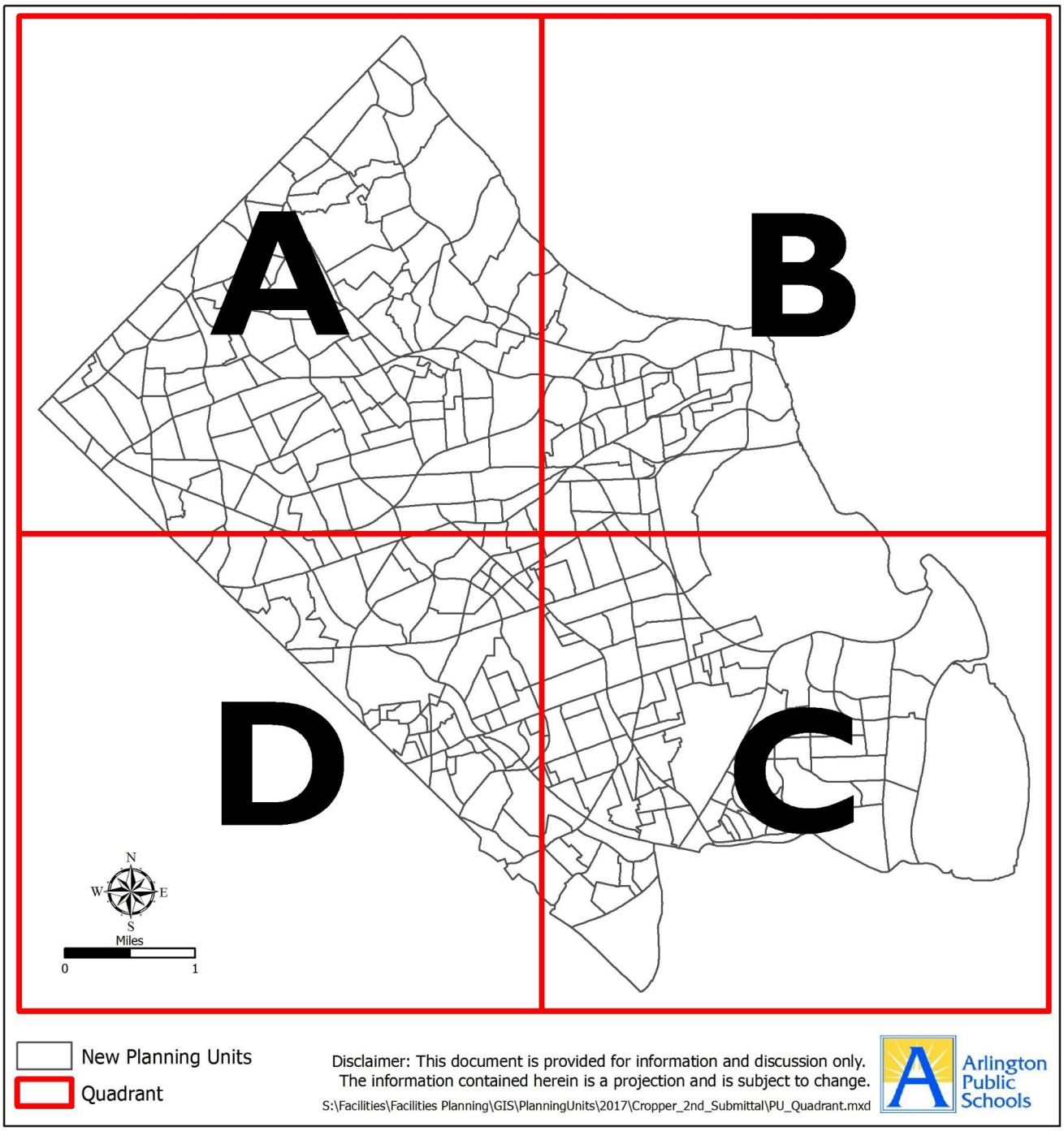


Cropper Recommended Planning Unit Boundaries

Cropper recommends a series of planning unit adjustments as a result of performing a comprehensive review of the APS planning unit geography. All suggested planning unit changes have been made with a focus on better aligning to the factors listed above and result in a total of 346 planning units for the entire school division. The recommended planning unit adjustments are highlighted in light green below.



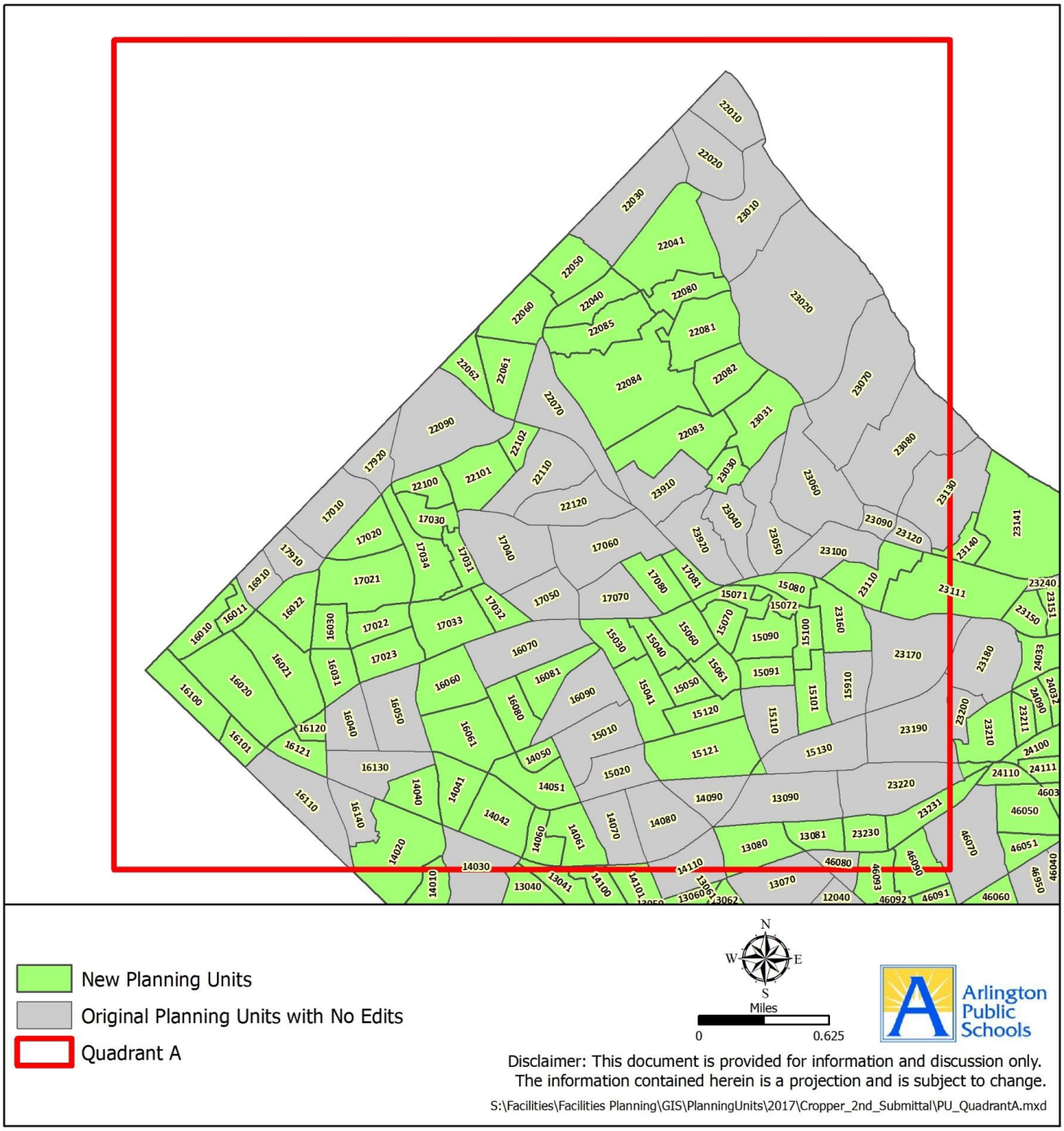
Map Index – Four Sections



Changes to the Planning Unit Numbering System

Because large planning units were split into smaller planning units, it was necessary to add an extra digit to the previous planning unit boundaries to denote the "parent" planning unit that the "child" planning unit(s) originated from. For example, planning unit 2201 was not split and its new planning unit number is 22010 which denotes no splits occurred. Conversely, planning unit 2303 was split into four planning units and the new planning unit numbers are 23030, 23031, 23032 and 23033 respectively. In summary, the new numbering system provides historical context around planning unit boundary adjustments both now and in the future (as needed).

Section A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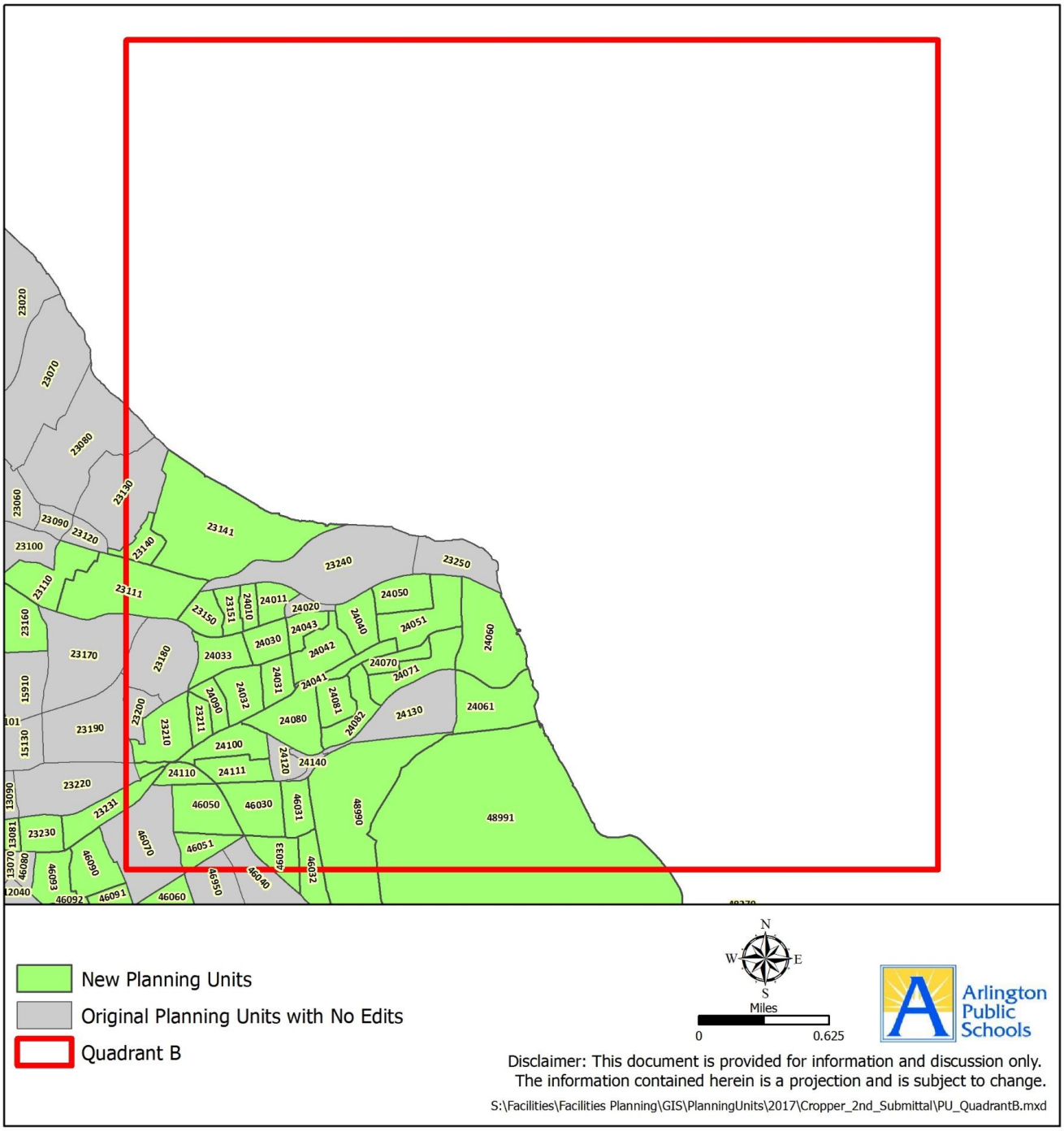
Section B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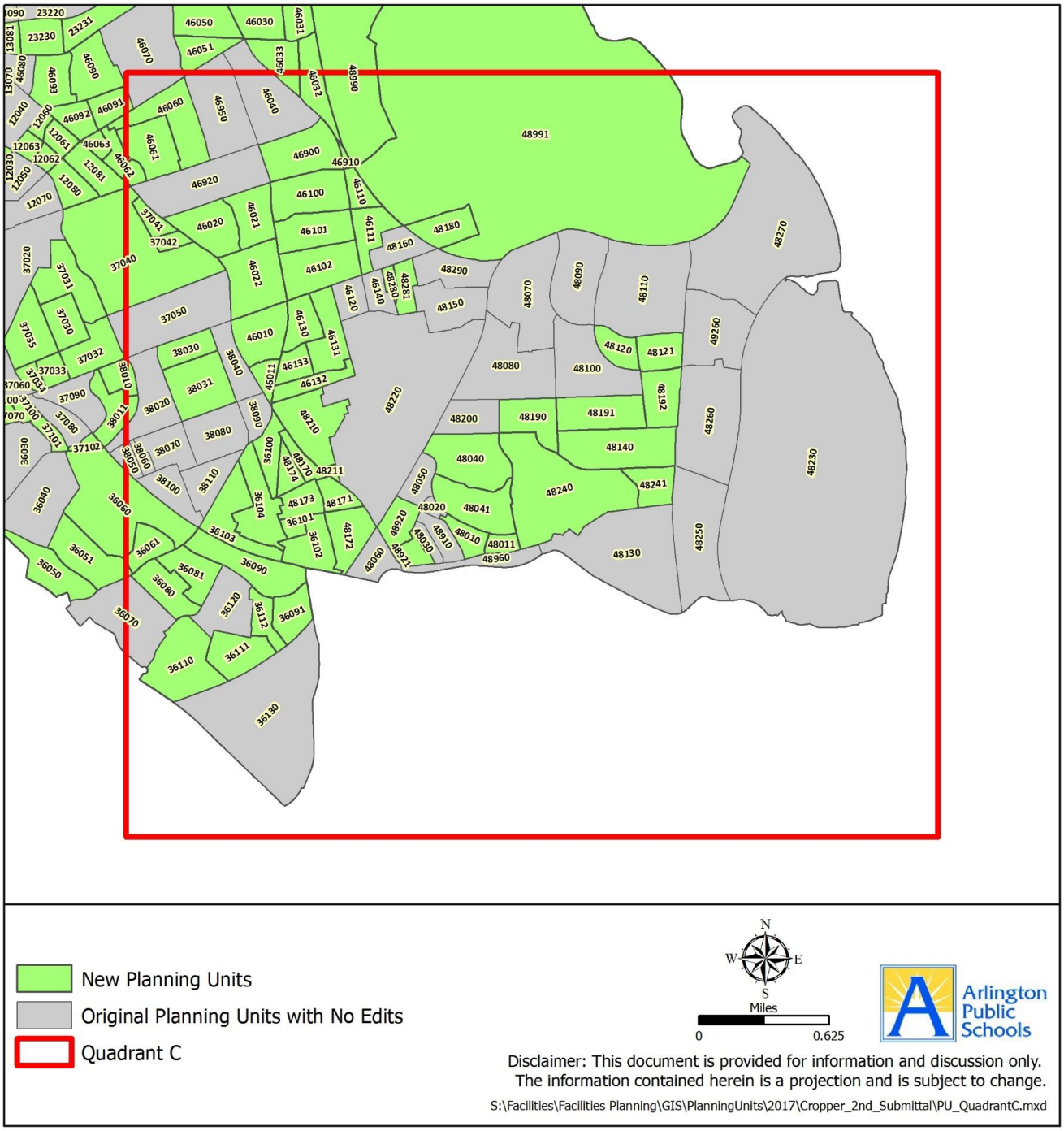
Section C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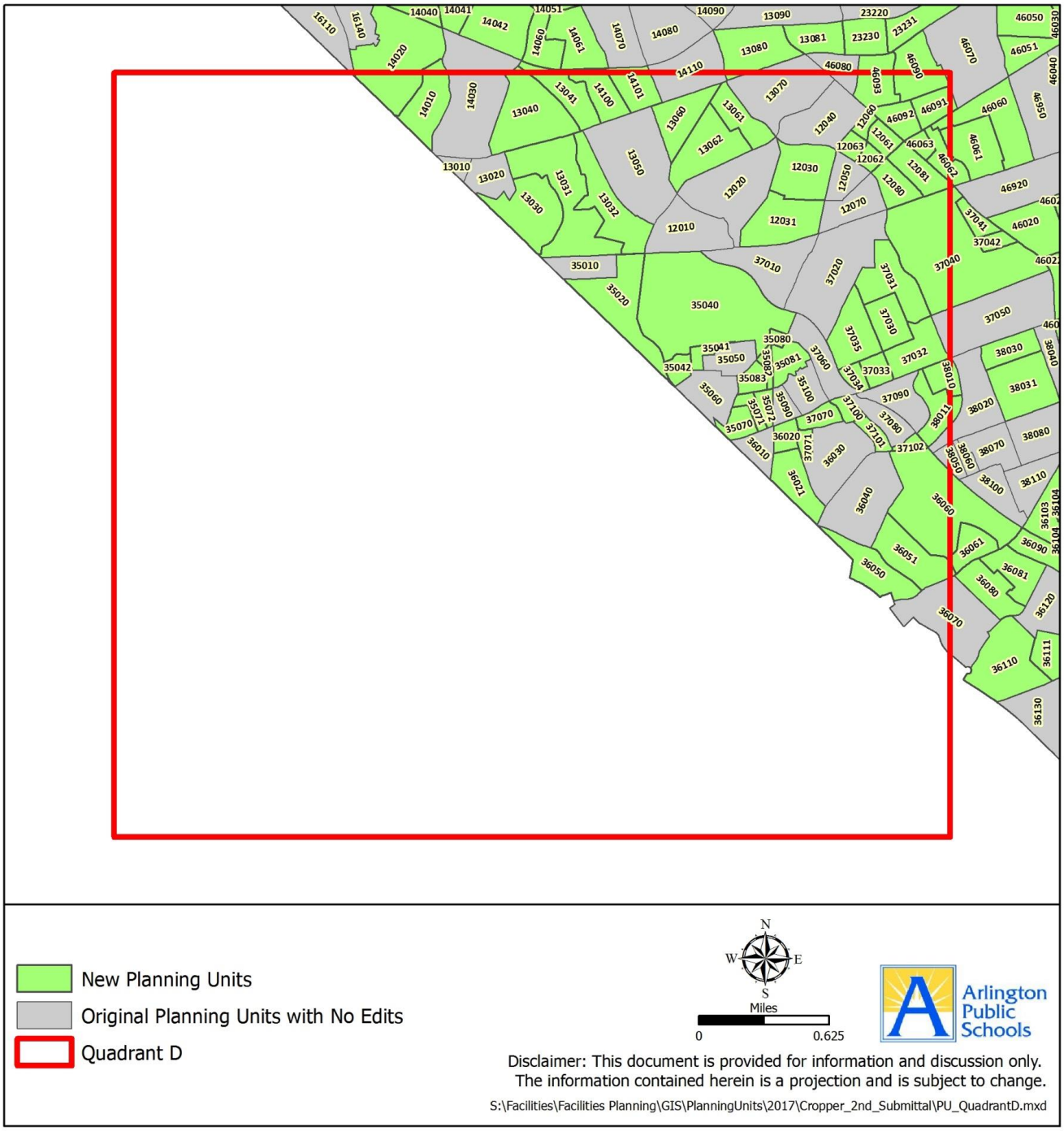
Section D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