

Profitable Development of Floodplain Plagued Parcels

Daniel L. Branham Sr., RLS and Khalid Siddiqi, Ph.D.

¹ Kennesaw State University, Marietta, GA 30060, USA

² Kennesaw State University, Kennesaw, GA 30144, USA

³ Springer Publishing, 69121 Heidelberg, Germany

dbranha2@kennesaw.edu

ksiddqi@kennesaw.edu

Abstract

The objective of this study was to promote development of residential tracts of land that include areas subject to flood hazards as identified by the Federal Emergency Management Agency (FEMA). The concept is that re-zoning of flood prone properties using Open Space Community (OSC) criteria will result in greater lot yields than could be obtained by developing the project under existing zoning classification. The authors collected historical data on re-zonings to make the case for promoting development of properties that contain floodplains. Recent re-zoning cases in Metro-Atlanta are examined to achieve the stated objective. In addition, this type of re-zoning will reduce the number of lots created that contain identified FEMA floodplain. This eliminates the need for future homeowners to purchase high-cost federally mandated flood insurance when financing their purchase using federally protected bank loans. Developers would be able to market these properties more readily to future residents since flood insurance would not be required. The intended audience were developers interested in profitable residential developments that contain large areas of restrictive acreage such as floodplains, stream buffers and steep slopes. The results of four case studies show an average increase in lot yield of 27.8% when these properties were re-zoned as open space community (OSC) projects.

Keywords

Floodplain development, OSC re-zoning, residential development, subdivision design, and natural buffers

1. Introduction

The study was undertaken to enhance the profitability of development of residential parcels in Flood Plans. The re-zoning process was found to reduce the potential of flooding in the areas where residential development takes place. In addition, the dwellers will be spared from paying high costs for flood insurance. The developers would be able to market these properties more easily to prospective residents due to lower insurance costs. Residential developers typically select tracts of land for potential projects based on the expected lot yield. The lot yield is determined by identifying the current zoning district of the tract to be developed. A developable lot is termed a “unit”. The current zoning indicates the typical lot yield per acre (commonly called units per acre - UPA) that the developer can expect to obtain from the parcel of land. To determine the lot yield of a parcel, take the parcel area (in acres) and multiply by the UPA number specified in the zoning of the property, [example: a tract of land located in an R-20 zoning district would have an expected lot yield of 1.75 UPA. If the parcel of land were 40 acres, then the developer could expect to obtain 70 buildable units: (40 acres) (1.75 units per acre) = 70 buildable units.

If the parcel of land has floodplain located within, the total buildable area can be dramatically reduced due to governmental regulations restricting the building of residential dwellings to areas that are located outside the identified 100-year flood hazard area.

Open Space Community (OSC) Zoning

OSC overlay re-zoning is a way for developers to minimize the adverse aspects of developments that have large areas of non-buildable area. OSC re-zoning is dependent upon separating a minimum of 35 percent of the original tract from the total area of the parent tract. County code dictates open space should be comprised of 100-year floodplains, stream buffers, wetlands, archeological sites and cemeteries or burial grounds. The remainder of the

tract is used to construct buildable lots and roads for the development. The new lots are substantially smaller in square footage than the minimum lot size requirement per existing zoning. As an example, for OSC overlay re-zoning from existing R-30 to R-20/OSC, the lot size for the original R-30 zoning would have required minimum lot sizes of 30,000 square feet. Normal R-20 zoning requires a minimum lot size of 20,000 square feet. R-20/OSC rezoned tracts require a minimum lot size of 13,000 square feet.

This represents a 57% reduction in lot size over the original R-30 zoning requirement and a 35% reduction in lot size for the normal minimum R-20 zoning lot size.

Table 1. Density and Open Space Requirements for Standard Residential Zones (Cobb County GA, 2017)

<u>District Designation</u>	<u>Min. Lot Area</u>	<u>(UPA)Units per Acre</u>
R-30	30,000 ft ²	1.1 avg.
R-30/OSC	15,000 ft²	1.1 avg.
R-20	20,000 ft ²	1.75 avg.
R-20/OSC	13,000 ft²	1.75 avg.
R-15	15,000 ft ²	2.1 avg.
R-15/OSC	10,000 ft²	2.1 avg.

The first column in Table 1 lists the zoning category. The second column shows the minimum lot size requirement for the zoning category. The third column lists the expected lot yield per acre based on the minimum lot size requirement.

When re-zoning a parcel to overlay Open Space Community (OSC) zoning, the developer is expected to separate the 100-year floodplain from the parent tract. Floodplain can only make-up 70% of the area set aside for open space. Other non-desirable areas (buffer zones, wetlands, streams, etc.) can be grouped with the floodplain to form one or more undisturbed tracts. Together these separated parcels need to add up to a minimum of 35% of the original tract being developed to qualify as an OSC re-zoning. If not, additional square footage will need to be added until the separated parcel(s) equal the 35% minimum required. The remaining parcel of land is subdivided into much smaller lots than those required by the original zoning of the parcel. The resulting subdivision provides the developer with an overall greater lot yield than would have resulted based on developing the same property under the original zoning category.

In addition, none of the lots created contain identified 100-year floodplain.

Landowners and developers could be compensated for preserving open land. For instance, developers could be granted permission to increase the density of their developments through so-called density bonus credits (Sheaffer, 2002).

Floodplain Definition

In 1968, Congress established the National Flood Insurance Program (NFIP) with the passage of the National Flood Insurance Act. This Act was an effort by the government to make flood insurance affordable and available to assist the public in recovering from flood damage. In exchange for this offer, State and community floodplain

management regulations were enacted to reduce future flood damages by enforcing new building developments to areas outside the identified 100-year or “Base Flood” hazard area as identified by the Federal Emergency Management Agency, (FEMA).

The 100-year flood hazard area is technically defined as the 1-percent-annual-chance flood. The 1-percent-annual-chance flood was chosen on the basis that it provides a higher level of protection while not imposing overly stringent requirements or the burden of excessive costs on property owners. The 1-percent-annual-chance flood (or 100-year flood) represents a magnitude and frequency that has a statistical probability of being equaled or exceeded in any given year, or stated alternatively, the 100-year flood has a 26 percent (or 1 in 4) chance of occurring over the life of a 30-year mortgage. (FEMA, 2002, p. 5).

Although FEMA provides communities with guidance on open space development, specific open space land uses are at the discretion of the local community. Local governments are encouraged by FEMA to develop the acquired properties in a manner that is “compatible with open space, recreational, or wetlands management practices, and consistent with conservation of natural floodplain functions” (FEMA, 2009, p. 39).

Cost of Flood Insurance

The cost for flood insurance varies based upon several factors such as the year the home was built, occupancy of the home, number of floors (including basement), location of personal belongings in the home, deductible of flood policy and most importantly the actual flood risk of the property. The three basic categories of flood risk properties are low, moderate, and high risk.

The most favorable designations are “moderate and low risk”. These properties have a lower average cost of flood insurance because the coverage is not required as it is not likely that a flood will occur. These areas are designated as Non-Special Flood Hazard Areas or NSFA by FEMA. The probability of flooding is 0.2 to 1 percent for moderate-risk and less than or equal to 0.2% for low-risk designated properties.

Properties located in known flood zones as identified by FEMA are “high-risk areas”. These areas are designated as Special Flood Hazard Areas or SFHA. There is a greater than 1% chance of flooding each year.

For a \$250,000, one-story house with a basement located in a “moderate or low risk” area, the yearly flood insurance cost would be \$427 per year with a \$5000 deductible. This includes \$100,000 coverage for replacement of personal items located within the dwelling.

For the same dwelling, but located in a “high-risk area”, a yearly premium of \$2482 could be expected for the same amount of coverage.

2. Data Collection

This explanatory case study is a mixed-method approach comprised of OSC re-zoning cases and semi-structured interviews of major stakeholders in the development of floodplain prone properties.

Initially 87 re-zoning cases comprised the study sample. These cases represent the re-zoning petitions reviewed by the Planning Commission in Cobb County, GA during 2017. While reviewing these cases it was decided to focus on those re-zoning cases involving OSC overlay criteria. OSC re-zoning criteria specifically states that floodplain prone areas of the parent tract are to be used as part of the open space area. OSC cases are reviewed to establish any connection between OSC re-zoning, floodplain and expected lot yields.

In 2017, there were four OSC re-zonings cases. These cases form the basis of this pilot study.

In addition to the 2017 OSC re-zoning case reviews, two semi-structured interviews were conducted with major stakeholders involved in the development of floodplain prone tracts of land. These semi-structured sessions provided opportunities to gather data using spontaneous follow-up questions as the interview proceeded. Transcripts were selectively mined for quotations that add information or clarify issues relative to the study data.

The first interview was conducted with a General Contractor who had developed properties in this county over the past forty years and is still actively doing so. This developer currently has a property undergoing review that is listed as an OSC re-zoning. His case falls under the 2018 county calendar and is not part of this study.

The second interview was conducted with a member of the Cobb County planning division who is specifically designated to review OSC re-zoning cases.

3. Results

Data analysis is based on enhancing the ability of a developer to market the rezoned lots with lower flood insurance rates. The results obtained from analysis were based on the number of additional lots generated through rezoning with the lower insurance rates.

4. Discussion

Detailed interviews were conducted with a General Contractor who has built subdivisions in the area for the past forty years. A second interview was conducted with a member of the Cobb County planning division designated to review Open Space Community Re-zoning projects. In addition, eighty-seven re-zoning cases were examined and reviewed to establish the connection between re-zoning and the increase in lot yield for floodplain developments. These cases involved all re-zoning cases submitted in Cobb County, Georgia for the 2017 year.

Through the interview process, the county official stated, “OSC re-zoning was not intended to result in greater lot yields for developers. The intent of the county was for the preservation of drainage basins and groundwater quality”, (Westbrook, 2018).

A question posed to the general contractor (GC) asked how many additional lots were required of an OSC re-zoning to make it more profitable. He stated, “The addition of one lot can potentially increase profit by as much as fifteen percent”, (Konigsmark, 2018).

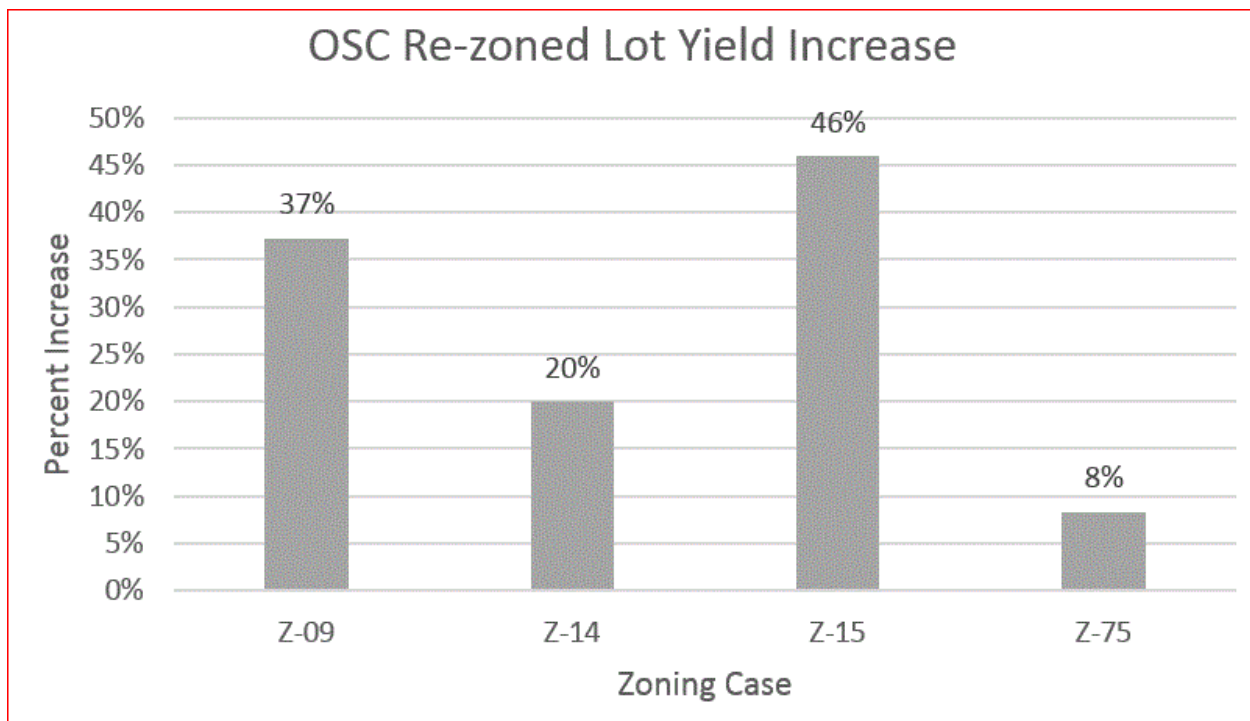


Figure 1. OSC Re-zoned Lot Yield Increase (generated by author)

In this bar chart, the vertical axis reflects the percentage of increase in lots over the original zoned lot yield. The horizontal axis indicated the four studied rezoning cases. The labels on the top of each bar indicate the percent of increase per re-zoned case.

Presented next are characteristics of the OSC cases reviewed.

Re-Zoning Case Z-9

This tract of land contains 46.962 acres currently zoned R-30. The required open space is 16.44 acres. The existing identified 100-year floodplain is 0.944 acres. A significant portion of the property set aside for open space consists of required stream buffers.

Under current zoning, the developer would realize a yield of 51 lots. To obtain this number, take the total number of acres and multiply by the expected UPA for the existing zoning category.

Existing Lot Yield Calculation:

$(46.962 \text{ acres}) \times (1.1 \text{ UPA}) = 51.66 \text{ lots (rounds down to 51 lots)}$

The same property re-zoned to R-20/OSC could yield 82 lots.

OSC Lot Yield Calculation:

$(46.962 \text{ acres}) \times (1.75 \text{ UPA}) = 82.18 \text{ lots (rounds down to 82 lots)}$

The developer finalized this re-zoning request with a proposed OSC yield of 70 lots. This results in a gain of 19 lots, or a 37% increase over current zoning expectations. Using information on the re-zoning request, the average proposed lot size is 13,369 ft². Two lots (representing 3% of the total) are substantially larger than the average. One is 49,484 ft² and the second is 95,832 ft².

Re-Zoning Case Z-14

This parcel is a 23.06-acre tract re-zoned from R-20 to R-15/OSC. Open space is 9.93 acres, which represents 43.1% of the total tract of land. None of the open space areas are in an identified 100-year floodplain. A small portion of the open space area consists of required stream buffers.

Under current zoning, the developer would realize a yield of 40 lots.

Under OSC re-zoning the same tract would yield 48 lots. This is a 20% increase in marketable lots. The average proposed lot size is 8,823 ft². The review board recommended that all lots meet the R-15/OSC required minimum of 10,000 ft² before approval. There are 35 lots smaller than required. The required area needed to increase them to the minimum of 10,000 ft² is 56,473 ft². Designated open space currently exceeds requirements by 80,978 ft². This is attainable permitting the development to meet OSC requirements.

Re-Zoning Case Z-15

A 34.2-acre tract of land being re-zoned from R-30 to R-20/OSC. Open space is 12.03 acres representing 35.2% of the total area. None of the open space areas are in an identified 100-year floodplain. Most of the open space area is comprised of required stream buffers.

Under current zoning, the developer would realize a yield of 37 lots.

Under OSC re-zoning the same tract could yield 59 lots. The developer chose to have some lots larger than the minimum required 13,000 square feet per the R-20/OSC designation resulting in a lot yield of 54 lots. This is a 46% increase in marketable lots.

Information on average lot size is not available from data reviewed for this case.

Re-Zoning Case Z-75

The last case is a 77.03-acre site re-zoned from R-30 to R-20/OSC. Open space is 31.8 acres, which is 41.3% of the total area. The existing identified 100-year floodplain on this site is 2.1 acres. Most of the open space area is comprised of steep slopes.

Under current zoning, the developer would realize a yield of 84 lots.

After OSC re-zoning, the yield could have been increased to 134 lots. The developer opted for some lots to be larger than the minimum of 13,000 ft² required and finalized the planned development to yield 91 lots. This is an 8% gain in buildable lots.

Information on average lot size is not available from data reviewed for this case.

During the interview with the GC, reasons given for a developer opting to settle for less than the maximum obtainable lot yield can be attributed to complaints from local landowners about the “increase in traffic and the overburdening of local schools” that are created by the new development (Konigsmark, 2018).

Lot Size and Valuation

In comparing lot sizes, those in Z-09 had a standard deviation of 1,769 ft² representing a 13.6% variation from the required 13,000 ft² for R-20/OSC.

When large variations in lot sizes occur, the cost per lot can significantly increase. The two acreage tracts in Z-09 would sell at a much greater price than the minimum size lots.

For Z-14, the standard deviation was 1,446 ft² representing a variation of 14.5% from the required 10,000 ft² for R-15/OSC re-zoning.

Except for the two acreage lots in Z-09, the vast majority of created lots are representative of the minimum lot size as required per each re-zoning category. The cost per lot is held constant throughout the development.

5. Conclusions

The objective of this study was to promote development of residential tracts of land that include areas subject to flood hazards as identified by the Federal Emergency Management Agency. Re-zoning of flood prone properties as discussed in the Section Discussion of Results translated to greater lot yields as compared to developing such projects under current zoning regulations. Historical data on re-zonings was used to investigate and justify the findings in this paper to promote more profitable development in flood plains.

The results of these four cases show that through OSC re-zoning these developments saw an average increase in lot yield per of 27.8%. Basing profitability solely on buildable lots created per development, more lots would equal greater profits for developers in these instances.

In addition to providing the developer with greater lot yields, OSC re-zoned tracts of land preserve in perpetuity environmentally sensitive lands in their natural condition. These saved areas result in large natural buffers to adjoining tracts of land. The initial hypothesis that areas being set aside as open space mainly would be comprised of identified 100-year floodplain (up to 70%) turns out not to be the case.

Through this exploratory pilot study, it was observed that most of the open space property consists of stream buffers and steep slopes.

Lots created through OSC re-zoning do eliminate the creation of floodplain affected residential home sites resulting in savings for future homeowners who don't have to purchase costly flood insurance as a condition of federally insured bank loans.

References

Cobb County GA, 2017. *Code of Ordinances*. [Online]

Available at: https://library.municode.com/ga/cobb_county/codes/code_of_ordinances

FEMA, 2002. *National flood insurance program*, Washington, DC: Federal Emergency Management Agency.

FEMA, 2009. *"Hazard mitigation assistance (HMA) fiscal year 2009 unified guidance"*, working paper, Washington, DC, July 14: Federal Emergency Management Agency.

Konigsmark, R., 2018. *General Contractor* [Interview] (9 April 2018).

Sheaffer, J. R. M. J. D. & H. N. B., 2002. Encouraging Wise Use of Flood Plains with Market Based Incentives. *Environment*, 44(1), pp. 32-43.

Westbrook, P., 2018. *Cobb County Community Development Comprehensive Planner* [Interview] (30 March 2018).