

Webster Groves School District



Student Transfer Status 2015 Enrollments

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Study Overview

The Superintendent and Board of Education of the Webster Groves School District (District) authorized an update of the District's enrollment projections with resident 2015 birth counts and a study of transfer students. The update to the District's enrollment projection model and birth series are provided in the report, *Webster Groves School District, Enrollment Projections Study, 2015 Birth Update, August 2016*. The focus of this report is the geocoding of transfer students, District housing types by attendance area, student transfer status by grade and attendance area, and student transfer status by housing type and attendance area. These topics emerged from conversations with the Superintendent and two Board members. The Letter of Agreement authorizing this work is contained in the Appendix (see Administrative Documents, Scope of Work, Appendix).

Student transfer data were obtained from the District in a special tabulation of student records from the 2015 school year. In this study, transfer students are defined as students that came into the district and reside in the District after Kindergarten. Non transfer students are students that reside in the District and started in Kindergarten. The District coded student transfer status in a separate field that included non-transferring (NT), transferring (T), VICC (V), and Normandy/Riverview (NR) transfer students. The District produced 4,487 student records with these codes, grades, and addresses. These data were geocoded using the data developed in the benchmark study and obtained from the St. Louis County, GIS Service Center for the current calendar year (2016). Address points and street centerlines were used to geocode or identify the residential address locations associated with the student records. Accordingly, the results and observations in this study pertain to student residential locations and not necessarily District schools that students attend. The District's authoritative digital boundary map was used to identify and count student falling within the District and elementary attendance areas. This map (Map 1) is provided in the Appendix (Maps).

Of the total, 4,467 student records were matched to St. Louis County address points and street centerlines. The table below summarizes the data sources that were used to geocode student addresses.

Table 1: Geocoding Summary for 2015 Student Records

Data Source	Record Count
Unmatched	20
Matched to Address Points	4303
Matched to Parcels	2
Matched to Street Centerlines	162
Total	4487

These data were spatially joined to the District's boundary and attendance area map. There were 153 address locations that were outside the District's boundaries and 20 student records that could not be matched to address points or street centerlines. These records (a total of 173 records) were defined as missing in crosstabulations involving student transfer characteristics.

Parcel polygons and associated information were used to identify housing and land use characteristics of attendance areas. These data provided tenure (owner and non-owner) and land use characteristics of parcels which included the type of housing on the parcel (Duplex/Townhome, Multi-Family, and Single Family). Overlaying the District's digital boundary map assigned the District's attendance areas to each parcel which provided the means of crosstabulating District parcel land use characteristics by attendance area. These data are provided in the table below.

Table 2: District Parcels by Tenure, Land Use, and Attendance Area

LAND USE * ATTENDANCE AREAS * TENURE Crosstabulation

TENURE				ATTENDANCE AREAS					Total
				AVERY	BRISTOL	CLARK	EDGAR ROAD	HUDSON	
NOT OWNER	LAND USE	Not Coded	Count	10	9	7			26
			% within LAND USE	38.5%	34.6%	26.9%			100.0%
			% within ATTENDANCE AREAS	100.0%	100.0%	100.0%			100.0%
	Total		Count	10	9	7			26
			% within LAND USE	38.5%	34.6%	26.9%			100.0%
			% within ATTENDANCE AREAS	100.0%	100.0%	100.0%			100.0%
NOT OWNER	LAND USE	Commercial	Count	85	78	22	15	55	255
			% within LAND USE	33.3%	30.6%	8.6%	5.9%	21.6%	100.0%
			% within ATTENDANCE AREAS	13.8%	11.9%	8.6%	3.0%	11.9%	10.2%
		Duplex/Townhome	Count	11	25	1	11	0	48
			% within LAND USE	22.9%	52.1%	2.1%	22.9%	.0%	100.0%
			% within ATTENDANCE AREAS	1.8%	3.8%	.4%	2.2%	.0%	1.9%
		Industrial/Utility	Count	39	28	5	7	27	106
			% within LAND USE	36.8%	26.4%	4.7%	6.6%	25.5%	100.0%
			% within ATTENDANCE AREAS	6.3%	4.3%	2.0%	1.4%	5.9%	4.2%
		Institution	Count	13	18	6	3	4	44
			% within LAND USE	29.5%	40.9%	13.6%	6.8%	9.1%	100.0%
			% within ATTENDANCE AREAS	2.1%	2.7%	2.3%	.6%	.9%	1.8%
		Multi-Family	Count	37	73	6	26	37	179
			% within LAND USE	20.7%	40.8%	3.4%	14.5%	20.7%	100.0%
			% within ATTENDANCE AREAS	6.0%	11.1%	2.3%	5.2%	8.0%	7.2%

			Park	Count	2	2	0	0	1	5
				% within LAND USE	40.0%	40.0%	.0%	.0%	20.0%	100.0%
				% within ATTENDANCE AREAS	.3%	.3%	.0%	.0%	.2%	.2%
			Recreation	Count	0	5	0	0	1	6
				% within LAND USE	.0%	83.3%	.0%	.0%	16.7%	100.0%
				% within ATTENDANCE AREAS	.0%	.8%	.0%	.0%	.2%	.2%
			Single Family	Count	281	272	187	374	270	1384
				% within LAND USE	20.3%	19.7%	13.5%	27.0%	19.5%	100.0%
				% within ATTENDANCE AREAS	45.6%	41.3%	73.0%	74.2%	58.6%	55.5%
			Vacant/Agriculture	Count	148	157	29	68	66	468
				% within LAND USE	31.6%	33.5%	6.2%	14.5%	14.1%	100.0%
				% within ATTENDANCE AREAS	24.0%	23.9%	11.3%	13.5%	14.3%	18.8%
			Total	Count	616	658	256	504	461	2495
				% within LAND USE	24.7%	26.4%	10.3%	20.2%	18.5%	100.0%
				% within ATTENDANCE AREAS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	OWNER	LAND USE	Commercial	Count	26	20	4	1	21	72
				% within LAND USE	36.1%	27.8%	5.6%	1.4%	29.2%	100.0%
				% within ATTENDANCE AREAS	1.2%	.9%	.2%	.0%	1.1%	.7%
			Duplex/Townhome	Count	10	22	1	8	4	45
				% within LAND USE	22.2%	48.9%	2.2%	17.8%	8.9%	100.0%
				% within ATTENDANCE AREAS	.4%	1.0%	.1%	.3%	.2%	.4%
			Industrial/Utility	Count	13	4	0	0	8	25
				% within LAND USE	52.0%	16.0%	.0%	.0%	32.0%	100.0%

		% within ATTENDANCE AREAS	.6%	.2%	.0%	.0%	.4%	.2%
Institution	Count		13	23	4	9	5	54
	% within LAND USE		24.1%	42.6%	7.4%	16.7%	9.3%	100.0%
	% within ATTENDANCE AREAS		.6%	1.0%	.2%	.4%	.3%	.5%
Multi-Family	Count		10	34	56	13	54	167
	% within LAND USE		6.0%	20.4%	33.5%	7.8%	32.3%	100.0%
	% within ATTENDANCE AREAS		.4%	1.5%	2.8%	.5%	2.8%	1.5%
Park	Count		2	2	0	5	4	13
	% within LAND USE		15.4%	15.4%	.0%	38.5%	30.8%	100.0%
	% within ATTENDANCE AREAS		.1%	.1%	.0%	.2%	.2%	.1%
Recreation	Count		2	1	1	0	0	4
	% within LAND USE		50.0%	25.0%	25.0%	.0%	.0%	100.0%
	% within ATTENDANCE AREAS		.1%	.0%	.1%	.0%	.0%	.0%
Single Family	Count		2120	2089	1929	2502	1823	10463
	% within LAND USE		20.3%	20.0%	18.4%	23.9%	17.4%	100.0%
	% within ATTENDANCE AREAS		95.1%	94.5%	96.5%	98.2%	94.8%	95.9%
Vacant/Agriculture	Count		33	16	4	9	5	67
	% within LAND USE		49.3%	23.9%	6.0%	13.4%	7.5%	100.0%
	% within ATTENDANCE AREAS		1.5%	.7%	.2%	.4%	.3%	.6%
Total	Count		2229	2211	1999	2547	1924	10910
	% within LAND USE		20.4%	20.3%	18.3%	23.3%	17.6%	100.0%
	% within ATTENDANCE AREAS		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Total	LAND	Not Coded	Count	10	9	7	0	26

USE	% within LAND USE	38.5%	34.6%	26.9%	.0%	.0%	100.0%
	% within ATTENDANCE AREAS	.4%	.3%	.3%	.0%	.0%	.2%
Commercial	Count	111	98	26	16	76	327
	% within LAND USE	33.9%	30.0%	8.0%	4.9%	23.2%	100.0%
	% within ATTENDANCE AREAS	3.9%	3.4%	1.1%	.5%	3.2%	2.4%
Duplex/Townhome	Count	21	47	2	19	4	93
	% within LAND USE	22.6%	50.5%	2.2%	20.4%	4.3%	100.0%
	% within ATTENDANCE AREAS	.7%	1.6%	.1%	.6%	.2%	.7%
Industrial/Utility	Count	52	32	5	7	35	131
	% within LAND USE	39.7%	24.4%	3.8%	5.3%	26.7%	100.0%
	% within ATTENDANCE AREAS	1.8%	1.1%	.2%	.2%	1.5%	1.0%
Institution	Count	26	41	10	12	9	98
	% within LAND USE	26.5%	41.8%	10.2%	12.2%	9.2%	100.0%
	% within ATTENDANCE AREAS	.9%	1.4%	.4%	.4%	.4%	.7%
Multi-Family	Count	47	107	62	39	91	346
	% within LAND USE	13.6%	30.9%	17.9%	11.3%	26.3%	100.0%
	% within ATTENDANCE AREAS	1.6%	3.7%	2.7%	1.3%	3.8%	2.6%
Park	Count	4	4	0	5	5	18
	% within LAND USE	22.2%	22.2%	.0%	27.8%	27.8%	100.0%
	% within ATTENDANCE AREAS	.1%	.1%	.0%	.2%	.2%	.1%
Recreation	Count	2	6	1	0	1	10
	% within LAND USE	20.0%	60.0%	10.0%	.0%	10.0%	100.0%

		% within ATTENDANCE AREAS					
		.1%	.2%	.0%	.0%	.0%	.1%
Single Family	Count	2401	2361	2116	2876	2093	11847
	% within LAND USE	20.3%	19.9%	17.9%	24.3%	17.7%	100.0%
	% within ATTENDANCE AREAS	84.1%	82.0%	93.5%	94.3%	87.8%	88.2%
Vacant/Agriculture	Count	181	173	33	77	71	535
	% within LAND USE	33.8%	32.3%	6.2%	14.4%	13.3%	100.0%
	% within ATTENDANCE AREAS	6.3%	6.0%	1.5%	2.5%	3.0%	4.0%
Total	Count	2855	2878	2262	3051	2385	13431
	% within LAND USE	21.3%	21.4%	16.8%	22.7%	17.8%	100.0%
	% within ATTENDANCE AREAS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

The format of this table and the other crosstabulation tables in this report includes frequency counts, percentages of cells to row totals and percentages of cell to column totals. This table is broken down into 3 main sections; non owner, owner, and totals with frequency counts and percentages found in each attendance area. The total (last) section of this table shows the total breakdown of land uses within the District. In the last column and cell, the count of parcels within the District numbers 13,431 which represents 100% of parcels within District boundaries. Of the total, more parcels are found within the Edgar Road attendance area (22.7%, n=3,051) while the Clark attendance area has fewer parcels (16.8% of the total, n=2,878). The Avery and Bristol attendance areas have close to the same number of parcels (21.3% and 21.4% of the total, respectively) while the balance of the District with 17.8% of the total is found in the Hudson attendance area.

The breakdown of the totals by tenure (not owner and owner) and attendance area shows that the larger percentage of not owning resident parcels are found in the Bristol attendance area (26.4%, n=658). Avery is close to Bristol with 24.7% (n=616), while Clark has the fewer number of not-owner parcels (10.3%, n=256). The larger categories of not-owner parcels are single family (n=1,384) and multi-family (n=179). Among owner tenure parcels, the larger percentage across attendance areas is found in the Edgar Road attendance area (23.3%, n=2,547), with Avery and Bristol following up at 20.4% (n=2,229) and 20.3% (n=2,211), respectively. This table shows that there are far more single family than multi-family and owner than not owner parcels in the District.

Geocoded student records with student transfer status coding were overlaid with parcel data containing these housing characteristics. These data provided the basis for crosstabulating student transfer status by housing type by attendance area and student transfer status by grade by attendance area.

Student Transfer Status

The geocoding of student records created X,Y coordinate points that were spatially overlaid onto the District's parcel layer. Map 2 (Appendix) shows the spatial distribution of geocoded student records. As parcels were tagged with attendance area definitions, the attributes of student records with the overlay included attendance area of residence, land use (and housing) characteristics of parcels, and the District's coding of transfer status of students. Map 3 (Appendix) shows student records within District parcels and attendance areas.

The data contained in the following table shows counts of student records broken down by transfer status, land use codes, and stratified by District attendance areas.

Table 3: Student Transfer Status by Land Use and Attendance Area

Land Use (LUCODE)* Transfer_Status (Transfer_S)* Attendance Area Crosstabulation							
Attendance Area		Transfer Status				Total	
		Normandy/Riverview	Nontransferring	Transferring	VICC		
LUCODE	Count	3	25	18	127	173	
	% within LUCODE	1.7%	14.5%	10.4%	73.4%	100.0%	
	% within Transfer_S	21.4%	34.2%	39.1%	97.7%	65.8%	
	Duplex/Townhome	Count	0	1	1	0	2
	% within LUCODE	.0%	50.0%	50.0%	.0%	100.0%	
	% within Transfer_S	.0%	1.4%	2.2%	.0%	.8%	
	Industrial/Utility	Count	0	0	3	0	3
	% within LUCODE	.0%	.0%	100.0%	.0%	100.0%	
	% within Transfer_S	.0%	.0%	6.5%	.0%	1.1%	
	Institution	Count	1	0	1	0	2
	% within LUCODE	50.0%	.0%	50.0%	.0%	100.0%	
	% within Transfer_S	7.1%	.0%	2.2%	.0%	.8%	
	Multi-Family	Count	0	1	4	0	5
	% within LUCODE	.0%	20.0%	80.0%	.0%	100.0%	
	% within Transfer_S	.0%	1.4%	8.7%	.0%	1.9%	
	Single Family	Count	10	46	19	3	78
	% within LUCODE	12.8%	59.0%	24.4%	3.8%	100.0%	
	% within Transfer_S	71.4%	63.0%	41.3%	2.3%	29.7%	
	Total	Count	14	73	46	130	263
		% within LUCODE	5.3%	27.8%	17.5%	49.4%	100.0%
		% within Transfer_S	100.0%	100.0%	100.0%	100.0%	100.0%

Avery	LUCODE	Commercial	Count		1	0	1
			% within LUCODE		100.0%	.0%	100.0%
			% within Transfer_S		.1%	.0%	.1%
		Duplex/Townhome	Count		7	15	22
			% within LUCODE		31.8%	68.2%	100.0%
			% within Transfer_S		.9%	4.5%	2.0%
		Institution	Count		2	2	4
			% within LUCODE		50.0%	50.0%	100.0%
			% within Transfer_S		.3%	.6%	.4%
		Multi-Family	Count		12	17	29
			% within LUCODE		41.4%	58.6%	100.0%
			% within Transfer_S		1.6%	5.0%	2.6%
		Single Family	Count		748	302	1050
			% within LUCODE		71.2%	28.8%	100.0%
			% within Transfer_S		97.1%	89.6%	94.9%
		Vacant/Agriculture	Count		0	1	1
			% within LUCODE		.0%	100.0%	100.0%
			% within Transfer_S		.0%	.3%	.1%
		Total	Count		770	337	1107
			% within LUCODE		69.6%	30.4%	100.0%
			% within Transfer_S		100.0%	100.0%	100.0%
Bristol	LUCODE	Commercial	Count		0	1	1
			% within LUCODE		.0%	100.0%	100.0%
			% within Transfer_S		.0%	.3%	.1%
		Duplex/Townhome	Count		11	10	21
			% within LUCODE		52.4%	47.6%	100.0%
			% within Transfer_S		1.6%	2.6%	1.9%
		Industrial/Utility	Count		0	57	57
			% within LUCODE		.0%	100.0%	100.0%
			% within Transfer_S		.0%	14.6%	5.2%
		Institution	Count		6	32	38
			% within LUCODE		15.8%	84.2%	100.0%

			% within Transfer_S		.9%	8.2%		3.5%
		Multi-Family	Count		5	12		17
			% within LUCODE		29.4%	70.6%		100.0%
			% within Transfer_S		.7%	3.1%		1.6%
		Single Family	Count		675	278		953
			% within LUCODE		70.8%	29.2%		100.0%
			% within Transfer_S		96.6%	71.1%		87.4%
		Vacant/Agriculture	Count		2	1		3
			% within LUCODE		66.7%	33.3%		100.0%
			% within Transfer_S		.3%	.3%		.3%
	Total		Count		699	391		1090
			% within LUCODE		64.1%	35.9%		100.0%
			% within Transfer_S		100.0%	100.0%		100.0%
Clark	LUCODE	Multi-Family	Count		6	6		12
			% within LUCODE		50.0%	50.0%		100.0%
			% within Transfer_S		1.2%	3.0%		1.8%
		Single Family	Count		474	196		670
			% within LUCODE		70.7%	29.3%		100.0%
			% within Transfer_S		98.3%	96.6%		97.8%
		Vacant/Agriculture	Count		2	1		3
			% within LUCODE		66.7%	33.3%		100.0%
			% within Transfer_S		.4%	.5%		.4%
	Total		Count		482	203		685
			% within LUCODE		70.4%	29.6%		100.0%
			% within Transfer_S		100.0%	100.0%		100.0%
Edgar Road	LUCODE	Duplex/Townhome	Count		4	1		5
			% within LUCODE		80.0%	20.0%		100.0%
			% within Transfer_S		.6%	.4%		.5%
		Multi-Family	Count		4	10		14
			% within LUCODE		28.6%	71.4%		100.0%
			% within Transfer_S		.6%	3.6%		1.5%
		Single Family	Count		642	266		908

				% within LUCODE		70.7%	29.3%		100.0%
				% within Transfer_S		98.3%	96.0%		97.6%
	Vacant/Agriculture	Count				3	0		3
						100.0%	.0%		100.0%
						.5%	.0%		.3%
	Total	Count				653	277		930
						70.2%	29.8%		100.0%
						100.0%	100.0%		100.0%
Hudson	LUCODE	Multi-Family	Count			6	12	0	18
						33.3%	66.7%	.0%	100.0%
						2.3%	7.8%	.0%	4.4%
	Single Family	Count				249	142	1	392
						63.5%	36.2%	.3%	100.0%
						96.9%	92.2%	100.0%	95.1%
	Vacant/Agriculture	Count				2	0	0	2
						100.0%	.0%	.0%	100.0%
						.8%	.0%	.0%	.5%
	Total	Count				257	154	1	412
						62.4%	37.4%	.2%	100.0%
						100.0%	100.0%	100.0%	100.0%
Total	LUCODE	Count				3	25	18	127
						1.7%	14.5%	10.4%	73.4%
						21.4%	.9%	1.3%	96.9%
	Commercial	Count				0	1	1	2
						.0%	50.0%	50.0%	.0%
						.0%	.0%	.1%	.0%
	Duplex/Townhome	Count				0	23	27	50
						.0%	46.0%	54.0%	.0%
						.0%	.8%	1.9%	.0%
	Industrial/Utility	Count				0	0	60	60
						.0%	.0%	100.0%	.0%
						.0%	.0%	4.3%	.0%

Institution	Count	1	8	35	0	44
	% within LUCODE	2.3%	18.2%	79.5%	.0%	100.0%
	% within Transfer_S	7.1%	.3%	2.5%	.0%	1.0%
Multi-Family	Count	0	34	61	0	95
	% within LUCODE	.0%	35.8%	64.2%	.0%	100.0%
	% within Transfer_S	.0%	1.2%	4.3%	.0%	2.1%
Single Family	Count	10	2834	1203	4	4051
	% within LUCODE	.2%	70.0%	29.7%	.1%	100.0%
	% within Transfer_S	71.4%	96.6%	85.4%	3.1%	90.3%
Vacant/Agriculture	Count	0	9	3	0	12
	% within LUCODE	.0%	75.0%	25.0%	.0%	100.0%
	% within Transfer_S	.0%	.3%	.2%	.0%	.3%
Total	Count	14	2934	1408	131	4487
	% within LUCODE	.3%	65.4%	31.4%	2.9%	100.0%
	% within Transfer_S	100.0%	100.0%	100.0%	100.0%	100.0%

The first block of counts refers to student records that were matched outside of District boundaries with location indexes not related to District parcels or address points. In all, there were 263 student records that were located outside of District parcels and the larger percentage of these records were VICC students (49.4%, n=130). The last block of data provides a summary of student records by transfer status. In the Total area, the counts and percentages show that 65.4% of District students were categorized as non-transferring (n=2,934). There were 1,408 transferring students or students moving into District schools which accounted for 31.4% of all student records. Larger percentages of non-transferring students were found in the Avery (69.6%), Clark (70.4%), and Edgar Road (70.2%) attendance areas. Bristol (35.9%) and Hudson (37.7%) attendance areas had higher percentages of transferring students. There was 1 anomaly in the crosstabulation where 60 transferring students were located in parcels categorized with an industrial/utility land use in the District. Most of these students were found in the Bristol attendance area (n=57).

A pattern of increasing student transfers with grade levels is observed in the crosstabulation of student records by transfer status and grade. These data are shown in Table 4 on the following pages. Looking at the total summary block at the end of the table and the % within Transfer_S rows in the Transferring column, the relationship appears to be positive and direct between grades K through 6 where percentages of transferring students increase with succeeding grades (e.g., K=0.0%, 1=3.3%, 2=4.5%, 3=5.8%, 4=6.3%, 5=8.0%, 6=8.8%).

Table 4: Student Transfer Status by Grade and Attendance Area

Grade * Transfer Status * Attendance Area Crosstabulation							
Attendance Area			Transfer_S				Total
			Normandy/Riverview	Nontransferring	Transferring	VICC	
Grade	01	Count	0	6	1	6	13
	% within Grade	.0%	46.2%	7.7%	46.2%	100.0%	
		% within Transfer_S	.0%	8.2%	2.2%	4.6%	4.9%
	02	Count	3	5	2	3	13
	% within Grade	23.1%	38.5%	15.4%	23.1%	100.0%	
		% within Transfer_S	21.4%	6.8%	4.3%	2.3%	4.9%
	03	Count	3	15	2	8	28
	% within Grade	10.7%	53.6%	7.1%	28.6%	100.0%	
		% within Transfer_S	21.4%	20.5%	4.3%	6.2%	10.6%
	04	Count	0	6	2	7	15
	% within Grade	.0%	40.0%	13.3%	46.7%	100.0%	
		% within Transfer_S	.0%	8.2%	4.3%	5.4%	5.7%
	05	Count	0	2	5	12	19
	% within Grade	.0%	10.5%	26.3%	63.2%	100.0%	
		% within Transfer_S	.0%	2.7%	10.9%	9.2%	7.2%
	06	Count	2	9	2	11	24
	% within Grade	8.3%	37.5%	8.3%	45.8%	100.0%	
		% within Transfer_S	14.3%	12.3%	4.3%	8.5%	9.1%
	07	Count	2	5	4	8	19
	% within Grade	10.5%	26.3%	21.1%	42.1%	100.0%	
		% within Transfer_S	14.3%	6.8%	8.7%	6.2%	7.2%
	08	Count	0	5	4	10	19
	% within Grade	.0%	26.3%	21.1%	52.6%	100.0%	
		% within Transfer_S	.0%	6.8%	8.7%	7.7%	7.2%
	09	Count	1	4	3	16	24
	% within Grade	4.2%	16.7%	12.5%	66.7%	100.0%	
		% within Transfer_S	7.1%	5.5%	6.5%	12.3%	9.1%
	10	Count	1	3	10	11	25

		% within Grade	4.0%	12.0%	40.0%	44.0%	100.0%
		% within Transfer_S	7.1%	4.1%	21.7%	8.5%	9.5%
11	Count	1	0	6	21	28	
	% within Grade	3.6%	.0%	21.4%	75.0%	100.0%	
	% within Transfer_S	7.1%	.0%	13.0%	16.2%	10.6%	
12	Count	0	1	5	16	22	
	% within Grade	.0%	4.5%	22.7%	72.7%	100.0%	
	% within Transfer_S	.0%	1.4%	10.9%	12.3%	8.4%	
K	Count	1	12	0	1	14	
	% within Grade	7.1%	85.7%	.0%	7.1%	100.0%	
	% within Transfer_S	7.1%	16.4%	.0%	.8%	5.3%	
Total	Count	14	73	46	130	263	
	% within Grade	5.3%	27.8%	17.5%	49.4%	100.0%	
	% within Transfer_S	100.0%	100.0%	100.0%	100.0%	100.0%	
Avery	Grade	01	Count	84	19	103	
	% within Grade		81.6%	18.4%		100.0%	
	% within Transfer_S		10.9%	5.6%		9.3%	
	02	Count	64	17	81		
	% within Grade		79.0%	21.0%		100.0%	
	% within Transfer_S		8.3%	5.0%		7.3%	
	03	Count	77	29	106		
	% within Grade		72.6%	27.4%		100.0%	
	% within Transfer_S		10.0%	8.6%		9.6%	
	04	Count	75	21	96		
	% within Grade		78.1%	21.9%		100.0%	
	% within Transfer_S		9.7%	6.2%		8.7%	
	05	Count	65	34	99		
	% within Grade		65.7%	34.3%		100.0%	
	% within Transfer_S		8.4%	10.1%		8.9%	
	06	Count	65	24	89		
	% within Grade		73.0%	27.0%		100.0%	
	% within Transfer_S		8.4%	7.1%		8.0%	

	07	Count		54	16	70
		% within Grade		77.1%	22.9%	100.0%
		% within Transfer_S		7.0%	4.7%	6.3%
	08	Count		54	20	74
		% within Grade		73.0%	27.0%	100.0%
		% within Transfer_S		7.0%	5.9%	6.7%
	09	Count		44	45	89
		% within Grade		49.4%	50.6%	100.0%
		% within Transfer_S		5.7%	13.4%	8.0%
	10	Count		44	39	83
		% within Grade		53.0%	47.0%	100.0%
		% within Transfer_S		5.7%	11.6%	7.5%
	11	Count		32	38	70
		% within Grade		45.7%	54.3%	100.0%
		% within Transfer_S		4.2%	11.3%	6.3%
	12	Count		35	35	70
		% within Grade		50.0%	50.0%	100.0%
		% within Transfer_S		4.5%	10.4%	6.3%
	K	Count		73	0	73
		% within Grade		100.0%	.0%	100.0%
		% within Transfer_S		9.5%	.0%	6.6%
	KA	Count		4	0	4
		% within Grade		100.0%	.0%	100.0%
		% within Transfer_S		.5%	.0%	.4%
	Total	Count		770	337	1107
		% within Grade		69.6%	30.4%	100.0%
		% within Transfer_S		100.0%	100.0%	100.0%
Bristol	Grade 01	Count		67	7	74
		% within Grade		90.5%	9.5%	100.0%
		% within Transfer_S		9.6%	1.8%	6.8%
	02	Count		49	14	63
		% within Grade		77.8%	22.2%	100.0%

	% within Transfer_S		7.0%	3.6%		5.8%
03	Count		76	16		92
	% within Grade		82.6%	17.4%		100.0%
	% within Transfer_S		10.9%	4.1%		8.4%
04	Count		54	22		76
	% within Grade		71.1%	28.9%		100.0%
	% within Transfer_S		7.7%	5.6%		7.0%
05	Count		49	28		77
	% within Grade		63.6%	36.4%		100.0%
	% within Transfer_S		7.0%	7.2%		7.1%
06	Count		71	37		108
	% within Grade		65.7%	34.3%		100.0%
	% within Transfer_S		10.2%	9.5%		9.9%
07	Count		52	34		86
	% within Grade		60.5%	39.5%		100.0%
	% within Transfer_S		7.4%	8.7%		7.9%
08	Count		41	39		80
	% within Grade		51.3%	48.8%		100.0%
	% within Transfer_S		5.9%	10.0%		7.3%
09	Count		52	49		101
	% within Grade		51.5%	48.5%		100.0%
	% within Transfer_S		7.4%	12.5%		9.3%
10	Count		33	49		82
	% within Grade		40.2%	59.8%		100.0%
	% within Transfer_S		4.7%	12.5%		7.5%
11	Count		42	60		102
	% within Grade		41.2%	58.8%		100.0%
	% within Transfer_S		6.0%	15.3%		9.4%
12	Count		35	36		71
	% within Grade		49.3%	50.7%		100.0%
	% within Transfer_S		5.0%	9.2%		6.5%
K	Count		75	0		75

				% within Grade		100.0%	.0%		100.0%
				% within Transfer_S		10.7%	.0%		6.9%
KA				Count		3	0		3
				% within Grade		100.0%	.0%		100.0%
				% within Transfer_S		.4%	.0%		.3%
Total				Count		699	391		1090
				% within Grade		64.1%	35.9%		100.0%
				% within Transfer_S		100.0%	100.0%		100.0%
Clark	Grade 01			Count		50	8		58
				% within Grade		86.2%	13.8%		100.0%
				% within Transfer_S		10.4%	3.9%		8.5%
	02			Count		45	10		55
				% within Grade		81.8%	18.2%		100.0%
				% within Transfer_S		9.3%	4.9%		8.0%
	03			Count		50	9		59
				% within Grade		84.7%	15.3%		100.0%
				% within Transfer_S		10.4%	4.4%		8.6%
	04			Count		48	15		63
				% within Grade		76.2%	23.8%		100.0%
				% within Transfer_S		10.0%	7.4%		9.2%
	05			Count		37	18		55
				% within Grade		67.3%	32.7%		100.0%
				% within Transfer_S		7.7%	8.9%		8.0%
	06			Count		39	22		61
				% within Grade		63.9%	36.1%		100.0%
				% within Transfer_S		8.1%	10.8%		8.9%
	07			Count		38	17		55
				% within Grade		69.1%	30.9%		100.0%
				% within Transfer_S		7.9%	8.4%		8.0%
	08			Count		28	15		43
				% within Grade		65.1%	34.9%		100.0%
				% within Transfer_S		5.8%	7.4%		6.3%

			09	Count		17	27		44
			% within Grade		38.6%	61.4%		100.0%	
			% within Transfer_S		3.5%	13.3%		6.4%	
			10	Count		34	19		53
			% within Grade		64.2%	35.8%		100.0%	
			% within Transfer_S		7.1%	9.4%		7.7%	
			11	Count		14	19		33
			% within Grade		42.4%	57.6%		100.0%	
			% within Transfer_S		2.9%	9.4%		4.8%	
			12	Count		25	24		49
			% within Grade		51.0%	49.0%		100.0%	
			% within Transfer_S		5.2%	11.8%		7.2%	
			K	Count		51	0		51
			% within Grade		100.0%	.0%		100.0%	
			% within Transfer_S		10.6%	.0%		7.4%	
			KA	Count		6	0		6
			% within Grade		100.0%	.0%		100.0%	
			% within Transfer_S		1.2%	.0%		.9%	
			Total	Count		482	203		685
			% within Grade		70.4%	29.6%		100.0%	
			% within Transfer_S		100.0%	100.0%		100.0%	
Edgar Road	Grade	01	Count		51	9		60	
			% within Grade		85.0%	15.0%		100.0%	
			% within Transfer_S		7.8%	3.2%		6.5%	
		02	Count		57	13		70	
			% within Grade		81.4%	18.6%		100.0%	
			% within Transfer_S		8.7%	4.7%		7.5%	
		03	Count		48	17		65	
			% within Grade		73.8%	26.2%		100.0%	
			% within Transfer_S		7.4%	6.1%		7.0%	
		04	Count		52	18		70	
			% within Grade		74.3%	25.7%		100.0%	

	% within Transfer_S		8.0%	6.5%		7.5%
05	Count		53	15		68
	% within Grade		77.9%	22.1%		100.0%
	% within Transfer_S		8.1%	5.4%		7.3%
06	Count		47	21		68
	% within Grade		69.1%	30.9%		100.0%
	% within Transfer_S		7.2%	7.6%		7.3%
07	Count		50	26		76
	% within Grade		65.8%	34.2%		100.0%
	% within Transfer_S		7.7%	9.4%		8.2%
08	Count		52	29		81
	% within Grade		64.2%	35.8%		100.0%
	% within Transfer_S		8.0%	10.5%		8.7%
09	Count		40	26		66
	% within Grade		60.6%	39.4%		100.0%
	% within Transfer_S		6.1%	9.4%		7.1%
10	Count		54	30		84
	% within Grade		64.3%	35.7%		100.0%
	% within Transfer_S		8.3%	10.8%		9.0%
11	Count		43	44		87
	% within Grade		49.4%	50.6%		100.0%
	% within Transfer_S		6.6%	15.9%		9.4%
12	Count		31	29		60
	% within Grade		51.7%	48.3%		100.0%
	% within Transfer_S		4.7%	10.5%		6.5%
K	Count		62	0		62
	% within Grade		100.0%	.0%		100.0%
	% within Transfer_S		9.5%	.0%		6.7%
KA	Count		13	0		13
	% within Grade		100.0%	.0%		100.0%
	% within Transfer_S		2.0%	.0%		1.4%
Total	Count		653	277		930

			% within Grade		70.2%	29.8%		100.0%
			% within Transfer_S		100.0%	100.0%		100.0%
Hudson	Grade	01	Count		31	3	0	34
			% within Grade		91.2%	8.8%	.0%	100.0%
			% within Transfer_S		12.1%	1.9%	.0%	8.3%
		02	Count		26	7	0	33
			% within Grade		78.8%	21.2%	.0%	100.0%
			% within Transfer_S		10.1%	4.5%	.0%	8.0%
		03	Count		23	8	0	31
			% within Grade		74.2%	25.8%	.0%	100.0%
			% within Transfer_S		8.9%	5.2%	.0%	7.5%
		04	Count		20	10	0	30
			% within Grade		66.7%	33.3%	.0%	100.0%
			% within Transfer_S		7.8%	6.5%	.0%	7.3%
		05	Count		20	13	0	33
			% within Grade		60.6%	39.4%	.0%	100.0%
			% within Transfer_S		7.8%	8.4%	.0%	8.0%
		06	Count		16	18	0	34
			% within Grade		47.1%	52.9%	.0%	100.0%
			% within Transfer_S		6.2%	11.7%	.0%	8.3%
		07	Count		18	13	0	31
			% within Grade		58.1%	41.9%	.0%	100.0%
			% within Transfer_S		7.0%	8.4%	.0%	7.5%
		08	Count		20	15	0	35
			% within Grade		57.1%	42.9%	.0%	100.0%
			% within Transfer_S		7.8%	9.7%	.0%	8.5%
		09	Count		14	18	0	32
			% within Grade		43.8%	56.3%	.0%	100.0%
			% within Transfer_S		5.4%	11.7%	.0%	7.8%
		10	Count		13	15	0	28
			% within Grade		46.4%	53.6%	.0%	100.0%
			% within Transfer_S		5.1%	9.7%	.0%	6.8%

	11	Count		13	14	0	27
		% within Grade		48.1%	51.9%	.0%	100.0%
		% within Transfer_S		5.1%	9.1%	.0%	6.6%
	12	Count		14	20	1	35
		% within Grade		40.0%	57.1%	2.9%	100.0%
		% within Transfer_S		5.4%	13.0%	100.0%	8.5%
	K	Count		23	0	0	23
		% within Grade		100.0%	.0%	.0%	100.0%
		% within Transfer_S		8.9%	.0%	.0%	5.6%
	KA	Count		6	0	0	6
		% within Grade		100.0%	.0%	.0%	100.0%
		% within Transfer_S		2.3%	.0%	.0%	1.5%
	Total	Count		257	154	1	412
		% within Grade		62.4%	37.4%	.2%	100.0%
		% within Transfer_S		100.0%	100.0%	100.0%	100.0%
Total	Grade 01	Count	0	289	47	6	342
		% within Grade	.0%	84.5%	13.7%	1.8%	100.0%
		% within Transfer_S	.0%	9.9%	3.3%	4.6%	7.6%
	02	Count	3	246	63	3	315
		% within Grade	1.0%	78.1%	20.0%	1.0%	100.0%
		% within Transfer_S	21.4%	8.4%	4.5%	2.3%	7.0%
	03	Count	3	289	81	8	381
		% within Grade	.8%	75.9%	21.3%	2.1%	100.0%
		% within Transfer_S	21.4%	9.9%	5.8%	6.1%	8.5%
	04	Count	0	255	88	7	350
		% within Grade	.0%	72.9%	25.1%	2.0%	100.0%
		% within Transfer_S	.0%	8.7%	6.3%	5.3%	7.8%
	05	Count	0	226	113	12	351
		% within Grade	.0%	64.4%	32.2%	3.4%	100.0%
		% within Transfer_S	.0%	7.7%	8.0%	9.2%	7.8%
	06	Count	2	247	124	11	384
		% within Grade	.5%	64.3%	32.3%	2.9%	100.0%

	% within Transfer_S	14.3%	8.4%	8.8%	8.4%	8.6%
07	Count	2	217	110	8	337
	% within Grade	.6%	64.4%	32.6%	2.4%	100.0%
	% within Transfer_S	14.3%	7.4%	7.8%	6.1%	7.5%
08	Count	0	200	122	10	332
	% within Grade	.0%	60.2%	36.7%	3.0%	100.0%
	% within Transfer_S	.0%	6.8%	8.7%	7.6%	7.4%
09	Count	1	171	168	16	356
	% within Grade	.3%	48.0%	47.2%	4.5%	100.0%
	% within Transfer_S	7.1%	5.8%	11.9%	12.2%	7.9%
10	Count	1	181	162	11	355
	% within Grade	.3%	51.0%	45.6%	3.1%	100.0%
	% within Transfer_S	7.1%	6.2%	11.5%	8.4%	7.9%
11	Count	1	144	181	21	347
	% within Grade	.3%	41.5%	52.2%	6.1%	100.0%
	% within Transfer_S	7.1%	4.9%	12.9%	16.0%	7.7%
12	Count	0	141	149	17	307
	% within Grade	.0%	45.9%	48.5%	5.5%	100.0%
	% within Transfer_S	.0%	4.8%	10.6%	13.0%	6.8%
K	Count	1	296	0	1	298
	% within Grade	.3%	99.3%	.0%	.3%	100.0%
	% within Transfer_S	7.1%	10.1%	.0%	.8%	6.6%
KA	Count	0	32	0	0	32
	% within Grade	.0%	100.0%	.0%	.0%	100.0%
	% within Transfer_S	.0%	1.1%	.0%	.0%	.7%
Total	Count	14	2934	1408	131	4487
	% within Grade	.3%	65.4%	31.4%	2.9%	100.0%
	% within Transfer_S	100.0%	100.0%	100.0%	100.0%	100.0%

In 7th grade, the percentage of transferring students drops back to 7.8%, but increases with 8th graders to 8.7%. The percentages of in-bound students are notably higher in the high school grades (e.g., 9=11.9%, 10=11.5%, 11=12.9%, and 12=10.6%).

Considering patterns within attendance areas, the percentages vary but the trend of increasing percentages of transferring students with grades appears to hold true in the elementary grades. In grades 6 through 8 transferring student percentages differ considerably. For example, the percentages of transferring students range from a low of 7.1% in Avery to a high of 11.7% in Hudson. The percentages of transferring student in 7th grade range from 4.7% in Avery to 9.4% in Edgar Road and the range of 8th graders is 5.9% in Avery to 10.5% in Edgar Road. It appears that the constant in these percentage comparisons is the lower percentage of transferring students in grades 6 to 8 residing in Avery.

The high school percentages of transferring students are notably higher than the percentages observed in the elementary and some middle grades in the District's attendance areas. The percentages of 9th grade transferring students range from a low of 9.4% in Edgar Road to 13.4% in Avery. The percentages of 10th grade transferring students are lower than the 9th grade range with 9.4% transferring in Clark to 12.5% transferring in Bristol. The percentages bounce back in 11th grade with a range of 9.1% in Hudson to 15.3% in Bristol. Students transferring in 12th grade range from 9.2% in Bristol to 13.0% in Hudson.

Students At Address

Overlaying student records also provided the capability of determining students at address. Associated with student records on parcels were parcel identification or locator text strings. The frequencies of these locator strings represent the number of student records at parcel addresses. The locator frequency with a count of 0 indicates no students living at District addresses. Only student addresses that were matched to address points or parcels are included in this analysis. The results of crosstabulating these data by attendance area appear in the table below.

Table 5: Numbers of Students at Address by Attendance Area

Parcel Locator Frequency by Attendance Area Crosstabulation								
			Attendance Areas					Total
			AVERY	BRISTOL	CLARK	EDGAR ROAD	HUDSON	
Frequencies	0	Count	2203	2296	1844	2479	2124	10946
		% within FREQ	20.1%	21.0%	16.8%	22.6%	19.4%	100.0%
		% within ATTND	77.2%	79.8%	81.5%	81.3%	89.1%	81.5%
	1	Count	329	277	208	308	152	1274
		% within FREQ	25.8%	21.7%	16.3%	24.2%	11.9%	100.0%
		% within ATTND	11.5%	9.6%	9.2%	10.1%	6.4%	9.5%
	2	Count	228	211	167	196	74	876
		% within FREQ	26.0%	24.1%	19.1%	22.4%	8.4%	100.0%
		% within ATTND	8.0%	7.3%	7.4%	6.4%	3.1%	6.5%
	3	Count	68	79	32	52	29	260
		% within FREQ	26.2%	30.4%	12.3%	20.0%	11.2%	100.0%
		% within ATTND	2.4%	2.7%	1.4%	1.7%	1.2%	1.9%
	4	Count	18	6	10	8	5	47
		% within FREQ	38.3%	12.8%	21.3%	17.0%	10.6%	100.0%
		% within ATTND	.6%	.2%	.4%	.3%	.2%	.3%
	5	Count	6	4	0	6	1	17
		% within FREQ	35.3%	23.5%	.0%	35.3%	5.9%	100.0%
		% within ATTND	.2%	.1%	.0%	.2%	.0%	.1%
	6	Count	3	1	0	2	0	6
		% within FREQ	50.0%	16.7%	.0%	33.3%	.0%	100.0%
		% within ATTND	.1%	.0%	.0%	.1%	.0%	.0%
	7	Count	0	0	1	0	0	1
		% within FREQ	.0%	.0%	100.0%	.0%	.0%	100.0%

	% within ATTND	.0%	.0%	.0%	.0%	.0%	.0%
9	Count	0	2	0	0	0	2
	% within FREQ	.0%	100.0%	.0%	.0%	.0%	100.0%
	% within ATTND	.0%	.1%	.0%	.0%	.0%	.0%
27	Count	0	1	0	0	0	1
	% within FREQ	.0%	100.0%	.0%	.0%	.0%	100.0%
	% within ATTND	.0%	.0%	.0%	.0%	.0%	.0%
57	Count	0	1	0	0	0	1
	% within FREQ	.0%	100.0%	.0%	.0%	.0%	100.0%
	% within ATTND	.0%	.0%	.0%	.0%	.0%	.0%
Total	Count	2855	2878	2262	3051	2385	13431
	% within FREQ	21.3%	21.4%	16.8%	22.7%	17.8%	100.0%
	% within ATTND	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Of the total number of parcels in the District, over 81% of the parcels do not send students to District schools. Close to 10% of the District parcels have 1 student enrolled in District schools. The greater frequency of only 1 student enrolled is found in the Avery attendance area (25.8% of parcels with 1 student attending) with Edgar Road following at 24.2%. The Avery attendance area also has the higher frequency of 2 students enrolled in District schools (26.0%). Bristol and Edgar Road attendance areas follow with 24.1% and 22.4% of the total number of parcels with 2 students enrolled, respectively. The numbers of households sending 3 or more students fall off dramatically.

Summary

The data used in this study support the following observations.

- The 2016 St. Louis County parcel data identifies 346 parcels with multi-family housing which is similar to the finding with the 2015 parcel land use data. More than 56% of the multi-family housing is located in the Bristol and Hudson attendance areas. The predominant type of housing in the District is single family (88.2% of the parcels in the District).
- Parcels are distributed fairly evenly across District attendance areas with Edgar Road having the larger percentage of parcels.
- Less than 20% of the parcels in the District are not occupied by property owners (18.6%). Owner occupied or used parcels comprise 81.3% of the District parcels.
- Over 31% of District resident student enrollments are transfer students. The non-transferring resident student enrollment base comprises 65.4% of District students. There were 145 students from the Normandy/Riverview and VICC programs that were included in the District's resident student base.
- Larger percentages of transferring students were found in the Bristol and Hudson attendance areas, although similar percentages of transferring students were found in all attendance areas.
- There appears to be a pattern related to grade and percentages of transferring students. At the District level, increases in grade seem to be directly related to increasing percentages of transfer students. The relationship was noted in in grades K-6 and 9-12.
- The pattern of increasing percentages of transfer students with increasing grades holds true for grades K-5 across all attendance areas. Middle and high school grades vary in percentages of transfer students.
- Students at address tabulations found close to 10% of District parcels with 1 student enrolled in the District. Within attendance areas, more than 1 in 4 parcels (households) in the Avery attendance area enroll 1 student in District schools. The percentages in Bristol and Edgar Road follow with 24.1% and 22.4%, respectively.

Recommendations for Further Study

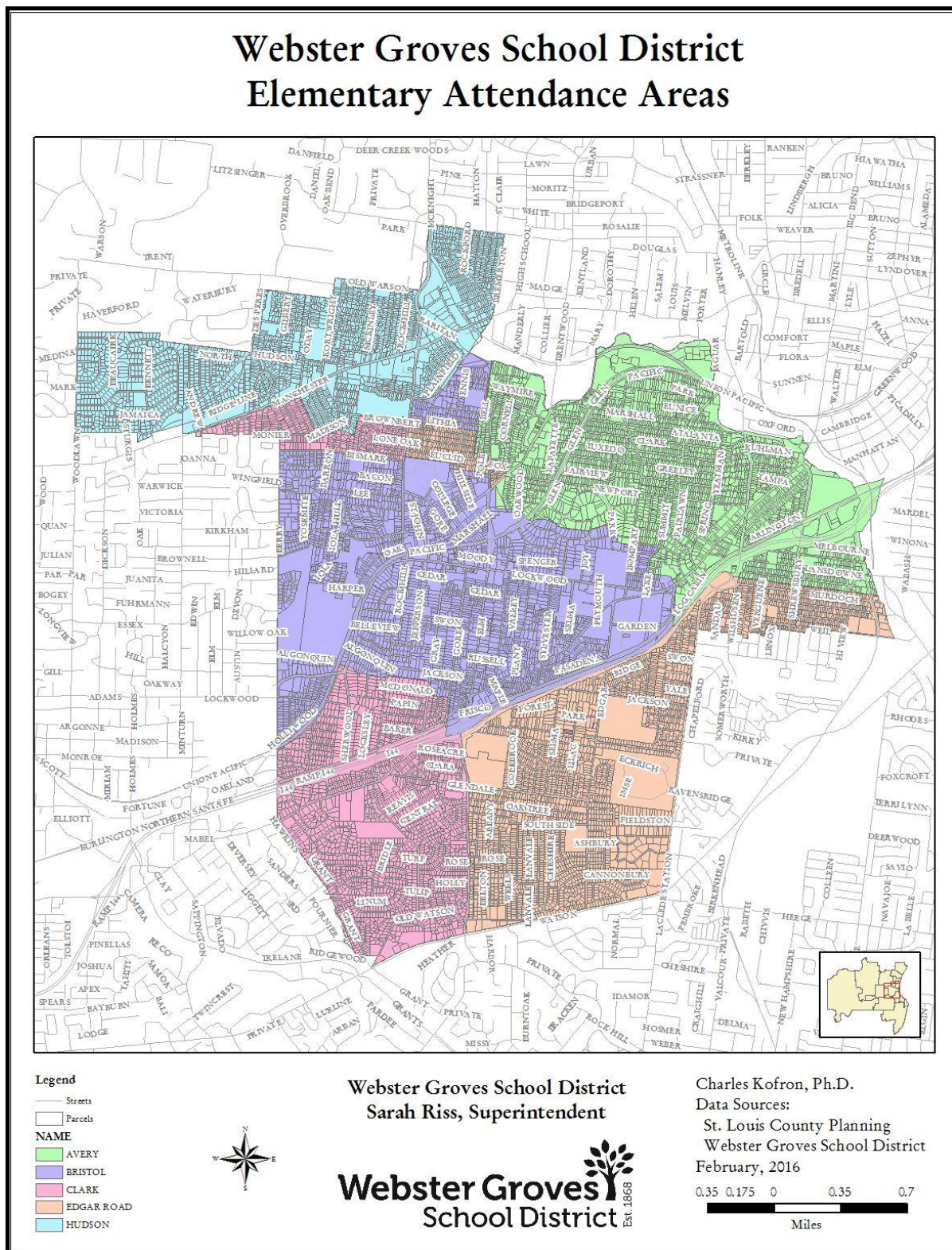
The data used in this report were taken from the District's student information system and reflect 2015 resident enrollments. The coding of student transfer status was accomplished in-house. The methods used to code and process these data can be replicated for future school years. The value of these tables will be enhanced as tabulations for additional years are compared. At the very least, this study should be replicated with 2016 enrollment data.

There are other opportunities for data mining that haven't been explored in this report. For example, the main stratifying variable of this study was the District's attendance areas. Other parcel data tied to student records (including property tax assessment data) may prove useful in explaining differences within and between attendance areas. The detailed explanation of data blocks in these tables will hopefully generate ideas for other tables.

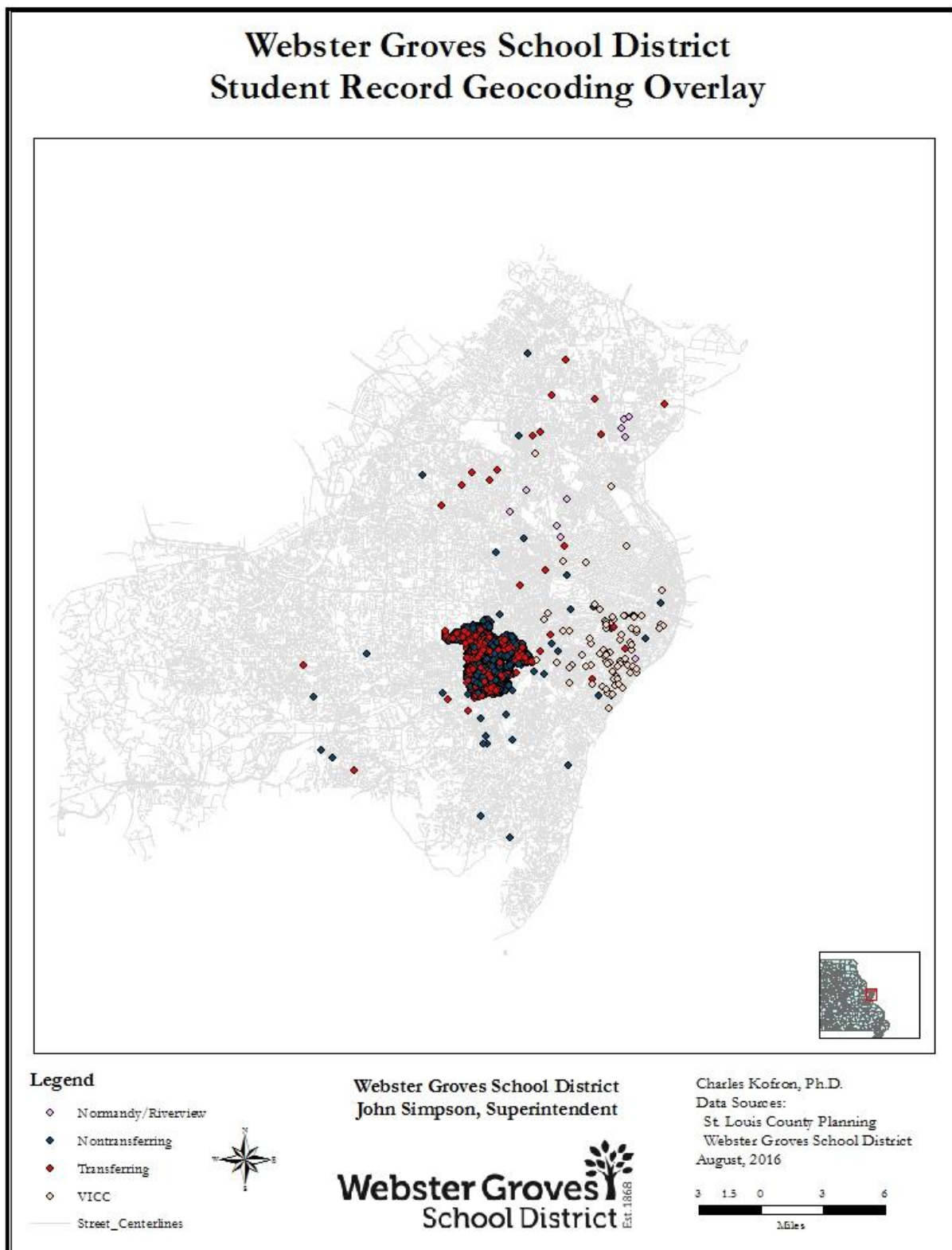
Appendix

Maps

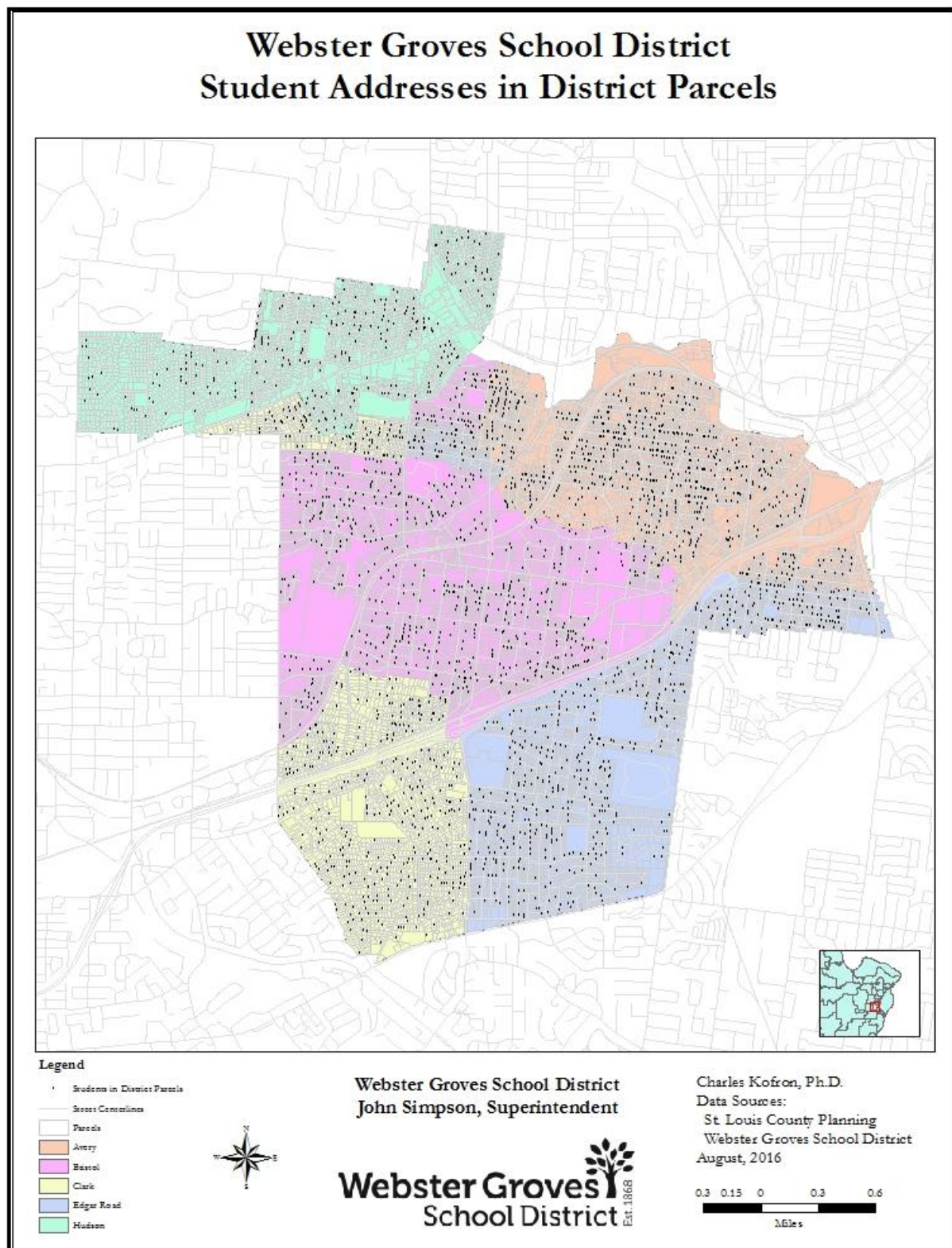
Map 1: WGSD Elementary Attendance Areas



Map 2: 2015 Student Record Geocoding



Map 3: 2015 Student Records in District Parcels



Administrative Document

Letter of Agreement

Charles Kofron, Ph.D.

June 20, 2016

Sarah Booth Riss, Ed.D.
Superintendent of Schools
Webster Groves School District
400 E. Lockwood Ave.
Webster Groves, MO 63119

Dear Dr. Riss,

Thank you for giving me the opportunity of proposing an update to the enrollment projection model for the Webster Groves School District (District) and a spatial study of transfer student address locations. This is the letter of agreement that authorizes the study.

For the sum of \$1,000, I propose to do the following:

1. Geocode births for 2015 and add birth counts to the projection model
2. Update enrollment projections based on 2015 birth counts
3. Geocode transfer student address locations
4. Provide a summary report with the results

The District agrees to provide the 2015 birth data in a machine-readable format (Excel file). If the District needs to acquire these data through the Missouri Department of Health and Senior Services (MoDHSS), the District will use the same zip code query that was used in the District's benchmark enrollment study for extracting these data. If these data are available through EducationPlus, the District will obtain copies of birth data sets of surrounding Districts. I will extract the birth record data using the original zip codes from these data sets. Both processes will ensure that all District birth records are captured and processed.

The District agrees to provide records of students that transferred to the District which will include complete residential address information and any other data that the District or Board will want to include in the analysis of these data.

The District agrees to provide staff assistance to manually geocode birth and student records that don't match parcel or street centerline data. In addition to locating these addresses in or outside of the District, District staff will identify the attendance area and approximate transfer student residential locations on the District's base map. The District understands that Charles Kofron, Ph.D. has no control over the timing of the release of birth data by the MoDHSS.

The District agrees to release, indemnify and hold harmless Charles Kofron, Ph.D. and his assigns, from and against all liability for conducting the study and the results, conclusions, interpretations, and any uses of any of the data, graphs, exhibits, or materials that ensue from this study.

Both Charles Kofron, Ph.D. and the District will agree to any additional work in writing.

A typical billing arrangement is for half of the amount to be paid at the beginning of the study. The remaining half of the contract amount will be due when the report is delivered.

If this meets with your expectations, please return to me a signed copy of this letter.

Sincerely,



Charles Kofron, Ph.D.

Accepted by:

Sarah Riss, Superintendent

8104 Kingsbury Boulevard

Clayton, Missouri 63105

(314) 518-6714