

IMPACTS OF LAND DEVELOPMENT AND POPULATION GROWTH ON WEST KNOX COUNTY SCHOOLS

A REPORT TO THE COUNTY MAYOR'S TASK FORCE ON SCHOOL OVERCROWDING



Prepared by the Knoxville/Knox County Metropolitan Planning Commission

June 30, 2004

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INTRODUCTION

Knox County's population is growing. While a moderate 5 percent increase was seen during the 1980s, the pace quickened to 14 percent in the 1990s, adding nearly 4,600 new residents annually. Census Bureau estimates for 2003 showed the countywide population at 393,000, up an additional 11,000 persons since the 2000 count was taken. New residents need places to live, and in the past 10 years, more than 22,000 subdivision lots were approved in Knox County, adding 33,000 new single-family and multi-family homes to the area's housing inventory.

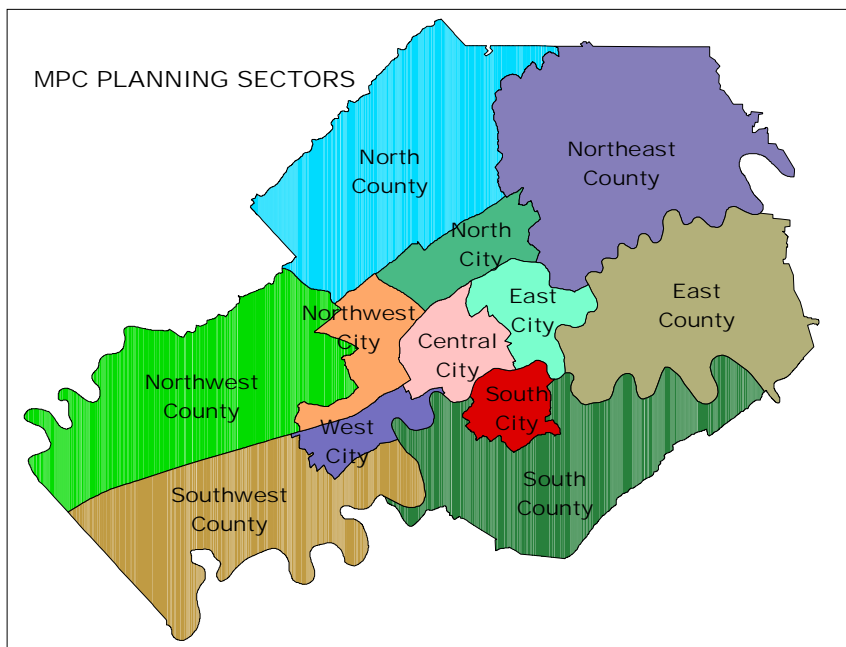
Much of the growth in Knox County in recent years has occurred on previously undeveloped land. As a result, many demands have been placed on the community for new roads, utility lines, schools, and law enforcement and fire protection services. A further challenge is that the growth has not been distributed equally across the county. Portions of west and north Knox County have captured large shares of new investment, while other areas have seen declines.

A review of Knox County's demographic characteristics and an examination of recent trends in local subdivision and building permit activity are presented in this report. The analysis is used to measure the impact of growth on the provision of public education. Data on population trends, residential construction activity, and school enrollment changes are reported, and growth projections have been generated to assess future strains on local schools.

RECENT TRENDS IN POPULATION GROWTH AND CONSTRUCTION ACTIVITY

All Population

- The population of Knox County grew by 46,000 between 1990 and 2000. Another 11,000 people have been added in the past three years.



- The Metropolitan Planning Commission (MPC) divides Knox County into 12 sectors for planning purposes. The City of Knoxville is represented by six sectors, while Farragut and the unincorporated portions of the county are covered by the remaining six.

- Among the 12 sectors, the Central and East City Sectors recorded population declines during the 1990s while all other sectors saw moderate to rapid growth.

- Fastest population growth occurred in the Southwest, North, and Northwest County Sectors, combining for more than 85 percent of the countywide increase.

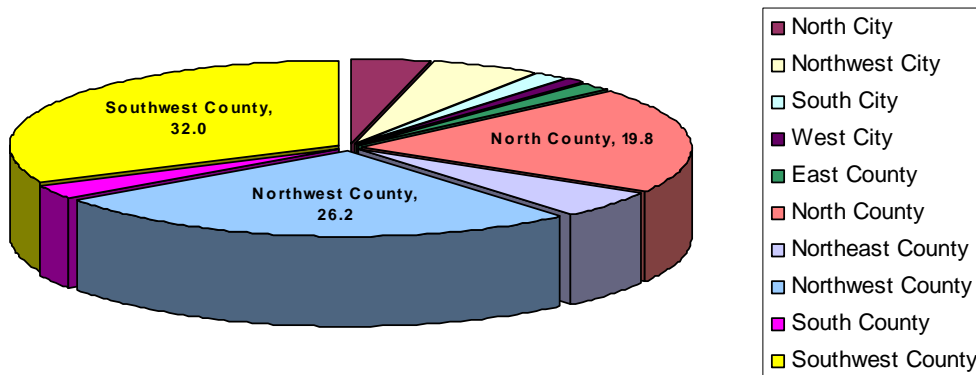
- The Northwest and Southwest County Sectors are now the most populous of the 12 sectors, taking the title that the Central City Sector held 10 years earlier.

TOTAL POPULATION, 1990-2000

SECTOR	1990 POPULATION	2000 POPULATION	CHANGE (%)	ABSOLUTE CHANGE	SHARE ABSOLUTE CHANGE (%)
<i>City</i>					
Central	52,881	48,162	-8.9	-4,719	-10.2
East	25,878	25,478	-1.5	-400	-0.9
North	23,344	25,343	8.6	1,999	4.3
Northwest	25,207	27,974	11.0	2,767	6.0
South	17,719	18,516	4.5	797	1.7
West	19,808	20,354	2.8	546	1.2
<i>City Total</i>	<i>164,837</i>	<i>165,827</i>	<i>0.6</i>	<i>990</i>	<i>2.1</i>
<i>County</i>					
East	12,357	13,313	7.7	956	2.1
North	32,391	42,557	31.4	10,166	22.0
Northeast	18,993	21,816	14.9	2,823	6.1
Northwest	49,422	62,864	27.2	13,442	29.0
South	17,759	19,236	8.3	1,477	3.2
Southwest	39,990	56,419	41.1	16,429	35.5
<i>County Total</i>	<i>170,912</i>	<i>216,205</i>	<i>26.5</i>	<i>45,293</i>	<i>97.9</i>
All Sectors	335,749	382,032	13.8	46,283	100.0

Source: Metropolitan Planning Commission, compiled from 2000 Census of Population and Housing data.

SHARE (%) OF TOTAL POPULATION GROWTH, 1990-2000



(Excludes sectors with population declines.)

Population By Age Groups

- The number of females of child-bearing age (15 to 44 years old) grew 5.3 percent countywide during the 1990s:
 - Higher rates of growth in that population cohort, ranging from 12 to 20 percent, were recorded in the North, Northeast, Northwest, and Southwest County Sectors, indicative of the potential for higher numbers of births in the near-term future and beyond.
 - Four of the six city sectors showed declines in this population cohort.
- School age population grew 14 percent countywide between 1990 and 2000:
 - Number of persons 0-4 years of age up 9.1 percent.
 - Number of persons 5-13 years of age up 15.4 percent.
 - Number of persons 14-18 years of age up 11.6 percent.

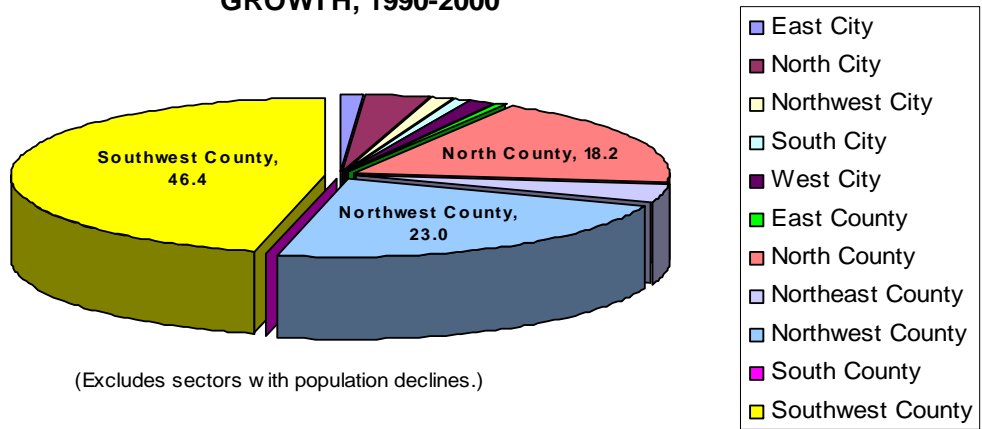
SCHOOL AGE POPULATION, 2000							
SECTOR	0-4 YRS	5-13 YRS	14-18 YRS	SCHOOL AGE 5-18 YRS	1990 TO 2000 CHANGE (%)	1990 TO 2000 ABSOLUTE CHANGE	SHARE ABSOLUTE CHANGE (%)
<i>City</i>							
Central	2,807	4,588	3,628	8,216	-7.3	-648	-7.8
East	1,454	2,840	1,546	4,386	2.3	98	1.2
North	1,504	2,334	1,300	3,634	8.6	288	3.5
Northwest	1,743	2,641	1,310	3,951	3.1	120	1.4
South	1,153	1,934	970	2,904	2.5	70	0.8
West	1,043	1,777	1,055	2,832	4.0	110	1.3
<i>City Total</i>	<i>9,704</i>	<i>16,114</i>	<i>9,809</i>	<i>25,923</i>	<i>0.1</i>	<i>38</i>	<i>0.5</i>
<i>County</i>							
East	741	1,471	867	2,338	2.9	65	0.8
North	2,671	5,260	2,991	8,251	24.5	1,625	19.6
Northeast	1,333	2,463	1,397	3,860	10.1	355	4.3
Northwest	4,382	7,699	3,793	11,492	21.8	2,058	24.8
South	1,054	2,007	1,124	3,131	0.3	10	0.1
Southwest	3,486	8,187	4,328	12,515	49.6	4,148	50.0
<i>County Total</i>	<i>13,667</i>	<i>27,087</i>	<i>14,500</i>	<i>41,587</i>	<i>24.8</i>	<i>8,261</i>	<i>99.5</i>
All Sectors	23,371	43,201	24,309	67,510	14.0	8,299	100.0

Source: Metropolitan Planning Commission, compiled from 2000 Census of Population and Housing data.

- Increases in the number of persons aged 0-4 years indicate a near-term demand for additional elementary and middle school service. Declines signal potential excess capacity, particularly at the elementary level where the number of facilities is much greater.
- Similar conclusions can be reached for the 5-13 age cohort, affecting near-term middle and high school capacities:
 - Expect strains at north and west county schools, while excess capacity may arise at center-city schools.

- The geographic pattern of school age population growth was the same as that of the overall population:
 - Largest increases in Southwest, Northwest, and North County Sectors. Represented nearly 95 percent of the county's net growth.
 - The Southwest County Sector alone accounted for half of all school age population increase during the 1990s.
 - A 7.3 percent decline occurred in the Central City Sector.

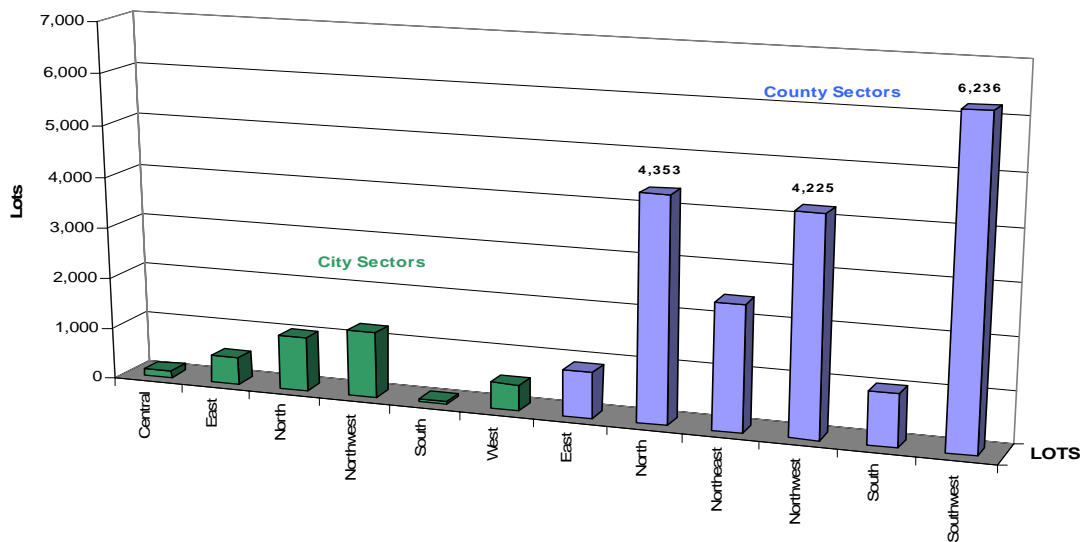
SHARE (%) OF SCHOOL AGE POPULATION GROWTH, 1990-2000



New Residential Subdivision Activity

- Over the past 10 years, 22,700 residential subdivision lots were created in Knox County. Peak expansion years were 1994 and 1995, when 3,000 lots per year were added. During the recessionary period of 2000 to 2002, new lot additions were half those of the peak years.
- Residential building lots averaged 0.9 acres in size in 2003, consistent with trends of the past several years.

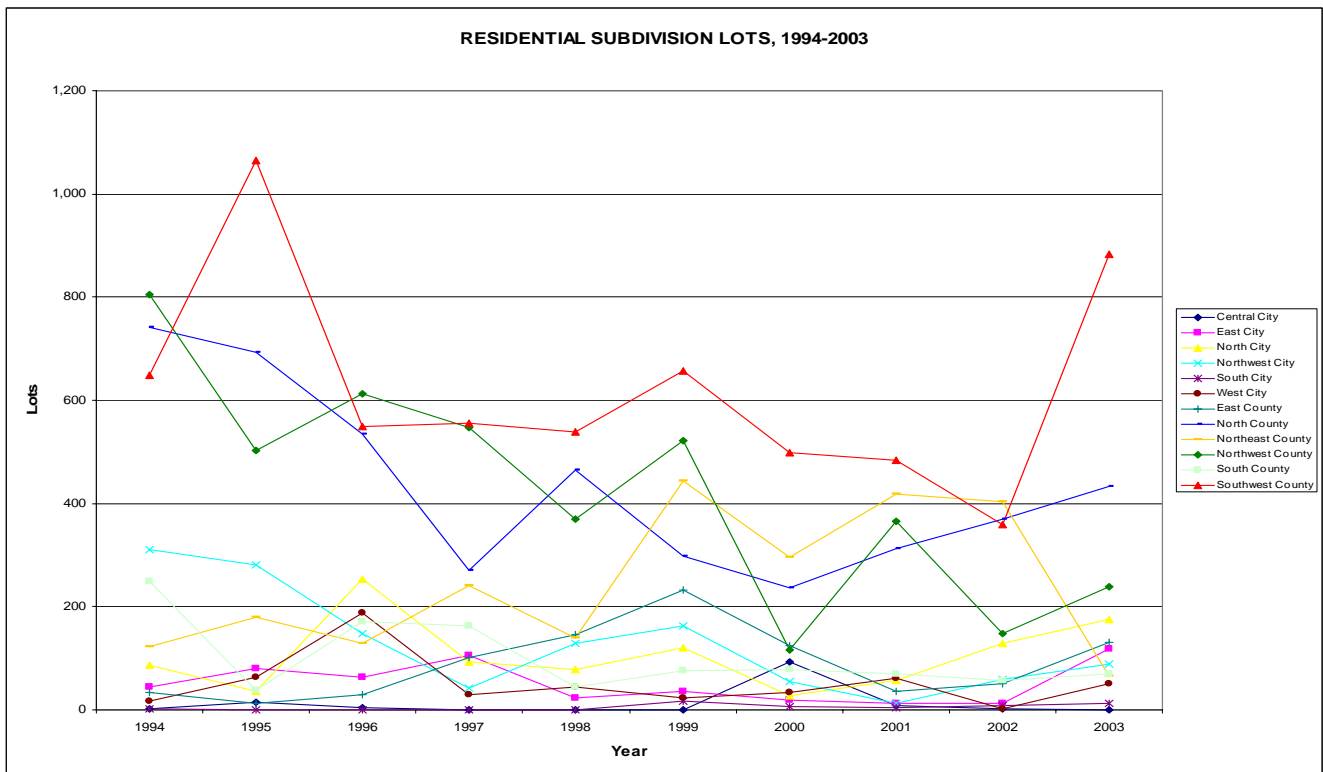
RESIDENTIAL SUBDIVISION LOTS, 1994-2003 TOTAL



- The Southwest County Sector led all others with its one-quarter share of all new subdivision lots, and, when combined with the North and Northwest County Sectors, 65 percent of the inventory was represented. The only other sector with a double-digit share of building lots was the Northeast County.
- For every one subdivision lot approved in city sectors, more than five were developed in county sectors.

RESIDENTIAL SUBDIVISION LOTS, 1994-2003		
SECTOR	LOTS	SHARE (%)
<i>City</i>		
Central	129	0.6
East	516	2.3
North	1,054	4.6
Northwest	1,283	5.6
South	55	0.2
West	513	2.3
<i>City Total</i>	<i>3,550</i>	<i>15.6</i>
<i>County</i>		
East	893	3.9
North	4,353	19.2
Northeast	2,437	10.7
Northwest	4,225	18.6
South	1,017	4.5
Southwest	6,236	27.5
<i>County Total</i>	<i>19,161</i>	<i>84.4</i>
All Sectors	22,711	100.0

Source: Metropolitan Planning Commission, Development Activity Report. Annual, 1994-2003.



2003 RESIDENTIAL SUBDIVISION DEVELOPMENT HIGHLIGHTS

Subdivision: Spring Hill Villas, Unit 2
Location: Sinclair Dr/McIntyre Rd (East City)
Description: 113 lots on 19.8 acres

Subdivision: Mallard Bay, Unit 4
Location: Mallard Bay Dr/Boyd Station Rd (Southwest County)
Description: 82 lots on 78 acres

Subdivision: Copperstone, Unit 1
Location: Harvey Rd/Tanglewood Dr (Southwest County)
Description: 79 lots on 46.4 acres

Subdivision: River Island, Unit 1
Location: Kodak Rd/Kelly Ln (East County)
Description: 62 lots on 69 acres

Subdivision: Westland Manor
Location: Westland Dr/Middleton Ct (Southwest County)
Description: 61 lots on 13.4 acres

Subdivision: The Woods at West Valley, Unit 1
Location: George Williams Rd/Fox Rd (Southwest County)
Description: 58 lots on 23.4 acres

Subdivision: Timberlake, Unit 3
Location: Lake Village Cir/Green Heron Blvd (North County)
Description: 50 lots on 33.4 acres

Subdivision: Richmond Hill
Location: Wallace Rd/Northshore Dr (Southwest County)
Description: 48 lots on 16.9 acres

Subdivision: Alpine Meadow, Unit 2
Location: E Beaver Creek Dr/I-75 (North County)
Description: 47 lots on 8.4 acres

Subdivision: The Estates of Wellsley Park
Location: Deane Hill Dr/Morrell Rd (West City)
Description: 45 lots on 32.7 acres

Subdivision: Greystone Court
Location: Bruce Smith Rd/Choto Rd (Southwest County)
Description: 45 lots on 16.6 acres

Subdivision: Lexi Landing, Unit 1
Location: Cate Rd/Anderson County line (Northwest County)
Description: 45 lots on 12.4 acres

Subdivision: Summer Rose, Unit 6
Location: Murphy Rd/Tazewell Pk (North City)
Description: 42 lots on 17.4 acres

Subdivision: Summer Rose, Unit 5
Location: Magic Lantern Dr/Fragrant Cloud Ln (North City)
Description: 41 lots on 25.3 acres

Subdivision: Fox Vue
Location: George Williams Rd/I-140 (Southwest County)
Description: 40 lots on 14 acres

Subdivision: Christian Springs, Unit 1
Location: Stair Dr/Maloneyville Rd (Northeast County)
Description: 38 lots on 17.9 acres

Subdivision: Sherman Oaks, Unit 1
Location: Lovell Rd/Hickey Rd (Northwest County)
Description: 38 lots on 11.9 acres

Subdivision: Twin Creek, Unit 2
Location: Broken Creek Ln/Tipton Station Rd (South County)
Description: 37 lots on 14.6 acres

Subdivision: Polo Club
Location: Westland Dr/Gettysvue Way (Southwest County)
Description: 35 lots on 13.1 acres

Source: Metropolitan Planning Commission, Development Activity 2003. February, 2004.

RESIDENTIAL BUILDING PERMITS, 1994-2003

SECTOR	PERMITS	SHARE (%)
<i>City</i>		
Central	1,135	3.4
East	783	2.3
North	2,175	6.5
Northwest	1,718	5.1
South	571	1.7
West	1,533	4.6
<i>City Total</i>	<i>7,915</i>	<i>23.6</i>
<i>County</i>		
East	1,233	3.7
North	5,449	16.3
Northeast	2,925	8.7
Northwest	6,755	20.2
South	1,380	4.1
Southwest	7,837	23.4
<i>County Total</i>	<i>25,579</i>	<i>76.4</i>
All Sectors	33,494	100.0

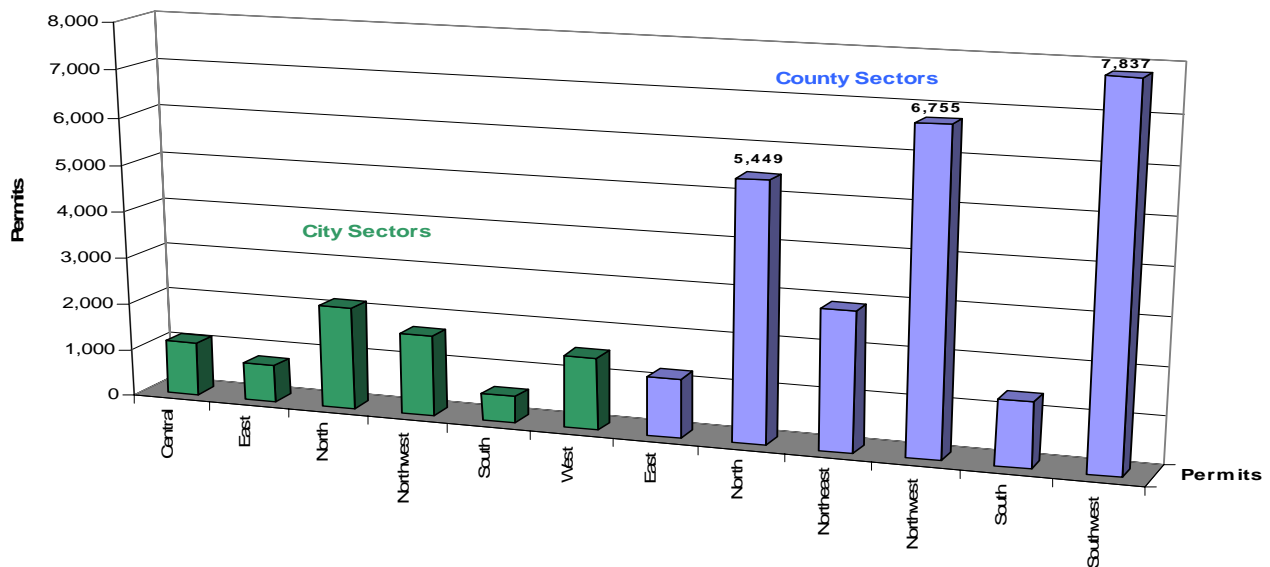
Note: Net building permits (total permits minus demolitions) are shown.

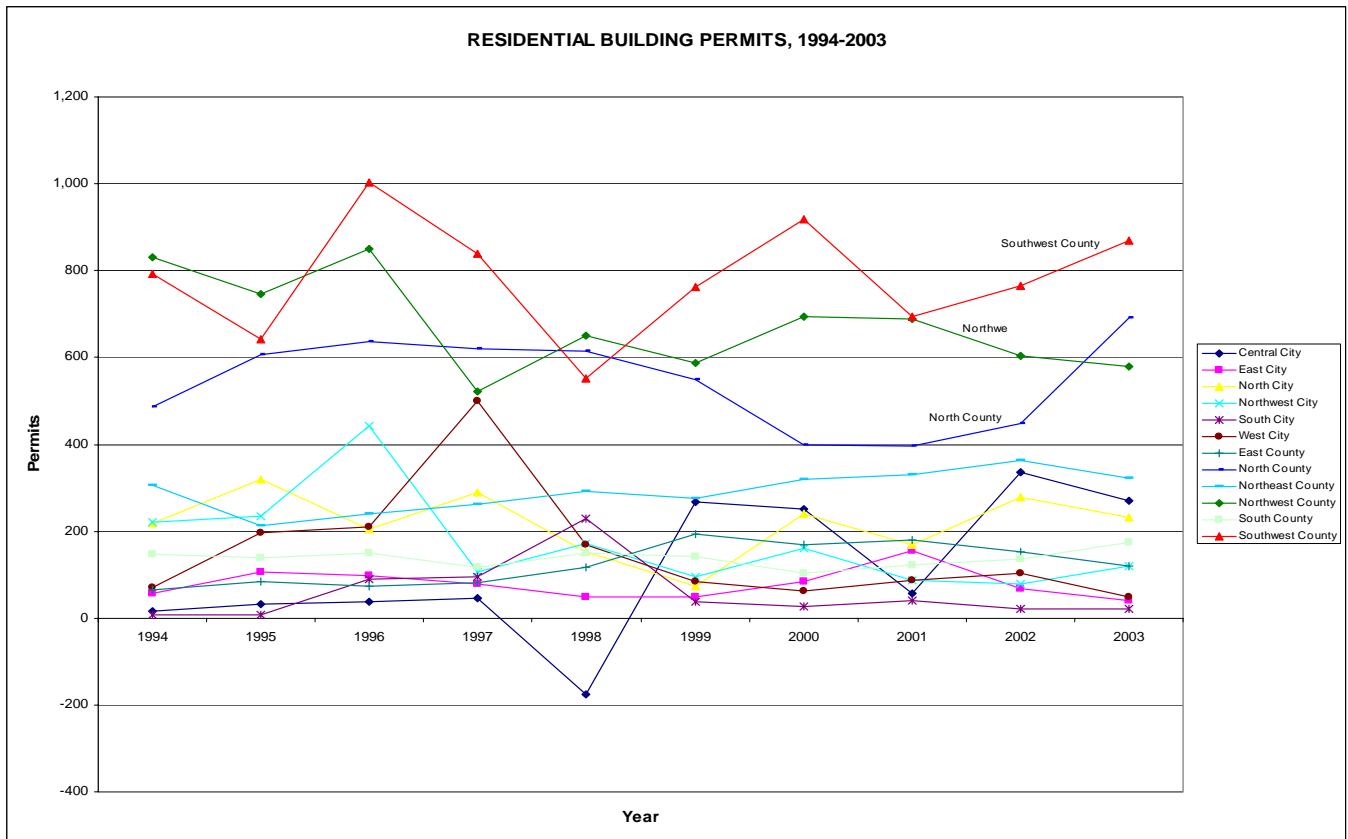
Source: Metropolitan Planning Commission, Development Activity Report. Annual, 1994-2003.

Residential Building Permit Activity

- On average, 3,350 residential building permits were issued in Knox County each year since 1994. The number peaked in 1996 at 4,033 units and dipped to 3,005 in 2001, otherwise they were consistent around the average throughout the decade.
- Since 1994, more than \$2.8 billion were invested in local residential construction projects. In 2003 alone, \$375 million were spent on residential building, an average of \$103,560 per housing unit.
- Similar to the pattern of subdivision lot generation, the west and north portions of Knox County reported the bulk of building permit activity, holding 60 percent of the permits issued.

RESIDENTIAL BUILDING PERMITS, 1994-2003 TOTAL





SCHOOL ENROLLMENT, 1990-2000

- The average number of school age children per housing unit remained unchanged in Knox County between 1990 and 2000:
 - New single-family subdivisions added 0.438 students per unit, while multi-family projects generated 0.162 students per unit.
 - A 100-unit single-family subdivision will add 44 school age children, on average.
- Pre-primary school enrollment climbed 17 percent countywide during the 1990s. Eighty-five percent of the growth was in west Knox County.
- Combined, public and private school enrollment in Knox County witnessed an overall increase of 25 percent between 1990 and 2000.

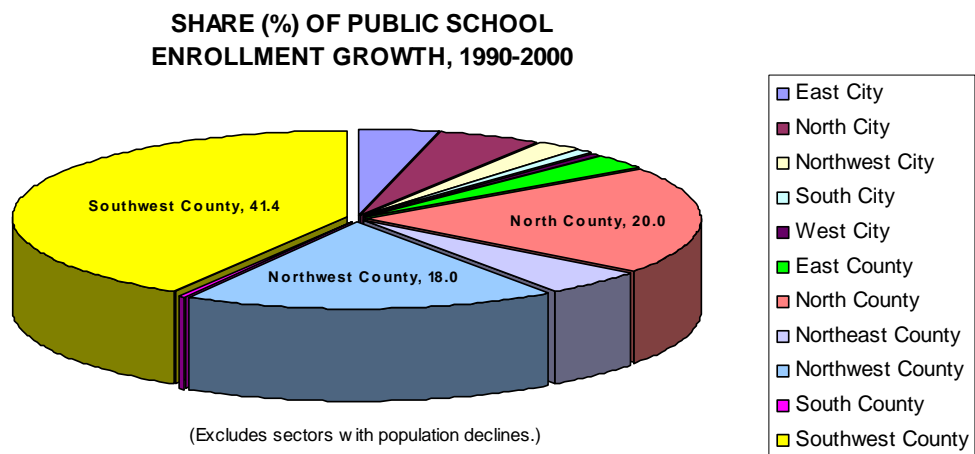
Public Schools

- Between 1990 and 2000, local public school enrollment climbed by 7,500, a 16 percent increase.
- The Central City Sector reported enrollment declines, while most of the remainder of the city saw single-digit growth. County sectors grew sharply, especially the Southwest area, with its 52 percent increase.

PUBLIC ELEMENTARY AND HIGH SCHOOL ENROLLMENT, 1990-2000					
SECTOR	1990 ENROLLMENT	2000 ENROLLMENT	CHANGE (%)	ABSOLUTE CHANGE	SHARE ABSOLUTE CHANGE (%)
<i>City</i>					
Central	6,546	6,277	-4.1	-269	-3.6
East	3,563	3,863	8.4	300	4.0
North	2,669	3,068	14.9	399	5.3
Northwest	3,017	3,187	5.6	170	2.3
South	2,381	2,446	2.7	65	0.9
West	1,917	1,951	1.8	34	0.5
<i>City Total</i>	<i>20,093</i>	<i>20,792</i>	<i>3.5</i>	<i>699</i>	<i>9.3</i>
<i>County</i>					
East	1,932	2,159	11.7	227	3.0
North	5,603	7,163	27.8	1,560	20.7
Northeast	2,850	3,252	14.1	402	5.3
Northwest	7,419	8,830	19.0	1,411	18.7
South	2,495	2,509	0.6	14	0.2
Southwest	6,218	9,454	52.0	3,236	42.9
<i>County Total</i>	<i>26,517</i>	<i>33,367</i>	<i>25.8</i>	<i>6,850</i>	<i>90.7</i>
All Sectors	46,610	54,159	16.2	7,549	100.0

Source: Metropolitan Planning Commission, compiled from 2000 Census of Population and Housing data.

- In light of the pattern of new residential investment in the county, it is no surprise that most of the school enrollment growth was seen in the previously-undeveloped areas of Knox County during the 1990s. About 80 percent of the new public school students resided in the North, Northwest, and Southwest County Sectors.



PRIVATE SCHOOL SHARES OF TOTAL SCHOOL ENROLLMENT, 1990-2000

SECTOR	1990 SHARE (%)	2000 SHARE (%)
<i>City</i>		
Central	2.4	4.3
East	6.2	10.2
North	7.0	11.1
Northwest	8.7	12.6
South	5.4	8.7
West	10.8	24.7
<i>City Total</i>	5.9	10.5
<i>County</i>		
East	2.1	4.2
North	3.7	8.3
Northeast	3.0	11.3
Northwest	6.0	16.2
South	6.1	11.8
Southwest	14.1	21.7
<i>County Total</i>	7.0	14.8
All Sectors	6.5	13.2

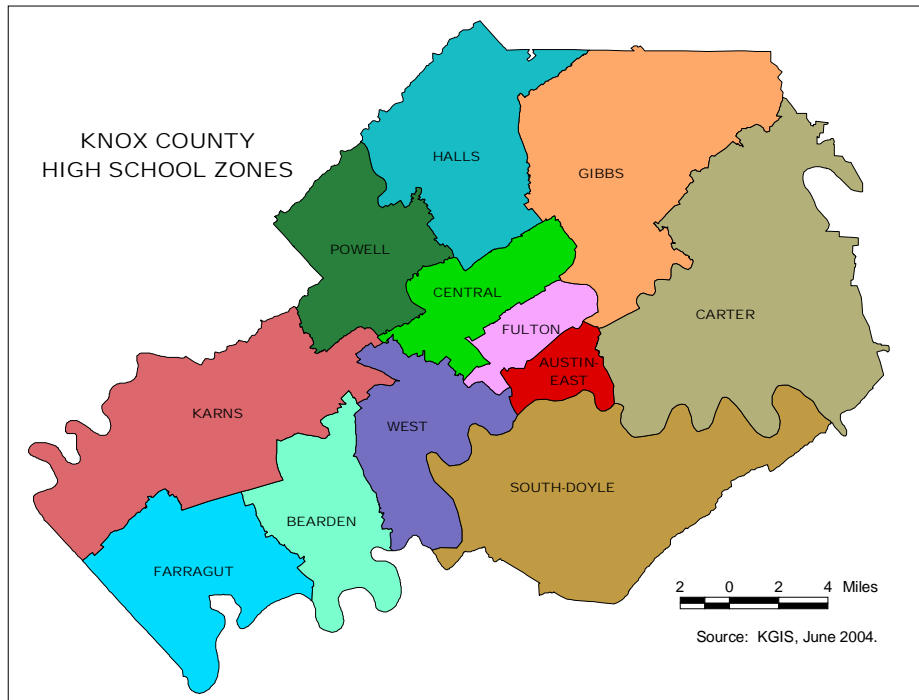
Source: Metropolitan Planning Commission, compiled from 2000 Census of Population and Housing data.

Private Schools

- Private elementary and high school enrollment soared during the 1990s. Countywide, enrollment jumped from 3,255 students at the start of the decade to 8,248 in 2000, a 153 percent change.
- In 1990, about 6.5 percent of all school age children attended private school in Knox County. By 2000, that share doubled to 13.2 percent. The West City, Northwest County, and Southwest County Sectors reported the largest portions of private school enrollment.
- An avoidance of real or perceived overcrowded public schools may have led some families to private education. Any new public schools built in coming years may attract students that otherwise might have opted for private education.

DEVELOPMENT TRENDS ANALYZED BY LOCAL HIGH SCHOOL ZONES

Up to this point, demographics, development activity, and enrollment data have been studied at the planning sector scale. Since this report is focused on development's impacts on public school facilities, trends in subdivision and building permit approvals are summarized for the service areas of local high schools.



Building Permits and Subdivision Lots

- Of the 12 high schools operated by Knox County Schools (KCS), the Karns school district received the highest number of new residential building permits in five of the past 10 years. The Farragut zone received four number-one rankings. Overall, the four west Knox area schools, Karns, Farragut, Bearden, and West, were ranked highest among all school zones in permit activity.
- Farragut and Bearden were home to the largest number of new residential subdivision lots. Karns and West ranked third and eighth respectively.
- The four west area schools accounted for half of all permit and subdivision activity since 1994.

BUILDING PERMITS AND SUBDIVISION LOTS BY HIGH SCHOOL ZONE, 1994-2003

SCHOOL	BUILDING		SUBDIVISION	
	PERMITS	SHARE (%)	LOTS	SHARE (%)
Austin-East	523	1.5	73	0.3
Bearden	4,595	13.2	3,326	14.8
Carter	1,684	4.8	1,157	5.1
Central	2,993	8.6	1,488	6.6
Farragut	4,812	13.8	3,830	17.0
Fulton	968	2.8	407	1.8
Gibbs	2,960	8.5	2,364	10.5
Halls	2,699	7.8	1,781	7.9
Karns	5,516	15.8	3,181	14.2
Powell	2,705	7.8	2,451	10.9
South-Doyle	2,049	5.9	1,079	4.8
West	3,317	9.5	1,337	5.9
Total	34,821	100.0	22,474	100.0

Note: Net building permits (total permits minus demolitions) were reported in earlier tables of this report. Total building permits are reported here.

Source: Metropolitan Planning Commission.

HOUSEHOLDS BY HIGH SCHOOL ZONE, 2003

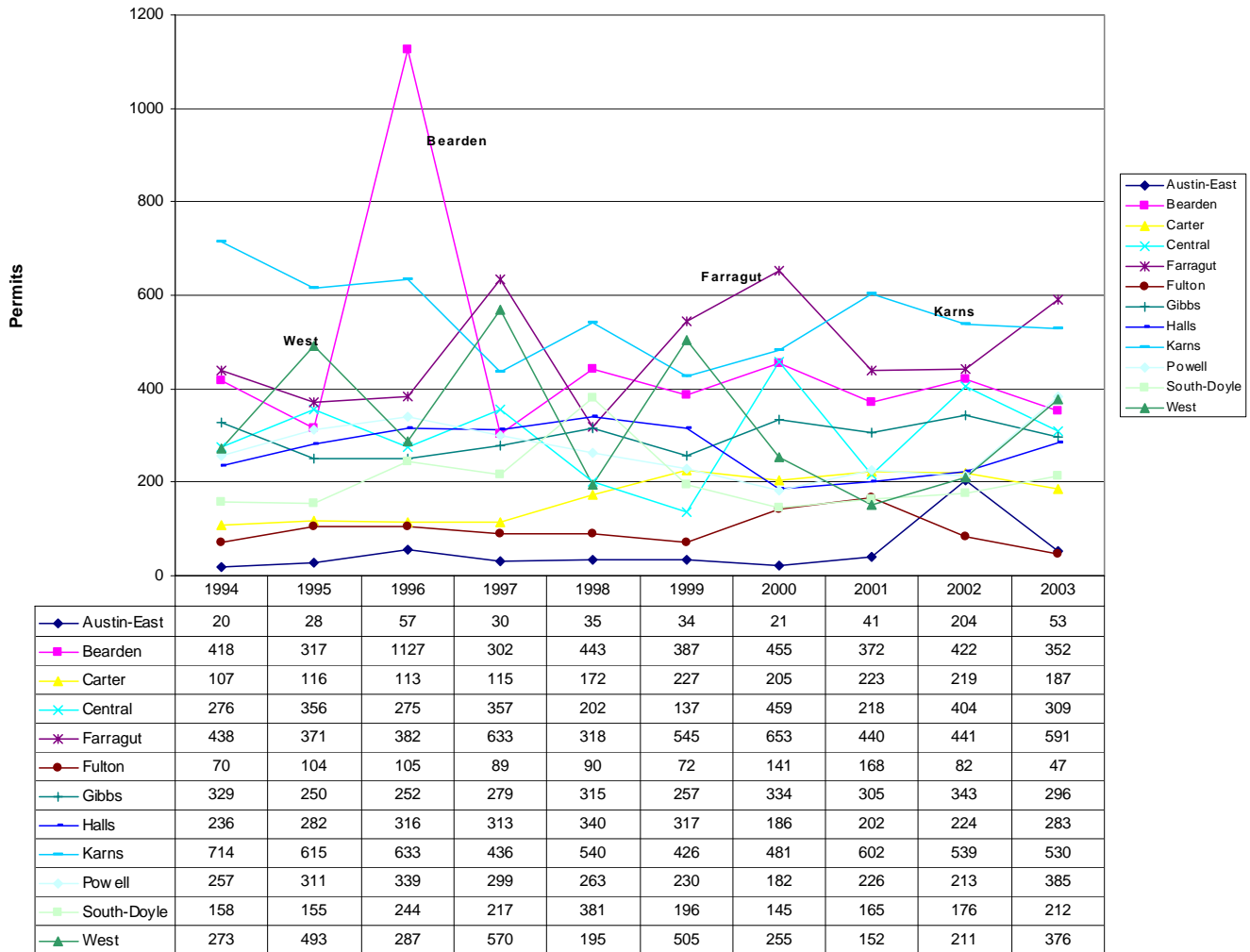
SCHOOL	HOUSEHOLDS	SHARE (%)
Austin-East	9,253	5.4
Bearden	20,775	12.1
Carter	8,995	5.3
Central	17,638	10.3
Farragut	13,851	8.1
Fulton	12,776	7.5
Gibbs	9,972	5.8
Halls	9,491	5.5
Karns	19,792	11.6
Powell	9,073	5.3
South-Doyle	16,830	9.8
West	22,652	13.2
Total	171,098	100.0

Source: Metropolitan Planning Commission.

Households

- About 171,000 households comprised the Knox County inventory of occupied housing units in 2003. The West High School zone was home to the largest portion, holding a 13.2 percent share with its 22,652 units. Next largest was the Bearden High zone, followed closely by Karns. Farragut ranked sixth among the 12 districts.
- The four west area high schools combined for 77,070 households, a 45 percent share of the countywide total.

BUILDING PERMITS BY HIGH SCHOOL ZONE, 1994-2003



ESTIMATING FUTURE ENROLLMENT AT WEST KNOX AREA HIGH SCHOOLS

Existing Conditions

- More than 15,000 students were enrolled in area high schools, with ability to accommodate 20,000 students, based on a 2003/2004 definition of school capacities. Under those conditions, the system could handle another 4,600 students before capacity was exhausted.
- Early in the 2003/2004 school year, 2,400 students were enrolled at Farragut High School, the largest student body of all 12 area facilities. By contrast, Austin-East enrolled about 750 students, roughly one-third the Farragut total. Bearden High was the second largest operation, with an enrollment of 1,879 students. Karns High School was third in size, and West High ranked fifth.
- Farragut High School housed 239 students over its facility limit. Karns was at capacity, with a leeway of only 31 students, representing 98 percent occupancy. The only other facility nearing its limit was Austin-East, just 48 students shy of being full.

- Bearden, Farragut, Karns, and West High Schools combined for a total enrollment of 7,119 students. Facility capacities totaled 7,656, leaving excess space for 537 students, or 93 percent occupancy.

KNOX COUNTY PUBLIC HIGH SCHOOLS: 2003 ENROLLMENT AND CAPACITY								
SCHOOL	ENROLLMENT BY GRADE				TOTAL ENROLLMENT	CAPACITY	EXCESS/ DEFICIT CAPACITY	SHARE (%) OF CAPACITY
	9	10	11	12				
Austin-East	218	169	201	156	744	792	48	93.9
Bearden	519	511	416	433	1,879	2,280	401	82.4
Carter	260	244	260	183	947	1,525	578	62.1
Central	348	348	328	279	1,303	1,719	416	75.8
Farragut	633	606	610	550	2,399	2,160	(239)	111.1
Fulton	321	257	304	155	1,037	1,375	338	75.4
Gibbs	269	216	256	224	965	1,522	557	63.4
Halls	286	291	258	232	1,067	2,023	956	52.7
Karns	400	383	387	335	1,505	1,536	31	98.0
Powell	310	274	286	282	1,152	1,437	285	80.2
South-Doyle	392	323	345	281	1,341	2,213	872	60.6
West	364	361	314	297	1,336	1,680	344	79.5
Total	4,320	3,983	3,965	3,407	15,675	20,262	4,587	77.4

Sources:
Knox County Schools, Knox County Schools Capacity and Enrollment. January 14, 2003.
Knox County Schools, Knox County Schools Past and Current Enrollment Figures. September 16, 2003.
Knox County Schools, West Knox County School Enrollment and Growth Projections. May 17, 2004.

- The average number of public high school students per household was calculated for the area. Values ranged from a low of 0.059 high schoolers per household at West to a high of 0.173 students in a typical Farragut home. The areawide average was 0.092 per household. For every 100 homes across Knox County, expect to find about 9 public high school students.

STUDENTS PER HOUSEHOLD, BY HIGH SCHOOL ZONE, 2003			
SCHOOL	HOUSEHOLDS	ENROLLMENT	STUDENTS PER HOUSEHOLD
Austin-East	9,253	744	0.080
Bearden	20,775	1,879	0.090
Carter	8,995	947	0.105
Central	17,638	1,303	0.074
Farragut	13,851	2,399	0.173
Fulton	12,776	1,037	0.081
Gibbs	9,972	965	0.097
Halls	9,491	1,067	0.112
Karns	19,792	1,505	0.076
Powell	9,073	1,152	0.127
South-Doyle	16,830	1,341	0.080
West	22,652	1,336	0.059
Total	171,098	15,675	0.092

Sources:
Metropolitan Planning Commission.
Knox County Schools.

Methodology for Generating Enrollment Projections

Two sets of enrollment projections were generated for west Knox area high schools.

Scenario A: Enrollment projections based on new residential property development

The first set of enrollment projections, Scenario A, was based entirely on forecasts of new housing unit development. By examining past trends in residential building permit activity within each of the four west Knox area high school zones, a statistical model generated projections for future permit approvals. Estimates were calculated for each year through 2013. Those permits were added to the 2003 (existing) base of housing units. Then, the average number of public high school students per household in each of the affected high school zones was multiplied by the estimated number of households for each of the 10 forecast years, under the assumption that average household population structures would remain constant over the forecast period. Accordingly, issues such as dropouts, relocations, and, deaths were neutralized because they were already built into the average students per household (Appendix).

Scenario B: Enrollment projections based on existing enrollment and new residential property development

The second set of projections, Scenario B, was based on a progression of current elementary, middle, and high school students through the public school system and increased by additional students moving into high school zones as new homes are built during the forecast period (based on the average number of public high school students per household in each of the affected zones). It was assumed that all students currently in the system would proceed through each grade level and reach or graduate high school by 2013. It was further assumed that no losses would occur due to dropouts or deaths, and any students relocating out of the area would be replaced by others of the same grade level moving into the system. The elementary and middle school zones comprising each high school zone were calculated to ensure that the correct enrollments were assigned to the appropriate high schools (Appendix).

Neither of the above scenarios directly addresses the issue of voluntary student transfers from one designated school zone (based on residence address) to a desired alternate school zone, although current instances of transfers would be built into the average number of public high school students per household calculated for the base year.

The Projections

WEST KNOX AREA HIGH SCHOOL ENROLLMENT PROJECTIONS, 2004-2013

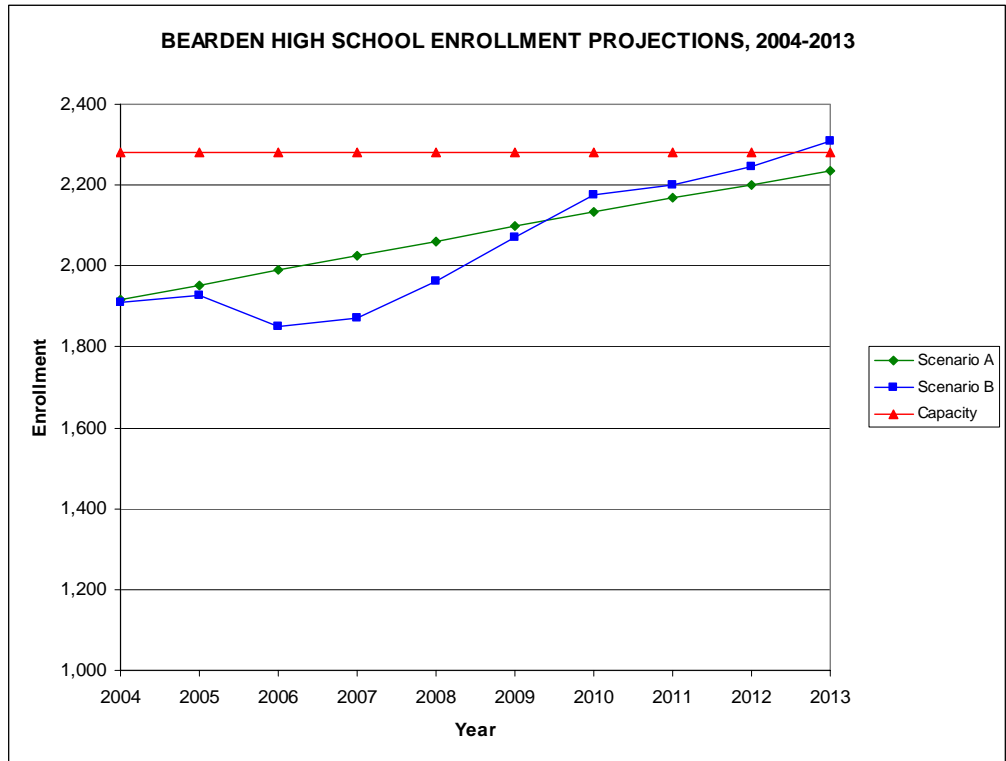
		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BEARDEN	Scenario A	1,916	1,953	1,990	2,026	2,062	2,097	2,133	2,168	2,202	2,236
Capacity: 2,280	Capacity Excess/Deficit	364	327	290	254	218	183	147	112	78	44
	Scenario B	1,911	1,926	1,851	1,872	1,962	2,070	2,177	2,202	2,248	2,308
	Capacity Excess/Deficit	369	354	429	408	318	210	103	78	32	(28)
FARRAGUT	Scenario A	2,495	2,592	2,691	2,792	2,895	2,999	3,105	3,212	3,322	3,433
Capacity: 2,160	Capacity Excess/Deficit	(335)	(432)	(531)	(632)	(735)	(839)	(945)	(1,052)	(1,162)	(1,273)
	Scenario B	2,439	2,428	2,385	2,316	2,334	2,352	2,411	2,498	2,575	2,649
	Capacity Excess/Deficit	(279)	(268)	(225)	(156)	(174)	(192)	(251)	(338)	(415)	(489)
KARNS	Scenario A	1,545	1,584	1,622	1,661	1,698	1,735	1,772	1,808	1,843	1,878
Capacity: 1,536	Capacity Excess/Deficit	(9)	(48)	(86)	(125)	(162)	(199)	(236)	(272)	(307)	(342)
	Scenario B	1,738	1,968	2,165	2,283	2,276	2,215	2,202	2,256	2,276	2,298
	Capacity Excess/Deficit	(202)	(432)	(629)	(747)	(740)	(679)	(666)	(720)	(740)	(762)
WEST	Scenario A	1,357	1,377	1,398	1,419	1,440	1,460	1,481	1,502	1,522	1,543
Capacity: 1,680	Capacity Excess/Deficit	323	303	282	261	240	220	199	178	158	137
	Scenario B	1,477	1,604	1,670	1,686	1,641	1,606	1,570	1,610	1,663	1,702
	Capacity Excess/Deficit	203	76	10	(6)	39	74	110	70	17	(22)
TOTAL	Scenario A	7,289	7,458	7,628	7,797	7,967	8,136	8,305	8,475	8,643	8,812
Capacity: 7,656	Capacity Excess/Deficit	367	198	28	(141)	(311)	(480)	(649)	(819)	(987)	(1,156)
	Scenario B	7,564	7,926	8,071	8,157	8,214	8,244	8,360	8,566	8,761	8,957
	Capacity Excess/Deficit	92	(270)	(415)	(501)	(558)	(588)	(704)	(910)	(1,105)	(1,301)

Notes:

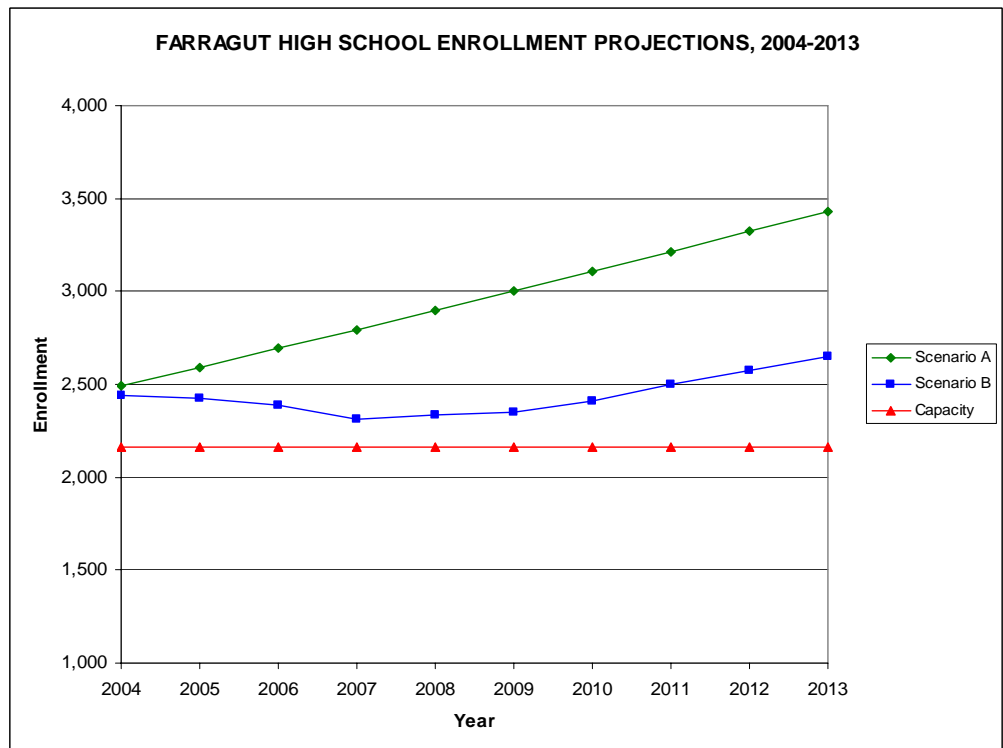
1. Figures in parentheses indicate periods when projected enrollments exceed facility capacities.
2. School capacities change with program adjustments from year to year. For the purposes of this analysis, it was assumed that school capacities would remain constant throughout the forecast period.

Findings

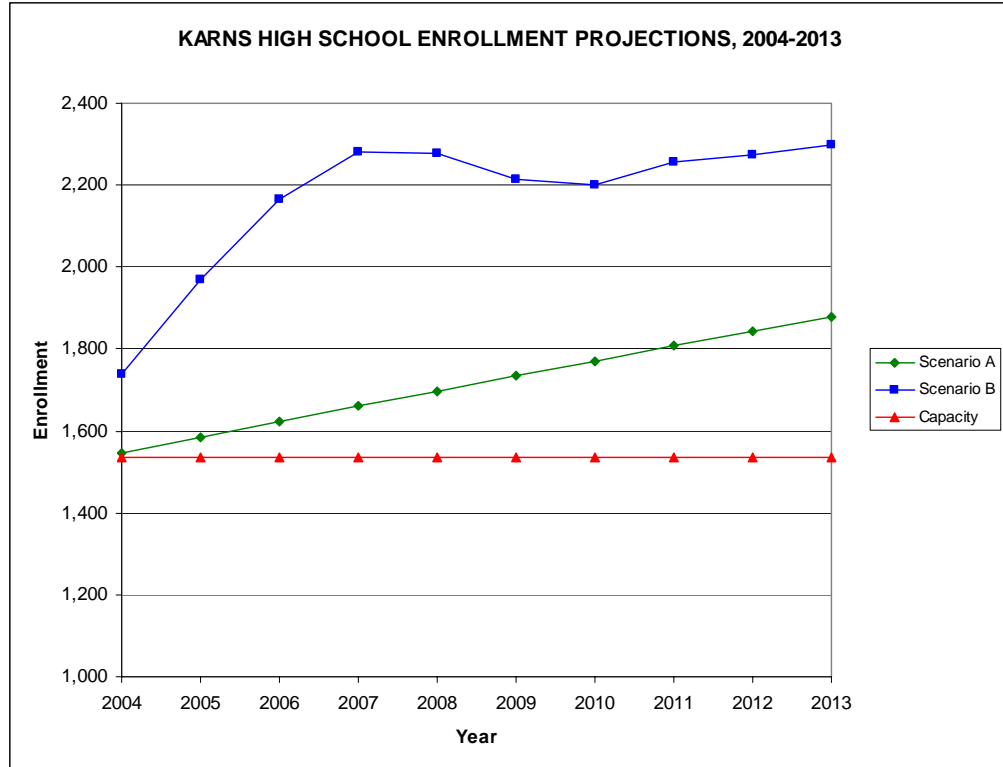
- According to growth scenarios A and B, Bearden High School is well-suited to accommodate enrollment increases over the next seven years. It will reach critical limits by 2012, and exceed capacity by 2013 if growth continues at its forecasted pace.



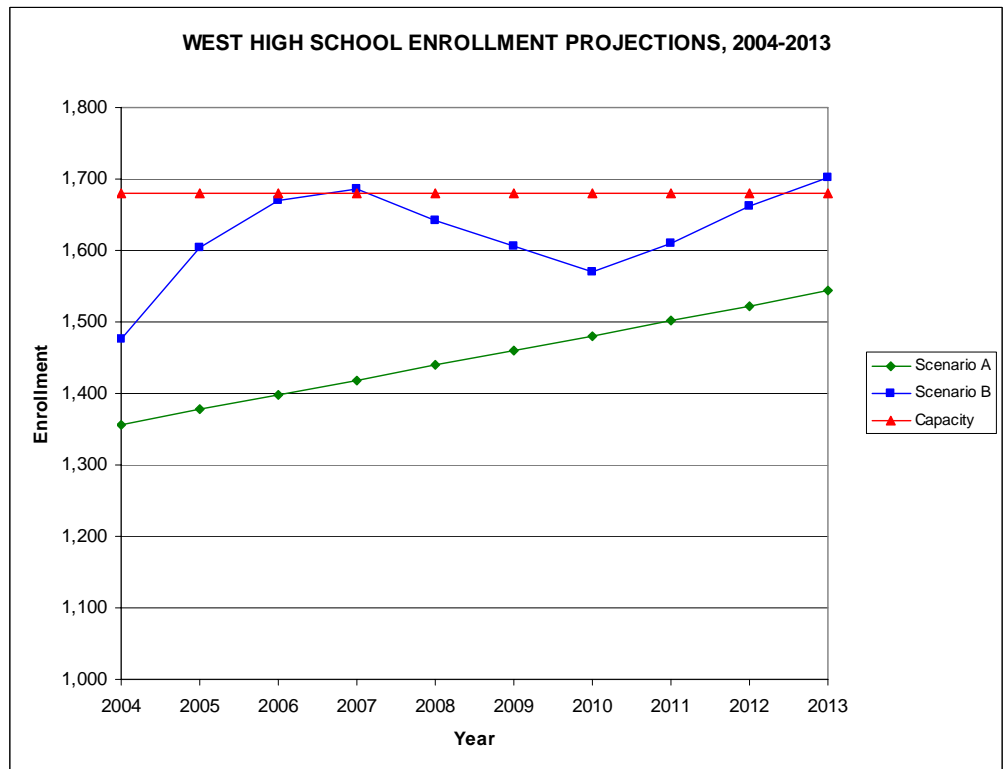
- Farragut High School enrollment currently exceeds facility capacity. Both growth scenarios show that the situation will worsen over the forecast period. Scenario A, based entirely on household unit growth, shows a more aggressive rate of enrollment expansion.



- Beginning with the 2004/2005 school year, Karns High School enrollment will exceed the facility's carrying capacity. The Karns area has been among the fastest growing in Knox County for the past several years, and its high school recorded a 98 percent occupancy rate for the 2003/2004 school year. It should be no surprise that excess enrollment is expected at the school in the near future and throughout the forecast period.

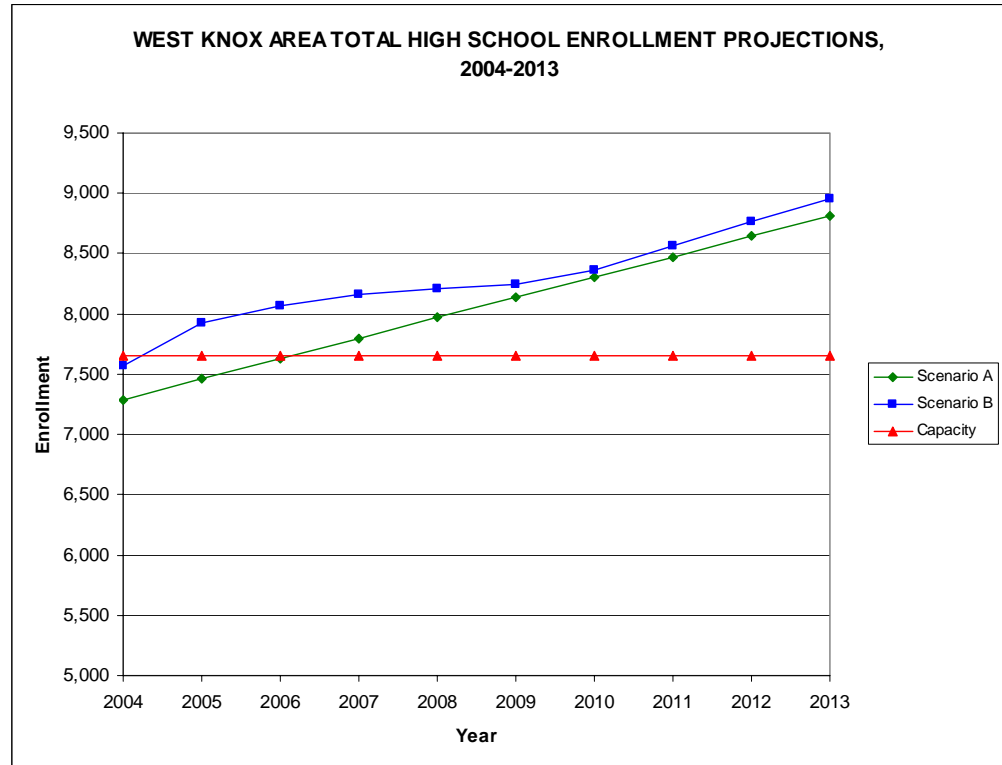


- According to growth scenario A, West High School is equipped to handle enrollment growth for the next 10 years. Excess capacity will shrink over the period, but it will not be exhausted. Alternatively, scenario B, based on existing enrollment numbers and anticipated housing development, shows several years of tight conditions where enrollment will near capacity and exceed it briefly in 2007 and again in 2013.



If zone boundaries for the four west area high schools were adjusted at the end of the 2003/2004 school year (such that enrollment was redistributed to eliminate overcrowding at Farragut and fill excess space at the other three facilities), there would be no immediate capacity shortfall. As shown above, there is room to handle 537 new students between the four schools. For how long would such a difficult undertaking solve the issue of school overcrowding in west Knox County though?

- Under growth scenario A, west Knox area schools will face a capacity crisis by the start of the 2006/2007 school year, when spare capacity will dwindle to 28 students, followed thereafter by consecutive years of increasing deficits. The same situation will play out under scenario B, however, the crisis will emerge two years sooner in the 2005/2006 school year. Both future courses show a facility shortfall of more than 1,100 students by 2013.



- The 10-year capacity shortage among the four west schools amounts to enrollment that would fill a school the size of Fulton High. A new facility the size of Karns High School would be 85 percent occupied by 2013 to accommodate the forecasted growth in the west portion of the county.

Conclusion

Zone boundary adjustments among the four west high schools would provide relief from overcrowding for only a short period. Unless adjustments are made to all 12 high school zones, shifting students out of rapidly growing west and north Knox County to other schools in the city and county that have considerable room to spare, overcrowding is not going to be resolved without new facility construction.

HIGH SCHOOL AGE POPULATION PROJECTIONS, 2004-2013		
YEAR	POPULATION 14-17 YEARS OF AGE	PUBLIC SCHOOL SHARE
2004	20,241	17,205
2005	20,714	17,607
2006	21,289	18,096
2007	21,427	18,213
2008	21,515	18,288
2009	21,563	18,329
2010	21,632	18,387
2011	22,043	18,737
2012	22,172	18,846
2013	22,389	19,031

Note: It was assumed public schools would accommodate 85 percent of the high school age population during the projection period. The remainder would attend private education facilities.

Source: Woods and Poole Economics, 2003.

The problems may not even be settled by adjusting all of the zones in the high school system. Forecasts of enrollment growth were made only for the four west schools. Meanwhile, other areas of the county have been growing, and they too may face capacity limitations in the future. Ten-year projections for Knox County's high school age population show an estimated total of 19,000 public high school students by 2013. Currently, system wide high school capacity is 20,262, which indicates strains will be felt at all local facilities, regardless of adjustments to zone boundaries. This issue warrants further investigation but extends beyond the scope of this briefing.

APPENDIX

WEST KNOX AREA HIGH SCHOOL ENROLLMENT PROJECTIONS, 2004-2013 SCENARIO A: BASED ON NEW HOUSEHOLDS					
	BEARDEN	FARRAGUT	KARNS	WEST	TOTAL
Existing Conditions					
Households, 2003	20,775	13,851	19,792	22,652	77,070
Enrollment, 2003	1,879	2,399	1,505	1,336	7,119
Students/Household, 2003	0.090	0.173	0.076	0.059	0.092
School Capacity, 2003	2,280	2,160	1,536	1,680	7,656
Building Permit Projections					
2004	412	553	522	351	1,838
2005	408	563	515	351	1,837
2006	404	572	508	351	1,835
2007	401	582	501	351	1,835
2008	397	592	494	351	1,834
2009	393	602	487	351	1,833
2010	390	611	480	351	1,832
2011	386	621	473	351	1,831
2012	382	631	465	351	1,829
2013	379	641	458	351	1,829
Household Projections					
2004	21,187	14,404	20,314	23,003	78,908
2005	21,595	14,967	20,829	23,354	80,745
2006	21,999	15,539	21,337	23,705	82,580
2007	22,400	16,121	21,838	24,056	84,415
2008	22,797	16,713	22,332	24,407	86,249
2009	23,190	17,315	22,819	24,758	88,082
2010	23,580	17,926	23,299	25,109	89,914
2011	23,966	18,547	23,772	25,460	91,745
2012	24,348	19,178	24,237	25,811	93,574
2013	24,727	19,819	24,695	26,162	95,403
Enrollment Projections					
2004	1,916	2,495	1,545	1,357	7,289
2005	1,953	2,592	1,584	1,377	7,458
2006	1,990	2,691	1,622	1,398	7,628
2007	2,026	2,792	1,661	1,419	7,797
2008	2,062	2,895	1,698	1,440	7,967
2009	2,097	2,999	1,735	1,460	8,136
2010	2,133	3,105	1,772	1,481	8,305
2011	2,168	3,212	1,808	1,502	8,475
2012	2,202	3,322	1,843	1,522	8,643
2013	2,236	3,433	1,878	1,543	8,812
Difference Between Capacity and Enrollment					
2004	364	(335)	(9)	323	367
2005	327	(432)	(48)	303	198
2006	290	(531)	(86)	282	28
2007	254	(632)	(125)	261	(141)
2008	218	(735)	(162)	240	(311)
2009	183	(839)	(199)	220	(480)
2010	147	(945)	(236)	199	(649)
2011	112	(1,052)	(272)	178	(819)
2012	78	(1,162)	(307)	158	(987)
2013	44	(1,273)	(342)	137	(1,156)
<p><i>Figures in parentheses indicate periods when projected enrollments exceed facility capacities.</i></p>					

WEST KNOX AREA HIGH SCHOOL ENROLLMENT PROJECTIONS, 2004-2013					
SCENARIO B: BASED ON EXISTING ENROLLMENT PROGRESSION AND NEW HOUSEHOLDS					
	BEARDEN	FARRAGUT	KARNS	WEST	TOTAL
<i>Existing Conditions</i>					
Households, 2003	20,775	13,851	19,792	22,652	77,070
Enrollment, 2003	1,879	2,399	1,505	1,336	7,119
Students/Household, 2003	0.090	0.173	0.076	0.059	0.092
School Capacity, 2003	2,280	2,160	1,536	1,680	7,656
<i>Building Permit Projections</i>					
2004	412	553	522	351	1,838
2005	408	563	515	351	1,837
2006	404	572	508	351	1,835
2007	401	582	501	351	1,835
2008	397	592	494	351	1,834
2009	393	602	487	351	1,833
2010	390	611	480	351	1,832
2011	386	621	473	351	1,831
2012	382	631	465	351	1,829
2013	379	641	458	351	1,829
<i>Enrollment Additions from New Homes</i>					
2004	37	96	40	21	170
2005	37	98	39	21	170
2006	37	99	39	21	170
2007	36	101	38	21	170
2008	36	103	38	21	169
2009	36	104	37	21	169
2010	35	106	36	21	169
2011	35	108	36	21	169
2012	35	109	35	21	169
2013	34	111	35	21	169
<i>Existing Enrollment Progression Through Grades</i>					
2004	1,874	2,343	1,698	1,456	7,371
2005	1,852	2,235	1,889	1,563	7,539
2006	1,740	2,092	2,047	1,608	7,488
2007	1,725	1,922	2,127	1,603	7,378
2008	1,779	1,839	2,083	1,538	7,238
2009	1,852	1,752	1,985	1,482	7,071
2010	1,923	1,705	1,935	1,425	6,988
2011	1,913	1,684	1,953	1,445	6,996
2012	1,924	1,652	1,938	1,476	6,991
2013	1,950	1,615	1,926	1,495	6,986
<i>Enrollment Projections</i>					
2004	1,911	2,439	1,738	1,477	7,564
2005	1,926	2,428	1,968	1,604	7,926
2006	1,851	2,385	2,165	1,670	8,071
2007	1,872	2,316	2,283	1,686	8,157
2008	1,962	2,334	2,276	1,641	8,214
2009	2,070	2,352	2,215	1,606	8,244
2010	2,177	2,411	2,202	1,570	8,360
2011	2,202	2,498	2,256	1,610	8,566
2012	2,248	2,575	2,276	1,663	8,761
2013	2,308	2,649	2,298	1,702	8,957
<i>Difference Between Capacity and Enrollment</i>					
2004	369	(279)	(202)	203	92
2005	354	(268)	(432)	76	(270)
2006	429	(225)	(629)	10	(415)
2007	408	(156)	(747)	(6)	(501)
2008	318	(174)	(740)	39	(558)
2009	210	(192)	(679)	74	(588)
2010	103	(251)	(666)	110	(704)
2011	78	(338)	(720)	70	(910)
2012	32	(415)	(740)	17	(1,105)
2013	(28)	(489)	(762)	(22)	(1,301)

Figures in parentheses indicate periods when projected enrollments exceed facility capacities.