



**The Economic Impact of the Redevelopment of Georgetown,
Connecticut:**

**The Former Gilbert and Bennett Wire Mill, Main Street, and
Old Mill Road**

By:

Stan McMillen, Ph. D., Manager, Research Projects
Brian Baird, Research Assistant

Publication Date:
October 18, 2005

CONNECTICUT CENTER FOR ECONOMIC ANALYSIS[®]

Fred V. Carstensen, Director
William F. Lott, Director of Research
University of Connecticut
341 Mansfield Road
Unit 1240
Storrs, CT 06269
Voice: 860-486-0485 Fax: 860-486-0204
<http://ceea.uconn.edu>

EXECUTIVE SUMMARY

Georgetown Land Development Company, LLC (GLDC) asked the Connecticut Center for Economic Analysis to assess the economic impact of the redevelopment of Georgetown, Connecticut, including the renovation of a mill formerly used by The Gilbert & Bennett Wire Company, and adjacent parcels on Main Street and Old Mill Road. The redevelopment of Main Street and Old Mill Road is made possible by two aspects of the GLDC redevelopment of the Gilbert & Bennett Site: the creation of necessary parking to accommodate new business, and the upgrading of an existing waste water treatment facility (see Appendix A).

Project Description

Together, the projects on the Mill site, Main Street and Old Mill Road create 446 new residential units and over 630,000 square feet of new commercial space to be occupied by a mix of retail, restaurant, office, and civic uses. The following Table summarizes the two developments' characteristics.

Characteristics of Gilbert & Bennett and Main St./Old Mill Rd. redevelopments.

Structure Type	Former Gilbert & Bennett Site		Main St./Old Mill Rd.	
	Square Feet	Comment	Square Feet	Comment
Residential Use	711,950	416 Units	60,000	30 Units
Retail Space	95,043		61,925	
Restaurant Uses	28,882		61,925	
Office Space	109,770		123,850	
Light Manufacturing	31,500			
Bed and Breakfast	32,924	50 Rooms		
YMCA	65,000			
Black Box Theater	17,476			
Civic Building	4000			
Transit Station	500			
Parking Structures	n/a	960 Spaces		
Sewage Plant	18,385	245,000 GPD cap.		
Total	1,115,430		307,700	

CCEA estimates construction costs associated with the former Gilbert & Bennett site to be \$256 million with \$14.6 million in planning costs. Parallel figures for the Main Street/Old Mill Road site are \$55.3 and \$2.8 million.

Economic Impacts to Fairfield County

Using the Connecticut Economic Model, REMI, described in Appendix B, and based on the detailed assumptions laid out in the body of the report, CCEA forecasts the development's direct, indirect, and induced economic impacts to Fairfield County, Connecticut. Simulations indicate that the developments create the following impacts:

Impact of redevelopments on Fairfield County, Connecticut

Variable	Units	Construction Period Avg.	Ongoing Avg.	Peak Value	Peak Year
Total Population	people	422	1,324	1,601	2025
Total Employment	jobs	1,516	1,874	2,047	2012
Prof. & Tech. Services	jobs	338	791	822	2012
Food Services	jobs	106	339	379	2012
Retail	jobs	174	332	392	2012
Construction	jobs	619	40	1,032	2006
Gross Regional Product	\$ millions*	126.11	208.95	242.46	2025
Personal Income	\$ millions*	85.48	143.06	171.47	2025

*Constant 2005 dollars

On-Site Impacts

Based on characteristics of the redevelopments and projected mill rates, CCEA estimates the following tax revenue streams to the Town of Redding and the Georgetown Special Taxing District (GSTD):

Forecasted annual revenues to Georgetown Special Taxing District and Town of Redding

Site	Description	2005 Prop. Tax Rate	Value
Former Gilbert & Bennett Site	Assessed Value		\$316,943,655
	Revenue to Redding	21.25 mills	\$6,735,053
	Revenue to GSTD	6 mills	\$2,738,959*
Main Street/ Old Mill Road	Assessed Value		\$66,514,875
	Revenue to Redding	21.25 mills	\$1,413,441
Town of Redding Annual Tax Revenues			\$8,148,494
Georgetown Special Taxing District Annual Tax Revenues			\$2,738,959*

* Includes estimated annual parking revenues of \$843,345

Finally, CCEA estimates that, due to the small size of residential units and age restrictions set by GLDC, the redevelopment of the former Gilbert & Bennett mill will accommodate approximately 61 school-aged children after 2008. This result does not account for school-age children outside the GLDC site.

Additional analysis suggests that the joint redevelopment projects will create 1,546 non-construction jobs (that is, jobs associated with ongoing operations), with 976 on the GLDC site and 570 on the Main Street/Old Mill Road site. We estimate that of the new 1,546 jobs, 280 are in the retail sector, 372 are in the food service sector, and 761 are office (professional, technical services).

1. INTRODUCTION

Georgetown Land Development Company, LLC (GLDC) asked the Connecticut Center for Economic Analysis to assess the economic impact of the redevelopment of Georgetown, Connecticut, including the renovation of the Gilbert & Bennett Wire Mill site, and adjacent parcels on Main Street and Old Mill Road. Overall, the projects seek to create a vibrant locus of economic activity in the Town of Redding as well as provide residents of the redevelopment and nearby towns with an enhanced quality of life. An important aspect of the vision is to create a mix of residences, retail establishments, office space, cultural attractions, and light manufacturing space in a dense yet attractive arrangement within walking distance to a new train station on the Metro North rail line.

Georgetown Land Development Company is responsible for the redevelopment and improvement of the Gilbert & Bennett Wire Mill site. Henceforth, the land area over which GLDC has authority will be referred to as the “GLDC Site.” Two important aspects of the GLDC redevelopment are construction of new parking facilities providing 960 spaces, and a new sewage treatment facility increasing local capacity to 245,000 gallons per day capacity. According to a July 16, 2005 report by John Hayes, Planning Consultant to the Town of Redding Board of Selectmen (Appendix A), the increased parking capacity, and a new sewage treatment plant opens the possibility of rezoning parcels from 2 to 34 Main Street and from 4 to 29 Old Mill Road. Henceforth, in this report, we refer to the area of proposed redevelopment on Main Street and Old Mill Road collectively as the “Main Street” site. The rezoning provides the possibility of increased retail, restaurant, and office space, and allows multi-story structures to have residential use on upper floors. The maximum allowable Main Street expansion would provide thirty 2,000 square foot dwelling units as well as 247,700 square feet of commercial development. Current commercial floor area is about 62,000 square feet.

The simultaneous GLDC and Main Street redevelopment projects will impact Fairfield County and the State of Connecticut in two distinct phases. The first phase comprises planning, site assessment, design, and construction, of which the latter includes environmental remediation, demolition, renovation, and construction of new buildings and infrastructure. The construction phase of the GLDC site is expected to take place from 2006 to 2008, with commercial units ready for occupancy as early as 2007,

and the Main Street redevelopment is expected to occur in the three years 2006 to 2008, with occupancy beginning in 2008. The second phase, which begins after construction is complete, captures new economic activity resulting from the redevelopments. This includes new employment, new retail and industrial sales, and demographic shifts resulting from non-pecuniary amenity benefits (that is, an increased quality of life in the region). Economic activity from the GLDC project is forecasted to begin with the occupancy in 2007, while new Main Street project activity will begin in 2008. As an additional component of our analysis, we consider certain direct effects of the GLDC redevelopment site. In particular, we forecast tax revenues accruing to Georgetown Special Tax District and the Town of Redding from the redevelopment, and we estimate the number of school age children (ages 5-17) living in the proposed GLDC redevelopment.

2. MODELING STRATEGY

CCEA adopts two separate modeling strategies to assess the economic impacts of the redevelopment. First, we use the Connecticut economic model, REMI, (from Regional Economic Models, Inc.; see Appendix B for a description) to forecast regional effects. This model is a dynamic representation of the state and regional (county) economies that allows us to examine in detail the annual impacts of projects and policies. The model captures the direct, indirect, and induced effects of the GLDC and Main Street redevelopments on Fairfield County. As we are not modeling impacts to other Connecticut counties, all inputs and outputs correspond to Fairfield County, where the Village of Georgetown (in the Town of Redding) is located. As such, results from this modeling strategy provide a broad, “big-picture” view of the redevelopments’ economic impact.

This broad view, however, can obscure a more detailed picture of economic impacts to the Town of Redding. Such a picture is important because the Town is the political body most directly responsible for taxation and service delivery adjacent to the GLDC redevelopment and on the Main Street and Old Mill Road sites. To provide this necessary local view, CCEA estimates three local economic impacts from the two redevelopments.

First, based on characteristics and age restrictions describing the GLDC residential units, we estimate the number of school-aged children (ages 5-17) likely to live on the GLDC property. This estimate does not take into account any activity outside the boundary of the redevelopment site that may affect the number of households with school age children that move into Redding or surrounding towns. As such, the model *does not* forecast the number of school-aged children generated by the Main Street redevelopment.

Second, CCEA estimates annual tax revenues that will flow to the Town of Redding and the Georgetown Special Taxing District after the project is complete. This model is based on assumptions about assessed value of new and renovated structures, as well as parking revenues on the GLDC site. Again, the tax model *does not* take into account any property outside of the GLDC site (including the Main Street site).

Finally, we estimate the number of sustained jobs *located on the GLDC and Main Street sites* that result from the redevelopments. It is important to note that this estimate of direct local employment is different from the employment estimates resulting from the REMI model, which include non-local direct, indirect, and induced employment (the latter two are also likely to be non-local). To estimate direct on-site employment, we utilize data from the U.S. Economic Census, Bureau of Labor Statistics, and the business statistics website www.bizstats.com.

3. REMI MODEL DEVELOPMENT

To forecast the total economic impact of the two developments on Fairfield County, the REMI model requires input describing direct economic activity from the construction and operations of the two sites. This activity can be modeled as either sales or employment (but not both, as this would “double count”). We select the modeling approach based on the most accurate information available. For example, we model retail activity as sales because existing sales per square foot data provides reasonable forecasts for the GLDC and Main Street Projects. Thus, REMI inputs are either in (sales) dollar or employment terms.

The period of analysis, from 2002 to 2025, includes construction, modeled from 2002 to 2008, and operations, modeled from 2007 to 2025. The main difference between

the construction and operations phase is that the construction phase describes a relatively short time span during which there is a spike of economic activity. In contrast, we assume that the economic changes associated with the operations phase, after increasing over a few years, are then ongoing, with relatively constant yearly effects.

3.1. Construction Phase

3.1.1. Cost Estimation

GLDC Site

Construction costs for the GLDC renovation of the former Gilbert and Bennett wire mill fall in three general categories. The first is project development costs consisting of consulting fees, legal fees, marketing, and administrative costs. The estimated costs for these services in Table 1 are based on information provided by Georgetown Land Development Company and supporting data from contract consulting firms O&G Industries, Inc., Liro Group, Fuss and O'Neill, and Tighe & Bond.

Table 1: Estimated planning costs for GLDC redevelopment

Planning Cost Type	Estimated Cost, 2002-2008
Engineering and Architectural	\$5,000,000
Management and Public Relations	\$4,000,000
Accounting and Auditing	\$250,000
Legal Services	\$2,500,000
Insurance	\$2,500,000
Total	\$14,250,000

The second construction cost category is site preparation, which includes environmental remediation, demolition of selected structures, and the construction of new infrastructure such as roads and intersections, parking structures, and water and sewer facilities. We estimate the costs (Table 2) for these tasks based on figures provided by GLDC and internal estimates by O&G Industries, Inc. The high construction cost of the South End Station Garage is due to necessary environmental remediation at that site. The wastewater treatment plant is 18,385 square feet, and we estimate construction costs of \$400 per square foot. Site preparation and infrastructure construction is forecasted to take place in 2006 and 2007 with most activity in the first year.

Table 2: Estimated site preparation and infrastructure costs for GLDC redevelopment

Cost Type	Estimated Cost, 2006-2007
Demolition and Abatement	\$4,500,000
Infrastructure Construction	\$20,000,000
Redding Intersection Improvements	\$2,500,000
New Parking Structures (960 total spaces)	
South End Station Garage (600 spaces)	\$15,000,000
Weaver District Garage (180 spaces)	\$4,500,000
Central Campus Garage (180 spaces)	\$4,500,000
New Wastewater Treatment Plant	\$7,500,000
Total	\$58,500,000

The final component is the cost of constructing new structures and renovating existing structures on the site. The GLDC proposal includes construction of residential units, office space, retail space, a bed and breakfast, light manufacturing space, and civic spaces. Table 3 provides details for the residential unit mix as well as estimated construction costs, and Table 4 provides cost estimates for commercial and civic building types. CCEA estimates square foot construction costs for both residential and non-residential buildings from three sources: RSMeans (<http://www.rsmeans.com>), Contractors.com website (www.contractors.com), and discussions with GLDC.

Table 3: Residential uses and estimated square foot construction costs for GLDC redevelopment

Structure Type	Number of Units	Average Square Feet	Estimated Cost/Sq. Ft.	Total Construction Cost
Detached House	31	3,500	\$250	\$27,125,000
Townhouse/Live-Work	72	2,500	\$200	36,000,000
Residential Loft	250	1,500	\$175	65,625,000
Market Rate Apt.	8	900	\$150	1,080,000
Subsidized Apt.	55	750	\$150	6,187,500
Totals	416	711,950		\$136,017,500

Table 4: Estimated square foot construction costs for GLDC site commercial uses

Structure Type	Square Feet	Estimated Construction Cost/sq. ft.	Total Construction Cost
Retail Space	95,043	\$150	\$14,256,450
Restaurant Uses	28,882	\$150	\$4,332,300
Office Space	109,770	\$150	\$16,465,500
Light Manufacturing	31,500	\$125	\$3,937,500
Bed and Breakfast	32,924	\$200	\$6,584,800
YMCA	65,000	\$200	\$13,000,000
Black Box Theater	17,476	\$150	\$2,621,400
Civic Building	4000	\$200	\$800,000
Transit Station/Ticket Office	500	\$400	\$200,000
Total	385,095		\$62,197,950

Main Street Site

For the Main Street site, we estimate construction costs based on the assumptions of John Hayes’ July 16, 2005 Memo (Appendix A). That is, “Each of the 23 affected parcels will be developed to the maximum floor area permitted by the amended zoning regulations.”¹ Thus, 62,000 square feet of commercial space will be converted into 247,700 square feet of commercial space, and, thirty 2,000 square foot dwelling units will be constructed. For the commercial uses, the floor area expansions can be achieved through renovation and addition, or through demolition and reconstruction. Lacking specific information as to which properties will be rebuilt and which will undergo renovations, we make a blanket assumption that all properties will cost an average of \$175 per square foot to update their building(s). This value acknowledges that new construction is typically cheaper (closer to \$150 per square foot) than renovation (closer to \$200 per square foot), and it is thus between these values. We assume \$200 per square foot for residential construction. Reconstruction of Main Street and Old Mill Road properties will require planning costs for architectural and engineering firms’ work. Following the cost breakdown of the GLDC site, we estimate that planning costs for the Main Street site will be roughly 5% of construction costs. We assume no site preparation costs. Total construction phase costs for the Main Street site are shown in Table 5. We apply these construction costs evenly over a three-year construction period 2006-2008.

¹ Bullet 2, page 3 (page 30 of this document)

Table 5: Estimated square foot construction costs for Main Street redevelopment

Redevelopment Type	Square Feet	Unit Cost Description	Total Costs
Commercial Use	247,700	\$175 per sq. ft.	\$43,347,500
Residential Use	60,000	\$200 per sq. ft.	\$12,000,000
Total Construction Costs	391,457		\$55,347,500
Project Development Costs		5% of const. costs	\$2,767,375

3.1.2. Construction Financing

CCEA assumes funding for the GLDC and Main Street redevelopment projects to be primarily from private sources. While the GLDC project does receive some federal and state grants, these have no impact to the county or state economy other than their direct usage that is accounted through construction spending. State grants are budgeted expenditures and have no tax or bonding consequences. CCEA is unaware of (and therefore did not model) any tax credits or state bonding to finance either of the redevelopment projects.

3.2. Operational Phase

Once operational, CCEA expects the GLDC and Main Street redevelopments to generate new economic activity in Fairfield County. This activity, which will result from the year-to-year operations of the developments, is comprised of new employment, new sales, and demographic shifts. It is important to note that for each of these operational effects, we make assumptions about the proportion that will be *net new* to the area. More explicitly, when a project such as this becomes operational it creates new employment and sales for the region, but it also draws employment and sales away from other establishments already existing in the area. We use the term “net new” to describe new economic effects adjusted for losses from crowding out.

3.2.1. GLDC Site Operational Phase

The GLDC redevelopment includes a variety of new and renovated space that we estimate will increase sales and employment in Fairfield County in twelve distinct

sectors.² REMI accounts for generated economic activity as either net new sales or net new employment. Thus, we estimate *either new sales or new employment* that will occur as part of the project. If, for example, sales are increased in a sector, then REMI increases employment in that sector based on its structural relationship between output and employment. The converse is true for an increase in jobs. We begin by describing our assumptions for net new sales; we then turn to net new employment.

First, the GLDC project will generate new real estate activity from sales and rental of new residential properties. The for-sale properties are the 31 detached houses, 72 live-work townhouses, and 250 residential lofts. We assume sale prices to be approximately twice construction costs. Rental properties are the eight market rate apartments and 55 senior/subsidized apartments. We assume that monthly rent will be \$2 per square foot for the market rate units and half that for the subsidized units. For all residential units, we assume that they will be completely filled within a year or two after construction ends. However, some of these units will be filled by families previously living in Fairfield County; these properties (within Fairfield County but outside the GLDC project) will also be put on the market for sale. Real estate sales for Fairfield County are only considered net new if the buyer is from out of state. We estimate that the real estate market re-establishes equilibrium after five years, and any activity beyond that time is not net-new. In other words, it takes five years to fill any housing vacancies generated by the GLDC project with non-Fairfield County residents. For residential property, real estate sales are calculated as 6% of the aggregate sale price, and total sales decline linearly from a maximum in 2008 to zero in 2013. Rental properties generate real estate sales calculated as the full rental price, and these increase linearly from zero in 2007 to the maximum, ongoing value of \$667,800 in 2012.

Second, the GLDC development allocates 95,043 square feet for new, unspecified retail shops. We estimate that this space will attract up-scale retail shops generating \$400 per square foot in gross sales per year. This estimate is likely conservative; estimates³ for 2002 and 2003 indicate that stores such as Aeropostale, Ann Taylor, and Williams-Sonoma all generate more than \$400 (gross) per square foot, with some boutiques (such

² The REMI model uses input and output based on the NAICS employment classification system. Thus, all economic activity falls into a two or three-digit NAICS sector.

³ All per square foot estimates are obtained from www.bizstats.com, which compiles industry statistics.

as jewelry or children's clothing stores reporting figures between \$500 and \$900 per square foot. We assume that 72.5% of gross retail sales are captured locally.⁴

Third, GLDC provides 28,882 square feet for restaurants or other food service establishments. As with the retail space, we assume that this space will be filled with up-scale chains. For the restaurant sector this translates to \$500 per square foot. This assumption is also likely conservative, as small food establishments (such as Starbucks or Papa John's) nationwide generated between \$525 and \$575 per square foot in 2002 (see footnote 3). For both retail and restaurant sales, we derive net new sales based on expected migration out of Fairfield County. Because we assume that after five years all housing vacancies resulting from the GLDC (and Main Street) project will be filled by people outside Fairfield County, it follows that sales following that five-year span will be entirely net new to the County. Over that five year span, however, retail and restaurant sales experience crowding out (diminishing linearly from 2007 to 2011).

Fourth, a new Bed and Breakfast will generate sales in the accommodation sector. The proposed Inn will be 32,924 square feet with 50 rooms. We assume that these rooms will be upscale, drawing \$200 per night with an overall occupancy rate of 60%. This translates to gross annual sales of \$2,190,000. We estimate that occupancy will reach this net new level two years after the Inn is opened.

Fifth, the GLDC redevelopment includes 65,000 square feet for a new YMCA. We assume, based on figures for an existing YMCA in another high income area⁵ that this structure will generate \$20 per square foot of sales per year.

Finally, GLDC indicates that only 600 of the total 960 garaged parking spaces will be rented, with 50% daily and 50% monthly. Thus, for 300 spaces, the monthly rate is assumed to be \$30 with a 3.5% vacancy rate, or \$8,685 per month gross revenue. For the remaining 300 spaces, the daily rate is \$5 with assumed 50% turnover and 10% vacancy, or \$2,025 per day. These figures translate to gross annual revenues of \$843,345.

⁴ For the retail sector, REMI requires the % of total retail price captured locally. The 72.5% is what remains after we subtract 14.2% for the producer's profit, 13% for wholesalers, and 3% for shipping. Percentages taken from IMPLAN User's Guide.

⁵ Figures from a 2002 tax return (form 990) for the Hampshire Regional YMCA in Northampton, MA.

All sales modeled as input to the regional model are shown in the first seven lines of Table 6 with the corresponding NAICS sector. As the REMI model uses sales to calculate new employment, we make no assumptions about actual employment for these six sectors.

Table 6: Ongoing Sales and employment on GLDC site*

Development Type	NAICS Sector(s)	Gross Square Feet	Ongoing Yearly Sales	Total Employment
Real Estate (for sale)	531	663,500	\$15,450,000**	
Real Estate (for rent)	531	48,450	\$667,800	
Retail	44-45	95,043	\$27,562,470	
Restaurant/Food Services	722	28,882	\$14,441,000	
Accommodation	721	32,923	\$2,190,000	
YMCA	813	65,000	\$1,300,000	
Parking	812	600 spaces	\$843,345	
Office Employment	54	113,525		439
Home-Based Employment	54	350 (units)		40
Sewage Treatment Plant	22	18,385		3
Black Box Theater	711	17,476		10
GLDC Operations (total)				
Grounds Maintenance	811			3
Management	55			1
Administration	561			2
Totals			\$47,004,615	498

* The REMI framework can model ongoing economic activity as either sales or employment (sales induces employment and vice versa).

** Total commission from all residential sales spread over five years 2008-2013. Not included in total.

The proposed GLDC redevelopment also includes several activities which we explicitly model as new employment because this method is more accurate than if we model sales. These activities are shown as the bottom eight rows of Table 6, and they include the 107,770 square feet of proposed office space, the Black Box Theater, select employment associated with the operations of the GLDC site, and home-based employment in the residential units. The GLDC development also includes new light manufacturing space for the existing wood/metal fabrication shop associated with a Stanley Steamer fabrication facility onsite. As this employment already exists, there is no net new component for manufacturing employment.

The office space is estimated to be filled with one office employee for every 250 square feet.⁶ As no information is available as to specific usage, we apply these jobs to NAICS sector 54, professional & technical services, which contains most office uses. We assume that the employment generated onsite will primarily be drawn from areas outside the county, and thus be 100% net new three years after the operational phase begins. In addition, there will likely be self-employed persons who relocate to the development or take on additional part time self-employment as a result of transportation efficiencies described below. The U.S. Census Bureau estimates that in 2004, Fairfield County had 37,547 self-employed workers “in own not incorporated business.”⁷ Assuming that all self-employed workers work from home, it follows that 11.4% of the estimated 328,304 occupied Fairfield County housing units held a home-based employee in 2004. This translates to an average of one home-based self-employed worker per 8.7 residences.⁸ For the GLDC site, 350 of the 416 units are well-suited for this type of home-based employment. Applying these assumptions to the 350 new residential units, we estimate that 40 jobs result from home-based employment. It is important to note that these 40 jobs are only *self-employed* home-based jobs. The 350 units may also house employees of area firms who choose to work from home part or full time. Because this latter type of employment describes only a location shift for existing employment, it is not net new, and therefore does not factor into our analysis. Following the assumption in Section 3.2.1, we assume that these 40 jobs increase linearly to 100% net new over a five year span after the residential units are available for purchase or rent.

The proposed Black Box Theater will house a dance school and music school, and will accommodate theater, dance, and music events throughout the year. We estimate that the educational and performance space capacities of the theater will require 10 full-time-equivalent employees in the form of instructors, managers, and other personnel.

Finally, the sewage treatment plant and GLDC operations will generate limited new employment in four sectors. GLDC has informed us that the sewage treatment plant

⁶ 250 s.f. per employee includes all building floor area uses (offices, hallways, bathrooms, stairwells, closets, etc.)

⁷ Figures derived from Census Fact Finder 2004 Estimates for Fairfield County at www.census.gov.

⁸ The 1 home based employee per 8.7 dwellings is likely conservative because (1) Fairfield County has a high proportion of industry suited to home-based employment, and (2) GLDC has designed many of its units specifically for this activity.

will employ three people full time. GLDC will employ one manager, one administrator, and three maintenance employees for upkeep and maintenance of the GLDC property such as plowing and lawn-mowing services.

3.2.2. Main Street Site Operational Phase

The redevelopment of Main Street and Old Mill Road will generate ongoing economic activity in the form of sales and employment. One added complication is that, because the Main Street project is an *expansion* of floor space, existing floor space generates economic activity in some form or another. We must therefore model the component of economic activity that is net new as a result of the redevelopment. This task is complicated by the fact that we have few details as to which current uses will remain, which might leave, and which might expand. However, the report by John Hayes (Appendix A) indicates that present commercial floor area is about 62,000 square feet. We assume that this present commercial capacity breaks down to 40% retail, 40% restaurants, and 20% office.⁹ In addition to expanding commercial floor space, the redevelopment will likely alter the mix of uses. We estimate that 50% of the resulting 247,700 square feet will be used for office space, that 25% will be used for retail, and that the remaining 25% will be used for restaurant or other food services (see footnote 9). To determine the net new component, we subtract current floor area from the total after the redevelopment for each commercial use. We then apply our sales and employment assumptions to the net new floor areas to determine net new economic activity (Table 7).

Table 7: Estimated sales and employment resulting from Main Street redevelopment project

Economic Activity	% of Existing	Existing Sq. Ft.	% of New	New Sq. Ft.	Net New Sq. Ft.	Assumption	Net New Sales/Empl.
Retail	40%	24,800	25%	61,925	37,125	\$290/sf*	\$10,766,250
Restaurant	40%	24,800	25%	61,925	37,125	\$500/sf	\$18,562,500
Office	20%	12,400	50%	123,850	111,450	1 empl./400sf	279 empl.
Totals		62,000		247,700	185,700		

* Local component. See footnote [4].

⁹ Based on conversations with GLDC, who performed a rough assessment of current and future Main Street site usage.

Using the same sales per square foot assumptions as the GLDC development, we estimate that the retail space will generate \$10,766,250 annual gross retail sales (amount captured locally; see footnote 4) and \$18,562,500 annual gross sales in the food service sector. For the office space, we make a conservative assumption that 400 square feet will accommodate one office worker. This is higher than for the GLDC site because the total office space is spread across many parcels, making the resulting floor space less productive. Finally, we assume that the 30 potential residential units (see Appendix A) will generate home-based employment at the same rate as for the GLDC units, or one employee per 8.7 units. All new sales and employment are estimated to increase to 100% net over a five year span beginning 2008 following the logic presented in section 3.2.1. Annual employment and sales figures are displayed in Table 8 with corresponding NAICS sector.

Table 8: Estimated employment and sales generated from Main Street redevelopment project

Activity Type	NAICS Code(s)	Annual Sales	Annual Employment
Retail	44-45	\$10,766,250	
Restaurant	722	\$18,562,500	
Office Employment	54		279
Home-Based Employment	54		3
Totals		\$18,701,719	282

3.2.3. Demographic Shifts

Finally, CCEA assumes the redevelopments will affect migration into Fairfield County. The completed developments are expected to draw people into Fairfield County because of certain non-pecuniary (quality of life) benefits resulting from the construction and operation of the sites. We estimate that this amenity value has three components. First, we expect the completed sites to increase nearby property values. This amounts to a one-time benefit equal to the net change in the value of these properties. We estimate this increase to be \$30 million, 3% of the 2002 Grand List for the Town of Redding. A second component of the non-pecuniary amenity value is the willingness for new residents and businesses of the GLDC site to pay a premium for their higher quality of life. We measure this benefit as the surcharge tax rate (6 mills) that these residents and businesses pay above the offsite mill rate. The final component of the non-pecuniary

benefit stems from the transportation aspects of the GLDC redevelopment design. In particular, we assume the new community transit station and the pedestrian-oriented design benefit residents of the GLDC and Main Street redevelopments as well as other nearby residents by way of reduced transportation costs and improved accessibility to New York City and other Connecticut cities. Savings accrue to future Georgetown residents in the form of foregone automobile trips, a reduced need for an automobile, reduced time and travel costs to New York City and other destinations available through Metro North, an improved viability of home-based employment, and other time savings via proximity to common service and retail destinations. We estimate these benefits to be \$1,000 per resident (within walking distance to GLDC site and train station) per year (at an average of 1.7 adult residents per unit). Table 9 summarizes CCEA’s amenity value estimates. It is important to note that the amenity estimates only affect demographic migration and has no affect on employment and only a marginal affect on gross regional product and personal income in Fairfield County.

Table 9: Description of non-pecuniary amenity values

Amenity Description	Assumption	Value
One-time increase in property values (applied in 2009)	3% of 2002 Grand List	\$30,000,000
Tax surcharge for GLDC residents (on-going)	6 mills applied to property improved by GLDC	\$1,864,114
Transportation-related benefits (on-going)	\$1,000 per resident within walking distance	\$806,250
Non-Pecuniary Amenity for 2010		\$32,670,364
Ongoing Amenity Value 2010-2025		\$2,670,364

4. RESULTS

4.1. On-Site Model Results

As the REMI model operates at the county level and not at the town level, CCEA uses details of the redevelopment plan to estimate three important results at the town and project site level. First, we project the number of school age children (ages 5 – 17) that we expect will inhabit the 416 residential units incorporated in the GLDC project design (See Table 3). Of the 416 units, we consider all except 31 detached houses and 72 townhouses too small for families with school age children. Furthermore, some of these

dwellings have age restrictions limiting renters or owners to 55 years of age and older. We assume that these age restrictions and size limitations effectively prevent occupation of these units by school-aged children. Thus, CCEA assumes families with school age children live only in non-age restricted detached homes and townhouses. Based on aggregate demographic data for Redding and information about bedrooms and total square footage per unit, we estimate that the remaining 17 detached houses accommodate 1.5 school age children per household unit, and that the 36 non-restricted townhouses accommodate 1 child per unit. We derive this ratio from Census 2000 data for Redding that estimated there were 1,586 children between the ages of 7 and 17, and 1,269 households with children under 18 in the household implying there were 1.25 school age children per household in Redding in 2000. This ratio is too low because there must be some households with children under 18 that have no school age children. Therefore, the number of households with school age children *exclusively* is less than 1,269 and the ratio of households with school age children to those with children younger than 18 is closer to 1.5. Given these assumptions, CCEA estimates the GLDC redevelopment will house approximately 61 school age children on an ongoing basis after 2009.

Second, we estimate tax revenues accruing to the Town of Redding and the Special Taxing District (GSTD) created to manage the redevelopment site. We calculate the revenues to Redding based on changes in property values for the GLDC and Main Street sites and an estimated mill rate of 21.25. Revenues to the GSTD accrue only from the GLDC site based on 6 mills applied in addition to the Redding's mill rate. We estimate the taxable value of residential property, commercial property, and parking structures separately. CCEA assumes that, once completed, residential property will have market value of 2 ½ times its construction cost.¹⁰ The mill rates apply to assessed value, which by Connecticut statute is 70% of market value. The market value of commercial space is calculated differently for different uses. We assume the market value of retail establishments to be twice the construction cost, and office and manufacturing space

¹⁰ We use this simple rule without a scientific survey of realtors or developers in the region. We believe that this factor is reasonable and recognize that different factors are possible. The linearity of the analysis allows one to scale market value depending on the factor used for each structure type. Another rule of thumb is that market value is comprised of: (1) land, (2) structures, and (3) location characteristics and profit in roughly equal proportion. We do not estimate values for these components separately as the issue is total value for tax revenue estimation purposes.

market value is estimated as construction cost. For the parking structure (960 total spaces), market value is assumed to be \$1,500 per space. Tax revenues thus accrue to Redding based on 21.25 mills. Revenue to GSTD, however, is comprised solely of gross parking revenues as estimated in section 3.2.1. Table 10 presents tax revenue estimates for the On-Site model.

Table 10: Projected revenues to Town of Redding and Special Taxing District

	Residential	Retail/Food & Drink	Office/Manufact.	Parking Structures	Hotel	Totals	
Market value assumption	2.5x const. costs	2x const. costs	1x const. costs	\$1,500 per space	2x const. costs		
GLDC Site	Construction Costs	\$136,017,500	\$35,010,150	\$28,103,000	\$6,584,800		
	Assessed Value	\$238,030,625	\$49,014,210	\$19,672,100	\$1,008,000	\$9,218,720	\$316,943,655
	Revenue to town (21.25 mills)	\$5,058,151	\$1,041,552	\$418,032	\$21,420	\$195,898	\$6,735,053
	Revenue to GSTD (6 mills)	\$1,428,184	\$294,085	\$118,033	\$843,345*	\$55,312	\$2,738,959
Main Street	Construction Costs	\$12,000,000	\$21,673,750	\$21,673,750			\$55,347,500
	Assessed Value	\$21,000,000	\$30,343,250	\$15,171,625			\$66,514,875
	Revenue to town (21.25 mills)	\$446,250	\$644,794	\$322,397			\$1,413,441
	Total Redding Revenues	\$5,504,401	\$1,686,346	\$740,429	\$21,420	\$195,898	\$8,148,494
Total GSTD Revenues	\$1,428,184	\$294,085	\$118,033	\$843,345*	\$55,312	\$2,738,959	

* Gross parking revenues. See section 3.2.1 for details.

Finally, we estimate direct on-site employment resulting from the GLDC and Main Street redevelopments. As in Section 3, we estimate the two sites create economic activity in twelve industry sectors. For those sectors in which we estimate employment as input to the REMI model (the last column of Tables 6 and 8), we carry these values to the current analysis. Thus, the GLDC project creates 479 office jobs (including home-based), 3 jobs for the sewage treatment plant, 10 jobs for the Black Box Theater, and 6 jobs for GLDC operations. For the Main Street site, we estimate there are 282 new office jobs.

In addition, we estimate how many jobs are associated with expected sales in retail and food service stores, the Bed and Breakfast, and the YMCA (the second to last

column in Tables 6 and 8). We exclude from our estimate real estate sales and parking revenues, as employees in the real estate sector are likely to be located off-site, and parking revenues may not create any jobs due to a fully automated collection system. For the retail, food service, and accommodation sectors, we use the following algorithm to estimate the number of jobs from gross sales. First, 2002 Fairfield County census data is used to calculate total employees from gross sales.¹¹ “Total employees,” however, is defined as all persons on payroll in a given year, including turnover and part time work. Thus, we use national 2002 data from the Bureau of Labor Statistics’ Current Employment Survey (CES) and Job Openings and Labor Turnover Survey (JOLTS) to adjust total employment to full time equivalent (FTE) employment.¹² More specifically, we calculate sales per FTE for a single sector as

$$\frac{\text{Sales}}{\text{FTE}} = \frac{\text{Sales}/\text{TotEmp}}{\left((1 - \text{TOR})\left(\text{HPE}/40\right)\right)}$$

where TOR is the “turnover rate” and HPE is “average weekly hours per employee.” By this calculation, we arrive at a method for estimating jobs from gross sales. Values used in the above equation for four sectors are shown in Table 11.

Table 11: Values used to estimate employment for retail, food service, accommodation, and membership assoc. sectors

Economic Activity	NAICS Sector	Sales per Total Empl. (Census)	Turn- over Rate (BLS-CES)	Weekly Hrs/ empl. (BLS-JOLTS)	Est. Sales per FTE Empl.
Retail	448	\$140,082	4.1%	30.9	\$189,089
Food Services	722	\$52,018	6.1%	25	\$88,636
Accommodation	721	\$81,146	6.1%	29.7	\$116,388
YMCA	813	n/a	5.0%*	31.2	0.741**

* Estimated

** Estimated FTE employee per total employee

¹¹ The “Summary Statistics by 2002 NAICS for Fairfield County, CT” provides gross sales and total employees by sector. Obtained from <http://www.census.gov/econ/census02/>.

¹² “Hours per employee” obtained is from <http://www.bls.gov/ces/home.htm>, and “turnover rate” obtained from <http://www.bls.gov/jlt/home.htm>.

Finally, we estimate YMCA employees based on figures for an existing YMCA in an area with similar demographic characteristics (see footnote 5) that employed 128 total employees in 2002. FTE employees are estimated by multiplying the FTE per total employee result from Table 11 by the figure for the existing YMCA to yield 95 FTE jobs. Total on-site employment results are shown in Table 12

Table 12: Estimated sustained employment on GLDC and Main Street sites

Economic Activity	NAICS Sector(s)	On-Site Employment
Retail	44-45	201
Food Services	722	163
Accommodation	721	19
YMCA	813	95
Office Employment	54	439
Home-Based Employment	54	40
Sewage Treatment Plant	22	3
Black Box Theater	711	10
GLDC Operations	55, 561, 811	6
GLDC Total Empl.		976
Retail	44-45	79
Food Service	722	209
Office Employment	54	279
Home-Based Employment	54	3
Main Street Empl.		570
Total On-Site Empl.		1546

4.2. REMI Model Results for Fairfield County

The results of the REMI model cover the direct, indirect, and induced effects of the GLDC and Main Street redevelopments to Fairfield County, Connecticut from 2002-2025, including the construction and operational phases. The direct effects in the construction phase arise from construction and related services’ sales and the resulting direct employment. In the operational phase, direct effects arise from net new retail and other sales, and new employment. Indirect effects in each phase arise from the business-to-business linkages (purchases of goods and services locally supplied) that result from the onsite increase in employment and retail activity. Finally, the employment created by the direct and indirect effects spurs additional economic activity through subsequent rounds of consumer spending. The sum of these effects amounts to the overall “multiplier effect” for Fairfield County.

We present REMI results as annual average, peak, and net present values (for monetary quantities). Average values are broken into components for the construction phase and operations phase of the development to capture the different effects of each phase. Peak values correspond to the maximum level attained by each variable over the 23-year time span modeled, with the year the peak occurring in parentheses. Net present values for monetary variables reflect the value today of the revenue stream discounted to the present at each point in the future. We use a discount rate of 5.0%. Table 11 summarizes key components of the REMI results for Fairfield County.

Table 13: REMI projected values for Fairfield County resulting from GLDC redevelopment project

Variable	Units	Avg. over Construction Period	Avg. over Operations Period	Peak Value (year)	Net Present Value
Total Population	people	422	1,324	1,601 (2025)	
School Age Children (ages 5 – 17)	children	73	271	355 (2025)	
Total Employment	people	1,516	1,874	2,047 (2012)	
Economic Migrants	jobs	168	44	216 (2009)	
Employment-Prof., Tech. Services	jobs	338	791	822 (2012)	
Employment-Food Services	jobs	106	339	379 (2012)	
Employment-Retail	jobs	174	332	392 (2012)	
Employment-Construction	jobs	619	40	1,032 (2006)	
Gross Regional Product	\$ millions*	126.11	208.95	242.46 (2025)	1,906.51
Personal Income	\$ millions*	85.48	143.06	171.47 (2025)	1,298.65

* GRP and Personal income are displayed in constant 2005 dollars (adjusted for expected inflation)

Figure 1 clearly shows the demographic dynamics that occur in the construction and operational phases in Fairfield County. Economic migrants are those people who migrate to the county in search of jobs due to increased probability of finding them. The overall county level demographic response to the net new economic activity (especially to the increased amenity value) takes place over a longer period of time than that for the redevelopment site where we assume full occupancy of all residences and businesses takes place within two years.

Figure 1: Projected change in Fairfield County population resulting from GLDC project

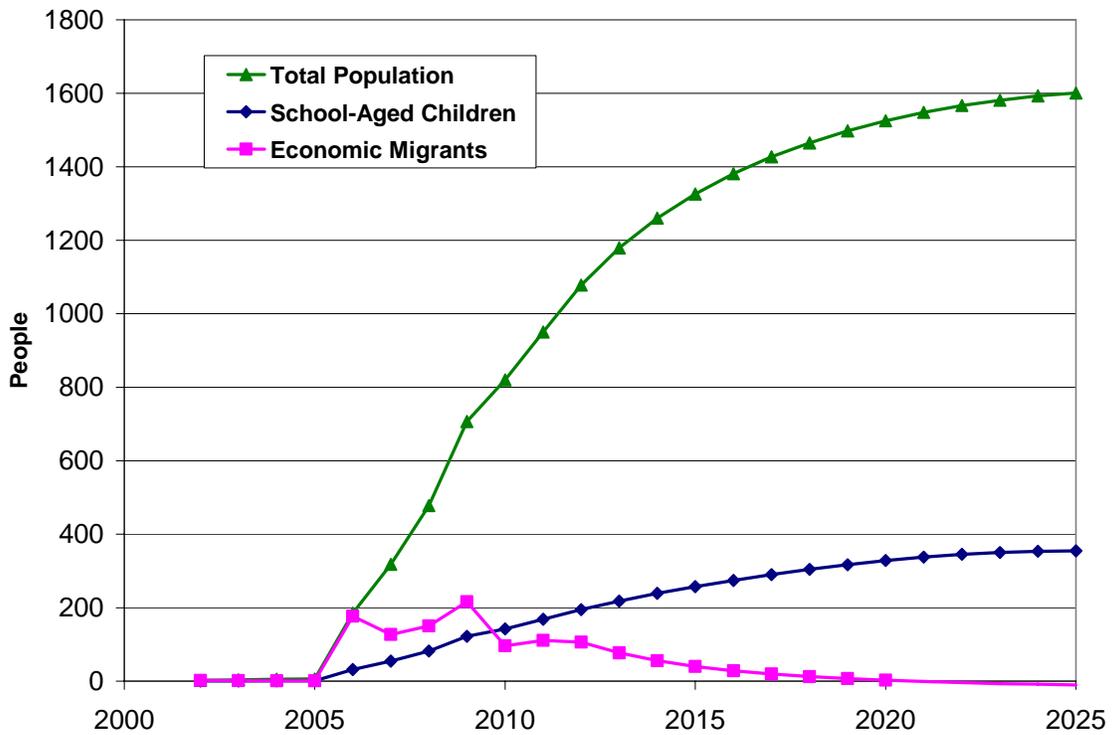


Figure 2 shows the demographic breakdown of school age children in three age cohorts for Fairfield County as a result of the net new economic activity in Redding. The top line is the sum of the three age cohorts predicted by the REMI model. Because the REMI model output is for Fairfield County, it includes the ‘onsite’ model’s prediction (for the GLDC site only). Note that the ‘onsite’ model predicts about 61 school age children based on our assumptions and Census 2000 data adding to Redding’s present school age population.

Figure 2: Projected change in number of children, ages 5-17 for Fairfield County

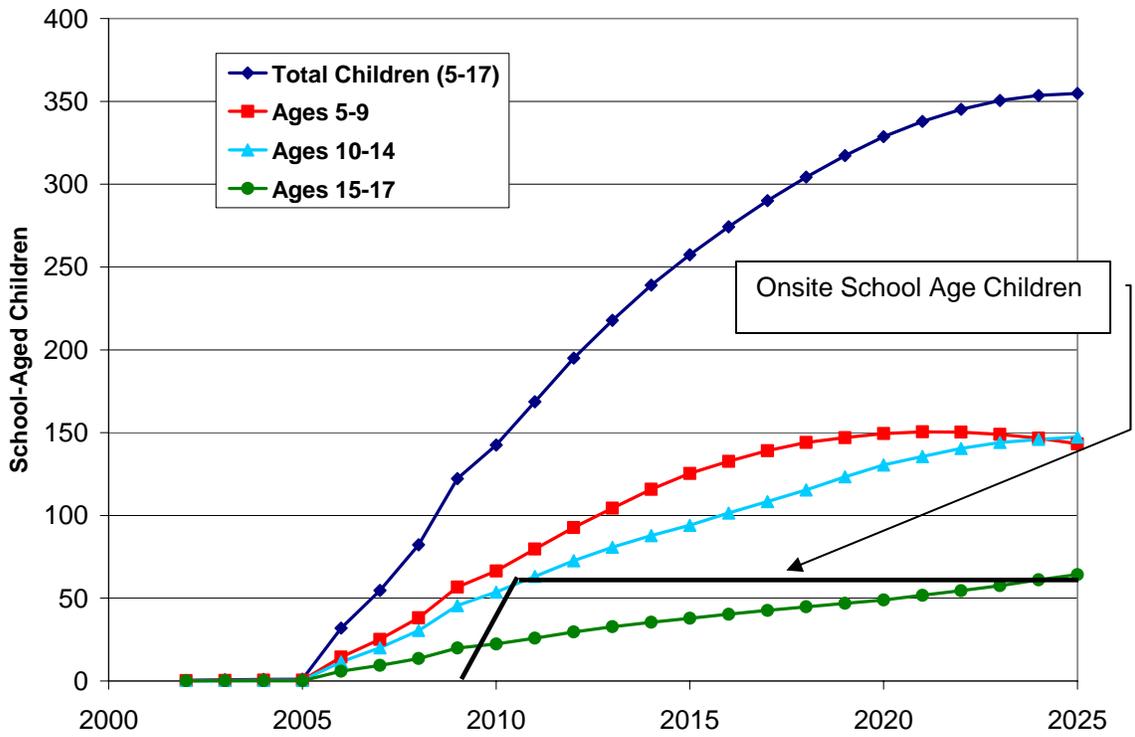


Figure 3 shows the employment dynamics in Fairfield County due to the new economic activity in Redding. This figure more clearly shows the job spike due to the construction phase, the subsequent falloff and recovery as the operational phase unfolds. The “professional and technical services” (NAICS 54) sector dominates new employment in Fairfield County after 2010 with an annual average of 791 new jobs. Of these, 761 jobs are in Redding based on our assumptions of office workers per square foot and home-based workers in the GLDC and Main Street redevelopments.

Figure 3: Projected change in Fairfield County employment resulting from GLDC project

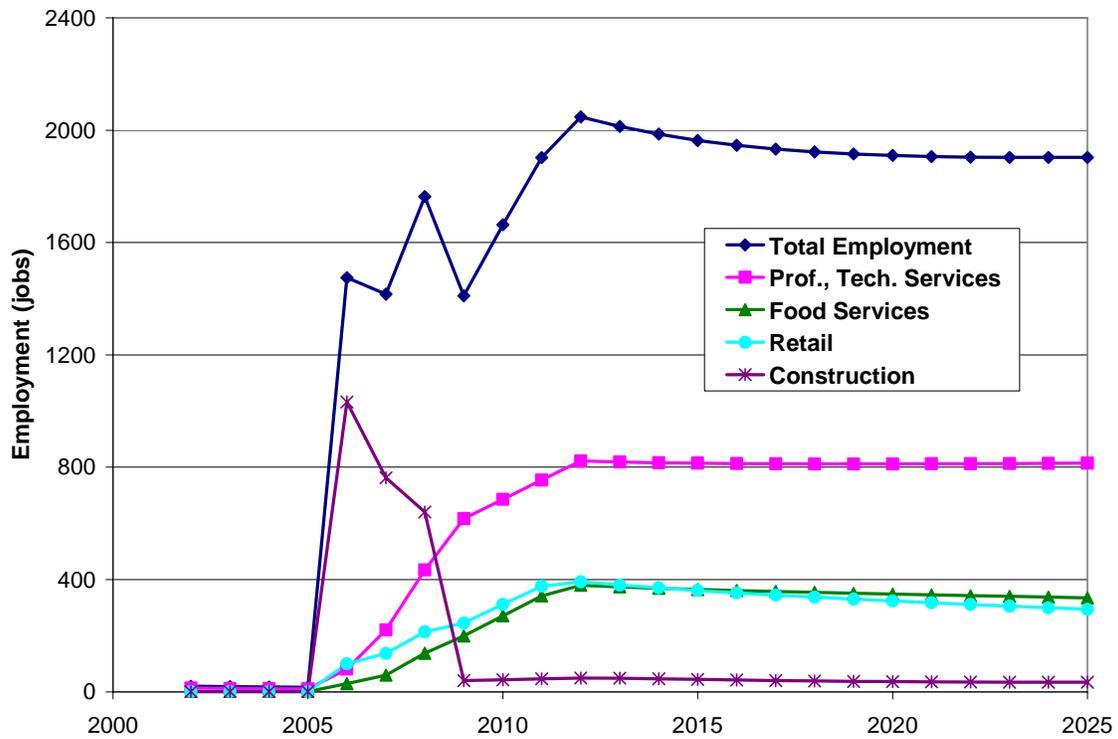
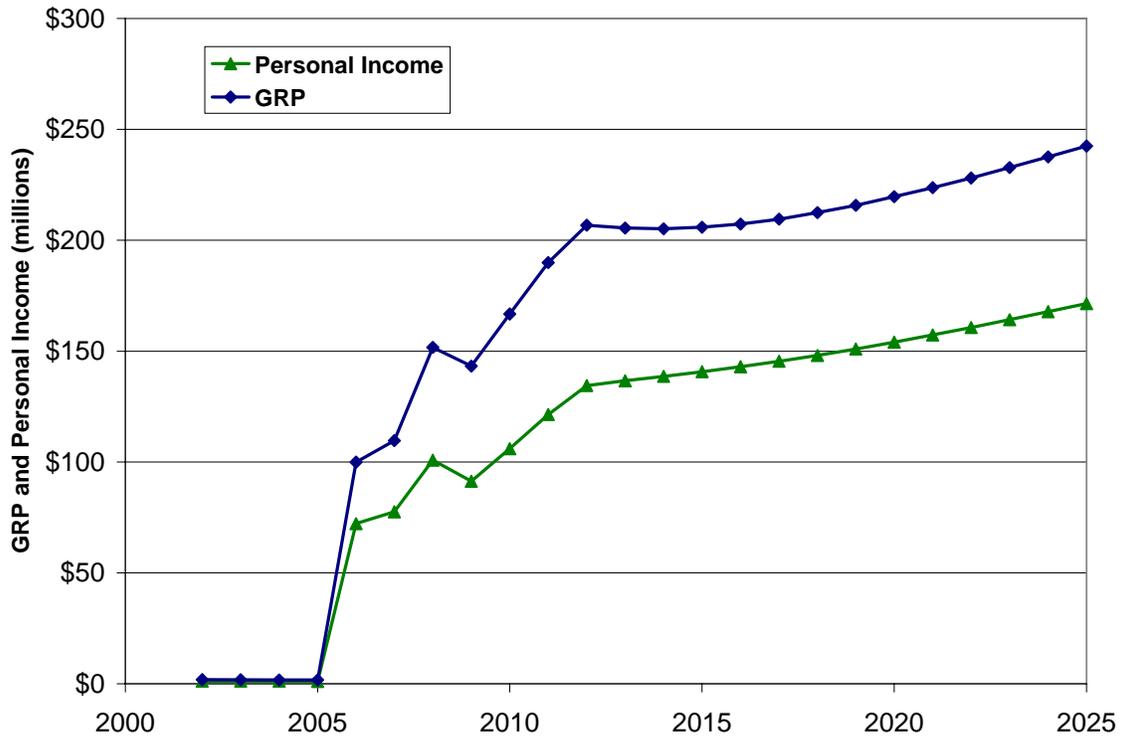


Figure 4 shows the dynamics of gross regional product (GRP) and personal income. GRP is the value of all goods and services produced in the county in a year. Personal income is the value of all compensation received by workers. The pattern again highlights the separate effects of the construction and operational phases.

Figure 4: Projected change in Fairfield County GRP and personal income



5. CONCLUSION

The redevelopment of the former Gilbert and Bennett wire mill complex at Georgetown in Redding, Connecticut is an example of smart growth that sets an example for other such developments in New England. The mill complex as it stands is an eyesore and generates no (perhaps negative) economic value for Redding and the region. The mill complex could be converted to green space that would not create much economic value, but would have intrinsic value as perhaps a nature preserve or quiet, green, open space for townspeople to enjoy. Such a transformation would not be

costless. The transformation of the existing, historical structures and the addition of new structures, infrastructure and amenities: (1) saves existing green space from new development, (2) prevents further deterioration of historical structures, (3) remediates an environmental impacted site preventing potential contamination of groundwater, (4) preserves the legacy of the mill town, (5) creates density and (6) eases transportation congestion with ready access to commuter rail.

Furthermore, the wastewater treatment facility and parking structures provided by the GLDC project provides an opportunity for the Town of Redding to rezone parcels on Main Street and Old Mill Road. This rezoning would invite further residential, commercial, and mixed-use development in close proximity to the GLDC site. The redeveloped properties on Main Street and Old Mill Road will complement the Neotraditional redesign of the former Gilbert and Bennett site, and help cement Redding's place as an attractive destination and positive example of modern community design.

As a result of these developments, property values of surrounding real estate should increase, additional density through infill should occur, tourism should increase, and preservation efforts of historical structures in the region should be encouraged.

CCEA's analysis of the proposed projects shows that there will be net new employment, sales and taxes for Redding, Fairfield County and the State of Connecticut. Because of effective age and space constraints, there will be few school children added to Redding's population in the foreseeable future. The constraints built into the GLDC redevelopment project will not prevent Redding from attracting new families with school age children, nor prevent childless families living in the redeveloped mill complex from having more than expected children, nor prevent age or otherwise constrained families or individuals from adopting, fostering, or bearing children in the long run. Thus, Redding like many other Connecticut towns will have to consider expanding its school facilities at some point. Expected tax revenue from the operational phase of the project could fund a significant school expansion project.

Any significant economic development brings with it some adverse consequences. There will be more people than in the recent past moving around Redding and the surrounding towns if the project comes to fruition. However, that number may not

exceed the number of people moving around Redding when the mill was in its heyday. There will be development in Redding and surrounding towns no matter what happens with the Gilbert and Bennett site. The Gilbert and Bennett redevelopment plan, however, forestalls consuming more green space by concentrating development in a small area with easy access to commuter rail, retail, entertainment, recreation and other amenities.

CCEA believes the assumptions underlying this analysis are reasonable. The actual selling prices and rental rates for residential units, the actual rental rates for retail, light manufacturing and commercial spaces, the occupancy rates for these spaces and the vehicle traffic consequences are not known precisely. Based on anecdotal evidence, the attractiveness of the region is high, empty nesters are looking to downsize and ease their commuting pattern, and cultural and heritage tourism is growing. In addition to CCEA's analytical findings, these patterns and the *regional* character of this development suggest that the Gilbert and Bennett redevelopment project should be a success.

Appendix A: Letter from John Hayes, Planning Consultant to Redding Board of Selectmen

City, Town & Regional

PLANNING

John Hayes, Consultant PO Box 1 Redding Ridge, CT, 06876 938-2380

Report to: Board of Selectmen
Attn.: Hon. Natalie Ketcham, First Selectman

Subject: Potential Full Capacity Development,
Main Street and Old Mill Road, Georgetown

Date: July 16, 2005
From: John Hayes, Planning Consultant



This brief report supplements and qualifies the tabular analysis of potential business development for the Main Street / Old Mill Road business district transmitted to you on May 4, 2005. Since that time the final positions of proposed building lines have been established on the Streetscape Plan prepared by B.L. Companies, resulting in one minor adjustment in my analysis of development capacity. #54 Redding Road was not included in the original analysis because it was not expected to gain any additional development potential due to its small size (0.08 acre); however the final plan does divide this parcel with a proposed building line, increasing its potential, and the tabular analysis has been adjusted accordingly. A copy of the revised schedule is attached.

For the two streets the revised maximum potential development estimate is as follows:

- Under long-established Town zoning standards, i.e. conventional development of new business buildings with specified setbacks and requisite on-site parking, a total of 115,400 square feet of floor area (entirely commercial) may be anticipated. Present commercial floor area is about 62,000 square feet.
- Under proposed building lines, as shown on the Streetscape Plan, and amended Zoning Regulations adopted in December 2004, maximum potential development increases significantly. If all 23 property owners affected by the proposed building lines were to donate to the Town the additional right-of-way shown on the plan the estimated aggregate potential development would be 307,700 square feet of floor area, of which 247,700 square feet (80.5%) would be commercial.

By way of comparison the planned redevelopment of the former Gilbert and Bennett factory site is projected to create 364,000 square feet of commercial floor space (Georgetown Land Development Co. Master Plan Engineering Report, June 2004). The G & B site redevelopment plan is now proposing about 360 residential units; the amended Main Street / Old Mill zoning regulations would allow, with building line area donations, 30 dwelling units in addition to the 247,700 square feet of business floor space.

The purpose of the 167% increase in development capacity for the Main Street /Old Mill Road area is, of course, to create a strong economic incentive for redevelopment of this historic business center. Benefits would include new economic vitality for the "other half" of Georgetown, as well as the aesthetic improvements depicted in the Streetscape Plan, and initiation of a process to coordinate development of the entire "downtown" area into a cohesive center.

However there are risks in this approach which must be addressed forthrightly in long-term planning.

First there is an actual, if presently minor, shortage of parking space in the area (my study in 1999-2000 indicated a need, for the entire area, for 279 spaces versus 238 available). While it is likely that most of the potential development made possible by the donations of building-line-areas will not occur for a long time, if ever, there will be a growing scarcity of needed parking spaces unless action is taken now to reserve spaces needed in the future. Full development of the potential business space would require, theoretically, 990 parking spaces at an average of one space per each 250 square feet of floor area.

In practice the number of parking spaces would be somewhat less because of varying times of demand (evening vs. day), duration (short visit vs. all day), and intensity of use (e.g., restaurant vs. professional office). However it is reasonable to project an ultimate parking need of at least 800 spaces for the full-development building-line-incentive-and-donation plan. Any surplus parking available at the Georgetown Land Development parking garage will be dependent on daily demand at the proposed YMCA and rail commuter station facilities. I recommend that early action be taken by the Town to acquire one or more strategically located sites, including possible surplus Route 107 right-of-way, for future parking development.

Another potential constraint on development of the center arises from the sewage treatment capacity of the expanded wastewater treatment plant to be operated by the Town and GLD Company, and the effluent dilution capacity of the Norwalk River as regulated by CT DEP. GLD Company's engineering plan projects a treatment capacity increased from 75,000 gallons per day to 245,000 gpd., using a new "xenon" technology to meet DEP's effluent concentration limitations (conversation 6/1/05 with Stephen Soler). While the present WWTP capacity of 75,000 gpd comfortably accommodates present development in the Main St. / Old Mill area, Redding Woods and Meadow Ridge, the projected full development of the Main Street / Old Mill Road center could generate between 50,000 and 60,000 gpd of additional sewage treatment needed capacity, if it is assumed that the commercial floor area of the center (247,700 sq. ft.) develops with uses and densities similar to the GLD Co. redevelopment plan and that there are 30 additional dwellings with an average 2.5 per persons per dwelling unit. Experience in future years may indicate that some of the needed additional sewage treatment capacity can be met from reserve in the presently planned

245,000 gpd system but it would be prudent to explore with CT DEP what may be the practical or feasible limits for treated effluent discharge to the Norwalk River, and to conduct an engineering study to determine the optimum means of meeting this need.

The following broad assumptions underlie this capacity analysis:

- All property owners will donate the right-of-way additions as shown on the Streetscape / Proposed Building Lines plan;
- Each of the 23 affected parcels will be developed to the maximum floor area permitted by the amended zoning regulations;
- Effective parking need will average one space per 250 square feet of nonresidential floor area;
- 30 dwelling units, average 2,000 square feet each, will be built at village margins with their own on-site parking.
- The Town will assume the responsibility for providing essential infrastructure including parking, sewers and other public improvements.

Appendix B: The REMI Model

The Connecticut REMI model is a dynamic, multi-sector, regional model developed and maintained for the Connecticut Center for Economic Analysis by Regional Economic Models, Inc. of Amherst, Massachusetts. This model provides detail on all eight counties in the State of Connecticut and any combination of these counties. The REMI model includes all of the major inter-industry linkages among 466 private industries, aggregated into 49 major industrial sectors. With the addition of farming and three public sectors (state and local government, civilian federal government, and military), there are 53 sectors represented in the model for the eight counties.

The REMI model is based on a nationwide *input-output* (I/O) model that the U.S. Department of Commerce (DoC) developed and continues to maintain. Modern input-output models are largely the result of groundbreaking research by Nobel laureate Wassily Leontief. Such models focus on the inter-relationships between industries and provide information about how changes in specific variables—whether economic variable such as employment or prices in a certain industry or other variables like population affect factor markets, intermediate goods production, and final goods production and consumption.

The REMI Connecticut model takes the U.S. I/O “table” results and scales them according to traditional regional relationships and current conditions, allowing the relationships to adapt at reasonable rates to changing conditions. Listed below are some salient structural characteristics of the REMI model:

- REMI determines consumption on an industry-by-industry basis, and models real disposable income in Keynesian fashion, i.e., with prices fixed in the short run and GDP (Gross Domestic Product) determined solely by aggregate demand.
- The demand for labor, capital, fuel, and intermediate inputs per unit of output depends on relative prices of inputs. Changes in relative prices cause producers to substitute cheaper inputs for relatively more expensive inputs.

- Supply and demand for labor in a sector determine the wage level, and these characteristics are factored by regional differences. The supply of labor depends on the size of the population and the size of the workforce.
- Migration—that affects population size—depends on real after-tax wages as well as employment opportunities and amenity value in a region relative to other areas.
- Wages and other measures of prices and productivity determine the cost of doing business. Changes in the cost of doing business will affect profits and/or prices in a given industry. When the change in the cost of doing business is specific to a region, the share of local and U.S. market supplied by local firms will also be affected. Market share and demand determine local output.
- “Imports” and “exports between states are related to relative prices and relative production costs.
- Property income depends only on population and its distribution adjusted for traditional regional differences, *not* on market conditions or building rates relative to business activity.
- Estimates of transfer payments depend on unemployment details of the previous period, and total government expenditures are proportional to population size.
- Federal military and civilian employment is exogenous and maintained at a *fixed* share of the corresponding total U.S. values, unless specifically altered in the analysis.

Because the variables in the REMI model are all related, a change in any one variable affects many others. For example, if wages in a certain sector rise, the relative prices of inputs change and may cause the producer to substitute capital for labor. This changes demand for inputs, which affects employment, wages, and other variables in those

industries. Changes in employment and wages affect migration and the population level that in turn affect other employment variables. Such chain-reactions continue in time across all sectors in the model. Depending on the analysis performed, the nature of the chain of events cascading through the model economy can be as informative for the policymaker as the final aggregate results. Because REMI generates extensive sectoral detail, it is possible for experienced economists in this field to discern the dominant causal linkages involved in the results.