III. D.

DATE: June 4, 2007

TO: Planning and Zoning Committee

FROM: Mike Geisel, DPW\CE – Acting Director of Planning

SUBJECT: Chesterfield Valley, PC\PI Zoning

As directed by the City Council, Staff has developed information related to policy decisions associated with the mix of Planned Commercial and Planned Industrial Zoning west of Long Road.

It is imperative that we all understand that the issue involved in this discussion, is not a debate of allocating Industrial versus Commercial uses, but the zoning of properties under the Planned Commercial or Planned Industrial Districts. It is equally important to understand that the City of Chesterfield, even to a larger degree, Chesterfield Valley, is not a micro-economy in and of itself, but Chesterfield Valley represents a small segment of the Metropolitan Economy. Business and Industry in Chesterfield is reliant upon, supported by, and supports other economic entities throughout the metropolitan area. The Valley is not, in and of itself, a separable economy which relies only upon itself for consumers and\or suppliers. This is much different than a City which is isolated and must independently support the entire regional economy.

Development Sub-Areas

During the preparation and approval of the current comprehensive plan, specific sub-areas were identified and development guidelines were established. It should also be noted that specific criteria was suggested for these areas due to the lack of infrastructure and utilities. This area was not included in the phase three master plan analysis for Chesterfield Valley.

Sub-Area #1 is defined as that area south of Olive Street Road and west of the airport. This area was suggested to be "**Low Intensity Industrial**". It should also be noted that specific criteria was suggested for this area due to its lack of infrastructure and utilities. This area was not included in the phase three master plan analysis for Chesterfield Valley.

Sub-Area #2 is defined as that area north of Olive Street Road, west of Chesterfield Airport Road, and south of I-64 (Highway 40). This area was suggested to be "**Low Density Office/Retail**".

Sub-Area #3 is defined as that area north of I-64 (Highway 40), west of Boone's Crossing, and south of the Monarch-Chesterfield Levee. This area was suggested to be "**Mixed Commercial**"

Land Use Plan

Attached hereto is a copy of the City's Land Use plan, as provided for in the adopted Comprehensive plan. As proposed, there are a few clearly discernable areas where different use types are suggested.

1) The area west of Long Road, east of the I-64 (Highway 40) off ramp, north of Chesterfield Airport Road and South of I-64 (Highway 40). This area is depicted as "Mixed Commercial", "Office Park", "Mixed Use", and "Mixed Commercial".
2) Area West of the I-64 (Highway 40) off ramp, north of Olive Street Road is shown to be "Mixed Use"
3) Area south of Chesterfield Airport Road, west of Spirit Trade Center is depicted as Spirit Airport.
4) Area west of Spirit Airport, and east of Eatherton Road, is depicted to be "Low Intensity – Industrial".

Planned Commercial Uses (not allowed in Planned Industrial zoning)

Amusement parks, drive-in theatres, and zoological gardens.
Associated work and storage areas required by a business, firm, or service to carry on business operations.
Barber shops and beauty parlors.
Bookstores.
Colleges and universities.
Dry cleaning drop-off and pick-up stations.
Hospitals.
Riding stables.
Souvenir shops and stands, not including any zoological displays, or permanent open storage and display of manufacturing goods.

Planned Industrial Uses (not allowed in Planned Commercial zoning)

Airport, landing strips, heliports
Business, professional, and technical training schools.
Business service establishment
Churches
Correctional Institutions
Dwelling or lodging units, only for watchmen, caretakers, or other personnel residence on the premises is essential to the operation of a permitted use or uses.
Extraction of raw materials from the earth and processing thereof.
Fairgrounds and race tracks
Gymnasium, indoor swimming pool, indoor handball and racquetball courts and tennis courts

Highway Department Garages.
Incinerators
Junk yards and salvage yards.
Laundries and dry cleaning plants; including personal and individual drop off and pick up service (modified by ordinance #1555)
Mail order sales warehouse
Manufacturing, fabrication, assembly processing, or packaging of any commodity
Radio, television, communication studios, relay towers, and other such facilities
Railroad switching yards.
Sulpher, cement, or rubber reclamation plants.
Warehousing, storage, wholesaling of manufactured commodities, live animals, explosives, or flammable gases and liquids.
Welding, sheet metal, and blacksmith shops.
Yards for storage of contractors' equipment, materials, and supplies, excluding junk yards

Performance Standards

For comparative purposes, we have provided the following table which describes the performance criteria for PC Office, PC Retail, and PI zoning districts. It should be noted, that ordinance #1678 adopts specific criteria for office development, but excludes those office developments in Chesterfield Valley.

DEVELOPMENT STANDARDS	PLANNED COMMERCIAL (PC) OFFICE DEVELOPMENT	PLANNED COMMERCIAL (PC) RETAIL DEVELOPMENT	PLANNED INDUSTRIAL (PI)
Min. Open Space Required	45%	40%	None
Maximum Building Height	75 ft.	2 stories	None
Min. Lot Area	1 acre or more if adjacent to residential	1 acre or more if adjacent to residential	None
Parking Requirement	4/1,000	5/1,000	General Standard
Max. Total Building Footprint	FAR is .55	footprint shall comprise max of 25% of site	None
Setback Requirement	50 ft from any right of way. And 25 ft if adjacent to	50 ft from any right of way. And 25 ft if adjacent to	25 ft if adjacent to NU, PS, or R

	NU, PS, or R	NU, PS, or R	
Modifications Allowed	Site specific conditions written with Attachment A.; additional requests achieved with 2/3s Vote of PC or majority of CC	Site specific conditions written with Attachment A.; additional requests achieved with 2/3s Vote of PC or majority of CC	Site specific conditions written with Attachment A.
Number of Permitted Uses	49	49	72

Infrastructure

All prior discussions relative to the comprehensive plan and proposed land uses have occurred prior to the City's partnership and development agreement to provide water and sewerage infrastructure to the western portion of the Valley. In addition, the stormwater management of the west end necessarily lagged behind the development and implementation of stormwater facilities further east as development was driving the completion of these improvements. Since that time, the City has purchased two separate tracts of land to be set aside for the future stormwater reservoir, have entered into a development agreement to provide for potable water and sanitary sewers, have entered into an agreement to excavate and provide temporary stormwater pumping facilities, and have authorized a land swap to facilitate development of the stormwater reservoir with adjacent development. In addition, the Levee District is proceeding to improve the horizontal alignment of Eatherton\Old Olive, is planning on improvements to the levee along the western perimeter of the Valley and is contracting for construction of the remaining necessary sand berms in this area. Clearly the developmental infrastructure is in place for the development scenarios currently planned. An electrical sub-station exists along Old Olive and sufficient power is available for the development scenarios presented.

It should be noted that no level of planning or installation of planned infrastructure would be sufficient to meet any unusual development. Certain specific uses require extraordinary water demand or generate special waste streams that must be separately treated. The following discussion presumes reasonably anticipated and traditional developments.

The Planned potable water improvements provide for a looped 12" water main. These facilities have been sized based upon the current planned zoning and the required fire demand to provide sprinklered buildings for all remaining

undeveloped areas. I've attached a summary of the potable water design analysis hereto for your information. Please note that ultimately, the required fire flows exceeded the anticipated domestic potable water demand for this area. Sufficient potable water supply is available for the anticipated industrial or commercial development.

The Planned sanitary sewerage improvements provide for flows anticipated under the light industrial development scenario. For your use and information, I have attached a summary of the design considerations and analysis related to the sanitary sewer capacity. Based upon MSD's findings and anticipated development, the infrastructure is sufficient to accept the sanitary waste generated for development of the west end of Chesterfield Valley. It is interesting to note, that for design purposes, the largest domestic water use is that of a restaurant, generating .6 gallons per day, per square foot, while the lesser intense generators are that of a warehouse or Light Industrial , generating only .007 gallons per day per square foot.

Laclede Gas does not presently serve the west end of Chesterfield Valley. City Staff has met with representatives of Laclede Gas and suggested that it would be more cost effective for them to construct their gas distribution at the same time water, sewer, stormwater, and road improvements were constructed. As a corporate policy, they will not construct anticipatory improvements. They will construct the required distribution system only when there is an imminent demand. Alternatively, facilities which may require natural gas, may opt for propane in lieu of natural gas provided by Laclede Gas.

Summary\Recommendation

The existing Land Use plan, sub-areas, and rezonings since 2000 have been consistent. There is no history of any legislation or policy considerations which would restrict Planned Commercial zoning west of Long Road. The Comprehensive Plan and subsequent sub-area identification within this area clearly establish an understanding that commercial uses are desirable west of Long Road. There is clearly a desire to maintain a separation of Industrial Uses and Commercial Uses, but the line of separation appears to be Chesterfield Airport Road and Olive Street Road. Due to the similarity and overlap of allowable uses within the two zoning categories, Planned Commercial and\or Planned Industrial is often used interchangeably dependent on a site specific performance standard as opposed to a specific use category. Those areas north of Chesterfield Airport Road have clearly been approved and planned as commercial type uses. This is consistent as far west as the Blue Valley Development. However, the actual apparent line of separation appears to occur at Chesterfield Airport Road. Those developments south of Chesterfield Airport

Road, except for those with direct frontage, appear to be consistently more Industrial type developments.

Based upon the cumulative information and direction previously provided by both the Planning Commission and City Council, it is clear that the current sub-area discussions were based on what is now outdated information. The provision of infrastructure and development that has occurred since the year 2000 has altered our perspective significantly.

From a planning perspective, it would be prudent to preserve the aesthetic appearance and recognize the traffic volumes on Chesterfield Airport Road to support commercial development. As such, Staff recommends City Council consider establishing a clear distinction for land use types south of Chesterfield Airport Road. Those properties west of Long Road, north of Chesterfield Airport Road, or those which have direct frontage upon and within 200 feet of the south right of way line would be proposed as commercial type uses. Properties west of Long Road, south of Chesterfield Airport Road would be reserved and designated solely for Planned Industrial zoning, and a more limited set of land uses.

If you need additional information, please advise.

attachments

CC Michael Herring, City Administrator
Libbey Malberg, Asst. City Administrator for Econ. & Comm. Development
Jeremy Craig, Director of Finance and Administration

City of Chesterfield

Economic & Community Development
636-537-6720

M E M O

DATE: June 4, 2007

TO: Michael G. Herring
City Administrator

FROM: Libbey Malberg
Assistant City Administrator for
Economic & Community Development

RE: PC vs. PI Zoning in Chesterfield Valley

In response to your request, I have studied the potential impact of allowing PC versus PI Zoning in the Chesterfield Valley, specifically in areas west of Long Road.

It is my position that allowing retail uses, as would be allowed in PC areas, would not be detrimental to the long term economic stability of the Valley. According to our licensed business information, there is an existing favorable blend of businesses within the entire Valley, with the largest segment in the Office/Service category.

109 – Manufacturing/Warehouse
454 – Office/Services
215 - Retail
85 – Non Profit/Seasonal

It has been my experience that the Chesterfield market is shifting away from growing in the area of heavy manufacturing, but continues to grow in the warehouse and light industrial components. This can also be evidenced by what the development community is seeing a demand for and is therefore requesting this type of zoning to accommodate the economic growth patterns. In fact, the manufacturing prospects I have dealt with are in high-tech areas of medical specialization and not the traditional heavy manufacturing that is often thought of. Manufacturing companies cannot afford the cost of land in the area, so they locate further west and in more rural communities where a blue-collar workforce is more readily available.

Locating retail and commercial businesses within the PC areas is practical and attractive to the other tenants in the area. These uses should, however, be restricted to the road frontage of the properties, for instance, along Chesterfield Airport Road or Olive Road. These businesses will provide services that are desired by the other tenants. Additionally, I have found that when meeting with manufacturing companies in the area, one of the top requests are more places to eat in the west end of the Valley. With restricted lunch or break periods of a half hour, employees cannot make it to the Commons area and back in the allotted time. Retail and associated service uses are definitely in high demand in this area and should be permitted if requested by the developer.

Section 2

WATER SERVICE, DOMESTIC AND FIRE PROTECTION

ISSUES

Missouri American Water Company (formerly St. Louis County Water Company) is the company franchised by the State of Missouri to provide domestic water service needs and also to provide the water supply needs for the various fire protection districts that service St. Louis County. The northern and western portions of Chesterfield Valley (Study Area) in the City of Chesterfield and the City of Wildwood are serviced by the Monarch Fire and Emergency Service District.

The main issues concerning domestic and fire protection fire service are as follows:

1. Size of the water mains to deliver the required "demand."
   i.e.: capacity (gallons) and flow rates (gallons per minute).

2. Pressures available to deliver the "demand" requirements and to provide minimum residual pressures (20 psi) in the system to prevent contamination.

3. Location of the water main lines to provide ease of making connection (service taps) for existing and new customers and to provide accessibility by the water company for maintenance and service needs.

4. Looping and networking the water main lines to provide options and continuous service when maintenance is required or when breaks occur.

CODE REQUIREMENTS

Missouri American Water Company and Missouri Department of Natural Resources (DNR) have established public drinking water codes to protect the health, welfare and safety of the public.

Missouri American Water Company published their "Standard Specification for Installation of Water Facilities," which includes general conditions, special conditions and technical specifications. This document meets the requirements of Missouri DNR* and is available to the public (property owners, developers, engineers, etc.).

* Rules of Department of Natural Resources (DNR) Division 60 – Public Drinking Water Program 10 CSR 60 (available from DNR)
* Design Guide for Community Public Water Supplies MO DNR (available from DNR)

The four main issues mentioned above are of specific interest to providing water service. The key code requirements are as follows:

Issue #1

The sizes of new water mains to service the study area are based on not exceeding 4.0 feet of head loss in 1,000 feet. Under this criteria a dead end 12" water main will provide 1,500 gallons per minute flow and a 12" looped main will deliver 3,000 gpm at a velocity of 4.0 feet per second (using a C factor of 140 in the Williams and Hazen Formula). An 8" water main will provide 500 gallons per minute, and a 6" line 220 gallons per minute. With the normal water main pressures in the Chesterfield Valley (50 to 100 PSI) a 12" water main can deliver upwards to 3,500 gallons per minute exceeding the fire demand requirements (See Exhibit 1).

Issue #2

As previously mentioned, the Chesterfield Valley generally has high water main pressures in the 50 to 100 PSI range and sometimes higher. This is because of the low ground elevations and the fact that the Chesterfield Valley Area is close to the Missouri American Water Co. Treatment Facilities (source) located on Hog Hollow Road next to the Missouri River. In addition, the eastern and central area of the Chesterfield Valley is presently being served with 8", 20" and 42" water service mains.

Issue #3

The approximate location of water service mains for the study area has been determined as shown on Exhibit 2. The proposed 12" mains will be located within private easements along and parallel to City and County maintained road Right-of-Way's. 12" water main extensions are proposed to start at the intersection of Chesterfield Airport Road and Spirit of St. Louis Boulevard. The proposed 12" water main is to be laid parallel to Olive Street Road and Eatherton Road right-of-way (ROW), and terminate at the intersection of Eatherton Road and the St. Louis Southwestern Railroad ROW. The 12" water main would then be extended westward about 3,800 feet parallel to Centaur Road ROW. Water service to the levee protected area north of State Route US 40/I-64 from Long Road westward will require a 12" water main. This 12" water main will be extended parallel to the North Outer Road of US 40/I-64 and will front on all parcels in this area. A section of this 12" main exists in front of the City of Chesterfield Athletic Complex. A 12" main inter-connection from the north side of US 40/I-64 to the south side of US 40/I-64 also exists at Goddard Avenue providing a looped system.

Issue #4

The water service mains will be looped and connected to existing and proposed mains to improve service efficiency, and guarantee continuous domestic and fire protection service. Three 12" water main loops are planned to complete the study area requirements. The first loop will be a water main from Eatherton Road eastward north of Wardenburg Road to connect to the existing 12" main at Spirit St. Louis Airport. The second loop will be a water main from Eatherton Road eastward to connect to the existing 12" main at the Windsor Crossing Community Church. The third loop will be to complete a missing 12" main section on Edison Avenue from Cepi Drive west to the Insituform Building site, about 500 feet.

The construction requirements to be noted at this time are the meter location and easement requirements. All meters need to be located out of pavement or if in pavements, ballards must be provided for protection. The service line must enter the building at a 90-degree angle and service line tap must be within the shadow of the building. Copies of the water company general information are provided in Exhibit 3 along with typical meter box designs for information purposes.

The easement requirements are 10 feet wide for 6" and 8" mains; and 20 feet wide for 12" mains.

Issue #5

Within the Study Area, the vertical design location of all Water Main shall be installed at least three (3) feet below all crossings of Storm Drainage Channels or encased with concrete at least one (1) foot below all crossings of Storm Drainage Channels. In additions, where water mains parallel Storm Drainage Channels, there should be at least four (4) feet of cover between the outside of the water main pipe and the side of the Storm Drainage Channel. Thrust protection shall be provided at the vertical and horizontal bends and turns of all water mains according to MAWC construction specifications.

EXISTING CONDTIONS

The Chesterfield Valley Area has existing service provided by a 20" and 42" main from the Missouri American Water Company Water Treatment Facilities. An 8" line is connected to the system at Baxter Road and Chesterfield Airport Road.

The 42" main exits the Chesterfield Valley Area at Long Road and extends westward along Wild Horse Creek Road serving that area of Chesterfield.

The 42" main decreases in size down to a 30" main while traveling west along Wild Horse Creek Road.

West of Long Road within the Chesterfield Valley Area, a 12" and 16" main provide service to the Spirit St. Louis Airport Complex and to the Industrial Parks along Chesterfield Airport Road south of US 40/I-64.

A 12" main exists at the western end of the Spirit of St. Louis Airport which is looped to an existing 8" main located along Edison Avenue.

On the north side of US 40/I-64 serving the levee protected property is a 12" main crossing just west of Boone's Crossing and a 12" main crossing near the Chesterfield Athletic Complex. These mains are dead-end lines and will require looping at some future date with a 12" main parallel to the north US 40/I-64 outer road.

FIRE PROTECTION REQUIREMENTS

A meeting was held with the Monarch Fire and Emergency Service District, Mr. David B. Nichols, Fire Marshal, to obtain the latest district requirements.

The Monarch Fire Protection District has an ordinance pertaining to their requirements which is available to the public.

Essentially the key code requirements for the Fire Protection are as follows:

- Minimum pressure and flow is 20 PSI and 1,500 gallons per minute (gpm).
- Optimal service line pressure is 75 PSI.
- Some special uses may require upwards to 3,000 gpm requiring multi hydrants on a 12" looped main. As 12" looped main provides 3,000 gpm fire protection service.
- Maximum hydrant spacing is 300 feet.
- System should be looped whenever possible.
- Dead-end lines require either a hydrant or flushing valve at the end of the line.
- Developments having road length over 1,000 feet require at least two entrances for emergency vehicles and fire trucks.

On December 22, 2004, Mr. David B. Nichols, Fire Marshal of the Monarch Fire and Emergency Service District issued his concept approval letter for the proposed water main system to service the study area. The proposed design meets or exceeds the fire district requirements and is based upon all buildings having a fire sprinkler system (See Exhibit 4).

STUDY AREA DOMESTIC WATER DEMAND

The western end of the Chesterfield Valley (Study Area) including the area north of US 40/I-64 and west of Long Road is approximately 2,550 acres. Assuming the area is developed according to the approved Chesterfield Comprehensive Plan of February 24, 2003 and the City of Wildwood Land Use Plan, it can be determined that the expected daily water demand as follows:

Study Area – 2,550 Acres

- 20% area roads, drainage channels, etc.
- 2,040 acres to be developed/existing development
  Assume 30% green space
  Of 70% (1428-acres), ¼ is building foot print.

- 357 acres under roof = 15,500,000 square feet
- Assume ¼ building office 3,900,000 square feet
- Assume ¾ office warehouse 11,600,000 square foot warehouse

Water Demand

- Office 1 person/200 square foot/day at 20 gpd = 390,000 gpd.
- Warehouse 1 person/2000 square foot/day at 20 gpd = 116,000 gpd.
- (PE 19,500 + 5,800 = 25,300 workers) Total = 506,000 gpd.

- For a 24-hour period 506,000 gpd is 351 gallons per minute.
- For an 8-hour period 506,000 gpd is 1054 gallons per minute.

It should be noted that a 12" dead-end water main can provide 1,500 gallons per minute at the maximum head loss of 4 feet per 1,000 feet. A looped 12" main can provide 3,000 gpm (Exhibit 1).

Final Design Criteria

Our analysis clearly identifies and confirms that looped 12" water mains extended to the areas west of the Spirit of St. Louis Airport, to the area north of Olive Street Road, and to the area north of US 40/I-64 from Long Road west to the bridge ramps will provide the required domestic and fire protection services. Missouri American Water Company has the present capacities, pressures and flows to serve this study area with the needed water. That has been confirmed in a conceptual approval letter from the MAWC, from Dave Pruitt dated December 7, 2004 (Exhibit 5).

During this study we obtained the domestic water service records for fourteen (14) existing uses in the Chesterfield Valley Area, ranging from offices, restaurants, manufacturing companies and retail services. Copies of these records are included in the report as Exhibit 6 along with calculations of domestic uses. Water service records for the past 1 to 3 years show that the high end uses

for domestic water are Offices and Restaurants. The uses range from sixty to ninety gallons per 8-hour day per acre. Using ninety gallons per 8-hour day per acre, the Study Area domestic water demand would require (2,040 acres)(90 gal/day/acre) 183,600 gallons, or 382 gallons per minute for an 8-hour period. To be conservative, we use MDNR's criteria of 20 gallons per population (day workers and customers) which results in a domestic demand of 506,000 gallons per day or 1,054 gallons per minute (refer to prior calculations in this section).

This information confirms that the "Fire Protection Water Service Demand" of 1,500 gpm exceeds the Domestic Service demands which establishes the size of the required water mains and their locations. Domestic service is easily provided by water mains sized to provide Fire Protection needs.

Exhibit 2 depicts the proposed conceptual layout of water mains to provide service to the western end of the Chesterfield Valley (Study Area). A 12" main system has been approved by MAWC as adequate to serve the area, and was modeled by the Engineering Department to confirm the fact it will meet both the domestic and fire protection demand requirements.

CONTACTS

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Section 3

SANITARY SEWERS

The significant issue for sanitary sewer service is providing sewer service to our study area within the western end of the Chesterfield Valley (Study Area). This is dependent on the ability of the Metropolitan St. Louis Sewer District (MSD) to provide capacity within its existing sanitary sewer systems currently serving the Valley. If capacity is an issue, the question is whether MSD will allow a new treatment facility to service this area as a solution to the capacity problem. MSD has not allowed a new treatment plant within their jurisdiction for over ten years, and it is doubtful this will be an acceptable solution.

EXISTING CONDITIONS AND ISSUES

The existing MSD public sanitary sewer system begins at the MSD Spirit #2 Pump Station located south of the intersection of Edison Avenue and Goddard Avenue. The Spirit #2 station is a duplex station that has a maximum capacity of 2,200 gallons per minute (gpm) with two constant speed submersible 75 H.P. pumps (Exhibit 1). A 12" force main that increases to a 16" force main at Long Road runs east paralleling Chesterfield Airport Road to the MSD Caulks Creek "A" Pump Station located near Old Olive Street Road and Chesterfield Airport Road. A 30" force main increasing to a 42" force main discharges to a major MSD pump station on Creve Coeur Mill Road (known as L-52) and is then pumped to the Missouri River Wastewater Treatment Plant. Currently, MSD has funded improvements to the treatment plant and the major pump station as part of the three year, $647 million Capital Improvement Program. The Caulks Creek Force Main is funded by the Caulks Creek Surcharge Fee paid by all new developments within the Caulks Creek service area. The treatment plant and pump station projects are in the preliminary design stage and the Caulks Creek Force Main has already had segments constructed.

There are several existing systems currently in place within the western end of the Chesterfield Valley (Study Area). A gravity sewer system exists within the Spirit of St. Louis Airport. There are 8" sanitary sewers located along Goddard, Edison and Chesterfield Airport Road. MSD-maintained pump stations exist in Chesterfield Business Park, Chesterfield Industrial Park, Chesterfield Valley Center, and Spirit Trade Center. Other facilities are private and may be converted to public stations such as the pump station at the old St. Louis County Corrections Facility. Exhibit 2 shows existing public sanitary systems in the western end of the Chesterfield Valley (Study Area).

Within the Study Area, the vertical design location of all sanitary Force Main shall be installed at least three (3) feet below all crossings of Storm Drainage Channels or encased with concrete at least one (1) foot below all crossings of

Storm Drainage Channels. In additions, where sanitary Force mains parallel Storm Drainage Channels, there should be at least four (4) feet of cover between the outside of the water main pipe and the side of the Storm Drainage Channel. Design of all sanitary facilities must be in compliance with the Rules and Regulations of the Metropolitan St. Louis Sewer District

ALTERNATIVE SANITARY SEWER SERVICE OPTIONS

As we reviewed the sewer service possibilities, four alternatives were available to the Levee District to provide sanitary sewer service to the Study Area.

1. MSD's system has capacity to accept flow from the Valley with no improvements required by the Levee District.
2. MSD did not have capacity in portions of the sewer system and required upgrade of the system before allowing new connections.
3. MSD's sewer system did not currently have capacity, but improvements were planned and underway (funded by MSD). The Levee District would have to provide interim treatment at their own cost until the MSD improvements were complete.
4. MSD's existing sewer system did not have capacity. However, MSD would allow a new treatment plant to serve the western end of the Chesterfield Valley (Study Area) in lieu of system improvements, with the cost borne by the Levee District.

PHYSICAL LOCATION OF SANITARY SEWERS IN RELATION TO DRAINAGE AND WATER MAINS

One of the directives of the MCLD was to locate the sewers within the stormwater conveyance channel easements. It appears that it may be difficult to comply with this directive and be efficient with the system layout. The water company prefers their mains to be located adjacent to street/road right-of-ways. The storm channels are typically located at side and rear property locations preferable for drainage purposes. Also, MSD and the Missouri Department of Natural Resources (MDNR) have specific requirements for the physical separation between sanitary sewers and potable water mains. MDNR Division 20 – Clean Water Commission, Chapter 8 – Design Guides, Section 10CSR 20 – 8.120, Design of Sewers provide the standard for vertical and horizontal separation along with crossing requirements. This document is available from MDNR, however it is attached for your information (Exhibit 3). These items were major planning/design issues in the Phase II system layout plan.

MSD SYSTEM CAPACITY FINDINGS

Attached is presentation documentation and pump station and force main calculations submitted to MSD providing the basis for verification of the existing

sewer system (Exhibit 4). The data submitted verified that, even with very conservative (higher land use) projections for sewer loadings, the existing systems were more than adequate to serve the western end of the Chesterfield Valley (Study Area).

1. Sewage Loading Demand (based on general land use characteristics)

   Office = 1 person/200 square foot/day
   Warehouse = 1 person/2,000 square foot/day
   1 person generates 15 gallons per day

   Use a peaking factor of 2.5

2. Sewage Loading Demand (based on specific land use classifications) (Exhibit 5)

   Restaurants = .6 gallons per day per square foot
   Retail = .1 gallons per day per square foot
   Office/warehouse = .02 gallons per day per square foot
   Office space = .0075 gallons per day per square foot
   Retail and office = .05 gallons per day per square foot
   Warehouse = .007 gallons per day per square foot
   Airport and Golf Course = .0025 gallons per day per square foot
   Light industrial = .007 gallons per day per square foot

Based on 357 acres there is predicted an average sanitary loading of 280 gallons per minute (gpm) and a peak loading of 700 gpm.

Loading factors can vary depending on the specific use, location and working hours of the facility. The factors listed above have been determined based on historical information and are an estimate of proposed use. We have attempted to calibrate these factors against actual usage in similar facilities in the Valley area. Our information has been reviewed by MSD and has been accepted and approved as reasonable in planning for system capacity (See Exhibit 6).

An existing 8" gravity sanitary sewer is located on the south side of Edison Avenue parallel to the street. This sewer is laid at an average grade of 0.2% and has two in-line pump stations that lift the sewage through the system. To date, there have been no problems reported with the surcharging of flow, per MSD. This system already includes the flow from the existing pump station in the Chesterfield Athletic complex north of I-64/Hwy 40.

MSD has plans from the St. Louis County Spirit Airport to construct two new pump stations of approximately 100 gpm in size that are proposed to connect the existing 8" MSD gravity sewer system. MSD has tentatively approved these connections.

In the MCLD plan, five stations, including two pump stations from Spirit Airport and the pump station from the Chesterfield Athletic Complex are included in the flow calculations. The net affect is that two additional pump stations of approximately 75 gpm and 100 gpm are proposed. Flow calculations indicate that the existing 8" sanitary sewer system does not have capacity to accept these flows. For this reason, a new 6" force main is proposed to connect to the existing MSD Spirit #2 Pump Station as part of the MCLD plan.

MSD has reviewed our analysis of their system, and has concluded that there is sufficient existing capacity for development of the western end of the Chesterfield Valley (Study Area) to meet the demand based on the proposed zoning and land use represented in the City of Chesterfield's and the City of Wildwood's Comprehensive Master Plan Study (Study Area, Planning and Land Uses – Section 1, Exhibits 2 and 3).

Final Design Recommendation

The most cost effective method of service is to use the Chesterfield Valley Force Main as the hub or interceptor for connecting any system serving the western end of the Chesterfield Valley (Study Area). The Spirit #2 Pump Station has capacity and will serve as a hub. The recommendation for the major western sewer system is to use a similar concept already in use in the Valley. A regional pump station has been planned to be constructed in the western end of the Chesterfield Valley to serve the areas north and south of US 40/I-64 which are protected by the Monarch-Chesterfield Levee including the area of the City of Wildwood west of Eatherton Road. Areas west of the existing gravity sewer system within the Spirit Airport that cannot drain by gravity would either connect through a pressure system to the force main or drain by gravity to the pump station. Areas north of US 40/I-64 would be served by a similar system, with a pump station centrally located to collect sanitary flow and pump south under US 40/I-64 to a system that will directly flow to the gravity system discharging into the Spirit #2 pump station.

Pump station design calculations are provided in Exhibit 7. The pump stations will meet MSD criteria and be dedicated to MSD for operation and maintenance. Each station will be monitored by MSD and have stand-by generators and 12 hours of storage located underground.

Exhibit 8 depicts the proposed location for four MSD approved sanitary sewer pumping stations and required force mains to serve the Chesterfield Valley west end, south of US 40/I-64 and one MSD approved sanitary sewer pumping station required force mains to serve the Study Area north of US 40/I-64.

BILL NO. 1871 ADOPTED 10-2-00 ORDINANCE NO. 1678

AN ORDINANCE AMENDING SECTION 1003.140, SUBSECTION 4, ITEM 6 OF THE CHESTERFIELD ZONING ORDINANCE BY PROVIDING ADDITIONAL CRITERIA FOR THE PERFORMANCE STANDARDS OF OFFICE DEVELOPMENT (P.Z. 36-1999 CITY OF CHESTERFIELD).

WHEREAS, Parsons Harland Bartholomew and Associates were engaged to prepare office performance standards for the City of Chesterfield,

WHEREAS, the Planning Commission approved an amendment to performance standards for office development providing that Chesterfield Valley is excluded from the conditions,

WHEREAS, the Planning and Zoning Committee approved an amendment to the performance standards for office development including a maximum density of .55 floor area ratio, a 50 foot front yard setback for all structures, and 75 feet maximum height excluding mechanical equipment, and

WHEREAS, the City Council approved amendments to the performance standards for office development which would allow for City Council to modify the standards through a majority vote and limited the maximum building height in two areas of the city.

NOW THEREFORE BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF CHESTERFIELD, ST. LOUIS COUNTY, MISSOURI, AS FOLLOWS:

Section 1. Section 1003.165 of the Zoning Ordinance of the City of Chesterfield, is hereby amended by adding the following:

6. *Performance standards.* All uses established in a Planned Commercial District shall operate in accord with performance standards contained in Section 1003.163, "Zoning Performance Standards." These performance standards are minimum requirements and may be made more restrictive in the conditions of the ordinance governing the particular Planned Commercial District, with the exception of the Chesterfield Valley bounded by the Missouri River and Bonhomme Creek. In addition to these performance standards, established uses for office development in the Planned Commercial District shall meet the following:

(1) Maximum density of .55 Floor Area Ratio (F.A.R., the gross floor area divided by site area.).

(2) Minimum Open Space of 45% (Minimum Open Space, landscaped area and pervious surface).

(3) Front Yard Setbacks: A minimum of a 50 foot setback for all structures must be maintained from any new right-of-way line. In addition, the building setback distance must equal or exceed the height of the building.

(4) Maximum Building Height: The maximum height of buildings shall not exceed 75 feet (exclusive of mechanical equipment) from floor elevation at grade, however the building height may not exceed the front setback distance. For every foot over 50 feet in height, up to the maximum of 75 feet (exclusive of mechanical equipment), the building must be moved back one foot.

There shall be a seventy (70) foot maximum building height (exclusive of mechanical equipment) in the following areas:

1. Conway Road on the north, Chesterfield Parkway on the west, Interstate 64/40 on the south side, and Highway 141 to the east.
2. Clarkson Road, Chesterfield Parkway, and Interstate 64/40.

(5) Minimum Parking Requirements: There shall be a minimum of 4 spaces for every 1,000 square feet of gross floor area.

The above standards may be modified if it may be demonstrated that said modification will encourage, promote, and reward good architecture and urban planning. Said modification shall require two-thirds (six) vote of the Planning Commission. Notwithstanding, the recommendation of the Planning Commission, if it may be demonstrated that a modification will encourage, promote, and reward good architectural and urban planning by a majority vote of City Council, the Council may modify the standards contained in this section.

Section 2. This Ordinance shall be in full force and effect from and after its passage and approval.

Passed and approved this 2ND day of OCTOBER 2000.

MAYOR

BILL NO. 1957 ORDINANCE NO. 1747

AN ORDINANCE AMENDING SECTION 1003.140, SUBSECTION 4, ITEM 6 OF THE CHESTERFIELD ZONING ORDINANCE BY PROVIDING ADDITIONAL CRITERIA FOR THE PERFORMANCE STANDARDS OF RETAIL DEVELOPMENT (P.Z. 13-2001 CITY OF CHESTERFIELD).

WHEREAS, the Planning Commission conducted a public hearing on March 26, 2001 to consider additional criteria for the performance standards of retail development, and

WHEREAS, the Planning Commission approved an amendment to performance standards for retail development providing that items (2)(b-e) include the words 'adjacent to' when specifying the setback in relation to specific residential districts, and

WHEREAS, the Planning Commission approved an amendment to performance standards for retail development providing that item (2)(e) include the words 'and all other residential development of comparable density'

Section 1. Section 1003. 140 "PC" Planned Commercial District, Subsection 6 shall be amended as follows:

6. *Performance standards.* All uses established in a Planned Commercial District shall operate in accord with performance standards contained in Section 1003.163, "Zoning Performance Standards." These performance standards are minimum requirements and may be made more restrictive in the conditions of the ordinance governing the particular Planned Commercial District. In addition to these performance standards, established uses for retail development in the Planned Commercial District shall meet the following:

(1) Minimum Open Space:

(a) 40% Minimum Open Space (landscaped area and *non-impervious surface*) for retail development adjacent to commercial uses.

(b) 45% Minimum Open Space (landscaped area and *non-impervious surface*) for retail development adjacent to residential uses.

(2) Setback Requirements:

(a) No minimum building setback is required for development adjacent to commercial/industrial uses.

(b) A minimum of a 20-foot setback is required for development adjacent to R-6 or greater.

(c) A minimum of a 25-foot setback is required for development adjacent to R-5.

(d) A minimum of a 30-foot setback is required for development adjacent to R-4.

(e) A minimum of a 35-foot setback is required for development adjacent to R-3, NU, AG, E-1, E-2, and E-3 districts and all other residential development of comparable density.

(3) Minimum Parking Requirements: There shall be a minimum of 5 spaces for every 1,000 square feet of gross floor area.

(4) Maximum Building Height: The maximum building height shall be two level stories from floor elevation at grade (exclusive of mechanical equipment).

(5) Maximum Building Footprint: The building footprint includes only the amount of building area on the horizontal plane measured from the outside walls and supporting columns of the exterior grade. The building footprint shall comprise a maximum of 25% of the development site.

The above standards may be amended if it may be demonstrated said amendment will encourage, promote, and reward good architecture and urban planning. Said amendment shall require two-thirds vote (six) of the Planning Commission. Notwithstanding, the recommendation of the Planning Commission, if it may be demonstrated that a modification will encourage, promote, and reward good architectural and urban planning by a majority vote of City Council, the Council may modify the standards contained in this section. These standards will be applied to those petitions filed after the date of this ordinance.

Section 2. This Ordinance shall be in full force and effect from and after its passage and approval.

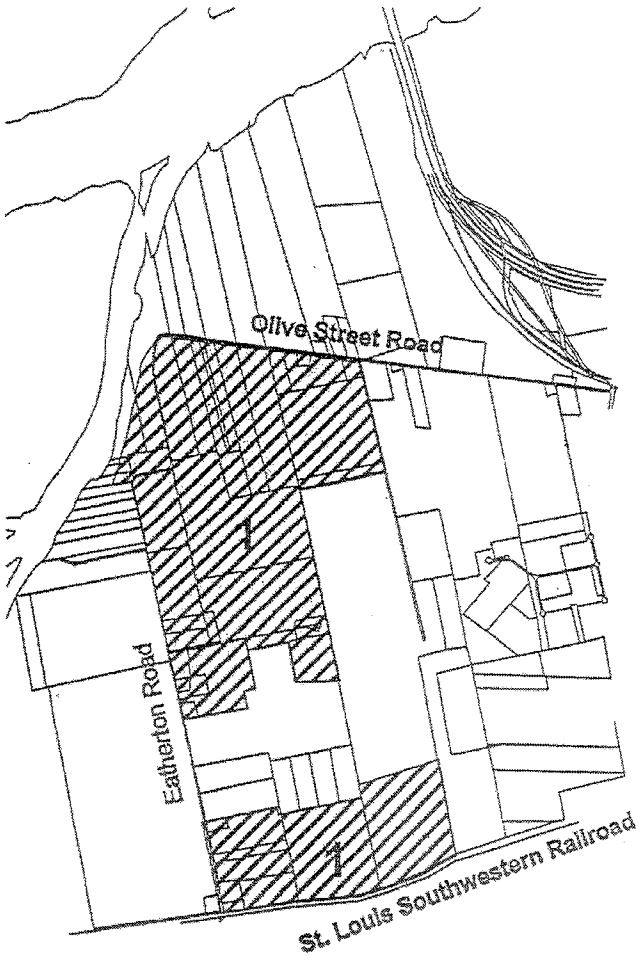
Passed and approved this 21ST day of MAY, 2001.

MAYOR

ATTEST:

Martha L. McMay
CITY CLERK

Chesterfield Valley Master Plan



1. Existing: Agricultural/Flood Plain/Conservation
   Proposed: Low Intensity Industrial (new)
   Location: South of Olive Street Road, East and West of Eatherton Road to City Limits, and South and East of Monarch-Chesterfield Levee

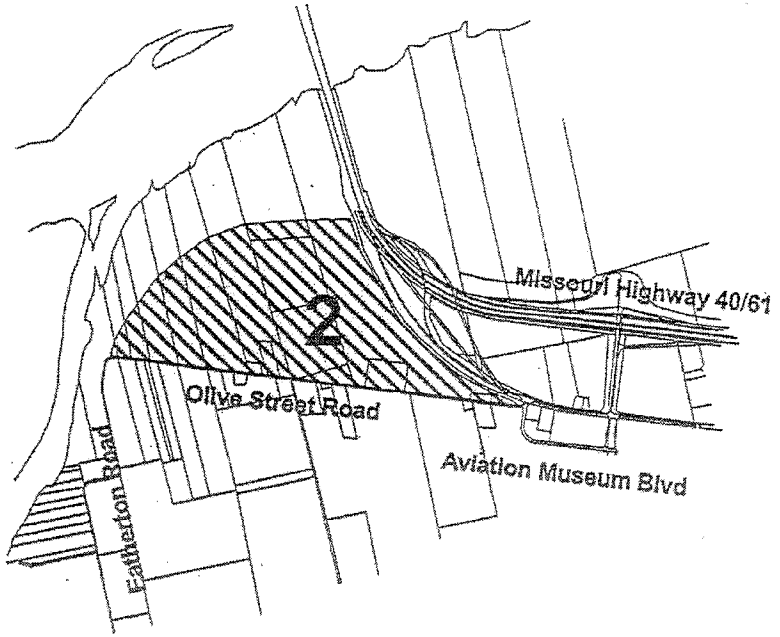
Note: This section of the Chesterfield Valley Master Plan includes the portions not reviewed in Phase III of the "Chesterfield Valley Master Plan and Implementation Strategy," dated October 1999.

Not To Scale

Prepared by the Department of Planning
City of Chesterfield, MO
April, 2001

Chesterfield Valley Master Plan

2. Existing: Agricultural/Flood Plain/Conservation
   Proposed: Low Density Office/Retail
   Location: North of Olive Street Road,
   South and West of Highway 40/61,
   West of Aviation Museum Boulevard,
   East & South of Monarch-Chesterfield Levee

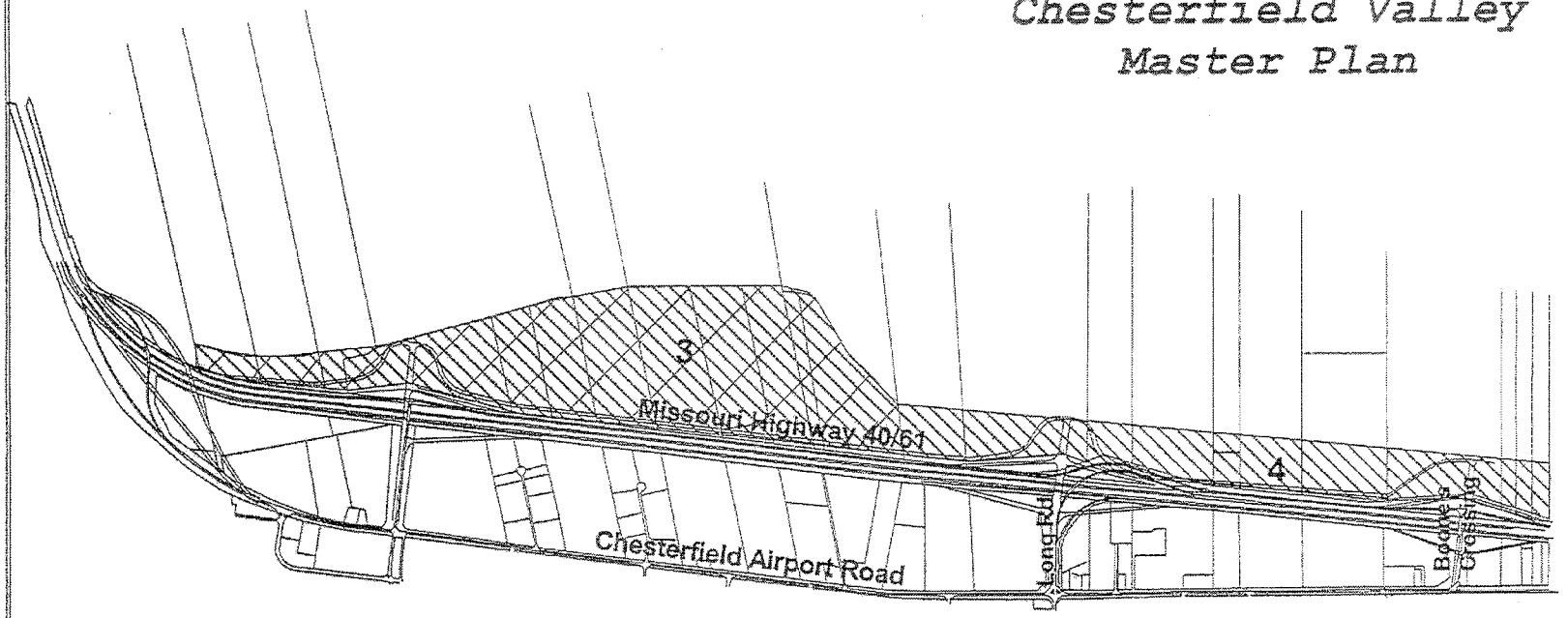


Note: This section of the Chesterfield Valley Master Plan includes the portions not reviewed in Phase III of the "Chesterfield Valley Master Plan and Implementation Strategy," dated October 1999.

Not To Scale

Prepared by the Department of Planning
City of Chesterfield, MO
April, 2001

Chesterfield Valley Master Plan



3. Existing: Agricultural / Flood Plain / Conservation
   Proposed: Mixed Commercial
   Location: North side of Highway 40/61
   West of Boone's Crossing Interchange
   South of Monarch Chesterfield Levee

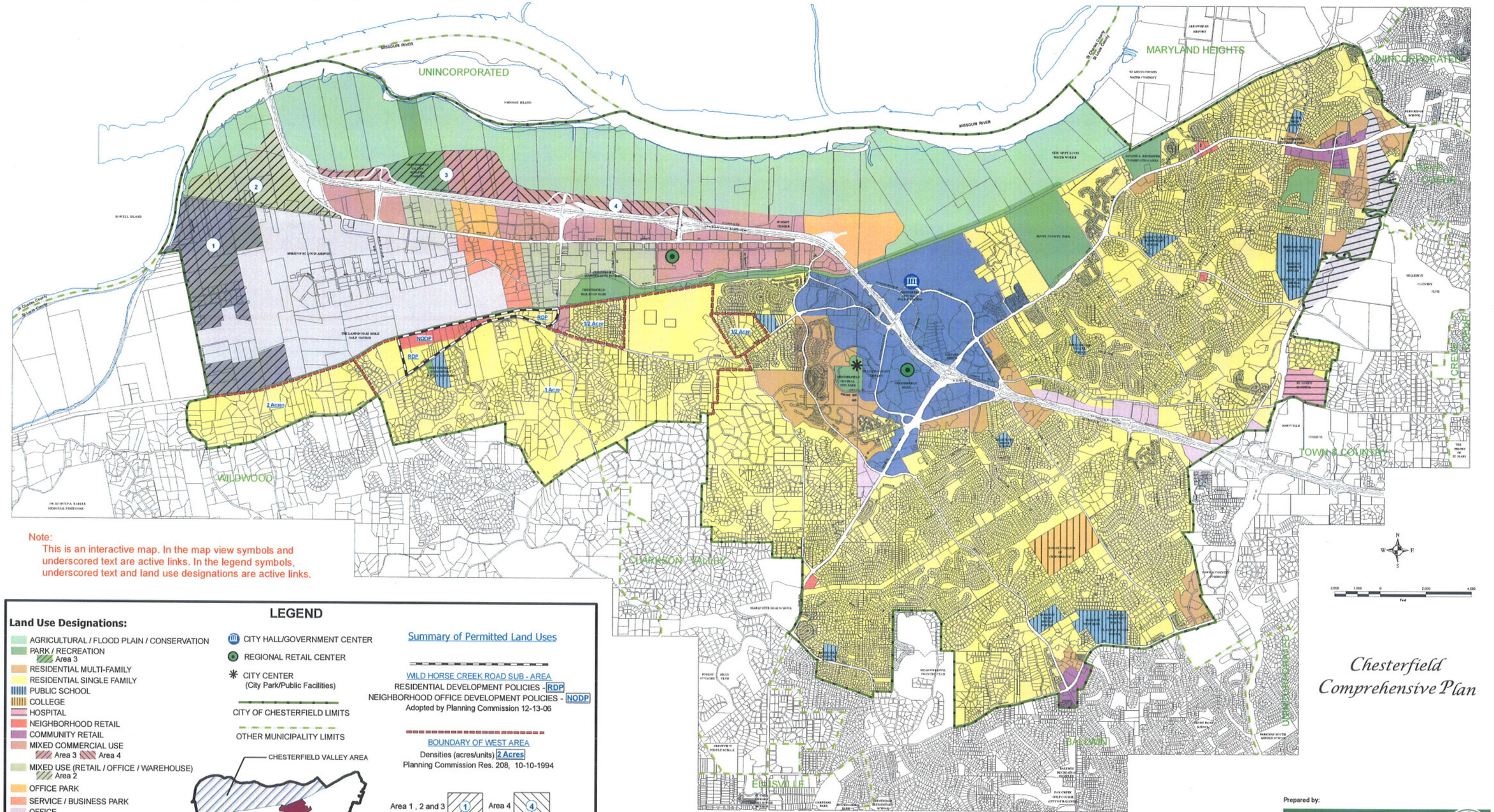
4. Existing: Agricultural / Flood Plain / Conservation
   Proposed: Mixed Commercial
   Location: North side of Highway 40/61
   East of Boone's Crossing Interchange
   South of Monarch Chesterfield Levee

Not To Scale

Note: This section of the Chesterfield Valley Master Plan includes the portions not reviewed in Phase III of the "Chesterfield Valley Master Plan and Implementation Strategy," dated October 1999.

Prepared by the Department of Planning
City of Chesterfield, MO
April, 2001

LAND USE PLAN



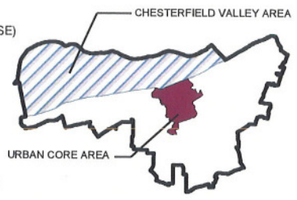
Note:
This is an interactive map. In the map view symbols and underscored text are active links. In the legend symbols, underscored text and land use designations are active links.

LEGEND

Land Use Designations:

- AGRICULTURAL / FLOOD PLAIN / CONSERVATION
- PARK / RECREATION
  - Area 3
- RESIDENTIAL MULTI-FAMILY
- RESIDENTIAL SINGLE FAMILY
- PUBLIC SCHOOL
- COLLEGE
- HOSPITAL
- NEIGHBORHOOD RETAIL
- COMMUNITY RETAIL
- MIXED COMMERCIAL USE
  - Area 3
  - Area 4
- MIXED USE (RETAIL / OFFICE / WAREHOUSE)
  - Area 2
- OFFICE PARK
- SERVICE / BUSINESS PARK
- OFFICE
- URBAN CORE
- SPIRIT AIRPORT
- LOW INTENSITY - INDUSTRIAL
  - Area 1
- CORRIDOR FOR FUTURE 141 EXTENSION

- CITY HALL/GOVERNMENT CENTER
- REGIONAL RETAIL CENTER
- CITY CENTER (City Park/Public Facilities)
- CITY OF CHESTERFIELD LIMITS
- OTHER MUNICIPALITY LIMITS



Summary of Permitted Land Uses

WILD HORSE CREEK ROAD SUB - AREA
RESIDENTIAL DEVELOPMENT POLICIES - RDP
NEIGHBORHOOD OFFICE DEVELOPMENT POLICIES - NODP
Adopted by Planning Commission 12-13-06

BOUNDARY OF WEST AREA
Densities (acres/units) 2 Acres
Planning Commission Res. 208, 10-10-1994

Area 1 , 2 and 3 (1) Area 4 (4)

CHESTERFIELD VALLEY MASTER PLAN SUB - AREA
Adopted by Planning Commission 02-08-99

Updated Through December 13, 2006

Chesterfield Comprehensive Plan

Prepared by:

The Mapping Section
of the Engineering Division
of the Public Works Department

Terms of Use:
This Map has been prepared from the most reliable information obtainable. We cannot, however, due to circumstances beyond our control, guarantee complete accuracy. Any errors or omissions brought to our attention will be appreciated and will be corrected in subsequent updates. Rev: 4-11-2007

The Mapping Section of the Engineering Division of the Public Works Department

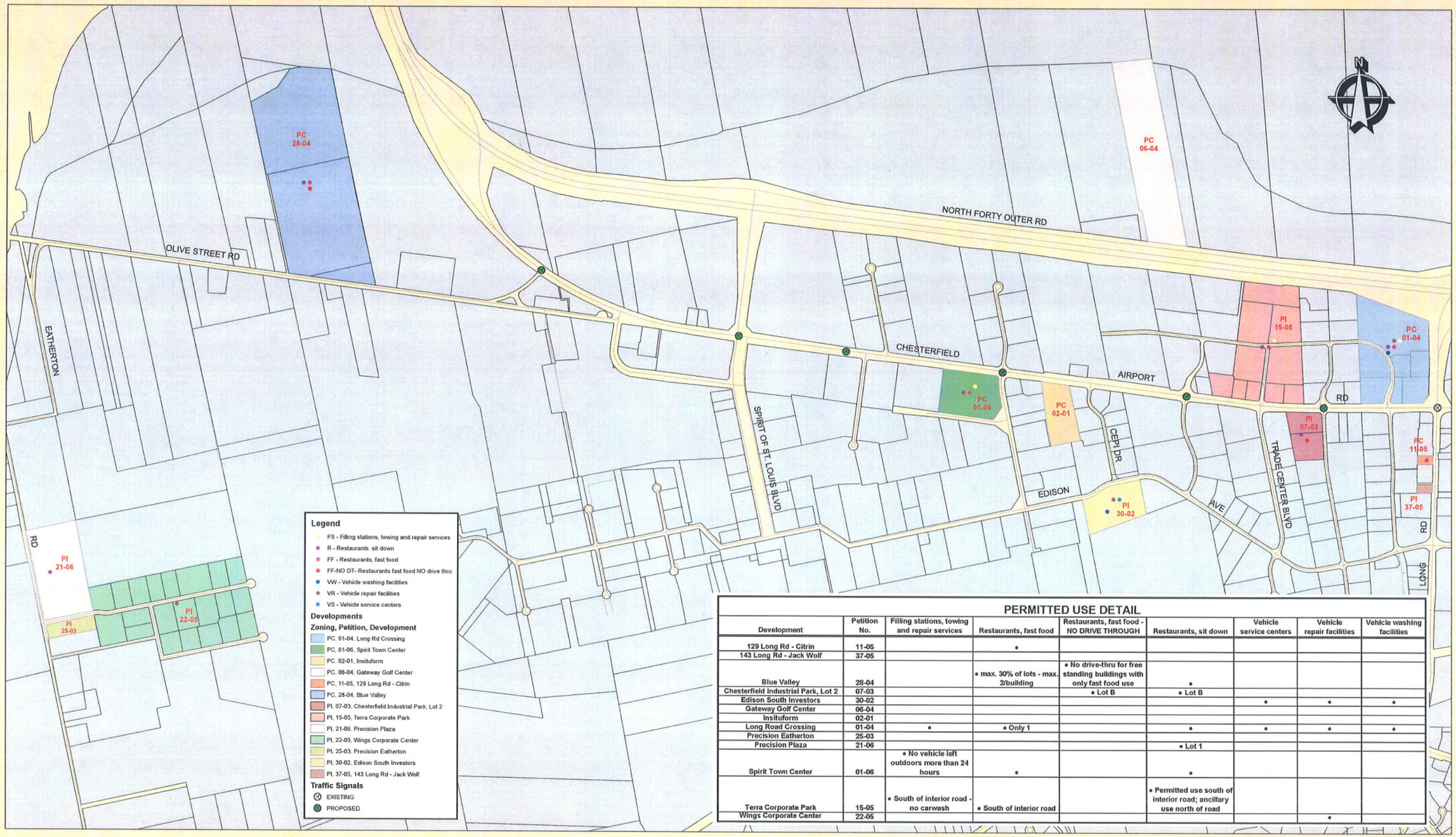
This Map has been prepared from the most reliable information obtainable. We cannot, however, due to circumstances beyond our control, guarantee complete accuracy. Any errors or omissions brought to our attention will be appreciated and will be corrected in subsequent updates. June 04, 2007

Zoning Type

- C8 Planned Commercial District
- PC Planned Commercial
  207 Acres
- PI Planned Industrial District
- M3 Planned Industrial District
  1507 Acres

Commercial and Industrial Zoning

as of 4-24-2007



PERMITTED USE DETAIL

Development	Petition No.	Filling stations, towing and repair services	Restaurants, fast food	Restaurants, fast food - NO DRIVE THROUGH	Restaurants, sit down	Vehicle service centers	Vehicle repair facilities	Vehicle washing facilities
129 Long Rd - Citrin	11-05		•					
143 Long Rd - Jack Wolf	37-05							
Blue Valley	28-04		• max. 30% of lots - max. 2/building	• No drive-thru for free standing buildings with only fast food use	•			
Chesterfield Industrial Park, Lot 2	07-03			• Lot B	• Lot B			
Edison South Investors	30-02					•	•	•
Gateway Golf Center	06-04							
Insituform	02-01							
Long Road Crossing	01-04	•	• Only 1		•	•	•	•
Precision Eatherton	25-03							
Precision Plaza	21-06				• Lot 1			
Spirit Town Center	01-06	• No vehicle left outdoors more than 24 hours	•		•			
Terra Corporate Park	15-05	• South of interior road - no carwash	• South of interior road		• Permitted use south of interior road; ancillary use north of road			
Wings Corporate Center	22-05						•	

Prepared By:

The Mapping Section of the Engineering Division of the Public Works Department

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Last Revised January 19, 2007

R:\GIS Projects\PDF\Exhibits\exhibit MG 1-19-07.pdf

Select Permitted Uses
Chesterfield Valley West of Long Road

0 250 500 1,000 1,500 2,000 Feet

City of Chesterfield