Appendix A
Summary of Contractual Street Projects

MILL/REPAVE					
Street	Ward 1	Ward 2	Ward 3	Ward 4	
Clear Meadows Phase 2	$143,158				
Portwind	$173,496				
Romine Circle		$105,605			
Morena		$173,091			
Graywood Phase 2			$149,863		
Rue Montand			$30,136		
Sunnyslope			$40,114		
Brightspur			$156,899		
Running Creek				$171,951	
Advertising	$250	$250	$250		
MILL/REPAVE TOTALS	**$316,904**	**$278,946**	**$377,262**	**$171,951**	**$1,145,063**

SLABS ONLY					
Street	Ward 1	Ward 2	Ward 3	Ward 4	
Buckhurst Dr				$20,850	
Panhurst				$10,613	
Buckhurst Ct				$41,262	
Advertising				$250	
SLABS ONLY TOTALS				**$72,975**	**$72,975**

ASPHALT OVERLAY OF CONCRETE STREETS					
Street	Ward 1	Ward 2	Ward 3	Ward 4	
Whiteacre Court		$54,074			**$54,074**

CRACKSEALING - CONTRACTURAL					
Street	Ward 1	Ward 2	Ward 3	Ward 4	
Cracksealing	$18,540	$7,454	$21,428	$5,945	
Advertising for Bids	$125	$125	$125	$125	
CRACKSEALING TOTAL	**$18,665**	**$7,579**	**$21,553**	**$6,070**	**$53,867**

	Ward 1	Ward 2	Ward 3	Ward 4	
Total Streets Budget (contractual)	**$335,569**	**$340,599**	**$398,815**	**$250,996**	**$1,325,979**
% of street budget	25%	26%	30%	19%	
% of streets in ward	23%	27%	28%	22%	

CAPITAL STREET PROJECTS	
Henry Ave.-engineering (80% reimbursable)	**$91,478**

TOTAL STREET BUDGET	**$1,417,457**

Henry Ave. project is considered a non-ward specific street. Therefore, this federally funded project is excluded from the ward funding distribution.

Appendix B
Contractual Cracksealing

The list for 2015 is separated into two groups. The "A" streets have extensive cracksealing throughout their length. The "B" streets have asphalt surfaces that have very few cracks, but require the edge of the asphalt to be sealed. The costs per mile will be significantly different for each type street.

Ward 1	Ward 2	Ward 3	Ward 4
"A" STREETS			
Ball Park Dr (Manchester – Jefferson)	Aspen Village Dr.	Bellerive Dr	Castle Ridge
Barker La (#144-cul-de-sac)	Kehrs Mill Ridge Dr	Bitterfield Ct	Woodside
Breezeview Dr	Oakwood Farms Ct	Burlington Mill Dr	Woodrun Ct
Brookside La	Stoney Creek Dr	Del Ray Ct	
Crowsnest Dr	Westpar Dr	Five Meadows La	
Kehrs Mill Bend Dr	Falmouth Ave	Glen Meadows Dr	
Kehrs Mill Trail	Travella Ct	Glenn Dr	
Magnolia Trace Dr		Hideaway La	
Pointe Lansing Ct.		Holly Terrace Ct	
Windcliffe Dr (Breezeview-Portwind)		Jares Ct (Muir View- Agean Way)	
Steamboat La		Mansion Hill Dr	
Treasure Cove		Meadowbrook Country Club	
Vail Ct		Monroe Mill Dr	
Pointe Lansing Circle		Monroe Mill Dr	
		Mountview Ct	
		Norwich Ct	
		Norwood Circle	
		South Woodsmill Rd	
		Silver Creek La	
		Silver Creek La	
		Spooners Mill Dr	
		Spragues Mill Ct	
		Spragues Mill Dr	
		Spring Lake Ct	
		Trailwood Dr	
		Wellshire Ct	
		Wild Oak Ct	
		Woodruff Dr	
"B" STREETS (Edges only)			
Clear Meadows Dr	Cumberland Dr.	Spring Meadows Dr $991	Twigwood Dr
Portwind Pl	East Skyline Dr		Running Creek
St. Joseph Dr	East Skyline Dr		
Towercliffe Dr	Nottingham Dr		

Appendix C
Summary of Sidewalks & Curb Ramps

Street	Ward 1	Ward 2	Ward 3	Ward 4	
Clear Meadows Phase 2	$8,092				
Whiteacre Ct		$2,057			
Morena		$3,484			
Graywood Phase 2			$4,692		
Rue Montand			$2,770		
Sunnyslope			$3,768		
Brightspur			$9,572		
Buckhurst Dr				$6,580	
Buckhurst Ct				$4,848	
Panhurst				$1,154	
Running Creek				$6,831	
Statewood				$9,979	
Golfwood				$13,969	
Ballwood/Marywood				$7,264	
Lemonwood				$6,048	
Goldwood				$6,047	
Blazedwood				$5,269	
Bitterwood				$2,120	
Arborwood				$4,000	
TOTALS SIDEWALKS & RAMPS	**$8,092**	**$5,541**	**$20,802**	**$74,109**	**$108,544**

Appendix D
Role of Public Works

In 2006, contracted slab replacement was supplemented with in-house slab replacement. City crew cannot match a contractor's productivity due to size of equipment and crew size. With the amount of slab replacement work assigned to city crews, resident requests were not responded to in a timely manner. In 2011, the in-house slab replacement work was significantly reduced, but not eliminated. Beginning in 2012, the role of the Public Works employees is of a maintenance nature, leaving construction work to contractors who are better suited. With this in mind, city crews will focus on calls for service/work requests.

There are many sidewalk tripping hazards where grinding by an employee is not possible.
The only solution is replacement. Beginning in 2012, sidewalk replacement and curb ramp upgrade to current ADA regulations has been included on streets where slabs are being replaced or the street is resurfaced by contract. We believe this will be a cost effective way to address these hazards in a timelier manner. City crews will continue grinding small trippers and replace sidewalks on other streets.

Appendix E
Pavement Treatments

In the early 1980s the City began asphalt overlaying concrete streets. It is my understanding that this decision was to overlay all concrete streets. The 1989 annexation area consisted primarily of concrete streets, both exposed concrete and overlaid concrete. The south annexed areas which are in Ward 2 and 4 were mostly exposed concrete. The north annexed area, primarily in Ward 3, had already been overlaid by St. Louis County. Overall, approximately 80% of city streets are a combination of exposed concrete and overlaid concrete.

The arterial streets (Holloway, Ries, Old Ballwin, New Ballwin, and Kehrs Mill Road) were reconstructed with full depth asphalt pavements. The 1992 street bond issue was passed to upgrade streets with curb and gutters, storm sewers, and a sidewalk on one side. These streets were also full depth asphalt pavements. Historically, full depth asphalt pavement requires little maintenance. Repairs are simpler and are usually completed the same day compared to concrete pavement which can take up to five days to reopen to traffic.

Recognizing the long term maintenance benefits of full depth asphalt pavement, Section 25-91 of the code of ordinances was modified in 1997 to require new streets to be full depth asphalt with

concrete curb and gutters. Unfortunately, there were many concrete streets already in place, many with overlays.

Initially, the overlays were kept a foot from the gutter to maintain the curb for drainage. This posed a problem at driveways. The thick asphalt edge created a trough affect for entering and departing. In response, the edges of the new overlaying were feathered to about one inch. This became acceptable. However, over time the thinner asphalt began to unravel creating a maintenance issue. The underlying concrete pavement expanded and contracted and in some locations there was minor vertical movement, causing reflective cracking. This reflective cracking became the source of further deterioration.

Since 2007, at the recommendation of the pavement maintenance engineer who assessed the streets, new overlays include a stress absorbing membrane interface (SAMI) between the concrete pavement and the new asphalt overlay. The purpose of the SAMI is to distribute the stresses caused by the underlying concrete pavement movement. The SAMI appears to have delayed the appearance, number, and size of reflective cracks.

Regardless of the overlay structure, the life expectancy of asphalt overlays is 12-15 years. However, due to funding limitations, some overlays exceed 15 years. Replacing overlays (mill/repave) are costly.

Budgeting for mill/repave projects is difficult because the deteriorated underlying slabs are hidden by the overlay. Once the overlay is removed, deteriorated concrete slabs are identified and replaced. If the cost of replacing all deteriorated slabs is less than a new overlay, then the street is not repaved. To be eligible for not repaving, no new asphalt patches are acceptable otherwise the street will be repaved.

Asphalt overlaying concrete pavement ceased in 2010 in order to minimize the future high cost of milling/repaving. Since then slabs have been replaced as needed.

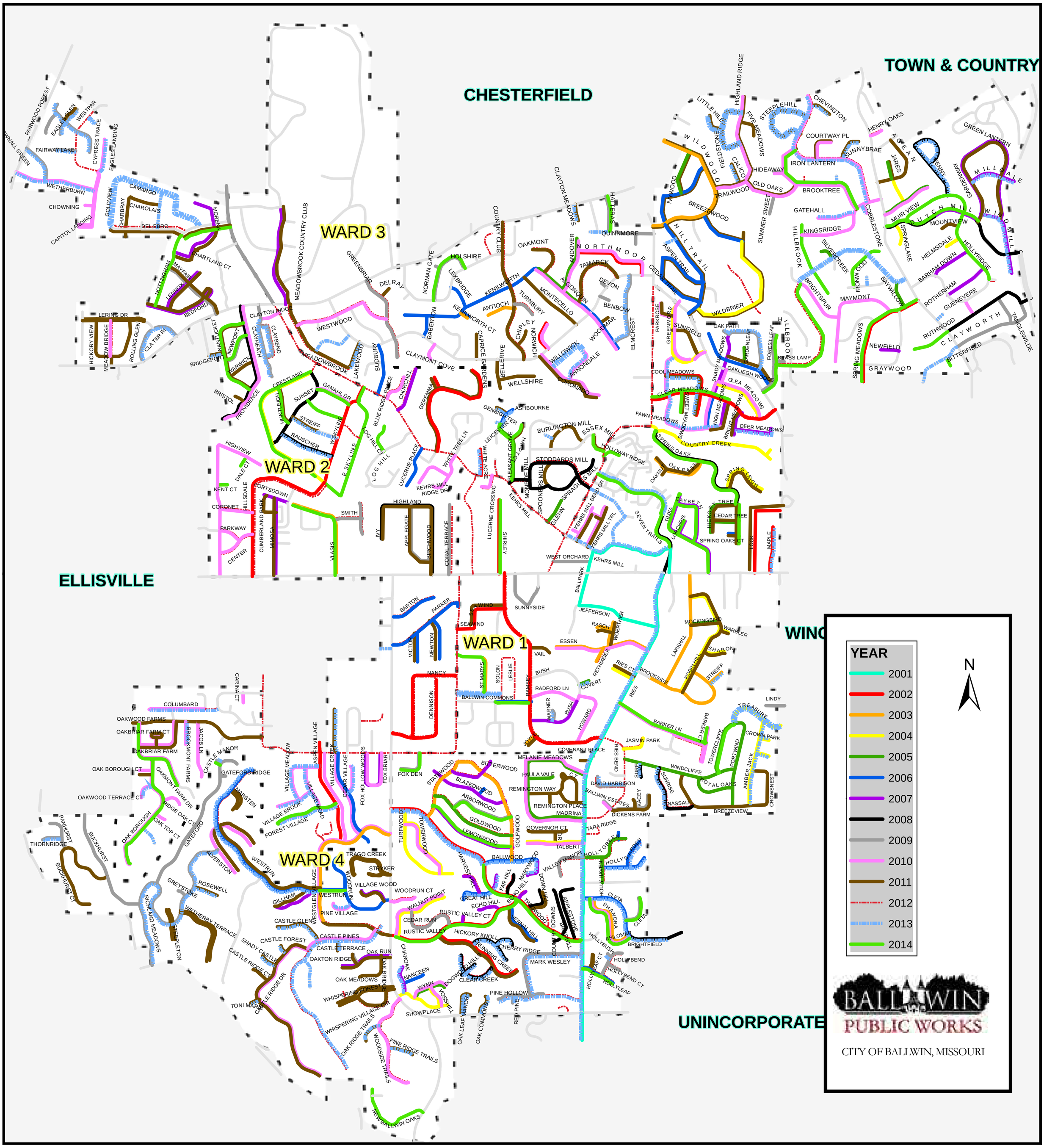
Cracks are sealed to prevent intrusion of water into the cracks which due to freezing and thawing widen the cracks further resulting in pavement failure. Sealing cracks is best performed in the fall when the cracks are the widest and the weather is usually dry. However, in-house cracksealing was curtailed during the leaf collection program. Since 2009, much more sealing has been completed by contract. The goal is to seal streets on a 7-8 year cycle which is possible by contracting.

Two other pavement treatments that have been used on a limited basis are microsurfacing and chip/seal. Microsurfacing requires the asphalt pavement to be in good condition, free of major distresses. Chip/seal can be used on other asphalt pavements.

To be cost effective microsurfacing requires large quantities for bidding purposes. This treatment is intended to only have a life expectancy of about five years. Microsurfacing wears off exposing the underlying asphalt surface. The black (due to the color of the rock used) microsurfacing contrasts with the underlying oxidized old asphalt pavement.

Chip/seal uses crushed rock imbedded in tack oil applied to the asphalt pavement. The rock is rolled into the oil, and then followed by a sweeper collecting the excess rock. Loose rock can be expected for 3-4 weeks.

2001 - 2014 YEAR OF STREET IMPROVEMENTS



2000 - 2014 TYPE OF STREET IMPROVEMENTS

CLARKSON VALLEY
CHESTERFIELD
TOWN & COUNTRY
ELLISVILLE
WINCHESTER
MANCHESTER
VALLEY PARK
UNINCORPORATED
WARD 1
WARD 2
WARD 3
WARD 4

LEGEND

TYPE

- ASPHALT OVERLAYS
- MICROSURFACING / NOVA CHIP
- MILL & REPAVE
- RECONSTRUCTION
- CHIP SEAL
- SLABS ONLY
- CRACK SEAL

WARDS

N

BALLWIN PUBLIC WORKS
CITY OF BALLWIN, MISSOURI

2004 - 2014
Mill & Repave

2004 - 2014
Slabs Only

JOINT SEAL
2003-2014

MEADOWBROOK COUNTRY CLUB
PRIVATE
CLAYTON
CLAYMONT
WELLSHIRE
ANDREWS PARKWAY
MANCHESTER
HIGHLAND
ORCHARD
BALLWIN COMMONS
COACHGATE
PRIVATE
ANTIOCH
KENILWORTH
QUINNMOOR
NORTHMOOR
HATTERAS
ANDOVER
OAKMONT
CHAMPION WAY
WILDFOREST
WILDBRIER
WILDOAK
TRAILWOOD
HILLTRAIL
TALLEYRAND
GATEHALL
KINGRIDGE
BROOKTREE
HIDEAWAY
OLD OAKS
TREEWOOD
IRON LANTERN
CHEVINGTON
CLINTON VALLEY
HENRY OAKS
PENNY
DUTCH MILL
MOUNTVIEW
MILL DALE
GREEN LANTERN
CLUBHOUSE
PEBBLE LAKE
IRONGATE MANSION
WOODS MILL
WESTSIDE
WETHERBURN
CHOWNING
GOLFVIEW
CHARBRAY
CHAROLAIS
ANGUS
DELEBRO
AUBREY
KEHRS MILL
MEADOWBROOK
CLAYTONBROOK
LIGHTNEHAM
HENSHAW
BEDFORD
LERING
HICKORY VIEW
ROLLING MEADOW BRIDGE
ROLLING GLEN
CLA TERR
NANTUCKET
CLAYTON RIDGE
CLAYBEND
WESTWOOD
WOODRIFF
SUDBURY
GREENRIDGE
LONDONDARY
NORHAM GATE
BRIARWICK
LEXBRIDGE
KENILWORTH
ANTIOCH
COACHGATE CLUB
TIMBERLEY
NORWICH
WILDWICK
CROMWELL
DEVON
BENBOW
ELMCREST
ALGONQUIN
TAMARACK
ANDOVER
MONTFIELD
WORKMAN
ABERTON
GLAYMONT COVE
SHAWNSCOVE
CLAYMONT
BELLERIVE
WELLSHIRE
BURLINGTON MILL
DEBICH
GERMMA
CHURCHILL
KEHRS MILL
WHITE ROCK RIDGE
BRISTOL
HUNTLEIGH
SUNSET
LINDELL
STREIFF
RAUSCHER
SKYLINE
LOG HILL
PINE TREE
WHITE TREE
PALOMINO
HIPPY
STORS MILL
WINDSOR MILL
STODDARDS MILL
SPRAGUES MILL
SHOEMAKER MILL
ESSEX MILL
NEWBURY
BLUE SAGE
BOLTON
HOLLOWAY RIDGE
COUNTRY CREEK
WATFORD
GREENYARD
BRITE STAR
AZTEC
TARA
OLD SPANISH
TRAIL
VALLEY TRAIL
OAK PASS
DEER MEADOWS
HOLLOWAY
STANDREWS
COOL MEADOWS
SWEET MEADOWS
HIGH MEADOWS
BRIGHT MEADOWS
FAIR MEADOWS
CLEAR MEADOWS
BEAU MEADOWS
FAIR VIEW
SUNFIELD
BAXTER
GREENRIDGE
OAKLEIGH WOODS
GLENLEAF
OAKHAVEN
FOREST LEAF
BRASSLAMP
SWEETWOOD
BRIERSPUR
WILLOWBROOK
SILVERSPUR
IRONWOOD
GLENMEADOW
MANORCREST
STANSTONE
SPRING MEADOWS
NEWFIELD
GRAYWOOD
MAYMONT
BRIERFIELD
CHANCELLOR HEIGHTS
GRELEY
ROTHERHAM
RUSTIC VALLEY
DAYWORTH
BRIERFIELD
HEATHERBROOK
HEATHERBROOK
GREELEY
GREELEY PARK
HEATHERBROOK
BRIERHAM DOWN
HEATHERBROOK
HEATHERBROOK
HEATHERBROOK